

Quality of Surface Waters of the United States 1959

Parts 7 and 8. Lower Mississippi River Basin
and Western Gulf of Mexico Basins

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1644

*Prepared in cooperation with the States
of Arkansas, Kansas, Louisiana, New
Mexico, Oklahoma, and Texas, 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

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PREFACE

This report was prepared by the Geological Survey in cooperation with the States of Arkansas, Kansas, Louisiana, New Mexico, Oklahoma, and Texas, 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, 1959

PARTS 7 and 8

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 other Federal agencies deal with the amounts of matter in solution and in suspension in streams.

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

Publication of annual records of chemical analyses, suspended sediment, and water temperature was begun by the Geological Survey in 1941. 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. The records were published in four volumes from 1950 to 1958 and beginning in 1959 they were published in five volumes. The drainage basins covered in the five volumes are shown in Figure 1. The samples for which data are given in this volume were collected from October 1, 1958, to September 30, 1959. The records are arranged by drainage basins according to Geological Survey practice in reporting records of streamflow: Stations on tributary streams are listed between stations on the main stem in the order in which those tributaries enter the main stem.

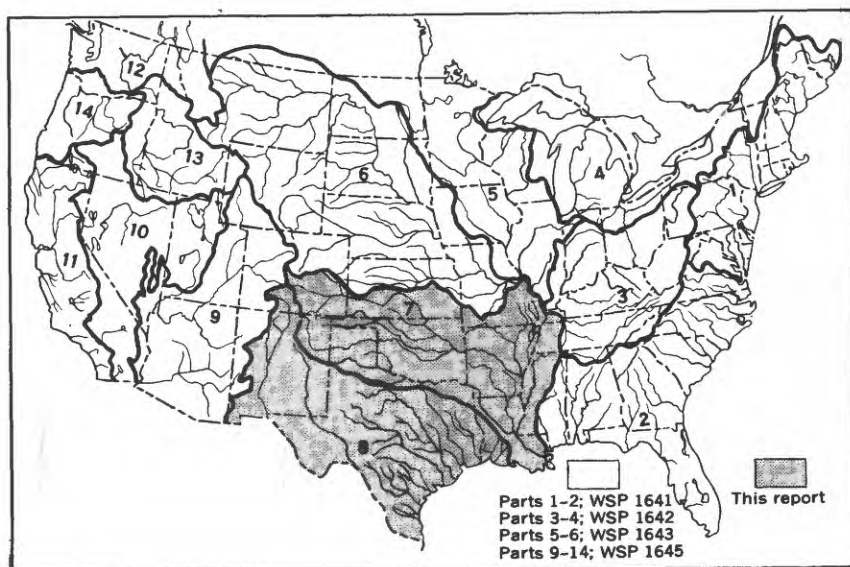


Figure 1. --Map of the United States showing basins covered by the five water-supply papers on quality of surface waters in 1959. The shaded portion represents the section of the country covered by this volume; the unshaded portion represents the section of the country covered by other water-supply papers.

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 for which regular series of 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, 1959, the Geological Survey maintained 178 stations on 101 streams for the study of chemical and physical characteristics of surface water. Samples were collected daily or monthly at 159 of these locations for chemical-quality studies. Samples were also collected less frequently at many other points. Water temperatures were measured at 111 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 28.

Quantities of suspended sediment are reported for 28 stations during the year ending September 30, 1959. Sediment samples were collected one or more times daily during periods of significant flow at most of the continuous-record stations. Particle-size distributions of sediments were determined for 21 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 spatial concentration that existed without regard to the variable velocities of the individual fluid elements.

The nearly uniform dispersed ions of the solute move with the velocity of the transporting media. The mean section concentration of solutes determined from samples is a precise measure of the solute. The mean section concentration obtained from suspended-sediment samples is a less precise measure of the total sediment load, because sediment samplers do not traverse the bottom 0.4 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 suspended sediment loads presented in this report are usually less than the total sediment loads. For most streams the difference between the suspended 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, 1948, p. 70-76 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 about 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 sediments 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) 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 obtained in the laboratory by use of volumetric glassware. The analytical results thus obtained 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 equivalent to parts per million.

Chemical equivalence in equivalents per million (epm) 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 terms "equivalents per million" is a contraction which has been generally adopted for convenience. In more exact language, these units are "milligram equivalents per kilogram" if derived from part-per million data, or "milligram equivalents per

liter" if derived from data expressed in milligrams per liter. Equivalent weights may be computed for use with any of the systems of expression of data (Hem, 1959, p. 30-34).

In an analysis expressed in equivalents per million, unit concentrations of all ions are chemically equivalent.

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by	Ion	Multiply by
Aluminum (Al^{+3})	0.11119	Iron (Fe^{+3})	0.05372
Barium (Ba^{+2}) . . . . .	.01456	Lead (Pb^{+2}) . . . . .	.00965
Bicarbonate (HCO_3^{-1}) . . . . .	.01639	Lithium (Li^{+1}) . . . . .	.14409
Bromide (Br^{-1}) . . . . .	.01251	Magnesium (Mg^{+2}) . . . . .	.08224
Calcium (Ca^{+2}) . . . . .	.04990	Manganese (Mn^{+2}) . . . . .	.03640
Carbonate (CO_3^{-2}) . . . . .	.03333	Nitrate (NO_3^{-1}) . . . . .	.01613
Chloride (Cl^{-1}) . . . . .	.02820	Phosphate (PO_4^{-3}) . . . . .	.03159
Chromium (Cr^{+6}) . . . . .	.11536	Potassium (K^{+1}) . . . . .	.02558
Copper (Cu^{+2}) . . . . .	.03148	Sodium (Na^{+1}) . . . . .	.04350
Fluoride (F^{-1}) . . . . .	.05263	Strontium (Sr^{+2}) . . . . .	.02282
Hydrogen (H^{+1}) . . . . .	.99206	Sulfate (SO_4^{-2}) . . . . .	.02082
Hydroxide (OH^{-1}) . . . . .	.05880	Zinc (Zn^{+2}) . . . . .	.03059
Iodide (I^{-1}) . . . . .	.00788		

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. 23) 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 or time-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 the 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.

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 is that 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 and sediment concentration when sample was collected, the concentration of the suspension during analysis, and the method of analysis.

COMPOSITION OF SURFACE WATERS

All natural waters contain dissolved mineral matter. Water in contact with soils or rock, even for only a few hours, will dissolve some 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.

In this report, dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Values reported for sodium (Na) are determined by analysis and do not include potassium (K).

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, agriculture, 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-in-flow carrying appreciable quantities of chloride. Large quantities of chloride may affect the industrial use of water by increasing the corrosiveness of waters that contain large quantities of calcium and magnesium.

Fluoride (F)

Fluoride has been reported as being present in some rocks to about the same extent as chloride. However, the quantity of fluoride in natural surface waters is ordinarily very small compared to that of chloride. Recent investigations indicate that the incidence of dental caries is less when there are small amounts of fluoride present in the water supply than when there is none. However, fluoride in excessive concentrations is undesirable in waters used for drinking. It is stated in a comprehensive report by the California State Water Pollution Control Board (1952, p. 257) on water-quality standards "... that water containing less than 0.9 to 1.0 ppm of fluoride will seldom cause mottled enamel in children, and for adults concentrations less than 3 or 4 ppm are not likely to cause endemic cumulative fluorosis and skeletal effects."

Nitrate (NO₃)

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 NO₃) 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 NO₃) may contribute to meth-

moglobinemia ("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 or more (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.

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 Cr in the hexavalent form constitutes ground for rejection of a water for domestic use on the basis of the standards of the U. S. Public Health Service (1946).

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 (1946) recommends that copper should not exceed 3.0 ppm

in drinking and culinary water on carriers subject to Federal quarantine regulations.

Lead (Pb)

Lead is only a minor element in most natural waters, but 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 0.1 ppm are significant, as this concentration is the upper limit for drinking water in the standards adopted by the U. S. Public Health Service (1946). 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 moderate concentrations is not known to have adverse physiological effects on man or stock, but zinc salts give water an unpleasant astringent taste and form a greasy film on boiling water (Howard, 1923, p. 411). The U. S. Public Health Service (1946, p. 13) recommends that the zinc content not exceed 15 ppm in drinking and culinary water on carriers subject to Federal quarantine regulations.

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 (1946) states that salts of barium, which have a deleterious physiological effect, must not be added to drinking and culinary water on carriers subject to Federal quarantine regulations.

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. Probably trace amounts of bromide are of frequent occurrence in surface water since compounds containing bromine are generally readily soluble. It resembles chloride in that it tends to be concentrated in sea water.

Iodide (I)

Iodine, like bromine, is a minor element and is normally present in natural 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 occurs in sea water to the extent of less than 1 ppm. Rankama and Sahama (1950, p. 767) report iodide present in rain-water to the extent of 0.001 to 0.003 ppm and in river water in about the same amount. Few waters will be found to 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. Water that has less than 60 parts per million of hardness is usually rated as soft and suitable for many purposes without further softening. Waters with hardness ranging from 61 to 120 parts per million may be considered moderately hard, but this degree of hardness does not seriously interfere with the use of water for many purposes except for use in high-pressure steam boilers and in some industrial processes. Waters with hardness ranging from 121 to 200 parts per million are considered hard, and laundries and industries may profitably soften such supplies. Water with hardness above 200 parts per million generally required some softening before being used for most purposes.

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:

$$SAR = \sqrt{\frac{Na^{+}}{Ca^{++} + Mg^{++}}} \times \frac{1}{2}$$

where the concentrations of the ions are expressed in milliequiv-

alents 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 dividing points are at SAR values of 19, 18, and 26, but at 5,000 micromhos the corresponding dividing points 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)

The specific conductance of a water is a measure of its capacity to conduct a current of electricity (see p. 8). The conductance varies with the concentration and degree of ionization of the different minerals in solution and with the temperature of the water. When considered in conjunction with results of determinations for other constituents, specific conductance is a useful determination and plays an important part in indicating changes in concentration of the total quantity of dissolved minerals in surface waters.

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

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 pres-

ence 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 0.01 to 0.1 ppm.

Detergents (ABS). -- The major type of detergents is the alkylbenzene-sulfonate group, which are highly resistant to biological degradation so that the effect of ABS in water persists over a long period of time. Waste water may carry these detergents to surface water supplies with resulting deterioration of water quality which includes unpleasant taste, odor, and foaming. Very little is known concerning the nature and the extent of occurrence and movement of detergents in waters or of the chemical and physical change that they may undergo after being added to surface waters (U.S. Geological Survey-Federal Housing, 1959).

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).

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 soil 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 sand size (larger than 0.062 mm) range do not appear to be affected by flocculation or dispersion resulting from the mineral constituents in solution. 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 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.

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 1941-59, are listed below:

Numbers of water-supply papers containing records for
Parts 7 and 8, 1941-59

Year	WSP	Year	WSP	Year	WSP	Year	WSP
1941	942	1946	1050	1951	1199	1956	1452
1942	950	1947	1102	1952	1252	1957	1522
1943	970	1948	1133	1953	1292	1958	1573
1944	1022	1949	1163	1954	1352	1959	1644
1945	1030	1950	1188	1955	1402		

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 25, D. C., who will, upon request, furnish lists giving prices.

COOPERATION

The table on p. 26 lists State and local agencies that cooperated in quality-of-water investigations in drainage basins included in this volume. The location of quality-of-water district offices responsible for the data collected are also given in this table.

Financial assistance was furnished by the Bureau of Reclamation of the United States Department of the Interior for some of the investigations in Oklahoma and New Mexico and by the Corps

State	Cooperating agency	Drainage basin	District office
Arkansas	Engineering Experiment Station, University of Arkansas, Dean George F. Branigan, director.	Lower Mississippi River	Room 2301 Federal Office Bldg. a 700 West Capitol Ave. Little Rock, Ark. 72201
Kansas	Kansas Water Resources Board, Robert L. Smith, executive secretary. Kansas, City of Wichita, Robert H. Hess, director of water.		Room 125 Nebraska Hall 901 North 17th St. Lincoln, Nebr. 68508
Louisiana	Louisiana Department of Public Works, Lorris M. Wimberly, director.	Lower Mississippi Western Gulf of Mexico	Vaughn Bldg. 807 Brazos St. Austin, Tex. 78701
New Mexico	New Mexico Interstate Stream Commission, J. H. Bliss, succeeded by George L. Reese, commissioner for New Mexico, and J. C. Wilson, commissioner for Texas.	Western Gulf of Mexico	P. O. Box 4217 Albuquerque, N. Mex. 87106
Oklahoma	Oklahoma Water Resources Board, Francis J. Borelli, executive director.	Lower Mississippi River	P. O. Box 4355 2300 S. Eastern Ave. Oklahoma City, Okla. 73109

a District office moved from Fayetteville to Little Rock in 1962.

State	Cooperating agency	Drainage basin	District office
Texas	<p>Texas Board of Water Engineers, consisting of Durwood Manford, chairman, R. M. Dixon, and O. F. Dent; the Brazos River Authority, the Canadian River Municipal Water Authority, the Chambers-Liberty Counties Navigation District, the cities of Dallas, Fort Worth, and Wichita Falls, the Colorado River Municipal Water District, the Greenbelt Municipal and Industrial Water Association, the Lower Colorado River Authority, the Lower Neches Valley Authority, the Red Bluff Water Power Control District, the Sabine River Authority, the Tarrant County Water Control Improvement District No. 1, the Texas Electric Service Company, the West Central Texas Municipal Water District, and the Wichita County Water Control and Improvement Districts.</p>	Lower Mississippi River Western Gulf of Mexico	Vaughn Bldg. 807 Brazos St. Austin, Tex. 78701

of Engineers, Department of the Army, for some investigations in Texas. The Corps also provided financial assistance and made most determinations of sediment concentrations and of particle-size of bed material in connection with the sedimentation investigations of the Mississippi River at St. Louis, Mo. The Soil Conservation Service of the United States Department of Agriculture assisted on special sedimentation studies in the Rio Grande basin in New Mexico. Assistance in collecting data was given by many individuals and by municipal, State, and Federal agencies.

In addition, many of the investigations were supported by funds appropriated directly to the Geological Survey. Studies of suspended-sediment loads in the middle Rio Grande in New Mexico were begun in 1948 as a Federal project.

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 of the Quality of Water Branch. The data were collected and prepared for publication under the supervision of district engineers or district chemists as follows; in Missouri and the Arkansas River basin in Kansas, D. M. Culbertson; in Oklahoma, T. B. Dover, succeeded by R. P. Orth; in Texas and Louisiana, Burge Irelan; in Arkansas, M. E. Schroeder; in New Mexico and the Rio Grande and Arkansas River basins in Colorado, J. M. Stow. Any additional information on file can be obtained by writing the responsible district office.

LITERATURE CITED

- American Society for Testing Materials, 1954, Manual on industrial water: Am. Soc. for Testing Mat., Philadelphia, Pa., p. 356.
- Baker, M. N., 1949, The quest for pure water: Am. Water Works Assoc., New York, N. Y.
- Brandt, H. J., 1948, Intensified injurious effects on fish, especially the increased toxic effect produced by a combination of sewage poisons: Chem. abs. 42, p. 9015.
- Busch, Werner, 1927, The applicability of electrometric titration to the determination of the solubility of slightly soluble oxides; Zeitschr. Anorg. Chem., v. 161, p. 161-179.
- California State Water Pollution Control Board, 1952, Water-quality criteria: California State Water Pollution Control Board, pub. 3., p. 257, 291-292, 377-378.
- 1954, Water-quality criteria: California State Water Pollution Control Board, pub. 3, Addendum no. 1., p. 291-292.

- Eriksson, E. , 1952, Composition of atmospheric precipitation II; sulfur, chloride, iodine compounds, bibliography: *Tellus*, v. 4, p. 280-303.
- Faucett, R. L. and Miller, H. C. , 1946, Methemoglobinemia occurring in infants fed milk diluted with well waters of high nitrate content: *Jour. Pediatrics*, v. 29, p. 593.
- Hazen, Allen, 1892, A new color standard for natural waters: *Am. Chem. Jour.* , v. 12, p. 427-428.
- Hem, John D. , 1959, Study and interpretation of chemical characteristics of natural water: U. S. Geo. Survey Water-Supply Paper 1473; 269 p.
- Howard, C. D. , 1923, Zinc contamination in drinking water: *Am. Water Works Assoc. Jour.* , v. 10, p. 411.
- Kilmer, V. J. and Alexander, L. T. , 1949, Methods of making mechanical analyses of soils: *Soil Sci.* , v. 68, p. 15-24.
- Lackey, J. B. , and Sawyer, C. N. , 1946, Plankton productivity of certain southeastern Wisconsin lakes as related to fertilization: *Sewage Works Jour.* , v. 17, p. 573.
- Lane, E. W. , and others, 1947, Report of the Subcommittee on Terminology: *Am. Geophys. Union Trans.* , v. 28, p. 937.
- Magistad, O. C. , and Christiansen, J. E. , 1944, Saline soils, their nature and management: U. S. Dept. , Agriculture Circ. 707, p. 8-9.
- Maxcy, K. F. , 1950, Report on the relation of nitrate concentrations in well waters to the occurrence of methemoglobinemia: *Natl. Research Council, Bull. Sanitary Eng. and Environment, App. D.* , p. 271.
- Moore, E. W. , 1950, The desalting of saline waters, a review of the present status: *Natl. Research Council Comm. on Sanitary Eng. and Environment, Rept. to Subcomm. on Water Supply.*
- National Research Council, 1954, Sodium restricted diets: *Natl. Research Council*, pub. 325.
- Northeastern Water Works Association, 1940, Progress report, Committee on quality Tolerances of Water for Industrial Uses: *Northeast Water Works Assoc. Jour.* , v. 54.
- Pleissner, M. , 1907, *Arb. Kais. Gesundheitsamt*, v. 26, p. 384-443.
- Rainwater, F. H. , and Thatcher, L. L. , 1960, Methods for collection and analysis of water samples: U. S. Geol. Survey Water-Supply Paper 1454, 301 p.
- Rankama, K. , and Sahama, T. G. , 1950, *Geochemistry*: Chicago Univ. Press, Chicago, Ill. , p. 767.
- Riffenburg, H. B. , 1925, Chemical character of ground waters of the northern Great Plains: U. S. Geol. Survey Water-Supply Paper 560-B, p. 31-52.
- Seidell, Atherton, 1940, *Solubilities of inorganic and metal organic compounds*, 3d ed. , v. 1, D. van Nostrand, New York.

- U. S. Interagency Report 6, 1952, A study of methods used in measurements and analysis of sediment loads in streams, the design of improved types of suspended samplers, p. 86-90; U. S. Engineer Office, St. Paul, Minn.
- U. S. Interagency Report 7, 1943, A study of methods used in measurement and analysis of sediment loads in streams, a study of new methods of size analysis of suspended sampler, p. 82-90; U. S. Engineer Office, St. Paul, Minn.
- U. S. Interagency Report 8, 1948, A study of methods used in measurement and analysis of sediment loads of streams, measurement of the sediment discharge of streams, p. 70-76; U. S. Engineer Office, St. Paul, Minn.
- U. S. Interagency Report 11, 1957, A study of methods used in measurement and analysis of sediment loads in streams, the development and calibration of the vicual-accumulation tube, p. 1-109.
- U. S. Geological Survey, Water Resources Division, 1959, A reconnaissance study of anionic surfactants in ground water: Federal Housing Adm., Washington 25, D. C.
- U. S. Public Health Service, 1946, Drinking water standards: U. S. Public Health Service Repts., v. 61, no. 11.
1946, Public Health Reports, reprint 2698.
- U. S. Salinity Laboratory Staff, 1954, Diagnosis and improvement of saline and alkali soils: U. S. Dept. Agriculture, Agriculture Handb. 60, p. 1-160.
- Waring, F. H., 1949, Significance of nitrates in water supplies: Am. Water Works Assoc. Jour., V. 41, no. 2., p. 147-150.

CHEMICAL ANALYSES, WATER TEMPERATURES, AND SEDIMENT

PART 7. LOWER MISSISSIPPI RIVER BASIN

MISSISSIPPI RIVER MAIN STEM

7-100. MISSISSIPPI RIVER AT ST. LOUIS, MO.

LOCATION.--At MacArthur Bridge, 1.1 miles below gaging station, which is 15 miles downstream from Missouri River and 180 miles upstream from Ohio River.

DRAINAGE AREA.--701,000 square miles, approximately.

RECORDS AVAILABLE.--Water temperatures: October 1951 to September 1959.

Sediment records: April 1948 to September 1959.

EXTREMES, 1958-59.--Water temperatures: Maximum, 85°F July 30; minimum, freezing point Jan. 26, 28.

Sediment concentrations: Maximum daily, 3,500 ppm May 10; minimum daily, 100 ppm Jan. 15.

Sediment loads: Maximum daily, 2,600,000 tons June 4; minimum daily, 13,600 tons Jan. 15.

EXTREMES, 1948-59.--Water temperatures (1951-59): Maximum (1951-56, 1957-59), 89°F Aug. 2, 1955; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 6,420 ppm June 7, 1951; minimum daily, 35 ppm Jan. 23, 25, 1956.

Sediment loads: Maximum daily, 7,010,000 tons May 5, 1951; minimum daily, 4,250 tons Jan. 25, 1956.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Temperature (°F) of water, water year October 1958 to September 1959

/Once-daily measurement usually between 8 a.m. and 4 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	--	64	--	--	--	68	--	--	--	64	--	65	66	66	--	66	--	--	--	--	--	--	--	--	--	59	--	57	--	57	
November	--	56	--	--	--	--	53	--	--	--	55	--	56	--	58	--	55	--	--	--	--	--	--	--	--	47	--	--	--	--	--	
December	42	--	40	--	--	--	--	--	--	--	--	--	--	--	33	33	35	37	--	--	--	--	34	--	--	--	--	47	--	35		
January	--	--	35	--	--	--	--	--	--	--	--	35	37	33	--	--	--	--	--	--	--	--	--	--	--	32	33	32	34	--		
February	--	--	--	--	--	--	--	36	38	--	36	37	--	36	36	--	--	--	--	--	--	35	--	35	--	36	38	40	--	--		
March	--	--	--	--	40	--	37	--	38	--	37	38	39	--	41	--	42	45	44	--	--	--	--	46	46	47	49	--	46	47		
April	--	47	48	--	50	--	51	--	48	--	48	--	48	50	52	--	55	--	53	--	52	56	57	--	--	--	58	61	--	--		
May	63	--	63	--	68	--	70	68	68	--	68	--	66	65	--	65	--	64	66	67	69	69	--	69	--	70	70	72	--	--		
June	74	73	73	--	74	74	--	--	74	--	74	--	79	--	76	--	78	78	78	--	80	--	80	--	79	--	82	--	84	--		
July	82	80	--	--	--	--	78	--	78	80	--	80	--	81	--	80	--	80	--	80	--	79	--	79	--	--	--	--	--	85	83	
August	--	83	81	81	--	83	81	81	--	79	79	78	--	80	--	82	--	80	--	82	--	83	--	84	--	84	83	--	--	83	--	
September	--	81	--	80	--	--	83	83	--	76	72	--	74	--	75	--	--	--	--	--	71	--	71	--	71	--	72	--	70	--	67	

QUALITY OF SURFACE WATERS, 1959

MISSISSIPPI RIVER MAIN STEM--Continued

7-100. MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Suspended sediment, water year October 1958 to September 1959

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1...	101,000	742	202,000	78,400	220	a47,000	67,900	236	43,300
2...	90,400	750	a180,000	79,100	240	a51,000	63,200	200	a34,000
3...	83,500	619	140,000	79,800	246	53,000	62,000	197	33,000
4...	80,500	550	a120,000	77,700	300	a63,000	63,200	180	a31,000
5...	74,900	440	a89,000	72,800	350	68,800	64,600	190	a33,000
6...	71,400	380	a73,000	69,300	320	a60,000	63,900	150	a26,000
7...	70,700	300	57,300	67,900	293	53,700	63,900	140	a24,000
8...	73,500	282	56,000	67,900	260	a48,000	63,900	150	a26,000
9...	74,900	320	a65,000	70,700	260	a50,000	61,300	170	a28,000
10...	87,200	500	a120,000	65,200	234	41,200	58,700	170	a27,000
11...	108,000	600	a170,000	64,600	220	a38,000	58,000	180	a28,000
12...	128,000	600	a210,000	64,600	243	42,400	58,700	190	a30,000
13...	130,000	880	309,000	63,900	260	a45,000	57,400	200	a31,000
14...	116,000	1,100	a340,000	63,900	278	48,000	54,800	200	a30,000
15...	102,000	937	258,000	63,900	220	a38,000	52,200	170	a24,000
16...	95,200	678	174,000	64,600	190	a33,000	51,600	165	23,000
17...	94,400	497	127,000	74,900	231	46,700	51,600	190	26,500
18...	86,800	360	a86,000	101,000	200	a55,000	52,200	235	33,100
19...	82,800	300	a87,000	108,000	500	a150,000	54,200	208	30,400
20...	80,500	201	65,400	120,000	488	158,000	53,500	180	a26,000
21...	76,300	292	60,200	141,000	750	a290,000	50,200	160	a22,000
22...	76,300	280	a58,000	158,000	1,300	a550,000	49,000	160	a21,000
23...	76,300	266	54,800	144,000	1,200	a470,000	49,000	150	a20,000
24...	75,600	240	a49,000	132,000	950	a340,000	49,600	145	19,400
25...	74,900	220	a44,000	119,000	689	221,000	52,200	--	a25,000
26...	74,900	240	a49,000	119,000	555	178,000	54,800	180	a27,000
27...	74,900	227	45,900	102,000	420	a120,000	56,800	170	a28,000
28...	74,900	240	a49,000	92,800	320	a80,000	60,000	260	a42,000
29...	74,900	256	51,800	83,500	280	a63,000	60,600	390	63,800
30...	74,900	260	a53,000	74,900	240	a49,000	59,400	280	a45,000
31...	76,300	235	48,400	--	--	--	59,400	183	29,300
Total	2,663,900	--	3,471,800	2,684,400	--	3,550,800	1,777,800	--	927,800
		January		February			March		
1...	60,600	--	e32,000	71,400	260	a50,000	218,000	600	a350,000
2...	60,600	209	34,200	74,200	240	a48,000	216,000	597	348,000
3...	60,600	190	a31,000	72,100	200	a39,000	224,000	700	a420,000
4...	58,700	200	a32,000	69,300	200	a37,000	215,000	641	374,000
5...	56,800	160	a25,000	68,600	220	a41,000	206,000	650	a360,000
6...	54,200	150	a22,000	72,800	220	a43,000	213,000	676	389,000
7...	50,900	130	a18,000	77,700	190	a40,000	222,000	750	a450,000
8...	47,600	160	a21,000	79,100	190	a41,000	234,000	1,300	a820,000
9...	48,300	160	a21,000	76,300	200	41,200	222,000	923	553,000
10...	49,000	160	a21,000	130,000	1,570	s596,000	203,000	700	a380,000
11...	49,600	130	a17,000	207,000	1,900	a1,100,000	204,000	665	366,000
12...	49,600	140	a19,000	257,000	1,880	1,300,000	228,000	580	357,000
13...	50,200	142	19,200	243,000	1,330	873,000	222,000	667	400,000
14...	49,600	118	15,800	221,000	950	a570,000	212,000	700	a400,000
15...	50,200	100	13,600	206,000	700	a390,000	206,000	650	a360,000
16...	49,000	120	a16,000	194,000	646	338,000	196,000	542	287,000
17...	49,600	190	a25,000	206,000	798	444,000	192,000	480	a250,000
18...	52,800	190	a27,000	207,000	950	a530,000	194,000	484	254,000
19...	54,800	240	a36,000	192,000	950	a490,000	201,000	527	286,000
20...	55,400	240	a36,000	176,000	850	a400,000	200,000	578	312,000
21...	56,100	220	a33,000	169,000	800	a370,000	190,000	600	a310,000
22...	55,400	200	a30,000	170,000	650	a300,000	200,000	550	a300,000
23...	56,100	180	a27,000	162,000	572	250,000	227,000	676	414,000
24...	56,800	150	a23,000	142,000	500	a190,000	240,000	1,120	726,000
25...	56,100	190	a29,000	148,000	456	182,000	243,000	1,350	886,000
26...	56,800	194	29,800	168,000	467	212,000	246,000	1,170	777,000
27...	60,600	238	38,900	190,000	521	267,000	239,000	950	a610,000
28...	63,900	342	59,000	200,000	500	a270,000	231,000	950	a590,000
29...	72,100	338	65,800	--	--	--	243,000	1,000	a60,000
30...	79,100	320	a68,000	--	--	--	289,000	1,350	1,060,000
31...	70,700	260	a50,000	--	--	--	304,000	1,450	1,190,000
Total	1,741,800	--	935,300	4,249,500	--	9,452,200	6,881,000	--	15,239,000

e Estimated.

s Computed by subdividing day.

a Computed from estimated-concentration graph and daily turbidity readings.

MISSISSIPPI RIVER MAIN STEM--Continued

7-100. MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Suspended sediment, water year October 1958 to September 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...	299,000	2,100	a1,700,000	200,000	452	244,000	255,000	1,100	757,000
2...	299,000	1,850	1,490,000	206,000	480	a 270,000	289,000	1,500	1,170,000
3...	294,000	1,480	1,170,000	197,000	750	a 400,000	347,000	2,500	2,340,000
4...	294,000	1,200	a950,000	177,000	550	263,000	362,000	2,700	a2,600,000
5...	300,000	1,300	a1,100,000	154,000	420	a 170,000	336,000	2,380	2,160,000
6...	300,000	1,300	1,050,000	146,000	392	155,000	307,000	2,030	1,680,000
7...	294,000	1,200	a950,000	148,000	410	164,000	283,000	1,700	a1,300,000
8...	289,000	975	761,000	154,000	418	174,000	255,000	1,600	a1,100,000
9...	287,000	900	a700,000	181,000	600	a 290,000	228,000	1,400	a860,000
10...	284,000	780	598,000	230,000	3,500	a 2,200,000	206,000	1,120	623,000
11...	278,000	750	a560,000	237,000	2,300	1,470,000	185,000	1,200	a600,000
12...	271,000	750	a550,000	237,000	2,100	a1,300,000	164,000	920	407,000
13...	263,000	608	432,000	240,000	1,570	1,020,000	150,000	900	a360,000
14...	236,000	522	333,000	243,000	1,430	938,000	140,000	800	a300,000
15...	201,000	390	212,000	257,000	1,380	958,000	140,000	732	277,000
16...	188,000	350	a180,000	246,000	1,300	a860,000	125,000	600	a200,000
17...	177,000	320	153,000	231,000	1,200	a750,000	113,000	575	175,000
18...	169,000	280	a130,000	234,000	1,360	859,000	115,000	468	145,000
19...	162,000	280	a120,000	234,000	1,550	979,000	114,000	420	129,000
20...	168,000	300	136,000	213,000	968	557,000	103,000	700	a190,000
21...	180,000	300	a150,000	209,000	712	402,000	92,800	900	a230,000
22...	193,000	370	193,000	213,000	672	386,000	86,500	718	168,000
23...	207,000	472	264,000	245,000	700	a460,000	88,000	650	a150,000
24...	230,000	804	499,000	265,000	1,300	a930,000	95,200	420	108,000
25...	230,000	850	a530,000	270,000	1,780	1,300,000	90,400	280	a68,000
26...	219,000	850	a500,000	255,000	1,800	a1,200,000	89,600	420	102,000
27...	206,000	800	a440,000	231,000	1,640	1,020,000	84,200	480	a110,000
28...	190,000	682	350,000	216,000	1,320	770,000	96,000	300	a78,000
29...	182,000	560	275,000	206,000	1,020	567,000	122,000	355	117,000
30...	185,000	460	a230,000	207,000	1,100	a610,000	125,000	360	a120,000
31...	--	--	--	230,000	1,100	a680,000	--	--	--
Total	7,075,000	--	16,706,000	6,712,000	--	22,346,000	5,186,700	--	18,624,000
July									
1...	124,000	370	124,000	90,400	200	a49,000	114,000	480	a150,000
2...	134,000	375	136,000	93,600	140	a35,000	116,000	360	113,000
3...	163,000	280	a120,000	94,400	238	60,700	112,000	300	a91,000
4...	184,000	260	a130,000	80,500	340	a74,000	113,000	320	97,600
5...	218,000	900	a530,000	92,000	338	84,000	122,000	500	a160,000
6...	212,000	1,860	1,060,000	118,000	305	97,200	123,000	500	a170,000
7...	182,000	1,700	a840,000	166,000	462	207,000	115,000	450	140,000
8...	168,000	1,640	744,000	206,000	650	a360,000	107,000	332	95,900
9...	168,000	1,730	785,000	182,000	1,310	644,000	102,000	380	a100,000
10...	150,000	1,880	761,000	160,000	1,680	726,000	102,000	375	103,000
11...	150,000	1,600	a650,000	141,000	1,770	674,000	92,000	330	82,000
12...	144,000	1,700	a660,000	128,000	1,300	a450,000	88,000	320	a76,000
13...	139,000	1,430	537,000	121,000	1,230	402,000	88,800	300	a72,000
14...	128,000	1,100	a380,000	109,000	1,000	a290,000	84,200	282	64,100
15...	125,000	972	328,000	99,200	985	264,000	80,500	240	52,200
16...	127,000	870	298,000	91,200	750	a180,000	76,300	240	a49,000
17...	124,000	662	222,000	90,400	532	130,000	72,800	260	a51,000
18...	124,000	550	a180,000	92,000	380	a94,000	70,000	240	a45,000
19...	118,000	650	a210,000	97,600	420	111,000	67,900	220	a40,000
20...	114,000	525	162,000	92,800	445	111,000	67,900	200	a37,000
21...	116,000	495	155,000	96,000	458	119,000	67,200	212	38,500
22...	106,000	550	a160,000	96,000	480	a120,000	65,800	280	a50,000
23...	106,000	510	146,000	88,800	550	a130,000	69,300	300	56,100
24...	104,000	500	a140,000	85,000	420	96,400	88,800	320	a77,000
25...	100,000	420	a110,000	86,500	420	a98,000	111,000	375	112,000
26...	97,600	340	a90,000	99,200	400	a110,000	128,000	600	a210,000
27...	95,200	365	93,800	94,400	335	85,400	142,000	500	a190,000
28...	92,800	360	a90,000	95,200	282	72,500	163,000	632	278,000
29...	92,800	368	92,200	97,600	240	a63,000	207,000	600	a340,000
30...	89,600	305	70,900	106,000	220	a63,000	233,000	1,100	692,000
31...	84,200	312	70,900	108,000	222	64,700	--	--	--
Total	4,080,200	--	10,078,700	3,397,800	--	6,064,900	189,500	--	3,832,400
Total discharge for year (cfs-days).....									
Total load for year (tons).....									
									49,639,600
									111,228,900

a Computed from estimated-concentration graph and daily turbidity readings.

MISSISSIPPI RIVER MAIN STEM--Continued
7-100. MISSISSIPPI RIVER AT ST. LOUIS, MO.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	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. 1, 1958	0840	65	103,000	704		55	62	80	80	94	98	100	--	VPWC	
Oct. 29	1005	57	74,900	202		--	40	46	53	65	75	88	99	100	SBWC
Nov. 5	1035	55	120,000	433		43	47	67	67	85	85	93	100	--	VPWC
Mar. 25, 1959	1040	47	243,000	1,410		36	42	63	63	85	85	88	97	100	VPWC
Apr. 8	0845	70	146,000	361		41	47	69	69	83	83	94	97	100	VPWC
May 6	0750	67	240,000	1,560		--	--	--	--	94	96	96	99	100	V
June 15	0845	76	141,000	645		--	--	--	--	91	96	96	99	100	S
July 2	0910	80	130,000	370		--	--	--	--	90	96	96	99	100	S
July 23	0850	79	a 106,000	553		--	--	--	--	92	96	96	99	100	S

a Daily mean discharge.

Particle-size analyses of bed material, water year October 1958 to September 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)	Number of sampling points	Discharge (cfs)	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
Oct. 1, 1958		17	102,000		0	6	18	59	83	89	95	98	100	SV
Nov. 20		17	126,000		0	10	32	68	87	91	96	99	100	SV
Mar. 24, 1959		17	240,000		0	1	25	74	92	95	96	98	100	SV
Apr. 8		18	287,000		0	1	16	60	86	92	96	98	99	SV
May 6		18	146,000		1	4	12	58	86	92	96	98	100	SV
May 13		17	240,000		--	0	9	59	84	89	92	96	100	SV
June 15		16	141,000		0	1	5	50	85	91	96	99	100	SV
July 2		19	131,000		0	1	5	44	84	93	97	99	100	SV
July 23-24		19	a 106,000		0	1	7	49	82	90	96	99	100	SV

a Daily mean discharge.

ST. FRANCIS RIVER BASIN
7-466. RIGHT HAND CRUTE OF LITTLE RIVER, AT RIVERVALE, ARK.

LOCATION.--At gaging station at bridge on State Highway 135 at Rivervale, Poinsett County.
DRAINAGE AREA.--2,113 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.
Water temperature: October 1958 to September 1959.
EXTREMES, 1958-59.--Dissolved solids: Maximum, 288 ppm May 11-20; minimum, 81 ppm Jan. 26-31.
Hardness: Maximum, 217 ppm May 11-20; minimum, 56 ppm Jan. 26-31.
Specific conductance: Maximum daily, 442 micromhos May 1, 9; minimum daily, 118 micromhos Jan. 28.
Water temperatures: Maximum, 91°F July 30, 31, Aug. 5; minimum, freezing point Jan. 4, 6, Feb. 2.
REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 furnished by District Office, Corps of Engineers, Memphis, Tenn.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 1-9, 1958.....	815	6.7	0.00	51	15	12	2.6	a 214	21	11	0.5	0.3	250	188	13	371	8.3	8
Oct. 10-20.....	677	7.4	0.00	55	16	13	2.4	b 236	19	14	.2	1.6	263	203	10	398	8.3	5
Oct. 21-31.....	608	7.4	0.00	56	15	14	2.5	240	20	14	.2	1.8	277	201	4	418	8.1	3
Nov. 1-10.....	652	6.8	0.00	57	15	13	2.4	234	19	14	.2	1.3	261	204	12	409	8.2	5
Nov. 11-19.....	1,165	5.3	0.1	49	14	11	2.9	206	18	12	.2	1.4	231	180	11	366	8.1	5
Nov. 20-24.....	2,140	5.2	1.0	31	8.6	7.1	4.1	130	16	8.0	.2	2.0	164	113	6	250	8.1	20
Nov. 25-30.....	1,407	6.1	0.00	39	11	8.4	3.7	162	18	8.8	.2	1.6	196	142	10	297	7.9	16
Dec. 1-10.....	1,279	6.9	0.00	48	12	10	3.0	190	19	12	.2	1.6	226	170	14	348	8.0	8
Dec. 11-20.....	953	7.7	0.00	53	15	12	2.6	224	21	14	.2	1.3	254	194	10	392	8.0	5
Dec. 21-31.....	1,035	6.9	0.00	54	15	11	2.0	232	14	12	.2	.8	256	196	6	381	8.4	1
Jan. 1-10, 1959.....	1,031	6.9	0.00	55	13	12	2.0	c 232	19	12	.0	.8	262	198	6	395	8.2	3
Jan. 11-20.....	1,850	5.8	0.00	52	14	12	2.5	216	20	11	.2	1.7	249	187	10	379	8.2	4
Jan. 20-21.....	2,943	--	--	45	7.8	9.7	2.7	160	17	12	--	3.6	209	158	10	337	8.1	5
Jan. 22-24.....	4,200	--	--	29	5.4	6.7	3.2	175	11	8.0	--	11	134	104	16	248	7.9	5
Jan. 25-31.....	5,167	2.2	.38	15	4.6	3.6	3.9	58	12	4.5	.2	4.4	81	56	9	127	6.9	75
Feb. 1-5.....	4,334	3.2	.13	23	6.5	5.2	3.7	88	16	6.0	1.3	3.4	138	84	12	187	7.4	33
Feb. 6-9.....	3,418	3.9	.05	34	8.7	7.1	3.2	132	17	7.0	.2	2.4	172	121	13	253	8.0	9
Feb. 10-13.....	2,460	5.2	0.03	42	11	9.0	2.9	168	19	9.2	.2	1.7	200	150	12	308	8.7	7
Feb. 14-18.....	3,952	3.2	.12	26	7.2	6.3	2.7	106	14	7.2	.1	1.8	145	94	8	209	7.9	32
Feb. 19-25.....	6,044	2.6	.44	16	4.8	3.7	-3.6	66	11	4.0	.2	2.7	84	60	6	137	7.3	70

a Includes equivalent of 2 parts per million of carbonate (CO₃).
b Includes equivalent of 4 parts per million of carbonate (CO₃).
c Includes equivalent of 8 parts per million of carbonate (CO₃).
d Calculated from determined constituents.

ST. FRANCIS RIVER BASIN--Continued
 7-466. RIGHT HAND CHUTE OF LITTLE RIVER AT RIVERVALE, ARK.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Feb. 26-28,	5,206	3.2	0.16	27	6.8	6.4	3.0	108	15	7.0	0.1	2.6	153	96	7	211	8.0	30
Mar. 1-5, 1959..	4,037	4.5	.06	38	9.6	8.2	2.8	154	17	8.8	.0	2.0	189	134	8	279	7.8	15
Mar. 6-11.....	2,478	3.5	.00	48	12	11	2.5	198	19	11	.0	1.4	232	170	7	350	8.0	9
Mar. 12-20.....	2,061	13	.00	48	15	12	2.3	222	11	10	.0	.8	244	182	0	356	7.8	5
Mar. 21-31.....	1,896	13	.00	52	15	12	2.3	226	20	10	.0	1.1	259	191	6	384	7.4	6
Apr. 1-10.....	1,487	13	.00	56	16	12	2.1	238	18	12	.5	1.6	285	206	10	398	7.9	7
Apr. 11-20.....	1,178	14	.00	58	16	12	2.1	250	19	12	.0	1.1	272	210	6	417	8.2	7
Apr. 21-30.....	1,032	9.5	.00	50	22	13	2.5	260	19	12	.1	.6	285	216	2	425	8.4	6
May 1-10.....	1,029	9.5	.00	64	14	13	2.5	254	19	12	.5	3.9	288	217	9	432	7.9	7
May 11-20.....	1,167	13	.00	49	13	11	2.0	202	17	11	.2	3.8	244	176	10	367	7.9	7
May 21-31.....	1,529	13	.00	39	11	10	2.3	168	14	9.2	.1	2.0	202	142	5	309	7.7	7
June 1-10.....	1,411	13	.00	47	13	10	2.3	196	16	10	.0	1.1	228	171	10	347	7.5	6
June 11-20.....	1,003	14	.00	54	15	13	2.5	232	17	12	.2	1.9	267	196	6	392	8.1	20
June 21-30.....	1,028	14	.00	54	14	13	2.5	224	17	12	.3	1.6	273	192	8	393	8.0	20
July 1-10.....	1,606	14	.00	58	15	13	2.5	242	19	12	.2	2.1	270	206	8	423	7.9	20
July 11-31.....	798	13	.00	50	14	12	2.2	214	17	11	.2	2.2	238	182	7	380	7.8	20
Aug. 1-8.....	589	13	.00	46	14	12	2.5	200	16	11	.2	2.4	223	172	8	366	8.0	15
Aug. 9-21.....	588	13	.00	50	15	13	2.2	220	17	12	.2	1.6	244	186	6	391	7.9	25
Aug. 22-31.....	576	12	.00	46	13	12	2.5	196	16	12	.3	2.0	216	166	8	354	7.8	22
Sept. 1-7.....	608	13	.00	49	13	12	2.5	208	17	12	.4	2.0	233	176	6	369	8.0	20
Sept. 8-12.....	707	11	.00	34	11	18.2	2.6	208	13	9.0	.3	2.0	271	180	7	427	7.7	20
Sept. 13-20.....	471	11	.00	49	14	11	2.6	209	16	11	.2	1.3	231	160	10	363	7.6	15
Sept. 21-30.....	463	12	.00	52	13	12	2.5	224	19	12	.2	1.2	240	191	8	388	8.0	17
Average.....	1,525	8.8	0.04	45	12	10	2.7	189	17	10	0.2	2.1	220	162	7	335	--	15

e Includes equivalent of 6 parts per million of carbonate (CO₃).

ST. FRANCIS RIVER BASIN--Continued
 7-466. RIGHT HAND CHUTE LITTLE RIVER AT RIVERVALE, ARK.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	61	63	65	68	70	72	73	72	70	67	69	69	68	70	70	69	68	68	73	60	62	64	62	56	56	51	48	46	43	
November	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
December	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--		
January	--	38	35	32	--	32	36	38	39	37	38	41	45	47	47	42	39	39	40	43	43	45	40	40	42	38	41	39	43	42	41	
February	38	32	33	38	42	39	39	43	41	50	49	45	45	47	48	47	46	40	41	39	41	43	44	41	48	50	51	49	--	--	43	
March	48	50	50	50	51	50	50	50	51	54	50	50	50	50	53	52	54	54	55	56	55	55	55	56	61	65	61	60	60	62	65	
April	67	68	68	69	69	71	73	73	66	63	58	57	59	62	63	65	67	70	73	73	63	64	65	68	69	68	68	71	72	75	67	
May	77	78	79	81	81	82	78	78	76	77	78	75	77	73	74	76	70	74	76	78	79	79	79	79	80	81	81	82	82	81	78	
June	80	80	79	78	76	79	80	81	80	80	81	82	83	81	81	82	84	84	82	82	83	84	84	83	82	84	84	85	88	89	82	
July	90	85	82	82	83	84	87	83	88	86	86	86	87	86	87	85	88	84	85	85	84	83	85	83	82	80	81	86	90	91	85	
August	90	90	89	90	91	87	87	83	84	84	85	87	87	86	85	85	85	87	82	86	88	89	88	89	89	86	85	86	86	87	87	
September ..	87	87	--	83	84	82	80	84	78	78	77	72	--	75	76	76	71	75	72	72	74	78	79	76	76	79	77	77	74	--	78	

WHITE RIVER BASIN
7-490. WAR EAGLE CREEK NEAR HINDSVILLE, ARK.

LOCATION.--At gaging station at bridge on State Highway 45, 3.8 miles downstream from Clear Creek and 3.9 miles north of Hindsville, Madison County.
DRAINAGE AREA.--262 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.
REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 24, 1958.....	26			38	3.1	3.0	1.3	124	5.6	3.8		1.0	144	108	6	202	7.7	7
Nov. 11.....	20			41	2.4	2.3	1.1	130	5.4	3.0		1.0	140	112	6	205	7.3	1
Dec. 2.....	180			23	2.8	1.5	.9	74	6.4	3.0		1.9	105	69	6	145	7.5	6
Dec. 22.....	81			25	.8	1.7	.6	72	5.0	2.8		1.7	85	66	7	133	7.4	1
Jan. 13, 1959.....	187			24	.4	1.9	.6	66	5.2	2.8		1.4	98	62	6	132	7.4	3
Feb. 3.....	134			20	1.3	1.5	.6	60	5.2	3.0		1.0	79	56	7	114	7.3	2
Feb. 24.....	187			18	1.4	1.7	.6	58	4.0	2.5		1.2	77	51	4	109	7.4	1
Mar. 26.....	2,050			11	.6	2.1	2.5	33	4.8	2.2		1.1	52	30	3	75	6.7	5
Apr. 6.....	512			17	1.6	1.7	1.8	53	6.2	2.0		1.0	72	49	6	105	7.4	8
Apr. 29.....	295			17	2.3	1.8	1.0	59	4.0	2.2		1.7	71	52	4	112	7.2	5
June 12.....	3,840			11	1.7	1.7	1.4	30	3.6	3.2		4.1	58	30	6	82	6.9	5
July 20.....	36			38	1.7	1.8	1.2	120	4.8	2.2		.9	116	102	4	194	7.9	3
Aug. 10.....	38			29	1.2	1.8	1.2	94	1.4	2.5		.7	97	78	0	156	7.6	1
Aug. 31.....	22			36	1.4	2.3	1.4	116	3.8	2.8		.9	120	96	1	192	7.5	3
Sept. 25.....	18			39	1.2	1.6	1.8	156	5.0	4.0		1.9	168	102	0	251	8.0	13

WHITE RIVER BASIN--Continued

7-505. KINGS RIVER NEAR BERRYVILLE, ARK.

LOCATION--At gaging station at bridge on county road, 1.2 miles downstream from Bee Creek, 2.2 miles upstream from Clabber Creek, and 5.2 miles north-west of Berryville, Carroll County.

DRAINAGE AREA--532 square miles

RECORDS AVAILABLE--Chemical analyses: October 1953 to September 1959.

REMARKS--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 23, 1958.....	52			42	8.7	2.5	1.4	176	2.4	3.0		1.0	171	141	0	272	7.8	6
Nov. 12.....	39			41	12	2.0	1.4	176	4.8	3.0		1.0	192	152	8	272	7.5	6
Dec. 2.....	352			35	10	1.6	1.0	148	5.8	3.2		1.6	146	128	7	236	7.7	3
Dec. 22.....	178			33	6.6	1.4	.6	128	3.6	2.2		1.3	118	110	4	202	7.8	0
Jan. 14, 1959.....	147			34	7.8	1.7	.7	138	5.0	2.8		1.3	140	117	4	222	7.7	1
Feb. 3.....	281			28	7.1	1.5	.6	114	4.2	2.5		1.4	121	99	6	191	7.7	1
Feb. 24.....	349			27	6.0	1.5	.6	108	3.8	2.5		1.4	118	92	4	181	7.9	1
Mar. 17.....	531			27	7.1	1.7	.7	110	5.4	2.2		1.0	112	96	6	181	7.8	6
Apr. 6.....	1,120			26	6.1	1.7	.8	106	3.6	2.0		1.2	121	90	3	178	7.9	6
Apr. 28.....	550			28	6.3	3.4	2.2	108	12	3.5		1.8	117	96	8	187	8.1	5
May 19.....	1,930			28	6.5	1.4	.9	114	6.6	1.8		.8	114	96	3	182	7.2	5
June 10.....	430			30	6.6	4.0	1.6	118	4.6	5.2		2.4	137	102	6	210	7.7	6
July 1.....	131			35	7.2	1.7	1.2	138	4.2	2.0		.1	134	117	4	219	7.7	3
July 21.....	55			37	9.4	1.8	1.3	154	4.4	2.5		1.3	.0	148	5	238	7.7	2
Aug. 11.....	60			34	8.0	3.1	1.3	140	3.8	1.8		1.8	.0	128	4	217	7.8	2
Sept. 1.....	43			36	8.3	2.1	1.5	148	3.8	2.5		.2	140	124	2	233	7.9	4
Sept. 24.....	12			37	10	2.3	1.6	160	3.8	2.8		.5	146	134	2	242	7.7	1

QUALITY OF SURFACE WATERS, 1959

WHITE RIVER BASIN--Continued

7-545. WHITE RIVER AT BULL SHOALS DAM, ARK.

LOCATION.--At dam on White River, 6.3 miles northeast of Flippin, Marion County, and 12.5 miles downstream from Little North Fork.

DRAINAGE AREA.--6,036 square miles.

RECORDS AVAILABLE.--Chemical analyses: July 1954 to September 1957.

Specific conductance and chloride: October 1957 to September 1959.

Water temperatures: July 1954 to September 1959.

REMARKS.--No discharge records available for this station.

Specific conductance and chloride (Cl), water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	246	2.5	249	2.5	240	2.2	244	2.5
2	247	2.5	249	3.2	239	2.8	239	2.5
3	248	2.8	248	2.8	238	2.8	236	2.5
4	247	2.5	246	2.5	235	3.0	238	2.5
5	249	2.2	248	3.0	239	2.5	236	2.5
6	247	2.5	245	2.5	237	2.5	237	2.5
7	246	2.2	248	3.0	240	2.8	240	2.2
8	247	2.5	244	2.5	241	2.5	233	3.0
9	245	2.5	242	2.2	242	2.5	237	2.8
10	243	3.0	246	2.5	237	2.5	239	2.5
11	243	2.8	248	2.8	240	2.5	240	2.5
12	243	2.8	250	3.2	240	2.5	237	2.2
13	243	2.0	248	2.5	240	2.5	232	2.2
14	243	2.2	241	2.8	242	2.5	233	2.5
15	243	2.5	244	2.8	242	2.5	239	2.5
16	243	2.8	237	2.5	243	2.2	231	2.5
17	243	2.2	239	2.2	241	3.8	237	2.5
18	242	2.5	242	2.5	240	3.0	240	2.8
19	244	2.2	242	3.0	243	5.0	235	3.2
20	243	2.2	244	2.5	240	2.8	238	4.0
21	245	2.5	241	2.5	239	3.0	238	3.2
22	237	2.5	242	2.8	239	2.8	241	2.5
23	239	2.2	240	2.2	236	2.8	234	2.0
24	244	2.2	241	2.8	239	2.5	239	2.5
25	243	2.5	241	2.8	237	2.5	230	2.8
26	244	2.5	234	2.8	234	2.8	232	2.2
27	238	2.2	231	2.8	239	2.8	241	3.0
28	243	2.2	232	2.5	235	2.5	232	2.8
29	245	2.2	233	3.0	239	2.5	236	2.5
30	242	2.2	244	3.8	238	2.8	240	2.5
31	246	2.5	--	--	242	3.0	240	2.5
Average	244	2.4	243	2.7	239	2.8	237	2.6

WHITE RIVER BASIN--Continued

7-545. WHITE RIVER AT BULL SHOALS DAM, ARK.--Continued

Specific conductance and chloride (Cl), water year October 1958 to September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	229	2.5	238	2.2	239	3.0	233	3.0
2	237	3.0	237	2.8	240	3.5	237	3.0
3	241	2.5	240	2.8	240	3.0	237	3.0
4	233	2.8	239	2.8	239	2.8	240	2.8
5	237	2.5	240	2.5	238	2.8	244	2.8
6	237	2.5	240	2.8	239	2.8	239	2.5
7	238	2.5	238	2.5	247	5.5	240	3.0
8	240	2.2	240	2.5	240	2.8	239	2.8
9	238	2.5	239	2.8	239	3.0	255	5.5
10	239	2.5	240	2.8	241	3.0	241	2.8
11	239	2.2	229	2.5	240	3.0	239	3.0
12	239	2.8	238	2.8	241	3.2	241	2.8
13	238	2.5	239	2.8	241	2.8	243	2.8
14	239	2.5	242	3.0	241	3.0	241	3.0
15	241	2.5	240	3.0	240	2.8	243	3.0
16	239	2.5	239	2.8	236	3.2	237	3.0
17	239	2.5	241	2.8	241	3.5	241	2.8
18	231	2.8	241	2.5	243	3.2	237	2.8
19	239	2.0	240	2.8	234	3.0	240	3.0
20	238	2.5	239	2.5	238	2.5	240	2.8
21	237	2.0	238	3.0	242	2.5	234	2.5
22	240	2.8	238	2.5	240	3.0	241	2.8
23	239	3.2	240	2.8	239	3.2	242	3.0
24	240	2.8	239	2.8	240	3.0	242	3.0
25	240	2.5	239	2.8	239	2.8	244	3.0
26	239	2.5	237	2.5	239	2.8	242	2.5
27	243	--	239	2.8	239	3.2	239	2.5
28	239	2.8	239	2.8	240	3.2	242	2.0
29	--	--	239	2.5	240	2.8	241	2.5
30	--	--	239	2.8	240	3.5	241	2.8
31	--	--	247	5.2	--	--	242	2.5
Average	238	2.6	239	2.8	240	3.1	240	2.9
Day	June		July		August		September	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	240	2.8	244	2.8	244	2.8	251	3.0
2	242	2.5	246	2.5	247	3.0	257	3.0
3	241	2.0	244	2.8	251	2.8	261	3.2
4	242	2.2	244	2.5	242	2.8	258	2.8
5	244	3.0	244	2.5	248	3.0	261	3.2
6	247	3.5	244	3.0	248	2.8	260	2.5
7	242	2.5	244	3.0	249	3.2	259	3.0
8	239	2.5	248	2.5	247	4.0	259	3.2
9	233	2.5	243	2.5	239	3.0	256	2.8
10	240	2.5	251	3.0	249	3.2	266	4.8
11	241	2.5	245	2.5	230	--	267	3.0
12	242	2.5	249	3.0	257	6.0	262	3.8
13	242	2.5	249	2.8	248	2.8	261	3.0
14	241	2.5	248	2.5	249	3.0	260	2.8
15	241	2.8	246	3.0	250	3.0	260	3.0
16	241	3.0	248	2.8	242	3.2	262	3.0
17	242	2.8	244	2.8	250	3.0	261	3.5
18	244	2.8	246	2.5	248	3.2	260	3.0
19	243	3.0	243	3.0	250	2.8	262	2.5
20	245	2.5	244	2.8	249	2.8	261	3.0
21	243	2.5	245	3.0	249	3.0	258	3.0
22	243	2.8	247	2.5	250	3.2	267	3.0
23	242	2.8	248	3.0	237	2.8	264	3.2
24	244	3.0	252	3.0	248	3.0	263	3.0
25	245	2.5	252	2.5	258	4.0	263	2.8
26	243	2.5	251	3.0	250	2.5	264	3.2
27	244	2.5	246	3.0	252	3.5	272	5.8
28	246	3.2	245	3.0	250	3.0	265	3.0
29	244	2.8	251	3.0	254	2.8	264	3.0
30	245	2.5	259	3.0	255	3.0	263	2.5
31	--	--	251	2.8	255	3.2	--	--
Average	242	2.7	247	2.8	248	3.1	262	3.2

WHITE RIVER BASIN-Continued

7-555. WHITE RIVER AT COTTER, ARK.

LOCATION.--At bridge on U.S. Highway 62 at Cotter, Baxter County, about 5 miles downstream from gaging station near Flippin.

DRAINAGE AREA.--6,067 square miles upstream from gaging station.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to July 1959.

Water temperatures: October 1947 to May 1955, December 1955 to July 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 182 ppm Nov. 1-30; minimum, 145 ppm Apr. 1-30.

Hardness: Maximum, 162 ppm Nov. 1-30; minimum, 117 ppm Apr. 1-30.

Specific conductance: Maximum daily, 396 micromhos Nov. 4; minimum daily, 200 micromhos Mar. 16.

Water temperatures: Minimum, 46°F Jan. 23, 24.

EXTREMES, 1951-59.--Dissolved solids: Maximum, 344 ppm Feb. 3, 7, 1954; minimum, 130 ppm Oct. 16-31, 1957.

Hardness: Maximum, 191 ppm Feb. 11-29, Mar. 11-19, 1952; minimum, 114 ppm Oct. 16-31, 1957.

Specific conductance: Maximum daily, 695 micromhos Nov. 23, 1954; minimum daily, 180 micromhos May 28, 1955.

Water temperatures: Maximum, 79°F Sept. 20, 1954; minimum, 35°F Feb. 11, 1955.

REMARKS.--Records of specific conductance of daily samples are available in district office at Little Rock, Ark. Records of discharge for gaging station near Flippin for water year October 1958 to September 1959 are given in WSP 1631. Flow regulated by Bull Shoals Reservoir since July 1951.

Chemical analyses, in parts per million, October 1958 to July 1959.

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 1-31, 1958.....	3,885	3.7		34	12	2.9	1.1	156	5.8	4.5	0.1	3.7	151	134	6	247	8.1	4
Nov. 1-30.....	2,085	3.2	45	45	12	3.2	1.1	190	5.4	4.2	.1	5.6	182	162	6	299	8.1	3
Dec. 1-31.....	2,783	4.3	39	39	11	2.5	.9	168	4.4	3.8	.1	3.2	168	142	5	264	8.2	5
Jan. 1-31, 1959.....	3,199	4.2	13	28	13	2.7	1.1	158	4.2	3.8	.0	3.8	160	138	9	246	8.2	2
Feb. 1-28.....	3,212	5.0	28	28	12	2.9	1.1	136	6.6	3.0	.0	1.9	134	120	8	217	7.6	5
Mar. 1-31.....	2,507	4.5	28	28	13	2.7	1.4	144	5.6	3.2	.0	1.5	146	124	6	235	7.4	6
Apr. 1-30.....	2,706	4.5	27	27	12	2.9	1.0	136	5.2	3.0	.0	1.4	145	117	6	233	7.4	6
May 1-31.....	2,898	5.0	31	31	12	2.4	1.2	148	4.8	4.2	.0	1.4	147	127	6	238	7.5	5
June 1-30.....	3,848	6.5	40	40	11	2.2	1.2	172	3.6	2.5	.0	1.6	172	145	4	271	7.0	5
July 1-12.....	3,088	6.8	38	38	10	2.4	1.0	162	4.4	2.5	.0	1.9	163	136	3	259	7.5	6
Average.....	a 3,062	4.7	34	34	12	2.7	1.1	157	5.0	3.5	0.0	2.8	159	134	6	251	--	5

a Mean discharge for water year October 1958 to September 1959 was 3,135 cfs.

WHITE RIVER BASIN--Continued

7-570. BUFFALO RIVER NEAR RUSH, ARK.

LOCATION --At gaging station, 0.8 mile upstream from Rush Creek, 1.5 miles southeast of Rush, Marion County, and 24.3 miles upstream from mouth. DRAINAGE AREA--1,091 square miles. RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

Water temperatures: October 1958 to September 1959. EXTREMES: 1958-59.--Dissolved solids: Maximum, 156 ppm Nov. 1-15; minimum, 68 ppm Nov. 17-19. Hardness: Maximum, 138 ppm Nov. 1-15; minimum, 56 ppm Nov. 17-19.

Specific conductance: Maximum daily, 273 micromhos Nov. 11; minimum daily, 97 micromhos Nov. 17.

Water temperatures: Maximum, 88°F July 30; minimum, freezing point Jan. 5, 6. REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1958.....	166	3.2	0.00	42	4.7	2.3	1.1	150	4.4	2.8	0.1	1.8	146	124	2	240	7.9	4
Oct. 11-20.....	124	3.0	0.00	42	4.8	2.8	1.0	148	4.8	2.8	.1	3.2	148	124	3	239	8.0	3
Oct. 21-31.....	144	3.3	0.00	44	6.3	2.5	1.0	160	6.4	3.0	.1	2.1	152	136	5	249	8.1	3
Nov. 1-15.....	472	2.9	0.00	47	4.9	2.5	.9	164	5.6	2.8	.0	.8	156	138	3	258	8.0	2
Nov. 16, 20-30.....	2,042	3.1	0.00	37	4.3	1.9	1.3	130	4.2	2.2	.1	2.0	130	110	4	213	7.9	5
Nov. 17-19.....	14,430	--	--	18	2.8	1.4	1.6	66	3.2	1.5	--	1.4	68	56	2	120	7.8	6
Dec. 1-10.....	1,197	2.4	0.00	40	3.9	2.0	.9	136	5.0	2.2	.0	2.9	134	116	4	221	7.9	4
Dec. 11-20.....	556	4.6	0.00	38	4.3	3.8	.8	134	4.4	2.5	.1	1.1	149	112	2	217	7.8	1
Dec. 21-31.....	411	1.9	0.00	40	6.8	2.0	.8	152	5.6	2.8	.1	.7	140	128	4	233	8.2	1
Jan. 1-10, 1959.....	344	1.8	0.01	41	4.8	2.1	.7	146	5.4	2.8	.1	.6	140	122	2	234	7.7	0
Jan. 11-20.....	310	1.8	0.00	40	5.9	2.0	.7	144	5.4	2.8	.1	.8	144	124	6	234	7.9	0
Jan. 21-31.....	1,286	2.7	0.00	34	3.9	2.0	.9	116	7.0	2.8	.1	1.4	127	101	6	195	7.8	4
Feb. 1-14.....	735	1.5	0.00	37	4.3	2.0	.8	90	2.4	26	.1	1.0	154	110	36	228	7.0	3
Feb. 15-20.....	2,162	2.8	0.00	34	4.2	1.8	.8	116	6.2	2.5	.2	1.2	120	102	8	195	7.8	3
Feb. 21-28.....	1,097	2.4	0.00	36	4.7	1.9	.9	128	6.2	2.5	.2	1.3	110	102	4	200	7.8	0
Mar. 1-5, 19-20.....	2,477	2.4	0.00	37	4.0	2.1	.9	120	6.2	2.5	.1	1.2	132	122	5	210	8.0	4
Mar. 6-18.....	2,416	2.2	0.02	37	4.0	1.8	.8	110	6.2	2.5	.1	1.9	132	96	2	186	8.0	5
Mar. 19-31.....	2,301	3.6	0.00	28	3.3	1.8	.8	98	5.8	1.8	.0	1.7	106	84	2	174	7.0	6

WHITE RIVER BASIN--Continued
7-570. BUFFALO RIVER NEAR RUSH, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25° C)	pH	Color
														Calcium	Non-magnesium carbonate			
Apr. 1-10, 1959.....	2,393	3.8	0.00	31	4.0	1.7	0.8	107	5.6	2.2	0.0	0.6	105	94	6	182	6.8	5
Apr. 11-20.....	4,288	2.1	0.00	34	3.4	1.7	0.9	113	6.4	2.0	0.0	0.6	130	99	6	189	6.9	5
Apr. 21-30.....	2,976	3.5	0.00	34	3.9	2.0	1.1	118	5.2	2.0	0.0	0.3	126	101	4	197	7.4	5
May 1-10.....	847	2.0	0.00	38	3.9	2.4	1.2	131	5.8	2.5	0.0	0.9	129	111	4	216	7.2	6
May 11-20.....	930	1.4	0.00	36	3.9	2.1	1.2	124	5.0	2.0	0.0	0.9	125	106	4	202	7.9	6
May 21-31.....	889	2.2	0.00	37	3.7	2.1	1.0	126	4.8	2.0	0.0	1.3	130	108	4	210	6.9	6
June 1-10.....	1,295	1.9	0.00	38	3.0	1.8	1.0	124	5.2	2.0	0.0	1.2	124	108	6	204	7.2	5
June 11-20.....	4,089	2.1	0.00	33	2.8	1.5	0.9	109	3.8	1.5	0.0	0.7	113	94	4	179	7.4	6
June 21-30.....	760	5.4	0.00	38	3.0	3.1	1.9	126	6.8	2.0	0.2	1.2	135	108	4	205	7.5	13
July 1-10.....	448	4.5	0.00	38	3.5	2.6	1.0	130	5.0	2.5	0.0	1.8	120	110	3	209	7.6	12
July 11-20.....	227	3.4	0.00	38	3.9	2.9	1.0	130	4.4	2.8	0.0	1.8	134	111	4	212	7.8	5
July 21-31.....	605	2.3	0.00	34	3.8	2.5	0.9	120	4.8	2.2	0.0	1.9	121	100	2	194	7.7	5
Aug. 1-10.....	269	5.7	0.00	33	3.6	2.8	1.0	116	4.4	2.5	0.0	1.2	121	98	2	193	7.1	5
Aug. 11-20.....	124	6.4	0.00	37	3.8	2.8	1.0	128	4.4	2.5	0.0	1.2	132	108	3	206	7.3	5
Aug. 21-31.....	112	5.5	0.00	37	4.1	2.9	1.0	129	4.4	3.2	0.0	1.8	133	110	4	213	7.6	8
Sept. 1-10.....	129	6.1	0.00	37	3.8	2.6	0.9	128	4.8	2.5	0.0	1.6	140	108	4	209	7.7	7
Sept. 11-20.....	104	5.9	0.00	39	4.3	3.3	1.0	138	4.4	3.0	0.0	2.7	155	115	2	222	7.8	7
Sept. 21-30.....	155	3.4	0.00	39	5.1	3.1	1.1	137	4.8	4.8	0.0	1.1	154	118	6	254	7.6	7
Average.....	1,165	3.2	0.00	37	4.2	2.3	1.0	126	5.1	3.2	0.1	1.1	131	110	6	209	--	5

WHITE RIVER BASIN--Continued
7-570. BUFFALO RIVER NEAR RUSH, ARK.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	--	63	61	73	69	71	69	--	64	65	65	65	65	--	63	63	65	64	61	61	--	59	54	54	53	54	56	62		
November ..	52	52	61	59	55	54	--	50	56	57	52	53	57	--	61	63	60	55	56	56	53	--	55	55	52	44	44	--	43	--	54	
December ..	45	48	50	49	49	--	44	42	43	43	42	42	--	34	33	34	37	38	--	40	40	40	45	45	47	42	--	42	47	45	42	43
January	43	42	--	34	32	32	38	40	41	--	34	45	46	43	47	43	--	37	41	42	44	42	39	--	40	46	45	44	45	45	--	41
February	40	39	41	40	43	39	--	42	44	49	45	45	47	--	48	47	48	47	44	40	--	45	44	45	46	47	49	--	--	--	44	
March	48	55	48	47	51	45	--	47	48	48	51	47	46	--	51	53	50	50	51	52	--	50	49	53	57	62	60	--	51	60	55	51
April	60	55	57	--	57	58	61	63	56	55	--	52	52	57	59	61	59	--	61	61	57	55	59	59	63	65	65	65	67	--	59	
May	66	--	70	76	70	76	77	70	--	69	73	73	72	70	70	--	57	72	70	72	74	74	71	69	69	71	72	73	72	72	72	72
June	78	75	73	70	70	--	73	74	73	70	70	70	--	69	67	70	72	75	75	--	77	77	77	76	74	76	--	80	80	81	--	74
July	82	79	76	--	80	75	77	78	78	86	79	77	78	79	80	79	--	80	79	79	80	78	80	--	78	82	78	84	81	88	--	80
August	87	82	83	80	85	85	85	78	77	77	77	76	80	82	82	80	81	79	79	--	82	82	81	81	81	81	80	78	--	82	79	81
September ..	76	77	75	78	--	79	79	80	79	76	69	--	71	69	70	71	71	72	--	75	75	75	74	74	74	75	--	72	74	74	72	74

WHITE RIVER BASIN--Continued
7-600. NORTH FORK RIVER AT NORFORK DAM, NEAR NORFORK, ARK.

LOCATION--At gaging station at Norfolk Dam, 4.3 miles northeast of Norfolk, Baxter County.

DRAINAGE AREA--866 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1946 to September 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 3, 1958	2,670	2.4	0.04	33	19	1.5	1.1	190	4.6	2.0	0.0	1.2	164	160	5	285	7.8	5
Oct. 7	2,780	2.8	.04	34	19	1.5	1.3	192	5.0	2.0	.0	1.1	160	163	6	290	7.9	5
Oct. 14	2,280	---	---	35	18	1.2	1.0	190	3.0	2.0	---	1.0	163	162	6	287	7.8	7
Nov. 4	3,820	1.8	.00	35	19	1.2	1.2	190	6.8	2.0	.1	1.4	164	166	10	281	7.5	5
Dec. 9	2,870	---	---	32	18	1.0	1.0	182	4.4	2.0	---	.9	161	154	5	274	7.8	2
Dec. 22	2,470	1.4	.04	31	19	1.3	1.5	182	5.8	2.5	.1	1.6	162	156	6	270	7.6	4
Jan. 6, 1959	2,820	---	---	32	18	.9	1.2	184	4.4	2.0	---	1.4	162	154	3	274	7.9	5
Jan. 28	2,160	1.6	.00	30	21	1.4	1.3	190	4.0	2.2	.1	1.8	161	162	6	269	8.0	4
Feb. 3	2,770	---	---	33	17	1.1	1.2	184	1.8	2.2	---	.9	161	152	2	269	7.9	6
Mar. 4	1,380	---	---	37	20	2.5	1.3	206	5.2	4.0	---	1.2	188	174	6	314	7.8	5
Mar. 13	871	1.6	.00	32	19	1.2	1.3	186	4.4	2.0	.1	1.9	163	158	6	278	8.4	5
Apr. 1	1,260	---	---	32	19	1.6	1.5	196	3.2	2.0	---	1.1	164	158	0	283	8.2	6
Apr. 9	1,420	1.4	.00	35	18	1.4	1.4	190	4.0	2.2	.1	1.3	166	162	6	283	8.3	7
Apr. 27	2,280	---	---	36	21	1.3	1.3	212	4.2	2.2	---	1.0	184	176	3	327	7.8	5
Apr. 29	2,300	3.5	.00	35	19	1.9	1.8	196	4.4	2.0	.0	.9	166	166	5	287	7.9	5
May 15	2,360	3.6	.00	29	22	2.5	2.0	194	4.4	2.5	.0	1.2	174	162	4	293	8.0	5
May 25	1,550	---	---	36	20	1.3	1.3	200	4.8	2.2	---	2.5	177	172	8	308	7.6	2
June 5	508	---	---	35	19	1.5	1.3	200	5.6	2.5	---	1.9	154	166	2	308	7.6	5
June 19	163	3.5	.01	34	20	1.8	1.8	200	4.8	2.0	.0	.5	174	167	3	299	7.9	5
July 16	1,330	---	.02	35	19	2.5	2.0	189	4.6	2.5	.0	1.4	176	176	3	289	7.4	5
July 20	1,530	---	.04	36	19	1.8	1.7	206	4.4	2.0	---	1.1	178	170	8	306	7.6	3
Aug. 14	1,680	4.3	.04	37	21	1.8	1.7	206	4.4	2.0	.0	1.1	178	176	8	309	8.1	5
Sept. 17	1,680	4.3	.04	39	21	2.6	2.0	216	4.4	3.0	.0	.8	205	184	7	332	7.9	5

a Includes equivalent of 2 parts per million of carbonate (CO₂).

WHITE RIVER BASIN--Continued

7-640. BLACK RIVER NEAR CORNING, ARK.

LOCATION.--At gaging station at bridge on U.S. Highway 62, 2.2 miles east of Corning, Clay County, 13.9 miles downstream from Cane Creek.

DRAINAGE AREA.--1,749 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1959.

Water temperatures: October 1956 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 175 ppm Nov. 1-10; minimum, 67 ppm Nov. 18-23.

Hardness: Maximum, 146 ppm Oct. 21-31, Nov. 1-10, Sept. 11-20, 21-30; minimum, 44 ppm Jan. 22-26.

Specific conductance: Maximum daily, 300 micromhos July 24; minimum, 83 micromhos Nov. 21.

Water temperatures: Maximum, 86° F Aug. 3, 5, minimum, 33° F Jan. 10.

EXTREMES, 1956-59.--Dissolved solids: Maximum, 175 ppm Nov. 1-10, 1958; minimum, 38 ppm Jan. 24, 1957.

Hardness: Maximum, 154 ppm Nov. 11-20, 1956; minimum, 25 ppm Jan. 24, 1957.

Specific conductance: Maximum daily, 323 micromhos Oct. 25, 1956; minimum daily, 42 micromhos Mar. 28, 1958.

Water temperatures: Maximum, 86° F Aug. 3, 5, 1959; minimum, 33° F Jan. 16, 1957, Jan. 10, 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year

October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1958.....	536	1.9	30	16	3.1	1.1	1.1	170	5.2	3.0	0.1	0.7	150	141	2	260	7.9	6
Oct. 11-20.....	320	--	31	16	2.9	1.1	1.1	168	3.8	3.0	--	1.3	163	144	6	262	7.9	4
Oct. 21-31.....	461	--	32	16	3.1	1.3	1.74	174	2.8	2.5	--	1.0	161	146	2	266	8.0	5
Nov. 1-10.....	623	3.9	32	16	2.9	1.6	1.62	162	5.8	6.2	.2	1.2	173	146	8	262	8.1	1
Nov. 11-20.....	2,731	--	18.0	10	1.8	1.0	1.0	84	4.6	2.0	--	2.1	167	81	2	106	7.6	6
Nov. 18-20.....	3,371	--	16	10	1.9	1.9	1.9	94	4.6	2.0	--	1.3	166	81	4	163	7.8	8
Nov. 24-30.....	2,699	3.7	19	10	1.9	1.4	1.4	108	3.2	2.0	.1	1.8	124	88	0	179	7.6	9
Dec. 1-10.....	1,034	--	24	13	2.5	1.3	1.34	134	3.4	2.5	--	1.6	126	114	4	212	8.1	5
Dec. 11-20.....	743	--	25	15	2.1	1.3	1.48	148	4.2	3.0	--	2.6	136	124	2	229	8.2	8
Dec. 21-31, 1959.....	656	3.1	26	16	2.9	1.0	1.56	156	4.0	3.2	.0	1.9	145	131	3	238	8.0	2
Jan. 1-10, 1959.....	716	--	29	14	2.8	1.9	1.9	156	4.4	3.0	--	2.3	150	130	2	232	8.0	1
Jan. 11-20.....	2,480	--	13	7.8	2.3	1.9	2.3	72	5.8	3.0	--	2.9	111	64	6	134	7.4	40
Jan. 21, 27.....	3,456	--	9.8	4.8	1.6	2.2	2.2	46	6.6	2.0	--	2.9	98	44	6	96	7.5	70
Jan. 22-26.....	2,998	--	18	10	1.7	1.1	1.1	100	5.0	2.2	--	1.8	111	86	4	165	7.8	18
Jan. 28-31.....	1,698	3.2	22	11	2.3	1.1	1.14	114	5.2	3.0	.0	2.2	118	100	6	189	7.7	5
Feb. 1-14.....	2,898	--	12	7.4	2.3	2.0	2.0	66	6.4	2.5	--	2.2	74	60	6	118	7.7	55
Feb. 15-19.....	2,560	--	17	9.2	2.1	1.3	1.3	106	6.4	2.5	--	2.0	109	80	5	157	8.1	22
Feb. 20-28.....	1,977	6.2	21	9.5	2.5	1.2	1.2	106	5.4	2.5	.1	2.0	105	92	4	180	7.6	8
Mar. 1-10.....	2,554	--	20	9.7	3.9	1.1	1.1	106	5.4	5.5	--	1.4	108	90	3	183	7.8	4
Mar. 11-20.....	2,144	--	19	9.9	2.7	1.1	1.1	104	5.2	3.8	--	1.8	109	88	3	177	7.4	9

WHITE RIVER BASIN--Continued
 7-640. BLACK RIVER NEAR CORNING, ARK.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Apr. 1-8, 1959.....	1,559	--		22	10	2.6	1.0	116	5.0	3.0	--	1.8	114	96	1	193	7.5	4
Apr. 22-31.....	1,063	6.5		25	12	3.1	1.9	136	4.0	3.5	0.1	1.8	134	172	4	237	7.6	3
Apr. 22-30, May 1-5.....	1,946	--		52	18.6	3.7	1.0	121	3.9	2.5	--	1.0	176	176	4	245	8.0	9
May 6-13.....	1,420	3.4		22	11	3.4	1.5	106	4.8	3.5	--	2.0	114	100	2	195	7.0	12
May 14-20.....	1,420	--		22	18.1	2.4	1.4	106	4.8	2.5	--	2.6	114	194	6	193	7.8	18
May 21-30.....	1,334	--		22	12	2.6	1.4	123	4.6	2.5	--	2.2	124	104	4	199	7.4	12
May 31, June 1-6.....	2,119	--		19	9.9	2.0	1.3	104	4.2	2.5	--	2.1	118	88	3	173	7.7	18
June 7-20.....	1,196	4.4		25	12	2.6	1.2	132	3.6	2.5	2	2.1	133	112	4	211	7.9	4
June 21-30.....	1,882	--		24	13	2.8	1.3	137	4.2	3.0	--	1.9	130	114	1	233	7.1	10
July 1-10.....	666	8.8		28	14	3.1	1.0	152	3.8	2.5	1	2.0	146	128	3	238	8.1	3
July 11-20.....	527	--		27	16	3.1	1.3	158	4.0	3.5	--	2.1	147	134	4	250	7.4	5
July 21-31.....	498	--		27	17	3.3	1.4	160	4.0	4.8	--	1.9	152	138	6	258	7.3	13
Aug. 1-10.....	457	7.9		31	14	3.0	1.1	164	4.0	2.8	2	1.9	163	135	0	246	7.6	10
Aug. 11-20.....	403	--		27	18	3.0	1.3	168	3.4	3.2	--	1.8	158	142	4	265	7.2	5
Aug. 21-31.....	417	--		26	17	2.8	1.5	159	5.2	3.0	--	1.8	156	135	4	253	7.6	18
Sept. 1-10.....	520	8.0		28	14	3.1	1.3	156	4.2	3.0	2	2.1	151	128	0	241	7.9	15
Sept. 11-20.....	391	--		29	18	2.8	1.3	173	3.6	3.5	--	1.8	164	146	4	269	8.0	5
Sept. 21-30.....	379	--		29	18	2.8	1.3	174	3.8	3.0	--	1.2	166	146	4	266	8.2	3
Average.....	1,290	--		23	12	2.6	1.3	129	4.5	3.0	--	1.9	131	107	2	208	--	12

WHITE RIVER BASIN--Continued
 7-640. BLACK RIVER NEAR CORNING, ARK.--Continued

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	64	63	62	63	64	65	65	67	68	67	66	65	66	65	66	67	66	65	65	66	64	63	62	61	59	59	57	56	55	64		
November ..	54	55	52	56	56	55	54	55	55	54	54	55	56	58	60	61	60	59	57	57	54	54	55	54	52	51	49	43	40	54		
December ..	42	43	45	46	45	43	42	43	39	39	40	39	38	37	37	39	40	41	42	41	41	43	44	43	42	42	43	43	--	43		
January	42	43	40	37	36	36	38	37	37	33	37	39	42	45	43	40	39	40	40	42	39	38	39	39	40	40	39	40	43	39		
February	39	39	39	39	38	39	40	42	45	45	43	44	45	43	43	45	47	45	42	40	43	43	43	45	45	46	47	47	--	43		
March	47	47	49	49	49	48	47	47	48	49	47	48	49	49	49	49	50	51	54	52	52	51	54	55	57	54	55	56	57	61		
April	59	60	57	61	62	63	65	64	59	60	57	58	56	58	59	62	62	64	65	65	62	62	64	64	64	64	64	64	65	67	--	
May	--	--	--	--	--	73	73	72	73	73	73	72	68	67	77	66	69	73	73	74	75	74	74	74	75	75	75	76	77	76	75	
June	74	73	72	74	74	74	74	75	76	77	77	78	77	78	77	78	78	78	78	78	78	79	79	79	79	80	80	82	83	85	--	
July	85	83	82	82	80	80	83	83	83	83	82	82	81	80	81	80	81	80	82	83	82	81	83	83	80	81	81	82	83	85	84	
August	84	85	86	85	86	85	84	82	80	81	81	81	82	81	82	83	82	82	81	82	83	84	85	85	84	82	82	81	82	84	83	
September ..	82	82	82	81	81	81	82	83	82	80	79	74	73	73	73	73	72	73	74	73	74	75	74	75	74	75	74	76	75	74	73	--

WHITE RIVER BASIN--Continued

7-695. SPRING RIVER AT IMBODEN, ARK.

LOCATION.--At gaging station at bridge on U.S. Highway 62 at Imboden, Lawrence County, 3.9 miles downstream from Janes Creek, 8.5 miles upstream from Eleven Point River, and 12.1 miles upstream from mouth.

DRAINAGE AREA.--1,162 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

Water temperatures: December 1955 to September 1959.

EXTREMES. 1958-59.--Dissolved solids: Maximum, 258 ppm Oct. 21-31; minimum, 86 ppm Nov. 17-18.

Hardness: Maximum, 252 ppm Oct. 21-31; minimum, 77 ppm Nov. 17-18.

Specific conductance: Maximum daily, 445 micromhos Nov. 7; minimum daily, 114 micromhos Nov. 18.

Water temperatures: Maximum, 81°F Aug. 4-6, 9; minimum, 36°F Jan. 5, 6.

EXTREMES. 1955-59.--Dissolved solids: Maximum, 312 ppm Jan. 6, 1956; minimum, 81 ppm Apr. 5, 1957.

Hardness: Maximum, 252 ppm Oct. 21-31, 1958; minimum, 69 ppm Apr. 5, 1957.

Specific conductance: Maximum daily, 557 micromhos Jan. 6, 1956; minimum, 114 micromhos Nov. 18, 1958.

Water temperatures: Maximum, 82°F on several days during July and August 1956; minimum, 34°F Jan. 17-19, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 1-10, 1958.....	640	1.8		46	28	2.7	1.3	282	3.6	2.5	0.1	1.4	234	230	0	394	8.0	7
Oct. 11-20.....	527	--		50	30	1.9	1.4	286	8.0	3.5	--	2.0	254	248	14	400	8.2	2
Oct. 21-31.....	482	--		32	32	2.3	1.3	294	6.0	3.5	--	1.7	258	252	10	418	8.1	2
Nov. 1-14.....	468	4.9		44	30	2.4	3.0	282	2.0	2.8	2.2	2.5	254	234	2	416	8.1	2
Nov. 15-16, 19-20.....	4,808	--		28	16	2.1	3.3	160	3.6	3.5	--	1.6	137	136	5	251	8.1	6
Nov. 17-18.....	29,750	--		21	6.0	2.9	3.9	88	7.0	2.0	--	2.0	a, 86	77	5	145	7.6	7
Nov. 21-30.....	1,594	--		41	24	2.0	1.7	240	2.6	2.0	--	2.6	212	201	4	339	8.3	5
Dec. 1-10.....	1,243	3.1		42	27	1.6	1.1	254	3.6	2.2	2.2	4.3	230	216	8	374	7.9	1
Dec. 11-20.....	911	--		44	25	2.0	1.3	b, 258	3.4	2.5	--	2.4	218	213	2	379	8.3	6
Dec. 21-31.....	748	--		46	28	2.4	1.3	c, 270	5.0	2.8	--	2.0	255	230	8	391	8.4	5
Jan. 1-10, 1959.....	693	3.2		35	21	1.9	1.1	b, 258	1.8	2.2	1.1	3.1	191	186	0	320	8.4	2
Jan. 11-20.....	571	--		37	27	2.0	.9	b, 259	3.6	2.0	--	2.7	193	188	4	351	8.2	1
Jan. 21-31.....	1,126	--		37	25	1.9	.8	b, 234	3.4	1.8	--	2.4	206	196	4	335	8.3	6
Feb. 1-10.....	811	2.8		33	27	1.5	.9	a, 232	4.4	2.5	1.1	2.2	201	194	4	375	7.7	0
Feb. 11-20.....	1,750	--		32	22	1.5	.9	b, 208	3.0	2.2	--	2.1	175	170	0	300	8.4	3
Feb. 21-28.....	1,344	--		37	26	1.8	.9	a, 236	2.6	3.0	--	2.4	195	200	6	355	8.2	1
Mar. 1-10.....	1,977	3.6		31	24	1.6	.8	212	5.2	2.2	0	1.0	190	181	8	321	7.7	5
Mar. 11-20.....	1,423	--		31	25	1.6	.9	216	3.0	2.5	--	3.2	174	180	4	323	7.2	2
Mar. 21-31.....	1,368	--		32	25	1.8	1.0	220	4.6	2.5	--	3.2	186	183	2	321	8.1	2

Apr. 1-10, 1959.....	1,065	4.6	33	27	2.0	1.0	228	5.4	2.5	0.0	1.8	202	194	6	329	7.8	5
Apr. 11-20.....	1,080	--	33	28	1.5	1.0	244	4.0	2.5	--	3.2	203	202	2	349	7.9	1
Apr. 21-30.....	1,333	--	40	26	1.5	1.1	248	4.4	2.0	--	3.0	209	207	4	365	7.5	3
May 1-10.....	958	3.2	32	28	1.8	1.1	252	4.4	2.2	1.0	1.9	199	195	5	342	7.6	5
May 11-20.....	892	--	32	28	1.4	1.0	270	4.0	2.8	--	2.8	186	192	7	386	7.6	2
May 21-30.....	892	--	32	28	1.6	1.1	271	4.4	2.8	--	2.8	186	225	7	386	7.4	2
May 29-31.....	933	--	38	21	1.2	1.4	218	4.0	2.2	--	2.5	185	182	3	359	7.3	8
June 1-10.....	784	9.0	29	25	2.5	1.1	210	3.2	3.0	1	2.2	208	176	4	313	8.0	8
June 11-20.....	971	--	35	25	1.6	1.2	230	4.0	2.0	--	2.3	188	190	2	336	7.8	5
June 21-30.....	936	--	33	24	1.6	1.2	216	3.8	2.0	--	2.6	184	181	4	324	7.9	4
July 1-10.....	577	9.8	33	27	2.3	1.1	232	3.4	2.5	1	2.0	227	194	4	340	7.8	10
July 11-20.....	476	--	37	28	1.7	1.0	250	3.8	2.5	--	2.0	203	208	2	368	7.9	2
July 21-31.....	492	--	42	29	1.6	1.2	272	3.2	2.5	--	1.9	221	224	1	388	8.1	5
Aug. 1-10.....	439	7.7	29	29	2.4	1.0	232	3.2	2.5	1	2.4	238	192	2	339	7.9	7
Aug. 11-20.....	441	--	27	28	2.0	1.3	220	4.0	2.5	--	3.1	183	182	2	329	8.1	4
Aug. 21-31.....	637	--	33	22	1.5	1.6	212	3.6	2.0	--	1.8	184	173	0	312	8.0	7
Sept. 1-10.....	449	8.3	32	27	2.4	1.3	234	3.6	2.8	0	2.1	200	191	0	342	7.6	3
Sept. 11-20.....	405	--	32	28	2.0	1.6	234	3.2	2.0	--	3.8	198	195	3	335	7.4	3
Sept. 21-30.....	392	--	35	28	2.4	1.7	242	4.4	2.2	--	7.0	211	202	4	353	7.6	3
Average.....	1,076	--	36	26	1.9	1.3	234	3.9	2.5	--	2.5	202	194	2	342	--	4

a Calculated from determined constituents.

b Includes equivalent of 4 parts per million of carbonate (CO₃).

c Includes equivalent of 8 parts per million of carbonate (CO₃).

WHITE RIVER BASIN--Continued
 7-695. SPRING RIVER AT IMBODEN, ARK.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	58	57	58	62	62	63	65	67	63	62	61	62	62	62	63	64	63	61	60	61	62	60	58	59	56	55	55	52	52	53	60	
November ..	53	53	52	53	55	52	50	52	52	48	49	53	53	55	56	61	64	56	55	53	52	52	53	55	53	53	51	45	43	42	--	52	
December ..	43	46	47	48	49	46	44	42	42	40	40	41	38	38	37	38	40	40	42	44	43	42	45	45	44	43	44	44	40	44	45	43	
January	44	43	42	38	36	36	39	39	38	39	42	43	49	46	40	40	40	40	41	43	38	37	38	41	44	44	43	45	45	43	41		
February	42	43	44	41	41	39	46	43	45	46	43	45	45	46	48	48	49	44	43	42	44	45	46	46	47	49	50	44	44	44	44		
March	49	48	48	48	51	45	46	47	48	49	51	48	48	52	49	48	48	49	51	53	53	50	51	52	57	59	51	50	53	55	57		
April	60	58	60	57	58	58	62	65	60	56	54	54	55	53	55	57	60	61	62	63	62	58	57	59	61	64	64	61	63	64	--	59	
May	65	69	70	72	72	72	72	70	66	68	69	70	70	68	64	--	--	66	68	70	71	73	72	--	72	72	72	73	73	74	--	70	
June	74	71	70	68	69	70	71	72	72	73	73	74	74	71	72	73	74	74	75	74	75	76	76	73	74	75	77	77	77	79	--	73	
July	79	76	74	75	74	73	75	75	77	77	75	76	75	76	75	76	76	76	77	77	77	77	77	78	77	77	77	77	77	78	80	76	
August	80	78	79	81	81	81	80	78	81	75	76	75	77	77	76	78	78	77	78	79	78	76	77	77	79	79	78	76	77	78	78	78	
September ...	77	77	77	78	76	76	77	72	76	73	69	68	69	69	67	69	68	67	69	70	70	72	72	72	73	73	73	72	73	72	69	--	72

WHITE RIVER BASIN--Continued

7-720. ELEVEN POINT RIVER NEAR RAVENDEN SPRINGS, ARK.

LOCATION.--At gaging station at bridge on State Highway 90, 4.5 miles downstream from small tributary, 6.2 miles northeast of Ravenden Springs, Randolph County, and 21 miles upstream from mouth.
DRAINAGE AREA.--1,123 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1958 (daily), October 1958 to September 1959 (monthly).

Water temperatures: October 1956 to September 1958.

REMARKS.--Records of specific conductance of daily samples (1956-58) available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium, magnesium	Non-carbonate			
Oct. 16, 1958.....	725			43	21	1.5	1.0	236	2.4	2.0		0.6	202	194	0	340	7.9	6
Dec. 11.....	1,200			35	18	.8	.8	194	2.0	2.0		4.0	161	162	2	293	8.0	2
Jan. 7, 1959.....	797			41	21	1.0	.8	230	1.8	2.0		3.4	186	189	0	335	8.0	2
Feb. 4.....	890			41	22	1.5	.9	236	1.4	2.2		1.9	209	193	0	338	8.0	6
Mar. 1.....	1,160			35	21	1.3	.8	204	3.4	2.0		1.0	176	174	7	307	8.1	8
Apr. 2.....	1,000			37	21	2.7	1.3	212	3.5	4.0		2.2	192	179	5	314	8.6	5
Apr. 29.....	1,200			37	20	1.7	.9	212	2.4	2.0		1.0	184	174	1	308	8.1	5
May 26.....	859			40	21	1.6	1.1	226	3.6	2.5		3.2	192	186	2	335	7.8	2
June 23.....	797			41	19	1.4	.9	224	2.2	1.8		2.0	180	180	0	331	7.8	5
July 21.....	623			47	23	1.5	1.2	254	2.6	2.0		1.8	204	212	4	353	8.1	5
Aug. 19.....	553			43	23	1.3	1.2	244	1.4	2.0		1.9	215	202	2	348	8.1	4
Sept. 16.....	445			46	24	1.4	1.0	260	.4	2.0		.4	221	214	0	370	8.2	3

a Includes equivalent of 6 parts per million of carbonate (CO₃).

WHITE RIVER BASIN--Continued

7-745. WHITE RIVER AT NEWPORT, ARK.

LOCATION:--At gaging station at bridge on U.S. Highway 67 at Newport, Jackson County, 7.2 miles downstream from Black River.

DRAINAGE AREA.--19,812 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1959.

Water temperatures: October 1945 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 204 ppm Dec. 8; minimum, 128 ppm Nov. 18-23.

Hardness: Maximum, 168 ppm Oct. 21-31; minimum, 88 ppm Nov. 18-23.

Specific conductance: Maximum daily, 356 micromhos Dec. 8; minimum daily, 153 micromhos Nov. 19.

Water temperatures: Maximum, 82°F July 4, 29, Aug. 2, 6, 17; minimum, 37°F Jan. 6.

EXTREMES, 1945-59.--Dissolved solids: Maximum, 388 ppm Jan. 20-21, 23, 30, 1954; minimum, 96 ppm Nov. 19-30, 1957.

Hardness: Maximum, 193 ppm Oct. 4-7, 10, 1945; minimum, 51 ppm Jan. 25-31, 1949.

Specific conductance: Maximum daily, 695 micromhos Jan. 30, 1954; minimum daily, 103 micromhos Jan. 28, 1949.

Water temperatures: Maximum, 87°F Aug. 4, 9, 1947, Aug. 1, 1952; minimum, 34°F Feb. 2-4, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year

October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium carbonate			
Oct. 1-10, 1958.....	12,630	4.4	0.00	37	16	2.2	1.1	186	3.6	3.5	0.1	1.2	188	158	6	282	8.2	6
Oct. 11-20.....	10,770	--	--	38	17	2.3	1.2	188	6.2	3.8	--	2.2	175	165	11	289	8.0	4
Oct. 21-31.....	9,567	--	--	39	17	2.6	1.3	198	5.4	3.2	--	3.0	183	168	5	299	7.9	4
Nov. 1-17.....	12,170	3.5	0.00	38	15	3.0	1.3	188	2.6	4.0	.1	2.4	177	156	2	285	8.0	5
Nov. 18-23.....	45,620	--	--	23	7.5	1.4	2.4	104	3.4	2.2	--	1.9	128	88	4	164	7.7	45
Nov. 24-30.....	36,070	--	--	27	12	1.9	2.0	138	4.0	2.2	--	1.9	145	117	4	214	7.9	23
Dec. 1-7.....	22,840	--	--	30	14	1.9	1.3	156	4.8	3.0	--	2.2	155	132	4	243	7.9	6
Dec. 8.....	19,200	--	--	32	13	2.1	1.8	132	15	27	--	29	a 204	134	26	356	8.2	--
Dec. 9-20.....	17,500	3.6	0.00	34	14	2.2	1.1	168	4.6	3.0	.0	3.1	164	142	5	264	7.8	5
Dec. 21-31.....	11,650	--	--	37	16	2.5	1.1	188	4.2	3.2	--	2.0	177	158	4	286	7.9	4
Jan. 1-10, 1959.....	12,180	2.4	0.00	35	18	2.6	1.3	188	4.4	3.5	.1	2.5	173	162	8	285	8.4	2
Jan. 11-20.....	11,540	--	--	37	16	2.8	1.0	186	4.8	3.5	--	1.1	156	158	6	287	8.0	6
Jan. 21-31.....	20,890	--	--	27	14	1.9	1.1	148	5.4	2.5	--	1.5	134	125	4	240	8.0	6
Feb. 1-13.....	16,890	2.3	.01	32	15	1.7	1.1	162	5.4	3.0	.0	1.9	148	142	8	288	8.2	3
Feb. 14-28.....	25,490	--	--	31	12	2.0	1.2	146	5.8	3.0	--	1.8	132	127	8	258	7.8	7
Mar. 1-10.....	23,850	2.8	.02	32	13	2.0	1.0	156	3.8	2.8	.1	1.8	154	134	5	248	7.8	5
Mar. 11-20.....	22,210	--	--	34	13	2.0	1.0	162	5.6	3.0	--	2.1	151	138	6	252	8.3	4
Mar. 21-22.....	23,100	--	--	30	14	6.8	1.8	150	7.2	12	--	1.6	159	132	10	262	7.1	5
Mar. 23-31.....	23,380	--	--	30	13	1.8	.9	148	6.8	2.8	--	1.9	151	128	7	232	7.8	5

Apr. 1-10, 1959.....	17,820	5.9	0.00	33	16	2.5	0.9	178	4.8	3.0	0.1	2.0	158	148	2	284	7.9	2
Apr. 11-20.....	14,960	---	---	36	16	2.7	1.0	184	5.6	3.2	---	1.8	179	156	5	285	7.7	5
Apr. 21-30.....	25,470	---	---	33	13	1.8	1.0	158	4.8	2.2	---	2.0	153	136	6	247	7.8	8
May 1-10.....	16,400	4.4	.00	35	15	3.1	.9	176	4.4	3.0	.1	1.8	157	149	5	272	8.2	4
May 11-20.....	13,300	---	---	33	16	3.0	1.1	180	4.8	3.0	---	2.2	172	148	1	278	7.6	5
May 21-31.....	12,090	---	---	35	16	2.8	1.1	184	4.8	3.2	---	3.1	175	154	2	288	7.8	5
June 1-10.....	12,560	6.5	.00	33	15	2.2	1.1	172	4.0	3.8	.0	2.3	164	144	3	275	7.5	8
June 11-20.....	17,160	---	---	32	12	2.7	1.1	156	4.8	2.8	---	2.1	154	130	2	248	8.0	5
June 21-30.....	13,870	---	---	33	15	2.4	1.2	168	5.6	3.0	---	2.1	160	144	6	263	7.9	7
July 1-10.....	11,600	5.2	.00	33	15	2.5	1.0	168	4.2	2.5	.1	2.4	156	144	6	268	7.7	4
July 11-20.....	9,592	---	---	34	17	3.0	1.1	184	4.8	3.8	---	1.8	166	155	4	285	8.1	8
July 21-31.....	9,175	---	---	34	17	3.2	1.2	188	4.4	3.8	---	1.4	171	155	1	291	8.0	5
Aug. 1-10.....	9,370	6.1	.00	37	16	3.6	1.1	186	4.4	4.5	.2	1.7	187	158	6	289	7.8	10
Aug. 11-20.....	8,676	---	---	33	17	3.4	1.2	190	5.0	4.5	---	2.4	167	158	2	285	9.0	5
Aug. 21-31.....	10,030	---	---	34	17	3.0	1.2	186	5.6	3.0	---	1.8	166	135	2	260	7.8	7
Sept. 1-10.....	9,711	5.3	.00	37	16	3.5	1.2	192	5.0	3.0	.1	2.8	169	188	1	300	7.9	10
Sept. 11-20.....	8,241	---	---	37	17	2.8	1.2	186	5.2	3.0	---	1.6	169	162	2	300	8.2	9
Sept. 21-30.....	7,611	---	---	37	17	2.8	1.2	186	5.2	4.0	---	1.6	172	162	2	300	8.1	7
Average.....	15,570	---	---	34	15	3.1	1.2	171	5.1	4.1	---	2.9	164	146	6	271	---	7

a Calculated from determined constituents.

b Includes equivalent of 4 parts per million of carbonate (CO₃).

c Includes equivalent of 2 parts per million of carbonate (CO₃).

WHITE RIVER BASIN--Continued

7-745. WHITE RIVER AT NEWPORT, ARK.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	63	61	63	64	65	67	68	70	69	67	67	68	66	65	66	68	69	67	66	65	65	61	65	64	62	60	59	59	58	57			
November ..	56	58	58	57	59	58	57	56	55	55	58	54	55	57	59	61	64	65	62	59	56	58	56	55	56	53	50	--	47	45	--	57		
December ..	45	45	47	48	49	48	47	46	41	42	43	42	40	42	40	41	42	43	46	45	45	45	46	47	45	46	45	45	45	44	45	45		
January	44	45	43	40	38	37	38	39	40	40	41	42	44	45	46	44	43	42	41	45	43	41	40	41	43	42	42	42	45	44	43	42		
February	43	41	41	41	40	42	43	44	44	46	46	47	47	49	47	48	49	48	46	46	45	44	45	45	45	46	47	49	49	49	--	--	45	
March	50	50	50	50	51	50	50	51	49	50	49	50	51	52	52	53	52	53	53	54	53	53	54	55	56	58	58	56	57	56	56	53	53	
April	58	60	61	61	61	62	63	64	62	62	59	57	58	58	56	59	59	59	62	63	62	61	61	61	60	61	62	62	62	63	64	--	61	
May	66	67	68	71	71	72	71	70	71	70	69	69	67	67	67	67	66	68	69	71	71	71	71	71	72	73	73	76	76	77	76	71	--	71
June	76	77	77	73	72	72	75	76	75	75	76	74	73	73	74	77	77	76	76	79	78	77	77	76	76	76	75	76	77	78	--	--	76	
July	80	80	81	82	78	76	77	77	78	78	78	77	77	77	80	79	80	79	81	79	78	77	78	78	78	78	79	76	77	82	81	79	79	
August	80	82	80	80	81	82	80	77	80	78	77	79	80	79	80	80	82	80	79	78	76	76	75	76	75	76	79	78	77	76	75	74	78	
September ..	74	75	76	74	74	74	75	75	75	74	72	70	72	69	72	70	70	71	71	71	71	71	72	72	72	74	73	74	71	71	71	70	--	72

WHITE RIVER BASIN--Continued

7-760. LITTLE RED RIVER NEAR HEBER SPRINGS, ARK.

LOCATION.--At gaging station, 2.8 miles downstream from Peter Creek and 3 miles northeast of town of Heber Springs, Cleburne County. DRAINAGE AREA.--1,141 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1949 to September 1952 (daily), October 1954 to September 1959 (monthly).

Water temperatures: November 1949 to September 1952. RECORDS AVAILABLE.--Records of specific conductance of daily samples (1949-52) available in district office in Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 15, 1958.....	130			7.8	1.6	1.6	0.7	29	5.2	1.8		0.7	40	27	3	64	7.1	4
Nov. 13.....	46			8.9	1.4	1.8	.8	33	4.4	1.8		.6	46	26	1	67	6.9	2
Dec. 9.....	1,450			3.6	.7	1.0	.4	18	3.6	1.5		.6	36	17	2	43	6.7	3
Jan. 20, 1959.....	2,120			5.6	.7	1.2	.3	16	2.9	2.0		2.2	32	14	2	39	6.2	8
Feb. 17.....	3,250			5.1	1.2	1.1	.4	13	3.2	1.5		2.5	31	16	5	37	6.9	8
Apr. 22.....	3,250			6.0	.5	1.2	.6	19	2.8	1.0		1.2	32	17	2	49	7.1	10
May 12.....	1,020			6.2	1.1	1.4	.7	24	3.4	1.8		.2	26	20	0	50	6.6	5
June 10.....	6,240			3.3	.9	.7	.9	14	2.0	1.0		.1	30	12	0	33	6.5	7
July 14.....	1,62			5.3	1.3	1.1	.5	20	4.4	1.5		.1	29	18	2	47	6.5	2
Aug. 5.....	236			4.9	1.5	1.0	.6	19	4.2	4.5		.1	34	18	2	44	6.5	3
Sept. 16.....	224			4.3	1.2	1.3	.9	19	2.6	1.5		1.4	26	16	0	40	6.6	10

WHITE RIVER BASIN--Continued
7-778. WHITE RIVER AT CLARENDON, ARK.

LOCATION --At gaging station on Cottonbelt Railroad bridge at Clarendon, Monroe County.
DRAINAGE AREA --25,497 square miles.
RECORDS AVAILABLE --Chemical analyses: October 1947 to September 1959.
Water temperatures: October 1948 to September 1959.
EXTREMES, 1958-59.--Dissolved solids: Maximum, 211 ppm Nov. 1-14; minimum, 60 ppm Feb. 23-28.
Hardness: Maximum, 170 ppm Nov. 1-14; minimum, 34 ppm Feb. 23-28.
Specific conductance: Maximum daily, 313 micromhos Nov. 9; minimum daily, 74 micromhos Feb. 26.
Water temperatures: Maximum, 87°F Aug. 3; minimum, 34°F Jan. 9, 31.
EXTREMES, 1947-59.--Dissolved solids: Maximum, 349 ppm Nov. 12, 1955; minimum, 38 ppm Feb. 1-9, 1950.
Hardness: Maximum, 202 ppm Apr. 25, 1956; minimum, 28 ppm Dec. 1-10, 1957.
Specific conductance: Maximum daily, 544 micromhos Nov. 12, 1955; minimum daily, 61 micromhos Feb. 3, 1950.
Water temperatures, 1948-59: Maximum, 90°F on several days during June and July 1954; minimum, 34°F on several days during winter months.
REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 furnished by District Office, Corps of Engineers, Memphis, Tenn.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1958.....	15,460	1.2	0.00	34	14	5.2	1.5	174	4.6	4.0	0.2	1.6	163	142	0	275	7.6	10
Oct. 11-20.....	13,780	--	--	36	16	4.3	1.4	184	7.0	3.8	--	1.8	172	156	5	281	8.0	5
Oct. 21-31.....	11,680	--	--	38	17	4.6	1.3	192	8.0	4.5	--	1.6	177	165	8	297	7.9	2
Nov. 1-14.....	9,873	3.8	.00	40	17	4.5	1.2	200	4.6	5.2	1.1	2.4	211	170	6	302	8.3	3
Nov. 15-17.....	13,600	--	--	29	14	4.6	1.8	152	4.8	7.0	--	1.4	151	130	6	244	8.0	6
Nov. 18-19.....	30,400	--	--	22	11	3.2	1.6	122	4.6	4.0	--	1.2	126	100	0	206	7.9	6
Nov. 20-30.....	43,920	--	--	18	5.4	3.2	2.6	81	5.2	3.8	--	1.1	94	67	0	150	7.5	10
Dec. 1-9.....	42,290	3.2	.12	20	7.4	3.0	2.5	96	5.8	3.2	.2	1.7	122	80	2	169	8.0	40
Dec. 10-15.....	21,760	--	--	25	10	2.7	1.7	124	5.8	3.9	--	1.6	139	104	2	234	7.9	6
Dec. 16-20.....	24,430	--	--	28	14	2.9	1.5	158	5.4	4.6	--	1.2	148	125	7	237	8.1	6
Dec. 21-31.....	15,530	--	--	28	15	3.7	1.2	164	5.0	4.0	--	2.5	161	139	4	260	8.2	5
Jan. 1-14, 1959.....	18,180	2.4	.00	23	12	4.1	1.4	130	6.2	3.5	--	2.4	135	112	6	230	7.9	7
Jan. 15-20.....	18,180	--	--	21	12	3.5	1.3	130	6.0	3.5	--	1.2	120	102	6	199	7.9	6
Jan. 21-24.....	25,520	--	--	21	12	3.1	1.3	130	6.0	4.0	--	1.1	114	81	6	166	7.6	10
Jan. 25-31.....	31,710	--	--	18	8.8	3.1	1.6	91	6.0	4.0	--	1.1	114	81	6	166	7.6	10
Feb. 1-7.....	25,600	3.1	.13	22	9.3	3.1	1.7	106	5.0	4.5	.1	1.8	148	93	6	189	8.0	40
Feb. 8-13.....	23,320	--	--	25	11	7.3	1.8	122	6.8	12	--	1.6	140	108	8	234	7.4	13
Feb. 14-15.....	32,250	--	--	19	6.8	2.9	1.9	86	5.8	4.0	--	2.0	81	76	5	159	7.9	45
Feb. 16-22.....	52,680	--	--	11	4.2	3.2	2.1	52	4.8	3.5	--	1.9	68	45	2	106	7.4	80

Feb. 23-28, 1959...	52,220	--	8.2	3.3	3.5	2.5	40	3.6	3.0	--	2.9	60	34	1	87	7.5	80
Mar. 1-3, 6, 8-10...	40,770	--	11	4.8	2.8	2.2	56	3.2	3.0	--	1.6	69	47	1	106	7.8	80
Mar. 4-5, 7...	38,930	--	14	4.9	16	2.9	62	5.4	26	--	1.9	115	55	4	199	7.7	70
Mar. 11-20...	39,900	4.2	0.13	6.9	4.8	1.9	80	5.4	6.5	0.1	2.4	97	71	6	157	7.4	45
Mar. 21-31...	36,650	--	17	7.6	4.2	1.7	84	4.0	6.0	--	1.4	86	72	2	159	7.5	40
Apr. 1-10...	33,080	--	21	8.3	4.9	1.6	102	6.0	7.0	--	1.9	125	86	3	189	7.6	22
Apr. 11-20...	19,840	5.3	0.01	31	3.6	1.5	144	5.0	3.8	1.1	2.0	142	122	4	239	7.8	5
Apr. 21-30...	26,420	--	29	11	2.9	1.1	141	5.2	3.2	--	1.9	136	118	2	227	7.8	5
May 1-10...	22,460	7.0	0.00	31	3.2	1.5	160	4.6	2.8	1.1	2.1	148	131	0	250	8.0	2
May 11-20...	17,310	--	33	14	3.1	1.2	168	5.2	4.2	--	1.8	154	140	2	272	7.4	4
May 21-31...	15,210	--	33	15	3.7	1.2	170	5.2	5.2	--	2.4	163	144	4	276	7.0	5
June 1-12...	15,100	5.7	0.00	32	3.9	1.5	168	4.6	4.0	1.1	3.1	137	138	0	266	8.0	4
June 13-22...	22,280	--	26	11	3.4	1.4	128	5.2	4.5	--	2.4	130	130	6	213	8.0	8
June 23-30...	17,490	--	31	12	4.1	1.3	188	4.2	3.2	--	3.2	158	157	0	254	8.0	6
July 1-10...	13,720	6.6	0.00	34	3.7	1.6	166	4.4	4.8	1.1	3.1	163	139	2	268	7.8	2
July 11-20...	17,720	--	34	13	3.7	1.3	166	5.2	6.2	--	2.3	164	144	4	279	7.6	1
July 21-31...	10,880	--	33	15	4.8	1.3	170	5.6	6.2	--	2.3	164	144	4	279	7.6	1
Aug. 1-10...	11,080	7.4	0.00	33	4.5	1.4	170	5.0	5.0	1.1	2.2	159	140	1	264	8.0	10
Aug. 11-20...	9,780	--	36	16	4.7	1.6	184	5.2	4.8	--	4.1	173	156	5	292	7.6	4
Aug. 21-31...	11,190	--	35	14	4.1	1.6	174	5.0	4.5	--	4.0	183	145	2	276	7.2	5
Sept. 1-10...	11,530	6.5	0.00	36	4.3	1.4	173	5.4	10	1.1	2.0	179	152	10	295	7.6	5
Sept. 11-20...	11,130	--	34	14	4.4	1.6	172	5.4	4.8	--	4.6	175	142	2	276	7.1	4
Sept. 21-30...	9,260	--	38	15	4.2	1.6	188	5.4	5.0	--	3.5	179	156	2	297	7.2	5
Average.....	21,430	--	27	12	4.2	1.6	136	5.3	5.3	--	2.2	139	117	6	227	--	17

a Includes equivalent of 2 parts per million of carbonate (CO₃).

WHITE RIVER BASIN--Continued
 7-778. WHITE RIVER AT CLARENDON, ARK.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	68	67	68	68	69	68	67	68	67	67	67	67	68	68	69	70	68	69	69	69	69	67	68	58	65	64	61	61	60	58	66				
November ..	59	59	59	59	60	56	56	58	56	55	58	59	59	60	60	60	60	60	61	60	60	59	58	58	59	58	50	48	48	52	--	58				
December ..	50	50	50	51	47	44	47	45	41	41	--	43	46	40	38	44	41	43	48	46	43	45	49	46	46	45	46	48	47	45	47	45				
January	47	45	45	43	41	38	42	40	34	39	42	45	45	40	45	41	39	42	44	52	43	43	43	43	43	49	49	41	41	46	44	34	43			
February	41	40	40	41	40	40	41	46	53	47	45	46	54	54	53	50	54	--	42	42	44	47	49	50	40	43	43	50	--	--	46	43				
March	52	55	53	53	50	50	49	56	53	56	55	51	56	52	53	53	54	54	56	53	53	54	56	60	58	58	54	55	55	60	64	55	55			
April	62	64	63	64	65	66	62	66	55	60	58	53	51	59	61	62	62	62	63	67	60	61	63	66	69	69	66	67	67	69	--	63	63			
May	74	79	73	75	75	75	75	73	75	75	76	74	74	73	70	72	73	74	75	76	74	72	75	76	76	75	78	80	78	80	75	75	80	78	80	
June	80	76	77	76	76	79	78	75	78	75	79	78	78	78	78	79	81	80	78	79	80	81	80	81	80	81	82	82	81	83	84	82	--	79	79	
July	84	80	81	84	80	84	83	83	83	83	82	82	80	81	83	86	83	82	83	83	80	80	84	81	80	80	81	79	80	81	83	84	85	86	82	82
August	84	85	87	86	85	86	86	86	83	82	82	84	83	85	83	84	81	83	84	84	84	84	84	84	84	84	84	80	82	83	82	84	82	84	82	84
September ..	84	84	79	80	82	80	82	79	77	75	75	75	75	75	74	75	75	75	78	77	74	78	78	78	78	78	77	78	79	80	75	75	--	--	78	--

ARKANSAS RIVER BASIN
7-1305. ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR, COLO.

LOCATION--At gaging station on left bank, 1 mile upstream from Coddoo Creek, 1.8 miles downstream from John Martin Dam, Bent County, and 3 miles southeast of Hasty.
DRAINAGE AREA--18,917 square miles, of which 785 square miles is probably noncontributing.
RECORDS AVAILABLE--Chemical analyses: January 1942 to August 1943, October 1945 to July 1949 (intermittent and weekly samples); January 1951 to September 1959 (daily samples).

Water temperatures: January 1951 to September 1959.
EXTREMES, 1958-59--Dissolved solids: Maximum, 4,010 ppm Jan. 21-23; minimum, 1,080 ppm Sept. 25-26.
Specific conductance: Maximum, 1,400 ppm Aug. 21-23; minimum, 320 ppm Sept. 25-26.
Water temperatures: Maximum, 41.4°C (106.5°F) Aug. 20, 1959; minimum, 20.0°C (68.0°F) Aug. 20, 1959.
Water temperatures: Maximum, 77°F Aug. 4, 12-13; minimum, 35°F Feb. 6, Mar. 5, 1955.
EXTREMES, 1951-59--Dissolved solids: Maximum, 4,280 ppm Aug. 8, 1955; minimum, 609 ppm June 11, 1956.
Hardness: Maximum, 1,910 ppm Aug. 8, 1955; minimum, 335 ppm Aug. 1-31, 1957.
Specific conductance: Maximum, 335 ppm Aug. 1-31, 1957.
Water temperatures: Maximum daily, 5,180 microhms Aug. 17, 20, 1957.
Hardness: Maximum daily, 5,180 microhms Apr. 21, 1955; minimum daily, 818 microhms Aug. 17, 20, 1957.

Water temperatures: Maximum, 85°F Aug. 6, 1951; minimum, freezing point on several days during winter months.
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. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhms at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate		Sodium	
Oct. 1-31, 1958.....	520	15	0.00	148	61	199	7.2	174	---	656	31	0.8	1.4	0.13	1,900	1.53	1,680	650	478	2.3	1,500	7.7
Nov. 1-20.....	11	---	---	288	117	323	---	523	---	---	---	---	---	---	2,720	3.29	80.8	1,200	936	3.0	3,067	7.7
Nov. 21-30.....	6.96	---	---	335	137	415	---	315	---	---	---	---	---	---	3,230	4.39	60.7	1,400	1,140	4.8	3,530	7.5
Dec. 1-31.....	6.75	---	---	345	170	421	---	362	---	---	---	---	---	---	3,290	4.37	60.0	1,560	1,260	4.6	3,820	7.6
Jan. 1-8, 1959....	5.78	25	.00	360	156	435	7.8	382	1,890	---	117	---	9	7.3	3,410	4.64	53.2	1,540	1,230	4.8	3,730	7.5
Jan. 9-20, 24-31..	9.57	---	---	302	148	357	---	387	---	---	---	---	---	---	2,900	3.94	74.9	1,360	1,040	4.2	3,230	7.7
Jan. 21-23.....	9.73	---	---	430	150	547	---	272	---	---	---	---	---	---	4,010	5.45	105	1,690	1,470	5.8	4,250	7.7
Feb. 1-28.....	6.48	---	---	332	149	391	---	395	---	---	---	---	---	---	3,130	4.29	63.0	1,440	1,120	4.5	3,370	7.7
Mar. 1-31.....	6.74	---	---	340	151	316	---	399	---	---	---	---	---	---	3,120	4.28	57.1	1,310	1,160	4.5	3,420	7.7
Apr. 1-9, 14-30..	615	10	.02	178	63	158	7.0	153	---	818	47	9	1.3	.21	1,480	2.01	2,460	705	580	2.6	1,790	7.8
Apr. 10-13.....	94.2	---	---	265	112	316	---	232	---	---	---	---	---	---	2,570	3.50	654	1,120	930	4.1	2,860	7.8
May 1-31.....	708	---	---	185	67	167	---	151	---	---	---	---	---	---	1,560	2.12	2,980	735	612	2.7	1,840	7.8
June 1-30.....	712	---	---	185	67	174	---	149	---	---	---	---	---	---	1,600	2.18	3,080	735	613	2.8	1,880	7.8
July 1-31.....	978	11	.03	200	65	184	7.7	153	998	---	48	---	1.0	.20	1,620	2.20	4,280	765	640	2.9	1,970	7.8
Aug. 1-31.....	924	---	---	195	75	196	---	168	---	---	---	---	---	---	1,730	2.35	4,320	795	658	3.0	2,070	7.8
Sept. 1-14.....	952	---	---	212	80	220	---	154	---	---	---	---	---	---	1,700	2.31	4,370	856	730	3.3	2,240	7.6
Sept. 15-19.....	15.2	---	---	330	135	414	---	248	---	---	---	---	---	---	3,210	4.37	1,332	1,380	1,180	4.8	3,560	7.6
Sept. 20-24.....	27.8	---	---	380	149	430	---	208	---	---	---	---	---	---	3,740	5.09	2,81	1,560	1,390	5.4	4,030	7.4
Sept. 25-28.....	218	---	---	148	37	130	---	188	---	---	---	---	---	---	1,080	1.47	636	520	368	2.5	1,420	7.8
Sept. 27-28.....	34.0	---	---	280	90	284	---	130	---	---	---	---	---	---	2,170	2.95	1,99	920	814	4.1	2,510	7.9
Sept. 29-30.....	41.5	---	---	220	112	374	---	140	---	---	---	---	---	---	2,780	3.78	311	1,160	1,050	4.8	3,160	7.7
Weighted average	411	---	---	189	69	179	---	159	---	---	---	---	---	---	1,590	2.16	1,760	755	624	2.8	1,930	---

ARKANSAS RIVER BASIN--Continued
 7-1305. ARKANSAS RIVER BELOW JOHN MARTIN RESERVOIR, COLO.--Continued

Temperature (°F) of water, water year October 1958 to September 1959
 /Once-daily measurement at 8:00 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	65	54	63	63	62	65	64	64	63	61	60	61	--	60	61	61	66	66	59	61	60	59	57	58	58	59	56	55	55	55	54	
November ..	52	52	52	52	52	51	51	48	51	51	50	50	51	51	51	50	49	49	49	47	48	52	50	49	48	48	46	43	45	46	46	
December ..	48	50	45	50	52	45	46	45	42	47	--	45	44	43	41	46	46	46	50	47	46	46	47	47	45	46	42	43	41	38	40	
January	42	42	37	40	46	47	42	45	42	45	46	43	45	45	37	36	39	44	40	38	40	45	44	45	41	42	37	41	42	42	39	
February	37	46	38	41	38	35	39	39	43	38	42	50	--	46	42	46	43	44	40	41	42	46	46	43	46	46	45	42	--	--	42	
March	44	45	45	41	35	43	44	44	50	48	44	44	49	46	42	44	47	49	50	45	38	42	48	50	47	41	43	46	46	51	45	
April	51	47	45	46	47	48	45	44	43	40	46	43	50	50	49	46	47	48	47	45	47	46	50	49	50	51	53	52	53	54	--	
May	53	56	56	55	53	56	54	54	56	57	56	58	57	56	58	58	59	60	60	50	60	58	59	63	62	64	64	65	64	63	58	
June	63	64	65	65	65	65	69	67	67	68	68	67	70	68	69	69	69	68	69	70	68	67	--	69	70	72	71	72	66	68	--	
July	--	70	71	72	72	71	74	73	72	73	73	73	73	73	72	74	73	73	74	74	74	75	74	75	74	73	75	75	75	74	75	
August	75	76	76	77	75	75	75	74	75	76	77	77	--	73	73	74	75	75	75	76	74	76	76	76	76	76	75	75	74	74	75	
September ..	73	71	72	73	72	71	71	72	70	--	66	67	66	69	60	60	57	58	63	61	62	62	60	58	55	53	57	60	50	47	--	

ARKANSAS RIVER BASIN--Continued

7-1442. LITTLE ARKANSAS RIVER AT VALLEY CENTER, KANS.

LOCATION.--At gaging station at bridge, 0.5 mile west of Valley Center, Sedgwick County.
 DRAINAGE AREA.--1,327 square miles, of which about 77 square miles is probably noncontributing.
 RECORDS AVAILABLE.--Water temperatures: October 1957 to September 1959.
 Sediment records: October 1957 to September 1959.
 EXTREMES, 1958-59.--Water temperatures: Maximum, 90°F Aug. 4, 5; minimum, freezing point Jan. 16.
 Sediment concentrations: Maximum daily, 2,960 ppm July 2; minimum daily, 1 ppm Dec. 7.
 Sediment loads: Maximum daily, 9,480 tons May 7; minimum daily, not determined.
 EXTREMES, 1957-59.--Water temperatures: Maximum, 90°F Aug. 4, 5, 1959; minimum, freezing point on several days during winter months.
 Sediment concentrations: Maximum daily, 2,960 ppm July 2, 1959; minimum daily, 1 ppm Dec. 7, 1958.
 Sediment loads: Maximum daily, 10,800 tons Sept. 17, 1958; minimum daily, not determined.
 REMARKS.--Records of combined discharge of Little Arkansas River at Valley Center and of Little Arkansas River floodway at Valley Center for water year October 1958 to September 1959 given in WSP 1631. Flow affected by ice Dec. 12-15, Jan. 3-6, 21-23, Feb. 1, 2. Part of high-water flow bypasses gage through floodway channel.

Temperature (°F) of water, water year October 1958 to September 1959
 [Once-daily measurement usually between 4 p.m. and 8 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.....	62	59	--	66	67	--	74	74	69	64	65	--	66	68	70	--	--	66	66	64	64	64	--	--	58	57	57	57	50	--	--	
November..	57	58	--	58	57	50	50	--	54	57	57	61	62	58	64	53	49	52	53	--	52	55	48	47	40	38	--	40	--	--	52	
December..	--	--	47	--	--	--	--	39	--	--	36	--	34	--	--	42	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
January.....	--	--	--	--	--	33	--	--	--	--	--	37	--	--	32	--	38	--	--	--	--	--	--	--	35	--	--	--	--	--	--	
February....	--	33	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	50	50	--	--	--	--	
March.....	53	50	52	48	39	46	51	52	50	51	49	51	--	54	55	58	59	54	49	54	57	61	58	50	--	49	48	56	61	53		
April.....	62	68	63	64	65	73	57	56	--	57	--	58	61	65	66	--	60	52	53	62	--	68	67	75	75	77	78	--	64			
May.....	79	75	--	76	68	--	64	67	67	70	70	66	65	62	73	79	72	69	71	73	75	70	82	80	--	74	72	--	72			
June.....	74	77	78	72	75	78	77	80	78	84	89	80	83	--	80	83	--	89	--	85	83	83	85	85	--	84	84	83	80	81		
July.....	82	76	76	85	83	83	86	84	80	77	85	77	76	78	79	--	--	--	77	--	--	--	--	--	--	--	--	--	--	--	--	
August.....	--	87	89	90	90	80	--	--	85	86	87	--	77	83	88	87	--	--	--	89	--	85	84	80	--	84	--	--	--	--	--	
September..	80	78	83	--	83	--	--	85	75	70	--	75	73	76	78	77	--	71	82	--	81	82	--	71	69	75	75	--	70	65	56	

QUALITY OF SURFACE WATERS, 1959

ARKANSAS RIVER BASIN--Continued

7-1442. LITTLE ARKANSAS RIVER AT VALLEY CENTER, KANS.--Continued

Suspended sediment, water year October 1958 to September 1959

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...	126	146	50	56	15	2.3	54	9	
2...	110	111	33	56	19	2.9	54	--	
3...	107	78	23	57	19	2.9	54	13	
4...	104	80	22	56	21	3.2	54	--	
5...	102	93	26	56	23	3.5	54	--	
6...	100	99	27	54	24	3.5	54	--	
7...	122	238	s 107	54	22	3.2	53	1	
8...	276	2,320	1,730	53	20	2.9	54	--	
9...	208	1,480	831	52	19	2.7	52	--	
10...	181	540	264	52	18	2.5	52	--	
11...	130	350	123	51	22	3.0	53	6	
12...	110	330	98	51	23	3.2	52	--	
13...	93	205	--	51	29	4.1	51	--	
14...	81	164	36	52	31	4.4	50	11	
15...	78	228	48	52	33	4.6	55	--	
16...	77	217	45	52	33	4.6	54	--	e 1
17...	73	146	29	54	27	3.9	55	7	
18...	70	92	17	76	70	sa 17	55	--	
19...	68	63	12	109	92	a 27	56	--	
20...	64	46	8.0	85	47	11	55	--	
21...	62	38	6.4	73	48	9.5	55	--	
22...	60	30	4.9	66	54	9.6	56	--	
23...	59	26	4.1	61	51	8.4	57	--	
24...	59	33	5.3	58	27	4.2	56	--	
25...	58	32	5.0	57	22	3.4	55	--	
26...	58	24	3.8	54	16	2.3	55	--	
27...	58	21	3.3	54	--	e 2.0	55	8	
28...	57	19	2.9	53	--	e 1.7	60	--	
29...	56	21	3.2	53	--	e 1.4	61	--	
30...	56	18	2.7	54	8	1.2	60	--	
31...	56	12	1.8	--	--	--	60	--	
Total	2,919	--	3,623.4	1,763	--	156.1	1,701	--	31
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...	60	--	--	58	--	--	67	15	2.7
2...	59	--	--	67	41	--	66	15	2.7
3...	50	--	--	77	--	--	64	17	3.0
4...	40	--	--	73	--	--	64	8	1.4
5...	56	--	--	69	--	e 7	65	7	1.2
6...	72	2	--	66	--	--	65	11	1.9
7...	70	--	--	70	--	--	65	12	2.1
8...	63	--	--	72	--	--	69	25	4.7
9...	60	--	--	78	--	--	81	54	12
10...	59	--	--	83	--	e 12	125	82	28
11...	60	--	--	88	--	--	183	142	70
12...	62	--	--	102	--	--	196	199	105
13...	64	11	e 1	138	--	--	168	185	84
14...	68	--	--	194	--	--	135	157	57
15...	72	--	--	244	--	--	110	126	37
16...	73	4	--	218	--	e 50	96	83	22
17...	73	--	--	184	--	--	83	70	16
18...	70	--	--	140	--	--	71	121	23
19...	68	--	--	115	--	--	66	64	11
20...	65	--	--	98	--	--	62	42	7.0
21...	60	--	--	85	--	--	56	250	38
22...	52	--	--	83	--	--	55	31	4.6
23...	68	--	--	79	--	--	54	46	6.7
24...	69	--	--	76	--	e 8	53	50	7.2
25...	70	--	--	74	--	--	54	46	6.7
26...	73	--	--	72	--	--	58	32	5.0
27...	81	--	--	70	30	5.7	127	--	e 190
28...	87	--	e 4	69	25	4.7	692	2,380	a 4,450
29...	87	--	--	--	--	--	555	1,250	s 2,000
30...	82	--	--	--	--	--	183	780	385
31...	73	--	--	--	--	--	130	440	154
Total	2,066	--	46	2,842	--	600.4	3,918	--	7,738.9

e Estimated.

s Computed by subdividing day.

a Computed from partly estimated-concentration graph.

LOWER MISSISSIPPI RIVER BASIN
 ARKANSAS RIVER BASIN--Continued

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7-1442. LITTLE ARKANSAS RIVER AT VALLEY CENTER, KANS.--Continued

Suspended sediment, water year October 1958 to September 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...	110	287	85	52	64	9.0	508	2,100	2,880
2...	98	224	59	49	68	9.0	232	1,300	814
3...	88	152	36	48	68	8.8	160	750	324
4...	81	117	26	49	93	12	126	430	146
5...	74	136	27	74	209	s 50	114	420	129
6...	69	75	14	1,220	1,760	s 6,450	103	246	68
7...	67	65	12	2,280	1,540	9,480	91	204	50
8...	72	65	13	2,370	1,150	7,360	96	217	56
9...	81	77	17	1,770	820	3,920	105	223	63
10...	74	51	10	452	880	1,070	86	182	42
11...	74	40	8.0	1,560	--	e 7,200	77	221	46
12...	74	42	8.4	2,360	1,060	6,750	68	162	30
13...	71	53	10	2,070	740	4,140	62	91	15
14...	68	73	13	681	620	1,140	60	72	12
15...	69	83	15	277	523	391	58	66	10
16...	68	90	17	209	394	222	55	74	11
17...	65	78	14	182	280	138	53	115	16
18...	62	92	15	201	284	sa 170	51	145	20
19...	71	93	18	286	404	a 312	51	167	23
20...	224	500	a 302	218	290	169	49	181	24
21...	208	746	a 419	182	196	96	50	144	19
22...	148	556	222	162	200	87	54	126	18
23...	106	340	97	152	200	82	53	206	29
24...	85	256	59	171	216	100	70	218	41
25...	75	207	42	282	576	439	75	203	41
26...	69	165	31	220	518	308	60	195	32
27...	65	147	26	182	458	225	50	229	31
28...	61	124	20	154	325	135	46	190	24
29...	58	94	15	216	732	sa 504	44	136	16
30...	55	76	11	498	1,900	b 2,600	44	85	10
31...	--	--	--	535	1,740	2,510	--	--	--
Total	2,590	--	1,661.4	19,160	--	56,086.8	2,751	--	5,040
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...	47	67	8.5	46	66	8.2	135	421	s 182
2...	409	2,960	s 3,880	43	58	6.7	134	1,370	496
3...	904	2,220	5,420	39	53	5.6	71	1,090	209
4...	344	1,360	1,260	35	50	4.7	48	835	108
5...	94	800	203	32	47	4.1	35	680	64
6...	76	382	78	30	48	3.9	30	545	44
7...	80	291	63	29	50	3.9	28	430	32
8...	79	220	47	28	46	3.5	26	320	22
9...	62	142	24	27	38	2.8	26	227	16
10...	54	111	16	27	29	2.1	24	180	12
11...	48	86	11	26	21	1.5	23	142	8.8
12...	44	74	8.8	26	21	1.5	23	103	6.4
13...	44	54	6.4	26	21	1.5	22	82	4.9
14...	43	41	4.8	24	22	1.4	20	51	2.8
15...	97	251	s 102	37	84	8.4	21	33	1.9
16...	696	--	e 2,500	47	100	13	21	32	1.8
17...	681	--	e 2,500	37	61	6.1	22	48	2.9
18...	1,150	--	e 4,900	30	69	5.6	22	53	3.1
19...	1,100	--	e 3,300	28	44	3.3	22	42	2.5
20...	202	570	311	26	43	3.0	21	23	1.3
21...	120	488	158	26	52	3.6	21	21	1.2
22...	132	744	265	26	67	4.7	20	33	1.8
23...	85	480	110	24	93	6.0	26	74	5.2
24...	91	--	e 120	24	97	6.3	42	284	s 48
25...	152	--	e 240	26	94	6.6	83	512	115
26...	102	--	e 100	24	89	5.8	51	428	59
27...	95	--	e 85	24	82	5.3	37	348	35
28...	73	140	e 28	24	40	2.6	30	270	22
29...	59	110	e 18	23	26	1.6	29	230	18
30...	50	88	e 12	22	48	2.9	28	290	22
31...	47	72	b 9	24	55	3.6	--	--	--
Total	7,260	--	25,788.5	910	--	139.8	1,141	--	1,548.6

Total discharge for year (cfs-days)..... 49,021
 Total load for year (tons)..... 102,460.9

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

QUALITY OF SURFACE WATERS, 1959

ARKANSAS RIVER BASIN--Continued

7-1442. LITTLE ARKANSAS RIVER AT VALLEY CENTER, KANS.--Continued

FLOODWAY

LOCATION.--At gaging station at highway bridge, 1.2 miles northwest of river gage at Little Arkansas River at Valley Center, Sedgwick County.

RECORDS AVAILABLE.--Sediment records: October 1957 to September 1959

EXTREMES, 1958-59.--Sediment concentrations: Maximum daily, 1,370 ppm May 8; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 2,730 tons May 12; minimum daily, 0 tons on many days.

EXTREMES, 1957-59.--Sediment concentrations: Maximum daily, 1,370 ppm May 8, 1959; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 14,000 tons July 17, 1958; minimum daily, 0 tons on many days.

REMARKS.--No flow during October to March, July to September; tabulation omitted for these periods.

Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Suspended sediment, water year October 1958 to September 1959

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...				0	--	0			
2...				0	--	0			
3...				0	--	0			
4...				0	--	0			
5...				0	--	0			
6...				27	--	e 55			
7...				525	1,220	a 1,730			
8...				686	1,370	2,540			
9...				96	410	sa 233			
10...				0	--	0			
11...				267	--	e 950			
12...				790	1,280	2,730			
13...				222	474	sa 448			
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...				0	--	0			
25...				0	--	0			
26...				0	--	0			
27...				0	--	0			
28...				0	--	0			
29...				0	--	0			
30...				0	--	0			
31...				0	--	0			
Total	0		0	2,613	--	8,686	0		0

Total discharge for year (cfs-days)..... 2,613

Total load for year (tons)..... 8,686

e Estimated.

s Computed by subdividing day.

a Partly estimated from concentration curve.

ARKANSAS RIVER BASIN--Continued
7-1465. ARKANSAS RIVER AT ARKANSAS CITY, KANS.

LOCATION--At gaging station at bridge on U.S. Highway 166, 0.1 mile downstream from St. Louis-San Francisco Railway Co. bridge, 0.5 mile west of Arkansas City, Cowley County, 5.4 miles upstream from Walnut River, and at mile 701.4.
DRAINAGE AREA--43,713 square miles, of which 7,607 square miles is probably noncontributing.
RECORDS AVAILABLE--Chemical analyses: October 1951 to September 1959.
Water temperatures: October 1951 to September 1959.

EXTRMS, 1958-59.--Dissolved solids: Maximum, 1,800 ppm Dec. 11-16; minimum, 299 ppm July 24.
Hardness: Maximum, 615 ppm Dec. 11-16; minimum, 108 ppm July 24.
Specific conductance: Maximum daily, 3,270 microhms Jan. 4; minimum daily, 388 microhms July 18.
Water temperatures: Maximum, 91° F June 20; minimum, freezing point on many days during December to February.
EXTRMS, 1951-59.--Dissolved solids: Maximum, 3,380 ppm Jan. 16, 1957; minimum, 172 ppm Oct. 1-6, 1955.
Hardness, 760 ppm Jan. 16, 1957; minimum, 84 ppm Oct. 1-6, 1955.

Specific conductance: Maximum daily, 5,700 microhms Jan. 16, 1957; minimum daily, 259 microhms Oct. 4, 1955.
Water temperatures: Maximum, 91° F June 20, 1959; minimum, freezing point on many days during winter months.
REMARKS--Dashes omitted. Potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (residue at 180°C)		Hardness as CaCO ₃		Specific conductance (microhms at 25°C)				
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate					
Oct. 1-10, 1958...	2,209	21	0.00	104	23	210	6.8	242	0	165	308	0.5	6.4	0.37	1.31	5,750	355	156	4.9	1,610	8.2	
Oct. 11-13.....	2,177	--	--	80	18	182	188	0	133	262	262	--	9.0	--	1.10	4,750	274	120	4.8	1,370	8.1	
Oct. 14-31.....	1,461	--	--	109	24	250	242	0	180	370	370	--	7.2	--	1,110	1,511	370	172	5.7	1,860	8.1	
Nov. 1-17.....	1,121	--	--	103	29	270	266	0	140	420	420	--	8.0	--	1,120	1,521	370	157	6.1	2,160	8.1	
Nov. 18-21.....	1,560	--	--	89	26	199	206	6	160	292	292	--	7.5	--	939	1,228	330	151	4.8	1,550	8.4	
Nov. 22-30.....	1,173	--	--	112	28	275	242	12	192	402	402	--	8.4	--	1,220	1,661	395	176	6.0	1,980	8.4	
Dec. 1-10.....	1,144	--	--	125	34	314	250	12	255	450	450	--	9.9	--	1,420	1,931	450	225	6.4	2,260	8.4	
Dec. 11-16.....	813	--	--	154	56	387	290	8	336	600	600	--	12	--	1,800	2,451	615	364	6.8	2,800	8.3	
Dec. 17-20.....	1,265	--	--	132	35	328	262	14	291	450	450	--	14	--	1,460	1,991	4,990	475	6.5	2,270	8.4	
Dec. 21-31.....	1,391	25	.00	131	32	311	248	8	326	412	412	4	8.0	.43	1,380	1,881	4,660	244	6.3	2,240	8.4	
Jan. 1-12, 1959...	959	--	--	126	45	397	304	0	352	530	530	--	1.0	--	1,660	2,226	5,300	500	231	7.8	2,370	8.1
Jan. 13-20.....	1,422	--	--	112	32	270	250	0	259	385	385	--	11	--	1,210	1,651	4,650	410	205	5.8	2,010	7.8
Jan. 21-24.....	1,037	--	--	131	49	404	260	12	354	570	570	--	3.6	--	1,720	2,341	4,820	530	297	7.7	2,500	8.4
Jan. 25-31.....	1,303	--	--	128	27	324	252	8	381	480	480	--	1.7	--	1,260	2,381	4,320	310	6.9	2,230	8.3	
Feb. 1-10.....	943	--	--	144	41	342	260	20	330	580	580	--	3.6	--	1,450	1,971	5,740	306	7.6	2,740	8.5	
Feb. 11-20.....	1,745	--	--	128	27	263	244	0	209	445	445	--	2.2	.00	1,320	1,801	6,230	430	244	6.9	2,210	8.2
Feb. 21-28.....	1,509	18	.00	122	40	278	8.0	252	0	203	435	.6	7.2	.00	1,330	1,811	5,420	470	264	5.6	2,360	8.0

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
7-1465. ARKANSAS RIVER AT ARKANSAS CITY, KANS.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (microhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Tons per day					
Mar. 1-10, 1959...	1,399	18	0.00	139	40	320	6.8	260	0	428	370	0.5	7.9	0.25	1,540	2.09	5,820	510	297	6.2	2,330	7.4
Mar. 11-20.....	1,538	20	.00	100	34	322	6.6	230	0	219	490	.0	.6	.11	1,450	1.97	6,020	390	202	7.1	2,240	7.8
Mar. 21-26.....	1,297	---	---	142	38	340	228	16	420	420	420	---	8.5	---	1,550	2.11	5,430	510	296	6.5	2,360	8.5
Mar. 27-31.....	2,610	---	---	83	25	178	180	0	216	228	228	---	3.3	---	860	1.17	6,520	310	162	4.4	1,390	8.1
Apr. 1-5.....	1,414	---	---	85	20	257	182	0	214	285	285	---	5	---	976	1.33	5,300	295	146	3.7	1,360	8.4
Apr. 2-8.....	1,414	---	---	130	32	327	236	0	326	326	326	---	7.1	---	1,360	1.59	5,190	420	226	6.7	2,100	8.2
Apr. 9.....	1,690	---	---	130	37	387	240	0	371	520	520	---	.5	---	1,680	2.28	7,170	475	278	7.7	2,590	7.8
Apr. 10.....	1,470	---	---	118	33	269	224	4	331	338	338	---	4.5	---	1,280	1.74	5,080	430	240	5.6	1,960	8.3
Apr. 11-20.....	1,239	20	.00	98	34	300	6.5	204	0	217	480	0	5	.10	1,440	1.66	4,820	384	217	6.7	2,160	7.7
Apr. 21-30.....	1,268	---	---	115	47	281	224	4	313	405	405	---	5.2	---	1,340	1.82	4,590	480	290	5.6	2,130	8.3
May 1-5.....	1,076	---	---	96	39	350	192	0	319	475	475	---	1.8	---	1,440	1.96	4,180	400	242	7.6	2,240	8.2
May 6.....	2,700	---	---	70	26	154	146	8	180	208	208	---	0	---	1,744	1.01	5,420	280	147	4.0	1,230	8.4
May 7-11.....	6,100	---	---	50	14	102	154	0	82	138	138	---	0	---	480	.65	7,910	184	58	3.3	835	7.6
May 12-17.....	6,605	---	---	49	13	89	150	0	66	125	125	---	2.2	---	438	.60	7,810	176	53	2.9	787	7.9
May 18-27.....	2,246	---	---	76	21	221	186	0	157	310	310	---	4.6	---	896	1.22	5,430	275	122	5.8	1,540	7.9
May 28-31.....	2,422	---	---	73	20	183	186	4	143	250	250	---	3.1	---	795	1.08	5,200	265	106	4.9	1,350	8.3
June 1-2.....	2,050	---	---	77	19	190	192	0	158	255	255	---	.4	---	829	1.13	4,590	270	112	5.0	1,370	7.8
June 3-10.....	1,540	---	---	82	24	254	176	0	223	340	340	---	3.3	---	1,050	1.43	4,370	305	161	6.3	1,750	8.0
June 11-20.....	1,124	---	---	90	33	310	176	0	295	412	412	---	2.6	---	1,240	1.69	3,760	360	216	7.1	2,070	8.0
June 21-22.....	1,014	---	---	92	35	342	168	4	204	478	478	---	1.2	---	1,370	1.86	3,750	280	234	7.6	2,250	8.1
June 23.....	1,780	---	---	77	25	221	168	4	204	295	295	---	5.1	---	1,975	1.33	4,690	295	151	5.6	1,570	8.3
June 24-26.....	2,097	---	---	53	19	124	152	0	118	165	165	---	.5	---	597	.81	3,380	210	86	3.7	971	6.9
June 27-30.....	1,110	---	---	78	26	248	178	0	204	340	340	---	.6	---	1,060	1.44	3,180	300	154	6.2	1,700	7.1

July 1, 1959.....	1,190	--	--	91	23	306	160	0	222	440	--	4.0	1,160	1.58	3,730	320	189	7.4	1,950	8.2	
July 2,.....	1,490	--	--	70	15	176	150	0	148	240	--	3.5	1,426	1.99	2,920	236	113	5.0	1,190	8.2	
July 3-4.....	1,180	--	--	90	19	260	158	0	210	370	--	.5	1,040	1.41	3,310	304	174	6.5	1,740	7.0	
July 5-14.....	1,308	--	--	83	15	106	184	0	154	132	--	4.0	800	1.09	2,830	270	119	2.8	1,340	8.2	
July 15-20.....	7,135	--	--	35	11	53	104	0	51	75	--	4.2	294	.40	5,660	132	47	2.0	526	7.6	
July 21-23.....	3,777	--	--	45	12	87	134	0	69	118	--	3.5	419	.57	4,270	162	52	3.0	723	8.0	
July 24.....	7,940	--	--	29	8.6	40	106	0	86	48	--	4.8	229	.31	4,910	108	21	1.7	392	7.9	
July 25-27.....	2,750	--	--	56	13	110	145	0	105	140	--	3.0	470	.61	3,470	240	62	3.6	1,210	8.1	
July 28-31.....	1,782	--	--	66	18	165	182	0	169	233	--	3.0	712	.97	3,430	340	91	4.7	1,240	8.1	
Aug. 1-10.....	997	12	0.00	99	25	289	5.7	230	0	189	430	0.5	1,200	1.63	3,230	348	168	6.7	1,980	8.2	
Aug. 11-15.....	609	--	--	110	31	358	216	0	227	540	--	4.5	1,420	1.93	2,330	400	223	7.8	2,330	8.1	
Aug. 16-20.....	2,616	--	--	56	13	104	128	0	89	155	--	4.5	504	.69	3,560	194	89	3.2	867	8.0	
Aug. 21-31.....	696	11	.00	98	24	284	3.2	176	0	190	440	.2	4.2	.06	1,170	344	200	6.6	2,070	7.9	
Sept. 1-10.....	488	14	.00	101	25	292	3.2	196	8	174	460	.2	3.8	.20	1,340	356	182	6.7	2,150	8.4	
Sept. 11-24.....	469	7.8	.00	102	23	400	3.0	246	0	128	620	.4	8.5	.00	1,450	1,840	350	148	9.3	2,520	7.9
Sept. 25-30.....	4,290	--	--	42	7.5	52	134	0	37	69	--	2.4	305	.41	3,330	136	28	1.9	507	7.9	
Weighted average	1,688	--	--	87	24	214	b200	--	181	304	--	0.4	967	1.32	4,410	316	152	5.3	1,560	--	

a Calculated from determined constituents.

b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued

7-1505. SALT FORK ARKANSAS RIVER AT GREAT SALT PLAINS RESERVOIR, NEAR JET, OKLA.

LOCATION.--Immediately below dam on Salt Fork Arkansas River, 0.6 mile upstream from gaging station, and 6 miles northeast of Jet, Alfalfa County.

DRAINAGE AREA.--3,200 square miles at sampling station; 3,202 square miles at gaging station, of which 8 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1955, October 1957 to September 1959.

Water temperatures: October 1954 to September 1955, October 1957 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 18,100 micromhos Sept. 5; minimum daily, 5,500 micromhos May 28.

Water temperatures: Maximum, 85°F June 29; minimum, freezing point on several days during December to February.

EXTREMES, 1954-55, 1957-59.--Dissolved solids (1954-55): Maximum, 27,100 ppm Feb. 19-25, 27-28, 1955; minimum, 2,480 ppm Sept. 28, 1955.

Hardness (1954-55): Maximum, 1,770 ppm Mar. 1-8, 10-13, 15-22, 24-31, 1955; minimum, 310 ppm Sept. 28, 1955.

Specific conductance: Maximum daily, 42,200 micromhos Mar. 9, 1955; minimum daily, 2,280 micromhos July 11, 1958.

Water temperatures: Maximum, 88°F Aug. 24, 1955; minimum, freezing point on many days during winter months.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1831. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Specific conductance and chloride (Cl), water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)
1	6,430	1,980	8,920	2,550	--	--	7,960	--
2	7,060	2,000	9,870	3,350	8,210	2,400	--	--
3	--	--	9,220	2,700	8,260	2,400	8,120	--
4	--	--	--	--	8,250	2,350	--	--
5	7,010	2,020	11,400	3,420	8,230	2,620	9,270	--
6	7,130	2,050	8,800	2,550	8,880	2,400	8,280	--
7	7,100	2,050	10,700	3,400	8,330	2,350	9,320	--
8	--	--	10,000	2,950	8,130	2,350	9,650	--
9	7,000	2,000	10,000	3,000	8,660	2,500	9,920	--
10	--	--	10,300	3,100	8,240	2,380	10,600	--
11	7,430	2,100	10,400	3,100	8,110	2,300	11,000	--
12	--	--	9,970	2,980	8,390	2,450	11,400	--
13	7,240	2,100	11,000	3,300	8,720	2,580	11,900	--
14	7,120	2,050	9,090	2,650	11,300	3,500	12,500	--
15	7,470	2,200	10,300	3,150	8,230	2,400	13,800	--
16	7,660	2,250	10,000	3,000	8,010	2,250	12,000	--
17	7,140	2,050	9,690	2,900	8,340	2,450	11,500	--
18	7,270	2,100	8,550	1,800	8,160	2,380	11,000	--
19	7,630	2,220	7,620	2,200	8,330	2,380	8,330	--
20	7,860	2,300	7,890	2,280	8,210	2,400	8,550	--
21	8,770	2,650	7,820	2,200	9,920	2,950	7,850	--
22	--	--	8,060	2,350	10,600	3,220	7,980	--
23	8,790	2,650	8,330	2,420	11,400	3,500	7,920	--
24	9,810	2,950	8,230	2,400	11,000	3,350	--	--
25	9,520	2,900	8,290	2,400	10,100	3,050	--	--
26	--	--	8,300	2,400	9,360	2,750	8,080	--
27	8,600	2,550	8,120	2,400	9,700	2,900	7,810	--
28	--	--	8,490	2,450	9,400	2,800	7,740	--
29	10,700	3,250	8,430	2,450	8,680	2,600	7,910	--
30	10,700	3,300	8,150	2,350	8,380	2,420	7,830	--
31	8,430	2,550	--	--	8,070	2,350	7,970	--

QUALITY OF SURFACE WATERS, 1959

ARKANSAS RIVER BASIN--Continued

7-1505. SALT FORK ARKANSAS RIVER AT GREAT SALT PLAINS RESERVOIR, NEAR JET, OKLA.--Continued

Specific conductance and chloride (Cl), water year October 1958 to
September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	7,580		7,360	2,000	7,840	2,320	6,920	2,000
2	7,650		7,310	2,120	7,850	2,300	6,980	1,950
3	7,650		7,510	2,150	7,100	1,880	7,420	2,150
4	7,620		7,490	2,220	7,370	2,190	8,060	2,400
5	7,680		6,920	--	6,690	1,750	7,570	2,180
6	7,770		7,170	2,200	7,200	1,900	7,360	2,100
7	9,620		7,290	2,050	7,180	1,850	7,690	2,250
8	11,100		7,200	2,220	6,840	1,750	7,860	2,300
9	11,600		7,170	2,100	7,210	1,920	7,570	2,220
10	11,900		6,860	1,950	7,650	2,120	7,160	2,050
11	9,620		7,400	2,200	7,360	1,920	7,350	2,150
12	8,470		7,560	2,150	7,500	2,000	7,220	2,100
13	7,800		7,580	2,220	7,270	1,920	7,230	2,100
14	7,620		7,660	2,150	7,180	1,780	7,240	2,100
15	7,680		7,260	2,100	6,500	1,620	7,580	2,250
16	7,620		7,600	2,440	6,800	1,650	7,500	2,150
17	7,530		7,300	2,150	7,000	1,800	7,500	2,200
18	7,780		7,440	2,100	6,240	1,580	7,520	2,220
19	7,640		8,020	--	6,820	1,780	7,330	2,100
20	7,610		8,250	--	7,000	1,800	6,650	1,880
21	7,720		7,580	2,350	7,230	1,820	6,710	1,900
22	7,710		7,760	2,200	7,300	1,850	6,640	1,850
23	7,240		7,790	2,350	7,370	2,100	6,690	1,900
24	7,360		7,620	2,150	7,280	2,050	7,010	2,000
25	7,670		7,780	2,200	6,840	1,780	7,220	2,100
26	7,480		7,060	2,050	7,230	1,950	6,610	1,850
27	7,070		7,990	2,380	7,280	1,920	6,620	1,880
28	7,170		7,610	2,200	7,270	1,950	5,500	1,520
29	--		7,610	2,000	7,420	2,020	--	--
30	--		7,560	2,050	7,220	1,880	5,790	1,600
31	--		7,540	2,250	--	--	6,170	1,750
	June		July		August		September	
1	6,140	1,800	8,570	2,580	11,200	3,500	13,200	4,100
2	6,480	1,880	8,650	2,550	11,800	3,750	13,700	4,300
3	6,490	1,850	8,920	2,680	12,700	4,000	12,400	3,850
4	6,510	1,900	8,960	2,650	12,500	4,000	15,200	4,900
5	6,460	1,850	9,030	2,720	12,300	3,900	18,100	6,000
6	6,470	1,900	8,690	2,550	12,600	4,100	15,100	4,800
7	6,620	1,900	8,800	2,650	12,600	4,000	14,400	4,550
8	6,610	1,900	8,720	2,600	12,500	4,000	14,200	4,550
9	6,460	1,900	8,740	2,620	12,600	4,000	13,600	4,300
10	6,480	1,850	8,850	2,650	12,400	3,900	14,000	4,400
11	6,710	1,950	8,810	2,650	12,800	4,100	14,400	4,500
12	6,480	1,900	8,870	2,700	12,800	4,100	13,800	4,350
13	6,670	1,950	8,320	2,500	12,500	4,000	14,000	4,450
14	6,750	2,000	8,990	2,700	12,800	4,100	14,300	4,500
15	6,990	2,100	9,080	2,750	12,800	4,100	14,200	4,500
16	7,270	2,150	9,040	2,700	12,500	3,900	14,200	4,500
17	7,380	2,180	8,990	2,720	12,500	4,050	14,500	4,500
18	7,470	2,180	9,230	2,780	12,300	3,850	14,400	4,650
19	8,710	2,650	9,380	2,820	11,400	3,550	14,400	4,650
20	7,790	2,350	9,530	2,900	11,200	3,500	14,500	4,600
21	8,430	2,500	9,970	3,050	11,100	3,400	15,500	4,900
22	7,070	2,050	9,970	3,080	11,100	3,500	15,200	4,900
23	7,070	2,050	11,000	3,400	11,100	3,450	14,400	4,600
24	13,200	4,350	10,500	3,250	11,300	3,500	--	--
25	13,200	4,300	11,200	3,500	11,700	3,700	12,500	3,900
26	8,530	2,600	11,600	3,450	12,000	3,800	12,200	3,800
27	7,400	2,150	11,300	3,700	12,300	3,900	8,060	2,300
28	9,050	2,800	10,800	3,650	12,400	3,950	--	--
29	8,600	2,580	10,600	3,300	12,900	4,100	7,220	2,150
30	8,690	2,580	10,600	3,320	13,200	4,250	5,930	1,700
31	--	--	9,940	3,050	12,400	3,950	--	--

ARKANSAS RIVER BASIN--Continued
 7-1505. SALT FORK ARKANSAS RIVER AT GREAT SALT PLAINS RESERVOIR, NEAR JET, OKLA.--Continued

Month	Temperature (°F) of water, water year October 1958 to September 1959																															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	60	60	--	--	63	62	65	--	65	--	63	--	67	62	58	58	63	83	64	64	63	--	61	56	58	--	52	--	48	53	49		
November ..	51	49	49	--	48	47	58	53	50	49	52	55	54	59	57	56	55	45	45	42	46	44	44	47	47	42	40	40	38	37	--	48	
December ..	--	41	41	41	41	38	38	39	37	34	35	33	33	32	32	32	32	33	34	--	37	37	39	38	39	39	40	38	37	37	34	36	
January	--	--	32	--	32	32	33	33	33	32	38	36	37	38	36	32	33	35	35	34	32	32	32	--	--	33	33	33	35	34	32	34	
February	32	32	32	32	32	32	35	37	35	34	33	36	38	39	39	40	40	39	38	37	38	38	41	38	40	42	44	44	--	--	--	37	
March	42	45	41	43	37	38	38	39	41	43	45	46	46	48	44	46	47	47	50	50	44	44	48	59	54	53	47	48	45	47	49	46	
April	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May	67	69	70	71	70	68	68	65	67	--	68	67	69	69	67	68	68	69	73	75	75	71	68	69	73	69	71	--	--	79	78	70	
June	--	77	72	74	72	74	74	74	76	75	78	77	78	78	77	79	79	78	76	78	78	80	77	78	77	78	76	76	85	78	--	77	
July	76	75	79	76	80	78	79	80	76	77	77	75	74	77	75	75	76	78	76	78	76	75	78	77	79	79	76	76	78	80	80	77	
August	81	80	80	79	80	80	77	76	76	78	78	75	76	76	79	77	80	--	79	79	78	78	79	79	78	76	76	78	78	75	72	72	78
September ..	76	73	74	74	74	75	76	75	72	68	66	68	68	68	70	69	68	69	68	68	72	70	70	--	68	69	69	--	67	62	--	70	

LOCATION.--At gaging station at bridge on State Highway 18 at Ralston, Pawnee County, 2 miles downstream from Salt Creek, and 2 miles upstream from Grayhorse
 ARKANSAS RIVER BASIN--Continued
 7-1525. ARKANSAS RIVER AT RALSTON, OKLA.

DRAINAGE AREA --54,465 square miles of which 7,615 square miles is probably noncontributing.
 RECORDS AVAILABLE --Chemical analyses: January 1950 to September 1959.
 Water temperatures: January 1950 to September 1959.
 EXTREMES, 1958-59--Dissolved solids: Maximum, 1,670 ppm Jan. 15-20, Sept. 26-27.
 Hardness: Maximum, 530 ppm Jan. 1-15; minimum, 108 ppm July 15-20.
 Specific conductance: Maximum daily, 3,070 microhms Feb. 16; minimum daily, 268 microhms July 17.
 Water temperatures: Maximum, 95°F Aug. 18; minimum, 33°F on several days during November to February.
 EXTREMES, 1950-59--Dissolved solids: Maximum, 3,390 ppm Sept. 11-16, 1955; minimum, 166 ppm Oct. 3-6, 1955.
 Hardness: Maximum, 582 ppm Jan. 5, 1951; minimum, 76 ppm Oct. 3-6, 1955.
 Specific conductance: Maximum daily, 7,510 microhms Sept. 14, 1955; minimum daily, 251 microhms Oct. 5, 1955.
 Water temperatures: Maximum, 98°F July 28, 1956; minimum, freezing point on many days during winter months.
 REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhms at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 1-11, 1958..	3,091	17	0.00	106	21	235	7.0	212	0	158	360	0.4	3.8	0.14	1,020	1.39	8,510	350	176	5.5	1,720	7.7
Oct. 12-31.....	2,112	---	---	98	23	231	---	204	0	152	365	---	4.5	---	1,020	1.39	5,820	340	173	5.5	1,740	8.0
Nov. 1-20.....	1,504	---	---	109	27	271	---	220	0	109	480	---	3.3	---	1,130	1.54	4,590	385	204	6.0	2,010	7.4
Nov. 21-22.....	2,740	---	---	96	37	174	---	186	10	152	310	---	5.9	---	993	1.35	7,350	390	221	3.8	1,560	8.4
Nov. 23-30.....	1,740	---	---	109	29	263	---	220	12	175	408	---	5.1	---	1,180	1.60	5,540	190	158	5.8	1,940	8.4
Dec. 1-10.....	1,492	---	---	122	31	328	---	244	12	204	500	---	7.2	---	1,390	1.89	5,600	430	210	6.9	2,280	8.3
Dec. 11-31.....	1,552	---	---	136	38	340	---	262	10	247	525	---	7.3	---	1,520	2.07	6,370	495	264	6.6	2,450	8.3
Jan. 1-15, 1959..	1,261	21	.00	156	34	400	6.2	288	0	322	580	.4	5.9	.45	1,670	2.27	5,690	530	294	7.6	2,760	8.0
Jan. 16-21.....	1,813	---	---	112	37	332	---	260	0	249	480	---	3.6	---	1,430	1.94	7,000	430	217	7.0	2,180	8.1
Jan. 22-31.....	1,676	---	---	99	54	421	---	264	2	287	600	---	3.6	---	1,640	2.23	7,420	470	234	8.5	2,610	8.3
Feb. 1-10.....	1,439	12	.00	142	29	400	6.1	264	0	278	580	.4	5.5	.30	1,590	2.16	6,180	475	258	8.0	2,660	8.0
Feb. 11-15.....	2,054	---	---	116	39	360	---	212	28	293	500	---	3.8	---	1,490	2.03	8,260	450	230	7.4	2,200	8.4
Feb. 16-28.....	2,113	17	.00	133	38	391	4.1	244	0	333	540	.5	6.9	.32	1,640	2.23	9,360	490	290	7.7	2,640	8.0
Mar. 1-29.....	1,843	14	.00	130	41	381	6.0	244	0	344	550	.5	6.4	.11	1,620	2.20	8,500	495	295	7.4	2,570	7.9
Mar. 30-31.....	3,735	---	---	94	24	294	---	202	0	222	410	---	.6	---	1,210	1.65	12,200	335	170	7.0	2,000	8.2
Apr. 1-9.....	5,021	---	---	110	28	386	---	186	0	258	565	---	5.6	---	1,510	2.05	11,460	390	230	8.5	2,500	8.2
Apr. 11-13.....	6,120	---	---	86	20	252	---	198	0	232	422	---	.4	---	1,250	1.70	16,940	365	202	6.6	2,020	7.3
Apr. 14-20.....	3,384	---	---	64	23	268	---	141	0	241	343	---	.5	---	1,980	1.33	16,500	349	170	7.0	1,980	7.7
Apr. 21-30.....	3,050	15	.00	80	17	323	6.4	132	8	123	510	.3	3.3	.05	1,380	1.89	12,700	285	222	7.3	2,220	8.3
															1,100	1.58	9,550	265	146	8.6	2,100	8.5

May 1-9, 1959.....	2,370		96	34	359	180	0	261	525	--	1.8	1,400	1.90	8,960	380	232	8.0	2,350	8.2
May 9-19.....	9,334		53	14	119	144	4	78	190	--	3.2	572	.78	14,420	190	72	4.1	1,000	8.2
May 20-23.....	9,645		56	20	123	144	4	88	180	--	5.5	605	.82	16,080	225	100	3.3	964	8.4
May 24-28.....	5,278		57	21	223	164	6	148	332	--	4.5	946	1.29	13,480	280	136	5.9	1,550	8.4
May 29-31.....	10,750		63	24	254	166	4	121	268	--	5.0	1,790	1.97	21,540	255	129	4.7	1,300	8.4
June 1-10.....	2,759		90	23	263	180	8	297	420	--	2.0	1,280	1.90	17,760	300	182	7.1	1,900	8.8
June 11-20.....	2,668		102	28	308	180	8	297	420	--	2.0	1,280	1.94	6,930	355	238	8.6	2,160	8.4
June 21-25.....	1,668		98	28	337	154	2	230	530	--	1.7	1,360	1.84	6,930	355	238	8.3	2,300	8.3
June 26-30.....	3,654		78	18	192	160	4	133	290	--	3.3	845	1.15	8,340	270	132	5.1	1,440	8.3
July 1-2.....	1,880		91	23	355	178	0	183	535	--	0	1,310	1.78	6,650	320	174	8.6	2,200	7.9
July 3-11.....	2,748		82	13	223	162	0	138	330	--	3.7	880	1.20	6,530	260	127	6.0	1,490	8.2
July 12-14.....	4,083		59	11	136	136	0	81	208	--	5	584	.79	6,440	194	82	4.3	955	8.0
July 15-20.....	35,750		37	3.8	32	110	0	23	44	--	2.6	200	.27	19,300	108	18	1.3	355	7.8
July 21-27.....	19,560		41	10	44	130	0	37	65	--	3.3	281	.38	14,840	144	38	1.6	497	7.8
July 28-31.....	6,232		61	16	112	172	0	74	170	--	3.6	544	.74	9,150	216	75	3.3	940	8.1
Aug. 1-15.....	2,534	14	0.00	66	18	217	150	2	350	0.3	0.00	858	1.17	5,870	240	113	6.1	1,550	8.3
Aug. 16-17.....	3,715		68	13	127	148	0	99	192	--	8.3	580	.79	5,820	225	104	3.7	992	8.2
Aug. 18.....	8,410		73	16	181	140	0	103	292	--	7.1	766	1.04	17,390	246	132	5.0	1,310	8.1
Aug. 19-20.....	11,610		44	7.8	57	120	0	49	80	--	3.6	314	.43	9,840	142	44	2.1	510	8.1
Aug. 21-22.....	4,010		53	9.2	95	132	0	69	138	--	2.9	447	.61	4,840	170	62	3.2	747	8.2
Aug. 23-31.....	2,256		80	18	218	172	0	140	325	--	2.5	880	1.20	5,360	272	131	5.8	1,460	8.2
Sept. 1-10.....	1,724	6.8	.00	78	18	272	152	0	430	.6	2.9	1,140	1.55	5,310	268	144	7.1	1,750	8.0
Sept. 11-19.....	1,128		82	27	326	148	0	161	520	--	2.3	1,210	1.65	3,690	316	194	8.0	2,110	7.7
Sept. 20-21.....	3,450		50	12	115	112	0	67	185	--	2.9	506	.69	4,710	176	84	3.8	890	7.8
Sept. 22-24.....	1,937		53	27	213	122	0	111	348	--	3.6	874	1.19	4,570	245	145	5.9	1,500	7.8
Sept. 25.....	13,400		56	13	90	114	0	21	195	--	1.1	486	.66	17,580	195	102	2.8	1,800	7.5
Sept. 26-27.....	31,500		29	8.6	51	96	0	27	77	--	3.5	264	.36	22,450	108	30	2.1	466	7.6
Sept. 28.....	25,800		40	15	156	104	0	56	252	--	1.0	625	.85	43,540	160	75	5.4	1,070	7.5
Sept. 29-30.....	13,850		64	24	366	114	0	130	585	--	2.0	1,330	1.81	49,740	260	166	9.9	2,300	7.4
Weighted average.....	3,942	--	73	19	189	--	165	--	286	--	3.6	812	1.10	8,640	260	125	5.1	1,360	--

a Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
7-1525. ARKANSAS RIVER AT RALSTON, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	49	48	52	59	--	47	61	65	62	53	51	--	52	50	55	56	57	58	--	56	51	50	50	47	45	41	--	43	40	38	38	51			
November	--	--	42	42	40	40	38	38	--	38	48	45	47	47	--	47	38	33	34	34	35	34	--	33	33	33	--	38	43	--	--	--			
December	45	48	50	50	45	38	--	40	--	33	33	33	--	33	33	35	38	41	41	48	--	45	48	--	41	48	46	40	34	--	--	--			
January	--	33	--	33	33	35	33	35	38	--	43	52	52	40	38	38	42	42	--	33	--	35	38	--	38	40	38	45	43	38	--	--	--		
February	50	33	34	40	40	42	49	46	43	38	44	42	48	--	53	53	45	38	42	--	40	--	50	53	65	53	--	--	--	--	--	--	45		
March	--	51	53	50	40	45	51	--	55	47	53	55	58	59	--	55	58	60	60	--	52	--	60	67	66	50	45	47	--	60	65	--	--		
April	50	67	63	62	--	72	53	62	56	56	58	--	58	60	61	62	70	66	48	52	54	61	66	70	71	--	74	74	75	80	--	63			
May	79	86	--	78	68	72	73	66	69	66	72	77	75	70	70	67	--	78	81	80	75	73	72	--	80	73	80	81	82	83	--	--	--		
June	75	78	70	77	75	77	--	82	--	89	86	87	--	84	87	90	90	89	88	--	84	83	84	84	81	--	--	87	87	--	--	--	--		
July	82	85	--	--	--	88	89	88	85	87	87	80	73	78	73	76	75	78	76	80	78	75	80	81	82	80	80	85	--	87	92	81	--	--	
August	82	--	90	90	90	92	86	85	--	88	85	86	85	85	80	--	83	95	83	85	86	88	88	87	85	85	--	--	87	--	--	--	--	--	
September	83	83	75	82	--	--	84	--	--	85	75	75	75	76	79	80	80	76	79	80	77	79	80	74	70	70	72	73	75	66	--	--	--	--	--

ARKANSAS RIVER BASIN--Continued

7-1530. BLACK BEAR CREEK AT PAWNEE, OKLA.

