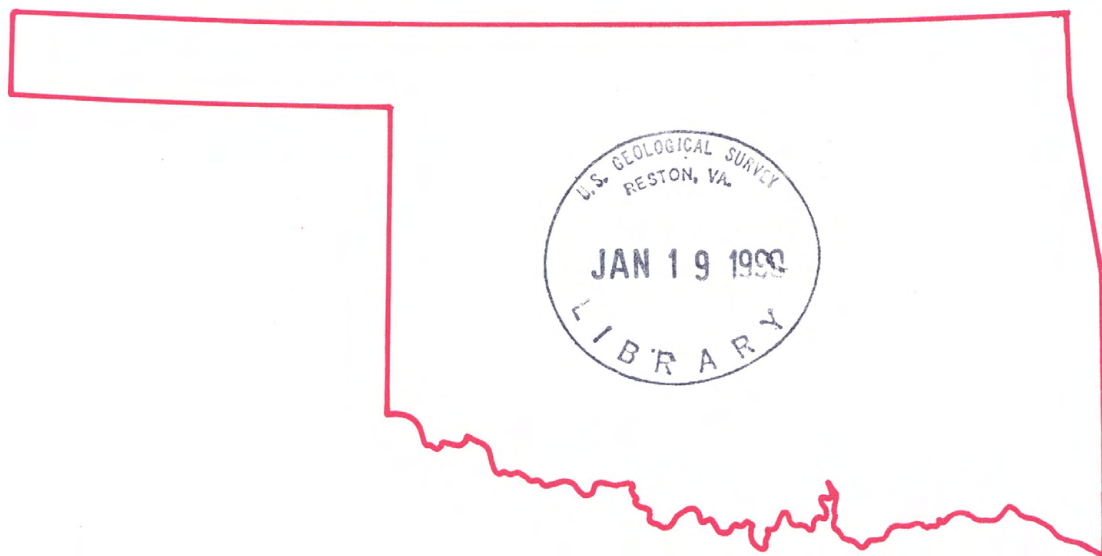


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Water Resources Data Oklahoma Water Year 1987



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OK-87-1
Prepared in cooperation with the State of Oklahoma
and with other agencies

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Water Resources Data Oklahoma Water Year 1987

by L.D. Hauth, D.M. Walters, T.E. Coffey, and D.K. White



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT OK-87-1
Prepared in cooperation with the State of Oklahoma
and with other agencies

DEPARTMENT OF THE INTERIOR
MANUEL LUJAN, JR., Secretary

U.S. GEOLOGICAL SURVEY
Dallas L. Peck, Director

For information on the water program in Oklahoma write to
District Chief, Water Resources Division
U.S. Geological Survey
215 Dean A. McGee Avenue, Room 621
Oklahoma City, Oklahoma 73102

PREFACE

This hydrologic-data report for Oklahoma is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface-water data-collection network in each state, Puerto Rico, and the Trust Territories. These records of streamflow and water quality provide the hydrologic information needed by state, local, and federal agencies, and the private sector for developing and managing our Nation's land and water resources.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. The authors had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines.

The data were collected, computed, and processed by the following personnel:

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16. Abstract (Limit: 200 words) Water resources data for the 1987 water year for Oklahoma consists of records of stage, discharge, and water quality of streams; stage, contents, and water quality of lakes or reservoirs. This report contains discharge records for 123 gaging stations; stage and contents for 30 lakes or reservoirs; water quality for 38 gaging stations and 3 lakes. Also included are 5 partial-record stations. These data represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating State and Federal agencies in Oklahoma.			
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[Letters after station name designate type of data: (d) discharge, (c) chemical, (b) biological, (e) contents, (m) microbiological, (t) water temperature, (s) sediment]

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WATER RESOURCES DATA - OKLAHOMA, 1987

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State agencies, obtains a large amount of data pertaining to the water resources of Oklahoma each water year (October 1 to September 30). These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Oklahoma."

This report includes records on surface water in the State. Specifically, it contains: (1) Discharge records for 123 streamflow-gaging stations, and 5 partial-record or miscellaneous streamflow stations; (2) stage and content records for 30 lakes and reservoirs; and (3) water-quality records for 38 streamflow-gaging stations, and 3 lakes.

This series of annual reports for Oklahoma began with the 1961 water year with a report that contained only data relating to the quantities of surface water. For the 1964 water year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to present, in one volume, data on quantity and quality of surface water.

Prior to introduction of this series and for several water years concurrent with it, water-resources data for Oklahoma were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface Water Supply of the United States, Parts 7A and 7B." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from Books and Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the Geological Survey for all States. These official Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water-Data Report OK-87-1." For archiving and general distribution, the reports for 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on back of title page or by telephone (405) 231-4256.

COOPERATION

The U.S. Geological Survey and organizations of the State of Oklahoma have had cooperative agreements for the systematic collection of streamflow records since 1935, and for water quality records since 1941. Organizations that assisted in collecting the data through cooperative agreement with the Survey are:

Oklahoma Water Resources Board, Gerald E. Borelli, Chairman
and James R. Barnett, Executive Director.
Oklahoma Department of Transportation, Richard A. Ward, Chief Engineer.
Oklahoma Geological Survey, Charles J. Mankin, Director.
Oklahoma State Department of Health, Environmental Health Services, Mark S. Coleman,
Deputy Commissioner.
Oklahoma City Water Department, Earl Potts, Director of Water Services.

The following Federal agencies assisted in the data collection program by providing funds or services:

Corps of Engineers, U.S. Army
Bureau of Reclamation, U.S. Department of Interior
Bureau of Land Management, U.S. Department of Interior

Assistance in the form of funds or services was rendered by the city of Oklahoma City and the following organizations through the Oklahoma Water Resources Board: Grand River Dam Authority; Central Oklahoma Master Conservancy District; Fort Cobb Reservoir Master Conservancy District; Lugert-Altus Irrigation District; Foss Reservoir Master Conservancy District; Mountain Park Master Conservancy District; Oklahoma Gas and Electric Company; the cities of Ada, Altus, Claremore, Lawton, Sapulpa, and Tulsa.

Organizations that supplied data are acknowledged in the station descriptions.

SUMMARY OF HYDROLOGIC CONDITIONS

Streamflow

During the 1987 water year, record or near-record peak flows were recorded during two storm periods.

Intense rain fell over a large part of Oklahoma from September 28 to October 4, 1986. More than 10 inches of rain fell over western and central Oklahoma with amounts near 20 inches recorded in north-central Oklahoma and Kansas. Floods during September 30 through October 4, 1986, resulted in several peaks that exceeded the 50-year recurrence interval. North-central, northeastern, and southwestern Oklahoma were the most affected. Not only was damage great in urban areas, but agricultural loss was extensive, especially the wheat crop.

Thunderstorms on May 27 and 28, 1987, climaxed 11 days of intense rains in central and southwestern Oklahoma. Ten to fifteen inches of rain fell on some areas of southwestern Oklahoma. Floods during May 29 and 30, 1987, caused several substantial peak flows, especially in the Washita River basin in southwestern and south-central Oklahoma. Flood damage was extensive in both urban and agricultural areas.

A comparison of streamflow and annual peak flows for the 1987 water year and the period of record at six selected stations (fig. 1-6) reflects the severity of the floods and the unusually large daily discharges in 1987. Annual peak discharges for 1987 were maximums for the period of record at 5 of the 6 index sites. Stations were selected to show the statewide distribution of flooding during the year.

A comparison of streamflow for the 1987 water year with streamflow for the period of record at the six selected stations is presented in the following table:

Station identification	Statistics of discharge during 1987 water year (cubic feet per second)			Statistics of discharge during period of record (cubic feet per second)		
	Maximum	Minimum	Average	Maximum	Minimum	Average
OCTOBER 1986 FLOODS						
07152500 Arkansas River at Ralston	174,000	1,610	14,220	211,000	14.0	5,576 (1977-87)
07161000 Cimarron River at Perkins	162,000	375	5,281	162,000	0.8	1,285 (1940-87)
07197000 Baron Fork at Eldon	55,500	29.0	521	55,500	1.7	300 (1949-87)
07304500 Elk Creek near Hobart	28,000*	26.0	427	28,000	0	83.2 (1904-08, 1950-87)
MAY 1987 FLOODS						
07329700 Wildhorse Creek near Hoover	36,000	28.0	631	36,000	0	223 (1970-87)
07331000 Washita River near Dickson	105,000	1,060	5,644	105,000	0	1,401 (1962-87)

* The next highest peak of record of 22,400 occurred during the May 1987 floods.

All three streamflow statistics - maximum, minimum, and average discharge - illustrate the greater-than-normal runoff in 1987.

The relation between relative peak flow and drainage areas from all 1987 gaging stations is shown in figure 7. Also included is a curve that encloses the upper limit of all historical Oklahoma flood-peak data (Hauth, Kurklin, and Walters, 1986). Data points plotting near the limiting curve are considered to be outstanding floods. Flood discharges for 1987 at many sites plot near the limiting curve and reflect the magnitude of 1987 runoff.

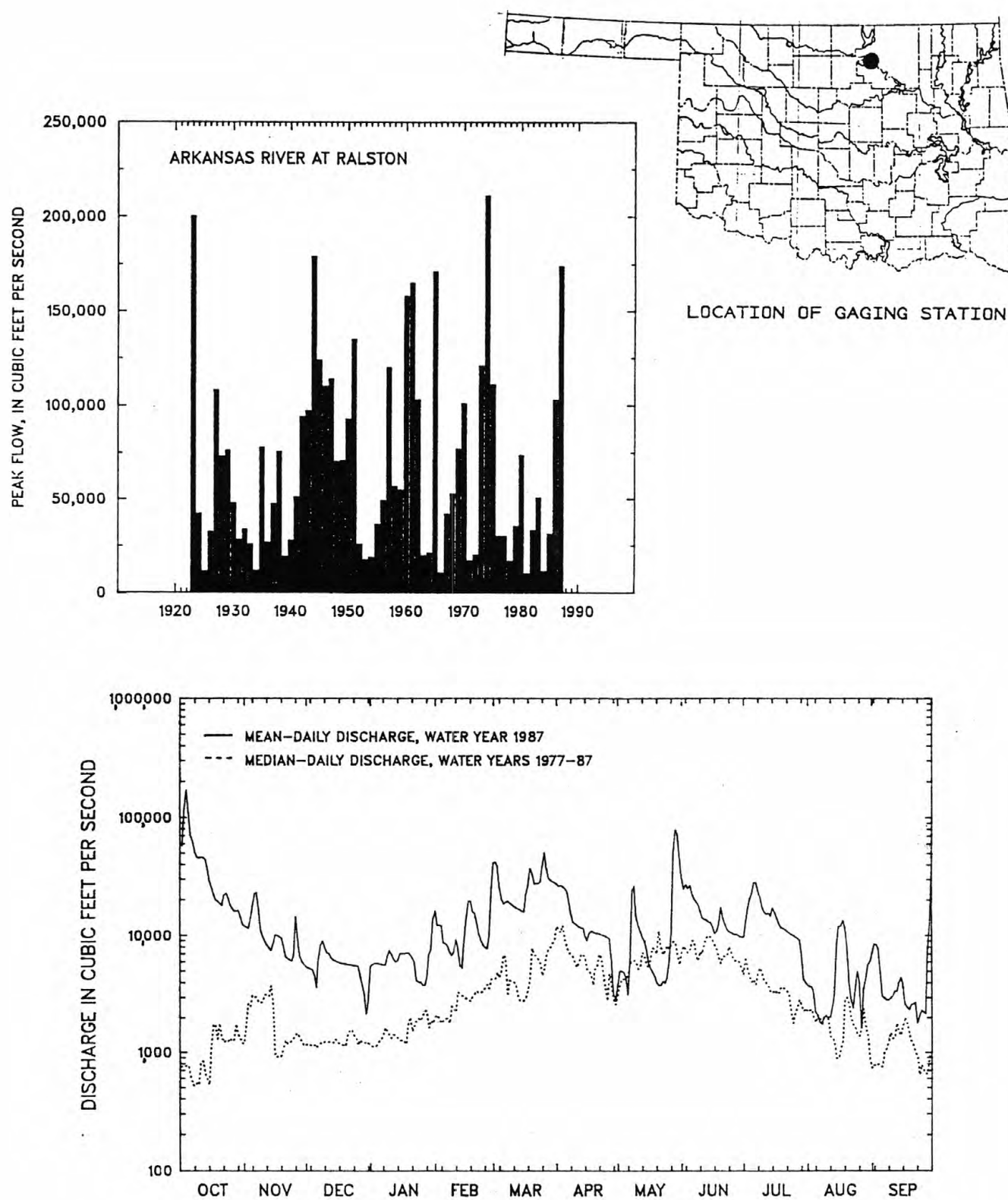


Figure 1.--Comparison of mean-daily discharges, median-daily discharges, and annual peak flows for Arkansas River at Ralston.

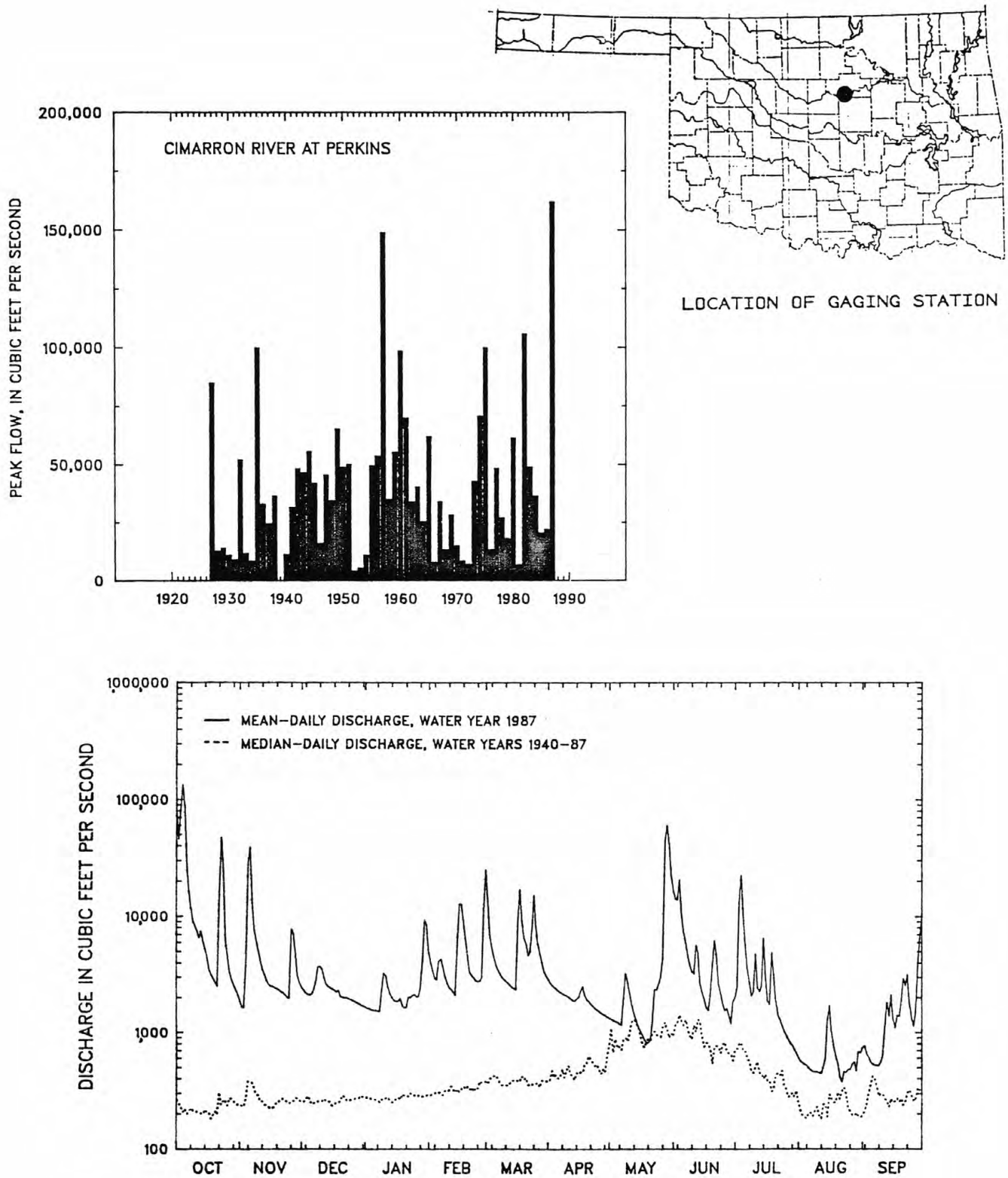


Figure 2.--Comparison of mean-daily discharges, median-daily discharges, and annual peak flows for Cimarron River at Perkins.

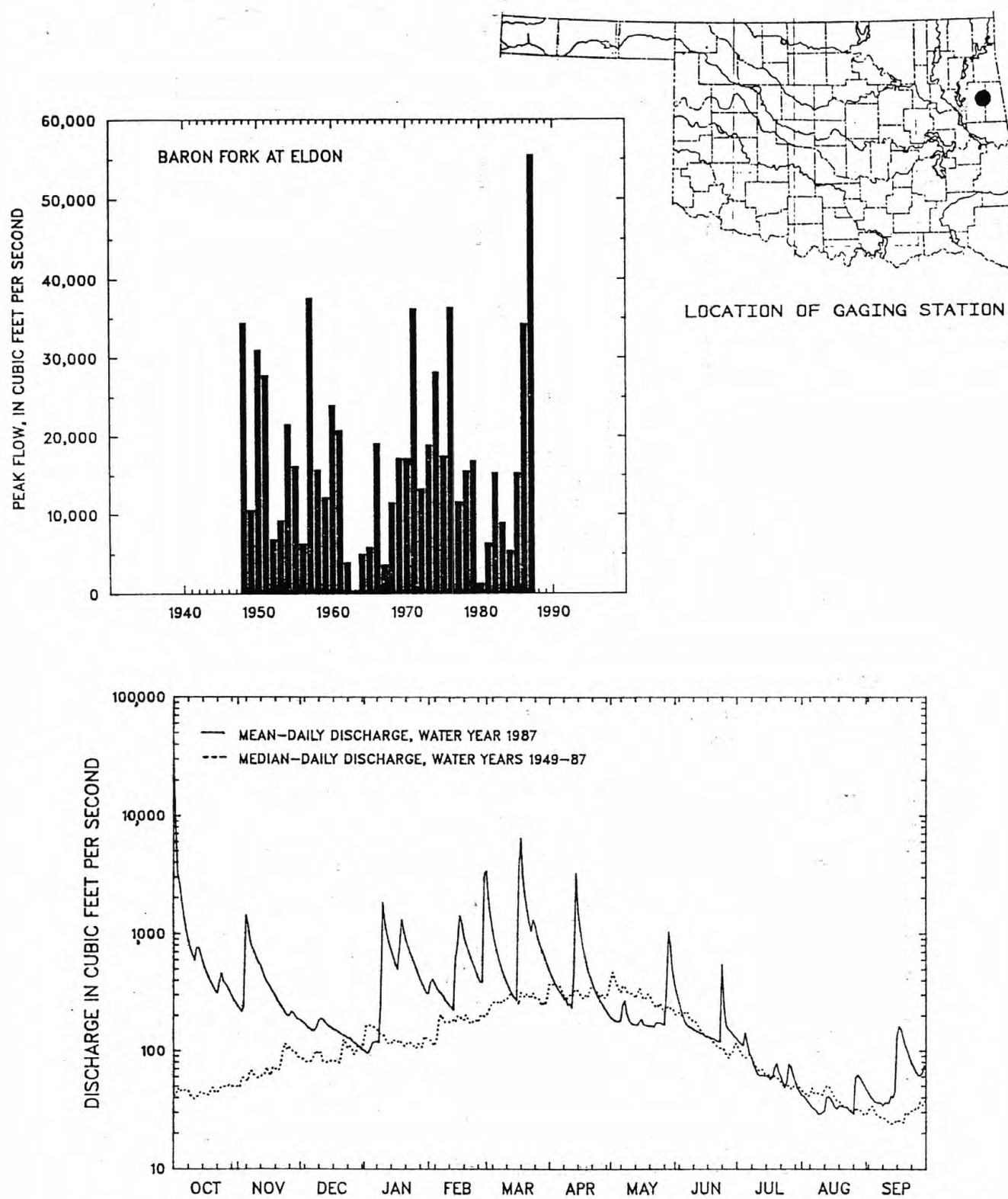


Figure 3.--Comparison of mean-daily discharges, median-daily discharges, and annual peak flows for Baron Fork at Eldon.