LOCATION.--At gaging station on downstream side of left pier of bridge on State Highway 18 in north Pawnee, Pawnee County, 300 feet downstream from Skedee Creek and at mile 23.4.

DRAINAGE AREA.--576 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1951 to August 1952, October 1955 to September 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Boiron (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. 15, 1958.....	--	16		60	23	60		206	14	19	115		1.6		442	0.60	246	54	1.7	738	8.4
Oct. 20.....	3.21	--		29	23	70		172	0	--	120		--		168	27	168	27	2.3	769	8.0
Oct. 23.....	--	14		67	27	67		234	12	18	135		1.2		475	.65	276	64	1.8	832	8.3
Nov. 20.....	55.2	--		144	--	144		268	0	--	220		--		240	20	240	20	4.0	1,080	8.2
Dec. 2.....	3.35	--		106	49	190		436	0	--	330		--		465	108	465	108	3.8	1,630	7.8
Jan. 13, 1959.....	7.64	--		--	--	260		140	0	--	520		--		370	256	370	256	5.9	1,950	8.0
Feb. 17.....	5.86	--		122	65	450		74	0	--	1,050		--		655	594	655	594	7.6	3,370	8.1
Apr. 14.....	13.9	--		84	33	200		136	6	--	412		--		345	224	345	224	4.7	1,560	8.5
May 5.....	4.74	--		61	34	82		108	0	--	168		--		290	120	290	120	2.1	537	7.9
May 11.....	284	--		46	18	84		100	0	--	188		--		190	108	190	108	2.6	788	8.1
June 2.....	41.4	--		24	6.1	24		80	0	--	48		--		85	20	85	20	1.1	300	7.9
June 15.....	4.69	--		28	19	19		229	0	--	28		--		102	42	102	42	1.8	792	8.0
Aug. 5.....	12.5	--		66	19	66		109	0	--	135		--		244	62	244	62	1.8	782	8.2
Aug. 17.....	--	--		50	23	43		196	8	--	60		--		218	44	218	44	1.3	588	8.5
Sept. 2.....	8.63	--		57	16	56		238	0	--	90		--		208	11	208	11	1.7	658	8.0

ARKANSAS RIVER BASIN--Continued

7-1570. CIMARRON RIVER NEAR MOCANE, OKLA.

LOCATION.--At gaging station near right bank on downstream side of county highway bridge, 6.5 miles northeast of Mocane, Beaver County, 14.7 miles upstream from Crooked Creek, and at mile 364.1.

DRAINAGE AREA--8,970 square miles, of which 4,365 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1948, October 1952 to September 1959.

TEMPERATURES.--Discharge solids: October 1948 to September 1948.

EXTREMES.--Discharge solids: Maximum, 2,010 ppm Jan. 1-3, 1948; minimum, 435 ppm Oct. 6, 8-11, 17, 1946.

Water temperature: Maximum, 58° F Aug. 3, 29, 1948; minimum, 162° F Nov. 5, 1946.

Water temperature: Maximum, 78° F Aug. 3, 29, 1948; minimum, freezing point on many days during winter months.

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 Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids			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. 8, 1958	51.4			75	35	366		200			540					330	166	8.5	2,260	7.8
Oct. 24	55.4			86	33	366		240			540					350	152	8.5	2,260	7.7
Oct. 30	59.0			96	34	364		222			500					380	146	8.3	2,270	7.6
Nov. 18	105.0			101	32	336		294			500					385	154	7.7	2,220	7.6
Nov. 24	69.3			88	34	336		252			500					360	154	7.7	2,220	7.8
Dec. 4	70.7			95	45	352		272			520					420	197	7.5	2,280	7.7
Dec. 10	47.4			107	38	400		298			590					425	181	8.4	2,560	7.8
Dec. 23	64.6			90	32	338		254			500					355	147	7.8	2,190	7.9
Jan. 4, 1959	29.8			86	37	362		228			490					368	181	8.2	2,480	8.2
Jan. 9	77.0			98	33	414		262			600					380	166	9.2	2,540	8.0
Feb. 9	79.4			93	34	365		256			540					370	160	8.3	2,310	8.0
Mar. 12	70.6			87	31	319		272			490					374	151	7.2	2,190	8.0
Mar. 29	73.7			88	31	352		240			520					344	148	8.2	2,260	8.0
Apr. 29	30.6			70	35	407		180			620					320	172	9.9	2,550	8.2
June 16	19.1			76	39	417		206			630					350	181	9.7	2,540	8.1
Sept. 8	29.5			76	35	385		200			590					334	170	9.2	2,430	8.1
Sept. 14	24.7			73	36	380		192			570					328	170	9.0	2,380	8.1

ARKANSAS RIVER BASIN--Continued
7-1600. CIMARRON RIVER NEAR GUTHRIE, OKLA.

LOCATION.--At gaging station, 125 feet upstream from the Atchinson, Topeka and Santa Fe Railroad Co. bridge, 1.2 miles downstream from Cottonwood Creek, and 2.5 miles north of Guthrie, Logan County.

DRAINAGE AREA.--16,892 square miles, of which 4,926 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: May 1949 to September 1959.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- on- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo- r- ide (F)	Ni- trate (NO ₃)	Bo- ron (B)	Dissolved solids			Hardness as CaCO ₃		So- dium ad- sorp- tion ratio	Specific duct- ance (micro- mhos at 25°C)	pH
															Parts per million	Tons per acre- foot	Tons per day	Cal- cium Mag- nes- ium	Non- car- bon- ate			
Oct. 8, 1958	211			106	72	--	--	92	0		2,800						560	484	--	9,220	7.9	
Oct. 29	104			180	92			190	12		2,800						700	498	--	8,600	8.3	
Nov. 4	--			180	73	1,520	--	290	0		2,100						740	480	24	9,250	7.9	
Nov. 8	--			176	73	1,340	--	304	0		2,100						740	480	21	10,500	8.1	
Nov. 18	163			135	88		--	151	0		3,390						690	571	--	13,500	8.1	
Dec. 9	168			159	156		--	119	0		4,720						1,040	942	--	13,400	8.0	
Dec. 16	156			199	44		--	112	0		3,980						677	585	--	10,800	8.2	
Jan. 28, 1959	282			108	70		--	76	0		3,390						558	496	--	11,000	8.1	
Feb. 16	333			100	73		--	102	0		4,130						548	464	--	12,700	8.1	
Mar. 9	320			139	80		--	86	0		4,830						677	606	--	14,700	8.1	
Apr. 21	611			163	76		--	175	8		3,540						716	560	--	11,300	8.4	
May 12	1,910			146	38	979	--	146	0		1,520						520	400	19	5,570	8.2	
May 21	299			183	78		--	167	0		3,780						777	640	--	12,000	8.2	
June 4	305			196	73		--	162	0		3,190						788	655	--	10,300	8.2	
July 2	191			144	63		--	160	4		3,000						620	482	--	9,530	8.3	
Sept. 28	4,470			98	18	682	--	120	0		1,100						320	222	17	3,730	8.1	

a North channel.
b South channel.

ARKANSAS RIVER BASIN--Continued

7-1610. CIMARRON RIVER AT PERKINS, OKLA.

LOCATION.--At gaging station at bridge on State Highway 40, 1 mile south of Perkins, Payne County, 1.5 miles upstream from Dugout Creek, and 4 miles downstream from Wildhorse Creek.

DRAINAGE AREA.--17,852 square miles, of which 4,926 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1959.

Water temperatures: October 1952 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 14,300 ppm July 27-28.

Hardness: Maximum, 1,140 ppm Aug. 3-6; minimum, 132 ppm July 27-28.

Water temperatures: Maximum, 83°F July 31, Aug. 1; minimum, freezing point on several days during December and January.

Specific conductance: Maximum daily, 22,800 microhos Feb. 14; minimum daily, 910 microhos July 27.

EXTREMES, 1952-59.--Dissolved solids: Maximum, 20,500 ppm Feb. 18, 20, 1955; minimum, 277 ppm May 17, 1957.

Hardness: Maximum, 1,860 ppm Aug. 27-29, 1954; minimum, 92 ppm May 20, 1955.

Water temperatures: Maximum daily, 32,400 microhos Mar. 18, 1956; minimum daily, 438 microhos Oct. 5, 1955.

Specific conductance: Maximum, 88°F Oct. 1, 1954; minimum, freezing point on many days during winter months.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance and chloride of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium			Non-carbonate
Oct. 1-20, 1958....	207	23	0.02	194	56	1,460	9.6	232	0	388	2,380	0.3	--	--	0.64	4,470	6.49	715	525	24	8,010
Oct. 21-31,	127	--	--	190	65	1,490	--	256	0	402	2,380	--	--	--	--	4,880	6.64	740	530	24	8,330
Nov. 1-19,	135	--	--	192	59	1,420	--	276	0	394	2,250	--	--	--	--	4,520	6.15	720	494	23	7,610
Nov. 20-22,	279	--	--	152	53	1,320	--	286	0	340	2,050	--	--	--	--	4,130	5.62	595	385	23	6,980
Nov. 23-28,	227	--	--	224	61	1,920	--	280	0	499	3,000	--	--	--	--	5,980	8.13	810	580	29	9,820
Nov. 29-30,	204	--	--	247	65	2,760	--	297	0	501	4,340	--	--	--	--	8,220	11.18	882	638	40	13,500
Dec. 1-15,	170	--	--	231	65	2,310	--	317	0	463	3,640	--	--	--	--	7,000	9.52	742	582	35	11,700
Dec. 17-20,	214	--	--	264	65	1,870	--	368	0	491	3,600	--	--	--	--	5,050	7.43	850	750	483	8,170
Dec. 21-25,	229	--	--	207	77	1,670	--	293	0	449	3,540	--	--	--	--	6,980	8.49	790	538	28	10,700
Dec. 26,	237	--	--	239	83	3,680	--	278	0	543	3,270	--	--	--	--	10,500	14.28	836	711	52	17,200
Dec. 30-31,	216	--	--	188	52	2,060	--	294	0	402	3,200	--	--	--	--	6,120	8.32	684	443	34	17,400
Jan. 1-6, 1959....	173	--	--	208	73	2,210	--	342	0	454	3,450	--	--	--	--	6,770	9.21	820	540	34	11,200
Jan. 7-10,	185	--	--	180	85	1,830	--	302	10	416	2,900	--	--	--	--	5,770	7.85	800	536	28	9,680
Jan. 11-14,	224	--	--	186	77	2,010	--	282	10	437	3,150	--	--	--	--	6,270	8.53	780	532	31	10,400
Jan. 15-20,	222	--	--	177	96	2,750	--	231	8	475	4,340	--	--	--	--	8,160	11.10	840	637	41	13,500
Jan. 21-22,	185	--	--	222	102	4,150	--	202	0	675	6,500	--	--	--	--	12,100	16.46	972	806	58	19,500
Jan. 23,	200	--	--	135	90	2,810	--	135	0	505	4,380	--	--	--	--	9,130	12.42	707	596	46	14,900

Jan. 24-31, 1959...	280	--	--	158	72	1,920	276	0	398	3,000	--	5,720	7,78	4,320	690	484	32	9,850	8.2
Feb. 1-8.....	188	--	--	181	83	2,300	283	0	456	3,590	--	6,910	9.48	3,510	758	596	26	11,600	7.2
Feb. 9.....	328	--	--	184	79	3,380	163	0	567	5,270	--	9,740	13.23	8,630	816	682	51	15,800	7.9
Feb. 10.....	360	--	--	182	67	2,640	218	0	463	4,080	--	7,820	10.63	7,600	679	500	44	13,000	7.8
Feb. 11-12.....	322	--	--	156	68	2,210	228	0	410	3,450	--	6,550	8.91	5,690	669	482	37	11,000	8.1
Feb. 13.....	430	--	--	159	85	3,550	125	0	491	5,560	--	10,200	13.87	11,840	745	642	56	16,700	8.1
Feb. 14.....	430	--	--	222	101	4,960	196	0	608	7,770	--	14,300	19.45	16,600	970	810	69	22,800	8.1
Feb. 15-16.....	378	--	--	163	78	3,170	259	0	441	4,930	--	9,080	12.35	9,270	727	514	51	15,100	8.2
Feb. 17-18.....	324	--	--	154	72	2,300	236	10	397	3,590	--	6,870	9.34	6,010	679	469	38	11,600	8.3
Feb. 19-21.....	287	--	--	191	88	3,130	263	0	463	4,930	--	9,260	12.59	7,180	837	622	47	15,300	8.2
Feb. 22-28.....	255	12	0.00	164	85	2,470	243	0	473	3,890	0.4	7,450	10.13	5,130	758	559	39	12,800	8.1
Mar. 1-20.....	244	11	.00	179	73	2,340	199	12	501	3,680	.7	6,850	9.37	4,540	746	563	37	11,500	8.6
Mar. 21-26.....	252	--	--	169	64	2,040	215	12	434	3,170	--	6,300	8.57	4,290	683	467	34	10,300	8.5
Mar. 27.....	370	--	--	221	74	3,130	261	0	617	4,830	--	9,350	12.72	9,340	856	642	47	14,700	8.0
Mar. 28.....	336	--	--	209	68	2,550	239	10	571	3,930	--	7,730	10.51	7,010	802	590	39	12,300	8.4
Mar. 29-30.....	987	--	--	229	68	3,260	225	12	624	5,020	--	9,670	13.15	25,770	851	646	49	15,500	8.4
Mar. 31.....	678	--	--	184	43	1,360	188	0	618	1,980	--	4,400	5.98	8,050	635	481	23	7,150	8.2
Apr. 1-2.....	500	--	--	204	46	1,450	170	0	568	2,220	--	4,590	6.24	6,200	700	560	24	7,600	7.7
Apr. 3-10.....	383	--	--	225	66	2,690	229	6	571	4,180	--	8,390	11.41	8,680	831	634	41	13,100	8.4
Apr. 11-14.....	510	--	--	150	42	1,520	136	10	457	2,300	--	4,600	6.26	10,060	545	417	28	7,630	8.5
Apr. 15-18.....	444	--	--	221	59	2,950	183	6	551	4,600	--	8,690	11.82	10,420	796	636	46	14,100	8.4
Apr. 19-26.....	625	--	--	182	50	1,930	210	0	473	2,980	--	5,820	7.92	9,980	660	488	33	9,730	7.9
Apr. 27-28.....	523	--	--	205	52	3,320	229	8	533	5,120	--	9,940	13.32	9,470	765	564	52	13,700	8.4
Apr. 29-30.....	304	--	--	161	54	2,340	235	8	447	3,280	--	6,870	9.34	5,560	648	442	37	10,700	8.4
May 1-8.....	304	--	--	161	54	2,340	245	0	470	3,680	--	6,510	9.40	5,670	716	515	39	11,600	8.2
May 9-10.....	2,800	--	--	168	26	7,782	158	0	271	1,180	--	2,530	3.44	19,130	375	246	18	4,360	8.1
May 11.....	3,860	--	--	98	21	814	148	4	200	1,250	--	2,680	3.64	27,690	330	202	19	4,380	8.4
May 12-14.....	1,837	--	--	133	31	1,150	146	0	349	1,750	--	3,590	4.76	17,460	460	296	23	6,070	8.2
May 15.....	1,020	--	--	200	39	1,670	136	6	473	2,600	--	5,190	7.06	14,290	668	508	23	8,610	8.4
May 16-30.....	1,997	--	--	187	37	2,100	197	0	433	3,240	--	6,170	8.39	6,580	618	456	37	10,400	8.0
May 21-24.....	536	--	--	180	46	1,890	206	2	444	2,920	--	5,700	7.75	8,250	640	468	33	9,530	8.3

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-1610. CIMARRON RIVER AT PERKINS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
May 25, 1959	798	--	--	99	27	956	152	6	249	1,450	--	--	--	--	2,890	3.93	6,230	360	286	22	5,040	8.5
May 28-27	1,246	--	--	130	37	1,430	168	0	306	2,220	--	--	--	--	4,250	5.78	14,300	475	338	29	3,700	8.0
May 28-29	4,360	--	--	79	14	840	142	2	175	1,820	1.2	--	--	--	a 1,750	2.38	20,700	255	135	15	3,170	8.3
May 30	1,980	--	--	119	23	983	136	4	384	1,450	--	--	--	--	3,060	4.16	15,950	400	282	21	5,240	8.4
May 31	1,050	--	--	119	23	983	136	4	384	1,450	--	--	--	--	1,940	2.64	5,500	390	288	12	3,290	8.4
June 1	756	--	--	154	27	589	140	0	415	870	--	--	3.0	--	2,140	2.91	4,370	495	360	12	3,440	8.2
June 2-3	515	--	--	188	33	880	174	0	454	1,350	--	--	--	--	3,400	4.27	4,370	602	492	23	7,020	7.5
June 4-5	405	--	--	236	23	1,380	204	0	469	2,150	--	--	--	--	4,440	5.96	8,810	802	568	30	9,380	8.2
June 6-10	279	--	--	216	49	1,850	216	6	483	2,900	--	--	--	--	5,720	7.78	4,310	740	558	30	9,380	8.2
June 11-16	229	--	--	207	63	2,090	205	0	492	3,290	--	--	--	--	6,450	8.77	3,990	777	609	33	10,600	8.2
June 17-20	136	--	--	164	46	1,300	192	0	440	2,000	--	--	--	--	4,180	5.68	1,530	600	442	23	6,860	8.1
June 21-26	163	--	--	223	75	2,280	221	0	511	3,630	--	--	--	--	7,200	9.79	3,170	866	685	34	11,400	8.1
June 27-30	356	--	--	160	46	1,230	166	0	461	2,630	--	--	--	--	4,030	5.38	3,870	590	454	23	6,570	8.2
July 1-4	290	--	--	168	42	1,550	174	6	376	2,420	--	--	--	--	4,820	6.56	3,770	590	438	28	8,040	8.4
July 5-10	177	--	--	205	52	2,030	197	6	517	3,140	--	--	--	--	6,260	8.51	2,990	727	556	33	10,200	8.4
July 11-12	592	--	--	251	61	2,290	165	0	648	3,580	--	--	--	--	7,080	9.63	11,320	876	741	34	11,600	7.5
July 13-20	373	--	--	110	24	791	132	0	269	1,210	--	--	--	--	2,570	3.50	2,590	375	267	18	4,370	7.7
July 21-25	305	--	--	134	34	1,170	176	4	252	1,850	--	--	--	--	3,690	5.02	3,040	475	324	23	6,240	8.3
July 26	172	--	--	142	38	1,290	184	8	295	2,020	--	--	--	--	3,980	5.41	1,850	510	346	25	6,790	8.4
July 27-28	1,590	--	--	38	9.0	164	104	0	40	255	--	--	2.3	--	572	.78	2,460	132	47	6.2	1,080	8.2
July 29-31	562	--	--	114	31	1,100	154	0	270	1,700	--	--	--	--	3,420	4.65	5,190	410	284	24	5,760	8.2
Aug. 1-4	177	--	--	126	43	926	198	0	284	1,450	--	--	--	--	3,030	4.12	1,450	490	328	18	5,160	8.0
Aug. 5-6	152	--	--	310	89	4,200	203	0	765	6,600	--	--	--	--	12,400	16.86	5,090	1,140	974	54	19,900	7.9
Aug. 7	419	--	--	142	40	2,060	166	0	327	3,200	--	--	--	--	a 5,850	7.96	6,620	519	346	39	11,500	7.8
Aug. 8	440	--	--	108	32	308	150	0	217	510	--	--	1.1	--	a 1,250	1.70	1,480	400	277	6.7	1,950	7.8
Aug. 9-10	240	--	--	125	41	1,310	150	0	267	2,080	--	--	--	--	4,030	5.48	2,610	480	357	26	7,000	7.8
Aug. 11-20	129	--	--	263	99	2,320	228	0	468	3,690	--	--	--	--	7,000	9.52	2,440	828	641	35	11,600	8.0
Aug. 23-28	291	--	--	265	70	3,360	176	0	655	5,270	--	--	1.0	--	10,000	13.60	5,160	945	802	48	16,200	7.9
Aug. 29	271	--	--	47	33	328	115	0	67	570	--	--	--	--	1,150	1.56	841	285	160	8.9	2,180	7.7
Aug. 30	162	--	--	170	69	2,050	170	0	439	3,240	--	--	--	--	6,370	8.66	3,130	709	570	33	10,500	7.8

Aug. 31, 1959	563	--	45	21	307	150	0	85	465	--	1.1	--	1,030	1.40	1,570	200	77	9.4	1,860	7.7
Sept. 1-2	232	--	56	24	418	118	0	107	665	--	4.4	--	1,420	1.93	1,889	240	144	12	2,540	7.8
Sept. 3	609	--	117	48	1,090	180	0	236	1,750	--	--	--	3,460	4.71	5,690	490	342	21	5,920	7.9
Sept. 4	721	--	218	72	2,210	202	0	524	3,490	--	--	--	6,810	9.26	13,260	838	672	33	11,200	7.8
Sept. 5-6	280	--	43	31	267	110	0	72	3,460	--	3.5	--	896	1.35	13,753	235	145	7.6	11,810	7.7
Sept. 7-8	242	--	124	44	1,210	178	0	268	1,920	--	--	--	3,730	5.07	2,440	490	344	24	8,410	8.0
Sept. 9-10	291	--	240	58	2,200	166	0	666	3,400	--	--	--	6,850	9.32	5,380	839	703	33	11,100	7.8
Sept. 11	320	--	103	26	517	134	0	240	2,800	--	1.1	--	1,830	2.49	1,580	365	255	12	3,090	7.3
Sept. 12	208	--	234	60	1,650	166	0	514	2,500	--	--	--	5,050	6.87	2,840	830	694	23	8,250	7.7
Sept. 13-20	148	--	220	61	2,180	222	0	480	3,440	--	--	--	6,750	9.18	2,660	798	616	33	11,000	7.9
Sept. 21-23	88.0	--	220	85	2,120	232	0	451	3,440	--	--	--	6,710	9.13	1,590	898	708	31	11,000	8.0
Sept. 24	9,340	--	33	15	149	100	0	32	250	--	1.1	--	591	.80	14,900	145	63	5.4	1,090	7.6
Sept. 25	43,500	--	63	14	516	140	0	100	790	--	5.2	--	1,600	2.18	187,900	215	100	15	2,820	7.8
Sept. 26-27	28,350	--	70	14	308	118	0	149	460	--	3.3	--	1,100	1.50	84,200	234	138	8.7	2,020	7.8
Sept. 28-30	5,397	--	85	27	571	110	0	183	910	--	3.5	--	1,880	2.56	27,400	325	235	14	3,300	7.7
Weighted average	695	--	115	32	1,040	--	b162	262	1,620	--	--	--	3,250	4.42	6,100	418	286	22	5,490	--

a Calculated from determined constituents.
 b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
7-1610. CIMARRON RIVER AT PERKINS, OKLA.--Continued
Temperature (°F) of water, water year October 1958 to September 1959

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	54	55	58	62	63	67	71	73	74	63	56	63	60	64	65	65	65	66	66	68	66	68	67	57	60	55	55	53	50	52	53	61
November ..	54	48	53	56	48	48	53	52	49	53	56	64	67	60	56	56	44	44	47	48	48	50	48	54	41	40	35	35	38	50	50	50
December ..	48	48	45	46	44	37	37	35	32	32	33	33	32	32	33	32	34	33	37	38	38	41	43	40	38	41	41	40	38	37	33	38
January	--	33	33	33	33	33	36	34	33	33	35	40	52	54	44	32	35	36	42	40	33	32	33	35	48	42	38	38	46	38	37	38
February	33	33	35	34	34	34	38	48	48	38	38	42	48	48	43	46	48	38	36	34	37	40	41	42	47	45	52	46	--	--	41	
March	43	47	45	46	44	34	58	48	45	47	46	44	50	57	43	45	47	52	50	50	44	44	48	56	50	50	44	46	48	50	48	
April	48	55	57	53	58	64	50	50	47	48	50	50	55	60	64	68	70	65	65	65	52	--	45	48	53	50	50	50	60	48	--	55
May	73	--	70	74	70	63	65	66	65	68	65	68	73	65	66	66	68	73	74	76	75	70	68	68	72	72	70	74	76	77	70	
June	75	70	72	73	70	75	76	76	76	77	80	77	77	76	75	77	78	80	78	78	78	76	77	78	78	78	77	78	78	80	--	76
July	77	72	77	78	80	78	80	80	78	77	76	78	76	78	76	75	76	74	78	71	76	73	73	76	75	77	72	74	77	80	83	76
August	83	81	80	80	81	80	74	74	74	74	73	73	74	74	76	76	74	76	79	79	78	77	78	75	75	75	75	77	73	78	73	77
September ..	74	71	73	75	68	75	75	76	74	66	63	61	61	63	63	65	68	69	68	68	70	70	72	68	66	70	68	73	62	67	--	69

ARKANSAS RIVER BASIN--Continued

7-1644. ARKANSAS RIVER AT SAND SPRINGS BRIDGE, NEAR TULSA, OKLA.

LOCATION.--At bridge on State Highway 33 in Sand Springs, 7 miles downstream from Cimarron River, and 10 miles above gaging station at Tulsa, Tulsa County. DRAINAGE AREA.--74,615 square miles above gaging station, of which 12,541 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1959.

Water temperatures: October 1946 to September 1959.

EXTREMES, 1946-59.--Dissolved solids: Maximum, 4,040 ppm Apr. 1-2; minimum, 268 ppm July 23-31.

Hardness: Maximum, 590 ppm Dec. 21-31, Jan. 24-28; minimum, 100 ppm July 23-31.

Specific conductance: Maximum daily, 7,720 microhos Apr. 2; minimum daily, 379 microhos July 26.

Water temperatures: Maximum, 90° F Aug. 5, 6; minimum, freezing point on several days during December to February.

EXTREMES, 1946-59.--Dissolved solids: Maximum, 13,500 ppm Oct. 19, 1956; minimum, 232 ppm July 18-20, 1950.

Hardness: Maximum, 2,600 ppm Oct. 19, 1956; minimum, 100 ppm July 23-31, 1959.

Specific conductance: Maximum daily, 21,200 microhos Oct. 19, 1956; minimum daily, 379 microhos July 19, 1950, July 26, 1959.

Water temperatures: Maximum, 96° F Aug. 7, 1947; minimum, freezing point on many days during winter months.

REMARKS.--ashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance and chloride of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1956 to September 1959 given in WSP 1631. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (microhos at 25°C)			
														Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate				
Oct. 1-10, 1958	4,412	16	0.00	107	24	301	7.2	206	0	156	500	0.4	2.6	0.21	1,270	1.73	15,130	365	196	6.9	2,170	8.0
Oct. 11-20	2,449	--	--	106	28	362	200	200	0	185	585	--	3.5	--	1,440	1.96	9,520	380	216	8.1	2,450	7.7
Nov. 1-10	1,613	--	--	112	26	372	192	192	0	131	630	--	1.6	--	1,720	2.34	7,490	385	221	8.3	2,869	8.2
Nov. 11-20	1,582	--	--	108	30	458	192	192	8	181	700	--	1.3	--	1,720	2.34	7,250	395	224	9.4	2,900	8.5
Nov. 21-28	2,711	--	--	116	37	453	228	228	4	197	725	--	4.5	--	1,740	2.37	12,740	440	246	9.4	2,910	8.3
Nov. 29-30	2,080	--	--	125	42	546	238	238	8	216	875	--	4.3	--	2,060	2.80	11,570	485	276	11	3,450	8.4
Dec. 1-20	1,552	--	--	139	61	570	256	10	244	244	900	--	6.2	--	2,200	2.99	9,220	515	288	11	3,630	8.4
Dec. 21-31	2,102	--	--	136	61	559	268	0	266	925	925	--	5.3	--	2,200	2.99	12,490	590	370	10	3,670	8.2
Jan. 1-23, 1959	1,650	--	--	128	49	664	252	20	300	300	1,000	--	--	--	2,460	3.35	10,960	520	280	13	3,860	8.4
Jan. 24-28	1,958	--	--	136	61	1,400	252	0	315	315	1,650	--	--	--	3,460	4.71	18,290	590	384	19	5,450	8.1
Jan. 29-31	2,100	--	--	112	58	1,800	204	8	326	326	1,210	--	--	--	2,770	3.77	15,710	520	306	15	4,440	8.6
Feb. 1-10	1,851	21	0.00	98	62	560	5.8	256	0	146	970	.5	4.2	.00	2,360	3.22	11,840	500	290	11	3,890	8.2
Feb. 11-16	2,312	--	--	139	40	850	238	4	311	311	1,300	--	--	--	2,870	3.89	17,850	510	308	16	4,810	8.4
Feb. 17-19	2,463	--	--	150	43	1,210	248	0	337	1,860	--	--	--	--	3,860	5.25	25,670	550	347	22	6,510	8.2
Feb. 20-28	2,284	19	0.00	120	56	640	240	0	153	1,220	.6	--	--	.00	2,520	3.43	15,540	530	334	14	4,610	8.0
Mar. 1-10	2,062	13	0.00	137	45	685	238	0	348	1,080	.3	--	--	.22	2,520	3.43	14,030	525	330	13	4,240	8.2
Mar. 11-20	2,130	12	0.00	130	45	656	222	0	348	1,075	.5	--	--	.40	2,430	3.30	13,970	510	328	13	4,090	7.8
Mar. 21-22	2,125	--	--	126	39	634	194	10	323	323	950	--	2.4	--	2,300	3.13	13,200	475	300	13	3,760	8.5

ARKANSAS RIVER BASIN--Continued

7-1644. ARKANSAS RIVER AT SAND SPRINGS BRIDGE, NEAR TULSA, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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-sulfate ratio (micro-mhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-bicarbonate				
Mar. 23-25, 1959..	2,220	---	---	128	41	724	---	188	10	329	1,100	---	---	---	---	2,490	3.39	14,930	490	320	14	4,210	8.5
Mar. 26-27.....	2,440	---	---	114	38	570	---	174	12	276	1,870	---	---	---	---	2,040	2.77	13,440	440	278	12	3,440	8.5
Mar. 28-31.....	2,482	---	---	123	40	733	---	188	4	316	1,120	---	2.6	---	---	2,540	3.45	17,020	470	311	15	4,220	8.3
Apr. 1-2.....	5,440	---	---	136	43	1,300	---	200	0	337	2,000	---	---	---	---	4,040	5.49	59,340	515	351	25	6,720	7.6
Apr. 3-10.....	4,069	---	---	133	32	772	---	196	0	316	1,070	---	---	---	---	2,490	3.39	27,360	465	304	14	4,130	7.9
Apr. 11-20.....	5,401	---	---	123	35	772	---	184	6	289	1,180	---	3.8	---	---	2,630	3.58	38,350	450	289	16	4,330	8.4
Apr. 21.....	6,380	---	---	130	37	1,150	---	168	8	266	1,800	---	---	---	---	3,620	4.92	62,360	475	324	23	6,080	8.5
Apr. 22-30.....	4,341	---	---	114	32	675	---	174	6	267	1,030	---	---	---	---	2,320	3.16	27,190	415	262	14	3,900	8.4
May 1-9.....	3,306	---	---	109	36	718	---	168	4	275	1,100	---	---	---	---	2,420	3.29	21,600	420	276	15	4,110	8.3
May 10-11.....	17,600	---	---	63	25	400	---	164	0	110	625	---	.5	---	---	1,300	1.77	61,780	260	126	11	2,330	7.5
May 12-15.....	13,350	---	---	89	26	649	---	148	2	198	1,000	---	---	---	---	2,070	2.82	74,610	330	205	16	3,600	8.3
May 16-17.....	12,400	---	---	88	24	540	---	136	0	210	825	---	.7	---	---	1,750	2.38	58,590	320	208	13	3,010	8.0
May 18-21.....	8,765	---	---	56	24	704	---	138	0	209	1,100	---	---	---	---	2,260	3.07	33,480	350	237	16	3,910	8.2
May 22-23.....	17,400	---	---	56	44	222	---	140	0	97	415	---	3.3	---	---	1,000	1.36	46,980	320	206	5.4	1,690	8.2
May 24-26.....	8,047	---	---	62	27	481	---	112	0	134	765	---	.4	---	---	1,620	2.20	35,200	265	173	13	2,780	7.6
May 27-29.....	10,730	---	---	49	22	194	---	132	0	77	310	---	.1	---	---	1,794	1.08	23,000	215	107	5.7	1,350	8.2
May 30-31.....	16,300	---	---	76	24	581	---	150	0	181	880	---	.7	---	---	1,880	2.56	82,740	290	167	15	3,210	8.1
June 1.....	12,100	---	---	86	23	553	---	136	0	190	850	---	5.7	---	---	1,870	2.54	61,090	310	198	14	3,160	8.2
June 2-3.....	12,350	---	---	54	18	310	---	130	0	112	310	---	2.4	---	---	822	1.12	27,410	210	198	6.3	1,390	8.2
June 4-9.....	3,417	---	---	82	29	300	---	160	0	166	475	---	3.1	---	---	1,220	1.66	20,810	325	194	7.2	2,000	8.1
June 10-16.....	3,416	---	---	92	29	454	---	162	6	212	690	---	.6	---	---	1,640	2.23	15,330	350	207	11	2,780	8.4
June 17-21.....	2,386	---	---	122	37	627	---	216	0	288	950	---	.8	---	---	2,150	2.92	13,680	455	278	13	3,680	8.1
June 22-27.....	2,360	---	---	102	34	471	---	180	0	246	720	---	1.2	---	---	1,740	2.37	11,090	395	248	10	2,900	7.3
June 28-30.....	6,767	---	---	53	17	231	---	126	0	86	360	---	.1	---	---	859	1.17	15,690	200	95	7.1	1,510	7.6
July 1-8.....	3,271	---	---	88	22	408	---	156	0	174	630	---	1.9	---	---	1,460	1.99	12,890	312	184	10	2,440	8.2
July 9-10.....	3,200	---	---	79	24	539	---	168	0	196	830	---	.5	---	---	1,800	2.45	15,550	340	202	13	3,010	8.2
July 11-14.....	3,750	---	---	78	24	398	---	156	0	135	630	---	3.8	---	---	1,350	1.84	13,600	295	177	10	2,370	8.1
July 15.....	14,900	---	---	47	14	210	---	124	0	59	330	---	4.3	---	---	742	1.01	29,850	175	74	6.9	1,340	8.0
July 16-20.....	33,860	---	---	32	7.3	86	---	100	0	26	86	---	2.4	---	---	287	.39	59,500	110	26	2.3	333	8.0
July 21.....	33,900	---	---	36	9.7	30	---	124	0	29	90	---	3.7	---	---	506	.52	24,000	165	66	4.6	532	8.0
July 22-31.....	24,600	---	---	23	9.1	138	---	92	0	47	218	---	3.0	---	---	268	.72	31,330	165	66	2.4	416	8.0
July 23-31.....	24,600	---	---	23	9.1	38	---	92	0	14	95	---	3.0	---	---	268	.36	37,840	100	24	2.5	488	7.9

Aug. 1, 1959.....	6,860	79		104	0	25	115	--	3.3	--	338	0.46	6,350	104	19	3.4	558	8.2
Aug. 2-8.....	4,881	333	180	8	128	150	530	--	1.9	--	1,200	1.63	15,810	320	159	8.1	2,070	8.4
Aug. 9-10.....	5,825	52	124	0	70	320	320	--	4.6	--	750	1.02	11,190	216	114	5.6	1,290	8.2
Aug. 11-18.....	2,829	86	19	130	0	148	550	--	2.2	--	11,250	1.87	18,730	284	171	8.9	2,120	8.1
Aug. 19-21.....	10,690	62	13	134	0	72	230	--	4.6	--	8,622	1.85	17,930	206	96	4.7	1,090	8.1
Aug. 22-31.....	3,217	101	21	160	0	176	840	--	2.5	--	1,780	2.42	15,460	340	209	13	3,080	8.1
Sept. 1-3.....	2,297		740		156	0	181		0		2,380	3.24	14,760	400	272	16	4,220	7.9
Sept. 4.....	2,486		327		150	0	134		2.0		1,380	1.60	7,920	280	157	8.5	2,050	8.0
Sept. 11.....	1,760		375		168	0	570		1.3		1,290	1.25	6,130	550	212	7.8	2,240	7.9
Sept. 12-20.....	1,412		568		168	0	820		1.0		1,950	2.65	7,430	400	262	12.8	3,350	8.0
Sept. 21-23.....	2,380		367		124	0	620		4.5		1,300	1.77	8,350	300	198	9.2	2,290	7.9
Sept. 24-25.....	22,720		125		115	0	205		1.7		489	67	30,000	124	42	4.9	878	7.8
Sept. 26.....	71,600		359		140	0	580		0		1,310	1.78	253,200	300	186	9.0	2,240	7.8
Sept. 27-30.....	47,100		234		110	0	355		3.0		840	1.14	106,800	188	98	7.4	1,470	7.8
Weighted average	5,586	75	23		138		562		--		1,300	1.77	19,610	282	157	9.3	2,210	--

^a Calculated from determined constituents.

^b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
 7-1644. ARKANSAS RIVER AT SAND SPRINGS BRIDGE, NEAR TULSA, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	58	62	64	66	65	67	72	74	67	--	60	61	66	67	66	67	70	74	74	69	61	60	54	52	56	53	53	48	54	54	62	
November..	57	60	62	54	56	54	51	53	60	51	55	58	62	64	60	66	68	50	49	49	50	49	55	51	54	45	40	37	37	39	--	53	
December..	44	46	45	47	43	38	36	36	35	33	33	33	--	32	32	33	34	34	36	40	44	39	48	50	42	41	45	47	43	36	33	39	
January....	--	--	32	32	32	32	33	36	33	33	42	39	46	50	39	34	39	36	39	39	32	32	33	40	44	42	37	39	46	43	36	37	
February....	33	32	32	34	33	32	38	50	47	40	39	41	46	50	42	45	52	45	40	40	40	39	38	41	44	52	54	52	--	--	42		
March.....	50	49	45	49	40	38	40	38	40	49	53	55	50	55	60	55	52	53	55	58	70	52	46	53	57	65	61	55	46	51	64	53	53
April.....	59	62	61	61	65	69	69	57	50	51	52	54	52	54	61	59	60	64	68	59	55	57	62	66	68	72	75	71	69	75	--	62	
May.....	78	72	75	77	72	66	72	66	66	65	70	73	75	67	68	60	74	74	77	79	81	74	71	72	75	71	71	79	80	80	81	73	--
June.....	76	74	76	75	72	77	81	--	79	78	--	77	84	--	--	84	--	--	--	86	88	82	82	80	82	80	80	81	82	85	--	--	
July.....	80	--	81	83	83	86	86	86	85	84	85	84	82	--	74	75	76	79	78	80	81	77	--	--	--	77	75	80	80	81	80	81	80
August.....	83	80	82	84	90	80	88	84	82	80	79	79	85	85	82	82	86	88	87	87	87	87	88	86	82	87	86	88	88	82	79	85	85
September..	86	79	76	60	79	82	85	81	85	74	74	77	75	78	69	79	80	80	81	80	81	80	81	80	77	69	70	72	77	75	--	--	78

ARKANSAS RIVER BASIN--Continued
7-1710. VERDIGRIS RIVER NEAR LENAPAH, OKLA.

LOCATION --At gaging station at bridge on county highway, 2.8 miles east of Lenapah, Nowata County, and 4.5 miles upstream from Cedar Creek, and at mile 144.6.

DRAINAGE AREA 5,635 square miles.

RECORDS AVAILABLE, Check dates: October 1951 to September 1959.

Water temperatures: October 1951 to September 1959.

EXTREMES 1958-59.--Dissolved solids: Maximum, 679 ppm Feb. 17-20; minimum, 114 ppm July 14-20.

Hardness: Maximum, 355 ppm Feb. 17-20; minimum, 68 ppm July 14-20.

Water temperatures: Maximum, 88°F Aug. 10, 11; minimum, 33°F Jan. 22.

EXTREMES 1951-59.--Dissolved solids: Maximum, 937 ppm Feb. 25-28, 1958; minimum, 114 ppm July 14-20, 1959.

Hardness: Maximum, 360 ppm Mar. 1-7, 1958; minimum, 48 ppm Oct. 3-4, 1955.

Specific conductance: Maximum daily, 1,620 microhos Feb. 27, 1957; minimum daily, 134 microhos Oct. 3, 1955.

Water temperatures: Maximum, 94°F July 22, Aug. 15, 1957; minimum, freezing point Dec. 21, 22, 1951, Jan. 3, 1952, Feb. 16, 1958.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhos at 25°C)	pH	
															Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate			
Oct. 1-31, 1958...	112	9.6	0.00	65	7.8	40	3.7	168	0	30	76	0.4	3.2	0.15	327	0.44	194	56	1.2	555	8.1
Nov. 1-18.....	88.9	--	--	78	16	33	188	8	32	80	91	--	2.6	--	382	.52	260	92	1.2	661	8.5
Nov. 19.....	275	--	--	60	12	37	375	0	21	41	77	--	2.6	--	357	.49	200	51	1.1	568	8.2
Nov. 20.....	3,490	--	--	66	18	55	192	0	58	50	100	--	2.2	--	435	.59	240	83	1.5	722	8.0
Nov. 21-30.....	913	10	--	66	13	48	184	0	27	102	102	--	2.5	--	420	.57	220	89	1.4	885	8.1
Dec. 1-31.....	172	10	--	76	15	53	212	0	36	108	108	--	3.3	--	460	.63	250	76	1.5	722	8.2
Jan. 1-31, 1959...	224	7.8	0.00	99	14	74	4.2	240	12	46	145	2	3.9	.30	555	.75	305	88	1.8	926	8.5
Feb. 1-9.....	226	5.5	.00	92	19	84	5.2	230	0	49	172	3.3	3.2	.04	594	.51	362	120	2.1	980	8.2
Feb. 10-12.....	1,222	5.5	--	52	12	49	124	0	41	197	51	--	4.9	--	372	.51	178	76	1.6	565	8.1
Feb. 13-16.....	1,222	4.0	--	84	21	81	788	0	55	200	175	--	3.4	--	580	.79	230	131	2.0	942	8.2
Feb. 17-20.....	638	3.0	--	88	27	99	236	0	60	222	222	--	2.6	--	679	.92	335	162	2.3	1,160	8.1
Feb. 21-26.....	336	4.8	.00	77	21	112	2.8	228	0	42	200	.2	--	.00	614	.84	280	93	2.9	1,170	7.2
Mar. 1-4.....	302	5	--	91	21	90	302	0	57	191	191	--	2.6	--	636	.86	315	134	2.2	1,040	8.2
Mar. 5-10.....	1,152	5.0	--	97	18	60	294	0	53	126	126	--	2.9	--	584	.76	240	106	2.7	762	8.0
Mar. 11-31.....	553	4.0	.00	74	13	80	2.0	176	4	60	113	3	3.0	.09	584	.66	304	120	2.0	943	8.0
Apr. 1-4.....	1,652	--	--	13	58	58	176	4	53	102	102	--	2.4	--	482	.66	240	194	1.6	752	8.3
Apr. 5-11.....	3,207	--	--	--	80	18	190	4	47	125	125	--	2.4	--	520	.71	250	275	1.3	817	8.3
Apr. 12-20.....	1,901	--	--	66	13	45	164	4	44	90	90	--	4.0	--	427	.58	220	79	1.3	651	8.3

ARKANSAS RIVER BASIN--Continued
7-1710. VERDIGRIS RIVER NEAR LENAPAH, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (B)	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. 1-30, 1959...	844	6.2	0.00	53	15	80	3.5	140	0	32	155	0.3	0.1	0.00	0.57	959	192	78	2.5	772
May 1-11.....	615	8.4	0.00	50	10	64	5.0	134	0	35	120	0.0	0.2	0.00	.56	689	168	58	2.1	754
May 12-18.....	1,351	--	--	68	10	49	168	6	50	83	83	--	3.2	--	.52	1,400	212	64	1.5	629
May 19-20.....	12,100	--	--	35	6.0	14	12	104	2	16	25	--	3.2	--	.24	5,850	112	24	6.6	281
May 21-31.....	4,948	--	--	58	7.7	37	150	4	31	65	65	--	3.1	--	.42	4,140	176	46	1.2	504
June 1-10.....	428	14	0.00	32	15	68	4.2	148	0	22	102	0.0	1.0	0.00	.46	383	140	18	2.5	628
June 11-18.....	197	--	--	68	12	54	182	4	46	93	93	--	2.4	--	.56	220	220	64	1.6	664
June 19-20.....	1,122	--	--	29	13	32	122	0	26	59	59	--	1.3	--	.33	745	124	40	1.3	412
June 21-30.....	416	--	--	76	6.9	56	194	0	40	98	98	--	1.1	--	.61	505	218	59	1.6	668
July 1-6.....	461	--	--	70	13	50	186	4	42	94	94	--	1.3	--	.56	517	228	69	1.4	717
July 7-9.....	1,115	--	--	43	11	26	132	0	25	52	52	--	2.0	--	.32	710	152	44	9	400
July 10-13.....	1,836	--	--	59	11	65	142	0	26	135	135	--	1.9	--	.98	2,110	194	78	2.0	708
July 14-20.....	24,100	--	--	59	5.0	7.6	70	0	30	5.6	15	--	1.1	--	.14	7,460	68	10	4	176
July 21-31.....	9,377	15	0.00	30	11	24	3.8	82	0	30	30	0.0	6.5	0.00	.37	6,900	120	44	7.9	357
Aug. 1-10.....	327	14	0.00	70	12	44	2.2	198	8	39	70	1.1	2.3	.13	.51	351	224	48	1.3	597
Aug. 11-20.....	1,771	--	--	61	16	45	171	0	35	60	60	--	2.0	--	.50	1,770	216	54	1.3	622
Aug. 21-31.....	918	10	0.00	50	14	36	1.4	170	0	37	63	2.2	3.0	0.06	.41	756	182	68	1.2	520
Sept. 1-10.....	863	--	--	56	13	32	863	0	22	66	66	--	3.0	--	.43	758	194	48	1.0	546
Sept. 11-20.....	104	6.8	0.00	44	14	27	1.5	132	0	38	47	3	0.4	0.04	.86	167	59	9	9	508
Sept. 21-24.....	104	--	--	46	19	26	2.6	156	0	29	62	--	2.3	--	.38	78	192	64	8	499
Sept. 25-30.....	1,054	--	--	60	22	24	24	188	0	24	78	--	3.3	--	.48	1,010	240	86	7	600
Weighted average	1,534	--	--	44	10	31	--	b 125	--	26	62	--	2.7	--	0.38	1,170	151	48	1.1	453

a Calculated from determined constituents.

b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
 7-1710. VERDIGRIS RIVER NEAR LENAPAH, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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.....	63	65	68	68	66	67	70	69	68	68	67	68	69	65	70	--	69	--	67	66	65	67	68	61	63	--	--	56	57	55	53	65	
November..	53	49	--	49	55	54	55	53	57	60	60	62	61	62	--	61	57	55	--	53	52	52	50	52	57	--	42	44	44	--	54		
December..	43	46	--	--	43	42	40	40	38	38	35	36	34	35	37	38	40	--	38	43	45	43	43	42	41	45	--	40	37	37	40	--	
January.....	37	--	--	--	--	35	35	35	--	37	39	43	43	43	38	37	40	40	38	38	35	33	36	40	40	35	34	40	42	39	37	38	
February....	35	35	36	38	36	36	42	40	41	43	41	36	35	36	46	45	45	45	40	45	40	41	45	45	46	48	46	47	--	--	42	42	
March.....	47	47	48	--	43	40	46	44	48	48	46	--	52	55	--	53	55	57	55	57	55	54	55	57	61	--	--	50	58	58	--	62	
April.....	57	60	60	63	61	64	63	57	57	56	52	55	54	56	60	60	62	64	64	58	61	64	64	64	64	67	68	67	70	70	75	--	62
May.....	--	74	74	--	72	73	70	69	70	68	--	--	69	70	68	67	72	68	69	68	70	68	68	72	74	74	72	78	77	78	78	71	80
June.....	78	--	75	75	75	72	77	78	79	79	80	82	82	84	83	--	--	--	81	80	79	80	80	82	83	82	82	84	82	--	--	80	
July.....	78	77	82	83	83	85	84	83	81	83	82	82	77	72	70	73	72	74	77	76	76	75	74	75	79	79	78	80	82	85	86	79	84
August.....	86	86	85	--	86	87	86	86	87	88	88	--	87	87	87	86	86	83	80	80	82	82	82	82	82	82	82	81	84	85	81	78	84
September..	--	81	79	80	81	82	82	82	81	77	76	74	75	76	77	76	74	77	78	79	83	80	77	75	75	76	75	75	75	70	69	--	77

ARKANSAS RIVER BASIN--Continued

7-1786. VERDIGRIS RIVER NEAR INOLA, OKLA.

LOCATION.--At gaging station at bridge on State Highway 33, 6 miles downstream from Dog Creek, and 6 miles west of Inola, Rogers County.

DRAINAGE AREA.--7,911 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1959.

Water temperatures: October 1950 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 689 ppm Feb. 21-28; minimum, 154 ppm July 21-31.

Hardness: Maximum, 335 ppm Feb. 21-28; minimum, 66 ppm July 21-31.

Specific conductance: Maximum daily, 1,210 microhos Feb. 25-26; minimum daily, 147 microhos July 17.

Water temperatures: Maximum, 84°F July 9, 13, Aug. 31; minimum, freezing point on several days during December and January.

EXTREMES, 1947-59.--Dissolved solids: Maximum, 3,060 ppm Sept. 21-24, 1956; minimum, 81 ppm June 22-30, July 1-2, 1948.

Hardness: Maximum, 580 ppm Sept. 21-24, 1956; minimum, 48 ppm Oct. 4, 1953.

Specific conductance: Maximum daily, 6,030 microhos Sept. 22, 1956; minimum daily, 143 microhos June 24, 1948.

Water temperatures (1950-59): Maximum, 95°F on several days during July 1954; minimum, freezing point on many days during winter months.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- on- ate (SO ₄)	Chloride (Cl)	Fluo- ride (F)	Ni- trate (NO ₃) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Specific con- duct- ance pH (micro- hos at 25°C)				
													Parts per million	Tons per acre- day foot	Cal- cium, Mag- nesium	Non- sorp- tion ratio					
Oct. 1-31, 1958,...	189	5.8	0.00	74	10	76	4.9	158	0	157	0.4	7.8	0.18	472	0.64	241	96	2.2	825	8.2	
Nov. 1-16, 1958,...	98.1	--	--	66	12	107	--	158	0	200	--	9.8	--	557	.76	148	215	86	3.2	960	7.2
Nov. 17-19, 1958,...	494	--	--	54	8.6	49	--	128	0	89	--	14	--	341	.46	455	170	65	1.6	585	8.0
Nov. 20-23, 1958,...	2,485	--	--	106	16	89	--	280	4	182	--	5.6	--	651	.89	4,370	330	110	2.1	1,040	8.4
Nov. 24-30, 1958,...	634	--	--	67	10	59	--	168	0	116	--	5.0	--	414	.56	709	210	72	1.8	695	8.2
Dec. 1-10, 1958,...	311	--	--	66	16	58	--	158	4	132	--	6.9	--	475	.65	399	230	94	1.7	761	8.3
Dec. 11-31, 1958,...	245	--	--	74	20	73	--	168	10	165	--	9.9	--	555	.75	363	265	112	2.0	878	8.3
Jan. 1-31, 1959,...	312	8.0	0.00	77	12	93	5.2	190	0	180	2	5.7	2.0	560	.76	473	243	86	2.6	923	8.3
Feb. 1-20, 1959,...	1,007	5.5	0.00	81	13	110	4.0	194	0	202	1.1	5.9	1.9	615	.84	1,670	256	97	3.0	1,050	7.8
Feb. 21-28, 1959,...	1,847	5.0	--	94	24	100	--	206	0	223	--	3.8	--	689	.94	1,020	335	166	2.1	1,150	8.0
Mar. 1-9, 1959,...	1,780	5.5	--	78	21	89	--	168	0	200	--	3.2	--	634	.86	3,050	280	142	2.3	1,010	7.8
Mar. 10-12, 1959,...	1,573	8.0	--	80	23	56	--	132	0	120	--	5.9	--	432	.59	1,830	205	97	1.7	679	8.0
Mar. 13-20, 1959,...	1,936	--	--	80	22	74	--	176	0	173	--	4.8	--	600	.82	1,520	290	146	1.9	934	8.1
Mar. 21-27, 1959,...	1,446	--	--	78	20	92	--	168	0	200	--	3.1	--	609	.83	2,380	275	138	2.4	1,020	8.1
Mar. 28-31, 1959,...	1,878	--	--	60	12	73	--	124	0	155	--	4.8	--	478	.65	2,420	200	98	2.2	767	8.0
Apr. 1-10, 1959,...	1,838	--	--	74	17	69	--	160	0	155	--	4.8	--	551	.75	2,730	255	124	1.9	876	8.0
Apr. 11-20, 1959,...	4,546	--	--	66	13	75	--	162	0	148	--	3.7	--	443	.60	5,440	220	87	2.2	702	8.2
Apr. 21-30, 1959,...	1,738	5.8	0.00	53	17	80	3.4	142	0	160	0	4	.01	468	.64	2,200	200	84	2.5	806	7.6
May 1-18, 1959,...	2,562	5.8	0.00	45	14	76	4.4	128	0	135	1.0	2.0	.00	415	.56	2,870	172	96	2.5	725	7.8
May 19-20, 1959,...	17,950	--	--	43	6.4	37	--	120	0	64	--	1.0	--	281	.38	13,620	134	36	1.4	436	7.8

May 21-31, 1959...	12,250	--	--	40	5.4	32	106	0	24	56	--	2.0	--	262	0.36	8,650	122	35	1.3	400	7.7
June 1-10.....	2,130	12	0.00	35	12	64	118	0	21	107	0.00	1.1	0.00	332	.45	1,910	136	40	2.4	528	7.8
June 11-28.....	702	--	--	67	12	77	168	0	40	145	--	2.4	--	477	.65	904	218	80	2.3	595	7.4
June 29-30.....	2,365	--	--	45	9.1	46	112	0	21	96	--	1.3	--	313	.43	2,000	150	38	1.5	525	8.0
July 1-10.....	1,031	--	--	54	10	66	138	0	33	121	--	3.0	--	53	.53	1,090	176	63	2.2	660	7.5
July 11-15.....	3,302	--	--	48	11	50	184	0	26	95	--	2.5	--	327	.44	2,920	164	54	1.7	546	8.1
July 16-20.....	33,940	--	--	20	5.4	12	68	0	11	22	--	1.2	--	166	.23	15,270	72	16	1.6	195	7.9
July 21-31.....	33,350	12	--	22	2.7	18	4.4	0	17	40	--	0	0.00	334	.21	13,870	65	24	1.0	265	7.9
Aug. 1-10.....	6,905	6.5	--	25	4.7	28	2.8	0	18	47	.3	1.8	.12	237	.57	4,290	132	24	1.2	382	8.1
Aug. 11-20.....	1,000	--	--	67	2.9	43	208	0	14	110	--	2.0	--	421	.57	1,140	248	78	1.2	746	8.2
Aug. 21-24.....	3,898	--	--	47	14	34	156	0	19	70	--	2.9	--	309	.42	3,250	174	46	1.1	526	7.9
Aug. 25-31.....	1,827	--	--	60	16	56	176	0	26	114	--	5.4	--	417	.57	931	214	70	1.7	707	7.8
Sept. 1-2.....	1,355	--	--	62	15	56	160	0	28	114	--	3.1	--	408	.55	1,490	218	70	1.6	704	7.9
Sept. 3-8.....	1,488	--	--	52	11	37	134	0	21	75	--	4.3	--	314	.4	1,260	176	50	1.2	544	7.6
Sept. 9-10.....	1,922	--	--	70	16	62	214	0	27	119	--	5.2	--	451	.61	636	240	64	1.7	766	8.0
Sept. 11-20.....	245	--	--	83	10	60	184	0	26	140	--	5.9	--	460	.63	304	250	99	1.7	787	7.6
Sept. 21-22.....	128	--	--	67	18	94	184	0	27	185	--	4.6	--	537	.73	186	240	89	2.6	942	8.0
Sept. 23-25.....	1,924	--	--	26	6.6	22	82	0	23	33	--	3.7	--	167	.23	868	92	25	1.1	291	7.7
Sept. 26.....	6,620	--	--	50	12	59	124	0	33	118	--	1.4	--	371	.50	6,630	176	74	1.9	631	7.8
Sept. 27-28.....	3,205	--	--	39	12	39	102	0	25	85	--	3.1	--	290	.39	2,510	148	64	1.4	498	7.5
Sept. 29.....	3,520	--	--	69	15	61	166	0	40	132	--	1.4	--	457	.62	4,340	232	96	1.7	759	7.9
Sept. 30.....	9,280	--	--	35	11	19	106	0	21	45	--	1.2	--	202	.27	5,060	132	45	1.7	354	7.7
Weighted average	3,175	--	--	39	7.4	39	101	--	22	73	--	3.8	--	274	0.37	2,350	128	45	1.5	442	--

a Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued

7-1786. VERDIGRIS RIVER NEAR INOLA, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	63	66	65	64	64	--	66	71	71	66	68	64	62	64	67	67	66	64	66	67	66	67	--	64	64	62	62	60	60	59	56	
November ..	54	58	56	58	54	53	52	52	52	54	54	54	54	54	55	52	52	52	52	51	51	52	54	50	52	46	43	47	46	41		
December ..	46	46	46	45	44	40	43	39	35	--	34	33	32	32	34	--	35	38	34	--	34	34	34	33	36	34	33	34	34	34		
January	33	33	32	32	34	34	34	34	34	34	35	36	36	37	--	--	34	35	35	--	33	34	34	--	36	37	33	34	35	36	34	
February	33	33	34	34	34	36	37	37	36	37	36	39	38	39	39	40	40	38	37	38	38	37	37	40	41	45	46	43	--	38		
March	46	45	--	45	42	42	39	39	39	40	40	42	41	43	41	41	42	42	42	43	43	43	46	51	46	46	44	44	47	--	54	
April	55	61	61	63	66	68	65	65	65	62	62	61	62	66	68	68	68	68	--	66	66	66	66	68	69	68	69	68	69	70	--	
May	71	71	72	72	72	72	72	73	73	73	74	74	74	73	73	73	76	76	76	76	77	76	76	68	69	67	66	69	70	70	78	72
June	68	74	74	74	76	75	78	76	78	78	78	78	79	79	79	79	80	76	79	79	79	79	79	80	80	80	82	81	81	83	78	
July.....	81	82	81	81	81	82	82	82	84	80	82	81	84	80	80	75	73	74	71	73	73	72	72	71	71	71	71	74	74	74	74	77
August.....	76	76	78	78	78	78	78	78	78	78	78	78	78	78	78	80	80	80	80	80	80	80	81	81	80	79	80	81	80	80	84	79
September ..	77	77	75	75	76	78	78	78	78	79	74	79	80	80	--	78	78	--	76	78	--	78	78	78	78	75	78	78	78	76	--	77

ARKANSAS RIVER BASIN--Continued
7-1905, NEOSHO (GRAND) RIVER NEAR LANGLEY, OKLA.

LOCATION --At gaging station at bridge on State Highway 82, 1.5 miles southwest of Langley, Mayes County, 4.1 miles downstream from Pennsacola Dam, and 5.8 miles
DRAINAGE AREA --10,335 square miles.
RECORDS AVAILABLE --Chemical analyses: May 1956 to September 1959.

Water temperatures: May 1956 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 238 ppm June 1-30; minimum, 146 ppm Mar. 1-31.

Hardness: Maximum, 144 ppm May 1-31; minimum, 110 ppm Sept. 1-30.
Specific conductance: Maximum daily, 429 microhos June 1; minimum daily, 167 microhos Mar. 6, Sept. 30.

Water temperatures: Maximum, 84°F Aug. 23; minimum, 33°F Jan. 16.

EXTREMES, 1956-59.--Dissolved solids: Maximum, 293 ppm Nov. 22, 24-30, 1956; minimum, 128 ppm June 11-20, 1957.

Hardness: Maximum, 170 ppm Nov. 22, 24-30, 1956; minimum, 78 ppm June 1-10, 1957.

Specific conductance: Maximum daily, 508 microhos Nov. 22, 1956; minimum daily, 148 microhos Apr. 23, 1957.

Water temperatures: Maximum, 88°F Aug. 9, 1956; minimum, freezing point Jan. 27, 1957.
REMARKS --Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958
to September 1959 given in WSP 1491.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)		
															Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate				
Oct. 1-31, 1958....	1,637	12	0.00	41	5.7	8.8	3.1	110	0	35	8.5	0.4	3.7	0.12	0.24	769	126	36	0.3	274	8.1	
Nov. 1-30.....	2,518	111	.00	42	6.6	10	3.1	112	0	37	9.5	.4	3.7	.07	178	1,210	132	40	.4	290	7.6	
Dec. 1-31.....	1,256	9.4	.00	42	5.6	9.5	3.0	116	0	38	9.0	.2	4.6	.06	181	614	128	33	.4	296	7.7	
Jan. 1-31, 1959..	1,098	8.0	.00	44	5.4	10	3.0	118	0	40	9.6	.2	3.5	.20	186	551	132	36	.4	302	7.8	
Feb. 1-28.....	3,734	12	.00	44	5.8	10	3.3	114	0	40	10	.1	.0	.04	212	2,140	134	40	.4	304	7.8	
Mar. 1-31.....	5,130	.6	.00	37	7.7	7.3	--	82	0	47	17	.1	.0	.00	146	2,020	124	57	.4	304	7.9	
Apr. 1-30.....	1,207	.6	.00	35	10	12	--	118	0	41	19	.2	.0	.00	176	574	130	34	.5	351	7.8	
May 1-31.....	7,006	6	.00	40	11	7.5	--	108	0	51	12	.3	3.2	.00	178	3,370	144	56	.3	349	7.8	
June 1-30.....	2,063	6.2	.00	46	6.1	13	1.5	112	0	42	17	.5	3.4	.00	238	1,330	140	45	.5	354	7.8	
July 1-31.....	10,460	8.4	--	40	4.9	12	1.3	92	0	48	15	.7	7.8	.03	186	5,250	120	44	.5	318	8.0	
Aug. 1-31.....	4,684	6.2	.00	44	7.3	8.2	.3	90	0	53	13	.3	2.8	.00	211	2,99	140	66	.3	323	7.8	
Sept. 1-30.....	3,500	4.8	.00	32	7.3	12	.6	82	0	46	12	.5	2.0	.00	157	2,140	110	43	.5	304	7.7	
Weighted average	3,706	6.0	--	40	7.1	9.9	--	99	--	45	13	0.3	3.8	0.03	184	0.25	1,840	129	48	0.4	318	--

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
7-1905. NEOSHO (GRAND) RIVER NEAR LANGLEY, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	--	66	70	68	70	68	68	67	68	69	68	68	68	--	65	65	67	78	--	68	68	65	60	61	59	63	62	67	
November ..	61	60	59	61	60	58	60	59	56	60	58	59	60	59	--	59	60	59	58	58	58	60	--	58	59	55	53	--	--	--	59	
December ..	--	52	--	53	50	--	44	46	48	45	49	48	45	44	43	45	45	49	45	45	47	46	46	46	46	46	45	44	42	42	46	
January	45	45	45	45	--	43	44	43	--	43	40	43	43	45	41	33	34	40	41	43	34	35	40	41	41	41	43	42	44	39	41	
February	43	34	36	37	37	36	45	41	44	40	41	40	41	40	--	40	--	41	40	40	--	40	40	--	40	40	41	--	--	40	--	
March	40	43	40	42	41	42	41	43	42	42	42	42	42	42	43	45	44	45	44	44	46	48	47	47	50	58	46	46	48	47	44	
April	48	52	54	54	50	--	52	49	52	49	48	54	48	50	50	52	58	56	55	54	--	54	55	55	55	60	58	55	58	60	--	53
May	60	58	60	60	61	62	59	60	58	58	60	60	62	62	62	62	61	61	60	64	64	65	65	68	68	65	65	70	71	68	71	68
June	68	69	67	--	68	66	70	70	68	68	69	70	71	75	75	76	70	68	75	69	76	72	76	76	73	76	76	75	70	--	72	
July	70	70	70	72	75	75	71	72	73	74	74	73	72	72	76	--	76	76	76	78	72	75	76	--	74	76	74	--	75	74	74	
August	75	68	76	76	75	76	76	78	--	77	76	74	76	75	76	80	76	76	77	--	76	77	84	81	78	75	80	78	78	78	77	
September ..	78	78	78	78	80	81	80	78	79	76	75	74	78	74	72	74	76	74	74	75	76	74	74	75	75	75	70	71	68	--	75	

ARKANSAS RIVER BASIN--Continued

7-1935. NEOSHO (GRAND) RIVER AT FORT GIBSON RESERVOIR, NEAR FORT GIBSON, OKLA.
 LOCATION--Immediately downstream from Fort Gibson Dam, 1.1 miles upstream from gaging station, and 4 miles north of Fort Gibson, Wagoner County.
 DRAINAGE AREA--12,492 square miles upstream from sampling station; 12,495 square miles upstream from gaging station.
 RECORDS AVAILABLE--Chemical analyses, October 1951 to September 1959.

Water temperatures: October 1951 to September 1959

EXTREMES, 1958-59--Dissolved solids: Maximum, 212 ppm July 1-31; minimum, 149 ppm Nov. 1-30.

Hardness: Maximum, 140 ppm May 1-31; minimum, 100 ppm Nov. 1-30.

Specific conductance: Maximum daily, 443 microhos. Apr. 2; minimum daily, 228 microhos Oct. 8, 19.

Water temperatures: Maximum, 84°F Aug. 7; minimum, 36°F Jan. 5, 22.

EXTREMES, 1951-59--Dissolved solids: Maximum, 233 ppm Nov. 1-30, 1952; minimum, 128 ppm June 1-10, 1957.

Hardness: Maximum, 171 ppm Dec. 1-31, 1952; minimum, 82 ppm June 1-10, 1957.

Specific conductance: Maximum daily, 443 microhos Apr. 2, 1959; minimum daily, 176 microhos June 20, 1957.

Water temperatures: Maximum, 89°F July 31, Aug. 1, 1955; minimum, 34°F Dec. 21, 1951.

REMARKS--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station below Gibson Reservoir for water year October 1958 to September 1959 given in WSP 1631. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (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							
Oct. 1-31, 1958...	1,818	12	0.01	35	5.0	8.8	2.9	92	0	30	8.4	0.4	3.1	0.14	157	0.21	771	108	32	0.4	241	8.1
Nov. 1-30.....	2,557	3.2	.00	33	4.3	7.1	--	104	0	26	9.4	-1	3.0	.25	149	.21	1,030	100	15	.3	234	7.7
Dec. 1-31.....	1,324	8.8	.00	37	4.7	10	2.7	102	0	33	11	-2	3.0	.20	161	.22	576	112	28	.4	270	7.4
Jan. 1-31, 1959..	1,946	8.4	.00	39	5.0	11	2.8	108	0	34	11	-2	3.1	.35	a 168	.23	429	118	30	.4	283	7.7
Feb. 1-28.....	3,940	12	.00	38	6.1	10	3.1	104	0	38	11	-3	4.0	.10	174	.24	1,850	120	35	.4	284	7.1
Mar. 1-31.....	6,891	6.0	.00	46	1.2	11	--	116	0	31	13	0	3.5	.00	a 163	.22	3,030	120	25	.4	294	7.4
Apr. 1-30.....	2,190	4.0	.00	42	5.1	8.0	--	112	0	33	12	0	4	.00	158	.21	934	126	34	.3	310	7.4
May 1-31.....	7,511	--	.00	50	3.6	8.1	--	108	0	44	12	0	1.8	.00	a 174	.24	3,530	140	52	.3	315	7.7
June 1-30.....	2,492	3.0	.00	44	4.4	14	2.8	92	0	49	19	5	7.7	.03	204	.28	1,370	128	52	.5	345	6.3
July 1-31.....	12,290	9.4	.00	42	6.6	12	4	88	0	53	19	5	8.2	.04	212	.29	7,030	132	60	.5	333	7.8
Aug. 1-31.....	5,423	9.0	.00	42	4.6	8.5	4	84	0	45	13	6	7.9	.03	200	.27	2,930	124	55	.3	318	7.7
Sept. 1-30.....	3,735	5.6	.00	40	8.3	11	1.7	108	0	57	15	3	1.3	.02	a 192	.26	1,940	134	46	.4	326	7.8
Weighted average.....	4,279	--	0.00	43	4.9	10	--	100	--	43	14	0.3	4.8	0.05	184	0.25	2,130	128	46	0.4	308	--

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-1935. NEOSHO (GRAND) RIVER AT FORT GIBSON RESERVOIR, NEAR FORT GIBSON, OKLA.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	70	69	68	68	68	68	67	70	68	68	68	68	68	66	--	68	67	67	67	67	67	67	67	67	67	64	62	62	62	61	67		
November ..	61	61	60	60	60	60	--	59	58	58	58	58	59	59	60	--	60	58	58	58	58	58	58	56	56	56	56	52	52	52	52	58		
December ..	57	53	51	51	50	50	49	48	47	46	45	43	42	42	42	42	42	43	43	43	43	43	44	44	43	43	43	43	43	44	43	45		
January	42	42	40	38	36	38	40	39	38	39	39	39	40	42	40	42	40	--	39	40	40	38	36	38	38	38	38	38	39	39	39	39		
February ..	39	39	40	40	39	38	40	40	41	41	39	43	42	42	43	42	44	43	42	43	43	44	44	44	44	44	44	44	44	44	44	42		
March	45	45	46	46	46	45	45	45	--	46	45	45	46	46	47	47	49	48	48	48	48	49	49	49	50	51	51	50	50	50	51	48		
April	52	52	53	54	53	54	54	54	56	55	56	59	55	55	55	55	55	56	57	57	58	57	58	58	58	58	57	59	59	60	61	56		
May	62	62	61	61	62	62	62	63	62	--	65	67	70	68	68	68	67	68	69	70	70	71	72	72	72	72	72	72	72	72	72	68		
June	73	72	--	69	69	69	69	69	69	69	70	72	77	71	71	71	71	71	71	71	71	71	71	71	72	73	73	71	--	71	73	73	71	
July	75	76	78	78	78	78	78	77	77	77	79	79	79	78	79	80	82	82	82	81	79	79	79	79	79	79	79	79	79	79	79	79	79	
August	81	83	79	80	80	81	84	80	83	83	79	81	79	79	78	78	80	81	79	79	80	80	80	80	80	80	80	80	80	80	81	80	81	80
September ..	--	81	81	81	81	80	80	--	80	81	79	80	78	79	78	77	76	77	76	76	75	75	75	76	76	76	75	--	75	75	75	--	78	

ARKANSAS RIVER BASIN--Continued
7-1945.5. ARKANSAS RIVER AT WEBBERS FALLS, OKLA.

LOCATION.--At bridge on U.S. Highway 64, at Webbers Falls, Muskogee County.

DRAINAGE AREA.--97,049 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1949, October 1956 to September 1959.

Water temperatures: October 1948 to September 1959. Maximum, 2,040 ppm Feb. 3-4; minimum, 139 ppm Mar. 5-6.

EXTREMES. 1958-59.--Dissolved solids: Maximum, 2,040 ppm Feb. 3-4; minimum, 139 ppm Mar. 5-6.

Hardness: Maximum, 465 ppm Dec. 28, Jan. 13-14; minimum, 60 ppm Mar. 5-6.

Specific conductance: Maximum, 3,480 microhos Feb. 3; minimum daily, 174 microhos July 21.

Water temperatures: Maximum, 85°F on several days during June and August; minimum, freezing point Jan. 4, 5, 7.

EXTREMES. 1948-49, 1956-59.--Dissolved solids: Maximum, 3,500 ppm Nov. 2-3, 1956; minimum, 139 ppm Mar. 5-6, 1959.

Hardness: Maximum, 650 ppm Nov. 2-3, 1956; minimum, 60 ppm Mar. 5-6, 1959.

Specific conductance: Maximum, 6,070 microhos Nov. 2, 1956; minimum daily, 174 microhos July 21, 1959.

Water temperatures: Maximum, 88°F July 19, 1957; minimum, freezing point Jan. 20, 1949, Jan. 4, 5, 7, 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. No discharge records available.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (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
Oct. 1-2, 1958...						90		128	0	64	140		0.6	459	0.62	174	69	3.0	797	7.2
Oct. 3-5.....						161		148	0	74	258		5.7	657	.95	216	94	4.8	1,210	7.8
Oct. 6-7.....						232		186	0	106	375		1.3	971	1.32	288	136	5.9	1,690	7.2
Oct. 8.....						114		156	0	65	190		1.2	568	.77	216	88	3.4	989	7.7
Oct. 9-10.....						161		174	0	81	265		5.5	727	.99	254	112	4.4	1,250	7.9
Oct. 11-13.....						137		154	0	83	220		4.8	635	.86	228	102	3.9	1,120	7.8
Oct. 14.....						285		194	0	145	460		.7	1,170	1.59	340	181	6.7	2,010	7.8
Oct. 15-22.....						140		156	0	86	225		2.4	21	.650	232	104	4.0	1,140	7.8
Oct. 23-31.....						272		196	0	135	445		4.5	20	1.56	340	180	6.4	1,970	7.9
Nov. 1-13.....	11		0.00			251		196	0	136	428		4	1,100	1.50	304	180	5.9	1,890	8.1
Nov. 14-17.....						181	5.6	200	0	99	305		1.7	1,100	1.19	340	140	4.5	1,430	8.1
Nov. 18.....						292		198	0	144	475		1.6	1,220	1.66	350	188	6.8	1,990	8.2
Nov. 19-20.....						105		136	0	69	172		4.8	550	.75	200	88	3.2	907	8.0
Nov. 21-30.....	11					134	4.6	168	0	85	222		2.9	651	.86	250	112	3.7	1,140	8.2
Dec. 1-4.....						105		148	2	71	175		3.8	570	.78	220	95	3.1	943	8.3
Dec. 5-9.....						156		264	8	107	255		9.7	869	1.18	370	140	3.5	1,420	8.3
Dec. 10-15.....						237		212	10	116	403		5.0	1,100	1.50	370	180	5.4	1,830	8.4
Dec. 16-19.....						155		164	6	94	260		4.5	1,769	1.05	275	130	4.1	1,300	8.4

ARKANSAS RIVER BASIN--Continued
 7-1945.5. ARKANSAS RIVER AT WEBBERS FALLS, OKLA.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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)	Boiron (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO ₃		Sodium-sulfate ratio	Specific conductance (microhm-cm at 25° C)	pH
															Parts per million	Tons per acre-foot	Calcium-Magnesium	Non-carbonate			
Dec. 20-27, 1958.		--	--	104 28		350		208	10	161	550	0.3	5.9	0.34	1,360	1.85	375	188	7.8	2,270	8.4
Dec. 28.....		--	--	127 36		447		264	0	220	700	--	5.0	--	1,740	2.37	465	248	9.0	2,900	8.2
Dec. 29-31.....		--	--	112 32		356		220	10	198	550	3	6.0	.54	1,460	1.99	410	213	7.6	2,420	8.5
Jan. 4-5, 1959.....		--	--	91 32		280		192	0	139	455	3	4.9	--	1,160	1.58	360	202	6.4	2,040	8.2
Jan. 6.....		--	--	164 32		561		242	0	402	650	3	6.2	--	1,560	2.12	415	216	9.0	2,660	8.2
Jan. 7-9.....		--	--	120 34		449		248	0	149	350	3	4.2	.58	1,160	1.58	325	162	7.0	2,020	8.6
Jan. 13-14.....		--	--	126 37		525		232	8	241	845	3	7.0	--	1,190	2.68	465	262	11	3,360	6.4
Jan. 15-16.....		--	--	83 35		272		212	0	136	442	1	3.7	--	1,100	1.50	350	176	6.3	1,950	8.0
Jan. 17-20.....		--	--	108 29		352		222	0	185	550	5	5.9	20	1,400	1.90	390	208	7.7	2,410	8.2
Jan. 21-25.....		--	--	114 33		433		232	0	214	700	3	6.9	1.18	1,660	2.26	420	230	9.6	2,840	8.2
Jan. 26-29.....		--	--	91 24		324		196	0	152	500	3	6.2	.25	1,240	1.69	325	164	7.8	2,120	8.1
Jan. 30-31.....		--	--	66 18		196		156	0	94	310	--	4.4	--	832	1.13	240	112	5.5	1,410	8.1
Feb. 1-2.....		--	--	78 17		284		154	6	117	440	--	4.8	--	1,050	1.43	265	129	7.6	1,860	8.5
Feb. 3-4.....		--	--	125 36		578		224	8	235	900	--	6.0	--	2,040	2.77	460	263	12	3,460	8.4
Feb. 5-14.....		--	--	80 21		202		196	0	112	315	3	4.2	1.14	878	1.19	285	124	5.2	1,500	8.2
Feb. 15-20.....		--	--	86 23		278		176	0	137	442	3	5.8	.36	1,100	1.50	310	166	6.9	1,920	8.2
Feb. 21-28.....		11	0.00	82 37		300	5.0	168	0	181	490	3	3.5	.00	1,190	1.62	355	218	6.9	2,090	7.3
Mar. 1-4.....		--	--	83 23		175		220	0	109	272	3	5.0	.23	795	1.08	300	120	4.4	1,390	8.2
Mar. 5-6.....		--	--	17 4.3		14		52	0	13	22	--	3.5	--	139	.19	60	18	8	201	7.8
Mar. 7-8.....		--	--	51 12		130		110	0	82	198	--	5.1	--	550	.75	175	85	4.3	974	8.1
Mar. 9-10.....		--	--	66 16		153		136	0	102	252	--	5.0	--	683	.94	230	118	4.4	1,190	8.1
Mar. 11-20.....		6.4	.00	62 9.6		164	4.3	120	0	93	252	2	4.4	.00	730	.99	194	96	5.1	1,230	7.5
Mar. 21-24.....		--	--	54 16		129		118	0	94	200	--	4.0	--	573	.78	200	104	4.0	1,010	8.0
Mar. 25.....		--	--	74 21		219		152	0	139	338	--	4	--	910	1.24	270	146	5.8	1,510	8.1
Mar. 26-27.....		--	--	69 19		97		182	8	74	155	--	2.8	--	510	.72	250	135	7.7	937	8.5
Mar. 28-29.....		--	--	83 26		300		154	6	161	468	--	3.5	--	1,160	1.58	315	179	7.3	2,010	8.4

Mar. 30, 1959.....	69	23	167	0	106	280	---	0.5	---	734	1.00	265	142	4.5	1,300	8.2
Mar. 31.....	82	26	270	2	152	430	---	.4	---	1,080	1.47	310	177	6.7	1,850	8.2
Apr. 1.....	30	7.5	48	86	0	79	---	.4	---	283	.38	106	36	2.0	483	7.3
Apr. 2.....	72	26	249	142	0	146	---	.4	---	1,010	1.37	285	168	6.4	1,710	8.0
Apr. 3.....	58	16	152	138	0	235	---	.2	---	676	.92	212	99	4.5	1,150	8.0
Apr. 4-7.....	94	29	435	168	0	200	---	5.2	---	1,610	2.19	355	218	10	2,730	8.2
Apr. 8.....	78	23	181	212	0	109	---	.8	---	846	1.15	290	116	4.6	1,410	8.2
Apr. 9-10.....	90	27	319	158	4	182	---	5.5	---	1,300	1.77	335	199	7.6	2,170	8.3
Apr. 11-13.....	96	26	330	190	0	173	---	0.6	.7	1,300	1.77	345	190	7.7	2,190	7.9
Apr. 14-16.....	75	20	221	160	0	121	---	.2	1.0	1,150	1.28	270	139	5.9	1,570	8.0
Apr. 17-19.....	86	22	334	184	0	147	---	.6	.8	1,260	1.71	305	154	8.3	2,450	8.1
Apr. 20-21.....	58	20	186	126	0	117	---	.7	---	820	1.12	225	122	5.7	1,400	8.0
Apr. 22-23.....	74	18	242	148	0	123	---	.7	---	959	1.30	260	138	6.5	1,660	8.0
Apr. 24.....	76	22	349	156	0	129	---	.6	---	al, 200	1.63	280	152	9.1	2,120	7.9
Apr. 25-26.....	62	17	187	136	0	104	---	.3	3.0	795	1.08	225	114	5.7	1,390	7.9
Apr. 27-30.....	88	27	352	178	0	165	---	3.1	---	al, 270	1.73	330	184	8.4	2,190	8.1
May 1-6.....	87	32	317	166	6	171	---	.5	2.8	1,240	1.69	350	204	7.4	2,180	8.4
May 6.....	94	35	475	166	6	199	---	.2	---	1,730	2.35	380	234	11	2,990	8.4
May 8-10.....	64	23	217	134	4	112	---	.3	3.6	860	1.17	255	138	5.9	1,530	8.3
May 11-17.....	62	26	264	135	0	120	---	.3	7.8	530	1.02	230	110	5.3	1,340	8.4
May 18-20.....	62	27	272	138	0	109	---	.3	6.9	665	1.01	235	127	7.4	1,680	8.2
May 21-26.....	51	18	138	81	6	61	---	.3	5.1	792	.83	225	102	5.0	1,270	8.4
May 27-28.....	48	21	184	124	0	62	---	.3	3.1	598	.81	205	104	4.2	1,045	8.3
May 29-31.....	48	19	140	114	0	67	---	.3	3.1	448	.61	200	106	4.3	1,100	8.2
June 1.....	75	15	301	156	0	112	---	5.2	---	1,120	1.52	250	122	8.3	1,920	7.7
June 2-3.....	44	8.8	138	114	0	57	---	.6	---	544	.74	146	52	5.0	959	7.5
June 4-8.....	62	12	183	132	0	100	---	3.1	---	737	1.00	204	96	5.6	1,270	8.2
June 9-10.....	72	13	198	154	0	109	---	.4	---	804	1.09	232	106	5.7	1,380	8.0
June 11-12.....	80	17	250	164	2	131	---	.4	---	1,010	1.37	268	130	6.6	1,680	8.3
June 13-14.....	64	12	151	142	0	98	---	.4	---	644	.88	208	92	4.5	1,110	8.2

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

7-1945.5. ARKANSAS RIVER AT WEBBERS FALLS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium		Non-carbonate	Soil sorption ratio
June 15-20, 1959.																				
June 21-30.....				81	18	257		170	0	137	390	0.4	2.2	0.13	1,040	1.41	276	136	6.7	1,740
July 1.....				77	19	267		152	0	142	410	.4	3.2	.18	1,060	1.44	272	148	7.1	1,790
July 1.....				78	19	308		144	4	116	490	--	5.0	--	1,130	1.54	272	148	8.1	1,930
July 2-6.....				62	14	172		136	0	89	270	.5	3.1	--	690	.94	212	100	5.2	1,200
July 7-9.....				83	17	262		160	0	137	405	.3	0	--	1,020	1.39	276	145	6.9	1,750
July 10-16.....				61	17	172		144	0	88	270	.5	3.6	.20	700	.95	220	102	5.0	1,280
July 17.....				67	15	283		136	0	92	448	--	8.7	--	1,000	1.36	230	118	8.1	1,790
July 18-20.....				35	9.8	39		110	0	33	62	--	2	--	244	.33	128	38	1.5	459
July 21-31.....				29	8.1	30		94	0	24	48	.3	2.6	.18	194	.26	106	29	1.3	349
Aug. 1-10.....				43	12	68		134	0	39	109	.7	1.9	.26	373	.51	158	48	2.3	638
Aug. 11-20.....				33	15	118		142	0	65	187	.3	2.6	.22	336	.33	192	46	3.7	967
Aug. 21-26.....				54	22	172		156	0	47	228	.3	4.0	--	438	.67	230	138	3.4	1,600
Aug. 27.....				58	10	125		148	0	52	202	.6	2.3	--	454	.76	196	79	2.8	892
Aug. 28-31.....				67	14	147		158	0	72	240	.6	1.9	--	560	.76	196	79	2.8	892
Sept. 1-2.....				54	23	154		144	0	81	255	--	0	--	690	.94	228	110	4.4	1,180
Sept. 3-7.....				71	17	228		134	0	97	375	--	5.6	--	898	1.22	248	138	6.3	1,570
Sept. 8-9.....				78	20	328		144	0	104	540	--	1.0	--	1,200	1.63	276	158	8.6	2,070
Sept. 10-15.....				54	16	114		126	0	67	192	.7	1.7	.17	552	.75	200	96	3.5	944
Sept. 16.....				52	11	80		120	0	70	128	.6	1.2	--	448	.61	176	78	2.6	725
Sept. 17-21.....				57	11	118		130	0	72	185	.7	2.0	.09	540	.73	188	82	3.7	913
Sept. 22.....				83	25	332		126	0	126	550	--	2.6	--	1,260	1.71	308	188	8.2	2,150
Sept. 23-24.....				58	12	111		128	0	77	175	--	1.8	--	520	.71	192	87	3.5	894
Sept. 25.....				72	15	204		120	0	114	330	--	0	--	834	1.13	240	142	5.7	1,440
Sept. 26.....				56	9.8	105		122	0	66	170	--	0	--	604	.69	180	80	3.4	868
Sept. 27-28.....				66	12	284		132	0	81	450	--	3.8	--	1,010	1.37	212	104	8.5	1,770
Sept. 29-30.....				46	8.0	107		110	0	54	165	--	3.0	--	462	.63	148	58	3.8	805

ARKANSAS RIVER BASIN--Continued
 7-1945. 5. ARKANSAS RIVER AT WEBBERS FALLS, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	62	65	65	65	65	65	68	70	73	70	70	65	65	65	--	68	68	68	68	68	--	67	64	65	63	60	58	58	64	56	65	
November ..	58	55	57	60	56	54	55	55	55	55	59	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	60	
December ..	49	50	50	49	45	40	40	40	40	40	40	39	40	33	34	35	36	43	42	39	40	40	40	40	40	40	40	42	44	44	41	
January	40	40	--	32	32	35	32	39	39	43	42	40	44	45	40	40	40	40	40	40	--	40	40	40	40	40	40	40	41	40	40	
February	40	40	44	45	40	43	40	40	39	38	43	43	43	43	43	43	44	45	49	48	45	40	40	40	40	40	40	40	40	40	40	
March	43	44	40	45	46	45	44	44	45	48	40	45	48	50	52	46	47	50	50	52	--	--	54	56	60	55	52	48	48	58	56	
April	56	58	55	58	53	65	66	57	57	55	56	56	55	55	56	56	60	60	61	60	56	55	58	61	62	62	65	65	65	65	59	
May	69	70	70	74	74	70	70	65	69	70	66	70	72	70	70	70	72	74	74	74	74	72	72	72	74	74	74	74	74	77	78	72
June	78	73	75	74	74	75	77	77	78	78	78	78	78	78	79	78	80	85	81	84	84	82	80	80	80	80	80	80	81	83	79	
July	82	82	79	81	82	82	82	82	83	84	82	82	82	82	80	78	78	78	78	78	78	78	78	77	79	78	78	78	78	80	84	
August	85	84	84	85	85	85	85	82	81	82	83	82	82	82	82	82	82	81	82	83	83	83	83	83	83	83	81	80	79	80	83	80
September ..	80	80	80	79	80	80	--	81	80	76	75	72	74	74	74	76	74	74	75	78	76	76	78	73	72	74	--	74	77	70	--	76

ARKANSAS RIVER BASIN--Continued

7-1955. ILLINOIS RIVER NEAR WATTS, OKLA.

LOCATION.--At gaging station near right bank on downstream side of pier of bridge on U.S. Highway 59, 1.5 miles north of Watts, Adair County, 4.5 miles downstream from Cincinnati Creek, and at mile 106.2.
DRAINAGE AREA.--635 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1958 to September 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of discharge for water year October 1958 to September 1959 given in MSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	
															Residue at 180° C (ppm)	Calculation (ppm)	Tons per acre-foot	Calcium, Magnesium			Non-carbonate
Nov. 4, 1958.....	160			40	2.9	5.0	--	112		--	8.4	--	--	--	--	--	112	20	0.2	280	7.7
Jan. 5, 1959.....	160			38	5.1	5.5	--	124		--	8.8	--	--	--	--	--	116	14	.2	239	7.6
May 27.....	726			31	1.6	3.2	--	96		4.5	4.0	0.13	94	3.0	0.06	0.13	84	16	.2	180	7.8
June 2.....	765			--	--	--	--	67		--	3.5	0.0	--	--	--	--	88	33	--	198	7.6
June 10.....	348			--	--	--	--	107		--	4.0	0.0	--	--	--	--	94	6	--	204	7.5
June 17.....	302			--	--	--	--	102		--	3.5	.0	--	--	--	--	91	8	--	193	7.3
June 25.....	226			39	2.1	4.1	--	124		2.5	6.0	--	118	3.2	0.11	.16	106	4	.2	224	8.1
July 2.....	156			40	2.9	3.0	--	126		2.5	6.8	--	122	2.4	0.06	.16	112	8	.1	228	8.2
July 8.....	144			40	1.9	3.1	--	128		2.3	6.0	--	118	1.5	--	.17	102	3	.2	232	8.2
July 14.....	73			38	1.3	3.9	--	128		1.6	7.0	.1	115	1.6	0.11	.16	108	3	.2	224	7.7
July 22.....	342			38	2.2	4.1	--	122		1.6	7.0	--	115	1.6	0.11	.16	104	4	.2	216	8.1
July 28.....	414			34	1.7	3.5	--	106		2.1	5.8	--	104	4.4	.14	.14	92	5	.2	195	8.1
Aug. 6.....	184			37	.9	4.8	--	116		2.1	5.2	--	110	2.5	.06	.15	96	1	.2	205	7.9
Aug. 10.....	139			40	1.9	2.8	--	124		2.1	5.8	--	116	2.2	.14	.16	108	6	1	218	8.2
Aug. 13.....	132			38	3.2	2.8	--	126		--	7.0	--	133	1.9	--	.18	108	4	.3	226	7.9
Aug. 26.....	126			42	1.7	7.8	--	132		2.5	12.0	--	133	--	--	--	112	4	.3	251	8.2
Sept. 2.....	106			41	1.8	--	--	132		--	9.0	--	--	--	--	--	110	2	--	243	7.9
Sept. 10.....	76			42	1.7	--	--	132		--	7.5	--	--	--	--	--	112	4	--	245	8.2
Sept. 17.....	75			38	5.6	8.6	--	132		--	6.1	--	--	1.6	--	--	118	10	.3	243	8.0
Sept. 25.....	283			38	3.2	6.2	--	128		4.5	7.0	--	134	2.3	--	.18	108	3	.3	235	7.7
Sept. 30.....	313			35	4.0	5.5	--	122		3.3	7.2	--	118	2.9	--	.16	104	4	.2	231	7.7

ARKANSAS RIVER BASIN--Continued
7-1969. 7. BARREN FORK NEAR BARON, OKLA.

LOCATION.--At bridge on U.S. Highway 59, 0.5 mile west of Baron, Adair County.
RECORDS AVAILABLE.--Chemical analyses: April 1958 to September 1959.
REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium, Magnesium	Non-carbonate			
Oct. 8, 1958.....		--		38	1.2	2.1		112		7.4	2.5		1.8		133	--	0.18	100	8	0.1	196	8.1
Nov. 6.....		--		38	1.2	.7		112		4.5	2.2		2.2		124	--	.17	100	8	.0	197	8.0
Jan. 10, 1959....		14		38	2.2	3.2		118		4.1	5.9		0.0	1.9	--	127	.17	104	8	.1	209	8.1
Feb. 7.....		10		36	1.9	1.2		108		4.1	4.1		.2	1.6	--	118	.16	98	10	.1	201	8.0
Mar. 6.....		12		--	--	--		76		--	--		--	--	--	--	--	64	2	--	119	8.0
Apr. 8.....		--		--	--	--		94		--	--		.1	--	--	--	--	86	9	--	172	7.9
June 2.....		--		30	2.2	.7		94		4.1	3.0		--	0	--	86	.12	84	7	.0	169	7.8
July 2.....		--		35	.6	.2		104		1.2	2.6		1.3	--	--	92	.13	90	5	.0	181	8.0
Aug. 13.....		--		30	1.7	.5		94		1.2	3.0		1.1	--	--	84	.11	82	5	.0	167	7.9
Sept. 2.....		--		--	--	--		106		--	--		0	--	--	--	--	92	5	--	186	8.1
Sept. 7.....		--		30	5.1	8.1		100		--	6.2		3.1	--	--	--	--	96	14	.4	194	7.9

ARKANSAS RIVER BASIN--Continued

7-1970. BARREN FORK AT ELDON, OKLA.

LOCATION.--At gaging station at bridge on State Highway 51, three-eighths of a mile southeast of Eldon, Cherokee County, and 6 miles downstream from Tyner Creek.
 DRAINAGE AREA.--307 square miles.
 RECORDS AVAILABLE.--Chemical analyses: May 1958 to September 1959.
 REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			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, 1958.....	--	--	--	34	0.7	2.5		104	0	4.1	2.8	--	0.2	--	--	124	0.17	88	3	0.1	181	8.0
Nov. 5.....	45	22		34	1.2	3.4		108	0	3.7	2.4	0.2	1.7	--	--	122	.17	90	2	.2	178	8.2
Dec. 3.....	85			34	1.7	2.3		102	0	3.7	2.8	.2	1.8	--	--	99	.13	85	5	.2	179	8.1
Jan. 9, 1959.....	53	12		30	1.7	4.1		94	0	3.8	4.5	.0	1.7	--	--	106	.14	82	5	.2	171	8.0
Feb. 5.....	57	10		30	2.2	1.2		96	0	2.1	3.1	1.0	1.7	--	--	97	.13	82	6	.1	171	7.0
Mar. 3.....	4,130	12		--	--	--		84	0	--	--	--	--	0.00	--	--	--	48	12	--	94	7.8
Apr. 6.....	158	--		--	--	--		80	0	--	--	--	--	--	--	--	--	78	12	--	167	7.9
May 6.....		--		--	--	--		89	0	--	3.0	.0	--	--	--	--	--	75	2	--	166	7.9
May 27.....	456	--		26	2.2	1.4		84	0	3.7	2.0	--	1.2	--	--	78	.11	74	5	.1	149	7.7
June 2.....	368	--		27	1.6	1.2		82	0	6.2	2.0	.0	1.1	--	--	78	.11	74	7	.1	151	7.7
June 10.....	174	--		--	--	--		85	0	6.2	1.5	.1	--	--	--	--	--	76	6	--	157	7.4
June 17.....	118	--		29	1.8	9		90	0	4.9	2.0	--	1	--	--	83	.11	80	6	.0	163	7.4
June 25.....	87	--		30	1.7	2.5		98	0	2.1	2.0	--	2.3	--	--	89	.12	82	2	.1	175	8.0
July 8.....	43	--		30	1.2	4.6		100	0	2.9	3.0	--	1.4	--	--	92	.13	80	0	.2	178	8.0
July 14.....	30	--		32	1.0	5		92	0	4.1	2.8	--	1.2	0.00	--	87	.12	84	8	.0	168	7.7
July 22.....	168	--		32	1.0	1.4		96	0	2.5	3.2	--	1.7	--	--	89	.12	84	6	.1	166	8.0
July 29.....	235	--		29	1.3	3.7		94	0	3.7	2.0	--	2.3	--	--	88	.12	78	0	.2	168	7.9
Aug. 6.....	90	--		30	1.7	--		96	0	--	5.0	--	--	--	--	--	--	82	4	--	173	7.8
Aug. 13.....	60	--		30	2.2	.5		94	0	2.9	2.8	--	1.2	--	--	86	.12	84	7	.0	164	7.9
Aug. 20.....	39	--		31	1.6	--		100	0	--	3.5	--	--	--	--	--	--	84	2	--	177	7.7
Aug. 26.....	31	--		32	1.5	--		100	0	--	4.0	--	--	--	--	--	--	86	4	--	175	7.8
Aug. 27.....	45	--		27	3.5	3.4		98	0	3.7	2.0	--	2.4	--	--	92	.13	82	2	.2	176	7.6
Sept. 10.....	22	--		32	1.0	--		98	0	--	3.5	--	--	--	--	--	--	84	4	--	177	7.8
Sept. 17.....	23	--		30	3.2	4.4		94	0	--	2.3	--	1.9	--	--	88	.11	80	11	.2	179	7.9
Sept. 25.....	46	--		25	4.3	2.3		92	0	4.1	2.4	--	2.0	--	--	101	.14	80	4	.1	169	7.7
Sept. 30.....	46	--		27	3.0	3.0		92	0	5.8	2.3	--	2.4	--	--	92	.13	80	4	.1	166	7.7

ARKANSAS RIVER BASIN--Continued

7-1980. ILLINOIS RIVER AT TENKILLER RESERVOIR, NEAR GORE, OKLA.
 LOCATION.--Immediately below dam on Illinois River, 4.3 miles upstream from gaging station, and 6 miles northeast of Gore, Sequoyah County.
 DRAINAGE AREA.--1,610 square miles upstream from sampling station; 1,626 square miles upstream from gaging station.
 RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

Water temperatures: October 1953 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 116 ppm Sept. 1-30; minimum, 102 ppm Jan. 1-31, Feb. 1-28.

Hardness: Maximum, 90 ppm Mar. 1-31, Aug. 1-31; minimum, 78 ppm Dec. 1 to Feb. 28.

Water temperatures: Maximum daily, 238 microhms Nov. 24; minimum daily, 142 microhms Dec. 12.

Specific conductance: Maximum, 75 F Oct. 1, 2; minimum, 42 F on several days during February.

EXTREMES, 1953-59.--Dissolved solids: Maximum, 138 ppm Aug. 1-31, 1956; minimum, 99 ppm July 1-31, Sept. 1-30, 1958.

Hardness: Maximum, 107 ppm Sept. 1-30, 1956; minimum, 61 ppm July 1-31, 1957.

Water temperatures: Maximum daily, 396 microhms Aug. 2, 1956; minimum daily, 123 microhms July 14, 1957.

Specific conductance: Maximum, 73 F Sept. 28-30, Oct. 1, 2, 1958; minimum, 42 F on several days during February and March in 1955, 1956, 1958, and 1959.

REMARKS--Records of specific conductance of daily samples available in the District office at Oklahoma City, Okla. Records of discharge for gaging station during water year October 1958 to September 1959 given in WSP 1631. No appreciable inflow between sampling station and gaging station except during periods of heavy local runoff.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhms at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
																					108	0.15	302	85	10
Oct. 1-31, 1958.....	600	11	0.00	30	1.7	5.5	1.9	93	0	4.7	8.8	0.2	2.0	0.14	0.15	181	82	6	0.3	184	7.9
Nov. 1-30.....	408	6.4	0.00	30	1.7	7.0	1.9	92	0	5.6	9.3	3.3	1.6	0.09	0.15	122	82	6	0.3	186	7.9
Dec. 1-31.....	951	9.4	0.00	29	1.3	5.4	1.5	90	0	3.7	7.2	1.1	1.6	0.15	0.14	264	78	4	0.3	178	7.4
Jan. 1-31, 1959.....	783	6.4	0.00	29	1.3	5.4	1.5	92	0	4.9	7.3	1.1	1.4	0.04	0.14	218	78	2	0.3	179	7.7
Feb. 1-28.....	799	6.5	0.00	29	1.3	5.5	1.6	90	0	5.1	6.5	3.1	1.7	0.11	0.14	220	78	4	0.3	179	7.1
Mar. 1-31.....	1,227	4	0.00	26	6.1	6.3	--	96	0	6.9	10	0	1.9	0.00	0.15	354	90	12	0.3	177	7.5
Apr. 1-30.....	2,435	6	0.00	26	5.6	6.8	--	96	0	9.7	12	0	0.7	0.00	0.15	717	88	10	0.4	174	7.5
May 1-31.....	1,228	1.0	0.00	25	6.2	6.9	--	98	0	5.1	11	0	0.5	0.00	0.15	361	88	8	0.3	175	7.8
June 1-30.....	1,448	6.0	0.00	28	3.4	4.5	2.0	76	0	12	9.5	2.2	4.5	0.00	0.16	446	84	22	0.2	179	6.3
July 1-31.....	1,077	2.5	0.01	32	1.9	4.0	1.7	100	0	6.7	5.0	1.7	0.3	0.04	0.14	302	88	6	0.2	183	8.2
Aug. 1-31.....	1,123	8.4	0.00	30	3.6	3.1	2	84	0	13	8.0	5.5	4.6	0.11	0.16	346	90	24	0.1	191	7.8
Sept. 1-30.....	1,310	9.0	0.00	30	1.2	7.5	4	80	0	16	8.0	1	1.4	0.01	0.16	397	80	11	0.4	198	7.5
Weighted average	1,034	4.5	0.00	28	3.6	5.8	--	91	--	8.0	9.1	0.1	2.0	0.04	0.15	302	85	10	0.3	180	--

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

CANADIAN RIVER AND TUCUMCARI IRRIGATION PROJECT SEEPAGE INVESTIGATION

Samples collected for chemical analysis in downstream order on the Canadian River below Conchas Dam at time of discharge measurements during Nov. 17-19, Mar. 8-11, Sept. 8-10. Discharge measurements and sample collections were concentrated on the Tucumcari Irrigation Project which is divided primarily by Pajarito and Revuelto Creeks and their tributary systems in New Mexico. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date	Stream or diversion	Location	Discharge (cfs)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH
							Calcium	Noncarbonate magnesium		
Nov. 18, 1959.	Conchas Reservoir.	At dam.	--	151	174	6	232	108	605	7.5
Nov. 18	Canadian River.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 28, T. 14 N., R. 26 E., 150 feet below toe of Conchas Dam.	2.48	335	449	382	642	368	2,390	6.7
Nov. 18	....do.....	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 36, T. 13 N., R. 28 E., below Johnson Rincon 14 miles northwest of Tucumcari.	4.50	245	506	215	512	311	1,970	7.9
Nov. 18	Pajarito Creek.	NE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 13, T. 11 N., R. 29 E., below Conchas Canal siphon 25, 4 miles west of Tucumcari.	.04	376	194	11	161	0	1,010	7.8
Nov. 18	....do.....	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 3, T. 11 N., R. 30 E., at State Highway 104 bridge 2.5 miles northwest of Tucumcari.	4.34	454	917	142	552	180	2,700	8.0
Nov. 18	Drain No. 10.	SW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 33, T. 12 N., R. 30 E., below State Highway 104, 4 miles northwest of Tucumcari.	.12	262	682	75	710	496	1,960	7.7
Nov. 18	Dawson Drain.	SW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 36, T. 12 N., R. 30 E., at end 2 miles north of Tucumcari.	.19	603	1,040	240	675	181	3,310	8.2
Nov. 18	Sewage Creek.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 30, T. 12 N., R. 31 E., above pond about 2 miles north of Tucumcari.	(a)	654	9.1	6	182	0	1,220	7.5
Nov. 18	....do.....	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 35, T. 12 N., R. 30 E., above mouth 3 miles north of Tucumcari.	.96	599	294	112	304	0	1,790	7.8
Nov. 18	Pajarito Creek.	NW $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 25, T. 12 N., R. 30 E., below railroad bridge at county line, 3 miles north of Tucumcari and 6 miles above mouth.	8.42	458	961	158	504	128	2,830	7.9
Nov. 19	Drain No. 20.	SW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 18, T. 11 N., R. 31 E., at end 1.5 miles east of Tucumcari.	.31	430	597	97	424	72	2,130	7.8
Nov. 18	Canadian River.	NW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 24, T. 13 N., R. 31 E., below dripping springs 2 miles east of Quay County line and 12 miles northeast of Tucumcari.	7.67	377	757	164	432	123	2,440	8.0
Nov. 19	....do.....	NE $\frac{1}{4}$ sec. 15, T. 13 N., R. 33 E., at regular gaging station at Logan.	7.87	355	566	660	494	203	3,440	7.9
Nov. 17	Plaza Larga Creek.	SE $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 15, T. 10 N., R. 31 E., below Conchas Canal siphon 32 at gaging station of Arch Hurley Conservancy district, about 7 miles southeast of Tucumcari.	.04	383	612	64	332	18	1,960	8.0

a Water sample only taken.

ARKANSAS RIVER BASIN--Continued
 CANADIAN RIVER AND TUCUMCARI IRRIGATION PROJECT SEEPAGE INVESTIGATION--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

Date	Stream or diversion	Location	Discharge (cfs)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH
							Calcium magnesium	Noncarbonate		
Nov. 17, 1958.	Piazza Larga Creek.	SW $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 13, T. 10 N., R. 31 E., at Highway 88 about 8 miles southeast of Tucumcari.	0.33	347	1,310	238	668	384	3,470	8.0
Nov. 17.	...do.....	NW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 29, T. 11 N., R. 32 E., at 9-mile Road, about 9 miles east of Tucumcari.	1.83	290	1,190	204	600	362	3,110	8.0
Nov. 17.	Drain No. 50.	NE $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 1, T. 11 N., R. 31 E., at mouth about 7 miles east of Tucumcari.	b.07	c398	647	80	426	99	1,990	8.6
Nov. 17.	Drain No. 51.	SE $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 4, T. 11 N., R. 32 E., at mouth about 9 miles northwest of Tucumcari.	b.05	573	444	38	534	64	1,750	8.2
Nov. 19.	Piazza Larga Creek.	SE $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 19, T. 11 N., R. 33 E., at mouth about 14 miles east of Tucumcari.	2.65	326	971	154	524	257	2,640	8.0
Nov. 19.	Revuelto Creek.	NW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 20, T. 11 N., R. 33 E., below Plaza Larga Creek 14 miles east of Tucumcari.	1.97	309	947	150	500	248	2,580	8.1
Nov. 19.	...do.....	NE $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 24, T. 13 N., R. 33 E., at State Highway 39 about 2 miles above mouth and 3 miles southeast of Logan.	.18	339	241	434	254	0	2,280	8.2
Mar. 9, 1959.	Canadian River.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 28, T. 14 N., R. 26 E., 150 feet below toe of Conchas Dam.	2.41	326	447	365	630	363	2,340	7.9
Mar. 9.	...do.....	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 36, T. 13 N., R. 28 E., below Johnson Rincon 14 miles northwest of Tucumcari.	2.81	242	658	925	705	506	4,230	7.3
Mar. 10.	Drain No. 10.	SW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 33, T. 12 N., R. 30 E., below State Highway 104, 4 miles northwest of Tucumcari.	.07	207	721	130	640	470	1,820	8.1
Mar. 11.	Dawson Drain.	SW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 36, T. 12 N., R. 30 E., at end 2 miles north of Tucumcari.	.10	587	1,030	232	610	129	3,290	8.1
Mar. 11.	Sewage Creek.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 30, T. 12 N., R. 31 E., above pond about 2 miles north of Tucumcari.	(a)	504	97	83	201	0	1,230	7.3
Mar. 11.	...do.....	SE $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 35, T. 12 N., R. 30 E., above mouth 3 miles north of Tucumcari.	.81	547	277	112	324	0	1,720	7.4
Mar. 11.	Drain No. 20.	SW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 18, T. 11 N., R. 31 E., at end 1.5 miles east of Tucumcari.	.28	431	617	155	440	87	2,220	7.4
Mar. 9.	Canadian River.	NW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 24, T. 13 N., R. 31 E., below dripping springs 2 miles east of Quay County line and 12 miles northeast of Tucumcari.	3.50	d358	736	220	434	140	2,520	8.6

Mar. 10, 1959	Plaza Larga Creek.	SE $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 15, T. 10 N., R. 31 E., below Conchas Canal siphon 32 at gaging station of Arch Hurley Conservancy District, about 7 miles southeast of Tucumcari.	0.01.	356	953	125	484	192	2,600	7.6
Mar. 10.	.....	SW $\frac{1}{2}$ NW $\frac{1}{4}$ sec. 13, T. 10 N., R. 31 E., at Highway 88 about 8 miles southeast of Tucumcari.	.10	377	1,550	285	790	481	4,000	7.9
Mar. 10.	.....do.....	NW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 29, T. 11 N., R. 32 E., at 9-mile Road, about 9 miles east of Tucumcari.	.41	281	1,450	218	760	530	3,520	7.9
Mar. 10.	Drain No. 50.	NE $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 1, T. 11 N., R. 31 E., at mouth about 7 miles east of Tucumcari.	b.04	412	585	70	465	128	1,840	8.0
Mar. 10.	Drain No. 51.	SE $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 4, T. 11 N., R. 32 E., at mouth about 9 miles northeast of Tucumcari.	b.05	543	452	45	330	0	1,740	7.8
Mar. 10.	Barranca Creek.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 19, T. 11 N., R. 33 E., at mouth 13 miles east of Tucumcari.	.09	335	1,210	242	620	346	3,330	7.8
Mar. 10.	Plaza Larga Creek.	SE $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 19, T. 11 N., R. 33 E., at mouth 14 miles east of Tucumcari.	.38	324	1,210	180	606	340	3,120	8.0
Mar. 10.	Revelto Creek.	NW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 20, T. 11 N., R. 33 E., below Plaza Larga Creek 14 miles east of Tucumcari.	.23	320	1,160	180	600	338	3,120	8.1
Sept. 9, 1959	Canadian River.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 26, T. 14 N., R. 26 E., 150 feet below toe of Conchas Dam.	1.06	328	436	270	568	299	2,030	7.5
Sept. 9.	.....do.....	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 36, T. 13 N., R. 28 E., below Johnson Rincon 14 miles northwest of Tucumcari.	.42	292	432	59	224	0	1,170	7.4
Sept. 9.	Drain No. 10.	SW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 33, T. 12 N., R. 30 E., below State Highway 104, 4 miles northwest of Tucumcari.	.02	280	956	162	780	550	2,560	7.4
Sept. 10.	Dawson Drain.	SW $\frac{1}{2}$ SE $\frac{1}{4}$ sec. 36, T. 12 N., R. 30 E., at end 2 miles north of Tucumcari.	.06	635	1,110	250	735	214	3,420	8.1
Sept. 10.	Sewage Creek.	SW $\frac{1}{2}$ SW $\frac{1}{4}$ sec. 30, T. 12 N., R. 31 E., above pond about 2 miles north of Tucumcari.	(a)	405	182	92	260	0	1,340	6.9
Sept. 9.	.....do.....	SE $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 35, T. 12 N., R. 30 E., above mouth 3 miles north of Tucumcari.	1.38	558	131	16	278	0	1,280	7.7
Sept. 10.	Drain No. 20.	SW $\frac{1}{2}$ NE $\frac{1}{4}$ sec. 18, T. 11 N., R. 31 E., at end 1.5 miles east of Tucumcari.	32	441	557	130	408	46	2,020	7.7

a Water sample only taken.
 b Estimated.
 c Includes equivalent of 24 parts per million of carbonate (CO₃).
 d Includes equivalent of 17 parts per million of carbonate (CO₃).

ARKANSAS RIVER BASIN--Continued
 CANADIAN RIVER AND TUCUMCARI IRRIGATION PROJECT SEEPAGE INVESTIGATION--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

Date	Stream or diversion	Location	Discharge (cfs)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH
							Calcium, magnesium	Noncarbonate		
Sept. 8, 1959	Canadian River.	NW $\frac{1}{4}$ sec. 24, T. 13 N., R. 31 E., below dripping springs 2 miles east of Quay County line and 12 miles northeast of Tucumcari.	3.80	275	441	124	316	90	1,160	7.5
Sept. 9.	.....do.....	NE $\frac{1}{4}$ sec. 15, T. 13 N., R. 33 E., at regular gaging station at Logan.	9.50	220	313	190	324	144	1,510	7.9
Sept. 9.	Plaza Larga Creek	SW $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 13, T. 10 N., R. 31 E., at Highway 88 about 8 miles southeast of Tucumcari.	.01	359	1,390	212	650	438	3,430	8.0
Sept. 9.	.....do.....	NW $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 29, T. 11 N., R. 32 E., at 9-mills Road, about 9 miles east of Tucumcari.	13.2	178	281	21	290	144	869	7.6
Sept. 10.	Drain No. 50.	NE $\frac{1}{4}$ SE $\frac{1}{4}$ sec. 1, T. 11 N., R. 31 E., at mouth about 7 miles east of Tucumcari.	b. 10	400	616	90	498	170	1,910	8.1
Sept. 10.	Drain No. 51.	SE $\frac{1}{4}$ SW $\frac{1}{4}$ sec. 4, T. 11 N., R. 32 E., at mouth about 9 miles northeast of Tucumcari.	b. 12	533	449	51	322	0	1,720	8.1
Sept. 9.	Plaza Larga Creek	SE $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 19, T. 11 N., R. 33 E., at mouth 14 miles east of Tucumcari.	28.5	173	276	21	292	150	842	7.6
Sept. 9.	Revalto Creek.	NW $\frac{1}{4}$ NE $\frac{1}{4}$ sec. 20, T. 11 N., R. 33 E., below Plaza Larga Creek 14 miles east of Tucumcari.	22.9	175	279	22	288	144	858	7.9
Sept. 8.	.....do.....	NE $\frac{1}{4}$ NW $\frac{1}{4}$ sec. 24, T. 13 N., R. 33 E., at State Highway 39 about 2 miles above mouth and 3 miles southeast of Logan.	11.9	192	309	36	284	126	989	8.2

b Estimated.

ARKANSAS RIVER BASIN--Continued
7-2270. CANADIAN RIVER AT LOGAN, N. MEX.

LOCATION--At bridges on U. S. Highway 54, 1,100 feet below gaging station which is 0.5 mile south of Logan, Quay County, 1.5 miles upstream from Chicago, N. M. and 1.5 miles upstream from Revuelto Creek, and 5.3 miles downstream from Ute Creek.
DRAINAGE AREA 11,141 square miles, of which 110 square miles are probably noncontributing.
RECORDS AVAILABLE--Chemical analyses, July 1957 to September 1959.

Water temperatures: July 1957 to September 1959.

EXTREMES 1958-59--Dissolved solids: Maximum, 6,980 ppm Mar. 23-25; minimum, 242 ppm Aug. 24-25.

Hardness: Maximum, 1,010 ppm Mar. 23-25; minimum, 84 ppm Aug. 24-25.

Specific conductance: Maximum daily, 11,500 micromhos Mar. 25; minimum daily, 377 micromhos Aug. 25.

Water temperatures: Maximum, 93°F Aug. 3; minimum, freezing point on several days during December and January.

EXTREMES 1957-59--Dissolved solids: Maximum, 6,980 ppm Mar. 23-25, 1959; minimum, 224 ppm July 6, 1958.

Hardness: Maximum, 1,010 ppm Mar. 23-25, 1959; minimum, 84 ppm Aug. 24-25, 1959.

Specific conductance: Maximum daily, 11,500 micromhos Mar. 25, 1959; minimum daily, 327 micromhos Sept. 5, 1958.

Water temperatures: Maximum, 93°F Aug. 3, 1959; minimum, freezing point on several days during winter months.

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. Records of discharge for water year October 1958 to September 1959 given in WSP 1631. Flow affected by ice Dec. 12-19, 31-Jan. 5.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		Sodium
Oct. 1-6, 1958	28.7	34		103	33	350		295		407	365		0.6	0.32	1.440	1.96	112	394	152	7.7	2,250
Oct. 7-10	10.8	22		108	42	486		301		460	545		.6	.37	1,810	2.46	52.8	544	106	10.0	2,910
Oct. 11-18	5.6	29		130	50	672		341		519	870		.9	.43	2,440	3.22	26.4	535	250	13	3,970
Oct. 19-27	2.7	33		168	65	1,030		407		570	1,420		1.0	.46	3,420	4.29	48.3	685	332	17	5,680
Oct. 28-Nov. 8	7.4	30		128	51	660		376		551	1,775		1.2	.45	3,120	4.29	33.7	530	232	12	3,860
Nov. 9-16	4.0	20		142	61	910		388		620	1,360		1.5	.44	2,490	3.39	46.4	605	233	16	5,000
Nov. 17-30	6.9	22		125	54	696		368		610	805		1.5	.44	2,490	3.39	46.4	535	234	13	3,990
Dec. 1-11	5.5	17		125	55	710		377		634	895		1.3	.46	2,550	3.47	37.9	540	231	13	4,060
Dec. 12-19	7.3	16		102	40	415		303		472	425		2.4	.31	1,620	2.20	31.9	420	172	8.8	2,570
Dec. 20-17	8.0	21		85	32	242		245		365	220		2.5	.26	1,090	1.48	23.5	340	139	5.7	1,700
Dec. 20-Jan. 6, 1959	6.1	16		118	55	674		361		617	775		1.2	.46	2,430	3.30	40.0	520	224	13	3,900
Jan. 7-14	13.8	10		86	49	501		311		519	500		3.6	.28	1,830	2.49	68.2	416	161	11	2,890
Jan. 15-20	22.8	13		83	41	370		290		458	325		1.8	.26	1,440	1.96	88.6	374	136	8.3	2,270
Jan. 21-27	17.9	14		97	53	470		320		538	465		2.5	.30	1,800	2.45	87.0	458	196	9.5	2,780
Jan. 21-24 28-31	13.2	16		107	53	618		318		582	655		1.3	.32	2,190	2.98	78.1	484	224	12	3,460

ARKANSAS RIVER BASIN--Continued
 7-2270. CANADIAN RIVER AT LOGAN, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (calculated)			Hardness as CaCO ₃		Sodium-sulfate ratio	Specific conductance (microhmhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate			
Feb. 1-4, 1959...	9.5	17		116	66	784		342	617	935		1.4	0.31	2,700	3.67	69.3	560	220	14	4,220	8.1
Feb. 5-9, 14-17...	13.6	16		108	55	573		326	642	565		1.2	0.36	2,120	2.88	77.8	494	287	11	3,130	7.7
Feb. 10-13...	7.0	15		110	61	724		328	657	795		1.0	0.35	2,520	3.43	47.6	526	255	14	3,950	7.7
Feb. 18-Mar. 4...	6.2	16		114	69	776		342	685	865		1.0	0.38	2,690	3.66	45.0	568	288	14	4,200	7.7
Mar. 5-14...	3.6	15		133	85	1,060		330	780	1,330		1.9	0.36	4,900	35.0	680	360	18	5,650	8.1	
Mar. 15-20...	1.0	17		138	103	1,400		376	808	1,850		1.5	0.42	4,500	6.12	12.2	770	462	22	7,080	7.8
Mar. 21-22...	1.0	18		156	117	1,690		376	808	2,480		1.3	0.46	5,460	7.43	14.7	870	562	25	8,770	7.8
Mar. 23-25...	1.0	21		192	129	2,290		438	855	3,280		--	0.41	6,980	9.49	18.8	1,010	651	31	11,100	7.9
Mar. 26-27...	2.0	21		152	100	1,580		348	790	2,320		1.1	0.46	4,970	6.76	26.8	790	464	24	7,870	7.9
Mar. 28-31...	10.5	12		98	57	582		346	764	450		1.9	0.42	2,140	2.91	60.7	480	196	12	3,210	7.6
Apr. 1...	14.0	13		79	38	302		284	433	262		2	0.24	1,260	1.71	47.6	352	136	7.0	1,970	7.5
Apr. 2-6...	9.0	14		87	45	430		286	538	405		4	0.31	1,660	2.26	40.3	402	168	9.4	2,610	7.8
Apr. 7-10...	19.5	13		83	34	270		240	384	238		5	0.25	1,140	1.55	60.0	346	150	6.3	1,800	7.8
Apr. 11-12...	13.0	11		93	44	405		301	547	555		9	0.30	1,600	2.18	56.2	454	168	8.6	2,500	7.9
Apr. 13-15...	3.4	27		193	54	576		305	596	604		2	0.38	2,100	2.86	30.6	494	204	12	3,310	7.9
Apr. 20-22...	3.7	30		188	54	750		319	572	825		2	0.35	2,610	3.35	26.1	515	234	14	4,180	7.8
Apr. 23-26...	9.2	13		88	52	470		350	526	595		4	0.33	1,800	2.43	44.7	432	170	9.9	2,850	7.8
Apr. 28-30...	11.0	40		79	33	230		222	339	220		8	0.21	1,030	1.43	31.2	334	132	3.5	1,630	7.7
May 1...	5.0	11		94	41	406		255	434	452		2	0.23	1,560	2.12	21.1	402	193	8.8	2,520	7.6
May 2-6...	5.0	17		110	57	614		326	637	646		7	0.38	2,240	3.05	18.1	510	243	12.7	3,540	7.8
May 7-10...	29.2	12		75	36	326		232	464	285		4	0.27	1,310	1.78	103	336	146	7.7	2,060	7.9
May 11-14...	16.8	18		59	29	288		228	382	230		4	0.30	1,320	1.52	50.8	266	79	7.7	1,770	8.0
May 15-17...	7.0	16		84	40	390		270	458	385		4	0.28	1,510	2.05	28.5	372	150	8.8	2,370	7.8
May 18...	2.0	18		115	47	612		313	517	722		2	0.34	2,190	2.98	11.8	480	220	12	3,550	7.7
May 19-21...	1.0	24		128	67	835		368	603	1,220		1.2	0.40	3,160	4.30	8.53	595	298	17	5,120	7.7
May 22, 24-26...	53.2	20		50	12	166		224	192	120		2.3	0.18	1,672	.91	96.5	176	0	5.4	1,080	7.7
May 23...	18.0	19		36	8.3	--		253	--	55		4	0.40	--	--	--	124	0	--	695	7.9
May 27-29...	71.0	21		61	20	245		216	326	168		1.3	0.26	967	1.32	47.0	234	26	7.0	1,510	7.8
May 30-31...	5.5	20		80	30	320		249	360	325		1.0	0.23	1,270	1.73	18.9	322	118	8.0	2,020	7.6
June 1-2...	3.0	17		102	42	530		250	396	702		0.5	0.24	1,910	2.60	15.5	426	221	11	3,200	7.6
June 3-5...	164	21		33	9.1	111		208	95	70		2.2	0.16	443	.60	196	120	0	4.4	718	7.8
June 6...	23.0	20		42	10	189		189	182	150		1.5	0.32	688	.94	42.7	146	0	6.8	1,110	7.6
June 7...	5.0	22		58	17	316		232	260	321		1.4	0.39	1,100	1.50	14.8	216	35	9.4	1,830	7.6
June 8-10...	4.0	20		70	32	531		225	365	650		0.4	0.37	1,780	2.42	19.2	306	122	13	2,990	7.7

June 11-13, 1959.....	1.0	21	944	265	449	1,340	0.5	0.51	3,050	4.15	8.24	485	268	19	5,150	7.6
June 14-16.....	1.0	24	674	249	502	850	.4	.4	2,320	3.16	6.26	460	256	14	3,810	7.7
June 17-18.....	1.0	25	1,440	296	519	2,200	.4	.50	4,560	6.20	12.3	700	458	24	7,580	7.6
June 19.....	1.0	21	843	250	334	1,200	.6	.49	2,660	3.62	7.18	410	205	18	4,550	7.6
June 21-22.....	9.5	16	550	189	355	785	.3	.35	1,930	2.62	48.5	395	240	12	3,250	7.6
June 23.....	11.0	15	95	132	80	109	.4	.31	412	1.56	12.2	132	24	3.6	687	7.7
June 24-25.....	14.0	33	248	457	237	134	5.6	5.1	983	1.34	37.2	276	0	6.5	1,530	7.8
June 26.....	53.0	20	312	250	356	292	.3	.44	1,210	1.65	173	302	97	7.8	1,910	7.6
June 27-28.....	43.5	22	152	273	135	52	2.8	.41	532	.72	62.5	97	0	6.7	827	7.9
June 29.....	1.0	20	246	236	198	204	1.7	.38	838	1.14	2.26	146	0	8.9	1,360	7.6
June 30.....	5.0	29	420	252	264	480	1.7	.40	1,400	1.90	18.9	242	36	12	2,380	7.9
July 1.....	68.0	15	211	162	147	254	1.1	.31	771	1.05	142	178	45	6.9	1,330	7.6
July 2-4.....	94.7	26	123	248	166	58	.2	.25	556	1.76	142	181	0	4.0	869	7.7
July 5.....	1.0	19	208	205	252	214	1.4	.22	888	1.21	2.40	270	102	5.5	1,430	7.9
July 6.....	1.0	20	314	227	314	562	1.7	.27	1,550	2.11	4.19	364	178	9.5	2,630	7.5
July 7-8.....	1.0	16	184	211	246	64	.3	.28	637	.87	1.72	238	65	3.5	984	7.8
July 9-10.....	30.0	14	187	190	262	164	1.4	.29	807	1.10	65.4	246	90	5.2	1,310	7.8
July 11-14.....	85.8	19	116	218	109	59	1.0	.27	432	.61	105	116	0	4.7	734	7.7
July 15.....	48.0	16	73	187	86	32	1.2	.22	343	.47	44.5	120	0	2.9	329	7.5
July 16-20.....	45.0	21	139	209	203	189	1.7	.32	625	.83	73.9	287	26	7.3	1,692	7.3
July 21.....	319	29	288	699	273	190	1.7	.36	1,470	1.66	122	142	0	3.3	1,631	7.5
July 22-25.....	123	23	171	331	202	115	1.3	.51	698	.99	37.9	194	26	5.3	1,680	7.4
July 26.....	21.0	19	324	228	202	115	1.0	.35	1,160	1.53	40.7	274	83	8.3	1,920	7.7
July 27-28.....	32.0	18	304	224	286	336	1.0	.32	1,460	1.99	138.7	316	132	9.8	2,460	7.3
July 29.....	30.0	18	401	224	339	485	2.0	.24	1,368	1.99	124.9	124	0	2.3	499	7.4
July 30.....	30.0	16	60	154	68	42	1.0	.24	308	.42	116	184	0	4.0	886	7.6
July 31-Aug. 2.....	75.7	25	125	229	171	68	1.5	.27	568	.77	116	184	0	2.3	499	7.4
Aug. 3.....	20.0	21	367	242	245	446	2.2	.39	1,300	1.77	70.2	286	88	9.5	2,210	7.5
Aug. 4-6.....	6.0	25	1,140	303	418	1,750	1.8	.41	3,690	5.02	59.8	625	376	20	6,280	7.9
Aug. 7-9, 11-12.....	356	25	89	236	109	36	3.0	.32	433	5.59	416	160	0	3.1	683	7.7
Aug. 10.....	547	18	76	197	70	36	.4	.74	339	.46	501	116	0	3.1	533	7.4
Aug. 13.....	55.0	16	122	185	189	84	1.3	.44	573	.78	85.1	198	46	3.8	909	7.5

ARKANSAS RIVER BASIN--Continued
 7-2270. CANADIAN RIVER AT LOGAN, N. MEX.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (calculated)		Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
															Parts per million	Tons per acre-foot					
Aug. 14-17, 1959...	1,810	20		29	7.9	68		181		61	31		0.5	0.26	00.42	1,500	105	0	2.9	493	7.7
Aug. 18.....	154	17		38	9.0	89		169		116	53		.3	.26	.55	169	132	0	3.4	644	7.7
Aug. 19-20.....	68.5	16		133	13	184		184		162	102		.7	.42	.564	104	169	18	4.5	917	7.7
Aug. 21-22.....	129.5	20		56	20	190		211		240	154		1.2	.52	786	107	220	47	5.6	1,260	7.8
Aug. 23.....	1,130	16		37	9.6	72		153		114	36		.9	.54	361	49	132	6	2.7	571	7.5
Aug. 24-25.....	2,860	17		24	5.6	83		139		44	44		.4	.32	242	33	184	0	2.3	391	7.5
Aug. 26-30.....	423	21		32	10	63		177		31	31		.8	.23	322	44	122	0	2.6	514	7.7
Aug. 31-Sept. 2...	96.7	21		39	13	107		196		133	67		.3	.28	477	63	132	0	3.8	764	7.6
Sept. 3.....	35.0	20		46	15	151		209		168	117		1.4	.74	622	85	178	6	4.9	1,010	7.5
Sept. 4.....	23.5	18		58	23	214		239		248	168		.7	.54	873	119	238	50	6.0	1,420	7.7
Sept. 5.....	14.5	18		66	28	276		235		268	268		1.1	.33	1,100	43	278	86	7.2	1,770	7.8
Sept. 6-7.....	10.5	14		74	30	190		213		303	172		1.0	.32	1,889	1,21	308	134	4.7	1,420	7.9
Sept. 8.....	10.0	14		30	30	190		213		303	172		1.0	.32	1,889	1,21	308	134	4.7	1,420	7.9
Sept. 10.....	5.0	16		94	31	309		239		321	370		1.4	.38	1,260	171	360	164	7.1	2,050	7.5
Sept. 11-12.....	4.0	15		99	37	422		266		365	540		1.2	.39	1,610	219	400	182	9.2	2,670	7.7
Sept. 13-15.....	12.0	13		82	30	226		226		343	218		1.0	.33	1,030	140	328	143	5.5	1,630	7.8
Sept. 16-19.....	5.0	12		92	38	363		261		398	398		1.8	.40	1,430	194	384	170	8.0	2,310	7.9
Sept. 20-21.....	1.0	15		103	47	543		274		433	685		.8	.47	1,960	267	450	226	11	3,210	7.9
Sept. 22.....	1.0	21		145	63	1,020		314		502	1,460		1.3	.54	3,370	458	620	362	18	5,320	7.4
Sept. 23.....	1.0	18		202	83	1,730		355		585	2,660		--	.77	5,450	741	845	554	26	8,970	7.3
Sept. 24.....	1.0	15		138	68	1,050		297		509	1,490		1.5	.52	3,420	465	625	352	18	5,660	7.7
Sept. 25.....	1.0	12		110	55	693		302		554	865		.8	.57	2,440	332	500	252	13	3,980	7.8
Sept. 26-27.....	2.0	19		89	40	383		248		415	432		.8	.46	1,500	204	386	183	8.5	2,410	7.9
Sept. 28-29.....	1.0	12		110	51	637		268		443	860		.8	.46	2,250	306	484	264	13	3,740	7.9
Sept. 30.....	5.0	9.1		92	45	408		267		475	435		1.0	.47	1,600	218	414	195	8.7	2,570	8.0
Weighted average	a 68.2	20		39	13	121		200		123	90		0.9	0.31	505	0.69	151	0	4.3	802	--

a Average for 364 days of flow.

ARKANSAS RIVER BASIN--Continued

7-2270. CANADIAN RIVER AT LOGAN, N. MEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959
/Once-daily measurement. Generally in the 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	59	58	71	75	71	71	75	73	69	67	69	71	67	66	70	73	69	70	--	79	67	66	65	67	57	58	56	50	48	48	57	65
November ..	59	60	58	58	56	56	60	59	64	67	57	57	63	57	52	46	47	46	59	52	51	55	53	53	50	40	46	45	45	53	--	54
December ..	49	49	50	51	55	41	46	45	37	42	46	49	37	40	38	39	44	47	47	47	48	45	43	45	45	41	42	45	32	34	35	44
January	35	32	32	32	32	32	32	36	38	34	40	46	48	45	42	38	49	48	42	34	36	38	40	41	49	48	43	50	49	47	36	40
February	--	--	56	52	59	44	50	52	50	57	59	55	48	53	49	53	58	44	50	52	48	52	54	54	55	58	57	56	--	--	50	50
March	61	51	59	59	52	48	50	61	62	53	54	60	53	51	53	61	65	63	59	--	65	65	66	--	47	64	53	66	62	67	55	58
April	68	69	66	70	71	69	49	51	47	62	53	63	65	65	69	63	71	69	66	53	52	62	75	79	73	71	68	71	77	80	--	66
May	68	73	--	71	67	74	58	61	71	72	82	85	72	75	63	78	75	75	75	75	71	72	65	75	76	75	75	73	79	75	81	73
June	73	80	62	80	87	88	83	87	83	85	--	--	--	--	87	89	--	81	84	88	90	70	85	89	87	82	81	87	74	82	--	83
July	80	82	85	87	81	88	85	79	88	86	77	84	83	88	88	79	80	84	84	85	84	79	84	86	86	90	89	88	90	75	86	84
August	87	88	93	84	83	75	84	83	84	74	87	69	78	--	69	83	88	84	80	86	87	88	78	75	75	79	82	85	88	82	83	82
September ..	79	80	85	83	84	88	82	80	70	81	85	79	78	77	83	78	77	80	76	78	77	69	70	77	67	73	73	78	62	50	--	77

ARKANSAS RIVER BASIN--Continued
7-2271. REVUELTO CREEK NEAR LOGAN, N. MEX.

LOCATION.--At bridge on State Highway 39, a quarter of a mile downstream from gaging station, 1.2 miles upstream from mouth, and about 2 miles southeast of Logansport, Gray County, Oklahoma, 78.5 square miles.
DRAINAGE AREA.--786 square miles.
RECORDS AVAILABLE.--Chemical analyses: July to September 1959.
Water temperatures: July to September 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. Records of discharge for August 1959 to September 1959 given in WSP 1711. No appreciable inflow between gaging station and sampling point.

Chemical analyses, in parts per million, July to September 1959

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 sulfate ratio	Specific conductance (micro-mhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-bicarbonate					Total
July 20-22, 1959..	(a)	21	34	8.8	62	--	217	--	97	14	--	0.3	0.23	364	0.50	--	121	0	3.2	570	7.9
July 23-31.....	(a)	19	68	22	112	--	197	--	291	36	--	3	27	646	.88	--	260	98	3.0	969	7.7
Aug. 1-5.....	35.0	18	70	28	122	--	199	--	334	37	--	3	28	708	.96	--	288	125	3.1	1,060	7.7
Aug. 6-9.....	680	19	40	7.8	79	--	233	--	97	15	--	2	23	373	.51	163	132	0	3.0	595	7.8
Aug. 10.....	800	19	20	8.0	66	--	200	--	46	7	--	4	27	267	.36	577	83	0	3.3	409	8.0
Aug. 11-13.....	187	20	60	16	81	4.8	196	203	203	20	0.8	1.1	15	503	.68	268	215	54	2.4	735	7.9
Aug. 14-16.....	787	16	21	5.2	90	2.4	197	91	11	11	6.4	4	23	337	.46	725	74	0	4.6	507	8.1
Aug. 17-19.....	139	20	53	13	103	5.0	194	211	211	26	1.7	9	22	530	.72	195	36	3.2	795	8.1	
Aug. 20-21.....	194	17	33	7.2	104	3.7	191	153	153	22	7	3	27	435	.59	228	112	0	4.3	654	8.1
Aug. 22.....	122	21	52	14	2	3.0	194	289	42	48	3	3	24	666	.91	219	188	29	4.6	962	8.1
Aug. 23-24.....	2,638	23	31	5	78	9.5	206	35	35	15.4	6	3	24	496	.40	2,110	174	0	3.9	447	8.1
Aug. 25-26.....	126	22	31	6.2	106	3.1	206	195	53	43	6	6	26	410	.56	139	103	0	4.5	614	8.1
Aug. 27-28.....	24	5	34	8.0	138	3.6	220	180	23	53	8	6	27	540	.73	35.7	118	0	3.5	803	8.1
Aug. 29-31.....	6.33	18	40	13.0	175	5.1	222	273	273	24	8	3	26	527	.72	132	132	0	6.2	1,020	8.1
Sept. 1-3.....	46.7	18	38	8.0	135	2.8	267	169	24	24	8	3	26	527	.72	66.4	176	0	5.2	787	8.1
Sept. 4-30.....	280	16	73	22	111	6.0	207	303	303	31	8	3	11	668	.91	505	274	104	2.9	960	8.0

a. Discharge data not available for this period.

Temperature (°F) of water, July to September 1959

Once-daily measurement, generally in the 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	
July.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	80	82	85	87	87	88	91	90	90	88	76	92	
August.....	85	88	92	89	88	82	67	78	--	--	--	--	79	--	--	68	68	91	86	97	96	97	97	72	79	78	80	85	89	83	82	85
September..	79	79	85	83	84	88	60	80	70	80	83	79	78	75	82	78	76	80	76	79	76	80	76	75	68	72	75	60	50	--	77	

ARKANSAS RIVER BASIN--Continued
7-2275. CANADIAN RIVER NEAR AMARILLO, TEX.

LOCATION --At gaging station at bridge on U. S. Highways 87 and 287, 1.500 feet downstream from Pitcher Creek, 1.4 miles downstream from East Amarillo Creek, 1.7 miles downstream from Pankard and 48th Freeway bridges, and 19 mi. north of Amarillo, Potter County.

DRAINAGE AREA --19,445 square miles of which 4,059 miles probably contribute to the flow of the river at this station.

RECORDS AVAILABLE --Chemical analyses: July 1948 to October 1949, February 1950 to September 1959.

Water temperatures: August 1949 to September 1959.

Sediment records: August 1949 to September 1952.

EXTREMES 1958-59 --Dissolved solids: Maximum, 2,130 ppm Apr. 8, 9; minimum, 394 ppm Aug. 23-31.

Hardness: Maximum, 704 ppm Apr. 8-9; minimum, 116 ppm Aug. 23-31.

Specific conductance: Maximum daily, 4,130 microhos Apr. 9; minimum daily, 475 microhos Aug. 24.

Water temperatures: Maximum, 76°F Aug. 16; minimum, freezing point on many days during November to March.

EXTREMES, 1948-59 --Dissolved solids: Maximum, 3,000 ppm Mar. 21, 1957; minimum, 252 ppm Sept. 21-30, 1957.

Hardness: Maximum, 974 ppm Mar. 21, 1957; minimum, 69 ppm Sept. 6, 1957.

Specific conductance: Maximum daily, 4,490 microhos Mar. 21, 1957; minimum daily, 359 microhos July 6, 1958.

Water temperatures (1948-59): Maximum, 95°F June 29, 1951; minimum, freezing point on many days during winter months.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Values reported for dissolved-solids concentrations less than 1,000 ppm are residues at 180°C and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Specific conductance (microhos at 25°C)	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-bicarbonate		Sodium sulfate
Oct. 1-10, 1958.....	69.1	23		84	28	270		238		280	290	1.0 17	1.110	1.51	207	324	130	6.5	1,810
Oct. 11-20.....	29.2	31		102	38	304		241		317	362	1.6 36	1,310	1.78	103	411	214	6.5	2,140
Oct. 21-31.....	14.4	49		100	42	257		255		281	292	2.5 77	1,230	1.87	47.8	422	213	5.9	1,950
Nov. 1-10.....	17.0	54		89	40	284		410		233	250	2.5 83	1,240	1.69	56.9	386	50	6.3	1,840
Nov. 11-20.....	30.8	34		96	41	259		303		245	290	2.0 66	1,180	1.60	98.1	408	160	5.6	1,960
Nov. 21-30.....	29.6	34		112	43	319		241		340	390	1.6 56	1,410	1.92	113	456	259	6.5	2,330
Dec. 1-10.....	21.7	39		108	42	332		350		311	345	1.9 77	1,430	1.94	83.8	442	155	6.9	2,250
Dec. 11-19.....	27.4	42		122	39	321		321		378	378	1.7 60	1,440	1.96	107	465	243	6.5	2,280
Dec. 20-31.....	48.2	26		114	39	380		256		397	442	1.1 26	1,550	2.11	202	445	235	7.8	2,500
Jan. 1-10, 1959.....	17.6	30		142	41	348	8.9	257		411	455	1.2 38	1,600	2.18	76.0	523	312	6.8	2,570
Jan. 11-20.....	49.8	24		95	36	340		254		306	412	1.9 16	1,350	1.84	182	385	176	7.5	2,260
Jan. 21-31.....	31.0	26		112	41	384		282		371	258	1.0 21	1,550	2.11	130	448	217	7.9	2,520
Feb. 1-14.....	61.6	33		118	44	397		262		399	478	1.4 39	1,640	2.23	273	476	261	7.9	2,660
Feb. 15-28.....	14.2	51		85	39	272		426		235	258	2.5 52	1,150	1.56	44.1	372	24	6.2	1,870
Mar. 1-10.....	10.6	50		70	34	162		288		143	149	2.5 82	858	1.17	24.6	314	78	4.0	1,380
Mar. 11-20.....	8.52	51		64	32	159		390		117	118	2.7 26	a 762	1.04	17.5	291	0	4.1	1,300
Mar. 21-31.....	10.0	60		60	32	165		400		117	114	2.4 28	a 775	1.05	20.9	281	0	4.3	1,240

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-2275. CANADIAN RIVER NEAR AMARILLO, TEX.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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			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-bicarbonate				
Apr. 1-7, 1959.....	13.0	59		64	33	139	16	305		113	118	2.7	88	783	1.06	27.5	295	45	3.5	1,240	6.9	
Apr. 8-9.....	33.5	37		188	57	466		202		634	610	1.3	33	2,130	2.80	193	704	538	7.6	3,270	8.2	
Apr. 10-20.....	14.5	50		64	33	176		403		130	143	2.5	4.2	801	1.09	31.4	295	0	4.5	1,340	7.4	
Apr. 21-30.....	10.9	58		60	35	138		384		104	116	2.9	2.2	728	.99	21.4	294	0	3.5	1,250	7.1	
May 1-3, 6.....	9.65	54		63	36	147		298		117	144	2.5	62	841	1.14	21.9	305	61	3.7	1,350	6.8	
May 4-5, 7-10.....	130	18		38	16	137		187		134	115	.9	3.2	584	.79	205	161	8	4.7	954	7.7	
May 11-20.....	119	22		69	28	339		238		315	348	1.1	9.9	1,250	1.70	402	287	92	8.7	2,090	7.2	
May 21-31.....	60.4	36		237	36	237		246		231	260	1.8	50	1,050	1.43	171	338	136	5.6	1,780	6.5	
June 1-10.....	495	38		53	27	187		259		158	169	1.4	37	843	1.15	1,130	243	30	5.2	1,310	6.8	
June 11-22.....	28.3	50		63	34	186		326		168	171	2.0	22	896	1.22	858	283	30	4.8	1,380	7.0	
June 23-30.....	454	21		39	17	160		200		141	120	1.7	9.2	577	.91	168	168	8	5.4	1,925	7.2	
July 1-6.....	1,067	34		80	31	237		282		258	245	1.6	14.5	1,020	1.59	327	123	4	5.6	1,830	6.8	
July 7-13.....	690	37		34	11	105		173		191	182	.6	3.0	432	.59	723	150	0	4.0	1,706	7.4	
July 14-18.....	169	20		49	19	178		214		187	150	.9	5.4	734	1.00	335	200	25	5.5	1,180	7.7	
Aug. 1-2, 9.....	298	35		64	32	224		292		202	220	1.7	16	939	1.28	756	291	52	5.7	1,310	8.2	
Aug. 3-8, 10, 16.....	947	48		54	32	150		307		139	125	2.2	18	753	1.02	1,930	266	14	4.0	1,150	7.4	
Aug. 11-15, 17-22.....	722	17		36	13	137		196		123	105	.72	2.5	532	.72	1,040	144	0	5.0	863	7.4	
Aug. 23-31.....	2,332	15		30	10	97		168		91	65	.7	2.5	394	.44	2,480	116	0	3.9	637	7.8	
Sept. 1-8.....	128	20		46	16	140		195		136	127	.9	7.9	592	.81	2,205	166	26	4.5	1,000	7.5	
Sept. 9-18.....	14.9	48		74	33	206		278		203	212	2.0	29	944	1.28	38.0	320	92	5.0	1,570	6.8	
Sept. 19-25, 27-30.....	48.7	42		56	26	159		310		126	135	1.9	14	728	.99	95.5	246	0	4.4	1,210	6.9	
Sept. 26.....	74.0	--		--	--	--		215		--	77	--	--	--	--	--	186	10	--	--	768	7.8
Weighted average	188	24		46	19	153		215		143	134	1.1	11	649	0.88	329	193	17	4.8	1,040	--	

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-2275. CANADIAN RIVER NEAR AMARILLO, TEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959
 /Once-daily measurement, between 5 a.m. and 9 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	50	48	50	54	57	61	57	55	55	--	50	60	60	61	--	--	55	--	49	53	45	40	41	42	40	50	49	41	51	47	44	51
November ..	42	38	38	58	39	41	40	41	41	42	43	45	46	--	--	48	38	32	32	34	35	40	40	37	49	33	33	--	33	32	--	40
December ..	37	35	34	38	38	35	32	--	32	--	32	35	32	32	32	32	32	32	33	33	34	34	36	32	32	35	32	34	--	32	32	34
January	32	--	32	32	32	32	33	32	33	33	33	35	35	35	32	32	48	--	34	32	32	32	32	32	32	35	34	33	35	33	33	33
February	32	32	32	33	34	32	35	38	46	34	34	38	40	36	35	40	45	35	34	33	35	40	33	34	33	33	33	36	35	--	--	36
March	33	35	33	37	33	32	33	35	33	34	35	33	35	40	--	33	33	35	36	40	33	33	38	40	46	34	--	32	--	--	--	35
April	40	42	43	41	48	50	48	40	41	38	42	35	35	39	42	49	48	53	48	43	42	38	45	48	51	52	55	46	48	--	--	44
May	56	57	53	--	51	39	53	55	50	51	55	61	66	58	55	56	62	58	56	56	55	60	57	60	59	59	56	62	65	60	60	57
June	62	60	61	61	68	63	65	--	64	65	65	66	66	62	64	67	68	70	68	--	69	69	68	70	70	70	70	69	--	--	66	66
July	65	68	69	68	68	69	70	64	67	68	64	65	68	65	68	67	72	70	68	68	67	66	69	68	70	67	68	68	69	69	70	68
August	70	70	69	69	70	70	71	72	70	70	69	70	80	69	68	76	66	70	70	71	70	71	68	70	70	67	68	69	69	72	68	70
September ..	--	69	68	--	--	65	--	--	68	--	55	54	50	52	55	57	58	59	61	63	64	63	64	65	58	63	54	53	53	49	--	59

ARKANSAS RIVER BASIN--Continued
7-2285. CANADIAN RIVER AT BRIDGEPORT, OKLA.

LOCATION.--At gaging station at Chicago, Rock Island and Pacific Railroad bridge, 1 mile north of Bridgeport, Caddo County, and 2.8 miles upstream from Linnmouth Creek.

DRAINAGE AREA.--25,229 square miles, of which 4,801 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1959.

Water temperatures: October 1948 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,770 ppm July 6-8; minimum, 172 ppm May 27.

Hardness: Maximum, 760 ppm June 7-9; minimum, 112 ppm May 27.

Specific conductance: Maximum daily, 2,800 micromhos July 6; minimum daily, 265 micromhos May 27.

Water temperatures: Maximum, 82° F Aug. 1; minimum, freezing point on several days during December to February.

EXTREMES, 1948-59.--Dissolved solids: Maximum, 2,450 ppm Oct. 11, 1954; minimum, 172 ppm May 27, 1959.

Hardness: Maximum, 778 ppm Jan. 28-31, 1951; minimum, 112 ppm May 27, 1959.

Specific conductance: Maximum daily, 4,000 micromhos Oct. 11, 1954; minimum daily, 226 micromhos May 23, 1952.

Water temperatures: Maximum, 97° F July 11, 1952; minimum, freezing point on many days during winter months.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance and chloride of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 carbonate ratio	Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 1-4, 1958...	38.0	--	--	71	20	113		208	0	155	122	--	2.9	--	619	0.84	64	260	90	3.1	1,010	8.0
Oct. 5-6,	16.5	--	--	82	21	220		220	8	174	17	--	2.0	--	581	.79	26	290	110	2.0	905	8.1
Oct. 7-12,	14.0	--	--	40	20	46		222	0	164	40	--	1.4	--	509	.69	19	310	128	1.1	765	8.1
Oct. 13-15,	16.3	--	--	74	16	41		178	0	134	38	--	2.2	--	469	.64	21	252	106	1.1	656	8.1
Oct. 16-31,	7.92	--	--	104	17	22		242	0	147	17	--	2.5	--	468	.64	10	330	132	.5	683	8.2
Nov. 1-20,	20.0	--	--	117	19	20		246	0	184	14	--	1.6	--	522	.71	28	370	168	.5	749	8.1
Nov. 21-30,	21.6	--	--	108	28	7.8		220	8	174	17	--	3.9	--	511	.69	30	385	191	.2	741	8.6
Dec. 1-20,	21.6	--	--	115	15	26		228	4	177	20	--	.4	--	565	.77	33	350	156	.6	927	8.4
Dec. 21-27,	24.6	--	--	141	30	29		242	10	279	21	--	3.7	--	705	.96	47	475	260	.6	918	8.4
Dec. 28,	37.0	--	--	106	33	74		104	0	364	67	--	2.8	--	770	1.05	77	400	1.6	1.6	1,030	8.2
Dec. 29-30,	40.5	--	--	82	41	98		108	0	302	130	--	1.6	--	784	1.07	86	375	286	2.2	1,330	8.2
Dec. 31,	35.0	--	--	91	34	60		112	0	298	66	--	.5	--	684	.93	65	365	273	1.4	928	8.2
Jan. 1-3, 1959...	25.0	--	--	110	32	74		176	0	301	74	--	3.8	--	715	.97	48	405	261	1.6	1,040	8.0
Jan. 4,	8.00	--	--	98	48	105		88	0	420	111	--	4.3	--	895	1.22	19	440	368	2.2	1,510	8.1
Jan. 5,	5.00	--	--	132	45	82		94	0	499	66	--	4.3	--	957	1.30	13	515	438	1.6	1,580	7.9
Jan. 6,	13.0	--	--	126	41	61		116	0	426	56	--	4.5	--	836	1.14	29	485	380	1.2	1,400	7.8
Jan. 7-10,	67.8	--	--	138	51	50		242	4	292	47	--	4.5	--	735	1.00	47	470	265	1.0	1,010	8.3
Jan. 11-14,	140	--	--	121	25	49		232	0	255	38	--	3.5	--	662	.90	250	405	215	1.1	914	8.2

Jan. 15-20, 1959.	257	--	--	98	34	250	0	241	318	--	3.1	--	al.	1,030	1.40	715	385	203	5.1	1,750	8.1
Jan. 21-31.....	193	18	0.00	119	37	235	0	288	320	0.8	3.3	0.26	1,150	1.56	599	450	250	4.8	4.8	1,850	8.1
Feb. 1-10.....	378	22	--	104	41	235	0	288	320	0.7	1.6	.00	1,140	1.55	599	450	250	4.8	4.8	1,840	8.0
Feb. 11-28.....	114	--	--	117	34	231	0	262	320	--	1.8	--	958	1.60	1,160	430	283	4.8	4.8	1,840	7.7
Mar. 1-4.....	41.0	--	--	132	34	130	10	330	140	--	3.0	--	958	1.30	106	470	283	2.4	1.8	1,330	8.4
Mar. 5-11.....	31.7	--	--	138	28	89	12	332	85	--	2.4	--	868	1.18	74	460	273	1.8	1.8	1,160	8.5
Mar. 12-14.....	25.7	--	--	146	28	61	10	351	33	--	1.9	--	790	1.07	55	470	280	1.2	1.2	987	8.4
Mar. 15-20.....	22.0	--	--	132	22	42	12	325	15	--	1.4	--	972	1.06	44	480	283	1.8	1.8	1,592	8.4
Mar. 21-31.....	21.8	9.5	--	114	23	75	10	302	59	1.1	1.4	.00	706	1.05	64	485	294	1.7	1.7	1,050	8.1
Apr. 1-7.....	21.7	--	--	117	23	49	12	366	52	1.1	1.7	--	802	1.09	47	500	308	1.9	1.9	1,000	8.5
Apr. 8-12.....	13.8	--	--	112	23	84	6	309	79	--	2.4	--	763	1.04	284	375	232	1.9	1.9	1,010	8.4
Apr. 13.....	146	--	--	138	45	163	2	526	168	--	2.2	--	1,190	1.62	496	530	432	3.1	3.1	1,550	8.3
Apr. 14-18.....	138	--	--	104	34	243	8	317	308	--	1.8	--	1,210	1.65	451	400	238	5.3	5.3	1,790	8.4
Apr. 19.....	188	--	--	82	16	79	4	194	86	--	6.9	--	599	1.81	304	270	157	2.1	2.1	1,852	8.4
Apr. 20.....	82.0	--	--	111	27	166	8	308	205	--	2.8	--	967	1.32	214	390	250	3.7	3.7	1,450	8.5
Apr. 21-24.....	43.8	--	--	140	34	173	6	391	215	--	2.4	--	1,120	1.52	132	490	336	3.4	3.4	1,590	8.4
Apr. 25.....	24.0	--	--	86	26	77	2	295	68	--	2.3	--	652	1.89	42	320	238	1.9	1.9	912	8.3
Apr. 26-30.....	19.6	--	--	134	23	50	0	302	28	--	1.9	--	685	.93	38	430	246	1.1	1.1	932	8.0
May 1-5.....	135	--	--	127	30	40	0	312	24	--	2.3	--	694	.94	253	440	273	.8	.8	921	8.2
May 6.....	1,490	--	--	110	32	79	0	337	85	--	4.8	--	735	1.00	2,960	405	304	1.7	1.7	1,030	8.1
May 7.....	823	--	--	114	35	133	0	363	165	--	5.5	--	988	1.34	2,200	430	325	2.8	2.8	1,420	8.2
May 8.....	2,260	--	--	117	43	350	2	337	510	--	7.0	--	1,480	2.01	9,030	470	314	7.0	7.0	2,370	8.3
May 9-20.....	907	20	.00	95	29	194	4	179	300	.9	3.5	.00	992	1.35	2,450	355	181	4.5	4.5	1,640	8.1
May 21.....	45.0	--	--	104	44	208	0	358	290	--	3.0	--	1,130	1.54	137	440	336	4.3	4.3	1,790	8.1
May 22.....	600	--	--	58	13	30	0	67	40	--	5.2	--	324	.44	525	200	66	.9	.9	528	8.2
May 23-25.....	283	--	--	100	28	98	0	294	118	--	3.2	--	748	1.02	592	365	262	2.2	2.2	1,110	8.1
May 26.....	7,560	--	--	52	13	57	0	98	62	--	7.8	--	384	.52	7,840	185	72	1.8	1.8	606	8.1
May 27.....	5,280	--	--	30	9.0	114	0	26	16	--	1.6	--	172	.23	2,450	112	20	.6	.6	265	8.1
May 28-31.....	558	--	--	108	32	108	0	311	128	--	1.8	--	829	1.13	1,250	400	272	2.3	2.3	1,210	8.1

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

7-2285. CANADIAN RIVER AT BRIDGEPORT, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959.--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		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate			
June 1-3, 1959.....	154	--	--	91	53	162	184	0	501	102	--	2.3	--	1,090	1.48	453	620	469	1.6	1,410	8.2
June 4-6.....	64.7	--	--	73	56	164	122	0	594	55	--	3.0	--	1,090	1.48	190	640	540	1.3	1,330	8.1
June 7-9.....	66.3	--	--	109	66	196	110	0	735	100	--	.1	--	1,360	1.85	243	760	670	1.7	1,640	8.0
June 10.....	34.0	--	--	70	65	156	86	0	651	40	--	2.9	--	1,130	1.54	104	655	584	1.2	1,470	8.1
June 11-12.....	74.0	--	--	46	55	150	158	0	493	30	--	.1	--	925	1.26	185	565	436	1.0	1,130	8.2
June 13-19.....	53.1	--	--	119	50	166	158	4	520	142	--	1.9	--	1,150	1.56	165	620	484	2.1	1,540	8.3
June 20.....	24.0	--	--	52	42	111	96	0	429	26	--	1.4	--	766	1.04	50	450	372	1.1	1,080	8.1
June 21.....	184	--	--	49	40	114	108	0	422	20	--	1.6	--	780	1.06	388	450	362	1.0	1,040	8.1
June 22-28.....	359	--	--	27	17	82	142	0	174	24	--	2.3	--	428	1.58	415	275	158	1.7	610	8.2
June 29-30.....	224	--	--	38	312	133	172	4	397	428	--	4.6	--	al,400	1.90	847	490	342	6.1	2,110	8.4
July 1-5.....	530	--	--	170	24	95	140	4	258	220	--	5.1	--	900	1.22	1,290	335	214	4.0	1,430	8.3
July 6-8.....	1,320	--	--	407	42	135	210	6	392	570	--	2.2	--	1,770	2.41	6,310	510	328	7.8	2,800	8.3
July 9-10.....	1,225	--	--	53	13	62	120	0	133	58	--	2.5	--	396	.54	1,310	206	108	1.6	647	8.1
July 11-15.....	250	--	--	77	18	83	128	2	209	84	--	3.0	--	572	.78	386	280	172	2.0	880	8.3
July 16.....	80.0	--	--	164	22	114	136	2	305	210	--	4.6	--	934	1.27	202	375	260	3.7	1,460	8.3
July 17-20.....	484	--	--	319	32	103	200	0	284	440	--	4.2	--	1,350	1.84	1,800	390	228	7.0	2,240	8.2
July 21-26.....	464	--	--	226	23	84	168	0	229	495	--	4.5	--	1,000	1.36	7,310	305	168	5.6	1,620	8.2
July 27.....	5,800	--	--	104	33	63	104	0	131	126	--	5.2	--	300	.89	5,960	190	42	3.2	498	7.8
July 28.....	6,170	--	--	123	36	111	184	0	157	125	--	1.7	--	639	.83	5,860	240	51	2.9	498	7.8
July 29-31.....	341	--	--	107	16	78	120	2	191	135	--	1.9	--	613	.83	564	260	138	2.9	994	8.3
Aug. 1-4.....	85.0	--	--	137	30	99	174	0	244	192	--	1.9	--	841	1.14	193	370	228	3.1	1,310	7.8
Aug. 5-10.....	979	--	--	58	25	92	132	0	245	58	--	3.0	--	579	.79	1,530	322	214	1.4	837	8.1
Aug. 11-14.....	68.5	--	--	122	22	114	160	0	245	145	--	2.6	--	760	1.03	141	330	196	2.9	1,170	8.2
Aug. 15-16.....	410	--	--	34	34	119	210	0	276	34	--	2.9	--	655	.89	725	435	263	7.7	921	8.2
Aug. 17-20.....	1,667	--	--	226	36	89	34	0	289	295	--	5.0	--	1,090	1.48	4,910	370	229	5.1	1,740	8.1
Aug. 21.....	4,090	--	--	339	32	101	38	0	309	445	--	.7	--	1,440	1.96	15,900	410	212	7.3	2,270	8.1
Aug. 22-30.....	1,512	--	--	212	24	76	212	0	242	332	--	3.5	--	1,130	1.54	4,610	320	146	6.4	1,840	8.1
Aug. 31.....	2,100	--	--	138	24	74	188	0	206	152	--	3.5	--	1,731	.99	4,140	285	131	3.6	1,130	8.1

Sept. 1, 1959.....	258	--	67	21	169	188	0	203	181	--	3.1	--	766	1.04	534	255	101	4.6	1,220	7.9
Sept. 2.....	71.0	--	43	13	76	154	0	85	77	--	3.8	--	404	.55	77	160	34	2.6	635	7.9
Sept. 3-5.....	360	--	54	20	168	176	0	157	190	--	6.9	--	713	.97	693	215	71	5.0	1,230	8.1
Sept. 6-10.....	96.6	--	63	23	213	184	0	202	245	--	8.8	--	874	1.19	228	250	99	5.9	1,440	8.2
Sept. 11-12.....	29.0	--	85	26	154	222	0	233	160	--	5.4	--	799	1.09	63	320	138	3.7	1,270	8.2
Sept. 13-16.....	4.52	--	113	26	57	220	0	261	42	--	3.7	--	645	.88	7.9	390	210	1.3	914	8.2
Sept. 17-20.....	13.0	--	121	27	38	202	0	294	16	--	3.8	--	632	.86	22	415	250	.8	855	8.2
Sept. 21-23.....	9.83	--	113	32	32	166	0	314	14	--	3.1	--	643	.87	17	415	279	.7	858	8.1
Sept. 24-25.....	16,000	--	49	13	20	132	0	77	20	--	3.6	--	278	.38	12,010	176	68	.6	425	8.0
Sept. 26-30.....	927	--	74	21	61	128	0	205	58	--	2.6	--	515	.70	1,290	270	165	1.6	768	8.0
Weighted average	420	--	78	24	131	b169	--	190	169	--	3.6	--	726	0.99	823	293	154	3.3	1,140	--

a Calculated from determined constituents.

b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
 7-2285. CANADIAN RIVER AT BRIDGEPORT, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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.....	47	51	56	57	60	66	67	67	52	60	60	58	62	62	60	58	61	62	60	58	46	55	56	51	50	50	45	45	48	46	56		
November....	42	42	41	46	45	43	42	35	--	72	51	66	62	54	64	40	36	40	41	43	42	49	40	--	33	33	36	33	36	45			
December... 42	44	37	41	--	33	33	32	--	33	33	--	--	34	34	36	34	33	--	37	35	44	36	--	--	--	41	35	--	34	--			
January.....	33	33	--	32	32	35	36	--	33	32	35	35	44	45	35	32	35	38	37	35	--	38	34	35	44	34	33	36	--	33	32		
February....	--	--	33	33	32	33	38	44	39	41	39	42	50	46	37	42	43	37	32	--	40	40	39	41	55	38	46	41	--	--	40		
March.....	39	43	35	42	--	35	41	43	41	42	38	38	45	50	36	41	40	49	44	51	37	42	44	53	58	43	38	43	53	70	56	44	
April.....	50	51	--	49	60	61	63	48	42	43	44	42	40	45	48	54	59	62	57	47	43	44	54	62	61	65	70	57	59	63	--	53	
May.....	67	72	69	70	65	58	57	59	60	66	63	67	68	58	61	59	67	69	72	76	73	67	61	68	70	68	72	72	76	71	74	67	73
June.....	65	70	68	68	70	73	76	69	70	77	75	73	78	73	72	73	74	78	75	77	76	72	74	74	75	75	75	75	71	74	--	73	
July.....	73	71	77	73	78	77	--	--	72	68	--	75	72	74	76	74	76	75	75	75	75	76	75	74	74	75	74	73	75	78	81	75	
August.....	82	80	79	77	77	78	75	73	74	73	74	73	74	75	74	75	74	76	75	74	76	75	75	--	74	74	73	76	78	76	75	75	
September.. 74	72	70	--	75	75	73	73	--	61	56	58	58	60	61	63	66	67	67	67	70	74	73	63	70	67	70	67	69	67	--	--	67	

ARKANSAS RIVER BASIN--Continued
7-2300. LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.

LOCATION.--At gaging station at bridge on county road just downstream from Hog Creek, 0.8 mile upstream from Prairie Creek, 0.8 mile south of Little Axe, and 13 miles east of Norman, Cleveland County.

DRAINAGE AREA.--257 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

Water temperatures: October 1953 to September 1959.

EXTREMES, 1958-59:--May 1956 to September 1958, 559 ppm Sept. 21-24; minimum, 109 ppm July 1.

Specific conductance: Maximum daily, 1,180 microhmhos, 82 ppm July 1.

Water temperatures: Maximum daily, 148 microhmhos, 82 ppm Oct. 13; minimum, 109 ppm July 1.

Specific conductance: Maximum daily, 1,180 microhmhos, 82 ppm Oct. 13; minimum, 109 ppm July 1.

Water temperatures: Maximum, 92°F Aug. 3, 5; minimum, freezing point Jan. 3, Feb. 11.

EXTREMES, 1953-59.--Dissolved solids: Maximum, 1,460 ppm Nov. 1-3, 1956; minimum, 80 ppm May 24-25, 1957.

Hardness: Maximum, 394 ppm Nov. 22-30, Dec. 11-20, 1957; minimum, 52 ppm Sept. 21, 1957.

Specific conductance: Maximum daily, 2,770 microhmhos Nov. 3, 1956; minimum daily, 100 microhmhos May 25, 1957.

Water temperature: Maximum, 98°F July 11-12, 1954; minimum, freezing point Feb. 2, 1956, Jan. 29, 1957, Jan. 3, Feb. 11, 1959.

REMARKS.--Dashes omitted in potassium, iron (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium	Magnesium	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. sulfate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluo-Ni-Bor-iron (F) (NO ₃) (B)	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		Sodium adsorption ratio			
Oct. 1-10, 1958....	5.37	11	0.00	50	41	93	3.1	336	0	49	108	0.5	0.7	0.43	522	0.71	7.6	292	16	2.4	906	8.2
Oct. 11-20, 1958....	5.52	11	0.00	46	46	92	3.1	322	8	52	108	0.5	0.7	0.43	510	0.69	7.6	284	16	2.4	915	8.4
Oct. 21-31, 1958....	4.62	11	0.00	59	40	69	3.1	362	8	38	80	0.5	0.7	0.43	475	0.65	5.9	312	2	1.7	830	8.3
Nov. 1-20, 1958....	6.97	11	0.00	52	41	63	3.1	350	10	34	70	0.5	0.7	0.43	458	0.62	8.6	300	0	1.6	805	8.5
Nov. 21-30, 1958....	6.27	11	0.00	44	46	74	3.1	360	8	38	79	0.5	0.7	0.43	478	0.65	8.1	300	0	1.9	842	8.5
Dec. 1-20, 1958....	7.38	18	0.00	36	49	46	1.5	312	8	29	65	0.5	0.7	0.43	396	0.54	7.9	290	21	1.2	716	8.4
Dec. 21-31, 1958....	6.78	18	0.00	38	54	47	1.5	350	0	30	76	0.5	0.7	0.43	458	0.62	8.4	316	29	1.1	795	8.2
Jan. 1-3, 1959....	4.83	11	0.00	30	45	42	3.1	260	20	27	81	0.5	0.7	0.43	418	0.57	5.5	258	12	1.1	753	8.4
Jan. 4-7, 1959....	4.08	11	0.00	22	57	75	3.1	356	0	44	80	0.5	0.7	0.43	471	0.64	5.2	288	0	1.9	825	8.2
Jan. 8-31, 1959....	6.93	11	0.00	18	69	49	3.1	396	0	31	54	0.5	0.7	0.43	429	0.58	8.0	328	4	1.2	777	8.2
Feb. 1-20, 1959....	9.40	18	0.00	51	27	50	1.1	280	8	28	54	0.5	0.7	0.43	374	0.51	9.5	240	60	1.4	618	8.4
Feb. 21-28, 1959....	8.92	18	0.00	39	45	55	1.6	354	0	25	54	0.5	0.7	0.43	412	0.56	9.9	282	0	1.4	717	8.1
Mar. 1-31, 1959....	10.4	17	0.00	31	45	50	1.8	326	0	24	54	0.5	0.7	0.43	384	0.52	11	264	0	1.3	683	8.1
Apr. 1-10, 1959....	11.5	17	0.00	47	44	49	4.1	342	12	24	52	0.5	0.7	0.43	399	0.54	12	292	0	1.3	773	8.5
Apr. 11-16, 1959....	10.6	21	0.00	42	52	52	4.1	322	18	24	52	0.5	0.7	0.43	388	0.53	11	280	0	1.3	681	8.7
Apr. 17-21, 1959....	68.6	21	0.00	46	27	27	4.1	256	14	14	26	0.5	0.7	0.43	304	0.41	56	228	0	1.8	506	8.6
Apr. 22-30, 1959....	10.2	21	0.00	54	43	53	4.1	372	8	24	52	0.5	0.7	0.43	444	0.60	12	312	0	1.3	753	8.3

ARKANSAS RIVER BASIN--Continued

7-2300. LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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		Specific conductance (micro-mhos at 25°C)	pH		
															Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-carbonate				
May 1-5 1959.....	10.6	--	--	32	43	60		294	16	29	62	--	0.4	--	--	404	0.55	12	256	2	1.6	700	8.6
May 6-8.....	32.3	--	--	48	25	29		240	14	15	35	--	1.3	--	--	325	.44	28	222	0	.9	513	8.6
May 9-10.....	56.4	--	--	30	11	12		144	4	4.3		--	1.7	--	--	183	.25	279	122	0	.5	284	8.4
May 11-20.....	29.0	--	--	48	31	37		308	0	19	39	--	.5	--	--	351	.48	27	248	0	1.0	593	8.2
May 26-31.....	22.9	--	--	39	17	23		196	8	12	21	--	1.3	--	--	236	.32	146	168	0	.8	394	8.5
June 1-4.....	18.8	--	--	43	39	44		318	4	25	48	--	1.0	--	--	377	.51	199	266	0	1.2	637	8.4
June 5-10.....	45.0	--	--	42	23	26		234	4	15	28	--	1.3	--	--	270	.37	33	198	0	.8	456	8.4
June 11-20.....	5.42	16	0.00	42	21	90	5.2	194	12	46	100	0.2	1.0	0.01	475	.65	7.0	190	11	2.8	736	8.4	
June 21-26.....	36.9	--	--	30	40	78		292	6	42	82	--	1.1	--	--	431	.59	43	240	0	2.2	752	8.4
June 27-30.....	140	--	--	30	16	21		164	2	12	23	--	2.2	--	--	202	.27	76	140	2	.8	347	8.3
July 1.....	2.810	--	--	22	6.6	9.7		102	0	8.2	6.0	--	2.9	--	--	109	.15	827	82	0	.5	177	8.1
July 2-8.....	118	--	--	50	24	40		308	0	16	28	--	2.6	--	--	312	.42	99	224	0	1.2	496	8.0
July 9-10.....	320	--	--	26	9.0	19		140	0	8.2	15	--	.0	--	--	153	.21	132	102	0	.8	257	8.0
July 11-20.....	276	--	--	40	18	20		196	4	13	23	--	3.1	--	--	238	.32	177	172	5	.7	394	8.4
July 21-31.....	78.4	14	.04	43	25	23	2.8	234	8	13	35	.3	1.6	.28	292	.40	62	212	6	1.7	487	8.5	
Aug. 1-6.....	16.8	--	--	42	48	44		368	0	15	56	--	1.1	--	--	434	.59	20	302	0	1.1	760	8.2
Aug. 7-10.....	101	--	--	28	21	20		180	0	6.2	31	--	1.3	--	--	233	.32	64	186	8	1.7	397	8.2
Aug. 11-20.....	10.6	16	.00	54	32	59	2.8	314	14	33	62	.3	1.1	.34	429	.58	12	268	0	1.6	715	8.6	
Aug. 21-28.....	4.09	--	--	30	42	66		308	0	28	75	--	1.1	--	--	422	.57	4.7	246	0	1.8	735	8.1
Aug. 29-31.....	51.2	--	--	30	35	51		248	8	23	61	--	1.8	--	--	343	.47	47	218	2	1.5	621	8.4
Sept. 1-10.....	123	13	.00	37	7.7	37	4.6	140	0	21	48	.3	.7	.00	456	.35	85	124	10	1.4	411	8.1	
Sept. 11-15.....	3.18	--	--	45	31	69		290	6	34	78	--	1.6	--	--	240	.60	3.0	242	0	1.9	577	8.3
Sept. 16-20.....	3.28	--	--	43	41	101		348	8	55	102	--	1.7	--	--	453	.76	4.4	268	0	2.4	682	8.4
Sept. 21-24.....	53.4	--	--	43	46	104		366	0	5	119.0	--	1.9	--	--	313	1.0	463	182	0	2.7	195	7.9
Sept. 25.....	1,510	--	--	20	16	5.1		148	0	8.6	18.0	--	2.3	--	--	175	.24	52	136	14	.4	303	7.9
Sept. 26-27.....	109	--	--	26	17	10		148	0	8.6	18.0	--	2.3	--	--	255	.35	24	182	0	.9	457	8.1
Sept. 28-30.....	34.7	--	--	36	22	29		228	0	13	30	--	2.3	--	--	255	.35	24	182	0	.9	457	8.1
Weighted average	50.0	--	--	34	19	26		b200	--	14	28	--	1.8	--	--	239	0.33	32	163	0	0.9	402	--

a Calculated from determined constituents.

b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
 7-2300. LITTLE RIVER BELOW HOG CREEK, NEAR NORMAN, OKLA.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	63	57	67	72	73	73	71	79	82	73	76	65	64	67	65	63	63	64	63	65	69	59	66	65	63	56	55	57	55	56	65	65	
November ..	56	51	51	62	57	57	55	57	60	57	65	65	66	65	66	68	61	48	53	53	53	54	61	53	56	45	40	40	43	45	--	55	
December ..	46	47	46	--	45	40	38	40	35	34	38	35	34	34	39	38	39	39	41	37	37	49	51	43	43	41	41	45	42	41	35	40	
January	35	35	32	33	36	40	35	37	35	35	38	42	47	50	42	35	42	40	43	40	34	35	38	44	48	35	36	40	47	36	37	39	
February	35	34	33	37	39	38	38	47	53	45	32	46	49	52	43	47	52	43	39	37	36	40	50	52	55	56	50	53	50	54	44	44	
March	56	55	53	49	43	47	56	--	57	59	51	54	60	60	56	56	60	61	66	53	52	50	63	55	60	50	50	48	52	67	56	54	
April	54	56	62	55	65	70	70	60	57	60	52	52	54	61	61	57	68	72	72	58	52	65	63	68	74	68	74	68	71	73	78	--	63
May	68	72	72	73	68	72	73	66	63	70	65	72	66	74	67	63	91	70	76	76	77	73	72	72	81	65	76	74	74	76	75	72	72
June	75	75	75	71	69	75	75	76	73	84	82	88	78	77	74	76	71	76	88	81	87	84	82	78	79	77	80	80	79	83	--	78	
July	75	78	79	86	79	79	80	90	78	84	85	86	79	80	75	82	86	79	80	82	74	81	82	86	87	77	78	74	87	90	88	81	81
August	90	85	92	88	92	87	79	83	80	78	86	88	77	86	86	89	87	82	84	88	89	88	88	70	87	84	83	88	77	89	78	65	65
September ..	80	75	70	77	80	85	85	83	83	77	67	64	73	65	76	77	77	76	72	80	83	83	73	72	76	79	82	73	62	--	76	--	76

7-2310. LITTLE RIVER NEAR SASAKWA, OKLA.

LOCATION.--At gaging station on highway bridge, 2.8 miles northwest of Sasakwa, Seminole County, and 8.7 miles downstream from Salt Creek.

DRAINAGE AREA.--865 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1951 to September 1955 (monthly), October 1955 to September 1959 (daily).

Water temperatures: October 1955 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 15,100 micromhos Nov. 17; minimum daily, 432 micromhos Sept. 3.

Water temperatures: Maximum, 90°F Aug. 5, 6, 30, 31; minimum, 35°F Jan. 1-5.

EXTREMES, 1955-59.--Dissolved solids (1955-57): Maximum, 129,000 ppm Oct. 30-31, 1956; minimum, 189 ppm June 11, 1957.

Hardness (1955-57): Maximum, 24,400 ppm Oct. 30-31, Nov. 1-2, 1956; minimum, 112 ppm June 11, 1957.

Specific conductance: Maximum daily, 138,000 micromhos Oct. 31, 1956; minimum daily, 365 micromhos June 11, 1957.

Water temperatures: Maximum, 93°F July 27, Aug. 14, 1956; minimum, 33°F Dec. 16, 1955, Jan. 18, Feb. 3, 1956.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Specific conductance and chloride (Cl), water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)
1	9,140	3,050	10,300	3,500	9,660	3,200	9,320	3,100
2	9,210	3,050	10,300	3,450	11,600	3,950	9,840	3,220
3	8,680	2,800	10,300	3,500	11,500	3,950	9,810	3,250
4	8,660	2,850	10,200	3,450	7,580	2,500	6,320	1,950
5	6,370	2,050	10,900	3,600	7,500	2,450	6,120	1,950
6	6,350	2,020	10,900	3,700	6,770	2,150	8,470	2,750
7	7,840	2,550	10,600	3,600	6,840	2,150	7,000	2,720
8	7,850	2,500	10,900	3,200	6,780	2,180	6,950	2,150
9	4,850	1,520	10,500	3,200	6,430	2,020	5,910	1,850
10	6,080	1,950	10,500	3,200	6,370	1,980	5,940	1,820
11	6,070	1,950	11,100	3,700	6,270	1,900	5,790	1,700
12	8,710	2,800	11,200	3,650	6,200	1,950	5,780	1,700
13	8,630	2,900	11,100	3,700	6,200	1,900	6,270	2,000
14	10,800	3,650	14,600	4,950	6,180	1,950	6,550	2,000
15	10,600	3,650	14,500	5,000	6,280	1,950	6,470	2,100
16	10,500	3,600	15,000	5,200	8,430	2,700	6,190	2,000
17	10,700	3,600	15,100	5,100	8,350	2,780	5,360	1,600
18	11,700	4,000	10,100	3,300	8,190	2,650	5,240	1,700
19	11,800	4,050	9,970	3,350	8,710	2,900	5,330	1,600
20	11,900	4,050	8,490	2,700	6,840	2,150	5,330	1,700
21	12,300	4,300	8,530	2,750	6,700	2,120	5,980	1,880
22	12,200	4,100	6,200	1,950	6,720	2,100	5,920	1,850
23	11,800	4,100	6,090	1,850	6,660	2,180	8,720	2,850
24	11,700	4,100	6,130	1,900	6,120	2,000	6,670	2,120
25	11,700	4,000	6,140	1,900	6,350	2,000	6,630	2,080
26	11,700	4,000	6,470	2,100	6,350	2,000	7,160	2,300
27	11,300	3,900	6,480	2,050	--	--	7,210	2,300
28	11,200	3,800	7,550	2,400	6,090	1,900	6,340	2,000
29	10,900	3,750	7,530	2,500	9,160	3,020	6,550	2,050
30	10,700	3,550	9,680	3,250	9,230	3,100	6,450	2,020
31	10,700	3,600	--	--	9,230	3,100	6,740	2,120

ARKANSAS RIVER BASIN--Continued

7-2310. LITTLE RIVER NEAR SASAKWA, OKLA.--Continued

Specific conductance and chloride (Cl), water year October 1958 to September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)
1	6,740	2,120	6,620	2,120	5,770	1,750	6,580	2,150
2	5,900	1,800	6,590	2,100	6,370	2,020	6,160	2,000
3	5,970	1,850	7,180	2,300	6,310	2,000	6,180	2,050
4	6,270	2,000	5,690	1,700	4,900	1,500	1,550	418
5	6,680	2,150	5,420	1,700	5,480	1,700	1,520	420
6	6,700	2,100	6,170	1,950	5,500	1,700	1,740	480
7	6,100	1,900	6,170	1,950	4,970	1,580	741	174
8	6,080	1,920	6,560	2,100	5,110	1,450	756	172
9	6,940	2,180	6,570	2,100	5,050	1,550	1,210	345
10	6,920	2,180	5,910	1,850	9,810	3,050	1,250	345
11	9,260	3,100	5,940	1,850	9,520	3,200	1,820	500
12	9,140	3,050	5,340	1,650	8,340	2,800	1,750	500
13	8,610	2,900	5,360	1,620	8,460	2,850	2,960	900
14	8,570	2,900	5,850	1,850	5,470	1,750	2,960	850
15	6,730	2,150	5,810	1,800	5,480	1,751	4,760	1,500
16	7,170	2,400	6,480	2,020	5,060	1,650	4,820	1,450
17	7,300	2,400	6,480	2,000	5,060	1,600	4,290	1,300
18	6,770	2,150	10,600	3,550	1,880	520	5,110	1,650
19	5,430	1,710	10,600	3,600	1,880	500	5,120	1,600
20	5,360	1,600	5,480	1,720	1,560	440	5,060	1,600
21	5,140	1,550	5,530	2,150	1,540	420	5,390	1,700
22	5,050	1,580	3,860	1,120	2,300	660	4,910	1,550
23	5,230	1,600	3,790	1,100	2,310	660	5,340	1,700
24	5,130	1,600	3,620	1,100	2,850	800	6,730	2,200
25	5,370	1,620	3,860	1,100	2,850	920	6,890	2,200
26	5,340	1,680	3,740	1,150	3,980	1,200	649	130
27	6,100	1,900	3,690	1,100	4,010	1,250	610	130
28	5,980	1,900	3,690	1,080	4,900	1,550	713	158
29	--	--	3,680	1,100	4,970	1,550	710	151
30	--	--	3,730	1,100	6,800	2,200	1,840	495
31	--	--	3,720	--	--	--	1,820	492
	June		July		August		September	
1	2,150	600	1,770	490	3,030	900	1,850	500
2	2,140	590	1,770	490	4,110	1,250	1,820	520
3	3,010	870	1,320	340	4,130	1,250	432	78
4	2,990	870	1,310	340	4,560	1,420	438	84
5	1,430	362	2,140	590	4,460	1,380	989	237
6	--	--	2,210	610	5,000	1,550	991	250
7	1,410	360	1,870	510	4,990	1,550	1,330	342
8	1,250	305	1,870	530	934	210	1,360	340
9	1,240	310	1,240	320	934	220	1,660	430
10	2,040	540	1,220	315	988	235	1,780	465
11	2,800	775	749	180	988	232	1,890	520
12	2,820	790	746	180	1,840	440	1,870	515
13	4,150	1,250	955	234	1,840	400	2,480	695
14	4,120	1,280	955	231	2,860	680	2,470	690
15	4,670	1,420	777	170	2,880	660	2,750	780
16	4,050	1,200	772	170	3,150	750	2,990	850
17	4,050	1,250	757	178	3,150	740	2,980	870
18	5,040	1,580	757	175	1,720	400	3,160	920
19	5,220	1,650	2,440	700	1,700	400	3,130	905
20	5,660	1,850	--	--	2,010	460	818	205
21	1,480	390	1,610	430	1,970	580	--	--
22	1,440	380	1,610	410	2,470	720	--	--
23	1,050	270	2,170	620	2,470	720	3,850	1,150
24	1,030	265	2,170	610	2,540	740	612	131
25	1,380	365	1,050	260	2,540	740	614	134
26	1,380	360	1,040	260	3,170	950	1,010	265
27	526	100	--	--	3,170	925	1,010	262
28	519	105	1,940	530	4,030	1,220	1,370	372
29	626	120	1,140	270	4,030	1,220	1,360	372
30	611	120	1,130	260	5,060	1,600	464	89
31	--	--	3,030	875	5,010	1,580	--	--

ARKANSAS RIVER BASIN--Continued
 7-2310. LITTLE RIVER NEAR SASARWA, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	72	72	71	72	71	70	74	65	67	68	68	70	68	67	67	67	68	68	67	65	64	64	63	63	61	60	60	60	60	59	67	
November ..	60	60	61	60	59	60	62	62	60	60	62	62	60	59	58	59	56	55	55	56	55	56	56	55	51	48	46	47	47	46	56		
December ..	45	44	43	43	44	41	42	43	42	41	40	38	37	38	38	38	39	41	42	43	43	44	44	44	43	42	--	41	41	40	37	41	
January	35	35	35	35	35	36	37	38	38	40	43	49	52	52	43	42	42	41	40	39	39	38	40	42	47	46	46	47	48	46	43	42	
February	43	42	42	41	42	42	43	44	45	45	50	50	49	49	51	50	50	49	47	45	47	47	48	48	48	48	47	--	--	--	46	46	
March	48	48	47	47	48	48	49	52	55	60	58	53	53	53	57	57	60	58	58	56	53	54	56	58	58	57	58	60	62	63	55	55	
April	63	63	64	68	70	72	70	62	62	62	60	56	58	57	57	58	59	58	59	60	60	62	62	63	63	64	67	70	72	73	--	63	
May	74	73	74	73	73	73	72	71	72	72	73	73	70	70	74	76	78	80	82	82	82	82	82	82	82	82	82	80	80	80	81	75	75
June	81	81	80	80	80	--	80	84	85	85	87	86	85	85	86	87	87	85	84	84	82	80	81	80	82	82	83	82	80	80	--	83	
July	80	84	80	81	80	81	82	80	81	82	79	80	80	80	81	80	81	82	--	--	83	83	82	83	80	80	--	81	82	83	82	81	
August	83	86	87	88	90	90	88	89	88	87	87	86	85	87	88	85	86	80	86	86	87	86	87	86	86	87	87	87	89	90	87	87	
September ..	87	87	85	86	84	78	78	78	77	76	78	78	78	78	78	78	78	78	78	82	--	--	--	78	78	78	78	78	76	76	76	--	79

ARKANSAS RIVER BASIN--Continued

7-2385. NORTH CANADIAN RIVER AT CANTON RESERVOIR, NEAR CANTON, OKLA.

LOCATION.--Immediately below dam on North Canadian River, 2 miles northwest of Canton, Blaine County, and 4.5 miles upstream from Minnehaha Creek. DRAINAGE AREA.--12,483 square miles, of which 4,883 square miles is probably noncontributing. RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1954 (daily), December 1955 to September 1959 (monthly). Water temperatures: October 1951 to September 1954.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate		
October 1958.....	--	12	0.00	59	29	80	8.5	176	0	131	122	0.6	1.2	0.06	0.74	268	124	2.1	875	7.4
Nov. 13.....	5.90	13	0.00	54	25	76	9.4	164	0	115	108	.8	.7	.00	.71	236	102	2.1	803	8.1
Dec. 4.....	5.40	14	0.00	56	35	70	8.9	168	0	117	112	.7	1.2	.00	.520	284	146	1.8	822	8.0
Jan. 22, 1959.....	15.0	12	0.00	62	23	81	8.0	123	0	123	116	.8	1.2	.18	.72	248	79	2.2	852	7.8
February.....	--	15	0.00	56	29	74	8.1	150	0	107	125	.6	1.2	.14	.532	260	137	1.9	761	8.1
Mar. 17.....	5.10	10	0.00	64	23	94	7.7	176	0	134	126	.6	1.4	.00	.567	256	112	2.5	931	7.7
Apr. 12.....	190	11	0.00	64	32	99	7.6	194	0	150	131	.7	1.0	.00	.602	292	195	2.3	980	7.7
May 6.....	710	11	0.00	74	28	101	8.0	202	0	151	134	.8	1.4	.15	.675	300	134	2.5	1,010	8.1
June.....	--	1.0	0.00	64	40	82	--	190	0	136	146	.3	1.0	.26	.622	322	166	2.0	1,070	7.8
July 21.....	17.0	11	0.00	64	23	104	4.0	136	0	180	130	.9	2.6	.06	.642	256	144	2.8	1,030	7.7
August.....	--	11	0.00	66	23	104	4.0	134	0	185	130	.9	2.6	.06	.621	258	148	2.8	1,030	7.7
September.....	--	4.6	.07	74	22	80	2.4	192	0	126	110	.8	1.1	.02	.581	276	118	2.1	885	7.7

QUALITY OF SURFACE WATERS, 1959

ARKANSAS RIVER BASIN--Continued

7-2420. NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.

LOCATION.--At gaging station at bridge on U.S. Highway 75, 2.3. miles upstream from Wewoka Creek, and 2.5 miles northeast of Wetumka, Hughes County.

DRAINAGE AREA.--14,290 square miles, of which 4,899 square miles is probably non-contributing.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

Water temperatures: October 1953 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 5,660 micromhos Nov. 22; minimum daily, 345 micromhos July 27.

Water temperatures: Maximum, 94°F Aug. 29; minimum, freezing point on several days during December to February.

EXTREMES, 1953-59.--Dissolved solids (1953-57): Maximum, 25,800 ppm Feb. 8, 1955; minimum, 190 ppm May 26-27, 1957.

Hardness (1953-57): Maximum, 4,640 ppm Dec. 31, 1954; minimum, 108 ppm May 26-27, 1957.

Specific conductance: Maximum daily, 37,100 micromhos Dec. 31, 1954; minimum daily, 319 micromhos Aug. 22, 1958.

Water temperatures: Maximum, 94°F Aug. 29, 1959; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Specific conductance and chloride (Cl), water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)
1	1,510	330	2,880	680	2,920	750	2,630	680
2	1,910	470	2,950	740	2,910	775	2,620	670
3	1,450	320	2,950	740	2,910	750	2,740	725
4	1,610	350	2,950	755	2,800	750	3,140	820
5	1,670	405	2,950	750	2,810	725	3,140	820
6	1,740	450	2,950	750	2,770	700	3,370	880
7	1,840	470	2,990	775	2,650	700	3,250	860
8	2,020	560	2,950	770	2,710	700	2,770	720
9	2,280	650	2,980	780	2,730	700	2,740	710
10	2,000	560	2,980	760	2,690	700	2,680	685
11	2,170	620	3,050	820	2,740	700	2,620	640
12	2,530	740	3,170	840	3,180	860	2,770	700
13	2,510	720	3,200	870	3,580	1,000	2,760	690
14	2,580	760	3,230	880	--	--	2,530	610
15	2,660	780	2,770	740	3,260	850	2,500	610
16	2,620	760	2,510	660	3,010	800	2,310	560
17	2,700	800	2,970	780	2,610	700	2,380	600
18	2,700	780	2,950	790	2,640	680	2,640	660
19	2,720	790	2,970	790	2,680	710	2,520	640
20	2,690	780	2,800	730	2,740	700	2,580	640
21	2,700	780	3,190	850	2,660	650	2,760	700
22	2,720	780	5,660	1,680	2,640	580	2,800	700
23	2,740	780	3,370	875	2,640	560	2,820	720
24	2,770	790	2,980	800	2,590	550	2,620	680
25	2,830	820	2,820	725	--	--	2,470	620
26	2,780	800	2,870	725	2,640	580	2,470	620
27	2,800	800	3,100	800	2,620	560	2,630	700
28	3,000	870	2,700	725	2,600	560	2,570	660
29	2,830	810	2,740	700	2,620	560	2,500	640
30	2,850	800	2,910	750	2,700	600	2,610	680
31	2,900	780	--	--	2,580	540	2,630	700

LOWER MISSISSIPPI RIVER BASIN
ARKANSAS RIVER BASIN--Continued

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7-2420. NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Specific conductance and chloride (Cl), water year October 1958 to
September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	2,610	660	2,820	730	1,800	430	2,030	560
2	2,370	580	2,820	740	2,050	520	2,280	680
3	2,390	580	2,900	740	1,240	290	2,350	680
4	2,380	570	3,250	870	1,820	485	2,300	680
5	2,890	750	1,950	480	1,990	510	1,930	540
6	2,740	720	1,970	510	1,940	510	3,240	960
7	2,700	680	3,150	820	1,980	535	2,870	820
8	2,680	700	3,340	900	2,050	545	1,750	480
9	2,660	680	3,250	860	2,220	585	1,590	440
10	2,620	680	3,310	890	2,290	600	902	188
11	2,850	790	1,710	430	2,160	560	614	125
12	2,760	770	2,680	760	2,070	540	5 595	115
13	2,550	690	2,930	780	2,380	670	619	115
14	3,030	840	2,550	650	2,280	570	922	185
15	3,080	870	2,600	640	1,680	420	1,070	208
16	2,820	780	2,190	510	1,810	450	1,060	218
17	2,610	705	2,360	590	1,510	370	1,130	215
18	2,600	750	2,350	580	1,400	320	1,200	238
19	2,610	700	2,420	610	1,590	380	1,180	210
20	3,030	845	2,550	640	1,920	510	1,220	215
21	2,740	760	1,750	410	1,890	555	1,230	210
22	2,950	820	1,910	500	1,900	530	1,270	235
23	2,900	790	1,770	460	1,690	410	1,270	222
24	2,950	810	1,900	480	1,650	390	1,230	200
25	3,160	800	3,910	1,100	1,650	390	1,140	210
26	2,900	760	2,110	530	1,600	390	1,300	250
27	2,680	680	2,580	660	1,540	370	1,020	225
28	2,700	680	2,200	550	1,520	390	662	112
29	--	--	1,760	440	1,660	420	56563	82
30	--	--	2,290	610	1,950	510	665	109
31	--	--	1,840	440	--	--	963	144
	June		July		August		September	
1	986	158	1,280	290	1,020	225	771	165
2	1,050	190	1,120	250	1,450	330	829	185
3	1,030	172	540	90	1,320	300	1,530	375
4	1,060	178	434	66	1,450	350	1,280	320
5	845	156	840	172	1,630	405	564	102
6	496	84	1,000	230	1,960	510	710	140
7	518	86	1,170	280	2,110	550	1,000	232
8	831	156	898	185	2,150	570	1,040	235
9	1,030	225	1,100	242	2,330	630	819	170
10	1,200	270	1,800	470	2,280	610	874	195
11	1,150	225	1,310	305	1,780	440	855	180
12	1,200	230	1,290	298	1,290	310	886	175
13	660	128	1,420	330	1,130	260	952	210
14	1,110	238	592	116	1,220	280	1,130	260
15	2,000	510	673	130	1,220	270	1,290	305
16	1,740	420	560	110	1,350	310	1,480	365
17	1,670	390	866	190	1,460	330	1,670	420
18	1,780	450	1,010	222	1,630	400	1,750	460
19	1,710	395	1,350	305	1,830	460	1,770	495
20	1,810	430	955	190	1,750	450	1,910	515
21	2,040	505	1,010	218	1,280	320	2,020	510
22	1,880	450	816	170	2,760	795	2,010	500
23	1,990	485	464	87	2,770	770	2,100	530
24	1,340	320	550	110	2,420	660	1,890	460
25	2,190	610	596	120	2,470	665	941	230
26	1,990	440	957	205	2,400	640	462	71
27	450	86	345	54	2,610	740	587	275
28	684	145	894	222	2,330	620	587	268
29	702	144	565	112	2,320	640	515	212
30	686	137	746	161	2,550	710	552	228
31	--	--	835	182	1,140	300	--	--

ARKANSAS RIVER BASIN--Continued
7-2420. NORTH CANADIAN RIVER NEAR WETUMKA, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	51	57	61	65	65	67	76	73	63	60	62	60	62	65	63	65	65	67	66	66	59	56	61	56	54	50	50	49	50	50	60
November ..	53	53	50	54	55	50	56	51	51	48	55	58	60	64	65	64	65	46	45	47	48	48	52	50	54	38	38	38	37	40	--	51
December ..	42	43	42	44	40	34	36	35	33	33	32	32	32	--	32	32	32	33	35	36	35	40	50	39	--	37	42	42	42	36	32	37
January	32	34	32	32	32	--	33	33	32	32	34	43	50	51	42	32	35	36	42	40	32	32	35	49	41	36	37	49	37	37	37	
February	35	32	34	32	33	32	38	48	55	42	39	43	48	47	44	44	47	40	34	34	36	41	44	43	44	45	44	45	--	--	41	
March	45	47	44	47	42	38	40	51	42	59	42	47	50	57	45	48	49	52	50	52	45	42	50	51	60	50	48	42	47	57	62	48
April	52	52	59	59	58	67	65	55	56	52	51	48	46	48	50	57	62	70	62	58	50	50	55	57	71	70	61	65	62	67	--	58
May	73	70	68	74	71	70	65	61	65	66	65	67	72	65	64	65	70	75	74	76	78	77	72	70	74	75	72	74	75	78	78	71
June	77	75	72	73	72	73	77	77	78	78	81	77	77	78	78	75	76	78	81	78	78	80	75	78	78	77	75	78	77	84	--	77
July	79	73	78	78	79	81	82	85	84	75	78	78	78	75	78	76	78	78	76	82	78	79	75	80	82	78	74	78	83	88	83	79
August	82	88	87	86	85	82	82	83	80	77	80	80	84	83	85	84	83	82	78	93	81	83	83	89	88	79	80	78	94	83	86	83
September ..	80	80	78	73	78	80	81	77	71	71	67	68	68	64	66	71	73	74	70	77	78	78	76	72	70	75	76	75	70	69	--	74

ARKANSAS RIVER BASIN--Continued
7-2435. DEEP FORK NEAR BEGGS, OKLA.

LOCATION.--At gaging station at highway bridge, 3 miles upstream from Adams Creek, 4 miles south of Beggs, Okmulgee County, and 8 miles downstream from Flat Rock (Checkerboard) Creek.

DRAINAGE AREA.--2,018 square miles.

RECORDS AVAILABLE.--Chemical analyses: November 1951 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 2,100 ppm Feb. 12; minimum, 161 ppm July 22-31.

Hardness: Maximum, 555 ppm Feb. 12; minimum, 56 ppm July 22-31.

Water temperature: Maximum daily, 3,520 microhms Nov. 20; minimum daily, 160 microhms July 27.

Water specific conductance: Maximum, 91°F June 17; minimum, 33°F on several days during December and January.

EXTREMES, 1951-59.--Dissolved solids: Maximum, 5,340 ppm Mar. 26, 1954, Jan. 11-17, 1955; minimum, 87 ppm Sept. 27, 1955.

Hardness: Maximum, 1,310 ppm July 21, 1955; minimum, 16 ppm Sept. 27, 1955.

Water temperature: Maximum daily, 10,500 microhms Jan. 12, 1955; minimum daily, 113 microhms May 27, 1957.

Water specific conductance: Maximum, 97°F July 28, Aug. 6, 16, 18, 1956; minimum, freezing point on many days during winter months.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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-boronate	
Oct. 1-11, 1958..	89.6	9.6	0.00	55	27	101	4.8	220	0	30	185	0.4	1.7	0.28	536	0.73	130	250	70	2.8	981	7.7
Oct. 12-13.....	73.5	--	--	55	23	104	172	172	0	25	205	--	2.4	--	555	1.75	110	229	91	3.6	997	7.9
Oct. 14-15.....	53.0	--	--	74	31	145	232	232	0	35	285	--	1.6	--	531	1.22	197	314	124	4.1	1,320	8.1
Oct. 16-31.....	40.2	--	--	84	35	176	248	248	0	37	350	--	1.0	--	874	1.56	88	352	149	3.1	1,950	8.0
Nov. 1-18.....	29.6	--	--	96	44	247	278	278	0	58	450	--	1.6	--	1,100	1.99	260	430	192	5.2	2,970	7.9
Nov. 19.....	66.0	--	--	74	55	321	164	164	0	54	650	--	1.4	--	1,460	1.99	260	410	276	6.9	2,970	8.2
Nov. 20-21.....	39.1	--	--	97	55	422	276	276	0	52	540	--	1.3	--	1,720	2.34	239	470	348	8.4	2,950	8.1
Nov. 22-30.....	39.1	--	--	98	49	275	276	276	0	50	540	--	1.3	--	1,240	1.69	131	445	219	5.7	2,170	8.2
Dec. 1-31.....	47.8	--	--	92	51	279	320	320	0	62	510	--	1.4	--	1,200	1.63	155	440	178	5.8	2,090	8.2
Jan. 1-31, 1959..	60.6	4.8	0.00	90	46	264	6.8	310	0	55	470	3	5.0	.41	1,170	1.59	191	415	161	5.6	1,990	7.9
Feb. 1-10.....	59.5	5.5	0.00	75	46	220	7.0	268	0	49	412	3	3.3	.40	1,020	1.39	147	378	158	4.9	1,790	7.5
Feb. 11.....	109.	--	--	82	46	238	292	292	0	49	440	--	5.5	--	1,080	1.47	318	395	156	5.2	1,850	7.9
Feb. 13.....	138	--	--	146	46	479	198	198	0	35	990	--	2.00	--	2,100	2.86	180	555	392	8.8	3,390	7.7
Feb. 13-20.....	80.9	--	--	175	38	224	250	250	0	45	410	--	2.5	--	991	1.35	160	345	140	5.2	1,720	8.2
Feb. 21-28.....	56.9	5.8	0.00	126	23	210	5.6	276	0	313	215	7	9.0	.00	1,170	1.59	180	410	184	4.5	1,620	7.9
Mar. 1-2.....	72.0	--	--	90	41	266	174	174	2	51	490	--	1.6	--	1,120	1.52	218	395	167	5.8	1,980	8.3
Mar. 3-10.....	141.0	--	--	74	27	217	7.2	244	0	38	415	--	3.6	--	993	1.35	378	316	156	5.5	1,620	8.1
Mar. 11-19.....	75.7	8.0	0.00	66	37	182	7.2	244	0	43	332	3	3.6	.31	864	1.18	177	316	116	4.5	1,500	8.1
Mar. 20-31.....	341	--	--	59	26	151	174	174	0	29	290	--	3.0	--	716	.97	659	255	112	4.1	1,210	7.9

ARKANSAS RIVER BASIN--Continued
7-2435. DEEP FORK NEAR BEGGS, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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, Mg-nesium	Non-carbonate			
Apr. 1-10, 1959....	164	--	--	66	29	168	--	236	8	37	292	--	2.2	--	802	1.09	355	285	86	4.3	1,320	8.5
Apr. 11-18.....	98.1	--	--	79	35	187	--	270	0	35	345	--	2.0	--	898	1.22	238	340	118	4.4	1,550	7.9
Apr. 19-22.....	663	--	--	42	15	115	--	102	0	17	225	--	1.8	--	571	1.78	1,030	168	84	3.9	914	7.7
Apr. 23-28.....	183	--	--	66	27	143	--	232	0	34	255	--	1.8	--	715	.97	353	275	85	3.8	1,200	8.0
Apr. 29.....	220	--	--	75	35	208	--	212	10	41	390	--	.1	--	955	1.30	567	330	140	5.0	1,620	8.5
Apr. 30.....	180	--	--	69	31	175	--	220	12	41	310	--	.1	--	855	1.16	416	300	100	4.4	1,380	8.5
May 1-6.....	109	--	--	66	36	158	--	254	4	35	285	--	1.6	--	771	1.05	227	312	98	3.9	1,320	8.3
May 7.....	293	--	--	71	26	246	--	112	0	16	500	--	6.9	--	1,080	1.47	854	284	192	6.3	1,780	8.2
May 8-9.....	302	--	--	58	34	133	--	208	4	26	260	--	3.5	--	696	.95	568	285	108	3.4	1,200	8.4
May 10.....	1,590	--	--	22	11	62	--	70	0	8.2	118	--	3.2	--	321	.44	1,380	100	42	2.7	527	7.3
May 11-17.....	2,510	--	--	19	12	34	--	92	0	10	59	--	2.0	--	231	.31	1,570	96	20	1.5	358	7.8
May 18-23.....	989	--	--	32	16	54	--	134	0	1.4	96	--	1.9	--	326	.44	871	144	34	2.0	543	8.0
May 24-25.....	353	--	--	54	31	115	--	184	4	26	230	--	.2	--	600	.82	572	260	102	3.1	1,050	8.4
May 26.....	1,010	--	--	34	19	66	--	140	0	12	128	--	2.0	--	394	.54	1,070	165	50	2.2	648	8.2
May 27-31.....	2,602	--	--	18	10	38	--	82	0	12	62	--	2.4	--	243	.33	1,710	86	19	1.8	359	8.0
June 1-3.....	3,737	--	--	15	7.9	36	--	60	0	12	61	--	1.7	--	204	.28	2,060	70	21	1.9	312	7.9
June 4-7.....	2,660	--	--	22	10	48	--	80	0	8.6	88	--	1.6	--	259	.35	1,860	96	30	2.1	411	8.0
June 8-10.....	1,053	--	--	40	18	72	--	152	2	19	128	--	.1	--	400	.54	1,140	172	44	2.4	663	8.3
June 11-20.....	318	--	--	56	20	100	--	172	0	21	194	--	1.8	--	520	.71	446	220	79	2.9	952	8.2
June 21-26.....	106	--	--	72	34	141	--	248	8	9.5	300	--	1.9	--	778	1.06	223	320	128	3.4	1,340	8.5
June 27-30.....	585	--	--	43	18	97	--	118	0	11	200	--	1.8	--	523	.71	826	180	54	3.2	777	8.2
July 1.....	909	--	--	30	11	96	--	52	0	9.9	192	--	6.0	--	435	.59	1,070	120	42	1.9	438	7.9
July 2-10.....	1,000	--	--	27	12	47	--	114	0	13	178	--	2.4	--	244	.33	659	146	42	2.4	634	8.2
July 11-15.....	1,427	--	--	58	15	69	--	134	2	14	125	--	2.5	--	355	.46	787	198	36	2.4	475	8.1
July 16-21.....	1,117	--	--	49	9.2	54	--	76	0	6.6	102	--	2.0	--	261	.55	869	158	36	2.4	475	8.1
July 22-31.....	5,285	--	--	14	5.1	27	--	52	0	4.1	46	--	2.2	--	161	.22	2,300	56	14	1.5	252	7.7

Aug. 1-10, 1959.....	1,476	12	0.23	39	12	56	4.8	104	0	26	110	0.1	2.5	0.01	330	0.45	1,320	148	63	2.0	584	8.0
Aug. 11-20.....	225	8.0	.02	62	24	144	2.4	192	0	28	260	.3	1.7	.21	643	.87	391	254	96	3.9	1,100	8.2
Aug. 21-27.....	87.6	--	--	69	37	159		212	0	23	335	--	1.8	--	817	1.11	193	325	152	3.8	1,430	8.2
Aug. 28-29.....	316	--	--	93	42	291		122	0	19	650	--	2.6	--	1,330	1.81	1,130	405	305	6.3	2,250	8.0
Aug. 30-31.....	210	--	--	68	28	203		142	0	13	422	--	2.6	--	913	1.24	518	285	168	5.2	1,590	7.9
Sept. 1-5.....	94.8	--	--	62	29	167		176	0	26	330	--	2.5	--	780	1.06	200	275	131	4.4	1,370	8.1
Sept. 6.....	175	--	--	87	34	298		148	0	19	610	--	1.2	--	1,270	1.73	600	355	234	6.9	2,150	7.9
Sept. 7.....	252	--	--	62	37	146		246	0	48	262	--	.8	--	a 677	.92	461	305	104	3.6	1,270	8.1
Sept. 8.....	110	--	--	34	22	84		180	0	36	122	--	.8	--	a 404	.55	120	175	28	2.8	715	8.0
Sept. 9-10.....	117	--	--	28	14	48		134	0	17	73	--	3.1	--	273	.37	86	128	18	1.9	478	8.0
Sept. 11-20.....	168	--	--	34	21	61		154	0	18	112	--	3.6	--	370	.50	168	172	46	2.0	628	8.0
Sept. 21-23.....	73.7	--	--	46	27	90		188	0	22	172	--	2.6	--	498	.68	99	225	71	2.6	871	8.0
Sept. 24-30.....	1,375	--	--	18	12	46		72	0	12	87	--	2.6	--	260	.35	965	96	37	2.0	422	7.7
Weighted average	538	--	--	29	13	63	--	b101	--	15	115	--	2.2	--	333	0.45	484	126	43	2.4	563	--

a Calculated from determined constituents.

b Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
 7-2435. DEEP FORK NEAR BEGGS, OKLA.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	66	67	72	69	70	72	77	77	87	67	86	72	69	67	69	75	72	72	74	64	66	70	67	67	62	50	59	58	56	53	67
November ..	55	56	67	85	66	65	66	66	62	63	67	64	62	67	67	67	57	53	56	60	64	69	69	58	57	47	42	46	49	50	60	
December ..	--	53	55	53	47	45	46	42	35	39	41	33	33	33	33	34	37	--	45	40	51	53	53	45	49	49	53	50	45	42	40	
January	43	39	34	33	33	35	--	--	42	42	56	55	63	55	42	40	45	51	45	41	33	36	43	44	47	41	43	40	46	43	49	
February	40	39	40	49	39	46	53	54	47	49	47	51	51	54	56	59	56	42	41	44	46	47	55	57	62	59	62	59	--	--	50	
March	56	54	51	48	44	52	54	56	57	55	54	54	50	51	58	59	60	60	64	51	59	60	61	55	54	51	54	54	67	65	55	
April	63	71	59	66	76	76	77	58	60	63	59	51	58	61	63	64	71	71	70	59	61	62	69	70	73	73	71	73	74	79	--	67
May	78	78	78	77	72	73	73	71	74	64	73	77	67	61	66	67	71	77	80	82	72	76	72	73	79	71	75	76	81	83	84	74
June	71	74	74	70	75	78	77	78	78	81	83	84	82	78	82	84	91	85	86	87	82	87	85	80	80	82	--	81	84	84	--	81
July	76	79	81	81	82	85	--	83	88	84	86	86	79	86	76	79	83	83	76	78	79	79	79	79	79	74	79	79	81	--	--	81
August	86	87	87	88	86	90	84	81	80	83	89	84	81	83	83	84	83	84	86	88	83	87	84	83	84	82	82	82	81	81	81	81
September ..	83	83	77	80	80	81	83	83	83	76	76	74	77	74	77	76	74	78	80	80	79	81	79	72	74	77	76	67	--	--	77	

ARKANSAS RIVER BASIN--Continued
7-2450. CANADIAN RIVER NEAR WHITEFIELD, OKLA.

LOCATION.--At gaging station at bridge on State Highway 2, 0.8 mile north of Whitefield, Haskell County, and 5.5 miles upstream from Snake Creek. DRAINAGE AREA.--47,576 square miles, of which 9,700 square miles is probably noncontributing. RECORDS AVAILABLE.--Chemical analyses: September 1944 to February 1945, September 1946 to September 1959. Water temperatures: September 1944 to February 1945, September 1946 to September 1959. EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,620 ppm Nov. 11-14, Jan. 11-20; minimum, 104 ppm Mar. 5. Hardness: Maximum, 490 ppm Dec. 11-31; minimum, 60 ppm Mar. 5.

Specific conductance: Maximum daily, 3,030 microhmhos Oct. 17; minimum daily, 148 microhmhos Mar. 5. Water temperatures: Maximum, 83 F Aug. 4-6; minimum freezing point Dec. 14, 15, Jan. 4, 5, 22. EXTREMES, 1944-59.--Dissolved solids: Maximum, 15,000 ppm Nov. 10-11, 1957; minimum, 89 ppm Jan. 2, 5-7, 1948. Hardness: Maximum, 3,060 ppm Nov. 10, 1956; minimum, 18 ppm Feb. 17, 1946.

Specific conductance: Maximum daily, 22,900 microhmhos Nov. 11, 1956; minimum daily, 71.7 microhmhos Jan. 2, 1948. Water temperatures: Maximum, 88 F Sept. 4, 1944; minimum, freezing point on many days during winter months.

REMARKS.--Data omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance and chloride of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhmhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-bicarbonate			
Oct. 1-4, 1958.....	1,128	--	--	76	22	156	170	0	64	290	--	4.5	--	--	753	1.02	2,290	280	140	4.0	1,310	7.9
Oct. 5-10.....	756	--	--	86	30	218	180	0	59	425	--	3.0	--	--	1,010	1.37	2,060	336	188	5.2	1,740	7.9
Oct. 11-13.....	1,104	--	--	92	35	248	184	0	58	495	--	1.3	--	--	1,190	1.62	3,550	372	281	5.6	1,940	7.9
Oct. 14-31.....	459	--	--	114	38	346	164	0	40	720	--	1.1	--	--	1,430	1.94	1,770	440	306	7.2	2,580	7.8
Nov. 1-10.....	272	--	--	117	43	367	214	0	31	750	--	1.9	--	--	1,560	2.12	1,150	470	294	7.4	2,680	8.2
Nov. 11-14.....	256	--	--	106	48	342	202	4	42	700	--	1.7	--	--	1,620	2.20	1,120	460	288	6.9	2,560	8.4
Nov. 15.....	444	--	--	--	32	207	154	0	31	420	--	.5	--	--	987	1.34	1,180	300	174	5.2	1,590	7.9
Nov. 16-18.....	1,251	--	--	80	46	234	156	0	34	520	--	1.7	--	--	1,180	1.60	3,990	390	262	5.1	1,890	8.1
Nov. 19.....	1,770	--	--	54	18	142	148	0	42	250	--	.8	--	--	628	.85	3,000	210	88	4.3	1,090	8.1
Nov. 20.....	1,370	--	--	64	27	206	144	0	33	400	--	1.2	--	--	921	1.25	3,410	270	152	5.4	1,510	7.8
Nov. 21-22.....	980	--	--	78	31	242	146	0	32	490	--	1.6	--	--	1,020	1.39	2,700	320	200	5.9	1,820	8.2
Nov. 23-30.....	603	--	--	110	45	358	182	4	37	480	--	1.6	--	--	1,530	2.08	2,490	460	304	7.3	2,660	8.3
Dec. 1-10.....	635	--	--	116	37	318	212	6	42	640	--	3.0	--	--	1,390	1.89	2,380	440	256	6.6	2,380	8.3
Dec. 11-31.....	397	--	--	124	44	325	246	6	49	660	--	4.5	--	--	1,460	1.99	1,560	490	278	6.4	2,500	8.3
Jan. 1-10, 1959...	419	--	--	119	42	329	244	10	48	650	--	3.7	--	--	1,480	2.01	1,670	470	254	6.6	2,490	8.4
Jan. 11-20.....	451	7.4	0.00	126	40	357	7.6	266	53	680	0.2	2.0	0.38	--	1,620	2.20	1,970	480	262	7.1	2,560	8.2
Jan. 21-31.....	514	13	0.00	112	39	324	6.6	242	0	78	600	.3	1.9	.25	1,450	1.97	2,010	440	242	6.7	2,350	7.7
Feb. 1-15.....	533	12	0.00	102	38	308	7.2	190	0	85	570	.4	1.2	.30	1,300	1.77	1,870	410	233	6.6	2,250	7.9
Feb. 16-20.....	900	--	--	93	41	273	190	6	123	495	--	2.0	--	--	1,240	1.69	3,010	400	234	5.9	2,100	8.3
Feb. 21-28.....	514	13	0.00	99	42	318	7.0	204	0	94	580	.3	1.0	.32	1,350	1.84	1,870	420	253	6.7	2,310	7.5

ARKANSAS RIVER BASIN--Continued
 7-2450. CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (microhmhos at 25°C)	pH		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate				
Mar. 1-4, 1959.....	497	--	--	101	38	326	--	192	8	79	610	--	6.2	--	1,390	1.89	1,870	239	410	7.0	2,340	8.4	
Mar. 5.....	7,000	--	--	19	3.0	7.4	--	72	0	4.9	8.0	--	1.6	--	104	14	1,970	60	60	1.4	162	7.9	
Mar. 6-10.....	8,250	--	--	31	7.9	53	--	84	0	17	98	--	1.8	--	314	43	6,990	110	110	2.2	494	7.9	
Mar. 11-14.....	2,550	--	--	40	11	96	--	88	0	24	180	--	2.5	--	440	60	3,030	144	144	2.2	759	8.1	
Mar. 15-20.....	1,089	--	--	64	20	188	--	120	0	40	360	--	2.2	--	829	1.13	2,440	240	142	5.3	1,380	8.1	
Mar. 21.....	21,800	--	--	22	2.2	9.9	--	72	0	1.6	17	--	1.4	--	122	1.17	7,180	64	5	1.7	181	7.9	
Mar. 22-23.....	12,680	--	--	27	5.0	36	--	80	0	14	60	--	1.0	--	211	.29	7,220	88	22	1.7	355	7.4	
Mar. 24-26.....	5,840	--	--	38	9.5	89	--	80	0	22	168	--	2.6	--	458	.62	7,220	134	68	3.3	735	7.9	
Mar. 27-28.....	6,695	--	--	24	5.4	34	--	74	0	15	57	--	.8	--	225	.31	4,070	82	22	1.7	338	7.3	
Mar. 29-31.....	2,640	--	--	41	12	108	--	88	0	22	205	--	1.8	--	513	.70	3,660	150	78	3.8	823	7.9	
Apr. 1.....	3,510	--	--	43	12	118	--	92	0	26	220	--	.2	--	486	.66	4,610	156	80	4.1	835	8.0	
Apr. 2-4.....	4,153	--	--	229	7.2	58	--	76	0	23	101	--	.0	--	293	.40	3,290	102	40	2.5	489	7.8	
Apr. 5-10.....	1,440	--	--	47	16	126	--	116	0	30	235	--	1.2	--	559	.76	2,170	184	89	4.0	955	7.9	
Apr. 11-17.....	1,024	--	--	61	21	176	--	134	4	38	330	--	.7	--	783	1.06	2,160	240	124	4.9	1,310	8.4	
Apr. 18.....	3,940	--	--	37	13	89	--	98	2	28	158	--	1.6	--	433	.59	4,610	144	60	3.2	716	8.3	
Apr. 19.....	8,400	--	--	22	7.1	43	--	76	0	20	61	--	1.9	--	230	.31	5,220	84	22	2.1	377	8.2	
Apr. 20.....	14,000	--	--	50	11	109	--	108	2	31	200	--	2.4	--	a	458	.62	17,310	172	80	3.6	854	8.3
Apr. 21-30.....	3,212	13	0.00	46	6.1	107	6.5	190	0	16	200	0.5	3.3	0.00	516	.70	4,470	140	66	3.9	901	8.1	
May 1-7.....	1,990	--	--	58	24	149	--	162	0	43	275	--	1.1	--	700	.95	1,870	244	111	4.1	1,190	8.2	
May 8.....	1,720	--	--	59	30	207	--	134	0	43	400	--	1.8	--	931	1.27	4,320	270	160	5.5	1,560	8.1	
May 9-10.....	32,250	--	--	29	9.1	55	--	58	0	33	105	--	.0	--	296	.40	25,770	110	62	2.3	503	7.6	
May 11-15.....	39,480	--	--	33	7.2	43	--	104	0	27	65	--	1.8	--	242	.33	25,800	112	27	1.8	404	7.5	
May 16-20.....	6,046	--	--	42	14	75	--	124	0	47	125	--	1.9	--	407	.55	6,640	164	62	2.6	669	7.9	
May 21-25.....	3,242	--	--	53	25	104	--	150	4	60	195	--	2.6	--	559	.76	4,890	235	174	2.9	629	8.3	
May 26-28.....	8,793	--	--	38	17	68	--	110	0	37	130	--	.0	--	391	.52	9,050	253	102	3.3	937	8.1	
May 29-30.....	13,720	--	--	54	22	103	--	150	0	68	180	--	.0	--	544	.74	20,560	243	102	3.0	975	8.0	
May 31.....	7,500	--	--	36	13	62	--	110	2	36	104	--	3.7	--	353	.46	6,960	145	55	2.3	568	8.3	

June 1-6, 1959.....	6,767	--	34	14	54	--	110	0	39	90	--	2.0	--	296	0.40	5,410	142	52	2.0	522	8.2
June 7-14.....	5,129	--	40	16	87	--	112	0	35	160	--	1.7	--	435	.59	6,020	166	74	2.9	742	8.2
June 15-18.....	1,852	--	46	18	112	--	116	0	39	210	--	2.2	--	535	.73	2,680	190	95	3.5	935	8.1
June 19-20.....	946	--	63	24	150	--	152	0	47	280	--	1.2	--	719	.98	1,840	256	132	4.1	1,230	8.1
June 21-27.....	2,668	--	71	34	186	--	156	0	65	370	--	1.9	--	920	1.25	6,630	315	187	4.5	1,550	8.2
June 28-30.....	10,490	--	43	13	78	--	108	0	15	160	--	2.6	--	440	.60	12,460	162	74	2.7	1,729	8.2
July 1-10.....	4,380	--	45	14	89	--	116	0	29	168	--	2.6	--	468	.64	5,550	170	75	3.0	791	8.2
July 11-16.....	3,252	--	66	19	150	--	128	2	61	280	--	3.2	--	731	1.02	6,680	244	136	4.2	1,250	8.3
July 17-21.....	7,328	--	64	8.5	98	--	94	0	16	152	--	1.7	--	349	.47	6,750	180	91	2.7	599	8.2
July 22.....	15,900	--	23	7.5	67	--	90	0	13	132	--	3.9	--	a	.6	15,970	186	66	2.9	660	8.6
July 23.....	15,900	--	28	13	67	--	110	0	13	132	--	3.8	--	323	.50	15,970	186	66	2.9	660	8.6
July 24-31.....	31,060	--	22	9.0	29	--	84	0	13	50	--	2.6	--	201	.27	16,860	92	23	1.3	332	7.8
Aug. 1-10.....	7,397	8.8	0.00	19	6.0	74	0.6	64	11	116	0.3	1.1	0.00	309	.42	6,170	72	20	3.8	455	7.7
Aug. 11-20.....	1,491	--	54	23	122	144	144	0	40	235	2.0	2.0	--	610	.83	2,460	228	110	3.5	1,050	8.1
Aug. 21-31.....	1,190	13	.01	89	29	224	5.2	176	0	400	4.0	4.4	.26	1,080	1.47	3,470	340	196	5.3	1,680	8.2
Sept. 1-7.....	4,784	--	67	32	186	--	162	0	120	312	--	7.2	--	872	1.19	11,290	300	167	4.7	1,470	7.9
Sept. 8-10.....	2,483	--	39	22	91	--	126	0	42	168	--	3.8	--	481	.65	3,240	190	86	2.9	838	7.7
Sept. 11-20.....	954	11	.00	36	10	144	2.4	88	0	24	250	3	1.0	640	.87	1,650	132	60	5.4	1,050	8.0
Sept. 21-25.....	1,959	--	55	26	142	--	174	0	38	262	--	2.2	--	696	.95	3,680	245	102	3.9	1,190	8.0
Sept. 26-30.....	27,160	--	37	12	55	--	126	0	32	86	--	3.6	--	334	.45	24,490	142	38	2.0	553	7.7
Weighted average	4,177	--	39	13	83	--	108	--	31	147	--	2.2	--	416	0.57	4,690	151	62	2.9	693	--

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-2450. CANADIAN RIVER NEAR WHITEFIELD, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	57	56	59	56	60	63	68	72	72	61	64	61	59	62	65	64	64	65	65	66	67	51	58	60	58	56	51	51	51	53	55	60
November ..	52	50	52	55	59	51	49	54	53	50	53	56	59	60	53	65	67	50	49	50	49	50	50	58	46	42	38	38	43	--	52	
December ..	46	46	41	43	45	40	38	34	39	38	35	38	34	32	32	34	34	38	43	40	--	--	44	41	41	45	44	45	42	40	40	
January	33	37	33	32	32	34	37	35	35	34	35	44	53	55	46	34	36	34	44	45	34	32	33	36	46	46	36	41	48	42	40	
February	40	36	40	35	40	33	38	45	50	47	41	43	49	52	45	45	50	45	38	36	38	43	44	44	41	47	50	50	--	43		
March	46	48	46	41	46	40	42	47	46	48	48	44	48	55	46	47	48	48	54	54	49	46	48	54	59	55	51	50	51	55	60	
April	60	55	58	55	60	65	66	62	52	55	54	50	50	52	55	58	62	66	64	60	56	55	58	61	63	67	67	63	64	64	59	
May	72	71	70	73	71	69	71	66	64	66	65	66	68	62	64	63	63	63	63	63	73	76	73	71	70	72	74	73	75	76	70	
June	75	72	72	70	68	70	74	75	73	75	76	76	78	76	74	75	79	80	77	79	80	78	76	77	77	77	77	77	78	78	76	
July	76	76	76	78	76	75	80	80	79	79	76	75	75	79	73	76	76	77	76	76	72	74	77	75	75	74	75	74	75	71	79	
August	81	80	82	83	83	83	82	77	75	76	78	77	78	76	79	80	76	80	80	80	80	82	70	78	66	66	62	68	68	70	76	
September ..	75	75	75	73	76	76	77	78	76	72	65	65	66	66	67	67	66	70	70	72	73	74	74	73	70	73	70	76	71	69	--	

ARKANSAS RIVER BASIN--Continued
7-2453. SALLISAW CREEK AT BUNCH, OKLA.

LOCATION.--At bridge on county highway at Bunch, Adair County, 1959.
RECORDS AVAILABLE.--Chemical analyses: May 1958 to September 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean silica discharge (cfs)	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			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
														Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium Magnesium	Non-carbonate		
Oct. 7, 1958.....			47	1.1	1.4		136	0	3.7	5.5	--	1.8	--	150	0.20	122	10	0.1	242	8.1
Nov. 3.....	12		46	1.8	.9		130	0	4.9	2.2	0.2	1.8	--	143	.19	122	8	.0	228	8.2
Dec. 3.....	12		47	1.5	.2		136	2	4.5	2.1	--	2.0	--	135	.18	120	10	.0	243	8.0
Feb. 5, 1959.....	12		46	1.7	2.1		136	0	4.1	6.2	--	2.3	--	141	.19	122	10	.1	242	8.1
Mar. 5.....	10		--	--	--		72	0	--	--	.6	--	0.00	--	--	160	1	--	132	8.1
Apr. 6.....	--		--	--	--		112	0	--	--	.1	--	.28	--	--	100	8	--	133	8.0
May 6.....	--		--	--	--		117	0	--	2.0	.0	--	--	--	--	101	5	--	201	8.2
June 10.....	--		--	--	--		110	0	--	2.0	.0	--	--	--	--	94	4	--	189	7.6
July 8.....	--		36	1.0	3.4		112	0	2.9	4.0	--	1.0	--	--	103	.14	94	.2	197	7.9
Aug. 13.....	40		40	1.5	--		126	0	--	3.0	--	--	--	--	--	106	2	--	216	7.9
Sept. 2.....	--		37	.9	--		112	0	--	4.0	--	--	--	--	--	96	4	--	196	7.7

ARKANSAS RIVER BASIN--Continued
7-2455. SALLISAW CREEK NEAR SALLISAW, OKLA.

LOCATION.--At gaging station on abandoned highway bridge, 400 feet downstream from water-supply dam of city of Sallisaw, 3.5 miles west of Sallisaw, Sequoyah County, and 5 miles upstream from Little Sallisaw Creek.
DRAINAGE AREA.--182 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1951 to September 1956, October 1957 to September 1959.
REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
															Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium, magnesium	Non-carbonate			
Oct. 3, 1958.....	30	--	--	29	0.4	3.0	--	86	--	5.8	2.6	--	0.4	--	122	--	0.17	74	4	0.2	158	7.9
Oct. 9.....	14.0	--	--	26	1.2	4.4	--	80	--	--	3.5	--	--	--	--	--	--	70	4	0.2	159	8.1
Nov. 3.....	13	--	--	30	1.2	4.6	--	98	--	5.4	2.8	0.4	0.2	--	110	--	0.15	80	0	0.2	174	8.1
Nov. 3.....	13.5	--	--	26	2.7	3.5	--	82	--	--	3.0	--	--	--	--	--	--	76	9	0.2	157	8.1
Dec. 29.....	30.7	--	--	22	2.2	2.0	--	68	--	6.6	3.3	--	--	--	--	--	--	64	8	0.1	134	8.0
Jan. 7, 1959.....	35	7.5	--	24	1.5	1.8	--	72	--	6.6	2.4	--	0.5	--	84	--	0.11	66	7	0.1	140	7.7
Feb. 2.....	26	--	--	--	--	--	--	72	--	--	--	0.1	0.2	0.00	--	--	--	66	7	--	140	7.9
Mar. 2.....	63	9.6	--	--	--	--	--	80	--	--	--	0.3	0.0	--	--	--	--	72	6	--	139	8.0
Apr. 2.....	655	--	--	--	--	--	--	60	--	--	3.0	0.1	0.0	--	--	--	--	54	5	--	122	7.8
May 2.....	157	--	--	--	--	--	--	56	--	--	3.0	0.1	0.0	--	--	--	--	67	21	--	146	7.8
May 30.....	124	--	--	--	--	--	--	69	--	--	2.0	0.0	0.0	--	--	--	--	61	4	--	134	7.5
June 6.....	120	--	--	--	--	--	--	74	--	--	2.0	0.0	0.0	--	--	--	--	64	4	--	138	7.8
June 13.....	94	--	--	--	--	--	--	66	--	--	2.5	0.0	0.0	--	--	--	--	59	5	--	134	7.3
June 20.....	45	--	--	--	1.5	3.2	--	66	--	5.8	2.5	0.0	0.2	--	--	--	--	76	2	0.2	162	7.8
June 27.....	32	--	--	28	2.4	2.1	--	92	--	3.3	3.0	0.0	1.7	--	--	--	--	80	4	0.1	170	8.0
July 5.....	11	--	--	28	2.4	5.8	--	100	--	5.4	3.0	0.1	0.6	--	--	--	--	86	0	0.3	180	8.0
July 12.....	7.0	--	--	31	6.2	2.3	--	88	--	7.0	3.8	0.0	0.0	--	--	--	--	88	0	0.1	167	8.0
July 19.....	16	--	--	29	2.8	1.4	--	96	--	2.5	3.8	0.0	0.5	--	--	--	--	87	6	0.1	173	7.9
July 26.....	287	--	--	27	6	1.4	--	78	--	2.9	3.6	0.0	1.1	0.1	--	--	0.10	70	6	0.1	147	7.9
Aug. 2.....	50	--	--	26	1.7	2.8	--	86	--	3.7	4.0	0.0	0.8	--	--	--	0.11	72	2	0.1	160	7.9
Aug. 9.....	25	--	--	28	1.0	--	--	88	--	--	4.5	0.0	0.0	--	--	--	--	74	2	--	163	7.7
Aug. 16.....	12	--	--	29	1.8	7.6	--	94	--	3.7	14	0.0	1.2	--	--	--	0.14	80	8	0.4	199	7.8
Aug. 23.....	5.0	--	--	30	1.2	--	--	94	--	--	3.0	0.0	0.0	--	--	--	--	80	3	0.4	169	7.8
Aug. 30.....	14	--	--	28	1.9	--	--	94	--	--	3.0	0.0	0.0	--	--	--	--	78	1	--	167	7.8
Sept. 4.....	740	--	--	24	3.9	2.9	--	72	--	--	2.8	0.0	1.6	0.1	--	--	--	76	17	0.1	139	7.6
Sept. 6.....	6.0	--	--	29	2.3	2.1	--	94	--	2.5	4.8	0.0	0.0	0.01	--	--	0.12	82	5	0.1	170	7.9
Sept. 13.....	2.0	--	--	30	1.2	3.7	--	96	--	2.1	5.0	0.0	0.4	0.00	--	--	0.12	80	2	0.2	171	7.9
Sept. 20.....	3.0	--	--	27	2.6	5.5	--	92	--	4.5	6.4	0.0	1.3	--	108	--	0.15	78	2	0.3	182	7.7
Sept. 27.....	17	--	--	20	3.9	3.9	--	76	--	5.8	3.3	0.0	1.7	--	89	--	0.12	66	4	0.2	145	7.5

ARKANSAS RIVER BASIN--Continued
7-2460. SAN BOIS CREEK NEAR KEOTA, OKLA.

LOCATION --At bridge on State Highway 9, 3 miles west of Keota, Haskell County.

RECORDS AVAILABLE--May 1958 to September 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			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. 6, 1958.....		--		7.2	3.4	9.9		36	0	15	4.8	--	1.9	104	--	0.14	32	2	0.8	107	7.3
Nov. 4.....	13			11	6.4	9.4		64	0	16	3.9	--	.2	--	91	.12	54	.6	155	8.0	
Dec. 5.....	12			8.0	4.9	15		44	0	25	3.4	--	1.0	--	94	.13	40	4	1.0	147	7.9
Jan. 8, 1959.....	12			8.0	3.4	9.0		36	0	11	8.3	0.6	1.0	102	--	.14	34	4	.7	143	7.5
Feb. 4.....				--	--	--		32	0	--	--	.3	--	--	--	--	38	12	--	138	7.4
Mar. 4.....	7.4			--	--	--		44	0	--	--	.6	0.00	--	--	--	56	20	--	161	7.5
Apr. 4.....				--	--	--		30	0	--	--	.5	.38	--	--	--	36	12	--	80	7.5
May 5.....				--	--	--		37	0	--	5.0	--	.1	--	--	--	32	2	--	115	7.5
June 3.....				--	--	--		104	0	--	2.0	.2	--	--	--	--	120	35	--	429	7.7
July 12.....				56	41	160		248	8	414	5.0	1.1	2.6	--	809	1.10	310	94	3.9	1,160	8.4
Aug. 13.....				50	38	144		232	4	371	612	--	1.0	--	731	.99	280	84	3.7	1,050	8.4
Sept. 13.....				54	60	110		276	0	373	3.0	--	1.6	739	1.01	380	154	2.5		1,090	8.1

ARKANSAS RIVER NEAR SALLISAW, OKLA.

7-2465. ARKANSAS RIVER NEAR SALLISAW, OKLA.

LOCATION.--At Kansas City Southern Railroad Co. bridge, 0.5 mile south of Hedlands, 4 miles downstream from Cache Creek, and 15 miles downstream from gaging station.

DRAINAGE AREA.--147,898 square miles, of which 22,241 square miles as probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

Water temperatures: June to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,380 ppm Feb. 4; minimum, 208 ppm July 19-31.

HARDNESS: Maximum, 385 ppm Dec. 29-31, Jan. 6-7; minimum, 104 ppm July 19-31.

Specific conductance: Maximum daily, 2,500 micromhos Dec. 31; minimum daily, 302 micromhos July 28.

Water temperatures: Maximum, 88°F Aug. 7.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for gaging station for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. iron (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	Non-carbonate			
Oct. 1-3, 1958	16,270	--	--	53	14	67		148	0	54	110	--	3.6	422	0.57	18,540	190	63	2.1	695	8.1
Oct. 4	10,700	--	--	60	12	92		172	0	54	142	--	3.1	478	.65	13,810	200	59	2.8	809	8.2
Oct. 5-6	7,675	--	--	61	16	77		182	0	53	127	--	1.4	450	.61	9,330	216	67	2.3	780	8.2
Oct. 7-8	7,655	--	--	83	18	223		190	0	98	358	--	2.8	929	1.26	19,200	280	124	5.8	1,590	8.2
Oct. 9	7,360	--	--	--	62	15	137	150	0	68	210	--	3.2	595	.81	11,820	216	93	3.8	1,020	8.1
Oct. 10-13	7,860	--	--	66	16	111		158	0	77	185	--	3.4	666	.91	14,130	232	102	3.2	1,130	8.1
Oct. 14	7,360	--	--	78	22	156		180	0	87	272	--	2.4	841	1.14	16,710	284	136	4.0	1,430	8.1
Oct. 15	9,050	--	--	91	25	277		184	0	126	460	--	2.4	1,140	1.55	27,860	330	179	6.6	1,930	8.2
Oct. 16-19	9,385	--	--	72	19	189		156	0	97	310	--	2.5	830	1.09	20,300	258	130	5.1	1,380	8.2
Oct. 20	6,650	--	--	63	16	61		182	0	55	105	--	2.2	527	.72	9,430	224	75	1.8	893	8.2
Oct. 21-28	5,651	--	--	74	39	69		350	0	34	122	--	2.0	575	.78	8,770	346	59	1.6	970	8.0
Oct. 29-31	4,903	--	--	77	21	182		174	0	90	325	--	2.4	837	1.14	11,080	278	136	5.6	1,440	8.2
Nov. 1-9	4,356	--	--	76	22	187		174	0	89	320	--	1.9	828	1.13	9,740	280	138	4.9	1,440	8.2
Nov. 10-12	3,970	--	--	83	26	229		188	0	103	390	--	1.7	974	1.32	10,440	314	160	5.6	1,680	8.2
Nov. 13	4,740	--	--	90	28	132		306	0	56	225	--	2.0	708	.96	9,060	340	89	3.1	1,250	8.2
Nov. 14	6,200	--	--	86	28	278		176	0	135	458	--	1.4	1,130	1.54	18,920	328	184	6.6	1,940	8.2
Nov. 15-16	7,675	--	--	45	12	79		120	0	42	134	--	1.4	395	.54	8,190	160	62	2.7	683	8.0
Nov. 17	7,810	--	--	78	25	76		292	0	38	130	--	2.0	75	.75	11,580	298	58	1.9	904	8.2
Nov. 18	8,120	--	--	54	17	146		128	0	62	248	--	1.6	612	.83	13,420	204	99	4.4	1,040	8.1
Nov. 19	9,050	--	--	67	24	197		148	0	91	338	--	1.4	868	1.18	21,210	266	144	5.3	1,460	8.2
Nov. 20	8,450	--	--	56	20	137		136	0	60	242	--	2.0	633	.86	14,410	220	107	4.0	1,400	8.1
Nov. 21-28	10,500	--	--	64	17	118		146	0	94	210	--	2.6	630	.86	17,860	230	108	3.4	1,040	7.1
Nov. 29	10,000	--	--	59	15	91		144	0	58	160	--	2.8	496	.67	13,940	206	90	2.7	857	8.1
Nov. 30	10,000	--	--	66	20	128		158	0	78	222	--	2.6	657	.89	17,740	248	118	3.5	1,110	8.2

7-2465. ARKANSAS RIVER NEAR SALLISAW, OKLA.--Continued
 ARKANSAS RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb- on- ate (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluor- ide (F)	Ni- trate (NO ₃) (E)	Bo- ron (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		So- dium sorp- tion ratio	Specific ad- ductance (micro- mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Mag- nesium	Non-car- bon- ate			
Dec. 1-8, 1958...	7,008	--	--	70	18	127		164	0	70	225	--	3.4	--	697	0.95	13,190	250	116	3.5	1,110	8.2
Dec. 9,	5,510	--	--	101	29	218		212	12	107	380	--	3.8	--	1,080	1.47	16,070	370	178	4.9	1,720	8.6
Dec. 10,	6,920	--	--	78	21	175		174	6	79	300	--	4.0	--	873	1.19	16,310	280	156	4.5	1,410	8.4
Dec. 11,	6,200	--	--	87	23	223		188	6	101	370	--	5.7	--	1,010	1.37	16,910	310	146	5.5	1,570	8.5
Dec. 12,	6,200	--	--	72	16	173		160	2	71	290	--	3.5	--	813	1.11	13,610	245	110	4.8	1,350	8.3
Dec. 13-16,	4,678	--	--	81	21	210		184	2	91	350	--	4.0	--	917	1.25	11,580	290	136	5.3	1,580	8.3
Dec. 17-18,	5,780	--	--	75	20	154		174	4	77	265	--	3.4	--	775	1.05	12,090	270	121	4.1	1,320	8.3
Dec. 19-21,	5,480	--	--	58	13	129		148	0	50	195	--	2.9	--	509	.69	7,350	200	178	2.8	844	8.2
Dec. 22-28,	4,947	--	--	86	23	229		194	0	100	325	--	3.7	--	1,020	1.39	13,650	310	151	3.5	1,390	7.9
Dec. 29-31,	5,347	--	--	108	29	316		216	6	139	420	--	4.2	--	1,150	1.54	19,490	385	176	6.5	2,520	8.3
Jan. 1, 1959,	6,340	--	--	93	26	262		196	6	139	420	--	4.2	--	1,150	1.54	19,490	340	160	5.2	1,860	8.3
Jan. 2-5,	5,198	--	--	82	26	207		200	0	109	340	--	4.0	--	978	1.33	13,730	310	146	5.1	1,630	7.7
Jan. 6-7,	6,200	--	--	104	31	303		228	4	150	490	--	4.0	--	1,320	1.80	22,110	385	192	6.7	2,170	8.3
Jan. 8-9,	5,985	--	--	84	22	231		188	2	109	375	--	3.6	--	1,040	1.41	16,810	300	142	5.8	1,700	8.3
Jan. 10-11,	5,215	--	--	70	20	181		162	0	87	300	--	3.0	--	833	1.13	11,700	255	122	4.9	1,370	8.2
Jan. 12-15,	4,940	--	--	90	24	273		192	0	118	450	--	3.8	--	1,180	1.60	15,740	325	168	6.6	1,940	8.0
Jan. 16-29,	5,166	--	--	93	30	280		208	0	137	460	--	3.9	--	1,230	1.67	17,160	355	184	6.5	2,010	8.2
Jan. 30-31,	7,220	--	--	58	15	140		138	0	68	230	--	1.4	--	661	.86	12,890	205	92	4.3	1,100	8.1
Feb. 1-3,	5,397	--	--	80	22	254		168	4	106	415	--	3.1	--	1,050	1.43	15,300	290	146	6.5	1,770	8.4
Feb. 4,	8,430	--	--	94	28	353		180	6	147	540	--	3.9	--	1,380	1.88	31,410	350	192	8.2	2,260	8.4
Feb. 5-9,	6,750	--	--	69	19	169		152	2	94	275	--	3.5	--	766	1.04	13,960	250	122	4.6	1,290	8.3
Feb. 10-11,	6,420	--	--	82	26	210		176	4	115	350	--	3.7	--	982	1.34	17,020	310	160	5.2	1,600	8.4
Feb. 12-17,	10,650	--	--	74	21	177		176	0	95	290	--	3.9	--	828	1.13	23,810	270	126	4.7	1,360	7.5
Feb. 18-23,	11,480	--	--	75	23	223		150	4	119	360	--	4.2	--	968	1.32	30,000	280	150	5.8	1,620	8.4
Feb. 24,	10,440	--	--	83	25	342		156	4	134	550	--	4.2	--	1,330	1.81	37,350	310	176	8.4	2,230	8.5
Feb. 25-28,	8,440	--	--	74	21	230		146	4	120	356	--	4.9	--	969	1.22	22,080	270	144	6.1	1,620	8.4
Mar. 1-5,	10,050	--	--	72	24	187		156	0	120	305	--	4.3	--	893	1.21	24,230	280	152	4.9	1,450	8.2
Mar. 6-15,	26,980	--	--	47	13	72		104	0	59	126	--	3.6	--	418	.57	30,450	170	85	2.4	695	7.3
Mar. 16-21,	19,300	--	--	56	15	112		118	0	88	180	--	3.4	--	573	.78	30,790	200	104	3.4	951	8.2
Mar. 22-25,	34,900	--	--	38	9.7	49		86	0	44	84	--	2.8	--	329	.45	30,470	130	60	1.9	504	7.9
Mar. 26-31,	16,900	--	--	56	16	131		116	0	82	218	--	2.2	--	658	.89	30,020	205	110	4.0	1,060	8.0

Apr. 1-4, 1959...	16,920	--	53	15	136	110	0	83	222	0.89	29,970	195	105	4.2	1,060
Apr. 5-7.....	13,720	--	71	22	299	136	0	136	475	1.200	44,490	275	164	7.8	2,000
Apr. 8-12.....	12,880	--	64	22	164	136	0	100	265	1.06	26,140	315	124	4.7	1,260
Apr. 13.....	17,300	--	85	24	268	158	0	149	430	1.56	50,610	310	180	6.6	1,890
Apr. 14.....	19,200	--	90	23	189	196	0	107	325	.977	60,650	250	160	4.6	1,540
Apr. 15-19.....	18,360	--	70	18	188	148	0	101	305	1.18	42,930	250	128	5.2	1,390
Apr. 20-24.....	29,520	--	50	13	109	112	0	61	184	.567	45,190	180	88	3.5	893
Apr. 25.....	18,800	--	64	18	210	116	0	102	348	1.25	46,500	235	140	6.0	1,490
Apr. 26-27.....	12,950	--	58	15	135	132	0	77	220	.92	23,600	205	97	4.1	1,060
Apr. 28-30.....	13,430	--	67	20	204	148	0	104	328	1.24	33,070	250	128	5.6	1,480
May 1-9.....	10,340	5.5	62	17	180	144	0	96	282	1.00	20,490	226	108	5.2	1,300
May 10-16.....	70,910	10	46	10	68	130	0	39	111	.50	70,460	156	50	2.4	636
May 17-19.....	30,370	10	57	13	150	148	0	69	232	.84	50,840	194	72	4.7	1,100
May 20-23.....	46,220	8.0	46	23	49	124	0	37	116	.53	48,540	162	60	2.2	675
May 24-31.....	45,320	9.0	49	11	85	120	0	56	136	.58	52,490	166	68	2.9	743
June 1-30.....	17,950	8.4	0	00	60	144	0	81	230	1.00	35,480	240	122	3.7	1,090
July 1-16.....	13,300	--	62	12	135	138	0	70	218	.84	22,230	202	89	4.2	1,050
July 17-18.....	67,900	--	49	7.7	79	118	2	49	122	.55	74,250	154	54	2.8	689
July 19-31.....	121,000	--	34	4.6	25	98	0	23	37	.208	67,950	104	24	1.1	333
Aug. 1-10.....	34,330	--	40	10	44	122	0	37	70	.39	26,230	142	42	1.6	504
Aug. 11-26.....	15,140	5.6	00	50	19	83	0	58	145	.66	19,780	204	91	2.5	768
Aug. 27-31.....	10,400	--	62	22	140	150	0	81	240	.87	18,060	245	122	3.9	1,140
Sept. 1-9.....	10,040	--	68	23	206	158	0	102	335	1.16	23,200	265	136	5.5	1,510
Sept. 10-20.....	7,216	--	50	17	115	138	0	65	185	.72	10,270	195	82	3.6	936
Sept. 21-22.....	3,305	--	62	20	182	142	0	90	298	1.01	6,660	235	118	5.2	1,340
Sept. 23-25.....	3,493	--	54	16	109	156	0	54	178	.75	11,110	200	72	3.3	914
Sept. 26.....	35,000	--	39	18	201	154	0	74	320	1.07	110,100	220	94	5.9	1,400
Sept. 27.....	92,700	--	43	13	99	116	0	56	135	.60	109,900	260	65	3.4	805
Sept. 27-29.....	71,800	--	73	24	189	164	0	133	290	1.13	167,900	280	146	4.9	1,420
Sept. 30.....		--													
Weighted average	19,730	--	52	13	101	130	--	60	165	0.70	27,330	183	76	3.8	849

a Includes equivalent of individual carbonate values.

ARKANSAS RIVER BASIN--Continued
 7-2465. ARKANSAS RIVER NEAR SALLISAW, OKLA.--Continued
 Temperature (°F) of water, June to September 1959

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	--	75	73	74	73	74	77	77	77	79	79	79	78	77	77	77	80	80	78	78	77	77	77	77	78	77	77	78	80	83	--	77	
July	81	80	82	82	85	78	81	81	82	82	82	81	78	--	82	81	77	78	78	77	76	78	75	77	78	77	77	80	78	79	81	79	
August	83	86	82	--	85	85	82	82	80	80	81	80	84	84	--	83	83	84	84	84	--	85	83	85	86	85	--	84	85	84	84	83	84
September ..	81	--	75	76	78	83	83	84	78	73	74	74	74	76	75	78	77	77	74	77	76	77	76	76	75	77	76	76	73	79	--	77	

CACHE CREEK NEAR COWLINGTON, OKLA.

LOCATION ---At bridge on U.S. Highway 59, 2 miles southeast of Cowlington, Haskell County.
 RECORDS AVAILABLE ---November 1958 to September 1959.
 REMARKS ---Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH		
															Residue at 180°C (ppm)	Calculation (ppm)	Tons per acre-foot	Calcium, Magnesium	Non-carbonate				
Nov. 6, 1958.....	--	--	--	18	11	43	--	84	--	21	20	9.8	--	--	--	--	82	92	23	2.0	467	7.8	
Dec. 5.....	--	--	--	9.6	4.4	1.4	--	44	44	9.9	8.7	0.6	1.2	--	--	--	82	42	6	1.0	151	7.5	
Jan. 8, 1959.....	12	--	--	7.2	4.4	5.6	--	28	28	16	8.5	2.1	1.6	--	--	--	108	36	13	4.4	145	7.4	
Feb. 4.....	10	--	--	8.8	5.4	5.1	--	30	30	16	8.7	2.1	1.6	--	--	--	112	44	20	3.3	161	7.4	
Mar. 4.....	7.8	--	--	--	--	--	--	36	36	--	--	2	--	0.00	--	--	--	44	14	16	--	129	7.5
Apr. 4.....	--	--	--	--	--	--	--	24	24	--	--	--	--	0.51	--	--	--	36	16	--	--	106	7.3
May 5.....	--	--	--	--	--	--	--	46	46	91	6.5	2	--	--	--	--	--	51	14	14	--	198	7.5
June 3.....	--	--	--	15	7.4	42	--	54	54	21	12	2	2.4	--	--	--	197	68	24	2.2	320	7.6	
Aug. 9.....	--	--	--	11	4.0	11	--	44	44	21	6.6	--	7	1.4	--	--	76	44	8	7	137	7.6	
Sept. 13.....	--	--	--	7.2	11	12	--	68	68	23	5.6	--	1.4	--	--	--	102	62	6	7	205	7.5	

ARKANSAS RIVER BASIN--Continued
7-2466.S. SKIN BAYOU NEAR GANS, OKLA.

LOCATION.--At bridge on U.S. Highway 64, 2 miles east of Gans, Sequoyah County.
RECORDS AVAILABLE.--May 1958 to September 1959.
REMARKS.--Dashes omitted in Potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
															Residue at 180°C (ppm)	Calculated (ppm)					Calcium, Magnesium	Non-carbonate	Tons per acre-foot
Oct. 3, 1958.....				8.0	1.0	3.7		28		5.4	2.2	--	0.5	--	69	0.09	1	0.3	70	7.5
Nov. 3.....				7.2	1.5	5.5		26		8.6	2.7	0.2	1.8	--	56	.08	2	.5	73	7.6
Dec. 2.....				5.4	1.9	4.8		20		11	2.9	.2	.6	--	53	.07	6	.4	72	7.3
Jan. 7, 1959.....			13	7.2	1.9	4.1		20		9.5	5.6	--	.6	--	52	.07	10	.4	76	7.4
Feb. 3.....				--	--	--		18		--	--	--	--	--	32	--	17	--	80	7.1
Mar. 3.....				--	--	--		20	0.00	--	--	.2	--	--	40	--	24	--	80	7.4
Apr. 3.....				--	--	--		14		--	--	1	--	--	28	--	16	--	55	7.0
May 2.....				--	--	--		19		3.4	3.4	--	--	--	20	--	4	--	63	7.3
May 26.....				--	--	--		19		4.1	2.0	.0	8	0.03	--	51	.07	2	113	7.7
July 9.....				11	3.5	3.7		38		2.5	3.2	--	--	--	36	.05	4	.1	84	7.5
Aug. 16.....				8.0	3.4	1.8		36		1.6	3.4	--	--	--	40	.05	3	.1	86	7.4
Sept. 6.....				10	2.1	1.8		40		1.6	3.4	--	--	--	40	.05	3	.1	86	7.4

ARKANSAS RIVER BASIN--Continued

7-2470. POTEAU RIVER AT CAUTHRON, ARK.

LOCATION.--At gaging station at bridge on county road at Cauthron, Scott County, 8 miles downstream from Jones Creek.

DRAINAGE AREA.--200 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 6, 1958.....	2.6			3.6	2.8	3.7	2.3	28	5.2	2.8		0.6	44	20	0	63	7.0	8
Nov. 3.....	5.4			3.6	2.0	3.5	3.3	24	5.6	3.0		.5	47	17	0	58	7.0	35
Dec. 1.....	97			4.7	1.8	5.4	1.8	18	8.8	4.8		.6	68	19	4	70	6.6	45
Jan. 5, 1959.....	30			4.0	3.0	7.0	1.2	20	14	5.8		.8	64	22	4	82	6.8	30
Jan. 26.....	82			3.1	2.3	6.0	1.6	15	10	5.2		.4	84	17	4	76	6.7	5
Feb. 19.....	109			2.1	2.2	5.0	1.6	14	7.8	4.2		.5	77	14	2	58	6.7	5
Mar. 16.....	102			3.0	1.5	4.9	1.2	14	9.9	4.0		.0	54	14	2	62	6.8	7
Apr. 13.....	67			2.5	2.2	4.6	1.0	16	8.4	3.5		.1	34	15	2	61	7.3	6
May 11.....	43			3.3	2.4	4.8	1.1	22	9.0	3.0		.1	42	23	0	63	7.7	7
June 9.....	7.7			4.2	3.0	6.3	1.5	32	6.6	3.8		.3	53	23	0	73	6.7	7
July 4.....	11.5			4.1	2.9	6.7	1.5	29	5.4	3.5		.3	50	23	0	84	7.7	4
Aug. 4.....	11			4.1	2.6	4.7	1.6	20	5.4	3.0		1.6	55	20	0	65	6.8	4
Aug. 31.....	12			3.7	2.8	4.4	1.6	30	3.8	3.0		.0	52	20	0	64	6.5	5
Sept. 28.....	.3			4.5	3.2	4.8	1.8	35	3.8	3.5		.0	49	24	0	72	6.7	5

ARKANSAS RIVER BASIN--Continued

7-2480. WISTER RESERVOIR NEAR WISTER, OKLA.
(Formerly published as Poteau River at Wister Reservoir, near Wister, Okla.)

LOCATION.--At release gate at Wister Dam, on Poteau River, 2 miles south of Wister, Le Flore County.

DRAINAGE AREA.--993 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1948 (daily), December 1955 to September 1959 (monthly).

Water temperatures: October 1947 to September 1948.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of reservoir storage for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhm-cm at 25°C)	pH	
															Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate			
Oct. 8, 1958.....		5.5	0.21	3.2	1.7	3.5	1.7	14	0	6.6	2.5	0.5	2.0	0.07	57	0.08	15	4	0.4	59	6.1
Nov. 5.....		7.5	.04	3.2	1.9	6.0	2.1	12	0	12	5.5	.4	1.6	.12	52	.07	16	6	.6	65	6.6
Dec. 8.....		5.5	.2	3.2	2.4	3.5	1.8	16	0	7.1	2.3	.6	1.3	.09	46	.06	18	5	.4	46	6.6
Jan. 24, 1959.....		2.5	.25	2.4	1.9	4.0	1.9	16	0	7.2	2.4	.4	2.4	.03	58	.08	14	1	.5	62	6.6
February.....		8.0	.37	3.6	1.7	4.0	2.5	16	0	10	3.8	.2	1.6	.08	58	.08	16	3	.4	66	6.5
Mar. 3.....		8.4	.04	8.0	.7	5.5	.3	16	0	15	4.1	.3	1.8	.01	52	.07	23	10	.5	67	6.8
Apr. 21.....		4.0	.22	2.8	1.7	3.5	1.6	10	0	6.8	2.1	.5	1.9	.06	55	.07	14	6	.4	58	6.4
May 4.....		8.0	.10	3.2	1.7	4.1	.3	12	0	10	3.0	.4	.7	.02	41	.06	15	5	.5	66	6.7
June 9.....		7.5	.19	3.6	1.9	4.5	2.2	20	0	8.3	3.1	.6	1.2	.06	53	.07	17	0	.5	64	6.7
July 8.....		7.8	.12	3.5	1.6	4.1	1.0	10	0	10	2.6	.2	1.4	.01	40	.05	15	7	.5	66	6.2
August.....		6.8	.23	3.2	1.5	2.8	.3	8.0	0	8.4	2.1	.4	1.2	.02	39	.05	14	8	.3	63	6.1
September.....		7.2	.11	4.8	1.5	4.4	.2	18	0	7.6	3.4	.2	1.4	.02	43	.06	18	3	.4	63	6.7

ARKANSAS RIVER BASIN--Continued
7-2494.2. POTEAU RIVER NEAR BRADEN, OKLA.

LOCATION.--At bridge on U.S. Highway 271, one mile south of Braden, Le Flore County.
RECORDS AVAILABLE.--October 1958 to September 1959.
REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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
Oct. 6, 1958.....				6.4	2.9	9.4		30		16	3.4					93	0.13	28	4	0.8	99	7.4
Nov. 4.....	10			6.4	3.9	9.2		36		15	4.0					62	.09	32	2	.7	113	7.7
Jan. 8, 1959.....	10			6.4	3.4	5.1		22		12	6.8		0.6	1.1		85	.12	30	12	.4	113	7.3
Feb. 4.....								24					.3					46	26		120	7.3
Mar. 4.....	7.8							40					.2					72	39		136	7.8
Apr. 4.....								16										20	7		66	7.1
May 5.....								25			4.0							26	6		104	7.4
June 3.....				5.6	3.4	11		30		20	4.0							28	4	.9	117	7.2
July 12.....				10	4.6	22		61		29	7.0		1.1	1.2		104	.14	44	0	1.4	195	7.8
Aug. 9.....				5.6	2.4			26			4.5							24	2		85	7.2
Sept. 13.....				7.2	4.9			38			4.5							38	7		110	7.3

ARKANSAS RIVER BASIN--Continued
7-2498. LEE CREEK NEAR SHORT, OKLA.

LOCATION.--At bridge on county highway, half a mile west of Short, Sequoyah County.
RECORDS AVAILABLE.--May 1958 to September 1959.
REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	pH
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 7, 1958.....		--			1.2	3.7		48	2.9	3.7	--	0.4	--	73	--	0.10	40	0	0.3	97	7.8
Nov. 3.....		12		14	1.2	9.4		50	2.1	12	--	.4	--	--	76	.10	40	0	.6	126	7.8
Jan. 7, 1959.....		9.0		12	1.0	3.0		38	3.7	3.9	0.2	.2	--	--	52	.07	34	2	.2	86	7.7
Feb. 3.....				--	--	--		38	--	--	.1	--	0.50	--	--	--	36	5	--	89	7.5
Mar. 5.....		8.4		--	--	--		44	--	--	.2	--	--	--	--	--	28	0	--	81	7.8
Apr. 3.....		--		--	--	--		30	--	--	.3	--	--	--	--	--	24	0	--	60	7.3
May 4.....		--		--	--	--		37	--	3.4	.0	--	--	--	--	--	31	0	--	75	7.3
June 9.....		--		--	--	--		36	1.2	2.8	.0	--	--	--	--	--	30	0	--	73	7.5
July 9.....		--		13	1.8	3.0		48	4.1	4.0	--	.4	--	--	47	.06	40	0	.2	97	7.7
Aug. 6.....		--		16	2.9	3.9		50	4.1	5.8	--	.7	.02	--	55	.07	52	11	.1	103	7.7
Sept. 12.....		--		9.6	3.9	5.3		46	4.9	5.3	--	2.0	--	56	.08	40	2	.4	104	7.3	

ARKANSAS RIVER BASIN--Continued

7-2500. LEE CREEK NEAR VAN BUREN, ARK.

LOCATION.--At gaging station, 300 feet west of Arkansas-Oklahoma State line, 3.2 miles downstream from Webbers Creek, 6.8 miles northwest of Van Buren, Crawford County, Arkansas, drainage area 427 square miles, 7.9 miles upstream from mouth.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 29, 1958.....	53			11	1.7	2.6	1.1	42	2.4	3.2		0.5	55	34	0	79	7.2	7
Dec. 10.....	180			9.4	2.0	2.1	.6	34	4.0	3.2		.5	48	32	4	79	7.1	7
Dec. 31.....	124			9.5	1.9	2.2	.5	32	4.0	3.8		.5	44	.32	6	72	7.2	2
Jan. 20, 1959.....	106			8.6	2.4	2.5	.5	31	5.4	4.0		.2	47	32	6	69	7.1	5
Feb. 13.....	320			8.9	2.2	2.7	.5	31	6.6	4.5		.2	50	31	6	74	7.1	1
Mar. 24.....	678			7.5	1.7	2.1	.9	28	4.2	2.5		.3	49	26	2	63	7.4	5
Apr. 15.....	415			9.2	1.7	2.1	.8	34	5.8	2.5		.2	50	30	2	78	7.2	5
May 7.....	212			11	1.4	2.3	.9	36	6.6	2.5		.3	58	34	4	83	7.2	5
May 25.....	891			10	1.2	1.9	1.5	36	4.4	2.0		.6	59	30	0	80	6.9	5
July 22.....	402			9.4	1.5	2.2	1.2	35	4.0	2.5		.1	46	30	1	70	6.9	3
Aug. 11.....	28			13	1.7	2.9	1.1	46	4.2	4.0		.0	58	40	2	90	7.0	0
Sept. 4.....	27			12	1.8	6.1	1.3	40	4.8	6.0		6.0	72	38	4	104	6.7	1
Sept. 22.....	5.3			14	1.8	3.4	1.2	49	4.4	5.0		.0	64	42	2	98	7.3	4

ARKANSAS RIVER BASIN--Continued
7-2505. ARKANSAS RIVER AT VAN BUREN, ARK.

LOCATION:--At gaging station at bridge on U.S. Highways 64 and 71 at Van Buren, Crawford County, 1.3 miles downstream from Lee Creek, 8.6 miles downstream from Lee Creek, and at mile 355.4.
DRAINAGE AREA: 30,183 square miles, of which 22,241 square miles probably are noncontributing.
RECORDS AVAILABLE: Chemical analyses: October 1945 to September 1959.
Water temperatures: October 1945 to September 1959.
EXTREMES 1958-59--Dissolved solids: Maximum, 1,270 ppm Feb. 12; minimum, 166 ppm Apr. 19.
Hardness: Maximum, 318 ppm Feb. 12; minimum, 58 ppm Apr. 19.
Specific conductance: Maximum, 2,200 microhmhos Jan. 15; minimum daily, 255 microhmhos Dec. 19.
Water temperatures: Maximum, 89°F Aug. 4, 5; minimum, freezing point on several days during December, January, and February.
EXTREMES 1945-59--Dissolved solids: Maximum, 5,830 ppm Apr. 1, 1954; minimum, 110 ppm Mar. 22, 1957.
Hardness: Maximum, 1,100 ppm Apr. 1, 1954; minimum, 40 ppm Mar. 20, 1955.
Specific conductance: Maximum daily, 8,980 microhmhos Apr. 1, 1954; minimum daily, 132 microhmhos May 11, 1948.
Water temperatures: Maximum, 92°F Aug. 6, 1956; minimum, freezing point on many days during winter months.
REMARKS:--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhmhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Magnesium		Calcium	Non-carbonate	Soil adsorption ratio
Oct. 1-4, 1958	15,980	5.6	0.04	45	9.9	68	4.9	126	0	48	103	0.5	3.2	0.01	403	0.55	17,390	153	50	2.4	617	8.0	20
Oct. 5-7, 10	8,650	5.7	0.10	58	14	116	5.7	155	0	76	178	0.5	4.2	0.05	614	0.84	14,340	202	75	3.6	945	7.9	--
Oct. 8-9	8,160	--	--	79	19	199	7.1	190	0	98	315	1.22	3.0	--	896	1.22	19,740	275	120	5.2	1,450	8.0	10
Oct. 11-20	8,080	5.4	0.04	70	19	157	6.4	172	0	99	258	0.5	3.0	0.20	772	1.05	16,840	252	112	4.3	1,210	7.7	5
Oct. 21	6,030	--	--	62	13	114	5.9	155	0	71	180	--	1.3	--	523	0.71	8,510	208	81	3.4	1,926	8.1	7
Oct. 22-28	5,636	5.4	0.00	72	17	166	6.5	178	0	84	265	0.4	3.2	0.05	788	1.07	11,990	250	104	4.6	1,240	8.2	5
Oct. 29-31	5,040	--	--	73	22	196	7.2	188	0	88	322	--	0.9	0.05	896	1.22	12,190	272	118	5.2	1,460	8.2	7
Nov. 1-10	4,390	5.2	0.00	78	18	189	6.2	182	0	97	305	0.4	3.4	0.11	874	1.19	10,360	268	120	5.0	1,420	8.1	4
Nov. 11-14	4,900	3.5	0.00	80	19	208	6.4	184	0	102	332	0.5	3.1	0.15	927	1.26	12,260	278	126	5.4	1,530	8.1	4
Nov. 15	17,000	--	--	55	15	125	5.5	145	0	78	195	--	1.5	--	a	548	25,060	198	80	3.9	991	8.1	7
Nov. 16-18	19,030	--	--	26	7.5	40	4.4	81	0	31	63	--	1.2	0.02	257	0.35	13,000	96	30	1.8	420	7.5	6
Nov. 19-20	13,150	--	--	42	14	110	5.2	109	0	55	182	--	1.1	0.05	310	0.69	18,110	162	73	3.7	861	7.7	6
Nov. 21-23	13,030	--	--	33	12	78	4.5	96	0	46	128	--	0.9	0.04	384	0.52	13,510	132	54	3.0	661	8.2	7
Nov. 24-30	11,910	4.5	0.00	58	13	106	4.6	138	0	66	178	0.4	4.2	0.06	562	0.76	18,070	198	85	3.3	928	8.2	5
Dec. 1-6	8,662	4.6	0.00	58	13	105	4.4	142	0	65	172	0.3	4.1	0.01	548	0.74	12,770	198	82	3.2	890	7.9	4
Dec. 7-17	5,650	4.1	0.00	72	16	137	5.1	178	0	82	282	--	4.4	0.12	807	1.10	12,310	246	100	4.9	1,310	8.0	4
Dec. 18-19	6,660	--	--	64	18	157	5.4	171	0	86	248	--	1.6	--	718	0.98	12,910	234	94	4.5	1,200	7.5	7
Dec. 20-22	5,970	--	--	58	14	117	4.6	153	0	64	190	--	0.8	0.04	560	0.76	9,030	202	76	3.6	966	8.1	6
Dec. 23-24, 27-29	4,960	4.5	0.00	73	18	178	4.9	176	0	88	290	0.3	4.0	0.07	831	1.13	11,200	256	112	4.8	1,360	8.2	4
Dec. 25-26, 30-31	5,860	3.8	0.00	94	20	259	6.0	202	0	130	420	0.1	4.6	0.04	1,150	1.54	17,880	316	151	6.3	1,820	8.2	5

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

7-2505. ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	Color or pH				
													Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate						
Jan. 1-12, 1959	5,642	3.6	0.00	71	15	188	4.3	170	0	99	290	0.2	4.1	0.05	831	1.13	12,660	238	99	5.3	1,380	8.1	5
Jan. 13-16,	5,108	4.2	0.00	89	21	271	5.7	188	0	129	440	1.1	5.1	.06	1,863	1.58	16,000	308	154	6.7	1,870	8.2	5
Jan. 17-20,	4,672	3.8	0.00	79	17	187	4.8	172	0	101	305	2.2	3.2	.05	1,460	1.17	10,890	267	126	5.0	1,440	8.2	5
Jan. 21-23, 28-29	6,504	3.1	.07	83	23	248	5.5	166	0	134	398	2.4	4.7	.07	1,080	1.47	18,970	302	166	6.2	1,720	7.9	5
Jan. 24-26, 30-31	7,228	2.8	0.03	55	17	159	4.1	134	0	90	252	2.2	3.6	.09	716	.97	13,970	207	97	4.8	1,180	8.2	5
Jan. 27,	4,280	--	--	74	21	215	5.7	168	6	110	335	--	3.8	.05	960	1.31	11,090	271	124	5.7	1,520	8.4	--
Feb. 1, 7-8, 10	6,740	2.8	.07	62	18	166	4.7	152	0	92	262	.2	4.0	.02	762	1.04	13,870	228	104	4.8	1,240	7.8	6
Feb. 2, 6,	6,970	--	--	69	18	217	5.4	160	0	115	328	--	3.8	.16	925	1.26	17,410	246	115	6.0	1,490	7.4	5
Feb. 3-5,	7,170	2.7	.04	79	22	292	6.0	176	0	138	462	.3	4.2	.11	1,180	1.60	22,840	288	144	7.5	1,940	8.0	10
Feb. 9, 11,	10,400	3.2	.05	60	16	141	4.3	134	0	81	232	.3	4.5	.15	698	.95	19,600	216	106	4.2	1,130	8.2	12
Feb. 12,	7,080	--	--	86	25	285	5.7	186	6	142	438	--	5.2	.26	1,270	1.73	24,310	318	155	6.9	1,930	8.3	--
Feb. 13, 18,	11,900	--	--	68	18	198	5.4	150	0	114	305	--	5.0	.22	878	1.19	28,210	244	120	5.5	1,410	7.4	4
Feb. 14-15,	13,600	--	--	56	13	106	4.2	134	0	66	172	--	5.0	.17	568	.80	21,590	193	83	3.3	896	7.3	--
Feb. 21-22, 28, ..	12,470	--	--	54	12	123	4.0	128	0	81	188	--	4.4	.14	599	.81	20,170	184	79	3.9	977	7.6	5
Feb. 23-27,	11,500	5.5	.01	57	14	157	5.5	132	0	91	248	4.4	5.5	.04	716	.97	22,230	200	92	4.8	1,140	7.9	4
Mar. 1-2,	9,430	--	--	63	16	158	4.9	142	0	116	240	5.4	5.4	.17	750	1.02	19,100	223	106	4.6	1,180	7.7	5
Mar. 3-4,	9,910	--	--	75	20	237	5.3	160	0	146	358	--	4.9	.17	1,050	1.43	28,090	289	138	6.3	1,660	7.8	4
Mar. 5,	32,000	--	--	44	11	115	3.7	104	0	76	172	--	4.6	.15	554	.75	47,870	155	70	4.0	1,687	8.0	--
Mar. 6-10,	44,560	6.2	.04	33	7.8	92	3.5	85	0	40	85	.3	4.1	.01	301	.41	36,210	114	45	2.1	520	7.5	4
Mar. 11-13,	35,900	--	--	33	6.2	89	3.0	86	0	44	60	--	4.9	.11	252	.34	24,830	96	42	1.8	427	7.5	35
Mar. 13-14,	29,400	--	--	33	7.2	89	4.4	82	0	52	102	--	2.7	.12	310	.42	24,010	114	46	2.1	486	7.3	22
Mar. 15-20,	19,650	6.7	.01	46	11.5	89	4.8	131	0	52	132	--	3.0	.01	494	.62	24,090	160	69	3.1	736	7.8	5
Mar. 21, 29-31,	26,580	--	--	32	9.7	64	3.5	76	0	56	153	--	2.5	.03	239	.33	24,830	120	58	2.5	539	7.4	20
Mar. 22-28,	41,040	5.5	.05	26	6.3	39	3.2	69	0	34	62	.3	3.1	.01	239	.33	26,860	91	34	1.8	400	6.8	20
Apr. 1-3,	24,930	--	--	36	10	84	4.1	80	0	62	135	--	4.1	.93	448	.61	30,160	131	66	3.2	686	7.4	15
Apr. 4,	25,800	--	--	26	7.4	51	3.9	62	0	43	80	--	8.1	.04	250	.34	17,010	96	44	2.3	463	7.5	4
Apr. 5-6,	23,200	--	--	38	10	122	3.8	82	0	73	188	--	3.9	.09	543	.74	34,010	136	68	4.6	880	7.4	15
Apr. 7-8,	16,400	--	--	54	14	213	5.2	108	0	99	322	--	4.5	.13	850	1.16	37,640	192	104	6.7	1,380	7.5	17
Apr. 9-13,	14,340	5.0	.00	49	11	107	4.6	112	0	73	170	4	7.3	.01	535	.73	20,710	168	76	3.6	863	7.8	4
Apr. 14-18,	18,220	8.7	.04	68	15	161	5.9	152	0	92	255	.5	7.4	.02	773	1.05	38,030	231	106	4.6	1,220	7.8	5

Apr. 19, 1959.....	27,400	--	0.04	18	3.1	27	2.1	52	0	17	40	3.2	0.00	166	0.23	12,280	58	1.5	255	7.1	--
Apr. 20-24, 27..	35,000	4.7	0.04	41	8.9	89	4.0	104	0	56	135	3.2	0.00	497	.58	40,950	139	3.3	727	7.3	--
Apr. 25-26, 28-30	17,420	6.6	0.04	53	13	149	4.9	122	0	38	202	4.3	0.04	466	.98	18,320	186	4.8	1,090	7.6	6
May 1-3.....	11,770	--	--	38	12	132	3.7	136	0	202	232	--	0.01	608	.83	19,320	194	4.1	1,050	7.1	3
May 4-5.....	6,840	--	--	63	16	136	5.7	182	0	96	250	--	0.01	744	1.01	13,740	228	4.5	1,270	7.2	4
May 6-7.....	6,080	--	--	91	14	245	7.1	168	0	137	383	--	0.01	1,050	1.43	22,910	284	147	6.3	1,780	7.2
May 8-9.....	10,940	--	--	68	16	200	6.9	152	0	100	325	--	0.01	902	1.23	26,640	236	111	5.7	1,510	7.0
May 9-10.....	44,800	--	--	38	10	92	4.0	96	0	46	155	--	0.02	450	.61	54,430	136	58	3.4	763	7.4
May 11-15.....	100,700	5.9	0.04	40	6.8	48	3.5	109	0	33	81	3	0.02	308	.42	83,740	138	38	1.8	498	7.3
May 16-17, 20..	42,200	--	--	48	8.4	90	4.8	116	0	55	140	--	0.01	446	.61	50,820	154	60	3.2	775	7.0
May 18-19.....	35,900	--	--	52	12	147	6.0	128	0	72	230	--	0.01	652	.89	63,200	179	74	4.8	1,110	7.2
May 21-June 1....	48,580	7.2	0.1	47	9.6	80	4.8	122	0	54	125	5	0.02	436	.59	57,190	157	57	2.8	698	7.8
June 2.....	54,700	--	--	50	12	127	5.4	126	0	67	195	--	0.01	592	.81	87,430	174	71	4.2	930	7.6
June 3-8.....	34,770	7.7	0.04	44	9.2	98	4.8	110	0	60	145	5	0.01	464	.63	43,860	148	58	3.5	766	7.8
June 9-10.....	20,500	--	--	57	15	136	6.0	132	0	75	222	--	0.03	650	.88	35,980	204	96	4.1	1,100	7.5
June 11-16.....	16,170	4.7	0.04	50	11	95	5.4	126	0	66	145	5	0.02	484	.66	21,330	170	66	3.2	796	7.8
June 17-23.....	7,916	4.6	0.1	63	16	156	6.5	152	0	94	245	4	0.04	726	.99	15,520	223	98	4.5	1,180	8.0
June 24-28.....	8,564	4.7	0.04	63	19	185	6.9	142	0	100	290	6	0.03	819	1.11	18,940	235	118	5.3	1,340	7.9
June 29-30.....	18,600	--	--	57	9.1	107	5.4	126	0	47	188	--	0.03	532	.72	26,720	180	76	3.5	915	7.3
July 1-3.....	15,400	--	--	62	15	158	6.5	136	0	82	260	--	0.03	740	1.01	20,770	216	104	4.7	1,250	7.1
July 4-13.....	11,580	6.3	0.01	53	13	99	5.5	134	0	65	158	4	0.04	517	.70	25,160	268	176	3.2	871	7.8
July 14-15.....	12,580	--	--	71	18	158	6.0	146	0	62	280	--	0.04	564	.77	28,920	291	132	4.2	1,321	6.8
July 16.....	18,600	--	--	50	18	109	3.1	148	0	66	180	--	0.03	484	.77	28,920	199	76	3.4	839	7.6
July 17-18.....	50,600	--	--	45	8.8	57	4.3	120	0	44	95	--	0.03	352	.46	48,090	148	50	2.0	608	7.3
July 19-21, 23-31	127,700	5.2	0.7	31	5.6	21	3.9	94	0	22	34	3	0.04	194	.26	66,890	100	24	9	333	7.6
July 22.....	117,000	--	--	78	12	26	4.4	2	0	27	182	--	0.00	518	.70	163,600	244	242	7	673	4.9
July 23.....	43,750	7.5	0.04	38	7.4	30	4.1	114	0	28	50	2	0.22	250	.34	29,530	136	32	1.2	388	7.1
Aug. 1-6.....	28,230	--	--	45	7.5	47	4.7	134	0	38	73	--	0.04	338	.46	25,760	144	34	1.7	506	7.3
Aug. 7-9.....	14,760	6.6	0.04	48	13	65	4.8	134	0	52	105	4	0.04	418	.57	16,680	174	64	2.1	658	7.1
Aug. 10-21.....	14,760	--	--	72	10	100	6.2	180	0	68	160	--	0.03	613	.83	34,920	230	73	2.9	914	6.9
Aug. 22-24.....	21,100	--	--	72	10	100	6.2	180	0	68	160	--	0.03	613	.83	34,920	230	73	2.9	914	6.9
Aug. 25-28.....	9,225	6.9	0.04	51	13	67	4.4	138	0	53	110	3	0.05	426	.58	10,610	180	68	2.2	678	7.3
Aug. 29-30.....	9,900	--	--	63	12	108	5.6	170	0	71	168	--	0.02	609	.83	16,280	206	67	3.2	929	6.8
Aug. 31-Sept. 8.	8,922	6.6	0.04	75	18	154	9.4	166	0	94	260	1	0.02	808	1.10	19,460	261	125	4.2	1,320	7.3
Sept. 9-10.....	9,220	--	--	81	15	231	9.8	175	0	88	372	--	0.03	1,070	1.46	26,640	264	120	5.9	1,640	6.8
Sept. 11-12.....	9,220	--	--	69	10	142	6.9	180	0	71	225	--	0.03	713	.97	17,750	213	66	4.2	1,130	6.8

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-2505, ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Boron (B)	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				Non-carbonate		
Sept. 13-18, 1959	6,817	5.4	0.00	55	15	94	6.1	146	0	63	155	0.1	2.7	0.10	537	0.73	9,880	198	79	2.9	887	7.2	6
Sept. 19-23.....	4,766	3.5	.00	54	16	122	7.5	148	0	79	182	.3	2.8	.05	603	.82	7,760	200	79	3.8	979	7.3	6
Sept. 24.....	4,400	--	--	65	17	159	6.5	154	0	87	255	--	2.4	.03	a 668	.91	7,940	232	106	4.6	1,250	6.8	4
Sept. 25.....	8,550	--	--	59	9.0	93	4.9	150	0	66	142	--	4.6	.03	a 452	.61	10,430	184	61	3.0	821	6.9	5
Sept. 26-27.....	56,550	--	--	67	11	114	5.4	170	0	66	185	--	2.4	.03	a 621	.84	94,820	212	72	3.4	974	6.9	7
Sept. 28-29.....	94,100	--	--	62	9.7	162	6.5	160	0	72	245	--	4.7	.03	a 747	1.02	189,800	194	65	5.1	1,210	6.9	6
Sept. 30.....	78,700	--	--	48	5.4	66	5.0	132	0	48	100	--	5.6	.03	a 343	.47	72,880	142	34	2.4	628	6.9	6
Weighted average.....	21,750	--	--	46	10	83	4.6	116	0	53	135	--	3.6	--	447	0.61	26,250	156	61	2.9	728	--	7

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

7--2505. ARKANSAS RIVER AT VAN BUREN, ARK.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	59	60	61	64	63	68	69	72	70	66	66	62	67	66	65	70	67	68	68	67	66	64	66	64	59	60	58	55	54	53		
November ..	52	56	54	58	53	54	54	56	52	52	56	48	49	59	52	51	64	56	56	55	52	54	52	54	54	50	44	40	40	42	52		
December ..	43	44	47	48	46	42	40	38	36	38	37	36	34	32	32	34	40	40	41	38	42	42	44	40	42	44	44	42	39	38	40		
January	39	38	32	32	--	--	32	32	34	36	38	40	48	40	36	36	33	36	44	32	32	32	32	40	38	38	42	44	38	40	37		
February	38	36	36	42	34	32	36	40	44	44	42	40	42	44	46	42	48	46	40	39	39	38	42	43	48	46	48	49	--	42	42		
March	42	48	50	48	47	44	45	47	44	44	44	47	42	52	58	60	58	58	56	54	54	57	62	62	56	60	66	58	60	53	53		
April	66	68	62	64	66	68	70	68	65	64	60	60	64	64	62	63	68	68	67	66	64	65	62	62	63	66	64	67	69	--	65		
May	70	71	72	72	76	73	75	70	70	68	68	69	72	74	70	69	70	72	74	73	74	73	74	73	74	73	75	76	76	78	73	73	
June	77	76	75	74	74	76	74	78	76	78	80	78	80	77	77	79	82	80	82	86	82	78	78	80	83	83	82	84	82	--	79	79	
July	84	83	82	83	85	87	87	88	88	87	86	84	82	83	79	80	80	79	80	78	80	78	79	79	78	76	79	81	82	84	85	82	82
August	87	88	86	89	89	88	87	85	83	84	85	84	85	85	85	84	85	87	86	85	85	85	88	86	85	82	83	85	84	83	85	85	85
September ..	85	85	83	80	82	84	83	84	84	80	77	79	75	78	80	80	79	78	78	76	73	73	81	79	76	72	78	78	78	73	--	79	--

ARKANSAS RIVER BASIN--Continued
7-2520. MULBERRY RIVER NEAR MULBERRY, ARK.

LOCATION.--At gaging station, 0.2 mile upstream from Mill Creek, 5 miles northeast of Mulberry, Crawford County, and 11.3 miles upstream from mouth. DRAINAGE AREA.--372 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1956 (daily), October 1956 to September 1959 (monthly).

Water temperatures: October 1955 to September 1956.

REMARKS.--Records of specific conductance of daily samples (1955-56) available in district office at Little Rock, Ark. Records of discharge for water year October 1956 to September 1959 given in WSP 1651.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 23, 1958.....	23	4.3		1.4	1.4	1.9	0.7	22	2.0	2.0		0.2	31	16	0	40	6.9	6
Nov. 20.....	1,110	2.5		1.2	1.3	.9	.9	13	3.4	1.5		.9	44	11	0	33	6.9	1
Dec. 18.....	164	3.9		1.4	1.4	.5	.5	12	1.8	1.8		.4	20	11	1	29	6.7	7
Jan. 12, 1959.....	356	2.1		1.2	1.3	.3	.3	13	1.0	2.0		.3	28	10	0	29	6.8	5
Feb. 11.....	360	2.4		1.0	1.2	.8	.8	12	.4	1.8		.2	28	10	0	29	6.8	5
Mar. 13.....	1,510	2.4		.7	1.1	.8	10	3.0	3.0	1.8		.2	40	9	1	25	6.7	5
Apr. 7.....	988	2.5		5	1.3	.8	10	1.2	1.2	2.0		.3	28	8	0	30	7.2	5
Apr. 4.....	285	2.6		1.0	1.3	.7	15	1.2	1.5	1.5		.4	30	10	0	31	6.7	5
June 2.....	220	3.1		1.9	1.1	.6	14	1.8	1.0	1.0		.6	22	11	0	30	7.2	9
July 29.....	635	3.0		1.2	1.2	1.0	17	1.4	1.5	1.5		.6	32	12	0	33	6.8	6
Aug. 27.....	24	3.6		1.6	1.8	1.8	1.0	22	.2	2.0		.3	30	16	0	40	6.8	3
Sept. 25.....	47	3.0		1.6	1.7	.8	18	1.8	1.2	2.0		1.0	28	14	0	38	6.7	8

ARKANSAS RIVER BASIN--Continued
7-2570. PINEY CREEK NEAR DOVER, ARK.

LOCATION.--At gaging station, 7.2 miles downstream from Indian Creek, and 10 miles north of Dover, Pope County.
DRAINAGE AREA.--274 square miles.
RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1956 (daily), October 1956 to September 1959 (monthly).
Water temperatures: October 1955 to September 1956.
REMARKS.--Records of specific conductance of daily samples (1955-56) available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 23, 1958.....	154			10	2.0	1.4	0.9	42	1.8	1.2		0.4	50	28	0	70	7.2	8
Nov. 19.....	1,720	4.7	1.3	4.7	1.3	.6	1.0	18	3.2			.3	44	17	2	48	6.7	2
Dec. 18.....	1,132	6.2	1.9	6.2	1.9	.8	1.4	24	4.4	1.2		.3	32	19	0	48	7.1	1
Jan. 15, 1959.....	87	5.6	1.3	5.6	1.3	1.0	.3	23	2.2	1.5		.2	30	20	0	45	7.1	0
Feb. 17.....	209	4.8	1.0	4.8	1.0	1.0	.4	19	2.0	1.5		.2	28	16	0	39	7.0	1
Mar. 12.....	1,250	4.3	1.1	4.3	1.1	.8	.8	16	2.6	2.0		.2	44	15	2	35	7.0	5
Apr. 7.....	630			4.3	1.0	1.0	.6	19	1.2	1.0		.0	32	14	0	37	6.8	5
May 6.....	179	6.3	1.1	6.3	1.1	1.0	.7	24	2.4	.8		.2	34	20	0	50	6.9	6
June 2.....	885	4.7	1.1	4.7	1.1	1.0	.8	19	2.6	1.2		.4	52	16	0	37	6.7	25
June 23.....	231	6.7	1.2	6.7	1.2	1.0	1.8	24	4.2	1.0		.0	40	22	2	50	7.4	7
July 29.....	294	6.8	1.1	6.8	1.1	1.1	.9	28	1.2	1.0		.2	40	22	0	49	6.7	2
Aug. 26.....	6.3	10	1.8	10	1.8	1.5	1.1	42	.4	1.5		.2	46	32	0	67	7.0	1
Sept. 25.....	8.2	3.6	4.0	3.6	4.0	1.5	.8	33	2.0	1.5		.8	38	26	0	59	7.5	9

ARKANSAS RIVER BASIN--Continued

7--2575. ILLINOIS BAYOU NEAR SCOTTSVILLE, ARK.

LOCATION.--At gaging station at bridge on county road, 1.2 miles north of Scottsville, Pope County, and 3 miles downstream from North Fork Illinois Bayou. DRAINAGE AREA.--242 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1956 (daily), October 1956 to September 1959 (monthly).

Water temperatures: October 1955 to September 1956.

REMARKS.--Records of specific conductance of daily samples (1955-56) available in district office, Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 23, 1958	18			3.6	1.2	1.6	0.7	20	1.6	1.5		0.2	28	14	0	40	6.8	6
Nov. 19,	1,120			2.3	1.2	1.7	1.0	11	3.4	1.5		.8	38	10	2	28	6.4	4
Dec. 17,	1,108			2.8	.7	.6	.5	12	2.4	1.8		.4	26	10	0	28	6.6	4
Jan. 13, 1959	75			2.3	.8	.9	.3	10	1.2	1.5		.5	22	9	1	26	6.8	0
Feb. 10,	170			2.0	.9	.9	.4	11	.8	1.8		3	25	8	0	25	6.8	5
Mar. 12,	1,240			1.9	.8	4.6	1.3	6	1.8	8.2		1.3	42	8	3	46	6.5	5
Apr. 7,	405			2.2	.9	1.4	.7	10	1.0	2.5		.6	26	9	1	32	6.8	5
May 5,	183			2.7	1.0	1.4	1.2	12	1.0	2.0		.8	25	10	0	36	6.5	6
June 3,	222			2.5	1.0	1.2	.8	12	2.4	1.8		.2	34	10	0	30	6.6	6
June 23,	254			3.0	1.0	1.0	.7	15	1.6	1.0		.2	22	11	0	30	7.2	10
July 28,	1,350			3.5	.8	1.0	.9	13	2.6	1.0		.5	34	12	2	32	6.5	8
Aug. 26,	9.8			4.0	1.1	1.4	.9	21	.2	1.5		.2	31	14	0	37	6.7	1
Sept. 25,	12			3.7	1.4	1.4	.8	19	1.4	1.5		.8	32	15	0	40	6.9	5

ARKANSAS RIVER BASIN--Continued
7-2580. ARKANSAS RIVER AT DARDANELLE, ARK.

LOCATION--At gaging station at bridge on State Highway 7 at Dardanelle, Yell County, 1 mile upstream from Whig Creek and 4.7 miles downstream from Littleton Bayou.

DRAINAGE AREA--53,707 square miles, of which 22,241 square miles probably are noncontributing.

RECORDS AVAILABLE--Chemical analyses: October 1948 to September 1959.

Water temperatures: October 1948 to September 1959.

EXTREMES 1958-59 Dissolved solids: Maximum, 978 ppm Jan. 3; minimum, 100 ppm Nov. 17.

Hardness: Maximum, 286 ppm Jan. 3; minimum, 42 ppm Mar. 18.

Specific conductance: Maximum, 1,790 micromhos Feb. 8; minimum daily, 128 micromhos Nov. 18.

Water temperatures: Maximum, 88°F Aug. 4-6; minimum freezing point Jan. 6.

EXTREMES, 1948-59--Dissolved solids: Maximum, 3,140 ppm Apr. 4-6, 1954; minimum daily, 107 micromhos Mar. 21, 1955.

Hardness: Maximum, 583 ppm Apr. 4-6, 1954; minimum, freezing point Jan. 30, 1949.

Specific conductance: Maximum daily, 5,310 micromhos Apr. 4, 1954; minimum daily, 107 micromhos Mar. 21, 1955.

Water temperatures: Maximum, 94°F Aug. 17, 1952; minimum, freezing point Jan. 30, 1949.

REMARKS--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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	Color	
														Tons per acre-foot	Tons per day	Calcium	Non-carbonate					
Oct. 1-5, 1958..	18,700	4.3	0.00	45	11	61	4.8	120	0	51	0.4	4.4		389	0.53	19,640	158	59	2.1	597	7.9	8
Oct. 6-9.....	9,405	6.5	0.00	55	10	88	5.6	148	0	54	1.38	3.6		491	0.67	12,470	178	56	2.9	774	7.9	6
Oct. 10-20.....	8,695	6.2	0.00	71	16	156	6.5	180	0	78	2.55	4.0		771	1.05	18,100	243	93	4.3	1,290	8.1	3
Oct. 21-25.....	7,208	4.3	0.00	64	14	130	5.4	160	0	72	2.10	3.7		663	0.90	12,900	217	86	3.9	1,097	8.0	3
Oct. 26-31.....	5,493	3.3	0.00	71	16	151	5.6	188	0	76	2.48	5.9		741	1.01	10,990	243	89	4.2	1,190	8.2	5
Nov. 1-14.....	4,611	3.3	0.00	76	19	171	6.3	190	2	88	3.21	2.1		828	1.13	10,310	268	108	4.5	1,350	8.3	5
Nov. 15-16.....	15,160	--	--	49	17	115	4.9	137	0	68	--	1.0		552	.75	22,590	192	80	3.6	1,952	8.0	6
Nov. 17.....	44,500	--	--	17	2.2	15	2.5	48	0	12	--	1.7		a 100	.14	12,010	52	12	.9	186	7.7	--
Nov. 18-19.....	39,700	--	--	12	3.1	12	2.6	42	0	9.6	--	.5		110	.15	11,790	42	8	.8	145	7.1	7
Nov. 20-21.....	20,450	--	--	13	5.8	33	3.1	54	0	29	--	.2		185	.25	10,210	69	24	1.7	304	7.3	7
Nov. 22-26.....	15,440	3.2	.00	32	9.5	66	3.5	86	0	38	11.2	1.2		363	.49	15,130	119	48	2.6	567	7.4	9
Nov. 27-30.....	14,800	4.4	.00	48	11	92	3.9	120	0	51	15.5	4.2		499	.68	19,940	165	66	3.1	780	8.0	9
Dec. 1-8.....	12,200	4.1	.00	43	9.0	67	3.5	110	0	45	11.2	2.7		386	.52	12,710	144	54	2.4	622	8.0	8
Dec. 9-12.....	7,945	--	--	48	14	104	4.1	131	0	54	16.5	--		478	.65	10,250	172	65	3.4	825	7.7	8
Dec. 13-22.....	7,045	4.0	.00	60	14	136	4.0	154	0	64	22.0	3.0		653	.89	12,420	207	81	4.1	1,050	7.8	5
Dec. 23-26.....	6,285	3.3	.00	53	10	92	3.2	138	0	53	15.0	2.2		490	.67	8,320	173	60	3.0	792	8.1	5
Dec. 27-31.....	6,078	3.3	.00	67	14	159	4.2	162	0	78	26.0	3.2		758	1.03	12,440	224	92	4.6	1,210	8.1	3
Jan. 1-2, 4-6, 1959.....	6,598	3.1	.00	64	16	159	4.2	158	0	84	25.2	2.2		743	1.01	13,240	226	96	4.8	1,210	8.1	4
Jan. 5.....	8,300	--	--	77	23	228	5.3	190	0	109	37.2	--		976	1.33	21,870	286	131	5.6	1,630	8.2	6
Jan. 7-10.....	5,450	--	--	58	14	126	4.1	146	0	75	19.5	--		582	.79	8,560	202	82	3.9	1,030	8.0	6

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued

7-2580. ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate				
Jan. 11-13, 1959	6,790	---	---	66	19	182	5.1	171	0	94	285	---	0.8	---	792	1.08	14,520	242	102	5.1	1,340	7.9	5
Jan. 14-16,	5,930	---	---	53	16	135	4.0	144	0	69	215	---	.8	---	596	.81	9,540	198	80	4.2	1,050	7.4	5
Jan. 17-20,	6,350	2.1	0.00	71	18	211	4.6	160	0	98	335	0.3	3.1	---	908	1.23	15,570	251	120	5.8	1,490	8.0	5
Jan. 21-30,	7,868	2.6	.00	63	13	138	3.3	126	0	74	220	.3	3.0	---	640	.87	13,600	186	82	4.4	1,040	8.1	6
Jan. 31, Feb. 1-2	9,967	---	---	64	15	185	4.3	154	0	92	280	---	1.5	---	832	1.13	22,390	221	95	5.4	1,300	7.5	5
Feb. 3-5,	7,207	---	---	50	11	129	3.1	122	0	65	208	---	1.7	---	599	.81	11,660	170	70	4.3	1,000	7.4	6
Feb. 6-8,	9,407	2.3	.07	67	23	232	4.9	150	0	116	365	.2	3.1	---	968	1.32	24,580	262	138	6.3	1,540	8.0	10
Feb. 9-10,	8,900	---	---	54	13	141	3.4	129	0	83	218	---	1.4	---	666	.91	16,000	188	82	4.5	1,080	7.5	8
Feb. 11-15,	9,618	2.0	.04	46	13	112	3.6	120	0	62	180	.1	2.5	---	547	.74	14,200	168	70	3.8	860	7.3	6
Feb. 16-20,	17,040	2.8	.00	39	9.6	86	3.4	90	0	51	140	.0	2.4	---	433	.59	19,920	137	63	3.2	686	6.9	5
Feb. 21-28,	14,840	3.1	.02	47	11	138	4.0	104	0	77	208	.2	2.4	---	635	.86	25,440	162	78	4.7	994	7.5	5
Mar. 1-4, 6,	15,820	2.7	.06	47	11	115	3.7	110	0	77	168	.1	2.8	---	575	.78	24,560	162	72	3.9	887	7.3	6
Mar. 5, 7,	32,850	---	---	32	6.7	62	2.7	78	0	47	95	---	2.6	---	351	.48	31,130	108	44	2.6	563	7.5	8
Mar. 8-16,	44,190	2.4	.01	50	6.1	46	3.0	74	0	38	72	.1	3.1	---	296	.40	35,320	100	40	2.0	457	7.5	16
Mar. 17-20,	24,150	3.2	.03	36	7.4	60	3.2	86	0	31	95	.1	2.4	---	360	.49	21,820	120	30	2.4	538	7.4	7
Mar. 21, 23-25,	52,430	6.7	.09	27	6.0	34	2.6	74	0	40	84	.1	2.2	---	219	.30	31,190	92	32	1.3	346	7.1	7
Mar. 26-27,	56,050	---	---	16	4.0	17	2.3	46	0	19	27	---	3.6	---	306	.52	33,110	150	19	2.0	496	7.3	16
Mar. 28,	43,800	---	---	32	5.0	28	2.3	55	0	25	46	---	2.8	---	196	.27	23,180	73	28	1.4	291	7.4	40
Mar. 29, 31,	36,000	---	---	28	7.9	58	2.9	66	0	41	92	---	2.2	---	318	.40	30,910	102	48	2.5	493	7.3	20
Mar. 30,	36,600	---	---	33	6.4	35	2.5	66	0	27	56	---	2.1	---	226	.30	22,330	84	30	1.7	344	7.4	40
Apr. 1-3,	31,370	---	---	24	6.7	38	2.2	62	0	30	65	---	2.6	---	238	.32	20,160	88	36	1.8	373	7.2	22
Apr. 4-6,	33,800	---	---	34	7.7	53	2.6	66	0	39	84	---	2.0	---	295	.40	26,920	99	45	2.3	474	7.0	22
Apr. 7-8,	25,000	---	---	37	10	92	3.4	76	0	57	148	---	2.2	---	454	.62	30,640	126	64	3.6	738	7.3	15
Apr. 9-10,	20,100	---	---	40	12	153	3.5	88	0	67	238	---	3.4	---	647	.88	35,110	150	78	5.4	1,040	7.4	5
Apr. 11-14,	16,320	7.2	.02	44	10	108	3.6	102	0	64	167	.2	3.9	---	516	.70	32,740	151	68	3.8	835	7.3	5
Apr. 15-17,	20,630	8.3	.00	59	15	134	4.7	134	0	76	215	.3	4.5	---	666	.91	37,100	208	98	4.0	1,060	7.2	5
Apr. 18,	23,800	---	---	42	10	94	3.5	96	0	59	148	---	3.2	---	480	.65	38,840	146	68	3.4	764	7.6	6
Apr. 19-22,	50,400	6.6	.02	24	8.7	55	2.7	70	0	32	88	.2	1.2	---	286	.39	38,920	196	38	2.4	490	6.6	15

LOWER MISSISSIPPI RIVER BASIN

Apr. 23-25, 1959	43,770	9.1	57	8.9	40	0	57	102	--	28	377	0.51	44,550	128	94	2.2	587	7.0	8
Apr. 26-30.....	23,160	11	133	3.7	94	0	72	160	0.3	2.5	476	.65	29,770	142	66	3.6	774	7.2	4
May 1-11.....	16,960	4.4	90	5.2	124	0	57	208	3.3	3.0	627	.85	28,030	167	86	4.2	1,020	7.8	3
May 12-19.....	47,560	6.6	74	3.7	90	0	29	79	3.3	3.1	294	.40	77,620	120	40	1.9	494	7.7	13
May 20-21.....	41,200	--	39	8.4	44	0	44	115	--	3.3	374	.51	45,110	122	48	2.9	607	7.5	8
May 22-25.....	56,220	7.3	40	4.1	101	0	65	182	--	3.6	569	.77	63,300	158	68	4.0	901	7.2	8
May 26.....	57,100	--	62	4.1	101	0	64	97	3.3	3.0	357	.49	54,190	134	52	2.3	565	7.4	3
May 27.....	57,100	--	99	4.4	110	0	63	158	--	4.8	516	.70	79,550	156	66	3.5	806	7.7	9
May 28.....	52,220	7.3	66	4.4	105	0	46	102	5	3.4	370	.53	54,980	142	56	2.4	605	7.5	7
June 1-3.....	51,970	--	70	4.3	108	0	56	119	3	3.2	421	.63	59,070	150	62	2.5	952	7.6	8
June 4-8.....	41,020	8.5	93	4.8	107	0	53	145	3	2.2	461	.42	51,260	146	38	3.4	474	7.4	10
June 9-10.....	31,500	--	49	3.3	92	0	37	177	--	2.3	308	.42	26,290	144	59	2.0	480	7.5	9
June 11.....	30,800	--	77	4.4	100	0	47	130	--	2.6	418	.57	34,590	158	56	2.9	667	7.6	--
June 12.....	49,400	--	18	1.5	61	0	13	31	--	2.0	143	.19	19,070	62	12	1.0	212	7.0	--
June 13-14.....	33,850	--	27	5.5	69	0	31	67	--	1.6	243	.33	22,210	90	34	1.9	401	7.1	10
June 15-19.....	18,840	6.0	43	9.7	112	0	53	114	3	2.0	401	.55	20,400	148	56	2.7	664	7.3	8
June 20-23.....	10,630	5.9	54	5.1	135	0	70	198	3	1.3	608	.83	17,450	196	86	3.9	989	7.3	7
June 24-26.....	9,730	--	48	10	95	4.3	126	145	--	2.4	480	.65	12,610	161	58	3.3	783	7.3	4
June 27-30.....	12,350	3.5	58	15	164	5.7	84	258	6	3.1	752	1.02	25,080	206	101	5.0	1,200	7.8	5
July 1-2.....	18,950	--	48	12	100	5.0	55	175	--	3.1	541	.74	27,680	170	86	3.3	844	6.7	8
July 3-6.....	15,020	5.5	57	14	152	5.9	73	248	4	3.9	722	.98	29,280	200	96	4.7	1,150	7.2	6
July 7-10.....	13,020	6.7	50	12	91	4.6	50	150	5	2.6	518	.70	18,210	174	70	3.0	821	7.5	7
July 11-13.....	12,370	--	57	13	124	5.5	61	200	--	1.8	627	.85	20,940	196	88	3.9	997	7.2	6
July 14-15.....	11,450	--	48	10	96	5.6	108	155	--	2.2	486	.66	15,020	161	72	3.3	816	7.4	6
July 16-19.....	30,300	6.9	58	14	117	6.0	58	185	5	5.2	595	.81	48,680	202	88	3.6	986	7.7	8
July 20.....	107,000	--	38	7.3	41	3.9	114	61	--	4.6	290	.39	83,780	125	32	1.6	458	7.3	--
July 21-31.....	129,400	6.5	33	5.2	20	3.5	98	34	3	3.2	209	.28	73,020	104	24	1.6	311	7.7	18
Aug. 1-2.....	87,900	--	31	5.5	21	4.3	94	36	--	1.1	200	.27	47,470	100	23	.91	304	7.1	7
Aug. 3-8.....	41,230	7.3	42	3	28	3.9	108	44	2	2.9	239	.33	26,610	117	28	1.0	368	7.4	8
Aug. 9-13.....	27,020	6.7	45	8.3	47	5.3	153	78	2	2.2	322	.44	23,490	142	40	1.7	512	7.5	8
Aug. 14-17.....	15,980	7.1	50	16	56	4.6	138	142	3	2.2	475	.65	20,490	166	56	2.9	759	7.7	7
Aug. 18-20.....	9,433	--	53	9.1	65	4.6	148	100	5	1.6	412	.56	10,490	170	48	2.2	638	7.8	7
Aug. 21-24.....	15,600	.00	53	11	81	5.1	141	130	3	2.4	469	.64	19,750	177	62	2.6	751	7.6	6

ARKANSAS RIVER BASIN--Continued
 ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

7-2580. ARKANSAS RIVER AT DARDANELLE, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Aug. 25, 1959...	22,700	--	--	66	18	110	6.5	159	0	83	185	--	1.5	528	0.85	38,490	238	108	3.1	954	7.9	7	
Aug. 26-31.....	12,880	5.4	0.00	55	11	63	4.9	144	0	48	110	0.4	4.0	422	.57	14,680	162	64	2.0	683	7.3	8	
Sept. 1-5.....	9,444	6.6	.00	66	15	120	5.9	157	0	72	198	.4	5.6	626	.85	15,960	226	98	3.5	1,020	7.6	5	
Sept. 6-14.....	9,891	3.6	.00	67	17	166	7.2	150	0	91	270	.6	6.2	816	1.11	21,790	237	114	4.7	1,310	7.4	5	
Sept. 15-27.....	6,870	5.6	.00	57	14	104	5.5	150	0	62	170	.6	3.8	546	.74	10,130	200	76	3.2	906	6.5	4	
Sept. 28.....	77,200	--	--	62	5.7	65	4.9	142	0	46	112	--	2.2	432	.59	90,050	178	62	2.1	662	7.9	6	
Sept. 29-30.....	86,550	--	--	64	11	169	7.0	147	0	78	272	--	1.8	769	1.05	179,700	204	84	5.1	1,260	7.7	7	
Weighted average.....	24,570	--	--	40	8.9	70	4.0	104	0	45	113	--	3.2	392	0.53	26,000	136	52	2.6	624	--	9	

Temperature (°F) of water, water year October 1958 to September 1959

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.....	53	51	49	51	54	55	55	57	58	72	68	69	70	69	68	71	72	71	71	70	69	68	70	69	67	64	63	62	60	60	58
November..	56	57	57	59	59	58	56	57	58	57	57	58	60	61	62	62	62	62	62	59	58	57	55	56	57	57	55	49	47	46	45
December..	45	47	49	51	50	47	45	44	41	41	45	41	39	37	36	37	39	41	42	41	42	43	45	45	44	44	45	45	47	45	44
January.....	43	44	39	36	34	32	35	36	37	36	38	41	43	45	45	40	38	40	40	43	39	37	38	38	41	43	43	42	46	44	42
February....	43	41	40	42	40	41	41	42	46	47	46	44	45	47	48	48	50	48	45	45	45	44	46	47	48	47	50	50	52	53	--
March.....	53	54	53	51	49	47	46	46	48	49	50	51	53	51	52	53	54	55	56	53	53	55	56	57	56	57	54	52	54	56	59
April.....	--	61	60	60	62	64	65	64	62	61	58	57	58	59	59	60	64	65	64	62	62	62	62	63	64	67	67	69	70	72	--
May.....	74	74	75	76	77	78	79	74	74	72	71	68	70	70	70	70	72	74	77	75	73	74	75	77	78	79	79	79	79	79	80
June.....	78	77	78	75	76	76	75	75	75	77	72	70	77	78	79	80	83	84	86	85	83	81	81	82	84	84	84	84	84	87	87
July.....	86	84	82	83	82	85	85	86	85	86	86	84	84	84	82	80	80	80	80	81	79	80	79	79	78	79	79	79	80	81	82
August.....	84	85	86	88	86	86	87	84	83	84	86	85	84	84	84	86	85	84	85	84	87	87	86	84	84	84	84	84	84	84	85
September..	84	84	81	80	81	82	83	82	81	78	76	76	76	76	76	77	77	77	77	--	78	--	79	--	77	76	77	74	74	--	79

ARKANSAS RIVER BASIN--Continued

7-2605. PETIT JEAN CREEK AT DANVILLE, ARK.

LOCATION.--At gaging station at bridge on State Highway 10 at Danville, Yell County, 1,800 feet upstream from Chicago, Rock Island and Pacific Railroad Co. bridge, 0.71 mile upstream from Spring Creek, and 0.6 mile downstream from Dutch Creek.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1952 (daily), October 1957 to September 1959 (monthly).

WATER TEMPERATURES.--Records of specific conductance of daily samples (1948-52) available in district office at Little Rock, Ark.

REMARKS.--Records of specific conductance of daily samples (1948-52) available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631. Flow regulated by Blue Mountain Reservoir since March 1947.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 21, 1958.....	6.7			3.8	2.3	4.1	1.7	24	7.2	3.2		0.5	42	19	0	61	7.0	7
Nov. 18.....	2,850		2.0	3.8	1.4	1.5	3.0	11	4.0	2.2		1.8	64	11	2	35	6.0	10
Dec. 16.....	172		3.6	2.1	6.6	1.6	2.2	7.2	7.2	5.5		1.0	52	18	0	72	6.7	8
Jan. 14, 1959.....	88		3.5	2.2	4.6	1.5	2.3	3.0	5.0	5.0		.4	80	18	0	68	7.1	5
Feb. 9.....	133		2.8	1.8	4.3	1.2	1.6	5.2	4.5	4.5		.1	47	14	2	56	7.0	6
Mar. 10.....	1,560		3.1	2.1	5.7	1.7	1.6	10	10	3.5		.2	54	16	3	69	6.7	5
Apr. 9.....	2,460		2.5	1.7	3.9	1.5	1.1	8.8	8.8	3.0		.8	46	13	4	50	7.0	6
May 4.....	176		3.2	2.0	3.9	1.2	1.8	7.6	7.6	3.0		.6	32	16	1	59	6.6	5
June 2.....	314		3.6	2.5	4.9	1.4	2.0	8.6	8.6	3.8		.7	52	20	3	65	6.6	20
June 25.....	68		4.3	2.1	4.2	1.7	2.2	7.0	7.0	3.5		.3	46	19	1	67	7.2	5
July 27.....	240		3.3	2.2	4.4	1.4	2.1	8.4	8.4	3.2		.0	46	17	0	60	6.8	5
Aug. 26.....	487		4.0	2.6	5.4	1.6	2.4	9.6	9.6	3.8		.2	48	20	1	71	6.8	5
Sept. 21.....	6.0		5.0	3.2	6.2	1.8	3.0	9.4	9.4	5.0		.8	54	26	1	85	6.8	4

ARKANSAS RIVER BASIN--Continued

7-2625. FOURCHE LA FAVE RIVER NEAR NIMROD, ARK.

LOCATION.--At gaging station, 2,000 feet downstream from Nimrod Dam, 4.5 miles southwest of Nimrod, Perry County, and 9.8 miles upstream from South Fourche La Fave River.

DRAINAGE AREA.--680 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1957 to September 1959.

REMARKS.--Records of discharge for water year October 1957 to September 1958 given in WSP 1631. Flow regulated by Nimrod Dam since May 1942.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 22, 1958.....	3.4			3.0	0.8	2.5	1.1	15	3.6	2.0		0.5	35	11	0	37	6.7	16
Nov. 19.....	3,990			2.1	1.3	2.1	1.3	12	4.0	2.0		.6	32	10	0	35	6.3	10
Dec. 16.....	161			2.2	1.2	1.6	1.4	12	1.2	2.2		.8	41	10	0	36	6.6	45
Jan. 13, 1959.....	99			1.8	1.4	2.1	1.2	14	2.6	2.5		.6	42	10	0	36	6.7	35
Feb. 9.....	217			1.5	1.3	2.4	1.0	12	1.6	3.0		.6	46	9	0	35	6.6	45
Mar. 11.....	1,110			2.2	.5	1.9	1.2	8	2.2	2.8		.2	49	8	1	28	6.8	5
Apr. 8.....	805			2.4	.7	2.0	1.0	10	2.2	2.0		.4	26	9	1	30	6.7	5
May 4.....	328			1.8	1.1	1.9	1.0	11	1.6	1.5		.9	18	9	0	31	6.6	5
June 2.....	148			2.9	1.2	2.2	.9	15	3.6	2.2		.8	38	12	0	39	6.6	20
June 24.....	7.1			2.4	1.5	2.3	1.1	16	.4	2.5		1.2	38	12	0	40	6.5	5
July 28.....	241			2.9	1.4	2.5	.8	18	2.2	2.0		.6	30	13	0	41	7.0	5
Aug. 25.....	44			2.6	1.9	2.6	.9	18	1.8	2.5		1.0	30	14	0	44	6.6	4

ARKANSAS RIVER BASIN--Continued
7-2635. ARKANSAS RIVER AT LITTLE ROCK, ARK.

LOCATION.--At gaging station at Missouri Pacific Railroad bridge at Little Rock, Pulaski County.
DRAINAGE AREA.--158,201 square miles, of which 22,241 square miles probably are noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1959.

Water temperatures.--October 1945 to September 1959.
EXTREMES, 1958-59.--Dissolved solids: Maximum, 867 ppm Feb. 9-10; minimum, 137 ppm Nov. 21-22.

Sardness: Maximum, 258 ppm Nov. 8-14; minimum, 51 ppm Nov. 21-22.
Specific conductance: Maximum, 387 microhos Feb. 10; minimum daily, 173 microhos Nov. 20.

Water temperatures: Maximum, 88° July 1, Aug. 2-7; minimum, 32° Jan. 5.
EXTREMES, 1945-59.--Dissolved solids: Maximum, 828 ppm Nov. 28-29, 1953; minimum, 105 ppm Mar. 3, 1957.

Hardness: Maximum, 556 ppm Nov. 28-29, 1953; minimum, 46 ppm Feb. 2-4, 9, 12-16, 1957; microhos Feb. 4, 1957 Nov. 20, 1958.
Specific conductance: Maximum daily, 5,050 microhos Aug. 16, 1954; minimum daily, 173 microhos Feb. 4, 1957 Nov. 20, 1958.

Water temperatures: Maximum, 98° Aug. 16, 1954; minimum daily, 51° Dec. 19, 1945, Feb. 10, 11, 1947; Jan. 28, 29, 1948.
REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in RSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Specific conductance (microhos at 25°C)	Color or pH				
													Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate			Tons per day	Non-carbonate		
Oct. 1-5, 1958..	23,240	3.0	0.04	43	8.8	57	5.1	130	0	44	85	0.1	2.4	345	0.47	21,650	144	37	2.1	541	8.2	7
Oct. 6-12.....	11,050	3.9	.02	52	9.9	75	5.4	152	0	52	115	.1	1.8	423	.58	12,620	170	46	2.5	666	9.1	6
Oct. 13-20.....	8,352	2.4	.18	64	17	141	8.9	200	0	62	270	--	2.1	672	1.91	15,210	230	66	4.0	1,080	7.9	8
Oct. 21-23.....	8,823	1.8	.04	62	16	163	6.6	172	4	90	202	--	1.4	778	1,066	19,530	250	103	4.5	1,300	8.3	4
Oct. 24-31.....	5,845	1.8	.01	71	16	121	6.1	170	0	77	240	.1	1.2	623	11,460	220	81	3.5	1,010	8.2	7	
Nov. 1-7.....	5,839	1.1	.01	71	16	121	6.6	180	2	77	240	.2	1.1	623	11,460	220	88	4.2	1,180	8.3	7	
Nov. 8-14.....	5,391	2.4	.06	77	16	162	6.2	196	3	79	260	.2	.8	774	1,055	11,250	258	92	4.4	1,280	8.4	8
Nov. 15-17.....	14,470	--	--	56	13	111	4.7	144	2	58	180	--	2.8	543	.74	21,210	193	72	3.5	922	8.3	8
Nov. 18-20.....	51,900	--	--	18	3	25	3.1	52	0	18	41	--	1.6	165	.22	23,120	60	15	1.4	247	7.6	55
Nov. 21-22.....	39,450	--	--	15	3.3	18	2.9	48	0	16	27	--	1.5	137	.19	14,590	51	12	1.3	200	7.7	70
Nov. 24-28.....	24,100	1.9	.11	25	6.6	50	3.7	68	0	28	86	.0	.6	264	.36	17,180	90	34	2.3	467	7.8	7
Nov. 29-30.....	19,180	.9	.00	42	11	79	4.4	111	0	41	135	.0	1.5	401	.55	20,770	150	59	2.8	680	7.8	6
Dec. 1-2.....	15,480	.9	.00	37	8.6	60	3.6	101	0	40	100	.0	1.1	315	.43	13,170	128	45	2.3	554	7.8	6
Dec. 3-10.....	10,320	1.7	.00	43	11	84	3.9	122	0	44	135	.2	.7	410	.56	11,420	152	52	3.0	709	7.8	7
Dec. 16-25, 30-31	8,938	.9	.00	54	12	111	4.2	139	2	51	185	.1	.8	541	.74	13,060	184	67	3.6	889	8.3	6
Dec. 26-29.....	8,695	.9	.00	45	11	77	3.9	131	0	44	128	.1	.5	413	.56	9,700	158	50	2.7	712	7.5	7
Jan. 1-4, 1959..	8,662	3.7	.02	56	14	134	4.5	144	0	66	211	.2	1.5	641	1,007	14,990	197	79	4.2	1,020	7.9	7
Jan. 5-9.....	8,196	4.3	.00	61	17	152	4.8	152	0	62	238	.1	1.8	733	1,000	16,220	222	98	4.5	1,150	7.9	6
Jan. 10-13.....	7,542	4.6	.03	53	12	112	4.1	144	0	64	170	.1	2.1	597	.81	12,160	182	64	3.6	907	8.0	5
Jan. 14-16.....	8,560	--	--	56	14	132	3.8	144	0	75	212	--	1.4	640	.87	14,790	197	79	4.1	1,060	7.9	8

ARKANSAS RIVER BASIN--Continued
 7-2635. ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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)	Iron (E)	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	Non-carbonate			
Jan. 17-21, 1959	10,100	3.1	0.04	45	11	110	3.6	118	0	56	168	0.1	3.6	514	0.70	14,020	158	61	3.8	857	7.3	5
Jan. 22.....	13,600	4.5	--	50	12	147	4.2	114	0	72	230	--	1.5	666	.91	24,460	174	81	4.8	1,070	8.0	5
Jan. 23-31.....	14,260	4.5	.01	37	10	98	3.3	98	0	53	150	.2	2.0	479	.65	18,440	134	55	3.6	743	7.8	6
Feb. 1, 5-7.....	11,075	3.4	--	42	9.7	105	2.9	108	0	54	180	--	1.0	510	.69	15,250	145	56	4.0	827	7.6	6
Feb. 2-4, 8, 11.	12,800	3.4	.00	53	15	154	4.6	130	0	81	240	3.3	2.4	698	1.95	24,120	194	87	4.8	1,120	7.3	4
Feb. 9-10.....	12,200	--	--	42	16	185	4.6	140	0	89	305	--	1.4	867	1.18	28,560	216	101	5.8	1,400	7.9	7
Feb. 12-13.....	10,800	--	--	42	12	166	2.7	112	0	61	162	--	1.1	522	1.71	15,220	154	62	3.7	853	7.7	6
Feb. 14-22.....	34,630	3.3	.04	27	6.8	54	2.8	68	0	35	88	3	2.1	288	.39	26,930	96	40	2.4	482	7.3	20
Feb. 23-28.....	26,980	3.5	.01	37	7.8	86	3.4	90	0	45	135	.3	2.6	420	.67	30,880	122	45	3.5	959	7.1	10
Mar. 1-5.....	16,380	3.7	.01	37	8.8	106	2.9	92	0	37	172	.2	2.6	279	.67	43,640	197	38	3.8	959	7.3	15
Mar. 6-16.....	53,320	4.2	.05	32	6.6	66	3.2	72	0	44	89	.3	2.2	312	.48	28,870	114*	52	2.2	435	7.3	13
Mar. 17-22.....	34,270	4.0	.05	32	8.3	54	3.2	76	0	44	89	.3	2.2	312	.48	28,870	114*	52	2.2	435	7.3	13
Mar. 23-24.....	71,650	4.0	.05	32	5.3	41	2.3	100	0	18	59	.2	2.2	241	.33	48,630	90	32	1.9	492	6.6	15
Mar. 25-31.....	67,010	4.2	.18	20	4.3	27	2.7	53	0	22	41	.4	2.7	194	.26	35,100	68	24	1.4	277	7.6	40
Apr. 1-5.....	46,860	5.7	.00	22	5.7	39	2.6	57	0	27	65	--	2.0	329	.39	29,990	78	32	1.9	384	6.8	17
Apr. 6-8.....	42,430	--	--	25	6.4	54	2.9	62	0	38	82	--	2.3	284	.32	32,540	89	38	2.5	447	7.3	20
Apr. 9-10.....	32,500	--	--	30	8.1	82	3.3	66	0	48	133	--	4.2	393	.53	34,490	108	54	3.4	652	7.1	8
Apr. 11-12.....	28,600	--	--	35	9.4	129	4.1	79	0	54	202	--	2.0	548	.75	42,320	126	62	5.0	882	7.3	7
Apr. 13-16.....	23,620	6.6	.00	37	9.1	90	3.6	91	0	56	138	1.2	2.7	425	.58	27,100	130	56	3.4	702	7.6	15
Apr. 17-20.....	29,680	6.5	.00	51	12	116	4.5	113	0	70	192	.2	7.4	592	.81	47,440	176	84	3.8	983	7.8	8
Apr. 21-27.....	56,160	7.9	.02	29	6.2	56	3.0	74	0	34	91	.1	2.4	302	.41	45,790	98	38	2.5	510	7.2	13
Apr. 28-30.....	29,170	--	--	36	8.7	92	3.8	87	0	48	150	--	2.0	447	.61	35,210	126	54	3.6	728	7.3	5
May 1-2.....	22,600	--	--	37	7.9	79	3.8	96	0	48	150	--	2.6	403	.55	24,590	125	46	3.1	663	7.4	5
May 3-10.....	15,390	6.0	.00	49	11	109	4.4	124	0	64	175	.2	1.6	539	.73	22,400	168	66	3.7	865	7.3	7
May 11-12.....	25,350	--	--	57	13	139	5.6	137	0	81	220	--	2.0	670	.91	45,860	196	83	4.3	1,090	7.6	4
May 13-19.....	87,640	7.9	.04	39	5.3	53	3.7	108	0	32	88	.3	3.2	328	.45	77,610	126	38	2.1	536	7.5	9
May 20-21.....	43,100	--	--	37	6.9	84	4.4	93	0	47	135	--	3.9	423	.58	49,220	125	45	4.9	3,699	7.5	6
May 22.....	41,800	--	--	47	10	143	6.1	118	0	69	220	--	3.7	644	.88	72,680	158	62	4.9	1,030	7.5	--
May 23-31.....	53,190	8.5	.01	42	8.2	71	4.5	107	0	47	115	--	3.0	392	.53	56,300	138	51	2.6	634	7.6	8
June 1-4.....	55,540	8.0	.02	43	9.0	69	4.5	107	0	48	115	.3	4.1	400	.54	59,890	144	57	2.5	664	7.1	10
June 5-6.....	58,400	--	--	44	8.2	108	5.1	111	0	58	165	--	3.0	518	.70	77,480	144	52	3.9	840	7.1	13
June 7-10.....	38,480	7.7	.00	37	8.6	80	4.4	99	0	48	122	.2	3.8	407	.55	42,290	128	48	3.1	664	7.3	8
June 11-13.....	48,170	--	--	30	5.7	50	3.6	77	0	34	82	--	2.6	287	.39	37,330	98	36	2.2	460	7.4	8
June 14-16.....	43,930	--	--	24	4.9	41	3.0	66	0	27	64	--	2.4	235	.32	27,870	80	26	2.0	375	7.2	11

June 17-21, 1959	23,100	8.2	0.00	36	8.3	57	3.8	98	0	43	92	0.2	2.0	341	0.46	21,270	124	44	2.2	556	7.5
June 22-29	12,810	5.9	0.00	48	11	96	4.9	127	0	59	152	.2	1.5	488	.66	16,880	165	61	3.3	799	7.3
June 30	11,600	--	--	57	13	134	5.8	124	0	80	212	--	1.5	640	.87	20,040	196	81	4.2	1,030	7.6
July 1-2	18,050	--	--	61	13	152	6.7	124	0	100	242	--	1.3	701	.96	34,160	206	104	4.6	1,170	7.8
July 3-4	19,000	--	--	59	8.3	111	5.8	117	0	58	188	--	1.8	576	.78	29,550	181	83	3.6	928	7.6
July 5-8	14,980	6.2	0.00	57	14	146	7.1	132	0	81	235	.4	5.5	704	.96	28,470	200	92	4.5	1,130	7.0
July 9-14	13,730	7.7	0.00	51	13	95	5.8	136	0	62	155	.4	4.1	516	.70	19,130	180	69	3.1	824	7.4
July 15	12,800	--	--	80	5.7	147	6.9	38	0	92	240	--	.94	a 685	.93	23,670	223	192	4.3	1,180	6.7
July 16-18	13,470	--	--	59	10	99	3.3	140	0	69	160	--	1.5	518	.70	18,840	188	74	3.1	863	7.7
July 19	22,100	--	--	67	16	135	8.1	152	0	81	230	--	3.2	738	1.00	44,040	233	108	3.9	1,502	7.7
July 20	59,500	--	--	58	13	93	6.6	140	0	64	155	--	3.2	530	.72	83,140	136	51	2.9	892	7.7
July 21	102,000	--	--	40	8.3	50	6.1	128	0	40	70	--	3.2	330	.45	90,860	134	27	1.9	497	7.5
July 22-23	113,500	--	--	43	5.3	24	6.1	125	0	27	40	--	4.1	239	.35	79,300	130	27	.9	396	7.6
July 24-26	127,700	--	--	35	5.8	20	3.7	102	0	26	34	--	1.4	209	.28	72,060	112	26	.8	308	7.7
July 27-31, Aug. 1-5	110,200	7.1	0.00	35	4.5	24	4.0	106	0	21	38	.3	3.2	229	.31	68,140	106	19	1.0	322	7.1
Aug. 6-10	38,280	7.8	0.00	39	5.7	31	4.2	112	0	30	46	.2	3.0	249	.41	24,810	121	29	1.2	384	7.3
Aug. 11-14	27,000	6.9	0.00	46	5.6	45	4.8	128	0	36	76	--	1.6	299	.54	21,800	138	33	1.7	494	7.3
Aug. 15-16	20,300	--	--	48	9.5	88	6.0	136	0	49	98	--	1.0	394	.41	21,600	159	48	2.0	629	7.7
Aug. 17-18	16,750	--	--	22	12	82	6.8	136	0	59	142	--	1.0	484	.66	21,890	179	68	2.9	790	7.4
Aug. 19-26	16,160	5.6	0.00	52	12.1	66	4.8	136	0	48	106	.3	2.5	390	.53	17,020	163	52	2.2	648	7.3
Aug. 27-28	18,000	--	--	58	18	88	6.3	148	0	69	155	--	1.5	542	.74	26,340	218	97	2.6	861	7.9
Aug. 29-31, Sept. 1-3	14,270	8.3	0.00	54	8.7	59	5.0	141	0	45	100	.3	3.5	402	.55	15,490	170	55	2.0	635	7.5
Sept. 4-10	13,330	6.5	0.00	61	11	107	5.9	160	0	63	165	.4	2.9	549	.75	19,760	197	66	3.3	899	7.5
Sept. 10-17	12,330	6.4	0.00	57	15	144	6.9	142	0	75	234	.4	3.1	679	.92	22,600	204	87	4.4	1,130	7.3
Sept. 18-23	7,933	4.8	0.00	56	11	92	5.6	160	0	56	145	.4	2.7	491	.67	10,520	184	54	2.9	823	7.4
Sept. 24-25	6,445	--	--	58	17	116	6.9	152	0	73	190	--	1.6	614	.84	10,680	214	90	3.4	1,000	7.9
Sept. 26-29	24,410	4.1	0.00	53	11	81	5.1	150	0	55	137	.3	2.9	456	.62	30,050	177	54	2.6	749	7.3
Sept. 30	94,700	--	--	68	13	139	6.8	156	0	58	240	--	2.4	720	.98	184,100	223	95	4.0	1,100	7.6
Weighted average	28,900	--	--	38	7.8	64	4.1	102	0	41	102	--	2.8	361	0.49	28,170	127	44	2.5	572	--

a Calculated from determined constituents.

ARKANSAS RIVER BASIN--Continued
 7-2635. ARKANSAS RIVER AT LITTLE ROCK, ARK.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	65	64	65	66	68	72	74	74	70	67	69	69	69	69	69	69	70	70	70	70	70	68	70	67	66	63	67	70	70	60	68		
November ..	57	57	59	59	61	57	56	57	59	56	58	62	62	62	64	67	64	62	61	60	60	59	58	57	59	51	47	45	50	45	--	58		
December ..	46	46	47	55	44	41	43	43	39	38	39	38	36	36	35	38	38	41	43	42	42	43	45	43	43	43	44	43	44	44	42	42		
January	42	44	36	35	33	34	35	35	38	37	39	41	43	46	45	38	38	39	42	46	36	37	37	40	43	45	41	42	40	43	40	40		
February	40	38	39	41	39	40	42	45	49	47	44	44	47	49	48	49	51	47	45	45	44	43	47	46	49	50	51	50	--	--	45	--		
March	52	53	52	52	50	47	49	48	49	46	49	50	53	51	52	53	53	54	54	54	53	54	54	55	55	59	54	53	54	52	60	52		
April	60	60	60	61	62	63	63	62	60	61	58	60	59	60	60	61	61	62	64	64	64	68	66	66	66	66	66	66	66	66	66	63	--	
May	74	76	76	78	79	79	80	76	76	76	77	74	72	72	71	72	74	75	76	78	78	76	78	76	78	77	79	80	80	80	77	77		
June	78	78	79	78	79	79	78	76	77	78	78	79	80	80	81	83	84	83	84	83	84	84	84	85	85	84	85	85	86	87	87	81	--	
July	88	86	84	84	81	83	84	87	86	87	84	85	85	85	86	84	82	82	83	80	80	81	80	80	78	78	80	81	82	82	84	83	83	
August	84	85	87	88	88	88	88	86	84	85	85	85	85	86	86	86	86	85	85	84	87	86	87	87	87	87	83	84	84	85	83	83	86	86
September ..	84	85	83	82	80	81	81	--	81	80	76	75	75	76	77	78	78	78	79	79	79	81	79	81	74	80	79	78	77	78	76	75	--	79

RED RIVER BASIN

7-2999-3. SALT FORK RED RIVER NEAR HEDLEY, TEX.

LOCATION (revised).--One mile downstream from Whitefish Creek and 9.5 miles northeast of Hedley, Donley County. DRAINAGE AREA.--868 square miles, of which 209 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: March 1956 to September 1959.

Water temperatures: March 1956 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,810 ppm Mar. 11-14, 16, 20, 22, 25, 28; minimum, 563 ppm Mar. 5.

Hardness: Maximum, 841 ppm Mar. 11-14, 16, 20, 22, 25, 28; minimum, 275 ppm Jan. 8.

Specific conductance: Maximum daily, 2,700 micromhos May 11; minimum daily, 768 micromhos May 27.

EXTREMES, 1956-59.--Dissolved solids: Maximum, 2,600 ppm Apr. 30, 1956; minimum, 231 ppm Aug. 29, 1957.

Hardness: Maximum, 1,146 ppm Apr. 30, 1956; minimum, 166 ppm Aug. 29, 1957.

Specific conductance: Maximum, 3,530 micromhos June 16, 1957; minimum daily, 382 micromhos Aug. 29, 1957.

Water temperatures: Maximum, 95°F, June 30, 1957; minimum, freezing point Jan. 16-18, 1957, Feb. 17, 1958.

REMARKS.--Desires omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated.

Values reported for dissolved-solids concentrations less than 1,000 ppm are residues at 180°C and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted.

Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available. No flow during much of the period.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate		
Nov. 14-30, 1958.	--	28		116	36	158		202		332	188	0.8	2.8	992	1.35	438	272	3.3	1,490	7.8
Dec. 1-15.....	--	24		124	38	149		186		398	173	.6	2.5	892	1.35	466	306	2.9	1,460	7.7
Dec. 16-31.....	--	22		144	40	145		201		418	168	.6	2.5	1,040	1.41	524	360	2.8	1,550	7.8
Jan. 4-7, 1959.....	--	32		91	34	126	4.9	176		283	153	.8	4.5	862	1.17	367	223	2.9	1,260	8.2
Jan. 8.....	73.8	39		69	25	113		129		227	124	.6	2.2	696	.95	275	169	3.0	1,040	8.2
Jan. 13-31.....	--	32		121	44	178		192		402	205	.8	3.5	1,080	1.47	483	326	3.5	1,620	8.2
Feb. 1-3, 11, 17, 20.....	--	30		119	42	155		184		386	175	.7	4.8	1,000	1.36	470	318	3.1	1,510	8.2
Feb. 4, 17, 20.....	2.0	45		144	53	179		175		518	198	.7	3.5	1,230	1.67	578	434	3.2	1,800	8.1
Feb. 10, 12-13.....	--	16		74	24	91		110		234	103	.4	1.5	634	.86	283	193	2.3	956	8.1
Feb. 15-16, 18, 19.....	--	24		152	56	193		183		556	210	.7	2.5	1,280	1.74	610	460	3.4	1,870	8.1
Feb. 22-28.....	--	24		151	50	152		155		504	182	.7	3.0	1,140	1.55	582	455	2.7	1,710	7.6
Mar. 1-4, 6-10.....	--	17		72	24	81		100		218	101	.3	1.0	a 563	.77	278	196	2.1	917	8.2
Mar. 5.....	--	17		72	24	81		100		218	101	.3	1.0	a 563	.77	278	196	2.1	917	8.2
Mar. 11-14, 16.....	--	24		215	74	278		184		800	325	.9	1.8	1,810	2.46	841	690	4.2	2,570	7.6
Mar. 20, 22, 25, 28.....	--	24		215	74	278		184		800	325	.9	1.8	1,810	2.46	841	690	4.2	2,570	7.6
Mar. 15, 17-19, 21, 23-24, 26-27, 29.....	--	24		149	54	172		156		554	198	.7	2.5	1,210	1.65	594	466	3.1	1,800	8.2

a Calculated from determined constituents.

RED RIVER BASIN--Continued
7-3045. ELK CREEK NEAR HOBART, OKLA.

LOCATION.--At gaging station at highway bridge, 7 miles downstream from Little Elk Creek and 7.5 miles south of Hobart, Kiowa County. DRAINAGE AREA.--549 square miles. RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1951, October 1958 to September 1959. Water temperatures: October 1949 to September 1951, October 1958 to September 1959.

Sediment records: December 1958 to September 1959. EXTREMES, 1958-59.--Dissolved solids: Maximum, 2,620 ppm Nov. 26-30; minimum, 151 ppm July 1-3.

Hardness: Maximum, 1,640 ppm Nov. 26-30; minimum, 96 ppm July 28-29. Specific conductance: Maximum daily, 3,100 micromhos Nov. 27; minimum daily, 154 micromhos May 26.

Water temperatures: Maximum, 85 F June 13, 15, 16; minimum, freezing point on several days during January and February. Sediment concentrations: Maximum daily, 6,860 ppm Sept. 25; minimum daily, 6 ppm Jan. 18, 19.

Sediment loads: Maximum daily, 39,800 tons Sept. 25; minimum daily, 280 tons on several days. EXTREMES, 1949-51, 1958-59.--Dissolved solids: Maximum, 2,620 ppm Nov. 26-30, 1958; minimum, 151 ppm July 1-3, 1959.

Specific conductance: Maximum daily, 3,100 micromhos Nov. 27, 1958; minimum daily, 154 micromhos May 26, 1959.

Water temperatures: Maximum, 85 F June 13, 15, 16; minimum, freezing point on many days during winter months. Sediment concentrations: Maximum daily, 6,860 ppm Sept. 25; minimum daily, 6 ppm Jan. 18, 19.