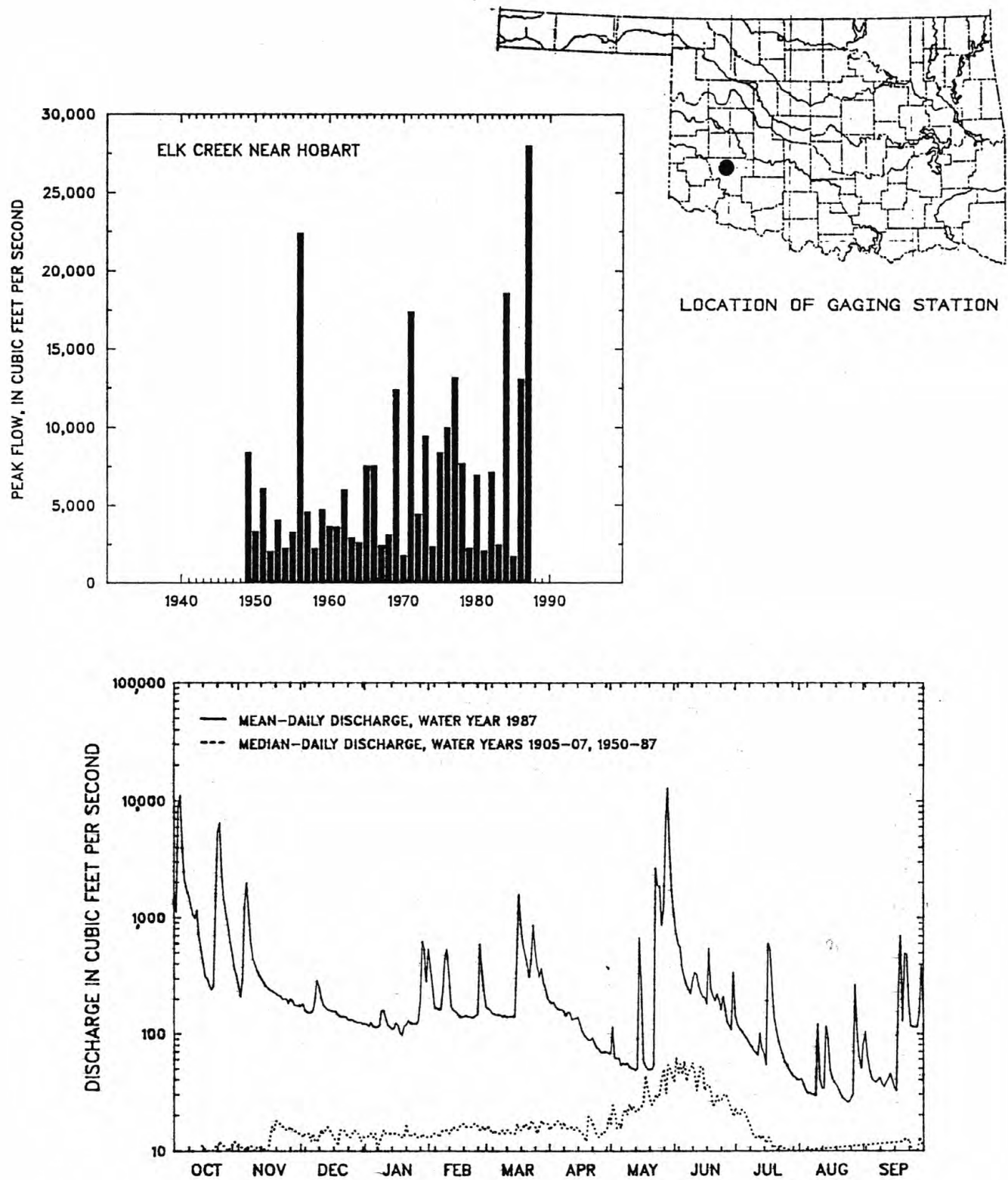


Figure 4.--Comparison of mean-daily discharges, median-daily discharges, and annual peak flows for Elk Creek near Hobart.

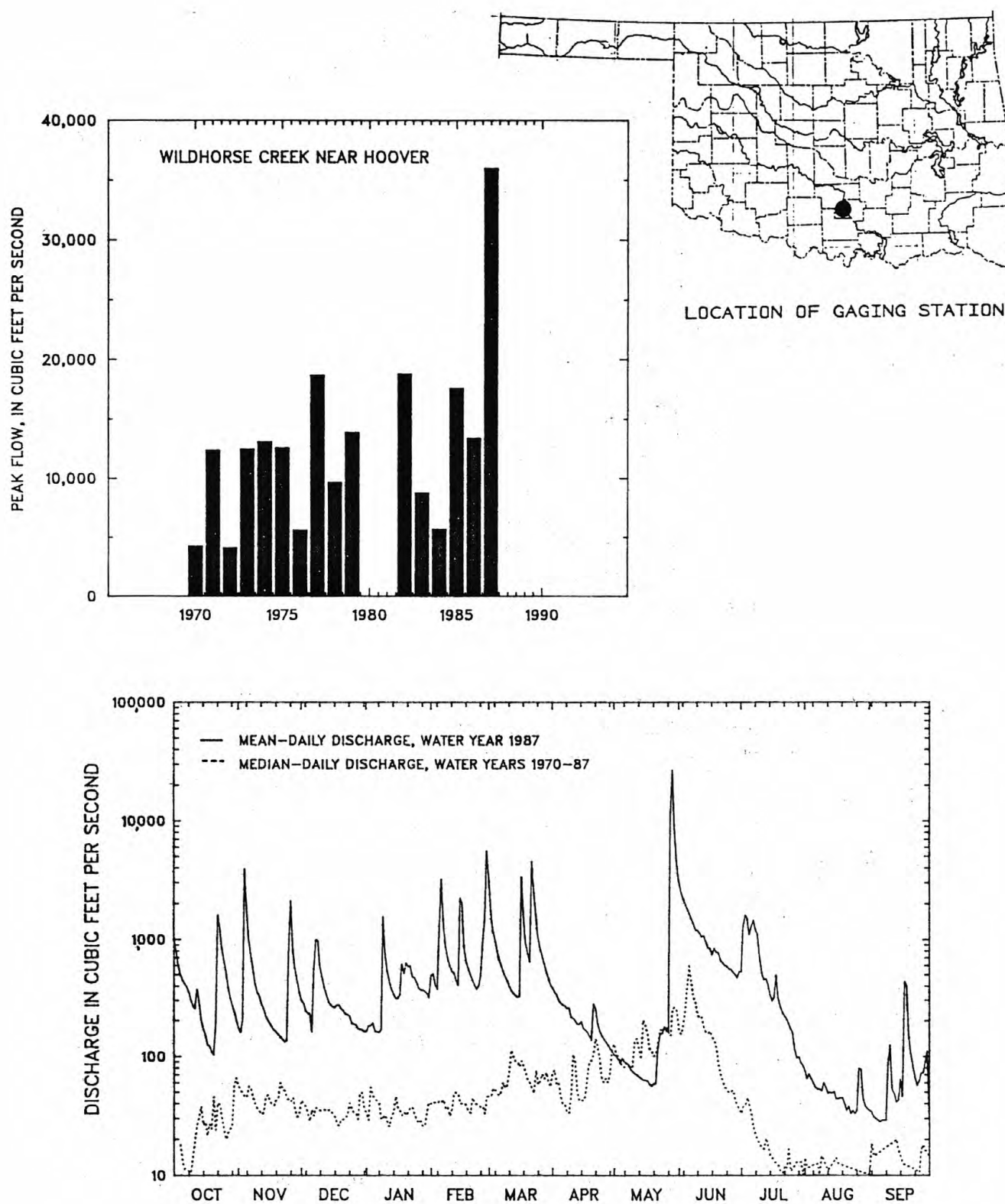


Figure 5.--Comparison of mean-daily discharges, median-daily discharges, and annual peak flows for Wildhorse Creek near Hoover.

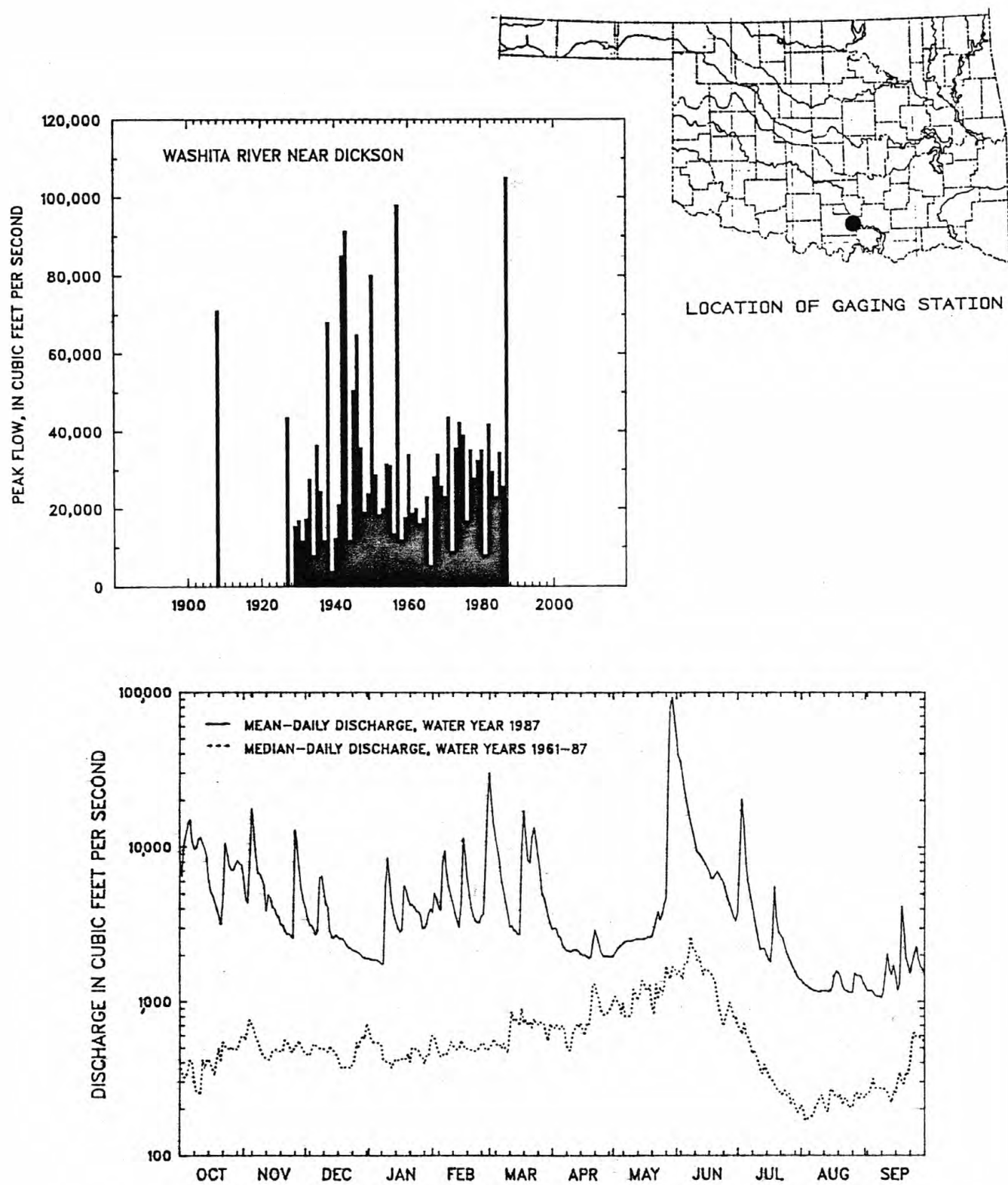


Figure 6.--Comparison of mean-daily discharges, median-daily discharges, and annual peak flows for Washita River near Dickson.

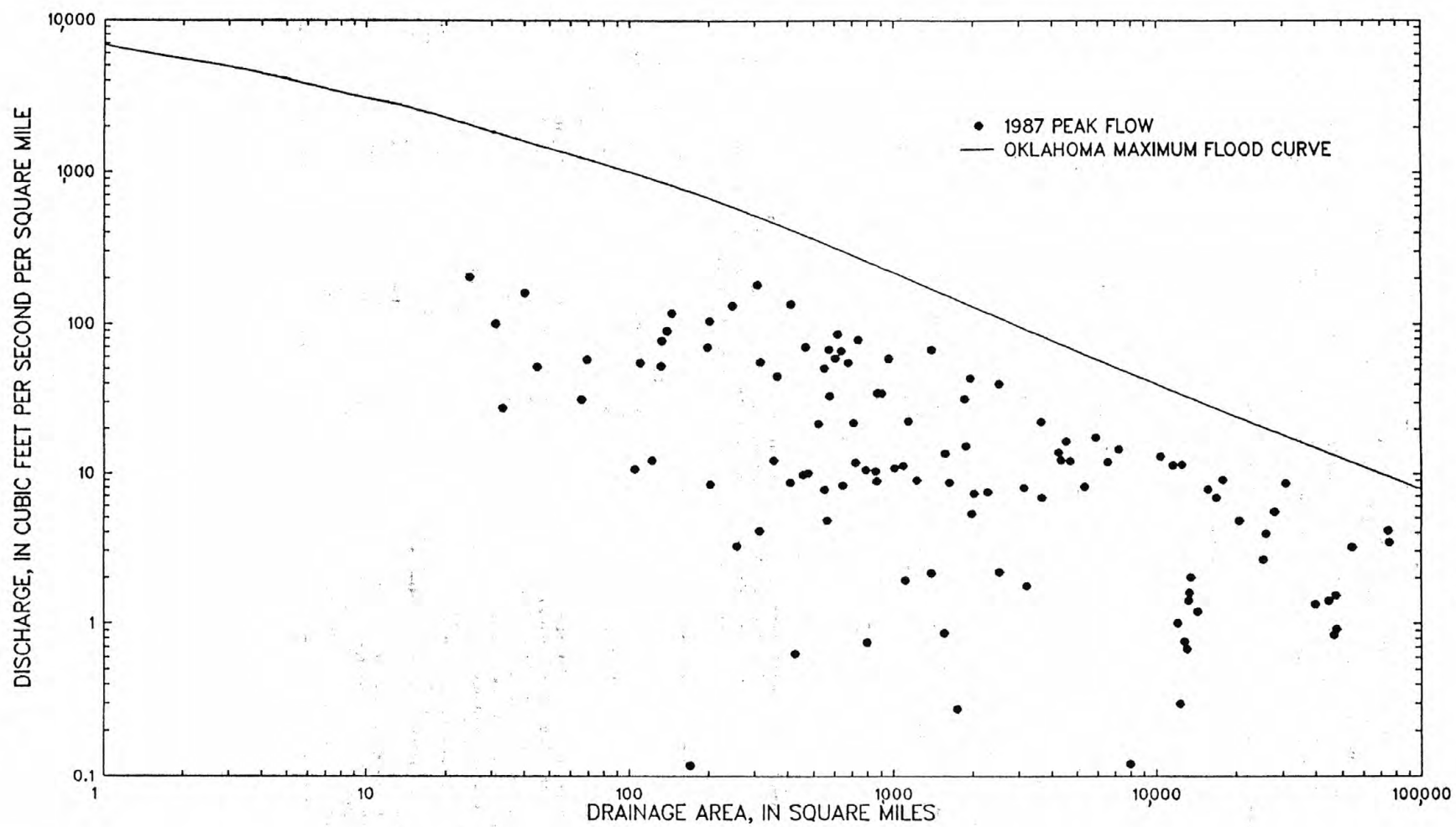


Figure 7.--Relation between 1987 peak flow and drainage area for all gaging stations.

Chemical Quality of Streamflow

The concentrations of selected dissolved chemical constituents measured at surface-water sampling stations in the State during the 1987 water year generally were within the ranges measured during previous years. Concentrations of dissolved solids, chloride, sulfate, and suspended sediment are shown in the following tables for sampling sites on selected principal streams in the State. Maximum and minimum concentrations of these constituents for the 1987 water year are compared to maximum and minimum concentrations for the water years 1970 through 1985.