Sediment loads: Maximum daily, 39,800 tons Sept. 25; minimum daily, 280 tons on several days. REMARKS.--Dates omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (Fe)	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) (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	So-dium ad-justed ratio	pH	
Oct. 12-20, 1958	1.01	6.8	0.00	140	116	177	8.6	356	0	600	185	0.5	1.4	0.72	1,470	2.00	4.0	825	534	2.7	2,010	8.2
Nov. 1-5	.18	--	--	146	86	185	--	322	0	547	205	--	.5	--	1,390	1.89	.7	720	456	3.0	1,960	8.2
Nov. 6-10	.22	--	--	136	68	158	--	388	0	390	170	--	.5	--	1,170	1.59	.7	620	302	2.8	1,710	8.2
Nov. 11-24	.71	10	.00	130	69	156	9.4	382	16	346	170	.5	.8	.78	1,100	1.50	2.1	610	270	2.7	1,640	8.5
Nov. 25	1.40	--	--	222	84	198	--	344	16	548	310	--	17	--	1,640	2.23	6.2	900	592	2.9	2,330	8.5
Nov. 26-30	1.00	--	--	460	120	161	--	392	0	1,270	245	--	1.8	--	2,620	3.56	7.1	1,640	1,320	1.7	3,020	8.2
Dec. 1-2	1.10	--	--	368	112	203	--	404	28	1,060	240	--	2.2	--	2,400	3.26	7.1	1,380	1,000	2.4	2,860	8.5
Dec. 3-4	2.05	--	--	264	127	156	--	428	24	878	150	--	4.4	--	1,970	2.68	11	1,180	790	2.0	2,390	8.5
Dec. 5-20	1.77	--	--	200	78	126	--	356	0	578	135	--	12	--	1,400	1.90	6.7	820	528	1.9	1,860	8.2
Dec. 21-31	2.47	--	--	200	83	130	--	380	0	593	132	--	9.8	--	1,440	1.96	9.6	840	528	2.0	1,900	7.9
Jan. 1-31, 1959	3.23	13	.00	198	82	148	8.2	420	0	607	142	.7	10	.63	1,440	1.96	13	830	486	2.2	1,930	8.2
Feb. 1-20	5.04	4.0	.00	182	78	138	6.8	354	12	573	140	.7	5.0	.43	1,360	1.85	19	775	465	2.2	1,850	8.4
Feb. 21-28	3.85	6.5	.00	170	87	146	8.3	416	0	547	138	.9	4.2	.56	1,380	1.88	14	780	439	2.3	1,850	8.2
Mar. 1-10	6.31	7.5	.00	186	93	151	7.8	442	0	565	151	.4	5.2	.29	1,870	2.00	23	845	483	2.3	1,950	8.0
Mar. 11-28	6.39	7.2	.00	209	84	95	9.4	310	0	617	102	.7	1.2	.07	1,360	1.83	15	850	596	1.4	2,060	7.6
Mar. 29-Apr. 3	6.80	--	--	89	38	61	--	200	8	236	52	--	6.6	--	607	.83	11	370	192	1.4	900	8.4

RED RIVER BASIN--Continued
 7-3045. ELK CREEK NEAR HOBART, OKLA.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (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						
Apr. 4-8, 1959.....	6.98	--	--	130	48	100	--	308	16	314	90	--	4.5	928	1.26	17	520	241	1.9	1,270	8.5
Apr. 9-10,	221	--	--	38	10	18	--	116	2	56	12	--	3.3	232	.32	138	138	40	1.7	341	8.3
Apr. 11-13,	13.4	--	--	70	26	46	--	146	4	191	38	--	3.1	536	.73	19	280	154	1.2	717	8.4
Apr. 14-17,	6.98	--	--	96	37	82	--	224	8	257	72	--	3.7	766	1.04	14	390	183	1.8	1,020	8.5
Apr. 18-20,	34.2	--	--	138	55	119	--	324	22	356	102	--	5.1	1,060	1.44	98	570	268	2.1	1,390	8.6
Apr. 21-24,	26.5	--	--	45	19	36	--	154	4	87	30	--	6.4	316	.43	23	192	60	1.1	516	8.6
Apr. 25-27,	11.3	--	--	80	32	67	--	240	0	191	54	--	4.0	601	.82	18	330	134	1.6	878	8.1
Apr. 28-30,	10.2	--	--	111	45	86	--	304	2	281	70	--	4.0	843	1.15	23	460	208	1.7	1,150	8.3
May 1-5,	28.3	--	--	138	56	111	--	324	22	372	88	--	3.2	1,030	1.40	79	575	273	2.0	1,370	8.6
May 6-13,	552	--	--	42	17	23	--	126	2	158	29	--	2.7	278	.88	418	190	44	1.8	297	8.5
May 14-16,	17.8	--	--	82	27	53	--	182	0	182	39	--	2.7	991	1.50	46	315	152	1.2	773	8.5
May 19-20,	13.5	--	--	150	67	103	--	368	26	386	90	--	3.7	1,170	1.45	334	415	310	1.8	1,430	8.5
May 21-25,	375	--	--	51	17	34	--	148	0	94	37	--	4.9	240	.45	46	192	80	1.0	521	8.2
May 26-31,	667	--	--	42	11	20	--	136	0	54	20	--	4.5	240	.33	432	152	40	1.8	371	8.2
June 1-2,	27.0	--	--	99	45	70	--	272	14	236	62	--	5.7	698	.95	51	430	184	1.5	1,010	8.5
June 3-20,	15.9	--	--	134	89	111	--	384	14	423	112	--	5.7	1,140	1.55	49	700	362	1.8	1,570	8.5
June 21,	10.0	--	--	42	116	225	--	126	0	472	335	--	1.6	1,030	1.40	28	580	476	4.1	1,670	8.1
June 22-26,	166	--	--	69	43	8.9	--	128	0	46	20	--	1.9	218	.30	98	144	39	1.6	349	8.2
June 27-28,	10.8	--	--	69	21	45	--	178	6	133	42	--	1.9	a 405	.55	12	258	102	1.2	650	8.4
June 29-30,	10.6	--	--	106	40	69	--	228	12	272	60	--	7.3	a 678	.92	19	430	223	1.5	982	7.5
July 1-3,	643	--	--	32	7.8	9.7	--	104	0	30	12	--	0	151	.21	262	112	27	1.4	254	7.5
July 4-9,	263	--	--	50	22	46	--	176	0	160	36	--	2.5	431	.59	306	264	120	1.2	662	7.4
July 10-12,	192	--	--	58	15	41	--	170	0	103	34	--	4.0	350	.48	181	208	68	1.2	539	8.2
July 13-16,	183	--	--	57	19	38	--	182	0	102	32	--	3.8	347	.47	171	220	71	1.1	553	8.1

July 17-20, 1959..	15.8	--	--	123	57	97	--	324	8	333	85	--	7.1	--	890	1.21	540	261	1.8	1,250	8.4	
July 21-27.....	71.4	--	126	71	122	--	326	0	450	105	105	--	5.2	--	1,070	1.46	630	354	2.1	1,490	8.0	
July 28-29.....	3.020	--	28	5.7	13	--	173	6	24	9.2	9.2	--	1.9	--	1,62	.22	96	11	1.6	1,237	8.0	
July 30-31.....	170	--	68	21	43	--	173	6	156	42	42	--	4.4	--	402	.55	250	99	1.2	629	8.4	
Aug. 1-10.....	35.6	16	0.01	143	57	94	6.0	250	0	387	122	0.3	7.8	0.36	1,130	1.54	590	385	1.7	1,530	8.2	
Aug. 11-31.....	12.1	13	.00	160	85	164	4.0	372	12	528	172	4.5	4.6	.41	81,330	1.81	43	425	2.6	2,550	8.3	
Sept. 1-3.....	22.5	--	152	90	173	--	332	16	555	175	175	--	3.8	--	1,400	1.90	85	750	452	2.7	1,900	8.5
Sept. 4-10.....	74.3	--	59	31	57	--	180	0	164	54	54	--	5.6	--	497	.68	100	126	1.5	1,768	8.1	
Sept. 11.....	7.60	--	90	45	74	--	258	0	247	70	70	4.4	4.4	--	696	.95	14	198	1.6	1,010	8.2	
Sept. 12-20.....	6.83	--	138	65	126	--	318	8	419	120	120	5.7	5.7	--	1,090	1.48	20	610	336	2.2	1,550	8.2
Sept. 21-24.....	9.72	--	168	83	144	--	384	0	536	140	140	3.3	3.3	--	1,360	1.85	36	760	446	2.3	1,800	8.2
Sept. 25-26.....	2.195	--	27	7.4	6.2	--	98	0	20	5.8	5.8	2.4	2.4	--	1,59	.22	942	98	18	.3	241	7.8
Sept. 27.....	180	--	43	14	20	--	152	0	53	21	21	1.3	1.3	--	273	.37	133	166	42	.7	413	7.2
Sept. 28.....	46.0	--	55	24	33	--	182	0	101	36	36	1.9	1.9	--	391	.53	49	234	85	.9	591	8.0
Sept. 29-30.....	32.5	--	81	37	57	--	238	0	180	66	66	4.6	4.6	--	599	.81	53	160	1.3	881	8.2	
Weighted average	90.0	--	49	16	29	--	b145	--	89	27	27	2.9	2.9	--	319	0.43	78	188	70	0.9	474	--

a Calculated from determined constituents.
 b Includes equivalent of individual carbonate values.

Temperature (°F) of water, water year October 1958 to September 1959

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.....	--	--	50	50	41	--	--	--	--	--	--	--	68	65	72	63	74	75	69	75	61	70	75	59	75	58	60	50	50	52	54	
November..	60	50	--	--	--	55	55	54	54	55	62	62	62	62	60	48	57	48	60	50	41	39	43	40	39	40	38	38	40	50	--	
December..	45	46	51	45	43	38	37	--	--	34	35	34	--	33	37	33	36	39	--	41	39	43	43	40	39	40	40	44	38	33	34	
January.....	36	34	31	32	32	34	31	34	32	33	33	39	39	44	41	35	38	32	40	38	31	32	33	35	36	38	35	44	--	37	35	
February....	31	31	32	35	34	36	40	46	45	42	39	43	49	40	41	48	49	40	35	33	39	40	41	45	45	46	47	--	--	41	48	
March.....	45	45	42	42	40	39	42	47	49	48	47	47	47	56	47	45	47	52	52	--	48	--	--	55	60	50	47	48	--	--	48	
April.....	55	56	56	54	60	66	70	52	--	48	52	55	50	51	54	57	69	59	62	55	51	54	62	61	74	70	74	65	67	76	--	
May.....	80	71	74	74	69	67	64	64	--	65	66	67	68	66	64	62	--	76	75	64	74	65	68	73	65	72	72	78	77	--	70	
June.....	71	--	76	75	72	76	79	77	80	80	81	80	85	79	85	85	80	80	82	84	72	74	76	75	76	79	79	83	--	79		
July.....	69	70	69	75	77	82	82	82	73	75	75	76	74	74	84	81	82	80	80	80	80	80	80	80	81	84	75	71	76	79	82	
August.....	82	81	81	82	84	82	73	82	80	82	75	82	82	80	81	80	80	77	77	79	81	80	80	81	82	82	81	82	82	80	80	
September..	84	72	77	70	70	76	70	76	77	72	67	70	65	70	70	77	75	74	72	70	75	75	75	75	72	70	74	75	75	59	--	

QUALITY OF SURFACE WATERS, 1959

RED RIVER BASIN--Continued

7-3045. ELK CREEK NEAR HOBART, OKLA.--Continued

Suspended sediment, December 1958 to September 1959

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...							0.8	--	e 0.1
2...							1.4	--	--
3...							2.3	19	.1
4...							1.8	17	.1
5...							1.7	16	.1
6...							1.6	12	.1
7...							1.6	11	(t)
8...							1.6	8	(t)
9...							1.5	12	(t)
10...							1.5	13	.1
11...							1.4	13	(t)
12...							1.4	11	(t)
13...							1.8	11	.1
14...							1.9	12	.1
15...							2.0	12	.1
16...							2.0	12	.1
17...							1.9	11	.1
18...							2.0	11	.1
19...							2.1	13	.1
20...							2.3	14	.1
21...							2.5	14	.1
22...							2.5	12	.1
23...							2.6	11	.1
24...							2.4	11	.1
25...							2.3	11	.1
26...							2.3	10	.1
27...							2.3	9	.1
28...							2.7	8	.1
29...							2.5	7	(t)
30...							2.6	8	.1
31...							2.5	9	.1
Total							61.8	--	2.8
	January			February			March		
1...	2.6	9	0.1	4.7	10	0.1	4.0	137	1.5
2...	2.6	7	(t)	5.7	11	.2	4.0	157	1.7
3...	2.7	8	.1	5.8	10	.2	4.0	155	1.7
4...	2.5	8	.1	5.6	10	.2	3.8	120	1.2
5...	2.3	7	(t)	5.0	11	.1	3.8	186	1.9
6...	2.7	7	.1	4.9	10	.1	3.6	180	1.7
7...	3.0	9	.1	5.1	10	.1	3.5	166	1.6
8...	2.7	7	(t)	5.7	10	.2	3.6	158	1.5
9...	2.5	7	(t)	5.7	10	.2	3.5	174	1.6
10...	2.7	9	.1	5.4	9	.1	3.3	205	1.8
11...	2.6	10	.1	5.0	8	.1	3.3	223	2.0
12...	3.3	9	.1	5.3	9	.1	3.3	194	1.7
13...	4.0	7	.1	5.3	8	.1	3.2	215	1.9
14...	3.3	7	.1	5.0	7	.1	3.2	237	2.0
15...	3.2	9	.1	5.0	9	.1	3.2	266	2.3
16...	3.6	10	.1	4.6	9	.1	3.1	261	2.2
17...	3.7	8	.1	4.5	7	.1	3.1	252	2.1
18...	3.6	6	.1	4.4	9	.1	3.3	211	1.9
19...	3.5	6	.1	4.1	10	.1	3.2	251	2.2
20...	3.5	7	.1	4.1	8	.1	3.5	260	2.5
21...	3.5	8	.1	4.1	9	.1	3.5	256	2.4
22...	3.5	8	.1	3.8	9	.1	3.5	232	2.2
23...	3.5	8	.1	3.7	15	.2	5.6	249	s 3.9
24...	3.3	11	.1	3.7	20	.2	10	279	7.5
25...	3.5	11	.1	3.6	20	.2	7.3	321	6.3
26...	3.5	10	.1	3.8	21	.2	5.8	344	s 5.0
27...	3.2	9	.1	4.0	21	.2	20	298	s 20
28...	3.7	11	.1	4.1	35	.4	27	372	s 28
29...	3.8	11	.1	--	--	--	11	271	8
30...	4.2	9	.1	--	--	--	7.9	152	3.2
31...	4.4	9	.1	--	--	--	6.7	83	1.5
Total	100.7	--	2.9	131.7	--	4.1	177.8	--	125.0

e Estimated.

s Computed by subdividing day.

t Less than 0.05 ton.

RED RIVER BASIN--Continued

7-3045. ELK CREEK NEAR HOBART, OKLA.--Continued

Suspended sediment, December 1958 to September 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...	5.3	80	1.1	9.5	123	3.2	28	435	33
2...	5.0	87	1.2	9.5	125	3.2	26	342	24
3...	4.9	87	1.2	9.2	135	3.4	24	297	19
4...	4.7	82	1.0	9.2	148	3.7	22	282	17
5...	4.4	75	.9	104	1,760	s 2,420	20	248	13
6...	3.7	80	.8	831	5,980	s 13,400	20	285	15
7...	4.1	85	.9	216	3,170	s 2,030	20	272	15
8...	18	240	s 124	246	4,060	s 4,980	19	270	14
9...	384	5,210	s 6,090	1,700	4,690	s 21,900	18	255	12
10...	58	2,320	s 392	477	4,780	s 7,330	17	255	12
11...	19	1,020	s 53	596	4,480	s 7,200	16	260	11
12...	12	455	15	311	2,880	s 2,950	15	263	11
13...	9.3	260	6.5	42	1,220	138	14	251	9.5
14...	7.9	144	3.1	25	585	39	13	278	10
15...	7.2	130	2.5	18	296	14	13	285	10
16...	6.4	122	2.1	17	200	9.2	12	287	9.3
17...	6.4	107	1.8	15	180	7.3	12	289	9.4
18...	6.4	98	1.7	14	148	5.6	11	312	9.3
19...	6.1	152	2.5	14	152	5.7	11	292	8.7
20...	90	2,080	s 810	13	232	8.1	10	304	8.2
21...	61	2,130	s 380	14	1,210	46	10	211	5.7
22...	19	1,040	53	1,070	5,050	s 17,500	336	4,500	s 4,580
23...	14	439	17	632	4,740	s 8,080	50	2,110	s 288
24...	12	258	8.4	119	3,400	s 1,130	352	3,910	s 3,920
25...	12	183	5.9	38	1,400	s 155	76	1,860	s 400
26...	11	151	4.5	1,370	4,820	s 20,900	17	675	s 32
27...	11	121	3.6	1,260	5,760	s 19,200	12	254	8.2
28...	11	103	3.1	1,160	3,790	s 12,300	9.5	160	4.1
29...	10	117	3.2	119	2,860	s 1,070	12	173	5.6
30...	9.7	130	3.4	54	1,150	168	9.3	178	4.5
31...	--	--	--	37	600	60	--	--	--
Total	833.5	--	7,993.4	10,549.4	--	143,059.4	1,224.8	--	9,518.5
July August September									
1...	945	5,050	s 14,000	77	390	81	7.6	202	4.1
2...	830	4,430	s 9,580	56	223	34	7.9	203	4.3
3...	155	1,690	s 808	44	270	32	52	1,350	sa 601
4...	37	700	70	36	257	25	317	5,830	sa 5,080
5...	22	360	21	31	274	23	143	2,830	sa 1,340
6...	129	2,780	s 1,570	24	265	17	24	930	s 62
7...	55	1,540	s 347	22	305	18	12	320	10
8...	17	360	17	22	296	18	9.0	193	4.7
9...	1,320	4,450	s 18,000	22	229	14	7.8	153	3.2
10...	479	2,630	s 3,610	22	227	13	7.6	128	2.6
11...	69	854	s 185	19	212	11	7.6	92	1.9
12...	29	325	25	17	196	9.0	7.3	88	1.7
13...	506	3,670	s 6,620	16	205	8.9	7.3	80	1.6
14...	147	1,840	s 685	15	180	7.3	7.3	73	1.4
15...	54	392	57	15	158	6.4	7.3	70	1.4
16...	24	169	11	14	120	4.5	7.0	67	1.3
17...	19	128	6.6	14	83	3.1	6.8	64	1.2
18...	16	68	2.9	14	113	4.3	6.4	56	1.0
19...	14	40	1.5	15	173	7.0	6.0	47	.8
20...	14	53	2.0	14	145	5.5	6.1	37	.6
21...	13	93	3.3	14	196	7.4	6.1	17	.3
22...	12	124	4.0	14	162	6.1	6.1	13	.2
23...	12	140	4.5	8.8	164	3.9	5.7	15	.2
24...	10	140	3.8	8.6	140	3.3	21	404	sa 147
25...	11	139	4.1	8.6	141	3.3	2,570	6,860	sa 39,800
26...	10	105	2.8	8.3	104	2.3	1,820	3,110	s 14,000
27...	426	2,880	s 7,310	8.1	127	2.8	180	1,900	s 624
28...	4,020	3,480	s 34,800	7.9	160	3.4	46	730	91
29...	2,020	2,720	s 11,300	8.1	135	3.0	27	280	20
30...	229	1,880	s 1,260	7.9	160	3.4	38	452	s 150
31...	122	812	267	7.8	165	3.5	--	--	--
Total	11,772	--	110,578.5	611.1	--	384.4	5,376.9	--	61,957.5
Total discharge for period (cfs days)..... 30,839.7									
Total load for period (tons)..... 333,626.5									

s Computed by subdividing day.

a Computed from partly estimated-concentration graph.

RED RIVER BASIN--Continued
7-3135. BEAVER CREEK NEAR WAURIKA, OKLA.

LOCATION---At gaging station at bridge on State Highway 5, 4.5 miles northwest of Waurika, Jefferson County, and 6.2 miles upstream from Cow Creek.
DRAINAGE AREA.--563 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1959.

Water temperatures: May 1956 to September 1957.

Sediment records: May 1956 to September 1957.

EXTREMES, 1956-59.--Dissolved solids: October 1955 to September 1957.

Hardness: Maximum, 590 ppm Apr. 12; minimum, 98 ppm July 1-10.

Specific conductance: Maximum daily, 1,550 microhos Apr. 12; minimum, 152 ppm July 1-10.

Water temperatures: Maximum, 85° F Aug. 3, 4; minimum, 33° F Dec. 14.

Wet-bulb temperatures: Maximum, 83° F Aug. 3, 4; minimum, 33° F Dec. 14.

EXTREMES, 1955-59.--Dissolved solids: Maximum, 1,210 ppm May 16, 18, 20, 1956; minimum, 151 microhos July 9, 1959.

Hardness: Maximum, 650 ppm Dec. 10, 1957; minimum, 56 ppm Apr. 21-30, 1957.

Specific conductance: Maximum daily, 2,067 microhos Feb. 14, 1958; minimum, 125 ppm July 4-8, 1956.

Water temperatures: Maximum, 89° F Aug. 19, 1958; minimum, freezing point on several days during December, 1956, January 1957.

REMARKS.--Batches omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Oklahama City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631. No flow Oct. 23 to Nov. 13.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)				
														Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		Soilium sorption ratio			
Oct. 1-20, 1958..	0.74	7.8	0.00	51	46	18	4.6	182	0	55	13	0.5	1.8	0.20	0.5	0.5	43	0.6	424	7.4		
Oct. 21-22.....	2.10	---	---	134	46	54	3.4	334	0	234	43	---	---	---	734	1.00	525	252	0.6	1,040	8.1	
Nov. 14-20.....	5.97	---	---	92	18	28	2.6	256	0	163	22	---	---	---	356	48	246	36	0.8	961	8.1	
Dec. 1-31, 1959..	8.75	---	---	92	17	28	2.1	208	4	101	173	---	---	---	729	98	400	188	1.9	1,031	8.4	
Jan. 1-31, 1959..	8.70	13	0.00	106	45	36	2.1	208	0	304	26	---	0.63	---	766	103	400	208	1.7	1,037	8.0	
Feb. 1-20.....	8.14	9.0	0.00	134	50	34	2.4	284	0	323	26	---	---	---	766	103	540	308	0.8	1,030	8.0	
Feb. 21-28.....	8.14	9.0	0.00	106	49	42	2.4	208	0	330	31	---	0.23	---	713	97	465	294	1.8	969	8.0	
Mar. 1-10.....	6.87	8.7	0.00	126	21	73	4.0	286	0	175	108	0	1.7	0.00	758	103	400	166	1.6	1,010	7.3	
Mar. 11-31.....	6.90	8.9	0.00	130	22	79	2.9	292	0	187	111	---	---	---	697	95	415	176	1.7	1,080	7.8	
Apr. 1-11.....	12.3	---	---	126	51	50	2.9	276	6	328	40	---	1.8	0.00	818	111	27	525	289	1.0	1,040	8.4
Apr. 12-17.....	18.0	---	---	144	56	126	2.6	216	0	350	228	---	---	---	1,100	150	53	590	413	2.3	1,550	8.3
Apr. 18-17.....	8.46	---	---	114	46	61	2.8	196	2	344	60	---	---	---	838	114	475	311	1.2	1,060	8.3	
Apr. 18-20.....	416	---	---	76	21	28	4.5	176	2	157	17	---	---	---	456	62	512	275	1.28	7	602	8.3
Apr. 19-20.....	385	---	---	40	7.8	21	4.0	130	0	38	23	---	---	---	240	33	249	132	26	8	346	8.2
Apr. 21-23.....	39.3	---	---	62	16	34	4.2	142	8	108	37	---	2.3	---	411	56	44	222	92	1.0	546	8.5
Apr. 24-30.....	15.2	---	---	126	38	55	2.64	6	261	6	110	---	1.4	---	812	110	33	470	244	1.1	1,020	8.4
May 1-7.....	8.69	---	---	110	48	49	2.44	0	286	56	56	---	1.3	---	726	99	17	470	270	1.0	1,030	8.1
May 8-14.....	496	---	---	46	13	9.2	1.22	0	73	6.8	---	3.1	---	---	228	31	305	168	68	3	362	8.1
May 15.....	45.0	---	---	65	21	37	1.56	6	107	56	---	1.9	---	---	406	55	49	250	112	1.0	639	8.4
May 18.....	39.0	---	---	46	13	6.0	1.16	0	70	7.8	---	4.9	---	---	228	31	24	170	75	1.2	357	8.1

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	Aver- age
May 17-20, 1959..	31.5	---	---	---	101	32	60	75	214	6	132	82	---	1.6	---	642	0.87	55	385	200	1.3	946	8.4									
May 21-22.....	16.0	---	---	---	74	24	25	126	126	0	275	126	---	1.2	---	361	.93	35	364	284	1.7	1,480	8.1									
May 23-31.....	33.0	---	---	---	57	17	26	182	182	0	275	126	---	1.9	---	361	.93	280	364	276	1.9	1,480	8.1									
June 1-10.....	31.0	---	---	---	75	25	44	180	180	4	179	48	---	3.1	---	501	1.36	95	390	160	1.1	708	8.4									
June 11-12.....	35.1	---	---	---	134	45	134	210	210	0	256	282	---	1.8	---	1,000	1.36	40	520	323	2.6	1,500	8.2									
June 13-20.....	14.5	---	---	---	120	48	151	210	210	0	236	288	---	2	---	1,020	1.39	40	495	323	3.0	1,500	8.2									
June 21-30.....	5.59	---	---	---	141	43	74	188	188	10	316	75	---	1.3	---	848	1.15	13	530	278	1.4	1,180	8.4									
July 1-10.....	18.9	---	---	---	90	28	74	166	166	4	172	126	---	1.6	---	641	.87	33	340	198	1.7	972	8.3									
July 11-19.....	110	---	---	---	30	5.6	12	88	0	34	34	11	---	2.2	---	152	.21	45	98	26	.5	244	7.7									
July 20-31.....	57.4	---	---	---	35	5.5	17	104	0	34	34	17	---	1.8	---	166	.23	26	110	25	1.7	281	7.6									
Aug. 1-20.....	9.66	---	---	---	48	15	37	182	0	49	43	13	---	1.2	---	286	.39	7.5	180	31	1.2	501	8.2									
Aug. 21-31.....	11.5	2.5	0.04	---	38	13	30	3.2	136	0	34	42	0.5	2.2	0.12	243	.33	68	148	36	1.1	407	8.1									
Sept. 1-2.....	18.1	---	---	---	58	28	70	240	8	114	58	44	---	2.3	---	348	.47	11	204	48	1.3	562	7.7									
Sept. 3-10.....	61.1	---	---	---	34	14	26	126	0	35	44	58	---	1.8	---	480	.65	23	260	50	1.9	760	8.4									
Sept. 11-20.....	9.96	---	---	---	48	18	34	184	0	54	44	44	---	2.0	---	241	.33	40	144	40	.9	402	8.1									
Sept. 21-23.....	13.0	---	---	---	49	22	37	200	0	68	48	6.4	---	1.9	---	325	.44	.8	196	45	1.1	524	8.1									
Sept. 24-25.....	428	---	---	---	49	9.6	15	126	0	72	6.4	8.8	---	8.7	---	256	.35	9.0	162	58	2.5	379	7.9									
Sept. 26-30.....	48.3	---	---	---	36	7.8	7.6	106	0	35	8.8	8.8	---	3.1	---	185	.25	21.4	122	35	.3	277	7.8									
Weighted average	48.3	---	---	---	52	16	25	b141	---	81	34	34	---	2.1	---	310	0.42	40	196	80	0.8	473	---									

a Calculated from determined constituents.
b Includes equivalent of individual carbonate values.

Temperature (°F) of water, water year October 1958 to September 1959

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	60	62	63	65	64	66	67	67	65	64	64	64	63	67	65	66	67	68	65	64	63	59	59	60	58	---	---	---	---	---	---	64	
November ..	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
December ..	46	50	48	---	---	---	45	42	40	38	40	---	---	33	35	38	37	40	42	40	41	42	47	46	45	46	45	44	45	46	42	43	---	
January	40	39	34	34	35	37	38	38	36	38	38	37	37	38	38	36	37	39	40	39	37	36	37	37	39	40	41	43	43	44	---	---	38	
February	42	44	45	44	45	44	44	44	44	45	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	44	
March	50	50	50	51	52	51	52	53	53	53	54	55	56	54	53	53	53	54	53	54	55	55	59	61	64	62	59	57	58	60	63	55		
April	64	63	62	63	65	68	68	65	63	58	58	58	57	58	61	64	67	64	65	65	59	56	58	63	71	74	72	70	70	71	---	64		
May	72	71	74	74	71	68	68	67	65	64	71	72	69	67	67	67	68	73	74	75	76	74	70	68	69	70	73	74	77	76	76	71	79	
June	77	73	72	73	74	74	71	72	74	78	80	81	81	82	83	83	84	83	84	83	82	82	80	80	80	79	78	79	78	79	78	79	79	
July	76	75	79	79	77	79	78	78	80	79	79	79	78	76	76	76	79	78	78	78	78	77	76	76	76	76	76	76	76	76	76	76	76	76
August	82	84	85	85	84	82	77	78	79	79	79	78	78	79	79	79	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82
September ..	81	79	74	73	77	78	77	77	76	73	73	69	70	72	69	71	73	74	74	74	73	74	77	77	76	74	75	76	75	74	---	74	---	

RED RIVER BASIN--Continued

7-3150. LITTLE WICHITA RIVER NEAR HENRIETTA, TEX.

LOCATION--At gaging station on left bank at downstream side of bridge on State Highway 148, 1.5 miles northwest of Henrietta, Clay County, 4 miles upstream from Turkey Creek, and 5 miles upstream from Dry Fork Little Wichita River.

RECORDS AVAILABLE--1,037 square miles.

EXTREMES 1952-56--Chemical analyses: December 1952 to January 1956, March to September 1959.

RAINFALL--December 1959--Dissolved solids: Maximum, 1,430 ppm Sept. 5; minimum, 63 ppm June 23.

TEMPERATURES--December 1952 to January 1956, March to September 1959.

WATER--Maximum, 950 ppm Sept. 5; minimum, 31 ppm June 23.

SPECIFIC CONDUCTANCE--Maximum daily, 1959--Dissolved solids: Maximum, 1,700 ppm Mar. 15-16, 1953; minimum, 57 ppm May 19, 1955.

EXTREMES 1952-56--Maximum daily, 1959--Dissolved solids: Maximum, 1,700 ppm Mar. 15-16, 1953; minimum, 57 ppm May 19, 1955.

HARDNESS--Maximum, 700 ppm March to September 1959--Dissolved solids: Maximum, 25 ppm Feb. 1953.

HAZARD--Maximum daily, 1959--Dissolved solids: Maximum, 25 ppm Feb. 1953.

REMARKS--Dashes omitted in potassium (K), sodium (Na), bicarbonate sodium (HCO₃), and chloride (Cl) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. records of discharge for period March to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, March to September 1959

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		Non-carbonate	Sodium sulfate ratio	
Mar. 11, 1959.....	(a)	2.2		88	23	258		178		15	505	0.3	0.8			980	1.33	314	168	1,860	7.7	
Mar. 12-16.....		2.60		92	27	261		169		17	532	.3	.8			1,020	1.39	340	202	6.1	2,000	7.4
Mar. 17-26.....		12.2		9.2		51		170		10	60	.2	.8			b 270	.37	125	0	2.0	491	8.2
Mar. 27-37.....																						
Apr. 1-3.....	(a)	8.2		34	11	55		179		11	64	.2	.8			b 284	.39	130	0	2.1	518	7.4
Apr. 4-15.....	(a)	6.8		36	12	61	4.4	194		13	71	.3	.8			b 312	.42	140	0	2.2	559	7.9
Apr. 16-17.....		7.50		3.3		62		170		11	72	.4	2.0			b 300	.41	121	0	2.4	529	7.8
Apr. 18-30.....		18.0		8.6		24		88		7.0	26	.2	5.9			b 140	.19	70	0	1.2	258	7.4
May 1-11.....		14.0		8.8		28		102		7.2	35	.2	3.5			162	.22	82	0	1.3	308	7.4
May 12 (12 p.m. to 8 a.m.).....		471		9.6		345		128		25	642	.6	2.2			1,190	1.62	289	184	8.8	2,300	7.8
May 12 (8 a.m. to 12 p.m.) 13-24.....		53.5		8.8		34		108		9.4	161	.3	4.4			b 376	.51	120	32	3.5	739	7.6
May 25-31, June 1.....		.01		9.3		89		124		11	142	.4	3.0			b 382	.52	123	22	3.8	688	7.2
June 2, 4.....		197		7.8		227		83		16	440	.4	3.5			811	1.10	278	214	6.7	1,580	7.2
June 3, 5.....		20.0		8.4		97		120		9.2	156	.4	3.5			b 390	.53	21.1	110	22.4	704	7.3
June 6-22.....		1.295		9.4		71		127		6.4	96	.3	3.5			b 186	.25	615	126	28	832	7.4
June 22, 25-26.....		2,280		6.4		39		89		4.6	164	.2	2.5			b 63	.09	386	63	0	300	7.1
June 23.....		1,650		4.2		89		80		7.6	164	.2	1.0			345	.47	114	48	3.6	673	8.2

June 27-30,	599	11	14	4.4	60	4.0	18	0.3	2.0	97	0.13	157	53	4	0.8	174	6.7
July 1-2, 1959..	46.3	11	39	12	80	11	250	.3	2.0	495	.67	61.9	147	82	4.7	961	7.1
July 3-10.....	59.0	--	--	--	89	--	139	--	--	--	--	--	108	35	--	605	7.0
July 11.....	36.0	11	14	4.9	81	5.2	23	.3	3.5	126	.17	12.2	56	0	1.4	223	7.5
July 12-13.....	8.90	--	--	--	78	--	136	--	--	--	--	--	110	46	--	591	6.9
July 14.....	7.60	11	43	13	126	10	241	.3	2.0	495	.67	10.2	161	80	4.3	950	7.4
July 15.....	258	10	14	4.1	13	3.2	17	.2	1.5	94	.13	65.5	52	0	1.8	167	7.0
July 16-21.....	7.36	12	20	5.5	25	4.4	31	.3	1.5	146	.20	2.90	72	0	1.3	266	7.2
July 22-31.....	(a)	16	27	6.9	34	5.4	50	.3	1.2	b 210	.29	--	96	3	1.5	353	6.8
Aug. 1-15.....	(a)	14	31	8.3	45	5.6	52	.3	1.5	b 230	.34	--	112	12	1.6	435	6.8
Aug. 16-30.....	(a)	9.0	92	22	122	14	528	.3	2.0	941	1.28	2.29	295	245	9.2	1,620	6.9
Sept. 1, Sept. 1-2	138	8.6	86	4.8	35	6.6	924	.1	2.0	1,432	.24	856.6	355	10	2.1	2,781	7.7
Sept. 3-4.....	223	19.6	86	27.9	49	29	152	.4	2.2	b 367	.50	59.8	305	31	4.5	2,740	7.3
Sept. 5-10.....	59.3	9.6	29	9	97	11	184	.4	1.0	b 430	.58	38.8	118	4	4.4	769	7.3
Sept. 11-20.....	17.3	8.0	36	9.4	106	11	232	.4	.8	b 497	.88	23.2	128	49	5.1	935	6.9
Sept. 21-30.....	c 79.4	8.9	21	6.1	50	6.6	85	0.3	2.4	218	0.30	46.7	78	21	2.5	404	--
Weighted average																	

a Includes days of less than 0.05 cubic feet per second discharge.
 b Residue at 180° C.
 c Represents 99 percent of flow for water year.

Temperature (°F) of water, March to September 1959
 /Once-daily measurement, usually between 5 p.m. and 8 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		
March	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	54	56	57	57	60	--	--	--	--	--	--	--	--	--	--	--	--	
April	--	--	--	--	--	--	--	--	73	74	73	75	73	75	74	71	74	77	84	78	83	--	65	65	--	--	--	--	--	--	--	--	
May	--	--	--	--	--	--	--	78	78	80	84	86	86	86	85	--	--	--	--	--	--	--	--	75	78	--	--	--	--	--	--	--	
June	--	78	78	80	79	82	79	80	84	86	86	86	86	85	--	--	--	--	--	--	--	--	82	78	80	80	80	83	86	--	--	--	
July.....	80	80	84	85	86	87	86	88	88	84	87	88	87	88	85	80	83	83	84	82	83	85	87	80	85	84	83	83	85	88	87	85	
August.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	85
September..	87	85	74	68	81	80	81	85	86	80	82	79	77	82	79	78	79	80	80	--	--	--	--	--	--	81	78	80	81	78	69	--	80

RED RIVER BASIN--Continued
7-3160, RED RIVER NEAR GAINESVILLE, TEX.

LOCATION.--At gaging station at bridge on U.S. Highway 77, 0.2 mile downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 5 miles downstream from Fish Creek, and 7 miles north of Gainesville, Cooke County.

DRAINAGE AREA.--30,762 square miles, of which 5,936 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1959.

Water temperatures: October 1952 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 4,680 ppm Apr. 20; minimum, 472 ppm Sept. 5.

Hardness: Maximum, 1,220 ppm Aug. 16; minimum, 185 ppm Sept. 5.

Specific conductance: Maximum daily, 7,920 micromhos Aug. 18; minimum daily, 802 micromhos Sept. 5.

Water temperatures: Maximum daily, 74.3; minimum, freezing point Jan. 21, 1953; minimum, 115 ppm Nov. 4, 1958.

Hardness: Maximum, 952-56 Dissolved Solids, 801.4; minimum, 83 ppm Nov. 4, 1958.

Specific conductance: Maximum daily, 9,890 micromhos Apr. 11, 1953; minimum daily, 176 micromhos Nov. 4, 1958.

Water temperatures (1952-58): Maximum, 95°F July 13, 1954; minimum, freezing point on Dec. 23, 1953; Jan. 21, 1954, Jan. 16-17, 1957, Jan. 21, 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples for period May 1944 to April 1946 available in district office at Austin, Tex. Records of specific conductance of daily samples for period October 1952 to September 1959 available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-2, 1958.....	759	--	--	340	88	976	158	0	0	800	1,680	--	--	--	--	4,110	5.59	8,420	1,210	1,080	12	6,360	7.9
Oct. 3-31.....	240	--	--	258	72	785	148	0	0	597	1,350	--	--	--	--	3,280	4.46	2,130	940	818	11	5,240	7.9
Nov. 1-10.....	149	11	0.00	284	66	606	244	0	0	517	1,160	0.4	0.59	--	--	2,920	3.97	1,170	980	780	8.4	4,640	8.2
Nov. 11-13.....	139	--	--	240	85	686	228	6	4	530	1,200	--	--	--	--	3,040	4.13	1,140	950	753	9.7	4,770	8.3
Nov. 14-20.....	198	--	--	216	78	551	192	0	0	470	1,000	--	--	--	--	2,630	3.58	1,410	860	702	8.2	4,100	8.2
Nov. 21-30.....	208	--	--	248	88	676	196	0	0	548	1,200	--	--	--	--	3,120	4.24	1,750	980	820	9.4	4,840	8.1
Dec. 1-31.....	200	14	.00	258	77	728	8.0	260	2	573	1,200	.3	--	.64	--	3,130	4.26	1,690	960	744	10	4,810	8.3
Jan. 1-20, 1959.....	225	13	.00	288	85	820	7.0	236	0	671	1,400	.3	--	.70	--	3,590	4.88	2,180	1,070	876	11	5,500	7.8
Jan. 21-31.....	218	7.5	--	292	93	925	190	0	0	750	1,550	--	0.0	--	--	3,860	5.25	2,270	1,110	995	12	6,110	8.0
Feb. 1-20.....	244	9.0	.00	302	92	975	7.5	204	0	746	1,600	.3	--	.56	--	3,980	5.41	2,620	1,130	963	13	6,170	8.1
Feb. 21-28.....	197	8.0	.00	286	92	964	202	0	0	761	1,600	.3	--	.64	--	3,940	5.36	2,100	1,090	924	13	6,150	7.7
Mar. 1-10.....	196	7.5	.00	270	92	850	200	0	0	686	1,500	.5	--	.47	--	3,690	5.02	1,950	1,050	886	11	5,800	6.8
Mar. 11-12.....	180	5.5	--	194	63	592	178	0	0	492	975	--	--	--	--	2,590	3.52	1,260	745	599	9.4	4,160	8.2
Mar. 13-20.....	146	6.5	--	274	101	949	194	0	0	716	1,580	--	--	--	--	3,790	5.15	1,490	1,100	941	12	5,920	8.1
Mar. 21-31.....	160	--	--	216	112	837	232	0	0	643	1,390	--	--	--	--	3,500	4.76	1,510	1,000	810	12	5,190	8.2

RED RIVER BASIN--Continued

7-3160. RED RIVER NEAR GAINESVILLE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (microhmios at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate				
Aug. 1-4, 1959.....	1,995	--	--	180	51	447		128	0	447	750	--	3.9	--	--	2,040	2,77	10,990	660	555	7.6	3,260	8.0
Aug. 5-10,.....	818	--	--	110	25	293		136	0	249	455	--	2.9	--	--	1,250	1,70	2,760	378	266	6.5	2,100	8.1
Aug. 11-15,.....	499	--	--	176	57	508		156	0	432	850	--	2.8	--	--	2,200	2,99	2,960	675	547	8.5	3,550	8.1
Aug. 16-22,.....	655	--	--	348	85	984	1,120	134	0	984	1,780	--	--	--	--	4,480	6,09	7,920	1,220	1,110	14	6,880	7.9
Aug. 23-26,.....	674	--	--	144	45	390		128	0	355	650	--	2.6	--	--	1,720	2,34	3,130	543	440	7.3	2,880	8.0
Aug. 27-31,.....	317	--	--	168	117	774		136	0	681	1,250	--	--	--	--	3,200	4,35	2,740	900	788	11	5,070	7.9
Sept. 1-2,.....	290	--	--	224	65	711		134	0	615	1,150	--	--	--	--	2,900	3,94	2,270	825	715	11	4,620	8.0
Sept. 3,.....	650	--	--	147	41	438		128	0	378	700	--	1.0	--	--	1,840	2,50	3,230	535	430	8.2	2,980	7.5
Sept. 4,.....	1,250	--	--	66	21	167		114	0	137	265	--	3.3	--	--	1,759	1,03	2,560	250	156	4.6	1,260	7.9
Sept. 5,.....	1,960	--	--	48	16	93		104	0	73	160	--	8	--	--	472	.64	2,500	185	100	3.0	802	7.7
Sept. 6,.....	2,430	--	--	70	24	186		98	0	147	315	--	3.2	--	--	859	1,17	5,640	275	194	4.9	1,420	7.8
Sept. 7-8,.....	3,900	--	--	50	18	108		104	0	88	182	--	3.0	--	--	568	.76	5,880	200	115	3.3	962	7.9
Sept. 9,.....	2,340	--	--	66	23	172		98	0	117	305	--	2.0	--	--	796	1,08	5,030	260	180	4.6	1,330	7.8
Sept. 10,.....	1,100	--	--	118	38	293		118	0	137	600	--	1.2	--	--	1,480	2,01	4,400	450	354	6.0	2,400	7.7
Sept. 11,.....	726	--	--	98	34	255		108	0	200	455	--	1.3	--	--	1,190	1,62	2,330	385	296	5.6	1,970	7.7
Sept. 12-20,.....	416	--	--	162	55	477		132	0	412	800	--	3.8	--	--	2,060	2,80	2,310	630	522	8.3	3,250	7.8
Sept. 21-28,.....	238	--	--	192	71	561		142	0	476	975	--	3.1	--	--	2,530	3,44	1,630	770	654	8.8	4,010	7.6
Sept. 29-30,.....	6,110	--	--	109	27	233		132	0	249	370	--	5.2	--	--	1,120	1,52	18,480	385	277	5.2	1,830	7.9
Weighted average	1,534	--	--	154	31	359		a125	--	375	566	--	--	--	--	1,640	2,23	6,790	512	409	6.9	2,560	--

a Includes equivalent of individual carbonate values.

RED RIVER BASIN--Continued
 7-3160. RED RIVER NEAR GAINESVILLE, TEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	58	62	60	58	66	70	79	74	71	65	72	63	64	65	70	68	69	68	73	73	64	88	63	65	68	67	70	55	62	--	66
November.....	60	58	58	60	60	65	55	54	57	52	53	64	66	69	65	63	62	57	56	54	55	56	60	54	52	52	56	50	51	--	58	58
December.....	--	--	50	42	--	--	40	--	--	--	--	--	33	34	36	38	44	42	49	--	42	40	45	40	41	40	39	40	38	37	--	--
January.....	36	36	34	--	--	33	34	36	34	39	36	46	59	57	46	46	44	42	52	56	32	46	44	39	43	48	45	38	54	47	45	43
February.....	41	36	36	38	42	48	45	50	56	50	54	51	50	55	54	55	54	49	38	40	42	43	54	48	54	54	43	48	--	47	47	
March.....	56	50	48	51	50	50	52	54	52	58	56	59	52	54	55	52	58	--	67	65	60	62	63	60	62	65	64	58	60	63	62	57
April.....	58	62	68	70	68	72	58	60	64	45	52	45	48	48	68	64	78	68	62	68	69	60	68	65	68	70	72	74	70	68	--	64
May.....	72	76	72	70	68	78	76	70	68	70	71	73	68	72	69	70	72	72	78	78	72	68	72	69	73	73	76	80	74	78	68	73
June.....	74	68	70	72	68	70	71	70	72	75	66	70	72	68	70	72	74	72	78	72	73	69	78	77	75	76	78	76	80	--	--	73
July.....	81	79	81	81	80	79	81	80	82	79	80	82	80	81	83	84	81	--	79	78	78	79	79	78	80	82	78	85	80	83	86	81
August.....	80	90	81	86	84	84	86	84	85	88	82	88	82	84	85	84	82	81	85	85	84	86	80	86	80	86	84	82	84	86	86	85
September.....	82	81	82	78	82	81	82	78	78	68	76	74	72	70	71	74	76	78	73	78	80	75	76	78	79	82	--	--	78	71	--	77

RED RIVER BASIN--Continued

7-3255. WASHITA RIVER AT CARNEGIE, OKLA.

LOCATION.--At gaging station on downstream side of right pier of bridge, on State Highway 9, 1,300 feet upstream from Running Creek, 2.7 miles east of

Carnegie, Caddo County, and at mile 353.9.

DRAINAGE AREA.--3,129 square miles, includes that of Running Creek.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

Water temperatures: October 1953 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 2,140 ppm Apr. 1; minimum, 280 ppm May 9-10.

Hardness: Maximum, 1,270 ppm Apr. 1; minimum, 182 ppm May 9-10.

Water temperatures: Maximum daily, 2,640 microhms Nov. 20; minimum daily, 274 microhms May 29.

Specific conductance: Maximum, 89°F Aug. 6; minimum, freezing point Dec. 14.

EXTREMES, 1953-59.--Dissolved solids: Maximum, 2,460 ppm May 9-10, 1956; minimum, 163 ppm Sept. 21, 1957.

Hardness: Maximum, 1,480 ppm May 9-10, 1956; minimum, 120 ppm Sept. 21, 1957.

Specific conductance: Maximum daily, 3,530 microhms Aug. 26, 1954; minimum daily, 222 microhms Sept. 21, 1957.

Water temperatures: Maximum, 90°F July 14, 30, 31, 1955, July 5, 1956; minimum, freezing point on several days during January, February, and March 1954, Feb. 11, 1955, Dec. 14, 1958.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples

available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhms at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 1-31, 1958	27.9	15	0.00	272	64	137	5.6	264	0	727	182	0.4	2.2	0.45	1,600	2.18	121	940	724	1.9	2,060	8.1
Nov. 1-20	54.8	--	--	260	84	156	3.8	280	0	795	204	--	2.4	--	1,880	2.56	177	995	774	2.2	2,340	8.6
Nov. 21-27	51.7	18	--	184	53	122	2.56	222	24	537	38	--	1.6	--	1,040	1.41	145	675	502	1.9	1,290	7.9
Nov. 28-30	39.3	18	--	218	67	82	4.7	156	0	631	33	--	1.3	--	1,330	1.81	141	820	610	1.2	1,640	8.2
Dec. 1-10	44.6	20	--	240	74	117	2.54	254	0	733	133	--	1.7	--	1,340	2.09	185	905	697	1.7	1,900	8.0
Dec. 11-31	39.6	22	--	292	84	133	3.20	320	0	866	143	--	2.2	--	1,800	2.43	192	1,060	813	1.8	2,170	8.1
Jan. 1-31, 1959	39.7	15	0.00	290	75	146	3.5	300	0	847	148	4	1.3	57	1,730	2.35	185	1,030	784	2.0	2,140	7.8
Feb. 1-20	39.9	7.8	0.00	286	82	118	3.8	280	0	914	118	4	1.3	38	1,750	2.38	189	1,050	820	2.6	2,110	8.0
Feb. 21-28	39.5	11	0.00	264	105	98	2.52	252	0	893	118	--	0.0	0.01	1,700	2.31	183	1,090	884	1.3	2,070	8.0
Mar. 1-20	34.6	6.2	0.00	264	64	115	4.7	156	0	724	200	0	6.0	0.01	1,580	2.15	148	920	792	1.6	2,110	8.1
Mar. 21-24	40.0	11	--	274	104	106	2.84	284	0	887	130	--	1.4	--	1,790	2.43	193	1,110	878	1.4	2,120	8.0
Mar. 25	38.0	9.0	--	200	59	92	2.32	232	0	613	80	--	1.7	--	1,270	1.73	130	740	550	1.5	1,560	8.1
Mar. 26-31	41.5	7.5	--	300	100	145	3.02	302	0	977	148	--	1.6	--	1,930	2.62	216	1,160	913	1.8	2,310	8.2
Apr. 1	41.0	--	--	314	118	146	2.62	262	0	1,100	160	--	2.5	--	2,140	2.90	237	1,270	1,060	1.8	2,480	7.8
Apr. 2-10	62.9	--	--	244	90	106	2.56	256	0	838	90	--	1.6	--	1,640	2.23	279	980	770	1.5	1,920	8.2
Apr. 11-15	97.6	--	--	133	48	38	1.48	148	0	417	28	--	4.5	--	824	1.12	217	530	395	1.7	1,050	8.4
Apr. 16-20	76.0	--	--	186	72	70	2.16	216	0	633	52	--	2.5	--	1,240	1.69	254	760	583	1.1	1,500	7.9

Apr. 21-24, 1959..	171	--	--	91	34	30	140	0	268	24	--	3.6	--	570	0.78	263	365	250	0.7	773	8.0
Apr. 25-29.....	41.0	--	146	48	49	180	184	0	433	41	--	3.1	--	885	1.20	98	560	404	0.9	1,150	8.1
Apr. 30.....	31.0	--	164	62	78	132	194	0	595	75	--	2.5	--	1,140	1.55	89	665	357	1.3	1,550	8.0
May 1-6.....	98.2	--	236	63	113	260	274	0	702	110	--	1.7	--	1,460	1.99	850	837	637	1.7	1,790	8.2
May 6.....	1	--	58	11	33	122	144	4	392	16.0	--	7.3	--	305	.41	1,580	188	82	.4	410	8.4
May 8.....	3,802	--	129	29	34	145	164	2	300	14	--	3.0	--	400	.36	1,700	440	366	.5	899	8.6
May 9.....	3,923	--	85	19	27	134	154	2	107	9.0	--	3.8	--	281	.87	2,960	262	172	.7	513	8.3
May 10.....	7	--	142	34	65	202	224	8	381	42	--	1.9	--	842	1.15	222	495	316	1.3	1,060	8.5
May 17-21.....	67.6	--	61	11	14	124	144	0	109	8.0	--	2.9	--	319	.43	2,970	198	96	.4	442	7.7
May 22-31.....	3,450	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
June 1-10.....	750	--	142	43	47	188	184	8	404	30	--	2.6	--	809	1.10	1,640	530	362	.9	1,050	8.4
June 11-20.....	296	26	0.00	189	46	54	208	0	482	85	0.0	4.2	0.00	1,060	1.44	1,733	660	490	.9	1,440	8.1
June 21-23.....	446	--	248	67	103	204	204	0	793	88	--	3.5	--	1,490	2.03	1,790	895	728	1.5	1,790	8.2
June 24-26.....	747	--	109	25	31	116	116	0	307	19	--	3.4	--	1,576	.78	1,160	375	280	1.7	1,769	8.1
June 27-30.....	126	--	212	71	65	200	200	0	671	68	--	4.6	--	1,410	1.92	1,480	820	656	1.0	1,610	8.1
July 1-10.....	914	--	78	20	32	140	140	0	193	27	--	4.2	--	1,448	.61	1,110	278	164	.9	1,644	7.8
July 11-14.....	439	--	131	34	42	164	164	0	354	36	--	3.8	--	710	.97	842	465	330	.9	977	8.2
July 15-20.....	359	--	74	21	39	144	144	0	177	34	--	4.5	--	436	.59	453	270	152	1.0	646	8.1
July 21-23.....	210	--	192	54	91	212	212	8	556	90	--	4.8	--	1,140	1.55	646	700	513	1.5	1,460	8.4
July 24-25.....	253	--	118	38	59	158	158	8	330	62	--	4.2	--	707	.96	483	450	307	1.2	1,010	8.4
July 26.....	144	--	172	55	80	184	184	0	537	82	--	3.0	--	1,060	1.44	412	655	504	1.4	1,350	8.1
July 27-31.....	4,766	--	65	14	21	118	118	0	134	17	--	3.9	--	1,325	.44	4,180	218	122	.6	480	8.1
Aug. 1-2.....	712	--	125	43	36	194	194	0	338	38	--	3.6	--	713	.97	1,370	490	331	.7	1,010	8.1
Aug. 3-8.....	391	--	188	66	69	274	274	0	520	85	--	4.6	--	1,140	1.55	1,200	740	516	1.1	1,500	8.0
Aug. 9-20.....	301	--	188	70	86	226	226	0	614	80	--	4.9	--	1,240	1.69	1,010	755	370	1.4	1,600	7.9
Aug. 21-31.....	91.4	24	.00	214	40	84	7.6	0	526	100	.0	3.0	.19	1,190	1.62	700	474	1.4	1,050	8.1	
Sept. 1-5.....	144	--	238	88	104	226	226	0	807	108	--	5.5	--	1,580	2.15	614	955	770	1.5	1,930	8.0
Sept. 6-10.....	230	--	110	46	17	142	142	0	328	29	--	3.7	--	656	.89	407	465	348	.3	900	7.9
Sept. 11-20.....	49.2	--	210	76	67	280	280	0	671	52	--	4.4	--	1,400	1.90	186	835	630	1.0	1,780	8.0
Sept. 21-24.....	48.5	--	264	81	134	230	230	0	850	145	--	4.0	--	1,660	2.26	217	980	802	1.8	2,090	7.8
Sept. 25-30.....	1,947	--	88	22	3.0	116	116	0	192	14	--	2.6	--	414	.56	2,180	310	215	.1	576	7.9
Weighted average	364	--	102	26	34	--	1150	--	256	31	--	3.4	--	574	0.78	564	362	238	0.8	765	--

a Includes equivalent of individual carbonate values.

RED RIVER BASIN--Continued
 7-3255. WASHITA RIVER AT CARNEGIE, OKLA.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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.....	64	62	64	70	70	70	75	75	73	67	66	65	69	68	68	70	71	67	69	68	66	65	65	64	--	65	63	60	58	57	59	66
November.....	54	55	54	55	57	55	57	57	56	67	58	59	62	62	62	63	58	52	52	51	58	55	57	54	53	46	42	43	44	44	--	55
December.....	44	45	48	48	47	44	42	42	37	37	40	36	--	32	34	36	38	38	42	43	44	45	45	44	44	44	44	35	43	36	38	41
January.....	39	36	--	33	34	35	36	37	36	38	39	40	41	45	42	41	44	45	45	42	35	37	38	40	38	39	40	45	--	41	40	
February.....	36	34	36	37	39	39	41	43	45	47	46	48	52	52	52	50	49	46	43	44	44	45	47	47	48	50	52	51	--	45	45	
March.....	52	53	51	51	45	46	47	51	50	49	50	51	55	56	54	--	55	56	54	--	50	51	55	61	63	56	53	55	55	55	--	53
April.....	62	65	61	62	69	71	68	56	48	54	--	56	59	58	58	64	70	67	67	60	59	62	65	66	71	73	72	69	73	76	--	64
May.....	76	78	77	74	71	69	65	66	65	68	69	69	72	70	70	66	71	76	81	79	80	73	64	68	71	66	75	75	76	80	--	72
June.....	76	75	75	74	76	78	76	78	79	81	83	83	85	82	80	84	84	85	86	86	83	84	78	77	78	77	80	81	79	85	--	80
July.....	72	73	75	81	--	79	81	83	75	77	81	84	80	82	81	82	84	80	82	83	83	82	85	81	81	81	72	75	77	79	81	80
August.....	85	86	85	86	83	89	84	82	80	80	--	81	81	82	83	82	79	77	81	83	81	82	82	83	78	78	81	80	82	84	84	82
September.....	83	80	78	76	75	78	81	80	81	75	73	70	70	69	71	74	75	75	74	75	74	77	77	76	70	--	73	72	69	65	--	75

RED RIVER BASIN--Continued

7--3295. RUSH CREEK NEAR MAYSVILLE, OKLA.

LOCATION--At gaging station on bridge on State Highway 74, 2.8 miles downstream from Panther Creek and 5.3 miles south of Maysville, Garvin County.
DRAINAGE AREA--206 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1954 to September 1955, October 1957 to September 1959.

Water temperatures: October 1954 to September 1955.
REMARKS--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office in Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃)	Boron (B)	Dissolved solids		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH
														Parts per million	Calculated (ppm)	Calcium	Non-carbonate magnesium				Tons per acre-foot
Oct. 7, 1958.....	7.48			62	79	232		128	4		460					430	368	4.6	1,990	8.4
Oct. 31.....	7.79			58	79	226		136	0		430					450	358	4.6	1,840	8.2
Nov. 3.....	--			62	62	185		124	0		300		0.31			455	326	4.0	1,840	8.2
Dec. 17.....	25.6			56	46	191		124	0		180					288	194	2.3	1,570	8.2
Jan. 9, 1959.....	13.9			50	46	191		144	0		302					540	342	3.2	1,690	8.1
Mar. 10.....	109			92	76	172		242	0		302					540	342	3.2	1,690	8.2
Apr. 23.....	20.6			124	58	110		288	0		210					550	214	2.0	1,480	7.8
Apr. 30.....	12.1			88	66	128		196	6		245					490	320	2.5	1,510	8.3
May 9.....	528.8			66	18	26		214	0		32					240	64	7	546	8.2
May 12.....	--			63	29	41		176	0	107	75	2.9				275	131	1.1	720	8.2
May 14.....	21.8			104	45	90		272	0		155					445	222	1.9	1,190	8.2
May 28.....	41.4			82	23	34		172	0		63					300	159	.9	725	8.2
June 24.....	6.90			89	68	183		206	0		305					500	331	3.6	1,760	8.0
July 1.....	55.2			77	40	95		196	0		185					355	194	2.2	1,110	8.1
July 16.....	10.2			101	80	219		252	0		440					580	374	4.0	2,100	7.8
Aug. 24.....	.07			114	94	163		392	0		362					670	349	2.7	1,970	8.2

QUALITY OF SURFACE WATERS, 1959

RED RIVER BASIN--Continued

7-3299. ROCK CREEK AT DOUGHERTY, OKLA.
(Formerly published as Rock Creek near Dougherty)

LOCATION.--At gaging station on downstream side of bridge on State Highway 7-C, 1 mile east of Dougherty, Murray County, and 1 mile upstream from mouth.

DRAINAGE AREA.--138 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1959.

Water temperatures: October 1956 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 2,410 micromhos Feb. 21; minimum daily, 394 micromhos May 15.

Water temperatures: Maximum, 95°F May 30, July 7, 23-24, 31; minimum, freezing point Dec. 13, Jan. 3.

EXTREMES, 1956-59.--Dissolved solids (1956-57): Maximum, 1,760 ppm Oct. 1-10, minimum, 145 ppm May 17-18.

Hardness (1956-57): Maximum, 470 ppm Dec. 1-7; minimum, 112 ppm Sept. 21-22.

Specific conductance: Maximum daily, 3,250 micromhos Oct. 2, 1956; minimum daily, 171 micromhos Sept. 21, 1957.

Water temperatures: Maximum, 96°F July 27, 29, 31, Aug. 1-2, 1957; minimum, freezing point on many days during winter months.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year 1958 to September 1959 given in WSP 1631.

Specific conductance and chloride (Cl), water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)
1	1,340	290	1,400	295	1,480	300	1,520	305
2	1,370	290	--	--	1,470	410	1,520	315
3	1,350	282	--	--	1,450	305	1,520	305
4	1,350	290	1,420	295	1,520	310	--	--
5	1,380	295	1,440	300	1,500	320	--	--
6	1,380	290	1,450	300	--	--	1,700	352
7	1,360	285	1,460	300	1,460	305	1,520	282
8	1,310	270	1,460	295	1,510	310	1,410	285
9	1,290	282	1,480	295	1,520	310	1,400	280
10	1,390	295	1,450	290	1,530	315	1,540	312
11	1,410	300	1,510	312	1,530	310	1,560	330
12	1,390	305	1,520	335	1,520	310	1,550	330
13	1,380	305	1,480	270	1,470	300	1,570	330
14	1,380	300	1,470	275	--	--	--	--
15	1,430	310	1,450	298	1,490	305	1,580	340
16	1,440	310	1,350	265	1,460	305	1,580	340
17	--	--	1,320	258	1,470	302	1,560	340
18	1,450	320	1,400	278	--	--	1,560	340
19	1,430	308	1,400	275	1,480	302	1,590	340
20	1,460	325	1,480	298	1,510	312	1,600	340
21	1,440	305	1,470	300	1,520	308	--	--
22	1,820	412	1,480	305	1,510	305	1,630	370
23	1,430	302	--	--	1,500	308	1,650	360
24	1,390	295	1,500	315	1,530	310	1,550	320
25	1,400	295	1,470	305	1,600	325	--	--
26	1,420	295	1,520	320	1,590	330	1,610	360
27	1,430	300	1,480	300	1,580	325	1,630	350
28	1,380	290	1,460	310	1,520	310	1,560	340
29	1,430	300	1,450	305	--	--	1,630	360
30	1,490	312	1,460	305	--	--	1,640	360
31	1,490	312	--	--	1,490	310	1,650	360

RED RIVER BASIN--Continued

7-3299. ROCK CREEK AT DOUGHERTY, OKLA.--Continued

Specific conductance and chloride (Cl), water year October 1958
to September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)
1	--	--	1,830	400	1,610	345	1,620	142
2	1,640	342	1,160	220	1,600	360	1,600	340
3	1,610	345	1,150	220	1,580	320	1,590	340
4	1,600	345	1,320	270	1,700	380	1,610	348
5	1,640	345	1,330	270	1,580	350	1,460	315
6	1,700	362	1,480	320	1,700	395	869	140
7	1,690	360	1,500	340	1,320	355	1,170	230
8	1,760	382	1,600	360	1,560	335	1,190	232
9	1,680	350	1,500	320	1,770	400	527	73
10	1,750	382	1,500	340	1,690	385	1,160	205
11	--	--	1,600	340	1,550	350	410	32
12	--	--	1,480	320	1,810	450	702	98
13	--	--	1,610	370	1,830	470	1,170	242
14	1,670	305	1,260	240	1,830	470	--	--
15	1,750	390	1,580	360	1,980	480	394	34
16	1,560	335	1,600	340	946	165	1,220	242
17	1,560	345	1,280	260	1,910	480	1,150	225
18	1,730	370	1,690	390	1,150	245	1,000	190
19	1,740	375	1,660	390	868	150	1,360	280
20	--	--	--	--	846	150	1,340	275
21	2,410	580	1,620	352	994	180	1,320	282
22	2,370	580	1,660	370	1,230	255	1,410	305
23	1,800	400	1,640	375	1,220	245	1,400	298
24	1,760	410	1,540	342	1,560	330	1,420	295
25	1,780	390	--	--	1,540	335	1,010	185
26	1,850	420	1,100	222	1,500	315	700	120
27	1,800	410	1,150	225	1,510	335	1,040	198
28	1,800	400	1,050	195	1,540	345	1,030	188
29	--	--	1,270	245	1,680	375	1,030	195
30	--	--	1,430	290	--	--	1,100	220
31	--	--	1,470	312	--	--	1,400	300
	June		July		August		September	
1	1,100	220	1,240	245	1,340	288	1,810	430
2	1,400	302	--	--	1,880	445	1,830	430
3	1,320	275	--	--	1,810	440	1,530	360
4	1,410	330	--	--	1,880	450	1,630	380
5	1,220	262	--	--	1,890	462	1,740	420
6	1,130	240	1,550	338	1,800	425	1,560	355
7	1,510	340	1,580	365	1,810	440	1,590	355
8	1,370	308	1,550	358	1,860	455	1,650	385
9	1,370	310	1,550	365	1,830	435	1,660	385
10	1,400	315	--	--	1,820	442	1,800	440
11	1,760	420	1,760	428	1,790	410	1,800	435
12	1,450	320	1,770	425	1,870	450	1,920	490
13	1,440	322	1,650	388	2,300	560	1,850	460
14	1,760	418	1,660	390	2,160	530	1,860	465
15	1,760	415	1,720	405	2,140	530	1,910	490
16	1,770	420	1,680	395	2,320	570	1,940	480
17	1,770	415	1,720	405	2,300	570	2,350	610
18	--	--	1,720	420	2,100	510	2,320	610
19	1,770	420	1,760	425	2,080	505	2,340	620
20	1,780	418	1,700	410	2,160	550	2,340	620
21	1,760	400	1,730	420	2,240	570	2,370	605
22	1,760	415	1,750	415	2,180	540	2,370	600
23	1,780	410	1,630	380	2,160	565	2,020	485
24	1,760	410	1,970	490	2,140	545	2,020	480
25	1,690	385	1,670	385	2,220	585	2,020	480
26	1,750	400	1,500	355	2,190	555	2,010	485
27	1,170	245	1,640	370	2,040	515	--	--
28	1,310	285	1,650	380	2,060	500	2,040	475
29	1,160	245	1,710	395	2,160	550	1,250	280
30	1,230	242	1,720	395	1,710	420	1,980	480
31	--	--	1,540	348	1,660	385	--	--

RED RIVER BASIN--Continued
 7-3299. ROCK CREEK AT DOUGHERTY, OKLA.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	53	58	64	62	65	68	70	68	68	69	70	72	60	62	63	--	67	69	76	71	62	69	61	59	55	55	60	48	51	53	
November..	45	--	--	50	59	65	59	59	60	62	65	65	60	60	55	68	60	58	55	56	57	55	--	54	51	43	45	48	45	48	--	
December..	50	55	57	53	43	--	44	48	45	37	34	35	32	--	35	35	--	35	35	35	50	50	50	50	50	50	50	50	49	--	38	45
January.....	38	41	32	--	--	33	35	36	36	36	37	35	55	--	49	45	48	50	48	48	48	37	35	40	38	--	--	58	48	49	--	
February....	38	40	45	--	45	45	47	45	52	52	50	50	55	56	62	45	39	--	37	45	51	56	60	58	56	58	--	--	58	49	--	
March.....	55	58	61	60	58	60	60	60	62	65	60	65	65	66	63	65	72	65	70	--	45	47	65	76	--	55	55	59	65	60	57	61
April.....	55	70	63	58	60	75	75	55	60	65	59	58	61	68	59	60	62	65	62	62	55	55	65	73	71	75	80	82	81	--	--	65
May.....	79	79	79	76	68	62	63	69	67	62	75	71	69	--	68	71	79	82	90	73	78	73	68	70	72	75	80	80	95	79	74	
June.....	80	80	85	82	87	90	85	88	89	75	79	75	72	79	82	88	90	--	90	90	84	78	76	76	75	78	80	81	83	79	--	82
July.....	76	--	--	--	--	90	95	91	90	--	91	90	89	90	89	88	90	88	89	88	87	91	95	95	93	85	85	85	89	90	95	89
August.....	80	87	89	89	90	90	90	89	90	90	--	90	89	90	90	87	82	89	90	89	91	84	80	70	88	88	88	88	83	85	87	87
September..	85	81	79	81	--	79	79	83	90	71	62	68	79	80	80	82	80	82	81	80	80	81	81	82	81	--	82	70	65	--	--	79

RED RIVER BASIN--Continued
7-3310. WASHITA RIVER NEAR DURWOOD, OKLA.

LOCATION.--At gaging station near left bank on downstream side of pier of bridge on State Highway 18, 1.3 miles downstream from Caddo Creek, 4 miles north of Durwood, Carter County, and at mile 63.4.
DRAINAGE AREA.--7,202 square miles.
RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1959.
Water temperatures: April 1947 to September 1959.
Specific conductance: Maximum, 710 ppm Aug. 13-17; minimum, 208 ppm June 1-3.
Hardness: Maximum, 410 ppm Aug. 13-17; minimum, 1,830 microhos Sept. 13; minimum daily, 367 microhos Sept. 25.
Sulfate: Maximum, 914 mg/l; minimum, freezing point on several days during November, December, and January.
EXTRMS: 1944-49.--Dissolved solids: Maximum, 1,210 ppm Sept. 14-17, 1951; minimum, 280 ppm June 1-3.
Hardness: Maximum, 410 ppm Aug. 13-17, 1951; minimum, 208 ppm June 1-3.
Sulfate: Maximum, 914 mg/l; minimum, freezing point on several days during November, December, and January.
EXTRMS: 1944-49.--Dissolved solids: Maximum, 1,210 ppm Sept. 14-17, 1951; minimum, 280 ppm June 1-3.
Hardness: Maximum, 410 ppm Aug. 13-17, 1951; minimum, 208 ppm June 1-3.
Sulfate: Maximum, 914 mg/l; minimum, freezing point on several days during November, December, and January.

Specific conductance: Maximum, 715 ppm Dec. 1-20, 1955; minimum, 410 ppm Jan. 2, 1957; minimum daily, 94.9 microhos Nov. 2, 1951.
Sulfate: Maximum, 914 mg/l; minimum, freezing point on many days during winter months.
Water temperatures (1947-59): Maximum, 91°F Aug. 11, 1959; minimum, freezing point in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 1-31, 1958.....	119	7.8	0.01	100	40	64	4.6	192	0	247	95	0.4	1.4	0.28	677	0.92	218	415	258	1.4	1,030	7.5
Nov. 1-30, 1958.....	135	---	---	138	40	118	---	220	16	334	149	---	2.5	---	1,040	1.41	379	510	303	2.3	1,400	8.6
Dec. 1-31, 1958.....	179	17	---	141	58	114	---	290	0	369	153	---	6.0	---	1,060	1.44	512	590	352	2.0	1,500	8.1
Jan. 1-31, 1959.....	182	10	---	156	53	100	3.5	334	0	347	140	3.0	4.1	---	1,998	1.36	490	605	332	1.8	1,460	8.1
Feb. 1-20, 1959.....	187	13	---	138	55	105	1.7	268	0	370	128	3.3	1.7	---	2,000	1.36	504	570	350	1.9	1,390	7.9
Feb. 21-28, 1959.....	166	10	---	112	67	104	3.4	236	0	395	130	5.5	8	---	959	1.28	421	555	362	1.9	1,400	7.9
Mar. 1-31, 1959.....	177	9.0	---	124	56	97	3.2	230	0	370	125	5	1.1	0.38	950	1.29	454	540	352	1.8	1,340	8.1
Apr. 1-10, 1959.....	162	---	---	110	67	82	---	176	8	370	128	---	1.6	---	891	1.21	390	550	389	1.5	1,320	8.5
Apr. 11-16, 1959.....	184	---	---	105	64	92	---	180	8	361	135	---	1.8	---	894	1.22	444	525	368	1.7	1,330	8.4
Apr. 17-18, 1959.....	744	---	---	54	27	18	---	132	4	112	37	---	4	---	354	1.44	651	243	130	5	547	8.3
Apr. 19, 1959.....	3,100	---	---	56	38	35	---	126	2	169	62	---	4	---	3,760	2.69	62	295	188	9	815	8.3
Apr. 20-23, 1959.....	1,159	---	---	66	32	25	---	166	8	136	40	---	2.6	---	412	1.56	290	295	146	1.6	656	8.4
Apr. 24-30, 1959.....	1,321	---	---	130	48	55	---	180	8	357	75	---	2.6	---	804	1.09	697	520	359	1.1	1,110	8.4
May 1-9, 1959.....	290	12	---	126	48	77	4.2	196	0	379	96	3	2.4	0.37	885	1.20	693	510	350	1.5	1,240	8.2
May 10-31, 1959.....	2,558	---	---	70	22	30	---	164	0	143	31	---	2.7	---	422	1.57	2,910	284	190	8	440	7.3
June 1-3, 1959.....	4,833	---	---	66	11	15	---	132	6	98	12	---	3.6	---	2,500	3.8	2,700	308	190	7	697	8.4
June 4-10, 1959.....	1,631	---	---	94	22	31	---	132	6	207	29	---	2.4	---	2,400	3.6	1,100	364	154	1.6	997	8.1
June 11-20, 1959.....	654	17	---	117	18	70	2.2	286	0	437	184	5.5	2.9	0.00	623	1.94	1,944	560	388	1.2	1,190	8.4
June 21-26, 1959.....	391	---	---	144	49	53	---	158	6	437	98	---	1.9	---	894	1.22	1,944	560	388	1.2	1,190	8.4
June 27-30, 1959.....	1,356	---	---	93	34	29	---	158	6	236	32	---	3.2	---	557	1.76	2,040	370	230	1.6	799	8.4

a Sum of determined constituents.

RED RIVER BASIN--Continued

7-3316. RED RIVER AT DENISON DAM, NEAR DENISON, TEX.

LOCATION.--Immediately below Denison Dam, 1.7 miles upstream from Sand Creek, 4 miles northwest of Denison, Grayson County, and 3 miles upstream from gaging station near Colbert, Bryan County, Okla.
DRAINAGE AREA.--39,719 square miles upstream from dam; 39,777 square miles upstream from gaging station of which 5,936 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: May 1944 to September 1959.

Water temperatures: October 1945 to September 1959.

Hardness: 1958-59.--Dissolved solids: Maximum, 1,140 ppm July 1-31, Aug. 1-31, Sept. 1-30; minimum, 1,020 ppm Oct. 1-31.

Specific conductance: Maximum daily, 1,980 micromhos May 7; minimum daily, 1,790 micromhos Oct. 2.

Hardness: 1944-59.--Dissolved solids: Maximum, 1,140 ppm Aug. 1-20, Sept. 1-10, 944; minimum, 1,020 ppm Oct. 21-31, 1945.

Hardness: Maximum daily, 2,300 micromhos Aug. 14, 1944; minimum daily, 656 micromhos Oct. 16, 1945.

Specific conductance: Maximum daily, 3,520 micromhos Aug. 14, 1944; minimum daily, 656 micromhos Oct. 16, 1945.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Colbert, Okla. for water year October 1958 to September 1959 given in WSP 1631. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (P)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	Sodium-sulfate ratio	Specific conductance (micro-mhos at 25° C)		
													Parts per million	Tons per acre-foot	Tons per day					
Oct. 1-31, 1958.	1,823	8.8		99	24	234		138	218	365	0.5		1,020	1.39	5,020	232	5.5	1,770	8.2	
Nov. 1-30.....	1,912	9.8		101	31	228		136	225	375	0.8		1,040	1.41	5,370	268	5.1	1,830	7.9	
Dec. 1-31.....	1,483	9.0		41	48	270		136	230	380	0.5		1,050	1.43	4,200	300	188	6.8	1,840	8.0
Jan. 1-31, 1959.	2,268	10		104	28	238	5.3	139	238	382	0.4		1,070	1.46	6,550	374	260	5.3	1,870	8.0
Feb. 1-28.....	772	9.0		104	29	245		140	243	385	0.2		1,080	1.47	2,250	378	264	5.5	1,870	8.2
Mar. 1-31.....	2,432	9.2		108	26	242		135	243	382	0.5		1,080	1.47	7,090	376	266	5.4	1,880	8.0
Apr. 1-30.....	2,263	8.8		108	26	238	5.6	139	238	378	0.5		1,070	1.46	6,540	376	262	5.3	1,850	7.8
May 1-31.....	712	8.2		108	27	242		142	245	380	0.5		1,080	1.47	2,080	380	266	5.4	1,870	7.5
June 1-30.....	2,117	8.4		105	25	251		142	245	382	0.3		1,090	1.48	6,230	365	248	5.7	1,860	7.8
July 1-31.....	3,952	10		110	26	264		138	259	405	0.2		1,140	1.55	12,160	382	268	5.9	1,920	7.0
Aug. 1-31.....	4,623	10		112	27	263		131	259	408	0.4		1,140	1.55	14,230	390	283	5.7	1,900	7.4
Sept. 1-30.....	3,074	9.2		108	26	260		124	266	402	0.4		1,140	1.55	9,460	376	265	5.9	1,940	7.6
Weighted average.....	2,298	9.4		104	28	252	--	135	246	390	--	0.8	1,100	1.50	6,830	374	264	5.7	1,880	--

RED RIVER BASIN--Continued
 7-3316. RED RIVER AT DENISON DAM, NEAR DENISON, TEX.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	70	70	69	--	--	72	73	73	73	73	--	--	72	72	72	72	--	--	72	71	71	71	71	71	--	--	--	70	69	69	68	68	
November	--	--	67	67	66	66	--	--	60	60	--	--	60	60	--	--	60	60	59	59	59	--	--	62	63	61	--	60	--	--	--	--	
December	59	58	58	59	58	--	--	55	57	57	55	--	--	53	52	52	52	52	52	--	--	50	51	--	--	--	--	--	50	50	49	--	
January	--	49	--	--	47	47	47	46	45	--	--	46	47	48	47	46	--	--	47	47	45	44	45	--	--	45	45	45	45	45	--	--	
February	--	45	44	45	45	45	--	--	56	46	45	45	--	--	46	48	48	47	47	--	--	--	47	47	47	--	--	47	47	47	--	--	
March	--	47	48	48	48	48	--	--	48	48	48	--	--	--	49	51	50	50	50	--	--	--	51	52	52	53	53	--	--	53	53	--	
April	53	54	55	--	--	55	55	56	56	57	--	--	57	57	57	57	--	--	58	58	59	59	60	--	--	--	60	60	60	61	--	--	
May	61	--	--	59	62	63	63	63	--	--	--	65	65	65	65	--	--	65	65	65	65	--	--	65	--	--	66	67	67	--	--	--	
June	70	69	69	70	70	--	--	70	69	71	71	--	--	70	70	70	71	70	--	--	70	70	70	71	--	--	70	70	71	--	--	--	
July	73	75	--	--	--	75	75	74	75	77	--	--	75	75	76	75	77	--	--	76	77	77	77	78	--	--	78	78	78	77	78	--	
August	79	79	79	79	79	79	79	79	78	78	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79	--
September	79	79	79	--	--	--	79	78	78	78	--	--	78	78	77	77	77	78	78	--	--	78	78	78	78	78	78	--	78	78	77	77	--

RED RIVER BASIN--Continued

7-3350. CLEAR BOGGY CREEK NEAR CANEY, OKLA.

LOCATION.--At gaging station on downstream side of left pier of bridge on old U.S. Highways 69 and 75, half a mile downstream from Caney Creek, 1.5 miles north of Caney, Atoka County, and at mile 48.5.

DRAINAGE AREA.--720 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1955 to September 1959.

Water temperatures: October 1955 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 1,980 micromhos Sept. 29; minimum daily, 147 micromhos Apr. 1.

Water temperatures: Maximum, 85°F Aug. 3, 5-7, 30; minimum, freezing point Dec. 15, Jan. 4, 5, 22.

EXTREMES, 1955-59.--Dissolved solids (1955-57): Maximum, 1,690 ppm Nov. 11-20, 1955; minimum, 105 ppm July 25, 1957.

Hardness (1955-57): Maximum, 675 ppm Nov. 11-20, 1955; minimum, 52 ppm June 1-2, 1956. Specific conductance: Maximum daily, 3,010 micromhos Nov. 12, 1955; minimum daily, 70.1 micromhos Sept. 22, 1957.

Water temperatures: Maximum, 87°F Aug. 3, 6, 1957, July 17, Aug. 2, 15, 1958; minimum, freezing point on several days during December 1955, February 1956, December 1958, and January 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Oklahoma City, Okla. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Specific conductance and chloride (Cl), water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micromhos at 25°C)	Chloride (Cl) (ppm)
1	250	25	911	134	1,260	270	895	130
2	251	27	907	136	967	164	921	140
3	269	29	1,020	156	952	155	914	141
4	275	28	959	153	907	137	942	146
5	288	30	945	154	894	130	984	153
6	310	30	952	154	909	132	974	148
7	363	40	945	154	914	134	--	--
8	461	60	933	146	922	136	887	131
9	653	98	942	148	904	134	877	130
10	755	118	940	144	904	132	900	136
11	829	135	997	141	840	125	888	128
12	445	59	938	136	901	140	895	129
13	251	28	917	132	865	125	890	127
14	340	45	906	132	894	130	881	124
15	495	70	855	122	901	130	873	122
17	537	79	856	122	903	140	896	132
18	565	84	434	56	969	160	926	144
19	648	103	527	90	901	130	908	134
20	648	102	321	43	903	138	903	136
21	618	88	345	39	925	140	913	131
22	492	50	349	43	921	90	827	100
23	467	54	405	46	923	92	842	100
24	505	67	493	65	930	92	809	90
25	510	92	491	63	916	90	809	100
26	586	124	510	63	926	90	873	105
28	734	112	546	66	928	92	887	110
27	661	129	543	64	928	95	882	108
28	768	133	741	112	935	95	887	112
29	807	132	718	98	942	100	883	115
30	820	132	1,280	270	937	100	884	115
31	853	132	--	--	--	--	887	125

QUALITY OF SURFACE WATERS, 1959

RED RIVER BASIN--Continued

7-3350. CLEAR BOGGY CREEK NEAR CANEY, OKLA.--Continued

Specific conductance and chloride (Cl), water year October 1958
to September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) (ppm)
1	866	128	868	150	147	5.5	621	62
2	841	108	925	150	180	13	581	66
3	850	102	--	--	231	17	655	68
4	868	102	1,000	170	313	24	674	74
5	881	100	199	9.5	388	33	674	76
6	889	105	164	12	457	44	576	58
7	869	110	187	17	513	46	606	70
8	908	110	313	28	558	50	1,030	174
9	885	105	376	27	603	61	700	106
10	871	108	422	30	603	60	480	56
11	888	127	458	36	--	--	216	18
12	837	122	479	38	--	--	175	15
13	861	119	711	125	--	--	186	15
14	848	118	455	61	--	--	326	28
15	812	118	501	58	--	--	--	--
18	816	120	501	56	--	--	499	50
17	816	115	581	70	--	--	543	54
18	859	117	561	63	--	--	564	50
19	861	128	599	68	--	--	597	54
20	888	136	659	72	--	--	615	60
21	904	138	646	74	324	35	655	60
22	908	138	561	54	522	60	636	70
23	888	131	610	66	580	70	617	72
24	908	136	688	82	550	61	646	75
25	908	136	693	87	524	63	651	72
26	921	144	578	85	525	68	725	90
27	914	143	330	48	539	60	1,020	215
28	924	148	233	21	566	61	722	132
29	--	--	299	22	578	70	659	100
30	--	--	345	26	604	80	889	160
31	--	--	402	30	--	--	803	115
	June		July		August		September	
1	784	110	296	21	407	34	1,970	262
2	832	120	423	36	549	52	873	192
3	908	138	513	49	638	68	1,730	228
4	1,060	190	654	68	--	--	1,560	195
5	934	162	734	84	712	82	745	152
6	887	128	631	62	778	101	937	218
7	830	116	516	84	799	115	706	157
8	--	--	327	24	748	116	776	169
9	960	148	358	26	911	137	848	182
10	960	146	327	22	955	146	892	191
11	834	138	326	21	883	162	978	225
12	738	106	442	40	937	170	1,090	260
13	859	137	542	52	1,060	185	1,090	255
14	904	162	618	68	1,050	195	1,020	225
15	795	132	599	66	1,170	220	927	198
16	578	84	644	75	1,130	240	915	190
17	509	72	681	74	1,260	265	927	192
18	507	70	909	134	1,140	230	957	200
19	540	74	760	103	969	198	1,000	215
20	655	96	680	84	469	75	1,090	245
21	718	106	1,100	223	1,050	174	1,210	280
22	717	100	401	58	1,400	254	1,310	310
23	647	76	346	52	1,570	314	1,400	330
24	499	70	339	58	1,700	322	1,370	330
25	506	59	346	44	1,632	328	1,350	320
26	562	76	447	64	1,720	348	1,330	310
27	574	93	192	11	1,880	388	1,340	315
28	207	17	235	20	1,920	400	1,450	350
29	161	12	240	17	1,940	392	1,980	510
30	186	11	382	28	1,970	412	1,900	480
31	--	--	482	38	1,670	328	--	--

RED RIVER BASIN--Continued

7-3350. CLEAR BOGGY CREEK NEAR CANEY, OKLA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	61	62	62	62	63	71	71	73	73	68	65	63	63	66	67	67	67	--	68	60	65	61	63	60	59	58	55	55	55	56	63	
November ..	54	53	54	54	60	55	50	53	52	52	54	57	60	64	61	64	69	59	53	50	49	49	--	55	56	52	49	43	42	44	--	54	
December ..	45	47	48	49	48	44	40	40	40	39	36	38	34	33	32	33	33	37	38	40	40	41	48	45	42	42	43	44	45	44	--	41	
January	37	37	35	32	32	33	--	36	35	35	38	40	49	52	51	40	40	44	43	49	35	32	34	37	44	46	42	41	47	46	42	40	
February	41	39	38	37	36	35	40	46	53	47	46	47	49	46	47	47	51	50	44	41	40	44	44	47	48	49	49	53	--	--	45		
March	50	50	--	50	51	46	44	49	49	52	54	53	52	58	51	51	53	56	52	55	51	53	58	63	55	53	54	52	57	61	53		
April	55	51	59	58	59	65	67	67	58	59	--	--	--	--	--	--	--	--	--	61	58	58	63	67	69	70	69	69	69	--	--		
May	74	75	74	76	73	70	70	72	71	71	67	67	69	70	73	76	75	78	78	78	78	78	78	78	78	78	78	78	80	80	73		
June	81	77	74	75	73	78	78	--	78	79	83	79	81	80	78	78	82	83	84	83	83	83	79	79	79	79	79	77	80	80	--	79	
July	82	80	81	81	82	79	81	82	81	81	80	81	79	82	78	78	78	79	79	78	76	76	79	79	78	79	75	76	77	81	82	79	
August	82	83	85	85	85	85	85	83	80	79	80	80	81	81	83	84	80	82	83	84	83	83	82	82	82	82	80	82	85	86	82	80	
September ..	82	80	80	75	78	80	80	80	80	80	80	74	69	71	70	72	70	72	73	74	76	77	77	77	78	77	78	77	80	77	74	--	76

RED RIVER BASIN--Continued

7-3400. LITTLE RIVER NEAR HORATIO, ARK.

LOCATION.--At gaging station at bridge, on State Highway 41, 0.9 mile downstream from Rolling Fork, 2 miles southwest of Horatio, Sevier County, and 28.5 miles upstream from Cossatot River.

DRAINAGE AREA.--2,874 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1953 to September 1959.

Water temperatures: October 1953 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 92 ppm Aug. 21-29; minimum, 28 ppm Mar. 22-31, May 25-31, June 1-2.

Hardness: Maximum, 28 ppm Aug. 21-29, Sept. 11-20, Sept. 11-20, Oct. 1-30; minimum, 12 ppm Nov. 18-22, Mar. 6-10, 22-31, Apr. 1-10.

Specific conductance: Maximum, 117, 174 microhos Aug. 29; minimum daily, 30 microhos Nov. 18-22, Mar. 6-10, 22-31, Apr. 1-10.

Water temperatures: Maximum, 85°; on several occasions during Aug. 21-31, 1958; minimum, 55° F. Jan. 5, 6, 10, 11.

EXTREMES, 1953-59.--Dissolved solids: Maximum, 389 ppm Oct. 21-31, 1958; minimum, 27 ppm June 27, 1958.

Hardness: Maximum, 70 ppm Oct. 21-31, 1958; minimum, 6 ppm Nov. 6, 1958.

Specific conductance: Maximum daily, 685 microhos Nov. 21 microhos daily, 253 microhos Mar. 6, 1958.

Water temperatures: Maximum, 89° F. July 14-18, 1954; minimum, 35° F. Dec. 25, 1953, Jan. 17, 1957, Jan. 5, 6, 10, 11, 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1958.....	429	3.6	0.00	6.1	1.8	8.9	1.3	27	1.2	13	0.4	0.5	72	22	0	93	7.1	5
Oct. 11-20.....	603	--	--	6.3	2.5	8.2	1.4	28	3.2	12	--	1.0	83	26	3	94	7.1	40
Oct. 21-22.....	1,932	--	--	6.3	2.1	8.8	1.4	25	9.4	9.0	--	2.0	82	24	4	95	7.4	30
Oct. 23-31.....	2,429	--	--	5.2	1.6	4.0	1.4	24	2.6	5.2	--	1.2	61	20	0	61	6.7	40
Nov. 1-12, 14-15.....	1,316	3.1	-.21	6.3	2.2	8.3	1.4	28	3.6	12	0	.9	72	24	2	98	7.3	30
Nov. 13.....	286	--	--	7.0	2.3	12	1.2	28	3.2	20	--	1.5	a	27	4	115	7.4	20
Nov. 16-22.....	19,500	--	--	3.5	.9	2.6	1.6	16	2.0	5.8	--	1.2	54	12	0	41	7.2	50
Nov. 23-30.....	2,459	--	--	4.6	1.4	4.3	1.1	21	3.6	5.5	--	1.2	65	18	0	58	7.1	40
Dec. 1-10.....	2,303	3.2	.23	4.8	1.9	4.6	1.1	22	3.8	6.0	.1	.9	63	20	2	64	7.3	40
Dec. 11-20.....	1,005	--	--	5.1	1.6	6.7	.9	23	2.2	9.0	--	1.2	68	19	0	73	7.3	40
Dec. 21-31, Jan. 1-4, 1959.....	859	3.1	.30	6.2	1.7	8.4	.9	25	4.0	12	.1	1.2	66	22	0	89	7.5	25
Jan. 5-10.....	1,079	--	--	5.0	1.6	5.9	.8	22	2.8	6.8	--	.9	64	19	1	75	7.1	40
Jan. 11-15.....	1,614	--	--	4.8	1.6	6.6	.8	23	3.6	8.8	--	.7	64	18	0	72	7.1	35
Jan. 16-20.....	1,612	--	--	4.4	1.2	5.3	.8	20	2.6	6.8	--	.6	60	16	0	59	7.1	40
Feb. 1-10.....	1,088	2.4	.19	4.8	1.4	6.4	.8	20	4.0	8.0	.1	.7	54	18	2	69	6.8	25
Feb. 11-13, 15.....	5,995	--	--	3.8	1.2	6.7	.7	22	6.0	8.5	--	1.0	41	20	2	76	7.0	5
Feb. 14-20.....	8,340	3.7	.16	3.8	1.2	2.9	1.2	15	2.2	3.0	--	1.0	36	13	0	45	6.9	50
Feb. 21-28.....	2,525	4.2	.11	4.4	1.4	4.2	.9	18	4.2	5.5	--	1.0	44	17	2	55	6.9	35
Mar. 1-5.....	2,518	3.5	.10	4.9	1.2	5.1	.9	20	4.0	6.5	--	.5	46	17	0	63	7.0	30
Mar. 6-10.....	10,670	3.3	.15	3.2	1.0	2.8	1.1	14	2.4	3.2	.2	.8	34	12	0	41	6.7	40
Mar. 11-21.....	3,042	--	--	4.0	1.1	4.4	.9	19	3.8	4.5	--	.8	30	14	0	54	6.6	5
Mar. 22-31.....	5,589	--	--	3.3	1.1	3.4	.9	14	3.2	3.5	--	.8	28	12	1	45	6.9	5

Apr. 1-10, 1959.....	4,521	4.4	0.06	3.7	0.7	3.6	0.6	15	3.2	4.0	0.0	0.9	42	12	0	46	6.7	25
Apr. 11-20.....	3,700	--	--	5.2	1.0	4.8	.9	20	4.0	5.5	--	.8	36	17	0	61	6.5	5
Apr. 21-30.....	2,708	--	--	4.9	1.1	4.3	.8	22	4.0	8.8	--	.8	34	16	0	60	6.2	5
May 1-7.....	801	--	.04	5.5	1.3	7.0	3.0	8	4.0	8.8	--	.6	45	19	1	78	6.5	5
May 8-20.....	737	4.0	.04	6.0	1.5	8.8	.6	24	3.2	12	.1	1.0	54	21	2	89	6.8	5
May 21-24.....	934	--	--	5.2	1.5	9.0	1.0	22	3.6	13	--	.8	53	19	1	90	6.8	5
May 25-31, June 1-2	5,313	--	--	4.4	.8	4.4	1.0	18	2.4	4.2	--	.6	28	14	0	54	6.5	5
June 3-10.....	975	5.8	.09	5.6	1.4	7.4	.8	23	3.4	9.0	--	2.0	60	20	1	78	7.4	25
June 11-20.....	1,389	--	--	6.0	1.4	6.2	1.1	26	3.4	8.0	--	1.8	48	22	1	78	6.9	5
June 21-30.....	1,286	--	.03	6.8	1.5	6.2	1.1	24	5.0	8.5	--	1.6	53	21	2	83	6.5	10
July 1-10.....	389	5.4	--	7.5	2.1	9.2	1.4	27	4.0	13.0	--	.8	64	23	1	96	7.0	18
July 11-16.....	1,120	--	--	6.0	2.1	17.3	2.0	25	4.0	20	--	.9	76	27	2	128	6.5	10
July 17-22.....	3,120	--	--	5.1	1.1	7.3	2.3	19	3.4	11	--	2.1	a	46	3	88	6.8	5
July 23-28.....	3,892	--	--	5.1	1.1	3.6	2.3	19	3.0	16.0	--	2.1	46	17	2	61	6.5	5
July 28-31.....	8,990	--	--	3.6	1.0	2.5	1.1	17	1.4	2.5	--	.8	40	13	1	42	6.5	5
Aug. 1-10.....	1,774	7.8	.05	5.4	2.2	5.1	1.1	24	3.0	6.0	--	1.1	58	22	3	78	6.6	30
Aug. 11-20.....	364	--	--	6.1	2.5	10	1.3	28	3.8	16	--	1.0	77	26	2	115	6.8	23
Aug. 21-29.....	198	--	--	7.3	2.6	16	1.4	32	4.4	26	--	1.2	92	28	2	149	7.1	18
Aug. 30-31.....	1,331	--	--	5.2	2.3	10	1.4	26	3.8	14	--	1.2	72	22	1	100	7.0	28
Sept. 1, 3-5.....	1,610	--	--	5.3	2.2	6.2	1.6	24	3.8	8.8	--	1.0	62	22	2	77	7.1	38
Sept. 6-10.....	1,238	--	.04	7.2	2.4	9.9	1.2	30	4.8	15	--	1.1	70	28	4	106	7.1	38
Sept. 11-20.....	331	6.4	--	7.1	2.4	15	2.1	30	4.6	24	--	1.0	86	28	3	136	7.0	17
Sept. 21-30.....	148	--	--	7.1	2.4	15	2.1	30	4.6	24	--	1.0	86	28	3	136	7.0	17
Average.....	2,507	--	--	5.4	1.6	6.9	1.1	23	3.6	9.4	--	1.0	57	20	1	78	--	23

a Calculated from determined constituents.

Month	Temperature (°F) of water, water year October 1958 to September 1959																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.....	70	67	--	66	67	66	68	69	70	71	70	68	66	67	68	68	68	68	68	68	68	69	69	65	64	65	62	61	59	59	59	58
November..	56	55	55	56	58	57	55	54	54	55	58	60	59	62	65	61	59	57	55	53	52	54	55	55	53	50	47	45	--	56	--	
December..	46	46	47	47	48	47	45	45	45	43	42	42	42	39	38	38	39	41	39	40	44	43	42	42	44	44	45	46	45	43	--	
January.....	41	41	42	37	35	35	37	35	35	38	43	45	46	42	41	39	42	45	43	39	38	39	41	43	42	43	44	44	43	40	--	
February....	42	42	42	41	40	40	43	46	48	46	45	47	48	49	49	47	46	45	45	45	46	46	47	47	49	--	--	--	45	--		
March.....	49	49	49	49	51	48	47	48	51	49	52	49	49	53	52	51	51	52	53	51	51	53	55	56	55	54	54	56	52	52	--	
April.....	59	57	59	58	57	60	62	63	50	61	61	56	56	55	56	58	60	61	62	64	63	61	60	61	64	65	66	66	66	60	--	
May.....	69	71	72	72	73	74	75	75	75	74	75	75	75	76	77	77	77	79	81	83	82	82	82	81	80	79	79	80	82	78	--	
June.....	77	76	75	75	73	73	74	76	77	78	81	81	81	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	82	78	--	
July.....	84	84	83	83	84	84	84	83	85	84	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	80	--	
August.....	80	80	81	83	84	85	85	83	81	82	82	82	83	83	83	83	83	84	84	85	85	85	85	85	85	85	85	85	83	80	--	
September..	78	77	78	77	76	76	77	78	79	80	77	75	73	75	76	76	76	76	77	78	77	77	77	78	78	78	78	79	78	78	--	

RED RIVER BASIN--Continued
7-3405. COSSATOT RIVER NEAR DE QUEEN, ARK.

LOCATION.--A. gaging station at bridge on U.S. Highway 71, just downstream from Hale Creek, and 7 miles east of De Queen, Sevier County.

DRAINAGE AREA.--361 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

Water temperatures: October 1958 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 80 ppm Jan. 1; minimum, 26 ppm Nov. 1-14.

Hardness: Maximum, 20 ppm Jan. 1; minimum, 8 ppm Feb. 11-20, Mar. 1-20.

Specific conductance: Maximum daily, 116 micromhos Jan. 1; minimum daily, 24 micromhos Feb. 15, Mar. 5.

Water temperatures: Maximum, 91°F Aug. 6; minimum, 35°F Feb. 5.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 1-10, 1958.....	44.1	2.8	0.00	3.5	1.3	3.6	1.1	20	2.2	3.2	0.3	0.2	38	14	0	45	6.9	5
Oct. 11-21.....	60.4	2.6	0.00	4.3	1.6	3.4	.9	24	1.8	2.8	.3	.1	37	17	0	54	7.3	5
Oct. 22-31.....	589	1.5	0.00	2.9	.8	2.6	1.1	14	2.0	2.0	.5	.2	42	10	0	36	6.9	6
Nov. 1-14.....	62.4	1.8	0.00	3.1	1.3	3.0	.9	18	1.6	2.5	.3	.1	26	13	0	42	7.0	5
Nov. 15-30.....	2,240	1.8	0.00	2.6	.6	2.3	1.1	11	1.8	2.0	.3	.3	37	9	0	34	6.7	5
Dec. 1-10.....	449	2.3	0.00	2.3	1.0	2.6	.9	12	2.0	2.5	.3	.1	44	10	0	36	6.9	6
Dec. 11-20.....	161	2.4	0.00	2.6	.9	2.5	.8	14	2.6	2.0	.3	.2	29	10	0	36	6.7	5
Dec. 21-31.....	122	4.2	0.04	2.9	1.3	3.0	1.7	18	1.8	2.8	0	.6	42	12	0	43	6.4	8
Jan. 1, 1959.....	130	--	--	4.4	2.3	11	2.4	10	6.4	18	--	5.5	80	20	12	116	6.5	15
Jan. 2-10.....	119	4.4	.03	2.9	1.3	2.9	1.7	19	1.6	2.8	0	.6	44	12	0	43	6.6	5
Jan. 11-20.....	230	4.3	.06	3.1	1.0	3.2	.9	17	2.0	3.0	0	.8	38	12	0	44	6.7	17
Jan. 21-31.....	278	4.6	.05	2.5	1.0	2.7	1.4	14	2.4	2.5	.1	.6	34	10	0	37	6.2	15
Feb. 1-10.....	176	4.3	.05	2.4	1.2	3.0	.7	15	1.6	2.5	.1	.5	35	11	0	40	6.3	10
Feb. 11-20.....	2,230	4.7	.11	2.0	.9	2.6	.8	12	2.8	2.2	0	.8	34	8	0	32	9.3	30
Feb. 21-28.....	603	4.6	.08	2.1	1.2	2.6	1.0	9	3.0	2.0	.1	.6	30	10	0	32	6.9	20
Mar. 1-10.....	1,591	4.6	.09	1.8	.6	2.6	.6	11	2.2	2.5	.0	.8	30	8	0	32	6.6	16
Mar. 11-20.....	1,591	4.3	.05	2.1	.7	2.6	.6	12	2.2	2.2	.0	.9	32	8	0	32	6.6	16
Mar. 21-31.....	1,280	2.5	.04	1.8	1.1	2.3	.6	12	2.2	2.2	.0	1.1	34	9	0	31	6.2	30

Apr. 1-10, 1959.....	948	2.6	0.04	1.9	1.1	2.4	0.6	13	2.0	2.2	0.1	0.9	34	9	0	33	6.3	18
Apr. 11-17.....	487	2.7	.04	2.4	1.3	2.6	.6	14	2.4	2.5	.1	1.8	35	12	0	37	6.7	17
Apr. 18-30.....	981	2.7	.03	2.1	1.2	2.2	.6	14	2.0	2.0	.0	.8	33	10	0	33	6.8	18
May 1-10.....	107	6.2	.00	3.9	.6	3.3	.6	16	2.0	2.5	.0	2.0	34	12	0	42	7.2	4
May 11-23.....	68.6	4.5	.01	4.1	1.1	3.4	.8	20	2.2	2.0	.0	1.0	35	14	0	47	6.9	3
May 24-31.....	963	2.7	.06	3.0	.5	2.5	.8	15	1.4	2.0	.0	.9	38	10	0	36	6.7	25
June 1-10.....	123	5.4	.01	4.3	.2	3.1	.7	16	1.4	2.0	.1	1.0	36	12	0	39	6.9	6
June 11-20.....	172	6.0	.03	4.0	.7	3.4	.6	20	1.0	2.0	.0	.8	40	13	0	43	7.0	10
June 21-30.....	78.3	4.7	.00	4.4	.5	3.4	.6	20	1.4	2.0	.0	.8	36	13	0	44	7.1	6
July 1-10.....	31.4	4.2	.00	5.2	.7	3.4	.7	24	1.8	2.5	.0	.8	52	16	0	48	6.9	4
July 11-23.....	98.1	2.6	.00	4.7	1.1	3.4	1.1	23	2.2	2.5	.0	1.0	32	10	0	49	7.4	5
July 24-31.....	384	4.5	.04	3.8	.3	2.3	.6	14	1.8	1.5	.1	1.0	30	10	0	35	6.9	22
Aug. 1-10.....	140	5.5	.05	4.3	1.0	2.8	.9	18	3.2	2.0	.0	.6	40	14	0	40	7.1	5
Aug. 11-20.....	48.2	6.5	.02	4.0	1.5	2.9	.9	20	3.6	2.0	.0	.7	38	16	0	46	7.1	5
Aug. 21-31.....	47.1	5.0	.02	4.4	1.6	3.2	.9	22	3.5	2.0	.1	.9	38	18	0	48	7.1	5
Sept. 1-10.....	278	4.1	.12	3.5	1.0	2.9	1.2	17	3.2	2.5	.0	1.1	44	12	0	41	7.0	35
Sept. 11-20.....	45.3	5.5	.10	3.6	1.0	3.4	1.0	19	3.2	2.5	.0	.9	45	13	0	45	6.8	20
Sept. 21-30.....	290	4.1	.04	3.9	1.2	3.7	1.0	22	3.2	2.5	.0	1.1	39	14	0	49	6.9	5
Average.....	474	3.7	0.03	3.2	1.0	3.1	0.9	16	2.2	2.8	0.1	0.9	37	12	0	42	--	12

Temperature (°F) of water, water year October 1958 to September 1959

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.....	69	67	67	68	68	69	70	71	72	71	69	69	68	68	69	68	69	68	70	70	70	70	67	75	67	65	61	61	60	59	59	58		
November..	55	58	56	58	53	58	57	56	58	56	58	58	64	63	62	59	51	59	59	54	59	56	59	56	58	55	51	42	43	46	--	56		
December..	45	42	51	52	51	40	42	45	50	48	43	44	40	39	40	42	49	50	50	49	45	40	46	44	47	50	49	50	49	48	46	46	46	
January.....	49	48	45	47	43	36	40	42	46	46	47	42	46	46	43	40	42	43	45	43	40	40	38	41	40	41	39	41	40	37	42	42	42	
February....	40	39	37	39	35	39	38	40	42	45	43	40	42	42	43	45	45	47	44	45	42	38	45	47	47	47	48	52	--	--	--	43	43	
March.....	50	52	54	48	44	44	46	45	48	50	48	47	49	52	52	55	54	51	48	50	50	51	56	64	55	48	55	55	58	52	52	52	52	
April.....	67	58	57	59	68	66	65	63	62	61	56	59	57	61	59	60	60	68	62	66	62	63	69	65	65	68	67	73	71	78	--	64	64	
May.....	79	73	74	77	76	76	79	76	73	78	73	74	76	79	79	79	79	79	78	78	78	78	78	78	78	78	77	77	77	77	77	77	77	
June.....	77	78	79	73	75	77	78	76	78	78	80	83	89	78	83	82	85	87	85	86	86	86	85	84	81	83	81	86	87	--	81	81	81	
July.....	84	86	85	86	84	86	85	84	82	85	84	83	83	85	80	78	83	82	82	80	82	80	82	84	80	82	78	79	76	81	79	83	82	82
August.....	84	80	87	88	89	91	85	85	87	85	84	86	84	85	86	85	87	87	88	88	85	86	87	84	83	81	83	86	82	85	85	82	85	85
September..	80	81	78	78	80	82	81	78	82	82	76	78	76	77	80	79	78	79	80	81	79	77	79	78	76	79	78	80	78	76	--	79	79	79

RED RIVER BASIN--Continued

7-3415. RED RIVER AT FULTON, ARK.

LOCATION.--At gaging station at bridge on U.S. Highway 67 at Fulton, Miller County, 0.3 mile downstream from Missouri Pacific Railroad Co. bridge, and 2.5 miles downstream from Little River.

DRAINAGE AREA.--52,380 square miles, of which 5,936 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947, October 1952 to September 1959.

Water temperatures: October 1946 to September 1947, October 1952 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,060 ppm Aug. 19-31; minimum, 56 ppm Nov. 19-27.

Hardness: Maximum, 358 ppm Aug. 19-31; minimum, 24 ppm Feb. 17-22.

Specific conductance: Maximum daily, 1,730 micromhos Aug. 26; minimum daily, 53 micromhos Feb. 20.

Water temperatures: Maximum, 85°F Aug. 5, 6; minimum, 37°F Dec. 13, 14.

EXTREMES, 1952-59.--Dissolved solids: Maximum, 1,380 ppm Sept. 21-30; minimum, 54 ppm Nov. 1-3, 1954, Dec. 11-16, 1956.

Hardness: Maximum, 468 ppm Sept. 21-30, 1956; minimum, 17 ppm Dec. 11-16, 1956.

Specific conductance: Maximum daily, 2,210 micromhos Oct. 5, 1956; minimum daily, 49 micromhos Mar. 8, 1953.

Water temperatures: Maximum, 88°F July 30, 1958; minimum, 35°F Dec. 23, 24, 26, 1953, Dec. 16, 1955.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color	
														Calcium	Non-carbonate				
Oct. 1-3, 1958.....	4,573	--	--	51	13	60	3.2	150	60	95	--	0.3	419	180	58	618	7.7	6	
Oct. 4-6.....	3,600	--	--	63	19	103	3.4	150	107	160	--	1.2	585	235	112	936	7.6	8	
Oct. 7-11.....	2,788	1.5	0.01	57	16	61	3.5	177	71	92	0.2	1.0	408	208	63	667	8.0	9	
Oct. 12-13.....	3,300	--	--	44	11	37	2.9	132	34	55	--	.2	302	135	30	795	7.7	7	
Oct. 14-15.....	3,730	--	--	62	16	73	3.4	180	115	115	--	.1	493	226	37	1,060	8.0	8	
Oct. 16-23.....	2,920	1.4	.01	21	8.4	124	4.1	182	136	185	.2	1.0	289	137	56	1,060	7.7	7	
Oct. 24-27.....	8,500	--	--	31	8.4	48	2.9	48	37	48	--	.3	216	172	34	455	7.4	8	
Oct. 28-29.....	7,720	--	--	20	5.2	72	2.4	89	78	118	--	.4	434	160	86	668	7.3	9	
Oct. 30-31, Nov. 1-5	3,511	1.9	.07	63	17	114	4.4	138	126	170	.1	.9	598	227	114	903	7.7	7	
Nov. 6-14.....	3,267	1.9	.07	80	22	146	5.3	172	146	230	.1	.7	774	290	149	1,210	7.9	6	
Nov. 15.....	4,760	--	--	53	14	100	4.0	100	102	150	--	.7	a	467	190	108	813	8.1	--
Nov. 16.....	9,600	--	--	20	2.4	13	2.8	58	16	23	--	2.0	a	108	60	12	207	7.8	--
Nov. 17-18.....	21,650	--	--	12	1.9	9.4	2.5	36	10	15	--	1.4	92	27	8	120	7.6	70	
Nov. 19-27.....	25,290	9	.22	8.7	1.3	4.9	2.4	32	5.2	6.5	.0	1.4	56	27	1	87	7.1	7	
Nov. 28-30.....	8,120	--	--	20	4.4	23	2.5	52	29	35	--	1.4	163	68	26	245	7.7	40	
Dec. 1-3.....	8,813	--	--	16	4.3	21	2.0	46	23	30	--	.8	143	58	20	229	7.2	10	
Dec. 4-7.....	6,980	--	--	21	6.1	31	1.9	52	35	50	--	.8	191	78	35	313	7.1	7	
Dec. 8-10.....	5,273	--	--	27	8.1	38	2.2	73	43	58	--	1.0	229	101	41	364	7.2	6	
Dec. 11-17.....	3,728	3.6	.07	47	12	73	3.3	108	76	115	.0	1.0	418	167	78	651	7.4	8	
Dec. 18-31.....	3,007	3.6	.04	59	16	94	3.9	132	98	152	.1	1.6	552	213	105	855	7.5	6	

Jan. 1-6, 1959.....	3,547	3.7	0.01	53	14	67	3.0	148	76	102	0.1	0.7	446	190	68	686	8.0	5
Jan. 7-11.....	3,688	2.8	.08	41	11	54	2.9	108	59	85	.1	1.2	340	148	59	533	7.7	8
Jan. 12-15.....	3,610	--	--	61	20	118	3.3	121	129	185	--	.8	624	234	135	1,010	7.7	6
Jan. 16-18.....	3,120	--	--	48	16	84	3.2	110	91	132	--	.7	462	186	96	779	7.7	7
Jan. 19-21.....	3,880	--	--	33	48	7.8	2.6	84	47	69	--	.7	286	114	46	435	7.5	8
Jan. 22-27.....	4,093	2.8	.04	47	13	79	3.1	96	90	123	.1	.8	462	171	92	715	7.7	5
Jan. 28-31.....	4,935	--	--	55	15	104	3.6	100	115	155	--	.6	581	198	116	888	7.4	5
Feb. 1-4.....	4,160	2.7	.04	46	12	78	3.1	86	70	128	0	.4	448	164	86	678	7.8	10
Feb. 5-9.....	3,756	2.3	.04	57	15	108	3.8	104	109	170	.1	1.9	597	204	118	909	8.1	7
Feb. 10-13.....	7,560	2.3	.07	43	16	93	4.0	160	66	105	.1	.6	386	152	70	615	7.9	12
Feb. 14-16.....	23,400	--	--	29	8.0	3.3	2.1	168	36	96	--	1.6	244	81	36	358	7.7	--
Feb. 17-22.....	26,150	--	--	22	3.0	6.3	2.1	70	12	10	--	1.4	198	68	10	164	7.5	50
Feb. 23-27.....	7,172	2.3	.12	7.2	1.6	4.0	1.7	26	1.6	8.0	0	1.2	60	24	3	68	6.9	80
Feb. 28, Mar. 1-3.....	4,920	--	--	9.4	2.6	6.5	1.3	32	9.2	22	--	1.0	79	34	8	106	7.4	45
Mar. 4-7.....	11,250	--	--	18	3.6	15	1.6	84	15	22	--	1.3	121	95	10	186	7.5	27
Mar. 8-17.....	21,880	2.7	.16	11	5.7	24	1.8	68	27	36	--	.8	175	81	26	274	7.6	32
Mar. 18-20.....	7,560	--	--	20	5.7	26	2.1	35	11	14	.4	1.2	104	39	10	146	6.6	50
Mar. 21-22, 25-26.....	10,980	--	--	27	7.7	43	2.4	58	49	70	--	.6	271	99	52	419	7.5	20
Mar. 23-24, 27.....	12,830	--	--	16	4.7	25	1.7	40	28	38	--	.9	163	60	26	254	7.3	30
Mar. 28-31.....	18,500	--	--	14	3.3	19	1.6	32	23	31	--	.6	144	48	22	205	7.2	45
Apr. 1-2.....	15,300	--	--	25	6.4	37	2.3	54	44	60	--	.8	242	89	44	365	7.6	40
Apr. 3, 5-9.....	17,680	2.9	.08	18	5.0	24	1.8	45	29	38	.2	1.1	177	66	28	266	7.0	35
Apr. 4.....	16,900	--	--	11	2.1	13	.8	28	17	18	--	.8	77	36	13	140	7.5	--
Apr. 10-13.....	8,790	--	--	26	6.4	36	2.4	63	42	57	--	.7	238	92	40	372	7.6	40
Apr. 14.....	8,260	--	--	34	8.9	49	2.8	86	56	77	--	1.3	324	71	1	484	7.8	--
Apr. 15-18.....	6,460	--	--	42	12	70	3.1	86	78	111	--	.6	411	154	84	641	7.6	18
Apr. 19, 22-24, 28.....	19,420	--	--	20	4.2	25	2.1	53	29	37	--	.8	180	68	24	281	7.4	60
Apr. 20-21, 25-27.....	15,860	--	--	15	3.0	13	1.9	47	14	19	--	1.1	130	50	12	169	7.5	70
Apr. 29-30.....	7,230	--	--	35	8.6	51	3.0	74	60	81	--	.8	333	123	62	498	7.7	30

a Calculated from determined constituents.

RED RIVER BASIN--Continued
 7-3415. RED RIVER AT FULTON, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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)	Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	Color	
													Calcium	Non-magnesium				
May 1-5, 1959.....	5,140	8.9	0.00	46	10	65	3.6	103	71	103	0.2	1.4	156	72	633	7.0	8	
May 6-14.....	4,113	9.6	.00	70	17	110	4.6	143	115	172	.2	3.2	244	138	983	7.7	6	
May 15.....	18,000	---	---	48	6.9	57	3.8	114	61	88	---	1.7	322	148	558	7.4	---	
May 16-20.....	13,840	---	---	21	3.8	13	2.5	70	16	18	---	2.0	145	68	200	7.0	40	
May 21-24.....	5,450	---	---	22	5.1	19	2.7	72	22	28	---	1.4	163	76	251	6.9	40	
May 25, 29.....	14,050	---	---	14	2.7	11	1.6	44	12	17	---	1.6	108	46	152	6.8	40	
May 26-28.....	20,100	---	---	9.7	1.4	6.3	1.5	31	7.6	9.0	---	1.6	76	30	95	6.5	45	
May 30-31.....	9,420	---	---	21	4.4	19	2.3	64	21	29	---	1.2	152	70	236	6.9	40	
June 1-8.....	5,228	6.3	.00	29	5.5	20	2.3	94	22	29	.1	2.1	181	95	287	6.8	15	
June 9-12.....	5,285	7.9	.00	49	9.9	60	3.5	118	66	95	.3	1.6	393	163	622	6.8	12	
June 13-15.....	7,047	---	---	28	5.9	35	2.5	72	38	54	---	1.4	232	94	367	7.0	15	
June 16-24.....	5,416	7.8	.01	55	12	77	4.2	110	87	128	.4	1.9	475	186	762	6.8	8	
June 23-26, 28.....	7,647	---	---	30	7.3	46	2.9	61	51	77	---	1.2	287	105	55	460	6.8	13
June 27.....	7,560	---	---	42	9.6	70	3.7	74	77	115	---	1.6	355	144	84	634	7.4	---
June 29-30.....	5,940	---	---	28	5.8	35	3.1	70	40	54	---	2.0	231	94	369	7.3	20	
July 1-3, 5-8.....	7,143	7.8	.00	53	11	73	4.6	106	82	122	.3	2.0	458	177	90	733	7.4	10
July 4.....	7,560	---	.00	77	18	132	5.9	154	190	212	---	4.2	742	266	164	1,130	7.7	---
July 9-13.....	4,460	6.2	.00	87	16	138	6.2	129	149	225	.4	2.8	766	273	168	1,210	7.2	9
July 14-17.....	4,460	7.2	.01	98	21	166	6.7	143	183	272	.3	5.0	942	331	212	1,450	7.1	7
July 18-19.....	13,250	---	---	40	21	41	3.3	74	65	102	---	1.1	562	138	77	590	7.5	8
July 20-21.....	22,250	---	---	37	7.1	41	3.3	84	59	72	---	2.0	294	152	51	475	7.4	15
July 22-24, 27, 30.....	27,100	6.1	.00	26	3.9	24	2.5	64	27	38	.2	1.6	182	78	28	489	7.2	25
July 25-26, 28, 31.....	31,600	---	---	17	3.2	15	1.7	49	17	52	---	2.2	156	56	16	189	7.1	30
July 29.....	49,100	---	---	47	7.5	55	3.5	98	65	92	---	2.2	321	150	70	561	7.6	---

RED RIVER BASIN--Continued

7-3425. SOUTH SULPHUR RIVER NEAR COOPER, TEX.

LOCATION --At gaging station at bridge on State Highway 154, 0.6 mile downstream from Big Creek, 1.0 mile upstream from Brushy Creek, 3.5 miles downstream from Doctors Creek, and 3.7 miles southeast of Cooper, Delta County.

DRAINAGE AREA 527 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1958 to September 1959.

RECORDS AVAILABLE--Chemical analyses: October 1958 to September 1959.

EXTREMES Temperature--Chemical analyses: Maximum, 452 ppm Nov. 18-20; minimum, 125 ppm Apr. 17-21.

Hardness, 1958-59--Dissolved solids: Maximum, 452 ppm Nov. 18-20, May 1-11; minimum, 69 ppm Apr. 17-21.

Hardness, Maximum, 164 ppm Nov. 18-20, May 1-11; minimum, 69 ppm Apr. 17-21.

Specific conductance: Maximum daily, 904 micromhos Nov. 16.

Water temperatures: Maximum, 91°F Aug. 5.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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	Calcium, magnesium			Non-carbonate	
Oct. 1-10, 1958...	0.05	12		43	4.6	25		151		32	14	0.5	3.2	a 218	0.30	126	22	1.0	348	7.9	
Oct. 11-20, 1958...	29.3	9.8		27	3.1	23		101		30	10	4	1.8	155	.21	80	00	1.1	262	7.5	
Oct. 21-31, 1958...	.04	11		34	3.7	25		125		29	14	4	5	179	.24	100	0	1.1	302	7.5	
Nov. 1-14, 1958...	.02	11		47	5.6	36		165		44	25	4	8	a 262	.36	140	5	1.3	429	8.2	
Nov. 15-17, 1958...	24.7	8.4		25	4.1	15		104		15	7.5	4	5	127	.17	79	0	.8	222	7.5	
Nov. 18-20, 1958...	11.7	10		55	6.7	103		139		60	148	6	1.2	452	.61	164	50	3.5	815	7.6	
Nov. 21-30, 1958...	32.0	8.2		39	4.2	37		147		32	28	6	1.2	222	.30	115	0	1.5	398	7.7	
Dec. 1-17, 1958...	17.1	11		38	3.7	35		128		40	26	5	2.5	a 236	.32	110	5	1.5	374	7.6	
Dec. 18-31, 1958...	5.89	12		46	4.6	42		164		52	24	4	1.8	a 276	.38	134	0	1.6	439	7.5	
Jan. 1-14, 1959...																					
Jan. 17-19, 1959...	28.6	11		33	3.2	47	4.1	108		40	46	4	5.0	243	.33	96	7	2.1	427	7.4	
Jan. 20-31, 1959...	23.0	9.8		33	5.1	124		93		32	180	--	5.0	434	.49	99	23	5.4	803	7.4	
Feb. 1-10, 1959...	97.2	14		31	6.4	65		134		45	93	--	2.6	a 360	.49	149	39	2.3	606	7.5	
Feb. 11-20, 1959...	97.8	8.8		52	2.0	64		134		43	84	4	6.8	a 334	.48	134	28	2.2	606	7.9	
Feb. 21-28, 1959...	82	13		31	2.9	19		98		29	160	5	6.3	a 359	.22	89	9	.9	264	7.8	
Mar. 1-4, 1959...	6.94	14		44	4.5	28		145		39	18	4	5.9	a 242	.33	129	10	1.1	374	8.0	
Mar. 5-7, 1959...	3.02	15		52	6.3	32		176		47	20	4	4.2	a 264	.36	156	11	1.1	435	8.1	
Mar. 8-10, 1959...																					
Mar. 13-16, 1959...	132	10		32	3.5	19		107		29	9.2	5	3.5	1 160	.22	57.0	7	.8	268	7.6	
Mar. 17-19, 1959...	594	11		36	2.7	33		122		40	20	--	5.0	208	.28	334	2	1.4	355	8.2	

RED RIVER BASIN--Continued

7-3444. RED RIVER NEAR HOSSTON, LA.

LOCATION.--At gaging station at bridge on State Highway 2, 1.8 miles downstream from Dry Bayou, and 3.2 miles east of Hosston, Caddo Parish. DRAINAGE AREA.--57,041 square miles, of which 5,936 square miles above Denison Dam is noncontributing.

RECORDS AVAILABLE.--Chemical analyses: March 1957 to September 1959.

Water temperatures: March 1957 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 87°F Aug. 7; minimum, 40°F Jan. 9, 23.

Hardness: Maximum, 356 ppm Aug. 22-31; minimum, 68 ppm Feb. 16-28.

Specific conductance: Maximum daily, 1,760 micromhos Aug. 28; minimum daily, 165 micromhos Feb. 20.

Water temperatures: Maximum, 87°F Aug. 7; minimum, 40°F Jan. 9, 23.

EXTREMES, 1957-59.--Dissolved solids: Maximum, 965 ppm Aug. 22-31, 1959; minimum, 121 ppm Feb. 16-28, 1959.

Hardness: Maximum, 356 ppm Aug. 22-31, 1959; minimum, 68 ppm Feb. 16-28, 1959.

Specific conductance: Maximum daily, 1,760 micromhos Aug. 28, 1959; minimum daily, 165 micromhos Feb. 20, 1959.

Water temperatures: Maximum, 90°F Sept. 3, 4, 1958; minimum, 40°F Feb. 17, 1958, Jan. 9, 23, 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Baton Rouge, La. Records of discharge for water year October 1958 to September 1959 given in NSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	Color	pH		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium				Non-carbonate	Soil adsorption ratio
Oct. 1-2, 1958..	5,020	12	0.06	40	7.1	45	3.1	100		42	71	0.5	0.6		307	0.42	4,160	129	47	477	7.4	40	
Oct. 3-10.....	4,560	14	.01	58	22	3.8	3.8	178		78	134	3	4		543	.74	6,690	233	87	2.4	836	7.7	20
Oct. 11-18, 27-30	5,800	14	.05	56	13	61	2.8	163		57	96	2	5		400	.54	6,260	192	58	1.9	639	7.9	20
Oct. 20-25, 31..	4,540	15	.04	76	23	110	3.2	204		108	176	3	5		622	.85	7,820	282	113	2.9	1,020	7.9	20
Nov. 1-10.....	3,080	13	.02	71	22	115	3.5	171		113	192	3	3		679	.92	7,480	266	129	3.1	1,070	7.8	30
Nov. 11-15.....	3,590	14	.00	68	37	139	3.6	199		124	236	4	2		735	1.0	7,930	320	137	3.4	1,240	8.0	10
Nov. 17-29.....	2,116	9.4	.22	29	5.8	31	2.7	74		32	49	4	6		218	.30	1,250	96	35	1.4	337	7.2	100
Dec. 1-9.....	8,840	12	.10	39	8.0	50	2.6	94		50	82	1	6		313	.43	7,470	130	53	1.9	510	7.7	60
Dec. 12-18, 23-28	9,510	15	.06	56	13	78	2.8	138		78	128	1	6		448	.61	1,150	195	82	2.4	756	7.6	40
Jan. 8-20.....	6,100	11.9	.04	52	11	72	2.9	119		71	120	5	3		413	.56	7,370	176	78	2.4	700	7.6	40
Jan. 21-28, 30..	11,400	11	.01	41	17.0	50	2.9	102		48	78	2	7		289	.41	9,200	131	47	1.9	514	7.8	30
Feb. 2-11.....	6,150	11	.01	59	13	97	3.6	115		92	158	3	4		508	.69	8,440	200	106	3.0	881	7.6	40
Feb. 12-14.....	8,000	11	.09	37	8.0	44	2.6	93		43	72	3	6		282	.36	6,090	125	49	1.7	478	7.8	70
Feb. 16-28.....	29,000	8.6	.28	23	2.6	14	2.3	67		16	20	2	1.0		a 131	.16	9,470	68	13	7.0	208	7.5	160
Mar. 2-11.....	6,150	9.1	.26	29	4.3	23	2.4	81		26	35	2	8		a 198	.27	3,290	90	24	1.0	301	7.5	160
Mar. 12-20.....	20,000	7.8	.45	24	3.2	17	2.4	66		37	25	3	9		a 136	.18	7,340	73	19	.9	241	7.4	80
Mar. 21-25, 30.	18,720	11	.15	28	5.6	34	2.3	69		37	51	7	1.0		a 232	.32	11,700	93	36	1.5	363	7.5	80
Apr. 6-11.....	18,800	12	.06	39	9.4	63	2.2	75		66	101	5	6		364	.50	18,500	136	75	2.4	589	7.6	60

RED RIVER BASIN--Continued
7-3480. TWELVEMILE BAYOU NEAR DIXIE, LA.

LOCATION.--At gaging station at bridge on State Highway 173, 0.1 mile downstream from Cottonwood Bayou, 4.2 miles southwest of Dixie, Caddo Parish, and 5.5 miles downstream from Caddo Lake.
DRAINAGE AREA.--3,137 square miles.
RECORDS AVAILABLE.--Chemical analyses: September 1953 to September 1955, October 1957 to September 1959.
REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 21, 1958.....	640	11	0.17	18	5.6	102	3.4	36		10	180	0.5	0.2		387	0.53	669	68	38	5.4	656
Nov. 6.....	328	19.8	0.08	30	10	193	3.9	54		17	346	1.1	.2		725	.99	642	117	73	7.8	1,200
Dec. 16.....	1,370	11	0.07	18	5.6	126	3.3	26		11	220	.2	.2		470	.64	1,740	66	47	6.7	772
Jan. 7, 1959.....	1,760	12	0.16	20	5.9	132	3.3	27		16	232	.3	.2		478	.65	981	74	52	6.7	816
Feb. 4.....	1,120	11	0.07	22	6.1	146	3.1	22		14	280	.2	.2		512	.70	1,550	80	62	7.1	894
Mar. 4.....	4,050	11	.21	14	3.9	63	2.6	20		15	114	.2	.4		253	.34	2,770	51	35	3.9	453
May 7.....	5,900	9.7	.23	8.1	2.4	29	2.2	17		11	98	.3	.6		141	.19	2,250	30	16	2.3	214
June 2.....	3,850	7.7	.27	16	4.4	55	4.9	36		14	50	.2	1.1		242	.33	2,520	58	28	3.2	409
July 2.....	880	11	0.10	18	5.1	97	3.3	30		18	168	.2	1.3		378	.51	898	66	41	5.2	624
Aug. 5.....	1,410	14	0.12	12	4.4	71	3.6	24		14	125	.1	.4		298	.41	1,130	448	28	4.5	495
Sept. 2.....	1,105	12	.01	67	26	501	7.0	81		39	905	.3	.1		1,740	2.37	1,493	272	206	13	3,050

RED RIVER BASIN--Continued

7-3555. RED RIVER AT ALEXANDRIA, LA.

LOCATION --At gaging station at old bridge on U.S. Highway 165 between Alexandria and Pineville, 1.7 miles downstream from Bayou Rigolette. DRAINAGE AREA 67,500 square miles of which 5,936 square miles above Denison Dam is noncontributing.

RECORDS AVAILABLE --Chemical analyses: October 1952 to September 1959.

Water temperatures: October 1952 to September 1959.

EXTREMES 1958-59 --Dissolved solids: Maximum, 922 ppm Sept. 1-12; minimum, 175 ppm June 1-10.

Hardness: Maximum, 364 ppm Sept. 1-12; minimum, 74 ppm Mar. 13-20.

Specific conductance: Maximum daily, 1,660 micromhos Sept. 30; minimum daily 249 micromhos June 1.

Water temperatures: Maximum, 90°F July 17, 18; minimum, 44°F Jan. 9.

EXTREMES 1952-59 --Dissolved solids: Maximum, 1,130 ppm Oct. 1, 3-9, 11-20, 1956; minimum, 91 ppm June 1-9, 1953.

Hardness: Maximum, 464 ppm Oct. 11-20, 1956; minimum, 57 ppm June 1-9, 1953.

Specific conductance: Maximum daily, 2,020 micromhos Oct. 8, 1956; minimum daily, 133 micromhos June 24, 1953.

Water temperatures: Maximum, 93°F Aug. 2, 8, 10, 1956; minimum, 43°F Jan. 7, 1958.

REMARKS --Records of specific conductance of daily samples available in district office at Baton Rouge, La. Records of discharge for water year October 1958 to September 1959 give in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Color or pH	
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate				
Oct. 1-10, 1958.	21,200	13	0.08	27	5.3	31	2.5	80	21	51	0.2	0.7		0.29	210	89	23	1.4	337	7.4	70
Oct. 11-20.....	10,400	14	.05	41	9.0	46	2.8	126	32	76	.3	.6		.41	299	139	36	1.7	495	7.7	50
Oct. 21-31.....	7,980	15	.03	47	17	56	2.9	174	43	92	.2	.4		.52	383	188	45	1.8	635	8.0	30
Nov. 1-10.....	7,200	14	.02	52	12	73	2.7	132	64	120	.3	.4		.60	442	180	72	2.4	691	7.7	20
Nov. 11-20.....	8,070	12	.01	55	29	106	3.0	190	92	174	.3	.4		.79	584	258	102	2.9	972	7.6	30
Nov. 23-30.....	29,300	9.0	.33	29	5.5	32	2.6	77	29	52	.2	.7		.31	230	95	32	1.4	341	7.2	120
Dec. 1-10.....	13,600	9.7	.23	32	6.4	45	2.7	80	33	76	.1	.6		.37	274	106	40	1.9	430	7.2	80
Dec. 11-21.....	9,540	12	.18	43	9.2	63	2.5	114	42	106	.3	.4		.47	349	145	52	2.3	596	7.6	70
Dec. 22-31.....	7,520	13	.12	51	15	82	2.8	138	58	144	.4	.2		.64	467	187	74	2.6	774	7.6	60
Jan. 1-10, 1959.	6,690	13	.12	48	21	86	2.9	158	65	146	.3	.3		.57	491	206	76	2.6	831	7.7	60
Jan. 11-20.....	9,460	14	.04	50	13	74	2.8	146	49	121	.3	.5		.67	418	178	58	2.4	715	7.9	50
Jan. 21-31.....	14,000	11	.05	42	9.1	54	3.1	102	21	107	.3	.5		.47	349	142	58	2.3	614	7.6	50
Feb. 1-10.....	17,800	10	.17	35	8.7	52	2.8	80	42	91	.2	.3		.43	315	123	57	2.0	521	7.4	70
Feb. 11-21.....	21,300	13	.19	40	6.5	59	2.8	80	49	117	.3	.7		.30	246	136	52	2.9	369	7.6	70
Feb. 19-28.....	50,800	8	.47	34	4.7	34	2.3	60	16	63	.2	.5		.27	191	80	27	1.7	350	7.3	140
Mar. 1-10.....	32,500	10	.28	25	4.3	37	2.5	66	18	67	.4	.2		.31	227	91	27	1.3	409	7.5	100
Mar. 11-20.....	42,000	12	.23	23	4.3	31	2.5	62	21	42	.4	.1		.21	195	74	20	1.3	284	7.5	100
Mar. 21-30.....	29,300	11	.26	25	3.8	27	2.5	62	23	50	.4	.8		.29	212	78	27	1.5	317	7.7	80

RED RIVER BASIN--Continued

7-3555. RED RIVER AT ALEXANDRIA, LA.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (microhmhos at 25°C)	pH	Color	
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate				
Mar. 31-Apr. 10, 1959.....	27,300	11	0.14	32	5.4	49	2.9	68		44	78	0.3	0.5	275	0.37	20,300	102	46	452	7.4	50
Apr. 11-20.....	27,200	12	0.17	29	5.3	40	2.5	71		35	64	1.1	1.2	246	0.33	18,100	94	36	353	7.3	70
Apr. 21-30.....	48,500	12	0.28	26	5.2	35	2.7	64		29	58	3.7	7.7	227	0.31	29,700	86	34	353	7.3	80
May 1-10.....	24,000	12	0.23	27	4.8	36	2.5	68		26	61	2.2	6.6	226	0.31	14,800	87	31	513	7.2	60
May 11-20.....	16,100	11	0.12	37	8.2	52	2.8	96		45	83	4.7	7.7	303	0.41	13,200	126	47	363	7.3	50
May 21-31.....	20,500	14	0.14	28	5.2	30	2.3	88		23	45	4.1	1.1	192	0.26	10,600	91	19	323	7.4	50
June 1-10.....	23,100	13	0.19	24	4.4	25	2.3	75		14	40	4.4	8.8	175	0.24	10,900	78	17	288	7.3	80
June 11-20.....	24,200	11	0.20	25	4.8	30	2.4	74		20	48	3.6	6.6	185	0.25	12,100	82	21	318	7.2	80
June 21-30.....	14,500	14	0.02	38	8.1	58	2.2	102		46	89	4.4	2.2	323	0.44	12,600	128	44	258	7.6	30
July 1-10.....	12,500	13	0.04	44	9.3	70	2.4	107		64	106	4.4	2.2	377	0.51	12,700	148	60	629	7.6	30
July 11-18.....	10,900	12	0.02	47	12	69	3.2	123		68	106	5.3	3.3	394	0.54	11,600	167	68	664	7.7	30
July 18-25.....	11,900	14	0.01	63	19	108	3.2	156		106	164	4.4	1.0	583	0.79	18,700	234	106	986	7.8	20
July 26-Aug. 2.....	33,000	11	0.01	41	8.2	59	3.2	97		63	85	3.1	1.3	326	0.44	29,000	136	56	551	7.3	30
Aug. 3-12.....	31,700	11	0.07	32	5.4	34	2.5	84		35	51	2.9	9.9	235	0.31	19,300	102	33	373	7.0	60
Aug. 13-18.....	13,300	12	0.01	48	8.8	66	2.1	109		85	104	4.4	4.4	253	0.52	13,600	82	21	457	7.4	30
Aug. 19-31.....	9,300	12	0.01	65	28	42	4.1	159		135	201	5.4	4.4	354	0.86	13,800	278	152	1,150	8.0	10
Sept. 1-12.....	9,340	12	0.01	78	41	177	4.5	163		197	206	5.4	4.4	922	1.25	23,300	364	230	1,560	8.0	10
Sept. 13-21.....	8,050	11	0.03	48	19	91	3.3	128		86	146	4.4	4.4	478	0.65	18,400	197	82	846	7.8	10
Sept. 22-28.....	4,860	13	0.02	58	25	101	3.2	198		97	149	3.1	1.1	550	0.75	6,770	247	85	944	7.8	10
Sept. 29-30.....	4,280	12	0.02	77	40	172	3.8	232		179	258	5.1	1.1	856	1.16	9,890	355	185	1,430	7.7	10
Time-weighted average.....	18,700	12	0.12	41	12	62	2.8	108		54	102	0.3	0.6	359	0.49	18,100	152	63	586	--	55

RED RIVER BASIN--Continued

7-3555. RED RIVER AT ALEXANDRIA, LA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	78	80	79	78	78	78	--	--	--	80	76	76	76	76	78	78	79	76	76	75	78	79	79	80	79	76	77	77	78	77	77	78		
November ..	78	68	67	68	69	74	73	78	79	--	--	--	--	74	74	74	74	74	73	73	--	68	68	65	63	62	62	68	69	67	--	70		
December ..	59	--	59	57	--	52	--	--	53	52	--	--	--	--	--	--	--	--	50	--	--	--	--	--	--	55	--	51	50	49	49	--		
January	48	49	48	47	46	45	44	46	46	46	46	46	48	47	47	47	46	48	50	53	50	50	51	52	--	54	56	54	54	56	55	49		
February	--	58	59	56	53	53	53	54	53	54	53	53	59	56	57	58	59	59	59	59	59	59	59	59	59	59	58	58	57	57	57	57		
March	58	58	59	60	58	58	58	58	58	59	60	58	--	60	59	58	61	60	60	59	--	59	59	60	62	61	59	55	62	62	62	59		
April	61	63	61	61	--	61	69	70	60	60	59	60	59	--	61	64	75	66	67	67	68	--	69	69	70	69	70	69	70	78	74	--	65	
May	77	79	79	80	80	81	81	81	82	88	87	89	80	80	80	81	80	81	80	81	80	81	81	81	82	81	--	79	80	81	80	82	80	81
June	--	81	82	82	82	80	79	79	80	81	81	82	82	82	83	85	85	82	82	80	82	81	81	84	84	85	86	87	87	86	--	83	83	
July	87	86	86	84	86	85	87	85	85	86	86	--	87	88	88	89	90	90	88	87	89	--	89	89	89	88	89	87	89	89	--	87		
August	89	88	88	88	87	89	89	87	87	86	86	85	86	86	86	86	87	86	85	86	85	86	89	--	86	84	84	85	85	84	--	87		
September ..	84	84	84	85	86	86	84	85	86	84	84	81	84	83	75	75	75	76	78	78	80	85	82	83	83	83	87	81	82	82	--	82		

RED RIVER BASIN--Continued

7-3600. OUACHITA RIVER AT ARKADELPHIA, ARK.

LOCATION.--At gaging station at bridge on State Highway 8 at Arkadelphia, Clark County, 800 feet upstream from Missouri Pacific Railroad Co. bridge. DRAINAGE AREA.--2,311 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 74 ppm July 1-10; minimum, 39 ppm Feb. 16-28.

Hardness: Maximum, 34 ppm July 11-18; minimum, 18 ppm Mar. 1-10.

Water temperatures: Maximum daily, 120 microhos June 29; minimum daily, 42 microhos Mar. 8.

Specific conductance: Maximum, 89°F July 16-18; minimum, 39°F Feb. 1.

EXTREMES, 1948-59.--Dissolved solids: Maximum, 266 ppm Jan. 16, 1956; minimum, 30 ppm Mar. 17-21, 23, 25-28, 1955.

Hardness: Maximum, 77 ppm June 20, 1957; minimum, 11 ppm Jan. 23-31, 1949.

Water temperatures: Maximum daily, 390 microhos Jan. 16, 1956; minimum daily, 27 microhos Jan. 27, 1949.

Specific conductance: Maximum, 99°F July 7, 1955; minimum, 36°F Jan. 30, 31, Feb. 1, 2, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. Records of discharge for water year October 1958 to September 1959 furnished by district office, Corps of Engineers, Vicksburg, Miss.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-magnesium			
Oct. 1-9, 1958.....	2,619	0.9	0.00	6.9	2.0	2.5	0.9	22	7.4	2.8	0.1	0.6	46	25	7	72	7.0	6
Oct. 10-20.....	2,393	--	--	7.5	2.1	2.4	.8	30	5.2	3.0	--	.9	48	27	2	64	7.1	5
Oct. 21-31.....	2,954	--	--	7.9	2.4	2.3	.9	31	5.6	3.5	--	.8	52	30	4	66	7.2	3
Nov. 1-10.....	1,742	2.3	.00	7.6	1.9	2.8	.9	30	4.0	3.2	.2	.6	56	27	2	72	7.1	8
Nov. 11-20.....	5,296	--	--	6.4	2.0	2.3	1.2	24	6.4	3.0	--	1.2	45	24	4	67	7.1	6
Nov. 21-30.....	4,151	--	--	7.2	1.4	2.4	1.1	24	7.0	2.5	--	.7	42	24	4	64	7.0	6
Dec. 1-10.....	3,984	2.1	.00	6.6	1.4	2.4	1.0	26	2.8	2.2	.2	1.1	50	22	1	60	6.8	5
Dec. 11-20.....	5,601	--	--	6.4	1.8	2.4	1.1	23	4.6	2.5	--	.6	42	24	4	62	7.1	6
Dec. 21-31.....	3,894	--	--	6.5	1.7	2.4	1.1	26	4.2	2.5	--	.9	48	24	0	68	6.9	5
Jan. 1-10, 1959.....	2,238	2.9	.00	6.9	1.7	2.5	.8	26	2.6	3.5	.2	.8	56	27	3	70	7.4	7
Jan. 11-20.....	2,544	--	--	7.0	2.4	3.2	.8	30	5.6	4.9	--	.8	56	27	2	70	7.4	7
Jan. 21-31.....	2,749	--	--	7.2	2.1	3.2	.8	30	4.8	4.2	--	.6	52	26	2	67	7.5	5
Feb. 1-15.....	6,570	2.4	.00	6.4	1.7	2.6	.9	25	3.6	3.5	.1	1.1	39	22	2	62	7.0	5
Feb. 16-28.....	6,782	--	--	5.6	1.8	2.7	.7	22	5.6	2.5	--	1.2	48	23	4	59	6.4	10
Mar. 1-10.....	4,908	3.1	.09	4.8	1.6	2.5	1.0	17	6.0	3.0	.2	1.1	52	18	4	54	6.8	21
Mar. 11-20.....	4,429	--	--	5.4	1.3	3.0	.7	20	4.8	3.5	--	.9	40	20	3	57	6.5	5
Mar. 21-31.....	4,102	--	--	5.4	1.8	3.1	.7	23	4.6	3.5	--	.6	42	21	2	60	6.3	5

Date	4, 290	3.0	0.03	7.6	2.2	11	0.8	25	7.0	16	0.1	1.4	a	28	8	108	7.0	5
Apr. 1-10, 1959	4, 530	3.0	0.03	7.6	2.2	11	0.8	25	7.0	16	0.1	1.4	58	28	8	108	7.0	5
Apr. 11-20	3, 729	3.0	0.03	6.8	1.7	3.2	0.8	23	4.2	3.2	0.1	1.4	45	22	2	61	6.9	5
Apr. 21-30	3, 729	3.0	0.03	6.8	1.7	3.2	0.8	23	4.2	3.0	0.1	1.4	45	22	2	61	7.1	3
May 1-10	1, 724	4.3	.02	8.1	2.3	3.4	0.8	30	4.8	3.5	0	0.8	45	26	3	77	6.1	3
May 11-20	568	8.1	2.0	8.1	2.3	3.4	0.8	32	6.0	5.0	0	0.8	54	29	3	81	6.6	5
May 21-31	790	---	---	8.6	2.1	3.9	0.9	32	7.6	4.5	---	0.8	53	30	4	82	6.4	6
June 1-10	1, 412	4.6	.03	9.7	2.1	4.5	1.1	32	9.6	5.8	0	1.7	64	32	6	92	7.2	5
June 11-21	2, 207	---	---	7.9	1.3	3.5	1.9	26	7.6	3.5	---	0.9	54	25	4	71	7.0	12
June 22-30	521	---	---	9.3	2.4	5.3	1.0	28	14	6.0	---	1.0	64	33	10	97	7.0	3
July 1-10	403	4.9	.02	9.2	1.9	5.0	1.3	30	9.8	7.2	1.1	1.6	74	31	6	92	7.2	5
July 11-18	418	---	---	9.7	2.5	5.1	0.9	34	10	6.0	---	0.4	72	34	6	98	6.7	3
July 19-22	1, 628	---	---	8.3	1.7	3.2	1.0	29	7.6	3.5	---	0.8	57	28	4	76	6.7	14
July 23-31	1, 868	---	---	7.2	1.8	2.5	0.8	27	6.4	3.0	---	1.2	51	26	4	67	6.8	12
Aug. 1-10	1, 949	5.3	.02	8.7	1.6	3.6	1.1	30	7.2	4.0	0	1.4	54	28	4	77	7.2	5
Aug. 11-20	1, 854	---	---	7.6	2.1	2.9	0.9	31	5.8	2.5	---	1.4	54	28	2	69	6.8	3
Aug. 21-31	1, 817	---	---	7.2	2.7	2.7	1.0	33	4.4	2.5	---	1.4	52	29	2	68	6.9	4
Sept. 1-10	1, 940	4.4	.00	8.4	1.8	2.6	1.8	30	6.6	2.5	1.1	0.9	49	28	4	71	7.2	5
Sept. 11-20	1, 890	---	---	7.3	2.2	2.5	1.0	29	6.0	3.0	---	1.4	51	27	3	69	6.4	4
Sept. 21-30	2, 256	---	---	7.8	2.1	2.7	1.0	31	4.8	3.5	---	1.2	54	28	2	69	6.9	5
Average	2, 879	---	---	7.4	1.9	3.3	0.9	28	6.1	4.0	---	0.9	51	26	4	71	---	6

a Calculated from determined constituents.

Temperature (°F) of water, water year October 1958 to September 1959

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	64	65	63	63	67	67	69	69	69	67	67	68	65	65	65	66	65	66	65	63	63	63	63	63	59	58	60	59	60	59	64	
November	58	59	60	60	58	58	58	58	58	58	58	59	59	59	58	60	58	57	56	56	56	56	56	58	58	58	57	53	51	45	44	44	57	
December	53	52	58	55	54	53	53	49	48	47	48	48	48	48	43	45	43	45	47	48	48	49	48	45	47	43	43	45	47	46	46	48		
January	48	---	48	44	42	40	41	45	43	43	45	47	48	43	43	42	45	46	46	45	40	40	41	40	46	47	48	48	47	49	48	45		
February	39	40	41	43	45	44	45	45	49	48	48	46	49	49	---	50	52	47	47	48	49	52	53	53	53	53	53	54	---	---	---	48		
March	52	52	53	54	49	50	52	53	53	53	54	52	52	54	53	54	54	56	56	57	57	57	57	54	56	56	57	57	58	57	58	54		
April	65	66	66	67	68	68	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	69	63	
May	70	70	70	71	71	71	72	73	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	74	
June	74	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	75	80
July	87	87	86	86	85	84	84	84	85	85	86	85	84	84	86	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	89	84	
August	84	85	86	85	87	88	87	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	88	80	
September	77	79	80	82	77	78	78	79	77	77	78	77	74	74	75	75	76	73	74	73	74	73	74	73	74	73	74	73	73	74	74	74	76	

RED RIVER BASIN--Continued

7--3610. LITTLE MISSOURI RIVER NEAR MURFREESBORO, ARK.

LOCATION.--At gaging station at bridge on State Highway 27, 1.9 miles downstream from Muddy Fork, 2 miles southwest of Murfreesboro, Pike County, 4.6 miles upstream from Prairie Creek, and 11.4 miles downstream from Lake Greason.

DRAINAGE AREA.--380 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631. Flow regulated by Lake Greason since November 1949.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 10, 1958.....	220		2.6	0.8	1.7	0.8	15	0.6	1.8	0.0	26	10	34	6.8	7			
Nov. 11.....	150		2.2	.8	1.8	.8	20	3.4	2.0	.1	38	16	46	6.7	6			
Dec. 1.....	696		3.8	.9	2.0	.8	15	6.0	2.0	.4	42	16	47	6.6	7			
Dec. 30.....	553		4.0	.9	2.0	.9	15	4.0	2.0	.2	32	14	44	7.0	7			
Mar. 3, 1959.....	647		4.1	1.2	2.0	.8	15	5.0	2.5		38	15	49	6.9	5			
Apr. 27.....	548		4.7	1.0	2.0	.8	16	4.4	2.0	.4	34	16	46	6.8	6			
June 1.....	38		6.8	1.3	2.3	.9	24	5.6	2.0	1.6	40	22	60	6.5	12			
June 23.....	736		3.6	1.0	2.2	1.0	14	3.2	3.0	1.4	37	13	43	6.4	10			
July 24.....	642		4.1	1.9	1.9	.9	17	4.6	2.5	.4	30	16	51	6.2	10			
Aug. 7.....	574		4.3	1.0	1.9	.7	16	3.8	1.5	2.6	33	14	44	6.4	13			
Sept. 30.....	210		2.9	1.1	1.5	.9	14	3.6	1.5	.6	32	12	48	6.4	15			

RED RIVER BASIN--Continued
7-3625. MORO CREEK NEAR FORDYCE, ARK.

LOCATION.--At gaging station at bridge on State Highway 8, 1,100 feet upstream from Caney Creek, 4 miles southeast of Fordyce, Bradley County, and 12 miles upstream from White Water Creek.

DRAINAGE AREA.--216 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1957 to September 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 7, 1958.....	49			2.6	0.8	1.7	1.4	11	2.8	2.0		0.9	55	10	1	33	6.5	40
Nov. 4.....	30.8			10.0	2.7	20.7	5.2	64	7.4	16.0		3.8	146	36	4	172	7.0	40
Dec. 2.....	30			4.0	1.0	3.7	2.4	13	5.8	5.0		4	36	14	0	57	6.2	35
Jan. 6, 1959.....	14			4.4	1.8	6.6	2.1	20	4.8	7.5		2.5	65	18	2	76	6.5	22
Jan. 27.....	133			2.9	1.3	3.6	1.3	8	10.0	4.5		1.7	70	12	6	51	6.3	35
Feb. 17.....	2,610			2.1	1.8	1.0	1.8	7	1.6	1.8		1.7	66	8	3	29	6.1	85
Mar. 17.....	148			3.1	1.1	3.6	1.0	9	7.6	4.0		.1	26	12	4	52	6.9	6
Apr. 14.....	304			3.0	1.0	2.6	1.1	13	2.6	3.0		.8	36	12	1	46	6.9	5
May 12.....	10			5.7	1.4	5.5	2.3	26	5.2	5.5		3	50	20	0	73	6.8	5
June 9.....	13			8.5	2.4	12.0	4.2	42	4.4	12.0		6.5	110	31	0	123	6.5	45
July 8.....	.9			8.1	1.8	6.1	3.3	36	4.6	6.0		1.0	82	28	0	89	6.6	40
Aug. 5.....	.4			7.3	2.0	5.4	3.0	34	5.4	4.8		.9	66	26	0	84	6.6	15
Sept. 1.....	22			14	2.8	24	8.6	90	10	18		1.0	160	46	0	233	6.7	35
Sept. 29.....	35			5.6	.8	3.4	3.2	17	6.4	4.5		.5	60	18	4	65	6.3	45

RED RIVER BASIN--Continued

7-3635. SALINE RIVER NEAR RYE, ARK.

LOCATION.--At gaging station at bridge on State Highway 15, 4 miles southwest of Rye, Cleveland County and 5 miles upstream from Hudgin Creek. DRAINAGE AREA.--2,062 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1947, October 1948 to September 1955, November 1957 to September 1959.

Water temperatures: October 1946 to September 1948 to September 1955, October 1958 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 118 ppm Sept. 1-5; minimum, 55 ppm Mar. 11-20.

Hardness: Maximum, 50 ppm July 11-17; minimum, 16 ppm Feb. 14-28.

Specific conductance: Maximum daily, 183 microhos July 12; minimum daily, 37 microhos Feb. 23.

Water temperature: Maximum, 85° F Aug. 7; minimum, 35° F Jan. 6.

EXTREMES, 1946-47, 1948-55, 1956-59.--Dissolved solids: Maximum, 186 ppm July 13-15, 1955; minimum, 18 ppm Jan. 11-14, 1950.

Hardness: Maximum, 77 ppm Jan. 24, 30, 1949; minimum, 8 ppm June 1-7, 9-10, 1947.

Specific conductance: Maximum daily, 534 microhos Jan. 28, 1949; minimum daily, 19.7 microhos June 24, 1947.

Water temperature: Maximum, not determined; minimum, 35° F Jan. 6, 1939.

REMARKS.--Records of specific conductance available in district office at Little Rock, Ark. Records of discharge for water year

October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
Oct. 1-10, 1958.....	1,618	3.8	0.35	8.1	1.6	6.6	1.7	23	19	2.5	0.3	1.2	85	26	8	90	7.0	35
Oct. 11-20.....	340	4.5	.39	10.	2.3	7.5	1.4	31	21	2.5		1.5	95	24	9	112	6.8	22
Oct. 21-31.....	274	4.4	.46	11	3.0	9.7	1.5	43	15	4.0	.4	3.4	104	40	5	131	7.3	17
Nov. 1-10.....	263	3.7	.30	13	3.0	11	1.2	54	19	3.2	.5	1.0	104	45	0	138	7.5	10
Nov. 11-15.....	334	3.1	.43	12	2.6	9.9	1.4	50	16	3.2	.6	1.1	98	40	0	130	7.4	22
Nov. 16-30.....	2,781	2.5	.35	7.1	2.2	4.8	2.4	24	15	2.5	.3	1.2	78	26	7	86	7.0	40
Dec. 1-10.....	1,368	4.2	.26	9.0	2.6	6.4	1.4	31	18	3.5	.3	.6	84	33	8	101	7.1	20
Dec. 11-20.....	718	3.7	.28	10	2.8	6.0	1.0	35	17	3.2	.3	.7	82	36	8	107	7.0	10
Dec. 21-31.....	825	3.8	.35	9.4	2.6	8.2	1.1	32	19	4.2	.4	.6	92	34	8	115	7.3	15
Jan. 1-10, 1959.....	984	2.9	.04	11	2.6	7.7	1.2	28	24	5.0	.1	1.2	88	38	15	122	6.7	10
Jan. 11-16.....	1,611	3.1	.07	8.1	2.1	6.2	1.4	19	21	5.0	.1	.9	75	28	13	98	6.7	20
Jan. 17-26.....	4,000	2.3	.13	6.6	1.7	4.4	1.6	16	15	4.0	.1	1.6	74	24	10	77	6.6	45
Jan. 27-31.....	2,656	--	--	8.3	2.0	5.4	1.2	24	15	4.0	--	.5	66	28	9	87	6.6	12
Feb. 1-13.....	1,727	3.0	.10	8.5	2.4	6.1	1.1	22	20	5.0	.2	1.4	79	31	13	99	6.9	30
Feb. 14-28.....	11,410	2.0	.15	4.5	1.2	3.0	1.5	12	12	3.0	.0	1.6	62	16	6	54	6.5	60
Mar. 1-10.....	5,090	2.3	.24	6.8	1.8	4.2	1.1	20	12	3.0	.2	1.0	66	24	8	72	6.8	40
Mar. 11-20.....	5,188	3.2	.07	7.5	1.3	3.7	1.0	20	12	2.0	.0	.6	55	25	4	70	6.5	18
Mar. 21-31.....	4,153	2.9	.08	7.1	1.9	3.9	1.0	24	10	3.0	.0	.7	62	26	6	74	6.4	20

	2,789	3.3	0.06	8.9	2.1	4.7	1.0	28	12	3.2	0.0	1.2	68	30	8	87	6.7	20
Apr. 1-10, 1959.....	3,221	2.7	.07	6.4	2.5	4.6	1.0	24	12	3.2	0.0	1.0	66	26	7	78	6.4	22
Apr. 11-20.....	3,651	5.5	.08	7.0	1.8	4.1	1.2	22	11	2.8	.5	.9	64	25	7	74	6.5	23
Apr. 21-30.....	607	5.0	.09	10	3.0	5.6	1.2	40	14	3.2	0.0	.6	72	38	4	102	6.5	25
May 1-10.....	300	3.2	.07	11	3.2	6.3	1.2	46	12	4.0	0.0	1.2	40	3	3	112	6.9	25
May 11-20.....	469	5.5	.18	11	2.8	8.2	1.7	47	15	2.8	.5	1.7	87	38	1	118	7.2	27
May 21-31.....	266	7.3	.19	8.7	2.8	7.0	1.7	31	17	3.5	.5	1.8	90	33	8	108	6.9	32
June 1-10.....	1,402	--	--	8.4	3.1	7.0	1.7	32	16	4.0	--	1.6	78	34	8	95	6.7	25
June 11-14.....	3,786	4.9	.07	6.2	2.0	2.9	1.5	23	10	1.0	.4	1.4	57	24	4	64	6.5	32
June 15-23.....	944	8.1	.15	9.2	3.0	4.7	1.3	38	10	2.8	.3	1.6	80	36	4	86	7.3	23
June 24-30.....	200	6.3	.08	11	3.4	9.0	1.4	42	20	3.8	.6	1.2	40	42	7	129	7.1	13
July 1-10.....	200	6.3	.08	11	3.4	9.0	1.4	42	20	3.8	.6	1.2	40	42	7	129	7.1	13
July 11-20.....	862	4.4	.01	13	3.3	12.1	1.5	32	26	5.0	.6	1.4	106	50	15	159	7.2	10
July 18-27, 26-31.....	862	4.4	.01	13	3.3	12.1	1.5	32	26	5.0	.6	1.4	106	50	15	159	7.2	10
July 23-28.....	654	--	--	12	3.4	15	1.8	42	33	5.5	.6	.8	102	44	10	144	6.8	13
Aug. 1-10.....	475	6.3	.07	12	3.0	6.9	1.4	49	15	2.0	6	1.2	79	42	2	117	7.4	15
Aug. 11-20.....	154	7.6	.11	12	3.1	7.5	1.4	51	14	2.8	.5	.9	86	42	2	119	7.1	20
Aug. 21-31.....	104	6.5	.04	11	3.4	8.6	1.3	54	11	3.0	.5	.7	84	42	0	120	7.0	10
Sept. 1-5.....	186	6.4	-.02	11	3.6	8.5	1.5	54	13	3.2	.5	.9	118	42	0	124	6.8	5
Sept. 6-10.....	174	5.4	.07	7.9	3.6	6.4	2.0	38	10	2.5	3	1.0	66	30	0	97	6.6	20
Sept. 11-20.....	279	5.4	.01	12	3.5	9.8	1.9	53	19	3.8	.5	1.8	94	46	3	139	7.4	10
Sept. 21-30.....	214	5.4	.03	12	4.0	9.0	1.9	51	17	3.0	.5	6.1	88	46	4	130	7.4	13
Average.....	1,947	4.4	0.15	9.4	2.7	6.9	1.4	35	16	3.3	0.3	1.3	82	34	6	105	--	22

Temperature (°F) of water, water year October, 1958 to September, 1959

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	64	63	60	60	60	60	60	62	64	65	64	63	61	60	61	63	64	64	62	62	62	64	63	62	62	62	61	60	56	56	61		
November ..	55	54	53	64	57	55	53	54	53	52	52	52	51	53	56	50	52	50	58	55	52	53	52	53	52	52	50	49	45	46	54		
December ..	46	46	47	46	48	43	40	39	41	40	49	50	42	38	36	37	36	37	36	38	39	39	37	39	40	39	40	42	41	39	41		
January	40	42	39	36	35	36	40	38	37	37	38	39	40	41	39	39	39	40	44	45	42	40	44	40	39	41	42	43	45	44	43		
February	42	41	40	40	39	38	39	40	41	40	48	49	50	50	50	51	47	47	47	47	47	47	48	47	48	47	50	51	--	--	46		
March	50	49	50	50	49	49	49	49	50	52	52	50	52	--	51	50	50	52	54	53	52	51	53	55	56	57	57	55	56	57	52		
April	60	61	60	59	61	63	64	62	60	60	57	56	53	54	56	57	59	60	62	60	59	60	59	60	61	62	64	65	65	--	60		
May	67	69	71	72	73	73	74	74	74	74	72	71	70	69	70	71	73	74	73	75	73	76	75	76	75	76	76	77	76	76	76	76	
June	77	75	74	74	73	74	75	74	75	74	75	74	71	70	72	73	73	73	73	74	74	75	76	77	78	79	80	81	82	--	75		
July	81	80	79	80	80	80	81	82	82	81	80	80	80	80	80	80	79	79	78	78	78	78	79	80	80	80	78	76	77	78	79	80	
August	81	81	82	82	83	84	85	84	81	80	81	80	81	82	82	81	82	82	83	82	82	82	82	82	82	81	82	80	81	82	80	79	
September ..	79	80	79	80	79	79	79	78	77	79	78	72	72	74	75	74	73	73	73	74	74	74	75	75	75	76	76	76	77	75	74	--	76

RED RIVER BASIN--Continued
7-3640.8. OUACHITA RIVER NEAR FELSENTHAL, ARK.

LOCATION --At U. S. Engineers lock No. 6, 3 miles south of Felseenthal, Union County.

DRAINAGE AREA.--10,787 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1949 to September 1959.

Water temperatures: October 1949 to September 1959.

EXTREMES: 1958-59.--Dissolved solids: Maximum, 1,710 ppm July 26-27; minimum, 94 ppm Mar. 1-4.

Hardness: Maximum, 308 ppm July 26-27; minimum, 24 ppm Feb. 21-28, Mar. 1-4.

Specific conductance: Maximum daily, 2,760 micromhos July 26; minimum daily, 104 micromhos Feb. 28.

Water temperatures: Maximum, 89°F July 7; minimum, 40°F Dec. 11, Jan. 6, 11.

EXTREMES: 1948-59.--Dissolved solids: Maximum, 2,730 ppm Jan. 27, 1957; minimum, 44 ppm Jan. 23-31, Mar. 1-9, 1950.

Hardness: Maximum, 522 ppm Jan. 27, 1957; minimum, 5 ppm May 8, 1956.

Specific conductance: Maximum daily, 7,610 micromhos Oct. 7, 1954; minimum daily, 44 micromhos May 19, 1958.

Water temperatures: Maximum, 96°F June 9, 1953, Aug. 29, 1954; minimum, freezing point Feb. 8, 12, 13, 1958.

REMARKS.--Records of specific conductance of daily samples available in district office at Little Rock, Ark. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH	Color
														as CaCO ₃	Non-magnesium carbonate			
Oct. 1-4, 7-10, 1958.		0.6	0.00	14	2.6	44	2.2	14	9.6	84	0.2	1.6	209	46	34	335	6.5	35
Oct. 5-6,		--	--	21	6.0	79	1.9	18	8.0	160	--	1.8	378	77	62	593	6.9	18
Oct. 11-13,		--	--	20	5.7	75	2.2	17	8.4	150	--	2.1	337	74	60	564	6.7	16
Oct. 14-22, . . . . .		.9	.00	27	6.5	107	2.6	18	6.4	215	.2	4.4	469	94	79	765	6.7	18
Oct. 23, 29-30,		1.0	.00	37	10.2	168	3.4	20	9.6	330	.2	2.6	698	134	117	1,140	6.9	10
Oct. 24-28, 31, . . . . .		.9	.00	27	6.9	109	2.4	23	9.2	215	.2	2.3	482	96	77	798	7.0	12
Nov. 1-15,		2.9	.00	29	6.8	114	3.0	25	8.6	228	.1	2.9	505	100	80	795	6.8	5
Nov. 16-19,		--	--	39	9.1	171	4.5	22	9.8	340	--	2.1	743	135	117	1,150	7.0	7
Nov. 20-30,		1.1	.15	14	4.0	69	3.3	19	6.8	98	.1	.6	234	52	36	393	7.1	10
Dec. 1-10,		3.6	1.10	20	4.5	68	2.5	24	11	132	.2	2.3	323	68	49	541	7.1	20
Dec. 11-17,		3.3	1.0	20	4.8	75	2.2	22	10	145	.3	4.0	346	70	52	543	6.8	12
Dec. 18-31,		3.6	.09	26	4.8	93	1.7	20	9.8	182	.1	5.4	443	84	68	773	7.0	11
Jan. 1-12, 1959,		3.1	.10	26	6.4	106	1.7	18	11	208	.3	7.1	486	92	76	758	6.9	8
Jan. 13-14,		--	--	34	9.3	150	4.9	14	46	282	--	4.3	702	123	112	1,010	6.0	5
Jan. 15-18,		--	--	22	6.2	82	3.3	14	15	170	--	1.0	418	80	69	637	6.3	8
Jan. 19-20,		--	--	28	8.7	119	5.1	14	12	240	--	1.9	503	106	94	883	6.0	10
Jan. 21-26,		3.1	.20	17	4.3	59	2.2	13	12	120	.2	2.3	301	60	50	459	6.7	40
Jan. 27-31,		--	--	14	3.9	43	2.4	18	14	84	--	1.8	247	51	36	372	6.2	15
Feb. 1-8,		2.6	.04	23	6.1	83	2.6	17	12	168	.3	3.2	398	82	68	604	6.9	10
Feb. 9,		--	--	33	9.3	140	4.7	14	14	285	--	2.7	714	120	109	977	6.9	5
Feb. 10-13,		--	--	20	5.3	78	3.1	13	10	155	--	1.1	415	72	62	592	6.3	20
Feb. 14-17,		--	--	14	3.9	51	2.8	10	8.8	105	--	.4	275	51	43	409	5.9	15
Feb. 18-20,		--	--	7.2	2.1	19	2.0	10	8.4	28	--	.6	127	26	18	185	6.4	10
Feb. 21-28,		1.8	.11	6.2	1.9	15	1.8	11	7.6	39	--	1.6	102	24	14	133	6.5	40

RED RIVER BASIN--Continued
 7-3640.8. OUACHITA RIVER NEAR FELSENTHAL, ARK.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25°C)	pH	Color
														Calcium	Non-carbonate			
July 1-6, 1959.....		7.8	0.05	26	5.1	84	3.4	26	7.6	170	0.2	4.9	400	86	64	644	6.6	22
July 7-12.....		9.1	.00	40	8.3	152	4.5	20	9.4	312	.1	9.4	684	134	118	1,100	6.7	8
July 13-16.....		8.4	.00	35	6.7	129	3.9	24	9.4	258	.2	6.7	594	115	96	933	6.6	5
July 17-24.....		6.9	.00	42	9.7	169	4.8	19	10	340	.2	8.0	807	145	130	1,220	6.4	4
July 25, 28.....		---	---	52	11	215	6.3	15	12	445	---	7.6	976	174	162	1,560	6.5	7
July 26-27.....		---	---	92	19	382	11	6	14	790	---	17	1,710	308	302	2,710	5.5	5
July 29, 31.....		---	---	30	5.1	110	3.7	20	12	218	---	4.4	504	96	80	823	6.5	9
July 30.....		---	---	44	8.3	168	5.1	25	12	345	---	5.8	600	144	124	1,180	6.8	---
Aug. 1-4.....		5.8	.00	28	6.8	112	3.6	19	11	218	.2	5.6	521	98	82	808	6.5	10
Aug. 5-10.....		7.3	.00	21	4.3	66	2.9	26	12	130	.2	3.0	331	70	48	518	6.5	8
Aug. 11-12, 15-20.....		5.1	.00	29	6.8	112	3.3	21	7.8	220	.3	7.4	472	100	84	805	6.7	5
Aug. 13-14.....		---	---	38	7.6	138	4.1	22	9.0	280	---	7.5	668	126	108	1,040	6.4	4
Aug. 21-28.....		6.4	.00	29	6.6	112	3.3	24	7.4	218	.2	7.5	489	100	80	808	6.5	5
Aug. 29-30.....		---	---	46	9.3	184	4.9	20	7.4	380	---	10	852	153	136	1,360	6.7	3
Aug. 31, Sept. 1.....		---	---	30	5.7	114	3.4	21	7.0	225	---	7.7	536	98	82	844	6.6	4
Sept. 2-3.....		---	---	28	5.3	96	3.1	24	7.0	198	---	6.0	470	92	72	751	6.8	5
Sept. 4-8.....		---	.00	53	11	289	6.4	16	7.8	450	.2	12	1,010	177	164	1,580	6.5	4
Sept. 6-8.....		5.4	.00	61	11	280	5.6	18	6.8	560	.2	16	1,180	210	194	1,920	6.2	4
Sept. 9.....		---	---	36	9.5	144	5.2	20	5.2	298	---	4.8	533	129	112	1,080	7.0	5
Sept. 10-12.....		---	---	24	8.1	199	4.0	24	7.2	198	---	2.8	464	84	74	746	6.9	5
Sept. 13-14.....		---	---	31	12	130	5.3	23	8.8	270	---	4.3	615	127	108	989	6.8	6
Sept. 15-16.....		---	---	42	17	194	8.8	18	8.8	405	---	5.8	888	175	160	1,420	6.8	8
Sept. 17-18.....		---	---	35	9.5	152	7.4	21	7.6	305	---	3.2	714	126	110	1,110	6.8	5
Sept. 19-21.....		---	---	27	7.4	123	4.9	25	6.0	255	---	2.2	595	110	90	923	6.7	6
Sept. 22-25.....		---	---	27	5.7	90	4.3	29	6.2	180	---	3.6	432	91	67	652	6.6	5
Sept. 26.....		---	---	34	8.3	131	4.9	24	6.0	268	---	2.1	466	119	100	949	6.8	6
Sept. 27-28.....		---	---	35	15	151	5.1	20	7.6	325	---	2.8	718	149	132	1,150	6.8	5
Sept. 29-30.....		---	---	27	6.6	105	3.9	24	5.6	215	---	2.1	491	94	75	787	6.5	5
Time-weighted average.....		---	---	30	7.2	117	3.8	18	9.7	236	---	4.6	534	104	90	851	---	14

a Calculated from determined constituents.

QUALITY OF SURFACE WATERS, 1959

RED RIVER BASIN--Continued

7-3658. CORNIE BAYOU NEAR THREE CREEKS, ARK.

LOCATION.--At gaging station at bridge on State Highway 15, 4.5 miles downstream from Pidgeon Roost Creek and 6 miles southwest of town of Three Creeks, Union County.

DRAINAGE AREA.--180 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1955.

Specific conductance, chloride, and pH: May 1950 to September 1952, February 1956 to September 1959.

Water temperatures: May 1950 to September 1955, February 1956 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 5,730 micromhos Sept. 5; minimum daily, 254 micromhos July 20.

Water temperatures: Maximum, 88°F June 29, Aug. 3, 5; minimum, 33°F Jan. 3.

EXTREMES, 1950-58.--Dissolved solids (1952-55): Maximum, 20,600 ppm July 15-21, 1954; minimum, 287 ppm Apr. 28-30, 1953.

Hardness (1952-55): Maximum, 6,270 ppm July 15-21, 1954; minimum, 62 ppm Apr. 28-30, 1953.

Specific conductance: Maximum daily, 33,200 micromhos Dec. 9, 1954; minimum daily, 114 micromhos Apr. 27, 1958.

Water temperatures: Maximum, 95°F July 8, 1953; minimum, freezing point on several days during winter months.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Specific conductance, chloride, and pH, water year October 1958 to September 1959

Day	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl) ppm	pH	October				November				December			
					Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl) ppm	pH	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl) ppm	pH	Mean discharge (cfs)	Specific conductance (micromhos at 25°C)	Chloride (Cl) ppm	pH
1....	20	2,060	640	4.6	5.1	1,670	490	5.1	50	1,810	565	5.1				
2....	18	2,180	665	4.4	5.0	1,780	530	4.9	56	1,860	565	4.9				
3....	15	2,390	755	4.6	5.2	1,950	600	5.3	48	1,800	550	4.9				
4....	16	2,350	740	4.5	5.4	1,930	590	4.9	43	1,560	465	5.0				
5....	16	2,640	830	4.6	5.6	2,080	650	4.9	38	1,570	465	5.1				
6....	14	2,640	820	4.6	5.7	2,240	690	4.8	34	1,930	580	4.8				
7....	13	2,260	725	4.7	5.8	2,410	745	4.7	30	2,100	640	4.8				
8....	13	2,370	725	4.5	5.7	2,410	750	4.7	28	2,410	740	4.9				
9....	12	2,530	785	4.6	5.6	1,000	275	6.0	26	2,070	630	4.9				
10....	11	2,720	835	4.5	5.4	1,240	370	5.7	23	2,060	610	4.9				
11....	10	2,710	835	4.4	5.2	1,370	400	6.8	20	2,070	620	4.8				
12....	9.0	2,680	825	4.4	5.1	1,320	400	6.7	19	1,860	550	4.9				
13....	8.5	2,830	870	4.5	5.2	1,370	410	5.6	18	1,750	520	5.0				
14....	7.6	2,920	900	4.4	5.8	1,470	445	5.5	18	1,710	510	4.8				
15....	7.1	2,780	860	4.4	36	1,520	462	5.5	17	1,760	520	4.8				
16....	6.3	2,800	870	4.4	51	1,620	488	5.5	18	1,760	530	4.9				
17....	5.7	2,930	910	4.4	57	1,730	525	6.0	18	1,580	470	5.0				
18....	5.4	2,930	905	4.5	62	1,730	522	6.0	18	1,670	500	5.0				
19....	5.1	2,650	810	4.6	55	1,190	355	6.1	19	1,740	520	4.9				
20....	5.1	2,610	805	4.5	64	1,400	420	6.0	20	1,740	520	4.9				
21....	5.0	2,590	790	4.4	83	2,050	640	5.6	19	1,960	600	4.9				
22....	5.0	2,530	775	4.5	62	2,830	880	6.1	20	2,160	660	4.9				
23....	5.2	2,540	780	4.4	43	2,780	865	5.0	20	2,060	620	4.9				
24....	5.6	2,610	795	4.5	33	2,720	870	4.9	20	2,060	630	4.9				
25....	5.1	2,610	805	4.7	26	3,090	960	4.9	20	1,560	470	5.0				
26....	4.8	2,560	790	4.6	22	2,900	910	5.0	20	1,550	470	5.1				
27....	6.0	2,050	640	4.6	22	2,590	780	5.0	21	1,500	450	5.0				
28....	5.0	2,100	650	4.6	23	2,430	740	5.0	22	1,490	450	5.1				
29....	5.4	2,170	660	4.6	26	2,130	650	5.5	22	1,480	430	5.2				
30....	5.7	2,210	680	4.6	31	2,110	635	5.1	22	1,470	435	5.1				
31....	5.4	2,260	685	4.6	--	--	--	--	23	1,460	425	5.2				
Average.	8.9	2,520	779	--	25.7	1,970	602	--	25	1,790	539	--				

RED RIVER BASIN--Continued

7-3658. CORNIE BAYOU NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1958
to September 1959--Continued

Day	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH
January				February				March				
1....	24	2,280	690	5.0	29	3,040	930	4.5	80	--	--	--
2....	26	2,150	645	5.0	30	2,700	820	4.6	76	1,990	610	4.8
3....	26	1,980	610	5.1	38	2,030	600	4.6	73	2,120	635	4.7
4....	25	1,840	555	5.1	63	2,000	590	4.6	71	2,160	645	4.6
5....	26	1,590	460	5.2	88	1,590	470	4.7	214	868	232	4.8
6....	23	1,410	430	5.4	93	2,030	620	4.5	284	1,370	398	4.6
7....	21	1,580	465	5.1	80	1,960	580	4.6	262	1,150	332	4.9
8....	24	1,520	445	5.3	88	2,260	680	4.5	262	1,100	310	4.8
9....	30	1,970	595	4.8	108	2,270	680	4.5	257	1,100	315	5.0
10....	34	1,980	590	4.9	198	1,760	510	4.7	267	1,030	292	5.0
11....	56	2,090	625	4.8	252	1,250	360	4.8	278	860	245	4.9
12....	50	2,090	630	4.8	324	922	260	5.5	289	894	252	5.2
13....	42	2,400	730	4.8	412	913	262	5.1	257	1,700	505	4.6
14....	35	2,400	730	4.8	496	507	137	5.2	242	1,840	565	4.5
15....	40	1,780	530	5.7	720	478	135	5.5	210	1,460	430	4.5
16....	47	2,480	770	5.0	1,560	595	170	5.6	157	1,240	350	4.5
17....	48	3,210	1,000	4.7	1,770	525	145	5.4	132	1,330	400	4.4
18....	60	4,220	1,340	4.7	1,120	547	150	6.7	106	1,380	410	4.4
19....	58	3,350	1,030	4.7	650	883	250	4.9	88	1,470	430	4.4
20....	47	3,310	1,020	4.7	496	889	258	5.0	80	1,590	465	4.4
21....	45	2,100	655	4.8	312	1,060	308	4.9	252	765	212	4.8
22....	45	2,250	680	4.8	206	1,400	420	4.6	306	864	248	4.8
23....	43	2,260	680	4.8	138	1,410	410	4.6	278	967	275	4.7
24....	40	2,140	640	4.9	126	1,570	460	4.7	289	1,090	315	4.7
25....	39	2,270	690	4.7	123	1,820	540	4.5	294	1,110	320	4.6
26....	37	2,270	690	4.8	114	1,930	580	4.6	164	1,260	365	4.5
27....	35	2,290	705	4.8	96	2,300	700	4.6	129	1,260	365	4.5
28....	33	2,280	695	4.8	86	2,260	680	4.4	111	1,430	415	4.4
29....	32	2,800	870	4.8	--	--	--	--	83	1,500	440	4.3
30....	31	2,980	920	4.7	--	--	--	--	76	1,500	435	4.3
31....	29	3,330	1,010	4.8	--	--	--	--	73	1,780	530	4.3
Average.	37.1	2,340	714	--	351	1,530	454	--	185	1,340	391	--
April				May				June				
1....	76	1,870	560	4.7	41	1,760	530	4.5	19	2,050	625	4.0
2....	76	1,720	500	4.7	40	1,920	565	4.4	21	2,300	680	4.0
3....	76	1,910	570	4.6	36	1,920	565	4.4	21	616	175	4.8
4....	69	1,780	520	4.8	33	2,210	660	4.4	69	631	175	4.9
5....	64	1,780	525	4.8	30	2,210	660	4.4	257	628	175	4.9
6....	62	901	268	5.2	28	1,910	550	4.7	284	891	258	4.8
7....	60	936	272	5.3	25	1,950	590	4.4	242	1,310	380	4.5
8....	98	933	265	5.0	24	2,020	605	4.3	210	1,310	385	4.5
9....	219	944	270	5.4	22	2,280	670	4.3	494	281	73	5.4
10....	257	1,080	310	5.3	20	2,280	670	4.2	530	485	138	5.7
11....	278	1,240	365	5.0	21	2,300	690	4.2	384	1,090	315	5.1
12....	312	1,190	340	6.2	34	2,250	670	4.3	257	969	270	4.6
13....	324	1,020	290	5.1	60	1,590	460	4.5	117	1,170	335	5.1
14....	300	1,190	345	4.8	90	3,120	965	4.2	86	1,480	430	4.6
15....	267	1,430	425	4.7	80	3,100	940	4.2	69	1,490	430	4.6
16....	224	1,260	365	4.8	52	3,610	1,120	4.1	48	1,920	570	4.6
17....	186	1,220	350	4.7	35	3,610	1,110	4.2	34	2,690	810	4.2
18....	324	487	128	5.4	26	3,350	1,010	4.1	25	2,740	850	4.2
19....	570	403	112	5.6	21	3,020	910	4.1	21	3,730	1,210	4.2
20....	1,280	487	134	5.0	18	3,130	950	4.0	17	4,940	1,630	3.9
21....	1,560	488	134	5.1	17	2,970	890	4.0	14	4,720	1,530	3.9
22....	1,050	489	134	5.4	16	2,280	670	4.1	12	4,360	1,420	4.0
23....	920	605	170	5.6	25	2,260	670	4.1	12	4,110	1,290	4.0
24....	570	830	235	5.4	53	1,260	345	4.6	12	3,850	1,230	4.0
25....	376	842	240	5.0	157	528	142	5.0	12	3,590	1,130	3.9
26....	194	875	250	4.8	117	1,520	448	4.7	13	3,330	1,030	4.0
27....	100	1,030	295	4.6	88	1,870	560	4.6	13	3,190	990	4.0
28....	76	1,180	342	4.6	69	2,260	680	4.2	12	3,110	960	3.9
29....	64	1,350	388	4.7	41	2,290	680	4.3	9.8	2,900	910	4.0
30....	54	1,560	452	4.3	26	1,990	580	4.2	8.8	2,670	810	4.0
31....	--	--	--	--	20	2,000	580	4.6	--	--	--	--
Average.	336	1,100	318	--	44	2,280	682	--	111	2,285	710	--

QUALITY OF SURFACE WATERS, 1959

RED RIVER BASIN--Continued

7-3658. CORNIE BAYOU NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1958
to September 1959--Continued

Day	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH
July				August				September				
1....	8.3	2,660	790	4.0	31	1,560	460	4.4	12	2,430	735	4.4
2....	7.8	2,540	750	4.0	23	1,680	480	4.3	9.3	2,710	830	4.4
3....	7.2	2,410	710	4.0	18	1,770	510	4.2	6.7	2,440	735	4.4
4....	7.4	2,250	650	4.1	16	1,800	520	4.3	8.6	3,900	1,290	4.2
5....	8.6	2,230	655	4.2	14	1,790	525	4.6	10	5,730	1,930	4.1
6....	11	2,100	620	4.2	13	1,920	565	4.3	9.0	5,650	1,870	4.0
7....	9.8	2,140	630	4.3	11	1,840	535	4.2	15	4,120	1,330	4.1
8....	10	1,810	525	4.5	10	1,980	575	4.2	20	3,090	980	4.0
9....	13	1,790	520	4.4	10	1,860	535	4.5	14	3,050	960	4.2
10....	13	1,840	540	4.6	10	2,080	605	4.3	9.8	2,310	690	4.5
11....	8.1	1,490	430	4.5	9.3	1,870	545	4.3	7.4	2,020	600	4.8
12....	8.6	1,470	428	4.6	7.4	1,900	555	4.3	6.1	2,350	710	5.1
13....	14	1,380	402	5.3	6.3	2,270	660	4.2	5.4	3,280	1,050	4.3
14....	9.3	1,420	420	5.0	5.8	2,280	665	4.3	5.2	3,280	1,050	4.6
15....	7.2	913	258	5.1	5.4	1,710	490	4.3	4.1	3,410	1,100	4.4
16....	26	987	310	5.1	4.2	2,250	670	4.2	3.5	3,500	1,120	4.4
17....	39	1,050	305	5.5	5.0	2,330	680	4.3	3.2	3,530	1,150	4.4
18....	28	963	270	5.9	4.9	2,070	600	4.2	2.9	3,510	1,130	4.2
19....	109	632	178	5.1	4.3	1,830	530	4.3	2.8	3,200	1,010	4.4
20....	144	254	67	6.1	4.1	1,820	520	4.3	2.8	3,200	1,020	4.3
21....	86	810	235	5.3	4.0	2,010	585	4.2	2.6	3,130	1,010	4.3
22....	106	415	110	6.0	3.8	2,180	635	4.2	2.3	3,170	1,010	4.4
23....	402	404	110	6.0	3.5	2,320	685	4.5	2.2	3,170	1,010	4.4
24....	368	591	165	6.1	3.3	2,370	695	4.4	2.1	3,290	1,050	4.5
25....	324	690	200	5.9	3.2	2,460	725	4.3	2.1	3,410	1,090	4.2
26....	422	649	175	5.9	4.3	2,460	730	4.2	2.0	3,410	1,100	4.4
27....	376	621	172	5.9	8.1	2,660	785	4.2	2.1	3,570	1,140	4.3
28....	278	1,240	358	4.6	9.5	2,340	680	4.2	3.6	3,720	1,210	4.2
29....	190	1,260	355	4.7	7.6	2,320	680	4.3	4.3	3,910	1,250	4.2
30....	88	1,420	420	4.5	9.3	1,850	530	4.4	4.1	4,000	1,290	4.2
31....	45	1,490	435	4.5	12	1,450	430	4.6	--	--	--	--
Aver- age.	102	1,350	393	--	9.11	2,030	593	--	6.17	3,380	1,080	--

RED RIVER BASIN--Continued

7-3658. CORNIE BAYOU NEAR THREE CREEKS, ARK.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	67	62	64	66	70	71	71	75	70	72	72	70	64	65	69	66	70	68	67	64	69	70	64	65	63	60	54	60	61	57	66	
November.....	60	67	60	58	54	54	57	55	70	68	63	59	--	57	58	58	60	59	61	55	57	68	55	57	54	54	52	49	55	56	--	58	
December.....	48	48	--	58	53	48	47	45	43	42	41	42	39	35	38	41	48	46	--	44	35	44	45	34	45	47	47	45	41	46	45	44	
January.....	43	41	33	--	40	47	43	46	45	47	--	54	44	47	41	42	43	44	50	42	53	45	44	46	48	52	47	46	52	50	43	45	
February.....	44	43	44	43	46	42	47	49	52	52	54	54	56	56	54	--	62	55	52	49	47	57	57	54	57	56	59	55	--	--	52	52	
March.....	--	58	58	59	55	52	58	46	59	45	51	51	59	60	56	57	59	57	61	59	55	53	55	63	61	65	62	60	61	66	68	58	
April.....	59	58	62	65	63	62	66	64	61	60	60	55	57	56	57	62	60	61	62	63	64	63	63	67	69	59	67	73	74	75	--	63	
May.....	74	73	75	75	74	78	79	80	78	74	78	76	79	74	75	73	67	77	76	78	77	78	76	74	76	78	79	79	82	80	82	77	77
June.....	76	76	78	76	74	74	73	71	73	75	76	77	79	78	80	82	85	83	83	82	83	83	80	83	83	86	85	84	86	85	--	80	
July.....	84	85	85	83	80	86	87	83	84	83	84	78	82	85	83	80	80	83	79	76	79	81	77	78	76	76	75	77	83	83	85	81	
August.....	85	87	88	78	88	83	87	84	82	84	83	84	82	84	86	85	85	86	87	82	85	84	85	84	85	86	83	87	82	83	87	85	
September.....	85	--	83	80	79	74	78	81	82	80	77	73	74	76	77	70	75	76	76	70	74	80	79	79	78	79	83	82	79	78	--	78	

RED RIVER BASIN--Continued

7-3659. THREE CREEK NEAR THREE CREEKS, ARK.

LOCATION.--At gaging station at bridge on State Highway 15, 2.2 miles southwest of town of Three Creeks, Union County, and 2.2 miles upstream from small tributary.

DRAINAGE AREA (revised).--46 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1952 to September 1955.

Specific conductance, chloride, and pH: May 1950 to September 1952, February 1956 to September 1959.

Water temperatures: May 1950 to September 1955, February 1956 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 6,230 micromhos Sept. 26; minimum daily, 173 micromhos June 9.

Water temperatures: Maximum, 87°F Sept. 29; minimum 40°F Feb. 2.

EXTREMES, 1950-59.--Dissolved solids (1952-55): Maximum, 13,200 ppm July 29-31, 1953; minimum, 133 ppm Apr. 28-30, 1953.

Hardness (1952-55): Maximum, 4,390 ppm July 29-31, 1953; minimum, 30 ppm Apr. 28-30, May 12-15, 1953.

Specific conductance: Maximum daily, 20,300 micromhos Sept. 4, 1952; minimum daily, 46 micromhos Feb. 1, 1952.

Water temperatures: Maximum, 89°F Sept. 1, 1951, Aug. 4, 1953; minimum, freezing point Dec. 16, 1952; Jan. 17-19, 1957.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Specific conductance, chloride, and pH, water year October 1958 to September 1959

Day	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH	Mean dis-charge (cfs)	Spe-cific conduc-tance (micro-mhos at 25°C)	Chlo-ride (Cl) ppm	pH
1....	4.5	1,170	325	7.6	2.4	895	235	7.5	9.6	--	--	--
2....	4.5	1,290	385	7.6	2.4	1,130	305	7.3	11	1,720	510	7.3
3....	4.3	1,500	450	7.5	2.6	1,090	292	7.7	11	1,770	520	6.7
4....	3.8	1,610	480	7.4	2.4	1,210	328	7.1	10	1,770	520	7.2
5....	3.7	1,400	410	7.5	2.4	1,210	328	7.7	9.4	1,610	465	7.3
6....	4.2	1,390	405	7.3	2.4	1,280	352	7.6	8.1	1,540	445	7.3
7....	4.0	1,400	402	7.3	2.3	1,540	440	7.6	6.5	1,760	520	7.5
8....	3.2	1,660	495	7.6	2.3	1,550	440	7.7	6.0	1,710	500	7.4
9....	3.2	1,730	515	7.7	2.3	2,820	860	7.6	5.6	1,640	470	7.3
10....	3.1	1,820	535	7.2	2.3	2,940	880	7.4	5.6	1,580	460	7.4
11....	2.8	1,820	540	7.7	2.3	2,000	565	7.4	5.3	1,600	460	7.3
12....	2.5	1,940	590	7.3	2.3	2,350	685	7.7	5.5	1,590	465	7.5
13....	2.3	1,830	550	7.8	2.3	2,000	565	7.7	5.8	1,690	495	7.3
14....	2.2	3,350	1,050	7.1	4.0	1,060	302	6.8	6.5	1,690	490	7.5
15....	2.1	3,350	1,060	7.2	3.0	696	175	6.7	6.7	1,720	500	7.6
16....	1.8	3,260	1,040	7.7	3.6	1,860	545	7.0	6.7	1,870	550	7.6
17....	2.0	2,550	770	7.7	1.8	2,770	845	6.3	6.7	2,010	595	7.6
18....	2.2	1,730	490	7.2	1.7	1,800	540	6.4	6.7	1,240	350	7.5
19....	2.5	1,700	500	7.8	2.2	934	260	6.6	6.3	2,140	640	7.4
20....	2.3	1,580	450	7.7	1.7	1,370	405	6.5	6.0	2,160	640	7.5
21....	2.2	1,400	390	7.8	1.4	1,680	515	6.2	6.0	3,030	945	7.5
22....	2.4	1,210	325	7.7	1.0	2,470	750	6.0	6.0	2,990	925	7.5
23....	2.4	1,060	290	7.7	8.3	2,030	530	6.2	6.3	2,090	610	7.6
24....	2.4	978	258	7.4	7.4	1,750	520	6.2	6.7	1,600	450	7.6
25....	2.6	883	225	7.6	6.5	--	--	--	6.7	1,370	392	7.6
26....	2.5	883	232	7.8	6.0	1,530	455	6.3	6.5	1,300	350	7.3
27....	2.3	892	225	7.9	5.8	1,360	415	6.6	6.5	1,300	360	7.7
28....	2.2	893	235	7.9	6.7	1,320	400	6.7	7.0	1,190	332	7.6
29....	2.1	793	202	8.0	7.4	1,550	455	6.8	7.0	--	--	--
30....	2.2	819	188	7.3	8.4	1,540	450	6.8	7.0	--	--	--
31....	2.3	840	205	7.1	--	--	--	--	7.4	1,230	348	7.7
Average.	2.80	1,570	459	--	8.51	1,650	477	--	7.04	1,750	511	--

QUALITY OF SURFACE WATERS, 1959

RED RIVER BASIN--Continued

7-3659. THREE CREEK NEAR THREE CREEKS, ARK.--Continued

Specific conductance, chloride, and pH, water year October 1958
to September 1959--Continued

Day	Mean discharge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) ppm	pH	Mean discharge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) ppm	pH	Mean discharge (cfs)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl) ppm	pH
July				August				September				
1....	2.1	1,920	560	8.0	9.0	974	275	7.4	4.9	1,390	390	7.6
2....	1.9	1,840	500	7.7	8.6	980	275	7.3	4.9	1,180	308	7.9
3....	1.6	1,840	502	8.1	6.1	977	270	7.6	4.7	1,050	262	8.0
4....	1.5	1,450	375	8.2	5.6	985	265	7.8	5.8	771	175	8.0
5....	1.4	1,490	430	8.1	5.1	948	240	7.7	8.8	886	212	8.0
6....	2.6	1,460	400	8.1	5.1	904	222	8.0	15	1,880	535	7.9
7....	3.8	1,610	420	8.2	5.1	849	205	8.0	19	1,020	282	6.8
8....	4.9	1,160	320	8.3	8.2	744	170	8.1	14	988	280	6.5
9....	43	440	112	8.2	9.5	659	142	8.0	8.6	1,050	300	7.1
10....	4.0	1,500	435	7.8	6.5	789	182	8.0	6.1	1,400	400	7.2
11....	3.4	1,230	335	7.8	5.4	1,370	365	7.5	4.6	1,880	575	7.3
12....	5.6	1,570	445	7.9	4.9	1,390	365	8.0	3.8	2,100	625	7.4
13....	5.2	1,030	252	8.0	4.6	2,140	610	7.1	3.2	2,090	610	6.9
14....	2.9	917	232	8.1	4.4	1,580	430	7.9	2.8	2,070	600	7.6
15....	2.4	1,090	280	8.0	4.1	1,300	360	8.0	2.8	2,790	835	7.0
16....	4.0	979	230	7.5	4.4	1,290	330	8.1	2.6	3,690	1,180	7.4
17....	14	1,010	270	7.7	4.4	1,020	252	8.2	2.4	3,730	1,190	7.6
18....	9.0	1,050	260	8.2	4.2	855	188	8.2	2.1	3,980	1,280	7.6
19....	70	1,680	482	7.8	4.0	768	182	8.2	2.1	4,340	1,410	7.1
20....	98	828	222	7.5	4.1	667	122	8.2	2.0	4,350	1,410	7.5
21....	33	1,510	445	7.1	4.6	654	120	7.8	2.1	3,710	1,170	7.5
22....	25	1,600	465	7.2	4.2	613	105	8.1	2.1	2,810	825	7.8
23....	358	242	60	7.1	4.2	570	92	8.0	2.2	2,280	650	7.3
24....	139	749	215	6.7	4.1	555	88	8.2	2.2	4,130	1,350	7.7
25....	115	729	205	6.8	4.2	617	105	8.0	2.2	6,170	2,090	7.6
26....	290	461	120	7.0	5.9	842	180	8.2	2.2	6,230	2,100	7.5
27....	230	653	185	6.2	10	332	65	7.9	2.1	5,340	1,760	7.5
28....	57	704	195	6.5	7.6	616	132	8.1	2.2	5,430	1,780	7.7
29....	18	847	240	6.8	6.7	775	175	8.0	2.4	4,220	1,330	7.8
30....	12	911	250	7.2	5.1	2,210	630	7.6	2.9	2,380	710	8.0
31....	8.8	972	272	7.2	4.7	1,690	460	7.7	--	--	--	--
Average.	50.6	1,140	313	--	5.63	989	245	--	4.76	2,840	887	--

RED RIVER BASIN--Continued
 7-3659. THREE CREEK NEAR THREE CREEKS, ARK.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959

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	74	68	67	64	74	70	80	77	76	73	70	66	68	71	71	73	75	73	69	71	75	69	66	67	66	63	54	61	64	64	69	
November ..	54	55	57	61	65	66	57	61	61	63	59	54	59	66	68	74	76	69	64	60	54	56	60	61	62	58	53	47	49	61	61	
December ..	54	56	56	57	58	54	48	47	50	47	47	48	47	45	43	43	44	46	50	48	47	54	55	53	51	53	54	53	54	54	50	
January	51	51	49	45	--	--	45	45	51	44	43	46	56	56	60	50	47	47	51	57	51	47	44	45	48	52	57	51	--	56	50	
February	48	40	45	46	42	46	47	56	59	60	57	55	56	61	58	54	58	59	51	46	47	50	57	58	59	57	58	59	--	--	53	
March	59	63	63	57	61	53	53	54	54	55	66	56	56	60	60	56	55	56	58	61	60	57	53	57	59	68	65	65	57	60	59	
April	71	64	66	61	62	66	71	71	65	61	65	59	55	56	63	65	67	69	68	67	65	61	60	65	70	70	72	70	69	--	65	
May	73	75	75	75	78	71	75	77	77	78	77	75	75	76	70	71	73	76	77	77	78	77	76	78	77	76	78	80	81	81	78	
June	81	76	75	76	71	73	75	74	74	75	76	78	78	78	78	78	79	80	80	79	78	78	81	80	82	83	84	85	84	84	--	
July	84	82	81	81	83	83	83	82	79	82	83	80	80	82	81	80	81	82	78	80	81	79	81	79	81	81	79	81	81	82	81	
August	85	85	86	86	86	85	85	84	81	79	78	79	80	81	81	81	81	83	81	84	82	82	82	81	81	82	80	80	82	84	82	
September ..	82	81	80	78	77	77	78	79	81	80	75	73	74	75	78	76	74	77	77	78	76	78	76	77	79	81	83	84	87	80	--	

RED RIVER BASIN--Continued

7-3670. OUACHITA RIVER AT MONROE, LA.

LOCATION.--At gaging station at bridge on U.S. Highway 80 at Monroe, 0.4 mile upstream from Illinois Central Railroad bridge and 5.5 miles upstream from lock and dam No. 4.

DRAINAGE AREA.--15,298 square miles.

RECORDS AVAILABLE.--Chemical analyses: August 1954 to September 1959.

Water temperatures: August 1954 to September 1958.

REMARKS.--Records of continuous specific conductance available in district office at Baton Rouge, La. Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 21, 1958.....	10,000	7.5	0.43	16	3.0	50	2.4	24		7.0	96	0.6	2.7		258	0.35	6,970	32	3.0	369	6.2	
Nov. 19.....	15,300	7.0	0.16	28	5.4	117	2.3	24		9.0	230	1.1	0.9		412	0.70	21,200	92	72	5.3	765	6.4
Dec. 11.....	10,000	9.2	0.38	18	3.9	62	2.4	24		9.0	120	1.1	0.8		254	0.35	6,860	61	41	3.4	441	6.7
Jan. 29, 1959.....	14,000	8.7	0.21	16	2.2	47	1.8	14		13	93	2.2	1.4		240	0.33	9,070	49	38	2.9	360	6.4
Feb. 18.....	26,200	6.7	0.30	11	2.3	38	1.9	8.2		7.2	76	3.1	1.0		168	0.23	11,900	37	30	2.7	280	6.1
Mar. 29.....	35,300	6.7	0.33	12	1.7	33	1.5	14		7.2	64	2.2	0.8		180	0.24	17,200	37	26	2.4	283	6.6
Apr. 27.....	29,000	6.5	0.43	11	2.1	30	1.6	13		9.4	58	1.1	0.9		153	0.21	12,000	36	25	2.2	246	6.3
May 26.....	29,500	7.0	0.28	21	4.1	68	2.2	20		6.4	136	3.3	0.8		322	0.33	10,650	73	55	3.5	348	6.4
June 24.....	23,100	7.0	0.42	13	4.6	28	2.2	20		8.2	270	2.2	0.8		166	0.23	10,700	43	23	2.7	268	6.0
July 30.....	12,800	7.0	0.09	32	1.9	135	2.5	12		8.0	270	2.2	2.0		600	0.82	20,700	104	94	5.7	560	6.0
Aug 20.....	14,110	5.3	0.02	28	5.9	107	2.2	21		12	210	2.2	4.0		423	0.58	17,110	64	77	4.8	781	6.3
Sept. 28.....	4,500	6.9	0.07	24	5.9	95	2.3	32		11	179	1.1	1.6		391	0.53	4,750	84	58	4.5	669	6.7

RED RIVER BASIN--Continued

7-3722. LITTLE RIVER NEAR ROCHELLE, LA.

LOCATION.--At gaging station at bridge on State Highway 500, 700 feet upstream from Louisiana Midland Railroad Co. bridge, 1.1 miles northeast of Zenoria, and 3 miles southeast of Rochelle, on Grant-La Salle Parish line.
DRAINAGE AREA.--1,880 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carb. 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)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium			Non-carbonate
Oct. 22, 1958.....	336	20	1.2	29	11	828	4.2	42	12	1,350	0.5	1.1	2,320	3.2	2,100	119	85	33	3,990	6.4
Nov. 19.....	160	18	.60	65	36	2,320	13	96	21	3,760	.2	1.0	6,530	8.9	2,820	308	229	58	10,600	6.8
Dec. 18.....	204	19	.52	33	16	1,040	5.6	39	40	1,660	.1	.6	2,880	3.9	1,590	146	114	37	4,900	7.2
Jan. 7, 1959.....	310	19	.54	27	13	857	5.2	45	18	1,380	.1	.4	2,370	3.2	1,980	120	83	34	4,110	7.4
Feb. 9.....	1,820	13	.25	10	2.7	126	2.2	12	17	205	.1	.7	436	.59	2,140	36	26	9.2	746	6.2
Mar. 9.....	3,240	8.2	.33	8.3	2.3	88	1.8	12	12	143	.1	.8	313	.43	1,150	30	20	7.0	525	6.1
Apr. 20.....	5,220	7.1	.42	8.6	2.3	127	2.1	12	8.0	207	.1	1.0	431	.59	6,070	31	21	9.9	725	6.0
May 12.....	336	16	.52	26	8.6	552	4.0	33	2.8	906	.3	1.3	1,720	2.3	1,560	100	73	24	3,080	6.4
June 24.....	1,210	13	.96	16	5.4	313	3.2	32	11	500	.3	.8	953	1.3	3,110	62	36	17	1,740	6.5
Aug. 20.....	63	8.7	.01	98	35	2,970	9.4	74	94	4,750	.3	.8	8,410	11	1,430	388	327	66	13,700	6.8
Sept. 16.....	222	8.6	.01	81	40	2,690	13	71	63	4,310	.3	.8	7,620	10	4,570	368	310	6.1	12,700	6.6

RED RIVER BASIN--Continued
 7-3732.67. BLACK RIVER AT JONESVILLE, LA.

LOCATION--At bridge on U.S. Highway 84 in Jonesville, 1.5 miles downstream from confluence of Ouachita, Texas and Little Rivers, and at Catahoula-Concordia Parish line.

DRAINAGE AREA--24,156 square miles.
 RECORDS AVAILABLE--Chemical analyses: October 1958 to September 1959.

Water temperatures: October 1958 to September 1959.
 EXTREMES, 1958-59.--Dissolved solids: Maximum, 692 ppm Sept. 17-25; minimum, 80 ppm Mar. 5-10.

Hardness: Maximum, 155 ppm Sept. 17-25; minimum, 30 ppm Feb. 25-28, Mar. 1-4, 5-10.
 Specific conductance: Maximum daily, 1,840 microhos Nov. 24; minimum daily, 137 microhos Mar. 10.

Water temperatures: Maximum, 91°F Aug. 8; minimum, 41°F Jan. 6, 7.
 REMARKS.--Records of specific conductance of daily samples available in district office at Baton Rouge, La. Records of discharge not available for this station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhos at 25°C)	Color or pH			
												Parts per million	Tons per acre-foot	Calcium	Non-carbonate						
Oct. 9-20, 1958.		9.1	0.34	12	3.9	24	33		7.2	47	0.1	1.5	143	0.19	46	19	1.6	213	6.6	100	
Oct. 21-31.....		9.7	.41	15	4.3	40	2.9	36	7.2	76	.1	1.7	206	.28	55	26	2.3	310	7.0	100	
Nov. 1-9.....		11	.19	21	6.7	63	2.9	50	8.0	120	.2	2.1	308	.42	80	39	3.0	476	7.4	60	
Nov. 10-21.....		11	.29	26	6.1	91	3.5	54	9.6	170	.2	1.7	393	.53	90	46	4.2	649	7.3	60	
Nov. 22-24.....		10	.10	46	7.1	164	3.7	49	12	326	.1	1.6	656	.89	144	104	6.0	1,150	7.1	30	
Nov. 25-30.....		8.5	.18	18	3.7	52	2.7	32	11	100	.1	1.3	248	.34	71	38	2.9	405	6.8	80	
Dec. 1-3, 6, 7, 10		12	.24	20	5.1	58	2.6	40	11	145	.2	1.6	303	.41	71	38	3.0	461	7.2	70	
Dec. 4, 5, 8, 9, 12		12	.28	20	6.6	98	2.5	40	10	183	.4	1.3	417	.57	77	44	4.8	665	7.3	70	
Dec. 11, 13-20.....		11	.35	20	5.4	58	2.3	44	10	113	.2	2.1	298	.41	72	36	2.9	461	7.3	70	
Dec. 21-31.....		10	.35	23	7.0	79	2.3	51	10	147	.4	2.2	361	.49	86	44	3.7	579	7.4	60	
Jan. 1-10, 1959.		10	.47	23	6.5	87	2.3	52	13	169	.4	2.9	413	.56	93	51	3.9	649	7.3	50	
Jan. 11-20.....		12	.17	31	6.5	98	2.3	52	12	186	.2	3.7	398	.54	104	61	4.2	732	7.3	60	
Jan. 21-26.....		10	.27	29	6.3	93	2.3	50	18	168	.3	.9	274	.51	98	57	4.0	680	7.3	60	
Jan. 27, Feb. 1.		8.9	.32	20	3.4	63	2.3	26	19.6	120	.2	1.6	378	.38	64	43	3.4	487	7.0	120	
Feb. 2-10.....		9.4	.33	19	4.1	44	2.4	40	12	96	.2	1.5	223	.30	64	31	2.4	352	7.0	120	
Feb. 11-18.....		9.6	.52	21	3.8	53	2.9	42	10	99	.2	1.6	274	.37	68	34	2.8	420	7.5	160	
Feb. 19-24.....		7.4	.52	14	2.2	32	2.7	25	6.4	62	.2	1.4	a 141	.19	44	24	2.1	284	7.1	160	
Feb. 25-28.....																					
Mar. 1-4.....		6.6	.33	8.6	2.0	18	1.8	14	6.6	36	.1	1.2	a 89	.12	30	19	1.4	169	6.8	160	
Mar. 5-10.....		6.5	.34	9.0	1.8	15	1.9	18	7.8	28	.1	1.0	a 80	.11	30	15	1.2	146	7.0	160	
Mar. 11-20.....		7.3	.31	10	2.7	23	2.4	24	10	41	.1	1.1	a 110	.15	36	16	1.6	188	7.1	140	
Mar. 21-26, 28-31		7.1	.25	11	2.1	27	2.1	20	8.6	50	.2	1.0	155	.21	36	20	1.9	218	6.8	100	
Mar. 27, Apr. 6																					
9-10.....		7.9	.23	11	2.6	81	2.7	16	10	138	.2	.9	305	.41	38	25	5.7	504	6.7	100	
Apr. 1-5, 7-8.....		7.6	.21	13	2.3	31	2.1	22	8.6	60	.1	1.0	174	.24	42	24	2.1	255	6.7	100	
Apr. 11-20.....		7.0	.23	15	3.1	37	2.2	28	9.6	70	.2	1.5	196	.27	50	27	2.3	301	7.0	100	

MISSISSIPPI RIVER MAIN STEM

7-3734-2. MISSISSIPPI RIVER NEAR ST. FRANCISVILLE, LA.

LOCATION --At ferry on State Highway 10 Crossing, 2 miles southwest of St. Francisville, West Feliciana Parish. DRAINAGE AREA --1,243,000 square miles, arbitrarily determined.

RECORDS AVAILABLE --Chemical analyses: August 1954 to September 1959.

Water temperatures: August 1954 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 285 ppm Nov. 11-20; minimum, 152 ppm Feb. 1-10.

Hardness: Maximum, 181 ppm Nov. 11-20; minimum, 101 ppm Feb. 1-10.

Specific conductance: Maximum daily, 492 micromhos Nov. 25, July 28; minimum daily, 228 micromhos Feb. 3.

Water temperatures: Maximum, 86°F Aug. 8; minimum, 42°F Jan. 5.

EXTREMES, 1964-65.--Dissolved solids: Maximum, 320 ppm Oct. 11-20, 1955; minimum, 111 ppm Feb. 11-19, 1957.

Hardness: Maximum, 185 ppm Jan. 21-31, 1956; minimum, 75 ppm Feb. 11-19, 1957.

Specific conductance: Maximum, 516 micromhos Oct. 6, 1956; minimum, 173 micromhos Apr. 15, 1955.

Water temperatures: Maximum, 87°F July 12, Aug. 12, 1955; minimum, 37°F Feb. 18, 1958.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 285 ppm Nov. 11-20; minimum, 152 ppm Feb. 1-10.

REMARKS --Records of specific conductance of daily samples available in district office at Baton Rouge, La. Records of discharge not available for this station.

Chemical analyses, in parts per million, water year: October 1958 to September 1959

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	Sediment ratio	Specific conductance (micro-mhos at 25°C)	Color or pH	
															Tons per acre-foot	Parts per million	Tons per day					
Oct. 1-10, 1958	11	0.04	38	9.3	17	3.2	120	42	42	21	0.3	2.2	210	0.29	133	35	0.7	344	7.7	30		
Oct. 11-20	12	.03	42	10	17	4.1	136	47	18	3.3	2.3	225	146	31	146	31	0.6	363	7.8	30		
Oct. 21-31	11	.03	46	11	22	3.7	148	54	22	4	1.8	249	160	39	160	39	.8	411	7.9	30		
Nov. 1-10	10	.01	48	13	24	3.1	161	59	25	4	1.9	264	175	43	175	43	.8	425	7.7	20		
Nov. 11-20	9.4	.00	50	14	26	3.0	168	63	25	4	1.6	285	181	43	181	43	.8	450	7.7	20		
Nov. 21-30	8.1	.02	45	13	26	3.1	146	59	27	4	1.5	259	164	44	164	44	.9	417	7.7	20		
Dec. 1-10	8.6	.05	41	11	20	2.7	125	51	24	4	1.9	227	146	44	146	44	.7	376	7.9	30		
Dec. 11-20	9.0	.05	43	12	19	2.7	129	56	26	4	2.6	241	156	50	156	50	.7	385	7.8	40		
Dec. 21-31	10	.04	49	12	21	2.7	146	58	29	4	2.6	259	172	52	172	52	.7	431	7.9	40		
Jan. 1-10, 1959	12	.01	50	13	20	2.4	169	61	28	4	2.6	262	178	40	178	40	.8	442	8.1	40		
Jan. 11-20	11	.02	48	12	23	2.3	154	56	28	4	1.5	265	170	44	170	44	.8	438	8.0	40		
Jan. 21-31	9.0	.03	42	11	19	2.2	124	49	25	3	3.2	229	148	46	148	46	.7	383	7.9	40		
Feb. 1-10	8.6	.20	31	5.8	11	2.2	82	35	14	4	3.5	152	101	34	101	34	.5	255	7.8	50		
Feb. 11-20	8.8	15	32	7.4	11	2.2	89	36	16	3	3.5	175	110	37	110	37	.5	274	7.8	80		
Feb. 21-28	8.3	18	35	7.5	12	2.4	98	39	16	3	3.5	189	118	38	118	38	.5	284	7.8	80		
Mar. 1-10	10	.06	34	7.4	12	2.7	95	39	14	4	4.6	186	115	37	115	37	.5	290	7.7	100		
Mar. 11-20	10	.06	36	9.3	15	2.8	106	48	16	4	4.6	202	128	41	128	41	.6	313	7.9	60		
Mar. 21-31	10	.03	39	9.7	15	2.7	109	52	17	4	4.8	211	137	48	137	48	.6	332	7.9	60		
Apr. 1-10	11	.03	40	9.8	14	2.7	115	48	16	4	4.6	220	140	46	140	46	.5	334	7.8	60		
Apr. 11-20	10	.04	39	9.9	15	2.9	116	48	16	4	5.6	222	138	45	138	45	.5	326	7.9	60		
Apr. 21-30	11	.04	38	10	16	2.7	116	48	17	4	4.0	213	146	46	146	46	.6	325	7.9	60		
May 1-10	13	.18	37	10	16	2.4	116	48	17	3	4.0	209	134	39	134	39	.7	325	7.8	30		
May 11-20	12	.19	40	11	19	2.5	125	58	22	4	4.2	237	154	49	154	49	.7	325	7.8	30		
May 21-31	10	.19	42	12	21	2.8	128	58	26	5	5.2	245	154	49	154	49	.7	329	7.9	30		

a Calculated from determined constituents.

June 1-10, 1959.	11	0.02	42	11	20	2.7	129	51	24	0.4	3.6	233	0.32	150	44	0.7	389	7.8	30
June 11-20.....	11	.02	41	10	19	2.6	127	51	20	.5	1.8	221	.30	144	40	.7	372	7.7	30
June 21-30.....	12	.01	43	9	17	2.6	135	45	18	.5	4.8	221	.30	148	37	.6	361	8.0	20
July 1-10.....	13	.01	43	14	19	3.0	156	46	25	.4	4.2	248	.34	166	38	.7	398	8.1	20
July 11-20.....	10	.01	46	14	23	3.1	155	58	30	.5	3.0	271	.37	174	47	.8	440	8.0	20
July 21-31.....	10	.02	40	14	24	3.2	143	48	32	.5	4.4	247	.34	157	40	.8	404	7.9	30
Aug. 1-10.....	13	.04	38	9	18	2.9	122	41	23	.3	3.8	217	.30	132	32	.7	340	7.9	30
Aug. 11-20.....	11	.04	42	12	23	2.9	134	57	28	.4	2.6	260	.35	156	46	.8	407	7.8	40
Aug. 21-31.....	11	.03	40	12	21	2.9	131	54	25	.4	3.0	249	.34	147	40	.8	389	7.7	40
Sept. 1-10.....	11	.02	39	12	26	3.1	130	62	23	.4	2.4	245	.33	145	38	.9	387	7.6	40
Sept. 11-20.....	10	.02	42	12	28	3.1	143	68	24	.4	1.8	262	.36	156	30	1.0	407	7.6	10
Sept. 21-30.....	11	.02	46	14	30	3.4	156	68	30	.4	2.2	282	.38	172	44	1.0	454	7.7	10
Time-weighted average.....	10	0.05	41	11	20	2.8	130	51	22	0.4	3.2	233	0.32	148	41	0.7	375	--	37

Temperature (°F) of water, water year October 1958 to September 1959
/Once-daily measurement, usually at 6 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	73	73	71	70	70	69	69	71	72	73	70	68	70	70	69	70	69	70	69	67	68	70	69	60	70	69	69	68	67	67	67	64	69		
November ..	64	64	64	64	64	64	63	63	63	63	63	62	63	64	64	64	64	61	61	60	59	59	59	60	60	61	60	60	55	54	--	62	60		
December ..	54	57	55	53	56	56	55	55	53	50	48	48	46	45	45	45	43	42	43	44	45	45	45	47	45	45	47	47	45	45	47	48	48		
January	45	45	45	45	42	43	44	46	43	43	44	44	44	44	43	43	44	46	45	44	46	45	45	45	45	45	45	47	44	45	45	44	45		
February	50	50	51	45	44	44	50	50	47	45	47	47	45	46	47	45	49	50	54	49	47	48	49	47	51	51	51	49	49	--	--	49	49		
March	49	48	47	48	50	50	52	54	50	55	58	55	50	50	49	51	50	51	50	54	54	54	54	52	52	53	49	50	54	54	56	52	56		
April	56	55	55	57	56	56	58	60	60	61	57	57	57	57	57	58	60	61	62	63	60	60	60	60	60	60	60	64	61	65	67	--	60		
May	67	67	68	68	68	68	68	68	69	71	71	72	72	72	72	72	71	73	74	74	74	75	75	75	76	75	76	74	75	75	74	72	72	72	
June	75	85	76	76	77	77	77	76	77	76	78	78	76	77	78	76	78	78	80	81	81	81	81	81	81	81	80	81	81	82	82	--	78	78	
July	82	82	82	82	82	83	83	83	83	83	83	83	82	84	83	84	84	84	84	84	84	84	84	83	84	83	82	83	84	84	84	84	81	83	83
August	82	81	82	83	84	84	86	85	83	--	83	82	83	82	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83	83
September ..	82	80	83	83	79	78	78	78	80	78	76	78	76	76	77	78	78	78	77	76	77	77	77	--	--	77	78	80	80	80	78	79	--	--	78

MISSISSIPPI RIVER MAIN STEM--Continued
7-3744. MISSISSIPPI RIVER AT LULING FERRY, LA.

LOCATION.--At ferry at Luling-to-Destrehan Crossing, St. Charles Parish, 17 miles west of New Orleans.
DRAINAGE AREA.--1,243,600 square miles, arbitrarily determined.
RECORDS AVAILABLE.--Chemical analyses: October 1957 to September 1959.

Water temperatures: October 1957 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 293 ppm Jan. 1-10; minimum, 175 ppm Feb. 11-20.

Hardness: Maximum, 182 ppm Nov. 11-20, Jan. 1-10; minimum, 105 ppm Feb. 11-20, Mar. 1-10.

Specific conductance: Maximum daily, 504 microhos Nov. 29; minimum daily, 236 microhos Feb. 3.

Water temperatures: Maximum, 85° F Aug. 7, 8, 11, 12, 14-16; minimum, 41° F Feb. 6, 7.

EXTREMES, 1957-59.--Dissolved solids: Maximum, 293 ppm Jan. 1-10, 1959; minimum, 152 ppm Dec. 11-20, 1957.

Hardness: Maximum, 182 ppm Nov. 11-20, 1958, Jan. 1-10, 1959; minimum, 90 ppm Dec. 1-10, 1957.

Specific conductance: Maximum daily, 513 microhos Oct. 7, 1957; minimum daily, 225 microhos Dec. 14, 1957.

Water temperatures: Maximum, 85° F Aug. 7, 8, 11, 12, 14-16, 1958; minimum, 39° F Feb. 18, 19, 1958.

REMARKS.--Records of specific conductance of daily samples available in district office at Baton Rouge, La. No discharge records available.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Color or pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Oct. 1-10, 1958		12	0.02	38	9.6	20	3.3	121		42	25	0.2	2.1		219	0.30	134	35	0.8	359	7.7	30
Oct. 11-20		11	.02	41	10	19	3.6	128		47	22	.2	2.2		222	.30	144	39	.6	364	7.8	30
Oct. 21-31		11	.02	45	11	22	4.1	142		53	23	.3	2.0		247	.34	156	40	.7	395	7.9	30
Nov. 1-10		11	.02	48	12	27	3.3	154		59	29	.4	2.6		269	.37	168	42	.9	448	7.7	20
Nov. 11-20		11	.01	53	12	28	3.2	166		62	29	.4	1.8		287	.36	182	46	.9	474	7.8	20
Nov. 21-30		9.2	.02	51	13	30	3.2	163		65	33	.4	1.8		290	.39	181	47	1.0	484	7.7	20
Dec. 1-10		7.4	.07	42	10	22	3.1	126		55	26	.3	2.2		232	.32	147	44	.8	392	7.4	30
Dec. 11-20		7.4	.04	40	13	20	3.3	128		50	30	.5	2.9		248	.34	152	47	.7	388	7.7	40
Dec. 21-31		9.8	.03	45	15	23	2.9	136		67	29	.5	2.6		289	.39	174	63	.8	444	7.8	40
Jan. 1-10, 1959		10	.03	42	19	24	2.7	165		49	36	.5	2.6		293	.40	182	47	.8	460	7.9	40
Jan. 11-20		9.8	.01	51	11	28	2.5	167		49	33	.5	2.8		278	.38	172	35	.9	466	7.9	40
Jan. 21-31		8.1	.02	45	11	22	2.4	128		53	31	.4	2.7		247	.34	158	53	.7	420	7.7	40
Feb. 1-10		6.5	.10	34	7.8	14	2.3	94		39	20	.4	3.7		190	.26	117	40	.6	307	7.5	50
Feb. 11-20		6.2	.16	31	6.7	11	2.4	82		38	17	.3	3.6		175	.25	105	38	.5	271	7.7	80
Feb. 21-28		7.3	.14	34	7.6	13	2.5	94		39	19	.4	2.5		197	.27	116	39	.5	299	7.8	80
Mar. 1-10		6.6	.22	32	6.1	10	2.8	82		35	16	.4	3.7		186	.26	105	38	.4	268	7.6	100
Mar. 11-20		9.2	.10	36	8.3	16	2.8	99		45	20	.2	4.0		197	.26	124	43	.6	310	7.8	60
Mar. 21-31		8.0	.09	38	9.3	14	2.7	106		49	19	.2	4.0		202	.27	133	46	.5	329	7.8	50

Apr. 1-10, 1959.	8.4	0.10	40	9.8	15	2.7	107	55	19	0.2	2.7	214	0.29	140	51	0.5	339	7.8	60
Apr. 11-20.....	11	.02	40	10	15	2.8	116	51	18	.5	5.6	231	.31	132	47	.6	346	7.8	30
Apr. 21-30.....	9.2	.02	38	10	17	2.9	102	48	21	4	4.8	226	.31	139	47	.6	350	7.8	30
May 1-10.....	8.3	.03	38	19.1	17	2.2	126	53	21	4	3.8	217	.30	132	43	.7	336	8.1	30
May 11-20.....	10	.18	40	12	18	2.3	128	53	28	4	4.4	223	.30	148	45	.6	370	7.8	30
May 21-31.....	10	.18	43	12	22	2.8	126	60	28	5	5.2	246	.33	158	55	.8	409	8.0	30
June 1-10.....	8.3	.19	42	11	21	2.8	126	56	27	5	4.4	237	.32	151	48	.8	395	7.9	30
June 11-20.....	7.8	.23	40	11	21	2.9	124	56	26	5	4.4	234	.32	151	48	.8	381	7.8	30
June 21-30.....	10	.03	40	9.8	17	2.8	124	43	20	5	5.0	211	.29	140	38	.6	409	8.0	30
July 1-10.....	9.4	.01	47	10	19	2.7	147	45	22	5	4.2	232	.32	160	40	.8	452	7.9	30
July 11-20.....	7.4	.01	48	13	25	2.9	152	58	30	6	2.8	263	.36	173	48	.8	452	7.9	30
July 21-31.....	9.6	.01	44	14	27	3.2	152	54	36	5	3.8	277	.38	168	43	.9	445	8.1	30
Aug. 1-10.....	8.6	.03	37	10	22	3.0	124	40	30	5	4.0	216	.29	134	42	.8	361	7.7	30
Aug. 11-20.....	9.0	.05	41	11	23	3.0	129	51	31	5	2.8	249	.34	148	42	.8	389	7.7	30
Aug. 21-31.....	8.4	.04	44	13	26	3.4	139	64	33	4	3.2	280	.38	165	51	.9	444	7.7	40
Sept. 1-10.....	8.4	.06	39	11	23	3.0	121	51	31	5	2.8	240	.33	142	43	.8	385	7.6	40
Sept. 11-20.....	9.5	.02	43	12	28	3.5	138	65	35	5	1.8	262	.36	157	44	1.0	424	7.7	10
Sept. 21-30.....	9.7	.02	44	14	34	3.4	149	73	38	5	2.0	290	.39	169	47	1.1	465	7.7	10
Time-weighted average.....	9.0	0.07	42	11	21	2.9	128	52	26	0.4	3.3	239	0.33	150	45	0.7	387	--	37

Temperature (°F) of water, water year October 1958 to September 1959

Month	Day																															Aver- age
	/Once-daily measurement, usually at 4 p.m./																															
	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.....	74	72	74	72	76	72	72	72	73	72	70	70	71	72	71	70	70	70	70	70	70	69	70	69	68	68	66	67	67	66	66	70
November...	66	66	65	65	65	64	64	64	64	64	64	64	66	66	66	66	66	66	66	60	61	63	63	62	63	62	60	58	58	58	63	
December...	58	57	57	56	57	53	53	53	53	51	50	51	50	47	46	46	46	46	46	45	44	44	44	44	44	44	43	43	43	43	48	
January.....	43	43	44	42	42	42	43	43	43	43	44	44	44	44	44	44	44	42	42	42	42	42	42	43	43	45	46	47	47	46	44	
February.....	42	42	42	42	41	41	43	44	44	44	44	45	46	46	44	45	46	48	48	48	48	48	48	48	48	45	45	46	46	44	44	
March.....	45	46	43	50	47	46	48	48	49	49	45	49	50	51	50	49	49	49	50	51	50	50	50	52	52	53	52	53	52	54	50	
April.....	55	55	55	56	57	57	58	58	60	59	58	57	57	57	57	58	59	59	60	60	60	60	60	61	61	61	61	63	63	63	63	59
May.....	63	66	65	66	66	66	68	68	69	70	71	70	71	71	70	72	73	73	72	73	73	74	74	74	74	74	74	74	74	74	74	71
June.....	75	75	75	75	75	75	75	75	75	77	76	77	77	77	77	77	78	79	79	79	79	79	80	80	81	81	81	81	81	82	82	78
July.....	81	80	80	80	80	81	81	81	81	81	83	83	83	83	83	83	83	83	84	84	84	84	84	84	84	84	84	84	84	84	84	82
August.....	83	83	83	83	83	84	84	84	84	85	85	85	85	85	85	85	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
September...	84	84	82	84	83	82	83	82	82	82	80	81	80	80	81	80	80	80	80	79	79	79	78	77	77	78	77	78	79	81	--	80

MISSISSIPPI RIVER DELTA

7-3750.5. TCHEFUNCTA RIVER NEAR COVINGTON, LA.

LOCATION.--At crest-stage station at bridge on U.S. Highway 190, 150 feet upstream from Illinois Central Railroad bridge, 1 mile downstream from Pruden Creek, and 4 miles west of Covington.

DRAINAGE AREA.--145 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 28, 1958		14	0.10	2.7	0.1	5.5	0.9	14		0.8	5.4	0.2	0.1			34	0.05	7	0	0.9	37	6.7
Nov. 28		14	.12	2.4	.7	5.1	0.8	15		.8	5.2	.1	.2			37	.02	8	0	.7	40	6.6
Dec. 20		13	.12	2.1	.9	3.7	1.3	13		0	5.2	.1	.2			33	.04	9	0	.5	37	6.9
Jan. 16, 1959		13	.04	2.2	.5	5.3	.5	15		.6	4.7	.1	.1			34	.05	8	0	.8	48	6.4
Feb. 27		5.2	.37	1.2	.4	3.0	.6	8		0	3.7	.1	.6			19	.03	5	0	.6	26	6.0
Mar. 20		12	.08	2.2	.2	4.1	.8	12		1.0	3.4	.1	.2			30	.04	6	0	.7	38	6.6
Apr. 22		10	.22	2.1	.2	3.0	1.1	8		2.0	3.1	.1	.4			26	.04	6	0	.5	31	6.5
May 26		8.2	.31	2.0	.7	2.3	.8	8		1.0	4.0	.2	.5			24	.03	8	2	.4	27	6.3
June 23		13	.31	2.6	.4	4.1	1.0	12		1.6	4.2	.1	.3			42	.05	8	0	.6	38	6.4
July 22		11	.14	2.4	.2	5.5	.7	12		1.6	5.8	.1	.2			a 42	.05	7	0	.9	35	6.3
Aug. 18		13	.06	2.1	.2	4.4	.9	14		.4	3.3	.0	.1			31	.04	6	0	.8	36	6.4
Sept. 24		14	.03	2.1	.2	4.4	.7	14		.8	2.7	.1	.1			32	.04	6	0	.8	41	6.5

a Residue at 180° C.

MISSISSIPPI RIVER DELTA.--Continued

7-3803. BAYOU DES ALLEMANDS AT ALLEMANDS, LA.

LOCATION.--On bridge crossing on U.S. Highway 90, approximately 10 miles northeast of Raceland, on Lafourche-St. Charles Parish line.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH or Col- or
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		
Oct. 28, 1958....		11	0.09	20	5.1	31	3.2	78		3.6	53	0.1	0.5		188	0.26	71	7	1.6	304	7.1
Nov. 25.....		11	.09	21	5.8	30	2.7	82		7.0	50	.1	.4		200	.27	76	9	1.5	305	7.1
Dec. 29.....		5.8	.07	24	7.1	52	3.0	85		5.2	90	.7	2.3		266	.36	89	19	2.4	458	6.8
Jan. 16, 1959....		6.1	.03	22	5.9	33	2.9	78		7.8	56	.3	3.9		189	.26	79	15	1.6	336	6.5
Feb. 27.....		3.4	.20	19	4.5	23	2.5	69		3.8	41	.3	.7		152	.21	66	9	1.2	252	7.0
Mar. 20.....		2.6	.30	16	3.9	16	2.7	62		1.0	29	.2	.8		104	.14	56	5	.9	206	7.2
Apr. 21.....		1.0	.12	22	5.1	35	2.7	73		8.2	60	.2	.6		204	.28	76	16	1.7	342	7.1
May 26.....		5.5	.24	21	4.5	25	2.8	69		6.0	45	.4	1.8		177	.24	71	14	1.3	273	6.9
June 23.....		6.6	.22	14	2.0	9.2	2.1	49		2.6	15	.3	.8		97	.13	43	3	.6	138	6.7
July 23.....		7.2	.13	14	3.4	17	1.9	49		2.0	30	.3	2.4		130	.18	49	9	1.0	200	6.7
Aug. 18.....		9.0	.04	16	3.4	11	2.2	59		4.4	16	.2	4.6		115	.16	44	6	.8	167	6.7
Sept. 23.....		7.7	.04	21	7.0	58	3.0	74		13	97	.2	.7		274	.37	81	20	2.8	465	6.9

MISSISSIPPI RIVER DELTA--Continued

7-3804. BAYOU LAFOURCHE AT DONALDSONVILLE, LA.

LOCATION.--At gaging station, 40 feet upstream from culvert under State Highway 18, in Donaldsonville, Ascension Parish, and 1,500 feet downstream from Donaldsonville Pumping Plant.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to August 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1631. Pumping plant at Donaldsonville pumps total flow of Bayou Lafourche from Mississippi River.

Chemical analyses, in parts per million, October 1958 to August 1959

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 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. 29, 1958.....	324	6.1	0.04	46	12	25	3.4	146		57	27	0.3	1.6		267	0.36	234	162	42	0.9	431	7.4
Dec. 5.....	358	4.5	.17	42	12	22	3.0	125		57	28	.3	1.7		34	.34	240	153	51	.8	387	7.4
Dec. 29.....	306	7.0	.46	44	15	21	2.7	143		53	32	.2	2.5		267	.36	221	176	56	.7	441	7.3
Jan. 29, 1959....	266	6.4	.11	39	13	26	2.5	147		61	33	.2	2.9		278	.38	200	175	55	.9	440	8.0
Feb. 27.....	208	9.6	.33	38	5	10	2.7	98		32	26	.5	3.4		192	.56	108	113	33	.4	280	7.4
Mar. 20.....	200	7.1	.18	38	8.6	13	2.8	111		39	20	.4	3.7		193	.26	104	130	39	.5	333	7.5
Apr. 30.....	284	5.5	.08	39	8.7	17	2.3	104		52	22	1	3.7		211	.29	162	133	48	.7	345	7.4
May 28.....	232	6.0	.11	45	10	17	3.0	128		51	24	.5	4.3		235	.32	147	153	50	.6	387	7.7
June 26.....	118	6.9	.14	42	9.6	15	2.9	127		43	19	.4	3.8		208	.28	144	140	40	.6	351	7.4
July 28.....	115	6.6	.12	45	11	22	3.0	138		49	27	.6	3.0		244	.33	76	156	43	.8	415	7.6
AUG. 25.....	200	5.2	.01	45	11	26	3.2	140		60	28	.5	2.4		258	.35	139	159	44	.9	427	7.6

MISSISSIPPI RIVER DELTA--Continued
7-3812. BAYOU LAFOURCHE AT VALENTINE, LA.

LOCATION.--At bridge on State Highway 1, at Valentine, Lafourche Parish.
RECORDS AVAILABLE.--Chemical analyses: March 1956 to August 1956, November 1958 to September 1959.
REMARKS.--No discharge records available.

Chemical analyses, in parts per million, November 1958 to September 1959

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) (NO ₃) (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. 28, 1958.....		5.8	0.15	42	10	19	3.3	137		43	23	0.3	1.9	a 216	0.29	147	35	0.7	369	7.2
Nov. 25.....		5.0	.09	51	14	27	3.2	168		63	30	.3	.9	292	.40	185	47	.9	480	7.4
Dec. 29.....		6.0	.05	49	14	23	2.9	134		67	34	.2	1.9	292	.40	178	68	.8	461	7.4
Jan. 16, 1959.....		6.7	.02	53	12	23	2.6	169		45	33	.4	2.7	274	.37	182	44	.7	454	7.3
Feb. 27.....		9.1	.98	22	4.4	6.2	3.5	75		11	11	.5	2.4	a 108	.15	73	12	.3	182	6.9
Mar. 20.....		6.6	.46	32	7.4	16	3.2	99		28	27	.3	2.6	208	.28	110	29	.7	307	7.4
Apr. 21.....		7.0	.10	45	9.7	15	3.4	134		41	22	.3	4.1	227	.31	152	42	.5	366	7.4
May 26.....		4.8	.11	48	7.9	16	2.9	135		44	19	.5	3.3	216	.29	152	41	.6	363	7.3
June 23.....		9.6	.90	25	5.3	6.9	3.1	191		4.4	14	.4	.8	151	.21	184	9	.3	214	6.9
July 23.....		1.0	.04	41	10	23	2.9	138		38	31	.5	.5	219	.30	144	31	.8	396	7.3
Aug. 18.....		7.9	.04	39	8.5	19	3.4	128		41	20	.4	3.2	205	.28	132	27	.7	340	7.0
Sept. 23.....		7.0	.30	39	30	285	12	85		73	500	.2	.4	1,060	1.4	221	151	8.3	1,950	7.0

a Calculated from determined constituents.

MISSISSIPPI RIVER DELTA--Continued

7-3816. ATCHAFALAYA RIVER AT MORGAN CITY, LA.

LOCATION.--At bridge on U.S. Highway 90 in Morgan City, St. Mary Parish.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate		
Oct. 29, 1958.....		7.1	0.22	37	8.5	29	3.0	117		36	42	0.1	0.4		0.30	127	31	1.1	391	7.2
Nov. 25.....		6.7	.10	48	13	50	3.0	152		54	72	.3	1.4		.46	174	49	1.6	546	7.5
Dec. 29.....		7.2	.08	44	12	38	2.7	124		52	60	.2	1.5		.39	157	55	1.3	502	7.4
Jan. 15, 1959.....		7.2	.39	39	19	37	2.7	158		34	64	.3	1.3		.44	174	44	1.2	526	7.5
Feb. 26.....		5.8	.48	29	6.3	20	2.6	79		31	32	.4	1.5		.27	98	33	.9	294	7.3
Mar. 19.....		6.2	.33	29	6.3	19	2.7	82		31	29	.2	2.5		.26	188	26	.8	297	7.4
Apr. 21.....		6.6	.20	35	8.0	22	2.5	95		36	36	.2	3.5		.31	226	42	.9	359	7.3
May 26.....		6.6	.08	40	11	29	2.7	117		53	41	.7	2.0		.37	146	50	1.0	426	7.6
June 23.....		6.9	.30	35	6.8	24	2.9	96		30	40	.4	1.8		.22	272	29	1.1	359	7.4
July 29.....		3.6	.02	46	1.2	33	3.0	146		52	48	.5	.9		.39	284	39	1.2	487	7.4
Aug. 16.....		6.9	.03	41	9.9	36	3.1	122		54	51	.5	1.5		.36	267	36	1.4	487	7.1
Sept. 23.....		5.2	.04	41	14	47	3.2	132		59	66	.4	1.2		.43	331	53	1.6	529	7.4

a Calculated from determined constituents.

MISSISSIPPI RIVER DELTA--Continued
7-3855. BAYOU TECHE AT ARNAUDVILLE, LA.

LOCATION --At gaging station near center of span on upstream side of bridge on State Highway 31 at Arnaudville, St. Martin-St. Landry Parish line, 300 feet upstream from Bayou Fusilier.
DRAINAGE AREA 1,531 square miles.
RECORDS AVAILABLE --Chemical analyses: October 1958 to September 1959.
REMARKS --Records of discharge for water year October 1958 to September 1959 given in WSP 1631.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 29, 1958	544	14	0.39	14	3.9	6.2	2.3	62		3.0	8.6	0.1	0.8		84	0.11	123	51	0	0.4	133	6.6
Nov. 25	431	18	34	20	5.9	20	2.5	85		6.4	29	1.1	1.5		a 156	.21	182	74	4	1.0	229	7.0
Dec. 29	394	16	14	35	11.9	19	3.5	156		13	24	2.2	.9		a 207	.28	220	133	5	1.7	344	7.4
Jan. 18, 1959	691	12	44	24	16.9	11	3.5	94		15	17	4.4	1.2		a 153	.21	285	88	11	.5	233	7.1
Feb. 26	1,360	4.6	.68	5.0	1.3	2.5	1.7	22		15	3.5	4.9	.7		32	.04	118	18	0	.3	55	6.6
Mar. 19	1,070	8.2	.54	9.7	3.1	9.9	1.9	41		3.8	16	3.2	.7		74	.10	214	37	3	.7	127	7.1
Apr. 20	1,410	5.2	.60	10	3.4	3.7	2.9	39		3.4	9.3	1.1	1.1		59	.08	225	39	7	.3	105	6.4
May 26	786	9.5	.95	8.5	4.1	5.5	3.0	45		1.8	7.4	4.2	2.0		65	.09	138	38	1	.4	104	6.9
June 23	837	11	.57	19	5.0	9.4	2.9	80		3.4	15	4.1	1.2		107	.15	242	68	2	.5	183	7.3
July 21	429	12	1.0	29	8.5	21	3.0	127		11	26	3.3	.7		a 188	.26	218	107	3	.9	308	7.0
Aug. 18	376	14	.24	21	6.2	13	3.3	97		9.8	13	3.2	.9		a 139	.19	141	78	0	.6	210	6.8
Sept. 23	457	12	.15	18	5.6	10	1.4	85		1.6	13	2.2	.6		a 122	.17	151	68	0	.5	192	7.0

a Residue at 180°C.

MISSISSIPPI RIVER DELTA--Continued

7-3869. VERMILION RIVER AT LAFAYETTE, LA.

LOCATION.--At bridge on U.S. Highway 90, 1.4 miles downstream from Southern Pacific Railroad bridge and 0.9 mile south of Lafayette, Lafayette Parish.
 RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.
 REMARKS.--No discharge records available.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 29, 1958		14	0.33	14	4.2	29	2.5	57		2.4	50	0.1	1.0		162	0.22	52	5	1.8	252	6.6
Nov. 25		17	.18	33	11	161	3.4	113		8.6	270	.1	.7		593	.81	128	35	6.2	996	7.1
Dec. 29		13	.30	22	6.1	60	5.0	79		12	100	.3	1.0		281	.38	80	15	2.9	479	6.9
Jan. 15, 1959		12	.26	24	7.8	34	3.9	94		12	57	.5	1.4		223	.30	92	15	1.5	366	7.0
Feb. 25		4.3	.68	5.8		15	2.3	18		1.0	28	.2	1.2		a 69	.09	20	5	1.5	131	6.6
Mar. 19		8.4	.62	11	3.6	17	2.1	46		1.8	29	.1	.9		a 98	.13	42	4	1.1	174	7.1
Apr. 20		8.3	.51	13	4.0	23	2.5	52		6.0	37	.1	1.1		a 122	.17	49	6	1.4	208	6.6
May 26		9.3	.79	16	5.4	29	3.8	67		3.4	46	.7	1.9		a 149	.20	62	7	1.6	272	7.0
June 23		10	.40	15	3.3	18	3.0	66		3.4	49	.3	1.5		a 82	.19	59	5	1.0	210	7.1
July 28		11	.17	23	8.2	32	3.2	87		3.6	66	.3	1.5		a 142	.36	90	16	2.4	433	6.9
Aug. 18		14	.13	25	9.2	33	4.2	97		5.2	160	.2	1.0		a 187	.53	96	23	1.7	686	6.7
Sept. 23		14	.15	19	7.2	39	3.0	90		2.8	35	.2	1.0		a 181	.23	77	3	1.7	333	7.1

a Calculated from determined constituents.

MISSISSIPPI RIVER DELTA--Continued

7-3870. VERMILION RIVER AT BANCKER FERRY, NEAR ABBEVILLE, LA.

LOCATION.--At Banker Ferry about 6 miles south of Abbeville, Vermilion Parish.

RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1959.

Water temperatures: January 1949 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 2,320 micromhos Jan. 3; minimum daily, 39.1 micromhos Feb. 26.

Water temperatures: Maximum, 89°F Aug. 14, 29, Sept. 1; minimum, 43°F Jan. 6.

EXTREMES, 1949-59.--Specific conductance: Maximum daily, 21,200 micromhos Sept. 18, 1954; minimum daily, 39.1 micromhos Feb. 26, 1959.

Water temperatures: Maximum, 98°F Aug. 9, Sept. 3, 1951; minimum, 38°F Jan. 30, 1951.

REMARKS.--No discharge records available.

Specific conductance and chloride (Cl), in parts per million, water year October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	Chloride (Cl)
1	199	--	255	--	1,160	--	1,010	272
2	165	--	272	--	1,160	--	950	--
3	164	--	281	--	1,070	--	2,320	715
4	292	--	322	--	1,310	365	501	92
5	211	40	352	94	1,210	--	495	--
6	162	--	404	--	737	174	576	--
7	150	--	333	--	680	--	573	--
8	176	--	358	--	710	--	550	--
9	241	--	317	--	693	--	509	115
10	186	--	340	--	611	--	455	--
11	173	--	351	--	812	--	423	--
12	178	--	365	--	799	--	401	83
13	308	66	412	--	739	--	304	--
14	254	48	425	--	736	--	279	51
15	214	--	438	94	657	136	269	--
16	184	--	602	144	792	--	294	52
17	190	--	580	--	775	176	286	--
18	317	--	670	--	788	--	285	--
19	235	--	622	--	673	--	315	--
20	229	--	627	--	709	--	376	73
21	242	--	633	--	581	118	335	--
22	349	--	647	--	593	--	499	--
23	211	32	791	--	605	--	1,570	458
24	246	--	804	200	612	--	849	--
25	244	--	779	--	1,260	348	361	--
26	273	--	699	--	1,270	--	406	59
27	333	--	747	--	1,270	--	1,240	350
28	341	--	637	--	--	--	444	--
29	273	--	1,170	307	529	115	383	--
30	361	81	1,160	--	490	--	302	--
31	363	--	--	--	459	--	95.8	13

QUALITY OF SURFACE WATERS, 1959

MISSISSIPPI RIVER DELTA--Continued

7-3870. VERMILION RIVER AT BANCKER FERRY, NEAR ABBEVILLE, LA.--Continued

Specific conductance and chloride (Cl), in parts per million, water year October 1958 to September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	57.3	8.6	120	--	274	--	244	42
2	117	24	126	--	300	--	221	--
3	48.0	--	132	--	241	41	189	--
4	41.7	6.7	146	--	281	--	157	16
5	90.5	--	134	--	359	--	174	--
6	118	--	102	--	294	--	186	--
7	138	29	193	44	1,050	280	172	--
8	138	--	168	--	812	--	163	--
9	139	--	168	--	342	--	167	--
10	138	--	138	26	262	--	177	--
11	140	--	139	--	261	--	177	--
12	150	--	154	--	314	--	137	12
13	137	--	176	37	313	--	96.5	--
14	302	115	197	--	271	--	193	--
15	184	34	201	--	373	88	198	--
16	115	--	212	46	230	--	435	--
17	192	42	169	--	184	34	685	172
18	138	28	169	--	189	--	489	--
19	135	--	176	--	210	--	359	--
20	130	--	167	26	214	--	282	--
21	136	--	172	--	228	40	252	--
22	159	--	201	--	212	--	236	--
23	159	--	203	--	249	--	238	24
24	142	--	192	--	209	--	275	--
25	60.1	8.4	200	--	209	--	247	--
26	39.1	5.8	220	--	573	146	428	85
27	39.4	--	230	--	293	--	355	--
28	105	23	258	--	200	--	272	--
29	--	--	267	--	207	--	353	--
30	--	--	281	57	236	--	373	--
31	--	--	258	--	--	--	259	--
	June		July		August		September	
1	337	--	255	--	168	27	765	199
2	200	--	346	--	205	--	771	--
3	205	--	--	--	205	--	428	--
4	194	--	348	--	256	55	597	--
5	258	--	405	--	246	--	427	--
6	447	104	401	--	221	--	376	70
7	362	--	245	--	239	--	394	--
8	337	--	491	118	233	--	377	--
9	121	19	251	--	235	--	375	--
10	124	--	320	--	248	--	314	--
11	163	--	195	--	258	43	343	--
12	252	--	188	30	256	--	915	235
13	138	87	208	--	236	--	873	--
14	220	--	210	--	239	--	910	--
15	198	--	219	--	243	--	810	--
16	122	--	201	--	309	--	570	130
17	288	--	202	--	298	--	512	--
18	214	--	207	31	323	--	504	--
19	336	87	199	--	284	48	502	--
20	210	--	198	--	287	--	475	91
21	223	--	--	--	280	--	528	--
22	194	--	210	30	599	146	569	--
23	217	--	216	--	623	--	501	--
24	188	33	337	--	660	--	466	--
25	202	--	316	--	363	74	465	--
26	207	--	339	65	358	--	466	--
27	227	--	244	--	361	--	516	--
28	254	--	347	--	328	--	433	--
29	230	--	242	--	307	--	429	--
30	234	35	245	--	552	--	348	--
31	--	--	175	--	554	--	--	--

MISSISSIPPI RIVER DELTA--Continued
 7-3870. VERMILION RIVER AT BANCKER FERRY, LA.--Continued

Month	Temperature (°F) of water, water year October 1958 to September 1959																															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	77	76	75	72	71	70	71	72	74	76	75	73	72	73	74	74	74	72	72	72	72	72	74	72	71	72	71	72	70	70	68	67	66	72
November ..	63	63	62	62	63	64	63	65	65	66	65	65	75	68	70	70	69	69	66	65	65	63	63	64	64	65	63	63	59	56	--	64	64	
December ..	57	57	57	57	57	59	57	56	56	56	52	52	54	50	49	48	48	49	49	51	50	51	52	53	54	52	52	--	60	57	54	54		
January	52	54	54	50	46	43	49	50	48	47	46	48	48	50	53	49	47	49	54	48	48	52	54	52	52	54	56	56	58	60	58	51		
February	52	56	49	52	50	53	52	53	58	60	58	58	60	62	62	59	60	63	58	56	54	56	58	58	55	54	53	56	--	--	56	55		
March	58	58	58	57	62	58	57	59	59	60	64	59	58	64	64	62	58	58	58	60	62	62	60	61	65	70	71	65	65	65	66	61		
April	57	67	68	67	72	71	71	73	75	72	70	66	60	60	59	69	62	62	66	67	68	68	67	66	67	69	68	68	70	70	--	68		
May	71	72	76	77	76	77	76	65	67	76	76	68	68	72	72	75	76	76	76	78	78	78	79	80	80	80	80	82	82	77	76	74		
June	78	77	78	79	78	78	80	78	75	76	79	76	78	78	77	78	80	80	80	80	86	80	82	84	80	80	80	82	85	82	--	79		
July	82	82	--	86	82	82	80	79	80	87	84	86	80	80	85	87	80	80	82	84	--	82	82	80	79	78	76	80	80	78	81			
August	80	75	84	84	84	84	86	86	86	86	86	86	86	86	86	86	84	84	84	84	84	84	84	84	84	86	86	86	86	85	85			
September ..	89	87	86	85	85	86	83	85	85	87	80	80	80	79	79	78	78	79	81	80	80	81	81	82	82	83	83	83	81	--	82			

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃	Sodium carbonate ratio	Specific conductance (microhos at 25°C)		
												Residue at 180°C (ppm)	Calculation (ppm)	Tons per acre-foot					
ARKANSAS RIVER BASIN																			
SAND CREEK NEAR MEDFORD, GRANT COUNTY, OKLA.																			
Oct. 3, 1958.....		30		63	38	119		368	24	103	1.7		642	0.87	315	0	2.9	1,040 8.5	
Oct. 13.....		20		61	45	118		368	20	83	2.2		656	.89	333	0	2.8	1,070 8.5	
Oct. 20.....		18		46	43	142		358	22	81	2.2		666	.80	290	0	3.6	1,110 8.5	
Oct. 27.....		18		66	33	164		422	20	95	1.2		739	1.01	310	0	4.1	1,210 8.5	
Nov. 5.....		16		56	49	147		398	22	102	.1		722	.98	340	0	3.5	1,200 8.5	
CROOKED CREEK NEAR MEDFORD, GRANT COUNTY, OKLA.																			
Oct. 3, 1958.....		25		37	35	269		404	24	144	4.8		947	1.29	236	0	7.6	1,570 8.5	
Oct. 13.....		30		52	38	315		450	20	174	4.8		1,120	1.52	284	0	8.1	1,830 8.5	
Oct. 27.....		22		59	29	339		488	20	175	2.4		1,160	1.58	268	0	9.0	1,900 8.5	
Nov. 5.....		22		80	48	335		538	18	210	302	9.9	1,290	1.75	396	0	7.3	2,110 8.4	
POND CREEK NEAR MEDFORD, GRANT COUNTY, OKLA.																			
Oct. 3, 1958.....		10		49	27	169		314	20	164	2.6		673	0.92	232	0	4.8	1,140 8.5	
Oct. 13.....	5.5		43	30	190		322	20	86	180	2.8		746	1.01	230	0	5.5	1,250 8.5	
Oct. 20.....	5.0		40	33	211		338	22	99	195	2.4		814	1.11	234	0	6.0	1,340 8.5	
Oct. 27.....	5.0		49	39	236		408	12	123	222	2.0		896	1.22	284	0	6.1	1,320 8.3	
Nov. 5.....	12		72	26	270		490	14	133	235	.2		--	1.37	288	0	7.1	1,680 8.4	
POLECAT CREEK NEAR NUMA, GRANT COUNTY, OKLA.																			
Oct. 3, 1958.....		18		56	19	63		260	16	38	52	1.0		391	0.53	216	0	1.9	652 8.4
Oct. 13.....		13		67	17	75		308	18	41	51	3.1		436	.59	236	0	2.1	730 8.5
Oct. 20.....	--			68	21	64		324	10	39	49	1.8		412	.96	254	0	1.7	710 8.4
Oct. 27.....	14			78	12	117		370	20	46	81	.8		551	.75	244	0	3.3	902 8.5
Nov. 5.....	9.0			57	12	103		436	18	35	47			525	.71	266	0	2.8	857 8.4
7-1507. POND CREEK NEAR LAMONT, GRANT COUNTY, OKLA.																			
Oct. 14, 1958.....		22		46	27	124		316	14	63	102	2.0		555	0.75	224	0	3.6	832 8.4
Oct. 24.....		24		52	26	139		384	16	69	106	2.4		633	.86	262	0	3.8	1,040 8.4
Oct. 30.....		22		78	21	152		422	20	68	113	3.1		684	.93	282	0	4.0	1,120 8.5

DEER CREEK NEAR DEER CREEK, GRANT COUNTY, OKLA.

Oct. 3, 1958.....	94	40	86	240	18	84	192		1.7		400	174	1.9	1,130	8.5
Oct. 13.....	118	60	125	320	16	113	322		1.1		540	300	2.3	1,590	8.4
Oct. 20.....	130	66	123	326	0	117	335		.7		595	328	2.2	1,690	8.2
Nov. 5.....	110	58	181	364	0	127	338		.4		515	216	3.5	1,760	8.2
	16														

7-1509. DEER CREEK NEAR TONKAWA, KAY COUNTY, OKLA.

Oct. 1, 1958.....	174	79	255	206	0	70	760		1.4		760	591	4.0	2,970	8.0
Oct. 16.....	188	84	261	270	0	85	760		1.2		815	594	4.0	3,080	8.0
Oct. 21.....	178	85	263	268	0	85	750		2.0		795	576	4.1	3,010	8.1
Oct. 28.....	190	87	253	332	0	89	720		.1		830	558	3.8	3,020	7.9

7-1510. SALT FORK ARKANSAS RIVER AT TONKAWA, KAY COUNTY, OKLA.

Oct. 1, 1958.....	178	36	1,130	156	0	491	1,700				590	462	20	6,020	8.1
Oct. 10.....	136	44	1,280	--	0	391	1,850				520	430	24	6,390	8.2
Oct. 16.....	160	44	1,490	--	0	391	1,820				590	387	21	6,340	8.2
Oct. 21.....	176	49	1,200	246	0	402	1,850				625	424	21	6,410	8.2
Oct. 28.....	102	49	1,360	104	0	--	2,000				455	370	28	6,600	8.2
Nov. 18.....	164	18	472	--	4	--	680				235	124	13	2,550	8.4
Dec. 8.....	120	45	1,250	100	0	--	1,850				485	403	25	6,370	8.1
Dec. 16.....	122	51	1,120	--	0	--	1,850				485	407	21	6,410	8.2
Jan. 29, 1959.....	134	40	1,260	--	48	--	2,020				500	460	25	6,890	7.8

CHIKASKIA RIVER NEAR BRAMAN, KAY COUNTY, OKLA.

Oct. 2, 1958.....	88	22	171	184	0	51	338		2.4		310	159	4.2	1,450	8.1
Oct. 17.....	82	24	86	222	18	77	163		1.4		315	116	2.1	940	8.4
Oct. 22.....	87	24	89	222	18	77	163		1.4		315	116	2.2	1,000	8.3
Oct. 29.....	87	29	72	256	0	75	142		.5		332	125	1.7	1,020	8.2
Nov. 3.....	74	27	53	230	12	72	90		.6		295	86	1.4	794	8.4

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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) (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Specific conductance (microhm-cm at 25°C)	pH	
													Residue at 180°C (ppm)	Calculation (ppm)	Tons per acre-foot	Calcium	Non-carbonate			
ARKANSAS RIVER BASIN--Continued																				
BITTER CREEK NEAR BRAMAN, KAY COUNTY, OKLA.																				
Oct. 3, 1958.....				770	160	555		90	0	1,290	1,680			5,530	7.52	2,580	2,510	4.7	7,100	7.4
Oct. 17.....				810	165	572		124	0	1,320	1,750			5,260	7.15	2,700	2,600	4.8	7,340	7.5
Oct. 22.....				860	188	537		228	0	1,320	1,850			6,070	8.26	2,920	2,820	4.3	7,670	7.6
Oct. 29.....				860	196	592		228	0	1,290	1,920			5,890	8.01	2,950	2,760	4.7	7,530	7.7
Nov. 3.....				880	196	607		240	0	1,320	1,950			6,130	8.34	3,000	2,800	4.8	7,750	7.7
BITTER CREEK NEAR SUMPTER, KAY COUNTY, OKLA.																				
Oct. 2, 1958.....				760	171	629		96	0	1,270	1,820			5,290	7.19	2,600	2,520	5.4	7,120	7.5
Oct. 17.....				850	134	746		158	0	1,310	1,950			5,380	7.32	2,620	2,490	6.3	7,360	7.8
Oct. 22.....				860	196	628		148	0	1,320	2,000			6,140	8.35	2,950	2,870	5.0	7,680	7.7
Oct. 29.....				860	179	606		168	0	1,300	1,920			5,450	7.41	2,860	2,740	4.9	7,500	7.7
Nov. 3.....				890	194	618		240	0	1,320	1,980			5,400	7.34	3,020	2,820	4.9	7,720	7.6
7-1520. CHIKASKIA RIVER NEAR BLACKWELL, KAY COUNTY, OKLA.																				
Oct. 2, 1958.....				113	24	198		188	0	74	410	2.9		1,130	1.54	380	226	4.4	1,740	8.2
Oct. 10.....	64.0			60	49	170		120	0	--	375	--		--	--	350	252	4.0	1,440	8.1
Oct. 17.....				130	37	145		218	0	133	335	1.3		974	1.32	475	296	2.9	1,690	8.2
Oct. 22.....				131	36		220	0	133	345	1.0		1,030	1.40	475	294	3.0	1,660	8.1	
Oct. 27.....	46.6			60	54	170		80	0	--	390	--		--	--	370	304	3.8	1,560	7.9
Oct. 29.....				152	42	152		236	0	144	380	.5		1,070	1.46	550	356	2.8	1,800	8.2
Nov. 3.....				116	37	98		114	8	114	225	.4		733	1.00	440	224	2.0	1,320	8.3
Nov. 19.....	260			45	22	46		96	0	--	96	--		--	--	204	126	1.4	678	8.0
Dec. 9.....	89.1			54	31	100		108	0	--	200	--		--	--	260	122	2.7	933	9.0
Dec. 17.....	59.8			32	156			88	0	--	290	--		--	--	340	268	3.7	1,340	7.6
Apr. 5, 1959.....				113	34	91		276	0	133	182	0.3	.5	--	.94	423	199	1.9	1,190	7.6
7-1520.5. CHIKASKIA RIVER NEAR TOKAWA, KAY COUNTY, OKLA.																				
Oct. 1, 1958.....				110	27	160		202	0	82	340	2.5		1,000	1.36	385	220	3.5	1,550	8.2
Oct. 16.....				127	40	124		236	8	128	290	1.1		932	1.27	480	273	2.5	1,500	8.3
Oct. 21.....				134	38	138		236	10	137	310	1.2		966	1.31	490	280	2.7	1,580	8.4
Oct. 28.....	10			144	45	120		244	10	131	320	1.0		1,010	1.37	545	328	2.2	1,740	8.4
Nov. 4.....	12			136	43	114		234	12	155	275	.8		923	1.26	515	303	2.2	1,590	8.4

DUCK CREEK NEAR BLACKWELL, KAY COUNTY, OKLA.

Oct. 2, 1958.....	396	90	86	184	0	1,240	71	1.2	1,980	2.69	1,360	1,210	1.0	2,320	7.8
Oct. 17.....	416	30	232	0	1,320	0	74	.6	2,180	2.96	1,160	970	3.0	2,350	7.8
Oct. 22.....	424	95	86	264	0	1,260	76	1.4	2,070	2.82	1,450	1,230	1.0	2,400	7.9
Oct. 29.....	452	103	80	322	0	1,300	75	.7	2,170	2.95	1,550	1,290	.9	2,500	7.8
Nov. 3.....	444	100	80	276	0	1,310	74	.5	2,140	2.91	1,520	1,290	.9	2,480	7.8

BOIS D'ARC CREEK NEAR KILDARE, KAY COUNTY, OKLA.

Oct. 2, 1958.....	312	61	89	140	0	891	158	1.9	1,680	2.28	1,030	916	1.2	1,980	7.9
Oct. 9.....	314	62	174	286	0	854	170	.4	1,800	2.12	1,040	888	1.0	2,540	7.9
Oct. 17.....	356	66	89	286	0	874	172	.6	1,560	2.30	1,160	950	1.1	2,140	8.0
Oct. 22.....	304	49	149	288	0	779	168	.2	--	2.19	960	724	2.1	2,110	8.1

7-1521.5, BOIS D'ARC CREEK NEAR PONCA CITY, KAY COUNTY, OKLA.

Oct. 1, 1958.....	254	55	97	170	0	690	150	2.2	1,360	1.85	860	720	1.4	1,820	8.0
Oct. 16.....	308	64	112	214	0	825	168	1.8	--	2.15	1,030	854	1.5	2,090	8.0
Oct. 21.....	298	62	80	212	0	744	160	1.7	1,490	2.03	1,000	826	1.1	1,990	8.1
Oct. 28.....	292	51	138	290	0	730	172	.2	--	2.09	940	702	2.0	2,060	8.1

RED ROCK CREEK NEAR GARBBER, GARFIELD COUNTY, OKLA.

Oct. 14, 1958.....	54	14	99	290	0	55	81	1.4	447	0.61	194	0	3.1	714	8.2
Oct. 24.....	54	17	92	310	0	58	64	1.4	438	.60	206	0	2.8	761	8.2
Oct. 30.....	56	17	96	316	0	63	65	1.2	453	.62	208	0	2.9	776	8.2

RED ROCK CREEK NEAR CERES, NOBLE COUNTY, OKLA.

Oct. 15, 1958.....	49	14	45	240	0	25	38	1.1	290	0.39	180	0	1.4	513	8.2
Oct. 23.....	53	16	46	260	0	24	42	1.3	311	.42	198	0	1.4	560	8.2

7-1523.5, RED ROCK CREEK NEAR RED ROCK, NOBLE COUNTY, OKLA.

Oct. 15, 1958.....	46	15	42	298	0	27	37	1.3	280	0.38	176	0	1.4	503	8.1
Oct. 23.....	49	16	44	244	0	30	38	1.3	299	.41	190	0	1.4	539	7.9

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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		Sodium adsorption ratio	Specific conductance (microhmios at 25°C)	pH
														Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium	Non-carbonate			
Oct. 14, 1958.....	13			52	18	80		256	16	60				429	440	0.58	204	0.24	712	8.6	
Oct. 24.....	24			50	19	88		266	16	60				475		.60	204	0.27	743	8.5	
Oct. 30.....	12			56	20	91		290	14	63						.65	220	0.27	773	8.4	
ARKANSAS RIVER BASIN--Continued																					
BLACK BEAR CREEK NEAR SHEA, GARFIELD COUNTY, OKLA.																					
Oct. 14, 1958.....	10			897	275	819		88	0	16	3,590			6,170		8.39	3,370	3,300	6.1	10,700	7.7
Oct. 24.....	6.5			1,280	362	1,290		123	0	19	5,220			9,080		12.35	4,680	4,680	8.2	15,000	7.5
BLACK BEAR CREEK NEAR GARBER, GARFIELD COUNTY, OKLA.																					
Oct. 15, 1958.....	12			87	52	192		218	0	40	445			1,020		1.39	430	252	4.0	1,880	8.1
Oct. 23.....	12			76	57	201		232	0	49	440			1,010		1.37	425	235	4.2	1,880	8.1
BLACK BEAR CREEK NEAR MORRISON, NOBLE COUNTY, OKLA.																					
Oct. 15, 1958.....	12			63	49	148		338	14	41	240					734	360	60	3.4	1,330	8.4
Oct. 23.....	10			51	48	160		304	16	50	245					730	326	50	3.9	1,350	8.5
7-1545. CIMARRON RIVER NEAR KENTON, CIMARRON COUNTY, OKLA.																					
Oct. 6, 1958.....	1.14			66	96	284		308	0		60						560	308	5.2	1,930	8.0
Oct. 27.....	2.08			70	89	282		348	0		60						540	255	5.3	2,040	8.0
Nov. 21.....	2.23			70	101	273		384	0	60	60						590	276	4.9	1,990	8.1
Dec. 8.....	2.51			66	96	274		372	0	60	60						560	255	5.0	1,920	8.1
Dec. 18.....	3.14			45	59	192		256	0	34							355	145	4.4	1,430	8.1
Jan. 7, 1959.....	5.54			59	110	258		388	0	60							600	282	4.6	1,910	8.2

7-1575. CROOKED CREEK NEAR NYE, MEADE COUNTY, KANS.

Oct. 24, 1958.....	4.83		105	36	623	228	0	1,020		410	223	13	3,750	8.1
Nov. 18.....	14.9		92	29	520	218	0	825		350	172	12	3,080	8.0

7-1580. CIMARRON RIVER NEAR WAYNOKA, WOODS COUNTY, OKLA.

Oct. 21, 1958.....	3.83		303	149	---	61	0	13,600		1,370	1,320	---	36,200	7.9
Nov. 4 a.....	---		315	152	8,770	205	0	13,800		1,330	1,560	105	38,500	8.0
Nov. 4 b.....	---		315	157	8,740	201	0	13,900		1,430	1,270	100	38,500	8.0
Nov. 4 c.....	25.8		178	134	---	91	0	12,700		987	822	---	53,800	8.0
Dec. 2.....	111		131	89	---	151	0	9,760		1,980	1,086	---	50,500	7.9
Dec. 16.....	111		---	---	---	160	0	15,900		1,430	1,250	---	57,500	7.8
Dec. 7, 1959.....	119		---	---	---	160	0	25,900		1,490	1,350	---	67,280	7.8
Jan. 8, 1959.....	894		286	56	1,010	112	0	6,710		944	830	---	19,800	7.9
Jan. 8.....	1,480		282	71	---	139	0	10,500		1,110	950	---	29,100	8.0
May 5.....	1,480		282	71	---	139	0	10,500		1,110	950	---	29,100	8.0
May 20.....	191		281	112	---	196	0	10,500		1,110	950	---	29,100	8.0

7-1581. EAGLE CHIEF CREEK NEAR ALINE, ALFALFA COUNTY, OKLA.

Oct. 21, 1958.....	4.47		70	57	71	94	0	40		410	333	1.5	1,010	8.2
Mar. 24, 1959.....	5.31		174	161	108	138	0	68		859	738	1.6	1,780	8.1
May 20.....	8.08		182	66	78	188	0	50		675	558	1.3	1,420	8.1

DEEP CREEK NEAR OKEENE, BLAINE COUNTY, OKLA.

Nov. 4, 1958.....			316	168	347	380	0	1,520	240	1.9	4.12	1,480	1,170	3.9	3,490	8.2
Jan. 16, 1959.....			243	169	318	98	0	1,560	200	0.6	3.8	1,300	1,220	3.8	3,180	8.1
									3,030	2,540						

TURKEY CREEK NEAR DRUMMOND, GARFIELD COUNTY, OKLA.

Dec. 3, 1958.....	1.24		66	111	900	136	6	1,480		620	498	16	5,290	8.4
Jan. 1, 1959.....	3.51		70	121	972	124	4	1,589		670	562	16	5,740	8.4
Mar. 24.....	56.2		47	99	264	224	10	723		400	250	2.2	2,780	8.5
Apr. 14.....	68.93		58	31	200	231	6	252		354	5.7	1,380	8.7	
May 6.....	346		24	35.4	198	106	18	252		280	42	1.2	3,310	8.2
May 20.....	1.26		75	38.4	266	266	---	435		342	88	7.0	2,010	8.4
May 8.....	1.64		67	40	335	222	20	495		332	100	8.0	2,160	8.6
June 24.....	7.26		38	12	387	122	2	138		146	42	3.1	744	8.3

a North channel.

b South channel.

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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		Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)			
													Residue at 180°C (ppm)	Calc. (ppm)	Calcium	Non-carbonate		Tons per acre-foot		
ARKANSAS RIVER BASIN--Continued																				
KINGFISHER CREEK NEAR KINGFISHER, KINGFISHER COUNTY, OKLA.																				
Nov. 4, 1958.....				70	76	303		248	0	315		0.6				485	282	6.0	2,480	8.2
Feb. 4, 1959.....				140	74	304		302	0	340		4.6				655	408	5.2	2,390	8.0
DEAD INDIAN CREEK NEAR KINGFISHER, KINGFISHER COUNTY, OKLA.																				
Nov. 4, 1958.....				68	49	191		280	0	128		0.2				370	140	4.3	1,600	8.2
Feb. 4, 1959.....				88	58	221		292	0	180		4.4				460	220	4.5	1,680	8.2
COTTONWOOD CREEK NEAR GUTHRIE, LOGAN COUNTY, OKLA.																				
Oct. 8, 1958.....	20.2			42	50	136		130	6	118						312	196	3.4	1,130	8.4
Nov. 18.....	16.0			140	5.0	130		226	10	114						370	568	2.9	1,330	8.3
Jan. 26, 1959.....	25.2			53	52	139		136	4	116						324	186	2.9	1,330	8.4
Feb. 16.....	21.5			53	47	132		184	8	104		0.3	5.2		698	330	166	3.2	1,140	8.5
Mar. 9.....	26.2			91	55	127		286	10	112						455	204	2.6	1,300	8.4
Apr. 14.....	20.3			126	56	150		300	42	150						545	229	2.8	1,450	8.7
June 6.....	14.8			78	40	98		210	12	93						360	168	2.2	1,020	8.5
Aug. 19.....	.16			40	39	86		200	16	100						260	70	2.4	926	8.5
SNOW CREEK NEAR LENAPAH, NOWATA COUNTY, OKLA.																				
May 7, 1959.....		4.0		80	7.4	20		2.4	0	37		0.2	0.1	0.06		230	46	0.6	485	7.7
May 12.....		7.5		67	6.6	20		2.2	192	0	33					194	36	.7	461	7.8
May 20.....						18			188	0	24					182			410	7.9
May 28.....						11			136	0	8.0					122			266	7.5
7-1710. VERDIGRIS RIVER NEAR LENAPAH, NOWATA COUNTY, OKLA.																				
Apr. 29, 1959.....	596					63		212	0	112						258			756	8.2
May 6, 8.....	459	3.0		86	19	69		310	0	67		0.3	1.4	0.15		392	114	1.8	882	7.7
May 11.....	883	4.0		89	15	58		216	0	55		.3	3.2			322	114	1.6	787	8.2
May 12.....	703			87	18	56		200	0	473			3.0			262	85	1.6	730	8.2
May 13-15.....	504			53	3.6	200		3.6	200	0	56					242	78	1.6	730	8.2
May 13-15.....	7.2			66	18	53		3.6	196	0	57		2.2	1.0	462	238	78	1.5	702	8.0
May 18.....	8,300					28		220	0	108						266			760	8.1
May 19.....	12,410					29		148	0	54						160			441	7.5
May 20.....	12,800					20		108	0	24						102			272	7.6
May 21.....	10,460	8.0		38	6.6	22		3.2	112	0	21		3.3		212	30	.9	349	7.7	
May 22.....	11,760					33		128	0	65						178			466	7.8
May 25.....	2,940					31		148	0	58						178			462	7.9
May 28.....	2,620					25		120	0	44						136			382	7.6
May 29.....	3,020					30		172	0	54						186			501	8.0

CALIFORNIA CREEK NEAR LENAPAH, NOWATA COUNTY, OKLA.

Apr. 29, 1959.....	1.2		35	10	94	--	144	0	181	234	56	869	8.1
May 12.....					50	--	90	0	92	130		513	6.9

CALIFORNIA CREEK NEAR NOWATA, NOWATA COUNTY, OKLA.

Apr. 29, 1959.....	2.1				152	--	140	0	375	346	--	1,480	7.9
May 7.....	4.0		91	--	132	4.1	134	0	53	178	214	3.2	1,280
May 12.....			62	14	92	3.8	98	0	51	1.78	214	3.2	1,280
May 13-16.....	8.4		85	18	127	4.6	116	0	53	1.09	284	1.9	1,273
May 19.....					53	--	72	0	--	1.09	189	3.3	1,210
May 21.....	13		75	16	110	5.6	108	0	33	1.36	--	--	1,530
May 26.....					139	--	124	0	--	.93	164	3.0	1,070
May 27.....					46	--	76	0	--	--	320	--	1,360
May 28.....					85	--	112	0	--	--	114	--	426
											184	--	781

BIG CREEK NEAR CHILDERS, NOWATA COUNTY, OKLA.

Apr. 29, 1959.....	26.3				10	--	148	0	8.0	152		332	8.0
Apr. 30.....	19.3				9.0	--	176	0	9.0	182		410	8.1
May 12.....	7.5	62	4.3		7.2	2.1	184	0	33	0.31	172	21	350
May 20.....					8.7	--	196	0	4.0		172		346
May 28.....					7.7	--	148	0	5.0		138		287

BIG CREEK NEAR NOWATA, NOWATA COUNTY, OKLA.

Apr. 30, 1959.....					14	--	160	0	17	160		394	7.8
May 7.....	4.0		82	9.6	14	2.4	242	0	39	0.55	244	46	347
May 12.....			63	4.2	11	2.4	184	0	23	.32	170	19	358
May 13-15.....	5.8		70	5.2	12	2.4	212	0	28	.37	196	22	411
May 19.....					18.4	--	112	0	--	1.4	112	--	229
May 20.....					10.8	--	128	0	5.0	--	132	--	287
May 21.....	13		54	5.2	8.2	2.5	166	0	19	.27	156	20	325
May 26.....					17	--	204	0	26	--	164	--	494
May 27.....					12	--	112	0	7.0	--	104	--	231
May 28.....					9.3	--	164	0	6.0	--	146	--	304

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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) (B)	Dissolved solids			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH
														Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium	Magnesium			
ARKANSAS RIVER BASIN--Continued																					
SALT CREEK NEAR ALLUWE, NOWATA COUNTY, OKLA.																					
Apr. 30, 1959.....		--				15	--	184	0	--	25				--	192	--	--	--	417	7.7
May 7.....		2.5		67	6.6	16	2.3	178	0	34	27	0.2	0.2	0.08	283	0.38	194	48	0.5	420	7.6
May 12.....		--		51	2.7	10	2.5	148	0	20	10	--	1.9	--	204	0.28	138	16	0.4	303	7.7
May 13-15.....		9.0		61	2.9	13	2.4	172	0	24	16	2.4	4.0	0.04	236	0.32	164	23	--	359	7.9
May 19.....		--		--	--	--	5.9	104	0	--	--	--	--	--	--	90	--	--	--	182	7.6
May 20.....		--		--	--	--	5.9	108	0	--	4.0	--	--	--	--	116	--	--	--	224	7.6
May 21.....		12		42	2.2	5.3	2.4	126	0	13	6.0	2.5	--	154	0.21	115	10	0.2	243	7.5	
May 26.....		--		--	--	12	--	180	0	--	15	--	--	--	--	174	--	--	--	364	8.2
May 27.....		--		--	--	--	9.8	124	0	--	12	--	--	--	--	114	--	--	--	257	7.7
May 28.....		--		--	--	9.4	--	152	0	--	8.0	--	--	--	--	144	--	--	--	292	7.9
LIGHTNING CREEK NEAR HAYDEN, NOWATA COUNTY, OKLA.																					
Apr. 30, 1959.....	6.6					15	--	124	0		14					268				590	7.8
May 26.....						13	--	164	0		12					328				651	7.8
May 27.....						10	--	140	0		3.0					206				421	7.9
May 28.....						10	--	168	0		6.0					246				491	7.7
LIGHTNING CREEK NEAR ALLUWE, NOWATA COUNTY, OKLA.																					
Apr. 30, 1959.....						49	--	176	0	--	121					372				858	7.9
May 7.....		3.0		117	20	83	3.5	168	0	155	168	0.3	0.4	0.16	714	0.97	374	236	1.9	1,050	7.6
May 12.....		--		74	11	31	3.1	124	0	108	58	--	2.8	--	420	0.57	228	126	0.9	583	7.9
May 13-15.....		11		90	13	46	3.1	152	0	120	68	4.4	4.07	--	496	0.67	276	132	1.2	739	7.9
May 19.....		--		--	--	--	15	120	0	--	28	--	--	--	--	164	--	--	--	388	7.5
May 20.....		--		--	--	--	15	132	0	--	50	--	--	--	--	170	--	--	--	448	7.7
May 21.....		10		64	7.9	32	2.6	120	0	70	66	3.3	4.4	--	328	0.45	362	94	1.0	831	8.0
May 26.....		--		--	--	56	--	180	0	--	114	--	--	--	--	262	--	--	--	807	7.9
May 27.....		--		--	--	61	--	132	0	--	115	--	--	--	--	212	--	--	--	696	7.7
May 28.....		--		--	--	63	--	128	0	--	109	--	--	--	--	212	--	--	--	696	7.7

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

Date of collection	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		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)		
														Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium, Magnesium		Non-carbonate	
ARKANSAS RIVER BASIN--Continued																				
CANEY RIVER NEAR COLLINSVILLE, TULSA COUNTY, OKLA.																				
Apr. 29, 1959.....						62	--	212	0	43	122	0.3	3.0	0.16	--	280	126	--	763	7.6
May 7.....	865	1.5		92	16	77	3.9	208	0	43	164				0.82	296	126	--	915	7.4
May 12.....	696	--		50	10	85	4.8	86	0	36	166				.66	168	98	--	745	7.4
May 13-15.....	9,800	7.8		56	11	89	4.3	110	0	36	172	.4	3.7	.00	.71	184	94	--	801	7.4
May 19.....	4,570	--		--	--	19	--	64	0	--	36	--	--	--	--	--	--	--	246	7.3
May 20.....	5,560	--		--	--	47	--	60	0	--	65	--	--	--	--	116	--	--	417	7.5
May 21.....	6,730	--		43	6.0	23	3.6	128	0	16	43	.4	2.9	--	.30	132	27	--	377	7.9
May 26.....	10,600	10		--	--	56	--	148	0	--	122	--	--	--	--	206	--	--	649	8.1
May 27.....	5,920	--		--	--	55	--	100	0	--	113	--	--	--	--	130	--	--	538	7.1
VERDIGRIS RIVER NEAR CLAREMORE (HIGHWAY 20 BRIDGE), ROGERS COUNTY, OKLA.																				
Apr. 30, 1959.....						62	3.6	196	2	50	132	--	0.4	0.5	0.09	260	96	--	799	8.3
May 7, 8.....	905	2.5		82	18	77	2.9	208	0	46	135				.66	284	110	--	853	8.1
May 11.....	9,800	1.5		33	5.2	31	4.0	208	0	19	111	.3	1.2	--	.74	284	115	--	853	7.8
May 12.....	4,570	--		52	9.8	57	4.1	172	0	39	171				.39	164	115	--	906	7.6
May 13-15.....	1,862	7.4		62	11	66	3.8	136	0	42	132				.57	170	75	--	926	7.8
May 18.....	5,560	--		--	--	58	4.0	188	0	42	117	.3	.5	.14	.65	198	86	--	728	7.9
May 19.....	15,270	--		--	--	32	3.4	108	0	--	65	--	--	--	.60	236	82	--	742	8.2
May 20.....	19,890	--		--	--	34	3.8	126	0	69	69	--	--	--	.36	136	48	--	443	8.0
May 21.....	18,900	9.0		40	4.9	21	3.4	116	0	16	38	.4	2.9	--	.40	144	40	1.2	463	8.0
May 22.....	16,040	--		--	--	22	3.7	118	0	42	42	--	--	--	.29	120	25	8.8	338	7.9
May 25-26.....	5,560	--		--	--	35	3.1	140	0	--	72	--	--	--	.31	126	30	1.2	501	7.9
May 27.....	6,730	--		--	--	53	4.6	138	0	--	105	--	--	--	.39	168	54	1.2	501	7.9
May 28.....	10,600	--		--	--	40	4.1	100	0	--	86	--	--	--	.51	174	61	1.8	612	8.0
May 29.....	5,920	--		--	--	35	4.1	122	0	--	72	--	--	--	.40	134	52	1.5	479	7.5
May 29.....	5,920	--		--	--	35	4.1	122	0	--	72	--	--	--	.42	144	44	1.3	506	8.1
7-1910. BIG CABIN CREEK NEAR BIG CABIN, CRAIG COUNTY, OKLA.																				
Oct. 30, 1958.....	1.15			45	7.7	11	--	142	0	12	12					144	28	0.4	280	8.0
Dec. 4.....	6.37			34	5.6	13	--	68	0	11	11					108	52	.5	276	7.1

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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			Hardness as CaCO ₃		Specific conductance (microhmios at 25°C)	
														Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium Magnesium	Non-carbonate		
ARKANSAS RIVER BASIN--Continued																				
SPRING CREEK NEAR LOCUST GROVE, MAYES COUNTY, OKLA.																				
Oct. 8, 1958.....		--		33	0.6	0.5		98	0	1.6	2.6	--	0.8	111	0.15	85	4	0.0	170	7.8
Nov. 6, 1958.....		--		34	2.1	0.9		100	0	1.6	2.8	--	0.8	115	0.16	86	4	0.0	172	7.9
Jan. 9, 1959.....		16		27	2.1	3.4		82	0	3.3	5.3	0.0	0.8	101	0.14	76	4	0.2	155	8.0
Feb. 7, 1959.....		--		--	--	--		88	0	--	--	--	0.34	--	--	68	1	--	148	8.1
Mar. 6, 1959.....		12		--	--	--		88	0	--	--	--	0.00	--	--	72	0	--	146	8.0
Apr. 8, 1959.....		--		--	--	--		78	0	--	--	--	--	--	--	74	10	--	154	8.0
May 7, 1959.....		--		--	--	--		88	0	--	6.0	0.0	--	--	--	76	4	--	169	7.9
BALLARD CREEK AT BALLARD, ADAIR COUNTY, OKLA.																				
Oct. 8, 1958.....		--		46	0.2	1.2		134	0	1.6	3.1	--	3.3	148	0.20	116	6	0.0	226	8.2
Nov. 6, 1958.....		--		46	2.2	1.2		142	0	2.1	3.8	--	2.9	163	0.22	124	8	0.0	242	8.2
Dec. 4, 1958.....		7.5		46	1.7	1.2		132	0	4.9	3.6	0.2	3.3	--	0.18	118	10	0.0	235	8.2
Jan. 10, 1959.....		10		45	1.8	1.6		134	0	3.7	4.3	0.0	4.5	138	0.19	120	10	0.1	251	8.2
Feb. 7, 1959.....		--		--	--	--		126	0	--	--	--	--	--	--	116	17	--	228	8.2
Mar. 6, 1959.....		11		--	--	--		60	0	--	--	--	0.02	--	--	98	12	--	174	7.9
Apr. 8, 1959.....		--		--	--	--		92	0	--	--	--	0.46	--	--	98	12	--	179	7.9
May 7, 1959.....		--		--	--	--		121	0	--	3.5	0.0	--	--	--	99	0	--	214	8.0
FLINT CREEK NEAR KANSAS, DELAWARE COUNTY, OKLA.																				
Nov. 4, 1958.....	23.0			34	1.7	4.8		84	14		9.0					92	0	0.2	192	8.5
June 2, 1959.....	93			--	--	--		102	0	4.0	0.0		2.4			85	2	--	185	7.3
July 2, 1959.....	30			38	1.7	6.4		122	0	1.6	6.0			115	0.16	98	0	0.3	215	8.2
Aug. 6, 1959.....	46			34	1.2	--		114	0	6.5						90	0	--	212	7.8
Sept. 2, 1959.....	19			38	1.7	--		116	0	7.0						98	3	--	208	7.8
EVANSVILLE CREEK NEAR EVANSVILLE, WASHINGTON COUNTY, ARK.																				
Oct. 7, 1958.....		--		37	1.3	3.9		116	0	4.5	4.6	--	0.5	132	0.18	98	3	0.2	205	7.7
Nov. 5, 1958.....		--		41	4.4	2.3		124	0	4.5	2.0	0.2	1.1	118	0.16	104	2	0.1	208	8.0
Dec. 3, 1958.....		12		29	1.9	3.7		82	0	3.7	4.3	--	0.6	--	0.12	76	9	0.0	157	8.0
Jan. 9, 1959.....		10		26	1.7	3.9		84	0	4.5	4.4	--	1.0	92	0.13	72	3	12	150	7.9
Feb. 5, 1959.....		10		26	1.2	1.4		80	0	2.1	3.5	--	0.5	88	0.12	70	4	1	152	8.0
Mar. 5, 1959.....		7.4		26	1.2	1.4		36	0	--	--	--	0.03	--	--	26	0	--	71	7.5
Apr. 6, 1959.....		--		--	--	--		70	0	--	--	--	--	--	--	68	10	--	149	7.8
May 6, 1959.....		--		--	--	--		90	0	--	2.0	0.0	--	--	--	76	2	--	159	7.9

WALNUT CREEK AT PURCELL, McCLAIN COUNTY, OKLA.

June 9, 1959.....	41	49	37	--	332	10		26					302	14	0.9	613	8.5
Sept. 14.....	22	53	44	--	292	12		34					272	12	1.2	616	8.6

LITTLE RIVER NEAR NORMAN, CLEVELAND COUNTY, OKLA.

Jan. 12, 1959.....	10	61	1.2		268	20	0.0	15	3.1	242		0.33	274	21	0.0	485	8.7
Apr. 13.....	9.6	60	13		268	32	.0	18	1.0	268		.36	272	0	.3	522	8.8

LITTLE RIVER BELOW HOG CREEK NEAR NORMAN, CLEVELAND COUNTY, OKLA.

Jan. 12, 1959.....	11	48	37		212	20	21	52	1.2	318		0.43	224	17	1.1	564	8.7
Apr. 13.....	13	50	38		238	20	19	50	1.2	324		.44	238	10	1.1	603	8.7

LITTLE RIVER NEAR TECUMSEH, POTTAWATOMIE COUNTY, OKLA.

Nov. 19, 1958.....	18	46	136	--	212	16	--	200	--	--		--	236	36	3.9	1,020	8.6
Dec. 17.....	21	44	172	--	200	16	--	250	--	--		--	232	42	4.9	1,190	8.6
Jan. 19, 1959.....	16	49	86	--	192	18	38	142	0.8	499		0.68	240	52	2.4	879	8.6
Apr. 13.....	18	54	88	--	224	24	31	142	1.2	482		.66	265	42	2.4	877	8.7

LITTLE RIVER NEAR MAUD, POTTAWATOMIE COUNTY, OKLA.

Jan. 12, 1959.....	24	63	175		158	12	41	360	1.9	900		1.22	320	170	4.3	1,540	8.6
Apr. 13.....	24	52	165		170	14	44	300	3.3	739		1.01	275	112	4.3	1,290	8.5

LITTLE RIVER NEAR BOWLEGS, SEMINOLE COUNTY, OKLA.

Jan. 12, 1959.....	20	57	152		164	12	35	300	1.4	766		1.04	285	130	3.9	1,280	8.5
Apr. 13.....	24	51	110		196	14	32	205	2.8	683		.93	270	86	2.9	1,150	8.6

SALT CREEK SOUTHWEST OF PEARSON, POTTAWATOMIE COUNTY, OKLA.

Nov. 6, 1958.....	9.6	50	132		290	36	124	64	0.8	597		0.81	230	0	3.8	1,030	8.9
Jan. 13, 1959.....	9.6	40	102		252	24	99	42	3.6	463		.63	190	0	3.2	787	8.9
Apr. 17.....	12	40	136		240	32	127	75	1.1	572		.78	194	0	4.2	956	8.9

SALT CREEK NEAR PEARSON, POTTAWATOMIE COUNTY, OKLA.

Oct. 28, 1958.....	42	83	360	--	140	6		715	--	--		--	445	320	7.4	2,560	8.4
Nov. 6.....	39	89	322	--	146	10		645	1.4	1,430		1.94	465	329	6.5	2,500	8.6
Dec. 17.....	25	69	281	--	160	10		530	--	--		--	356	208	6.5	2,020	8.5
Apr. 17, 1959.....	49	41	185		170	12	57	335	3.0	885		1.20	292	132	4.7	1,530	8.6

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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) (NO ₃) (B)	Dissolved solids		Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)			
													Residue at 180°C (ppm)	Calculated (ppm)	Calcium	Non-carbonate		Total	Non-carbonate	
ARKANSAS RIVER BASIN--Continued																				
SALT CREEK NEAR ST. LOUIS, POTTAWATOMIE COUNTY, OKLA.																				
Nov. 6, 1958.....				557	302	2,940		50	0	42	6,340			12,200	16.59	2,630	2,590	25	18,800	7.8
Jan. 13, 1959.....				339	290	2,040		54	0	68	4,510			8,050	10.95	2,040	2,000	20	13,100	8.0
Apr. 17.....				280	151	1,330		116	10	35	2,880			5,540	7.53	1,320	1,210	16	9,150	8.4
SALT CREEK NEAR DEWRIGHT, SEMINOLE COUNTY, OKLA.																				
Nov. 6, 1958.....	5.56			871	405	5,360		48	0	89	10,900			21,400	29.10	3,840	3,800	38	28,300	7.8
Nov. 19.....				200	91	1,220		84	0	--	2,280			--	--	875	806	18	6,890	8.1
Jan. 13, 1959.....				329	248	1,940		54	0	49	4,230			6,820	9.28	1,840	1,800	20	12,500	8.0
Apr. 17.....				300	134	1,410		120	4	28	3,000			5,500	7.48	1,300	1,200	17	8,760	8.3
NORTH CANADIAN RIVER NEAR GUYMON, TEXAS COUNTY, OKLA.																				
Oct. 22, 1958.....	4.78			40	31	34		--	262	0	17					228	14	1.0	551	8.2
Nov. 21.....	11.5			42	34	31		--	292	0	18					244	4	.9	527	8.1
Dec. 18.....	9.05			43	28	29		--	254	0	17					254	16	.8	499	8.1
COLDWATER CREEK NEAR HARDESTY, TEXAS COUNTY, OKLA.																				
Oct. 7, 1958.....	1.77			66	48	52		--	238	0	40					360	165	1.2	855	8.0
Oct. 21.....	1.85			63	48	53		--	228	0	40					355	168	1.2	855	8.1
Nov. 25.....	5.61			59	42	49		--	228	0	36					320	133	1.2	791	8.2
Dec. 2.....	6.07			70	44	50		--	258	0	35					355	144	1.2	827	8.1
Dec. 12.....	4.18			60	49	55		--	238	0	42					350	155	1.3	868	8.1
Dec. 19.....	5.96			62	44	46		--	238	0	34					335	140	1.1	786	8.2
Feb. 2, 1959.....	21.4			59	33	46		--	206	0	37					284	115	1.2	716	7.6
Feb. 16.....	7.03			42	46	50		--	174	0	38					295	152	1.3	729	8.2
Feb. 27.....	6.65			66	49	48		--	254	0	40					365	157	1.1	826	8.2
Mar. 2.....	5.44			70	46	49		--	256	0	40					365	155	1.1	848	8.2
PALO DURO CREEK NEAR RANGE, TEXAS COUNTY, OKLA.																				
Oct. 21, 1958.....	2.11			102	46	315		--	232	0	475					445	255	6.5	2,210	8.2
Dec. 19.....	13.6			75	35	160		--	236	0	240					330	136	3.8	1,370	8.2
Feb. 16, 1959.....	7.99			92	46	192		--	224	4	335					420	230	4.1	1,760	8.3
Apr. 1.....	6.10			89	47	186		--	236	0	355					415	222	4.0	1,610	8.2

NORTH CANADIAN RIVER AT BEAVER, BEAVER COUNTY, OKLA.

Nov. 24, 1958....	30.7	64	317	--	232	0	475		450	260	6.5	2,250	8.1
Jan. 13, 1959....	98.8	41	261	--	236	16	410		390	170	5.7	1,870	8.4

NORTH CANADIAN RIVER NEAR WOODWARD, WOODWARD COUNTY, OKLA.

Nov. 12, 1958....	12.9	55	193	--	220	0	255		540	360	3.6	1,410	7.7
Dec. 11.....	12.4	55	272	--	304	0	395		600	351	4.8	1,840	8.1

NORTH CANADIAN RIVER NEAR SEILING, DEWEY COUNTY, OKLA.

Oct. 21, 1958 ...	12.8	61	161	--	116	0	220		450	355	3.3	1,480	8.1
Nov. 12.....	9.21	68	156	--	92	0	210		470	394	3.1	1,460	8.1
Dec. 16.....	18.0	71	195	--	116	0	275		510	413	3.8	1,740	8.0

DRY CREEK NEAR KENDRICK, LINCOLN COUNTY, OKLA.

Nov. 21, 1958....	0.44	15	38	43	--	186	14	59	192	16	1.3	519	8.7
Mar. 9, 1959....	1.02	17	32	29	--	182	10	36	174	8	1.0	454	8.6
Apr. 21.....	2.31	35	20	17	--	178	10	18	170	8	.6	361	8.6
June 5.....	57.8	21	14	10	--	108	0	12	112	24	.4	222	8.2
June 15.....	4.04	22	35	33	--	194	6	56	198	29	1.0	513	8.6
July 1.....	63.6	38	13	22	--	149	3	42	148	21	.8	384	8.4
Aug. 17.....	2.61	19	37	29	--	186	16	44	200	20	.9	499	8.5

LITTLE SALLISAW CREEK NEAR SALLISAW, SEQUOYAH COUNTY, OKLA.

June 3, 1959....	9.4	--	11	11	16	0	55	3.4	0.2	6.5	--	162	6.2
July 12.....		48	20	66	124	0	215	12	8.0		428	2.0	655
Aug. 9.....		29	12	--	74	0	--	13			120	60	393
Sept. 13.....		55	26	76	152	0	255	13			244	120	759

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)	pH		
															Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium	Non-carbonate					
ARKANSAS RIVER BASIN--Continued																								
CACHE CREEK NEAR KOTYA (HIGHWAY 9 BRIDGE), HASKELL COUNTY, OKLA.																								
Oct. 6, 1958.....				8.0	0.5	9.4		32	0	8.2	5.4		0.4			76	0.10	22	0	0.9	87	7.4		
Nov. 4.....	20			9.6	4.4	9.9		56	0	5.8	8.2		.1			86	.12	42	0	.7	135	7.9		
Nov. 6.....				--	--	272		204	0	--	7.8		--			--	--	560	393	5.0	1,830	8.1		
CAMP CREEK NEAR MULBROW, SEQUOYAH COUNTY, OKLA.																								
Oct. 3, 1958.....				11	2.6	11		40	0	19	5.8		--			93	0.13	38	5	0.8	124	7.5		
Nov. 3.....				9.6	3.9	9.7		40	0	19	3.8		0.2	1.1		79	.11	40	17	.7	165	7.8		
Dec. 2.....	12			7.2	3.4	6.0		22	0	19	4.4		--	1.0		65	.09	32	14	.5	127	7.5		
Jan. 7, 1959.....	10			5.8	4.4	6.9		23	0	23	6.4		2.4			72	.10	48	25	--	130	7.3		
Feb. 3.....				--	--	--		23	0	--	--		2			--	--	48	14	--	118	7.7		
Mar. 3.....	12			--	--	--		20	0	--	--		3			--	--	30	14	--	84	7.3		
Apr. 3.....				--	--	--		28	0	--	5.5		3			.37	--	38	13	--	108	7.4		
May 3.....				--	--	--		28	0	--	5.0		1			--	--	34	12	--	104	7.3		
June 13.....				--	--	--		28	0	--	5.0		1			--	--	34	12	--	104	7.3		
7-2475. FOURCHE MALINE NEAR RED OAK, LATIMER COUNTY, OKLA.																								
Oct. 7, 1958.....	4.20			8.0	4.4	22		48	0	19	6.0		--					38	0	1.6	191	7.8		
Dec. 3.....	33.5			8.0	4.4	15		440	0	19	6.0		--					38	5	1.1	153	6.7		
Dec. 29.....	8.27			10	8.5	17		60	0	19	7.5		--					38	11	1.0	182	8.0		
Apr. 7, 1959.....	66			6.4	2.7	10		26	0	23	5.9		1.4					27	6	1.8	114	7.1		
May 5.....	23			9.6	2.9	18		42	0	23	7.0		2.0					36	2	1.3	139	7.5		
May 11.....	6,690			2.8	1.0	1.1		4	0	23	2.3		1.1					11	8	1.2	256	5.9		
June 4.....	7.0			14	5.8	27		58	0	19	9.3		3					39	12	1.3	256	7.7		
June 30.....	1.0			17	4.0	26		76	0	19	8.8		1					39	0	1.0	175	7.0		
Sept. 9.....	7.0			6.4	4.1	23		50	0	19	8.8		1					33	0	1.7	175	7.0		
LITTLE LEE CREEK NEAR NICUT, SEQUOYAH COUNTY, OKLA.																								
June 9, 1959.....				17	1.3	0.9		52	0	5.8	1.0		0.0	0.0				52	0.07	6	0.1	105	7.5	
Aug. 16.....	19			2.1	2.1	4.8		64	0	2.5	3.4		3.3	0.13				61	.08	4	.1	123	7.8	
Sept. 12.....				17	5.2	4.8		64	0	14	3.7		3.3					79	.11	64	12	.3	130	7.5

EAST AMARILLO CREEK NEAR AMARILLO, TEX.

Oct. 1, 1958.....	14.7	54		58	31	121	277	82	104	3.3	85	272	45	3.2	1,150	8.0
Dec. 3.....	12.1	48		54	37	137	384	156	122	2.6	94	286	0	4.8	1,340	7.6
Jan. 7, 1959.....	13.5	57		56	35	148	338	82	180	2.9	0	249	0	4.2	1,070	7.7
Feb. 3.....	18.73	54		50	31	155	446	93	106	3.0	5	252	0	4.5	1,230	7.8
Mar. 5.....	15.05	74		56	37	192	530	93	110	2.9	3.2	275	0	4.1	1,200	7.7
Apr. 28.....	12.6	62		58	34	156	463	99	198	3.1	.0	277	0	5.0	1,290	7.9
May 27.....	12.7	59		52	33	129	276	96	104	2.5	.82	284	0	4.0	1,190	7.9
June 12.....	13.0	64		54	36	150	420	83	112	3.0	16	282	0	3.4	1,230	7.8
														3.9	1,210	7.6

c Residue at 180°C.

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (B)	Dissolved solids			Hardness as CaCO ₃		Sodium adsorption ratio	Specific conductance (microhmhos at 25°C)	pH	
													Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot	Calcium, Magnesium	Non-carbonate				
RED RIVER BASIN IN OKLAHOMA																					
7-3015. NORTH FORK RED RIVER NEAR CARTER, BECKHAM COUNTY																					
Jan. 13, 1959...	--			192	83	227		156	657	355		1.9		1,690	2.30		820	692	3.5	2,370	7.8
Apr. 23.....	18.2			238	88	298		88		390				955	893	4.2	955	893	4.2	2,870	7.7
June 23.....	2,090			166	39	154		172		240				575	434	2.8	575	434	2.8	1,710	7.8
7-3050. NORTH FORK RED RIVER NEAR HEADRICK, JACKSON COUNTY																					
Feb. 5, 1959....	25.7			410	150	--		197		4,870							1,640	1,480	--	15,600	7.9
Feb. 25.....	14.3			465	153	--		175		5,460							1,790	1,650	--	17,000	7.8
Mar. 18.....	13.18			461	170	--		119		5,360							1,850	1,750	--	16,900	7.6
Apr. 28.....	13.7			493	98	--		122		2,690							1,840	1,440	--	10,100	7.6
May 14.....	26.0			481	22	176		118		600							580	575	3.3	10,300	7.4
July 1.....	30.0			218	33	339		144		600							500	525	6.4	2,930	8.1
July 8.....	332			154	28	228		144		348							500	382	4.4	1,930	7.4
CACHE CREEK NEAR LAWTON, COMANCHE COUNTY																					
Apr. 7, 1959....				66	21	75		244	14	44	90	0.5	19	554	0.75		250	26	2.0	806	8.5
Apr. 27.....				70	18	53		228	16	63	52	16		468	.64		250	36	1.5	685	8.6
Apr. 28.....				128	38	104		222	4	217	200	5.2		886	1.20		475	286	2.1	1,330	8.4
7-3110. CACHE CREEK NEAR WALTERS, COTTON COUNTY																					
Apr. 9, 1959....				31	18	105		198	10	43	95	0.3	26	518	0.70		150	0	3.7	773	8.5
Apr. 28.....				92	27	75		208	14	140	110	11		645	.88		340	146	1.8	962	8.6
DEEP RED RUN NEAR TAYLOR, COTTON COUNTY																					
Mar. 13, 1959....				46	47	369		200	10	197	515	1.2		1,390	1.86		310	130	9.1	2,250	8.5
Apr. 28.....				66	23	115		180	10	72	190	2.4		637	.87		260	96	3.1	1,100	8.5
CACHE CREEK NEAR TAYLOR, COTTON COUNTY																					
Apr. 9, 1959....				55	23	148		226	16	41	208	0.5	6.5	676	0.92		340	18	4.3	1,110	8.5
Apr. 28.....				94	26	111		204	14	107	192	11		728	.99		340	150	2.6	1,130	8.6
EAST STAGE STAND CREEK NEAR NELLIE, STEPHENS COUNTY																					
May 18, 1959....				35	58	42		140	12	236	25	0.0		551	0.75		324	190	1.0	719	8.5
July 14.....	0.24			19	52	25		164	16	113	26	2.3		406	.55		262	101	.7	613	8.7

7-3130. LITTLE BEAVER CREEK NEAR DUNCAN, STEPHENS COUNTY

Feb. 26, 1959.....	5.42	122	45	33	252	37	490	284	0.7	897	7.8
Mar. 17.....	4.04	141	51	40	264	48	560	384	.7	1,000	7.8
Apr. 29.....	3.96	138	52	40	220	52	560	384	.7	1,000	7.2
May 12.....	24.0	114	52	62	216	134	256	252	1.4	553	7.4
May 27.....	72.31	144	58	25	594	182	610	433	1.7	1,495	7.6
June 17.....	2.38	110	27	26	184	140	384	233	.6	793	7.4
July 8.....	4.43	118	40	31	176	43	460	316	.8	901	7.6

COW CREEK NEAR COMANCHE, STEPHENS COUNTY

May 20, 1959.....		78	59	138	356	4	230	122	0.2	639	1.28
Sept. 9.....		72	34	154	234	20	185	152	.28	849	1.15

BEAVER CREEK AT WAURIKA, JEFFERSON COUNTY

July 16, 1959 ..		46	15	61	136	20	72	62	3.1	434	0.59
July 30.....		58	26	89	172	16	118	96	.22	604	.82
Sept. 9.....		46	21	65	152	12	54	96	6.6	456	.62

QUARTERMASTER CREEK NEAR ANGORA, ROGER MILLS COUNTY

Mar. 30, 1959.....		512	346	90	92	0	2,650	44	0.8	3,980	5.41
May 29.....		512	171	15	300	12	1,650	21	.5	2,740	3.73

QUARTERMASTER CREEK NEAR MOOREWOOD, CUSTER COUNTY

Mar. 30, 1959.....		496	71	89	240	20	2,190	46	1.6	3,420	4.65
May 29.....		296	88	32	200	941	18	1,580	2.15	1,580	2.15

SUGAR CREEK NEAR BINGER, CADDO COUNTY

Feb. 24, 1959.....	8.0	93	19	16	208	8	138	12	0.2	410	0.56
Mar. 18.....		98	16	29	212	20	136	18	2.3	474	.64

		310	126	0.4	613	6.5
		312	103	.7	708	8.7

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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			Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25°C)		
														Residue at 180°C (ppm)	Calculated (ppm)	Tons per acre-foot					
RED RIVER BASIN IN OKLAHOMA--Continued																					
7-3270. SUGAR CREEK NEAR GRACEMONT, CADDO COUNTY																					
Feb. 24, 1959.....		24		115	18	15		252	6	150	13				474	0.64		360	144	0.3	689 8.3
Mar. 17.....				78	11	50		180	0	161	23				430	.58		240	92	1.4	687 8.2
Mar. 19.....				--	--	--		116	0	--	15	0.2		--	--	--		184	90	--	498 8.1
STINKING CREEK NEAR GRACEMONT, CADDO COUNTY																					
Feb. 26, 1959.....		10		440	78	54		180		1,260	55		0.4		2,110	2.87		1,420	1,270	0.6	2,300 8.0
Mar. 17.....								84			80	0.8		0.31				1,440	1,370		2,600 7.8
WASHITA RIVER NEAR CHICKASHA, GRADY COUNTY																					
Oct. 15, 1958.....		24		155	62	85		168		513	108		1.7		1,080	1.47		640	502	1.5	1,450 8.1
Nov. 3.....								84			148	0.3	0.32					590	521		1,640 8.1
MCCARDO CREEK NEAR CEMENT, CADDO COUNTY																					
June 10, 1959.....				--	--	--		140		--	7,400	0.2	0.21		--	--		3,300	3,190	--	19,400 7.7
June 30.....				1,160	347	3,600		167		449	8,180				16,100	21.90		4,320	4,200	94	23,100 7.1
July 27.....				627	206	2,110		64		273	4,730				8,420	11.45		2,410	2,360	19	13,600 7.5
Aug. 24.....				1,260	325	4,390		115		464	3,520				16,600	22.58		4,460	4,390	29	25,600 7.4
7-3275. LITTLE WASHITA RIVER AT NINNEKAH, GRADY COUNTY																					
Nov. 3, 1958.....	12			--	85	116		52		--	240	0.5	--	0.14	--	--		890	848	--	2,130 7.8
Mar. 19, 1959.....	15.1			360	39	125		208		--	194	--	--	--	--	--		1,040	870	1.6	2,070 7.7
May 6.....	23.9			344	39	125		252		--	215	--	--	--	--	--		1,020	814	1.7	2,140 7.6
May 9.....	644			168	12	17		156		--	21	--	--	--	--	--		520	392	1.3	911 7.7
May 12.....	37.7			--	--	--		120		--	116	--	--	--	--	--		1,000	902	1.0	1,680 7.8
May 27.....	392			298	31	16		138		719	30	0.0	0.0		1,250	1.70		870	757	2.2	1,420 7.5
June 1.....	35			322	416	35		216		1,020	155				1,970	2.63		1,180	1,000	1.6	2,270 7.8
June 23.....	23			322	43	96		186		758	178				1,650	2.24		980	828	1.4	1,950 7.9
July 6.....	27			248	54	72		180		--	132	--	--	--	--	--		840	692	1.1	1,590 7.4

LITTLE WASHITA RIVER EAST OF NINNEKAH, GRADY COUNTY

Oct. 15, 1958.....	33	328	39	133	82	815	250	2.0	1,720	2.34	980	913	1.8	2,210	7.8
May 6.....		258	50	113	66	772	167	4.0	1,670	2.27	850	796	1.7	1,850	7.9

CRINER CREEK NEAR PAYNE, MCCLAIN COUNTY

Oct. 20, 1958.....					266	20	14	0.2	0.34		246	0	--	557	8.8
Nov. 3.....					254	16	14	.2	.32		246	12	--	542	8.8
Dec. 1.....					252	20	14	.2	.54		232	8	--	531	8.7
Dec. 17.....	20	26	45	17	252	10	44	12	--	0.41	252	29	0.5	508	8.5
Aug. 13, 1959....		28	54	26	324	0	56	16	--	.49	290	24	.7	594	8.1

7-3283. FINN CREEK NEAR STORY, GARVIN COUNTY

Oct. 20, 1958.....					320	38	18	0.2	0.51		300	0	--	653	8.9
Nov. 3.....					342	34	19	.2	.49		316	0	--	671	8.7
Dec. 1.....					322	28	20	.2	.31		305	0	--	657	8.8
Aug. 26, 1959....		46	44	25	366	6	21	12	--	0.7	295	0	0.6	597	8.3
Sept. 16.....	0.15	53	33	32	348	0	13	--	--	--	268	0	.8	581	7.9

7-3285. WASHITA RIVER NEAR PAULS VALLEY, GARVIN COUNTY

Mar. 10, 1959.....	127	150	54	88	202		104				595	430	1.6	1,380	8.2
Apr. 23.....	226	150	4	36	182		15				55	354	.7	1,050	8.1
May 9.....	1,800	94	16	18	164		16				184	375	.5	404	8.2
May 12.....	2,800	82	12	9.9	168		9.6				318	176	.4	636	8.2
May 28.....	4,430	85	10	7.2	222		7.6				250	118	.3	513	8.2
June 1.....	4,650	115	29	32	192		29				250	68	.2	496	7.8
June 9.....	1,010	188	53	59	206		51				405	248	.7	865	8.1
June 24.....	331	89	17	25	150		28				685	516	1.0	1,370	7.9
July 16.....	519										290	167	.6	660	7.9

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	pH	
															Residue at 180°C (ppm)	Calculated (ppm)	Calcium Magnesium	Non-carbonate			
RED RIVER BASIN IN OKLAHOMA--Continued																					
RUSH CREEK AT PAULS VALLEY, GARVIN COUNTY--Continued																					
Oct. 16, 1958.....	6.5			101	92	210		228	8	268	430	--	1.0	--	1,280	1.74	630	430	3.6	2,110	8.3
Nov. 2.....								128	2	360	0.2	0.29					390	282		1,680	8.3
Dec. 16.....								136	2	380	0.2	.31					475	360		1,880	8.3
7-3297. WILDHORSE CREEK NEAR HOOVER, GARVIN COUNTY																					
Oct. 21, 1958.....								108	0	93	0.1	0.18					128	40		514	8.2
Nov. 5.....								108	0	100	1.1	.22					136	48		559	8.2
Dec. 3.....								170	2	195	1.6	.32					220	77		1,030	8.3
Dec. 18.....	18			40	31	91		204	0	70	132	--	0.5	--	486	0.66	228	61	2.6	859	8.1
ROCK CREEK AT SULPHUR, MURRAY COUNTY																					
Oct. 30, 1958.....	0.85			66	48	278		136	0	480							360	248	6.4	2,100	8.2
Nov. 5.....	.97			34	55	151		128	4	272							230	118	4.3	1,200	8.3
Sept. 16 d.....	.11			54	28	174		286	0	278							250	52	4.8	1,400	8.2
Sept. 16 e.....	.36			164	73	368		218	0	950	0.0						170	352	9.6	3,840	8.2
Sept. 16 f.....	2.10			66	59	307		284	0	500							325	108	7.4	2,040	8.2
CADDO CREEK NEAR GENE AUTRY, CARTER COUNTY																					
Oct. 21, 1958.....								188	18	--	240	3.2	--	0.21	--	--	200	8	--	1,870	8.7
Nov. 5.....								168	12	156	1.6	--	.45	--	--	--	134	8	--	1,180	8.6
Dec. 16.....	18			77	12	179		182	0	239	1.7	--	.32	--	835	1.14	200	132	5.0	1,320	7.9
July 1, 1959.....	0.44			40	22	76		184	10	71	78	--	4.5	--	431	.59	190	22	2.4	724	8.6
PENNINGTON CREEK NEAR REAGAN, JOHNSTON COUNTY																					
Nov. 5, 1958.....	9.94			14	36	5.0	--	200	12	5.0							184	0	0.2	335	8.6
Jan. 8, 1959.....	10.8			14	17	2.5	--	118	6	2.5							106	0	.1	198	8.4
7-3324.5. BLUE CREEK AT MILBURN, JOHNSTON COUNTY																					
Nov. 5, 1958.....	33.8			16	33	5.0	--	206	10	9.0							176	0	0.2	402	8.5
Jan. 8, 1959.....	40.4			18	29	3.0	--	190	0	6.2							164	8	.1	276	8.2
7-3330. NORTH BOGGY CREEK NEAR STRINGTOWN, ATOKA COUNTY																					
Nov. 4, 1958.....	0.68			30	7.5	38	--	152	16	11							106	0	1.6	322	8.7
Jan. 8, 1959.....	.57			18	7.5	19	--	90	0	11							76	2	1.0	213	8.1

d Above power plant.
 e Below power plant.
 f Below Platt National Park.

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium		Non-carbonate	
RED RIVER BASIN IN LOUISIANA																				
7-3516. BAYOU PIERRE NEAR GRAND BAYOU																				
Oct. 21, 1958.		9.8	0.08	51	28	54	3.8	218	84	68	0.7	0.1		c 426	0.58	242	63	688	7.2	
Jan. 29, 1959.		4.0	.08	27	15	50	2.5	127	49	73	1.5	.7		c 305	.41	154	42	544	7.9	
Apr. 29.....		6.4	.46	18	6.1	21	2.6	70	20	30	1.4	.7		c 140	.19	70	13	238	6.9	
July 30.....		7.5	.04	34	15	57	3.3	148	38	78	1.2	.6		c 323	.44	146	25	557	7.3	
7-3517. BAYOU NA BONCHASSE NEAR MANSFIELD																				
Oct. 21, 1958.	2.0	23	0.60	17	5.8	24	2.5	65	22	32	0.4	0.4		c 168	0.23	66	13	1.3	247	6.6
Jan. 29, 1959.	2.0	30	.06	25	11	79	4.1	138	61	71	.7	5.2		c 364	.50	108	0	3.3	569	7.0
Apr. 29.....	4.2	24	.21	27	14	62	3.6	120	70	62	.5	2.7		c 342	.47	123	25	2.4	548	7.1
Sept. 3.....	1.4	24	.23	14	7.1	121	7.8	255	29	67	1.4	3.5		c 401	.55	64	0	6.6	671	7.2
7-3518. BAYOU DUPONT NEAR MARTHAVILLE																				
Oct. 13, 1958.								23		4.0						18	0		67	7.5
Oct. 21,								34		4.5						27	0		89	7.6
Mar. 2, 4, 9, 11, 14, 21, 1959.....		7.6						--	26	16	0.4	0.2		86	0.12	29	15	1.3	149	7.0
Mar. 23.....								13		10						22	11		97	7.0
Mar. 25.....								14		10						22	11		101	7.0
7-3535. NANTACHIE CREEK NEAR MONTGOMERY																				
Oct. 22, 1958.	8.5	12	0.62	4.2	1.6	1.6	1.2	15	1.2	3.8	0.7	0.9		35	0.05	17	5	0.2	45	6.0
Jan. 29, 1959.	10	11	.40	5.3	.7	4.8	1.1	16	2.4	7.7	1.1	.5		44	.06	16	3	.5	61	6.6
May 26.....	8.7	13	.47	4.8	1.0	4.6	1.3	13	6.6	6.0	.3	.8		43	.06	16	5	.5	58	6.2
July 30.....	1.2	12	.34	4.2	1.6	4.1	1.6	15	.8	8.8	.2	1.8		42	.06	17	5	.4	57	6.3

c Residue at 180°C.

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	
													Parts per million	Tons per acre-foot	Calcium magnesium	Non-bicarbonate		Tons per day
RED RIVER BASIN IN LOUISIANA--Continued																		
7-3693.4. QUACHITA RIVER AT HARRISONBURG																		
Oct. 20, 1958..		8.0	0.53	14	2.7	36	2.3	24	8.6	69	0.4	2.1	207	0.28	46	26	2.3	290
Jan. 28, 1959..		4.6	.16	7.7	1.7	4.6	2.5	28	1.4	9.3	.3	1.7	58	.08	26	3	.4	90
Apr. 27.....	7,910	5.9	.42	11	2.6	30	2.1	20	9.0	56	.1	1.3	128	.17	38	22	2.1	238
July 29.....		8.0	.22	30	7.6	102	2.8	55	16	187	.5	2.9	384	.52	106	61	4.3	747
7-3701.9. TENSAS RIVER AT CLAYTON																		
Oct. 20, 1958..		10	0.39	21	5.0	8.0	4.5	84	4.6	16	0.1	0.9	129	0.18	73	4	0.4	198
Jan. 28, 1959..		14	.02	49	12	22	3.7	202	12	33	.5	.9	232	.34	173	7	.7	434
Apr. 27.....	7,910	8.0	.43	16	3	4.6	3.5	58	8.0	5.7	.2	1.8	80	.11	152	4	.3	128
July 29.....		15	.03	40	13	25	3.8	184	11	34	.5	1.3	241	.33	155	4	.9	412
7-3621.5. DUGDEMONA RIVER AT CURRY																		
Oct. 22, 1958..		20	0.99	8.2	1.8	45	1.6	28	16	62	0.4	0.8	171	0.23	28	5	3.7	281
Jan. 28, 1959..		4	.12	17	.9	12	1.6	22	41	9.6	.3	.2	111	.15	46	10	.8	163
Apr. 28.....		3.8	.32	11	.6	7.6	1.8	26	12	10	.2	.6	61	.08	30	9	.6	105
July 25.....		9.5	.37	5.0	1.3	5.8	1.6	16	13	4.1	.1	.6	49	.07	18	5	.6	68
7-3729.6. FISH CREEK NEAR POLLOCK																		
Oct. 22, 1958..		16	0.35	2.2	0.7	3.0	0.8	9.6	1.4	4.0	0.3	0.3	34	0.05	9	1	0.4	29
Jan. 28, 1959..		14	.17	1.8	.7	3.0	.9	8.0	.8	4.6	.1	.2	30	.04	7	1	.5	30
Apr. 28.....		15	.35	2.8	.5	3.2	1.2	9.0	3.0	4.5	.1	.3	35	.05	9	2	.5	37
July 29.....		14	.14	1.9	.3	2.1	.9	7.2	2.0	2.0	.1	.5	27	.04	6	0	.4	27
7-3730. BIG CREEK AT POLLOCK																		
Oct. 22, 1958..		21	0.25	2.8	0.5	3.9	1.1	12	1.0	4.8	0.3	0.2	42	0.06	9	0	0.6	42
Jan. 28, 1959..		18	.10	2.2	.5	4.4	.7	13	1.0	4.3	.1	.2	38	.05	8	0	.7	40
Apr. 28.....		18	.29	2.5	.9	3.4	1.1	14	1.4	4.4	.1	.4	38	.05	10	0	.5	37
July 29.....		18	.18	1.8	.9	4.8	1.4	13	1.0	6.2	.1	.5	41	.06	8	0	.7	37
Sept. 24.....		10	.15	1.7	.3	1.6	.6	6.2	1.4	2.5	.0	.4	22	.03	6	1	.3	23

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	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					Calcium, magnesium	Non-sulfate

MISSISSIPPI RIVER DELTA

7-3752.3. Tchefuncta River at Madisonville, LA.

Oct. 28, 1958.....	8.0	0.08	18	30	290	12	28	68	515	0.1	0.3	976	1.3	168	145	9.7	1,730	6.9
Jan. 16, 1959.....	11	.03	20	24	239	18	32	59	440	.3	.1	848	1.2	150	124	8.5	1,560	7.3
Apr. 22.....	7.1	.24	11	7.5	71	3.0	26	20	124	.1	.7	297	.40	58	37	1.4	489	6.7
July 22.....	8.0	.11	3.0	4	7.1	1.0	12	2.2	8.7	.1	1.2	g 38	.05	9	0	1.0	78	6.0

7-3802. Amite River at Port Vincent, LA.

Oct. 29, 1958.....	12	0.30	4.0	1.2	20	1.3	18	1.8	31	0.1	0.2	g 81	0.11	15	0	2.2	130	6.3
Jan. 19, 1959.....	11	.33	6.0	1.7	46	2.6	26	4.2	69	.4	.4	g 172	.23	22	1	4.2	257	7.1
Apr. 30.....	12	.26	5.8	1.6	16	1.6	20	2.8	25	.1	.8	g 78	.11	21	5	1.5	135	6.3
July 28.....	9.2	.25	5.1	1.8	15	1.0	20	1.6	28	.1	1.0	g 82	.11	20	4	1.5	126	6.3

7-3802.5. Bayou Barataria at Lafitte, LA.

Oct. 28, 1958.....	8.6	0.17	43	19	276	7.0	107	44	475	0.1	0.6	963	1.3	184	96	1.3	1,680	7.3
Jan. 16, 1959.....	6.9	.08	41	11	285	10.0	104	43	480	.5	1.0	874	1.3	186	101	9.1	1,720	6.9
Apr. 22.....	2.0	.09	41	11	193	4.5	79	37	335	.5	.0	691	.94	148	83	6.9	1,260	7.1
July 22.....	3.6	.07	20	10	115	3.8	57	22	193	.4	.4	443	.60	92	45	5.2	771	6.8

7-3802.7. Bayou Chevreuil at Cergy, LA.

Oct. 28, 1958.....	12	0.38	28	6.9	70	3.4	100	2.0	117	0.4	1.1	351	0.49	98	16	3.1	531	7.0
Jan. 16, 1959.....	17	.03	83	15	389	10	291	17	616	.5	1.4	1,310	1.8	268	30	10	2,331	7.1
Apr. 21.....	9.9	.22	35	7.7	40	3.8	122	10	70	.3	1.1	266	.36	148	19	1.6	1,260	7.0
July 28.....	12	.20	25	6.2	22	3.4	102	4.2	36	.2	1.2	g 160	.22	88	4	1.0	290	7.1

7-3810. Bayou Lafourche at Thibodaux, LA.

Oct. 29, 1958.....	6.3	0.06	43	13	22	3.0	147	54	23	0.7	1.5	g 240	0.33	161	41	0.8	400	7.6
Jan. 16, 1959.....	9.6	.42	55	13	20	3.0	235	34	4.0	.2	.1	g 458	.36	190	0	.6	458	7.0
Apr. 21.....	6.6	.08	44	10	113	2.6	125	47	20	.3	4.1	226	.31	452	50	.5	365	7.2
July 28.....	9.8	.12	30	7.1	10	3.4	109	21	12	.3	1.6	161	.22	104	15	.4	258	7.0

7-3813.2. Bayou Terrebonne at Houma, LA.

Oct. 28, 1958.....	10	1.1	30	5.9	11	3.4	115	6.4	13	0.4	1.8	g 140	0.19	99	5	0.5	239	6.7
Jan. 16, 1959.....	15	.21	38	31	28	3.2	288	6.0	47	.3	.5	222	.51	222	2	.8	573	7.4
Apr. 21.....	12	.31	60	14	20	3.6	240	11	31	.5	.5	302	.41	206	9	.6	479	7.4
July 23.....	12	.07	36	6.4	12	3.6	135	7.8	15	.3	1.6	186	.25	116	55	.5	279	6.9

c Residue at 180°C

g Calculated from determined constituents

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (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	Calcium	Non-sulfate magnesium				
MISSISSIPPI RIVER DELTA--Continued																				
7-3814.5. LOWER GRAND RIVER AT BAYOU SORRELL, LA.																				
Oct. 29, 1958.....		12	0.04	49	12	54	4.3	178		23	88	0.2	0.9	351	0.48	173	27	1.8	601	7.3
Jan. 19, 1959.....		11	.02	61	20	116	3.8	228		34	187	2.2	1.3	560	.76	233	46	3.3	965	8.2
Apr. 30.....		10	.12	56	14	54	3.8	192		31	93	3.3	1.5	374	.51	199	42	1.7	648	7.6
July 28.....		11	.13	41	10	78	4.3	146		21	127	5.5	.7	372	.51	145	25	2.8	684	7.4
7-3814.8. BAYOU BOEUF AT AMELIA, LA.																				
Oct. 29, 1958.....		10	0.02	35	8.5	48	3.4	126		15	80	0.3	0.2	301	0.41	122	19	1.9	472	7.2
Jan. 15, 1959.....		6.8	.37	38	16.0	46	2.8	146		30	82	.2	2.6	339	.46	166	46	1.6	549	7.6
Apr. 21.....		6.1	.25	35	8.0	34	2.7	102		29	60	2.2	2.3	258	.35	120	36	1.4	416	7.2
July 23.....		4.7	.01	41	9.9	34	3.2	125		43	48	4.4	3.3	269	.37	143	41	1.2	447	6.9
7-3815.3. WAX LAKE OUTLET AT CALMET, LA.																				
Oct. 29, 1958.....		6.4	0.20	36	8.6	26	3.0	116		36	37	0.8	1.3	249	0.34	125	30	1.0	369	7.2
Jan. 15, 1959.....		8.0	.01	50	13	38	2.9	155		44	63	.5	2.8	306	.42	176	49	1.2	530	7.4
Apr. 21.....		6.7	.20	35	8.0	21	2.4	96		36	36	2.2	3.2	220	.30	120	41	.8	349	7.2
July 23.....		5.9	.04	45	12	33	2.8	145		55	42	4.4	1.5	277	.38	160	41	1.1	462	7.7
7-3815.5. LOWER GRAND BAYOU AT LAKE DAUFERIVE, LA.																				
Oct. 29, 1958.....		8.2	0.14	34	8.1	24	3.0	114		33	33	0.2	1.4	217	0.30	118	25	10	346	7.2
Jan. 15, 1959.....		7.2	.02	50	12	38	2.9	150		48	62	.5	1.8	303	.41	172	49	1.3	527	7.3
Apr. 21.....		6.4	.21	34	7.8	20	2.5	96		33	34	3.2	3.2	a 188	.29	117	38	1.8	338	7.0
July 27.....		7.1	.03	39	12	35	2.7	136		43	51	5.5	2.3	a 265	.36	148	37	1.2	454	7.5
7-3815.6. GRAND LAKE AT CHARENTON BEACH, LA.																				
Nov. 29, 1958.....		8.3	0.12	32	7.4	21	2.7	105		23	33	0.1	0.8	180	0.28	110	24	0.9	324	7.2
Jan. 15, 1959.....		7.4	.01	49	11	36	2.9	147		43	58	4.4	2.3	290	.39	169	49	1.2	506	7.4
Apr. 21.....		7.0	.19	37	8.2	22	3.0	103		41	35	2.2	1.2	222	.30	126	42	1.9	355	7.3
July 27.....		3.7	.04	41	9.7	27	2.5	134		40	37	4.4	1.1	228	.31	142	32	1.0	406	7.6

7-3857.5. BAYOU TECHE AT MORENHAN, LA.

Oct. 29, 1958.....	12	0.15	16	3.4	8.3	2.7	70	2.2	9.7	0.1	1.0	104	0.14	54	0	0.5	147	6.7	
Jan. 15, 1959.....	7.7	.55	15	4.8	27.3	5.1	54	11	47	.5	1.1	8	147	20	13	1.6	257	7.4	
Apr. 21, 1959.....	6.4	.70	12	3.4	7.4	3.4	43	7.8	14	.1	1.0	8	77	10	9	5	134	6.5	
July 27.....	10	.37	11	3.6	6.9	2.1	51	1.4	10	.2	1.2	8	72	.10	42	0	.5	130	6.5

7-3857.5. BAYOU TECHE NEAR OLIVIER, LA.

Oct. 29, 1958.....	12	0.14	19	4.3	14	3.4	84	2.6	16	0.2	2.4	115	0.16	65	0	0.8	187	6.7	
Jan. 15, 1959.....	9.1	.71	22	6.1	17	3.9	88	9.0	27	.1	2.0	8	177	.24	80	8	.8	247	7.2
Apr. 21, 1959.....	8.3	.67	18	4.9	10	3.8	70	6.2	19	.1	1.1	8	106	.14	65	8	.6	360	6.8
July 27.....	11	.77	11	3.3	8.3	3.1	46	.6	14	.4	2.8	8	78	.11	41	3	.6	130	6.9

7-3857.6. LAKE DAUTERIVE AT STAFF GAUGE, LA.

Oct. 29, 1958.....	10	0.23	18	5.6	27	4.1	76	5.4	47	0.5	1.0	190	0.26	68	6	1.4	279	6.9
Jan. 15, 1959.....	7.2	.18	23	7.2	43	4.5	89	18	71	.1	1.7	231	.31	87	14	2.0	581	7.7
Apr. 21.....	7.2	.26	18	4.8	23	3.1	84	8	39	.3	2.2	247	.39	53	13	1.3	346	6.9
July 27.....	6.6	.49	14	4.6	24	3.1	59	2.6	41	.2	.4	151	.21	51	6	1.4	239	7.0

7-3857.7. LAKE FAUSSE POINTE AT CHARENTON FLOOD GAUGE, LA.

Oct. 29, 1958.....	7.5	0.12	24	7.3	79	4.5	74	11	140	0.2	0.5	351	0.48	90	29	3.6	585	7.0
Jan. 15, 1959.....	5.7	.01	40	8.3	71	4.1	111	29	123	.4	1.3	346	.47	134	43	2.7	622	7.2
Apr. 21.....	5.0	.25	27	7.0	26	2.9	85	23	43	.3	1.7	208	.28	96	26	1.1	320	7.2
July 27.....	5.5	.13	22	7.6	40	3.1	77	14	70	.3	.2	203	.28	86	23	1.9	374	7.5

7-3857.8. CHARENTON DRAINAGE CANAL AT CHARENTON, LA.

Oct. 29, 1958.....	8.8	0.15	27	7.5	121	4.1	76	11	207	0.5	0.5	505	0.69	98	36	5.3	785	7.1
Jan. 15, 1959.....	7.1	.01	50	10	53	3.3	144	39	92	.5	1.8	333	.45	167	49	1.8	597	7.5
Apr. 21.....	5.6	.25	29	7.5	33	2.9	86	25	58	.2	2.0	224	.30	103	32	1.4	382	7.3
July 27.....	4.7	.18	30	9.6	72	1.9	88	27	122	.3	.3	327	.44	114	42	2.9	591	7.4

7-3857.9. CHARENTON DRAINAGE CANAL AT BALDWIN, LA.

Oct. 29, 1958.....	8.7	0.22	30	8.1	115	4.4	78	14	197	0.1	0.7	448	0.61	108	44	4.8	780	7.2
Jan. 15, 1959.....	6.2	.02	47	11	91	4.4	125	39	163	.5	1.2	428	.58	162	60	3.1	789	7.4
Apr. 21.....	6.3	.23	34	8.3	50	3.3	90	29	88	.3	3.1	302	.41	119	45	2.0	486	7.1
July 27.....	5.3	.19	30	9.3	59	4.0	92	28	101	.4	.4	286	.39	113	38	2.4	530	7.1

g Calculated from determined constituents.

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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
ARKANSAS RIVER BASIN--Continued																
7-1413. ARKANSAS RIVER AT GREAT BEND, KANS.																
Oct. 14, 1958.....	1120		67	197	80						78	84	94	100		V
Dec. 11.....	1200		32	236	275						83	97	98	100		V
MISSISSIPPI RIVER DELTA																
MISSISSIPPI RIVER AT INTAKE TO BAYOU LAFOURCHE, LA.																
Jan. 27, 1959.....	1400				224	45	59	67	75	85	96	100				B
7-3804. BAYOU LAFOURCHE AT FOOTBRIDGE AT DONALDSONVILLE, LA.																
Dec. 5, 1958.....	1240				152	55	63	70	80	92	98	99	100			ENC
Jan. 27, 1959.....	1730				226	56	63	74	81	89	98	99	100			ENC
Mar. 30.....	1130				325	35	44	49	58	63	83	83	100			ENC
Apr. 30.....	1100				243	55	59	68	73	86	94	99	100			ENC
May 28.....	1130				536	59	73	77	89	96	99	100				ENC
June 26.....	1100				535	78	84	89	96	99	100					ENC
July 28.....	1230				466	66	73	80	93	97	99	100				ENC
Aug. 25.....	1055				266	--	93	94	94	99	99	100				ENC
7-3804. BAYOU LAFOURCHE AT CULVERT AT DONALDSONVILLE, LA.																
Dec. 5, 1958.....	1255				154	53	66	70	83	91	98	100	100			ENC
Jan. 27, 1959.....	1700				174	51	65	73	80	94	98	99	100			ENC
Mar. 30.....	1210				357	39	48	53	63	72	95	99	100			ENC
Apr. 30.....	1145				229	49	60	65	74	82	95	99	100			ENC
May 28.....	1130				462	61	71	76	86	92	98	100				ENC
July 28.....	1250				504	51	71	71	85	92	99	100				ENC
Aug. 25.....	1110				177	60	79	89	92	97	99	99	100			ENC

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Particle-size analyses of suspended sediment, water year October, 1958 to September, 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)	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				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		
MISSISSIPPI RIVER DELTA--Continued																			
BAYOU LAFOURCHE AT BRIDGE AT NAPOLEONVILLE, LA.																			
Dec. 5, 1958.....	1440				55		76	79	81	85	92	97	99	100					BNC
Jan. 30, 1959.....	1600				73		87	89	92	95	96	98	98	100					BNC
Mar. 30.....	1445				149		87	89	92	95	96	98	98	100					BNC
May 28.....	1315				136		86	94	95	98	99	99	100		100				BNC
May 28.....	1415				245		81	94	95	98	97	100	--	--	--	--	--	--	BNC
June 26.....	1415				129		81	94	95	98	97	100	--	--	--	--	--	--	BNC
July 28.....	1600				117		96	99	100	--	--	--	--	--	--	--	--	--	BNC
Aug. 25.....	1240				162		--	98	--	--	--	100	--	--	--	--	--	--	BNC
BAYOU LAFOURCHE AT BRIDGE AT LABADIEVILLE, LA.																			
Dec. 5, 1958.....	1550				137		81	83	84	85	86	93	97	98					BNC
Mar. 30, 1959.....	1405				313		64	67	70	74	83	94	99	100					BNC
Apr. 30.....	1300				148		80	89	93	95	96	98	99	100					BNC
May 28.....	1345				196		87	95	97	99	100	--	--	--					BNC
June 26.....	--				114		--	--	--	--	--	--	--	--					BNC
July 28.....	1545				296		64	80	76	83	95	100	--	--					BNC
Aug. 25.....	1300				239		--	84	86	88	88	98	100	--					BNC

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Periodic determinations of suspended-sediment discharge, water year October 1958 to September 1959

Date	Time (24 hr)	Water tem- per- ature (°F)	Discharge (cfs)	Suspended sediment	
				Mean concen- tration (ppm)	Discharge (tons per day)

ARKANSAS RIVER BASIN--Continued

7-1413. ARKANSAS RIVER AT GREAT BEND, KANS.

Oct. 14, 1958.....			197	80	42
Nov. 5.....			159	40	17
Dec. 11.....			236	275	175
Feb. 19, 1959.....			370	326	326
Mar. 24.....			313	108	91
Apr. 30.....			236	182	116
May 27.....			300	156	126
June 10.....			222	160	96
Aug. 11.....			59	45	7.1
Sept. 22.....			126	166	56
Sept. 23.....			203	367	201

7-1433. ARKANSAS RIVER NEAR HUTCHINSON, KANS.

Sept. 26, 1959.....	1230		6,500	4,080	71,600
Sept. 26.....	1500		6,250	4,160	70,200
Sept. 28.....	--		4,600	2,760	34,300

MISCELLANEOUS ANALYSES OF STREAMS IN LOWER MISSISSIPPI RIVER BASIN--Continued

Particle-size analyses of bed material, water year October 1958 to September 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)	Sampling point	Water temperature (°F)	Discharge (cfs)	Sediment concentration (ppm)	Bed material						Method of analysis
						Percent finer than size indicated, in millimeters						
						0.125	0.250	0.500	1.000	2.000	4.000		8.000	16.000	32.000

ARKANSAS RIVER BASIN--Continued

7-1413. ARKANSAS RIVER AT GREAT BEND, KANS.

APR. 30, 1959.....	10			236		0	2	31	66	83	95	98	100		SY
AUG. 11.....	30			59		0	4	36	60	74	88	94	99	100	SY

MERMENTAU RIVER BASIN

8-124. MERMENTAU RIVER AT LAKE ARTHUR, LA.

LOCATION.--At bridge on State Highway 14, 0.5 mile east of Lake Arthur, Jefferson Davis Parish.

RECORDS AVAILABLE.--Chemical analyses: January 1949 to September 1959.

EXTREMES, 1958-59.--Specific conductance: Maximum daily, 722 micromhos Jan. 13; minimum daily, 60.5 micromhos Feb. 25.

Water temperatures: Maximum, 98°F Aug. 18; minimum, 32°F Jan. 14-19, 23-26.

EXTREMES, 1949-59.--Specific conductance: Maximum daily, 6,330 micromhos June 30, 1952; minimum daily, 22 micromhos Sept. 12, 1956.

REMARKS.--Records of discharge for this station not available.

Specific conductance and chloride, in parts per million, water year
October 1958 to September 1959

Day	October		November		December		January	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	124	--	134	--	203	--	712	196
2	138	--	134	--	203	--	710	--
3	131	--	134	--	204	--	708	--
4	130	--	140	--	204	--	709	--
5	131	23	138	--	205	--	710	--
6	131	--	135	--	206	--	711	--
7	131	--	135	--	271	52	711	--
8	129	--	146	--	249	--	--	--
9	--	--	159	26	243	--	711	--
10	--	--	150	--	243	--	711	--
11	--	--	157	--	245	--	711	195
12	--	--	159	--	243	--	710	--
13	--	--	136	24	244	--	722	--
14	125	22	151	--	223	--	721	--
15	128	--	--	--	226	--	716	--
16	129	--	--	--	227	48	726	--
17	128	--	--	--	227	--	405	108
18	129	--	--	--	236	--	408	--
19	128	--	--	--	248	--	409	--
20	130	--	--	--	252	--	408	--
21	129	--	--	--	253	--	409	--
22	127	--	--	--	247	--	407	--
23	128	--	--	--	264	--	334	85
24	126	--	--	--	274	--	331	--
25	131	24	--	--	420	108	331	--
26	132	--	163	31	423	--	331	--
27	132	--	163	--	--	--	331	--
28	131	--	164	--	--	--	90.2	18
29	131	--	163	--	--	--	90.3	--
30	132	--	202	42	--	--	88.2	--
31	133	--	--	--	--	--	90.9	--

QUALITY OF SURFACE WATERS, 1959

MERMENEAU RIVER BASIN--Continued

8-124. MERMENEAU RIVER AT LAKE ARTHUR, LA.--Continued

Specific conductance and chloride, in parts per million, water year
October 1958 to September 1959--Continued

Day	February		March		April		May	
	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)	Specific conductance (micro-mhos at 25°C)	Chloride (Cl)
1	90.5	--	63.2	--	95.3	--	74.9	--
2	90.4	--	62.5	--	94.2	--	72.6	11
3	87.1	17	62.7	--	94.5	--	76.4	--
4	87.4	--	66.6	--	98.2	11	79.1	--
5	87.2	--	67.2	--	94.0	--	75.3	--
6	86.0	--	70.1	9.4	93.7	--	77.6	--
7	86.3	--	71.6	--	95.7	--	76.8	--
8	91.3	16	72.8	--	79.9	--	81.2	11
9	87.5	--	72.0	--	81.2	--	78.7	--
10	85.1	--	72.5	--	77.9	--	80.4	--
11	72.8	13	67.4	--	73.9	52	80.5	--
12	76.6	--	68.3	--	267	--	74.4	--
13	72.8	--	67.6	--	267	--	76.3	--
14	81.4	--	72.2	--	265	--	71.1	--
15	--	--	92.5	14	116	--	70.6	--
16	--	--	74.5	--	119	--	61.8	9.8
17	--	--	74.5	--	122	--	65.1	--
18	--	--	71.4	--	120	--	72.3	--
19	--	--	74.5	--	91.8	17	72.9	--
20	--	--	72.9	--	91.5	--	73.6	--
21	--	--	70.1	--	--	--	77.2	11
22	--	--	69.6	10	--	--	76.6	--
23	--	--	70.2	--	84.1	11	--	--
24	--	--	68.7	--	81.7	--	75.3	--
25	60.5	8.8	73.3	--	78.7	--	--	--
26	64.1	--	113	20	74.7	--	--	--
27	63.5	--	77.1	--	74.9	--	--	--
28	62.8	--	78.2	--	83.8	--	--	--
29	--	--	75.5	--	77.9	--	--	--
30	--	--	78.7	--	77.4	--	--	--
31	--	--	75.5	--	--	--	--	--
	June		July		August		September	
1	--	--	132	--	190	--	199	28
2	--	--	132	--	190	--	200	--
3	170	28	135	--	191	--	198	--
4	167	--	134	--	191	--	198	--
5	167	--	134	18	179	24	198	--
6	166	--	140	--	180	--	199	--
7	162	--	136	--	181	--	198	--
8	162	--	131	--	182	--	200	--
9	174	--	135	--	175	--	206	--
10	175	23	137	--	176	--	206	--
11	175	--	140	20	177	24	203	30
12	175	--	140	--	173	--	200	--
13	176	--	140	--	174	--	201	--
14	154	--	143	--	174	--	200	--
15	120	--	142	--	175	--	192	--
16	119	16	155	--	--	--	187	--
17	120	--	156	17	--	--	188	--
18	142	--	157	--	174	24	186	--
19	139	--	155	--	174	--	--	--
20	142	--	157	--	176	--	--	--
21	144	--	161	--	239	36	--	--
22	144	--	259	38	239	--	--	--
23	--	--	257	--	239	--	--	--
24	--	--	259	--	240	--	193	27
25	185	20	259	--	239	--	194	--
26	178	--	259	--	239	--	199	--
27	180	--	259	--	239	--	206	--
28	207	--	260	--	199	29	201	--
29	214	26	259	--	198	--	202	--
30	208	--	190	24	200	--	203	--
31	--	--	190	--	--	--	--	--

MERMENTAU RIVER BASIN--Continued

8-124. MERMENTAU RIVER AT LAKE ARTHUR, LA.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

Once-daily measurement, usually at 7 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	77	73	71	73	70	69	69	71	---	---	---	---	73	75	77	73	74	79	72	78	79	79	78	79	78	79	72	70	60	68	66	63	73	
November ..	63	64	69	69	71	70	71	73	74	77	73	71	71	72	---	---	---	---	---	---	---	---	---	---	---	---	62	62	63	64	78	---	---	77
December ..	77	72	73	74	75	79	78	78	76	78	79	79	79	73	73	72	75	77	79	78	79	77	77	78	78	79	---	---	---	---	---	---	---	
January	69	70	71	72	73	74	71	---	70	70	71	70	39	32	32	32	32	32	33	34	35	32	32	32	32	32	40	43	45	44	42	49		
February	43	44	47	48	49	49	50	50	70	69	67	68	69	58	---	---	---	---	---	---	---	---	---	---	---	---	54	56	55	55	---	---	---	
March	57	47	48	46	40	43	42	44	46	47	44	43	44	45	45	49	45	49	52	55	45	45	40	40	45	50	45	60	64	68	65	48		
April	75	75	78	76	78	79	79	62	63	68	69	71	72	70	72	71	71	71	70	71	---	---	78	79	80	70	70	80	79	88	---	74		
May	80	70	80	79	80	80	80	79	80	80	70	80	70	70	70	70	70	80	80	80	80	80	80	80	80	80	80	80	80	80	80	80	84	
June	---	---	53	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	85	86	86	86	86	86	86	86	86	86	86	86	86	84	
July	85	83	84	83	84	82	83	83	84	84	84	83	83	84	84	83	84	83	84	85	85	80	84	84	84	84	85	85	85	84	85	83	84	
August	84	83	84	85	84	84	85	85	84	84	82	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	
September ..	90	90	85	85	85	86	87	86	80	80	80	81	80	81	81	81	79	78	---	---	---	---	---	---	---	79	77	78	78	79	79	82	82	

CALCASIEU RIVER BASIN

8-169. BEARHEAD CREEK NEAR STARKS, LA.