The maximum dissolved-solids concentration measured in these streams in 1987 was 5,410 mg/L in the Cimarron River near Buffalo. This concentration is considered normal for the station. Dissolved-solids concentrations, in milligrams per liter, are listed in the following table:

Station Identification	1987 water year		1970-85 water years	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	1,420	345	2,550	139
07157950 Cimarron River near Buffalo	5,410	3,050	49,200	601
07161000 Cimarron River at Perkins	3,510	1,080	15,700	338
07164500 Arkansas River at Tulsa	1,230	514	2,400	108
07193500 Neosho River below Fort Gibson near Fort Gibson	180	155	213	102
07231500 Canadian River near Calvin	1,170	666	1,880	85
07234000 Beaver River near Beaver	3,760	1,320	4,320	164
07237500 North Canadian River near Woodward	1,390	862	3,110	626
07242000 North Canadian River near Wetumka	846	348	1,650	119
07243500 Deep Fork near Beggs	620	125	1,720	86
07301110 Salt Fork Red River near Elmer	3,640	1,630	4,450	192
07305000 North Fork Red River near Headrick	3,220	2,200	17,100	208
07331000 Washita River near Dickson	1,270	662	1,460	139
07335700 Kiamichi River near Big Cedar	25	21	45	8

The maximum dissolved-chloride concentration measured at the selected stations in 1987 was 2,800 mg/L in the Cimarron River at Perkins. The minimum dissolved-chloride concentration measured in the Kiamichi River near Big Cedar was less than the concentrations for the 1970 through 1985 water years. Dissolved-chloride concentrations, in milligrams per liter, are listed in the following table:

Station Identification	1987 water year		1970-85 water years	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	460	98	1,300	19
07157950 Cimarron River near Buffalo	2,300	1,400	29,000	180
07161000 Cimarron River at Perkins	2,800	510	8,600	110
07164500 Arkansas River at Tulsa	480	160	1,100	15
07193500 Neosho River below Fort Gibson near Fort Gibson	12	6.0	24	4.5
07231500 Canadian River near Calvin	270	130	750	18
07234000 Beaver River near Beaver	1,600	520	1,800	14
07237500 North Canadian River near Woodward	380	220	640	140
07242000 North Canadian River near Wetumka	210	75	640	17
07243500 Deep Fork near Beggs	180	17	800	7.3
07301110 Salt Fork Red River near Elmer	570	240	1,000	15
07305000 North Fork Red River near Headrick	900	630	8,000	40
07331000 Washita River near Dickson	83	38	250	6.0
07335700 Kiamichi River near Big Cedar	3.0	0.9	9.6	1.0

The maximum dissolved-sulfate concentration measured in 1987 was in the Salt Fork Red River near Elmer; however, this concentration is normal for the station. The maximum concentration in the Kiamichi River near Big Cedar was larger than the maximum for the 1970 through 1985 water years. Dissolved-sulfate concentrations, in milligrams per liter, are listed in the following table:

Station Identification	1987 water year		1970-85 water years	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	220	64	300	8.7
07157950 Cimarron River near Buffalo	810	410	2,400	7.1
07161000 Cimarron River at Perkins	540	120	690	12
07164500 Arkansas River at Tulsa	190	83	210	19
07193500 Neosho River below Fort Gibson near Fort Gibson	41	27	50	7.7
07231500 Canadian River near Calvin	360	100	380	7.0
07234000 Beaver River near Beaver	660	170	1,100	18
07237500 North Canadian River near Woodward	400	230	930	110
07242000 North Canadian River near Wetumka	180	62	280	6.2
07243500 Deep Fork near Beggs	50	10	170	2.4
07301110 Salt Fork Red River near Elmer	1,600	750	1,800	72
07305000 North Fork Red River near Headrick	890	740	2,000	24
07331000 Washita River near Dickson	510	260	760	9.6
07335700 Kiamichi River near Big Cedar	11	6.3	9.3	.8

The maximum suspended-sediment concentration measured in 1987 at the selected stations was in the Cimarron River at Perkins. The concentration was within the historic concentration range for this station. Suspended-sediment concentrations, in milligrams per liter, are listed in the following table:

Station Identification	1987 water year		1970-85 water years	
	Maximum	Minimum	Maximum	Minimum
07152500 Arkansas River at Ralston	3,100	76	13,500	10
07157950 Cimarron River near Buffalo	76	5	12,800	2
07161000 Cimarron River at Perkins	7,970	89	17,000	15
07164500 Arkansas River at Tulsa	106	10	5,280	3
07193500 Neosho River below Fort Gibson near Fort Gibson	21	2	496	1
07231500 Canadian River near Calvin	2,020	60	30,900	9
07234000 Beaver River near Beaver	1,780	15	14,900	7
07237500 North Canadian River near Woodward	139	41	3,770	6
07242000 North Canadian River near Wetumka	1,260	103	14,900	12
07243500 Deep Fork near Beggs	108	31	1,470	10
07301110 Salt Fork Red River near Elmer	922	67	12,100	7
07305000 North Fork Red River near Headrick	958	58	5,520	3
07331000 Washita River near Dickson	3,300	290	17,300	12
07335700 Kiamichi River near Big Cedar	54	11	154	1

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

EXPLANATION OF THE RECORDS

The surface-water and water-quality records published in this report are for the 1987 water year that began October 1, 1986, and ended September 30, 1987. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The locations of the stations where the data were collected are shown in figures 1-3. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for surface-water stations where only miscellaneous measurements are made.

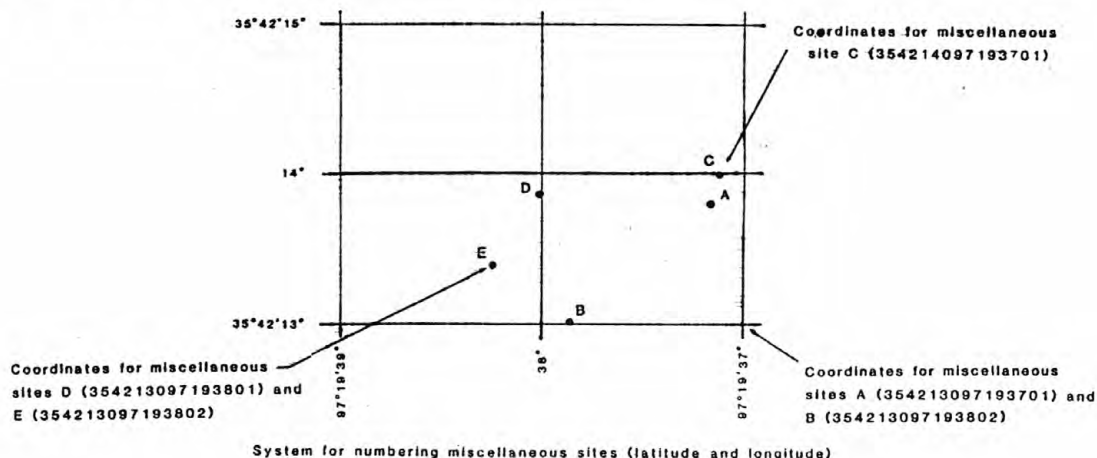
Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indentation in the "List of Stations" in the front of this report. Each indentation represents one rank. This downstream order and system of indentation show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete eight-digit number for each station, such as 07152500, which appears just to the left of the station name, includes the two-digit Part number "07" plus the six-digit downstream-order number "152500." The Part number designates the major river basin; for example, part "07" is the Lower Mississippi River basin.

Latitude-Longitude System

The identification numbers for miscellaneous surface-water sites are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the sites within a 1-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description. (See figure below.)



Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean daily discharge may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Location of all complete-record, crest-stage partial-record, and low-flow partial-record stations for which data are given in this report are shown in figures 8-9.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relationships between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relationship between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper tapes at selected time intervals. Measurements of discharge are made with current meters using methods adapted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

In computing discharge records, results of individual measurements are plotted against the corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. It is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the daily mean stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on the individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control. For some stations, formation of ice in the winter may so obscure the stage-discharge relations that daily mean discharges must be estimated from other information such as temperature and precipitation records, notes of observations, and records for other stations in the same or nearby basins for comparable periods.

At some stream-gaging stations the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

In computing records of lake or reservoir contents, it is necessary to have available from surveys, curves or tables defining the relationship of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relationship changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relationship. Even when this is done, the contents computed may become increasingly in error as time since the last survey increases. Discharges over lake or reservoir spillways are computed from stage-discharge relationships much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information.

Data Presentation

The records published for each gaging station consist of two parts, the manuscript or station description and data table for the current water year. The manuscript provides, under various headings, descriptive information, such as station location; period of record; average discharge; historical extremes; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to National Geodetic Vertical Datum of 1929 (see glossary), and a condensed history of the types, locations, and datums of previous gages are given under this heading.

REMARKS.--This paragraph is used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records furnished by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District office to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

The daily table for stream-gaging stations gives mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also is usually expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN."), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas. In the yearly summary below the monthly summary, the figures shown are the appropriate discharges for the calendar and water years. At some stations monthly and (or) yearly observed discharges are adjusted for reservoir storage or diversions, or diversions or reservoir contents are given. These figures are identified by a symbol and corresponding footnote.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of annual maximum stage and discharge at crest-stage stations, and the second is a table of discharge measurements at low-flow partial-record stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. These measurements and others collected for some special reason are called measurements at miscellaneous sites.

Identifying Estimated Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated."

Accuracy of the Records

The accuracy of streamflow records depends primarily on: (1) The stability of the stage-discharge relation or, if the control is unstable, the frequency of discharge measurements; and (2) the accuracy of measurements of stage, measurements of discharge, and interpretation of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of the true; "good," within 10 percent; and "fair," within 15 percent. Records that do not meet the criteria mentioned, are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft³/s; to the nearest tenth between 1.0 and 10 ft³/s; to whole numbers between 10 and 1,000 ft³/s; and to 3 significant figures for more than 1,000 ft³/s. The number of significant figures used is based solely on the magnitude of the discharge value. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Other Records Available

Records of discharge, not published by the Geological Survey, are collected in Oklahoma at several sites by the U.S. Army Corps of Engineers. The National Water Data Exchange (NAWDEX), U.S. Geological Survey, Reston, VA 22092, maintains an index of these sites as well as an index of records of discharge collected by other agencies but not published by the Geological Survey. Information on records at specific sites can be obtained from that office upon request.

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the Oklahoma District office. Also, most of the daily mean discharges are in computer-readable form.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be once or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figure 10.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory. Procedures for onsite measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed on p. 17 of this report. Also, detailed information on collecting, treating, and shipping samples may be obtained from the Geological Survey District Office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load. All samples obtained for the National Stream Quality Accounting Network (see definitions) are obtained from at least several verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the U.S. Geological Survey District Office whose address is given on the back of the title page of this report.

Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small diurnal temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained at several verticals in the cross section, or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

Suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow and in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of suspended-sediment discharge, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included for some stations.

Laboratory Measurements

Sediment samples, samples for biochemical-oxygen (BOD), samples for indicator bacteria, and daily samples for specific conductance are analyzed locally. All other samples are analyzed in the Geological Survey laboratories in Arvada, Colo. Methods used in analyzing sediment samples and computing sediment records are given in TWRI, Book 5, Chap. C1. Methods used by the Geological Survey laboratories are given in TWRI, Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, and water temperature then follow in sequence.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor temperature record, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums or minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, WATSTORE, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file to insure the most recent updates.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given for these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the water-quality data in this report:

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)
L	Biological organism count less than 0.5 percent (organisms may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

DEFINITIONS OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equal to 43,560 cubic feet or about 326,000 gallons or 1,233 cubic meters.

Algae are mostly aquatic single-celled, colonial, or multicelled plants, containing chlorophyll and lacking roots, stems, and leaves.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35 °C. In the laboratory these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35 °C $\pm$ 1.0 °C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5 °C $\pm$ 0.2 °C on M-FC medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as Gram-positive, cocci bacteria which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35 °C $\pm$ 1.0 °C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Bed material is the sediment mixture of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any given time, expressed as the mass per unit area of volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500 °C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter (g/m³), and periphyton and benthic organisms in grams per square meter (g/m²).

Dry mass refers to the mass of residue present after drying in an oven at 105 °C for zooplankton and periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash and sediment, in the sample. Dry-mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material: See Bed material.

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters (mL) or liters (L).

Chemical oxygen demand (COD) is a measure of the chemically oxidizable material in the water, and furnishes an approximation of the amount of organic and reducing material present. The determined value may correlate with natural water color or with carbonaceous organic pollution from sewage or industrial wastes.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common green pigments in plants.

Color unit is produced by one milligram per liter of platinum in the form of the chloro-platinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Control designates a feature downstream from the gage that determines the stage-discharge relation at the gage. This feature may be a natural constriction of the channel, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream.

Cubic foot per second (ft^3/s)¹ is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Cubic feet per second per square mile [$(\text{ft}^3/\text{s})/\text{mi}^2$]¹ is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment) that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic mean of individual daily mean discharges during a specific period.

Instantaneous discharge is the discharge at a particular instant of time.

Dissolved refers to that material in a representative water sample which passes through a 0.45 μm membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During the analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.492 to reflect the change.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains by gravity into the stream above the specified point. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise noted.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded surface water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO_3).

HWM is a high-water mark or flood mark.

¹Until appropriate changes can be made to the WATSTORE and Prime computer systems, the unit abbreviations "CFS" and "CFSM" will appear in some computer-generated table headings and summaries.

Hydrologic Bench-Mark Network is a network of 57 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by the activities of man.

Hydrologic unit is a geographic area representing part of all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an eight-digit number.

Micrograms per gram ($\mu\text{g/g}$) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter ($\mu\text{g/L}$, $\mu\text{G/L}$) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligrams per liter (MG/L , mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represents the mass of solute per unit volume (liter) of water. Concentrations of suspended sediment also is expressed in mg/L and is based on the mass of dry sediment per liter of water-sediment mixture.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of both the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf or Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place.

National Stream Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in natural or regional water-quality planning and management. The 500 or so sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

The National Trends Network (NTN) is a 150-station network for sampling atmospheric deposition in the United States. The purpose of the network is to determine the variability, both in location and in time, of the composition of atmospheric deposition, which includes snow, rain, dust particles, aerosols, and gases. The core from which the NTN was built was the already-existing deposition-monitoring network of the National Atmospheric Deposition Program (NADP).

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per unit area habitat, usually square meter (m^2), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliter (mL) or liter (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

Partial-record station is a particular site where limited streamflow and/or water-quality data are collected systematically over a period of years for use in hydrologic analyses.

Particle size is the diameter, in millimeters (mm), of a particle determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with the recommendation made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation
Silt.....	.004 - .062	Sedimentation
Sand.....	.062 - 2.0	Sedimentation or sieve
Gravel.....	2.0 - 64.0	Sieve

The particle-size distribution given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population in terms of types, numbers, mass, or volume.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms.

Pesticides are chemical compounds used to control undesirable organisms. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (PC, pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen release (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [$\text{mg C}/\text{m}^2 \cdot \text{time}$] for periphyton and macrophytes and [$\text{mg C}/(\text{m}^3 \cdot \text{time})$] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [$\text{mg O}/(\text{m}^2 \cdot \text{time})$] for periphyton and macrophytes and [$\text{mg O}/\text{m}^3 \cdot \text{time}$] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved-oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures are likely to produce different analytical results.

Return period is the average time interval between occurrences of a hydrological event of a given or greater magnitude, usually expressed in years. May also be called recurrence interval.

Runoff in inches (IN, in) shows the depth to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along the bed and very close to it. In this report, bed load is considered to consist of particles in transit within 0.25 ft of the streambed.

Bed load discharge (tons per day) is the quantity of bed load measured by dry weight that moves past a section as bed load in a given time.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Mean concentration is the time-weighted concentration of suspended sediment passing a stream section during a 24-hour day.

Suspended-sediment discharge (tons/day) is the rate at which dry mass of sediment passes a section of a stream or is the quantity of sediment, as measured by dry mass or volume, that passes a section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) $\times$ discharge (ft^3/s) $\times$ 0.0027.

Suspended-sediment load is a general term that refers to material in suspension. It is not synonymous with either discharge or concentration.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, as measured by dry mass or volume, that passes a section during a given time.

Total-sediment load or total load is a term which refers to the total sediment (bed load plus suspended-sediment load) that is in transport. It is not synonymous with total-sediment discharge.

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. 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.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25 °C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

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Stage-discharge relation is the relation between gage height (stage) and the volume of water, per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton.

Surface area of a lake is that area outlined on the latest U.S. Geological Survey topographic map as the boundary of the lake and measured by a planimeter in acres. In localities not covered by topographic maps, the areas are computed from the best maps available at the time planimetered. All areas shown are those for the stage when the planimetered map was made.

Surficial bed material is the part (0.1 to 0.2 ft) of the bed material that is sampled using U.S. Series Bed-Material Samplers.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of undissolved material in a water-sediment mixture. It is associated with the material retained on a 0.45-micrometer filter.

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45 μ m membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 μ m membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituent.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....	Animal
Phylum.....	Arthropoda
Class.....	Insecta
Order.....	Ephemeroptera
Family.....	Ephemeridae
Genus.....	<u>Hexagenia</u>
Species.....	<u>hexagenia limbata</u>

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. 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 stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY) is the quantity of a substance in solution or suspension that passes a stream section during a 24-hour period.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determines all of the constituent in the sample.)

Total discharge is the total quantity of any individual constituent, as measured by dry mass or volume, that passes through a stream cross-section per unit of time. This term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures are required of all laboratories performing such analyses, because different digestion procedures are likely to produce different analytical results.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period, October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1986, is called the "1986 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976).

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of the discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WSP is used as an abbreviation for "Water-Supply Paper" in references to previously published reports.

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. *Water temperature--influential factors, field measurement, and data presentation*, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.
- 1-D2. *Guidelines for collection and field analysis of ground-water samples for selected unstable constituents*, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.
- 2-D1. *Application of surface geophysics to ground-water investigations*, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.
- 2-E1. *Application of borehole geophysics to water-resources investigations*, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.
- 3-A1. *General field and office procedures for indirect discharge measurements*, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.
- 3-A2. *Measurement of peak discharge by the slope-area method*, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.
- 3-A3. *Measurement of peak discharge at culverts by indirect methods*, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.
- 3-A4. *Measurement of peak discharge at width contractions by indirect methods*, by H. F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 Pages.
- 3-A5. *Measurement of peak discharge at dams by indirect methods*, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.
- 3-A6. *General procedure for gaging streams*, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.
- 3-A7. *Stage measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 pages.
- 3-A8. *Discharge measurements at gaging stations*, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.
- 3-A9. *Measurement of time of travel and dispersion in streams by dye tracing*, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.
- 3-A10. *Discharge ratings at gaging stations*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.
- 3-A11. *Measurement of discharge by moving-boat method*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.
- 3-A13. *Computation of continuous records of streamflow*, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.
- 3-A14. *Use of flumes in measuring discharge*, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.
- 3-A15. *Computation of water-surface profiles in open channels*, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.
- 3-B1. *Aquifer-test design, observation, and data analysis*, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.
- 3-B2. *Introduction to ground-water hydraulics, a programed text for self-instruction*, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.
- 3-B3. *Type curves for selected problems of flow to wells in confined aquifers*, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

- 3-C1. *Fluvial sediment concepts* by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.
- 3-C2. *Field methods for measurement of fluvial sediment*. by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.
- 3-C3. *Computation of fluvial-sediment discharge*, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.
- 4-A1. *Some statistical tools in hydrology*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.
- 4-A2. *Frequency curves*, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.
- 4-B1. *Low-flow investigations*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.
- 4-B2. *Storage analyses for water supply*, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.
- 4-B3. *Regional analyses of streamflow characteristics*, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.
- 4-D1. *Computation of rate and volume of stream depletion by wells* by C. T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 pages.
- 5-A1. *Methods for determination of inorganic substances in water and fluvial sediments* by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.
- 5-A2. *Determination of minor elements in water by emission spectroscopy*, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.
- 5-A3. *Methods for analysis of organic substances in water*, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.
- 5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, edited by P. E. Greeson, T. A. Ehlike, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.
- 5-A5. *Methods for determination of radioactive substances in water and fluvial sediments*, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.
- 5-A6. *Quality assurance practices for the chemical and biological analyses of water and fluvial sediments*, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.
- 5-C1. *Laboratory theory and methods for sediment analysis*, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.
- 7-C1. *Finite difference model for aquifer simulation in two dimensions with results of numerical experiments*, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.
- 7-C2. *Computer model of two-dimensional solute transport and dispersion in ground water*, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.
- 7-C3. *A model for simulation of flow in singular and interconnected channels* by R. W. Schaffranek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.
- 8-A1. *Methods of measuring water levels in deep wells*, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.
- 8-A2. *Installation and service manual for U.S. Geological Survey manometers* by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.
- 8-B2. *Calibration and maintenance of vertical-axis type current meters*, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