LOCATION.--At gaging station near right bank on downstream side of bridge on State Highway 12, 2.4 miles northeast of Starks, Calcasieu Parish, 3.5 miles downstream from Green Island Marsh Creek, and 15.3 miles above confluence with Buxton Creek.

DRAINAGE AREA.--177 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1958 to September 1959.

REMARKS.--Values reported for sodium (Na) are determined by analyses and do not include potassium (K). Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 30, 1958.....	2.3	9.2	0.54	2.5	0.9	13	0.8	6.4	0.8	23	0.1	1.0	1.0	10	5	1.8	89	5.7			5.7	
Nov. 5.....	2.8	9.5	.62	2.6	1.3	13	.9	5.6	2.0	24	.2	1.0	0.7	12	7	1.6	81	5.7			5.7	
Dec. 1.....	120	8.2	.46	3.7	1.4	29	1.1	4.0	1.2	44	.1	0.7	0.7	12	12	2.6	151	5.6			5.6	
Dec. 5.....	3,220	3.6	.68	1.7	.4	3	.9	6.0	1.0	6.0	.1	5.0	1.1	6	0	1.0	44	5.7			5.7	
Feb. 5, 1959.....	698	3.4	.51	1.5	.4	4.6	.8	5.0	1.6	7.6	.1	.8	1.1	23	.03	.43	39	5.8			5.8	
Mar. 3.....																						
Apr. 7.....	29	7.9	.39	4.1	1.2	42	1.3	6.0	1.6	70	.3	1.4	1.4	133	.18	10	10	4.7	253	5.6	5.6	
June 2.....	10	11	1.1	2.3	1.8	8.7	1.6	14	1.4	14	.2	.8	1.2	50	.07	1.4	13	2	1.1	72	6.1	6.1
Aug. 6.....	436	4.4	.27	1.9	.5	7.6	-4	6.2	2.6	11	.1	.9	1.1	33	.04	39	7	2	1.2	56	5.8	5.8
Sept. 1.....	318	6.9	.45	2.8	.7	6.2	1.2	6.0	1.6	12	.1	1.2	1.1	36	.05	31	10	5	.9	66	5.5	5.5

SABINE RIVER BASIN
8-220. SABINE RIVER NEAR TATUM, TEX.

LOCATION.--At gaging station near right bank on downstream side of pier of bridge on State Highway 43, 5 miles upstream from Potter Creek, 5.2 miles northeast of Tatum, Rusk County, 7 miles downstream from Cherokee Bayou, and at mile 339.

DRAINAGE AREA.--3,586 square miles.

RECORDS AVAILABLE.--Chemical analyses: February 1952 to September 1959.

Water temperatures: February 1952 to September 1959.

EXTREMES, 1952-59.--Dissolved solids:--Maximum, 883 ppm Oct. 20; minimum, 92 ppm May 1-6.

Hardness:--Maximum, 121 ppm Oct. 20; minimum, 31 ppm May 26-30.

Specific conductance:--Maximum, 894 μ S/cm July 17; minimum, 40 μ S/cm May 26-30.

EXTREMES, 1952-59.--Dissolved solids:--Maximum, 936 ppm Aug. 21-31, 1956; minimum, 74 ppm Apr. 24-30, 1957.

Specific conductance:--Maximum, 121 ppm Oct. 20, 1958; minimum, 31 ppm May 26-30, 1957.

Water temperatures:--Maximum daily, 1,350 microhms Oct. 25, 1954, Aug. 31, 1956; minimum daily, 98 microhms Apr. 29, 1957.

Water specific conductance:--Maximum, 98 μ S/cm Aug. 13, 1956; minimum, 40 μ S/cm Jan. 6, 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Boron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (microhms at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		Sodium	
Oct. 1-5, 1958	971	17		12	3.4	52		29		17	82		1.2		199	0.27	522	44	20	3.4	359	7.4
Oct. 6-7, 11-19	528	20		14	4.6	87		30		19	140		1.5		301	0.41	429	154	29	5.1	559	7.2
Oct. 20	472	--		--	--	--		39		--	485		--		883	1.20	1,130	121	89	--	1,680	7.4
Oct. 21-25	564	14		14	4.6	119		29		20	189		.8		375	.51	571	54	30	7.0	715	7.2
Oct. 26-31	598	16		10	3.2	60		26		15	93		--		211	.29	341	38	17	4.2	385	7.0
Nov. 1-10	257	20		15	4.7	112		30		20	180		1.0		a 382	.52	265	57	32	6.5	687	7.2
Nov. 11-20	327	18		14	5.0	108		30		16	177		--		a 370	.50	327	56	31	6.3	673	6.9
Nov. 21-30	1,083	14		12	5.0	77		22		23	125		.4		a 292	.40	854	50	32	4.7	502	6.6
Dec. 1-11	1,082	16		14	5.2	64		20		32	103		.5		a 265	.36	774	56	40	3.7	445	6.8
Dec. 12-20	606	19		15	6.5	76		20		34	128		--		a 318	.43	520	64	48	4.2	542	6.7
Dec. 21-31	562	20		14	5.9	78		20		29	126		.8		a 302	.41	458	59	43	4.3	522	6.7
Jan. 1-9, 1959	611	19		14	6.0	79	2.8	20		29	134	0.1	--		a 294	.40	485	60	43	4.5	553	7.0
Jan. 10-20	645	19		17	7.2	96		22		39	157		1.0		a 347	.47	604	72	54	4.9	652	6.7
Jan. 21-31	525	17		15	6.6	75		23		33	123		--		a 281	.38	398	64	46	4.1	534	6.8
Feb. 1-9	774	16		15	6.0	78		20		32	129		.8		a 287	.39	600	62	46	4.3	540	6.8
Feb. 10-15	1,227	16		16	7.3	97		16		42	159		--		a 346	.47	1,150	62	46	5.0	655	6.9
Feb. 16-25	4,321	11		11	3.8	34		20		26	52		.8		a 149	.20	1,740	43	27	2.3	276	6.8

a Residue at 180°C.

SABINE RIVER BASIN--Continued
 8-220. SABINE RIVER NEAR TATUM, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (calculated)			Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Mar. 1-10, 1959...	3,316	14		14	4.1	46		22		31	72		1.0		193	0.26	1,730	52	34	2.8	343	6.7
Mar. 11-19,	3,839	12		14	4.3	47		20		33	74		.8		195	.27	2,020	53	36	2.8	350	6.9
Mar. 20-24,	3,200	11		14	3.4	33		30		25	49		1.2		152	.21	1,310	49	24	2.0	266	6.9
Mar. 25-31,	1,156	16		17	5.8	65		28		35	104		.8		258	.35	805	66	43	3.5	464	6.9
Apr. 1-9, 11,	1,241	15		18	6.5	61	3.3	30		38	104	0.2	1.0		262	.36	878	72	47	3.1	486	6.5
Apr. 10,	2,460	14		25	8.0	115		30		50	190		1.5		418	.57	2,780	96	72	5.1	790	7.3
Apr. 12-23,	4,633	11		12	3.9	36		18		26	58		1.0		157	.21	1,960	46	31	2.3	290	6.9
Apr. 24-30,	5,736	9.0		10	3.0	25		20		20	38		1.0		116	.16	1,800	37	21	1.8	213	7.2
May 1-6,	14,200	8.0		9.0	2.5	19		23		14	28		1.0		92	.13	3,530	33	14	1.4	172	7.0
May 7-10,	7,988	9.8		10	3.5	37		26		17	56		1.5		148	.20	3,190	39	18	2.5	277	6.8
May 11-20,	2,321	13		14	5.0	53		27		27	85		1.5		212	.29	1,330	56	33	3.1	402	6.3
May 21-25, 31,	2,093	12		15	4.2	46		35		25	69		2.0		190	.26	1,070	55	26	2.7	358	6.6
May 26-30,	3,936	10		8.0	2.7	24		19		15	36		1.0		106	.14	1,130	31	16	1.9	198	6.4
June 1-10,	1,658	15		12	4.5	45		25		18	75		1.2		183	.25	819	48	28	2.8	351	6.5
June 11-14, 18-19, 21-25,	864	14		14	4.9	47		36		21	75		1.5		195	.27	456	55	26	2.8	362	6.8
June 15-17, 20, 26-30,	797	15		17	6.0	84		38		24	137		1.5		a 332	.45	714	67	36	4.5	579	6.5
July 1-9,	455	19		14	5.4	68		40		21	106		1.2		255	.35	313	57	24	3.9	475	6.8
July 10-11, 24-25,	476	15		21	7.2	171		34		28	281		1.2		341	.74	695	82	54	8.2	1,030	6.3
July 12-23,	301	17		18	5.9	95		52		20	150		1.2		333	.45	211	70	27	5.0	629	6.9
July 26-29,	2,005	12		14	3.9	82		31		17	131		1.0		276	.38	1,490	51	26	3.0	517	6.7
July 30-31, Aug. 5-11, 12-15,	1,939	18		16	3.0	31		54		15	41		1.2		152	.21	755	52	8	1.8	265	6.7
Aug. 16-18, 23-25,	1,800	21		22	5.2	85		58		20	74		1.2		a 236	.32	793	62	15	2.8	379	6.7
Aug. 18-22, 26-29,	202	20		21	6.7	116		70		17	132		1.0		a 341	.46	184	80	20	4.2	586	7.0
										20	182		.8		a 422	.57	230	82	25	5.6	751	6.7

Aug. 30-31,	284	21	6.3	119	56	15	195	--	1.2	406	0.55	311	78	32	5.9	770	7.5
Sept. 1-2, 1959	470	12	4.4	69	36	17	107	--	1.2	a 263	.36	334	48	19	4.3	451	6.7
Sept. 3-12.....	220	18	6.4	98	40	25	159	--	1.2	a 360	.49	214	72	38	5.0	642	6.7
Sept. 13-20.....	185	21	6.0	122	30	20	193	--	1.2	a 424	.58	212	70	28	6.3	762	6.4
Sept. 21-30.....																	
Weighted average	1,683	13	4.1	46	25	24	73	--	1.0	188	0.26	854	49	29	2.9	343	--

a Residue at 180°C.

Temperature (°F) of water, water year October 1958 to September 1959

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.....	73	71	70	68	68	70	68	68	68	68	70	70	67	70	73	74	74	73	75	75	75	73	73	74	73	70	68	65	61	63	60	70
November..	60	60	62	--	63	61	61	61	65	63	64	65	65	62	63	62	62	62	62	63	62	62	62	60	60	60	60	57	57	50	52	
December..	--	--	50	--	49	48	48	48	47	46	46	--	--	41	43	47	45	46	46	45	50	47	48	--	--	49	--	--	--	--	48	46
January....	46	46	45	44	42	40	44	45	42	42	46	48	50	56	51	48	46	46	52	58	48	44	47	45	55	56	49	50	51	50	48	
February....	47	42	--	46	46	47	47	50	50	54	52	52	55	55	53	56	58	57	57	54	50	51	56	56	50	54	58	54	--	--	52	
March.....	53	51	52	56	54	51	51	51	57	57	57	56	56	56	--	56	56	56	56	56	56	56	58	60	64	60	60	56	--	--	63	62
April.....	64	65	64	60	63	64	66	57	63	62	61	57	56	56	56	56	60	59	61	63	61	60	61	62	64	68	67	67	67	67	62	
May.....	67	70	70	--	71	72	73	73	73	72	72	72	73	71	71	72	74	76	76	75	74	74	75	75	75	76	76	77	75	77	73	
June.....	78	76	76	75	74	74	78	76	75	77	78	79	80	--	71	80	82	82	82	82	--	81	82	80	80	81	82	82	84	84	--	79
July.....	84	84	84	84	84	84	84	84	83	81	83	82	82	82	83	84	89	85	83	83	84	84	82	81	79	79	79	80	80	83		
August.....	80	82	83	83	84	84	84	84	84	84	82	80	80	82	81	81	82	82	83	84	84	83	82	83	82	82	82	82	82	82	82	
September..	80	80	80	81	80	81	81	81	81	81	79	80	76	75	76	76	76	76	73	87	76	86	77	77	76	76	77	78	80	80	78	77

SABINE RIVER BASIN--Continued
8-305, SABINE RIVER NEAR RULIFF, TEX.

LOCATION.--At gaging station near right bank at downstream side of bridge on State Highway 235, 2.4 miles north of Ruliff, Newton County, 4.2 miles upstream from Kansas City Southern Railway Co. bridge, 4.5 miles downstream from Cypress Creek, and at mile 40.
DRAINAGE AREA.--9,440 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1947 to September 1959.

Water temperatures: October 1947 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 212 ppm Sept. 9, 16-24; minimum, 43 ppm Jan. 31.

Specific conductance: Maximum, 32 ppm Feb. 1-6; minimum, 7.5 micromhos Feb. 3.

Hardness: Maximum, 43 ppm Feb. 1-6; minimum, 18 ppm May 20-24, 1953.

Hardness, 1948: Maximum, 43 ppm Dec. 26-27, 1948; minimum, 32 ppm Sept. 23-26, 28-30, 1958.

Hardness, 1947: Maximum, 43 ppm Dec. 26-27, 1947; minimum, 32 ppm Sept. 23-26, 28-30, 1958.

Hardness, 1946: Maximum, 43 ppm Dec. 26-27, 1946; minimum, 32 ppm Sept. 23-26, 28-30, 1958.

Hardness, 1945: Maximum, 43 ppm Dec. 26-27, 1945; minimum, 32 ppm Sept. 23-26, 28-30, 1958.

Specific conductance: Maximum, 32 ppm Feb. 1-6; minimum, 7.5 micromhos Feb. 3.

Water temperatures (1947-59): Maximum, 95°F Aug. 12, 1953; minimum, 34°F Jan. 28, 1948.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Boiron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate		
Oct. 1-11, 1958.....	24,480	9.8		5.2	1.5	14		18		7.8	18				66	0.09	19	4	1.4	114
Oct. 12-16.....	5,196	15		8.0	1.9	18		25		12	24				92	.13	28	8	1.5	156
Oct. 17-31.....	3,219	17		9.5	3.0	30		34		13	42				132	.18	36	8	2.2	229
Nov. 1-10.....	2,633	16		12	3.3	44		42		14	68				182	.25	44	16	2.9	324
Nov. 11-20.....	2,462	17		10	2.8	37		35		11	54				154	.21	36	8	2.6	267
Nov. 21-30.....	4,096	16		10	3.0	37		25		13	60				151	.22	38	17	2.6	278
Dec. 1-10.....	3,372	16		9.5	3.6	40		28		15	61				176	.24	38	16	2.8	288
Dec. 11-20.....	2,854	18		11	4.0	41		28		19	64				172	.23	44	21	2.7	345
Dec. 21-31.....	2,830	18		9.2	3.2	38		26		18	56				170	.23	36	15	2.8	275
Jan. 1-10, 1959.....	2,440	20		10	3.6	40	2.2	30		17	60	0.1			183	.25	40	16	2.8	303
Jan. 11-20.....	2,482	18		10	3.6	41		27		17	64				182	.25	40	18	2.8	307
Jan. 21-30.....	2,931	17		10	3.6	45		24		19	70				177	.24	40	20	3.1	328
Feb. 1-6.....	9,730	5.8		7.4	1.1	4.4		6		5.8	15				43	.06	23	18	4.4	76
Feb. 7-13.....	19,280	7.0		3.0	1.1	12		6		9.0	16				52	.07	12	7	1.5	91
Feb. 14-22.....	17,440	10		5.1	2.0	18		12		15	24				81	.11	20	10	1.8	188
Feb. 23-28.....	13,070	12		6.8	2.7	27		13		19	35				107	.15	27	16	2.1	185
Feb. 29.....	19,100	9.4		8.3	3.1	30		10		4	24				77	.10	30	12	1.6	135
Mar. 1-13.....	11,540	13		8.5	3.1	26		21		22	26				120	.16	36	18	1.9	211
Mar. 14-20.....	7,966	14		10	4.3	26		20		156	21				136	.21	32	26	2.4	284
Mar. 21-31.....	7,733	13		9.8	3.6	29		22		24	41				132	.18	27	20	2.0	255
Apr. 1-7.....	5,231	15		10	3.4	28	2.5	28		22	40				136	.18	39	16	1.2	243

NECHES RIVER BASIN

8-370. ANGELINA RIVER NEAR LUFKIN, TEX.

LOCATION.--At gaging station near right bank on downstream side of bridge on U.S. Highway 59, 200 feet upstream from Procella Creek, 1.5 miles downstream from Bayou Loco, 1.5 miles upstream from Southern Pacific Railroad bridge, and 8 miles north of Lufkin, Angelina County.

DRAINAGE AREA.--1,604 square miles (revised).

RECORDS AVAILABLE.--Chemical analyses: October 1954 to September 1959.

Water temperatures: October 1954 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 186 ppm Aug. 27-31; minimum, 63 ppm Apr. 13-14, 18-23.

Hardness: Maximum, 53 ppm Feb. 11-14; minimum, 22 ppm Apr. 13-14, 18-23.

Specific conductance: Maximum daily, 398 microhos Dec. 13; minimum daily, 73 microhos Apr. 19.

Water temperatures: Maximum, 87°F Sept. 21; minimum, 38°F Jan. 5, 10.

EXTREMES, 1954-59.--Dissolved solids: Maximum, 412 ppm Nov. 4-18, 26-30, 1954; minimum, 11 ppm Oct. 16-18, 1957.

Hardness: Maximum, 76 ppm Nov. 4-18, 26-30, 1954; minimum, 38°F Jan. 5, 10, 1959.

Specific conductance: Maximum daily, 895 microhos Nov. 10, 1954; minimum daily, 38 microhos Sept. 21, 1958.

Water temperatures: Maximum, 89°F July 9, 1957; minimum, 38°F Jan. 5, 10, 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃)	Boron (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Specific conductance (microhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium		Non-carbonate	
Oct. 1-11, 1958	3,430	15	--	6.5	2.9	14	18	12	12	21	21	1.0	0.11	81	750	28	13	1.1	138	7.0
Oct. 12-20	723	18	--	8.8	4.4	22	24	19	19	34	34	1.0	0.16	119	232	40	20	1.5	200	7.0
Oct. 21-27	404	20	--	7.2	3.3	19	26	17	17	24	24	1.0	0.14	104	113	32	10	1.5	160	7.1
Oct. 28-31	478	18	0.11	9.5	4.5	39	26	18	18	62	62	0.8	0.22	164	212	42	21	2.6	282	7.5
Nov. 1-10	300	20	--	8.0	3.9	20	28	17	17	27	27	0.8	0.11	111	115	36	13	1.4	185	7.4
Nov. 11-18	301	19	--	7.0	3.4	17	27	15	15	22	22	0.8	0.13	97	113	31	9	1.3	161	7.3
Nov. 19-30	452	16	--	8.5	4.0	29	24	17	17	45	45	0.0	0.18	132	161	38	18	2.1	237	7.0
Dec. 1-10	488	17	--	8.0	4.1	24	23	23	23	33	33	0.0	0.16	120	158	37	18	1.7	206	6.8
Dec. 11-24	412	17	1.2	9.0	4.5	37	22	25	25	54	54	1.1	0.23	167	186	41	23	2.5	278	7.1
Dec. 25-31	336	18	1.4	7.2	3.6	22	24	21	21	21	21	1.1	0.16	120	109	33	13	1.7	186	7.1
Jan. 1-10, 1959	418	17	1.2	8.2	4.0	30	22	22	22	44	44	1.2	0.22	148	167	37	19	2.2	247	7.0
Jan. 11-20	396	16	--	8.8	4.7	29	24	26	26	40	40	1.2	0.19	152	152	41	22	1.9	236	6.7
Jan. 21-31	411	14	--	8.5	4.3	34	21	26	26	40	40	1.4	0.20	145	161	39	22	2.3	258	6.9
Feb. 1-10	779	15	--	8.0	4.7	25	16	30	30	35	35	0.4	0.19	137	288	39	26	1.7	220	6.8
Feb. 11-14	844	15	--	10	6.8	37	15	41	41	56	56	0.2	0.24	173	441	53	41	2.2	318	7.1
Feb. 15-20	1,862	14	--	4.8	3.4	11	15	16	16	15	15	0.8	0.12	72	381	25	14	1.0	115	6.9
Feb. 21-28	2,481	14	--	6.0	3.6	14	16	18	18	21	21	0.5	0.06	86	12	31	18	1.1	181	6.9
Mar. 7-20	1,882	16	--	6.0	4.5	27	18	27	27	38	38	0.5	0.19	143	572	38	24	1.9	222	6.9
Mar. 21-31	563	14	--	8.5	5.0	31	20	32	32	43	43	0.2	0.21	155	346	43	27	2.1	254	6.9
Apr. 1-4, 10-12	691	14	--	9.0	4.9	24	2.3	26	26	34	34	0.2	0.16	137	308	43	23	1.6	217	6.9
														118	220	43	20	1.3	1204	6.9

NECHES RIVER BASIN--Continued
8-410. NECHES RIVER AT EVADALE, TEX.

LOCATION.--At gaging station near right bank on downstream side of pier of bridge on U.S. Highway 96, 200 feet upstream from Gulf, Colorado and Santa Fe Railway Co. bridge at Evadale, Jasper County, 600 feet downstream from Mill Creek, 15 miles upstream from Village Creek, and at mile 55.

RAINAGE AREA.--7,923 square miles (revised).

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1959.

Water temperatures: October 1947 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 156 ppm Mar. 6; minimum, 52 ppm Oct. 1-10.

Hardness: Maximum, 48 ppm Mar. 6; minimum, 18 ppm Oct. 1-10.

Specific conductance: Maximum daily, 295 microhms Jan. 4; minimum daily, 61 microhms Oct. 4.

Water temperatures: Maximum, 88°F July 1, 5-6, 11-13; minimum, 46°F Jan. 5-7, 11.

EXTREMES, 1947-59.--Dissolved solids: Maximum, 222 ppm Oct. 21-31, 1956; minimum, 35 ppm Sept. 21-22, 24, 1958.

Hardness: Maximum, 70 ppm Nov. 1-10, 1947; minimum, 14 ppm May 3-15, 1957, Oct. 27-31, 1957, Sept. 21-22, 24, 1958.

Specific conductance: Maximum daily, 422 microhms Jan. 25, 1957; minimum daily, 44 microhms Sept. 22, 1958.

Water temperatures: Maximum, 37°F Jan. 30-31, 1948, Jan. 31, 1949.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Thermograph clock stopped Feb. 24 to Mar. 26; range 54°F to 64°F. Minimum temperatures reported for this period are daily observations taken at 8 a.m. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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	Calcium	Non-carbonate			Sum		
Oct. 1-10, 1958...	17,780	10		4.8	1.5	6.6	2.8	16		9.2	8.8		0.0	0.5		52	0.07	2,500	18	5	0.7	76	6.9	
Oct. 11-20, 1958...	7,197	13		7.0	2.4	12	22	22	12	16	16		0	0.5		74	0.10	1,440	28	10	1.0	123	7.0	
Oct. 21-31, 1958...	1,615	14		8.5	2.8	17	28	28	15	22	22		0	2		94	0.13	410	32	10	1.3	159	7.1	
Nov. 1-10, 1959...	1,597	18		9.8	2.9	20	29	29	17	27	27		0	2.8		110	0.15	474	36	12	1.5	181	7.1	
Nov. 11-20, 1959...	1,438	18		10	2.8	22	33	33	16	28	28		1	8		114	0.16	443	36	10	1.6	191	7.0	
Nov. 21-30, 1959...	2,788	18		9.5	2.7	25	34	34	17	30	30		1	5		120	0.16	903	34	6	1.9	195	7.2	
Dec. 1-10, 1959...	1,914	16		8.8	3.5	24	36	36	18	28	28		2	8		117	0.16	605	36	7	1.7	196	7.2	
Dec. 11-20, 1959...	1,227	18		8.8	3.6	25	40	40	17	28	28		1	8		121	0.16	401	37	4	1.8	201	7.1	
Dec. 21-31, 1959...	1,972	16		8.5	3.6	25	34	34	18	30	30		1	5		119	0.16	634	36	8	1.8	201	7.0	
Jan. 1-10, 1959...	1,529	20		9.0	3.8	25	2.6	2.6	20	35	35		2	8		132	0.18	545	38	12	2.0	218	6.8	
Jan. 11-20, 1959...	1,945	19		9.0	3.7	28	32	32	21	35	35		2	0		140	0.19	735	38	12	2.0	218	6.8	
Jan. 21-29, 1959...	1,608	18		9.0	3.7	29	32	32	22	36	36		2	4		139	0.19	603	38	12	2.1	222	7.1	
Jan. 30-31, 1959...	5,077	8.4		5.5	1.8	12	16	16	12	14	14		1	8		63	0.09	864	21	8	1.1	111	6.8	
Feb. 1-5, 1959...																								
Feb. 6-20, 1959...	7,185	12		7.1	2.8	19	19	19	21	22	22		2	8		94	0.13	1,820	29	14	1.5	159	6.8	
Feb. 21-28, 1959...	9,825	11		7.2	2.6	15	14	14	18	18	18		2	8		78	0.11	2,070	24	13	1.3	134	6.6	
Mar. 1-5, 7-10, 1959...	7,724	12		7.9	2.5	13	13	13	26	22	22		0	8		96	0.13	2,000	28	18	1.5	162	6.5	
Mar. 6, 1959...	5,660	14		13	3.5	33	33	33	30	50	50		1	2		156	0.21	2,380	48	35	2.0	273	7.1	
Mar. 11-20, 1959...	5,298	13		8.8	3.5	21	16	16	26	29	29		0	5		108	0.15	1,540	35	22	1.6	192	6.4	
Mar. 21-31, 1959...	3,743	14		10	3.5	24	21	21	30	32	32		0	5		124	0.17	1,250	41	24	1.6	218	6.5	

NECHES RIVER BASIN--Continued
8-410. NECHES RIVER AT EVADALE, TEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959
/Recorder with temperature attachment, continuous thermograph/

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	76	73	70	70	70	71	71	72	74	74	74	74	72	72	72	73	73	74	74	74	75	75	76	76	75	74	74	73	70	69	67	73
Maximum	73	70	70	70	70	71	71	72	74	74	74	74	72	72	72	73	73	74	74	74	75	75	76	75	74	74	73	70	69	67	73	
Minimum	65	65	65	64	64	64	64	65	66	67	67	67	67	66	66	68	70	72	68	66	65	65	64	65	65	65	64	62	60	57	66	
Maximum	56	56	57	58	58	58	58	57	56	56	54	53	52	51	50	49	48	48	49	49	50	50	51	53	53	53	52	52	52	52	53	
Minimum	51	49	50	50	48	46	46	47	47	47	46	47	48	49	50	51	51	49	48	48	49	50	50	51	51	51	51	52	52	51	52	
January	49	49	49	48	46	46	46	47	47	47	46	47	48	49	50	51	51	49	48	48	49	52	54	50	50	51	52	53	54	56	50	
Maximum	54	52	49	48	49	50	50	53	55	56	55	56	58	58	58	59	60	60	56	54	54	55	--	--	--	--	--	--	--	--	53	
Minimum	52	49	48	48	48	49	50	53	55	55	54	54	56	56	57	59	56	53	52	52	54	54	52	54	52	54	53	53	53	53	53	
March	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	53	
Maximum	53	51	53	54	55	54	52	--	--	57	61	57	54	59	57	55	53	55	53	57	55	54	55	56	58	60	64	64	63	65	--	
Minimum	67	66	68	68	68	70	71	71	70	68	67	65	63	62	62	63	64	64	67	67	67	66	65	65	66	66	68	69	71	72	67	
April	66	64	65	66	67	68	69	70	68	67	65	63	62	61	61	63	64	64	67	66	65	64	64	65	66	66	68	69	71	--	66	
Maximum	73	73	74	76	76	76	78	78	78	77	77	76	77	77	77	76	76	77	77	77	76	76	75	75	76	76	78	79	82	77	76	
Minimum	72	73	73	74	75	76	76	77	77	76	76	75	75	75	75	74	75	75	74	75	75	74	75	75	76	76	78	79	82	77	76	
June	83	82	83	82	81	79	79	80	80	81	81	80	82	82	82	84	85	86	86	86	86	86	86	86	84	83	84	85	84	86	--	83
Maximum	81	81	81	81	79	78	78	78	79	80	80	81	81	81	81	82	83	83	83	83	83	83	83	83	82	82	83	84	85	85	--	82
Minimum	88	87	87	88	88	87	86	86	87	88	88	87	86	86	87	86	86	87	86	86	86	86	86	86	84	83	84	85	84	86	--	83
July	89	86	86	85	87	87	86	86	85	86	87	86	85	85	85	86	86	85	86	85	84	84	84	84	84	84	84	84	84	84	85	85
Maximum	82	83	85	86	87	87	87	86	86	87	87	86	85	84	84	84	83	83	83	83	83	83	82	82	82	81	81	81	82	82	83	83
Minimum	79	82	83	84	84	85	85	84	84	85	85	85	85	84	84	84	83	83	83	83	83	82	82	81	81	81	79	80	81	82	83	
August	86	86	84	84	86	86	85	84	84	84	82	80	79	79	79	80	80	81	81	81	81	81	80	80	79	79	78	78	81	82	83	
Maximum	82	83	83	83	84	85	84	84	83	83	82	80	79	79	78	78	78	78	78	78	78	79	79	79	79	79	78	78	81	82	83	
Minimum	86	86	84	84	86	86	85	84	84	84	82	80	79	79	79	80	80	81	81	81	81	81	80	80	79	79	78	78	81	82	83	
September	82	83	83	83	84	85	84	84	83	83	82	80	79	79	78	78	78	78	78	78	79	79	79	79	79	79	78	78	81	82	83	
Maximum	82	83	83	83	84	85	84	84	83	83	82	80	79	79	78	78	78	78	78	79	79	79	79	79	79	79	78	78	81	82	83	
Minimum	86	86	84	84	86	86	85	84	84	84	82	80	79	79	79	80	80	81	81	81	81	81	80	80	79	79	78	81	82	83		
October	82	83	83	83	84	85	84	84	83	83	82	80	79	79	78	78	78	78	78	79	79	79	79	79	79	79	78	81	82	83		

QUALITY OF SURFACE WATERS, 1959

TRINITY RIVER BASIN--Continued

8-503. ELM FORK TRINITY RIVER NEAR MUESTER, TEX.

LOCATION.--At gaging station on left bank 40 feet upstream from bridge on Farm Road 373, 2.5 miles south of Muenster, Cooke County, 2.5 miles downstream from Long Branch, and 6.5 miles upstream from Brushy Elm Creek.

DRAINAGE AREA.--46.0 square miles, of which 31.0 square miles (corrected) is above flood-detention structures.

RECORDS AVAILABLE.--Water temperatures: October 1956 to September 1958.

Sediment records: October 1956 to September 1959.

EXTREMES, 1958-59.--Sediment concentrations: Minimum daily, no flow on many days.

Sediment loads: Maximum daily, 3.0 tons June 27; minimum daily, 0 tons on many days.

EXTREMES, 1956-59.--Water temperatures (1956-58): Maximum, 91°F May 27, 1958; minimum, 37°F Feb. 11, 1958.

Sediment concentrations: Maximum daily, 3,020 ppm May 2, 1958; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 16,000 tons May 1, 1958; minimum daily, 0 tons on many days.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Suspended sediment, water year October 1958 to September 1959

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	0.1	45	(t)	0.1	98	(t)				
2...	0	--	0	.1			.1						
3...	.3	54	(t)	.1			52			(t)	.1	138	(t)
4...	.2			.1							.1		
5...	.2			.1							.1		
6...	.1	52	(t)	.1	98	0.1		.1	150		0.1		
7...	.1			.1				.1					
8...	.5			.1			.1						
9...	.3	55	(t)	.1			105	(t)		.1		146	.1
10...	.2			.1						.1			
11...	.1			.1	.1								
12...	.1	32	(t)	1.5	98	(t)			.2	164	.3		
13...	.1			.1					.4				
14...	.1			.1			.3						
15...	.1	.1	.2	164			.3	.2					
16...	.1	.1	.1										
17...	.1	.1	.1										
18...	.1	.1	.1										
19...	.1	.1	.1										
20...	.1	32	(t)	.1	98	(t)	.2	164	.3				
21...	.2			.1			.1						
22...	.1			.1			.1						
23...	.1	.1	.1	98			(t)			.3	164	.3	
24...	.1	.1	.1										
25...	.1	.1	.1										
26...	.1	.1	.1										
27...	.1	.1	.1										
28...	.1	32	(t)	.1	98	(t)	1.2	164	.3				
29...	.1			.1			.1						
30...	.1			.1			.1						
31...	.1	--	--	--			--			--	.8	--	4.2
Total	4.1	--	0.6	6.5			--			1.3	8.0	--	4.2

t Less than 0.05 ton.

TRINITY RIVER BASIN--Continued

8-503. ELM FORK TRINITY RIVER NEAR MUENSTER, TEX.--Continued

Suspended sediment, water year October 1958 to September 1959--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...	0.8	160	0.3	0.6	85	0.2	0.6	82	0.1	
2...	.8			.6			.6			
3...	.8			1.0			.6			
4...	.8			1.0			1			
5...	.7			.8			.6			
6...	.7	84	.1	.7	.6	.6	.6			
7...	.7			.7						.6
8...	.7			.7						.6
9...	.7			.9						.6
10...	.8			.7						.6
11...	1.0	160	.4	.6	89	.1	.6	74	.1	
12...	1.3			.6						.6
13...	1.2			.6						.6
14...	1.1			.6						.6
15...	.8			.6						.6
16...	.8	88	.2	.6	36	.1	.6	--	e .2	
17...	.7			.6						.9
18...	.7			.6						.8
19...	.7			.6						.8
20...	.8			.6						2.1
21...	.9	85	.2	.6	59	.1	1.1	--	e .4	
22...	.7			.6						.9
23...	.7			.6						.8
24...	.7			.6						.8
25...	.8			.6						2.1
26...	.8	85	.2	.6	--	--	.8	90	.2	
27...	.8			.6						.8
28...	.8			.6						.8
29...	.7			--						--
30...	.7			--						--
31...	.6	--	--							
Total	24.8	--	9.5	18.5	--	3.5	23	--	5.2	
April										
1...	1.4	80	0.2	0.2	120	0.1	0	77	0.1	
2...	1.0			.2			.3			
3...	.7			.1			0			
4...	.7			.1			0			
5...	.6			.2			0			
6...	.6			.6			0			
7...	.6			.4			0			
8...	.7			.4			0			
9...	.7			1.2			0			
10...	.7			.8			0			
11...	.7	137	.3	1.0	.3	.3	0	--	0	
12...	.6			.7			0			
13...	.6			.4			0			
14...	.6			.2			0			
15...	.6			.1			0			
16...	.7	98	(t)	.1	.1	.1	0	--	0	
17...	1.0			.1			0			
18...	1.1			.1			0			
19...	1.7			.1			0			
20...	1.1			.1			0			
21...	.8	82	.2	0	130	.1	0	--	0	
22...	.7			.1			0			
23...	.6			.1			.9			
24...	.6			.4			3.1			
25...	.4			.2			.1			
26...	.4	142	.2	.1	--	0	.9	--	e .5	
27...	.4			.1			3.7			
28...	.4			0			.4			
29...	.4			0			.1			
30...	.4			0			0			
31...	--	--	0							
Total	21.5	--	6.0	8.1	--	3.3	9.5	--	6.7	

e Estimated.

t Less than 0.05 ton.

TRINITY RIVER BASIN--Continued

8-503. ELM FORK TRINITY RIVER NEAR MUESTER, TEX.--Continued

Suspended sediment, water year October 1958 to September 1959--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1...	0	--	0				0	--	0
2...	0	--	0				0	--	0
3...	0	--	0				.3	--	(et)
4...	0	--	0				0	--	0
5...	0	--	0				0	--	0
6...	0	--	0				0	--	0
7...	0	--	0				0	--	0
8...	0	--	0				0	--	0
9...	0	--	0				0	--	0
10...	0	--	0				.2	--	(et)
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...	1.3	--	0				0	--	0
21...	.6	} --	e .1				0	--	0
22...	.1	} --					0	--	0
23...	0	--	0				0	--	0
24...	.2	--	(et)				0	--	0
25...	0	--	0				0	--	0
26...	0	--	0				0	--	0
27...	0	--	0				0	--	0
28...	0	--	0				.2	} 30	(t)
29...	0	--	0				.2	} --	0
30...	0	--	0				0	--	0
31...	0	--	0				--	--	--
Total	2.2	--	0.3	0	--	0	0.9	--	0.1

Total discharge for year (cfs-days).....127.1

Total load for year (tons)..... 40.7

e Estimated.

t Less than 0.05 ton.

TRINITY RIVER BASIN--Continued

8-625. TRINITY RIVER NEAR ROSSER, TEX.

LOCATION --At gaging station on left bank at downstream side of left pier of bridge on State Highway 34, 2.5 miles south of Rosser, Kaufman County, 8.5 miles downstream from East Fork Trinity River, and at mile 451.

DRAINAGE AREA --8,162 square miles.

RECORDS AVAILABLE --Chemical analyses: October 1954 to September 1959.

EXTREMES 1958-59 --Dissolved solids: Maximum, 745 ppm Dec. 21-31; minimum, 174 ppm Apr. 19.

Water temperatures: Maximum, 197 ppm Feb. 26-28, Mar. 1-5; minimum, 104 ppm Apr. 19.

Specific conductance: Maximum daily, 1,280 microhos Dec. 30; minimum daily, 266 microhos May 3.

Water temperatures: Maximum, 87°F July 9, 11; minimum, 34°F Dec. 23, Jan. 3.

EXTREMES 1954-59 --Dissolved solids: Maximum, 1,800 ppm Aug. 21-31, 1956; minimum, 139 ppm Nov. 5-6, 1957.

Water temperatures: Maximum, 88 ppm Nov. 5-6, 1957.

Specific conductance: Maximum daily, 2,990 microhos Oct. 13, 1956; minimum daily, 224 microhos Nov. 6, 1957.

Water temperatures: Maximum, 97°F July 1, 1955; minimum, 34°F Jan. 20, 1956, Dec. 23, 1958, Jan. 3, 1959.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids (residue at 180° C)		Hardness as CaCO ₃		Specific conductance (microhos at 25°C)				
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium		Non-carbonate	Sodium sorption ratio		
Oct. 1-9, 11, 1958	920	10		52	3.9	52		166		60	36	--	12	320	0.44	146	10	1.9	512	7.9	
Oct. 10, 12-20	720	13		84	4.8	84		184		88	54	--	23	426	.58	154	3	2.9	676	7.6	
Oct. 21-31	704	11		56	4.8	89		188		105	49	--	24	432	.59	139	5	3.1	651	7.5	
Nov. 1-20	322	14		5	5.3	129		195		140	85	--	43	265	.80	150	20	4.2	926	7.8	
Nov. 21-30	327	14		59	5.2	187		204		149	81	--	47	268	.81	170	16	4.7	950	7.9	
Nov. 21-30	361	15		63	5.5	137		204		147	87	--	42	256	.81	180	12	4.4	968	7.1	
Dec. 1-10	432	11		66	5.5	102		191		114	73	--	39	537	.73	187	30	3.3	849	7.0	
Dec. 11-20	294	13		68	5.9	148		238		144	93	--	49	438	.87	194	0	4.6	1,050	7.0	
Dec. 21-31	284	14		66	6.6	130		288		178	105	--	43	475	1.01	192	0	6.0	1,180	7.2	
Jan. 1-10, 1959	360	14		66	6.0	130	14	288		167	90	0.9	53	667	.91	189	42	4.1	1,050	7.0	
Jan. 11-20	312	14		62	5.5	159		205		167	98	--	55	695	.95	177	12	5.2	1,100	6.8	
Jan. 21-31	299	14		62	6.1	183		232		184	104	--	57	695	.99	180	0	5.9	1,160	7.0	
Feb. 1-13	327	14		64	6.0	153		188		161	108	--	53	670	.91	184	30	4.9	1,060	7.4	
Feb. 14-15	5,260	12		47	2.6	23		6136		36	14	--	11	213	.29	128	16	9	351	8.5	
Feb. 16-25	1,192	8.8		66	4.4	56		190		93	36	--	15	375	.51	1,210	39	1.8	607	7.7	
Feb. 26-28																					
Mar. 1-5	493	13		70	5.5	103		175		130	73	--	33	559	.76	197	42	3.2	873	8.0	
Mar. 6-9, 11-13	1,513	8.8		64	3.8	40		140		64	32	--	14	312	.42	1,270	36	1.4	487	7.4	
Mar. 10, 14-20	1,537	11		62	5.4	68		172		90	52	--	20	412	.56	176	36	2.2	659	7.4	

a Calculated from determined constituents.

b Includes equivalent of 5 parts per million of carbonate (CO₃).

TRINITY RIVER BASIN--Continued
 8-625, TRINITY RIVER NEAR ROSSER, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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 (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	
Mar. 21-31, 1959..	433	11		64	5.1	98		186		116	70	--	26	516	0.70	603	180	28	3.2	824	6.9
Apr. 1-10.....	382	13		64	5.6	109		189		138	77	0.8	39	576	.78	594	182	28	3.5	880	7.8
Apr. 11-18.....	433	12		63	5.7	106		187		122	76	--	30	544	.74	536	180	28	3.4	833	7.5
Apr. 19.....	6,510	10		40	1.1	18		110		34	8.0	--	9.1	1,174	.24	3,060	104	14	8	287	9.0
Apr. 20-30.....	1,278	8.2		63	4.9	62		168		95	43	--	18	412	.96	1,420	177	40	2.0	635	7.9
May 1-2, 3-10.....	460	13		56	5.6	104		185		108	74	--	26	508	.69	631	162	11	3.6	804	7.7
May 3-4, 11-12.....	4,682	10		43	3.5	25		120		50	14	--	7.9	2,212	.29	2,680	122	23	1.0	367	7.9
May 13-20.....	779	11		60	6.0	69		167		99	48	--	15	412	.74	967	170	33	2.3	657	7.7
May 21-31.....	452	11		60	6.0	110		197		128	79	--	29	542	.74	661	174	21	3.6	821	7.0
June 1-5.....	870	16		62	6.2	129		149		166	100	--	29	581	.74	1,360	189	58	4.2	988	7.5
June 6-8.....	2,083	13		49	3.8	53		145		67	37	--	15	309	.42	1,740	138	19	1.8	508	7.8
June 9-22.....	449	15		60	5.2	114		188		122	82	--	27	817	.70	627	171	17	3.8	847	7.4
June 23-30.....	2,881	11		53	4.2	49		146		82	31	--	9.4	341	.46	2,650	150	30	1.7	516	7.3
July 1-6, 9-11.....	386	12		55	5.5	82		168		90	64	--	23	440	.60	459	160	22	2.8	688	7.2
July 7-8, 12-20.....	332	20		57	6.5	140		200		137	105	--	9.0	624	.85	559	168	4	4.7	980	7.0
July 21-31.....	995	12		50	3.8	49		58		58	37	--	12	306	.42	322	140	13	1.8	499	6.7
Aug. 1-2, 13.....	466	14		51	3.8	72		167		78	50	--	12	402	.55	457	142	6	2.6	597	7.4
Aug. 3-8.....	472	12		52	4.3	80		168		91	55	--	15	402	.55	512	147	10	2.9	638	7.3
Aug. 9-12, 14, 20-22.....	361	12		49	4.6	102		167		107	70	--	21	457	.62	445	142	4	3.7	734	6.9
Aug. 15-19, 23-31.....	250	16		48	5.1	161		187		150	109	--	28	613	.83	414	144	0	5.7	1,010	6.6
Sept. 1-10.....	294	19		48	5.1	161		181		162	104	--	34	660	.90	524	141	0	5.9	1,030	7.5
Sept. 11-20.....	192	18		42	6.0	158		189		126	108	--	44	621	.84	322	130	0	6.0	986	7.2
Sept. 21-30.....	262	19		35	5.8	187		202		136	125	--	43	695	.95	492	112	0	7.7	1,120	6.8
Weighted average	644	12		56	4.6	80		168		97	54	--	22	425	0.58	762	158	21	2.8	678	--

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
 8-625. TRINITY RIVER NEAR ROSSER, TEX.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959
 (Once-daily measurement, usually between 7 a.m. and 10 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	65	66	64	67	67	70	72	74	75	67	68	67	68	68	69	70	69	70	70	72	69	69	67	67	65	64	63	64	59	60	67		
November ..	59	58	58	--	62	62	60	61	60	60	61	62	64	66	64	66	70	59	60	58	57	57	61	62	62	59	52	--	51	--	--	60		
December ..	49	50	51	52	52	52	49	50	48	49	46	45	44	43	42	44	44	43	46	46	48	48	34	54	49	49	51	50	51	48	44	47		
January	--	--	34	35	37	39	40	41	41	43	43	45	54	54	52	48	48	50	50	59	50	50	46	49	51	50	47	48	51	50	48	47		
February	--	40	40	47	47	42	42	59	57	55	51	52	56	59	54	51	54	55	50	39	45	47	49	51	--	53	54	55	--	--	50	--		
March	53	55	53	54	53	52	51	53	54	56	57	54	54	59	55	54	53	55	56	59	55	55	53	58	62	60	59	59	55	57	62	56		
April	61	59	63	60	66	66	69	69	62	63	60	56	54	57	57	59	62	60	59	67	62	59	62	64	62	68	69	69	68	72	--	63		
May	74	74	70	73	74	72	76	76	75	75	84	70	72	72	70	69	73	74	74	77	79	77	75	74	75	74	75	77	78	80	81	82	74	
June	--	65	60	60	75	73	76	78	80	80	82	80	82	80	84	84	85	85	86	79	78	78	78	78	79	80	80	80	80	81	--	80		
July	86	84	85	86	85	85	84	86	87	85	87	85	85	85	84	84	85	85	85	80	79	78	80	80	80	80	80	79	80	81	83	86	83	
August	84	85	86	85	85	85	85	85	80	80	81	80	82	82	83	83	84	84	84	84	84	84	83	83	83	82	81	82	82	84	82	83	82	
September ..	84	81	83	82	82	82	82	82	81	82	80	75	75	75	76	77	75	79	76	79	79	80	79	80	79	80	79	80	83	84	80	81	--	80

WESTERN GULF OF MEXICO BASINS
TRINITY RIVER BASIN--Continued

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8-632. PIN OAK CREEK NEAR HUBBARD, TEX.--Continued

Suspended sediment, water year October 1958 to September 1959

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	--	0	4.8	160	2.1
2...	0	--	0	0	--	0	3.1	160	1.3
3...	0	--	0	0	--	0	1.1	60	.2
4...	0	--	0	0	--	0	.5		
5...	0	--	0	0	--	0	.4		
6...	0	--	0	0	--	0	.2	18	(t)
7...	0	--	0	0	--	0	.1		
8...	0	--	0	0	--	0	0		
9...	9.2	1,550	sa 50	0	--	0	.2		0
10...	2.2	300	1.8	0	--	0	.1		
11...	.9	150	.4	0	--	0	.1	30	(t)
12...	.5	104	.1	0	--	0	.1		
13...	.2			0	--	0	.2		
14...	.2		(et)	0	--	0	.1		
15...	.1			0	--	0	0		0
16...	0	--	0	0	--	0	.1	12	(t)
17...	3.0	1,620	s 45	0	--	0	.2		
18...	2.2	900	5.3	0	--	0	.2		
19...	.6	144	.2	0	--	0	.2		
20...	.1	125	(bt)	0	--	0	.2		0
21...	15	2,300	s 454	0	--	0	.1	19	(t)
22...	13	1,470	s 176	0	--	0	.2		
23...	1.3	145	.5	0	--	0	.4		
24...	.5			0	--	0	.2		
25...	.1			0	--	0	.2		
26...	.1	77	(t)	0	--	0	.2		
27...	.2			.3	41	sb .2	.2		
28...	.1	38	(t)	18	1,330	sa 84	.2		
29...	0	--	0	2.4	135		.4		
30...	0	--	0	.7	70	.9	2.2	531	sb 9.2
31...	0	--	0	--	--	--	2.6	400	2.8
Total	49.5	--	733.7	21.4	--	85.2	18.8	--	15.9
January			February			March			
1...	0.4	16	(t)	0.3	--	(et)	0.6	--	e 0.2
2...	.2			13	383	sa 17	.6	--	e .2
3...	.2			31	492	sa 47	.3	112	.1
4...	.1			14	170	6.4	.4	90	.1
5...	0			--	2.3	100	.6	240	2.4
6...	.1	--	(et)	.9	72	.2	.9	210	a .5
7...	.2			.4	56	.1	.5	165	a .2
8...	.2			.2	44	(t)	.3	150	.1
9...	.2			.2	63	(t)	.3		
10...	.2			.6	104	.2	.3		
11...	.2			.9	--	e .3	.3		e .1
12...	.2			3.1	170	1.4	.1	266	.1
13...	.2			3.0	105	.9	.1		
14...	.2			248	3,030	s 2,910	.2		
15...	.2			20	330	18	.1	--	e .1
16...	.1	--	(et)	8.0	150	32	.1	261	.1
17...	.1			5.3	103	1.5	.2		
18...	.1			3.3	106	.9	.1		
19...	.2			2.2	130	.8	.1		
20...	.2			3.9	170	1.8	.1		e .1
21...	.2			2.9	80	.6	.4	332	.5
22...	.2			2.0	65	.4	.6		
23...	.2			2.4	108	.7	.6		
24...	.2			1.8	51	.2	.9		
25...	.2			1.4	--	e .2	.7		
26...	.2	1.1	56	.2	5.2	412	s 6.7		
27...	.2	1.1	--	e .2	1.2	--	e 1.0		
28...	.2	.9	68	.2	.4	--	e .3		
29...	.2	--	--	--	.7	310	.6		
30...	.3	--	--	--	.9	--	e .7		
31...	.3	--	--	--	.6	--	e .5		
Total	5.9	--	0.3	374.2	--	3,013.1	21.5	--	17.2

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.

Suspended sediment, water year October 1958 to September 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...	0.7	260	0.5	0.1	--	(et)	0	--	(et)
2...	.6	210	b .3	2.5	263	sb 5.1	.1	--	(et)
3...	.1	175	(bt)	7.5	400	8.1	--	--	(et)
4...	0	--	0	2.9	--	e .4	15	758	188
5...	0	--	0	1.1	--	e .1	152	2,880	s 1,510
6...	.1	115	(bt)	.7	40	.1	18	400	19
7...	.3	90	b .1	.4	--	--	5.6	125	1.9
8...	14	1,750	s 116	.2	--	(et)	2.7	60	.4
9...	4.2	730	8.3	.3	--	--	1.1	--	e .1
10...	13	1,950	s 108	37	2,000	s 596	55	2,040	sb 521
11...	210	2,150	s 1,640	611	2,510	s 5,640	5.8	--	e 3.1
12...	28	600	450	18	270	13	3.5	146	1.4
13...	4.0	300	e 2.7	5.9	170	2.7	2.2	--	e .7
14...	.9	--	e .5	3.3	--	--	.6	--	e .2
15...	.5	150	.2	2.0	--	--	.1	50	(et)
16...	.4	--	e .1	1.4	--	--	0	--	0
17...	88	3,440	s 1,310	.9	--	e .3	0	--	0
18...	9.2	300	7.5	.6	--	--	0	--	0
19...	147	4,080	s 2,170	.4	--	--	0	--	0
20...	17	500	23	.3	--	--	14	1,790	sb 162
21...	5.8	200	3.1	.2	--	--	1.5	400	b 1.6
22...	2.9	--	e 1.6	.3	150	.1	672	2,300	sa 4,960
23...	1.8	190	.9	9.0	1,080	s 35	318	1,600	sa 5,700
24...	1.2	--	e .6	98	2,850	s 796	862	1,060	sa 2,960
25...	.6	--	e .2	8.8	400	9.5	39	1,480	sa 230
26...	.4	--	e .1	2.2	--	--	7.7	--	e 4.2
27...	.3	110	.1	.7	--	--	3.2	--	e 1.3
28...	.3	--	e .1	.4	--	--	1.6	--	e .4
29...	.2	--	(et)	.2	150	a .2	.6	--	e .1
30...	.1	--	(et)	.1	--	--	.2	--	(et)
31...	--	--	--	.1	--	--	--	--	--
Total	551.6	--	5,439.0	816.3	--	7,109.8	2,181.7	--	16,265.5
July									
1...	0.1	--	(et)						
2...	6.4	812	sb 64						
3...	1.8	--	e 1.5						
4...	1.2	--	e .8						
5...	.7	--	e .4						
6...	.6	--	e .2						
7...	.5	--	e .1						
8...	.4	--	e .1						
9...	.4	--	e .1						
10...	.2	--	(et)						
11...	0	--	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...	.7	--	.2						
21...	6.1	1,710	sa 58						
22...	2.2	--	e 1.8						
23...	.5	--	e .2						
24...	1.6	350	a 1.5						
25...	2.4	450	b 2.9						
26...	2.9	550	b 4.3						
27...	7.3	1,550	sa 78						
28...	3.5	--	e 3.8						
29...	.6	--	e .2						
30...	.1	--	(et)						
31...	0	--	0						
Total	40.2	--	218.2	0	--	0	0	--	0
August									
September									
Total discharge for year (cfs-days)..... 4,081.1									
Total load for year (tons)..... 32,897.9									

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.

TRINITY RIVER BASIN--Continued

8-632. PIN OAK CREEK NEAR HUBBARD, TEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	Sampling point	Water temperature (°F)	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	
Oct. 9, 1958.....	0700		70	15	2,750		79	89	93	95	96	99	100						SBWC
Oct. 9.....	0700		70	15	2,750		37	64	87	95	98	99	99	100					SEN
Nov. 28.....	0753		42	40	2,080		71	78	85	88	93	96	99	100					SBWC
Feb. 14, 1959.....	1516		60	166	2,000		62	70	76	82	89	96	98	100					SBWC
Apr. 10.....	0657		--	21	6,050		74	85	90	94	97	98	99	100					SBWC
Apr. 10.....	0657		--	21	6,050		6	10	68	86	96	96	99	100					SEN
Apr. 11.....	1150		53	508	5,020		63	71	76	81	89	94	99	100					SBWC
Apr. 19.....	1449		69	310	5,380		72	83	88	94	97	99	99	100					SBWC
May 11.....	0642		62	1,100	9,920		68	72	79	88	92	96	99	100					SBWC
May 23.....	1655		70	14	1,860		83	94	98	100	--	--	--	--					BWC
May 24.....	0740		68	186	3,680		62	68	75	81	86	95	99	100					SBWC
June 5.....	1130		70	281	3,940		68	70	75	83	93	99	100	--					SBWC
June 5.....	1130		70	281	3,940		27	44	57	74	90	98	100	--					SEN
June 22.....	1044		72	1,800	2,000		71	83	89	92	95	98	98	100					BWC
July 21.....	1350		78	14	3,240		79	98	98	98	99	99	100	--					BWC
July 27.....	1840		76	25	6,500		--	84	90	96	100	--	--	--					SPWC

TRINITY RIVER BASIN--Continued

8-646. RICHLAND CREEK NEAR FAIRFIELD, TEX.

LOCATION.--At bridge on State Farm Highway 488, 4 miles upstream from mouth, 4 miles downstream from Chambers Creek, and 16 miles north of Fairfield, Freestone County.

RECORDS AVAILABLE.--Chemical analyses: April 1956 to September 1959.

Water temperatures: April 1956 to September 1959.

EXTREMES, 1956-59.--Dissolved solids: Maximum, 4,260 ppm Feb. 4; minimum, 140 ppm June 24-27.

Hardness: Maximum, 300 ppm Feb. 4; minimum, 94 ppm June 24-27.

Specific conductance: Maximum daily, 10,100 micromhos Sept. 25; minimum daily, 217 micromhos June 25.

Water temperatures: Maximum, 91°F Aug. 3, 6; minimum, freezing point Jan. 3, 4.

EXTREMES, 1956-59.--Dissolved solids: Maximum, 13,500 ppm Aug. 11-31, 1956; minimum, 131 ppm Apr. 21-30, 1957.

Hardness: Maximum, 460 ppm Oct. 18, 1956; minimum, 79 ppm Nov. 5-8, 1956.

Specific conductance: Maximum daily, 22,000 micromhos Aug. 22, 1956; minimum daily, 157 micromhos Apr. 25, 1957.

Water temperatures: Maximum, 98°F Aug. 3, 1957; minimum, freezing point, Jan. 3, 4, 1959.

REMARKS.--Bases omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Values reported for dissolved solids concentrations less than 1,000 ppm are residues at 180°C and for concentrations more than 1,000 ppm are calculated from determined constituents unless otherwise noted.

Records of specific residue of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Iron (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	Non-carbonate				
Oct. 1-4, 11, 1958.		13	0.01	76	5.2	218		225	0	48	315	0.4	8.0			804	1.09		211	26	6.6	1,440	8.2
Oct. 5-10.....		12	.02	68	4.4	114		175	0	56	162	.4	5.5			524	1.71		188	44	3.6	924	8.2
Oct. 12-22.....		10	.02	77	6.3	383		246	0	50	560	.4	7.5			1,220	1.66		218	16	1.1	2,220	8.0
Oct. 23-27.....		10	.09	52	3.3	85		131	0	59	63	.4	3.8			322	1.44		143	36	2.0	540	7.9
Oct. 28-31.....		12	.03	76	5.0	190		208	0	57	275	.4	5.0			749	1.02		210	40	5.7	1,330	7.9
Nov. 3-4, 8-9, 18-20.....		9.6	.01	92	6.7	275		250	0	84	395	.4	6.5			al,000	1.36		257	52	7.5	1,800	8.0
Nov. 7-17.....		8.4	.03	66	5.9	85		192	0	61	101	.5	3.1			482	1.66		273	56	2.5	3,708	8.0
Nov. 10-17.....		3.8	.02	93	10	699		310	0	61	1,040	.5	9.0			2,070	2.82		273	18	1.8	3,708	8.0
Nov. 21-25.....		11	.04	89	7.6	473		473	0	85	700	.5	4.2			1,800	2.04		254	48	13	2,650	8.2
Dec. 7.....		13	.03	75	4.2	108		180	0	85	140	.5	6.5			b,921	.71		204	57	3.3	829	8.2
Dec. 11, 18-20.....		6.4	.01	95	7.5	590		296	0	72	760	.5	9.0			1,820	2.20		268	24	14	2,900	8.2
Dec. 21-31.....		6.2	.01	97	7.6	531		296	0	73	780	.6	6.9			1,850	2.24		274	31	14	2,900	8.2
Jan. 1-9-10, 1959		5.2	.01	100	7.7	388	5.1	277	0	98	580	.6	6.1			1,330	1.81		281	54	10	2,360	8.2
Jan. 2-8.....		4.6	.01	88	6.0	215		248	0	82	595	.4	6.1			856	1.16		244	41	6.0	1,490	8.2
Jan. 11-15, 18-31.....		3.8	--	95	9.1	555		292	0	89	810	--	8.0			1,710	2.33		274	36	15	3,100	8.2
Jan. 16-17.....		6.4	--	85	8.4	145		189	0	121	195	--	6.0			1,674	.92		246	92	4.0	1,170	7.9

Feb. 1-3, 1959.....	8.8	--	90	10	723	274	12	88	1,060	0.5	7.0	2,130	2.90	21	19	2,830	8.5	
Feb. 4.....	8.8	--	78	6.4	147	210	27	89	2,350	5	7.3	4,260	5.79	40	4.3	7,490	8.5	
Feb. 5-10, 14.....	5.6	--	88	8.1	332	252	0	108	1,900	5	6.0	4,654	1.89	49	9.0	1,100	8.0	
Feb. 11-13.....	12	--	54	4.0	36	140	0	58	460	5	8.5	1,130	1.54	253	46	2,030	8.0	
Feb. 15-20.....	12	--	96	6.5	114	244	0	79	332	7	8.8	288	.39	151	36	1,345	7.7	
Feb. 21-28.....	9.6	--	86	6.6	174	251	0	78	158	7	8.8	626	.85	266	66	1,040	8.2	
Mar. 1-5, 7-8.....	12	0.00	92	6.7	142	196	13	68	248	6	9.2	772	1.05	266	61	4.7	1,330	8.1
Mar. 6.....	10	0.00	89	7.0	252	214	14	75	880	7	8.5	1,800	2.45	255	28	3,240	8.6	
Mar. 9-15.....	7.0	--	42	3.2	54	110	0	46	198	3	7.7	b 661	.90	257	80	3.9	1,190	8.6
Mar. 16-21.....	9.0	--	82	7.6	343	113	8	76	365	2	8.2	b 922	1.25	251	52	6.9	1,710	8.7
Mar. 22.....	3.8	0.00	82	7.6	343	113	8	76	67	3	3.5	b 279	.38	118	28	2.2	499	8.2
Mar. 23-31.....	--	--	--	--	--	--	--	--	502	3	6.0	1,130	1.54	236	48	9.7	2,120	8.5
Apr. 1-2.....	10	0.01	49	3.0	68	133	0	54	772	--	--	--	--	252	26	--	2,930	7.9
Apr. 3-5.....	9.6	0.01	72	5.5	192	185	0	91	83	6	4.9	b 341	.46	135	26	2.5	611	7.6
Apr. 6-9.....	10	0.03	58	4.0	69	147	0	58	262	6	3.0	769	1.05	202	50	5.9	1,320	8.0
Apr. 10-11, 16-17.	11	--	48	3.4	30	129	0	47	88	5	5.0	392	.53	161	40	2.4	650	7.7
Apr. 12-15, 18-22.	13	--	61	3.6	34	159	0	57	28	5	5.7	254	.35	134	28	1.1	400	7.5
Apr. 23-24.....	11	--	88	6.2	123	238	0	75	33	4	3.8	296	.40	167	37	1.1	477	8.0
Apr. 25-30, May 1-2.....	11	--	62	4.5	78	170	0	52	165	.3	6.3	618	.84	245	50	3.4	1,070	7.7
May 3, 5-7, 12 at 6 p.m.....	10	.07	39	2.3	17	112	0	27	102	.4	4.8	416	.57	173	34	2.6	706	7.8
May 4, 10-11, 12 at 6:48 a.m., 13-15.....	10	--	--	--	--	--	--	--	14	.4	3.0	181	.25	107	15	.7	285	7.4
May 8.....	13	.03	70	4.8	44	206	0	60	230	--	--	--	--	214	45	--	1,260	7.9
May 9.....	--	--	--	--	--	209	0	--	458	--	--	--	--	232	60	--	2,000	7.9
May 16-18, 26-31.....	13	--	70	4.8	44	183	0	60	51	.4	5.2	356	.48	194	44	1.4	570	7.7

a Residue at 180°C.
b Calculated from determined constituents.

TRINITY RIVER BASIN--Continued

8-646. RICHLAND CREEK NEAR FAIRFIELD, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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			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	Non-carbonate				
June 1, 3-4, 14-20, 1959.....		14	0.01	86	6.1	114		222	0	76	155	0.5	6.6	598	0.81		240	58	3.2	1,000	7.9	
June 5, 11-13.....		14	.02	64	3.9	48		170	0	59	52	.5	4.8	346	.47		176	36	1.6	558	7.5	
June 6-10.....		13	.03	45	2.6	19		129	0	35	13	.5	3.0	208	.28		123	17	.7	325	7.3	
June 21.....		--	--	--	--	--		179	0	--	235	--	--	--	--		204	58	--	1,260	7.8	
June 22-23, 28-30.		14	.03	48	3.0	30		133	0	42	30	.5	2.5	250	.34		132	23	1.2	401	7.6	
June 24-27.....		11	.09	34	2.1	12		102	0	21	8.0	.5	1.5	b	.19		94	10	.5	239	7.5	
July 1-4.....		12	.04	66	5.1	52		164	0	49	77	.4	3.2	376	.51		186	51	1.6	633	6.5	
July 5, 7-9, 11-15		14	.02	80	7.3	168		201	0	76	245	.5	5.0	751	1.02		230	63	4.8	1,300	7.0	
July 16-20.....		9.8	--	74	8.2	288		196	0	78	425	.4	4.2	b	984	1.34		218	58	1,790	7.3	
July 21.....		15	--	39	2.2	59		136	0	49	47	.7	4.5	b	283	.38		106	0	2.5	459	8.0
July 22-31, Aug. 1-2.....		13	--	64	4.4	128		156	0	83	168	.6	3.0	550	.75		178	50	4.2	935	7.5	
Aug. 3-6.....		13	--	65	6.1	261		184	0	72	372	.6	1.8	894	1.22		187	36	8.3	1,600	8.0	
Aug. 7, 9-15.....		10	--	70	7.9	534		196	0	74	800	.7	.5	1,890	2.16		207	46	16.	2,880	7.8	
Aug. 16-28, 30-31.		8.0	--	86	10	812		274	0	70	1,220	.7	.5	2,340	3.18		256	31	22	4,180	7.9	
Sept. 1-5, 17-23.		7.8	.02	88	16	1,360		323	0	77	2,050	.8	--	3,760	5.11		286	21	35	6,600	7.7	
Sept. 7-16, 28-29.		7.8	.00	72	11	777		271	0	78	1,140	.6	1.5	2,220	3.05		224	2	23	3,970	8.1	
Sept. 30.....		--	--	--	--	--		159	0	--	465	--	--	--	--		122	0	--	1,790	8.0	

b Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
 8-646. RICHLAND CREEK NEAR FAIRFIELD, TEX.--Continued
 Temperature (°F) of water, water year October 1968 to September 1969
 (Once-daily measurement, usually between 4 p.m. and 7 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	71	70	68	72	79	69	70	68	69	65	68	71	78	68	69	70	72	70	74	78	69	64	72	63	66	61	63	61	60	63	61	68	
November ..	60	58	53	61	55	51	53	58	58	55	58	50	54	51	53	54	51	53	51	48	51	58	55	54	52	--	--	--	52	--	54		
December ..	55	52	50	48	51	50	48	43	40	40	39	41	43	48	41	50	46	44	45	40	38	48	43	41	42	38	40	44	43	38	44		
January	41	36	32	32	39	46	48	43	49	50	49	44	48	41	36	41	46	52	44	51	44	46	48	50	52	48	39	43	48	49	42	44	
February	45	--	41	48	45	47	48	49	44	49	54	42	52	54	55	57	56	47	40	49	50	51	54	46	55	53	58	53	--	--	50		
March	61	56	63	59	62	60	55	61	54	61	63	66	68	69	63	65	69	66	63	67	61	60	67	70	72	63	69	65	63	70	64		
April	64	66	69	64	73	66	71	64	62	68	59	68	59	61	66	61	68	68	71	69	72	68	70	72	66	68	70	73	74	76	--	68	
May	77	75	74	77	75	77	71	76	79	70	66	74	74	71	77	75	71	79	--	--	--	--	--	--	--	--	74	77	75	80	78	77	--
June	80	--	78	81	70	75	78	75	80	85	84	80	78	82	79	80	81	81	85	87	85	79	79	79	79	80	82	85	85	82	--	80	
July	85	85	79	84	85	--	89	84	88	--	90	85	86	84	88	89	90	90	85	86	79	82	80	80	80	79	80	81	80	82	85	83	84
August	90	90	91	90	83	91	90	--	87	87	85	86	88	85	80	89	87	88	88	85	87	84	86	88	85	82	88	85	--	83	85	87	
September ..	89	85	84	87	88	--	88	82	85	85	80	79	76	76	80	80	82	80	85	84	84	80	84	--	81	80	--	81	79	79	--	82	

TRINITY RIVER BASIN--Continued

8-665. TRINITY RIVER AT ROMAYOR, TEX.

LOCATION.--At gaging station near right bank on downstream side of pier of bridge on State Highway 105, 1.9 miles south of Romayor, Liberty County, 2.0 miles downstream from Gulf, Colorado and Santa Fe Railway Co. bridge, 4.1 miles downstream from Big Creek, and at mile 94.

DRAINAGE AREA.--17,192 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to November 1949, February 1950 to September 1951, April 1953 to September 1959.

Water temperatures: February 1950 to September 1951, April 1953 to January 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 666 ppm Sept. 7-8, 10-16; minimum, 132 ppm Apr. 12-22.

Hardness: Maximum, 187 ppm Sept. 7-8, 10-16; minimum, 66 ppm Apr. 12-22.

Specific conductance: Maximum daily, 1,520 microhos Sept. 15; minimum daily, 194 microhos Apr. 13.

EXTREMES, 1948-50, 1953-59.--Dissolved solids: Maximum, 1,900 ppm Nov. 7, 1953; minimum, 82 ppm July 31, 1954.

Hardness: Maximum, 238 ppm Oct. 21-31, 1956; minimum, 32 ppm Nov. 1-3, 1953.

Specific conductance: Maximum daily, 3,886 microhos Oct. 26, 1956; minimum daily, 103 microhos Nov. 9, 1946.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhos at 25°C)		
															Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		Sodium adsorption ratio	
Oct. 1-10, 1958...	4,813	15		44	4.0	37		124		40	43	--	3.5		0.36	3,430	126	25	1.4	434	8.0
Oct. 11-20.....	1,691	16		56	5.2	73		154		50	98	--	5.5		397	1,810	161	35	2.5	681	7.9
Oct. 21-31.....	1,420	14		59	5.3	84		165		62	104	--	7.5		434	1,660	169	34	2.8	742	7.8
Nov. 1-10.....	961	14		53	5.0	75		148		50	97	--	7.0		392	1,020	152	31	2.6	675	7.7
Nov. 11-20.....	754	15		58	5.5	75		156		58	98	--	3.5		407	829	167	39	2.5	691	7.8
Nov. 21-30.....	1,072	11		55	6.3	116		145		63	161	--	3.5		506	1,460	163	44	3.9	891	7.8
Dec. 1-14.....	1,321	16		51	6.9	135		143		73	178	--	7.2		555	1,980	156	38	4.7	964	7.5
Dec. 15-31.....	1,860	16		53	6.8	115		146		73	171	--	8.3		556	1,770	165	46	3.9	883	7.8
Jan. 1-31, 1959...	1,073	16		57	7.3	125		146		75	177	0.3	8.3		555	1,610	162	48	4.8	958	7.5
Jan. 16-31.....	1,824	13		53	8.0	144	6.3	150		89	188	--	16.2		593	1,320	172	50	4.8	1,040	7.8
Feb. 1-6.....	2,469	15		36	3.4	81		89		41	188	--	6.2		a 299	1,990	104	31	2.8	534	8.0
Feb. 7-15, 19-20..	4,450	17		48	6.6	115		115		70	155	--	8.2		a 511	6,140	142	48	4.2	851	7.9
Feb. 16-18.....	17,300	12		24	2.3	34		60		41	41	--	4.1		a 178	8,310	24	20	1.8	313	7.7
Feb. 21-28.....	9,182	14		39	3.9	35		110		44	35	--	5.3		a 230	5,710	114	24	1.4	395	7.8
Mar. 1-8.....	2,382	16		46	5.5	58		122		56	72	--	4.8		a 344	2,210	138	38	2.2	555	7.7
Mar. 9-20.....	3,354	14		49	6.5	91		129		70	114	--	8.4		a 438	3,970	149	44	3.2	735	7.7
Mar. 21-31.....	1,673	13		51	5.7	62		137		58	77	--	5.5		a 366	1,650	150	38	2.2	593	7.8

Apr. 1-9, 1959.....	1,814	16	59	8.0	101	5.1	147	73	140	0.4	4.8	516	0.70	2,530	180	60	3.3	856	7.8
Apr. 10-11.....	10,530	20	29	4.1	43		82	37	53	--	3.8	a 230	.31	6,540	90	22	2.0	393	7.8
Apr. 12-22.....	23,950	12	22	2.8	19		64	20	23	--	2.0	a 132	.18	8,550	66	14	1.0	235	7.3
Apr. 23-30.....	13,800	14	38	3.8	26		110	35	27	--	3.7	a 202	.27	7,330	110	20	1.1	355	7.6
May 1-7, 13-15.....	7,482	14	48	5.1	49		128	48	64	--	2.5	a 294	.40	5,910	141	36	1.8	321	7.6
May 8-12, 16-20.....	16,950	9.8	32	3.0	18		96	20	22	--	2.5	a 134	.21	7,060	92	14	.8	284	7.5
May 21-31.....	21,290	11	34	3.4	19		94	27	24	--	1.5	a 166	.23	9,520	99	22	.8	296	7.4
June 1-10.....	5,083	22	43	5.1	44		118	46	54	--	3.5	286	.39	3,930	128	32	1.7	461	7.2
June 11-17, 29-30	10,700	16	42	3.8	26		125	33	25	--	4.5	230	.31	6,540	126	18	1.0	359	7.2
June 18-28.....	3,505	21	48	5.0	52		143	41	65	--	2.8	308	.42	2,910	140	24	1.9	512	7.4
July 1-9.....	13,670	22	42	3.8	26		128	31	24	--	1.5	228	.31	8,340	120	16	1.0	350	7.8
July 10-25.....	1,502	19	58	5.8	66		166	48	88	--	3.5	372	.51	1,510	168	32	2.2	626	6.8
July 26-31.....	9,658	13	28	3.0	52		83	35	63	--	3.0	a 238	.32	6,210	82	14	2.5	414	7.3
Aug. 1-5, 9-16.....	2,202	17	40	4.2	56		116	40	71	--	2.2	308	.42	1,830	118	22	2.2	501	7.3
Aug. 6-8, 17-20.....	1,413	17	50	5.6	71		140	45	99	--	2.2	382	.52	1,460	148	34	2.5	639	7.5
Aug. 21, 23-25.....	7,948	20	57	6.0	112		171	46	157	--	.8	a 483	.66	1,240	166	26	3.8	832	7.9
Aug. 26-31.....	1,545	13	43	4.5	73		133	53	86	--	.2	357	.49	1,490	126	17	2.8	379	7.8
Sept. 1-6, 9.....	752	11	51	6.2	93		162	57	114	--	1.8	435	.59	1,100	152	20	3.3	741	7.6
Sept. 7-8, 10-16.....	516	13	62	7.9	171		187	75	232	--	1.8	666	.91	1,350	187	34	5.4	1,180	7.6
Sept. 17-30.....	4,909	14	60	7.4	157		205	63	203	--	1.5	614	.84	855	180	12	5.1	1,100	7.6
Weighted average	4,909	14	38	4.1	42		107	37	51	--	3.4	249	0.34	3,300	112	24	1.7	425	--

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
8-671. TRINITY RIVER NEAR MOSS BLUFF, TEX.

LOCATION.--At Devers Pumping Plant No. 1, 1 mile west of Moss Bluff, Liberty County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1959.
EXTREMES, 1958-59.--Dissolved solids: Maximum 693 ppm Dec. 5-8; minimum 143 ppm Apr. 12-20.
Hardness: Maximum 194 ppm Sept. 17-24, 27-30; minimum 69 ppm Apr. 12-20.
Specific conductance: Maximum daily, 1,270 micromhos Dec. 6; minimum daily, 235 micromhos Apr. 18.
EXTREMES, 1949-59.--Dissolved solids: Maximum 3,930 ppm Aug. 26-31, 1956; minimum, 110 ppm Oct. 4-10, 1949.
Hardness: Maximum, 790 ppm Aug. 26-31, 1956; minimum, 40 ppm Apr. 9-13, 1955.
Specific conductance: Maximum daily, 7,630 micromhos Aug. 27, 1952; minimum daily, 127 micromhos Oct. 7, 1949.
REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Nitrate (NO ₃) (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	Calcium Magnesium	Non-carbonate				
Oct. 1-8, 27-28, 1958	10			38	3.1	30	114			26	36				218	0.30	108	14	356	7.6		
Oct. 9-16	12			48	4.2	46	139			35	60				292	.40	137	23	490	7.8		
Oct. 17-26																						
29-31	11			58	5.3	79	169			48	104				408	.55	166	28	2.7	699	7.9	
Nov. 1-15	17			58	5.1	83	164			48	111				420	.57	166	31	2.8	725	7.6	
Nov. 16-30	12			60	5.4	89	164			55	121				433	.59	172	37	2.9	769	7.6	
Dec. 2-4, 9-15	17			53	7.0	121	149			73	155				544	.74	161	39	4.1	926	7.3	
Dec. 5-8	17			61	8.0	173	172			62	252				693	.94	185	44	5.5	1,210	7.0	
Dec. 19-31	16			59	6.9	110	160			67	148				514	.70	176	44	3.6	890	7.4	
Jan. 1-14, 1959	14			60	9.0	133	6.4			75	192	0.5			611	.83	186	56	4.2	1,030	7.8	
Jan. 15-28	12			60	7.9	149	164			70	204				645	.88	182	48	4.8	1,090	7.6	
Jan. 29-31																						
Feb. 1	12			45	5.0	88	111			47	127				403	.55	133	42	3.3	705	8.1	
Feb. 2-8	9.4			27	2.6	44	71			27	60				a208	.28	78	20	2.2	384	7.6	
Feb. 9-12, 16	12			43	4.7	76	104			54	105				374	.51	127	42	2.9	632	7.4	
Feb. 13-15	12			42	3.2	35	115			44	35				a233	.32	118	24	1.4	402	7.6	
Feb. 17-28																						
Mar. 1-8	16			43	4.9	49	116			41	66				304	.41	127	32	1.9	486	7.9	
Mar. 10-14	16			50	6.8	85	130			70	112				435	.59	158	51	3.0	728	7.5	
Mar. 20-24	14			50	4.9	50	141			42	65				313	.43	145	30	1.8	524	7.9	
Mar. 18-19	14			56	6.1	78	146			61	112				430	.58	164	45	2.6	730	7.9	
Apr. 1-11																						

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
 8-671. TRINITY RIVER NEAR MOSS BLUFF, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (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			
Apr. 12-20, 1959.		9.0		24	2.2	23		67		20	30	1.8	0.19	a143	69	14	1.2	255	7.0	
Apr. 21-30.....		11		36	3.2	30		101		33	35	2.8	a201	103	20	1.3	347	7.5		
May 1-5.....		13		40	4.1	32		111		33	42	2.5	a222	117	26	1.3	400	7.1		
May 6-8.....		13		60	6.2	61		150		67	80	3.6	a365	175	52	2.0	655	7.4		
May 9-20.....		9.8		32	3.3	28		96		22	36	2.0	a180	93	15	1.3	333	7.2		
May 21-31.....		10		36	3.2	23		101		26	29	2.0	a179	103	20	1.0	327	7.2		
June 1-2, 4-12, 14.....		15		40	3.5	34		123		35	34	2.5	236	114	13	1.4	390	7.2		
June 13, 17-20.....		16		54	5.2	53		157		43	68	3.0	332	156	28	1.9	564	7.3		
June 21-30.....		14		50	4.5	60		142		43	78	3.0	334	144	27	2.2	574	7.3		
July 1-6.....		10		58	3.4	21		101		34	24	2.0	a182	109	26	.9	337	6.2		
July 7, 9-13.....		18		56	5.0	44		182		47	56	2.8	350	160	36	1.5	532	6.7		
July 15-24.....		14		49	4.8	39		133		30	60	2.0	a264	142	33	1.4	488	6.5		
July 25-30.....		9.2		28	2.4	30		72		26	40	2.8	a173	86	21	1.5	333	6.3		
Aug. 1-10.....		14		39	4.2	54		114		34	74	2.2	300	116	21	1.2	482	7.2		
Aug. 11-20.....		13		46	5.0	53		133		34	75	2.2	315	136	26	2.0	521	7.3		
Aug. 21-31.....		13		44	4.5	57		134		34	74	2.2	320	128	18	2.2	521	7.1		
Sept. 1-10.....		16		46	4.8	69		152		36	86	1.2	350	134	10	2.6	565	6.5		
Sept. 11-16.....		13		59	6.4	106		185		50	142	.2	a468	174	22	3.5	827	8.2		
Sept. 17-24, 27-30.....		8.8		66	7.0	152		218		69	194	.8	a605	194	15	4.7	1,060	7.4		

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
8-672, OLD RIVER NEAR COVE, TEX.

LOCATION --At Barber Hill Pumping Plant, 5 miles northwest of Cove, Chambers County.
RECORDS AVAILABLE --Chemical analyses: Short periods during summers of 1946 to 1949, daily records October 1949 to September 1959.
EXTREMES 1958-59 --Dissolved solids: Maximum, 585 ppm Jan. 15-28; minimum, 105 ppm Feb. 6, 15-16.
Hardest: Maximum, 187 ppm Jan. 1-14; minimum, 50 ppm Feb. 6, 15-16.
Specific conductance: 1,480 microhmhos Jan. 25; minimum daily, 128 microhmhos Oct. 12.

EXTREMES 1949-59 --Dissolved solids: Maximum, 11,300 ppm Oct. 14-29, 1956; minimum, 77 ppm Apr. 29, May 1-2, 1957.
Hardest: Maximum, 2,460 ppm Oct. 14-29, 1956; minimum, 34 ppm Apr. 29, May 1-2, 1957.

Specific conductance: Maximum daily, 18,000 microhmhos Oct. 15, 17, 1956; minimum daily, 101 microhmhos Apr. 29, 1957.
REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	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
Oct. 1-14, 1958..		16		24	3.0	17		87		9.8	20	--	0.5	a133	0.18	72	1	0.9	224
Oct. 15-31.....		14		27	3.3	25		91		21	27	--	.5	173	.24	81	6	1.2	263
Nov. 1-31.....		14		31	4.0	30		105		15	40	--	.5	a186	.25	94	8	1.3	327
Nov. 16-30.....		12		35	4.7	36		118		17	49	--	.5	a212	.29	107	10	1.5	380
Dec. 1-10.....		13		42	5.7	51		134		24	73	--	.5	a275	.37	128	18	1.9	495
Dec. 11-20.....		13		54	7.3	86		153		42	138	--	1.0	433	.59	164	39	2.9	731
Dec. 21-31.....		13		57	8.5	112		149		61	166	--	1.8	530	.72	177	55	3.7	893
Jan. 1-14, 1959..		9.4		60	9.1	115	5.6	163		61	179	0.3	1.0	560	.76	187	54	3.7	947
Jan. 15-28.....		4.2		60	8.0	139		161		59	206	--	.1	585	.80	182	50	4.5	1,020
Jan. 29-31.....																			
Feb. 7-10.....		6.6		23	2.9	24		64		30	34	--	1.0	a142	.19	69	17	1.3	274
Feb. 1-5.....		9.6		34	5.1	61		100		35	84	--	1.2	306	.42	106	24	2.6	514
Feb. 6, 15-16...		9.8		17	1.8	17		61		11	17	--	1.0	a105	.14	50	0	1.0	187
Feb. 11-14.....																			
Feb. 17-28.....		11		26	3.3	29		98		15	32	--	1.2	a166	.23	78	0	1.4	299
Mar. 1-7.....		11		25	2.9	26		99		10	27	--	1.2	a152	.21	74	0	1.3	275
Mar. 8-20.....		11		34	4.5	38		124		15	48	--	1.0	233	.32	103	2	1.6	384
Mar. 21-31.....		12		45	5.8	57		138		34	79	--	1.0	327	.44	136	24	2.1	549
Apr. 1-9.....		11		50	6.4	65	4.1	152		39	92	.3	1.2	370	.50	132	27	2.3	616
Apr. 10-15.....		11		18	2.1	23		69		14	22	--	1.2	a123	.17	83	0	1.6	318
Apr. 16-30.....		12		28	3.2	32		99		20	36	--	1.2	a251	.23	85	2	1.6	376
May 1-11.....		13		37	4.2	39		120		28	46	--	1.2	4227	.31	110	11	1.6	402

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
 8-672. OLD RIVER NEAR COVE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Sodium carbonate ratio	Specific conductance (microhmhos at 25°C)	pH		
														Parts per million	Tons per acre-foot	Calcium, magnesium	Non-carbonate					
May 12-17, 1959...		10		22	2.6	24		75	18		26				1.41	0.19	66	4	1.3	252	7.2	
May 18-31,.....		12		32	3.4	34		110	20		39				214	.29	94	4	1.5	345	7.2	
June 1-14,.....		16		36	4.5	31		122	25		35				209	.28	108	8	1.3	363	7.3	
June 15-16,.....		20		45	5.7	58		130	50		71				2316	.43	136	30	2.1	519	7.8	
June 18-23,.....																						
June 25-30,.....		16		42	5.1	39		133	36		44				271	.37	126	17	1.5	420	7.4	
July 1-9, 13, 16-25,.....		17		43	5.1	41		143	30		48				278	.38	128	11	1.6	432	7.5	
July 10-12,.....																						
July 14-15, 26-28,...		16		36	4.2	35		127	23		38				238	.32	107	3	1.5	361	7.4	
July 29-31,.....		22		26	3.5	22		103	9.6		23				2158	.21	79	0	1.1	250	7.6	
Aug. 1-4, 6-10,...		22		34	5.0	35		135	14		40				226	.31	105	0	1.5	350	7.9	
Aug. 11-17, 19-26,.....		21		45	5.9	58		142	30		82				330	.45	137	20	2.2	543	7.8	
Aug. 27-31,.....		22		26	4.0	28		99	12		34				2176	.24	81	0	1.4	290	7.6	
Sept. 1-4,.....		19		40	5.3	50		140	19		68				286	.39	122	7	2.0	467	7.9	
Sept. 5-12,.....		21		53	6.6	75		165	37		105			397	.54	159	24	2.6	665	7.9		
Sept. 14-30,.....																						

a Calculated from determined constituents.

TRINITY RIVER BASIN--Continued
8-673. TRINITY RIVER AT ANAHUAC, TEX.

LOCATION.--At Lone Star Pumping Plant in Anahuac, Chambers County.
RECORDS AVAILABLE.--Chemical analyses: Short periods during summers of 1946 to 1949, December 1949 to September 1959.
EXTREMES, 1949-56.--Dissolved solids: Maximum, 18,400 ppm Aug. 1-13, 1956; minimum, 140 ppm Apr. 12-19, 1955.
Hardness: Maximum, 3,550 ppm Oct. 21-31, 1952; minimum, 45 ppm Apr. 12-19, 1955.
Specific conductance: Maximum daily, 33,700 micromhos Sept. 26, 1956; minimum daily, 199 micromhos Apr. 15, 1955.
REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. No discharge records available for this station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Borates (B)	Dissolved solids (calculated)			Hardness as CaCO ₃	Sodium ion ratio	Specific conductance (micro-mhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day					
Oct. 8, 1958.....	---	---	---	---	---	---	---	---	---	---	59	---	---	---	---	---	---	---	---	---	---	433
Oct. 16, 23, 29.....	13	---	---	56	5.2	88	---	109	---	51	115	---	3.5	---	---	113	24	---	---	---	---	725
Nov. 6, 13.....	20	---	---	64	11	158	---	163	---	71	235	---	7.0	---	---	161	28	3.0	---	---	---	725
Nov. 20, 25.....	18	---	---	59	6.5	104	---	167	---	56	150	---	2.0	---	---	204	68	4.8	---	---	---	1,160
Dec. 4, 11, 18.....	15	---	---	58	7.2	158	---	157	---	78	218	---	6.0	---	---	174	45	3.4	---	---	---	840
Dec. 26, 31.....	15	---	---	62	57	538	---	153	---	165	890	---	7.0	---	---	389	264	12	---	---	---	3,250
Jan. 8, 1959.....	---	---	---	---	---	---	---	160	---	---	415	---	---	---	---	247	116	---	---	---	---	1,770
Jan. 15.....	---	---	---	---	---	---	---	161	---	---	250	---	---	---	---	192	60	---	---	---	---	1,220
Jan. 21.....	---	---	---	---	---	---	---	152	---	---	628	---	---	---	---	320	196	---	---	---	---	2,460
Jan. 29.....	---	---	---	---	---	---	---	168	---	---	295	---	---	---	---	209	72	---	---	---	---	1,450
Feb. 5.....	---	---	---	---	---	---	---	77	---	---	109	---	---	---	---	95	32	---	---	---	---	562
Feb. 12.....	---	---	---	---	---	---	---	88	---	---	140	---	---	---	---	116	44	---	---	---	---	709
Feb. 19.....	---	---	---	---	---	---	---	51	---	---	38	---	---	---	---	64	22	---	---	---	---	282
Feb. 26.....	---	---	---	---	---	---	---	100	---	---	108	---	---	---	---	106	26	---	---	---	---	585
Mar. 9, 12, 19, 26.....	24	---	---	50	6.2	81	---	134	---	58	108	0.4	4.0	---	---	150	40	2.9	---	---	---	898
Apr. 1, 3, 6, 8.....	15	---	---	56	7.6	102	5.3	147	---	58	148	.3	3.5	---	---	171	50	3.4	---	---	---	829
Apr. 17, 20, 21, 26, 29.....	9.8	---	---	25	2.6	27	---	69	---	21	36	---	2.0	---	---	73	17	1.3	---	---	---	282
May 1, 4, 6, 8, 11.....	14	---	---	39	5.0	42	---	108	---	38	55	---	3.2	---	---	118	29	1.7	---	---	---	447
May 12, 15, 18-19, 22, 25, 27-28.....	9.6	---	---	31	3.3	25	---	96	---	22	30	---	2.0	---	---	91	12	1.1	---	---	---	315
June 1, 3, 8, 9.....	18	---	---	38	4.3	41	---	107	---	38	51	.3	2.5	---	---	112	25	1.7	---	---	---	429
June 12, 13, 15.....	---	---	---	45	4.6	46	---	125	---	41	59	.3	2.5	---	---	131	29	1.7	---	---	---	484
June 17, 19, 22.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---
June 24, 26, 29.....	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---	---

a Residue at 180°C.

TRINITY RIVER BASIN--Continued
 8-673. TRINITY RIVER AT ANARUAC, TEX.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (calculated)		Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)
														Parts per million	Tons per acre-foot	Calcium Magnesium	Non-carbonate	
July 1, 3, 6, 10, 13, 14, 17, 1959		18		42	4.3	52		126		38	64	0.3	2.0	122	19	2.0	482	7.6
July 20, 21, 24		22		51	7.1	94		153		52	126	0.3	2.0	156	30	3.3	743	7.8
July 26, 29, 31		12		30	3.1	37		79		23	56	0.3	1.8	88	23	1.7	354	7.5
Aug. 3, 5		17		19	3.8	42		64		14	61	0.3	1.8	63	11	2.3	320	7.8
Aug. 7, 12, 14, 17, 19, 21, 24, 28, 31		16		46	5.2	92		127		42	132	0.4	2.5	136	32	3.4	707	7.8
Aug. 26		--		--	--	--		103		--	770	--	--	302	218	--	2,750	7.8
Sept. 2, 4, 7, 11		22		46	5.7	107		139		45	149	--	0.5	138	24	4.0	780	7.9
Sept. 14, 16, 18		24		62	11	211		176		77	308	--	0.2	200	56	6.5	1,390	8.1
Sept. 21, 25		25		72	48	560		164		156	920	--	0.5	377	242	13	3,330	8.1
Sept. 22		--		--	--	--		126		--	2,400	--	--	830	726	--	7,690	7.9

a Residue at 180°C.

TRINITY RIVER BASIN--Continued

8-674. TRINITY BAY AT MOUTH OF TRINITY RIVER, NEAR ANAHUAC, TEX.

LOCATION--At four sampling stations in Trinity Bay opposite mouth of Trinity River near Anahuac, Chambers County, Station 2: In Anahuac Channel immediately below delta. Station 3: In Anahuac Channel about 1.5 miles southwest of Station 2. Station 6: In Anahuac Channel at south end. Station 7: In Trinity Bay about 1.5 miles west of Station 6.

RECORDS AVAILABLE--Chemical analyses: October 1950 to September 1959.

Date of collection	Station 2			Station 3			Station 6			Station 7		
	Conductance	Chloride		Conductance	Chloride		Conductance	Chloride		Conductance	Chloride	
Oct. 8, 1958.....	430	59		448	63		430	58		437	59	
Oct. 16.....	602	94		609	94		607	94		612	95	
Oct. 23.....	755	123		756	123		821	138		755	122	
Oct. 29.....	829	130		825	128		837	132		796	122	
Nov. 6.....	1,050	200		1,070	210		1,070	192		1,010	192	
Nov. 13.....	7,990	2,550		6,090	1,790		730	2,750		2,750	728	
Nov. 20.....	880	157		821	138		821	166		875	155	
Nov. 25.....	806	144		805	146		795	141		853	154	
Dec. 4.....	1,160	230		1,090	212		1,320	285		9,710	3,160	
Dec. 11.....	1,030	185		1,020	182		1,020	180		1,030	185	
Dec. 18.....	1,210	245		1,230	252		1,240	255		3,550	1,020	
Dec. 26.....	2,720	700		2,720	720		4,450	1,280		--	--	
Dec. 31.....	3,830	1,060		3,800	1,060		3,800	1,060		15,300	5,280	
Jan. 8, 1959.....	1,980	492		1,750	410		2,130	532		1,970	472	
Jan. 15.....	1,480	308		1,270	280		1,430	315		2,260	375	
Jan. 21.....	2,490	660		2,530	670		2,560	670		2,580	680	
Jan. 29.....	1,720	375		1,700	365		2,280	560		2,960	800	
Feb. 5.....	416	90		426	102		426	92		456	94	
Feb. 12.....	451	94		451	94		520	134		520	121	
Feb. 19.....	34	34		34	34		253	34		264	36	
Feb. 26.....	367	39		367	40		377	40		377	40	
Feb. 5.....	397	66		457	66		467	69		394	62	
Mar. 12.....	649	98		634	97		636	98		636	98	
Mar. 19.....	849	164		845	164		828	156		818	155	
Mar. 26.....	680	85		700	86		688	86		686	84	
Apr. 1.....	654	88		626	87		632	87		1,000	198	
Apr. 3.....	741	124		744	124		744	124		746	123	
Apr. 6.....	733	117		736	117		729	115		726	114	
Apr. 8.....	801	131		818	136		803	132		809	134	
Apr. 10.....	275	53		306	61		324	64		276	53	
Apr. 13.....	289	57		289	58		288	58		288	58	
Apr. 15.....	211	26		211	27		265	38		211	24	

TRINITY RIVER BASIN--Continued
 8-674. TRINITY BAY AT MOUTH OF TRINITY RIVER, NEAR ANAHUAC, TEX.--Continued
 Specific conductance, micromhos at 25°C, and chloride, in parts per million, water year October 1958 to September 1959--Continued

Date of collection	Station 2		Station 3		Station 6		Station 7	
	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride	Conductance	Chloride
Apr. 17, 1959.....	273	38	273	38	270	38	267	37
Apr. 20.....	281	35	281	35	279	34	279	34
Apr. 21.....	258	32	262	32	293	44	257	32
Apr. 24.....	252	32	254	32	251	32	291	42
Apr. 26.....	346	40	347	40	367	42	352	42
Apr. 29.....	328	30	322	30	339	32	340	32
May 1.....	351	30	351	30	352	30	351	30
May 4.....	411	49	411	49	430	52	414	50
May 6.....	455	60	468	66	451	60	498	73
May 8.....	446	49	446	49	447	49	449	49
May 11.....	458	61	489	67	442	57	453	59
May 12.....	279	29	278	29	280	29	290	30
May 15.....	326	40	324	40	324	40	327	40
May 18.....	355	40	375	46	352	41	343	39
May 19.....	295	31	311	36	305	32	305	30
May 22.....	316	26	316	26	313	26	336	32
May 25.....	327	34	372	36	326	36	489	81
May 27.....	311	27	306	27	305	26	320	30
May 28.....	290	32	292	32	287	31	287	31
June 1.....	397	60	351	40	314	36	431	72
June 3.....	349	37	359	38	347	36	369	42
June 5.....	380	41	384	42	380	41	379	41
June 8.....	573	100	404	50	409	49	588	103
June 9.....	489	63	479	60	477	63	510	70

June 12, 1959.....	437	51	436	51	435	51
June 13.....	639	71	520	72	612	98
June 14.....	389	33	387	34	386	34
June 15.....	352	29	341	28	354	29
June 16.....	454	52	404	39	404	40
June 19.....	592	91	533	76	462	57
June 22.....	708	112	583	89	600	82
June 24.....	491	72	553	82	502	75
June 26.....			867			
June 29.....	557	77	583	85	628	85
July 1.....	700	132	588	104	667	116
July 2.....	321	27	319	27	447	46
July 3.....	388	32	518	71	386	31
July 6.....	388	38	386	38	388	37
July 10.....	463	59	463	59	513	72
July 13.....	518	72	662	109	583	90
July 14.....	583	83	576	82	582	85
July 17.....						
July 20.....	963	183	756	122	780	125
July 21.....	648	99	647	100	645	99
July 24.....	851	172	843	169	851	169
July 26.....	435	67	439	67	438	67
July 29.....	313	49	296	43	304	48
July 31.....	307	57	301	57	301	57
Aug. 3.....	303	62	320	62	301	56
Aug. 5.....	324	60	328	60	343	64

TRINITY RIVER BASIN--Continued
8-674. TRINITY BAY AT MOUTH OF TRINITY RIVER, NEAR ANAHUAC, TEX.--Continued

Specific conductance, microhmohms at 25°C, and chloride, in parts per million, water year October 1958 to September 1959--Continued

Date of collection	Station 2			Station 3			Station 6			Station 7		
	Conductance	Chloride		Conductance	Chloride		Conductance	Chloride		Conductance	Chloride	
Aug. 7, 1959.....	564	100		569	100		556	98		555	97	
Aug. 10.....	569	102		569	102		566	102		566	102	
Aug. 12.....	576	120		582	105		579	104		583	105	
Aug. 14.....	695	126		702	127		695	126		703	126	
Aug. 17.....	725	133		712	133		704	131		709	131	
Aug. 19.....	726	156		796	157		790	155		891	179	
Aug. 21.....	815	157		721	134		783	152		757	143	
Aug. 24.....	628	126		667	129		756	151		761	153	
Aug. 26.....	1,300	312		1,300	310		2,350	632		1,110	258	
Aug. 28.....	567	102		562	100		593	105		600	106	
Aug. 31.....	570	95		514	95		510	92		510	92	
Sept. 2.....	660	122		665	125		674	127		670	126	
Sept. 4.....	690	134		709	138		649	121		650	121	
Sept. 7.....	682	129		682	130		708	140		722	142	
Sept. 9.....	877	181		848	172		988	216		1,160	267	
Sept. 11.....	886	168		872	167		918	178		944	186	
Sept. 14.....	1,510	370		1,510	370		1,800	455		1,850	480	
Sept. 16.....	1,260	265		1,250	265		1,180	248		1,220	260	
Sept. 18.....	1,430	318		1,430	315		1,420	310		1,420	310	
Sept. 21.....	4,470	1,320		5,400	1,620		4,450	320		8,390	2,680	
Sept. 22.....	8,040	2,550		8,050	2,550		8,860	2,820		9,130	2,950	
Sept. 25.....	5,460	1,620		5,380	1,620		6,470	2,000		7,420	2,320	
Sept. 28.....	2,210	570		2,280	600		5,770	1,750		5,550	1,680	

BRAZOS RIVER BASIN
8-805. DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION.--At gaging station near right bank on downstream side of bridge on U.S. Highway 83, 8 miles downstream from Mountain Creek, and 10 miles south of Aspermont, Stonewall County.

DRAINAGE AREA.--7,980 square miles, approximately, of which 6,470 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1948 to November 1951, October 1956 to September 1959.

Water temperatures: November 1949 to November 1951, October 1956 to September 1959.

Sediment records: November 1949 to September 1951.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 4,840 ppm Aug. 1-7; minimum, 715 ppm July 1-6.

Hardness: Maximum, 2,210 ppm Mar. 16-31; minimum, 273 ppm May 11-15, 18-21.

Specific conductance: Maximum daily, 6,890 micromhos Aug. 3; minimum daily, 860 micromhos July 3.

Water temperatures: Maximum, 94°F June 18; minimum, 34°F Jan. 5, 15, Feb. 1, 2.

EXTREMES, 1948-51, 1956-59.--Dissolved solids: Maximum, 6,350 ppm Feb. 23-28, 1958; minimum, 636 ppm Oct. 22-28, 1957.

Hardness: Maximum, 2,910 ppm Aug. 5, 8, 1951; minimum, 193 ppm Oct. 22-28, 1957.

Specific conductance: Maximum daily, 10,400 micromhos Feb. 25, 1958; minimum daily, 735 micromhos Oct. 24, 1957.

Water temperatures (1949-51, 1956-59): Maximum 96°F July 20, 1951; minimum, freezing point Jan. 4, 1950, Jan. 29, 1951, Jan. 16, 1957.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Values reported for dissolved solids concentrations less than 1,000 ppm are residues on evaporation and for concentrations more than 1,000 ppm are calculated from determined constituents. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (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		Non-carbonate	Sodium adsorption ratio			
Oct. 1-3, 12-13, 1958.....	72.4	10		169	17	215		106		500	248			1,210	1.65	237	452	404	4.2	1,850	8.0	
Oct. 4-11, 14-20.....	8.27	11		405	50	629		116		1,130	930			3,210	4.37	71.7	1,220	1,120	7.8	4,700	7.9	
Oct. 21-31.....	.77	14		570	75	555		80		1,620	840			3,710	5.05	7.71	1,730	1,660	5.8	4,930	7.5	
Nov. 1-13.....	.28	13		640	86	529		109		1,800	805			3,930	5.34	2.97	1,950	1,860	5.2	5,050	7.6	
Nov. 14-22.....	54.3	11		167	20	262		126		474	332			1,330	1.81	195	1,498	395	5.1	2,120	7.8	
Nov. 23-30.....	14.6	12		385	54	697		140		1,100	1,020			3,340	4.54	132	1,180	1,070	8.8	4,930	7.9	
Dec. 1-15.....	1.65	14		575	72	790		144		1,600	1,180			4,300	5.85	19.2	1,730	1,610	8.3	5,850	8.0	
Dec. 16-31.....	.59	16		630	73	665		154		1,780	950			4,190	5.70	6.67	1,870	1,670	5.7	5,000	8.0	
Jan. 1-15, 1959.....	.46	12		660	82	558	9.1	142		1,760	910			4,960	6.32	3.94	1,960	1,860	5.4	5,260	8.1	
Jan. 16-31.....	.28	11		685	93	603		136		1,820	990			3,970	5.17	3.28	2,080	1,980	4.3	5,510	7.7	
Feb. 1-10.....	.65	10		665	103	432		120		1,350	960			3,570	4.86	.87	2,170	2,070	3.2	5,690	7.8	
Feb. 11-20.....	.09	12		690	110			122		1,350	1,020			3,570	4.86							

BRAZOS RIVER BASIN--Continued
8-805. DOUBLE MOUNTAIN FORK BRAZOS RIVER NEAR ASPERMONT, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959.--Continued

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) (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Soil adsorption ratio	Specific conductance (microhmhos at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Feb. 21-28, 1959..	0.20	11		690	106	334		124		1,250	1,050	0.0	4.76	1.89	2,160	2,060	3.1	5.730	7.7	
Mar. 1-15, .....	.11	13		690	96	556		107		1,970	840	2.0	4.220	1.25	2,120	2,030	5.3	5.300	7.5
Mar. 16-31, .....	.23	12		720	101	596		122		2,000	940	.5	4,430	2.75	2,210	2,110	5.5	5.590	7.7
Apr. 1-7, .....	.14	12	10	680	106	574		83		2,030	860	0.5	4,310	1.63	2,130	2,060	5.4	5.400	7.3
Apr. 8,	175	11		283	24	175		90		736	242	5.6	1,520	718	805	731	2.7	2.110	7.6	
Apr. 9-13,	25.3	9.4		442	46	406		78		1,240	580	1.5	2,760	189	1,290	1,230	4.9	3.690	7.5	
Apr. 14-30, .....	.63	13		680	98	553		123		1,950	830	1.0	4,180	7.11	2,100	2,000	5.2	5.200	7.6
May 1-4, 7,	21.4	15		555	72	506		101		1,560	760	2.2	3,520	203	1,680	1,600	5.4	4.560	7.6	
May 5-6, 8-10,	212	16		232	25	246		172		653	280	2.0	1,540	881	682	541	4.1	2.200	7.6	
May 11-15, 18-21,	135	16		83	16	222		172		280	228	1.5	966	352	273	332	5.8	1.520	7.7	
May 16-17, 22,	115	20		135	22	270		144		412	330	3.0	1,260	391	428	310	5.7	2.000	7.9	
May 23-31,	3.92	17		470	80	587		116		1,410	860	2.0	3,480	36.8	1,500	1,410	6.6	4.680	7.3	
June 1, .....	.60	--		--	--	--		77		--	870	--	--	--	2,000	1,940	--	5.310	7.8
June 2-3, 11-12, 23, 30,	1,535	16		255	27	212		103		706	275	1.2	1,540	6,380	747	662	3.4	2.190	7.5	
June 4-10,	2,933	16		105	16	136		128		300	345	3.0	3,780	1,076	6,290	326	3.3	1.200	7.5	
June 13-22,	29.4	17		350	50	637		104		1,010	940	3.5	3,040	1,220	1,080	963	8.4	1.540	7.5	
June 24-29,	731	15		134	17	148		113		374	182	3.2	947	1,920	404	312	3.2	1.420	7.5	
July 1-6,	4,604	15		110	14	99		110		318	88	3.0	715	8,890	332	242	2.4	1.060	7.4	
July 7-9,	258	16		160	19	280		106		454	218	1.5	1,100	766	874	730	3.6	1.630	7.6	
July 10-13,	207	16		282	27	298		96		760	420	1.2	1,850	1,030	417	396	4.5	2.650	7.5	
July 14-22,	749	15		258	19	167		89		700	200	1.5	1,400	2,830	722	610	2.7	1.930	7.2	
July 23-31,	31.9	18		415	39	802		104		1,170	1,160	1.0	3,660	3,315	1,200	1,110	10	5.230	7.4	
Aug. 1-7,	4.96	18		590	80	969		103		1,600	1,530	1.0	4,840	64.8	1,800	1,720	9.9	6.690	7.2	

Aug. 8-12, 1959...	14	166	17	110	96	446	126	3.2	953	1.30	2,440	484	406	2.2	1,310	7.6
Aug. 13-14.....	23	195	27	257	111	565	338	2.0	1,460	1.99	295	596	506	8.0	2,140	7.9
Aug. 15-31.....	52.0	485	70	717	100	1,340	1,120	1.0	3,800	5.17	31.4	1,500	1,420	5.3	5,210	7.8
Sept. 1-16.....	.12	685	94	559	105	1,930	860	2.8	4,200	5.71	1.36	2,100	2,010	4.9	5,080	7.2
Sept. 17-30.....	.19	685	97	518	125	1,910	810	.8	4,100	5.58	2.10	2,110	2,010	4.9	5,080	7.2
Weighted average	219	153	18	149	113	429	168	2.6	999	1.36	591	456	363	3.0	1,460	--

Temperature (°F) of water, water year October 1958 to September 1959
 (Once-daily measurement, usually between 4 p.m. and 8 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.....	78	60	70	77	73	80	83	85	85	75	70	68	72	69	70	80	80	78	80	80	72	70	75	79	59	58	62	55	54	64	64	72	
November..	68	70	68	68	60	66	68	63	65	66	73	69	60	70	67	68	57	57	58	60	62	63	66	54	67	47	40	50	54	52	--	62	
December..	61	61	59	61	59	41	48	55	42	40	56	40	42	42	49	57	55	57	50	46	55	62	53	56	53	54	56	54	37	36	43	51	
January.....	42	42	39	36	34	48	53	56	53	54	61	61	63	60	34	41	57	53	60	37	41	53	50	60	61	56	58	56	55	53	50	51	
February....	34	34	--	59	53	51	63	65	64	--	--	68	64	61	--	--	--	--	45	49	51	63	59	60	63	64	69	68	--	--	--	--	
March.....	70	65	69	67	57	61	68	69	70	--	--	67	63	67	61	71	77	70	77	59	69	75	78	--	63	74	68	63	76	80	--	69	
April.....	73	73	69	79	87	--	73	58	61	58	62	64	76	77	75	77	78	80	81	67	77	76	76	78	84	80	80	74	83	87	--	75	
May.....	77	87	76	86	77	82	79	73	75	75	85	85	83	82	68	82	85	83	87	76	89	72	70	82	84	85	86	85	91	92	80	81	
June.....	86	79	73	75	78	80	82	84	90	92	90	89	88	88	92	85	93	94	89	90	90	90	79	79	81	83	88	89	86	85	--	86	
July.....	71	72	80	85	85	85	91	89	80	85	85	80	88	89	84	89	84	89	92	87	89	88	90	91	90	89	84	89	90	93	90	86	
August.....	92	88	89	91	91	91	87	75	83	85	85	88	85	88	89	88	89	89	86	91	93	89	87	81	85	84	--	--	--	--	87	--	
September..	86	87	76	87	80	86	81	79	52	72	74	69	76	79	78	--	--	--	--	--	--	--	--	--	--	--	--	--	--	74	61	--	--

BRAZOS RIVER BASIN--Continued

8-812. CROTON CREEK NEAR JAYTON, TEX.

LOCATION --At gaging station on left bank 460 feet upstream from county road, 1.5 miles upstream from mouth, and 8 miles northeast of Jayton, Stonewall County.
 DRAINAGE AREA --310 square miles, approximately.
 RECORDS AVAILABLE --Chemical analyses: May to September 1959.
 REMARKS --Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Values given are expressed in parts per million and should be multiplied by the density in any computation of loads.

Date of collection	Mean discharge	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) (B)	Dissolved solids			Hardness as CaCO ₃		Sodium carbonate ratio	Specific conductance (micro-mhos at 25°C)	pH	Density at 20°C	
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium, neonium	Non-carbonate					
May 6, 1959.....	17.0					4,780		--	2,820	7,530				3,230		895	--	22,600	--	1.009		
July 9.....	10					5,000		73	2,871	755				955			--	3,810	7.1	--		
July 17.....	.05					4,180		--	2,710	6,780							--	20,400	--	1.006		
July 18.....	--					5,490		--	3,040	9,020							--	25,400	--	1.009		
July 22.....	.37					3,240		--	2,700	5,100							--	16,900	--	1.004		
Aug. 13.....	.25					3,300		--	2,580	5,280							--	16,800	--	1.004		
Aug. 14.....	.04					3,610		--	2,720	5,800							--	18,100	--	1.005		
Aug. 20.....	22					3,270		--	2,590	5,030				2,740			--	16,700	--	1.004		
Aug. 21.....	4.11					1,260		73	2,060	1,980				2,190	2,130		--	18,340	7.5	--		
Aug. 22.....	.58					2,070		--	2,310	3,270				2,580			--	12,100	--	1.001		
Aug. 24.....	.04					2,270		--	2,380	3,640				2,670			--	13,000	--	1.002		

Chemical analyses, in parts per million, May to September 1959

BRAZOS RIVER BASIN--Continued

8-813. SALT FLAT CREEK AT WEIR B, NEAR ASPERMONT, TEX.

LOCATION --At mouth, about 20 miles northwest of Aspermont, Stonewall County.

RECORDS AVAILABLE --Chemical analyses, October 1958 to March, 1959.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Values given are expressed in parts per million and should be multiplied by the density in any computation of loads.

Chemical analyses, in parts per million, October 1958 to March 1959

Date of collection	Mean discharge (SI ₂ O ₃)	Silica (Fe)	Iron (Ca)	Calcium (Mg)	Magnesium (Na)	Sodium (K)	Potassium (HCO ₃)	Bicarbonate (SO ₄)	Chloride (Cl)	Fluoride (F) (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium adsorption ratio, at 25°C)	Specific conductance (micro-mhos at 25°C)	pH	Density at 20°C
											Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium					Non-carbonate
Oct. 22, 1958.	0.34					90,000	--	3,050	142,000				10,300	--	--	182,000	--	1.180
Nov. 21, .....	.46					89,000	--	3,180	140,000				10,100	--	--	181,000	--	1.178
Dec. 17, .....	.28					85,300	--	3,200	141,000				9,670	--	--	150,000	--	1.179
Jan. 21, 1959.	.31					85,500	--	3,280	139,000				9,950	--	--	148,000	--	1.176
Feb. 19, .....	.28					90,300	--	3,130	143,000				9,710	--	--	150,000	--	1.184
Mar. 17,	--					99,000	32	2,870	158,000				10,500	10,500	173,000	7.2	1.198	
Mar. 26, .....	.30	24				92,400	38	3,010	147,000			246,000	9,780	9,750	150,000	7.5	1.187	

BRAZOS RIVER BASIN--Continued

8-813.5. SALT CROTON CREEK AT WEIR C, NEAR ASPERMONT, TEX.

LOCATION--Half a mile downstream from Salt Flat Creek, about 20 miles northwest of Aspermont, Stonewall County.

RECORDS AVAILABLE--Chemical analyses, October 1956 to March 1959.

REMARKS--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Values given are expressed in parts per million and should be multiplied by the density in any computation of loads.

Chemical analyses, in parts per million, October 1958 to March 1959

Date of collection	Mean discharge (SQ ₃)	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) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (micro-mhos at 25° C)	pH	Density at 20° C	
													Parts per million	Tons per acre-foot						Calcium magnesium	Non-carbonate
Oct. 22, 1958..	0.57					91,100			3,270	144,000					9,720		182,000		1.183	
Nov. 21.....	1.15					88,100			3,440	138,000					9,350		181,000		1.176	
Dec. 17.....	.70					85,200			3,440	135,000					8,800		148,000		1.171	
Jan. 21, 1959..	.76					89,600			3,520	140,000					9,000		167,000		1.178	
Feb. 19.....	.64					91,600			3,390	145,000					9,120		150,000		1.184	
Mar. 26.....	.74	25		1,720	1,110	95,300	41		3,010	150,000					8,860	8,820	151,000	7.4	1.191	
														251,000	407					

BRAZOS RIVER BASIN--Continued
8-814. SALT CROTON CREEK AT WEIR D, NEAR ASPERMONT, TEX.

LOCATION.--About 500 feet upstream from Haystack Creek, 1,000 feet upstream from gaging station, and 20 miles northwest of Aspermont, Stonewall County. RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1959. REMARKS.--Values reported for sodium (Na) are determined by analysts and do not include potassium (K). Values given are expressed in parts per million and should be multiplied by the density in any computation of loads.

Date of collection	Mean discharge (SIG)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Bo- trate iron (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃	So- dum sorp- tion ratio	Specific conduct- ance (micro- mhos at 25°C)	pH	Density at 20°C
													Parts per million	Tons per acre- foot					
Oct. 9, 1958..	0.74	--	--	--	--	94,200	--	--	3,110	149,000	--	--	--	--	9,910	--	184,000	--	1.191
Oct. 22.....	.71	--	--	--	--	96,300	--	--	2,800	152,000	--	--	--	--	9,450	--	185,000	--	1.196
Nov. 6.....	.73	--	--	--	--	94,600	--	--	3,150	148,000	--	--	--	--	9,760	--	184,000	--	1.189
Nov. 21.....	.72	--	--	--	--	90,200	--	--	3,070	141,000	--	--	--	--	9,480	--	182,000	--	1.181
Dec. 5.....	.82	--	--	--	--	91,800	--	--	3,440	144,000	--	--	--	--	9,870	--	183,000	--	1.185
Dec. 17.....	.66	--	--	--	--	89,700	--	--	3,380	141,000	--	--	--	--	9,170	--	150,000	--	1.178
Jan. 6, 1959..	1.03	--	--	--	--	91,300	--	--	3,410	143,000	--	--	--	--	9,910	--	150,000	--	1.181
Jan. 21.....	.56	--	--	--	--	87,700	--	--	3,500	139,000	--	--	--	--	9,280	--	149,000	--	1.175
Feb. 4.....	1.16	--	--	--	--	76,900	--	--	3,760	131,000	--	--	--	--	8,510	--	160,000	--	1.151
Feb. 19.....	.67	--	--	--	--	97,700	--	--	2,920	154,000	--	--	--	--	9,030	--	152,000	--	1.196
Mar. 11.....	.53	--	--	--	--	99,000	--	--	2,940	157,000	--	--	--	--	9,330	--	152,000	--	1.201
Mar. 26.....	.40	22	1,700	1,280	99,800	41	2,370	159,000	264,000	432	264,000	431	9,500	9,470	445	152,000	7.5	1.203	
Apr. 7.....	.92	22	1,690	1,160	100,000	38	3,240	158,000	264,000	431	264,000	431	8,990	8,960	458	152,000	7.5	1.201	
Apr. 23.....	.87	--	--	--	--	98,900	--	--	2,880	155,000	--	--	--	--	9,270	--	149,000	--	1.187
May 6.....	.85	--	--	--	--	98,500	--	--	2,900	146,800	--	--	--	--	9,860	--	148,000	--	1.189
May 19.....	.93	--	--	--	--	97,800	--	--	2,740	157,800	--	--	--	--	9,960	--	149,000	--	1.183
June 2.....	1.96	--	--	--	--	101,000	--	--	2,880	167,800	--	--	--	--	9,730	--	155,000	--	1.203
June 19.....	.60	--	--	--	--	101,000	--	--	2,880	167,800	--	--	--	--	9,730	--	155,000	--	1.203
July 9.....	31.0	--	--	--	--	5,190	--	--	1,170	8,130	--	--	--	--	1,470	--	21,800	--	1.009
July 22.....	.75	--	--	--	--	88,300	--	--	3,620	140,000	--	--	--	--	9,420	--	153,000	--	1.178
Aug. 5.....	.38	--	--	--	--	100,000	--	--	2,770	160,000	--	--	--	--	10,200	--	149,000	--	1.202
Aug. 12.....	.51	--	--	--	--	37,000	--	--	3,240	60,100	--	--	--	--	6,670	--	100,000	--	1.074
Aug. 20.....	.43	--	--	--	--	67,000	--	--	3,880	107,000	--	--	--	--	8,360	--	134,000	--	1.134
Aug. 30.....	.36	--	--	--	--	101,000	--	--	2,790	160,000	--	--	--	--	9,890	--	150,000	--	1.203
Sept. 18.....	.59	--	--	--	--	100,000	--	--	2,930	160,000	--	--	--	--	10,300	--	157,000	--	1.204

Chemical analyses, in parts per million, water year October 1958 to September 1959

BRAZOS RIVER BASIN--Continued
8-814.5. HAYSTACK CREEK NEAR ASPERMONT, TEX.

LOCATION.--About 400 feet upstream from mouth, and 20 miles northwest of Aspermont, Stonewall County.
RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1959.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Values given are expressed in parts per million and should be multiplied by the density in any computation of loads.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Ni-tri-iron (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Soadum adsorption ratio (micro-mhos at 25°C)	Specific conductance (micro-mhos at 25°C)	pH	Density at 20°C
													Parts per million	Tons per acre-foot	Tons per day	Calcium-magnesium					Non-bicarbonate
Oct. 9, 1958..	0.17	--	--	--	--	40,300	--	--	4,600	63,700	--	--	--	--	6,900	--	120,000	--	1.079	
Oct. 22.....	.12	--	--	--	--	39,900	--	--	4,610	63,400	--	--	--	--	6,910	--	119,000	--	1.078	
Nov. 6.....	.20	--	--	--	--	38,600	--	--	4,600	59,500	--	--	--	--	6,900	--	118,000	--	1.076	
Nov. 21.....	.20	--	--	--	--	35,200	--	--	4,220	59,500	--	--	--	--	6,570	--	110,000	--	1.072	
Nov. 5.....	.22	--	--	--	--	36,400	--	--	4,200	57,100	--	--	--	--	6,390	--	112,000	--	1.072	
Dec. 1.....	.26	--	--	--	--	35,400	--	--	4,230	57,200	--	--	--	--	5,990	--	107,000	--	1.069	
Dec. 17.....	.26	--	--	--	--	37,300	--	--	4,220	57,800	--	--	--	--	6,190	--	100,000	--	1.073	
Jan. 1, 1959..	.20	--	--	--	--	44,900	--	--	4,610	70,300	--	--	--	--	6,730	--	112,000	--	1.088	
Jan. 21.....	.17	--	--	--	--	37,500	--	--	4,400	58,100	--	--	--	--	6,190	--	109,000	--	1.075	
Feb. 4.....	.28	--	--	--	--	38,200	--	--	4,330	59,500	--	--	--	--	6,370	--	103,000	--	1.076	
Feb. 19.....	.19	--	--	--	--	39,500	--	--	4,540	61,700	--	--	--	--	6,860	--	104,000	--	1.078	
Mar. 11.....	.22	--	--	--	--	39,500	--	--	4,540	61,700	--	--	--	--	6,860	--	104,000	--	1.078	
Mar. 26.....	.18	53	46	1,840	573	44,300	77	4,800	4,800	68,900	121,000	179	6,950	6,880	231	111,000	7.9	1.089		
Apr. 7.....	.43	46	46	1,660	494	43,500	72	4,280	67,300	60,300	117,000	172	6,170	6,100	241	110,000	7.9	1.084		
Apr. 23.....	.17	20	20	1,710	506	38,500	82	4,370	60,300	60,300	105,000	154	6,350	6,290	210	103,000	7.5	1.078		
May 6.....	.11	--	--	--	--	30,900	--	--	4,140	48,500	--	--	--	--	5,880	--	87,200	--	1.061	
May 19.....	.10	--	--	--	--	45,500	--	--	5,050	71,500	--	--	--	--	7,440	--	112,000	--	1.091	
June 2.....	.21	--	--	--	--	21,600	--	--	3,440	33,600	--	--	--	--	4,840	--	68,200	--	1.042	
June 19.....	a .06	--	--	--	--	44,400	--	--	4,870	69,000	--	--	--	--	6,990	--	113,000	--	1.087	
July 9.....	1.96	--	--	--	--	5,160	--	--	2,230	8,120	--	--	--	--	2,530	--	23,600	--	1.010	
July 22.....	a .01	--	--	--	--	41,500	--	--	4,870	65,600	--	--	--	--	7,200	--	108,000	--	1.083	
Aug. 5.....	.17	--	--	--	--	58,400	--	--	5,110	90,800	--	--	--	--	8,340	--	125,000	--	1.115	
Aug. 12.....	.03	--	--	--	--	39,100	--	--	4,310	61,700	--	--	--	--	7,200	--	102,000	--	1.078	
Aug. 20.....	.04	--	--	--	--	38,900	--	--	4,600	60,800	--	--	--	--	6,860	--	102,000	--	1.078	
Aug. 30.....	.14	--	--	--	--	48,600	--	--	5,250	75,700	--	--	--	--	7,550	--	115,000	--	1.096	
Sept. 18.....	a .06	--	--	--	--	44,400	--	--	4,880	68,900	--	--	--	--	7,350	--	114,000	--	1.089	

a Field estimate.

BRAZOS RIVER BASIN--Continued
8-816. SALT CROTON CREEK AT MOUTH, NEAR ASPERMONT, TEX.

LOCATION.--At junction with Salt Fork Brazos River, 15 miles northwest of Aspermont, Stonewall County.
RECORDS AVAILABLE.--Chemical analyses: December 1957 to June 1959.
REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Values given are expressed in parts per million and should be multiplied by the density in any computation of loads.

Chemical analyses, in parts per million, October 1958 to June 1959

Date of collection	Mean discharge	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F) (NO ₃) (B)	Dissolved solids (calculated)		Hardness as CaCO ₃		Sodium-sulfate ratio	Specific conductance (micro-mhos at 25°C)	Density at 20°C
												Parts per million	Tons per acre-foot	Tons per day	Calcium-magnesium				Non-carbonate
Oct. 9, 1958...	0.29					39,700			3,850	62,600			7,750			119,000	1.078	
Nov. 5.....	.79					72,700			3,770	117,000			8,890			169,000	1.147	
Dec. 4.....	.78					74,700			3,620	119,000			8,890			171,000	1.149	
Jan. 7, 1959...	1.34					77,200			3,380	122,000			9,320			181,000	1.152	
Feb. 5.....	1.08					76,400			3,640	120,000			9,370			159,000	1.152	
Mar. 12.....	18.5					93,200			3,830	149,000			9,570			151,000	1.191	
Apr. 8.....	14.2	29		921	296	29,200	57		1,720	13,400			3,520	3,470	200	82,700	7.3	
May 5.....	.21					34,500			2,780	53,900			2,220			33,000	1.016	
May 20.....	.21					34,500			2,780	53,900			5,290			94,300	1.067	
June 18.....	a .05					35,100			3,570	56,600			6,360			98,300	1.069	

a Field estimate.

BRAZOS RIVER BASIN--Continued

8-820. SALT FORK BRAZOS RIVER NEAR ASPERMONT, TEX.

LOCATION--At gaging station near left bank on downstream side of pier of bridge on U.S. Highway 83, 5.5 miles downstream from Salt Croton Creek and 13.2 miles northwest of Aspermont, Stonevally County.

DRAINAGE AREA--4,830 square miles, approximately.

RECORDS AVAILABLE--Chemical analyses: October 1948 to September 1951, October 1956 to September 1959.

Water temperatures: October 1948 to September 1951, October 1956 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 99,200 ppm Mar. 30-31; minimum, 2,130 ppm Aug. 8-12.

Hardness: Maximum, 6,200 ppm Mar. 30-31; minimum, 440 ppm Aug. 8-12.

Specific conductance: Maximum daily, 115,000 micromhos Mar. 30; minimum daily, 2,870 micromhos July 2.

Water temperatures: Maximum, 95°F July 5; minimum, freezing point on Dec. 13, Feb. 6.

EXTREMES, 1948-51, 1956-59.--Dissolved solids: Maximum, 99,200 ppm Mar. 30-31, 1959; minimum, 1,280 ppm June 2-4, 1957.

Hardness: Maximum, 6,200 ppm Mar. 30-31, 1959; minimum, 372 ppm May 19-23, 24 (12 m. to 10 p.m.) 1951.

Specific conductance: Maximum daily, 115,000 micromhos Mar. 30, 1959; minimum daily, 1,820 micromhos June 3, 1957.

Water temperatures: Maximum, 95°F July 5, 1959; minimum, freezing point on many days during winter months.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Values given are expressed in parts per million and should be multiplied by the density in any computation of loads. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (SQ.)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F) (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	Density at 20°C		
												Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate				
Oct. 1-4, 12-13, 1958.....	31.8	11		534	110	3,780		105	1,310	6,060	--	11,900	16.3	1,020	1,780	1,700	39	18,500	8.0	1.007
Oct. 5-9.....	4.00	9.4		885	197	8,590		116	2,190	13,700	--	25,600	35.4	276	3,020	2,920	68	36,400	7.8	1.017
Oct. 10-11, 14-31.....	2.33	11		1,120	297	13,600		156	2,800	21,700	--	39,600	55.3	249	4,020	3,890	93	53,900	7.8	1.027
Nov. 1-15.....	5.75	13		1,300	302	15,100		139	3,030	24,200	--	44,700	61.6	683	4,490	4,370	98	58,600	7.8	1.030
Nov. 16-30.....	1.91	9.0		1,140	261	13,700		140	2,630	21,900	--	39,700	55.4	205	3,920	3,800	95	53,600	7.8	1.027
Dec. 1-15.....	.61	14		1,250	296	16,300		132	3,100	25,900	--	46,900	65.8	77.2	4,340	4,230	108	56,400	7.9	1.032
Dec. 16-31.....	.88	11		1,290	323	19,100		175	3,030	30,300	--	55,100	76.4	129	4,550	4,400	123	63,900	7.8	1.038
Jan. 1-20, 1959.....				1,270	343	19,800		176	3,080	30,800	--	55,400	78.3	108	4,580	4,400	127	65,100	7.8	1.039
Jan. 21-31.....	72	10		1,240	362	20,200		157	3,180	32,700	--	57,400	81.2	112	4,960	4,830	125	69,500	7.2	1.046
Feb. 1-13.....	1.75	11		1,380	462	20,200		143	3,050	46,400	--	80,600	116.2	381	5,340	5,230	173	89,300	7.8	1.057
Feb. 7-28.....	.44	13		1,360	368	18,100		164	3,280	28,000	--	59,200	73.5	62.0	4,990	4,850	112	63,900	7.8	1.036
Mar. 1-14, 1959.....	.36	14		1,410	341	15,500		148	3,490	24,700	--	45,500	63.9	44.2	4,920	4,800	96	56,900	8.0	1.032
Mar. 15-29.....	.41	12		1,440	352	15,600		159	3,520	24,900	--	45,900	64.5	50.8	5,040	4,910	95	57,000	8.0	1.033
Mar. 30-31.....	5.78	21		1,570	556	36,100		90	3,510	57,400	--	99,200	145	161	6,200	6,130	199	101,000	7.3	1.072
Apr. 1-7, 9-18.....	5.78	11		1,400	381	18,300		129	3,350	29,600	--	53,100	75.0	829	5,060	4,950	112	64,900	7.2	1.038
Apr. 8, 10-12.....	49.0	12		742	188	12,400		86	1,620	19,800	--	34,800	48.5	4,600	2,260	2,550	106	46,300	7.5	1.024
Apr. 19-20.....	17.0	14		510	114	5,980		100	1,210	9,500	--	17,400	23.9	799	1,740	1,660	62	26,000	7.8	1.011

Apr. 21-30, 1959.....	0.59	9.7	1,310	326	15,200	148	3,210	24,200	--	44,300	62.1	70.6	4,610	4,490	97	55,500	7.4	1.031
May 1-4.....	18.0	13	1,190	290	19,700	89	2,740	31,300	--	55,300	78.1	2,690	4,160	4,090	133	64,500	7.2	1.039
May 5-8, 11....	86.6	14	546	98	4,200	111	1,340	6,680	--	12,900	17.7	3,020	1,770	1,670	44	19,300	7.6	1.007
May 9-10, 15, 19-20.....	31.4	16	339	70	2,170	134	881	3,420	--	6,960	9.48	590	1,130	1,020	28	11,000	7.6	1.002
May 12-14, 16- 18, 21-22....	12.1	13	711	170	6,760	109	1,700	10,800	--	20,300	28.0	663	2,470	2,380	59	28,400	7.4	1.013
May 23-26.....	1.70	9.6	1,190	371	21,900	112	2,650	35,000	--	61,200	86.8	281	4,490	4,400	142	69,800	7.4	1.043
May 27-31.....	1.78	17	1,090	302	12,900	171	2,560	20,700	--	37,700	52.6	181	3,960	3,820	89	47,800	7.5	1.026
June 1-2.....	124	22	1,150	328	18,400	123	2,580	29,400	--	51,900	73.2	17,380	4,250	4,120	123	63,300	7.2	1.037
June 3-4, 10- 11.....	4.003	19	282	52	1,540	127	734	2,430	--	5,130	6.98	55,450	942	838	22	8,160	9.0	--
June 11-19.....	1,585	16	182	27	1,644	118	479	870	2.0	2,380	3.24	9,990	565	468	12	3,800	7.8	--
June 12-20.....	51.4	19	390	147	4,230	114	1,550	6,800	--	13,400	18.4	1,860	2,060	1,960	40	19,900	7.7	1.008
June 21-22.....	79.0	--	--	--	--	--	--	--	--	8,870	12.1	41,670	1,280	1,190	34	32,600	--	--
June 23.....	1,740	16	430	50	2,830	113	1,110	4,380	--	--	--	--	--	--	--	13,700	7.8	1.004
June 24-28.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
July 2-7, 13- 16.....	728	15	142	26	680	119	373	1,030	2.0	2,330	3.17	4,580	462	364	14	3,950	7.9	--
June 29-30, July 1.....	353	17	310	60	1,690	124	784	2,680	--	5,600	7.62	5,340	1,020	918	23	8,910	7.8	--

BRAZOS RIVER BASIN--Continued
8-820. SALT FORK BRAZOS RIVER NEAR ASPERMONT, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

Date of collection	Mean discharge	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) (E)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (micro-mhos at 25°C)	Density at 20°C		
													Parts per million	Tons per acre-foot	Tons per day	Calcium-magnesium	Non-bicarbonate				
July 8-12, 17, 1959.....	214	14		315	50	1,650		123	780	2,600		--	5,470	7.44	3,160	982	890	23	8,750	7.4	--
July 18, 21-22.....	237	23		450	64	1,950		109	1,120	3,100		--	6,760	9.19	4,330	1,390	1,300	23	10,200	7.7	--
July 23-30.....	278	23		323	74	688		174	816	1,070		3.0	2,990	4.07	2,240	926	866	9.8	4,490	7.7	--
July 23-31.....	12.7	13		782	174	5,380		103	1,970	8,610		--	17,000	23.4	583	2,590	2,510	46	23,500	7.3	0.11
Aug. 5-7.....	1.60	13		860	374	7,140		111	2,100	11,400		--	21,700	29.9	93.7	2,820	2,730	58	29,000	7.2	0.12
Aug. 8-12.....	648	23		1,180	252	11,900		123	2,320	18,900		--	35,200	49.0	40.9	4,000	3,930	82	42,800	7.6	1.024
Aug. 13-14, 22-23.....	40.2	14		230	44	1,220		112	645	1,870		1.0	4,080	5.55	443	755	663	19	6,540	7.8	--
Aug. 15-21, 24-25.....	20.0	16		434	82	2,410		108	1,200	3,810		--	8,020	10.9	433	1,470	1,380	27	12,000	7.3	0.003
Aug. 26-31, Sept. 1-3.....	2.29	16		834	193	6,170		99	2,070	9,970		--	19,300	26.6	119	2,870	2,790	50	27,400	7.5	1.013
Sept. 4-15.....	3.32	21		1,450	334	16,100		121	3,550	25,700		--	47,200	66.3	40.8	4,950	4,890	99	57,500	6.4	1.033
Sept. 16-30.....	1.53	14		1,780	346	11,600		159	2,990	19,800		--	36,000	51.0	151	5,860	5,730	66	46,600	6.5	1.025
Weighted average...	126	17		263	47	1,540	--	121	666	2,420		--	5,020	6.83	1,710	850	750	23	7,700	--	--

BRAZOS RIVER BASIN--Continued
 8-820. SALT FORK BRAZOS RIVER NEAR ASPERMONT, TEX.--Continued

Temperature (°F) of water, water year October 1958 to September, 1959
 (Once-daily measurement, usually between 7 a.m. and 11 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	54	61	54	56	--	75	65	--	66	62	61	65	65	68	64	64	60	67	62	64	58	50	54	62	67	56	54	--	53	52	52	60
November ..	43	50	50	47	40	67	53	66	--	56	59	59	56	61	52	44	44	52	49	--	44	52	49	--	42	45	52	42	42	--	50	
December ..	43	49	49	--	--	39	41	43	39	--	39	48	32	--	34	39	42	--	44	39	40	45	49	--	--	42	--	41	39	--	--	
January	--	--	--	--	--	38	41	38	39	40	38	49	49	42	44	--	33	41	44	44	--	39	41	46	41	39	55	44	42	39	--	
February	--	--	44	40	38	32	43	47	54	--	46	55	49	48	46	46	47	--	36	--	38	--	50	44	45	49	45	42	--	--	--	
March	--	--	65	45	51	45	41	48	46	46	48	48	45	48	40	46	--	45	45	52	--	45	51	55	64	50	45	46	47	57	49	
April	51	51	54	49	59	61	66	46	44	46	65	--	--	--	--	67	71	62	56	--	49	49	61	54	66	66	73	64	69	78	59	
May	45	65	70	70	64	66	--	66	63	64	--	64	68	61	50	63	64	82	71	72	64	71	64	64	66	71	61	--	70	65	71	66
June	67	66	67	76	68	--	83	74	71	75	--	91	74	72	70	70	71	71	--	80	74	74	71	--	--	83	75	75	75	73	--	74
July	74	70	74	--	95	77	81	75	70	71	71	74	74	74	76	70	82	73	71	73	72	75	--	--	--	82	74	73	74	75	76	75
August	80	--	75	73	72	74	--	--	75	--	79	78	71	72	73	75	76	75	74	74	75	74	74	72	73	71	74	76	75	79	71	74
September ..	76	74	75	70	70	70	66	76	70	65	--	60	60	58	85	--	76	71	70	73	--	71	80	73	72	70	61	70	--	--	--	70

BRAZOS RIVER BASIN--Continued
8-825. BRAZOS RIVER AT SEYMOUR, TEX.

LOCATION --At gaging station near left bank on downstream side of pier of bridge on U. S. Highways 277 and 283, three-quarters of a mile upstream from Wichita Valley Railway bridge, 1 mile southwest of courthouse in Seymour, Baylor County, and at mile 832.
DRAINAGE AREA --14,480 square miles, approximately of which 9,640 square miles is probably noncontributing.
RECORDS AVAILABLE --Chemical analyses: August to September 1959.
Water temperatures: August to September 1959.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

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) (NO ₃) (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, sodium	Non-carbonate				
																					6,780	9.22	639	1,620	1,570	20
Aug. 1-8, 1959....	34.9	22		495	94	1,830		66		1,460	2,850	--	--	6,780	9.22	639	1,620	1,570	20	9,830	7.2
Aug. 9, 22-25....	136	11		400	67	1,500		102		1,090	2,350	--	--	5,470	7.44	2,010	1,270	1,190	18	8,210	7.9
Aug. 10-11, 19-21.	655	16		295	42	930		101		822	1,410	0.8	2.0	3,570	4.86	6,310	908	826	13	5,450	7.6
Aug. 12-18.....	330	15		189	24	485		92		536	700	.7	2.5	2,000	2.72	1,780	570	494	8.8	3,150	7.6
Aug. 26-31.....	17.4	14		622	103	2,670		97		1,670	4,230	--	--	9,360	12.8	440	1,980	1,900	26	13,400	7.3
Sept. 1-2, 4-15....	4.06	12		465	83	1,900		101		1,370	2,920	--	--	6,800	9.25	74.5	1,500	1,420	21	9,970	7.7
Sept. 3.....	17.0	11		214	37	837		72		614	1,280	.4	2.5	3,030	4.12	139	686	627	14	4,870	7.8
Sept. 16-30.....	0	13		533	96	2,000		120		1,550	3,090	--	--	7,340	10.0	--	1,720	1,630	21	10,500	7.8

Month	Temperature (°F) of water, August to September 1959																														Average	
	Day																															
August.....	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	87
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	78

BRAZOS RIVER BASIN--Continued
8--865. HUBBARD CREEK NEAR BRECKENRIDGE, TEX.

LOCATION.--At gaging station near right bank on downstream side of pier of bridge on U.S. Highway 183, 2.3 miles downstream from Big Sandy Creek, 6.8 miles northwest of Breckenridge, Stephens County, 7 miles upstream from Gonzales Creek, and 8 miles upstream from Clear Fork Brazos River.
DRAINAGE AREA.--1,087 square miles.

RECORDS AVAILABLE.--Chemical analyses: April 1955 to September 1959.

Water temperatures: April 1955 to September 1959.
EXTREMES, 1958-59.--Dissolved solids: Maximum, 2,420 ppm Apr. 16-30; minimum, 143 ppm July 16.

Hardness: Maximum, 1,140 ppm Apr. 16-30; minimum, 80 ppm July 16.

Specific conductance: Maximum daily, 3,900 microhms May 4; minimum daily, 254 microhms July 16.
EXTREMES, 1958-59.--Dissolved solids: Maximum, 3,100 ppm June 13, 1958; minimum, 118 ppm Feb. 6-8, 1957.

Hardness: Maximum, 1,140 ppm Apr. 16-30, 1959; minimum, 72 ppm Feb. 6-8, 1957.

Specific conductance: Maximum daily, 5,600 microhms June 13, 1958; minimum daily, 121 microhms Apr. 27, 1957.
REMARKS.--Bases omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂) (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		Specific conductance (microhms at 25°C)	pH			
													Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate					
Oct. 1-12, 1958.....	2.39	9.0	70	15	107	153	138	60	198	0.1	2.0	2.0	3.46	110	3.0	236	110	3.0	985	8.1	
Oct. 13-27.....	1.23	7.6	124	22	146	193	138	138	292	.1	4.0	4.0	2.75	400	3.2	400	242	3.2	1,480	8.0	
Oct. 28-31.....																					
Nov. 1-16.....	a 0.10	7.2	171	38	172	170	319	319	340	2	6.2	6.2	1.140	1,140	1.55	.31	583	444	3.1	1,940	7.8
Nov. 17-30.....	a 0	6.4	201	44	193	224	374	374	370	2	9.6	9.6	1,310	1,310	1.78	---	682	499	3.2	2,150	7.9
Dec. 1-15.....	a 0	6.8	208	45	176	236	370	370	355	.2	8.1	8.1	1,290	1,290	1.75	---	704	510	2.9	2,180	7.9
Dec. 16-31.....	a 0	7.8	192	41	209	194	358	400	358	400	8.2	8.2	1,310	1,310	1.78	---	488	3.6	2,160	7.9	
Jan. 1-15, 1959.....	a 0	5.5	200	52	195	223	366	418	418	2	8.5	8.5	1,360	1,360	1.85	---	713	530	3.2	2,250	7.8
Jan. 16-31.....	a 0.05	8.6	255	51	237	279	408	495	495	13	13	13	1,600	2,118	2.18	8.86	846	617	3.6	2,610	7.7
Feb. 1-14.....	.31	9.9	230	60	262	147	490	528	528	4	16	16	1,670	2,377	2.37	1.40	820	700	4.0	2,670	7.9
Feb. 15-28.....	.68	6.4	262	61	303	209	412	412	675	4	12	12	1,830	2,499	2.49	3.36	904	733	4.4	3,030	7.9
Mar. 1-17.....	.25	6.2	305	71	379	211	514	514	620	.4	15	15	2,210	3,011	3.01	1.49	1,050	880	5.1	3,550	7.9
Mar. 18-31.....	a 0	7.7	288	72	388	121	608	790	790	.4	15	15	2,230	3,033	3.03	---	1,010	916	5.3	3,500	7.5
Apr. 1-15.....	a 0	7.6	310	77	381	151	660	810	810	4	11	11	2,340	3,188	3.18	---	1,090	966	5.0	3,690	7.6
Apr. 16-30.....	a 0	5.8	325	81	389	144	702	840	840	4	6.8	6.8	2,420	3,229	3.29	---	1,140	1,030	5.0	3,780	7.9
May 1-8.....	a 0	5.6	298	76	438	94	631	900	900	3	5.4	5.4	2,400	3,266	3.26	---	1,060	979	5.9	3,810	7.5
May 9-11, 22-23.....	1.291	8.8	46	6.2	44	97	17	95	2	4.5	4.5	4.5	270	.37	---	941	140	61	1.6	538	7.5
May 12-21, 24-26.....	45.2	8.4	58	8.6	75	98	27	164	27	164	.2	3.0	392	.53	---	180	100	12.4	774	7.3	

a Includes days of less than 0.05 cfs discharge.

BRAZOS RIVER BASIN--Continued
 8-865, HUBBARD CREEK NEAR BRECKENRIDGE, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (microhm-cm at 25°C)				
													Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		Sodium adsorption ratio			
May 27-31,																						
June 1, 1959.....	5.43	7.6		89	15	109		107		100	230	0.3	2.8	0.83	607	8.90	284	196	2.8	1,140	7.1	
June 2-8.....	810	8.8		44	7.8	44		94		14	102	.2	3.0	.37	270	590	142	65	1.6	544	7.1	
June 9-20.....	7.48	14		42	117	117		152		58	262	.2	3.8	.87	640	12.9	304	179	2.9	1,200	7.9	
June 21-24.....	229	13		124	25	185		171		101	402	.2	3.8	1.28	938	580	412	272	4.0	1,680	7.7	
June 25-26.....	145	9.8		58	10	81		105		20	178	.2	4.0	.56	413	162	186	100	2.6	805	7.5	
June 27-30,																						
July 1-3.....	243	11		43	6.2	40		112		17	76	.3	2.0	.34	250	164	133	41	1.5	464	7.7	
July 4-15.....	24.0	9.8		54	8.8	70		116		27	139	.3	2.2	.50	368	23.8	170	76	2.3	702	7.1	
July 16.....	251	6.8		28	2.5	20		79		12	31	.1	3.5	.19	143	96.9	80	15	1.0	234	7.6	
July 17, Aug. 2-9,	16.5	9.8		84	16	142		132		67	285	.5	2.8	.91	672	29.9	276	168	3.7	1,220	7.8	
July 18-31.....	55.3	12		42	8.3	48		103		22	94	.4	2.2	.38	280	41.8	139	6	1.8	517	7.5	
Aug. 1, 16-20.....	1.20	11		72	15	94		155		73	170	.5	1.0	.72	b 533	1.73	241	114	2.6	594	7.7	
Aug. 10-15.....	11.6	11		57	11	69		116		36	143	.4	1.0	.52	b 365	12.1	187	182	2.7	1,110	7.6	
Aug. 21-31.....	a 0	7.6		82	20	108		132		129	202	.5	.8	.92	b 877	9.06	352	226	3.3	1,370	7.6	
Sept. 1-30.....	4.00	9.4		106	20	142		153		126	178	.2	14	1.14	b 859	42.0	162	76	1.9	628	7.6	
Weighted average	47.9	9.4		51	8.4	56	--	104		24	121	0.2	3.6	0.44	325	42.0	162	76	1.9	628	--	

a Includes days of less than 0.05 cfs discharge.

b Residue at 180°C.

BRAZOS RIVER BASIN--Continued
 8-865. HUBBARD CREEK NEAR BRECKENRIDGE, TEX.--Continued

Temperature (°F) of water, water year January 1958 to September 1959
 /Once-daily measurement, usually between 6 a.m. and 10 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	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
November ..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
December ..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
January	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	43	46	39	--	40	--	48	--	45	--	48	--	45	--	48	--
February	43	42	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	41	
March	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	51	51	51	51	
April	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
May	--	--	--	--	--	--	--	--	72	65	60	67	--	71	--	67	--	75	--	79	--	82	--	80	79	77	76	75	78	80	80	
June	73	--	--	75	76	77	79	--	80	--	82	--	82	--	81	--	82	--	82	--	82	--	80	79	77	76	75	78	80	82	--	
July.....	--	82	--	80	82	--	83	--	87	--	83	--	82	--	81	75	80	79	79	--	78	--	83	--	81	80	--	82	86	--	--	
August.....	84	--	84	--	84	--	83	--	80	--	80	--	81	--	80	--	82	--	82	--	78	--	83	--	81	80	--	82	86	--	--	
September ..	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	75	--	77	--	73	--	--	

BRAZOS RIVER BASIN--Continued
8-881. SALT CREEK AT OLNEY, TEX.

LOCATION --At gaging station on right bank 21 feet downstream from bridge on State Highway 199 and 0.5 mile east of Olney, Young County.

DRAINAGE AREA --9.6 square miles.

RECORDS AVAILABLE --Chemical analyses: April 1958 to September 1959.

EXTREMES 1958-59 --Dissolved solids: Maximum, 3,670 ppm Apr. 23-26; minimum, 101 ppm Sept. 3.

Hardness: Maximum, 962 ppm June 27-30, July 1-8; minimum, 69 ppm Sept. 3.

Specific conductance: Maximum daily, 7,980 microhos Apr. 26; minimum daily, 182 microhos Sept. 3.

EXTREMES, April 1958 to September 1959 --Dissolved solids: Maximum, 8,120 ppm June 8-9, 1958; minimum, 101 ppm Sept. 3, 1959.

Hardness: Maximum, 2,460 ppm June 8-9, 1958; minimum, 69 ppm Sept. 3, 1959.

Specific conductance: Maximum daily, 30,400 microhos July 5, 1958; minimum daily, 182 microhos Sept. 3, 1959.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632. No flow on many days.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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	Tons per day	Calcium, magnesium			Non-carbonate		
Oct. 1-7, 1958...	a 0.01	5.6		50	12	218		107		12	388	0.4	1.0		740	1.01	0.02	174	87	7.2	1,440	7.8	
Oct. 9-10, 18,																							
Oct. 26, 28,	(a)	4.8		57	16	228		104		10	430	2	1.2		798	1.09	--	208	123	6.8	1,560	7.9	
Oct. 11, 19-24...	a .03	6.4		28	8.6	132		108		6.2	210	3	1.5		b 484	.68	.04	106	17	5.6	881	7.5	
Oct. 12-17,	a .03	6.4		31	5.7	71		96		5.4	120	2	1.8		289	.39	.02	101	22	3.1	560	7.5	
Oct. 27-28, 30-31,																							
Nov. 1-4,.....	(a)	2.1		165	37	581		59		27	1,240	2	.8		2,080	2.83	--	564	515	11	3,970	7.2	
Nov. 6, 14-27....	a .08	4.6		173	41	943		70		59	1,790	.5	6.5		3,050	4.15	.66	600	542	17	5,600	7.1	
Nov. 28-30,																							
Dec. 3-6,.....	(a)	2.8		37	7.7	116		96		10	202	3	2.0		b 447	.61	--	124	46	4.5	833	7.6	
Dec. 1-2,.....	a .05	3.9		24	3.5	36		66		6.4	63	2	2.5		b 187	.25	.03	74	20	1.8	336	7.3	
Dec. 7-12, 15-16.	(a)	3.6		32	7.5	149		120		10	230	4	1.5		b 527	.72	--	111	13	6.2	965	8.2	
Dec. 14, 17-22...	(a)	2.8		79	19	320		85		17	625	.3	1.2		1,110	1.51	--	275	206	8.4	2,160	7.9	
Dec. 29-31,																							
Jan. 1-2, 1959.	a .04	6.1		31	4.5	36		94		86	60	2	3.0		195	.27	.02	96	19	1.6	378	8.2	
Jan. 7-15,.....	(a)	2.5		27	6.7	96	2.5	98		8.8	156	3	1.5		b 374	.51	--	95	14	4.3	690	8.1	
Jan. 16-17, 19-20	a .01	1.8		70	11	256		84		16	320	3	1.8		b 941	1.28	.01	274	205	6.7	1,850	7.9	
Jan. 18, 21-31...	(a)	3.5		40	20	138		137		14	224	.5	1.2		b 530	.72	.01	145	32	5.0	965	8.2	
Feb. 1, 4-8,																							
Feb. 10-14,.....	(a)	2.3		36	10	123		136		17	189	.5	1.8		b 468	.64	--	131	20	4.7	855	8.1	
Feb. 17-18,.....	(a)	3.3		100	32	344		154		26	690	.4	2.8		b 1,270	1.73	--	381	255	7.7	2,430	7.4	
Feb. 15-16, 20...	(a)	2.1		38	13	158		121		21	260	.5	1.5		b 611	.83	--	148	50	5.7	1,090	7.7	
Mar. 28-30,.....	a .07	6.3		38	7.3	82		102		18	140	.2	3.5		345	.47	.07	125	42	3.2	677	7.5	

Apr. 1-3, 1959.....	7.0	48	13	175	5.0	136	31	288	0.3	1.0	635	0.86	174	62	5.8	1,230	6.8	
Apr. 4.....	--	--	--	--	--	48	--	1,030	--	--	--	--	420	380	--	3,290	7.4	
Apr. 8-15, 19.....	a .20	110	24	717	51	51	37	1,310	1.0	2.0	2,230	3.03	1.20	373	331	4,150	7.0	
Apr. 17-18.....	(a) 6.0	77	16	440	85	85	25	1,790	7.7	3.0	1,400	1.90	--	258	188	2,650	6.9	
Apr. 23-26.....	(a) 3.9	194	56	1,140	55	55	61	2,190	.6	--	3,670	4.99	714	870	19	6,670	7.0	
May 5, 8.....	a .90	42	4.0	31	130	130	9.8	50	.1	1.0	208	.28	.51	121	15	404	7.6	
May 6-7.....	(a) 6.7	37	6.4	135	105	105	12	221	.3	1.8	472	.64	119	33	5.4	931	7.1	
May 9.....	(a) 6.5	168	39	770	56	56	38	1,530	.5	1.1	2,590	3.52	580	534	14	4,810	7.0	
May 10-14.....	a 2.42	50	11	275	82	82	17	1,482	.4	3.0	886	1.20	5.79	170	103	9.2	1,770	7.3
May 15-20.....	a .23	132	30	682	74	74	25	1,310	.6	2.0	2,220	3.02	1.38	453	392	14	4,190	7.2
May 22, 23-26, June 2-3.....	(a) 6.6	30	3.7	38	102	102	8.0	56	.3	2.0	b 210	.29	--	90	6	368	6.9	
May 23, 27-31.....	(a) 6.8	26	4.8	89	117	117	10	120	.5	2.5	b 339	.46	--	84	0	605	7.0	
June 1, 4-5.....	a .23	142	36	931	83	83	40	1,710	.6	6.0	2,910	3.96	1.81	502	434	18	5,230	6.9
June 2.....	(a) 3.5	138	34	55	53	53	27	1,476	.5	3.0	2,470	3.96	494	468	8	4,570	6.8	
June 25, 26.....	20.9	39	16	257	82	82	17	1,076	.4	4.5	1,873	1.36	266	186	6	1,720	7.6	
June 27-30.....	20.9	55	6.0	59	100	100	6.8	102	.3	1.0	263	.36	14.6	107	25	513	7.6	
July 1-8, July 9-16.....	a .02	280	64	901	55	55	39	2,010	.5	--	3,330	4.53	18	962	916	13	6,090	6.8
July 17-18.....	(a) .24	120	28	479	102	102	22	1,960	.5	2.5	1,680	2.28	1.09	414	331	10	3,170	7.1
July 19-22.....	(a) 9.0	104	36	521	65	65	30	1,030	.4	2.5	1,760	2.39	--	408	354	11	3,340	7.3
Aug. 30-31, Sept. 1-2.....	a .02	76	10	349	65	65	7.6	655	.5	3.0	1,140	1.55	.06	230	177	10	2,210	7.3
Sept. 3.....	a .22	103	22	612	69	69	34	1,120	.9	6.0	1,940	2.64	1.15	348	291	14	3,620	7.0
Sept. 4-12.....	20.0	25	1.7	9.8	84	84	2.6	12	.1	2.5	101	.14	5.45	69	1	182	7.7	
Sept. 13-18.....	(a) 9.8	34	5.5	163	112	112	13	250	.6	2.8	b 568	.76	108	16	6.8	1,020	7.3	
Sept. 24-30.....	a .46	70	15	486	72	72	29	850	.9	3.0	1,500	2.04	1.86	236	177	14	2,810	7.2
Weighted average	0.36	41	7.7	125	--	94	9.8	225	0.3	1.7	463	0.63	134	57	4.7	890	--	

a Includes days of less than 0.05 cfs.
b Residue at 180 C.

BRAZOS RIVER BASIN--Continued

8-892. SALT CREEK NEAR NEWCASTLE, TEX.

LOCATION.--At gaging station on left bank 75 feet downstream from county bridge, 1.0 mile upstream from Oak Creek, 5.0 miles east of Newcastle, Young County, and about 8.5 miles upstream from Salt Creek Reservoir Dam.

DRAINAGE AREA 57.9 square miles.

REMARKS: AVALANCHES.--Chemical analyses: April 1958 to September 1959.

EXCEEDS: 1958-59.--Dissolved solids: Maximum 2,170 ppm April 14-16; minimum, 51 ppm July 18-19.

Hardness: Maximum 661 ppm Apr. 14-16; minimum, 22 ppm July 18-19.

Specific conductance: Maximum daily, 3,940 microhos apt. 14; minimum daily, 72 microhos July 19.

EXTREMES: April 1958 to September 1959.--Dissolved solids: Maximum, 4,350 ppm June 21-30, July 1-5, 1958; minimum, 51 ppm July 18-19, 1959.

Hardness: Maximum, 1,230 ppm June 21-30, July 1-5, 1958; minimum, 22 ppm July 18-19, 1959.

Specific conductance: Maximum daily, 11,000 microhos June 24, 1958; minimum daily, 72 microhos July 19, 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium			Non-carbonate	
Oct. 1-11, 1958.....	(a)	5.0		60	12	135		118		12	270	0.3	1.5		554	0.75	--	199	102	4.1	1,100	7.9
Oct. 12.....	2.20	6.6		122	22	332		94		22	720	.3	3.0		1,270	1.73	7.54	396	319	7.3	2,470	8.0
Oct. 13-31.....	a .01	3.8		72	15	195		100		16	400	.3	1.0		752	1.02	.02	241	159	5.5	1,480	7.9
Nov. 1-15.....	(a)	3.2		70	15	218		87		15	440	.4	.8		b 874	1.19		236	164	6.2	1,580	7.6
Nov. 16-30.....	(a)	2.5		70	15	219		92		14	440	.3	.2		b 884	1.20		236	160	6.3	1,570	7.5
Dec. 1-13.....	(a)	2.1		74	18	225		82		17	468	.5	2.0		847	1.15		258	192	6.1	1,680	7.6
Dec. 14-31.....	(a)	5.1		92	22	266		142		21	538	.3	1.0		1,020	1.39	--	320	204	6.5	1,980	7.7
Jan. 1-4, 9-15, 1959.....	(a)	3.7		85	22	232	9.3	120		20	495	.3	1.0		927	1.26	--	302	204	5.8	1,820	8.0
Jan. 5-6.....	(a)	7.8		152	37	427	c190	190		42	890	.4	3.5		1,650	2.24	--	531	375	8.1	3,090	8.6
Jan. 7-8.....	(a)	5.7		62	16	159		88		14	340	.2	.8		641	.87	--	220	148	4.7	1,290	8.2
Jan. 16-31.....	(a)	3.5		113	28	288		168		17	615	.3	1.0		1,150	1.56	--	397	260	6.3	2,220	8.0
Feb. 1-10.....	(a)	7.4		90	22	274		131		22	552	.3	1.5		1,030	1.40	--	315	208	6.7	2,010	8.1
Feb. 11-20.....	(a)	5.6		82	22	283		132		21	552	.4	.5		1,030	1.40	--	295	187	7.2	2,010	8.0
Feb. 21-28.....	(a)	4.0		98	25	287		156		15	588	.5	.5		1,100	1.50	--	352	224	6.7	2,150	7.6
Mar. 1-4, 7-13.....	(a)	6.3		90	25	335		108		32	660	.3	2.2		1,200	1.63	--	328	239	8.0	2,330	7.9
Mar. 5-6, 14-15.....	(a)	6.4		82	21	246		106		23	458	.3	2.0		1,451	1.17	--	493	304	5.3	1,700	8.1
Mar. 16-31.....	(a)	4.1		127	30	384		179		29	820	.3	4.0		1,404	1.41	--	433	358	8.1	2,710	7.5
Apr. 1-10, 18.....	(a)	6.0		127	30	363		163		27	733	.3	4.5		1,300	1.44	--	420	269	2.9	1,598	6.9
Apr. 11-13.....	(a)	5.2		92	10	97		100		22	194	.3	3.0		432	.59	--	170	88	3.2	860	7.8

Apr. 14-16, 1959.....	(a)	4.1	194	43	568	56	95	1,240	0.5	--	2,170	2.95	--	661	61.5	9.6	3,940	7.5
Apr. 17.....	(a)	7.0	--	--	24	38	6.8	36	3	5.2	--	--	42	11	1.6	133	7.4	
Apr. 18-25.....	(a)	4.0	54	9.7	116	100	28	222	5	2.5	486	.66	--	174	92	3.8	982	7.0
Apr. 26-30.....	(a)	4.7	96	22	294	81	51	600	6	3.0	1,110	1.51	--	330	264	7.0	2,110	6.6
May 1-8.....	(a)	8.9	123	27	391	59	65	800	5	27	1,470	2.00	--	418	370	8.3	2,810	7.1
May 9-11.....	a	37.7	18	3.0	27	62	8.0	38	3	3.2	137	.19	13.9	57	6	1.6	262	6.6
May 12-16.....	a	3.38	48	8.4	117	100	14	218	4	5.7	472	.64	4.31	154	72	4.1	942	7.3
May 17-31.....	a	17	64	13	171	139	17	320	5	1.5	661	.90	.30	213	99	5.1	1,320	7.2
June 1-21.....	(a)	3.9	52	12	165	106	11	310	5	2.0	608	.83	--	179	92	5.4	1,220	6.9
June 22, 27-28.....	(a)	30.1	13	3.1	19	43	4.6	32	3	1.5	103	1.14	8.37	45	10	1.3	190	6.6
June 23-24.....	156	13	42	7.4	103	82	14	194	3	4.0	418	.57	176	136	68	3.8	797	7.4
June 25-28, 29-30.....	13.9	11	32	5.7	52	84	7.6	97	3	2.2	249	.34	9.34	103	34	2.2	482	7.2
July 1-6, 8-9.....	a	1.78	36	7.5	67	88	9.8	130	2	1.8	309	.42	1.49	121	49	2.7	578	7.5
July 7.....	2.90	14	20	5.0	42	71	7.6	65	3	3.8	193	.26	1.51	71	13	2.2	336	7.4
July 10, 16.....	a	1.75	46	9.5	116	83	12	229	2	2.8	470	.64	2.22	154	86	4.1	889	7.5
July 11-15, 17, 22-23.....	a	1.94	34	7.0	58	82	9.6	114	2	1.8	276	.38	1.45	114	46	2.4	520	7.3
July 18-19.....	170	13	5.4	2.1	5.8	26	3.6	5.0	--	3.2	51	.07	23.4	22	1	5	72	7.0
July 20-21, 24-31.....	3.36	8.8	22	4.3	26	63	11	45	2	2.8	151	.21	1.37	73	21	1.3	277	6.7
Aug. 1-10.....	(a)	11	33	6.3	41	111	12	65	4	2.5	244	.33	--	108	17	1.7	408	7.6
Aug. 11-22.....	(a)	5.2	37	6.8	53	108	17	88	6	4.0	290	.39	--	120	32	2.1	485	7.3
Aug. 23-30.....	(a)	12	48	8.3	78	103	27	138	6	1.8	381	.52	--	154	70	2.7	707	7.9
Aug. 31, Sept. 1.....	(a)	7.6	14	7.5	13	38	6.2	14	2	4.1	75	1.10	--	33	2	1.0	169	7.4
Sept. 2-4.....	a	34.3	14	3.4	21	53	7.4	28	2	2.9	113	.15	10.5	69	19	1.3	34	7.4
Sept. 5-12.....	a	3.72	29	5.0	41	90	7.6	70	2	2.6	211	.29	2.12	123	20	2.2	517	7.7
Sept. 13-30.....	(a)	6.1	38	6.8	56	126	10	91	3	1.9	291	.40	--	123	20	2.2	517	7.7
Weighted average		3.12	22	4.5	45	58	8.3	81	0.3	3.2	205	0.28	1.73	73	26	2.3	382	--

a Includes days of less than 0.05 cfs.

b Residue at 180°C.

c Includes equivalent of 12 parts per million of carbonate (CO₃).

BRAZOS RIVER BASIN--Continued

8-886. BRAZOS RIVER AT POSSUM KINGDOM DAM, NEAR GRAFORD, TEX.

LOCATION.--Immediately below Possum Kingdom Dam, 2.6 miles upstream from Loving Creek, 11.3 miles southwest of Graford, Palo Pinto County, and 20 miles upstream from gaging station near Palo Pinto.
 DRAINAGE AREA.--22,550 square miles, approximately, of which 9,240 square miles is probably noncontributing.
 RECORDS AVAILABLE.--Chemical analyses: January 1942 to September 1959.

Water temperatures: October 1949 to September 1955.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,370 ppm Sept. 1-30; minimum, 986 ppm Mar. 1-31.

Hardness: Maximum, 425 ppm Sept. 1-30; minimum, 328 ppm Dec. 1-31.

Specific conductance: Maximum daily, 2,350 micromhos Sept. 29; minimum daily, 1,730 micromhos June 4.

EXTREMES, 1942-59.--Dissolved solids: Maximum, 2,640 ppm Jan. 1-31, 1956; minimum, 331 ppm Apr. 26-30, May 1-10, 1957.

Hardness: Maximum, 628 ppm Jan. 1-31, 1956; minimum, 135 ppm Apr. 26-30, May 1-10, 1957.

Specific conductance: Maximum daily, 5,720 micromhos Jan. 7, 1956; minimum daily, 494 micromhos May 4, 1957.

Water temperatures (1949-55): Maximum, 76°F Sept. 27-30, 1950; minimum, 45°F on several days in February 1951.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Palo Pinto for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 1-31, 1958....	658	10		122	20	276		122		234	455		1.5		1.180	1.60	2,100	386	286	6.1	12.040	7.4
Nov. 1-30.....	332	7.8		110	19	249		119		211	408		1.0		1.060	1.44	1,010	352	255	5.8	11.900	7.8
Dec. 1-31.....	196	8.8		102	18	238		115		191	392		.8		1.010	1.37	534	328	234	5.7	11.770	7.3
Jan. 1-31, 1959....	217	10		103	19	232		118		197	382		.0		1.000	1.36	586	335	238	5.5	11.770	7.8
Feb. 1-28.....	77.5	7.6		104	19	232		118		198	382		.5		1.000	1.36	209	338	241	5.5	11.780	7.9
Mar. 1-31.....	68.1	10		104	19	229		114		195	382		1.0		.986	1.35	183	338	244	5.4	11.780	7.7
Apr. 1-30.....	77.7	8.8		105	20	233	7.1	119		195	392		.8		1.070	1.39	214	344	245	5.5	11.780	7.4
May 1-31.....	232	7.8		104	17	236		120		185	396		1.0		1.010	1.37	633	330	230	5.7	11.790	7.5
June 1-30.....	1,060	8.6		110	20	243		124		215	392		.5		1.050	1.43	3,010	356	255	5.5	11.840	7.4
July 1-31.....	2,080	9.0		118	22	277		126		256	438		.8		1.180	1.60	6,640	385	282	6.1	11.990	7.7
Aug. 1-31.....	225	12		125	22	292		128		264	465		1.2		1.240	1.69	753	402	298	6.3	12.120	7.2
Sept. 1-30.....	208	12		134	22	327		125		294	515		1.8		1,370	1.86	769	425	322	6.9	12.310	7.4
Weighted average	458	9.2		115	21	264		123		235	425		0.9		1,130	1.54	1,400	374	272	5.9	11.950	--

BRAZOS RIVER BASIN--Continued

8--926. BRAZOS RIVER NEAR WHITNEY, TEX.

LOCATION -- Immediately below Whitney Dam, 4.0 miles upstream from Iron Creek, 3.4 miles upstream from gaging station near Whitney, and 7.4 miles southwest of Whitney Hill County square miles, approximately of which 9.240 square miles is probably noncontributing.

DRAINAGE AREA -- 26,170 square miles.

RECORDS AVAILABLE -- Chemical analyses: October 1947 to May 1948, October 1948 to September 1959.

Water temperatures: October 1947 to May 1948, October 1948 to September 1959.

EXTREMES 1958-59 -- Dissolved solids: Maximum, 947 ppm Feb. 1-28; minimum, 845 ppm Aug. 1-31.

Hardness: Maximum, 328 ppm Apr. 1-30; minimum, 283 ppm Aug. 1-31.

Specific conductance: Maximum daily, 1,690 microhmhos May 9; minimum daily, 1,290 microhmhos July 26.

Water temperatures: Maximum, 88°F June 17; minimum, 39°F Jan. 4, 21.

EXTREMES 1947-59 -- Dissolved solids: Maximum, 1,560 ppm Oct. 1-10, 1948; minimum, 183 ppm June 11-20, 1952.

Hardness: Maximum, 542 ppm Oct. 1-10, 1948; minimum, 96 ppm June 11-20, 1952.

Specific conductance: Maximum daily, 2,660 microhmhos Oct. 1, 1948; minimum, freezing point Jan. 28, 29, 1948.

Water temperatures: Maximum, 92°F July 21, 28, 29, 1957; minimum, freezing point Jan. 28, 29, 1948.

REMARKS -- Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Whitney for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between dam and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhmhos at 25°C)			
														Parts per million	Tons per acre-foot	Tons per day	Calcium		Non-carbonate	Sodium adsorption ratio	pH
Oct. 1-31, 1958...	536	9.6		100	16	193		126	174	318	--	1.2		885	1.20	1,280	316	212	4.7	1,550	7.8
Nov. 1-30.....	571	9.8		94	16	198		131	167	318	--	1.0		930	1.26	1,430	300	193	5.0	1,540	8.0
Dec. 1-31.....	553	11		94	16	201		136	166	322	--	.2		925	1.26	1,380	300	189	5.1	1,570	8.2
Jan. 1-31, 1959...	530	11		96	18	191	5.8	133	173	322	0.3	.5		913	1.24	1,310	314	204	4.7	1,560	8.2
Feb. 1-28.....	596	11		93	18	196		114	176	322	--	.5		947	1.29	1,520	306	211	4.9	1,560	7.6
Mar. 1-31.....	612	11		99	18	199		134	178	325	--	.5		a 896	1.22	1,480	321	211	4.8	1,570	7.8
Apr. 1-30.....	614	8.4		100	19	192	5.6	140	185	318	3	.5		a 898	1.22	1,490	328	213	4.6	1,600	7.9
May 1-31.....	633	7.4		98	19	190		141	174	310	--	2.0		948	1.29	1,620	322	207	4.6	1,560	7.7
June 1-30.....	615	11		94	19	191		140	170	308	--	1.0		909	1.24	1,510	312	198	4.7	1,500	7.2
July 1-31.....	1,557	11		86	17	181		134	152	290	--	1.0		850	1.16	3,370	284	174	4.7	1,400	7.2
Aug. 1-31.....	711	11		87	16	177		132	138	290	--	2.2		845	1.15	1,620	283	170	4.6	1,400	7.6
Sept. 1-30.....	625	11		89	17	192		132	160	308	--	1.2		863	1.17	1,460	292	184	4.9	1,450	7.5
Weighted average	681	10		93	17	191	--	134	165	309	--	1.0		893	1.21	1,640	302	192	4.8	1,500	--

a Calculated from determined constituents.

BRAZOS RIVER BASIN--Continued
8-926. BRAZOS RIVER NEAR WHITNEY, TEX.--Continued
Temperature (°F) of water, water year October 1958 to September 1959

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	72	72	73	74	74	72	73	72	72	72	70	70	70	70	71	74	73	74	72	71	70	72	71	69	68	68	66	65	65	71	
Maximum	68	70	69	69	71	72	71	71	71	72	70	68	69	70	70	70	70	70	71	72	71	70	68	70	69	67	64	64	62	65	65	69
Minimum	65	64	63	64	66	66	64	64	64	64	64	65	65	65	67	67	65	63	63	64	64	64	67	66	64	62	60	60	58	--	64	
November	63	60	61	63	64	63	62	62	61	62	63	64	65	63	64	65	62	61	60	60	61	62	64	64	60	58	53	57	58	--	62	
Maximum	58	59	59	59	59	57	55	54	54	53	51	50	50	47	46	46	46	46	47	47	46	49	47	48	48	47	47	47	47	44	50	
Minimum	57	58	58	58	55	54	53	50	51	51	49	49	45	44	44	43	44	44	45	46	46	45	45	46	47	46	45	47	42	42	50	
December	44	45	45	44	43	43	44	43	42	42	44	44	44	48	43	42	43	43	49	52	44	42	43	44	50	50	46	45	46	47	46	
Maximum	47	48	46	49	49	48	48	53	54	47	47	47	49	50	52	52	47	47	47	45	45	45	45	46	45	46	45	46	46	47	48	
Minimum	46	44	45	45	47	45	47	48	46	46	46	46	46	46	46	46	46	46	45	44	45	45	45	44	45	44	45	46	--	46		
January	52	55	51	50	49	50	53	54	51	51	55	57	58	54	55	56	54	55	56	54	58	56	57	57	59	62	61	61	61	59	57	
Maximum	47	50	48	48	47	47	48	49	51	49	49	50	51	53	50	51	51	51	53	52	51	54	54	55	56	55	57	57	57	57	52	
Minimum	58	62	62	63	67	66	62	60	60	60	59	58	59	59	61	65	66	72	72	63	63	67	63	68	72	72	69	65	64	--	64	
February	57	57	58	57	59	59	59	60	59	59	57	55	56	57	58	58	58	60	60	66	62	60	59	60	61	62	68	63	63	64	62	60
Maximum	62	67	75	74	65	66	73	70	72	72	70	72	72	72	72	76	80	80	70	71	72	72	71	74	72	70	69	70	77	77	72	
Minimum	61	61	67	64	64	65	66	68	67	66	66	70	71	69	71	72	75	69	70	70	70	70	70	69	70	68	68	68	69	70	68	
March	74	75	75	75	75	70	70	75	75	74	74	74	78	79	80	84	80	84	80	78	78	83	73	76	77	76	82	84	84	78	--	
Maximum	77	78	76	75	75	78	80	80	76	82	75	82	80	83	86	86	88	80	79	83	86	86	76	77	77	76	82	84	84	78	--	
Minimum	74	75	75	75	70	70	75	75	74	74	74	78	79	80	84	80	84	80	78	78	83	73	76	77	76	75	80	78	78	--	76	
April	78	82	80	82	78	84	84	84	80	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	81	
Maximum	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	79	
Minimum	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	
May	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	81	
June	81	82	81	83	84	84	83	83	82	82	81	78	77	76	79	78	77	78	80	80	76	76	75	75	78	80	80	75	74	--	79	
Maximum	78	80	80	80	80	81	83	82	81	81	77	75	76	74	75	74	75	74	76	79	76	76	75	75	74	78	75	74	71	74	--	
Minimum	78	80	80	80	80	81	83	82	81	81	77	75	76	74	75	74	75	74	76	79	76	76	75	75	74	78	75	74	71	74	--	

BRAZOS RIVER BASIN--Continued
8-1025. LEON RIVER NEAR BELTON, TEX.

LOCATION.--Temperature recorder at gaging station on left bank, 1,400 feet upstream from bridge on Farm Road 817, 2,000 feet upstream from concrete dam, 1 mile upstream from bridge on U.S. Highway 81, 2 miles east of Belton, Bell County, 3.2 miles downstream from Belton Dam, and 5.0 miles upstream from Nolan Creek.

DRAINAGE AREA.--3,513 square miles.

RECORDS AVAILABLE.--Water temperatures: March 1957 to September 1959.

EXTREMES, 1958-59.--Water temperatures: Maximum, 90°F Aug. 17-18, Sept. 25-26; minimum, 53°F Jan. 10, 13.

EXTREMES, 1957-59.--Water temperatures: Maximum, 95°F Sept. 1, 1958; minimum, 49°F Jan. 8-31, Feb. 1-5, 19-22, 1958.

REMARKS.--Records for water year October 1958 to September 1959 given in WSP 1632.

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	85	80	79	77	77	81	81	83	84	84	84	81	80	79	79	80	79	80	79	80	79	80	79	79	79	80	79	78	77	77	76	75	80
Maximum	85	80	79	77	77	81	81	83	84	84	84	81	80	79	79	80	79	80	79	80	79	80	79	79	79	80	79	78	77	77	76	75	80
Minimum	80	79	77	77	77	76	77	78	80	80	83	81	79	79	78	78	78	78	78	79	78	79	77	77	77	78	78	77	77	76	75	74	78
November	74	73	72	72	73	74	73	73	73	73	72	72	72	73	74	74	74	73	72	72	72	72	72	72	73	73	71	70	67	67	--	72	
Maximum	74	73	72	72	73	74	73	73	73	73	72	72	72	73	74	74	74	73	72	72	72	72	72	73	73	71	70	67	67	--	72		
Minimum	73	72	72	71	72	73	72	72	72	72	71	72	72	72	72	72	72	72	71	71	71	71	70	71	72	71	70	67	66	--	71		
December	66	66	67	66	66	67	66	68	68	68	68	66	68	68	66	65	63	63	63	61	61	62	63	61	61	65	65	65	67	67	65		
Maximum	66	66	67	66	66	67	66	68	68	68	68	66	68	68	66	65	63	63	63	61	61	62	63	61	61	65	65	65	67	67	65		
Minimum	65	65	65	65	65	65	65	65	65	65	65	65	65	65	65	63	63	61	61	60	60	60	60	60	60	61	62	62	64	65	63		
January	65	61	58	58	57	57	57	58	56	56	55	56	56	60	59	61	60	60	62	62	62	61	61	62	64	64	66	61	65	67	66		
Maximum	65	61	58	58	57	57	57	58	56	56	55	56	56	60	59	61	60	60	62	62	62	61	61	62	64	64	66	61	65	67	66		
Minimum	60	57	57	55	54	55	55	56	56	53	54	54	53	56	59	57	59	59	59	59	58	59	59	59	62	62	61	59	60	65	64		
February	64	61	62	62	62	62	63	62	64	65	63	65	69	70	69	69	69	68	66	65	64	66	65	65	64	64	65	--	--	65			
Maximum	64	61	62	62	62	62	63	62	64	65	63	65	69	70	69	69	69	68	66	65	64	66	65	65	64	64	65	--	--	65			
Minimum	61	59	59	60	60	60	60	61	58	62	63	62	65	68	64	66	67	66	65	62	62	62	64	63	63	61	61	--	--	62			
March	68	68	68	66	66	67	66	66	66	70	72	73	72	71	74	75	74	72	72	70	70	70	68	66	65	67	75	76	75	75	69		
Maximum	68	68	68	66	66	67	66	66	66	70	72	73	72	71	74	75	74	72	70	70	70	68	66	65	67	75	76	75	75	75	69		
Minimum	64	62	66	63	64	64	65	65	66	66	68	71	70	70	70	72	72	70	70	70	68	66	65	67	70	75	76	75	75	75	69		
April	78	79	80	80	79	82	83	83	82	80	78	78	77	75	74	72	73	73	74	72	65	64	65	66	69	70	71	75	76	76	--		
Maximum	78	79	80	80	79	82	83	83	82	80	78	78	77	75	74	72	73	73	74	72	65	64	65	66	69	70	71	75	76	76	--		
Minimum	77	76	78	78	77	79	81	81	80	78	77	75	74	72	73	73	74	76	78	80	81	81	81	81	81	80	78	77	77	78	78		
May	76	77	78	78	80	82	82	82	82	81	80	80	78	73	73	74	76	78	80	81	81	81	81	81	81	81	80	78	77	78	80		
Maximum	76	77	78	78	80	82	82	82	82	81	80	80	78	73	73	74	76	78	80	81	81	81	81	81	81	81	80	78	77	78	80		
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		
June	80	80	80	79	79	78	78	77	67	67	66	65	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64		
Maximum	80	80	80	79	79	78	78	77	67	67	66	65	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64		
Minimum	80	79	79	79	77	78	77	67	66	67	65	65	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64	64		
July	68	69	69	68	67	67	75	78	--	--	82	83	83	83	84	84	84	84	84	85	85	85	83	83	83	71	72	72	74	75	76		
Maximum	68	69	69	68	67	67	75	78	--	--	82	83	83	83	84	84	84	84	84	85	85	85	83	83	83	83	71	72	72	74	75	76	
Minimum	68	68	67	66	66	66	67	75	--	--	80	81	80	80	82	83	84	84	84	84	84	84	84	84	84	81	81	72	74	74	75		
August	78	82	82	84	85	87	88	88	87	87	87	87	88	87	88	87	90	88	88	88	88	88	87	88	88	88	88	89	88	85	89		
Maximum	78	82	82	84	85	87	88	88	87	87	87	87	88	87	88	87	90	88	88	88	88	88	87	88	88	88	88	89	88	85	89		
Minimum	73	78	78	79	81	83	87	87	87	87	86	86	87	86	86	85	87	88	88	87	87	86	86	86	86	86	86	86	84	83	84	85	
September	85	86	78	79	79	80	79	82	84	86	87	84	84	84	84	84	86	87	87	87	87	87	88	88	88	89	90	88	88	88	85		
Maximum	85	86	78	79	79	80	79	82	84	86	87	84	84	84	84	84	86	87	87	87	87	87	88	88	88	89	90	88	88	88	85		
Minimum	85	86	77	77	78	78	79	79	78	78	84	86	83	83	82	82	84	86	87	87	87	86	86	86	86	86	86	87	87	87	85		

BRAZOS RIVER BASIN--Continued

8-1110, NAVASOTA RIVER NEAR BRYAN, TEX.

LOCATION--At gaging station on right bank just upstream from bridge on U.S. Highway 190, 2.5 miles upstream from Shepherd Creek, and 17 miles northeast of Bryan, Brazos County

DRAINAGE AREA--1,439 square miles.

RECORDS AVAILABLE--Chemical analyses: October 1958 to September 1959.

Water temperatures: October 1958 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 928 ppm Sept. 20-25; minimum, 72 ppm Feb. 15.

Hardness: Maximum, 226 ppm Sept. 20-25; minimum, 27 ppm Feb. 15.

Specific conductance: Maximum daily, 2,370 micromhos Sept. 22; minimum daily, 114 micromhos Feb. 15.

Water temperatures: Maximum, 89°F Aug. 4; minimum, 38°F Jan. 4, 5.

REMARKS--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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. 1-10, 1958..	311	16		22	4.5	73		66		20	110	--	1.5		a 299	0.41	251	73	19	3.7	499	7.0
Oct. 11-20.....	91.1	18		30	6.4	68		92		29	101	--	1.5		a 319	.43	78.5	101	26	2.9	531	7.2
Oct. 21-31.....	428	12		16	3.5	29		52		19	38	--	.5		144	.20	166	54	12	1.7	258	6.9
Nov. 1-16.....	53.2	16		29	6.7	52		78		39	77	0.1	.5		a 282	.38	40.5	100	36	2.3	471	7.4
Nov. 17.....	489	8.8		17	3.1	20		32		33	26	2.0	1.0		125	.17	155	55	29	1.2	188	7.0
Nov. 18-30.....	85.3	17		27	7.2	41		57		46	65	1.1	.5		232	.52	53.4	97	50	1.8	410	7.2
Dec. 1-7.....	217	18		26	6.5	40		52		48	61	--	.5		226	.31	132	92	49	1.8	388	7.1
Dec. 8-17.....	95.0	17		45	9.5	78		109		51	126	--	.2		a 416	.57	107	152	62	2.7	694	7.7
Dec. 18-31.....	62.2	17		41	7.8	52		102		47	61	--	.5		a 315	.33	152.9	133	51	1.9	593	7.7
Jan. 1-10, 1959..	159.6	18		23	8.2	43	4.5	57		59	68	1.4	.5		268	.35	104	104	57	1.8	441	7.7
Jan. 11-20.....	59.6	20		38	9.8	58		58		69	90	--	.2		308	.42	49.6	125	78	2.2	529	7.7
Jan. 21-31.....	40.5	20		38	11	67		65		79	107	--	.2		354	.48	38.7	140	86	2.5	616	7.8
Feb. 1-13.....	95.1	18		40	12	73		62		85	120	--	.5		378	.51	97.1	150	98	2.6	677	7.8
Feb. 14, 16-18... 2.241	2.241	9.6		16	4.1	36		35		29	53	--	1.0		166	.23	1,000	57	28	2.1	303	7.4

Feb. 15, 1959.....	3,400	8.2	8.4	1.5	13	25	14	14	---	1.2	72	0.10	661	27	6	1.1	114	7.5
Feb. 19-20.....	3,825	13	22	5.2	81	50	20	134	---	1.0	301	.41	3,110	76	38	4.0	570	7.8
Feb. 21-28.....	1,134	15	38	9.0	181	74	37	302	---	1.2	619	.84	1,900	132	72	6.9	1,200	7.6
Mar. 1-7, 10-11.....	258	13	210	12	170	79	46	282	---	2.2	635	.86	1,360	164	100	5.8	1,190	7.7
Mar. 8-9, 12-16.....	61.0	13	34	9.5	93	71	54	150	---	1.2	390	.53	272	124	66	3.6	718	7.6
Mar. 17-31.....	65.6	15	46	13	117	85	74	195	---	.8	503	.68	82.8	168	99	3.9	928	7.5
Apr. 1-7.....	2,524	8.4	14	3.6	106	78	88	186	4.6	.2	503	.68	89.1	184	120	3.4	908	7.5
Apr. 8-10, 12-17.....	3,212	8.8	14	4.6	28	33	22	42	---	1.2	135	.18	920	50	23	1.7	253	6.9
Apr. 11, 18-21.....	954	12	28	5.7	66	44	26	88	---	.5	224	.30	1,940	71	35	2.8	422	7.0
Apr. 22-30.....	304	15	34	9.0	72	76	32	99	---	1.5	281	.38	724	93	31	3.0	518	7.3
May 1-8.....	791	12	23	5.9	51	65	49	113	---	1.5	334	.45	274	122	54	2.9	617	7.8
May 9-13, 19-23.....	3,548	8.6	12	3.2	22	41	14	30	---	1.0	231	.31	483	82	28	2.5	439	6.9
May 14-18.....	2,201	8.8	13	3.6	24	43	16	33	---	1.0	120	.16	713	47	12	1.5	228	7.1
June 7-9.....	752	16	37	4.0	97	69	25	85	---	2.0	284	.39	394	92	47	2.6	330	7.4
June 10-14.....	127	17	37	8.8	56	37	22	50	---	.2	376	.25	376	78	48	1.8	335	7.3
June 18-25.....	3,508	12	16	3.0	34	47	14	91	---	1.0	a 324	.26	188	188	48	2.3	552	7.7
June 26-30.....	1,669	17	22	3.9	39	81	15	51	---	1.2	185	.21	1,470	52	14	2.1	282	6.7
July 1-7.....	45.0	18	40	8.7	63	99	44	102	3	1.0	189	.26	852	71	5	2.0	323	7.1
July 8-20.....	88.0	15	46	9.6	77	114	45	128	4	.8	a 346	.47	42.0	136	55	2.3	576	7.1
July 21-24, 28-30.....	240	13	52	12	124	120	48	212	---	.2	a 406	.55	96.5	154	61	2.7	680	7.0
July 25-27, 31.....	198	16	46	7.5	188	99	27	315	---	2.0	a 520	.71	337	179	80	4.0	974	7.0
Aug. 1-10.....	15.7	16	46	9.5	206	107	30	342	---	1.8	a 712	.97	381	146	65	6.8	1,220	7.4
Aug. 11-23.....	15.7	16	46	9.5	206	107	30	342	---	1.8	a 766	1.04	32.5	154	66	7.2	1,310	7.1

a Residue at 180°C.

BRAZOS RIVER BASIN--Continued
8-1110. NAVASOTA RIVER NEAR BRYAN, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (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			
Aug. 24-31 1959...	12.5	15	36	8.8	134	103				32	211		1.8	0.70	17.5	42	126	5.2	905	7.1	
Sept. 1-10.....	43.4	16	36	9.2	106	95			42	167			.8	a 457	62	53.6	128	50	4.1	786	6.9
Sept. 11-19.....	22.4	15	30	6.6	80	27			37	137			.8	a 329	45	19.9	102	47	3.4	626	7.3
Sept. 20-25.....	17.8	13	66	15	263	87			44	480			3.8	928	1,266	44.6	226	154	7.6	1,760	7.3
Sept. 26-30.....	40.4	14	28	5.7	101	67			25	165			.5	372	51	40.6	94	38	4.5	709	7.1
Weighted average	529	12	21	4.9	52	--	--	55	25	80			1.1	226	0.31	323	73	28	2.6	414	--

a Residue at 180°C.

Temperature (°F) of water, water year October 1958 to September 1959

/Once-daily measurement, usually between 6 a.m. and 10 a.m.7

Month	Day																															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	72	69	67	66	67	72	73	75	75	76	74	73	71	72	73	71	71	71	70	70	70	71	71	68	68	71	68	65	63	61	62	60	70	
November ..	59	59	58	59	61	63	62	61	61	64	64	66	68	65	70	72	67	63	60	59	62	62	61	58	53	50	49	--	61	58	53	50	49	--
December ..	50	50	49	50	52	51	50	49	49	49	45	45	46	42	40	44	40	46	43	46	46	50	51	50	50	49	50	48	53	50	45	48	48	
January	44	43	42	38	39	41	42	41	--	43	46	50	50	55	48	46	48	55	58	53	49	46	49	51	55	51	50	53	53	49	48	48		
February	50	46	47	47	50	49	46	52	56	58	55	55	59	62	58	56	61	58	53	49	49	56	55	58	55	58	60	58	--	54	54	54		
March	57	56	57	57	57	55	54	57	56	58	61	58	58	61	58	58	56	58	60	60	58	57	60	65	64	65	65	62	61	62	65	59		
April	65	61	64	64	67	69	71	71	61	62	60	56	55	56	57	59	61	63	67	69	67	65	69	70	66	68	69	70	70	73	--	65		
May	74	76	74	75	78	76	76	77	77	76	71	73	74	72	72	74	75	77	78	79	77	73	71	73	75	77	78	79	80	82	76	76		
June	82	80	79	79	80	77	76	76	77	79	81	80	81	81	81	81	81	82	82	83	84	85	84	83	83	82	80	81	82	83	--	81		
July	83	83	83	84	84	84	83	--	85	83	84	86	85	84	84	84	84	85	86	82	83	83	85	84	82	80	81	82	83	83	83	83		
August	83	86	85	89	85	86	87	87	83	82	81	82	83	84	84	83	84	85	85	82	82	82	81	80	79	78	80	82	83	82	83	82		
September ..	82	83	83	84	83	82	82	82	80	82	79	75	75	74	74	74	75	74	75	77	78	78	80	79	79	79	--	81	81	79	80	--	79	

BRAZOS RIVER BASIN--Continued
8-1140. BRAZOS RIVER AT RICHMOND, TEX.

LOCATION.--At gaging station near right bank on downstream side of pier of bridge on U.S. Highway 69 in Richmond, Fort Bend County, 925 feet downstream from Texas and New Orleans Railroad Co. bridge, and at mile 93.
DRAINAGE AREA.--44,020 square miles, approximately, of which 9,240 square miles is probably noncontributing.
RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1959.

Water temperatures: November 1950 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 718 ppm Apr. 1-7; minimum, 171 ppm Apr. 11-22.
Hardness: Maximum, 288 ppm Apr. 1-7; minimum, 100 ppm Oct. 1-9.

Specific conductance: Maximum daily, 1,230 micromhos Dec. 25, Apr. 4; minimum daily, 235 micromhos Oct. 1, Apr. 20.
Water temperatures: Maximum, 86° F on several days during June, July and August; minimum, 39° F Jan. 4.

EXTREMES, 1945-59.--Dissolved solids: Maximum, 1,400 ppm Sept. 1-10, 1951; minimum, 133 ppm Aug. 27-31, 1947.

Hardness: Maximum, 446 ppm Sept. 1-10, 1948; minimum, 74 ppm Jan. 13-14, 18-20, 1950.

Specific conductance: Maximum daily, 2,540 micromhos Sept. 4, 1951; minimum daily, 187 micromhos Aug. 31, 1947.

Water temperatures (1950-59): Maximum, 91° F Aug. 5, 1951; minimum, 39° F Jan. 4, 1959.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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	Calcium Magnesium	Non-carbonate				
Oct. 1-9, 1958...	7,501	16		33	4.2	27	3.9	101	25	40	--	1.5	--	a 201	0.27	4,070	100	17	1.2	342	7.8
Oct. 10-14, 21-23.....	2,893	14		51	8.4	48	4.8	145	47	73	--	2.0	--	330	.45	2,310	162	42	1.6	556	7.4
Oct. 26-31-20, Nov. 1-10.....	2,799	13		73	14	98	5.0	160	96	160	--	.5	--	563	.77	4,250	240	108	2.7	934	7.6
Nov. 11-20.....	2,365	10		59	10	61	4.8	158	66	90	--	1.8	--	402	.55	2,570	188	58	1.9	671	8.0
Nov. 21-30.....	2,181	10		64	13	73	4.6	168	85	110	--	1.5	--	464	.63	2,730	213	76	2.2	782	8.0
Nov. 21-30.....	2,018	10		62	11	72	5.3	158	72	114	--	.8	--	454	.62	2,470	200	70	2.2	754	7.9
Dec. 1-10.....	1,870	9.0		80	16	106	5.0	185	106	175	--	.5	--	615	.84	3,110	266	114	2.8	1,050	7.7
Dec. 11-20.....	1,692	10		78	15	95	4.9	191	100	150	--	1.5	--	578	.79	2,640	256	100	2.6	982	7.7
Dec. 21-31.....	1,544	7.0		87	16	117	4.9	196	117	142	--	1.0	--	679	.92	2,830	283	122	3.0	1,160	7.6
Jan. 1-10, 1959..	1,635	11		81	16	98	4.8	215	99	149	0.3	1.5	--	605	.82	2,670	268	102	2.6	988	8.1
Jan. 11-20.....	1,437	8.8		77	16	104	4.7	195	107	158	--	1.5	--	623	.85	2,420	258	98	2.8	1,000	8.0
Jan. 21-31.....	1,185	7.6		81	18	107	5.9	214	111	166	--	1.1	--	636	.86	2,030	276	100	2.8	1,050	8.0
Feb. 1-10.....	2,236	5.8		69	14	104	4.8	158	106	154	--	1.2	--	546	.74	3,300	230	100	3.0	941	8.1

a Calculated from determined constituents.

COLORADO RIVER BASIN

8-1195. COLORADO RIVER NEAR IRA, TEX.

LOCATION.--At gaging station on right bank 530 feet downstream from bridge on State Highway 350, 3.8 miles downstream from Bluff Creek, 4 miles upstream from Willow Creek, 4.5 miles southwest of Ira, Scurry County, and at mile 825.

DRAINAGE AREA.--3,617 square miles, approximately, of which 2,590 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: November 1958 to September 1959.

Water temperatures: November 1958 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 39,100 ppm Mar. 14-25; minimum, 255 ppm June 4-6.

Hardness: Maximum, 3,830 ppm Mar. 14-25; minimum, 102 ppm June 4-6.

Specific conductance: Maximum daily, 55,500 micromhos Mar. 25; minimum daily, 450 micromhos June 5.

Water temperatures: Maximum, 88°F Apr. 25, May 17, June 28, 29; minimum, freezing point Dec. 14.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, November 1958 to September 1959

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		Sodium	
Nov. 1-6, 1958...	0.25	1.2		465	172	6,220	93	93		1,400	9,830				18,100	24.9	12.2	1,870	1,790	63	27,500	7.9
Nov. 7-13, 25-30.	4.42	3.6		514	169	6,490	105	105		1,410	10,500				18,900	26.0	21.4	1,980	1,850	63	28,300	7.6
Nov. 14-24.....	2.35	3.6		387	128	4,450	98	98		1,110	7,050				13,200	18.1	53.8	1,490	1,410	30	20,600	7.2
Dec. 1-13.....	.30	2.2		553	186	7,210	133	133		1,350	11,400				21,000	28.9	27.6	2,440	2,070	66	31,100	7.8
Dec. 16-31.....	.39	3.2		566	226	8,360	188	188		1,760	13,700				21,300	29.6	24.9	2,400	2,050	72	32,400	7.7
Jan. 1-5, 1959..	.39	3.2		591	226	8,110	164	164		1,760	13,800				23,500	32.6	25.8	2,470	2,340	74	33,000	7.5
Jan. 16-31.....	.39	3.7		619	226	8,440	161	161		1,860	13,300				25,100	33.9	25.8	2,470	2,340	74	33,000	7.5
Feb. 1-14.....	.46	2.7		630	231	8,650	159	159		1,940	13,600				25,100	34.7	31.2	2,520	2,390	75	35,500	7.9
Feb. 15-28.....	.38	2.3		669	251	9,160	144	144		2,110	14,400				26,700	36.9	27.4	2,700	2,580	77	37,400	7.7
Mar. 1-13.....	.23	3.8		744	308	10,600	137	137		2,470	16,700				30,900	42.9	19.2	3,120	3,010	83	41,900	7.9
Mar. 14-25.....	.18	3.4		955	353	13,500	129	129		3,020	21,200				39,100	54.6	19.0	3,830	3,730	95	49,800	7.7
Mar. 26-31.....	3.53	4.4		659	239	8,270	427	427		2,220	12,900				24,400	33.7	23.3	2,630	2,520	70	33,900	7.8
Apr. 1-5.....	.26	3.3		688	290	9,080	114	114		2,410	14,200				26,700	37.0	18.7	2,910	2,820	73	36,800	7.1
Apr. 6-18.....	1.52	4.8		446	160	5,560	100	100		1,510	8,660				16,400	22.5	67.3	1,770	1,690	57	24,300	7.3

COLORADO RIVER BASIN--Continued
8-1210. COLORADO RIVER AT COLORADO CITY, TEX.

LOCATION --At gaging station on right bank at Colorado City, Mitchell County, 3.517 feet upstream from bridge on U.S. Highway 80, 4,100 feet upstream from

The Texas and Pacific Railway Co. bridge, 1.6 miles upstream from Lone Wolf Creek, and at mile 7.98

DRAINAGE AREA --4,082 square miles, approximately, of which 2,590 square miles is probably noncontributing.

RECORDS AVAILABLE --Chemical analyses: May 1946 to September 1954, November 1956 to September 1959.

Water temperatures: November 1952 to September 1954, November 1956 to September 1959.

EXTREMES, 1958-59 --Dissolved solids: Maximum, 19,000 ppm Apr. 1-7; minimum, 385 ppm July 2-3, 13-14.

Hardness: Maximum, 2,560 ppm Apr. 1-7; minimum, 110 ppm July 2-3, 13-14.

Specific conductance: Maximum daily, 30,500 microhos May 1; minimum daily, 605 microhos July 2.

Water temperatures: Maximum, 93°F June 19; minimum, freezing point Dec. 30-31, Jan. 4.

EXTREMES, 1946-54, 1956-59 --Dissolved solids: Maximum, 32,800 ppm Apr. 1-10, 1952; minimum, 176 ppm Oct. 26, 1947.

Hardness: Maximum, 4,500 ppm Aug. 9-12, 1946; minimum, 65 ppm Sept. 15-20, 1949.

Specific conductance: Maximum daily, 45,800 microhos Apr. 1-10, 1952; minimum daily, 245 microhos May 14, 1957.

Water temperatures (1956-59): Maximum, 93°F July 30, 1957, Aug. 19, 1958, June 19, 1959; minimum, freezing point on several days during December and January.

REMARKS --Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhos at 25°C)				
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium		Non-carbonate			
Oct. 1-5, 1958...	6.42	5.4	92	29	82	897		87		216	1,420		0.5		2,700	3.67	46.8	348	277	21	4,900	7.7	
Oct. 6-20.....	3.64	3.1	124	52	132	1,610		87		267	2,580				7,820	6.34	47.3	396	828	29	8,340	7.7	
Oct. 21.....	2.25	3.8	242	83	242	2,540		88		670	5,030				9,230	10.7	77.6	596	674	37	13,100	7.5	
Nov. 1-20.....	3.01	3.6	284	104	284	3,120		92		723	5,030				11,500	12.7	47.5	1,480	1,590	40	13,500	7.2	
Nov. 21-30.....	1.53	3.0	361	146	361	3,820		104		898	6,220				13,400	18.4	36.5	1,660	1,660	43	21,000	7.6	
Dec. 1-15.....	1.01	2.3	407	158	407	4,470		128		1,090	7,200				14,400	19.7	46.7	1,860	1,750	48	22,400	7.5	
Dec. 16-31.....	1.20	2.1	466	170	466	4,780		138		1,170	7,740				14,400	19.7	46.7	1,860	1,750	48	22,400	7.5	
Jan. 1-15, 1959..	1.73	3.0	496	175	496	5,180		137		1,250	8,370				15,900	21.3	72.4	1,960	1,840	51	23,600	7.4	
Jan. 16-31.....	1.97	2.9	470	188	470	4,950		131		1,250	8,020				14,800	20.5	79.3	1,950	1,840	49	23,100	8.2	
Feb. 1-13.....	1.81	4.1	461	184	461	4,840		131		1,290	7,790				15,800	20.0	71.4	1,910	1,800	48	22,200	7.8	
Feb. 14-26.....	2.48	3.5	486	195	486	5,260		133		1,420	8,420				15,800	21.7	106	2,010	1,910	51	23,800	7.6	
Feb. 27-28.....																							
Mar. 1-3.....	3.50	4.4	407	165	407	4,040		115		1,110	6,550				12,300	16.8	116	1,690	1,600	43	19,200	7.9	
Mar. 4-14.....	1.01	4.0	575	188	575	6,520		124		1,490	8,960				16,800	23.1	45.8	2,060	1,960	54	25,200	7.7	
Mar. 15-25.....	a 1.11	2.7	514	246	514	6,150		118		1,700	9,890				18,600	25.6	5.52	2,440	2,350	54	27,600	7.5	
Mar. 26-31.....	a 6.53	4.0	432	179	432	4,200		116		1,280	6,750				12,900	17.7	227	1,810	1,720	43	19,700	7.2	

Date	Temperature (°F) of water, water year October 1958 to September 1959 [Once daily measurement, usually between 4 p.m. and 8 p.m.]																																	
	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			
Weighted average	20.2	11				85	24	641			104			178	1,010			2,010	2.73	110			310			286	17	4,190	7.3	3,300	--			
Apr. 1-7, 1959.....	2.81	4.4				598	260	6,330						1,680	10,100			19,000	26.2	144			2,560	2,490	54					27,300	7.3			
Apr. 8-20.....	7.55	3.6				497	163	4,960						1,250	6,950			13,200	18.2	269			2,700	2,620	46					20,000	7.2			
Apr. 21-30.....	8.5	4.9				505	193	5,860						1,500	9,010			17,000	23.4	189			2,070	1,910	56					24,800	6.9			
May 1-11.....	3.88	5.2				515	213	5,830						1,550	8,960			16,700	22.9	125.2			2,160	2,090	52					24,300	6.9			
May 5-11.....	32.4	5.0				162	61	1,850						4,497	2,580			8,000	6.80	437			1,655	1,576	28					8,360	7.5			
May 12-23.....	3.15	4.1				251	104	2,910						783	4,810			8,710	11.9	74.1			1,050	993	39					13,900	6.7			
May 24-31.....	8.05					--	--	--						--	6,850			--	--	--			1,550	1,480	39					19,300	6.5			
June 1-3, 9-11.....	149	12				100	29	764						215	1,220			2,390	3.25	961			368	286	17					4,190	7.3			
June 4.....	1,590	11				40	5.0	116						41	170			437	.59	1,880			120	30	4.6						7,783	7.4		
June 5-6, 8.....																																		
June 26-27.....																																		
June 7, 24-25.....	85.0	8.8				68	14	358						102	568			1,180	1.60	271			227	131	10						2,140	7.7		
June 12-19.....	2.41	11				183	61	1,750						430	2,250			5,320	7.24	34.6			708	640	29						8,860	7.0		
June 20-23, 28-30.....	13.4	6.3				111	31	954						237	1,540			2,920	3.97	106			404	346	21						5,100	6.9		
July 1, 4-5.....	150	12				70	17	457						116	730			1,460	1.99	591			244	160	13						2,580	7.7		
July 2-3, 13-14.....	450	13				36	5.0	99						34	144			385	.52	468			110	26	4.1						687	7.5		
July 6-12.....	19.1	11				112	33	940						244	1,500			2,900	3.94	150			415	326	20						5,040	7.1		
July 15, 17-20.....	93.6	9.2				51	12	341						94	530			1,080	1.47	273			176	105	11						1,980	7.6		
July 16, 21-31.....	4.06	6.0				112	35	1,060						278	1,690			3,220	4.38	35.3			424	363	22						5,510	7.0		
Aug. 1-10.....	a	0.10				210	76	2,170						549	3,500			6,540	8.89	1.18			836	794	33						10,400	6.9		
Aug. 11-31.....	a	.24	9.6			252	84	2,840						687	4,220			7,920	10.8	5.13			974	928	37						12,300	6.6		
Sept. 1-29.....	a	1.03	9.3			422	145	4,300						1,080	6,970			13,000	17.8	36.2			1,650	1,600	46						19,500	6.6		
Sept. 30.....	2.50	6.0				140	42	1,030						293	1,700			3,250	4.42	21.9			522	460	20						5,620	7.5		

Temperature (°F) of water, water year October 1958 to September 1959
[Once daily measurement, usually between 4 p.m. and 8 p.m.]

a Includes days of less than 0.05 cfs.

COLORADO RIVER BASIN--Continued
8-1238. BEALS CREEK NEAR WESTBROOK, TEX.

LOCATION.--At gaging station near left bank on downstream side of pier of bridge on State Highway 163, 1.5 miles downstream from Crystal Creek, 11 miles south of Westbrook, Mitchell County, 12 miles upstream from Colorado River, and 16 miles southwest of Colorado City.

DRAINAGE AREA.--10,800 square miles, approximately, of which 7,045 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: November 1958 to September 1959.

Water temperatures: November 1958 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 8,440 ppm Aug. 18-20, 27-28; minimum, 180 ppm July 2, 12.

Hardness: Maximum, 2,640 ppm Aug. 18-20, 27-28; minimum, 84 ppm July 2, 12.

Specific conductance: Maximum daily, 13,900 microhms Aug. 20; minimum daily, 283 microhms July 12.

Water temperature: Maximum, 92°F July 22, 28; minimum, 33°F Dec. 30-31, Jan. 21.

REMARKS.--Bases omitted in potassium (K) column. Indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1682.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Bohrium (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (microhms at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Nov. 1-5, 1958	4.88	3.1		51	26	186		99	0	145	285	0.4	4.0		750	1.02	9.88	234	153	5.3	1,380	8.2
Nov. 6	1.10	--			--	100		100	0	285	285				241	159	--	241	159	5.3	1,370	7.7
Nov. 14	21.0	6.2		28	5.9	43		83	0	36	57	3	2.5		220	30	12.5	94	26	1.9	1,400	7.8
Nov. 15, 21-30	a 4.15	4.5		124	109.9	556		215	0	567	840	1.2	1.5		2,320	3.16	26.0	758	582	8.8	3,780	7.9
Nov. 16-20	a 5.66	7.9		66	42	252		127	0	223	380	6	1.5		1,050	1.43	16.0	337	233	6.0	1,890	7.3
Dec. 1-8	a .16	3.4		89	71	462		167	0	411	670	--	12		1,800	2.45	.78	514	377	8.9	2,980	7.7
Dec. 16-18, 22-25	.34	2.6		120	112	608		153	0	590	950	--	4.0		2,460	3.35	2.26	760	634	9.6	4,090	7.8
Dec. 26-31	a .17	1.8		149	193	949		194	0	928	1,490	--	3.0		3,810	5.18	1.75	1,170	1,010	12	6,040	7.7
Jan. 6, 12-20, 1959	.16	3.4		148	213	1,080		158	0	1,070	1,670	--	2.0		4,260	5.79	1.84	1,250	1,120	13	6,720	6.8
Jan. 21-31	a .14	3.1		144	217	1,140		152	0	1,120	1,730	--	9.7		4,440	6.04	1.68	1,250	1,130	14	6,910	6.9
Feb. 1-19	.21	4.2		146	238	1,170		190	0	1,180	1,770	--	6.5		4,610	6.27	2.61	1,340	1,190	14	7,100	7.9
Feb. 20-27	2.90	7.0		146	228	1,240		174	0	1,190	1,850	--	7.0		4,760	6.46	37.2	1,300	1,160	15	7,250	8.2
Feb. 28, Mar. 1	9.25	9.0		64	42	273		133	0	230	405	--	7.2		1,100	1.50	27.5	332	223	6.5	1,940	7.8
Mar. 2-4	.63	8.7		137	134	720		231	0	682	1,100	--	9.8		2,910	3.96	4.95	893	704	10	4,740	7.5
Mar. 5-13	a .08	7.4		137	199	1,080		186	0	1,010	1,630	--	6.0		4,160	5.66	.90	1,160	1,010	14	6,540	7.2

Mar. 28, Apr. 8	1.60	9.8	86	74	405	118	0	419	612	0.8	2.5	1,670	2.27	7.21	519	422	7.7	2,800	8.2
1959.....																			
Mar. 29-31,	2.50	6.2	200	280	1,440	218	10	1,520	2,180	--	--	5,780	7.86	39.0	1,650	1,460	15	8,490	8.4
Apr. 1-2,	7.46	4.8	166	225	1,100	250	18	1,060	1,690	--	2.0	4,390	5.97	5.45	1,340	1,100	13	6,760	8.6
Apr. 9-13,	1.80	9.2	44	26	194	101	0	180	258	.7	2.2	764	1.04	3.71	217	134	5.7	1,360	8.1
Apr. 17,																			
Apr. 18,	.10	4.5	128	133	739	174	15	699	1,120	--	.0	2,920	3.97	.79	866	699	11	4,640	8.6
May 1, 3,	4.15	--	--	--	--	230	0	47	1,520	--	2.2	--	--	--	1,190	1,000	--	6,140	8.0
May 2,	4.70	9.6	24	7.8	64	126	0	47	54	--	2.2	271	1.37	3.44	92	0	2.9	479	7.9
May 5-6, 10-16,	13.7	8.9	79	50	283	138	0	274	435	--	7.6	1,210	1.65	44.8	402	280	6.2	2,120	7.5
May 7-8,	50.0	12	96	74	383	204	0	372	380	--	11	1,630	2.82	23.0	349	362	7.1	2,800	8.3
May 9,	79.0	9.4	52	18	141	126	0	115	202	--	3.0	602	.82	128	204	100	4.3	1,100	8.0
May 17-20,	1.05	5.7	176	170	852	172	0	824	1,410	--	5.0	3,530	4.80	10.0	1,140	997	11	5,550	7.2
June 1-2,	29.6	--				232	0	824	1,410	--	5.0	3,530	4.80	10.0	1,140	997	11	5,550	7.2
June 3-5,	45.6	10	34	9.3	65	124	0	48	780	--	1.5	b 323	.44	398	123	22	2.5	3,170	7.4
June 6-21,	7.08	10	77	36	202	142	0	214	310	--	3.7	923	1.26	17.6	340	274	4.8	1,600	7.7
June 22, 28-30,	3.05	7.5	100	53	352	114	0	315	575	--	2.2	1,460	1.99	12.0	468	374	7.1	2,510	7.7
June 23,	185	9.9	31	10	63	116	0	52	74	--	2.5	299	.41	149	118	24	2.5	513	7.7
June 24-27,	60.6	11	58	26	159	119	0	152	240	--	3.4	b 767	1.04	135	252	154	4.4	1,250	7.5
July 1, 4-8, 10,																			
14, 20-22,	22.2	11	73	49	288	117	0	246	465	--	3.5	1,190	1.62	71.3	384	288	6.4	2,050	7.7
July 2, 12,	164	10	24	5.9	33	96	0	22	37	--	1.5	180	.24	79.7	84	6	1.5	317	7.8
July 3, 23-25,	21.4	6.6	117	128	555	142	0	546	950	--	2.0	2,370	3.22	137	818	702	8.4	3,970	7.0
July 9, 11,	41.0	9.4	43	15	141	100	0	81	218	--	1.2	b 577	.78	63.9	169	87	4.7	1,010	7.4

a Includes days of less than 0.05 cfs.

b Residue at 180°C

COLORADO RIVER BASIN--Continued

8-1239. COLORADO RIVER NEAR SILVER, TEX.

LOCATION.--At gaging station on downstream side of left pier of bridge on county road, 5.4 miles southwest of Silver, Coke County, 11 miles upstream from Pecan Creek, 18.5 miles downstream from Big Silver Creek, and at mile 743.

DRAINAGE AREA.--15,480 square miles, approximately, of which 11,600 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1956 to September 1959.

Water temperatures: October 1956 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 12,800 ppm Apr. 21-30; minimum, 314 ppm June 3.

Hardness: Maximum, 2,330 ppm Apr. 21-30; minimum, 128 ppm July 2-4.

Specific conductance: Maximum daily, 20,300 microhms May 1; minimum daily, 394 microhms July 2.

Water temperatures: Maximum, 88°F June 15; minimum, freezing point Dec. 15, Feb. 1-3, 5.

EXTREMES, 1956-59.--Dissolved solids: Maximum, 12,800 ppm Apr. 21-30, 1959; minimum, 180 ppm June 1-4, 1957.

Hardness: Maximum, 2,330 ppm Apr. 21-30, 1959; minimum, 93 ppm Apr. 29-30, 1957.

Specific conductance: Maximum daily, 20,300 microhms May 1, 1959; minimum daily, 202 microhms June 2, 1957.

Water temperatures: Maximum, 88°F May 24, June 8, 1958, June 15, 1959; minimum, freezing point Feb. 1-3, 5, 1959.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Values reported for dissolved solids less than 1,000 ppm are residues at 180°C and values more than 1,000 ppm are calculated from determined constituents unless otherwise noted. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (NO ₃) (B)	Dissolved solids			Hardness as CaCO ₃		Specific conductance (microhms at 25°C)	pH			
													Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate					
Oct. 1-7, 1958...	15.0	9.8		74	16	382	101	101		169	582	0.3	2.0	1,290	1.75	52.2	250	168	11	2,330	7.9	
Oct. 8-12,	7.74	9.4		130	29	637	103	103		346	980	.4	1.5	2,180	2.96	45.6	444	359	13	3,770	7.8	
Oct. 13-14,																						
Oct. 17-21,	30.4	6.0		80	18	292	101	101		208	430	.4	2.5	1,090	1.48	89.5	274	190	7.7	1,910	8.0	
Oct. 15-16,	21.5	10		46	12	152	97	97		106	215	.6	1.8	1,620	.84	36.0	164	85	5.2	1,060	7.5	
Oct. 22-31,																						
Nov. 1-10,	7.85	5.0		138	36	547	119	119		395	830	.5	2.5	2,010	2.73	42.6	492	395	11	3,390	7.7	
Nov. 11-20,	7.01	3.8		192	49	612	122	122		560	940	.5	.8	2,420	3.29	45.8	680	580	10	3,930	8.0	
Nov. 21-30,	4.24	2.7		200	68	778	129	129		590	1,240	.7	0.0	2,940	4.00	33.7	778	673	12	4,840	8.0	
Dec. 1-10,	2.00	3.1		272	97	1,090	136	136		852	1,730	.9	.2	4,110	5.99	22.2	1,080	966	14	6,580	8.0	
Dec. 11-20,	1.52	5.6		322	86	1,260	143	143		938	1,980	--	.5	4,660	6.34	19.1	1,160	1,040	16	7,450	7.8	
Dec. 21-31,	1.84	5.0		348	79	1,130	158	158		936	1,800	--	.0	4,380	5.96	21.8	1,190	1,060	14	6,990	7.9	
Jan. 1-10, 1959,	1.64	4.6		395	82	1,210	12	12		1,070	1,950	.4	.0	4,810	6.54	21.3	1,320	1,180	14	7,520	8.0	
Jan. 11-20,	1.86	8.2		390	93	1,230	178	178		1,080	2,000	--	--	4,850	6.60	24.4	1,360	1,270	15	7,550	8.0	

WESTERN GULF OF MEXICO BASINS

July 1, 2 (12 p.m.)	101	10	81	34	333	120	210	530	--	1.5	1,260	1.71	344	342	244	7.8	2,190	7.6
July 5-9 1955																		
July 2 (12 p.m.)	610	10	39	7.4	77	113	43	110	--	3.8	350	.48	576	128	36	3.0	623	7.4
July 3-4 (12 p.m.-12 m.)																		
July 10-11, 16-17, 26-27	65.7	17	94	35	396	128	237	628	--	3.5	1,470	2.00	261	378	274	8.8	2,380	7.6
July 12, 13 (12 p.m.-9 a.m.), 18 (12 m.-12 p.m.), 19 (12 p.m.-10 a.m.)	360	15	68	21	235	120	138	370	--	4.0	967	1.32	940	256	158	6.4	1,600	7.7
July 13 (9 a.m.-12 p.m.)	275	16	48	12	134	122	72	201	--	4.0	571	.78	424	170	70	4.5	975	7.6
July 14, 25	35.0	16	120	33	507	130	276	810	--	2.0	1,830	2.49	173	435	328	11	3,080	7.6
July 15, 28-31																		
July 18 (12 p.m.-12 m.)	742	17	42	13	95	128	70	130	--	4.8	b 435	.59	871	160	55	3.2	765	7.9
July 19 (10 a.m.-12 p.m.)	173	15	50	13	177	114	86	268	--	3.5	683	.93	319	178	85	5.8	1,190	7.7
Aug. 1-7	1.11	15	182	56	829	125	500	1,320	--	2.5	2,970	4.04	8.90	684	582	14	4,790	7.5
Aug. 8-17	.39	14	288	79	1,090	106	782	2,260	--	--	4,870	6.62	5.13	1,040	948	19	7,650	7.5
Aug. 18-31	a .04	13	458	99	2,590	107	1,180	3,220	--	--	7,170	9.75	.77	1,450	1,370	24	10,700	7.2
Sept. 1-9	29.0	15	518	130	2,570	198	1,500	4,130	--	--	8,930	12.2	--	1,830	1,750	26	13,600	7.4
Sept. 10	29.0	15	548	130	2,570	128	1,561	4,130	--	4.8	b 370	12.2	29.0	189	54	2.4	649	8.1
Sept. 11-14	68	8.8	154	31.5	254	72	441	385	--	3.0	1,310	1.78	2.41	512	452	4.9	2,100	7.5
Sept. 15-30	a .01	9.0	224	51	500	62	675	780	--	4.0	2,270	3.09	.06	768	718	7.8	3,590	7.2
Weighted average	35.7	13	84	23	345	--	189	534	--	--	1,270	1.73	122	304	200	8.6	2,120	--

a Includes days of less than 0.05 cfs.

b Calculated from determined constituents.

COLORADO RIVER BASIN--Continued

8-1470. COLORADO RIVER NEAR SAN SABA, TEX.

LOCATION--At gaging station on left bank at downstream side of pier of bridge on U.S. Highway 190, 5.2 miles downstream from San Saba River, 9.2 miles east of San Saba, San Saba County, and at mile 474.

DRAINAGE AREA--30,600 square miles, approximately, of which 11,900 square miles is probably noncontributing.

RECORDS AVAILABLE--Chemical analyses: September 1947 to September 1959.

Water temperatures: September 1947 to September 1959.

Sediment records: December 1950 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 818 ppm May 21-23, 30-31; minimum, 220 ppm Sept. 28-30.

Hardness: Maximum, 344 ppm May 21-23, 30-31; minimum, 114 ppm Sept. 29-30.

Specific conductance: Maximum daily, 2,010 micromhos July 17; minimum daily, 262 micromhos June 30.

Water temperatures: Maximum, 90°F July 4, Aug. 4, 30; minimum, 35°F Dec. 15.

EXTREMES, 1947-59.--Dissolved solids: Maximum, 1,530 ppm Oct. 15-19, 1947; minimum, 102 ppm Sept. 23-25, 1955.

Hardness: Maximum, 522 ppm Oct. 15-19, 1947; minimum, 71 ppm June 28-30, 1949.

Specific conductance: Maximum daily, 3,420 micromhos Sept. 20, 1947; minimum daily, 161 micromhos Sept. 11, 1952.

Water temperatures: Maximum, 98°F Aug. 3, 1956; minimum, freezing point Jan. 29, 1948, Jan. 30, 1951.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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-iron (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. 1-2, 1958....	931	11		80	19	127		170	125	200	--	2.5	2.5	0.88	1,630	278	138	3.3	1,160	8.0
Oct. 3-10.....	304	11		60	17	59		199	49	93	--	2.5	4.22	.57	346	220	56	1.7	708	8.2
Oct. 11-20.....	180	12		54	23	47		234	37	70	--	2.0	1.75	.49	229	229	37	1.3	643	8.2
Oct. 21-31.....	193	11		58	22	53		245	40	75	--	2.0	3.68	.53	202	235	34	1.5	686	8.2
Nov. 1-10.....	234	10		61	21	61		230	51	90	--	3.0	2.63	.57	263	238	50	1.7	733	8.1
Nov. 11-20.....	199	10		65	23	53		241	62	77	--	2.0	4.14	.56	222	256	59	1.4	723	8.1
Nov. 21-30.....	177	9.8		69	24	67		250	70	97	--	1.2	4.68	.64	224	270	66	1.8	812	8.2
Dec. 1-15.....	177	14		62	25	69		253	65	25	--	2.5	4.66	.63	223	258	50	1.8	857	8.2
Dec. 16-31.....	161	12		67	26	77	4.2	267	67	106	--	2.8	4.94	.67	215	274	55	2.0	897	8.2
Jan. 1-11, 1959....	165	9.6		71	28	77		268	80	112	0.3	2.2	5.26	.72	234	292	72	2.0	896	8.2
Jan. 12-20.....	150	8.2		70	27	76		263	75	110	--	2.0	512	.70	207	286	70	1.9	873	8.1
Jan. 21-30.....	143	7.2		68	26	85		228	71	110	--	1.3	3.20	.71	201	286	94	2.3	844	8.2
Feb. 1-10.....	126	6.8		63	26	66		239	72	119	--	2.1	3.19	.66	171	284	70	2.1	796	8.2
Feb. 11-20.....	120	5.2		54	26	66		238	60	102	--	1.9	4.43	.60	143	294	58	1.8	873	8.2
Feb. 21-28.....	129	6.0		60	28	69		257	60	100	--	1.2	4.56	.62	154	264	54	1.9	813	8.2

a Calculated from determined constituents.

COLORADO RIVER BASIN—Continued
 8-1470. COLORADO RIVER NEAR SAN SABA, TEX.—Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959.—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 (CO ₂)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F) (NO ₃) (B)	Dissolved solids (residue at 180°C)			Hardness as CaCO ₃		Sodium adsorption ratio (micro-mhos at 25°C)	Specific conductance pH			
													Parts per million	Tons per acre-foot	Tons per day	Calcium magnesium	Non-carbonate					
Mar. 1-10, 1959...	115	10		54	28	62		235		54	95	--	2.5	418	0.61	139	250	57	1.7	776	7.8	
Mar. 11-20.....	90.4	9.0		52	27	62		214		48	86	--	2.0	438	.59	108	240	43	1.7	747	7.8	
Mar. 21-31.....	73.4	8.0		51	30	61		244		48	94	--	1.2	438	.60	188	250	50	1.7	766	7.8	
Apr. 1-10.....	65.6	8.8		51	29	61	4.0	249		46	94	0.2	2.8	440	.60	77.9	246	42	1.7	773	8.0	
Apr. 11-20.....	107	14		50	33	49		250		42	83	--	2.5	422	.57	122	260	56	1.3	729	7.8	
Apr. 21-30.....	98.8	14		52	30	60		245		47	93	--	2.0	440	.60	117	253	52	1.6	765	7.8	
May 1-11.....	76.4	14		47	30	51		251		38	75	--	1.8	390	.53	80.4	241	36	1.4	687	7.8	
May 12-20.....	130	14		55	29	78		258		45	118	--	1.5	487	.66	171	256	44	2.1	855	7.9	
May 21-23, 30-31.....	246	8.2		82	34	149		207		156	238	--	8	818	1.11	543	344	175	3.5	1,350	7.7	
May 24-29.....	876	8.0		70	20	81		131		126	136	--	1.8	a 507	.69	1,200	256	149	2.2	894	7.5	
June 1-3, 10-12.....	584	14		85	31	155		155		170	262	--	2.8	a 796	1.08	1,260	340	212	3.6	1,410	7.8	
June 4.....	4,910	18		58	21	50		171		86	77	--	2.0	a 396	.54	5,250	231	91	1.4	674	7.7	
June 5-9.....	9,776	13		34	7.5	34		116		32	56	--	2.5	a 285	.36	6,990	136	41	1.3	435	7.6	
June 13-24.....	229	16		59	16	114		184		46	169	--	2.5	567	.77	351	213	62	3.4	953	7.9	
June 25-30.....												--	2.0									
July 1-2.....	2,434	14		39	8.5	29		132		25	42	--	2.0	237	.32	1,560	132	24	1.1	391	7.6	
July 3-9.....	479	14		52	14	46	5.5	151		50	47	.3	1.5	a 344	.47	445	187	64	1.5	612	7.7	
July 10-19.....	375	9.2		73	23	189		143		308	87	--	.5	a 803	1.09	813	276	160	5.0	1,470	7.6	
July 20-31.....	6,522	13		42	6.4	28		125		48	48	--	1.8	a 227	.31	4,000	131	29	1.1	380	7.4	
Aug. 1-10.....	419	14		44	8.3	44		140		22	47	--	1.8	a 252	.34	285	144	29	1.0	410	7.9	
Aug. 11-20.....	101	14		50	16	31		188		22	57	--	.8	a 286	.39	78.0	191	37	1.0	493	7.5	
Aug. 21-31.....	51.2	14		46	23	35		219		23	58	--	.2	a 320	.44	44.2	210	30	1.0	551	7.5	
Sept. 1-10.....	44.3	19		38	26	47		234		25	60	--	1.0	a 331	.45	39.6	202	10	1.4	580	8.0	
Sept. 11-20.....	41.8	17		39	28	43		243		24	57	--	.8	a 335	.46	37.8	212	14	1.3	573	7.9	
Sept. 21-28.....	41.8	16		44	28	44		266		22	56	--	.8	a 342	.47	38.6	225	7	1.3	606	7.7	
Sept. 29-30.....	1,345	---		---	---	---		124		---	42	--	---	---	---	220	114	12	---	---	---	
Weighted average	593	13		48	12	45	--	148		40	72	--	2.0	315	0.43	504	170	48	1.5	536	--	

a Calculated from determined constituents.

COLORADO RIVER BASIN--Continued
 COLORADO RIVER NEAR SAN SABA, TEX.--Continued

8-1470. COLORADO RIVER NEAR SAN SABA, TEX.--Continued
 Temperature (°F) of water, water year October 1958 to September 1959
 /Once-daily measurement, usually between 6 a.m. and 10 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	66	75	63	64	74	70	71	73	74	--	72	70	67	69	75	70	68	78	72	70	72	66	64	66	--	67	60	60	--	56	58	
November ..	56	61	54	59	57	58	55	60	55	59	61	62	67	67	60	--	62	56	54	52	53	56	60	60	60	60	55	50	54	58	50	
December ..	50	48	50	50	51	49	--	45	44	45	--	45	40	40	35	38	38	41	44	48	45	50	51	47	52	54	53	58	48	--	48	
January	46	42	39	36	39	39	40	41	40	40	--	48	52	57	48	40	54	54	51	42	39	40	49	55	52	48	48	55	50	48		
February	48	45	41	40	41	40	45	56	60	55	54	50	56	58	60	53	55	53	49	48	47	48	51	51	49	51	50	52	--	--		
March	50	52	50	55	50	46	51	65	54	58	56	51	52	61	54	51	50	54	55	56	52	55	50	58	61	60	57	56	65	60		
April	59	60	62	61	75	70	70	66	57	56	56	55	50	54	55	60	70	70	71	60	58	62	66	66	72	70	70	68	71	--		
May	71	71	78	75	72	68	71	72	72	70	70	70	75	71	69	70	79	74	75	75	76	75	73	74	74	76	76	77	78	80		
June	80	75	77	72	75	72	71	74	75	79	80	78	81	85	80	80	81	82	84	82	84	80	80	78	75	75	77	75	76	79		
July	80	81	81	80	81	82	84	85	--	82	80	80	83	81	81	81	82	84	86	--	74	75	76	77	78	76	80	78	79	80		
August	84	--	85	80	89	81	81	82	82	78	79	80	81	81	81	82	80	79	80	81	80	82	84	79	80	79	80	80	80	78		
September ..	80	81	80	80	80	81	80	80	80	80	75	71	76	71	70	75	75	76	76	--	76	75	76	75	76	79	78	80	75	72		

QUALITY OF SURFACE WATERS, 1959

COLORADO RIVER BASIN--Continued

8-1470. COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Suspended sediment, water year October 1958 to September 1959

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..	1,200	1,350	4,370	206			180		
2..	662	440	786	206	79	46	184	60	30
3..	462	220	274	236					
4..	365	150	148	418			187		
5..	306	110	91	306			184		
6..	278	100	75	232			180		
7..	287	90	70	211			180		
8..	265	100	72	187			176	51	24
9..	244	100	66	176					
10..	223	87	51	166	78	44	180		
11..	211			156					
12..	198			156			169		
13..	198			162			169		
14..	187			187			169		
15..	180			227			162	42	19
16..	169	96	45	240			162		
17..	166			166		236			166
18..	166			202			173		
19..	166			211			169		
20..	156			211			162		
21..	162			194	61	32	159		
22..	212			187					
23..	274	67	39	184			156		
24..	215			176		152			
25..	169			176			152		
26..	156			173			156	45	19
27..	180			169					
28..	184	75	37	173	52	24	152		
29..	184			166				156	
30..	187			169			169		
31..	198			--	--	--	173		
Total	8,210	--	6,882	6,099	--	1,126	5,232	--	681
Suspended sediment, water year 1959									
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..	176	16	7.7	122	46	15	140	58	20
2..	180			125			128		
3..	176			128			120		
4..	173			128			120		
5..	173			122			115		
6..	162	16	6.8	120			110		
7..	156			125		108			
8..	156			128			105		
9..	156			125			105		
10..	156			122			103		
11..	156			120	71	23	103	90	25
12..	152			118					
13..	152			118			98		
14..	152			125			98		
15..	152			122			91		
16..	149	20	8.0	120	68	23	86	97	21
17..	146			120						84
18..	149			118			82		
19..	146			120			80		
20..	149			122			82		
21..	152			122			82		
22..	146			122			78		
23..	146			122			74		
24..	146			122			72		
25..	149			125			72		
26..	149	40	15	128			70	102	20
27..	146			130		69			
28..	143			130			70		
29..	136			--	--	--	72		
30..	130			--	--	--	74		
31..	128			--	--	--	74		
Total	4,738	--	282.9	3,449	--	564	2,865	--	680

COLORADO RIVER BASIN--Continued

8-1470. COLORADO RIVER NEAR SAN SABA, TEX.--Continued

Suspended sediment, water year October 1958 to September 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..	74			72			133		
2..	69			74			128	46	16
3..	67			76			352	290	s 546
4..	66			84			4,910	3,110	s 47,800
5..	64			86	84	17	15,900	3,860	s 160,000
6..	62	92	16	76			19,200	1,760	s 92,800
7..	64			74			8,140	1,920	s 40,000
8..	62			74			3,680	2,300	22,900
9..	62			72			1,960	1,350	7,140
10..	66			76			1,420	1,200	4,600
11..	93			76	82	16		450	1,030
12..	108			72			620	250	419
13..	103			67			508	200	274
14..	118			69			408	140	154
15..	118	86	25	80			325	120	105
16..	112			105	83	29	265	100	72
17..	110			120			223	100	60
18..	105			206			194	90	47
19..	100			202			162	60	26
20..	100			253	80	46	149	60	24
21..	146	90	24	223			128	100	35
22..	130			173			122	100	33
23..	110			483	635	s 2,510	120	110	36
24..	100			2,410	2,400	s 16,300	146	100	39
25..	93			1,100	1,200	3,560	764	650	s 1,510
26..	89			690	330	615	5,010	2,040	s 34,400
27..	86	80	18	474	184	235	6,920	2,290	s 46,400
28..	86			335	162	147	3,220	1,650	14,300
29..	76			244	138	91	1,470	900	3,570
30..	72			194			945	730	1,860
31..	--	--	--	159	48	23	--	--	--
Total	2,711	--	612	8,499	--	24,036	78,370	--	480,212
		July			August			September	
1..	655	290	513	599	210	340	44		
2..	490	150	198	578	200	312	45		
3..	396	100	107	526	190	270	45		
4..	375	100	101	484	180	235	47		
5..	287	100	77	462	175	218	45		
6..	509	163	s 313	418	175	198	44	80	9.6
7..	840	170	386	386	180	188	44		
8..	538	110	160	330	150	134	44		
9..	408	100	110	215	90	52	43		
10..	325	90	79	191	70	36	42		
11..	296	40	32	149	50	20	42		
12..	253	40	27	130	60	21	40		
13..	468	55	69	118	55	18	40		
14..	345	50	47	112	60	18	39		
15..	248	50	33	105	60	17	40		
16..	206	45	25	95	50	13	42	73	8.2
17..	184	40	20	86	50	12	44		
18..	687	60	111	78	50	11	44		
19..	742	60	120	72	60	12	44		
20..	5,030	1,110	s 21,200	69	60	11	43		
21..	11,200	2,500	s 75,700	62	50	8.4	42		
22..	14,400	1,500	58,300	58	40	6.3	42		
23..	17,000	1,150	52,800	54	45	6.6	42		
24..	14,600	750	29,600	51	60	8.3	42		
25..	8,060	650	14,100	51	70	9.6	42	66	7.4
26..	2,620	800	5,660	50	80	11	42		
27..	1,680	550	2,490	50	70	9.4	40		
28..	1,230	400	1,330	47	60	7.6	42		
29..	960	300	778	48			42		
30..	788	250	532	47	74	9.3	1,350	1,150	s 10,700
31..	699	250	472	45			1,340	2,470	s 9,430
Total	86,510	--	265,490	5,766	--	2,231.1	3,885	--	20,367.2
Total discharge for year (cfs-days).....									216,334
Total load for year (tons).....									803,164.2

s Computed by subdividing day.

COLORADO RIVER BASIN--Continued
8-1575. WALLER CREEK AT 23d STREET, AT AUSTIN, TEX.

LOCATION.--Temperature recorder at gaging station on San Jacinto Boulevard, 50 feet upstream from bridge on East 23d Street at Austin, Travis County, and 2.1 miles upstream from Colorado River.

DRAINAGE AREA.--4.13 square miles.

RECORDS AVAILABLE.--water temperatures: March 1955 to September 1959.

EXTREMES, 1958-59.--water temperatures: Maximum, 88°F June 19, July 16, Aug. 2, 7, 20; minimum, 42°F Jan. 4, 5.

EXTREMES, 1955-59.--water temperatures: Maximum, 93°F June 28, 1955; minimum, 42°F Jan. 4, 5, 1959.

REMARKS.--Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

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	73	72	71	74	78	79	83	83	86	85	79	77	78	77	77	76	75	78	78	80	80	74	75	79	77	74	71	64	63	65	67	76
Maximum	70	69	70	70	73	77	78	80	80	79	73	72	73	74	74	72	74	73	72	74	77	70	69	72	74	71	63	60	60	60	65	72
Minimum	67	67	66	67	71	69	68	70	71	73	72	74	75	70	75	74	68	65	67	68	66	68	66	69	72	73	70	61	57	55	57	68
November	62	62	63	63	67	66	63	66	64	66	69	70	72	70	65	70	68	64	60	60	61	61	64	69	61	57	55	52	55	55	64	64
Maximum	62	68	67	68	64	60	57	60	57	56	56	56	50	52	54	57	59	62	60	58	60	65	62	59	59	57	58	54	50	59	59	54
Minimum	57	59	59	59	60	57	54	54	57	54	51	53	50	47	47	48	51	53	55	57	54	57	60	57	57	55	55	53	54	48	46	54
January	52	56	55	46	46	49	55	55	52	51	55	59	63	65	64	53	53	56	61	64	62	49	53	56	61	63	61	54	60	60	54	56
Maximum	47	50	47	42	42	46	49	52	49	47	49	55	59	62	54	49	48	50	55	61	48	45	46	53	56	58	53	52	54	54	52	51
Minimum	52	48	50	56	57	55	57	62	65	65	58	58	62	67	65	65	70	67	60	56	57	60	67	64	68	65	68	68	68	68	68	61
February	48	46	47	48	50	49	53	57	61	58	54	54	58	62	59	56	60	60	54	53	54	55	60	61	60	60	61	62	62	62	62	62
Maximum	66	68	66	65	64	64	63	69	69	68	70	68	70	76	69	64	65	68	69	73	66	67	73	74	70	68	69	72	73	69	69	69
Minimum	58	59	57	60	57	55	56	61	60	65	64	58	59	65	59	58	57	60	60	58	60	58	60	64	69	67	62	62	61	63	67	61
April	72	73	74	73	78	70	77	74	65	65	64	65	68	67	64	68	72	76	78	78	70	73	75	73	75	73	79	79	80	72	72	72
Maximum	66	62	65	64	69	66	71	65	63	63	56	59	58	59	61	63	66	70	70	64	60	62	65	69	69	71	68	72	65	65	65	65
Minimum	77	73	77	81	81	79	80	79	77	74	77	70	82	79	74	78	80	83	83	83	81	84	77	80	83	81	83	85	85	85	86	80
Maximum	73	71	73	74	73	72	74	73	73	71	70	71	73	70	72	70	75	75	75	75	75	75	77	77	77	77	77	76	76	77	73	73
Minimum	85	84	84	83	84	81	82	82	85	87	87	86	86	86	86	86	86	85	87	88	86	84	85	84	79	82	84	85	86	86	85	85
Maximum	78	77	77	74	75	74	75	74	76	78	80	79	78	78	77	78	78	77	78	79	79	79	79	79	75	76	78	78	79	80	77	77
Minimum	86	87	86	86	86	87	87	87	87	86	85	86	85	86	85	88	87	87	86	87	86	87	86	85	82	84	86	84	85	86	86	86
July	79	79	78	78	78	79	80	80	80	79	80	78	79	79	79	79	79	79	79	80	77	76	79	78	76	78	77	77	77	78	78	78
Maximum	79	79	78	78	78	79	80	80	80	79	80	78	79	79	79	79	79	79	79	80	77	76	79	78	76	78	77	77	77	78	78	78
Minimum	87	88	87	87	87	88	84	85	85	86	86	87	85	84	85	86	86	86	87	88	86	85	81	82	80	--	--	84	86	86	82	85
August	79	80	79	80	79	80	80	80	77	76	78	79	78	78	79	78	78	79	79	79	79	79	79	79	79	79	79	79	79	79	79	79
Maximum	86	85	86	86	86	86	86	86	83	80	85	85	80	77	74	83	85	84	85	85	83	81	83	81	82	87	87	86	83	84	83	83
Minimum	78	79	79	80	80	79	79	78	78	78	76	77	77	77	77	77	78	78	78	80	80	81	81	83	81	82	87	87	86	83	84	83
September	78	79	80	80	80	79	79	78	78	78	76	77	77	77	77	77	78	78	80	80	81	81	83	81	82	87	87	86	83	84	83	83
Maximum	78	79	80	80	80	79	79	78	78	78	76	77	77	77	77	77	78	78	80	80	81	81	83	81	82	87	87	86	83	84	83	83
Minimum	78	79	80	80	80	79	79	78	78	78	76	77	77	77	77	77	78	78	80	80	81	81	83	81	82	87	87	86	83	84	83	83

COLORADO RIVER BASIN--Continued

8-1580. COLORADO RIVER AT AUSTIN, TEX.

LOCATION.--At raw-water intake at Austin City Water Plant, just downstream from Lamar Street Bridge in Austin, Travis County, 0.5 mile downstream from Barton Creek and 4.5 miles upstream from gaging station at Montopolis Bridge on U.S. Highway 183.

DRAINAGE AREA.--38,400 square miles, approximately, above gaging station, of which 11,900 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: October 1947 to September 1959.

Water temperatures: October 1947 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 287 ppm Aug. 5; minimum, 221 ppm Oct. 1-31.

Hardness: Maximum, 181 ppm Feb. 1-28, Apr. 1-30; minimum, 164 ppm Oct. 1-31.

Specific conductance: Maximum daily, 573 microhos Jan. 2; minimum daily, 268 microhos July 14.

Water temperatures: Maximum, 80°F Sept. 30; minimum, 48°F Jan. 5.

EXTREMES, 1947-59.--Dissolved solids: Maximum, 340 ppm Nov. 1-30, 1951; minimum, 184 ppm July 1-31, 1957.

Hardness: Maximum, 214 ppm Jan. 1-31, 1954; minimum, 122 ppm June 1, 4-30, 1957.

Specific conductance: Maximum daily, 591 microhos July 1, 1948; minimum daily, 243 microhos Dec. 2, 1953.

Water temperatures: Maximum 87°F on several days during summer months; minimum, 43°F Jan. 28, 1948, Feb. 4, 1949.

Specific temperatures: Maximum 87°F on several days during summer months; minimum, 43°F Jan. 28, 1948, Feb. 4, 1949.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (microhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate			
Oct. 1-31, 1958...	1,477	10		44	13	19		179		19	26	0.1	2.0			0.30	881	154	17	0.6	387	8.2
Nov. 1-30.....	906	10		47	14	19		190		22	24	.3	4.2			.32	577	173	20	.6	419	8.2
Dec. 1-31.....	448	14		40	16	22		176		22	29	.3	4.8			.33	289	166	22	.7	413	8.2
Jan. 1-31, 1959...	853	11		46	15	22	3.3	188		25	32	.3	7.0			.37	705	176	23	.7	431	8.1
Feb. 1-28.....	966	9.4		46	16	23		180		26	32	.3	1.8			.248	660	181	23	.7	437	8.2
Mar. 1-31.....	800	9.8		42	15	23		169		26	36	.2	4.0			.282	544	166	28	.8	434	8.1
Apr. 1-30.....	1,711	9.6		46	16	23	3.5	182		25	31	.3	3.8			.285	1,180	181	32	.6	434	8.1
May 1-31.....	2,341	8.6		44	15	23		177		25	34	.2	2.0			.250	1,580	172	26	.8	429	8.1
June 1-30.....	1,778	7.4		44	15	23		176		27	46	.2	1.8			.37	1,310	172	28	1.0	474	7.8
July 1-31.....	2,241	9.2		42	15	18		162		24	32	.2	1.8			.245	1,480	166	34	.7	414	7.0
Aug. 1-4, 6-31...	3,342	9.4		42	16	21		176		24	33	.3	1.0			.245	3,210	171	27	.6	417	7.0
Aug. 5.....	3,430	--		--	--	--		181		--	58	--	--			.287	2,660	175	26	--	501	7.9
Sept. 1-30.....	2,555	11		40	16	27		177		24	38	--	.8			.250	1,710	166	21	.9	432	7.9
Weighted average	1,651	9.6		43	15	23	--	177		24	34	0.2	2.3			0.34	1,100	169	24	0.8	428	--

a Calculated from determined constituents.

COLORADO RIVER BASIN--Continued

8-1610, COLORADO RIVER AT COLUMBUS, TEX.--Continued

Suspended sediment, water year October 1958 to September 1959

Day	October			November			December		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1...	3,310	828	sa 9,190	5,440	765	11,200	912		
2...	4,810	774	10,100	3,300	364	3,240	896		
3...	2,970	300	2,410	2,550	368	2,530	896		
4...	2,150	460	2,670	2,300	184	1,140	880		
5...	1,960	230	1,220	4,040	560	sa 6,540	880		
6...	1,820	202	993	3,850	382	3,970	832	15	34
7...	1,780	95	457	3,190	228	1,960	816		
8...	1,640			2,300	230	1,430	816		
9...	1,690			2,100	230	1,300	800		
10...	1,690	63	285	2,000	138	745	760		
11...	1,690			1,560	95	400	752		
12...	1,820	184	904	1,440	55	213	736		
13...	3,630	273	2,680	1,480	168	sa 840	720		
14...	2,750	1,060	7,870	5,900	1,440	s 24,700	660		
15...	2,050	1,240	6,860	2,200	212	1,260	585	16	26
16...	1,920	460	2,380	1,780	76	365	525		
17...	1,820	156	767	1,600			495		
18...	1,740	142	667	1,520	61	257	481		
19...	1,690			1,360			474		
20...	1,640			1,320			638		
21...	1,520			1,240			720		
22...	1,400			1,200			600		
23...	1,600			1,160	32	100	555		
24...	1,780			1,100			736	18	34
25...	2,050			1,040			824		
26...	1,870	64	323	960			800		
27...	1,690	142	648	944	26	68	792		
28...	2,100	129	731	952			760	20	42
29...	2,250	120	729	936			776		
30...	3,740	364	3,680	960			824	17	41
31...	5,840	1,020	16,100	--	--	--	960		
Total	70,410	--	74,444	61,722	--	63,415	22,901	--	1,020
	January			February			March		
1...	1,100			1,360			1,640	118	522
2...	1,070	10	27	1,640	10	40	1,520	99	406
3...	864			1,960	112	593	1,320	82	292
4...	668			1,440			1,160	79	247
5...	570			1,560			1,240	95	318
6...	502	6	9.7	1,520			1,440	86	334
7...	652			1,440			1,360	79	290
8...	752			1,400	17	63	1,320	80	285
9...	968			1,360			1,280	71	245
10...	872			1,200			1,090		
11...	888	6	13	1,100			1,060		
12...	776			1,200	19	62	1,040	40	118
13...	675			1,600	38	164	1,160		
14...	800			2,420	255	sa 2,160	1,090		
15...	864			7,280	1,130	22,200	864		
16...	1,120			8,860	1,340	32,100	824	43	98
17...	1,240			3,700	1,360	13,600	840		
18...	1,320			2,050	1,000	5,540	904		
19...	1,400			1,480	618	2,470	1,020		
20...	1,360	11	37	984	314	834	1,060	26	72
21...	1,120			1,020	152	419	1,120		
22...	1,080			1,120	124	375	1,010		
23...	1,360			1,160	81	254	824		
24...	1,280			1,120	81	245	792		
25...	1,320			1,120	86	260	864		
26...	1,280			1,400	89	336	776	25	54
27...	1,100	8	26	1,480	108	432	744		
28...	992			1,560	108	455	800		
29...	920			--	--	--	1,030		
30...	1,160			--	--	--	1,030	22	61
31...	1,360			--	--	--	1,000		
Total	31,433	--	716.8	55,534	--	83,083	33,222	--	4,690

s Computed by subdividing day.

a Computed from estimated-concentration graph.

COLORADO RIVER BASIN--Continued
8-1610. COLORADO RIVER AT COLUMBUS, TEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	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. 2, 1958.....	0715		68	5,570	1,020		41	60	73	84	92	96	98	99	100	--	--	SBW
Oct. 2.....	0715		68	5,570	1,020		70	81	85	91	95	97	99	100	--	--	--	SBW
Oct. 15.....	0722		72	2,100	1,580		82	93	98	99	99	100	--	--	--	--	--	BWC
Oct. 31.....	0738		60	5,980	1,080		58	60	64	67	70	72	74	83	99	100	--	SBWC
Nov. 14.....	0744		72	8,400	2,150		60	65	72	77	82	90	92	96	100	--	--	SBWC
Feb. 16, 1959.....	0746		56	9,460	1,440		62	62	67	71	87	89	90	94	100	--	--	SBWC
Apr. 9.....	1700		61	8,550	3,350		55	60	68	73	75	77	78	88	99	100	--	SBWC
Apr. 10.....	1330		61	14,800	1,420		60	65	72	77	82	85	89	97	99	100	--	SBWC
Apr. 12.....	1000		60	30,400	1,830		56	61	67	73	78	84	86	95	100	--	--	SBWC
Apr. 18.....	0736		66	23,200	3,360		30	40	53	65	69	82	84	98	100	--	--	SEN
Apr. 18.....	0736		66	23,200	3,360		52	61	69	75	81	85	89	98	100	--	--	SBWC
May 11.....	0742		67	7,100	1,280		54	61	68	75	84	94	99	100	--	--	--	SBWC
May 23.....	0643		67	14,400	2,560		50	58	63	70	79	86	93	99	100	--	--	SBWC
May 23.....	0643		67	14,400	2,560		27	41	54	66	79	88	95	99	100	--	--	SEN

COLORADO RIVER BASIN--Continued
8-1620. COLORADO RIVER AT WHARTON, TEX.

LOCATION.--At gaging station near center of span on downstream side of bridge on U.S. Highway 59, in Wharton, Wharton County, 1,000 feet downstream from Texas and New Orleans Railroad Co. bridge, 12 miles upstream from Jones Creek, and at mile 67.

DRAINAGE AREA.--41,380 square miles, approximately, of which 11,900 square miles is probably noncontributing.

RECORDS AVAILABLE.--Chemical analyses: April 1944 to September 1959.

Water temperatures: October 1945 to September 1948, March 1950 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 302 ppm Dec. 1-31; minimum, 118 ppm May 24-25.

Hardness: Maximum, 210 ppm Dec. 1-31; minimum, 82 ppm May 24-25.

Specific conductance: Maximum daily, 604 microhos Sept. 10; minimum daily, 190 microhos Apr. 11.

Water temperatures: Maximum, 93°F June 18; minimum, 38°F Jan. 5.

EXTREMES, 1944-59.--Dissolved solids: Maximum, 386 ppm Apr. 1-10, 1948; minimum, 108 ppm Sept. 27-29, 1957.

Hardness: Maximum, 231 ppm Feb. 1-10, 1947; minimum, 66 ppm Sept. 27-29, 1957.

Specific conductance: Maximum daily, 765 microhos Feb. 5, 1957; minimum daily, 146 microhos Sept. 27, 1957.

Water temperatures (1948-48, 1950-59): Maximum, 95°F July 26, 1954; minimum, 38°F Jan. 17, 1957.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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-boronate		
Oct. 1-31, 1958..	2,244	10		46	10	18	4.2	168		28	25	--	2.2		249	0.34	1,500	156	18	0.6	395	8.0	
Nov. 1-30.....	2,311	10		50	11	16	3.2	176		32	26	--	3.8		233	0.34	1,580	170	20	0.6	411	7.9	
Dec. 1-31.....	1,876	6.4		58	16	25	3.3	218		36	37	--	3.0		262	0.34	1,720	201	32	0.8	532	8.6	
Jan. 1-31, 1959..	1,065	3.8		32	15	26	3.4	184		36	36	0.3	2.8		257	0.34	823	163	32	0.8	460	7.6	
Feb. 1-28.....	2,304	5.6		20	11	20	3.9	166		37	28	--	2.8		257	0.34	1,690	168	32	0.7	417	8.1	
Mar. 1-31.....	1,199	10		50	13	25	3.6	194		37	35	--	2.0		298	0.41	965	186	28	0.8	487	8.2	
Apr. 1-9, 23-30..	1,954	9.6		50	13	24	3.8	182		36	35	--	2.5		270	0.37	1,420	178	30	0.8	462	7.8	
Apr. 10-11, 14, 19-20, 21-15, 15-16, Apr. 12-13, 15-16, Apr. 21-22, 24-31... May 24-25.....	16,900 12,900 2,638 8,820	12 12 11 11		30 38 48 26	3.1 4.6 13 4.1	6.8 11 7.9 2.9	3.3 3.6 3.2 2.6	98 115 176 93		11 25 28 7.6	8.2 14 31 7.6	-- -- -- --	2.2 3.2 3.2 1.8		a a a a	125 168 254 118	17 23 35 16	5,700 5,480 1,810 2,810	88 114 174 82	7 20 30 6	0.3 4 4 4	217 292 439 204	7.6 7.5 7.4 7.8
June 1-30.....	1,837	11		38	13	20	3.3	152		26	30	--	1.2		226	0.31	1,120	148	24	0.7	390	7.6	
July 1-31.....	1,260	11		39	15	21	3.8	156		35	35	2	1.8		242	0.33	823	159	31	0.7	410	7.0	
Aug. 1-31.....	2,597	11		44	15	21	3.4	175		26	38	--	2.2		255	0.35	1,790	172	28	0.7	432	7.8	
Sept. 1-30.....	2,563	13		42	15	24	3.6	175		28	38	--	1.5		254	0.35	1,760	166	23	0.8	446	7.8	
Weighted average	2,372	11		43	11	18	3.5	159		27	27	--	2.5		231	0.31	1,480	152	22	0.6	393	--	

a Calculated from determined constituents.

COLORADO RIVER BASIN--Continued
8-1620. COLORADO RIVER AT WHARTON, TEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	75	70	68	68	70	72	73	--	76	78	76	75	73	75	73	73	73	71	73	73	74	75	72	72	73	73	70	64	61	59	60	71	
November	60	60	61	62	63	64	63	65	67	67	69	70	70	--	73	74	75	68	63	62	61	--	64	65	65	67	60	55	49	51	--	64	
December	50	54	54	55	59	57	54	55	59	55	47	49	55	44	43	44	46	49	42	--	58	55	58	56	55	52	53	52	55	54	45	52	
January	45	48	49	40	39	42	47	48	46	44	48	53	55	60	64	50	48	49	55	60	58	48	48	52	55	55	55	53	58	59	54	51	
February	52	46	47	47	49	50	50	52	62	66	59	55	55	65	60	60	63	59	52	50	55	59	59	56	58	58	59	--	--	--	56	62	
March	58	60	60	61	60	56	58	60	62	65	68	60	60	65	62	59	55	58	58	62	62	58	60	63	68	69	66	64	61	64	68	62	
April	68	65	68	68	71	72	73	74	68	63	60	57	56	57	60	61	63	65	68	71	70	67	68	69	70	70	72	73	75	76	--	67	
May	77	77	77	77	76	77	77	78	78	78	74	76	75	79	79	78	79	79	80	80	78	81	79	73	75	79	80	81	82	89	89	79	
June	84	84	84	83	83	82	82	82	82	83	85	85	85	85	85	83	85	83	86	86	87	86	86	85	82	79	82	83	85	85	--	84	
July	85	85	87	87	86	87	87	87	86	86	86	85	86	83	83	85	85	86	87	85	87	85	87	83	80	80	83	83	84	82	83	85	
August	86	88	88	87	87	87	87	87	87	87	84	86	84	83	83	83	84	84	84	84	83	82	82	83	82	81	80	79	80	82	84	83	84
September	83	83	84	85	85	85	85	82	82	83	73	77	78	78	77	77	78	78	78	78	82	82	83	81	81	81	81	83	83	83	80	--	81

GUADALUPE RIVER BASIN

8-1765. GUADALUPE RIVER AT VICTORIA, TEX.

LOCATION.--At gaging station on left bank just upstream from pier of bridge on U.S. Highway 59 in Victoria, Victoria County, 1,300 feet upstream from Texas and New Orleans Railroad Co. bridge, 10 miles upstream from Coletto Creek, and at mile 51.

DRAINAGE AREA.--5,161 square miles.

RECORDS AVAILABLE.--Chemical analyses: October 1945 to September 1946, October 1948 to September 1959.

EXTREMES 1954-59.--Discharge: Maximum, 1390 to September 1958.

Water temperatures: November, 1950 to September, 1958. Maximum, 37.6 ppm Mar. 1-10; minimum, 216 ppm May 23-26.

Specific conductance: Maximum, 849 ppm Apr. 9-20.

Water temperatures: Maximum, 80.1 microhos daily, 80 microhos, 44°F. Minimum, 44°F. Maximum daily, 298 microhos Apr. 16.

Hardness: Maximum, 1948-59.--Dissolved solids: Maximum, 1,040 ppm Jan. 11-17, 1946; minimum, 134 ppm Oct. 17-21, 1957.

Specific conductance: Maximum daily, 1,950 microhos, 86 ppm Oct. 23-31, 1956.

Water temperatures: Maximum daily, 1,950 microhos, 86 ppm Oct. 23-31, 1956.

Water temperatures (1950-59): Maximum, 90°F Aug. 4, 27, 1952; minimum, 40°F Feb. 1-2, 1951.

REMARKS.--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate			
Oct. 1-10, 1958..	2,129	15	10	50	10	16	3.5	184	20	24	3.8	0.32	1,330	166	15	0.5	406	7.9				
Oct. 11-20.....	1,415	18	64	15	23	2.8	2.8	232	27	33	6.2	0.44	1,400	221	31	0.7	530	7.7				
Oct. 21-28.....	1,436	17	70	16	23	2.5	2.5	255	27	32	8.3	0.45	1,290	240	32	0.6	560	7.8				
Oct. 29-31.....																						
Nov. 1-10.....	3,112	14	57	12	17	2.9	2.9	200	25	24	5.5	0.37	2,300	192	28	0.5	446	7.9				
Nov. 11-20.....	1,884	17	64	15	20	2.4	2.38	260	25	27	7.3	0.41	1,940	221	26	0.6	523	8.1				
Nov. 21-30.....	1,607	15	70	17	25	2.3	2.3	260	28	35	7.3	0.46	1,470	244	32	0.7	574	7.9				
Dec. 1-10.....	1,491	15	70	18	26	2.3	2.3	264	29	36	7.5	0.47	1,380	248	32	0.7	586	7.9				
Dec. 11-20.....	1,393	14	57	18	25	2.1	2.28	288	30	37	7.7	0.3	1,180	216	29	0.7	535	8.1				
Dec. 21-31.....	1,465	14	73	17	26	2.3	2.3	274	37	37	7.0	0.36	1,410	252	28	0.7	592	8.1				
Jan. 1-10, 1959..	1,363	15	73	16	29	2.3	2.3	277	29	41	6.7	0.50	1,350	248	21	0.8	609	8.1				
Jan. 11-20.....	1,251	13	55	18	28	1.7	1.8	225	28	42	7.7	0.44	1,030	211	26	0.8	550	8.2				
Jan. 21-31.....	1,205	12	67	18	31	1.8	1.8	259	32	46	7.4	0.47	1,110	241	28	0.9	616	7.9				
Feb. 1-10.....	1,649	15	58	15	29	2.8	2.8	223	29	42	4.9	0.42	1,380	206	24	0.9	537	8.1				
Feb. 11-20.....	2,510	15	54	12	30	3.3	3.1	189	31	42	4.2	0.40	1,990	184	29	1.0	506	8.1				
Feb. 21-28.....	1,686	14	64	13	26	3.1	3.1	219	36	34	5.8	0.42	1,420	213	34	0.8	524	8.0				
Mar. 1-10.....	1,523	15	72	16	33	2.8	2.8	257	39	48	6.1	0.51	1,550	246	35	0.9	617	8.1				
Mar. 11-20.....	1,245	15	71	17	33	2.4	2.4	262	35	50	6.3	0.51	1,250	247	32	0.9	633	8.2				
Mar. 21-31.....	1,152	14	64	18	30	2.2	2.2	249	32	42	5.0	0.46	1,050	234	30	0.8	576	8.1				

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	Aver- age
Apr. 1-8, 1959...	1,155	12	56	18	28	2.3	226	33	42	4.8	318	0.43	892	214	28	0.8	539	8.1														
Apr. 9-20.....	5,634	13	46	18.0	20	3.7	153	25	28	3.0	235	32	3,370	189	22	.7	389	6.7														
Apr. 21-30.....	2,298	15	57	11	29	4.0	194	30	33	3.2	283	39	1,650	231	28	.6	466	6.0														
May 1-10.....	1,755	15	68	15	29	3.0	236	34	43	5.4	348	47	1,450	231	28	.6	362	7.3														
May 11-20.....	1,463	15	70	15	30	2.5	242	36	42	6.1	352	48	1,390	236	30	.8	368	7.3														
May 21-22, 27-31..	1,246	14	64	15	29	2.8	233	31	41	4.6	332	45	1,120	221	30	.8	368	7.4														
May 23-26.....	2,758	9.6	46	9.1	19	3.0	164	19	27	2.5	a 216	.29	1,610	152	18	.7	393	7.6														
June 1-9.....	1,157	17	66	18	31	2.4	246	33	46	4.4	360	44	1,120	238	37	.9	584	7.4														
June 10-20.....	965	16	62	14	30	2.7	230	33	40	3.6	320	49	834	212	24	.9	541	8.0														
June 21-30.....	1,295	16	58	15	30	2.3	228	30	39	3.0	310	42	1,080	206	19	.9	530	7.9														
July 1-10.....	1,825	18	54	10	18	2.8	198	22	22	4.7	256	35	1,260	176	13	.6	429	7.5														
July 11-20.....	990	18	56	13	19	2.8	222	21	25	4.0	280	38	1,748	198	16	.6	462	7.7														
July 21-31.....	1,075	18	66	14	25	2.6	246	27	34	4.1	322	44	935	222	20	.7	537	7.7														
Aug. 1-4.....	834	20	60	17	27	2.9	233	28	44	4.0	318	43	716	220	28	.8	531	7.4														
Aug. 5-16, 26-28..	825	19	55	15	24	2.8	215	27	37	2.5	a 288	.39	642	198	22	.7	480	7.5														
Aug. 17-25, 29-31	824	18	--	17	28	2.7	--	29	44	2.5	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
Sept. 1-10.....	807	20	60	18	27	2.5	236	30	39	3.0	320	44	697	224	30	.8	540	7.2														
Sept. 11-20.....	715	20	61	17	27	2.4	241	29	38	2.5	316	.43	610	222	24	.8	531	7.9														
Sept. 21-30.....	696	18	59	17	27	2.3	237	30	38	2.5	a 311	.42	584	217	23	.8	523	7.4														
Weighted average	1,580	15	60	14	25	2.8	219	28	35	--	303	0.41	1,290	207	28	0.8	511	--														

a Calculated from determined constituents.

Temperature (°F) of water, water year October 1958 to September 1959

/Once-daily measurement, usually at 7 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.....	74	70	69	66	71	70	73	74	72	--	73	--	--	73	72	72	72	71	72	73	71	70	70	--	69	77	69	65	66	60	64	70		
November.....	63	62	62	66	67	65	63	62	64	63	62	68	68	70	71	67	--	67	64	64	64	65	65	64	65	65	64	62	60	56	54	--	64	
December.....	57	57	58	58	59	58	55	55	56	56	51	51	52	50	50	48	49	50	51	56	53	55	59	55	--	55	54	54	56	53	57	54		
January.....	49	50	53	46	44	47	50	51	48	47	49	52	54	56	56	51	--	56	60	54	51	52	54	55	--	56	55	59	57	55	52			
February.....	55	51	47	49	50	--	51	58	60	60	58	55	60	64	62	59	60	62	59	56	54	56	59	60	57	--	59	58	--	--	57			
March.....	58	--	60	62	61	58	59	61	62	62	66	61	62	62	61	59	58	60	60	64	62	60	61	63	66	65	68	56	64	66	67	62		
April.....	68	66	66	70	72	72	74	72	74	65	65	64	60	59	59	65	64	62	63	66	68	66	62	63	69	69	70	69	72	73	73	67		
May.....	76	75	76	75	76	77	76	77	76	77	77	77	77	77	77	74	77	80	80	77	76	80	77	74	76	78	77	78	78	--	--	81		
June.....	82	83	81	--	82	80	81	83	82	81	80	85	81	80	85	81	82	83	83	84	85	85	85	84	82	80	82	81	82	--	--	82		
July.....	83	82	--	82	84	--	84	84	84	84	84	84	84	84	84	84	84	85	83	84	84	84	85	85	83	83	83	83	84	83	84	84		
August.....	84	84	85	85	86	86	84	84	85	84	85	--	85	84	82	--	83	83	--	85	84	82	83	79	83	78	80	78	80	81	80	83		
September.....	80	81	83	76	76	78	81	--	60	79	--	77	60	76	78	77	78	78	78	77	78	79	79	79	79	76	76	80	81	--	79	--		

GUADALUPE RIVER BASIN--Continued
 8-1765. GUADALUPE RIVER AT VICTORIA, TEX.--Continued

Determinations of suspended-sediment discharge and particle size analyses of suspended sediment, water year October 1958 to September 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 temp-er-ature (°F)	Discharge (cfs)	Sediment concen-tration (ppm)	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. 11, 1959.....	1100		63	4,680	1,800	67	80	87	91	92	93	94	95	97		SBWC
Apr. 13.....	1200		61	8,150	1,250	66	76	79	82	82	83	84	86	94		SBWC

Particle-size analyses of bed material, water year October 1958 to September 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 temp-er-ature (°F)	Discharge (cfs)	Sediment concen-tration (ppm)	Bed material										Method of analysis
						Percent finer than size indicated, in millimeters										
						0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.00	32.00	
Apr. 11, 1959.....						0	0	6	52	92	98	100				\$
Apr. 13.....						0	0	3	50	84	93	100				\$

GUADALUPE RIVER BASIN--Continued

8-1885. SAN ANTONIO RIVER AT GOLIAD, TEX.

LOCATION.--At gaging station on right bank at upstream side of pier of bridge on U.S. Highway 183, 1.3 miles southeast of courthouse in Goliad, Goliad County, and 10 miles upstream from Manahuilla Creek.

DRAINAGE AREA.--3,918 square miles.

RECORDS AVAILABLE.--Chemical analyses: September 1958 to September 1959.

Water temperatures: September 1958 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 808 ppm Sept. 18; minimum, 159 ppm Oct. 30-31, Nov. 1.

Hardness: Maximum, 362 ppm Mar. 21-31; minimum, 96 ppm Oct. 30-31, Nov. 1.

Specific conductance: Maximum daily, 1,390 micromhos Apr. 3; minimum daily, 260 micromhos Oct. 31.

Water temperatures: Maximum, 87°F Sept. 21; minimum, 45°F Jan. 4.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Soilium adsorption ratio	
Oct. 1-10, 1958...	1,291	15		60	12	35		192	0	51	41	0.3	7.0	322	0.44	1,120	199	42	1.1	528	8.2
Oct. 11-20.....	824	16		74	15	42		227	3	64	52	.3	6.1	392	.53	872	246	55	1.2	635	8.3
Oct. 21-29.....	894	18		76	15	48		230	4	65	60	.3	7.8	419	.57	1,010	251	62	1.3	676	8.3
Oct. 30-31, Nov. 1	4,403	15		31	4.5	17		102	0	21	16	.2	4.2	a 159	.22	1,890	96	12	.7	271	7.8
Nov. 2-10.....	2,419	16		60	12	25		189	0	45	32	.2	6.9	298	.41	1,950	199	44	.8	485	8.0
Nov. 11-20.....	1,296	16		74	15	33		233	0	57	42	.3	8.3	368	.50	1,290	246	55	.9	601	8.1
Nov. 21-30.....	1,836	17		83	18	43		256	8	68	51	.3	9.6	434	.59	1,980	281	58	1.1	694	8.4
Dec. 1-10.....	662	17		90	19	58		286	4	77	68	.4	12	499	.68	892	302	62	1.4	797	8.3
Dec. 11-20.....	575	17		94	21	67		291	8	82	83	.4	13	544	.74	845	321	69	1.6	879	8.7
Dec. 21-31.....	516	20		96	21	87		275	20	90	107	.4	13	604	.82	841	326	67	2.1	965	8.7
Jan. 1-10, 1959...	504	20		105	19	73	5.0	285	11	92	90	.4	13	571	.78	777	315	93	1.8	909	8.4
Jan. 11-20.....	459	19		100	20	81		304	17	98	94	.4	15	602	.82	746	332	1	1.9	952	8.4
Jan. 21-31.....	434	18		101	22	80		286	15	101	96	.5	18	604	.82	708	342	83	1.9	936	8.5
Feb. 1-10.....	467	23		98	19	78		294	0	97	96	.5	15	589	.80	743	322	82	1.9	942	8.1
Feb. 11-20.....	504	22		98	19	76		277	7	94	90	.5	14	568	.77	773	318	76	1.8	910	8.3
Feb. 21-28.....	382	22		96	19	81		277	6	85	87	.4	14	545	.74	871	296	59	1.9	886	8.4
Mar. 1-10.....	398	21		103	20	88		312	0	95	97	.6	14	597	.81	751	318	72	2.0	938	8.4
Mar. 11-20.....	398	21		103	20	88		312	0	101	111	.6	14	637	.87	685	339	84	2.1	1,010	8.2
Mar. 21-31.....	338	19		107	23	89		310	4	111	118	.6	13	660	.90	602	362	101	2.0	1,050	8.3

a Calculated from determined constituents.

GUADALUPE RIVER BASIN--Continued
8-1885. SAN ANTONIO RIVER AT GOLIAD, TEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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		Specific conductance (micro-mhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium		Non-carbonate		
Apr. 1-9, 1959...	369	20		104	24	90	6.1	310	0	115	127	0.4	13		689	0.94	358	104	2.1	1,070	8.1	
Apr. 10, 12-13, 15-17.....	1,157	16		55	10	44		168	0	51	52	.4	11		353	.48	178	40	1.4	560	7.8	
Apr. 11, 14, 18-21.....	869	19		74	15	73		217	0	78	96	.4	12		505	.69	246	68	2.0	809	7.7	
Apr. 22-30.....	406	20		98	22	77		297	0	102	101	.5	11		606	.82	335	92	1.8	960	8.0	
May 1-2.....	370	21		101	22	100		280	19	109	122	.5	14		703	.96	342	82	2.4	1,050	8.5	
May 3-5.....	1,757	20		46	7.0	40		133	2	52	39	.4	9.1		a 250	.38	144	31	1.4	475	8.3	
May 6-11.....	541	16		74	16	54		218	2	75	70	.4	11		a 495	.58	250	68	1.5	729	8.3	
May 12-20.....	449	22		92	21	76		258	0	91	96	.5	13		a 675	.82	212	77	1.7	832	8.2	
May 21-31.....	542	15		62	19	55		209	0	65	61	.4	13.2		a 432	.60	236	41	1.7	932	8.0	
June 1-5, 8-12.....	344	21		89	17	86		273	0	97	106	.5	11.2		a 586	.80	292	68	2.3	928	8.0	
June 6-7, 8-12.....	757	17		63	5.8	28		148	0	25	28	.3	7		a 296	.31	121	10	1.1	397	8.0	
June 13-26.....	243	20		101	23	108		305	0	125	136	.3	9.4		a 688	.94	346	96	2.5	1,100	7.9	
June 27-30.....	535	15		74	16	78		227	0	86	97	.4	7.9		a 517	.70	250	64	2.1	829	7.6	
July 1-10.....	478	20		72	16	58		226	0	73	71	.4	11		459	.62	246	60	1.6	717	7.8	
July 11-18.....	272	21		87	20	65		260	0	93	88	.6	7		556	.76	299	86	1.6	826	7.9	
July 19-31.....	279	21		92	20	86		278	0	107	107	.5	8.2		609	.83	459	84	2.1	947	7.8	
Aug. 1-10.....	212	20		80	22	82		276	0	99	110	.5	10		598	.81	342	89	2.0	939	7.9	
Aug. 11-20.....	204	24		86	22	88		267	0	109	110	.5	9.2		602	.82	332	80	2.0	936	7.9	
Aug. 21-29.....	247	23		92	21	93		290	0	106	114	.5	10		627	.85	418	78	2.3	978	8.0	
Aug. 30-31, Sept. 1-5.....	243	23		78	18	73		246	0	90	87	.4	9.7		.70	.339	268	67	1.9	813	8.1	
Sept. 6-17.....	226	23		92	19	90		284	0	104	107	.6	11		610	.83	372	75	2.2	960	8.0	
Sept. 18.....	199	--		--	--	--		269	0	--	216	--	--		808	1.10	434	290	70	--	1,300	8.1
Sept. 19-30.....	222	23		90	19	93		283	0	96	114	.5	14		605	.82	302	70	2.3	988	7.8	
Weighted average	597	18		77	16	57		b 242	--	73	70	0.4	10		457	0.82	258	60	1.5	732	--	

a Calculated from determined constituents.

b Includes equivalent of individual carbonate values.

GUADALUPE RIVER BASIN--Continued

8-1885. SAN ANTONIO RIVER AT GOLIAD, TEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959
/Once-daily measurement, usually between 6 a.m. and 11:30 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	70	70	70	70	70	69	75	81	79	79	78	76	78	77	75	75	74	74	75	77	77	77	75	77	74	74	70	65	60	59	60	73		
November ...	59	60	60	60	60	65	67	67	65	67	70	67	70	73	74	70	73	75	70	68	67	67	65	68	69	67	65	60	58	50	55	--	66	
December ...	58	60	62	62	62	58	55	60	59	56	56	58	54	46	52	52	54	55	56	56	54	57	58	56	58	55	55	57	54	50	56	56	56	
January	51	50	49	45	47	47	54	54	50	47	52	52	59	62	62	58	54	70	62	64	60	56	55	55	57	60	58	51	60	58	58	55	55	
February	55	50	50	55	57	54	55	60	64	64	59	59	59	61	65	65	65	68	60	60	52	52	60	59	59	52	59	60	--	--	--	59	59	
March	60	62	65	65	65	65	60	62	68	68	69	65	62	65	64	60	62	65	66	69	62	62	66	68	70	72	70	64	65	70	72	65	65	
April	73	71	73	70	71	75	75	77	68	65	65	62	62	62	63	56	67	71	71	70	69	69	74	71	74	74	75	75	78	--	70	70	70	
May	78	77	79	74	74	76	76	76	79	79	78	76	76	77	77	80	79	79	80	81	81	--	--	--	--	--	--	--	--	--	--	--	--	78
June	81	82	82	82	84	80	80	80	80	82	84	84	84	84	82	83	81	84	82	84	84	84	84	84	84	81	81	81	82	84	84	81	82	82
July	84	84	82	84	85	86	84	--	81	85	84	85	85	83	83	83	83	85	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
August	84	84	84	84	85	85	85	85	85	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
September ...	85	85	85	85	84	84	84	84	84	84	82	75	79	79	79	80	81	81	80	81	87	82	80	80	80	80	80	80	85	85	81	84	--	82

GUADALUPE RIVER BASIN--Continued
8--1885. SAN ANTONIO RIVER AT GOLIAD, TEX.--Continued

Determinations of suspended sediment discharge and particle size analyses of suspended sediment, water year October 1958 to September 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)	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
Apr. 11, 1959	1730		63	712	1,100		72	84	90	95	97	99	100		SBWC
May 4	1900		64	2,440	1,940		78	91	97	99	99	100	--		BWC

Particle size analyses of bed material, water year October 1958 to September 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)	Sam- pling point	Water tem- per- ature (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Sediment discharge (tons per day)	Bed material						Method of analysis				
							Percent finer than size indicated, in millimeters										
							0.002	0.004	0.008	0.016	0.062	0.125		0.250	0.500	1.000	2.000
Apr. 11, 1959										0	0	1	49	93	100	S	
May 4										0	0	1	30	78	94	100	S

RIO GRANDE BASIN

8-2492. RIO GRANDE ABOVE CULEBRA CREEK, NEAR LOBATOS, COLO.

LOCATION --Half a mile southeast of La Saucos, 7 miles upstream from Culebra Creek, and 15 miles upstream from gaging station near Lobatos, Conejos County. DRAINAGE AREA --7,700 square miles, approximately, upstream from gaging station (includes 2,940 square miles in closed basin in northern part of San Luis Valley, Colo.).

RECORDS AVAILABLE --Chemical analyses: October 1946 to September 1959.

EXTREMES, 1958-59 --Dissolved solids: Maximum, 805 ppm Sept. 21; minimum, 194 ppm May 1-7.

Hardness: Maximum, 272 ppm Aug. 19; minimum, 90 ppm May 1-7.

Specific conductance: Maximum daily, 1,110 micromhos Sept. 21, 1959; minimum daily, 232 micromhos Feb. 18.

EXTREMES, 1946-59 --Dissolved solids: Maximum, 805 ppm Sept. 21, 1959; minimum, 104 ppm May 2-10, 1947.

Hardness: Maximum, 346 ppm June 9-14, 1953; minimum, 52 ppm May 1-10, 1952.

Specific conductance: Maximum daily, 1,110 micromhos Sept. 21, 1959; minimum daily, 122 micromhos June 1, 1949.

REMARKS --Values reported for sodium (Na) are determined by analyses and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Lobatos for water year October 1958 to September 1959 given in WSP 1652. Culebra Creek which enters the Rio Grande between the sampling point and the gaging station is usually dry at its mouth. Inflow from this and other sources between sampling point and gaging station occurs only after heavy local rainfall. Flow affected by ice Nov. 17 to Feb. 26, Mar. 8.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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) (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. 1-3, 1958,	26.3	--	--	26	15	56	7.3	73	27	--	16	--	--	--	0.51	26.6	21	126	2.2	452	9.1	
Oct. 4-5, 9-11,	31.6	68	0.00	54	13	59	130	201	0	126	--	0.7	0.5	0.18	446	38.1	22	187	1.9	597	8.2	
Oct. 6-8, 12,	33.8	--	--	32	12	52	130	9	9	--	--	--	--	--	382	52	129	8	2.0	465	8.5	
Oct. 13-17,	42.8	--	--	50	15	62	156	21	21	--	--	--	--	--	498	68	187	24	2.0	603	8.7	
Oct. 18-25,	60.6	--	--	49	10	48	189	0	0	--	--	--	--	--	396	54	165	10	1.6	523	8.0	
Oct. 26-Nov. 3,	81.8	--	--	42	10	37	185	0	0	--	--	--	--	--	332	45	146	0	1.3	432	7.6	
Nov. 4-19,	75.8	--	--	46	12	51	--	--	11	--	--	--	--	--	422	57	165	18	1.7	526	8.5	
Nov. 20-22,	110	--	--	42	10	38	--	138	26	--	--	--	--	--	357	49	148	0	1.4	426	8.9	
Nov. 23-Dec. 15,	239	--	--	34	8.8	24	141	0	0	--	--	--	--	--	272	37	175	121	6	330	8.2	
Dec. 16-20,	188	--	--	40	9.2	30	118	20	20	--	--	--	--	--	322	44	172	138	8	1.1	378	8.8
Dec. 21-31, 1959,	183	--	--	34	6.6	22	129	3	3	--	--	--	--	--	266	36	131	112	2	1.0	328	8.3
Jan. 1-11, 1959,	172	54	.03	34	7.8	25	5.5	150	0	42	6.0	.4	2.1	.10	238	35	120	117	0	1.0	338	8.2
Jan. 12-31,	206	--	--	30	6.0	18	--	123	0	--	--	--	--	--	202	27	112	108	6	.8	281	7.4
Feb. 1-4, 7,	209	--	--	32	7.3	22	--	145	0	--	--	--	--	--	216	29	122	110	0	.9	297	6.9
Feb. 5-6, 8-9,	214	--	--	34	9.5	29	--	132	25	--	--	--	--	--	293	40	169	124	0	1.1	344	8.8
Feb. 10-13,	212	--	--	32	9.2	25	--	124	13	--	--	--	--	--	258	37	148	113	0	1.0	302	8.4
Feb. 14-28,	267	--	--	34	6.3	20	--	111	4	--	--	--	--	--	199	27	143	96	0	.9	274	8.3
Mar. 1-6,	320	--	--	38	9.2	22	--	130	0	--	--	--	--	--	223	30	193	123	16	.9	324	7.9
Mar. 7-16,	238	--	--	38	9.7	27	--	139	0	--	--	--	--	--	280	38	180	135	21	1.0	368	7.6

RIO GRANDE BASIN--Continued
 8-2492. RIO GRANDE ABOVE CULEBRA CREEK, NEAR LOBATOS, COLO.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 carbonate ratio	Specific conductance pH (micro-mhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate			
Mar. 17-31, 1959...	164	--	--	44	12	35		140	6	--	--	--	--	--	334	0.45	148	158	34	1.2	433	8.4
Apr. 1-9,	127	52	0.04	48	10	44	6.3	172	7	88	14	0.5	0.8	0.12	368	0.50	126	162	10	1.5	485	--
Apr. 10-12,	155	--	--	38	9.7	32		147	8	--	--	--	--	--	278	0.38	116	135	11	1.2	382	8.4
Apr. 13-19,	136	--	--	52	12	46		176	0	--	--	--	--	--	362	0.52	140	180	36	1.5	535	8.1
Apr. 20-23,	97.0	--	--	38	7.8	33		168	0	--	--	--	--	--	263	0.36	68.9	127	0	1.3	386	7.6
Apr. 24-25,	62.5	--	--	46	11	38		172	0	--	--	--	--	--	332	0.45	56.0	162	21	1.3	464	7.4
Apr. 26-30,	66.0	--	--	34	9.7	30		157	0	--	--	--	--	--	265	0.35	47.2	125	0	1.2	359	7.4
May 1-7,	65.9	--	--	27	5.5	29		134	0	--	--	--	--	--	194	0.26	34.5	90	0	1.3	303	8.1
May 8-14, 18, 20-23	57.7	--	--	37	6.7	38		177	0	--	--	--	--	--	254	0.35	39.6	120	0	1.5	399	8.0
May 15-17, 19,	77.2	--	--	31	6.4	30		163	0	--	--	--	--	--	214	0.29	44.6	104	0	1.3	331	7.7
May 24-31,	54.4	--	--	36	6.3	37		185	0	--	--	--	--	--	290	0.34	36.7	116	0	1.5	380	7.7
June 1-10,	36.3	--	--	35	6.8	36		189	0	--	--	--	--	--	242	0.33	23.7	116	0	1.4	383	7.6
June 11-26,	33.2	--	--	47	6.0	32		196	0	--	--	--	--	--	284	0.33	47.8	139	0	1.8	498	7.2
June 27-30,	23.2	--	--	40	8.0	46	6.3	212	0	--	--	--	--	--	243	0.39	17.8	139	0	1.6	423	7.2
July 1-15,	11.9	44	0.01	60	8.8	48		206	0	51	11	1.0	0.3	0.22	313	0.43	10.0	126	0	1.9	444	7.8
July 16-20,	21.6	--	--	57	15	75		202	0	--	--	--	--	--	476	0.65	27.8	202	36	2.3	689	8.2
July 21-Aug. 1,	7.92	--	--	42	12	58		199	0	--	--	--	--	--	354	0.48	7.57	153	0	2.0	536	7.7
Aug. 2-3,	8.90	--	--	44	13	102		258	7	--	--	--	--	--	463	0.67	11.8	163	0	3.3	710	8.5
Aug. 4-5, 29-30,	17.6	--	--	47	13	71		210	0	--	--	--	--	--	415	0.56	19.7	172	0	2.4	599	8.2
Aug. 6,	19	--	--	38	13	140		249	0	--	--	--	--	--	593	0.81	30.4	148	0	5.0	882	8.0
Aug. 7-9, 13, 15-18	25.1	--	--	46	12	63		201	0	--	--	--	--	--	381	0.52	25.8	164	0	2.1	560	8.0
Aug. 20-26,	28.2	--	--	36	8.8	41		176	0	--	--	--	--	--	270	0.37	20.6	116	0	1.7	393	7.7
Aug. 27-28,	14	--	--	20	10.1	202		202	0	--	--	--	--	--	639	0.87	24.2	106	0	2.7	902	8.2
Aug. 31-Sept. 3,	13.8	--	--	22	13	61		102	0	--	--	--	--	--	314	0.43	11.7	108	24	2.6	472	7.7
Sept. 4-6,	10.9	--	--	50	11	62		204	0	--	--	--	--	--	414	0.56	12.2	171	4	2.1	565	7.0
Sept. 7-20, 22-23,	13.9	--	--	38	11	56		178	0	--	--	--	--	--	347	0.47	13.0	139	0	2.1	494	7.5
Sept. 21,	9.4	--	--	50	16	183		185	13	--	--	--	--	--	805	1.09	20.0	190	17	5.8	1,110	8.6
Sept. 24-30,	15.0	--	--	52	15	68		181	0	--	--	--	--	--	434	0.59	17.6	191	42	2.1	637	7.9
Weighted average, 107		--	--	36	8.9	29		150	--	--	--	--	--	--	275	0.37	79.4	126	4	1.1	364	--

a Equivalent of carbonate values included.

RIO GRANDE BASIN--Continued

8-2900. RIO CHAMA NEAR CHAMITA, N. MEX.

LOCATION.--At gaging station on left bank, 200 feet downstream from bridge on U.S. Highway 285, 0.5 mile west of Chamita, Rio Arriba County, 2.5 miles northwest of San Juan Pueblo, and 3 miles upstream from mouth.

DRAINAGE AREA.--3,200 square miles, approximately, 1950 to September 1959.

RECORDS AVAILABLE.--Water temperatures: October, 1950 to September 1959.

Sediment concentrations: October, 1947 to September 1959. Maximum, 87°F Aug. 11; minimum, freezing point on many days during winter months.

EXTREMES 1958-59: Maximum daily, 38, 200 ppm Aug. 15; minimum daily, 18 ppm Jan. 14.

Sediment concentrations: Maximum daily, 68, 900 tons Aug. 8; minimum daily, 2 tons July 14.

EXTREMES 1947-59.--Water temperatures (1950-59): Maximum, 89°F July 19, 1951, Aug. 8, 1956; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 55, 500 ppm Aug. 21, 1955; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 209,000 tons Aug. 7, 1957; minimum daily, 0 tons on many days.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632. Flow affected by ice Dec. 24 to Feb. 17.

Temperature (°F) of water, water year October 1958 to September 1959

Once-daily measurement, generally between 8 a.m. and 8 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.....	49	54	50	52	64	60	54	52	66	51	67	62	57	62	61	66	48	64	--	49	54	51	50	54	48	55	44	47	48	43	49	
November....	50	52	41	51	43	44	46	44	51	46	40	35	48	46	46	46	42	42	40	39	40	48	45	41	43	42	--	42	42	32	32	
December..	39	41	43	41	40	38	43	41	42	38	42	40	38	39	35	37	40	37	36	37	38	38	37	32	--	35	35	32	32	32	32	
January....	32	32	32	32	32	32	32	32	32	32	32	32	34	37	38	37	33	40	41	38	34	33	32	35	38	38	40	39	37	40	34	
February....	32	32	32	32	39	40	32	40	42	36	33	43	41	41	42	43	41	41	42	43	34	39	47	41	41	44	33	33	41	--	39	
March.....	38	37	45	42	41	40	42	46	35	48	45	39	41	47	48	38	46	46	44	47	39	44	53	47	47	44	45	53	43	51	44	
April.....	42	44	47	54	51	53	42	43	40	47	53	42	46	47	50	45	51	45	45	41	45	48	50	--	52	51	48	50	51	--	47	
May.....	53	58	54	53	48	48	49	50	50	54	52	54	57	56	57	52	54	63	56	53	51	56	54	56	53	55	57	56	60	--	54	
June.....	62	52	57	56	59	62	67	65	63	61	61	63	64	76	63	64	68	65	67	76	86	68	67	67	--	70	66	76	66	67	--	
July.....	74	63	64	--	--	64	67	65	68	66	--	78	67	70	70	65	65	--	--	--	77	77	--	--	75	77	76	75	65	68	67	--
August.....	70	75	82	73	76	66	72	75	73	80	87	72	72	69	72	71	79	73	72	76	80	73	73	69	79	73	69	67	75	76	76	74
September..	73	73	71	80	72	72	71	74	79	68	--	--	--	72	64	68	64	65	58	62	68	62	72	63	63	--	68	68	63	58	--	68

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-2900. RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959

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...	50	52	7	81	350	77	1,210	1,030	3,370
2...	63	67	11	244	1,690	s 2,280	1,180	617	1,970
3...	79	85	18	1,150	6,660	20,700	1,170	693	2,190
4...	89	101	24	1,390	3,600	13,500	1,160	609	1,910
5...	74	69	14	1,370	3,000	11,100	1,160	558	1,750
6...	77	68	14	1,390	2,700	10,100	1,150	527	1,640
7...	79	59	13	1,410	2,960	11,300	1,120	556	1,680
8...	91	120	29	1,390	2,240	8,410	1,100	591	1,760
9...	74	105	21	1,370	2,200	8,140	856	650	1,500
10...	66	350	62	1,370	2,800	10,400	1,040	575	1,610
11...	63	430	73	1,370	1,930	7,140	1,020	480	1,320
12...	59	270	43	1,360	1,700	6,240	998	540	1,460
13...	61	166	27	1,350	2,000	7,290	965	420	1,090
14...	61	116	19	1,350	1,790	6,520	943	404	1,030
15...	61	103	17	1,350	1,720	6,270	910	388	953
16...	61	87	14	1,360	1,500	5,510	880	320	760
17...	61	89	15	1,360	1,500	5,510	860	312	724
18...	57	89	14	1,320	1,400	4,990	840	310	703
19...	52	64	9	1,320	1,230	4,380	810	379	829
20...	52	72	10	1,310	1,150	4,070	762	308	634
21...	52	59	8	1,310	1,400	4,950	517	114	159
22...	52	66	9	1,280	984	3,400	295	101	80
23...	48	74	10	1,280	980	3,390	210	82	46
24...	50	67	9	1,250	1,030	3,480	150	47	159
25...	57	190	29	1,230	1,180	3,920	122	100	a 33
26...	72	200	39	1,230	1,020	3,390	95	115	29
27...	109	317	s 109	1,230	1,000	a 3,300	85	90	21
28...	81	325	71	1,230	1,000	a 3,300	75	47	10
29...	70	580	110	1,210	1,000	a 3,300	80	43	9
30...	77	500	104	1,210	1,000	a 3,300	70	60	11
31...	94	440	112	--	--	--	60	55	9
Total	2,092	--	1,064	37,075	--	189,657	21,893	--	29,309
	January			February			March		
1...	65	52	9	70	40	8	110	119	35
2...	70	83	16	70	45	5	110	144	43
3...	70	84	16	70	86	16	110	170	50
4...	60	70	11	70	53	10	120	176	57
5...	60	61	10	70	41	8	120	185	60
6...	70	61	12	70	37	7	110	179	53
7...	90	144	35	70	40	8	100	118	32
8...	90	83	20	70	38	7	100	81	22
9...	90	75	18	70	46	9	100	71	19
10...	95	68	17	60	39	6	100	101	27
11...	95	37	9	70	34	6	100	109	29
12...	95	30	8	70	47	9	100	98	26
13...	90	31	8	60	45	7	102	79	22
14...	90	18	4	60	49	8	97	73	19
15...	90	19	5	70	45	9	99	78	21
16...	85	28	6	80	39	8	99	58	16
17...	85	27	6	100	39	11	113	101	31
18...	90	30	7	122	80	26	99	66	18
19...	90	70	17	207	365	204	94	69	18
20...	85	64	15	155	630	264	104	216	61
21...	75	33	7	161	1,110	483	122	94	31
22...	60	36	6	170	765	351	124	93	31
23...	75	40	8	167	500	225	97	58	15
24...	80	46	10	158	290	124	81	115	25
25...	90	76	18	142	185	71	124	177	59
26...	90	83	20	124	98	33	148	153	61
27...	90	66	16	119	123	40	152	114	47
28...	90	56	14	110	81	24	130	150	33
29...	90	54	13	--	--	--	107	156	45
30...	90	46	11	--	--	--	99	129	34
31...	90	49	12	--	--	--	99	138	37
Total	2,575	--	384	2,810	--	1,986	3,370	--	1,097

s Computed by subdividing day.

a Computed from estimated-concentration graph.

WESTERN GULF OF MEXICO BASINS

407

RIO GRANDE BASIN--Continued

8-2900. RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 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...	97	108	28	744	2,700	5,420	284	720	552
2...	81	88	19	707	2,430	4,640	272	740	543
3...	74	87	17	667	1,970	3,550	333	1,790	s 1,940
4...	86	119	28	667	1,900	3,420	272	2,180	1,600
5...	116	200	63	643	2,200	3,820	239	1,080	697
6...	170	400	184	572	1,700	2,630	207	650	363
7...	232	470	294	505	1,380	1,880	133	480	172
8...	349	1,200	1,130	600	2,250	3,650	161	450	196
9...	425	5,000	5,740	643	2,370	4,110	145	400	157
10...	367	2,150	2,130	593	1,950	3,120	130	320	112
11...	311	1,050	882	517	1,780	2,480	97	200	52
12...	250	560	378	517	1,790	2,500	55	190	28
13...	228	498	307	533	2,200	3,280	70	888	s 230
14...	197	447	238	614	2,700	4,480	121	9,580	s 7,800
15...	210	418	237	744	2,550	5,120	104	14,600	s 4,950
16...	235	462	293	921	2,400	5,970	90	4,100	996
17...	254	453	311	1,170	3,900	12,300	90	2,410	586
18...	265	488	349	1,150	2,770	8,600	70	1,800	340
19...	295	546	435	706	1,730	s 3,760	40	1,190	129
20...	303	605	495	398	910	978	20	1,380	75
21...	272	561	412	232	500	313	30	4,230	343
22...	246	439	292	210	500	284	30	1,720	139
23...	218	414	244	250	14,400	s 11,900	30	1,320	107
24...	210	397	225	303	4,500	3,680	40	1,160	125
25...	235	500	317	246	950	631	60	2,130	345
26...	367	1,480	s 1,620	338	1,890	s 1,990	100	1,660	448
27...	514	3,020	5,010	425	1,900	2,180	50	980	132
28...	724	2,470	4,830	400	1,380	1,480	30	330	18
29...	699	1,660	3,130	292	900	710	10	250	7
30...	675	1,400	2,550	224	700	423	5	190	3
31...	--	--	--	272	950	698	--	--	--
Total	8,805	--	32,188	16,823	--	110,007	3,308	--	23,185
	July			August			September		
1...	190	4,380	s 4,970	20	3,100	167	54	1,900	277
2...	450	4,400	5,350	20	1,800	97	52	1,550	218
3...	361	3,100	3,020	20	7,200	389	58	1,750	274
4...	375	2,600	a 2,600	30	1,300	105	52	1,150	161
5...	410	2,190	2,420	150	13,000	s 21,100	41	750	83
6...	538	1,900	2,760	300	27,800	s 21,700	35	700	66
7...	562	2,090	3,170	422	23,000	s 28,200	30	350	28
8...	514	1,800	2,500	800	31,900	68,900	25	100	a 7
9...	263	510	362	662	29,700	s 64,600	20	62	3
10...	100	460	124	294	27,100	21,500	20	60	3
11...	70	215	41	250	26,300	17,800	20	60	a 3
12...	50	46	6	220	9,500	5,640	20	56	a 3
13...	35	52	5	300	7,600	6,160	20	54	a 3
14...	25	28	2	170	7,500	s 8,510	20	51	3
15...	100	8,060	s 8,670	517	38,200	5,300	20	57	3
16...	58	21,200	3,320	368	35,800	36,900	700	14,400	27,200
17...	30	7,300	591	205	12,700	7,030	554	6,500	9,720
18...	25	2,200	a 150	175	6,000	2,840	588	7,300	11,600
19...	25	880	a 59	197	6,460	s 4,730	450	5,400	6,560
20...	50	250	34	210	7,800	4,420	490	5,400	7,140
21...	760	7,160	14,700	233	5,200	3,270	458	4,800	5,940
22...	660	3,400	6,060	221	2,200	1,310	200	3,300	1,780
23...	554	3,180	4,760	190	1,900	975	68	1,000	184
24...	570	2,600	4,000	195	4,800	2,530	54	780	114
25...	570	2,710	4,170	215	5,500	3,190	44	480	57
26...	530	3,520	5,040	251	15,000	10,200	36	290	a 28
27...	510	22,000	s 50,700	215	8,100	4,700	25	160	11
28...	300	8,600	6,970	211	8,580	s 6,440	20	126	7
29...	100	1,620	437	295	12,800	s 12,300	15	137	6
30...	30	810	66	148	3,600	1,440	15	94	4
31...	10	450	12	110	2,200	653	--	--	--
Total	8,825	--	137,069	7,614	--	423,096	4,204	--	71,486
Total discharge for year (cfs-days)	119,394								
Total load for year (tons)	1,020,528								

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

RIO GRANDE BASIN--Continued

8-2900. RIO CHAMA NEAR CHAMITA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	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
Nov. 2, 1958.....	1700		52	456	3,810		--	28	--	40	--	62	82	93	99	100	100	VPWC
Apr. 9, 1959.....	1500		53	445	7,800		4	66	85	89	91	91	91	96	99	100	--	VPWC
Apr. 9.....	1500		53	445	7,800		2	4	15	90	91	91	96	99	100	--	--	VPWC
May 18.....	1515		63	1,440	2,330		--	15	--	22	--	32	50	84	98	100	--	VPWC
May 24.....	0830		54	292	3,640		--	59	--	77	--	87	92	99	100	--	--	VPWC
June 15.....	0805		65	127	18,200		--	64	--	82	--	87	94	99	100	--	--	VPWC
June 21.....	1440		96	308	5,430		--	68	--	82	--	87	94	100	100	--	--	VPWC
July 1.....	1405		76	308	16,800		--	22	--	37	--	64	85	98	100	--	--	VPWC
July 16.....	0825		65	60	16,510		--	72	--	94	--	95	97	99	100	--	--	VPWC
July 16.....	0825		65	60	16,510		30	33	36	43	53	67	85	98	100	--	--	SPWC
July 27.....	1810		65	1,480	105,000		3	5	16	44	52	67	85	98	100	--	--	SPN
July 27.....	1810		65	1,480	105,000		3	5	16	44	52	67	85	98	100	--	--	SPN
Aug. 2.....	2015		75	25	3,080		--	58	--	70	--	83	93	100	--	--	--	VPWC
Aug. 31.....	1500		80	110	1,860		--	33	--	41	--	54	78	94	100	--	--	VPWC
Sept. 30.....	0820		62	490	6,110		5	6	8	10	13	19	52	88	99	100	--	VPWC
Sept. 20.....	0820		62	490	6,110		0	2	7	10	14	19	52	88	99	100	--	VPW

d Mean daily discharge.

RIO GRANDE BASIN--Continued

8--3130. RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.

LOCATION.--At gaging station near right bank on downstream side of pier of former railway bridge, 400 feet downstream from bridge on State Highway 4, 1.8 miles southwest of San Ildefonso Pueblo, 2.5 miles downstream from Pojoaque River, and 7 miles west of Pojoaque, Santa Fe County.

DRAINAGE AREA.--14,300 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).

RECORDS AVAILABLE.--Chemical analyses: October 1946 to September 1959.

Water temperatures: October 1948 to September 1959.

Sediment records: October 1947 to September 1959.

EXTREMES, 1958--59.--Dissolved solids: Maximum, 392 ppm Aug. 6-18; minimum, 183 ppm May 17-20.

Hardness: Maximum, 230 ppm Aug. 6-18; minimum, 118 ppm Nov. 3-30.

Specific conductance: Maximum daily, 657 microhos Aug. 8; minimum daily, 253 microhos May 19.

Water temperatures: Maximum, 86° F Aug. 1, 9, 23; minimum, freezing point on many days during winter months.

Sediment concentrations: Maximum daily, 36,000 ppm Aug. 15; minimum daily, 37 ppm Sept. 12, 13.

Sediment loads: Maximum daily, 140,000 tons Aug. 15; minimum daily, 16 tons Sept. 12.

EXTREMES, 1946--59.--Dissolved solids: Maximum, 884 ppm Aug. 26, 1951; minimum, 137 ppm June 11-20, 1952.

Hardness: Maximum, 572 ppm Aug. 26, 1951; minimum, 85 ppm June 21-30, 1949.

Specific conductance: Maximum daily, 1,230 microhos Aug. 26, 1951; minimum daily, 165 microhos June 13, 1952.

Water temperatures (1948--59): Maximum, 88° F Aug. 4-5, 1954; minimum, freezing point on many days during winter months.

Sediment concentrations (1947--59): Maximum daily, 42,600 ppm Aug. 21, 1955; minimum daily, 18 ppm Sept. 24, 26, 1953.

Sediment loads (1947--59): Maximum daily, 362,000 tons Oct. 19, 1957; minimum daily, 9 tons Sept. 22, 24, 26, 1953.

REMARKS.--Values reported for dissolved solids are calculated from determined constituents. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632. Thermograph not operating Aug. 25 to Sept. 30, once-daily measurement, generally between 11:00 a.m. and 6:00 p.m.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Boiron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Sodium sulfate ratio	Specific conductance (microhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-sulfate			
Oct. 1-30, 1958.....	387	26	44	9.2	28	3.7	171	58	10	263	0.36	275	148	8	1.0	410	7.8					
Oct. 31-Nov. 2.....	423	26	51	9.5	31	3.7	171	84	9.8	300	.41	343	166	26	1.0	456	7.8					
Nov. 3-30.....	1,719	20	36	6.7	13	2.6	118	43	4.2	184	.25	854	118	21	1.5	289	7.8					
Dec. 1-18.....	1,602	22	38	7.4	15	2.9	120	53	5.2	203	.28	878	126	27	.6	313	7.7					
Dec. 19-31.....	766	26	42	8.0	23	3.5	146	63	7.5	246	.33	509	138	18	.9	375	7.8					
Jan. 1-31, 1959.....	600	45	47	9.8	29	--	170	73	9.0	298	.41	483	158	18	1.0	403	7.9					
Feb. 1-28.....	656	40	45	9.8	27	--	159	66	8.5	275	.37	487	153	22	.9	393	7.9					
Mar. 1-31.....	605	34	46	9.7	30	--	157	80	9.5	287	.39	469	155	26	1.0	419	7.9					
Apr. 1-13.....	636	29	50	11	33	--	167	89	10	304	.41	522	170	33	1.1	454	7.9					
Apr. 14-30.....	695	27	45	9.8	25	--	155	69	9.0	262	.36	492	153	26	.9	389	7.7					
May 1-16.....	1,013	26	43	6.0	18	--	146	43	6.5	216	.29	591	132	12	.7	326	7.7					
May 17-20.....	1,353	24	40	4.9	12	--	132	41	4.0	183	.25	669	120	12	.5	279	7.7					
May 21-27.....	797	25	49	5.2	21	--	166	43	8.5	235	.25	506	144	8	.8	353	7.5					
May 28-June 14.....	574	24	37	6.4	19	--	137	47	7.5	202	.27	313	119	6	.8	308	7.3					
June 15-30.....	343	29	46	6.8	25	--	169	47	8.0	246	.33	228	143	4	.9	366	7.7					

RIO GRANDE BASIN--Continued
 8-3130. RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (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		Sodium adsorption ratio		
July 1-9, 1959....	500	24		41	4.7	16	--	140		35	6.5		0.8			197	0.27	266	122	8	0.6	295	7.5
July 10-15, 18-25....	546	31		44	5.4	22	--	160		39	8.5		.7			230	.31	215	132	1	.8	345	7.4
July 16-17.....	526	30		52	7.9	48	--	259		36	15		.3			316	.43	198	162	0	1.6	494	7.7
July 26-31.....	592	30		50	5.8	22	--	177		43	9.0		.8			247	.34	351	149	4	.8	380	7.7
Aug. 1-5.....	192	35		58	6.2	30	--	195		57	7.4		.6			286	.39	348	163	5	1.0	439	7.7
Aug. 6-18.....	762	32		78	8.2	35	--	235		86	6.6		1.2			392	.53	807	230	21	1.2	595	7.5
Aug. 19-31.....	450	31		62	6.2	32	--	189		80	7.4		1.7			313	.43	380	180	25	1.0	475	7.6
Sept. 1-15.....	189	29		46	5.8	29	--	173		47	8.8		.9			252	.34	129	139	0	1.1	389	7.6
Sept. 16-22.....	566	26		55	6.3	25	--	168		70	5.8		.8			272	.37	416	163	26	1.0	415	7.7
Sept. 23-30.....	238	35		44	7.5	28	--	165		58	7.2		.4			261	.35	168	141	6	1.0	390	7.9
Weighted average	704	28		44	7.8	22	--	151		58	7.1		0.9			242	0.33	460	142	18	0.8	365	--

RIO GRANDE BASIN--Continued

8-3130. RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959

Day	October			November			December		
	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day	Mean discharge (cfs)	Mean concentration (ppm)	Tons per day
1...	372	330	331	399	348	375	1,800	1,150	5,590
2...	391	400	422	442	725	s 1,210	1,800	1,250	6,080
3...	423	550	628	1,340	6,070	22,000	1,760	1,100	5,230
4...	423	590	674	1,670	3,400	15,300	1,750	1,030	4,870
5...	403	350	381	1,700	2,250	10,300	1,750	1,270	6,000
6...	435	710	834	1,700	1,800	8,260	1,730	1,520	7,100
7...	427	610	703	1,710	2,000	9,230	1,720	1,200	5,570
8...	423	380	434	1,700	1,690	7,760	1,710	1,180	5,450
9...	407	300	330	1,710	1,360	6,280	1,510	1,260	5,140
10...	387	320	334	1,700	1,620	7,440	1,660	1,350	6,050
11...	391	308	325	1,690	1,660	7,570	1,620	1,000	4,370
12...	384	226	234	1,680	1,580	7,170	1,580	921	3,930
13...	391	313	330	1,680	1,690	7,670	1,560	1,220	5,140
14...	384	252	261	1,680	1,420	6,440	1,490	777	3,130
15...	376	248	252	1,680	1,300	5,900	1,400	686	2,590
16...	369	244	243	1,720	1,220	5,670	1,360	732	2,690
17...	369	234	233	1,760	1,370	6,510	1,320	755	2,690
18...	361	250	244	1,710	1,380	6,370	1,320	750	2,670
19...	347	190	178	1,690	1,340	6,110	1,300	917	3,220
20...	344	143	133	1,670	1,300	5,860	1,280	702	2,430
21...	351	254	241	1,690	1,600	7,300	1,110	588	1,760
22...	351	225	215	1,710	1,400	6,460	818	544	1,200
23...	351	215	204	1,720	1,470	6,830	714	436	841
24...	351	271	257	1,740	1,280	6,010	691	550	1,030
25...	361	197	192	1,780	1,280	6,150	653	620	a 1,100
26...	391	457	482	1,820	1,500	7,370	637	470	808
27...	411	285	316	1,880	1,400	a 7,100	596	570	917
28...	423	413	472	1,930	1,300	a 6,800	561	310	470
29...	411	367	407	1,840	1,300	a 6,500	586	400	633
30...	411	325	361	1,830	1,300	a 6,400	566	430	657
31...	427	402	463	--	--	--	440	300	356
Total	12,049	--	11,114	48,971	--	220,345	38,792	--	99,712
	January			February			March		
1...	550	600	891	632	190	324	703	281	533
2...	700	610	1,150	591	203	324	703	198	376
3...	611	580	957	621	308	516	714	308	594
4...	524	300	424	616	274	456	719	332	644
5...	506	350	478	591	206	329	737	586	1,170
6...	514	460	638	606	209	342	680	302	554
7...	621	380	637	596	250	402	637	385	662
8...	591	500	798	616	310	516	658	269	478
9...	586	282	446	632	284	485	686	324	600
10...	571	221	341	616	195	324	669	293	529
11...	586	340	538	591	219	349	621	233	391
12...	596	234	377	616	234	389	606	202	331
13...	596	296	476	637	253	435	586	205	324
14...	616	379	630	621	287	481	557	218	328
15...	621	251	421	606	174	285	557	204	307
16...	596	195	314	632	224	382	566	264	403
17...	601	257	417	653	270	476	557	162	244
18...	632	204	348	648	222	388	542	183	268
19...	642	266	461	714	342	659	528	131	187
20...	642	189	328	691	356	664	533	175	252
21...	632	299	510	708	421	805	552	192	286
22...	576	216	336	737	478	951	547	168	248
23...	581	314	493	755	436	889	528	135	192
24...	606	299	489	725	440	861	506	180	246
25...	616	215	358	737	304	605	576	162	252
26...	621	222	372	737	305	607	621	217	364
27...	606	238	389	708	306	585	596	230	370
28...	601	300	487	731	267	527	591	120	191
29...	606	311	509	--	--	--	576	170	264
30...	606	280	458	--	--	--	571	116	179
31...	632	276	471	--	--	--	547	128	189
Total	18,585	--	15,942	18,364	--	14,356	18,770	--	11,957

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3130. RIO GRANDE AT OTOWI BRIDGE NEAR SAN ILDEFONSO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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-perature (°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. 3, 1958	0835		42	1,350	7,210		--	34	--	49	--	60	70	81	87	96	VPWC
Apr. 10, 1959	0825		42	824	1,490		52	64	75	78	81	82	84	91	100	--	VPWC
Apr. 10	0825		42	824	1,490		2	4	21	80	80	82	84	91	100	--	VPWC
Apr. 18	0825		51	1,830	1,730		--	20	--	29	--	44	70	83	100	--	VPWC
May 21	0955		55	953	2,370		--	36	--	--	--	82	88	96	100	--	VPWC
June 15	0915		68	474	7,460		--	64	--	88	--	91	91	93	99	100	VPWC
July 16	0920		68	318	20,200		--	76	--	94	--	100	--	--	--	--	BWC
July 28	0930		68	506	18,500		--	67	--	92	--	98	99	99	100	--	VPWC
Aug. 7	0800		68	1,910	43,400		--	35	--	46	--	81	98	100	100	--	VPWC
Aug. 8	0720		67	1,230	34,200		48	52	67	77	82	88	96	98	100	--	VPWC
Aug. 8	0720		67	1,230	34,200		1	3	13	77	82	88	96	98	100	--	VPWC
Aug. 8	1300		73	1,270	24,000		--	54	--	77	--	91	97	99	100	--	VPWC
Sept. 16	1800		63	837	3,160		--	29	--	41	--	63	92	99	100	--	VPWC

Particle-size analyses of bed material, water year October 1958 to September 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-perature (°F)	Discharge (cfs)	Sediment concen-tration (ppm)	Bed material										Method of analysis
						Percent finer than size indicated, in millimeters										
						0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000	16.000		
Aug. 8, 1959	0805	4	67	1,270		2	14	57	96	100	98	98	99	100		S
Aug. 8	1330	4	73	1,240		1	4	19	70	90	96	98	99	100		S

RIO GRANDE BASIN--Continued

8-3180. GALISTEO CREEK AT DOMINGO, N. MEX.

LOCATION.--At gaging station in Santo Domingo Pueblo Grant, 160 feet downstream from highway bridge, 0.3 mile northeast of Domingo, Sandoval County, 2.8 miles east of Santo Domingo Pueblo, and 4 miles upstream from mouth.

DRAINAGE AREA.--640 square miles, approximately.

RECORDS AVAILABLE.--Sediment records: January 1948 to September 1959.

EXTREMES, 1958-59.--Sediment concentrations: Maximum daily, 60,600 ppm May 24; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 60,300 tons May 24; minimum daily, 0 tons on many days.

EXTREMES, 1948-59.--Sediment concentrations: Maximum daily, 96,300 ppm Oct. 20, 1957; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 1,600,000 tons Sept. 25, 1955; minimum daily, 0 tons on many days each year.

REMARKS.--Records of miscellaneous water temperatures available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Suspended sediment, water year October 1958 to September 1959

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	--	0			
2..	0	--	0	0	--	0			
3..	0	--	0	0	--	0			
4..	0	--	0	0	--	0			
5..	0	--	0	0	--	0			
6..	4	7,000	76	0	--	0			
7..	0	--	0	0	--	0			
8..	0	--	0	0	--	0			
9..	0	--	0	0	--	0			
10..	0	--	0	0	--	0			
11..	0	--	0	0	--	0			
12..	5	13,600	s 381	0	--	0			
13..	5	1,150	16	0	--	0			
14..	3	1,870	15	0	--	0			
15..	1	1,150	3	0	--	0			
16..	1	910	a 2	3	1,200	a 10			
17..	1	840	a 2	1	1,200	a 3			
18..	0	--	0	0	--	0			
19..	0	--	0	0	--	0			
20..	0	--	0	0	--	0			
21..	0	--	0	0	--	0			
22..	1	470	a 1	0	--	0			
23..	1	480	1	0	--	0			
24..	0	--	0	0	--	0			
25..	1	480	1	0	--	0			
26..	1	480	a 1	0	--	0			
27..	1	410	a 1	0	--	0			
28..	1	350	1	0	--	0			
29..	1	350	1	0	--	0			
30..	1	280	a 1	0	--	0			
31..	0	--	0	--	--	--			
Total	28	--	503	4	--	13	0		0

a Computed from estimated-concentration graph.

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-3180. GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959--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..	0									
2..	0									
3..	0									
4..	0									
5..	0									
6..	0									
7..	0									
8..	0									
9..	0									
10..	0									
11..	0									
12..	0									
13..	1									
14..	1									
15..	1									
16..	0									
17..	0									
18..	0									
19..	0									
20..	0									
21..	0									
22..	0									
23..	0									
24..	0									
25..	0									
26..	0									
27..	0									
28..	0									
29..	0									
30..	0									
31..	0									
Total	3		e 3	0		0	0		0	
		April			May			June		
1..	0			0	--	0	36	17,600	s 4,780	
2..	0			0	--	0	10	23,200	s 797	
3..	0			0	--	0	2	9,100	49	
4..	0			0	--	0	0	--	0	
5..	0			0	--	0	0	--	0	
6..	0			0	--	0	0	--	0	
7..	1			0	--	0	0	--	0	
8..	1			0	--	0	0	--	0	
9..	0			0	--	0	0	--	0	
10..	0			0	--	0	0	--	0	
11..	0			0	--	0	0	--	0	
12..	0			0	--	0	0	--	0	
13..	0			0	--	0	0	--	0	
14..	0			1	--	e 1	0	--	0	
15..	0			1	--	e 1	0	--	0	
16..	0			0	--	0	0	--	0	
17..	0			0	--	0	0	--	0	
18..	0			0	--	0	0	--	0	
19..	0			0	--	0	3	--	e 150	
20..	0			0	--	0	3	--	e 30	
21..	0			0	--	0	1	--	e 5	
22..	0			0	--	0	3	21,000	sa 530	
23..	0			22	28,000	s 4,820	11	53,200	s 2,490	
24..	0			253	60,600	s 60,300	5	6,500	88	
25..	0			7	10,100	s 183	4	20,000	a 220	
26..	0			2	5,000	27	1	--	e 5	
27..	0			0	--	0	0	--	0	
28..	0			0	--	0	0	--	0	
29..	0			0	--	0	0	--	0	
30..	0			0	--	0	0	--	0	
31..	--			0	--	0	--	--	--	
Total	2		e 2	286	--	65,332	79	--	9,154	

e Estimated.

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3180. GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0	--	0	2	--	e 30			
2..	0	--	0	2	--	e 20			
3..	0	--	0	0	--	0			
4..	0	--	0	0	--	0			
5..	0	--	0	0	--	0			
6..	0	--	0	32	14,200	s 8,420			
7..	0	--	0	16	12,500	s 821			
8..	0	--	0	5	12,000	162			
9..	0	--	0	3	7,500	61			
10..	0	--	0	0	--	0			
11..	0	--	0	0	--	0			
12..	0	--	0	1	8,000	a 22			
13..	0	--	0	0	--	0			
14..	0	--	0	11	10,100	s 1,330			
15..	0	--	0	69	24,400	s 8,870			
16..	0	--	0	2	5,000	27			
17..	203	--	e 39,000	0	--	0			
18..	5	--	e 240	0	--	0			
19..	2	9,200	a 50	58	13,100	s 9,540			
20..	8	12,500	s 776	19	19,500	s 1,200			
21..	0	--	0	8	4,500	97			
22..	0	--	0	4	3,500	a 38			
23..	0	--	0	24	15,000	sa 3,000			
24..	0	--	0	70	32,800	s 11,300			
25..	1	1,830	s 57	14	15,000	a 570			
26..	0	--	0	219	49,500	s 46,300			
27..	5	5,080	s 519	5	11,600	157			
28..	0	--	0	0	--	0			
29..	1	9,670	s 167	0	--	0			
30..	21	51,800	s 4,860	0	--	0			
31..	4	14,000	a 150	0	--	0			
Total	250	--	45,819	564	--	91,965	0		0

Total discharge for year (cfs-days)..... 1,216

Total load for year (tons)..... 212,791

e Estimated.

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3180. GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	Sampling point	Water temperature (°F)	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
Oct. 6, 1958	0930		66	6	7,250		--	89	--	99	100	--	--	--	--	PWC
Oct. 12	0930		70	20	76,100		--	70	--	96	100	--	--	--	--	PWC
May 24, 1959	0145		50	50	70,400		--	57	--	80	91	97	100	--	--	VPWC
June 1	2000		53	185	53,700		--	35	--	62	85	94	99	100	--	PWC
June 24	0945		81	6	5,390		--	87	--	97	100	--	--	--	--	PWC
July 25	2340		65	2	7,790		--	81	--	96	100	--	--	--	--	PWC
Aug. 6	1210		65	10	81,300		--	79	--	97	99	100	--	--	--	VPWC
Aug. 6	2215		67	448	110,000		3	41	53	63	78	88	94	99	100	SPWC
Aug. 6	2215		67	448	110,000		3	5	18	63	76	88	94	99	100	SPN
Aug. 20	1120		68	110	42,400		--	50	--	71	--	93	99	100	--	VPWC
Aug. 24	2115		68	364	104,000		--	45	--	67	--	90	97	100	--	VPWC

RIO GRANDE BASIN--Continued

8-3180. GALISTEO CREEK AT DOMINGO, N. MEX.--Continued

Particle-size analyses of bed material, water year October 1958 to September 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)	Sampling point	Water temperature (°F)	Discharge (cfs)	Sediment concentration (ppm)	Percent finer than size indicated, in millimeters								Method of analysis	
						Percent finer than size indicated, in millimeters									
						0.065	0.125	0.250	0.500	1.00	2.00	4.00	8.00		16.00
Aug. 6, 1959	2230	3	67			1	4	20	53	78	88	92	96	100	S

RIO GRANDE BASIN--Continued

8-3295. RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 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...	222	460	276	479	1,020	1,320	170	270	124
2...	265	560	401	650	1,400	2,460	174	1,600	752
3...	199	300	161	838	2,200	4,980	162	1,360	595
4...	178	230	111	642	2,420	4,190	158	450	192
5...	174	230	108	439	780	925	204	590	325
6...	162	360	157	388	780	817	154	840	349
7...	174	680	319	388	720	754	307	1,060	875
8...	336	2,120	1,920	420	1,620	1,840	80	280	60
9...	500	3,920	5,290	682	2,150	3,960	52	250	35
10...	493	2,200	2,930	856	3,450	7,970	40	280	30
11...	394	1,990	2,120	388	1,100	1,150	18	180	9
12...	514	1,880	2,610	521	1,700	2,390	9	680	17
13...	307	1,300	1,080	302	700	571	1	630	2
14...	280	910	688	807	20,200	\$ 48,100	0	--	0
15...	240	750	486	486	13,300	17,500	0	--	0
16...	240	700	454	550	2,500	3,710	0	--	0
17...	240	600	389	1,000	3,200	8,640	12	2,370	\$ 96
18...	240	670	434	1,000	1,750	4,720	7	1,980	37
19...	479	890	1,150	1,020	2,200	6,060	0	--	0
20...	302	720	587	588	1,400	2,220	0	--	0
21...	296	700	559	300	600	486	0	--	0
22...	265	580	415	250	500	338	0	--	0
23...	194	510	267	350	400	378	0	--	0
24...	170	600	275	570	12,900	\$ 27,100	0	--	0
25...	136	440	162	588	10,900	17,300	0	--	0
26...	245	780	516	450	3,250	3,950	0	--	0
27...	174	480	226	250	1,480	999	0	--	0
28...	479	1,020	1,320	382	1,220	1,260	0	--	0
29...	521	1,130	1,590	318	640	550	0	--	0
30...	486	980	1,290	265	600	429	0	--	0
31...	--	--	--	406	760	833	--	--	--
Total	8,905	--	28,293	16,578	--	177,900	1,548	--	3,502
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	--	0	8	11,000	a 240	5	1,000	14
2...	0	--	0	0	--	0	2	1,200	6
3...	0	--	0	0	--	0	3	1,300	11
4...	0	--	0	0	--	0	0	--	0
5...	0	--	0	0	--	0	0	--	0
6...	0	--	0	0	--	0	0	--	0
7...	0	--	0	450	26,000	\$ 34,500	0	--	0
8...	0	--	0	382	21,400	\$ 22,800	0	--	0
9...	0	--	0	544	22,400	\$ 33,100	0	--	0
10...	0	--	0	432	20,800	\$ 28,400	0	--	0
11...	0	--	0	118	9,200	2,930	0	--	0
12...	0	--	0	36	6,000	5,830	0	--	0
13...	0	--	0	28	7,500	567	0	--	0
14...	0	--	0	44	9,800	1,160	0	--	0
15...	0	--	0	920	27,400	\$ 87,500	0	--	0
16...	0	--	0	905	24,400	59,600	0	--	0
17...	2	--	e 5	382	10,900	11,200	0	--	0
18...	0	--	0	261	8,600	6,060	0	--	0
19...	0	--	0	40	7,600	821	0	--	0
20...	0	--	0	200	34,400	\$ 22,000	0	--	0
21...	0	--	0	280	25,000	\$ 20,400	0	--	0
22...	29	1,840	\$ 496	58	7,700	1,210	0	--	0
23...	68	3,400	624	72	4,500	875	0	--	0
24...	37	2,000	200	82	8,000	1,770	0	--	0
25...	91	4,700	1,150	551	31,600	\$ 61,900	0	--	0
26...	136	4,500	1,650	1,240	44,000	\$ 169,000	0	--	0
27...	190	5,500	2,820	1,490	29,200	\$ 122,000	0	--	0
28...	400	25,000	a 27,000	100	12,900	3,480	0	--	0
29...	160	14,000	sa 7,000	50	4,100	554	0	--	0
30...	109	40,800	12,500	30	4,900	397	0	--	0
31...	5	14,500	196	29	3,900	305	--	--	--
Total	1,227	--	53,641	8,642	--	703,596	10	--	31
Total discharge for year (cfs-days)..... 167,206									
Total load for year (tons)..... 1,446,720									

e Estimated.

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3295. RIO GRANDE NEAR BERNALILLO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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
Oct. 13, 1958	0645		56	153	5,250		--	81	--	98	--	100	--	--	--	--	--	PWC
Nov. 4	1730		49	1,080	6,390		--	40	--	61	--	86	95	100	--	--	--	VPWC
Dec. 12	0645		35	1,760	2,270		--	--	--	--	--	14	36	81	100	--	--	V
Feb. 6, 1959	0630		33	521	1,290		--	--	--	--	--	22	33	81	100	--	--	V
Mar. 4	1830		42	514	668		--	--	--	--	--	41	49	90	100	--	--	V
Apr. 9	0800		38	507	3,840		--	67	--	84	--	86	89	97	100	--	--	VPWC
May 14	1345		68	1,320	19,700		--	50	--	82	--	96	97	99	100	--	--	VPWC
May 24	0815		58	775	3,720		--	44	--	62	--	86	94	100	--	--	--	VPWC
June 18	0730		67	8	2,550		--	90	--	96	--	100	--	--	--	--	--	PWC
July 30	0950		70	170	40,700		63	81	91	98	99	99	100	100	--	--	--	VPWC
July 30	0950		70	170	40,700		4	9	16	98	98	99	100	100	--	--	--	VPN
Aug. 7	0730		67	286	29,500		--	70	--	94	--	--	99	100	--	--	--	VPWC
Aug. 25	1250		77	977	54,300		47	54	68	81	94	97	99	100	--	--	--	VPWC
Aug. 25	1250		77	977	54,300		0	2	17	81	93	97	99	100	--	--	--	VPN

RIO GRANDE BASIN--Continued

8-3520. RIO GRANDE NEAR BERNARDO, N. MEX.

LOCATION --At gaging station at bridge on U.S. Highway 60, 2 miles east of Bernardo, Socorro County, and 3.5 miles upstream from Rio Puerco.
 DRAINAGE AREA, 200 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).
 RECORDS AVAILABLE--Chemical analyses: October 1958 to September 1959.

Sediment temperatures: October 1947 to September 1959.

EXTREMES 1958-59.--Dissolved solids: Maximum, 1,080 ppm Aug. 28; minimum, 356 ppm Nov. 5-30.

Hardness: Maximum, 584 ppm Aug. 28; minimum, 181 ppm Dec. 1-20.

Specific conductance: Maximum, 1,490 microhm Aug. 28; minimum, 468 microhm Dec. 10.

Water temperatures: Maximum, 92°F June 16; minimum, 34°F Feb. 1.

Sediment loads: Maximum daily, 77,900 tons Aug. 28; minimum daily, less than 0.50 ton on many days during summer months.

EXTREMES 1947-59.--Dissolved solids (1956-59): Maximum, 1,080 ppm Aug. 28, 1959; minimum, 207 ppm June 1-9, 1958.

Hardness: (1956-59): Maximum, 584 ppm Aug. 28, 1959; minimum, 120 ppm July 1-4, 1957, June 1-9, 1958.

Specific conductance (1958-59): Maximum, 92°F June 16, 1959; minimum, 34°F Feb. 1, 1959.

Water temperatures: Maximum daily, 348,000 tons Sept. 26, 1955; minimum daily, 0 tons on many days during summer months of most years.

Sediment loads: Maximum daily, 348,000 tons Sept. 26, 1955; minimum daily, 0 tons on many days during summer months of most years.

REMARKS.--Values reported for sodium (Na) are determined by analysis and do not include potassium (K). Records of specific conductance of daily samples and mean daily sediment concentrations available in district office at Albuquerque, N. Mex. Records are summation of water and sediment discharges in Main Channel, Conveyance Channel, and Bernardo Interior Drain. Table for particle-size analyses for Conveyance Channel and Main Channel are published separately and show water discharges and concentrations in the channel at the time of sampling. Sediment concentrations are not listed because a composite concentration of more than one channel is meaningless. Chemical records computed from summation of water discharges from all channels. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)		Hardness as CaCO ₃	Sodium adsorption ratio	Specific conductance (microhm at 25°C)			
													Parts per million	Tons per acre-foot				Tons per day	Calcium, Magnesium	
Oct. 13-12, 1958...	218	85		54	12	77	--	171	10	143	31	0.2	496	0.67	292	184	2.5	684		
Oct. 13-18, 22,																				
27-31.....	130	96		50	15	92	--	177	11	170	36	.6	558	.76	196	188	24	732	8.6	
Oct. 19-21, 23-26.	68.6	95		64	19	106	--	210	10	208	46	.6	632	.89	321	236	48	3.0	901	8.5
Nov. 1-4.....	236	73		76	12	74	--	251	3	145	30	2.0	541	.74	345	240	10	2.1	599	8.3
Nov. 5-30.....	1,608	57		61	7.8	37	--	189	7	177	14	2.5	386	.48	1,500	184	18	1.2	492	8.6
Dec. 1-20.....	1,549	60		60	7.7	38	--	178	11	76	15	1.7	308	.49	1,800	181	18	1.2	492	8.6
Dec. 21-31.....	890	66		60	10	47	--	210	0	94	20	1.7	402	.55	966	191	19	1.5	556	8.2
Jan. 1-31, 1959...	610	71		62	11	54	--	194	13	102	22	1.9	432	.59	712	199	18	1.7	595	8.6
Feb. 1-28.....	393	67		62	8.4	50	--	198	12	98	22	1.9	406	.55	672	193	20	1.6	577	8.4
Mar. 1-31.....	378	59		68	8.4	56	--	213	2	115	26	1.6	440	.60	473	208	30	1.7	626	8.3
Apr. 1-7, 26-30...	178.6	84		58	11	74	--	189	9	140	32	1.1	504	.69	242	196	26	2.3	683	8.5
Apr. 8-25.....	163	69		81	15	97	--	254	0	197	43	1.2	628	.85	130	262	54	2.6	891	8.1
May 1-16.....	241	65		74	11	72	--	233	0	156	34	2.2	526	.72	234	237	46	2.1	760	8.1
May 17.....	331	38		122	13	118	--	250	0	302	70	1.9	788	1.07	704	360	155	2.7	1,160	8.0

RIO GRANDE BASIN--Continued
8-3320. RIO GRANDE NEAR BERNARDO, N. MEX.--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 (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				
May 18-19, 1959...	478	47		80	8.9	65	--	224	0	145	31		3.8			491	0.67	634	52	1.8	720	8.2	
May 20-27.....	440	51		75	9.2	57	--	225	0	126	26		2.5			458	.62	544	46	1.7	665	8.1	
May 28-31.....	382	46		77	10	67	--	225	0	147	31		2.8			492	.67	507	50	1.9	724	8.1	
June 1-6.....	182	53		80	13	76	--	234	4	162	36		1.7			541	.74	266	56	2.1	789	8.3	
June 7-15.....	45.2	70		90	18	110	--	265	4	229	52		1.4			703	.96	85.8	74	2.8	1,000	8.3	
June 16-30.....	15.9	84		85	21	134	--	249	9	280	64		.3			799	1.09	34.3	81	3.4	1,120	8.4	
July 1-Aug. 6.....	4.2	62		95	20	126	--	269	3	274	65		.7			778	1.06	8.82	94	3.1	1,120	8.3	
Aug. 7-12.....	88.8	37		94	13	86	--	259	0	200	39		1.6			598	.81	143	76	2.2	879	7.9	
Aug. 13-18.....	151	34		84	12	67	--	248	0	159	30		.7			509	.69	208	57	1.8	778	7.8	
Aug. 19-25.....	201	35		94	11	70	--	234	0	189	32		1.3			547	.74	297	88	1.8	818	7.9	
Aug. 26-27.....	332	36		126	18	70	--	248	0	271	36		1.9			681	.93	610	388	1.85	981	7.6	
Aug. 28.....	891	24		199	21	114	--	250	0	534	60		.4			1,080	1.47	2,600	584	379	2.1	1,490	7.5
Aug. 29-30.....	244	27		146	14	97	--	249	0	354	48		.4			1,808	1.10	532	422	218	2.1	1,160	7.4
Aug. 31-Sept. 2.....	129	41		90	8.6	72	--	244	0	168	32		3.4			535	.73	186	60	1.9	794	7.7	
Sept. 3-30.....	9.0	57		92	19	122	--	263	0	263	58		.9			741	1.01	18.0	308	92	3.0	1,080	8.2
Weighted average	424	60		65	9.4	50	--	a211	--	104	21		1.9			415	0.56	486	200	28	1.5	584	--

a Includes carbonate computed as bicarbonate.

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-3320. RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959

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...	242		380	242		745	1,730		17,300
2...	237		354	200		571	1,720		14,600
3...	218		265	235		692	1,670		15,200
4...	202		184	269		1,060	1,680		13,600
5...	200		164	942		s 17,300	1,660		13,100
6...	213		199	1,300		23,300	1,650		12,000
7...	276		399	1,410		20,400	1,630		13,600
8...	264		515	1,420		16,300	1,640		12,400
9...	234		502	1,460		15,000	1,630		10,600
10...	215		352	1,480		15,400	1,610		10,500
11...	171		214	1,490		14,400	1,460		13,300
12...	140		140	1,470		12,700	1,600		10,200
13...	112		60	1,500		12,300	1,570		9,580
14...	124		67	1,520		13,300	1,530		9,690
15...	112		53	1,620		12,300	1,480		10,100
16...	130		110	1,630		12,800	1,440		9,700
17...	116		87	1,790		17,600	1,390		8,290
18...	88		39	1,790		17,900	1,320		7,900
19...	66		18	1,790		20,900	1,290		8,080
20...	72		21	1,780		22,100	1,280		7,620
21...	59		22	1,710		17,500	1,230		7,160
22...	68		24	1,690		16,700	1,260		6,930
23...	74		21	1,680		20,800	1,100		4,980
24...	79		25	1,690		17,100	928		4,040
25...	66		21	1,700		13,800	817		3,550
26...	64		21	1,710		14,500	787		3,210
27...	86		28	1,770		16,000	765		2,820
28...	123		s 250	1,830		16,500	738		2,740
29...	199		682	1,830		15,700	782		3,040
30...	204		588	1,810		18,200	724		2,850
31...	200		455	--		--	659		3,070
Total	4,654		6,260	42,758		433,868	40,771		271,750
	January			February			March		
1...	639		2,940	589		1,420	715		1,410
2...	604		2,010	580		1,500	632		1,580
3...	434		759	595		1,560	570		1,670
4...	514		s 2,120	597		1,490	475		1,390
5...	684		2,230	587		1,200	477		1,920
6...	420		1,250	596		1,160	515		2,020
7...	462		1,530	630		1,300	594		2,010
8...	494		1,770	593		1,290	656		2,730
9...	574		2,250	574		1,270	560		1,610
10...	669		2,580	576		1,330	486		1,580
11...	674		2,400	575		1,360	480		1,690
12...	658		a 2,200	591		1,800	446		1,300
13...	673		1,930	596		1,480	436		1,120
14...	746		1,780	596		1,420	395		1,080
15...	809		2,240	592		1,630	398		1,300
16...	728		1,900	604		1,650	414		1,200
17...	670		1,680	618		1,400	372		1,030
18...	622		1,660	602		1,440	294		464
19...	602		1,350	592		1,270	261		347
20...	615		1,520	592		1,120	292		772
21...	613		1,500	592		1,110	262		569
22...	614		1,500	640		1,580	296		636
23...	619		1,670	655		1,440	321		670
24...	609		1,500	646		1,230	300		453
25...	588		1,540	700		1,480	298		401
26...	601		1,560	699		2,020	226		208
27...	604		1,460	696		1,650	204		186
28...	588		1,410	672		1,420	212		293
29...	596		896	--		--	266		769
30...	589		1,030	--		--	276		340
31...	587		1,160	--		--	213		139
Total	18,899		53,365	17,175		40,020	12,342		32,887

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3320. RIO GRANDE NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 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...	203		181	119		56	282		573
2...	181		132	124		58	228		365
3...	151		73	115		58	260		207
4...	72		18	157		144	103		77
5...	59		16	242		530	112		69
6...	44		7	302		866	104		92
7...	47		9	256		601	74		47
8...	86		34	223		306	99		45
9...	118		67	172		232	72		33
10...	150		109	183		283	38		8
11...	121		69	386	s 2,410		32		4
12...	155		239	382	1,970		28		3
13...	219		373	258	737		27		2
14...	275		795	299	860		13		2
15...	203		394	245	587		24		4
16...	162		142	384		2,170	28		16
17...	169		233	331		3,420	22		7
18...	136		121	454		5,450	21		4
19...	118		86	502		4,890	20		3
20...	146		130	602	a 4,800		18		2
21...	246		442	643		4,020	16		1
22...	208		220	438		1,730	16		1
23...	176		131	296		810	14		1
24...	156		113	252		629	15		2
25...	130		63	236		485	14		1
26...	103		34	491		2,220	11		1
27...	104		26	561		6,010	15		2
28...	82		23	489		3,980	10		(t)
29...	92		28	389		1,720	9		(t)
30...	86		26	358		1,190	9		(t)
31...	--		--	290		698	--		--
Total	4,198		4,334	10,189		53,920	1,734		1,573
	July			August			September		
1...	6		(t)	3			144		1,040
2...	6		(t)	3			77		322
3...	8		1	3			36		64
4...	9		(t)	3		(et)	27		36
5...	8		(t)	3			19		19
6...	7		(t)	3			10		6
7...	8		(t)	26		s 1,570	6		1
8...	7		(t)	11		44	5		(t)
9...	4			76		2,750	6		(t)
10...	4			152		5,970	14		3
11...	4			153		6,370	11		1
12...	4			115		3,780	10		1
13...	4			88		1,560	5		(t)
14...	4			76		1,250	11		1
15...	4			93		1,110	9		(t)
16...	4			132		1,690	5		1
17...	3			272		10,400	6		(t)
18...	4			245		9,850	3		
19...	3			173		4,180	3		
20...	3		(et)	208		4,190	4		
21...	3			201		4,040	4		
22...	3			217		3,920	7		
23...	3			240		5,690	7		
24...	3			231		3,310	5		(et)
25...	3			136		776	4		
26...	3			171		s 2,950	3		
27...	3			493		s 33,300	5		
28...	3			891		s 77,900	8		
29...	3			302		9,740	12		
30...	3			186		6,090	8		
31...	3			165		1,630	--		
Total	137		3	5,071		204,060	474		1,499
Total discharge for year (cfs-days).....									158,402
Total load for year (tons).....									1,103,499

e Estimated.