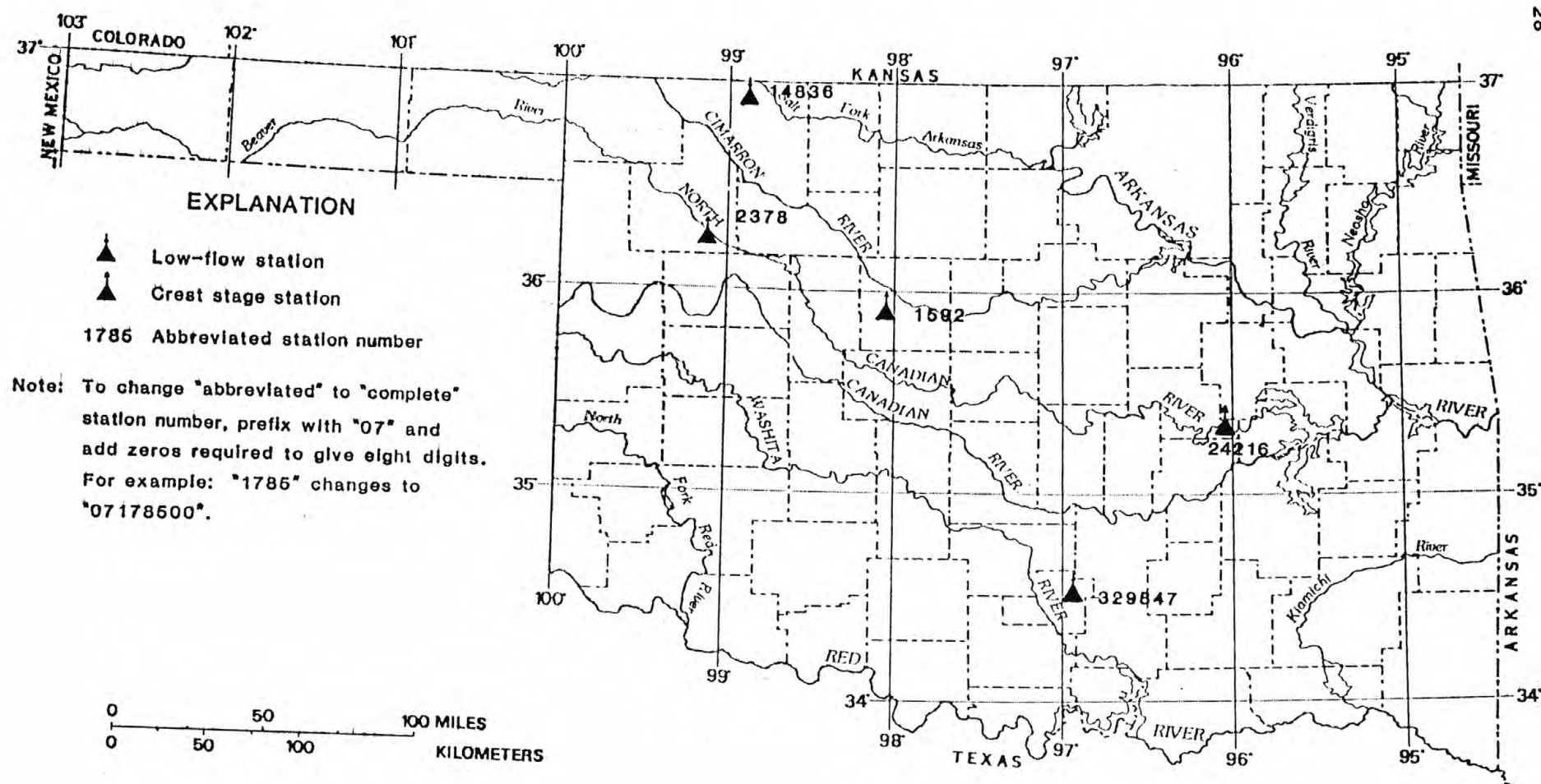


Figure 9.--Location of partial-record stations, water years 1987.

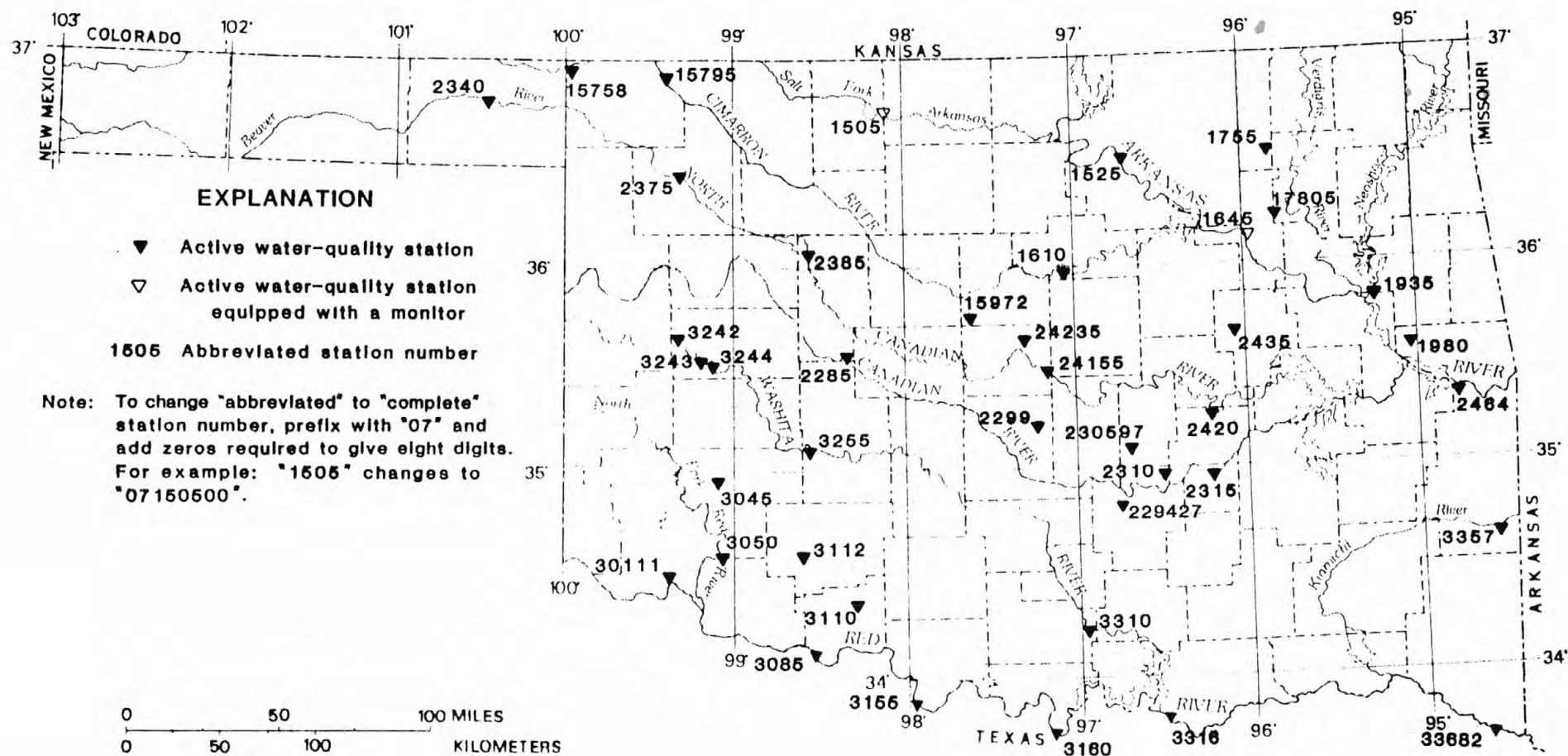


Figure 10.--Location of water-quality stations, water year 1987.

ARKANSAS RIVER BASIN

31

07148130 KAW LAKE NEAR PONCA CITY, OK

LOCATION.--Lat 36°41'58", long 96°55'18", in NW 1/4 SW 1/4 sec.30, T.26 N., R.4 E., Osage County, Hydrologic Unit 11060001, 1,700 ft east of centerline of spillway on dam on Arkansas River, about 8 mi east of Ponca City, and at mile 653.7.

DRAINAGE AREA.--46,530 mi², of which 7,607 mi² is probably noncontributing.

PERIOD OF RECORD.--April 1976 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to July 8, 1976 nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by a rolled, earth dam. Spillway is concrete, gravity ogee-weir type controlled by eight 50-foot taintor gates. Outlet works consist of two sluice gates. Regulated storage began April 22, 1976; conservation pool first filled July 6, 1976. Capacity, 1,348,000 acre-ft, at elevation 1,044.5 ft, top of flood control pool, 428,600 acre-ft, at elevation 1,010.0 ft, top of conservation pool, and 250,700 acre-ft, at elevation 997.5 ft, crest of controlled spillway. Dead storage 85,100 acre-ft below elevation 978.0 ft. Figures given herein represent total contents. Reservoir is designed for flood control, water-quality control, recreation, fish and wildlife, and water supply.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,387,000 acre-ft, Oct. 6, 1986, elevation, 1,045.52 ft; minimum since conservation pool first filled, 223,100 acre-ft, Mar. 25, 1977, elevation, 995.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,387,000 acre-ft, Oct. 6, elevation, 1,045.52 ft; minimum, 388,600 acre-ft, Feb. 11, elevation, 1,007.57 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

1,006	364,300	1,030	873,000
1,012	463,700	1,036	1,052,000
1,018	580,900	1,042	1,256,000
1,024	716,700	1,046	1,406,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	667900	603700	457800	471200	409800	605700	597900	422300	e788400	505600	401800	445400
2	791500	587500	454200	468100	400500	667200	575600	420800	e785500	516800	400100	438800
3	1100000	576200	451500	463500	391400	712800	550300	419300	e781900	516000	399900	432100
4	1257000	578600	451000	459200	389900	726500	525200	419700	e768100	511200	400800	431000
5	1364000	579600	451400	453800	392100	721800	500300	423400	e754400	509900	401900	431900
6	1381000	576300	452200	450800	394700	709200	482700	427200	e736000	518600	403200	431900
7	1334000	573900	461500	446600	397900	692700	473800	438000	e716700	540000	403800	432000
8	1277000	571700	467900	443500	400400	673000	469900	444300	e696500	543300	404400	431400
9	1215000	569600	476500	440500	397300	650700	467200	442400	e680400	536300	405000	429700
10	1151000	567000	481800	436700	391200	628900	460000	438200	e668100	529500	404900	429800
11	1090000	562800	484600	432900	389300	607800	455100	435000	e656400	522000	404700	429500
12	1033000	560100	486100	429500	390100	587000	449900	432900	e646400	519900	406300	428100
13	983000	554600	486300	424400	391000	565500	443800	428900	e634000	521700	414400	427500
14	950300	545300	486500	419400	395900	545900	443500	427900	e621100	522900	442300	426500
15	927100	533200	485500	414800	407200	525900	444200	427900	e609100	516200	452500	427100
16	907800	521600	484200	410000	420700	510500	440800	427300	e600300	505600	444800	427800
17	892100	510700	483300	407000	432000	519600	436200	427200	e593600	497200	425800	428700
18	874100	500400	481100	401700	439900	549300	433300	427800	591700	489900	409700	428500
19	853900	492800	479400	396300	446600	589600	432600	428900	588300	481600	402500	428200
20	831800	487200	478300	391300	453500	597700	434400	e429600	583900	472700	402000	428200
21	809900	482600	475700	391200	460600	583200	434800	e430300	577000	463300	402600	428100
22	795400	479400	473400	391400	466200	565500	432800	e429600	569000	453400	405000	429600
23	776300	473700	470800	393600	470100	554800	428800	e431500	560800	443800	409900	429200
24	756000	469700	468200	394500	473200	570800	423700	e430800	552900	434100	407100	428900
25	735600	471300	465900	394900	475400	608900	417600	e433300	544500	424300	409700	428400
26	714600	471300	467900	394600	478900	636700	410400	e441500	536500	414800	421100	427700
27	692700	469300	471900	394900	487600	639400	412400	e506800	528000	405400	424200	427400
28	669600	466400	475700	395500	530200	643900	418100	e617400	518400	401800	430300	435800
29	649400	463300	480000	401200	---	641200	423100	e723300	509800	403000	442800	435800
30	634300	460500	478500	408600	---	628700	424200	e781200	502600	403900	449400	436200
31	619200	---	475200	411500	---	613300	---	e791700	---	403100	449800	---
MAX	1381000	603700	486500	471200	530200	726500	597900	791700	788400	543300	452500	445400
MIN	619200	460500	451000	391200	389300	510500	410400	419300	502600	401800	399900	426500
(+)	1019.78	1011.82	1012.63	1008.98	1015.52	1019.51	1009.74	1026.89	1014.10	1008.47	1011.22	1010.44
(++)	+48,500	-158,700	+14,700	-63,700	+118,700	+83,100	-189,100	+367,500	-289,100	-99,500	+46,700	-13,600

CAL YR 1986 MAX 1381000 MIN 368900 (++) +6,000
WTR YR 1987 MAX 1381000 MIN 389300 (++) -134,500

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-FEET

e Estimated

ARKANSAS RIVER BASIN

07148140 ARKANSAS RIVER NEAR PONCA CITY, OK

LOCATION.--Lat 36°41'55", long 96°55'40", in SW 1/4 SE 1/4 sec.25, T.26 N., R.3 E., Kay County, Hydrologic Unit 11060001, at spillway of Kaw Dam, about 8 mi east of Ponca City, and at mile 653.7.

DRAINAGE AREA.--46,530 mi², of which 7,607 mi² is probably noncontributing.

PERIOD OF RECORD.--April 1976 to current year.

GAGE.--Nonrecording gage. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Flow totally regulated by Kaw Dam.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

AVERAGE DISCHARGE.--11 years, 3,275 ft³/s, 2,373,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,300 ft³/s, Oct. 11, 1986; no flow May 13, 1979, Sept. 14-24, 1986, Oct. 1-4, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 39,300 ft³/s, Oct. 11; no flow Oct. 1-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	9880	3110	3380	5520	6900	20900	3390	11700	7040	2880	7530
2	.00	9730	3090	3350	7030	8250	21500	3380	14000	8870	2870	7430
3	.00	8210	3070	3340	6550	11000	21600	3360	12800	10400	2010	6710
4	.00	5950	2560	3340	3320	12900	20700	2440	14900	10300	1320	3420
5	5930	5980	1520	3340	2040	12900	19700	1060	14800	10200	1030	2200
6	32400	6000	1520	3220	2040	14400	15300	2430	14600	10200	840	2200
7	39000	5220	1530	3180	2060	16200	10300	3760	14300	11900	1130	2200
8	38500	3950	1560	3150	2090	16000	8090	5080	14100	14600	1380	2200
9	39000	3940	1590	3140	3970	15700	7960	6110	12400	12900	1380	2200
10	38800	3920	2680	3140	5320	15300	7850	6050	9980	11800	1380	2200
11	39300	3900	3290	3080	3280	15200	7710	5550	9890	11600	1380	2040
12	39200	3880	3300	3060	2030	15200	7560	4970	9800	11200	1380	1930
13	35300	3850	3320	3640	2040	14300	7420	4940	9700	8310	3420	1930
14	26500	6330	3320	4000	2050	13600	5880	3700	9590	9520	8120	1930
15	22300	7910	3310	3960	2090	12800	5000	2430	9110	10900	11700	1430
16	19100	7740	3310	3910	2160	10900	6210	2430	7250	11400	11700	1120
17	15100	7550	3300	3850	2180	4540	6960	2420	6260	10700	13500	1120
18	15400	7380	3300	3800	2180	8920	6870	2060	7360	9880	11600	1310
19	15500	5490	3280	3740	2340	13500	6820	1720	8220	9760	6660	1660
20	15400	4190	3260	3680	2400	19600	6840	1720	8200	9620	2790	1660
21	15200	4140	3250	2320	2450	20500	6890	1870	8140	9480	2300	1120
22	15000	4100	3250	1410	2490	20000	6860	2020	8040	9320	2180	435
23	14800	4080	3220	1420	2520	16600	6790	2010	7940	9170	3860	1390
24	14600	3730	3200	1420	2540	12500	6700	2020	7820	9020	4800	1390
25	14400	3180	3180	1420	2550	17000	6620	2020	7710	8840	2500	1390
26	14100	3200	2180	1610	2550	21400	6520	2040	7590	8590	1220	1390
27	14400	3200	653	1740	4350	21700	2980	3780	7470	8370	3440	1390
28	15200	3180	150	1750	6880	21800	557	3160	7330	5300	4270	1390
29	12800	3160	150	1950	---	21900	913	157	7200	2880	5070	1390
30	10200	3140	2270	3950	---	21700	2520	3870	7100	2890	5140	1390
31	10000	---	3400	5550	---	21300	---	8740	---	2890	6440	---
TOTAL	587430.00	156110	80123	93840	89020	474510	268520	100687	295300	287850	129690	67095
MEAN	18950	5204	2585	3027	3179	15310	8951	3248	9843	9285	4184	2236
MAX	39300	9880	3400	5550	7030	21900	21600	8740	14900	14600	13500	7530
MIN	.00	3140	150	1410	2030	4540	557	157	6260	2880	840	435
AC-FT	1165000	309600	158900	186100	176600	941200	532600	199700	585700	571000	257200	133100

CAL YR 1986 TOTAL 1664817.00 MEAN 4561 MAX 39300 MIN .00 AC-FT 3302000

WTR YR 1987 TOTAL 2630175.00 MEAN 7206 MAX 39300 MIN .00 AC-FT 5217000

ARKANSAS RIVER BASIN

07148350 SALT FORK ARKANSAS RIVER NEAR WINCHESTER, OK

LOCATION (REVISED).--Lat 36°57'45", long 98°46'55", in NE 1/4 SE 1/4 sec.26, T.29 N., R.15 W., Woods County, Hydrologic Unit 11060002, near left bank on downstream side of pier of county road bridge, 1.0 mi northeast of Winchester, 2.5 mi upstream from Greenleaf Creek (formerly Greenwood Creek), 4.9 mi downstream from Yellowstone Creek, 5.0 mi downstream from State line, 19.0 mi northwest of Alva, and at mile 156.2.

DRAINAGE AREA.--856 mi².

PERIOD OF RECORD.--October 1959 to current year. Monthly discharge only for some periods, published in WSP 1731.

REVISED RECORDS.--WSP 1731: Drainage area. WSP 1921: 1960.