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3530. RIO PUERCO NEAR BERNARDO, N. MEX.

LOCATION.--At gaging station at bridge on U.S. Highway 85, 1.2 miles southwest of Bernardo, Socorro County, 3 miles upstream from mouth, and 18 miles south of Belen.

DRAINAGE AREA.--5,860 square miles, approximately.

RECORDS AVAILABLE.--Sediment records: October 1947 to September 1959.

EXTREMES, 1958-59.--Sediment concentrations: Maximum daily, 211,000 ppm Aug. 8; minimum daily, no flow on many days.

Sediment loads: Maximum daily, 977,000 tons Aug. 8; minimum daily, 0 tons on many days.

EXTREMES, 1947-59.--Sediment concentrations: Maximum daily, 230,000 ppm July 26, 1957; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 2,240,000 tons Aug. 7, 1957; minimum daily, 0 tons on many days each year.

REMARKS.--No flow November to April; tabulation omitted for these periods. Records of specific conductance of daily samples and miscellaneous temperatures available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

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		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, 1958.....	4	14	0.02	391	71	192	12	134		1,440	82	0.6	0.6	0.26	2,270	3.09	25	1,270	1,160	2.3	2,650	7.3

Chemical analysis, in parts per million, water year October 1958 to September 1959

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-3530. RIO PUERCO NEAR BERNARDO, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959

Day	October			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..	0	--	0	0	--	0	0	--	0
2..	0	--	0	0	--	0	0	--	0
3..	0	--	0	0	--	0	7	7,500	s 360
4..	0	--	0	0	--	0	0	--	0
5..	0	--	0	0	--	0	0	--	0
6..	0	--	0	0	--	0	0	--	0
7..	79	98,300	s 25,700	0	--	0	0	--	0
8..	21	86,500	5,000	0	--	0	0	--	0
9..	10	71,000	1,990	0	--	0	0	--	0
10..	4	45,000	504	10	109,000	s 3,800	0	--	0
11..	0	--	0	2	92,000	534	0	--	0
12..	0	--	0	0	--	0	8	4,380	s 435
13..	0	--	0	0	--	0	0	--	0
14..	0	--	0	22	16,000	sa 7,100	0	--	0
15..	0	--	0	28	62,500	s 5,770	0	--	0
16..	4	26,600	s 820	0	--	0	13	30,800	s 1,350
17..	6	35,000	588	0	--	0	0	--	0
18..	2	20,000	a 110	0	--	0	0	--	0
19..	0	--	0	0	--	0	0	--	0
20..	0	--	0	0	--	0	0	--	0
21..	0	--	0	0	--	0	0	--	0
22..	0	--	0	0	--	0	0	--	0
23..	0	--	0	0	--	0	0	--	0
24..	0	--	0	1,040	43,000	s 324,000	32	119,000	s 18,800
25..	0	--	0	432	81,500	98,600	10	143,000	4,290
26..	0	--	0	106	78,500	23,300	1	78,000	sa 460
27..	0	--	0	17	60,000	2,860	0	--	0
28..	38	27,800	s 4,130	2	49,000	a 270	0	--	0
29..	0	--	0	0	--	0	0	--	0
30..	7	18,000	sa 400	0	--	0	0	--	0
31..	0	--	0	0	--	0	--	--	--
Total	171	--	39,332	1,659	--	466,234	71	--	25,695
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	--	0	0	--	0	2	400	a 2
2..	0	--	0	0	--	0	0	--	0
3..	0	--	0	0	--	0	0	--	0
4..	0	--	0	0	--	0	0	--	0
5..	0	--	0	0	--	0	0	--	0
6..	0	--	0	0	--	0	0	--	0
7..	0	--	0	231	156,000	108,000	0	--	0
8..	0	--	0	1,340	211,000	s 977,000	0	--	0
9..	0	--	0	765	148,000	340,000	0	--	0
10..	0	--	0	865	138,000	s 436,000	0	--	0
11..	0	--	0	460	97,000	129,000	0	--	0
12..	0	--	0	70	62,000	12,200	0	--	0
13..	0	--	0	15	56,000	2,350	0	--	0
14..	0	--	0	6	70,000	1,180	0	--	0
15..	0	--	0	210	84,200	s 184,000	0	--	0
16..	0	--	0	920	164,000	s 536,000	0	--	0
17..	0	--	0	190	135,000	74,400	0	--	0
18..	0	--	0	60	125,000	21,800	0	--	0
19..	0	--	0	35	103,000	s 12,600	0	--	0
20..	0	--	0	130	146,000	s 77,100	0	--	0
21..	0	--	0	260	155,000	s 135,000	0	--	0
22..	0	--	0	375	162,000	s 195,000	0	--	0
23..	0	--	0	90	103,000	26,900	0	--	0
24..	0	--	0	76	82,000	17,400	0	--	0
25..	0	--	0	335	162,000	163,000	0	--	0
26..	0	--	0	1,380	162,000	s 747,000	0	--	0
27..	18	10,000	sa 6,300	610	110,000	195,000	0	--	0
28..	133	78,300	s 34,300	150	62,500	s 31,900	0	--	0
29..	72	93,900	s 23,000	32	47,000	4,210	0	--	0
30..	18	103,000	5,380	53	57,000	6,460	0	--	0
31..	10	79,000	2,210	15	23,000	931	--	--	--
Total	251	--	71,190	8,673	--	4,436,431	2	--	2
Total discharge for year (cfs-days).....									10,827
Total load for year (tons).....									5,038,884

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3530. RIO PUERCO NEAR BERNARDO, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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 temp-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. 17, 1958	1730		67	3	20,900		95	--	100	--	--	--	--	--	PWC	
May 10, 1959	1400		76	8	131,000		81	--	95	--	100	--	--	--	PWC	
June 3, 1959	1830		62	19	12,300		79	--	95	--	100	--	--	--	PWC	
June 25, 1959	1800		78	4	138,000		--	--	--	--	100	--	--	--	PWC	
July 30, 1959	0530		70	24	110,000		--	--	99	--	100	--	--	--	PWC	
Aug. 10, 1959	1915		73	1,040	141,000		43	50	51	61	72	87	95	99	100	SPWC
Aug. 10, 1959	1915		73	1,040	141,000		3	3	6	63	74	87	95	99	100	SPN
Aug. 12, 1959	0930		75	74	57,400		78	88	95	100	--	--	--	--	--	PWC
Aug. 12, 1959	0930		75	74	57,400		2	3	13	96	98	100	--	--	--	PN
Aug. 16, 1959	1545		80	840	123,000		--	46	--	63	84	95	100	--	--	SPWC
Aug. 25, 1959	1000		70	335	162,000		--	44	--	60	--	84	93	100	--	SPWC
Aug. 26, 1959	1405		72	1,860	165,000		--	38	--	50	--	77	92	100	--	SPWC

Particle-size analyses of bed material, water year October 1958 to September 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 temp-ature (°F)	Discharge (cfs)	Sediment concen-tration (ppm)	Bed material						Method of analysis		
						Percent finer than size indicated, in millimeters								
						0.0625	0.125	0.250	0.500	1.00	2.00			
Aug. 12, 1959	1130	2	--			0	6	46	99	100				S
Aug. 25, 1959	1035	2	70			7	23	60	96	100				S
Aug. 26, 1959	1340	3	72			4	15	48	86	99	100			S

RIO GRANDE BASIN--Continued

8-3548. RIO GRANDE CONVEYANCE CHANNEL AT SAN ACACIA, N. MEX.

LOCATION.--At gaging station, at railway crossing, 0.5 mile south of San Acacia, and 1.2 miles downstream from San Acacia diversion dam, Socorro County.
 DRAINAGE AREA.--26,770 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).
 RECORDS AVAILABLE.--Water temperatures: May to September 1959.

Sediment records: January to September 1959.

EXTREMES, January to September 1959.--Water temperatures (May to September 1959): Maximum, 93°F July 10.

Sediment concentrations: Maximum daily, 131,000 ppm Aug. 10; minimum daily, no flow July 22-27.
 Sediment loads: Maximum daily, 346,000 tons Aug. 8; minimum daily, 0 tons July 22-27.
 REMARKS.--Records of specific conductance of water samples available in district office at Albuquerque, N. Mex. Records of discharge for period January to September 1959 furnished by Santa Fe district office of Surface Water Branch. Records of composite discharge for Rio Grande conveyance channel at San Acacia, and Rio Grande floodway at San Acacia given under Rio Grande at San Acacia in WSP 1632. Quality-of-water records for Rio Grande floodway at San Acacia given on page 436.

Temperature (°F) of water, May to September 1959

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	70	74	62	70	65	67	67	65	70	67	73	81	69	63	71	72	73	70	68	65	62	70	69	74	66	69	67	72	67	59	71	--
June	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	75	70	69	62	70	69	74	66	69	67	72	67	59	71	--
July	86	87	70	--	65	90	80	80	85	83	90	80	91	87	86	84	81	78	83	77	72	85	85	72	73	73	71	71	82	74	82	80
August	80	81	83	82	82	82	82	83	83	80	70	72	80	82	77	71	79	80	87	80	79	79	73	78	81	83	84	68	78	78	78	78
September..	84	80	63	83	63	83	85	84	82	79	69	78	75	76	78	78	78	78	78	72	75	76	50	72	51	--	81	74	71	70	--	75

RIO GRANDE BASIN--Continued

8-3548. RIO GRANDE CONVEYANCE CHANNEL AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, January to September 1959

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..						5.6			
2..						5.4			
3..						6.2			
4..						5.6			
5..						5.9			
6..						6.2			
7..						6.4			
8..						6.2			
9..						6.4			
10..				5		6.2			
11..						6.2			
12..						5.9			
13..						5.9			
14..						5.9			
15..						6.2			
16..	6					6.4			
17..						6.4			
18..				5.2		6.2			
19..				5.4		6.2			
20..				5.2		5.9			
21..				5.4		5.9			
22..				5.4		5.6			
23..				5.4		6.4			
24..				5.0		6.4			
25..				5.0		6.2			
26..				5.4		5.9			
27..				5.6		5.6			
28..				5.6		5.9			
29..				--		5.2			
30..				--		5.9			
31..				--		5.9			
Total	186		e 30	143.6		e 20	186.2	e 40	
		April		May		June			
1..	5.9			4.6	--	57	1,150	177	
2..	5.6			5.2	--	37	376	38	
3..	5.9			5.4	--	8.4	86	2	
4..	5.6			5.2	--	7.3	126	2	
5..	5.4			5.6	--	7.3	63	1	
6..	5.0			6.2	--	7.3	50	1	
7..	5.0			6.4	--	6.7	37	1	
8..	5.0			6.4	--	6.4	31	1	
9..	5.0			6.4	--	5.9	43	1	
10..	5.0			6.2	--	5.6	53	1	
11..	5.6			6.2	--	5.6	50	1	
12..	5.4			6.7	--	5.4	53	1	
13..	5.4			6.4	--	5.2	38	1	
14..	5.9			6.4	--	5.0	54	1	
15..	5.9			6.4	--	4.8	32	(t)	
16..	5.9			6.2	--	4.8	32	(t)	
17..	5.9			5.9	--	4.8	46	1	
18..	5.9			138	3,200	s 1,990	4.6	44	1
19..	5.2			281	5,900	4,480	4.1	31	(t)
20..	5.4			349	3,600	3,390	3.3	31	(t)
21..	5.6			449	4,000	4,850	2.7	80	1
22..	5.9			385	2,700	2,810	2.4	86	1
23..	5.6			200	1,650	891	2.1	64	(t)
24..	5.4			189	5,330	s 4,500	1.7	16	(t)
25..	5.6			338	21,600	s 35,600	1.6	18	(t)
26..	5.0			400	17,900	19,300	1.6	20	(t)
27..	5.0			388	11,200	11,700	1.6	27	(t)
28..	4.6			294	6,950	5,520	1.6	27	(t)
29..	4.6			181	1,800	782	1.5	47	(t)
30..	4.3			134	2,800	1,010	1.7	27	(t)
31..	--	--	--	111	2,850	854	--	--	--
Total	161.5	--	e 30	3,918.8	--	97,694	215.0	--	236

e Estimated.

s Computed by subdividing day.

t Less than 0.50 ton.

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-3548. RIO GRANDE CONVEYANCE CHANNEL AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, January to September 1959--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..	1.7	250	251	0.3	226	(t)	2	9,000	49
2..	1.7	41	(t)	.3	173	(t)	2	880	5
3..	1.7	75	(t)	.3	186	(t)	1	175	(t)
4..	1.7	110	(t)	.3	177	(t)	.5	100	(t)
5..	1.6	89	(t)	.3	277	(t)	.6	84	(t)
6..	1.5	49	(t)	14	61,300	s 5,320	.6	32	(t)
7..	1.4	50	(t)	282	91,800	s 113,000	.6	47	(t)
8..	1.4	75	(t)	819	114,000	s 345,000	.5	55	(t)
9..	1.3	51	(t)	822	130,000	s 322,000	.5	64	(t)
10..	1.1	40	(t)	681	131,000	s 123,000	.5	83	(t)
11..	.9	38	(t)	458	80,000	s 115,000	.4	38	(t)
12..	.8	68	(t)	58	38,000	6,170	.4	83	(t)
13..	.7	71	(t)	15	15,300	620	.4	133	(t)
14..	.6	51	(t)	23	28,700	s 3,410	.4	92	(t)
15..	.5	42	(t)	102	84,800	s 33,400	.4	108	(t)
16..	.4	65	(t)	442	81,500	s 134,000	.3	110	(t)
17..	.4	76	(t)	400	65,500	73,400	.3	112	(t)
18..	.3	40	(t)	278	54,300	42,300	.3	83	(t)
19..	.2	60	(t)	120	34,900	s 12,200	.3	253	(t)
20..	.2	75	(t)	207	62,700	s 45,300	.3	67	(t)
21..	.2	27	(t)	424	92,500	s 135,000	.4	60	(t)
22..	0	--	0	292	79,400	s 74,800	.3	44	(t)
23..	0	--	0	186	46,200	s 30,600	.2	31	(t)
24..	0	--	0	60	26,900	s 7,910	.2	43	(t)
25..	0	--	0	331	75,800	s 71,900	.2	35	(t)
26..	0	--	0	253	57,400	s 70,600	.2	40	(at)
27..	0	--	0	332	57,900	s 71,100	.2	42	(t)
28..	11	33,200	s 2,760	298	55,500	s 48,900	.2	50	(t)
29..	.3	2,300	2	340	28,000	25,700	.2	94	(t)
30..	2.3	18,900	s 417	194	21,500	11,300	.2	52	(t)
31..	.3	800	1	7.5	19,000	385	--	--	--
Total	34.2	--	3,185	7,440.0	--	1,922,316	14.6	--	56

Total discharge for period (cfs-days)..... 12,299.9
 Total load for period (tons)..... 2,023,607

s Computed by subdividing day.

t Less than 0.50 ton.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued
8-3548. RIO GRANDE CONVEYANCE CHANNEL AT SAN ACACIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, January to September 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 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	
May 18, 1959.....	1800		69	218	4,920		--	62	--	73	--	82	93	100			VPWC
June 1.....	1700		70	36	1,662		--	--	--	--	--	98	98	99	100		S
June 17.....	1000		76	4.6	326		--	--	--	--	--	94	96	100			S
July 28.....	0930		72	91	93,600		--	72	--	95	--	100	--	--			PWC
Aug. 8.....	1400		82	1,450	120,000		51	54	71	79	88	91	96	100			VPWC
Aug. 8.....	1400		82	1,450	120,000		0	1	4	75	86	91	96	100			VFN
Aug. 11.....	1600		83	354	68,900		63	73	82	90	95	98	100	--			VPWC
Aug. 11.....	1600		83	354	68,900		1	2	6	81	96	98	100	--			VFN
Aug. 26.....	1230		78	815	144,000		--	44	--	63	--	89	95	100			SPWC
Sept. 1.....	1700		84	2	9,430		--	95	--	100	--	--	--	--			PWC

RIO GRANDE BASIN--Continued

8-3549. RIO GRANDE FLOODWAY AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, January to September 1959

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..	711			620	1,760	2,950	685	1,310	2,420
2..	685			633	1,690	2,890	672	1,360	2,470
3..	566	--	e 3,000	659	1,920	3,420	577	1,620	2,520
4..	503			672	1,720	3,120	485	1,470	1,920
5..	685	2,040	3,770	633	2,120	3,620	421	1,330	1,510
6..	544	1,980	2,910	609	1,900	3,120	413	1,770	1,970
7..	503	1,980	2,690	724	2,400	a 4,700	577	1,200	1,870
8..	512	1,840	2,540	646	2,380	4,150	598	1,600	2,580
9..	566	1,660	2,540	620	1,890	3,160	598	800	1,290
10..	633	2,010	3,440	620	2,000	3,350	359	410	475
11..	750	2,590	5,240	646	1,550	2,700	398	1,220	1,310
12..	737	2,280	4,540	711	1,340	2,570	343	720	667
13..	750	2,220	4,500	646	1,360	2,370	343	770	713
14..	766	1,940	4,010	620	1,340	2,240	310	1,080	904
15..	796	1,590	3,420	620	1,530	2,560	370	800	583
16..	812	2,000	4,380	620	1,300	2,180	251	730	692
17..	724	2,160	4,220	659	1,520	2,700	310	280	234
18..	685	2,370	4,380	659	1,820	3,240	205	290	161
19..	685	1,600	2,960	577	1,500	2,340	163	330	145
20..	588	2,960	4,700	598	1,580	2,550	171	450	208
21..	598	2,400	3,880	598	1,420	2,290	225	570	sb 400
22..	620	1,700	2,850	646	1,600	2,790	289	480	375
23..	711	1,800	3,460	711	2,100	4,030	176	480	228
24..	750	1,590	3,220	698	1,670	3,150	181	360	176
25..	672	1,600	2,900	766	1,660	3,430	155	280	117
26..	609	1,680	2,760	781	2,170	4,580	144	360	140
27..	620	1,490	2,490	766	2,200	4,550	122	330	109
28..	633	1,430	2,440	711	1,980	3,800	136	525	s 326
29..	588	1,620	2,570	--	--	--	1,100	900	650
30..	620	1,800	3,010	--	--	--	185	480	240
31..	659	1,700	3,020	--	--	--	136	530	195
Total	20,281	--	104,840	18,469	--	88,550	10,217	--	27,598
April									
1..	132	380	135	9	145	4	64	--	
2..	95	280	72	20	150	8	57	--	
3..	72	80	16	16	130	6	48	--	e 40
4..	50	150	20	22	175	sb 21	25	--	
5..	39	135	14	106	530	152	9	--	
6..	36	130	13	167	820	370	11	250	
7..	22	110	7	185	500	250	9	--	
8..	11	80	2	167	580	262	8	180	
9..	11	70	2	103	479	s 161	9	--	
10..	23	158	s 15	95	400	103	8	--	
11..	39	230	24	152	767	s 353	7	230	a 5
12..	21	135	8	323	1,500	1,310	6	--	
13..	77	315	65	140	1,060	401	7	--	
14..	122	480	158	119	570	183	7	--	
15..	126	680	231	209	2,710	s 1,640	8	--	
16..	97	350	92	189	2,500	s 1,710	7	--	
17..	87	210	49	284	6,050	4,640	8	--	
18..	103	192	s 72	78	3,030	s 759	7	--	
19..	145	183	s 80	90	2,300	a 560	4	--	
20..	43	138	s 22	68	--	e 350	0	--	0
21..	79	310	66	74	--	e 400	0	--	0
22..	136	460	169	43	--	e 200	0	--	0
23..	92	270	67	39	700	74	0	--	0
24..	57	210	32	973	--	e 250,000	0	--	0
25..	103	254	s 106	702	--	e 50,000	0	--	0
26..	178	320	154	55			0	--	0
27..	19	245	13	55			0	--	0
28..	18	205	10	57	--	e 600	0	--	0
29..	15	150	6	61			0	--	0
30..	8	140	3	68	1,000	184	0	--	0
31..	--	--	--	50	--	e 130	--	--	--
Total	2,056	--	1,723	4,719	--	316,631	309	--	235

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

RIO GRANDE BASIN--Continued

8-3549. RIO GRANDE FLOODWAY AT SAN ACACIA, N. MEX.--Continued

Suspended sediment, January to September 1959--Continued

Day	July			August			September		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1..	0	--	0	0	--	0	9		
2..	0	--	0	0	--	0	7		
3..	0	--	0	0	--	0	6		
4..	2	--	e 1	0	--	0	4		
5..	4	--	e 3	0	--	0	3		
6..	0	--	0	17	43,600	s 5,240	3	--	e 50
7..	0	--	0	556	97,600	s 252,000	2		
8..	0	--	0	558	92,900	s 241,000	3		
9..	0	--	0	158	87,900	s 46,900	2		
10..	0	--	0	99	76,000	s 27,700	2		
11..	0	--	0	30	68,000	5,710	1		
12..	1	--	e 1	140	46,800	s 22,600	0	--	0
13..	1	--	e 1	56	20,200	s 4,280	0	--	0
14..	0	--	0	37	33,200	s 5,960	0	--	0
15..	0	--	0	45	81,000	a 10,000	0	--	0
16..	0	--	0	390	110,000	sa 150,000	0	--	0
17..	0	--	0	74	71,000	14,700	0	--	0
18..	0	--	0	104	38,500	s 14,200	0	--	0
19..	0	--	0	230	49,000	sa 60,000	0	--	0
20..	0	--	0	37			0	--	0
21..	0	--	0	64		e 8,000	0	--	0
22..	0	--	0	132			0	--	0
23..	0	--	0	87			0	--	0
24..	0	--	0	45			0	--	0
25..	0	--	0	77	60,000	13,000	0	--	0
26..	0	--	0	938	86,200	s 269,000	0	--	0
27..	105	18,000	s 45,300	310	81,500	70,700	0	--	0
28..	76	59,000	s 20,300	566	75,000	119,000	0	--	0
29..	0	--	0	75	36,000	7,560	0	--	0
30..	0	--	0	45	28,000	3,400	0	--	0
31..	0	--	0	40	17,000	1,440	--	--	--
Total	189	--	65,600	4,910	--	1,384,790	42	--	550

Total discharge for period (cfs-days)..... 61,192
 Total load for period (tons)..... 1,990,517

e Estimated.

s Computed by subdividing day.

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3549. RIO GRANDE FLOODWAY AT SAN ACACIA, N. MEX.--Continued

Particle-size analyses of suspended sediment, January to September 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-perature (°F)	Discharge (cfs)	Sediment concen-tration (gpm)	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. 23, 1958.....	1500		45	1,070	1,040		--	16	--	32	--	68	93	100	--	--	VPWC
Jan. 20, 1959.....	0700		38	577	2,880		--	--	--	--	--	16	47	97	100	--	V
Feb. 26.....	0630		39	828	2,080		--	--	--	--	--	21	49	95	100	--	V
Mar. 13.....	1630		56	359	426		--	--	--	--	--	53	92	100	--	--	V
Apr. 14.....	1330		64	140	491		--	--	--	--	--	44	65	99	100	--	VPWC
May 18.....	1330		74	36	2,290		--	88	--	98	--	100	--	--	--	--	VPWC
July 28.....	1145		79	12	65,300		68	81	91	98	100	--	--	--	--	--	VPWC
July 28.....	1145		79	12	65,300		0	0	6	89	100	--	--	--	--	--	VPWC
Aug. 8.....	0800		72	2,140	190,000		45	57	64	75	87	93	97	100	--	--	SPWC
Aug. 8.....	0800		72	2,140	190,000		1	4	11	74	87	93	97	100	--	--	SPWC
Aug. 8.....	1800		82	74	77,200		--	1	76	92	--	100	--	--	--	--	VPWC
Aug. 26.....	1600		77	2,620	106,000		--	52	--	69	--	89	96	100	--	--	SPWC

RIO GRANDE BASIN--Continued

8-3583. RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.

LOCATION (revised).--At gaging station 1,800 feet west of San Marcial on railway bridge, about 18.5 miles southwest of San Antonio, and about 1 mile south of the site of former village of San Marcial, Socorro County.

RECORDS AVAILABLE.--Chemical analyses: March 1954 to September 1959.

Water temperatures: March 1954 to September 1959.

Sediment records: March 1954 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,620 ppm Aug. 7, 9, 11; minimum, 530 ppm May 20-24.

Hardness: Maximum, 755 ppm Aug. 16-17, 22-23, 26; minimum, 254 ppm May 20-24.

Specific conductance: Maximum daily, 2,450 micromhos Aug. 9; minimum daily, 718 micromhos May 21.

Water temperatures: Maximum, 89 F Aug. 7; minimum, 39 F Mar. 5.

Sediment concentrations: Maximum daily, 119,000 ppm Aug. 8; minimum daily, 36 ppm Sept. 26-27.

Sediment loads: Maximum daily, 334,000 tons Aug. 8; minimum daily, 22,223, 26-30.

EXTREMES, 1954-59.--Dissolved solids: Maximum, 2,610 ppm Aug. 8; minimum, 184 ppm Oct. 12, 1957.

Hardness: Maximum, 948 ppm Aug. 8, 1956; minimum, 184 ppm Oct. 12, 1957.

Specific conductance: Maximum, 3,171, 2,860 micromhos daily, 527 micromhos June 24, July 2, 1957.

Water temperatures: Maximum, 93 F, 81.5, 1955; minimum, 33 F Dec. 28, 30, 31, 1954 Dec. 30, 1955, Feb. 2, 1956.

Sediment concentrations: Maximum daily, 119,000 ppm Aug. 8, 1959; minimum daily, no flow on several days in 1956 and 1958.

Sediment loads: Maximum daily, 334,000 tons Aug. 8, 1959; minimum daily, 0 tons on several days in 1956 and 1958.

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. Records of discharge for water year October 1958 to September 1959 furnished by Santa Fe district office of Surface Water Branch. Records of composite discharge for Rio Grande conveyance channel at San Marcial, and Rio Grande floodway at San Marcial given under Rio Grande at San Marcial in WSP 1632. Quality-of-Water records for Rio Grande floodway given on page 445.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Fluoride (F) (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		Sodium adsorption ratio		
Oct. 1-31, 1958	180	---	---	89	20	127	---	238	---	---	---	---	739	1.01	359	304	109	3.2	1,100	7.9
Nov. 1-30,	242	---	---	84	18	117	---	226	---	---	---	---	690	.94	451	284	99	3.0	1,040	7.9
Dec. 1-31,	301	---	---	82	15	107	---	223	---	---	---	---	658	.89	535	268	86	2.8	975	8.0
Jan. 1-31, 1959	272	---	---	79	14	110	---	216	---	---	---	---	650	.88	477	256	79	3.0	977	7.9
Feb. 1-28,	285	---	---	79	16	111	---	219	---	---	---	---	657	.89	506	262	82	3.0	989	7.9
Mar. 1-31,	332	---	---	80	16	105	---	217	---	---	---	---	653	.86	567	266	88	2.8	953	8.0
Apr. 1-30,	242	62	0.07	78	16	123	6.3	224	212	92	0.7	0.5	714	.97	467	261	78	3.3	1,030	8.1
May 1-19,	222	---	---	76	18	124	---	218	---	---	---	---	721	.98	432	262	84	3.3	1,040	8.0
May 20-24,	493	---	---	84	11	69	---	238	---	---	---	---	530	.72	705	254	59	1.9	777	7.4
May 25-26,	552	---	---	131	23	128	---	249	---	---	---	---	922	1.25	1,370	420	216	2.7	1,280	7.2
May 27-June 4,	365	---	---	85	15	97	---	227	---	---	---	---	654	.89	645	272	86	2.6	919	8.2
June 5-July 23,	80.6	54	.09	89	18	168	8.1	245	250	139	.6	.6	860	1.17	187	298	97	4.0	1,260	8.1
July 24-Aug. 6,	31.6	---	---	101	21	233	---	272	---	---	---	---	1,110	1.51	94.7	338	115	5.5	1,670	7.9
Aug. 7, 9, 11,	655	---	---	214	40	240	---	316	---	---	---	---	1,620	2.20	2,860	700	441	3.9	2,130	7.7

RIO GRANDE BASIN--Continued

8-3583. RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 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...	276	248	185	183	234	116	302	750	612
2...	270	248	181	186	239	120	252	750	510
3...	260	248	174	194	239	125	222	460	276
4...	246	220	146	206	239	133	195	300	158
5...	238	220	141	202	95	52	159	310	133
6...	230	200	124	196	360	191	156	310	131
7...	226	200	122	204	470	259	152	285	117
8...	226	179	109	248	486	325	154	285	119
9...	234	252	159	228	300	185	148	243	97
10...	232	252	158	230	241	150	144	243	94
11...	220	187	111	236	241	154	138	222	83
12...	230	187	116	222	443	266	131	222	79
13...	252	276	188	200	443	239	120	120	39
14...	262	276	195	225	330	200	113	110	34
15...	260	234	164	238	464	298	104	110	31
16...	254	234	160	240	464	301	94	130	33
17...	254	214	147	232	350	219	88	130	31
18...	258	214	149	215	350	203	86	113	26
19...	262	309	219	339	2,360	s 2,360	81	113	25
20...	242	426	278	431	3,880	4,520	80	85	18
21...	246	132	88	504	3,370	4,590	79	85	18
22...	264	207	148	594	3,440	5,520	78	107	23
23...	266	207	149	522	1,950	2,750	74	107	21
24...	264	183	130	414	1,250	1,400	73	72	14
25...	260	183	128	445	17,700	s 23,100	71	64	12
26...	256	207	144	660	23,900	s 45,400	69	64	12
27...	228	198	122	532	10,200	14,700	68	64	12
28...	190	198	102	540	6,600	9,620	67	64	12
29...	179	213	103	501	4,300	5,820	68	64	12
30...	179	213	103	398	2,600	a 2,800	67	86	16
31...	--	--	--	347	1,300	1,220	--	--	--
Total	7,264	--	4,443	10,112	--	127,336	3,633	--	2,798
	July			August			September		
1...	66	99	18	29	89	7	127	9,000	3,090
2...	64	99	17	28	90	a 7	110	4,200	1,250
3...	64	76	13	28	95	7	74	1,340	268
4...	65	90	16	27	80	a 6	63	780	a 130
5...	63	112	19	26	68	5	56	398	60
6...	63	112	19	27	70	a 5	54	150	21
7...	62	198	33	194	45,900	s 69,500	50	157	21
8...	59	198	32	476	119,000	s 213,000	47	157	20
9...	58	91	14	975	118,000	334,000	37	130	13
10...	57	91	14	825	97,000	232,000	33	130	12
11...	56	91	14	797	95,900	s 238,000	31	79	7
12...	54	91	13	300	67,000	56,300	29	79	6
13...	53	98	14	100	18,600	5,020	27	55	4
14...	54	98	14	101	5,500	1,500	26	55	4
15...	53	103	15	160	45,000	20,200	25	208	14
16...	52	103	15	384	67,200	s 114,000	24	143	9
17...	51	93	13	462	83,000	107,000	24	143	9
18...	50	93	13	400	54,500	61,000	23	87	5
19...	49	99	13	279	58,100	s 48,200	22	87	5
20...	49	99	13	240	28,500	18,000	22	53	3
21...	49	94	12	629	78,200	s 158,000	21	53	3
22...	48	94	12	200	66,000	a 37,000	20	40	2
23...	46	73	9	350	76,500	75,000	19	40	2
24...	42	73	8	167	42,000	19,600	20	71	4
25...	39	92	10	280	40,500	31,800	19	71	4
26...	36	92	9	450	83,000	105,000	19	36	2
27...	33	90	8	240	52,400	s 42,700	18	36	2
28...	33	90	8	434	64,500	78,400	17	51	2
29...	33	194	17	320	51,500	46,100	17	51	2
30...	32	112	10	350	50,000	a 49,000	17	39	2
31...	30	100	a 8	178	20,000	9,610	--	--	--
Total	1,563	--	443	9,456	--	2,169,967	1,091	--	4,976

Total discharge for year (cfs-days)..... 81,999
 Total load for year (tons)..... 2,374,275

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

RIO GRANDE BASIN--Continued
8-35683. RIO GRANDE CONVEYANCE CHANNEL AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	Sam- pling point	Water temp- er- ature (°F)	Discharge (cfs)	Sediment con- cen- tration (ppm)	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, 1958.....	1455		69	218	4,050	--	74	--	83	--	89	97	100				VPWC
Nov. 6.....	0930		55	183	1,410	--	54	--	88	--	91	98	100				SPWC
Mar. 5, 1959.....	1630		53	354	744	--	--	--	--	--	68	82	100				V
Apr. 22.....	1450		66	262	207	--	--	--	--	--	64	95	99	100			S
May 21.....	0900		60	494	3,250	--	43	--	58	--	82	92	100				VPWC
June 3.....	1440		67	218	443	--	--	--	--	--	84	99	100				S
Aug. 10.....	1535		78	885	83,600	55	65	79	86	92	98	100	--				VPWC
Aug. 10.....	1535		78	885	83,600	1	3	10	88	95	98	100	--				VPWC
Aug. 14.....	1100		76	100	4,660	--	73	--	87	--	100	--	--				PHC

RIO GRANDE BASIN--Continued
8-3584. RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.

LOCATION.--At gaging station at Atchison, Topeka, and Santa Fe Railway bridge, 1.1 miles downstream from former site of San Marcial, Socorro County, and 18.5 miles southwest of San Antonio.

DRAINAGE AREA.--27,700 square miles, approximately (includes 2,940 square miles in closed basin in San Luis Valley, Colo.).

RECORDS AVAILABLE.--Chemical analyses: July 1946 to September 1959.

Water temperatures: January 1949 to September 1959.

Sediment records: July 1946 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,900 ppm Aug. 7-9; minimum, 347 ppm Dec. 1-31.

Hardness: Maximum, 905 ppm Aug. 7-9; minimum, 183 ppm Dec. 1-31.

Specific conductance: Maximum daily, 2,540 microhos Aug. 9; minimum daily, 457 microhos Dec. 9.

Water temperatures: Maximum, 85°F Aug. 10; minimum, 34°F Dec. 31, Jan. 3, 9.

Sediment concentrations: Maximum daily, 117,000 ppm Aug. 8; minimum daily, no flow on many days.

EXTREMES, 1946-59.--Dissolved solids: Maximum, 1,900 ppm Aug. 7-9; minimum, 347 ppm June 11-20, 1952.

Hardness: Maximum, 905 ppm Aug. 7-9; minimum, 183 ppm Dec. 1-31.

Specific conductance: Maximum daily, 2,540 microhos Aug. 9; minimum daily, 457 microhos June 14, 1952.

Water temperatures: Maximum, 85°F Aug. 10; minimum, 34°F Dec. 31, Jan. 3, 9.

Sediment concentrations: Maximum daily, 117,000 ppm Aug. 8; minimum daily, no flow on many days.

EXTREMES, 1949-59.--Dissolved solids: Maximum, 1,900 ppm Aug. 7-9; minimum, 347 ppm June 11-20, 1952.

Hardness: Maximum, 905 ppm Aug. 7-9; minimum, 183 ppm Dec. 1-31.

Specific conductance: Maximum daily, 2,540 microhos Aug. 9; minimum daily, 457 microhos June 14, 1952.

Water temperatures: Maximum, 85°F Aug. 10; minimum, 34°F Dec. 31, Jan. 3, 9.

Sediment concentrations: Maximum daily, 117,000 ppm Aug. 8; minimum daily, no flow on many days.

REMARKS.--Records of specific conductance of daily samples available in Water Bulletins of International Boundary and Water Commission. Records of discharge for water year October 1958 to September 1959 furnished by Santa Fe district office of Surface Water Branch. Records of composite discharge for Rio Grande conveyance channel at San Marcial and Rio Grande floodway at San Marcial given under Rio Grande at San Marcial in WSP 1632. Quality of water records for Rio Grande conveyance channel at San Marcial given on page 440. No flow Oct. 20, 22-28, Mar. 26 to May 23, May 28 to Aug. 6, Aug. 31, Sept. 3-30.

Chemical analyses, in parts per million, water year October 1958 to September 1959

RIO GRANDE BASIN--Continued

8-3584. RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959

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...	30	2,500	202	86	10,300	s 2,880	1,420	5,200	19,900
2...	20	1,600	86	121	12,000	a 3,900	1,320	5,500	19,600
3...	32	2,500	216	68	5,200	a 950	1,340	5,750	20,800
4...	35	3,200	a 300	53	4,300	a 620	1,310	5,800	20,500
5...	30	2,000	162	90	10,000	a 2,400	1,330	4,800	19,000
6...	25	3,480	235	495	18,600	30,100	1,330	4,800	17,200
7...	56	9,580	a 1,880	888	15,700	37,600	1,380	4,900	a 18,000
8...	107	29,300	8,460	984	10,300	27,400	1,400	5,200	19,700
9...	69	33,500	6,470	992	10,200	27,300	1,260	5,500	18,700
10...	56	24,000	a 3,600	1,070	7,700	22,200	1,240	6,700	22,400
11...	47	16,000	s 2,000	1,090	7,600	a 22,000	1,120	5,250	15,900
12...	40	13,000	a 1,400	1,140	6,500	20,000	1,120	5,000	15,100
13...	49	6,800	900	1,200	7,200	23,300	1,290	6,500	a 23,000
14...	42	3,700	420	1,230	6,700	22,300	1,230	4,350	14,400
15...	85	26,000	sa 7,500	1,260	7,000	a 24,000	1,220	4,600	15,200
16...	28	22,000	1,660	1,270	7,700	a 26,000	1,160	3,700	11,600
17...	1	12,000	a 32	1,290	7,500	26,100	1,110	3,650	10,900
18...	6	7,800	sa 150	1,380	7,100	26,500	1,110	4,000	12,000
19...	1	1,800	sa 10	1,400	8,400	31,800	970	3,000	7,860
20...	0	--	0	1,340	7,200	26,000	940	3,000	a 7,600
21...	7	8,000	sa 200	1,280	6,900	23,800	910	3,900	9,580
22...	0	--	0	1,320	7,400	a 26,000	1,000	3,200	8,640
23...	0	--	0	1,330	6,000	21,500	1,010	3,000	8,180
24...	0	--	0	1,310	5,600	19,800	880	5,700	13,500
25...	0	--	0	1,350	5,400	19,700	732	4,500	a 8,900
26...	0	--	0	1,340	4,600	16,600	596	2,000	3,220
27...	0	--	0	1,330	4,100	14,700	541	1,600	2,340
28...	0	--	0	1,350	5,200	19,000	512	3,000	s 4,100
29...	273	46,900	s 41,700	1,470	6,900	s 27,000	491	2,850	3,780
30...	101	17,000	a 4,600	1,440	5,900	22,900	450	3,000	3,640
31...	136	11,000	a 4,000	--	--	--	430	2,750	3,190
Total	1,276	--	30,967	30,967	--	614,350	32,152	--	398,430
	January			February			March		
1...	415	3,500	3,920	269	1,050	763	352	1,610	1,530
2...	350	1,600	1,510	269	900	654	381	1,700	a 1,700
3...	320	1,700	1,470	295	1,100	876	331	1,450	1,300
4...	250	950	a 640	331	1,300	1,160	247	1,100	a 750
5...	90	285	69	305	1,750	1,440	182	935	459
6...	240	310	201	264	1,780	1,270	144	800	a 310
7...	204	650	358	232	1,560	977	140	580	219
8...	232	1,200	a 750	255	1,500	a 1,000	201	690	a 370
9...	300	1,370	1,110	277	1,150	860	300	800	648
10...	315	950	808	270	1,410	1,030	260	1,200	a 840
11...	476	950	a 1,200	273	1,460	1,080	124	2,000	670
12...	491	1,600	2,121	236	1,200	a 760	100	1,200	324
13...	469	1,600	a 2,000	260	1,030	a 723	91	710	174
14...	462	1,520	1,900	310	1,100	a 920	75	400	a 81
15...	424	1,100	1,260	341	1,210	1,110	81	400	87
16...	410	1,800	1,990	346	1,100	a 1,000	41	400	a 44
17...	375	1,400	a 1,400	310	1,060	887	24	450	29
18...	352	1,800	1,710	310	1,000	a 840	49	500	a 66
19...	369	1,850	1,640	300	1,400	1,130	30	250	a 20
20...	320	1,280	1,110	277	1,410	1,050	6	100	16
21...	310	1,100	921	273	1,400	a 1,000	0	--	0
22...	369	1,710	1,700	300	1,580	1,280	0	--	0
23...	417	1,620	1,820	326	1,400	1,230	0	--	0
24...	424	1,500	a 1,700	341	1,200	2,030	6	2,600	sa 120
25...	436	1,350	1,590	369	170	a 1,700	1	610	sa 3
26...	410	1,000	1,110	404	1,440	1,570	0	--	0
27...	315	820	697	430	1,700	a 2,000	0	--	0
28...	286	980	757	417	2,200	2,480	0	--	0
29...	277	950	711	--	--	--	0	--	0
30...	282	1,090	830	--	--	--	0	--	0
31...	282	830	a 630	--	--	--	0	--	0
Total	10,672	--	39,632	8,590	--	32,820	3,166	--	9,740

s Computed by subdividing day.

a Computed from estimated concentration graph.

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-3584. RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 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...				0	--	0			
2...				0	--	0			
3...				0	--	0			
4...				0	--	0			
5...				0	--	0			
6...				0	--	0			
7...				0	--	0			
8...				0	--	0			
9...				0	--	0			
10...				0	--	0			
11...				0	--	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...				1	8,600	sa 78			
25...				428	52,000	sa 170,000			
26...				126	70,900	s 36,200			
27...				3	14,500	117			
28...				0	--	0			
29...				0	--	0			
30...				0	--	0			
31...				0	--	0			
Total	0		0	558	--	206,395	0		0
	July			August			September		
1...				0	--	0	8	31,000	s 980
2...				0	--	0	2	10,000	a 54
3...				0	--	0	0	--	0
4...				0	--	0	0	--	0
5...				0	--	0	0	--	0
6...				0	--	0	0	--	0
7...				10	7,900	sa 6,200	0	--	0
8...				91	117,000	s 42,800	0	--	0
9...				357	92,900	s 88,900	0	--	0
10...				94	90,100	s 27,500	0	--	0
11...				48	81,000	11,300	0	--	0
12...				12	47,500	1,600	0	--	0
13...				71	68,000	sa 21,000	0	--	0
14...				24	54,000	sa 4,500	0	--	0
15...				26	55,000	sa 4,700	0	--	0
16...				58	57,200	s 19,900	0	--	0
17...				157	108,000	s 55,800	0	--	0
18...				34	71,000	6,760	0	--	0
19...				66	72,300	s 17,400	0	--	0
20...				193	58,100	s 41,200	0	--	0
21...				45	32,500	4,100	0	--	0
22...				131	48,400	s 33,600	0	--	0
23...				75	63,500	13,300	0	--	0
24...				144	59,400	s 27,500	0	--	0
25...				86	49,000	11,800	0	--	0
26...				91	56,500	14,400	0	--	0
27...				668	70,200	s 143,000	0	--	0
28...				154	50,600	s 24,200	0	--	0
29...				265	47,500	s 41,500	0	--	0
30...				15	12,000	s 490	0	--	0
31...				0	--	0	--	--	--
Total	0		0	2,915	--	663,450	10	--	1,034
Total discharge for year (cfs-days).....									90,306
Total load for year (tons).....									2,052,034

s Computed by subdividing day.

a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued

8-3584. RIO GRANDE FLOODWAY AT SAN MARCIAL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 1959
 (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 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, 1958.....	1440		73	57	31,500		95		98		98	98	100						VPWC
Oct. 29.....	1700		47	157	34,900		87		98		100	--	--						PWC
Nov. 18.....	1530		39	1,420	7,330		23		40		67	90	100						VPWC
Dec. 27.....	1530		45	541	1,600		--		--		45	88	100						V
Jan. 25, 1959.....	1600		46	404	1,530		--		--		37	83	100						V
Feb. 11.....	1630		45	229	1,240		--		--		54	86	100						V
Mar. 1.....	1300		55	341	1,430		--		--		50	90	100						V
Aug. 11.....	1200		75	9	72,500		88		98		100	--	--						PWC

RIO GRANDE BASIN--Continued

8-3830. PECOS RIVER AT SANTA ROSA, N. MEX.

LOCATION.--At gaging station, 0.2 mile upstream from bridge on U.S. Highway 66, in Santa Rosa, Guadalupe County, and 1.2 miles upstream from Rio Agua Negra Chiquita.

DRAINAGE AREA.--2,650 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Water temperatures: October 1958 to September 1959.

Sediment records: October 1958 to September 1959.

EXTREMES, 1958-59.--Water temperatures: Maximum, 86° F June 30; minimum, freezing point on several days during winter months.

Sediment concentrations: Maximum daily, 17,900 ppm May 25; minimum daily, 13 ppm Mar. 15.

Sediment loads: Maximum daily, 86,800 tons Aug. 15; minimum daily, 1 ton on several days.

REMARKS.--Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Temperature (°F) of water, water year October 1958 to September 1959

↳Once-daily measurement, generally between 7 a.m. and 2 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	--	--	--	--	72	73	68	68	68	--	--	--	--	--	--	64	65	64	62	59	58	60	46	56	52	52	49	48	44	55		
November ..	42	48	41	53	53	53	53	--	56	58	59	58	50	49	43	38	48	46	51	51	52	53	49	41	49	44	43	50	--	50		
December ..	--	51	52	41	44	42	50	--	36	47	52	46	42	47	43	42	44	46	49	35	46	37	36	45	--	33	32	47	32	32	42	
January	41	32	32	32	32	33	33	39	32	49	43	33	36	37	44	39	--	37	38	--	42	44	44	--	54	--	46	47	44	38	39	
February	--	--	47	46	--	47	44	49	--	49	50	50	51	51	49	49	50	46	49	43	49	51	50	48	--	50	51	56	--	49		
March	--	43	44	--	42	45	47	45	46	46	--	45	--	--	38	44	43	--	53	59	--	56	54	50	50	70	51	49	48	--	50	
April	58	53	54	55	58	48	44	43	44	46	--	45	46	--	--	--	--	45	47	--	58	62	--	61	--	56	62	66	64	--	--	
May	54	52	56	53	--	--	67	55	54	62	79	74	72	75	64	70	68	74	64	65	--	66	54	64	64	63	--	62	74	67	70	65
June	70	72	65	62	73	73	74	64	68	69	72	72	--	--	74	--	70	--	75	74	73	75	74	69	73	65	76	80	86	--	72	
July	80	74	--	82	75	78	85	80	--	79	81	77	79	77	78	67	72	65	--	72	69	67	68	64	78	80	70	69	73	70	74	
August	73	71	72	73	73	75	76	70	72	--	68	72	--	70	73	75	--	70	78	76	76	--	70	78	70	74	74	75	70	--	--	
September ..	74	73	75	73	74	73	72	71	68	66	67	--	68	65	64	63	62	57	49	48	54	55	55	62	52	64	67	64	60	52	--	64

RIO GRANDE BASIN--Continued

8-3830. PECOS RIVER AT SANTA ROSA, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 1959

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...	37			32	73	6	28	75	a 6
2...	41			32	64	6	27	90	7
3...	36	78	7	31	52	4	27	81	6
4...	29			30	62	5			
5...	29			30	54	4	27	58	4
6...	29	96	8	30	56	5	28		
7...	28	61	5	29	54	4	27		
8...	29	62	5	29	48	4	28	80	6
9...	28	68	5	29	52	4	28		
10...	29	48	4	30	50	a 4	27		
11...	29	76	6	30	46	4	29		
12...	30	88	7	30	53	4	28	77	6
13...	31	53	4	31	46	4	28		
14...	31	83	7	30	42	3	27	76	6
15...	31	46	4	31	43	4	26		
16...	30	62	5	31	60	5	29	89	7
17...	29	62	5	37	88	9	29		
18...	30	77	6	32	65	6	27	73	6
19...	29	102	8	37	62	6	25		
20...	29	114	9	36	56	5	22	67	4
21...	31	85	7	34	48	4	24		
22...	32	120	10	30	56	5	22	90	6
23...	32	104	9	28	66	5	20		
24...	31	102	9	27	51	4	19		
25...	34	80	7	26	58	4	20	96	5
26...	38	122	13	27	42	3	21		
27...	35	96	9	27	50	4	20		
28...	36	78	8	27	92	7	23	125	7
29...	41	86	10	27	67	5	15	40	2
30...	40	103	11	28	63	5	16	146	6
31...	35	72	7	--	--	--	20	103	6
Total	999	--	223	908	--	142	764	--	173
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...	25			21	30	a 2	22		
2...	30			16	20	a 1	22		
3...	20			20	140	8	22		
4...	22			28	126	10	24		
5...	24			26	80	a 6	23		
6...	26			23	21	1	22	66	4
7...	31	88	6	23	31	2	22		
8...	30			23	93	6	22		
9...	30			22	60	a 4	21		
10...	29			22	44	3	21		
11...	28			26	35	2	20	40	a 2
12...	27			25	108	7	20	27	1
13...	26			25	34	2	19	20	a 1
14...	26			24	28	2	18	15	a 1
15...	25			23	101	6	20	13	1
16...	24			22	42	2	21		
17...	26			21	77	4	20	14	1
18...	26	--	e 4	21	77	4	20		
19...	26			21	36	2	19		
20...	28			22			19		
21...	26	55	4	23	26	2	22		
22...	29	60	5	23			22	17	1
23...	28	55	4	22			21		
24...	25	50	a 3	22	29	2	20		
25...	23	52	3	21			21		
26...	22	50	a 3	21	133	8	24		
27...	22	45	a 3	22			24		
28...	21	44	2	22			23		
29...	21	41	2	--	--	--	22	55	3
30...	22	38	2	--	--	--	20		
31...	22	38	2	--	--	--	21		
Total	790	--	143	630	--	116	659	--	72

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3830. PECOS RIVER AT SANTA ROSA, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	Sampling point	Water temperature (°F)	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	
Oct. 12, 1958	1125		--	d 30	585		--	--	--	10	18	41	67	100		V	
Nov. 26	2030		41	d 27	32		--	--	--	70	82	94	94	100		S	
May 17, 1959	1830		68	20I	9,980		62	86	99	94	99	100	100	100		VPWC	
May 25	1800		63	1,010	13,800		41	62	62	85	91	99	100	100		VPWC	
June 3	2145		64	762	8,220		30	47	77	87	98	100	100	100		VPWC	
June 4	2130		69	136	2,100		64	84	84	94	97	100	100	100		SPWC	
Aug. 16	1800		80	349	4,620		78	93	93	95	96	99	100	100		VPWC	
Sept. 1	1830		74	68	541		--	--	--	96	99	100	100	100		S	

d Mean daily discharge.

Particle-size analyses of bed material, water year October 1958 to September 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)	Water temperature (°F)	Discharge (cfs)	Sediment concentration (ppm)	Bed material										Method of analysis		
					Percent finer than size indicated, in millimeters												
					0.0625	0.125	0.250	0.500	1.000	2.00	4.00	8.00	16.00	32.00			
June 4, 1959	1630	3	69	136	1	6	70	96	99								S
Aug. 16	1600	3	80	349	0	1	18	75	91	98							S

RIO GRANDE BASIN--Continued
8-3834. PECOS RIVER AT PUERTO DE LUNA, N. MEX.

LOCATION.--At bridge at Puerto de Luna, Guadalupe County, 9 miles northwest of gaging station near Puerto de Luna and 17.5 miles upstream from Alamogordo Dam. DRAINAGE AREA.--5,970 square miles, approximately (contributing area above gaging station). RECORDS AVAILABLE.--Chemical analyses: July 1939 to September 1941, November 1941, December 1941 to June 1959 (discontinued). Water temperatures: June 1949 to September 1954, December 1958 to June 1959. Sediment records: January 1949 to November 1958 (discontinued). EXTREMES, 1958-59.--Dissolved solids: Maximum, 2,390 ppm Apr. 1-30; minimum, 477 ppm May 25.

Hardness: Maximum, 1,630 ppm Apr. 1-30; minimum, 315 ppm May 25.

Specific conductance: Maximum daily, 2,770 micromhos Jan. 4, May 5; minimum daily, 650 micromhos May 25.

EXTREMES, 1959-61, 1946-59.--Dissolved solids: Maximum, 2,740 ppm May 1-10, 1955, July 1-9, 1956; minimum, 220 ppm Aug. 7, 1957.

Hardness: Maximum, 1,910 ppm Apr. 21-30, 1954; minimum, 161 ppm Aug. 7, 1957.

Specific conductance: Maximum daily, 3,880 micromhos June 27, 30, 1957; minimum daily, 344 micromhos Sept. 21, 1941.

Sediment concentrations (1949-58): Maximum daily, 39,200 ppm July 28, 1956; minimum daily, 20 ppm Apr. 21-30, 1955.

Sediment loads (1949-58): Maximum daily, 1,510,000 tons Oct. 7, 1954; minimum daily, 4 tons Apr. 21-30, 1955.

REMARKS.--Distorted potassium (K) column, indicate sodium (Na) plus potassium (K) as calculated. Records of specific conductance of daily samples available district office, Albuquerque, N. Mex. Records of gaging station near Puerto de Luna for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between sampling point and gaging station, except during periods of heavy local runoff.

Chemical analyses, in parts per million, October 1958 to June 1959

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) (NO ₃) (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. 1-31, 1958.....	111	37				82		113	1,300	115	0.4	2,120	2.68	635	1,430	1,340	0.9	2,410	7.9
Nov. 1-30.....	109	34		480	71	75		111	1,340	118	.5	2,170	2.95	639	1,490	1,400	.8	2,450	7.9
Dec. 1-31.....	112	29		492	61	96		109	1,370	122	.6	2,220	3.02	671	1,480	1,390	1.1	2,490	7.8
Jan. 1-31, 1959.....	113	29		502	75	101		129	1,390	126	.6	2,290	3.11	699	1,510	1,400	1.1	2,540	7.8
Feb. 1-28.....	110	26		518	63	94		136	1,410	123	.6	2,300	3.13	683	1,550	1,440	1.0	2,580	7.7
Mar. 1-31.....	96.3	24	0.01	530	63	94	3.1	141	1,450	128	0.5	2,360	3.12	614	1,560	1,460	1.0	2,620	7.7
Apr. 1-30.....	92.7	21		542	67	92		147	1,470	127	.4	2,390	3.25	598	1,620	1,510	1.0	2,660	7.7
May 1-14.....	105	17		518	64	82		162	1,370	120	.5	2,280	3.96	628	1,650	1,420	.9	2,530	7.6
May 15-16, 22-24.....	317	17		318	36	51		162	496	93	1.5	1,863	1.97	889	605	407	.7	1,670	7.4
May 17-18, 27-28.....	380	18		210	20	32		176	456	39	1.3	1,477	1.55	705	770	643	.8	1,430	7.7
May 19-21, 29-31.....	229	18		269	27	32		185	689	36	1.8	1,477	.65	1,640	315	180	.8	1,650	7.2
May 25.....	1,270	23		112	8.6			202	118	14	1.8								
May 26.....	798	16		150	16	25		160	315	25	.4	626	.85	1,230	440	309	.5	873	7.5
June 1-3.....	272	16		345	36	54		150	864	74	.6	1,460	1.99	1,070	1,010	887	.7	1,810	7.7
June 4.....	415	16		170	15	33		152	367	34	1.6	1,712	.97	798	1,485	360	.6	1,971	7.7
June 5-6, 9.....	203	15		292	28	55		142	731	61	1.9	1,250	1.70	685	845	728	.8	1,560	7.5
June 7-9, 20-23.....																			
June 28, 30, 20-25.....	256	23		438	45	78		158	1,140	94	1.2	1,900	2.58	1,310	1,280	1,150	.9	2,190	7.7
June 10-19, 24-25.....	96.4	19		528	57	91		164	1,390	117	.5	2,280	3.10	593	1,550	1,420	1.0	2,560	7.7
June 26-27.....	708	14		155	18	27		164	334	26	.7	1,656	.89	1,250	1,460	326	.6	931	7.8

RIO GRANDE BASIN--Continued
 8-3834. PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued
 Temperature (°F) of water, December 1958 to June 1959

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	
December ..	--	--	58	60	58	58	60	60	60	60	68	68	68	68	58	58	58	58	58	58	62	60	58	62	64	64	62	62	62	62	61	
January	62	62	--	--	58	58	58	58	58	58	58	58	58	58	52	52	48	48	48	48	48	48	48	48	48	48	46	46	54	54		
February	45	45	55	55	45	50	53	55	60	54	53	45	45	55	50	50	52	43	45	48	45	55	62	60	55	60	55	60	54	52		
March	45	60	60	45	52	55	55	48	60	60	55	53	53	48	59	65	62	65	56	55	56	62	65	50	65	52	65	54	70	50		
April	65	70	65	50	52	70	64	60	60	60	55	65	65	60	71	55	60	50	69	70	69	72	65	60	70	72	82	--	63	67		
May	69	70	60	75	75	73	60	65	70	60	75	68	65	70	64	68	66	75	62	62	75	62	70	68	70	63	65	70	70	65		
June	75	62	65	60	65	74	72	65	65	65	65	66	70	78	73	72	70	70	72	--	--	70	72	70	65	72	68	75	65	69		

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

8-3834. PECOS RIVER AT PUERTO DE LUNA, N. MEX.--Continued

Suspended sediment, October to November 1958

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	164	52	113	116	35			
2..	118	660	210	108	313	91			
3..	129	993	346	116	227	71			
4..	118	249	79	118	84	27			
5..	113	224	68	113	376	115			
6..	116	232	73	113	553	a 169			
7..	111	393	118	111	400	120			
8..	113	225	69	104	206	58			
9..	111	258	77	106	277	79			
10..	111	312	94	106	256	73			
11..	108	204	59	106	143	41			
12..	104	202	57	106	252	72			
13..	101	141	38	108	218	64			
14..	106	294	84	108	484	141			
15..	106	108	31	106	108	31			
16..	106	256	73	108	122	36			
17..	104	128	36	116	185	58			
18..	106	140	40	116	563	176			
19..	106	236	68	101	39	11			
20..	104	160	45	104	274	77			
21..	101	146	40	104	144	40			
22..	104	207	58	104	212	60			
23..	101	117	32	106	54	15			
24..	101	159	43	104	145	41			
25..	104	143	40	108	447	130			
26..	118	277	88	111	721	216			
27..	121	145	47	113	60	18			
28..	113	140	a 40	111	144	43			
29..	126	150	a 50	108	302	88			
30..	129	158	55	111	71	21			
31..	116	363	114	--	--	--			
Total	3,443	--	2,324	3,267	--	2,217			

Total discharge for October to November (cfs-days).....6,710
 Total load for October to November (tons).....4,541

a Computed from estimated-concentration graph.

RIO GRANDE BASIN--Continued

8-3845. PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.

LOCATION.--At gaging station on left bank 1,200 feet downstream from Alamogordo Dam, 1.5 miles downstream from Alamogordo Creek, and 4.5 miles northeast of Guadalupe, DeBaca County.

DRAINAGE AREA.--4,390 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: June 1937 to September 1959.

Water temperatures: June to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 1,310 ppm Aug. 1-29; minimum, 738 ppm Oct. 1-31.

Hardness: Maximum, 885 ppm Aug. 1-29; minimum, 500 ppm Oct. 1-31.

Specific conductance: Maximum daily, 1,620 micromhos Aug. 14-18; minimum daily, 987 micromhos Oct. 3.

Water temperatures: Maximum, 79°F Aug. 6.

EXTREMES, 1957-59.--Dissolved solids: Maximum, 2,730 ppm May 11-20, 1954; minimum, 435 ppm Oct. 1-8, 1941.

Hardness: Maximum, 1,910 ppm May 1-10, 1954; minimum, 294 ppm Oct. 1-8, 12-20, 1941.

Specific conductance: Maximum daily, 3,200 micromhos Jan. 14, 1948; minimum daily, 513 micromhos July 22, 1937.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Values reported for dissolved solids are calculated from determined constituents. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	pH	
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate				
Oct. 1-31, 1958.....	78.0	14		166	21	34		124		406	36		0.5			738	1.00	155	500	399	0.7	1,040	7.7
Nov. 1-30.....	61.4	15		192	24	39		136		478	41		.5			854	1.16	142	578	471	.7	1,170	7.7
Dec. 1-31.....	66.7	12		205	27	42		132		520	45		.5			916	1.25	165	622	514	.7	1,250	7.8
Jan. 1-31, 1959.....	56.2	14		230	28	44		134		582	48		.5			1,010	1.37	153	688	578	.7	1,320	7.7
Feb. 1-28.....	78.4	15		248	27	49		137		626	52		.4			1,080	1.47	229	732	620	.8	1,400	7.7
Mar. 1-31.....	82.0	13		282	18	49		137		667	55		.3			1,150	1.56	255	778	656	.8	1,470	7.7
Apr. 1-30.....	98.5	14		271	34	48		136		696	59		.3			1,190	1.62	316	814	702	.7	1,520	7.6
May 1-31.....	300	15		286	36	60		136		759	63		.4			1,290	1.75	1,040	860	756	.9	1,860	7.7
June 1-30.....	154	14		288	35	56		133		758	63		.3			1,280	1.74	532	865	756	.8	1,860	7.6
July 1-31.....	570	14		286	36	57		119		767	62		.4			1,280	1.74	1,970	860	762	.8	1,860	7.5
Aug. 1-29.....	440	15		293	37	55		117		787	63		.5			1,310	1.78	1,560	885	789	.8	1,890	7.3
Aug. 30-Sept. 30..	95.8	14		256	32	45		115		672	53		.7			1,130	1.54	1,292	770	676	.7	1,400	7.4
Weighted average	173	14		272	33	53		125		717	59		0.4			1,210	1.65	565	814	712	0.8	1,500	--

RIO GRANDE BASIN--Continued
8-3845. PECOS RIVER BELOW ALAMOGORDO DAM, N. MEX.--Continued

Temperature (°F) of water, June to September 1959
/Once-daily measurement in the morning/

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	
April.....																																
May.....																																
June.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
July.....	71	72	72	71	73	73	73	73	74	73	73	73	73	72	72	73	73	73	73	74	74	78	74	74	75	74	76	76	75	75	75	
August.....	75	76	76	76	77	79	77	77	76	76	75	75	75	76	75	75	75	74	75	74	74	74	74	74	72	73	74	72	73	75	75	
September.....	73	73	73	73	72	72	72	71	72	71	72	70	70	71	70	71	71	69	69	69	68	68	68	68	67	68	66	66	65	64	--	

RIO GRANDE BASIN--Continued
PECOS RIVER SEEPAGE INVESTIGATION

Water samples were collected for chemical analyses at the time discharge measurements were made on the Pecos River and its tributaries beginning at Pecos River at old highway crossing at Fort Sumner, and ending at the gaging station near Acme, N. Mex. Discharge data are given in WSP 1632.

Chemical analyses, in parts per million, January 7, 1959

Stream or diversion	Location	Discharge (cfs)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conductance- (micro- mhos at 25°C)	pH
						Calcium, magne- sium	Noncar- bonate		
Pecos River.....	At old highway crossing at Fort Sumner.	34.8	143	626	53	740	623	1,410	7.0
.....Do.....	Below Fort-Summer irrigation project.	66.8	166	818	96	900	764	1,850	7.2
.....Do.....	One mile below mouth of Yeso Creek.	76.0	175	940	182	1,040	898	2,280	7.4
.....Do.....	Below Conejos Creek.	49.3	188	1,050	306	1,180	1,030	2,810	7.2
.....Do.....	One half mile below Arroyo Arona.	51.3	186	1,120	384	1,230	1,080	3,100	7.8
.....Do.....	Three miles above Huggins Creek.	61.4	170	1,070	378	1,190	1,050	2,990	7.9
.....Do.....	One mile below Crockett Draw.	74.9	161	1,060	314	1,170	1,040	2,790	7.8
.....Do.....	One half mile above Five Mile Draw.	54.1	153	997	282	1,100	974	2,630	7.2
.....Do.....	At El Paso Gas Co. pipeline crossing.	27.3	165	1,090	302	1,210	1,080	2,800	8.0
.....Do.....	Two hundred feet above Arroyo Alascoso.	36.6	156	1,030	302	1,150	1,020	2,710	7.8
Arroyo Alascoso.....	At mouth.	.26	106	3,010	9,380	4,290	4,200	27,100	8.2
Pecos River.....	Near Acme (gaging station).	41.4	163	1,090	356	1,210	1,080	2,970	7.6

RIO GRANDE BASIN--Continued

8-3860. PECOS RIVER NEAR ACME, N. MEX.

LOCATION--At gaging station on right bank 1 mile southeast of Melena railroad station, 3.5 miles downstream from Salt Creek, 5 miles southwest of Acme, Chaves County, and 13 miles northeast of Roswell.

DRAINAGE AREA--11,380 square miles, approximately (contributing area).

RECORDS AVAILABLE--Chemical analyses: July 1937 to September 1959.

Water temperatures: May 1952 to September 1959.

EXTRIMES, 1958-59.--Dissolved solids: Maximum, 14,900 ppm Sept. 19-21; minimum, 896 ppm Aug. 19, 21-27.

Hardness: Maximum, 3,470 ppm Sept. 19-21; minimum, 550 ppm Aug. 19, 21-27.

Specific conductance: Maximum, 24,200 microhos Sept. 20; minimum, 1,130 microhos Aug. 26-27.

Water temperatures: Maximum, 90°F June 23-25; minimum, 34°F Dec. 30, Jan. 4, Feb. 2.

EXTRIMES, 1937-59.--Dissolved solids: Maximum, 19,870 ppm May 23 to June 2, 1938; minimum, 594 ppm Aug. 11-16, 1957.

Hardness: Maximum, 5,320 ppm May 23 to June 2, 1938; minimum, 366 ppm July 26-27, 1957.

Specific conductance: Maximum daily, 39,300 microhos Aug. 9, 1945; minimum, freezing point Jan. 2, 1958.

Water temperatures (1952-59): Maximum, 95°F July 15, 1955; minimum, freezing point Jan. 2, 1958.

REMARKS. Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Acme for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between gaging station and sampling point except during periods of heavy local rainfall. No flow Sept. 22-30.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Iron (Fe)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (microhm-cm at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		Sodium adsorption ratio		
Oct. 1, 1958.....	238	--		568	183	1,920		74		2,200	2,830					7,820	10.6	5,030	2,170	2,110	18	11,100	8.1
Oct. 2-13, 18-26....	100	20	21	300	56	184	116			909	240			0.6		1,770	2.41	478	980	885	2.6	2,360	8.1
Oct. 14-17.....	93.8	20	178	27	109	102				490	140			1.1		1,020	1.39	258	555	472	2.0	1,440	8.0
Oct. 27-31.....	67.6	19	330	75	280	96				1,100	365			.6		2,220	3.02	405	1,130	1,050	3.1	2,930	8.1
Nov. 1-30.....	84.0	16	315	59	211	132				960	270			.5		1,900	2.58	431	1,030	922	2.6	2,500	7.9
Dec. 1-10, 13-22, 25-29.....	81.4	16	355	62	242	134				1,060	320			.7		2,120	2.88	466	1,140	1,030	3.1	2,780	7.8
Dec. 11-19.....	280	17	258	47	96	128				730	130			1.1		1,340	1.82	1,010	835	736	1.4	1,760	8.2
Dec. 23-24, 30-31.	48.5	18	378	75	395	120				1,160	565			.6		2,650	3.60	347	1,250	1,140	4.9	3,590	8.0
Jan. 1-4, 9-20, 1959	45.9	15	380	71	328	142				1,160	445			.9		2,470	3.36	306	1,240	1,120	4.0	3,290	7.8
Jan. 5-6, 28-31....	27.8	14	305	78	352	145				1,200	515			1.6		2,640	3.59	198	1,330	1,210	4.2	3,570	7.8
Jan. 7-8, 21-23....	40.4	14	435	67	234	147				1,070	305			6.2		2,120	2.88	231	1,160	1,040	3.0	2,790	7.6
Feb. 1-2, 26-28....	54.6	13	372	76	296	100				1,140	430			9.0		2,380	3.24	331	1,240	1,160	3.6	3,230	7.6
Feb. 3-5.....	56.7	18	330	72	189	129				981	240			1.2		1,860	2.53	285	1,180	1,060	2.5	2,750	7.5
Mar. 1-7, 30-31....	52.2	15	262	86	176	123				1,010	696			.9		1,430	2.00	222	1,430	1,290	4.8	3,670	7.8
Mar. 10-17.....	15.0	15	440	86	122	140				1,210	440			1.7		4,900	6.66	198	1,870	1,350	9.1	6,970	7.9
Mar. 18-22.....	29.3	12	508	108	392	135				1,610	1,460			1.7		3,250	4.42	257	1,710	1,610	4.1	4,100	7.9
Mar. 23-25.....	41.0	19	422	84	279	124				1,320	375			1.0		2,560	3.48	283	1,400	1,300	3.2	3,290	7.6

WESTERN GULF OF MEXICO BASINS

Apr. 1-10	25.1	17	428	105	299	1,370	445	0.8	2,720	3.70	184	1,500	1,400	3.4	3,520	7.6
Apr. 11-24	21.5	15	460	112	467	1,500	685	1.2	3,500	4.19	192	1,610	1,510	5.1	4,350	7.6
Apr. 25-28	51.0	13	510	116	602	1,680	865	1.2	3,840	5.22	529	1,750	1,660	6.3	5,090	7.7
Apr. 29-30	77.3	24	585	124	676	1,950	925	1.4	4,350	5.92	908	1,970	1,860	6.6	5,650	8.0
May 1-2	44.3	22	418	77	215	1,290	275	1.2	2,360	3.21	282	1,360	1,260	2.5	2,980	8.1
May 3-4	13.0	30	510	97	389	1,600	540	1.0	3,220	4.38	113	1,670	1,580	4.1	4,120	7.9
May 5-7	516	25	312	45	135	871	160	2.5	1,620	2.20	2,660	965	842	1.9	2,110	8.0
May 8-13	97.9	28	368	61	176	1,070	250	3.0	2,010	2.73	531	1,170	1,090	2.2	2,620	8.1
May 14-15, 22-26	100	23	300	40	114	802	150	.8	1,500	2.04	405	915	798	1.6	1,980	7.7
June 1-4	26.6	21	430	84	305	1,350	415	1.2	2,660	3.62	191	1,420	1,330	3.5	3,640	7.9
June 5-13, 23-24	48.4	41	640	122	1,280	1,930	1,950	1.6	6,030	8.20	788	2,100	1,190	12	8,570	8.0
June 14-17, 25	3.0	31	645	131	678	2,050	1,990	1.0	4,580	6.23	37.1	2,150	2,060	6.4	6,030	8.3
June 18	147	19	328	47	142	917	185	2.5	1,700	2.31	675	1,010	908	1.9	2,240	7.7
June 19-22, 26	51.8	23	415	84	272	1,250	410	4.4	2,510	3.41	351	1,380	1,290	3.2	3,300	7.9
July 1-5	566	17	305	41	93	831	115	1.5	1,470	2.00	2,250	930	825	1.3	1,870	7.7
July 6-11, 17-30	443	17	332	47	129	927	165	1.1	1,680	2.28	2,010	1,020	919	1.8	2,140	7.8
July 12-16	650	19	318	43	106	885	132	1.4	1,560	2.12	2,740	970	878	1.5	1,990	7.9
July 31-Aug. 5, 8-10	600	20	250	34	67	689	68	1.8	1,190	1.62	1,930	765	668	1.1	1,530	7.9
Aug. 6-7	430	19	285	44	83	789	105	1.7	1,390	1.89	1,610	890	791	1.2	1,780	7.8
Aug. 11-18, 20, 28-29	534	19	178	26	67	471	78	1.3	896	1.22	1,290	550	456	1.2	1,240	7.7
Aug. 19, 21-27	47.8	21	378	77	285	1,170	405	1.5	2,390	3.23	308	1,260	1,170	3.5	3,180	7.6
Aug. 30-Sept. 4	13.4	22	480	98	554	1,500	815	.9	3,530	4.80	128	1,600	1,510	6.0	4,770	7.9
Sept. 5-9	11.5	27	585	128	1,300	1,870	1,970	1.6	5,960	8.11	185	2,010	1,900	1.3	8,490	8.1
Sept. 10-11	12.0	21	505	109	788	1,630	1,160	.9	8,270	5.81	138	1,710	1,620	8.3	5,970	7.8
Sept. 12-14	2.2	24	717	168	2,050	2,240	3,170	---	8,550	11.5	40.2	2,450	2,350	18	12,470	7.9
Sept. 15-18	1.0	26	971	253	4,990	3,010	6,440	---	19,900	20.3	---	5,470	5,310	30	21,100	7.1
Sept. 19-21 &	b 158	19	311	50	155	889	204	1.6	1,690	2.30	721	982	878	2.2	2,210	---
Weighted average.																

a Includes equivalent of 2 parts per million of carbonate (CO₃).

b Average 356 days of flow.

RIO GRANDE BASIN--Continued

8-3660. PECOS RIVER NEAR ACME, N. MEX.--Continued

Temperature (°F) of water, water Year October 1958 to September 1959

/Once-daily measurement in the afternoon/

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	52	52	60	60	70	70	68	66	68	70	70	72	72	70	72	76	76	76	64	70	68	70	69	68	60	55	55	50	49	48	50	64	
November	50	50	48	50	48	52	60	64	68	67	66	65	65	60	58	58	48	50	49	50	52	48	52	52	49	46	45	48	47	49	54		
December	--	--	56	63	54	49	50	44	41	40	48	51	44	49	50	47	50	48	49	45	47	45	48	48	50	48	--	45	40	34	35	47	
January	36	38	36	34	38	40	48	49	40	41	41	45	50	--	50	44	44	49	48	45	44	49	50	50	49	47	50	54	50	52	49	45	
February	40	34	36	42	50	52	52	56	54	--	59	50	49	55	56	54	59	--	45	44	40	50	42	41	44	49	52	55	--	--	49	58	
March	61	60	55	46	50	51	58	55	50	58	58	61	56	51	60	59	61	60	55	59	55	60	64	70	56	55	58	60	61	65	68	58	
April	68	67	70	59	67	60	62	60	54	50	65	65	62	68	72	74	56	70	65	55	46	58	68	69	69	62	70	70	69	69	--	64	
May	60	68	75	65	68	72	72	68	76	74	75	81	76	75	72	67	70	76	71	75	74	75	75	76	75	73	71	74	74	72	76	73	
June	60	--	73	75	69	75	73	72	76	80	81	65	66	80	81	85	84	85	82	78	79	80	90	90	90	--	79	85	79	78	--	78	
July	80	85	87	87	72	78	70	82	74	86	80	82	84	84	83	82	85	82	82	86	82	86	82	76	70	80	62	84	72	81	79	84	81
August	84	86	80	86	84	80	64	80	82	80	72	82	84	73	77	74	82	80	72	82	82	77	68	80	73	70	68	68	80	82	80	78	
September	68	62	80	76	82	78	80	82	78	79	78	70	--	68	82	80	79	82	83	79	84	80	82	75	72	68	79	80	63	--	--	77	

RIO GRANDE BASIN--Continued
PECOS RIVER SEEPAGE INVESTIGATION

ACME TO ARTESIA, N. MEX.

Water samples were collected for chemical analysis at the time discharge measurements were made on the Pecos River, its tributaries and diversions in the reach beginning at the gaging station near Acme, N. Mex. and ending at the gaging station near Artesia, N. Mex. Discharge data are given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Stream or diversion	Location	Discharge (cfs)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conduc- tance (micro- mhos at 25°C)	pH
						Calcium, magne- sium	Noncar- bonate		
Pecos River.....	Near Acme (gaging station).	79.5	135	901	192	975	864	2,210	7.6
Do.....	Just upstream from Rio Hondo, 7 miles east of Roswell.	100	144	1,050	508	1,150	1,030	3,310	7.7
South Spring Creek.....	At entrance to Hagerman Canal, 2.5 miles northeast of East Grand Plains (tributary to Hagerman Canal).	4.99	272	1,350	704	1,850	1,630	4,280	7.3
Pamona Drain.....	At entrance to Hagerman Canal, 2.8 miles east of East Grand Plains (tributary to Hagerman Canal).	3.92	180	1,640	115	1,730	1,580	2,900	7.9
South Spring Drain.....	Near mouth, 3 miles northeast of East Grand Plains (tributary to Rio Hondo).	17.5	275	1,390	1,180	1,950	1,720	5,640	7.7
East Grand Plains Drainage District "D" line.	At mouth, 3.1 miles northeast of East Grand Plains.	2.02	275	1,210	866	1,720	1,490	4,550	7.4
Gravel Pit Drain.....	At mouth, 3.8 miles east of Grand Plains.	1.75	111	1,260	319	1,470	1,390	2,950	8.0
Oasis-Miller Drain.....	At mouth, 4.2 miles east of East Grand Plains.	.35	255	2,210	328	2,390	2,180	4,200	7.8
Zuber Hollow Wasteway.....	At mouth, 2 miles northeast of Dexter.	1.78	176	1,970	630	2,270	2,130	4,680	7.2
Pecos River.....	At Dexter Bridge, 2.2 miles northeast of Dexter.	149	184	1,150	614	1,410	1,260	3,780	7.6
Berry Drain.....	At mouth, 3 miles east of Dexter.	.66	197	2,410	190	2,580	2,420	3,950	7.9
Dexter-Greenfield Drain "A" line.	At mouth, 4 miles southeast of Dexter.	.39	296	2,890	1,630	3,490	3,250	8,280	7.9
Dexter-Greenfield Drain "D" line.	At mouth, 4 miles southeast of Dexter.	.35	291	2,350	1,350	3,050	2,810	7,130	7.6
Pecos River.....	0.8 mile upstream from mouth of Rio Felix and 2.5 miles north of Hagerman.	148	180	1,160	610	1,390	1,240	3,770	7.5
Hagerman Drainage District "D" line.	At mouth, 1.5 miles east of Hagerman.	.09	233	592	128	900	709	1,790	7.3

Nov. 5, 1958

RIO GRANDE BASIN--Continued
 PECOS RIVER SEEPAGE INVESTIGATION--Continued
 ACME TO ARTESIA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959.--Continued

Stream or diversion	Location	Discharge (cfs)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conduc- tance (micro- mhos at 25°C)	pH
						Calcium	Noncar- bonate		
Jan. 8, 1959									
Pecos River	Just upstream from Rio Hondo, 7 miles east of Roswell.	51.4	2177		1,020			5,240	8.6
South Spring Creek	At entrance to Hagerman Canal, 2.5 miles northeast of East Grand Plains (tributary to Hagerman Canal).	3.81	267		545			3,610	7.5
Pamona Drain	At entrance to Hagerman Canal, 2.8 miles east of East Grand Plains (tributary to Hagerman Canal).	2.20	262		107			2,870	7.9
South Spring Drain	Near mouth, 3 miles northeast of East Grand Plains (tributary to Rio Hondo).	1.40	333		950			5,210	7.7
East Grand Plains Drainage District "DP" line.	At mouth, 3.1 miles northeast of East Grand Plains.	1.55	274		465			3,420	7.3
Grauel Pitt Drain	At mouth, 3.8 miles east of Grand Plains.	1.52	186		290			2,910	7.6
Casis-Miller Drain	At mouth, 4.2 miles east of East Grand Plains.	1.22	248		450			4,500	7.3
Zuber Hollow Wasteway	At mouth, 2 miles northeast of Dexter.	1.78	220		560			4,440	7.3
Pecos River	At Dexter Bridge, 2.2 miles northeast of Dexter.	78.8	207		985			5,180	7.1
Berry Drain	At mouth, 3 miles east of Dexter.	.68	289		158			3,930	7.6
Dexter-Greenfield Drain "A" line.	At mouth, 4 miles southeast of Dexter.	.22	109		1,180			6,140	8.0
Dexter-Greenfield Drain "E" line.	At mouth, 4 miles southeast of Dexter.	.50	257		910			6,420	7.8
Dexter-Greenfield Drain "D" line.	At mouth, 4 miles southeast of Dexter.	.11	168		1,610			7,800	8.2
Pecos River	0.8 mile upstream from mouth of Rio Felix and 2.5 miles north of Hagerman.	73.9	206		1,060			5,530	7.5
Hagerman Drainage District "D" line.	At mouth, 1.5 miles east of Hagerman.	.09	559		136			2,070	7.4
Artesia sewage line	At mouth, 2.5 miles east of Artesia.	.24	230		180			2,160	6.7
Mar. 6, 1959									
Pecos River	Near Acme (gaging station).	53.6	132		1,070			2,900	7.4
...Do.	Just upstream from Rio Hondo, 7 miles east of Roswell.	61.4	142		1,280			4,480	7.2
South Spring Creek	At entrance to Hagerman Canal, 2.5 miles northeast of East Grand Plains (tributary to Hagerman Canal).	4.25	258		1,350			4,470	7.3
Pamona Drain	At entrance to Hagerman Canal, 2.8 miles east of East Grand Plains (tributary to Hagerman Canal).	4.90	263		1,620			3,010	7.6

South Spring Drain	Near mouth, 3 miles northeast of East Grand Plains (tributary to Rio Hondo).	1.10	320	1,420	780	4,670	7.7
Gravel Pit Drain	At mouth, 3.8 miles east of Grand Plains.	1.31	298	1,220	315	3,090	7.8
Oasis-Miller Drain	At mouth, 4.2 miles east of East Grand Plains.	.73	267	2,260	230	4,090	7.7
Zuber Hollow Wasteway	At mouth, 2 miles northeast of Dexter.	1.55	165	1,850	550	4,410	7.1
Pecos River	At Dexter Bridge, 2.2 miles northeast of Dexter.	90.2	167	1,350	815	4,650	7.5
Berry Drain	At mouth, 3 miles east of Dexter.	.79	268	2,350	180	3,980	7.8
Dexter-Greenfield Drain "A" line.	At mouth, 4 miles southeast of Dexter.	.22	256	1,800	1,050	5,710	8.2
Dexter-Greenfield Drain "E" line.	At mouth, 4 miles southeast of Dexter.	.25	256	3,750	1,790	9,940	7.3
Dexter-Greenfield Drain "D" line.	At mouth, 4 miles southeast of Dexter.	.58	255	2,560	1,770	8,500	8.2
Pecos River	0.8 mile upstream from mouth of Rio Felix and 2.5 miles north of Hagerman.	93.5	171	1,420	850	4,830	7.4
Greer Bros. Diversion upper pump on Rio Felix.	1.5 miles north of Hagerman.	3.60	256	1,840	1,390	6,780	7.3
Templeton Diversion Pump on Rio Felix.	1.8 miles north of Hagerman.	3.96	258	1,840	1,400	6,730	7.5
Michelet Diversion Pump	2 miles northeast of Hagerman.	2.45	168	1,450	880	4,940	7.2
Menoud Diversion Pump	1.5 miles east of Hagerman.	4.00	172	1,450	885	4,940	8.0
Hagerman Drainage District "D" line.	At mouth, 1.5 miles east of Hagerman.	.09	175	922	220	2,400	6.6
Lathrop Diversion Pump	3 miles southeast of Hagerman.	2.96	168	1,510	990	5,320	7.2
Buffalo Valley Diversion Pump ..	5 miles southeast of Hagerman.	8.79	170	1,490	940	5,170	7.3
Parker Diversion Upper Pump ..	6.1 miles northeast of Lake Arthur.	8.20	165	1,490	960	5,220	7.1
Artesia sewage line	At mouth, 2.5 miles east of Artesia.	.10	310	1,870	435	4,430	6.9

a Includes equivalent of 17 parts per million of carbonate (CO₂).

RIO GRANDE BASIN--Continued
 PECOS RIVER SEEPAGE INVESTIGATION--Continued
 ACME TO ARTESIA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

Stream or diversion	Location	Discharge (cfs)	Bicar- bonate (HCO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Hardness as CaCO ₃		Specific conduc- tance (micro- mhos at 25°C)
						Calcium	Noncar- bonate	
Sept. 23, 1959								
Pecos River.....	Above Bitter Lakes, 10.5 miles northeast of Roswell.	0.76			5,210			17,800
Do.....	At Bitter Lakes, 9.5 miles northeast of Roswell.	1.32			7,330			23,300
Bitter Creek (and Roswell sewage).	Near mouth, 6.5 miles east of Roswell.	2.27			1,250			5,580
Pecos River.....	At Tatum Bridge (U. S. Highway 380), 7.4 miles east of Roswell.	3.64			2,600			9,970
Do.....	Just upstream from Rio Hondo, 7 miles east of Roswell.	3.47			3,440			12,500
Rio Hondo.....	At bridge on U. S. Highway 380, 5.8 miles east of Roswell.	1.90			1,600			6,510
Do.....	At mouth, 7 miles east of Roswell.	4.14			1,360			5,830
Pecos River.....	Below mouth of Rio Hondo, 7 miles east of Roswell.	7.77			2,350			9,020
Do.....	Below Gravel Pit Drain, 4.5 miles east of East Grand Plains.	8.82			1,620			6,770
Do.....	Below Bottomless Lakes, 4.2 miles east of East Grand Plains (below Oasis-Miller drain).	10.3			1,350			6,090
Do.....	At pipeline crossing, 6 miles south of East Grand Plains.	10.1			1,250			5,810
Do.....	Above Nine Mile Draw, 3.5 miles north of Dexter.	9.23			1,300			6,040
Do.....	Below Nine Mile Draw, 3 miles north of Dexter.	9.32			1,320			6,080
Do.....	At Dexter Bridge, 2.2 miles northeast of Dexter.	10.7			1,400			6,560
Do.....	Below Berry Drain, 3.4 miles east of Dexter.	8.75			1,420			8,580
Do.....	0.8 mile upstream from mouth of Rio Felix and 2.5 miles north of Hagerman.	11.9			1,130			5,900
Do.....	Below Rio Felix, 1.5 miles northeast of Hagerman.	11.5			1,170			6,040
LaFord Diversion Pump.....	1.2 miles northeast of Hagerman.	4.67			1,180			5,970
Michelet Diversion Pump.....	2 miles northeast of Hagerman.	2.65			1,240			6,180
Menoud Diversion Pump.....	1.5 miles east of Hagerman.	3.85			1,420			6,910
Utterback Diversion Pump.....	1.5 miles east of Hagerman.	5.28			1,440			6,990
Pecos River.....	At Hagerman Bridge, 2.5 miles east of Hagerman.	1.19			2,000			8,820

Pecos River	At Hagerman Bridge, 2.5 miles east of Hagerman.	7.29	1,580	7,560
Haley Diversion Pump	2.8 miles east of Hagerman.	2.61	2,020	8,760
Pecos River	Above Hagerman Drainage District "A" line, 2.5 miles southeast of Hagerman.	8.83	4,080	14,900
Do.	Near Prichard Lakes, 3.5 miles southeast of Hagerman.	6.08	3,230	12,700
Do.	Above Buffalo Valley Diversion Pump, 5 miles southeast of Hagerman.	3.94	2,790	11,300
Parker Diversion Upper Pump	6.1 miles northeast of Lake Arthur.	3.17	2,970	11,500
Parker Diversion Lower Pump	5 miles east of Lake Arthur.	4.11	5,560	17,800
Pecos River	Near Lake Arthur regular gage, 4.5 miles east of Lake Arthur.	1.66	7,860	24,200
Do.	Near Lake Arthur (gaging station).	1.29	5,080	17,400
Do.	Below Walnut Creek, 2.5 miles south of Lake Arthur.	1.76	6,580	21,200
Do.	Below Cottonwood Creek, 4.5 miles northeast of Artesia.	2.15	6,480	21,000
Artesia sewage line	At mouth, 2.5 miles east of Artesia.	.27	320	2,950
Pecos River	Near Artesia (gaging station).	2.22	3,480	13,200

RIO GRANDE BASIN--Continued

8-3905. RIO HONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.
 LOCATION.--At gaging station on left bank on downstream side of road bridge at Diamond A Ranch, 8 miles upstream from Rocky Arroyo and 18 miles west of
 Dra Roswell, Chaves County.

DR. ROSWELL, CHAVES COUNTY. (contributing area).
 RECORDS AVAILABLE.--Chemical analyses: November 1955; to September 1959 (intermittent).
 Sediment records: September 1951 to September 1955, May 1957 to September 1959.

EXTREMES, 1958-59.--Water temperatures: Maximum, 88°F July 8; minimum, 34°F Jan. 5-6.
 Sediment concentrations: Maximum daily, 22,100 ppm July 1; minimum daily, no flow on many days.
 Sediment loads: Maximum daily, 26,300 tons Aug. 19; minimum daily, 0 tons on many days.
 EXTREMES, 1951-59.--Water temperatures (1951-55, 1957-59): Maximum, 88°F Aug. 1, 1957; minimum, 34°F Jan. 5-6, 1959.
 Sediment concentrations: Maximum daily, 64,900 ppm July 19, 1956; minimum daily, no flow on many days each year.
 Sediment loads: Maximum daily, 630,000 tons Oct. 6, 1954; minimum daily, 0 tons on many days.
 REMARKS.--Records of discharge for water year October, 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)	
														Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate		
Oct. 21, 1958.....	30	13	0.01	218	63	40	1.6	146	677	52	0.4	1.0	0.07	1,140	1.55	92.3	803	684	0.6	1,480
Dec. 3.....	21	16	.04	249	65	42	4.7	173	751	54	.6	2.5	.14	1,270	1.73	72.0	889	747	.6	1,600
Jan. 13, 1959.....	2	15	.00	250	83	43	1.9	173	792	56	.5	2.8	.16	1,330	1.81	7.18	965	823	.6	1,650
Aug. 10.....	33	12	.00	214	43	28	3.9	288	469	34	1.2	2.5	.05	1,29	1.29	84.6	710	474	.5	1,280

RIO GRANDE BASIN--Continued

8-3905. RIO HONDO AT DIAMOND A RANCH, NEAR ROSWELL, N. MEX.--Continued

Suspended sediment, water year October 1958 to September 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..							0	--	0
2..							0	--	0
3..							0	--	0
4..							8	1,000	sa 88
5..							10	3,700	100
6..							0	--	0
7..							0	--	0
8..							0	--	0
9..							0	--	0
10..							0	--	0
11..							0	--	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..							0	--	0
25..							0	--	0
26..							0	--	0
27..							0	--	0
28..							0	--	0
29..							0	--	0
30..							0	--	0
31..							0	--	0
Total	0		0	0		0	16	--	188
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..	19	22,100	s 1,570	0	--	0	17	100	5
2..	1	3,200	9	0	--	0	14	60	2
3..	0	--	0	0	--	0	4	60	1
4..	0	--	0	0	--	0	3	1	(t)
5..	0	--	0	0	--	0	1	1	(t)
6..	0	--	0	0	--	0	1	1	(t)
7..	0	--	0	0	--	0	0	--	0
8..	1	150	s 1	0	--	0	0	--	0
9..	1	70	(t)	0	--	0	0	--	0
10..	0	--	0	33	4,090	s 3,910	1	48	(t)
11..	0	--	0	57	15,700	s 4,220	0	--	0
12..	0	--	0	6	1,020	17	0	--	0
13..	0	--	0	4	340	4	0	--	0
14..	0	--	0	7	320	6	0	--	0
15..	0	--	0	40	2,980	s 427	0	--	0
16..	0	--	0	22	1,920	114	0	--	0
17..	101	9,540	s 8,160	20	710	38	0	--	0
18..	10	400	11	18	671	s 107	0	--	0
19..	0	--	0	232	10,300	s 26,300	0	--	0
20..	0	--	0	76	12,300	s 3,050	0	--	0
21..	0	--	0	45	3,800	sa 830	0	--	0
22..	0	--	0	40	2,800	sa 400	0	--	0
23..	0	--	0	29	800	63	0	--	0
24..	0	--	0	303	12,600	s 14,600	0	--	0
25..	0	--	0	49	2,600	s 373	0	--	0
26..	0	--	0	43	1,540	s 905	0	--	0
27..	0	--	0	127	15,900	s 6,970	0	--	0
28..	0	--	0	40	3,000	324	0	--	0
29..	1	80	s 2	37	850	85	0	--	0
30..	0	--	0	30	480	39	0	--	0
31..	0	--	0	25	290	20	--	--	--
Total	134	--	9,753	1,283	--	62,802	41	--	8

Total discharge for year (cfs-days).....4,480
 Total load for year (tons).....74,290

s Computed by subdividing day.
 t Less than 0.50 ton.
 a Computed from estimated concentration graph.

RIO GRANDE BASIN--Continued
8-3905. RIO HONDO AT DIAMOND A RANCH NEAR ROSWELL, N. MEX.--Continued

Particle-size analyses of suspended sediment, water year October 1958 to September 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 temp- ature (°F)	Discharge (cfs)	Sediment concentra- tion (ppm)	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	
July 1, 1959	0650		67	58	17,000		63		83		100							PWC
July 1	1150		69	29	38,200		82		97		100							PWC
July 17	0545		65	95	19,000		34		58		87		100					VPWC
Aug. 10	2300		73	342	49,400	34	47	66	84	95	99	100						VPWC
Aug. 10	2300		73	342	49,400	0	2	8	78	94	99	100						VPN
Aug. 15	0800		72	100	5,090		46		74		96		100					VPWC
Aug. 24	0800		68	793	25,400		29		50		82		99	100				VPWC
Aug. 24	0815		68	714	23,500	22	25	42	57	74	87	95	99	100				VPWC
Aug. 24	0815		68	714	23,500	0	3	12	54	76	87	95	99	100				VPN
Aug. 27	0500		69	182	23,100		38		74		89		99	100				VPWC

RIO GRANDE BASIN--Continued

8-3965. PECOS RIVER NEAR ARTESIA, N. MEX.

LOCATION.--At gaging station near left bank on downstream end of bridge pier on State Highway 83, 4.3 miles east of Artesia, Eddy County, 7.0 miles north of mouth of Rio Pecos, and 17 miles north of McMillan Dam.

DRAINAGE AREA.--15,300 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1959.

Water temperatures: April 1949 to September 1959.

Sediment records: January 1949 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 16,300 ppm June 22-23; minimum, 1,230 ppm July 9.

Hardness: Maximum, 4,360 ppm June 22-23; minimum, 665 ppm July 9.

Specific conductance: Maximum daily, 22,160 micromhos June 23; minimum daily, 1,410 micromhos May 16.

Water temperatures: Maximum, 88°F Aug. 4; minimum, freezing point Jan. 5.

Sediment concentrations: Maximum daily, 14,600 ppm May 18; minimum daily, 15 ppm Mar. 21-25.

Sediment loads: Maximum daily, 40,800 tons July 10; minimum daily, 185; than 1.5 tons on several days in June and September.

EXTREMES, 1937-59.--Dissolved solids: Maximum, 19,300 ppm June 22-23, 1959; minimum, 479 ppm Oct. 7-8, 1954.

Hardness: Maximum, 4,360 ppm June 22-23, 1959; minimum, 279 ppm Jan. 23, 1959.

Specific conductance: Maximum daily, 22,160 micromhos June 23, 1959; minimum daily, 727 micromhos July 8, 1958.

Water temperatures: Maximum, 92°F Aug. 30, 1953; minimum, freezing point Feb. 2, 1956 Jan. 5, 1959.

Sediment concentrations (1949-59): Maximum daily, 20,800 ppm July 22, 1955; minimum daily, no flow on many days.

Sediment loads (1949-59): Maximum daily, 183,000 tons Sept. 26, 1955; minimum daily, 0 tons on many days.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Bo-tons (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	So-dium	Non-car-bon-ate
Oct. 1-5, 1958.....	332	45	259	61	257	113				800	372			4.2	1,850	1,650	895	802	3.7	2,370	8.3
Oct. 6-22.....	201	39	372	105	448	151				1,200	680			4.5	2,940	1,420	1,360	1,240	3.3	4,020	7.8
Oct. 23-Nov. 30.....	137	43	430	133	640	155				1,420	985			4.2	3,740	1,920	1,480	1,490	7.9	5,180	7.9
Dec. 1-12.....	338	36	332	142	659	171				1,480	1,265			4.7	3,760	1,500	1,240	1,770	5.7	3,720	7.9
Dec. 13-17.....	707	43	436	149	998	164				1,480	1,240			4.1	2,660	1,500	1,240	1,730	5.7	3,720	7.9
Dec. 18-31.....	194	42	426	143	794	174				1,520	1,240			4.1	4,240	1,390	1,710	1,630	8.3	5,990	8.6
Jan. 1-31, 1959.....	98.9	42	480	166	864	140				1,870	1,350			3.4	4,640	1,240	1,880	1,770	8.7	6,470	7.9
Feb. 1-8.....	103	44	520	176	976	162				1,790	1,520			2.9	5,110	1,420	2,020	1,890	9.4	7,100	7.8
Feb. 9-28.....	125	30	442	135	646	154				1,820	1,590			1.8	3,800	1,280	1,660	1,530	6.9	5,240	7.7
Mar. 1-14.....	96.5	27	478	160	759	148				1,820	1,200			1.9	4,320	1,130	1,850	1,730	7.7	6,020	7.8
Mar. 15-19, 31.....	56.8	43	540	181	980	148				1,870	1,540			3.6	5,240	7,804	2,090	1,970	9.4	7,340	7.8
Mar. 20-27, 29-30.....	22.8	29	625	226	1,390	164				2,220	2,180			--	6,750	416	2,490	2,360	12	9,340	7.6

a Includes equivalent of 2 parts per million of carbonate (CO₃).

RIO GRANDE BASIN--Continued
 8-3965. PECOS RIVER NEAR ARTESIA, N. MEX.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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) (NO ₃) (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Soilium ad-sorption ratio	Specific conductance (microhmios at 25°C)	pH
													Parts per million	Tons per acre-foot	Tons per day	Calcium-Magnesium	Non-sodium			
Mar. 28, 1959.....	36	34	741	282	2,420	150		2,570	3,880				10,000	13.6	972	3,010	2,890	19	14,100	8.1
Apr. 1-26.....	444	30	600	237	1,300	165		2,160	2,070				6,480	8.81	647	2,470	2,340	11	8,940	7.8
Apr. 27-May 1.....	57.8	33	337	570	206	982	139	2,020	1,550				5,430	7.38	833	2,270	2,160	9.0	7,380	7.9
May 2-4.....	66.3	26	580	227	1,160	156		2,090	1,840				6,000	8.16	1,070	2,380	2,250	10	8,320	7.6
May 5-9.....	80.0	26	535	179	880	150		1,810	1,400				4,910	6.68	1,060	2,070	1,880	8.4	6,780	7.8
May 10-15.....	172	30	425	131	543	177		1,350	870				3,440	4.68	1,600	1,600	1,460	5.9	4,770	7.7
May 16-17.....	289	21	174	60	189	205		465	310				1,320	1.80	1,030	680	512	3.2	2,070	7.4
May 18-23.....	444	26	390	75	207	160		1,140	290				2,210	3.01	2,650	1,280	1,150	2.5	2,840	7.8
May 24-27.....	146	27	420	122	379	152		1,340	605				2,970	4.04	1,170	1,550	1,430	4.2	3,980	7.7
May 28-June 3.....	470	23	412	66	169	151		1,150	245				2,140	2.91	2,720	1,300	1,180	2.0	2,680	7.7
June 4-6.....	115	24	435	101	359	145		1,290	580				2,860	3.89	888	1,500	1,380	4.0	3,850	7.5
June 7-10.....	60.8	29	445	126	348	143		1,390	890				3,500	4.76	575	1,630	1,510	5.9	4,860	7.9
June 11-14.....	27.5	28	470	182	1,050	140		1,880	1,930				5,460	7.43	405	2,170	2,060	9.8	7,620	7.5
June 15-21, 24-26.....	11.0	27	320	228	1,470	155		1,260	2,140				7,420	9.68	211	2,520	2,400	12	9,840	7.7
June 22-23.....	26.5	24	340	171	430	171		3,260	740				16,300	22.2	1,170	4,360	4,260	29	22,600	7.9
June 27-30.....	110	23	420	81	267	145		1,260	375				5,500	3.40	1,742	1,380	1,260	3.1	3,250	7.7
July 1-4.....	115	21	432	81	382	136		1,280	575				2,840	3.86	882	1,420	1,310	4.4	3,840	7.9
July 5-6.....	50.5	21	458	102	571	119		1,410	875				3,500	4.76	477	1,560	1,460	6.3	4,880	7.7
July 7-8, 10-18.....	659	19	385	51	160	134		1,060	215				1,960	2.67	3,490	1,170	1,060	2.0	2,510	7.8
July 9.....	429	16	315	131	140	131		1,420	195				1,230	1.67	1,420	665	558	2.4	1,780	7.5
July 10.....	464	19	335	50	135	124		925	190				1,720	2.34	2,150	1,040	938	1.8	2,250	7.9
July 31-Aug. 10.....	452	21	368	49	171	126		1,020	230				1,920	2.61	2,340	1,120	1,020	2.2	2,460	7.8
Aug. 11-29.....	493	17	308	40	135	127		842	175				1,580	2.15	2,100	935	831	1.9	2,110	7.7
Aug. 30-31.....	78.5	16	318	65	348	126		919	535				2,270	3.09	481	1,060	956	4.6	3,280	7.8
Sept. 1-2.....	53.0	18	352	83	483	147		1,040	755				2,810	3.82	402	1,220	1,100	6.0	4,080	7.5
Sept. 3-4.....	24.5	18	382	104	679	115		1,190	1,080				3,510	4.77	232	1,380	1,290	8.0	5,180	7.3
Sept. 5-8, 11-12.....	14.5	21	550	167	1,230	121		1,810	1,950				5,790	7.87	227	2,060	1,960	12	8,320	7.4
Sept. 9.....	13	21	737	241	2,410	148		2,250	3,980				9,710	13.2	341	2,830	2,710	20	14,300	7.1
Sept. 10, 13-15.....	8.65	23	678	223	1,760	136		2,300	2,790				7,840	10.7	183	2,610	2,500	15	11,200	7.6
Sept. 16-21.....	5.15	22	805	295	2,700	153		2,620	4,420				11,000	15.0	153	3,220	3,090	21	15,800	7.5
Sept. 22-30.....	3.76	22	796	305	2,440	157		2,900	3,830				10,400	14.1	106	3,240	3,110	19	14,400	7.6
Weighted average	174	29	392	91	397	141		1,200	602				2,780	3.78	1,310	1,350	1,240	4.7	3,760	--

RIO GRANDE BASIN--Continued

8-3965. PECOS RIVER NEAR ARTESIA, N. MEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

/Once-daily measurement, generally during daylight hours/

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.....	55	58	62	63	68	65	67	70	72	68	60	70	65	65	62	62	63	63	70	70	62	67	60	60	60	58	55	52	50	50	55	62
November..	50	52	55	60	62	58	56	60	60	60	58	50	60	60	58	58	49	47	49	50	50	50	51	52	52	49	50	42	45	48	53	
December..	50	50	51	52	45	45	43	48	43	48	48	48	40	39	39	45	41	46	--	42	42	--	--	45	42	46	46	45	40	37	38	
January.....	37	41	35	35	32	35	43	49	45	47	48	49	47	48	52	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
February....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	
March.....	45	52	54	52	48	48	55	58	61	54	50	51	61	55	54	52	51	57	51	54	55	50	59	59	62	54	58	67	61	65	63	
April.....	60	68	64	66	57	60	60	56	52	51	49	53	54	58	68	65	60	67	63	61	58	62	63	73	72	70	75	73	74	68	--	
May.....	66	72	67	70	72	75	69	70	74	70	73	77	73	73	65	76	74	74	70	71	73	76	72	67	74	74	73	77	78	75	75	
June.....	73	69	70	68	75	70	78	79	82	74	83	77	85	81	83	80	81	82	84	76	78	79	80	79	82	81	86	82	80	78	--	
July.....	73	80	81	83	84	78	78	80	78	78	77	78	79	78	83	83	80	81	81	79	81	82	80	82	83	78	84	80	83	80	82	
August.....	81	84	84	88	84	83	84	80	80	82	84	82	83	79	77	80	79	79	80	78	82	82	78	77	77	78	76	77	82	86	85	
September..	82	84	81	75	82	77	79	78	77	76	75	70	74	80	79	78	77	74	78	76	--	--	75	75	--	83	--	76	--	63	--	

RIO GRANDE RIVER BASIN--Continued
 8-3965. PECOS RIVER NEAR ARTESIA, N. MEX.--Continued
 Particle-size analyses of suspended sediment, water year October 1958 to September 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 temp-er-ature (°F)	Discharge (cfs)	Sediment concen-tration (ppm)	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. 15, 1958.....	1120		39	219	193	--	--	--	--	--	75	85	99	100		S
May 15, 1959.....	0820		72	252	2,780	58	--	94	--	98	100	100	100		VPWC	
May 19.....	1010		72	747	7,790	50	--	74	--	95	99	100	100		VPWC	
June 4.....	1155		74	110	341	0	4	20	84	88	95	100	100		SPN	
July 7.....	1850		80	687	14,000	--	56	--	82	--	97	99	100		VPWC	
July 10.....	1915		77	1,040	10,900	--	57	--	79	--	96	99	100		VPWC	
July 18.....	1430		80	1,710	10,800	40	45	59	71	87	97	100	--		VPWC	
July 18.....	1430		80	1,710	10,800	5	9	16	74	87	97	100	--		VPN	
July 28.....	1000		80	373	1,320	--	66	--	86	--	93	97	100		VPWC	
Aug. 9.....	1530		84	2,040	10,700	--	38	--	64	--	98	100	--		VPWC	
Aug. 16.....	1530		81	1,100	6,090	--	40	--	61	--	95	99	100		VPWC	
Aug. 30.....	1830		86	107	799	--	--	--	--	--	92	96	100		S	

Particle-size analyses of bed material, water year October 1958 to September 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 temp-er-ature (°F)	Discharge (cfs)	Sediment concen-tration (ppm)	Sediment discharge (tons per day)	Bed material										Method of analysis
							Percent finer than size indicated, in millimeters										
							0.062	0.125	0.250	0.500	1.000	2.000	4.000	8.000			
May 16, 1959.....	2035	3	72	252			8	25	79	99	100						S
June 4.....	1210	3	74	110			1	6	95	100							S

RIO GRANDE BASIN--Continued

8-3985. RIO PENASCO AT DAYTON, N. MEX.

LOCATION.--At gaging station, 3 feet upstream from crest of abandoned diversion dam, 1 mile northeast of old Dayton Railway station, 3.5 miles upstream from mouth, and 7 miles south-east of Artesia, Eddy County.

DRAINAGE AREA.--1,070 square miles, approximately.

RECORDS AVAILABLE.--Sediment records: September 1951 to September 1959.

EXTREMES, 1951-59.--Sediment concentrations: Maximum daily, 30,000 ppm Oct. 7, 1954; minimum daily, no flow on many days each year.

Sediment loads: Maximum daily, 600,000 tons Oct. 7, 1954; minimum daily, 0 tons on many days each year.

REMARKS.--Records of specific conductance of daily samples and a few water temperature observations available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632. No flow since Aug. 25, 1958.

8-4005. LAKE McMILLAN AT McMILLAN DAM, NEAR LAKEWOOD, N. MEX.

LOCATION.--Near gates on dam on Pecos River, 3 miles southeast of Lakewood, N. Mex.

DRAINAGE AREA.--16,990 square miles (contributing area).

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Bicarbonate (HCO ₃)	Chloride (Cl)	Specific conductance (micromhos at 25°C)	pH
Oct. 2, 1958	--	160	1,960	--
Oct. 8	--	174	1,980	--
Oct. 15	--	198	2,070	--
Oct. 22	--	245	2,260	--
Oct. 29	--	250	2,250	--
Nov. 5	--	290	2,460	--
Nov. 12	--	342	2,680	--
Nov. 26	--	415	2,990	--
Dec. 3	--	445	3,070	--
Dec. 10	--	475	3,230	--
Dec. 17	--	505	3,310	--
Dec. 24	--	525	3,400	--
Dec. 31	--	545	3,470	--
Jan. 7, 1959	--	610	3,800	--
Jan. 14	--	615	3,790	--
Jan. 21	--	685	4,000	--
Jan. 28	--	675	3,990	--
Feb. 4	--	710	4,120	--
Feb. 10	--	760	4,330	--
Feb. 18	--	780	4,390	--
Feb. 25	--	805	4,490	--
Mar. 4	--	810	4,520	--
Mar. 11	--	830	4,600	--
Mar. 18	144	845	4,740	7.7
Mar. 25	--	880	4,850	--
Apr. 1	--	920	4,990	--
Apr. 8	--	950	5,110	--
Apr. 15	--	990	5,240	--
Apr. 22	140	1,060	5,560	7.4
Apr. 29	140	1,160	5,930	8.1
May 6	136	1,250	6,260	7.5
May 13	132	1,240	6,280	7.4
May 20	123	1,160	5,870	7.2
May 27	117	980	5,330	7.7
June 3	112	915	5,120	7.4
June 10	112	790	4,710	7.5
June 16	106	800	4,740	7.7
June 24	105	855	4,990	7.2
July 1	106	910	5,270	7.0
July 8	90	950	5,380	7.2
July 15	72	390	3,140	7.0
July 22	82	405	3,160	7.0
July 29	82	320	2,850	7.0
Aug. 5	80	290	2,740	7.1
Aug. 12	82	290	2,750	7.1
Aug. 19	78	260	2,640	7.4
Aug. 26	82	222	2,390	7.2
Sept. 2	76	212	2,340	7.1
Sept. 9	79	235	2,420	7.2
Sept. 16	80	255	2,530	7.5
Sept. 23	77	270	2,630	7.5
Sept. 30	84	290	2,740	7.2

RIO GRANDE BASIN--Continued

8-4020. PECOS RIVER AT DAMSITE 3, NEAR CARLSBAD, N. MEX.

LOCATION.--At gaging station on right bank at damsite 3 of Carlsbad project of Bureau of Reclamation, about 1 mile upstream from flow line of Lake Avalon, 1.3 miles downstream from Rocky Arroyo, and 8 miles northwest of Carlsbad, Eddy County.

DRAINAGE AREA.--17,620 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1951 to September 1959.

REMARKS.--Samples collected once or twice monthly. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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			Hardness as CaCO ₃		Specific conductance (microhmhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate				
Oct. 10, 1958.....	285							133			390										3,090	6.8	
Oct. 15.....	326							131			370											2,960	7.2
Nov. 3.....	115							161			700											4,590	7.4
Nov. 10.....	213							138			520											3,590	6.8
Nov. 20.....	106							163			710											4,600	8.2
Dec. 1.....	100							162			690											4,470	7.5
Dec. 18.....	244							144			570											3,790	6.9
Jan. 2, 1959.....	100							162			670											4,450	7.9
Jan. 15.....	108							160			670											4,460	7.1
Feb. 4.....	92							166			670											4,430	7.4
Mar. 2.....	92							160			675											4,470	7.4
Apr. 1.....	472							148			880											4,920	7.3
Apr. 3.....	468							150			890											4,970	7.2
May 1.....	241							146			1,030											5,570	7.3
June 1.....	177							127			875											5,030	7.4
July 1.....	382							120			900											5,370	6.9
July 16.....	49							161			640											3,060	7.9
Aug. 3.....	274							95			360											2,730	7.2
Sept. 1.....	319							82			292											2,940	7.5
Sept. 10.....	219							96			336											2,940	7.5

RIO GRANDE BASIN--Continued

8-4035. CARLSBAD MAIN CANAL AT HEAD, NEAR CARLSBAD, N. MEX.

LOCATION.--At gaging station on right bank 220 feet downstream from headgates in Avalon Dam and 5.0 miles north of Carlsbad, Eddy County.
 RECORDS AVAILABLE.--Chemical analyses: February 1939 to June 1959 (discontinued).
 EXTREMES, 1958-59.--Dissolved solids: Maximum, 4,020 ppm June 1-30; minimum, 1,820 ppm Oct. 1-7.

Hardness: Maximum, 1,820 ppm June 1-30; minimum, 992 ppm Oct. 1-7.
 Specific conductance: Maximum, 5,700 microhos May 7; minimum, 2,140 microhos Oct. 1.

EXTREMES, 1939-59.--Dissolved solids: Maximum, 7,430 ppm June 21-28, 1955; minimum, 552 ppm Aug. 24-31, 1954.
 Hardness: Maximum, 3,100 ppm June 11-20, 1955; minimum, 338 ppm Aug. 24-31, 1954.

Specific conductance: Maximum daily, 11,100 microhos June 24, 1955; minimum daily, 401 microhos June 3, 1948.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge furnished by Surface Water Branch, Santa Fe District, for water year October 1958 to September 1959. Monthly diversions to canal below Lake Avalon for water year October 1958 to September 1959 given in WSP 1632. No flow Nov. 1 to Jan. 4, Jan. 21, Mar. 10-17.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		Sodium carbonate ratio		
Oct. 1-7, 1958	32.0	15		315	50	197		116		927	255		1.2			1,820	2.48	157	992	896	2.7	2,390	7.5
Oct. 8	32.0	24		455	96	410		138		1,430	580		2.2			3,070	4.18	265	1,530	1,420	4.6	3,970	8.0
Oct. 9	32.0	18		325	54	224		116		976	290		1.0			1,940	2.64	168	1,030	938	3.0	2,560	7.5
Oct. 10-15	32.0	17		380	74	275		130		1,140	395		1.0			2,350	3.20	203	1,250	1,150	3.4	3,080	7.6
Oct. 16	32.0	17		490	99	433		151		1,490	635		1.2			3,240	4.41	280	1,630	1,510	4.7	4,230	7.9
Oct. 17-23	32.1	18		370	74	289		129		1,140	400		.8			2,350	3.20	204	1,230	1,120	3.6	3,100	7.6
Oct. 24	33.0	17		470	105	428		148		1,470	625		1.5			3,190	4.34	223	1,600	1,480	4.5	4,150	7.9
Oct. 25-26	33.0	16		395	80	305		134		1,190	445		.8			2,900	3.40	284	1,710	1,200	3.7	3,560	7.9
Oct. 27-28	33.0	18		490	128	389		153		1,510	635		1.0			3,250	4.42	290	1,730	1,420	4.6	4,260	8.0
Oct. 29-31	30.3	17		410	86	330		135		1,260	475		1.0			2,640	3.59	216	1,380	1,270	3.9	3,460	7.8
Jan. 5-20, 22-31, 1959	80.5	23		505	102	440		125		1,540	660		.2			3,640	4.53	791	1,680	1,580	4.7	4,330	8.0
Feb. 1-28	79.2	22		525	105	463		133		1,600	690		.2			3,700	4.72	791	1,740	1,630	4.8	4,450	7.8
Mar. 1-9, 18-31	204	20		530	116	487		144		1,620	740		.3			3,870	4.88	2,130	1,800	1,680	5.0	4,650	7.8
Apr. 1-30	235	15		505	122	532		150		1,560	860		.6			4,010	5.09	2,540	1,760	1,640	5.9	5,040	7.6
May 1-31	92.8	15		385	109	538		134		1,390	860		.4			3,850	4.87	2,965	1,660	1,550	6.0	4,820	7.6
June 1-30	243	16		530	121	538		124		1,650	830		.3			4,020	5.10	2,640	1,820	1,750	5.5	4,900	7.4

RIO GRANDE BASIN--Continued

8-4050. PECOS RIVER AT CARLSBAD, N. MEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

Once-daily measurement between 4 p.m. and 7 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	78	70	63	78	73	76	78	73	76	74	72	72	72	75	72	73	73	73	73	74	75	74	72	73	70	70	73	69	64	62	63	65
November ..	62	63	61	62	64	65	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	66	
December ..	65	64	65	66	64	55	59	67	58	60	64	63	57	55	--	58	59	60	63	56	57	63	62	64	65	65	68	70	57	57	57	
January	53	57	49	52	55	58	58	58	58	60	57	62	63	61	57	52	60	63	63	58	55	58	59	60	65	63	60	64	63	63	63	
February	49	50	52	63	62	53	58	64	63	62	66	63	68	70	70	62	62	58	57	63	65	63	65	63	65	62	64	65	65	65	65	
March	65	68	85	60	60	63	62	68	68	69	63	67	65	65	64	65	65	68	68	63	63	65	65	69	62	67	67	68	70	72	72	
April	73	74	72	71	71	73	69	66	63	63	65	--	65	68	70	65	73	73	75	72	68	73	75	78	80	78	79	73	80	76	--	
May	76	78	76	75	78	80	77	74	75	78	79	80	80	80	77	81	82	82	80	77	79	80	80	78	80	80	81	83	83	83	83	
June	80	78	83	80	79	78	82	80	83	83	82	85	87	86	87	85	87	84	85	84	84	83	85	84	83	85	86	87	84	81	--	
July	80	81	84	87	82	84	85	81	83	83	83	80	83	83	85	88	85	--	86	83	83	86	85	83	83	84	85	84	83	83	83	
August	86	84	85	86	85	85	86	83	84	84	83	83	81	80	83	83	84	84	84	--	85	82	82	83	82	82	82	82	85	86	83	
September ..	84	83	78	83	86	86	80	82	82	78	83	86	75	76	82	82	83	83	80	80	81	81	82	81	81	82	79	78	79	80	80	--

QUALITY OF SURFACE WATERS, 1959

RIO GRANDE BASIN--Continued

REFINERY INTAKE CANAL NEAR LOVING, N. MEX.

(Weekly samples taken from canal in sec. 13, T. 23 S., R. 28 E., representing water in Harroun Canal diverted from Pecos River at dam in sec. 11, T. 23 S., R. 28 E.)

Date of collection	Chloride (Cl)	Specific conductance (micromhos at 25°C)
Oct. 2, 1958.....	295	2,570
Oct. 9.....	420	3,160
Oct. 16.....	480	3,430
Oct. 23.....	560	3,830
Oct. 30.....	635	4,080
Nov. 6.....	595	3,930
Nov. 13.....	620	4,100
Nov. 20.....	600	4,010
Nov. 27.....	655	4,240
Dec. 4.....	675	4,300
Dec. 11.....	695	4,400
Dec. 18.....	700	4,420
Jan. 1, 1959.....	710	4,480
Jan. 8.....	710	4,430
Jan. 15.....	760	4,650
Jan. 22.....	770	4,720
Jan. 29.....	800	4,740
Feb. 5.....	775	4,650
Feb. 14.....	770	4,580
Feb. 20.....	775	4,580
Feb. 26.....	770	4,610
Mar. 5.....	750	4,510
Mar. 12.....	770	4,560
Mar. 19.....	815	4,770
Mar. 26.....	825	4,780
Apr. 9.....	770	4,580
Apr. 16.....	800	4,700
Apr. 23.....	865	4,990
Apr. 30.....	860	4,940
May 7.....	860	4,970
May 14.....	290	1,900
May 21.....	670	3,940
May 28.....	680	4,060
June 4.....	805	4,680
June 11.....	830	4,780
June 18.....	845	4,850
June 25.....	800	4,660
July 2.....	845	4,850
July 10.....	860	4,950
July 16.....	860	4,910
July 23.....	840	4,820
July 30.....	955	5,300
Aug. 6.....	975	5,410
Aug. 13.....	905	5,130
Aug. 20.....	850	4,920
Aug. 20.....	915	5,160
Sept. 2.....	860	4,920
Sept. 10.....	820	4,770
Sept. 17.....	840	4,830
Sept. 24.....	985	5,410

RIO GRANDE BASIN--Continued

8-4063. PECOS RIVER EAST OF MALAGA, N. MEX.

LOCATION.--One and a half miles upstream from gaging station near Malaga, Eddy County, and 4 miles downstream from Black River.
DRAINAGE AREA.--19,190 square miles, approximately, upstream from gaging station (contributing area).
RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 7,320 ppm July 21-28; minimum, 1,110 ppm May 8.

Hardness: Maximum, 2,430 ppm July 21-28; minimum, 595 ppm May 8.

Specific conductance: Maximum, 11,200 microhms July 27; minimum, 1,730 microhms May 8.

Water temperatures: Maximum, 88°F June 13, Aug. 3, 5, 8.

EXTREMES, 1937-59.--Dissolved solids: Maximum, 9,100 ppm June 22 to July 21, 1957; minimum, 384 ppm Sept. 21-22, 1941.

Hardness: Maximum, 2,750 ppm June 1-10, 1955; minimum, 254 ppm Sept. 21-22, 1941.

Specific conductance: Maximum daily, 14,600 microhms July 21, 1957; minimum daily, 450 microhms Sept. 21, 1941.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for gaging station near Malaga for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

Date of collection	Mean discharge (cfs)	Silica (SiO ₂)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO ₃)	Carbonates (CO ₃)	Sulfate (SO ₄)	Chloride (Cl)	Fluoride (F)	Nitrate (NO ₃)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (microhms at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium Magnesium	Non-carbonate		Sodium sorption ratio	Calcium	Non-carbonate
Oct. 1-5, 1958.....	539	29		352	69	305	131	131		1,010	470		1.8	2,300	3.13	3,350	1,160	1,050	3.9	3,140	7.9
Oct. 6-20.....	278	48		382	94	437	109	109		1,190	680		2.4	2,890	3.93	2,170	1,340	1,250	5.2	3,960	7.9
Oct. 21-31.....	164	42		435	118	567	129	129		1,370	900		3.0	3,500	4.76	1,550	1,570	1,460	6.2	4,820	7.9
Nov. 1-30.....	213	33		442	126	539	129	129		1,400	870		3.1	3,480	4.73	2,000	1,620	1,510	5.8	4,750	7.9
Dec. 1-31.....	175	29		478	140	583	151	151		1,510	950		4.0	3,770	5.13	1,780	1,770	1,650	6.0	5,140	7.8
Jan. 1-31, 1959....	112	24		500	147	691	158	158		1,590	1,110		4.4	4,140	5.63	1,250	1,850	1,720	7.0	5,650	7.7
Feb. 1-28.....	90.9	21		505	153	684	139	139		1,600	1,130		4.2	4,170	5.67	1,020	1,890	1,780	6.8	5,760	7.5
Mar. 1-13.....	32.1	20		565	180	1,060	143	143		1,810	1,730		6.4	5,440	7.40	471	2,150	2,030	9.9	7,620	7.7
Mar. 14-31.....	24.7	23		600	205	1,340	175	175		1,960	2,170		--	6,380	8.68	425	2,340	2,200	12	8,990	7.7
Apr. 1-27.....	39.2	22		600	193	1,250	176	176		1,920	2,030		--	6,100	8.30	646	2,290	2,150	11	8,590	7.4
Apr. 28-May 7.....	83.4	17		560	188	948	165	165		1,830	1,550		5.8	5,180	7.04	1,170	2,170	2,040	8.8	7,170	7.3
May 8.....	1,620	11		171	41	145	156	156		430	234		5.7	1,110	1.51	4,860	595	467	2.6	1,730	7.0
May 9-10.....	193	15		210	57	351	132	132		590	566		4.9	1,860	2.53	989	760	652	5.5	2,900	7.5
May 11-17.....	95.9	17		298	82	576	158	158		851	851		6.3	2,840	3.86	735	1,080	950	6.1	4,330	7.2
May 18-21.....	66.5	19		358	114	773	177	177		1,070	1,260		5.6	3,690	5.02	663	1,360	1,220	6.1	7,290	7.4
May 22-23.....	52.5	20		412	139	1,120	175	175		1,310	1,780		6.0	4,880	6.64	692	1,460	1,360	6.6	4,900	7.2
May 24-25.....	136	17		385	126	585	149	149		1,180	990		5.8	3,360	4.57	1,232	1,460	1,360	6.6	4,900	7.2
May 26-31.....	51.5	17		465	158	993	149	149		1,510	1,610		5.0	4,630	6.57	1,272	1,810	1,690	10	6,950	7.2

RIO GRANDE BASIN--Continued
8-4063. PECOS RIVER EAST OF MALAGA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--Continued

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 (calculated)			Hardness as CaCO ₃		Sodium-sorption ratio	Specific conductance (micro-mhos at 25°C)
															Parts per million	Tons per acre-foot	Tons per day	Calcium-magnesium	Non-carbonate		
June 1-23, 1959...	61.0	15	530	179	1,050	149	1,720	1,490	1,720	1,720	1,720	4.9	---	---	---	871	7.19	2,060	1,940	10	7,530
June 24-30.....	34.1	19	585	200	1,560	24	1,840	1,560	1,840	1,840	1,840	---	---	---	633	9.34	2,950	2,560	10	8,810	
July 1-9.....	36.7	22	610	201	1,470	188	1,980	1,470	1,980	1,980	1,980	---	---	---	689	9.18	2,850	2,590	13	8,580	
July 10-11.....	50.5	23	555	191	1,260	158	1,880	1,260	1,880	1,880	1,880	5.6	---	---	817	8.15	2,470	2,040	12	7,250	
July 12-15.....	76.0	22	505	175	1,010	156	1,880	1,010	1,880	1,880	1,880	5.3	---	---	1,040	6.92	1,680	1,850	9.8	7,250	
July 16-20.....	40.2	23	560	190	1,340	170	1,850	1,340	1,850	1,850	1,850	---	---	---	672	8.42	2,180	2,040	12	8,590	
July 21-28.....	37.9	24	579	240	1,670	178	2,030	1,670	2,030	2,030	2,030	---	---	---	749	9.96	7,320	2,430	15	10,600	
July 29-Aug. 4.....	55.0	22	590	223	1,240	153	1,990	1,240	1,990	1,990	1,990	6.3	---	---	921	8.43	6,200	2,260	11	8,710	
Aug. 5-31.....	40.0	25	610	209	1,550	176	2,010	1,550	2,010	2,010	2,010	---	---	---	754	9.49	6,980	2,380	14	9,970	
Sept. 1-5.....	46.6	25	599	225	1,560	180	2,030	1,560	2,030	2,030	2,030	---	---	---	887	9.59	7,050	2,420	14	10,100	
Sept. 6-16.....	61.1	21	550	206	1,210	166	1,890	1,210	1,890	1,890	1,890	7.2	---	---	977	8.05	5,920	2,220	11	8,360	
Sept. 17-30.....	39.7	23	603	206	1,640	186	2,000	1,640	2,000	2,000	2,000	---	---	---	769	9.75	7,170	2,350	15	10,200	
Weighted average	106	28	456	135	695	144	1,440	1,120	1,440	1,440	1,120	3.9	---	---	1,130	5.37	3,950	1,690	1,570	7.4	5,500

Temperature (°F) of water, February to September 1959
/Once-daily measurement during daylight hours/

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	
February.....	55	56	55	54	55	54	55	55	53	58	59	55	55	51	50	53	58	59	55	55	51	49	48	52	49	54	55	58	50	55	58	61
March.....	66	69	70	63	64	59	57	59	56	55	56	56	58	65	70	70	71	70	68	67	71	71	74	74	72	67	75	75	75	75	75	75
April.....	72	74	75	76	70	71	68	70	72	73	73	73	78	79	77	72	79	71	81	75	75	73	80	71	81	82	83	75	75	75	75	75
May.....	81	77	75	79	78	77	78	78	86	85	84	80	88	83	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
June.....	79	79	84	85	84	85	86	85	83	82	77	85	84	87	83	84	83	84	83	83	87	86	84	83	87	86	84	83	84	83	84	83
July.....	84	87	88	87	88	86	87	88	87	85	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84	84
August.....	85	83	86	82	80	80	80	80	80	83	83	77	78	75	68	79	79	80	80	71	71	71	71	71	71	75	75	70	67	68	68	70
September.....	85	83	86	82	80	80	80	80	80	83	83	77	78	75	68	79	79	80	80	71	71	71	71	71	71	75	75	70	67	68	68	70

RIO GRANDE BASIN--Continued
 S-4070. PECOS RIVER AT PIERCE CANYON CROSSING, NEAR MALAGA, N. MEX.

LOCATION--At Pierce Canyon Crossing, a quarter of a mile downstream from gaging station and 6 miles southeast of Malaga, Eddy County.
 DRAINAGE AREA--19,260 square miles, approximately (contributing area).

RECORDS AVAILABLE--Chemical analyses: March 1938 to September 1941, October 1951 to September 1959.

Water temperatures: October 1952 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 11,600 ppm Mar. 17-26; minimum, 630 ppm May 8-9.

Hardness: Maximum, 2,550 ppm Aug. 5-31; minimum, 88° F Aug. 8; minimum, 38° F Jan. 5.

Specific conductance: Maximum daily, 18,200 microhos Mar. 22; minimum daily, 2,480 microhos May 9.

Water temperatures: Maximum, 88° F Aug. 8; minimum, 38° F Jan. 5.

EXTREMES, 1938-41, 1951-59.--Dissolved solids: Maximum, 23,700 ppm Aug. 11-21, 1954; minimum, 280 ppm Sept. 21, 1941.

Hardness: Maximum, 3,420 ppm Aug. 11-21, 1954; minimum, 202 ppm Sept. 21, 1941.

Specific conductance: Maximum daily, 34,400 microhos Aug. 2, 1954; minimum daily, 433 microhos Sept. 21, 1941.

Water temperatures: (1952-59): Maximum, 90° F Aug. 3, 1953, July 24, 1954, July 1, 1957; minimum, 37° F Dec. 24, 1953, Feb. 5, 1956.

REMARKS.--Bases omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

No appreciable inflow between sampling point and gaging station except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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- trate (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		Specific conductance (microhos at 25°C)		
														Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Non-carbonate		So- luum ad- sorp- tion ratio	
Oct. 1, 3-5, 1958.	590	20		340	76	337		129	1,030	505		3.1		2,370	3.22	3,780	1,160	1,050	4.3	3,300	7.9
Oct. 6, 7-13.	297	24		375	103	645		147	1,000	1,000		3.4		3,400	4.62	2,730	1,360	1,240	7.6	4,830	7.8
Oct. 8, 14-15.	213	29		390	116	864		171	1,230	1,350		4.8		4,070	5.54	2,340	1,450	1,310	9.9	5,920	8.2
Oct. 16-20.	308	26		400	120	612		165	1,270	1,965		3.8		3,480	4.73	2,890	1,490	1,360	6.9	4,950	8.1
Oct. 21-31.	171	30		435	169	943		157	1,440	1,560		5.2		4,660	6.34	2,150	1,780	1,650	9.7	6,750	8.0
Nov. 1-4.	175	29		460	142	943		175	1,470	1,490		6.8		4,630	6.30	2,190	1,730	1,590	9.9	6,580	8.1
Nov. 5-20.	265	37		460	107	744		174	1,400	1,100		5.8		3,920	5.33	2,800	1,540	1,400	8.2	5,440	8.0
Nov. 21-30.	165	39		460	149	1,090		174	1,600	1,640		4.1		5,070	6.90	2,240	1,760	1,620	11	7,070	7.9
Dec. 1-31.	172	27		460	147	1,200		108	1,490	1,490		4.1		4,720	6.42	2,190	1,750	1,660	10	6,730	8.0
Jan. 1-31, 1959.	113	26		480	188	1,200		140	1,690	1,920		5.2		5,580	7.59	1,700	1,970	1,860	12	8,000	7.8
Feb. 1-28.	95.3	20		485	175	1,260		120	1,670	2,000		5.2		5,670	7.71	1,460	1,830	1,830	12	8,310	7.7
Mar. 1-10.	46.8	17		512	212	2,020		130	1,870	3,190		--		7,880	10.7	996	2,150	2,040	19	11,800	7.6
Mar. 11-16, 27-31	31.7	22		567	245	2,680		146	2,000	4,290		--		9,880	13.4	846	2,420	2,300	24	14,900	7.8
Mar. 17-26.	28.1	27		576	263	3,290		166	2,200	5,150		--		11,600	15.8	880	2,520	2,390	29	17,300	8.0
Apr. 1-28.	46.5	25		586	243	2,650		187	2,130	4,650		--		9,880	13.4	1,240	2,460	2,320	23	14,600	7.6
Apr. 29-May 7.	81.0	20		563	223	1,750		171	2,000	2,770		--		7,410	10.1	1,620	2,320	2,180	16	10,800	7.8
May 8-9.	132	13		218	63	311		136	654	485		7.1		1,820	2.48	5,070	805	694	4.8	2,730	7.2
May 10.	132	13		162	55	535		119	494	835		5.7		2,160	2.94	7,770	630	532	9.3	3,650	7.0
May 11-13.	93.0	19		245	87	1,080		163	782	1,680		5.5		3,970	5.40	997	970	844	15	6,460	7.2
May 14-20, 24-27.	89.6	20		330	121	1,360		152	1,130	2,100		--		5,140	6.99	1,240	1,320	1,190	16	7,930	7.3
May 21-23, 28-31.	55.4	18		394	165	1,810		148	1,410	2,840		--		6,710	9.13	1,000	1,660	1,540	19	10,300	7.2

RIO GRANDE BASIN--Continued

8-4070. PECOS RIVER AT PIERCE CANYON CROSSING, NEAR MALAGA, N. MEX.--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959.--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 (calculated)			Hardness as CaCO ₃		Soil adsorption ratio	Specific conductance (microhmhos at 25°C)	
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-carbonate			
June 1-24, 1959..	62.9	17		517	204	1,980		143		1,850	3,120				7,760	10.6	1,320	2,130	2,010	19	11,600	7.5
June 25-30.....	37.0	19		567	228	2,630		153		2,050	4,120				9,690	13.2	968	2,350	2,220	24	14,300	7.3
July 1-12, 23-30..	44.4	23		591	254	3,080		165		2,190	4,820				11,000	15.0	1,320	2,520	2,380	27	16,000	7.4
July 13, 16-22....	50.6	21		538	223	2,390		206		1,970	3,740				8,960	12.2	1,220	2,260	1,130	22	13,100	7.4
July 14-15.....	73.0	21		475	169	1,370		130		1,610	2,480				6,390	8.69	1,260	1,880	1,710	16	9,380	7.4
July 14-Aug. 4....	35.6	22		603	242	2,280		130		2,190	3,580				9,000	12.2	1,350	2,500	2,380	20	12,900	7.4
Aug. 5-31.....	42.1	24		602	235	3,050		169		2,460	4,730				11,000	15.0	1,230	2,550	2,410	26	15,700	7.4
Sept. 1-5, 17-30..	69.4	22		597	255	2,870		181		2,160	4,530				10,500	14.3	1,360	2,540	2,390	25	15,500	7.7
Sept. 6-16.....	69.4	22		563	225	2,220		162		2,030	3,480				8,550	11.7	1,620	2,330	2,200	20	12,300	7.6
Weighted average	110	25		451	156	1,260		148		1,540	1,970				5,480	7.45	1,630	1,770	1,640	13	7,910	--

Temperature (°F) of water, water year October 1958 to September 1959

Month	Day																															Average
	Once-daily measurement during daylight hours ⁷																															
	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	63	63	69	67	73	73	73	71	68	70	68	68	66	68	71	68	66	67	70	68	65	66	67	65	61	60	58	55	55	57	
November.....	58	56	60	60	59	56	54	57	58	--	58	62	60	62	61	55	55	53	52	53	52	53	55	54	56	55	50	49	49	51		
December.....	53	53	--	51	54	51	50	50	50	50	49	50	48	46	45	45	46	48	48	51	46	47	50	48	46	48	47	47	40	39		
January.....	41	43	41	39	38	39	43	39	44	40	47	46	49	50	47	49	48	52	--	47	45	45	47	45	52	51	52	53	52	54		
February.....	52	44	42	43	48	47	48	52	55	54	55	56	53	57	56	58	60	60	51	49	47	49	55	53	61	60	57	--	--	53		
March.....	59	55	58	55	49	49	58	51	56	60	57	54	--	57	57	59	55	58	62	60	52	49	53	56	62	63	64	65	61	57		
April.....	59	60	65	67	65	63	63	60	58	58	55	55	59	61	58	63	70	68	70	70	67	65	70	72	73	74	74	77	73	--		
May.....	71	73	77	77	77	77	77	77	77	77	75	75	78	75	78	75	79	78	72	72	78	75	78	82	75	77	81	82	83	75		
June.....	80	76	73	75	76	76	76	75	75	83	83	79	78	78	79	83	82	83	79	78	78	80	82	83	84	82	85	86	80	80		
July.....	77	76	83	86	84	85	79	83	83	85	85	82	82	84	84	84	82	82	80	84	82	82	85	82	82	82	83	86	82	--		
August.....	80	80	85	84	84	85	87	88	86	83	84	82	82	84	81	86	84	80	78	85	84	82	79	77	75	83	82	86	83	82		
September.....	87	80	87	--	79	79	78	78	80	--	78	78	78	75	81	80	79	79	78	75	78	72	74	77	73	74	69	69	69	--		

RIO GRANDE BASIN--Continued

8-4075. PECOS RIVER AT RED BLUFF, N. MEX.

LOCATION.--At pipeline bridge, 2.5 miles downstream from gaging station at Red Bluff, Eddy County, 0.2 mile downstream from Red Bluff Creek, and 5.5 miles upstream from Delaware River.

DRAINAGE AREA.--19,540 square miles, approximately (contributing area upstream from gaging station).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1959.

Water temperatures: October 1952 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 12,400 ppm Mar. 23 to Apr. 7; minimum, 1,900 ppm May 8-10.

Hardness: Maximum, 2,680 ppm Aug. 28 to Sept. 9; minimum, 710 ppm May 11.

Specific conductance: Maximum daily, 19,500 micromhos Mar. 27; minimum daily, 2,720 micromhos May 9.

Water temperatures: Maximum, 93°F Aug. 30; minimum, 39°F Jan. 5.

EXTREMES, 1937-59.--Dissolved solids: Maximum, 22,800 ppm June 3, 1948.

Hardness: Maximum, 3,860 ppm Sept. 1-10, 1953; minimum, 256 ppm June 3, 1948.

Specific conductance: Maximum daily, 33,200 micromhos Sept. 18, 1953; minimum, 35°F Dec. 28, 1954.

Water temperatures: (1952-59): Maximum, 95°F Aug. 30, 1959; minimum, 35°F Dec. 28, 1954.

REMARKS.--Values reported for sodium (Na) are determined by analyses and do not include potassium (K). Records of specific conductance of daily samples available in district office at Albuquerque, N. Mex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632. No appreciable inflow between gaging station and sampling point except during periods of heavy local rains.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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		Specific conductance (micro-mhos at 25°C)			
															Parts per million	Tons per acre-foot	Tons per day	Calcium, magnesium	Non-carbonate		Sodium		
Oct. 1, 1958.....	1,150	--	--	320	68	270	--	30	--	--	410	--	--	--	--	2,190	2,98	6,800	1,080	1,060	3.6	2,920	7.7
Oct. 2-6.....	508	--	--	345	75	432	--	110	--	--	685	--	--	--	--	2,780	3,810	3,810	1,170	1,080	5.5	3,750	7.5
Oct. 7, 10-14.....	288	--	--	360	93	601	--	82	--	--	970	--	--	--	--	3,470	4,72	2,700	1,280	1,210	7.3	4,780	8.0
Oct. 8-9, 15-16.....	251	--	--	400	100	860	--	142	--	--	1,360	--	--	--	--	4,470	6,08	3,030	1,410	1,290	10	6,140	7.9
Oct. 17-22.....	275	18	0.00	400	105	649	12	78	1,230	0.8	0.0	0.24	--	--	--	3,710	5,05	2,750	1,430	1,370	7.5	5,130	7.9
Oct. 23-30.....	169	--	--	445	124	1,080	--	130	--	--	1,680	--	--	--	--	5,160	7,02	2,330	1,620	1,510	11	7,200	7.6
Oct. 31-Nov. 6.....	197	--	--	455	130	944	--	124	--	--	1,500	--	--	--	--	4,860	6,75	2,670	1,670	1,570	10	6,720	7.8
Nov. 7-22.....	267	--	--	460	115	711	--	158	--	--	1,120	--	--	--	--	4,190	5,70	3,020	1,620	1,490	7-7	5,610	7.8
Nov. 23-30.....	155	--	--	470	138	1,080	--	122	--	--	1,740	--	--	--	--	5,340	7,28	2,230	1,740	1,640	11	7,440	7.8
Dec. 1-19.....	157	--	--	470	153	1,080	--	118	--	--	1,680	--	--	--	--	5,280	7,18	2,240	1,800	1,700	11	7,220	7.9
Dec. 20-27.....	207	--	--	470	148	844	--	134	--	--	1,320	--	--	--	--	4,640	6,31	2,590	1,780	1,670	8.7	6,200	7.9
Dec. 28-Jan. 11, 1959.....	145	--	--	495	159	1,080	--	137	--	--	1,700	--	--	--	--	5,430	7,38	2,130	1,890	1,780	11	7,380	7.9
Jan. 12-31.....	102	17	.01	552	173	1,380	36	154	1,710	1.0	--	.32	--	--	--	6,340	8,62	1,590	1,970	1,840	14	8,610	7.7
Feb. 1-28.....	94.2	--	--	482	179	1,370	--	91	--	--	2,130	--	--	--	--	6,250	8,50	1,590	1,940	1,870	14	8,610	7.4
Mar. 1-4.....	42.0	--	--	505	192	1,640	--	107	--	--	2,630	--	--	--	--	7,150	9,72	8,110	2,050	1,860	16	9,940	7.3
Mar. 5-16.....	39.7	--	--	552	220	2,360	--	104	--	--	3,780	--	--	--	--	9,180	12.5	984	2,280	2,200	21	13,200	7.2
Mar. 17-22.....	25.0	--	--	608	250	3,140	--	134	--	--	4,970	--	--	--	--	11,500	15.6	776	2,540	2,430	27	16,500	7.1
Mar. 23-Apr. 7.....	35.4	--	--	610	267	3,420	--	108	--	--	5,510	--	--	--	--	12,400	16.9	1,190	2,620	2,530	29	17,700	7.1
Apr. 8-30.....	46.0	15	.04	601	248	2,820	83	130	2,160	1.1	4,470	--	--	--	--	10,800	14.7	1,340	2,520	2,410	24	15,200	7.0

RIO GRANDE BASIN--Continued
 8-4075. PECOS RIVER AT RED BLUFF, N. MEX.--Continued
 Chemical analyses, in parts per million, water year October 1958 to September 1959--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)	Boiron (B)	Dissolved solids (residue at 180°C)		Hardness as CaCO ₃		Sodium-sulfate ratio	Specific conductance (micro-mhos at 25°C)	pH
															Parts per million	Tons per acre-foot	Calcium-Magnesium	Non-carbonate			
May 1-7, 1959.....	73.0	--	--	587	224	1,880	--	147	--	--	2,990	--	--	--	8,230	11.2	2,410	2,280	17	11,300	7.0
May 8-10.....	633	--	--	202	65	334	--	123	--	--	522	--	--	--	1,900	2.58	770	669	5.2	2,780	7.2
May 11.....	116	--	--	188	59	577	--	121	--	--	895	--	--	--	2,460	3.35	710	611	9.4	3,850	7.1
May 12.....	104	--	--	215	71	845	--	130	--	--	1,320	--	--	--	3,360	4.57	830	724	13	5,190	6.9
May 13-16.....	98.2	--	--	270	94	1,210	--	149	--	--	1,900	--	--	--	4,590	6.24	1,060	938	16	7,080	7.4
May 17-24.....	80.8	--	--	310	116	1,520	--	112	--	--	2,400	--	--	--	5,700	7.75	1,250	1,160	19	8,600	7.1
May 25-26.....	118	--	--	369	163	1,960	--	148	--	--	3,140	--	--	--	7,110	9.67	1,640	1,520	21	10,800	7.6
May 27-31.....	60.2	--	--	392	161	1,580	--	134	--	--	2,500	--	--	--	6,380	8.68	1,640	1,580	17	9,280	7.0
June 1-12, 16-26.....	59.1	--	--	512	212	2,020	--	123	--	--	3,230	--	--	--	8,160	11.1	2,130	2,050	19	11,600	7.1
June 13-15, 27-30.....	58.9	--	--	567	223	2,450	--	130	--	--	3,930	--	--	--	9,030	12.3	2,330	2,220	22	13,500	7.0
July 1-14.....	48.5	22	0.01	592	224	2,810	84	145	2,060	1.3	4,530	0.68	0.68	10,600	14.4	2,400	2,280	25	15,400	8.1	
July 15-16.....	56.0	--	--	563	201	2,290	--	127	--	--	3,540	--	--	8,990	12.2	1,360	2,280	21	12,900	8.1	
July 17-20.....	42.2	--	--	513	187	1,880	--	109	--	--	2,920	--	--	7,680	10.4	1,875	2,050	18	11,000	7.9	
July 21-27.....	35.3	--	--	573	219	2,550	--	109	--	--	4,130	--	--	10,000	13.6	953	2,330	2,240	23	14,400	7.9
July 28-Aug. 2.....	65.5	--	--	601	270	3,180	--	119	--	--	5,070	--	--	11,800	16.0	2,090	2,610	2,510	27	16,900	7.6
Aug. 3-10.....	36.5	--	--	623	257	2,450	--	105	--	--	3,990	--	--	10,000	13.6	986	2,610	2,520	21	14,100	7.8
Aug. 11-17.....	43.9	--	--	652	261	3,230	--	128	--	--	5,120	--	--	12,000	16.3	1,420	2,650	2,540	27	17,100	8.0
Aug. 18-27.....	44.5	--	--	587	242	2,860	--	131	--	--	4,530	--	--	10,800	14.7	1,300	2,460	2,350	25	15,700	7.9
Aug. 28-Sept. 9.....	50.1	--	--	687	253	3,150	--	139	--	--	5,020	--	--	11,700	15.9	1,580	2,660	2,570	26	16,700	7.9
Sept. 10-20.....	62.9	--	--	568	210	2,170	--	132	--	--	3,440	--	--	8,860	12.0	1,500	2,280	2,170	20	12,600	7.8
Sept. 21-30.....	46.5	--	--	603	245	2,830	--	149	--	--	4,430	--	--	10,700	14.6	1,340	2,510	2,390	25	15,300	7.6
Weighted average..	111	--	--	456	149	1,280	--	122	--	--	2,020	--	--	5,760	7.83	1,730	1,750	1,650	13	8,050	--

RIO GRANDE BASIN--Continued
8-4075. PECOS RIVER AT RED BLUFF, N. MEX.--Continued

Temperature (°F) of water, water year October 1958 to September 1959

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	--	63	67	71	--	74	73	72	71	69	70	67	68	68	69	70	70	67	68	67	65	67	67	67	67	--	62	--	57	56	57	67		
November ..	60	61	62	63	63	63	83	82	62	63	64	63	65	65	63	62	52	55	54	57	56	56	56	57	58	--	53	--	--	52	--	60	55	60	
December ..	53	54	--	56	57	53	52	53	52	50	51	52	50	47	48	47	48	48	52	51	50	50	50	52	50	51	52	52	45	45	43	42	50		
January	43	47	43	40	39	42	46	--	47	47	48	50	--	44	48	50	51	--	53	53	49	48	46	49	51	52	52	52	52	--	52	48	48		
February	50	45	45	46	48	50	52	52	58	56	58	55	56	56	56	59	62	62	--	51	47	55	52	52	59	61	64	--	--	54	55	61	65		
March	63	62	60	56	55	56	58	59	63	62	61	61	62	62	59	59	62	60	62	58	61	59	64	67	60	--	65	66	67	70	67	62	62		
April	69	72	70	68	72	69	68	63	63	57	58	58	60	63	67	66	71	69	72	70	70	69	74	75	74	76	75	75	77	73	--	69	69	69	
May	75	77	78	78	75	69	75	73	72	--	77	79	81	79	78	79	81	79	80	80	82	82	82	76	80	80	78	82	--	84	84	78	80	84	
June	82	78	76	74	76	81	81	81	85	83	88	85	87	87	87	85	83	87	--	87	88	86	84	89	89	86	90	85	83	--	84	84	84	84	
July	81	82	84	87	87	87	--	88	89	84	85	85	85	85	86	86	85	86	--	87	87	87	87	88	84	85	86	84	--	--	86	86	84	--	
August	--	88	86	88	88	89	--	88	89	89	--	88	90	89	90	87	--	85	84	89	87	86	85	81	82	82	85	84	91	93	90	87	87	87	
September ..	90	89	89	87	89	87	84	84	85	79	82	82	80	78	80	82	86	--	82	82	82	81	81	81	81	79	79	78	78	75	73	--	82	82	82

RIO GRANDE BASIN--Continued

8-4101. PECOS RIVER BELOW RED BLUFF DAM, NEAR ORLA, TEX.

LOCATION--Just below dam, 3 miles upstream from Salt (Screwbean) Draw, 5 miles northwest of Orla, Reeves County, and 14 miles upstream from gaging station near Orla.

DRAINAGE AREA.--20,720 square miles, approximately (contributing area).

RECORDS AVAILABLE.--Chemical analyses: July 1937 to September 1959.

Water temperatures: March 1953 to September 1959.

EXTREMES, 1958-59.--Dissolved solids: Maximum, 6,220 ppm Oct. 1-31; minimum, 1,510 ppm Nov. 1-22.

Hardness: Maximum, 1,860 ppm Sept. 1-30; minimum, 1,510 ppm Nov. 1-22.

Specific conductance: Maximum daily, 10,600 microhos Oct. 3; minimum daily, 5,660 microhos Nov. 28.

Water temperatures: Maximum, 79°F on many days during August and September; minimum, 44°F on several days in January.

EXTREMES, 1937-59.--Dissolved solids: Maximum, 15,600 ppm Sept. 17-30, 1953; minimum, 1,090 ppm June 1-2, 1948.

Hardness: Maximum, 3,430 ppm July 1-31, Oct. 1-16, 1953; minimum, 602 ppm June 1-2, 1948.

Specific conductance: Maximum daily, 24,200 microhos Sept. 28, 30, 1953; minimum daily, 1,610 microhos June 2, 1948.

Water temperatures (1953-59): Maximum, 81°F Aug. 1-4, 1958; minimum, 40°F on several days during winter months.

REMARKS.--Dashes omitted in potassium (K) column indicate sodium (Na) plus potassium (K) are calculated. Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for gaging station near Orla for water year October 1958 to September 1959 given in WSP 1632. Mean discharge values reported below have been adjusted to exclude inflow from Salt (Screwbean) Draw which enters Pecos River between sampling point and gaging station.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhos at 25°C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium	Non-sulfate		Calcium	Non-sulfate
Oct. 1-31, 1958.....	3.23	18	400	400	135	1,670	175	1,310	2,600	2,010	2,010	---	---	---	---	6,220	8.46	54.2	1,550	1,410	18	9,670
Nov. 1-22.....	4.00	21	398	125	1,290	1,290	179	1,280	2,010	1,280	2,010	---	---	---	---	5,210	7.09	56.3	1,510	1,360	14	8,000
Nov. 23-30.....	3.40	15	418	116	893	1,340	143	1,340	1,380	1,340	1,380	4.0	4.0	---	---	4,240	5.77	38.9	1,520	1,400	10	6,280
Dec. 1-31.....	3.97	15	448	120	913	1,480	164	1,480	1,360	1,480	1,360	4.0	4.0	---	---	4,420	6.01	47.4	1,510	1,480	9	6,550
Jan. 1-31, 1959.....	3.72	14	455	141	916	1,100	24	1,490	1,430	1,490	1,430	2.5	2.5	---	---	4,550	6.19	45.7	1,720	1,580	9.6	6,520
Feb. 1-28.....	4.19	13	455	138	1,100	1,100	149	1,590	1,640	1,590	1,640	3.0	3.0	---	---	5,010	6.81	56.7	1,700	1,580	12	6,990
Mar. 1-31.....	81.2	12	445	131	1,000	1,000	143	1,490	1,530	1,490	1,530	3.0	3.0	---	---	4,680	6.36	1,030	1,650	1,530	11	6,740
Apr. 1-30.....	200	11	448	127	1,010	1,010	30	1,470	1,620	1,470	1,620	1.0	1.0	---	---	5,950	6.51	2,950	1,820	1,530	11	6,890
May 1-31.....	4.11	14	470	137	1,310	1,310	132	1,610	2,050	1,610	2,050	1.5	1.5	---	---	5,010	6.81	2,229	1,820	1,690	13	8,310
June 1-30.....	164	14	448	132	1,120	1,120	131	1,500	1,690	1,500	1,690	1.0	1.0	---	---	4,970	6.76	2,310	1,610	1,500	12	7,190
July 1-31.....	172	17	489	153	1,200	1,200	133	1,820	1,870	1,820	1,870	2.5	2.5	---	---	5,410	7.36	3,810	1,830	1,720	12	7,470
Aug. 1-31.....	263	17	505	145	1,390	1,390	130	1,700	2,130	1,700	2,130	---	---	---	---	5,950	8.09	1,740	1,860	1,750	14	8,460
Sept. 1-30.....	108	17	463	135	1,150	1,150	---	1,550	1,760	1,550	1,760	2.2	2.2	---	---	5,140	6.99	1,170	1,710	1,600	12	7,280
Weighted average	84.4	14	463	135	1,150	1,150	---	1,550	1,760	1,550	1,760	2.2	2.2	---	---	5,140	6.99	1,170	1,710	1,600	12	7,280

RIO GRANDE BASIN--Continued

8-4465. PECOS RIVER NEAR GIRVIN, TEX.

LOCATION--At supplementary gage at bridge on U.S. Highway 67, about half a mile downstream from Panhandle and Santa Fe Railway bridge, 2.1 miles east of Girvin, Pecos County, 6.5 miles downstream from Comanche Creek, and 7.8 miles downstream from regular gaging station.

DRAINAGE AREA 29,560, 7.6 miles, approximately contributing area at supplementary gage).

RECORDS AVAILABLE--Chemical analyses: October 1939 to June 1941, October 1946 to September 1947, October 1953 to September 1959.

Water temperatures: October 1953 to June 1959.

EXTREMES 1958-59--Hardness: Maximum, 4,940 ppm Sept. 1-30; minimum, 1,910 ppm July 18-24.

Specific conductance: Maximum daily, 25,600 microhos. Sept. 5, 9; minimum daily, 7,100 microhos July 19-20.

EXTREMES 1939-41, 1946-47, 1953-59--Hardness: Maximum, 5,040 ppm June 1-30, 1946; minimum, 330 ppm May 18, 1957.

Specific conductance: Maximum daily, 29,100 microhos, Aug. 13, 1958; minimum daily, 790 microhos Apr. 26, 1957.

Water temperatures (1953-59): Maximum, 93°F Feb. 3, 4, 1956.

REMARKS--Records of specific conductance of daily samples available in district office at Austin, Tex. Records of discharge for water year October 1958 to September 1959 given in WSP 1632.

Chemical analyses, in parts per million, water year October 1958 to September 1959

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)	Bo-ron (B)	Dissolved solids (calculated)			Hardness as CaCO ₃		So-ldium con-ductance (micro-mhos at 25° C)		
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Mag-nesium	Non-car-bon-ate			
Oct. 1-13, 1958..	68.2	--	--	--	--	1,960	--	163	--	1,980	3,020	--	--	--	--	--	--	2,210	2,080	18	11,500	7.9
Oct. 14-31.....	35.7	--	--	--	--	2,790	--	163	--	2,740	4,270	--	--	--	--	--	--	3,000	2,870	22	15,500	7.9
Nov. 1-30.....	33.0	--	--	--	--	3,490	--	150	--	3,280	5,430	--	--	--	--	--	--	3,670	3,550	25	18,700	7.4
Dec. 1-31.....	30.5	--	--	--	--	3,910	--	177	--	3,540	6,000	--	--	--	--	--	--	3,790	3,640	28	20,200	7.8
Jan. 1-31, 1959..	31.2	--	--	--	--	4,020	--	200	--	3,590	6,190	--	--	--	--	--	--	3,960	3,800	28	20,600	7.6
Feb. 1-28.....	30.5	--	--	--	--	3,890	--	188	--	3,660	6,140	--	--	--	--	--	--	4,040	3,890	27	20,500	8.0
Mar. 1-31.....	26.1	--	--	--	--	4,330	--	172	--	3,890	6,780	--	--	--	--	--	--	4,230	4,090	29	22,200	8.1
Apr. 1-30.....	24.1	--	--	--	--	4,310	--	118	--	3,940	7,070	--	--	--	--	--	--	4,330	4,230	30	22,700	7.5
Apr. 1-31.....	24.3	5.4	7.3	6.0	533	2,860	66	66	66	3,760	5,460	1.029	1.029	15,600	21.4	1,029	4,060	3,960	28	21,200	7.2	
May 1-30.....	16.8	7.2	6.2	5.4	431	2,780	54	54	54	3,560	5,280	1,200	16.7	12,500	16.7	838	3,330	3,280	26	17,900	6.9	
July 1-17.....	23.8	6.3	6.55	5.4	412	2,470	54	54	54	1,830	2,150	6,060	8.24	705	18,24	705	1,910	1,850	14	8,640	8.0	
July 18-24.....	43.1	1.9	460	460	186	1,390	80	80	80	1,830	2,150	6,060	8.24	705	18,24	705	1,910	1,850	14	8,640	8.0	
July 25-31.....	14.0	4.7	478	478	317	2,370	94	94	94	4,520	3,610	353	12.8	9,350	12.8	353	2,500	2,420	21	13,100	7.0	
Aug. 1-31.....	10.3	--	--	--	--	4,690	53	53	53	4,420	7,360	--	--	--	--	--	--	4,730	4,690	30	22,700	7.3
Sept. 1-30.....	10.3	--	--	--	--	4,960	62	62	62	4,590	7,910	--	--	--	--	--	--	4,940	4,890	31	23,900	7.2
Weighted average	26.1	--	--	--	--	3,620	138	138	138	3,370	5,640	--	--	--	--	--	--	3,670	3,560	26	18,900	--

MISCELLANEOUS ANALYSES OF STREAMS IN WESTERN GULF OF MEXICO BASINS

Chemical analyses, in parts per million, water year October 1958 to September 1959

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 (microhmios at 25°C)			
														Parts per million	Tons per acre-foot	Calcium, Magnesium	Non-carbonate				
MERMENTAU RIVER BASIN																					
8-120. BAYOU NEZPIQUE NEAR BASILE, LA.																					
Oct. 20, 1958.....		9.3	0.82	7.1	3.0	12	2.6	34		2.8	18	0.2	1.1	74	0.10		30	2	0.9	120	6.5
Jan. 15, 1959.....		7.2	.51	7.2	2.5	30	3.4	18		5.6	55	.3	1.1	a	158	.21	28	13	2.4	232	6.3
Apr. 20.....		5.4	.51	3.1	0.5	38	1.3	7		2.0	6.7	.1	0.9		27	.04	10	4	.5	44	5.6
July 23.....		15	.38	12	4.6	21	1.8	72		0.0	25	.4	.6	a	156	.21	49	0	1.3	210	7.0

NECHES RIVER BASIN

8-415. VILLAGE CREEK NEAR KOUNTZE, TEX.

Mar. 19, 1959.....	277	15		6.2	2.1	31	1.2	14		2.8	54	0.1	0.0	118	0.16		24	13	2.7	214	6.5
Apr. 17.....	1,890	9.0		3.2	1.7	8.7	1.2	10		3.6	16	.1	.5	49	.07		15	7	1.0	83	5.9

TRINITY RIVER BASIN

8-502. ELM FORK TRINITY RIVER RESERVOIR 6-0, NEAR MUENSTER, TEX.

Jan. 15, 1959.....		5.0		58	4.0	47	152			25	77	0.5	2.5	294	0.40		161	36	1.6	489	7.9
Apr. 22.....		3.2		62	3.9	35	149			27	68	.1	1.2	273	.37		171	49	1.2	514	7.7
July 14.....		18		45	4.0	43	108			26	74	--	2.0	265	.36		129	40	1.6	468	7.6

8-503. ELM FORK TRINITY RIVER NEAR MUENSTER, TEX.

Jan. 15, 1959.....	0.8	10		190	17	175	230			55	480	0.2	0.0	1,040	1.41		544	356	3.3	1,920	7.7
Apr. 22.....	.7	13		210	16	178	240			47	518	.2	.2	1,100	1.50		590	394	3.2	2,020	7.5

MISCELLANEOUS ANALYSES OF STREAMS IN WESTERN GULF OF MEXICO BASINS--Continued

Chemical analyses, in parts per million, water year October 1958 to September 1959--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 (calculated)		Hardness as CaCO ₃	Sodium-sulfate ratio	Specific conductance (micro-mhos at 25° C)	
															Parts per million	Tons per acre-foot				Calcium-Magnesium	Non-carbonate
COLORADO RIVER BASIN																				
CUMMINS CREEK AT FM ROAD 109, NEAR COLUMBUS, TEX.																				
Mar. 17, 1959.....	b 100	16		68	4.3	25	8.2	211		20	34	0.3	0.0		b 280	0.38	187	14	0.8	470
Apr. 9.....		9.0		30	1.4	8.2	3.2	92		6.0	12		2.5		117	.16	81	5	.4	212
NUECES RIVER BASIN																				
8-1945. NUECES RIVER NEAR TILDEN, TEX.																				
Feb. 16, 1959.....	85	2.3		72	14	65		199		52	110	0.2	7.7		a 443	0.60	237	74	1.8	769
Mar. 30.....	7.2	4.6		67	15	107		196		67	164		1.5		522	.71	228	68	3.1	962
FRIO RIVER AT TILDEN, TEX.																				
Feb. 16, 1959.....		2.1		56	23	288		300		138	330	0.6	3.5		989	1.35	234	0	8.2	1,760
Mar. 30.....		4.6		40	25	567		526		212	555		1.0		1,680	2.26	203	0	1.7	2,860
RIO GRANDE BASIN																				
8-3300. RIO GRANDE AT ALBUQUERQUE, N. MEX.																				
Oct. 23, 1958.....	51	26	0.01	54	8.1	34	4.2	176		78	15	0.5	0.9	0.14	308	0.42	168	24	1.1	473
Jan. 21, 1959.....	600	24	.00	24	6.2	29	3.3	166		72	14	2.2	1.3	284	3.39	506	160	24	1.0	444
Feb. 10.....	500	24	.01	48	8.8	30	3.7	185		71	14	5.4	1.8	282	3.88	449	156	21	1.0	435
Feb. 23.....	290	26	.01	50	9.5	33	4.1	184		70	15	6.8	1.2	300	4.1	235	164	30	1.1	456
Mar. 20.....	328	26	.01	50	10.5	35	4.1	169		79	19	6.6	1.1	200	308	42	171	25	1.2	470
May 28.....	429	22	.03	50	7.5	28	4.1	160		65	12	6.6	2.8	271	37	314	156	28	1.0	422
June 25.....	62	24	.03	52	8.9	32	4.1	173		78	13	6.6	.7	112	298	41	166	24	1.1	459
8-3550. RIO GRANDE AT SAN ACACIA, N. MEX.																				
Oct. 2, 1958.....	211	30	0.01	72	11	65	5.5	213		150	32	0.6	1.7	0.18	477	0.64	224	50	1.9	715
Nov. 11.....	1,690	22	.44	62	6.4	33	3.9	172		96	20	.4	1.1	.09	402	--	181	40	--	564
Dec. 23.....	1,120	22	.00	62	6.4	36	3.6	172		114	27	.6	2.1	1.19	332	.45	181	40	1.2	512
Feb. 24, 1959.....	1,05	27	.00	60	11	51	4.8	188		148	35	.7	2.0	.21	470	.53	196	44	1.6	512
May 10.....	105	28	.02	71	12	65	6.0	208		148	35	.7	2.0	.21	470	.53	196	44	1.6	512
June 8.....	14	34	.01	82	16	82	6.4	233		197	46	.7	1.2	.22	581	.79	272	81	2.2	864

MISCELLANEOUS ANALYSES OF STREAMS IN WESTERN GULF OF MEXICO BASINS--Continued

Periodic determinations of suspended-sediment discharge, water year October 1958 to September 1959

Date	Time (24 hr)	Water tem- per- ature (°F)	Discharge (cfs)	Suspended sediment	
				Mean con- cen- tra- tion (ppm)	Discharge (tons per day)
RIO GRANDE BASIN--Continued					
8-3540. RIO SALADO NEAR SAN ACACIA, N. MEX.					
Oct. 14, 1958.....	--		30	64,000	5,380
July 27, 1959.....	--		30	133,000	11,600
Aug. 6.....	0700		724	187,000	406,000
Aug. 6.....	0800		519	188,000	302,000
Aug. 6.....	0900		361	168,000	182,000
Aug. 7.....			468	150,000	211,000
Aug. 10.....	0830		e 100	85,400	24,000
Aug. 10.....	1815		e 10	61,900	1,700
Aug. 11.....	0700		8	104,000	2,410
Aug. 11.....	0800		8	101,000	2,340
Aug. 15.....	0700		67	71,900	13,500
Aug. 15.....	0800		39	69,600	7,600
Aug. 17.....	--		8	64,500	1,440
Aug. 20.....	0800		8	109,000	2,530
Aug. 20.....	0900		e 100	112,000	32,000
Aug. 21.....	--		a 20	78,700	4,400
Aug. 25.....	--		a 110	82,400	25,000
Aug. 26.....	--		335	93,400	90,700
Aug. 27.....	--		a 10	66,100	1,900
Aug. 28.....	--		a 15	79,500	3,300

e Estimated.

a Mean daily discharge.

MISCELLANEOUS ANALYSES OF STREAMS IN WESTERN GULF OF MEXICO BASINS--Continued

Periodic determinations of suspended-sediment discharge and particle-size analyses of suspended sediment, water year October 1958 to September 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)	Water temperature per-ature (°F)	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
Apr. 12, 1959.....	1615	60	25,500	2,500	172,000	45	54	58	65	69	78	84	96	99	SBWC
May 5.....	1700	79	2,530	251	1,730	60	71	79	84	85	96	97	98	100	SBWC
May 12.....	1900	79	5,060	724	9,890	42	50	57	67	78	83	98	99	100	SBWC

COLORADO RIVER BASIN

8-1625. COLORADO RIVER NEAR BAY CITY, TEX.

Particle-size analyses of suspended sediment, water year October 1958 to September 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)	Water temperature per-ature (°F)	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
July 27, 1959.....	0900	77	30	133,000	--	--	96	--	--	100	--	--	--	--	PMC
Aug. 2.....	0900	68	361	188,000	38	46	55	65	76	82	89	88	100	100	SBWC
Aug. 6.....	0900	68	361	168,000	1	0	15	66	74	82	89	88	100	100	SPN
Aug. 26.....	1030	72	335	93,400	--	50	--	74	--	96	100	--	--	--	VPWC

RIO GRANDE BASIN

8-3540. RIO SALADO NEAR SAN ACACIA, N. MEX.

MISCELLANEOUS ANALYSES OF STREAMS IN WESTERN GULF OF MEXICO BASINS--Continued

Particle-size analyses of bed material, water year October 1958 to September 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)	Water temp- per- sure point (°F)	Discharge (cfs)	Sediment concen- tration (ppm)	Bed material						Method of analysis				
					Percent finer than size indicated, in millimeters										
					0.062	0.125	0.250	0.500	1.000	2.000		4.000	8.000	16.00	32.00
Apr. 12, 1959.....					2	9	43	99	100	100					S
May 5.....					0	0	13	80	98	100					S

COLORADO RIVER BASIN

8-1625, COLORADO RIVER NEAR BAY CITY, TEX.

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