GAGE.--Water-stage recorder. Datum of gage is 1,410.05 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except for periods of estimated record, which were affected by ice, and are poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--28 years, 95.5 ft³/s, 69,190 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,000 ft³/s, Aug. 19, 1961, gage height, 13.95 ft, from rating curve extended above 17,400 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1957 reached a stage of 15.4 ft, from information provided by county engineer, discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	1545	5,580	10.49	Mar. 23	1815	*8,910	*12.10

Minimum daily discharge, 2.6 ft³/s, Aug. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	294	89	93	86	114	268	484	147	331	1140	25	34
2	468	89	115	84	110	219	421	140	604	847	21	33
3	3380	94	115	92	108	208	378	141	761	773	20	29
4	1080	200	107	98	104	195	356	149	274	484	18	25
5	417	423	101	100	101	185	336	243	218	857	18	23
6	268	404	98	102	102	176	332	301	191	579	17	29
7	218	261	112	98	104	170	324	292	176	338	13	39
8	181	214	133	98	99	163	315	228	160	248	10	43
9	180	181	142	110	94	159	305	184	150	233	39	42
10	186	165	131	108	95	158	293	164	161	179	28	55
11	666	156	119	100	93	159	278	153	224	152	27	57
12	703	150	117	104	87	158	264	143	714	131	20	103
13	273	130	115	116	86	154	259	134	385	123	41	154
14	210	129	112	118	97	152	336	125	237	115	35	107
15	179	123	113	111	230	143	341	117	191	109	30	73
16	161	119	109	e69	360	148	282	110	171	100	24	59
17	150	118	106	e55	219	2170	256	102	151	101	15	49
18	137	115	101	e60	169	1710	236	96	174	111	9.5	59
19	127	111	98	e74	157	574	226	93	151	103	5.7	84
20	112	111	98	e80	142	338	211	95	152	80	4.6	81
21	120	109	95	e74	133	262	201	109	149	69	3.1	83
22	205	109	97	e72	127	219	199	105	139	63	2.6	136
23	192	106	100	e70	126	5130	196	114	135	58	4.3	91
24	165	97	104	e74	129	5560	190	173	126	54	13	71
25	145	93	102	e80	137	1630	183	211	154	50	19	62
26	136	91	96	e90	165	934	177	305	164	47	146	56
27	121	87	86	e110	478	781	171	1960	135	43	154	49
28	107	87	84	132	497	919	166	1280	117	40	93	1010
29	97	88	87	132	---	859	160	1410	112	40	66	372
30	90	90	85	120	---	571	153	932	857	36	53	181
31	92	---	87	112	---	524	---	464	---	30	43	---
TOTAL	10860	4339	3258	2929	4463	24996	8029	10220	7664	7333	1017.8	3289
MEAN	350	145	105	94.5	159	806	268	330	255	237	32.8	110
MAX	3380	423	142	132	497	5560	484	1960	857	1140	154	1010
MIN	90	87	84	55	86	143	153	93	112	30	2.6	23
AC-FT	21540	8610	6460	5810	8850	49580	15930	20270	15200	14550	2020	6520

CAL YR 1986 TOTAL 53359.69 MEAN 146 MAX 3380 MIN .37 AC-FT 105800
WTR YR 1987 TOTAL 88397.8 MEAN 242 MAX 5560 MIN 2.6 AC-FT 175300

e Estimated

ARKANSAS RIVER BASIN

07148400 SALT FORK ARKANSAS RIVER NEAR ALVA, OK

LOCATION.--Lat 36°48'54", long 98°38'52" (revised), in SW 1/4 SW 1/4 sec.18, T.27 N., R.13 W., Woods County, Hydrologic Unit 11060002, at bridge on U.S. Highway 281, 1.0 mi northeast of Alva, 19.0 mi upstream from Medicine Lodge River, and at mile 126.0.

DRAINAGE AREA.--1,009 mi².

PERIOD OF RECORD.--April 1904 to December 1905 (gage heights only), October 1937 to September 1951, monthly discharge only for some periods, published in WSP 1311, October 1979 to current year. Occasional low-flow measurements water years 1952-54, 1977-79.

GAGE.--Water stage recorder. Datum of gage is 1,292.04 ft above National Geodetic Vertical Datum of 1929. April 1904 to December 1905, chain gage at site 0.8 mi upstream at different datum, and February 1938 to September 1951, water stage recorder at present site and at datum 5.00 ft higher.

REMARKS.--Records fair except for period with ice effect, which are poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--14 years (water years 1938-51), 109 ft³/s, 78,970 acre-ft/yr; 8 years (water years 1980-87), 136 ft³/s, 98,530 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,000 ft³/s, Oct. 23, 1941, from rating curve extended above 13,000 ft³/s. Maximum gage height, 15.24 ft, Oct. 10, 1985; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 24	0600	*11,000	*14.91	No other peaks greater than base discharge.			
Minimum daily discharge, 13.0 ft ³ /s, Aug. 22.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	342	100	102	100	137	449	513	195	444	888	45	72
2	808	92	112	102	128	325	473	189	470	661	41	63
3	1860	94	124	109	119	278	437	185	2030	766	38	60
4	1190	203	116	107	116	247	413	186	569	478	36	55
5	575	467	114	106	111	227	393	428	410	643	35	51
6	387	435	115	104	110	216	381	396	340	584	34	49
7	292	331	126	99	110	209	372	369	297	427	33	53
8	252	255	139	95	111	203	361	316	261	325	28	55
9	460	210	150	102	106	199	341	259	234	287	33	57
10	332	188	146	117	106	193	333	234	228	245	50	94
11	419	169	131	104	111	186	320	217	247	207	43	79
12	804	159	124	109	107	182	310	205	427	184	46	78
13	397	140	116	121	110	180	304	196	510	168	42	143
14	270	129	108	121	120	181	348	186	313	163	48	156
15	226	134	114	112	478	180	397	178	246	144	39	106
16	194	134	115	e97	704	178	347	170	204	136	30	78
17	174	130	113	e81	385	968	321	164	188	145	26	69
18	154	125	116	e76	266	1720	306	160	200	144	22	86
19	143	120	112	e73	220	820	291	154	216	145	18	89
20	133	121	112	e78	204	580	277	151	193	130	18	97
21	133	122	106	e82	200	452	266	153	188	112	15	91
22	167	119	99	e86	189	377	257	166	177	96	13	121
23	203	113	95	e91	182	2500	254	170	160	83	26	138
24	173	97	97	e94	185	7880	249	208	145	79	108	107
25	151	102	102	e87	187	1990	242	264	197	75	219	93
26	137	105	108	e90	205	1020	233	291	194	70	458	84
27	128	103	104	e108	618	821	224	1580	171	65	333	75
28	124	99	100	e170	727	763	216	1150	145	60	201	867
29	119	98	106	e180	---	799	208	1070	138	57	131	523
30	110	100	104	171	---	611	202	900	373	54	102	312
31	105	---	100	145	---	540	---	587	---	50	85	---
TOTAL	10962	4794	3526	3317	6352	25474	9589	11077	9915	7671	2396	4001
MEAN	354	160	114	107	227	822	320	357	330	247	77.3	133
MAX	1860	467	150	180	727	7880	513	1580	2030	888	458	867
MIN	105	92	95	73	106	178	202	151	138	50	13	49
AC-FT	21740	9510	6990	6580	12600	50530	19020	21970	19670	15220	4750	7940

CAL YR 1986 TOTAL 51832.7 MEAN 142 MAX 1860 MIN 2.5 AC-FT 102800
WTR YR 1987 TOTAL 99074 MEAN 271 MAX 7880 MIN 13 AC-FT 196500

e Estimated

ARKANSAS RIVER BASIN

07150000 GREAT SALT PLAINS LAKE NEAR JET, OK

LOCATION.--Lat 36°44'40", long 98°08'08", in NW 1/4 SE 1/4 sec.11, T.26 N., R.9 W., Alfalfa County, Hydrologic Unit 11060004, at right end of Great Salt Plains Dam on Salt Fork Arkansas River, 4.5 mi upstream from Wagon Creek, 5.5 mi northeast of Jet, and at mile 103.3.

DRAINAGE AREA.--3,200 mi², of which 8 mi² is probably noncontributing.

PERIOD OF RECORD.--July 1941 to current year. Prior to October 1970, published as Great Salt Plains Reservoir near Jet.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Outlet works consist of a 310-foot uncontrolled concrete spillway containing a series of three weirs to form a cascade. Storage began in June 1941; conservation pool was first filled Oct. 21, 1941. Capacity, 257,700 acre-ft at elevation 1,138.5 ft, crest of upper weir, and 31,420 acre-ft at elevation 1,125.0 ft, crest of intermediate weir and conservation pool. Reservoir is used for flood control and as a wildlife refuge. Figures given herein represent total contents. Revised capacity table, based on survey in 1971, used since Oct. 1, 1972. U.S. Corps of Engineers' satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 189,400 acre-ft, July 2, 1951, elevation, 1,134.38 ft; minimum, 17,180 acre-ft, Sept. 6, 1973, elevation, 1,123.16 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 89,340 acre-ft, Mar. 27, elevation 1,129.93 ft; minimum, 28,330 acre-ft, Aug. 22, elevation 1,124.62 ft affected by seiche.

Capacity table (elevation, in feet, and contents, in acre-ft):

1,124	23,280	1,127	51,180
1,125	31,420	1,128	62,940
1,126	40,070	1,130	90,350

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	51080	36900	36800	35970	39310	52120	62700	36250	69590	38750	33280	38010
2	61290	36800	36430	35690	38840	52000	59290	36060	65160	43950	32900	37170
3	72320	37080	36340	36250	38470	50450	56120	36620	62940	46150	33280	36060
4	79570	44260	36340	35970	38290	48770	53060	38010	61760	50130	32530	35410
5	81290	47620	36150	36710	38660	46670	50970	46040	59880	50660	32530	35130
6	76260	48350	36250	35970	38750	44790	48770	51650	56120	48980	32260	34390
7	69980	49290	37360	35970	38570	43420	47300	56000	52710	49710	32260	34670
8	63590	47200	37270	36520	38010	42270	45730	57060	49400	49290	31790	34390
9	60120	45630	36990	37450	37820	41640	44160	54590	46780	47410	32160	34580
10	57530	44790	37170	36620	37730	40910	43530	51080	45940	45420	31980	36520
11	57650	42800	37080	36520	37450	40240	40700	48660	44680	43320	32260	35320
12	57530	41850	37170	36520	37270	39770	43320	45940	43420	44790	31790	37640
13	57770	40800	37360	36430	37080	39590	45000	44050	43220	43010	32720	37540
14	55300	40140	36800	36340	36800	38660	42480	42270	42380	41430	33460	37920
15	52360	39490	36900	35690	43740	38010	41960	40700	41330	40140	32720	37080
16	49610	39030	36800	36800	49190	38010	41750	39590	40050	39030	32630	36520
17	47200	38750	36710	37170	54360	43220	41640	38660	37820	39310	32350	35870
18	45100	37820	36710	36900	53530	47510	40910	38100	38840	39960	31180	36990
19	43320	38570	36520	36620	51300	51080	39960	36990	38380	38660	32630	36520
20	41960	37920	36340	36710	49080	53180	39960	36900	38380	38100	31980	36520
21	39310	37360	36340	36710	46990	52830	39680	35690	38190	37540	31880	35690
22	41750	37450	36340	36800	45000	50870	39030	36800	37730	36800	29630	35690
23	40800	36900	36340	36800	43320	60590	38940	39030	37170	36430	31880	35040
24	40420	36900	36340	36800	42380	68150	38380	41010	38100	35870	33180	34950
25	39680	36900	36340	36710	41540	81870	38290	39860	37080	35500	34020	34850
26	39120	36800	36340	36710	41330	89060	38290	43320	36900	35130	35600	34300
27	38660	36620	35970	36710	45000	85030	37170	57530	36520	34670	38570	34850
28	38100	36520	36340	37080	50240	84170	37540	68800	36250	34300	39960	48040
29	37730	35690	36150	37820	---	76260	37270	78270	37080	33930	40140	51770
30	37270	36430	35780	38660	---	71930	36710	78560	37170	33550	39030	56940
31	37450	---	36250	39220	---	67500	---	74540	---	33460	38750	---
MAX	81290	49290	37360	39220	54360	89060	62700	78560	69590	50660	40140	56940
MIN	37270	35690	35780	35690	36800	38010	36710	35690	36250	33460	29630	34300
(+)	1,125.65	1,125.54	1,125.52	1,125.84	1,126.91	1,128.35	1,125.57	1,128.89	1,125.62	1,125.22	1,125.79	1,127.49
(++)	-12,370	-1,020	-180	+2,970	+11,020	+17,260	-30,790	+37,830	-37,370	-3,710	+5,290	+18,190
CAL YR 1986	MAX 81290	MIN 29950	(++)	0								
WTR YR 1987	MAX 89060	MIN 29630	(++)	+7,120								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07150500 SALT FORK ARKANSAS RIVER NEAR JET. OK

LOCATION.--Lat 36°45'09", long 98°07'43", in NE 1/4 NE 1/4 sec.11, T.26 N., R.9 W., Alfalfa County, Hydrologic Unit 11060004, near center of span on downstream side of bridge on State Highway 38, 0.6 mi downstream from Great Salt Plains Dam, 4 mi upstream from Wagon Creek, 6.7 mi northeast of Jet, and at mile 102.7.

DRAINAGE AREA.--3,202 mi², of which 8 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,092.20 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 17, 1938, nonrecording gage at site 2.5 mi upstream at datum 13.46 ft higher. Mar. 17, 1938 to Apr. 26, 1953, water-stage recorder at site 200 ft upstream, datum 5.00 ft higher prior to Oct. 1, 1950.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since June 1941 by Great Salt Plains Lake (station 07150000). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Since regulation by Great Salt Plains Dam, 46 years (water years 1942-87), 395 ft³/s, 286,200 acre-ft/vr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,900 ft³/s, May 19, 1938, gage height, 13.80 ft, present datum; no flow at times in 1939-41, 1944, and 1955-56.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,660 ft³/s, Mar. 27, gage height, 8.41 ft; minimum daily discharge, 24 ft³/s, Aug. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2080	477	444	377	801	2120	3690	544	4280	598	165	697
2	2480	478	458	338	772	2250	3350	483	3860	1100	142	596
3	4080	493	419	379	687	2120	3020	500	3590	1480	124	516
4	4820	833	416	365	576	1950	2610	477	3450	1690	88	397
5	5340	1610	402	360	711	1720	2320	1260	3320	1820	79	329
6	5110	1780	410	428	718	1510	2100	1930	2990	1940	74	280
7	4620	1930	471	366	724	1360	1880	2520	2540	2020	78	269
8	4040	1770	479	371	622	1220	1730	2920	2160	2050	73	250
9	3520	1600	462	506	637	1100	1560	2790	1840	1900	50	212
10	3140	1440	499	458	595	1030	1410	2450	1610	1740	47	428
11	3050	1290	538	431	575	970	1290	2120	1530	1480	48	433
12	2950	1090	511	429	545	889	1150	1820	1380	1310	57	481
13	2950	1050	499	420	517	876	1260	1580	1300	1320	97	569
14	2790	976	488	428	518	827	1340	1350	1260	1190	108	622
15	2470	873	474	346	783	696	1200	1160	1160	1060	124	636
16	2140	815	483	431	1580	624	1150	1050	1050	954	114	583
17	1860	752	458	496	2200	1130	1150	931	956	785	76	412
18	1610	689	451	512	2410	1540	1100	808	868	956	37	464
19	1390	644	451	508	2200	1910	1080	733	792	886	63	484
20	1220	640	431	499	1980	2240	1030	648	781	772	84	429
21	1080	614	409	471	1750	2310	961	579	751	675	81	375
22	1120	549	418	466	1540	2140	890	503	689	597	33	345
23	1080	498	413	476	1340	2470	828	619	616	528	24	315
24	1010	506	413	480	1190	3560	792	875	574	457	90	287
25	951	490	405	462	1110	4350	772	961	548	403	187	282
26	854	479	401	455	1040	5420	750	1050	528	351	297	261
27	782	462	361	464	1200	5560	655	2190	532	317	512	184
28	713	444	376	491	1800	5330	641	3340	468	286	811	1060
29	652	420	406	571	---	4820	678	4430	414	254	940	1930
30	580	466	368	666	---	4440	576	4790	472	222	911	2460
31	580	---	364	771	---	4080	---	4630	---	195	756	---
TOTAL	71062	26158	13578	14221	31121	72562	42963	52041	46309	31336	6370	16586
MEAN	2292	872	438	459	1111	2341	1432	1679	1544	1011	205	553
MAX	5340	1930	538	771	2410	5560	3690	4790	4280	2050	940	2460
MIN	580	420	361	338	517	624	576	477	414	195	24	184
AC-FT	141000	51880	26930	28210	61730	143900	85220	103200	91850	62150	12630	32900

ARKANSAS RIVER BASIN

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1954 to September 1959, October 1961 to September 1963, July 1968 to current year.

WATER TEMPERATURE: October 1954 to September 1959, October 1961 to September 1963, July 1968 to current year.

CHLORIDES: October 1955 to September 1959.

INSTRUMENTATION.--Water-quality monitor since July 1968.

REMARKS.--In addition to water-quality monitor, samples were collected by a local observer on a daily basis.

Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 57,000 microsiemens, Jan. 28, 1977; minimum daily, 1,280 microsiemens, Nov. 4, 1980.

WATER TEMPERATURE: Maximum daily, 36.0 °C, Aug. 11, 1980, Aug. 22, 1986; minimum daily, 0.0 °C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 15,000 microsiemens, Feb. 4; minimum daily, 1,380 microsiemens, May 31.

WATER TEMPERATURE: Maximum daily, 33.0 °C, June 14, 15; minimum daily, 0.0 °C, Jan. 17, 18, 20.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)
DEC 09...	1500	1028	80020	4.28	423	*3610	8.60	2.0	5.0	736
FEB 25...	1500	1028	80020	5.03	1050	4100	8.50	6.0	7.5	733
MAR 27...	1500	1028	1028	8.34	5530	1980	8.00	16.0	8.5	--
MAY 19...	1800	1028	80020	4.60	798	3020	8.00	28.0	28.0	720
JUL 23...	1800	1028	80020	4.40	523	3390	8.20	32.5	28.5	729

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM
DEC 09...	12.7	105	26	640	460	170	54	550	65
FEB 25...	12.9	114	30	580	440	140	56	680	72
MAR 27...	--	--	--	--	--	--	--	--	--
MAY 19...	6.8	93	23	590	430	150	52	420	61
JUL 23...	7.6	104	25	600	480	160	48	470	63

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WHOLE IT-FLD (MG/L)	CAR- BONATE WATER WHOLE IT-FLD (MG/L)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
DEC 09...	10	5.2	196	18	191	0.9	470	840	2340
FEB 25...	13	5.2	139	15	138	0.9	460	1100	2470
MAR 27...	--	--	--	--	--	--	--	--	--
MAY 19...	8	6.1	190	0	154	0	500	650	1900
JUL 23...	9	7.1	150	0	119	1.5	500	690	2020

*SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5430	3300	3570	4620	4620	3390	2200	3190	1790	3870	3500	3840
2	5440	3440	4010	4680	3990	2570	2410	3100	1980	3750	3590	3740
3	4340	3530	3890	4490	10500	3660	3030	3320	3000	3770	3760	2920
4	3400	3320	3910	4370	15000	3680	2680	3310	3180	4080	3920	4370
5	2510	3610	3890	4370	5510	2570	2640	3110	2920	4190	3980	4380
6	1990	3350	3960	4220	5340	3240	2660	3400	1840	1620	4170	4270
7	1490	1850	3900	4130	5190	3370	2700	3680	2280	2060	4050	4260
8	2330	3200	3900	4220	4990	3440	2630	3220	3340	1930	4100	4580
9	2640	3220	3820	4200	5090	4120	2320	3360	3400	2310	4080	4560
10	2730	3510	4200	3920	5270	4540	2520	1630	3650	1770	4120	4710
11	2730	3970	3580	4300	5180	4660	2360	2790	3490	2240	4340	4830
12	3140	3850	3460	4320	5010	4460	2560	3070	3220	3180	4180	4910
13	3580	3910	3570	4280	5090	4290	2730	3070	3080	3350	4100	5130
14	2640	3820	3620	4360	5080	3620	4290	3190	3400	3370	4140	5100
15	2200	3860	3830	4440	5350	3810	4610	3520	3680	3450	4040	2540
16	1880	3860	3950	4750	5410	3910	3070	3490	3750	3430	4430	3800
17	2500	3840	3980	5580	6500	3920	3130	3480	3730	2510	5090	4300
18	1950	3820	4140	5640	5020	4070	3190	3260	3340	3360	5180	4380
19	2360	3850	4200	5640	4180	3440	3040	3210	3290	2360	4860	4690
20	2380	3850	4090	5540	4230	2950	2960	2970	2990	2630	5010	4680
21	2390	3830	4100	5400	3140	2960	3190	3000	3050	2880	4840	4700
22	2510	3450	4060	5260	4010	3290	3340	3230	3260	2590	5380	4690
23	2860	3660	4070	5160	4020	3260	3350	3350	3090	3030	5580	4630
24	3090	3810	4150	5150	3890	3270	3220	3320	3280	2830	5140	4650
25	3070	3790	4180	5190	4200	2560	3170	3390	3490	3220	5100	4700
26	3490	3740	4030	5180	4170	2520	3080	3330	3670	3630	5020	---
27	3130	3800	4800	5180	4340	1920	3050	3320	2310	3240	5010	4200
28	3150	3840	4830	5110	4700	2690	2820	4630	3100	3200	4960	4580
29	3180	3830	4430	5040	---	3270	3040	1650	4090	3360	2880	4960
30	3330	3790	4200	4120	---	2140	3140	1770	4100	3480	3140	1780
31	3280	---	4590	4260	---	2150	---	1380	---	3410	3620	---
MEAN	2940	3620	4030	4750	5320	3350	2970	3090	3160	3040	4360	---
MAX	5440	3970	4830	5640	15000	4660	4610	4630	4100	4190	5580	---
MIN	1490	1850	3460	3920	3140	1920	2200	1380	1790	1620	2880	---

ARKANSAS RIVER BASIN

07150500 SALT FORK ARKANSAS RIVER NEAR JET, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21.0	14.0	6.0	5.0	6.0	7.5	8.0	25.0	25.0	28.0	28.5	26.0
2	21.0	12.0	5.0	4.0	7.0	9.0	8.0	23.5	26.0	26.5	29.5	27.0
3	22.5	11.5	5.5	4.0	7.0	10.0	10.5	23.0	24.0	26.0	30.0	20.0
4	21.0	10.0	6.0	4.0	8.0	10.5	10.0	21.5	25.0	26.0	29.0	25.0
5	20.0	11.0	6.0	4.0	6.0	13.5	10.0	22.0	25.0	28.0	29.0	24.5
6	20.0	11.5	7.0	5.0	5.5	14.0	10.0	20.0	25.0	27.5	28.0	24.0
7	20.0	13.0	7.0	4.0	7.5	14.0	16.0	20.5	25.0	28.5	28.0	26.0
8	21.0	13.0	5.5	3.5	7.5	14.5	13.0	20.5	25.5	28.5	30.0	24.0
9	19.5	12.0	5.0	3.0	7.5	10.0	18.0	20.0	25.5	28.0	28.0	23.0
10	13.5	9.0	4.0	2.0	8.0	8.0	17.0	24.0	25.0	28.0	29.0	23.5
11	17.0	7.0	3.5	3.0	10.0	10.0	16.5	25.0	27.0	28.0	28.0	23.0
12	12.5	3.0	4.0	3.0	10.5	10.5	13.0	24.5	27.5	27.0	28.0	23.0
13	13.0	2.0	5.5	4.0	10.0	9.5	11.0	25.0	31.0	26.0	31.0	24.5
14	13.5	2.5	5.5	4.5	9.5	14.5	15.5	25.0	33.0	27.5	30.0	25.5
15	14.0	4.5	7.0	4.0	8.0	12.5	13.0	25.0	33.0	28.0	29.0	26.0
16	16.0	5.0	7.0	1.0	6.5	12.5	16.5	28.0	30.0	28.0	27.0	24.0
17	16.0	5.0	7.5	.0	6.0	13.0	22.5	27.5	28.0	26.5	28.5	25.0
18	17.0	8.0	7.0	.0	6.5	13.0	17.5	28.5	28.5	27.0	26.5	23.0
19	18.0	7.0	7.0	1.0	5.0	14.0	20.0	27.0	23.5	28.0	27.5	24.0
20	18.0	8.0	7.0	.0	5.5	14.0	19.0	24.0	28.0	28.5	27.5	24.0
21	17.0	8.0	5.0	2.0	7.5	14.5	16.5	26.0	23.5	29.0	26.0	24.0
22	16.0	10.0	5.5	2.0	8.0	15.0	20.5	23.5	27.5	27.5	31.5	22.0
23	18.0	8.0	5.0	2.5	8.0	10.5	18.5	21.0	28.0	28.0	23.5	23.0
24	16.0	7.0	5.0	3.0	7.5	10.0	21.0	21.0	26.0	30.5	23.0	24.0
25	15.0	7.0	5.5	2.5	7.5	8.0	21.0	23.5	26.5	28.0	25.0	25.0
26	15.0	6.5	6.0	3.0	8.0	9.0	21.5	22.0	23.0	29.0	24.0	---
27	17.0	5.5	6.0	4.0	9.5	9.5	22.0	21.0	27.0	28.5	22.5	24.0
28	15.0	7.5	6.0	4.0	7.0	7.5	22.5	20.0	27.0	28.0	26.0	23.0
29	14.5	8.5	5.0	5.0	---	5.0	22.5	22.0	23.5	29.0	24.5	22.0
30	16.0	8.5	6.0	5.0	---	5.0	23.0	22.0	23.0	29.0	26.5	23.0
31	17.0	---	5.0	5.0	---	7.5	---	24.0	---	29.0	24.0	---
MEAN	17.1	8.2	5.7	3.1	7.5	10.8	16.5	23.4	26.5	27.9	27.4	---
MAX	22.5	14.0	7.5	5.0	10.5	15.0	23.0	28.5	33.0	30.5	31.5	---
MIN	12.5	2.0	3.5	.0	5.0	5.0	8.0	20.0	23.0	26.0	22.5	---

07151000 SALT FORK ARKANSAS RIVER AT TONKAWA, OK

LOCATION.--Lat 36°40'13", long 97°18'33", in NW 1/4 SE 1/4 sec.4, T.25 N., R.1 W., Kay County, Hydrologic Unit 11060004, near right bank on downstream side of pier of bridge on U.S. Highway 77 in Tonkawa, 4 mi downstream from Thompson Creek, 7.8 mi upstream from Chikaskia River, and at mile 33.8.

DRAINAGE AREA.--4,528 mi², of which 8 mi² is probably noncontributing.

PERIOD OF RECORD.--September 1903 to October 1905 (gage heights only), October 1935 to current year. Monthly discharge only for some periods, published as Arkansas River (Salt Fork) near Tonkawa 1903-4 and as "near Tonkawa" 1905.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 930.22 ft above National Geodetic Vertical Datum of 1929. September 1903 to October 1905, nonrecording gage near present site at different datum. Jan. 2, 1936 to Jan. 22, 1939, nonrecording gage, and Jan. 23, 1939 to June 20, 1960, water-stage recorder at site 100 ft upstream at same datum.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since June 1941 by Great Salt Plains Lake, 69.5 mi upstream (station 07150000). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Since regulation by Great Salt Plains Dam, 46 years (water years 1942-87) 799 ft³/s, 578,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 97,300 ft³/s, Oct. 11, 1973, gage height, 28.98 ft; no flow Aug. 31 to Oct. 12, and Oct. 14-16, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1923, reached a stage of 26.8 ft, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 11,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	1600	*74,700	*27.61	Mar. 24	2130	15,800	19.49
Nov. 6	0530	11,900	16.90	May 28	2330	47,000	25.12
Feb. 16	1330	11,700	16.79	July 5	1813	14,700	18.49
Mar. 1	1400	16,200	19.72	Sept. 29	1350	24,300	21.43
Mar. 18	0200	12,800	17.54				

Minimum daily discharge, 167 ft³/s, Aug. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27700	976	764	e656	2440	15700	5050	e718	8860	3820	515	972
2	23900	946	798	e653	1970	13100	4580	e695	6640	2310	482	894
3	53300	878	793	e652	1500	7540	4040	e665	6200	5110	446	835
4	e45000	2260	781	e651	1300	4470	3680	e638	6240	5580	409	755
5	35200	9210	755	e645	1170	3110	3280	e619	5630	13800	387	697
6	e18000	11200	744	634	1260	2660	2950	1300	4780	10900	351	621
7	9410	5930	1240	645	1720	2290	2660	8170	4290	5650	e314	572
8	6790	3720	1360	659	1800	2020	2350	7430	3770	3700	e287	532
9	6540	2980	1560	671	1470	1790	2140	3910	3290	3090	e265	574
10	6800	2460	1230	717	1200	1580	1940	3440	2910	2780	e253	715
11	6860	2140	1040	775	1120	1430	1720	3060	2680	2490	e239	1040
12	6010	1890	940	734	1080	1330	1590	2630	2880	2240	e227	1330
13	4730	1620	886	737	1040	1240	1470	2230	2530	2980	342	2100
14	4160	1430	839	745	1030	1190	1510	1910	2140	4360	312	1720
15	3900	1350	823	725	5590	1160	2050	1620	1960	2770	300	1150
16	3550	1260	790	717	11100	1110	1750	1370	1790	1920	e288	989
17	3170	1190	780	662	e8550	7650	1460	1210	1580	e1700	e271	917
18	2790	1140	774	1420	7150	10900	1380	1160	e1420	e1580	e253	820
19	2410	1090	752	2410	6760	6540	1300	1140	e1310	e1440	e234	760
20	2110	1030	744	e1800	4350	4320	1230	1130	2000	e1340	e225	992
21	1860	1010	734	e1400	3400	4250	1160	1210	1850	e1210	e213	852
22	2580	983	728	e1200	2780	4620	e1080	1160	1670	e1050	e203	772
23	3520	938	715	e1100	2340	6170	e1030	1130	e1590	e930	e191	671
24	2390	891	e695	e1000	2020	14500	e990	1660	e1480	e850	e181	615
25	1730	859	e690	e980	1800	15100	e965	2570	e1380	e795	e173	574
26	1500	878	e675	950	1770	9780	e920	2430	e1300	e745	e167	534
27	1350	849	e665	920	4330	7030	e875	14700	e1240	e700	284	515
28	1230	828	e660	904	10700	6770	e830	36200	e1170	656	441	5750
29	1160	804	e660	1840	---	6470	e780	39600	e1120	637	607	22400
30	1090	787	e658	5680	---	6140	e750	25500	e1060	601	869	20900
31	1030	---	e657	3510	---	5510	---	14800	---	555	980	---
TOTAL	291770	63527	25930	36792	92740	177470	57510	186005	86760	88289	10709	72568
MEAN	9412	2118	836	1187	3312	5725	1917	6000	2892	2848	345	2419
MAX	53300	11200	1560	5680	11100	15700	5050	39600	8860	13800	980	22400
MIN	1030	787	657	634	1030	1110	750	619	1060	555	167	515
AC-FT	578700	126000	51430	72980	183900	352000	114100	368900	172100	175100	21240	143900

CAL YR 1986 TOTAL 585222 MEAN 1603 MAX 53300 MIN 44 AC-FT 1161000
WTR YR 1987 TOTAL 1190070 MEAN 3260 MAX 53300 MIN 167 AC-FT 2361000

e Estimated

ARKANSAS RIVER BASIN

41

07152000 CHIKASKIA RIVER NEAR BLACKWELL, OK

LOCATION.--Lat 36°48'41", long 97°16'41", in NE 1/4 NW 1/4 sec.23, T.27 N., R.1 W., Kay County, Hydrologic Unit 11060005, near left bank on downstream side of State Highway 11 bridge at northeast edge of Blackwell, 0.1 mi (revised) downstream from Bitter Creek, and at mile 28.2.

DRAINAGE AREA.--1,859 mi².

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 967.41 ft above National Geodetic Vertical Datum of 1929. See WSP 1921 for history of changes prior to April, 1952.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation at low flow by Lake Blackwell, capacity 3,600 acre-ft, 12.6 mi upstream from station. Small diversion made from reservoir for municipal supply of city of Blackwell. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--52 years, 522 ft³/s, 378,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 85,000 ft³/s, June 22, 1942, gage height, 33.3 ft, from floodmark present datum; maximum gage height, 34.28 ft, Oct. 3, 1986, no flow at times in 1954, and 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 10, 1923, reached a stage of about 34 ft, present site and datum, from information provided by local residents, discharge 100,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	0100	28,100	31.86	Mar. 24	1700	19,200	30.24
Oct. 3	1100	*59,400	*34.28	May 7	0300	26,600	31.65
Feb. 16	1100	8,260	22.57	May 28	1000	37,000	32.90
Mar. 1	1600	19,100	30.20	Sept. 28	1700	36,800	32.89
Mar. 18	0600	18,900	30.12				

Minimum daily discharge, 76 ft³/s, Sept. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21200	279	268	235	929	17400	881	270	1280	6920	151	237
2	7700	268	270	230	655	8210	782	265	1080	5190	142	197
3	45100	268	276	237	525	1750	714	257	3850	6840	134	180
4	31100	802	281	244	447	1150	646	249	3180	3520	124	169
5	7480	3320	274	249	683	930	607	1070	1120	4340	127	154
6	1550	3930	268	257	1020	800	578	15700	781	5240	139	143
7	1090	1360	583	251	822	712	559	20800	648	3810	121	136
8	813	739	905	248	588	647	539	5620	564	1760	85	138
9	1720	561	812	272	462	592	514	1720	508	1220	112	138
10	2560	476	638	281	402	572	505	1240	529	1040	202	163
11	3010	423	474	268	364	534	487	996	779	724	305	165
12	2770	387	386	271	343	500	467	831	748	607	211	184
13	2050	352	350	286	380	480	593	712	586	2010	719	259
14	1190	330	327	320	1710	465	596	630	492	3940	723	468
15	831	344	314	346	2800	457	598	567	417	942	475	258
16	651	346	310	337	7520	722	655	515	375	611	324	196
17	550	344	306	217	2890	9220	555	476	344	507	230	174
18	487	339	297	187	1700	15300	484	448	1130	459	622	134
19	444	327	283	230	2680	4010	451	413	1430	442	275	126
20	404	319	277	258	1470	1540	420	388	2090	405	107	134
21	377	309	270	304	907	1200	384	375	997	350	91	133
22	481	302	265	321	703	1000	364	374	639	318	94	135
23	416	295	263	317	604	3800	348	425	496	285	79	147
24	383	289	265	302	547	16400	338	632	361	266	85	144
25	366	288	266	286	529	11000	328	1320	415	245	176	87
26	342	292	263	244	573	4370	319	1060	970	227	262	76
27	330	285	255	270	4230	2060	308	14700	676	212	315	97
28	320	282	252	328	11100	1440	294	33800	433	192	642	21500
29	305	273	247	1230	---	1170	283	16900	323	185	564	20700
30	295	268	239	6220	---	1100	275	4460	1060	172	382	10100
31	285	---	238	2790	---	1030	---	1760	---	160	308	---
TOTAL	136600	18397	10722	17836	47583	110561	14872	128973	28301	53139	8326	56872
MEAN	4406	613	346	575	1699	3566	496	4160	943	1714	269	1896
MAX	45100	3930	905	6220	11100	17400	881	33800	3850	6920	723	21500
MIN	285	268	238	187	343	457	275	249	323	160	79	76
AC-FT	270900	36490	21270	35380	94380	219300	29500	255800	56140	105400	16510	112800

CAL YR 1986 TOTAL 299298 MEAN 820 MAX 45100 MIN 3.6 AC-FT 593700
WTR YR 1987 TOTAL 632182 MEAN 1732 MAX 45100 MIN 76 AC-FT 1254000

ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK

LOCATION.--Lat 36°30'09", long 96°43'22", in NW 1/4 sec.1, T.23 N., R.5 E., Osage County, Hydrologic Unit 11060006, near left bank on downstream side of pier of bridge on State Highway 18 at Ralston, 2 mi downstream from Salt Creek, 2 mi upstream from Grayhorse Creek, and at mile 594.0.

DRAINAGE AREA.--54,465 mi², of which 7,615 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1925 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected in this vicinity since 1922 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 776.70 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1925 to Nov. 13, 1935, nonrecording gage at site of former highway bridge 1,200 ft downstream at same datum. Nov. 14, 1935 to Feb. 23, 1939, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since April 1976 by Kaw Lake (station 07148130) 59.7 mi upstream; some regulation by Great Salt Plains Lake (station 07150000) since 1941.

AVERAGE DISCHARGE.--Prior to regulation by Kaw Dam, 50 years (water years 1926-75), 4,826 ft³/s, 3,496,000 acre-ft/yr; since regulation by Kaw Dam, 11 years (water years 1977-87), 5,576 ft³/s, 4,040,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 211,000 ft³/s, Oct. 13, 1973, gage height, 22.98 ft; minimum discharge, 14 ft³/s, Oct. 12, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 11, 1923, reached a stage of 23.8 ft, referred to outside gage on basis of stages observed in 1923 and 1944 at site 1,200 ft downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 174,000 ft³/s, Oct. 4, gage height, 22.20 ft, minimum daily discharge, 1,610 ft³/s, Aug. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58700	12000	5430	5530	16200	41700	27200	3800	30800	9650	3800	7080
2	57600	11700	5300	5720	12200	42300	26200	5010	25000	12900	3710	8490
3	118000	11400	5200	5820	12300	38900	26700	4990	27100	16900	3660	8390
4	170000	13800	5140	5800	12100	25400	26000	4850	25100	20600	3210	7750
5	108000	18100	4590	5750	8660	20400	25000	4360	26700	22900	2240	5040
6	69900	22700	3640	5700	8520	18600	23700	3180	22500	28400	2080	3070
7	62700	23100	6390	5610	8120	19200	19300	6000	20400	28100	1820	2970
8	51000	16500	8330	5590	7240	19700	15300	24500	19300	23700	1790	2860
9	46200	11000	8960	6670	6780	18800	13000	26400	18200	21000	2050	2870
10	45400	9660	7850	7410	7280	18200	12600	14300	16100	17200	2040	2970
11	46100	8860	7120	6940	9230	17600	12200	12100	14200	15800	2020	3100
12	45800	8250	7010	6260	7890	17200	11800	10800	13700	15200	2040	3380
13	43900	7780	6480	5960	5560	16800	11600	9590	13600	15500	2530	3400
14	37000	7430	6200	6160	5320	16500	11500	8960	13100	14700	3200	4030
15	28900	8450	6060	7020	9160	16000	9800	7540	12900	17200	8120	4430
16	25600	10100	5950	7060	14200	15800	9060	5710	11900	15800	12000	3840
17	22200	9930	5860	7040	19500	22600	10400	5240	10400	14100	12000	2640
18	20000	9660	5770	7120	19700	27000	10900	4900	10900	12600	13400	2460
19	19500	9430	5750	7160	16000	37300	10700	4520	12600	11700	11700	2370
20	18600	8140	5720	6840	15400	33600	10400	4000	17300	11500	8220	2620
21	17900	6650	5660	6410	12900	27800	10500	3810	14000	11200	3910	2670
22	22000	6370	5650	5900	10400	27600	10300	3800	12500	10800	2860	2740
23	22900	6210	5590	4170	9120	27700	10100	4100	11300	10500	2420	1790
24	20900	6060	5550	4030	8370	28700	10000	3980	10800	10200	3460	2100
25	18100	6760	5520	4070	7940	39600	9800	4440	10600	9990	4980	2340
26	16900	14500	5460	3820	7710	50800	9590	6040	10300	9710	4050	2240
27	16100	9250	4610	3780	9830	37700	9320	10400	10200	9440	1610	2180
28	16100	6640	3840	4420	23400	30900	6150	51400	10100	9150	3530	7450
29	16300	5970	3210	6970	---	29500	3190	78900	9810	6800	4350	12100
30	14300	5680	2180	7660	---	28600	2800	72000	9720	4260	5700	35200
31	12400	---	2880	13900	---	28100	---	46800	---	3990	6060	---
TOTAL	1289000	312080	172900	192290	311030	840600	405110	456420	471130	441490	144560	154570
MEAN	41580	10400	5577	6203	11110	27120	13500	14720	15700	14240	4663	5152
MAX	170000	23100	8960	13900	23400	50800	27200	78900	30800	28400	13400	35200
MIN	12400	5680	2180	3780	5320	15800	2800	3180	9720	3990	1610	1790
AC-FT	2557000	619000	342900	381400	616900	1667000	803500	905300	934500	875700	286700	306600

CAL YR 1986 TOTAL 3171900 MEAN 8690 MAX 170000 MIN 1110 AC-FT 6291000
WTR YR 1987 TOTAL 5191180 MEAN 14220 MAX 170000 MIN 1610 AC-FT 10300000

ARKANSAS RIVER BASIN

43

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-63, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1950 to September 1963, July 1968 to current year.

WATER TEMPERATURE: January 1950 to September 1963, July 1968 to current year.

INSTRUMENTATION.--Water-quality monitor, July 1968 to September 1980.

REMARKS.--Samples were collected by a local observer on a daily basis. Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,510 microsiemens, Sept. 14, 1955; minimum daily, 157 microsiemens, Nov. 21, 1979.

WATER TEMPERATURE: Maximum daily, 37.0 °C, July 28, 1956; minimum daily, -0.5 °C on many days during winter period.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily (more than 20 percent missing record), 1,880 microsiemens, Dec. 31, Feb. 9; minimum daily, 168 microsiemens, Oct. 4.

WATER TEMPERATURE: Maximum daily (more than 20 percent missing record), 28.0 °C on several days during summer; minimum daily, 0.0 °C on several days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	
OCT													
01...	1900	1028	1028	13.51	52900	725	7.30	23.0	23.5	--	--	--	
03...	2035	1028	1028	20.73	140000	600	7.40	22.0	21.0	--	--	--	
04...	2100	1028	1028	21.54	160000	620	7.20	20.0	20.5	--	--	--	
NOV													
18...	1730	1028	80020	6.45	9670	830	7.80	16.0	9.5	43	740	10.8	
JAN													
07...	1400	1028	80020	4.96	5460	1280	8.00	12.5	10.0	8.4	750	13.0	
FEB													
19...	1420	1028	1028	7.65	15800	1150	7.80	5.5	7.0	--	--	--	
MAR													
25...	1500	1028	80020	11.80	39900	657	7.40	8.0	10.0	600	740	9.5	
MAY													
22...	1530	1028	80020	4.14	3740	1540	--	26.0	26.0	28	750	12.4	
JUN													
18...	1205	1028	1028	6.61	10600	952	7.60	29.0	27.0	--	--	--	
JUL													
29...	1300	1028	80020	5.52	7280	966	8.40	34.5	29.5	18	740	9.2	
SEP													
24...	1400	1028	80020	3.60	2220	2220	8.20	29.0	23.0	97	740	10.6	
DATE		OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOC- CI, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH IT FIELD (MG/L AS HC03)	
OCT													
01...	--	--	--	--	--	--	--	--	--	--	--	--	
03...	--	--	--	--	--	--	--	--	--	--	--	--	
04...	--	--	--	--	--	--	--	--	--	--	--	--	
NOV													
18...	98	--	--	--	210	78	61	15	110	52	3	4.7	183
JAN													
07...	117	42	K6	290	95	85	20	130	49	3	4.1	268	
FEB													
19...	--	--	--	--	--	--	--	--	--	--	--	--	
MAR													
25...	87	--	--	--	150	52	40	12	68	49	3	3.6	139
MAY													
22...	156	K24	K17	300	150	74	27	190	58	5	5.8	--	
JUN													
18...	--	--	--	--	--	--	--	--	--	--	--	--	
JUL													
29...	125	K8	S4	250	110	67	20	98	46	3	2.7	--	
SEP													
24...	128	740	K46	350	190	93	28	300	65	7	6.4	198	

ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
OCT												
01...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
18...	0	150	80	180	0.30	10	528	548	0.72	13800	--	<0.010
JAN												
07...	0	220	110	210	0.30	9.8	685	694	0.93	10100	0.990	0.010
FEB												
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
25...	0	114	64	98	0.20	6.6	345	355	0.47	37200	0.640	0.020
MAY												
22...	--	--	180	290	<0.10	3.8	876	857	1.19	8850	--	<0.010
JUN												
18...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
29...	--	--	170	120	0.40	9.6	583	575	0.79	11500	--	<0.010
SEP												
24...	0	162	220	460	0.40	7.1	1420	1210	1.93	8510	--	<0.010
DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)
OCT												
01...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
18...	--	0.870	0.060	0.020	0.03	2.3	2.4	0.220	0.150	0.130	0.40	0.22
JAN												
07...	0.03	1.00	0.060	0.070	0.09	0.54	0.60	0.180	0.130	0.120	0.37	0.18
FEB												
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
25...	0.07	0.660	0.040	--	0.17	3.2	3.2	0.670	0.070	0.040	0.12	0.67
MAY												
22...	--	<0.100	0.040	0.020	0.03	2.4	2.4	0.140	0.010	0.020	0.06	0.14
JUN												
18...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
29...	--	0.610	<0.010	0.040	0.05	1.3	1.3	0.390	0.140	0.110	0.34	0.39
SEP												
24...	--	0.400	0.040	<0.010	--	1.9	1.9	0.230	0.080	0.050	0.15	0.23

ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
OCT												
01...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
18...	0.02	60	2	110	<0.5	2	<1	<3	5	23	<5	16
JAN												
07...	0.01	--	--	--	--	--	--	--	--	--	--	--
FEB												
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
25...	0.03	150	1	85	<0.5	1	<1	<3	7	78	<5	9
MAY												
22...	0.0	<10	2	110	<0.5	2	<1	<3	4	11	<5	25
JUN												
18...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
29...	0.03	--	--	--	--	--	--	--	--	--	--	--
SEP												
24...	0.03	30	3	170	<0.5	1	<1	<3	8	12	<5	19

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT												
01...	--	--	--	--	--	--	--	--	--	--	--	--
03...	--	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
18...	5	<0.1	<10	2	<1	<1.0	540	6	8	182	4750	50
JAN												
07...	--	--	--	--	--	--	--	--	--	76	1120	30
FEB												
19...	--	--	--	--	--	--	--	--	--	--	--	--
MAR												
25...	4	<0.1	<10	4	<1	<1.0	340	<6	15	3100	334000	44
MAY												
22...	1	0.1	<10	3	<1	<1.0	830	<6	5	--	--	--
JUN												
18...	--	--	--	--	--	--	--	--	--	--	--	--
JUL												
29...	--	--	--	--	--	--	--	--	--	120	2360	50
SEP												
24...	2	0.3	<10	3	1	<1.0	860	<6	14	233	1400	83

ARKANSAS RIVER BASIN

07152500 ARKANSAS RIVER AT RALSTON, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	202	553	1020	---	---	---	555	1700	980	1010	---	---
2	200	---	1060	1240	831	620	539	---	877	921	---	1220
3	188	556	1050	1200	908	692	522	---	561	830	1180	1100
4	168	---	1080	1160	---	860	494	1160	808	---	1140	1050
5	---	359	1100	---	---	865	479	1150	917	867	1160	1130
6	217	468	---	1190	750	872	474	1250	878	932	1260	---
7	617	---	---	1200	890	---	505	1340	868	933	1270	---
8	515	524	403	1200	1340	836	539	790	854	1060	---	1320
9	447	---	724	---	1880	---	674	610	827	1050	---	1280
10	---	895	726	---	1480	---	687	---	802	1050	1240	1170
11	478	904	932	1090	1260	---	685	1050	800	1070	1190	1210
12	---	989	915	1070	1110	---	---	1120	837	1060	1210	1240
13	426	1040	---	1110	1450	---	672	1200	830	1030	1130	1200
14	428	1100	1010	1130	---	690	685	1020	850	933	973	1300
15	---	1160	1060	---	750	738	725	1140	860	1040	---	1230
16	---	796	1090	---	748	700	866	1410	831	---	---	1200
17	410	---	1080	1100	---	570	958	1500	896	1030	960	1250
18	385	---	1090	---	688	440	---	1450	949	1020	971	1780
19	---	---	1090	1000	818	519	---	1440	872	1070	1020	1790
20	---	790	---	1000	---	533	838	1570	446	1070	1040	---
21	318	---	1190	1060	---	567	---	1550	815	1020	1070	1340
22	---	---	---	---	1260	568	853	---	852	954	1120	1480
23	376	1120	1170	1540	1390	---	852	1490	912	1000	1140	1610
24	395	1130	1180	---	1480	494	850	1350	925	956	1110	1800
25	---	1070	---	---	---	650	904	1240	---	1020	1060	1640
26	---	355	1170	1850	1380	---	973	1430	932	---	1100	1600
27	540	---	---	---	848	642	929	280	972	1010	---	1580
28	443	---	---	1550	---	654	890	280	1010	998	1140	764
29	453	---	1760	955	---	642	1190	330	954	963	1150	560
30	446	---	---	1060	---	627	1540	260	952	1110	1090	330
31	539	---	1880	1230	---	---	---	520	---	1160	1170	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	16.0	5.0	---	---	---	10.0	21.0	22.0	23.0	---	---
2	23.0	---	6.0	4.0	5.0	9.0	10.0	---	23.5	26.0	---	23.0
3	24.0	14.0	5.0	4.0	5.0	8.0	9.0	---	22.0	25.0	28.0	23.0
4	23.0	---	8.0	4.0	---	8.0	10.0	21.0	21.0	---	28.0	25.0
5	---	11.0	5.0	---	---	8.0	10.0	20.0	22.0	25.0	26.0	24.0
6	23.0	12.0	---	5.0	6.0	9.0	9.0	20.0	22.0	26.0	26.0	---
7	22.0	---	---	5.0	5.0	---	10.0	18.0	22.0	26.0	27.0	---
8	22.0	12.0	7.0	4.0	6.0	10.0	11.0	19.0	21.5	26.0	---	23.0
9	21.0	---	6.0	---	.5	---	11.0	19.0	24.0	26.0	---	24.0
10	---	10.0	9.0	---	.5	---	13.0	---	23.0	26.0	26.0	21.0
11	20.0	7.0	4.0	5.0	.5	---	12.0	21.0	22.0	26.0	27.0	23.0
12	---	7.0	4.0	5.0	6.0	---	---	22.0	24.0	26.0	28.0	23.0
13	19.0	3.0	---	4.0	9.0	---	12.0	22.0	25.0	24.0	27.0	21.0
14	19.0	4.0	8.0	8.0	---	10.0	11.0	22.0	25.0	24.0	26.0	24.0
15	---	5.0	7.0	---	10.0	10.0	10.0	23.0	26.0	24.0	---	24.0
16	---	10.0	6.0	---	6.0	10.0	12.0	23.0	26.0	---	---	21.0
17	19.0	---	8.0	2.0	---	13.0	14.0	24.0	27.0	24.0	27.0	22.0
18	20.0	---	9.0	---	4.0	11.0	---	24.0	25.0	25.0	27.0	20.0
19	---	---	5.0	.0	4.0	10.0	---	25.0	26.0	25.0	26.0	19.0
20	---	9.0	---	.0	---	11.0	18.0	24.0	23.0	24.0	26.0	---
21	18.0	---	5.5	1.0	---	12.0	---	23.0	25.0	25.0	27.0	20.0
22	---	---	---	---	8.0	12.0	14.0	---	25.0	26.0	21.0	19.0
23	18.0	9.0	6.0	.0	6.0	---	15.0	21.0	25.0	25.0	23.0	19.0
24	19.0	7.0	6.0	---	7.0	11.0	16.0	21.0	26.0	26.0	22.0	20.0
25	---	7.5	---	---	---	10.0	17.0	20.0	---	26.0	24.0	21.0
26	---	7.0	8.0	.0	8.0	---	19.0	23.0	25.0	---	26.0	22.0
27	16.0	---	---	---	9.0	12.0	18.0	20.0	26.0	27.0	---	21.0
28	15.0	---	---	1.0	---	12.0	17.0	19.0	25.0	27.0	23.0	22.0
29	16.0	---	5.0	2.0	---	8.0	19.0	19.0	25.0	27.0	22.0	19.0
30	15.0	---	---	5.0	---	9.0	20.0	20.0	24.0	28.0	24.0	19.0
31	16.0	---	4.0	4.0	---	---	---	21.0	---	28.0	24.0	---

07153000 BLACK BEAR CREEK AT PAWNEE, OK

LOCATION.--Lat 36°20'37", long 96°47'57", on east line of SE 1/4 NE 1/4 sec.31, T.22 N., R.5 E., Pawnee County, Hydrologic Unit 11060006, on downstream side of left pier of bridge on State Highway 18 in north Pawnee, 300 ft downstream from Skedee Creek, and at mile 23.4.

DRAINAGE AREA.--576 mi².

PERIOD OF RECORD.--July 1944 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 802.73 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 21, 1944, nonrecording gage at present site and datum except for Aug. 27, 1953 to Apr. 29, 1954, nonrecording gage at site 500 ft downstream at same datum.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--43 years, 188 ft³/s, 136,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,200 ft³/s, Oct. 3, 1959, gage height, 31.43 ft; no flow at times in many years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1943, reached a stage of 28.19 ft, from floodmark, discharge 17,800 ft³/s.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 5	0200	*19,200	*27.30	Mar. 2	1800	6,690	15.89
Nov. 7	0100	4,030	11.18	May 30	0500	7,510	17.21
Nov. 26	0700	4,340	11.78				

Minimum daily discharge, 8.6 ft³/s, Aug. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12200	e405	465	99	750	5540	220	58	1730	86	e20	12
2	12700	e340	378	93	584	6370	203	58	1150	110	e19	11
3	14800	e295	306	94	428	4690	177	56	1300	212	e19	10
4	16300	1040	247	96	330	2180	156	53	2190	1320	e18	9.2
5	16500	3480	208	96	634	1510	144	55	1390	2200	e18	9.2
6	9300	3740	180	97	2160	e1270	136	52	734	1620	e17	9.0
7	4400	3300	648	92	1610	e1020	131	52	538	746	e17	10
8	3150	e1280	1400	91	842	e840	125	52	431	482	e17	8.7
9	2890	e990	1390	532	528	e720	121	50	335	328	e17	48
10	2900	e780	1080	969	387	e615	122	49	278	222	e16	69
11	2610	e610	668	567	310	e510	123	48	250	161	e16	34
12	2270	e490	456	360	258	e450	119	46	238	117	e16	281
13	1950	e375	349	261	225	e400	108	45	193	111	23	151
14	1650	e305	282	205	209	e360	108	43	161	88	e20	242
15	e1370	e243	237	173	2110	e328	130	41	124	93	e18	204
16	e1210	e203	210	150	2720	e300	130	39	96	82	e16	150
17	e1020	e178	192	139	2270	2360	138	37	79	62	e15	65
18	e860	e160	176	e133	1390	3230	122	36	76	52	14	55
19	e745	157	161	e118	1550	2640	108	36	65	99	12	46
20	e625	150	149	e108	1230	1460	99	34	175	157	11	64
21	e540	139	139	e100	826	e1030	185	33	439	85	10	59
22	1760	128	131	e97	597	e840	117	34	316	56	9.4	61
23	3920	122	126	e93	460	e635	93	38	176	44	8.7	81
24	2920	113	126	e90	389	1820	83	38	117	e33	8.9	50
25	e1340	671	130	e88	414	e1400	77	139	135	e29	8.9	35
26	e1180	4030	126	e86	443	900	72	122	211	e25	8.6	28
27	e975	3570	119	e84	1080	790	69	735	165	e23	13	25
28	e830	1970	115	502	3630	412	67	4470	97	e21	12	814
29	e690	960	113	1890	---	347	64	6170	66	20	12	1230
30	e600	628	106	1810	---	284	61	6880	97	21	13	1380
31	e570	---	102	1190	---	242	---	3280	---	e20	13	---
TOTAL	124775	30852	10515	10503	28364	45493	3608	22879	13352	8725	456.5	5251.1
MEAN	4025	1028	339	339	1013	1468	120	738	445	281	14.7	175
MAX	16500	4030	1400	1890	3630	6370	220	6880	2190	2200	23	1380
MIN	540	113	102	84	209	242	61	33	65	20	8.6	8.7
AC-FT	247500	61190	20860	20830	56260	90240	7160	45380	26480	17310	905	10420

CAL YR 1986 TOTAL 212792.4 MEAN 583 MAX 16500 MIN 3.7 AC-FT 422100
WTR YR 1987 TOTAL 304773.6 MEAN 835 MAX 16500 MIN 8.6 AC-FT 604500

e Estimated

07154500 CIMARRON RIVER NEAR KENTON, OK

LOCATION.--Lat 36°55'36", long 102°57'31", in SW 1/4 (revised) sec.4, T.5 N., R.1 E., Cimarron County, Hydrologic Unit 11040001, near right bank on downstream side of pier of county road bridge, 1.5 mi upstream from North Carrizo Creek, 1.7 mi northeast of Kenton, 2.2 mi downstream from Carrizozo Creek, and at mile 594.0.

DRAINAGE AREA.--1,106 mi², of which 68 mi² is probably noncontributing.

PERIOD OF RECORD.--April 1904 to July 1905 (gage heights only), October 1950 to current year.

REVISED RECORDS.--WSP 1711: 1956 (M).

GAGE.--Water-stage recorder. Datum of gage is 4,262.08 ft above National Geodetic Vertical Datum of 1929. April 1904 to July 1905 nonrecording gage at site 0.9 mi upstream at different datum. Oct. 1, 1950 to Sept. 19, 1967, water-stage recorder at same site and at datum 5.00 ft higher.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Extensive diversions for irrigation upstream from station.

AVERAGE DISCHARGE.--37 years (water years 1951-87), 20.4 ft³/s, 14,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,400 ft³/s, Oct. 17, 1965, gage height, 22.32 ft, present datum; from rating curve extended above 7,000 ft³/s, on basis of contracted-opening measurement of peak flow; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
July 8	1300	*2,130	*12.45	No other peak greater than base discharge.			
No flow July 28 to Aug. 3.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3.1	3.0	4.1	e3.7	1.8	1.9	6.0	1.3	e29	.42	.00	4.7
2	e2.8	5.0	4.4	e3.9	1.8	1.7	3.8	1.0	e27	.33	.00	4.1
3	e2.6	5.7	4.6	e3.8	1.7	1.7	4.1	1.6	e27	.28	.00	5.1
4	e2.3	7.5	4.6	e3.7	1.7	1.6	12	5.9	e26	.23	.02	3.8
5	e2.1	7.4	4.7	3.0	1.8	1.5	36	226	24	.18	.25	3.4
6	e2.1	7.3	4.7	2.5	1.6	1.5	43	464	20	.18	.44	3.7
7	e2.0	5.8	4.9	2.4	1.5	1.5	33	664	17	.13	.15	2.4
8	e2.0	5.2	4.6	2.7	1.6	1.3	25	263	9.3	408	1.8	1.6
9	e1.9	4.6	4.4	3.0	1.7	1.5	13	103	11	41	42	1.4
10	e2.0	4.1	4.3	2.7	1.6	1.6	7.1	63	15	8.8	7.4	48
11	e2.0	2.4	4.1	3.0	1.6	1.7	6.1	51	9.9	5.5	4.7	11
12	e2.0	4.6	e3.0	3.3	1.7	1.7	12	41	5.8	5.1	8.9	4.6
13	e2.0	2.4	e3.2	2.7	1.6	2.5	27	38	5.8	4.8	4.3	2.8
14	e1.9	1.6	e3.3	2.3	1.7	4.0	33	42	1.0	4.1	2.9	.56
15	2.0	1.9	e3.4	2.3	2.4	3.9	21	86	.74	3.4	1.3	.35
16	2.9	1.5	e3.4	2.1	2.2	2.7	6.7	32	.53	3.6	.82	.15
17	4.6	1.4	e3.2	2.3	2.3	3.5	17	38	1.1	3.2	.82	1.9
18	3.6	1.3	e3.1	1.8	2.0	11	48	38	7.7	2.7	.92	4.7
19	3.7	1.3	e3.2	2.4	2.6	7.2	47	34	7.0	1.9	1.4	14
20	8.8	1.2	e3.3	2.0	2.8	4.3	35	39	3.7	1.3	.86	13
21	30	1.2	e3.5	2.0	2.5	3.3	19	41	.69	1.3	.57	11
22	20	3.4	e3.5	1.9	2.1	1.9	15	49	.40	1.1	.58	7.9
23	24	4.3	e3.3	1.9	1.9	2.4	14	688	.36	.83	1.1	6.7
24	13	3.2	e3.6	2.0	1.8	2.2	6.7	223	.33	.54	2.0	6.4
25	8.0	3.1	e3.1	2.2	1.7	1.9	9.0	82	.37	.31	1.9	6.0
26	6.5	4.4	e2.9	2.3	3.6	7.4	4.5	e58	.34	.17	3.3	5.6
27	5.9	2.9	e3.2	2.2	5.1	15	2.0	e50	.60	.06	3.9	6.1
28	5.2	4.1	e3.3	2.1	2.5	14	1.5	e41	.47	.01	3.9	7.9
29	3.8	4.2	e3.6	1.9	---	12	.88	e37	.45	.00	2.7	5.8
30	4.7	4.3	e3.0	1.7	---	9.0	.69	e34	.86	.00	2.1	5.8
31	3.0	---	e2.8	1.7	---	9.5	---	e31	---	.00	5.3	---
TOTAL	180.5	110.3	114.3	77.5	58.9	136.9	509.07	3565.8	253.44	499.47	106.33	200.46
MEAN	5.82	3.68	3.69	2.50	2.10	4.42	17.0	115	8.45	16.1	3.43	6.68
MAX	30	7.5	4.9	3.9	5.1	15	48	688	29	408	42	48
MIN	1.9	1.2	2.8	1.7	1.5	1.3	.69	1.0	.33	.00	.00	.15
AC-FT	358	219	227	154	117	272	1010	7070	503	991	211	398

CAL YR 1986 TOTAL 6004.78 MEAN 16.5 MAX 1900 MIN .00 AC-FT 11910
WTR YR 1987 TOTAL 5812.92 MEAN 15.9 MAX 688 MIN .00 AC-FT 11530

e Estimated

ARKANSAS RIVER

07157580 CIMARRON RIVER NEAR ENGLEWOOD, KS

LOCATION.--Lat 36°58'38", long 99°58'32", In SE 1/4 sec.23, T.29 N. (revised), R.26 W., Harper County, Okla., Hydrologic Unit 11040008, on the downstream side of bridge on U.S. Highway 283, 4.0 mi south of Englewood, Kans., 10.5 mi north of junction of U.S. Highways 283 and 64, and at mile 341.6.

DRAINAGE AREA.--10,096 mi², of which 4,813 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1982 to September 1987 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,965.62 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Flow regulated at times by canal gates 4.9 mi upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,560 ft³/s, June 10, 1983, gage height, 7.11 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 738 ft³/s, June 30, gage height, 6.77 ft; no flow July 23 to Aug. 26, and Aug. 29 to Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	34	71	58	65	99	97	3.0	77	75	.00	.00
2	73	38	64	58	66	67	91	2.3	52	45	.00	.00
3	86	61	63	67	64	58	102	1.9	42	31	.00	.00
4	46	194	63	58	62	52	111	6.8	38	27	.00	.00
5	42	198	59	52	63	53	104	243	29	20	.00	.00
6	42	63	56	52	59	68	92	102	23	10	.00	.00
7	41	48	62	57	60	79	60	66	16	8.7	.00	.00
8	41	44	65	62	62	85	45	44	10	7.6	.00	.00
9	60	45	66	63	59	89	34	29	8.6	6.3	.00	.00
10	64	44	53	e58	58	97	29	17	11	4.1	.00	.01
11	57	43	50	e55	62	92	24	9.7	11	2.4	.00	.22
12	46	43	50	e68	60	91	22	3.9	15	1.4	.00	42
13	39	35	48	86	61	79	38	6.7	18	1.0	.00	29
14	36	48	52	88	81	63	90	4.0	15	.72	.00	10
15	29	71	52	85	139	72	84	1.9	9.0	.58	.00	6.5
16	27	46	56	e69	60	94	74	2.7	2.7	.48	.00	6.9
17	28	48	55	e58	53	188	63	2.8	.46	6.7	.00	3.5
18	28	48	51	e63	49	189	48	1.1	.16	7.9	.00	61
19	27	50	50	e71	44	94	23	1.4	8.6	3.1	.00	55
20	28	46	51	e66	44	71	19	4.9	54	1.0	.00	42
21	56	47	55	e70	56	55	16	3.2	40	.32	.00	32
22	90	51	67	e60	55	66	14	4.8	64	.08	.00	25
23	54	54	64	e57	51	308	13	6.4	52	.00	.00	23
24	45	52	69	e64	49	195	12	9.2	45	.00	.00	20
25	44	49	59	e62	53	151	11	12	47	.00	.00	16
26	43	50	59	e67	66	148	9.2	59	38	.00	.00	9.9
27	40	54	57	65	149	118	7.9	93	26	.00	.69	5.4
28	40	56	51	60	158	115	7.2	58	10	.00	.20	26
29	39	57	52	61	---	60	5.9	135	48	.00	.00	18
30	40	56	58	63	---	97	4.4	129	187	.00	.00	15
31	38	---	58	64	---	89	---	102	---	.00	.00	---
TOTAL	1404	1773	1786	1987	1908	3182	1350.6	1165.7	997.52	260.38	0.89	446.43
MEAN	45.3	59.1	57.6	64.1	68.1	103	45.0	37.6	33.3	8.40	.029	14.9
MAX	90	198	71	88	158	308	111	243	187	75	.69	61
MIN	27	34	48	52	44	52	4.4	1.1	.16	.00	.00	.00
AC-FT	2780	3520	3540	3940	3780	6310	2680	2310	1980	516	1.8	885

CAL YR 1986 TOTAL 9689.44 MEAN 26.5 MAX 198 MIN .00 AC-FT 19220
WTR YR 1987 TOTAL 16261.52 MEAN 44.6 MAX 308 MIN .00 AC-FT 32250

e Estimated

ARKANSAS RIVER BASIN

07157580 CIMARRON RIVER NEAR ENGLEWOOD, KS--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year February 1982 to June 1987 (discontinued).

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	DIS-CHARGE, IN	SPE-CIFIC CON-DUCT-ANCE	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-	OXYGEN, DIS-SOLVED (MG/L)
					CUBIC FEET PER SECOND	(US/CM)				SURE (MM OF HG)	
OCT 20...	1430	1028	80020	5.70	29	4230	8.50	22.0	20.0	713	8.4
NOV 18...	1500	1028	80020	5.94	48	4210	8.30	12.0	11.0	712	10.0
DEC 18...	1200	1028	80020	5.86	50	4080	8.40	7.0	5.0	712	11.7
MAR 05...	1630	1028	80020	6.09	59	3950	8.30	24.0	21.0	710	8.4
APR 02...	1630	1028	80020	5.96	92	3750	8.30	7.0	11.5	712	10.5
JUN 03...	1430	1028	1028	5.88	47	3380	8.20	24.0	24.0	--	--

[illegible][illegible]

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible]

ARKANSAS RIVER BASIN

07157950 CIMARRON RIVER NEAR BUFFALO, OK

LOCATION.--Lat 36°51'07", long 99°18'54", in SE 1/4 NE 1/4 sec.2, T.27 N., R.20 W., Harper County, Hydrologic Unit 11050001, near left bank on downstream side of pier of U.S. Highway 64, 0.5 mi downstream from Keno Creek, 17.0 mi northeast of Buffalo, and at mile 289.1.

DRAINAGE AREA.--12,004 mi², of which 4,813 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1960 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,599.67 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1979, at site 6.9 mi upstream at elevation 1,650 ft.

REMARKS.--Records fair except for estimated daily discharges, which are poor.

AVERAGE DISCHARGE.--27 years, 142 ft³/s, 102,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,400 ft³/s, Sept. 26, 1973, gage height, 5.57 ft, datum then in use; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 24	0330	9,980	8.82	May 27	2145	*12,100	*9.04
May 5	1430	6,010	8.19	June 30	0230	3,400	7.44

Minimum daily discharge, .41 ft³/s, Aug. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	346	87	146	123	113	340	406	136	480	1160	8.3	7.3
2	438	87	136	118	115	276	369	131	406	686	7.2	5.6
3	1900	120	137	136	113	224	342	126	335	472	6.1	4.4
4	1040	326	123	128	115	198	328	125	281	402	7.6	3.0
5	481	897	114	139	115	181	304	2930	243	377	9.5	3.1
6	293	847	119	141	112	167	282	2320	216	345	4.9	7.7
7	212	473	179	128	109	156	268	1350	184	340	3.8	8.1
8	164	294	195	127	107	149	266	756	163	257	3.1	7.3
9	229	217	251	155	101	146	266	519	149	205	16	26
10	154	178	230	149	107	142	257	382	151	176	7.7	84
11	324	148	201	142	107	144	251	299	153	158	5.6	53
12	227	142	174	138	108	152	236	247	171	153	5.0	264
13	162	124	159	143	120	155	240	201	183	141	34	162
14	130	115	149	147	128	158	277	175	156	e132	15	130
15	109	117	148	132	218	144	306	157	141	e125	8.2	79
16	98	166	141	e97	322	198	305	138	126	e118	4.5	66
17	90	148	144	e68	302	875	264	120	109	160	3.0	44
18	83	130	144	e62	229	909	239	109	95	e146	1.9	172
19	76	117	148	e74	184	693	221	99	113	e131	1.6	228
20	72	116	149	e180	165	448	209	101	135	e101	1.2	203
21	123	106	147	e260	156	299	191	105	173	e68	.45	149
22	130	112	144	e240	159	238	191	110	221	e85	.41	101
23	157	113	147	e170	159	3680	188	134	216	e64	2.4	78
24	169	113	149	e94	169	6210	183	193	217	e52	5.1	64
25	147	110	148	e98	158	1420	168	248	167	e45	4.8	54
26	128	110	144	e140	186	718	151	441	152	e36	66	46
27	117	111	142	219	287	555	144	7750	144	e31	59	40
28	107	109	135	203	378	530	142	3960	120	e28	42	141
29	98	108	131	167	---	487	141	1470	280	e24	32	97
30	93	113	125	132	---	439	139	911	1790	20	18	108
31	94	---	127	115	---	450	---	651	---	11	11	---
TOTAL	7991	5954	4726	4365	4642	20881	7274	26394	7470	6249	395.36	2435.5
MEAN	258	198	152	141	166	674	242	851	249	202	12.8	81.2
MAX	1900	897	251	260	378	6210	406	7750	1790	1160	66	264
MIN	72	87	114	62	101	142	139	99	95	11	.41	3.0
AC-FT	15850	11810	9370	8660	9210	41420	14430	52350	14820	12390	784	4830

CAL YR 1986 TOTAL 41584.38 MEAN 114 MAX 1900 MIN .00 AC-FT 82480

WTR YR 1987 TOTAL 98776.67 MEAN 271 MAX 7750 MIN .41 AC-FT 195900

e Estimated

ARKANSAS RIVER BASIN

53

07157950 CIMARRON RIVER NEAR BUFFALO, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1953, 1961-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1968 to January 1982.

WATER TEMPERATURE: July 1968 to January 1982.

INSTRUMENTATION.--Water-quality monitor from March 1969 to September 1979.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
DEC 17...	1330	1028	80020	4.90	147	12100	8.30	10.0	8.0	10	722	11.2
FEB 13...	1530	1028	80020	4.87	119	13600	8.30	19.0	16.0	6.9	712	10.1
APR 06...	1830	1028	1028	4.85	265	6980	8.40	15.0	13.0	--	--	--
MAY 13...	1400	1028	80020	4.62	191	5290	8.30	28.5	27.0	22	715	8.3
JUL 30...	1500	1028	80020	3.95	21	8350	8.20	35.5	33.0	1.8	718	7.2
SEP 09...	1400	1028	80020	3.97	24	9110	8.10	27.0	28.0	--	717	7.9

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	HARD- NESS (MG/L AS CAC03)	HARD- NESS WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WHOLE IT-FLD (MG/L)
DEC 17...	104	K2	K7	770	560	180	77	2500	88	41	6.4	260
FEB 13...	115	K10	K12	690	490	160	69	2500	89	43	6.6	237
APR 06...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 13...	113	120	K33	680	450	160	68	870	73	15	7.6	270
JUL 30...	110	40	30	930	790	230	86	1500	78	22	7.7	180
SEP 09...	111	--	--	850	720	220	71	1700	81	26	6.3	150

DATE	CAR- BONATE WATER WHOLE IT-FLD (MG/L)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
DEC 17...	9	227	2.0	540	3700	0.70	17	7100	7200	9.7	2820	<0.010
FEB 13...	0	194	1.9	530	4200	0.70	13	7740	7600	10.5	2490	<0.010
APR 06...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 13...	0	224	2.3	410	1400	0.70	17	3050	3100	4.1	1570	0.020
JUL 30...	0	148	1.7	810	2300	0.70	20	5170	5000	7.0	297	<0.010
SEP 09...	0	123	1.9	720	--	--	16	5410	--	--	--	<0.010

ARKANSAS RIVER BASIN

07157950 CIMARRON RIVER NEAR BUFFALO, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)
DEC 17...	--	0.210	0.080	0.080	0.10	0.82	0.90	0.020	0.020	0.020	0.06	20
FEB 13...	--	<0.100	0.060	0.050	0.06	0.54	0.60	0.020	<0.010	<0.010	--	<10
APR 06...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 13...	0.07	<0.100	0.270	0.090	0.12	0.93	1.2	0.090	0.020	0.040	0.12	<10
JUL 30...	--	<0.100	0.050	0.040	0.05	0.85	0.90	0.020	<0.010	<0.010	--	<10
SEP 09...	--	<0.100	--	0.050	0.06	--	--	--	--	<0.010	--	--

DATE	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
DEC 17...	2	200	<10	<1	<1	<1	<1	30	<5	60	20
FEB 13...	4	200	<10	<1	<1	<1	1	40	<5	60	30
APR 06...	--	--	--	--	--	--	--	--	--	--	--
MAY 13...	5	300	<10	<1	<1	<1	3	20	<5	60	10
JUL 30...	3	200	<10	1	<1	<1	2	150	<5	70	10
SEP 09...	2	73	6	<10	<50	<30	<100	65	<100	170	31

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 17...	0.3	7	<1	2	<1	2900	<400	20	63	25	62
FEB 13...	<0.1	5	<1	2	<1	3100	<60	20	40	13	62
APR 06...	--	--	--	--	--	--	--	--	--	--	--
MAY 13...	0.3	5	<1	1	<1	2500	<30	20	76	39	71
JUL 30...	0.1	4	2	<1	<1	3400	34	20	14	0.81	57
SEP 09...	0.4	<100	<100	--	<10	2800	<60	<30	5	0.33	44

ARKANSAS RIVER BASIN

07157960 BUFFALO CREEK NEAR LOVEDALE, OK

LOCATION REVISED.--Lat 36°46'14", long 99°22'00", in SW 1/4 SW 1/4 sec.33, T.27 N., R.20 W., Harper County, Hydrologic Unit 11050001, near center of channel on downstream side of pier of bridge on State Highway 34, 1.2 mi east of Lovedale, 1.3 mi upstream from Sleeping Bear Creek, and at mile 7.6.

DRAINAGE AREA.--408 mi².

PERIOD OF RECORD.--August 1966 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,602.56 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good, except for period of estimated record, which is poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--21 years, 11.7 ft³/s, 8,480 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,800 ft³/s, Aug. 9, 1967, gage height, 14.80 ft, from rating curve extended above 7,000 ft³/s on basis of slope-area determination of peak flow; maximum gage height, 16.17 ft, May 10, 1979; no flow most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 23	2115	1,490	9.72	June 30	1245	*3,550	*12.18

Minimum daily discharge, 6.1 ft³/s, June 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	9.7	14	8.0	14	32	61	28	36	512	13	12
2	6.5	9.3	14	8.1	14	26	57	27	34	218	13	11
3	487	9.8	15	8.5	13	23	54	26	99	144	12	10
4	145	15	14	8.8	13	21	53	26	41	102	12	9.5
5	43	121	14	9.2	13	20	51	72	27	77	12	9.6
6	28	62	13	9.3	13	19	51	80	22	58	11	10
7	21	33	13	9.3	13	19	49	50	17	49	11	11
8	17	24	13	9.4	14	18	48	42	14	41	10	11
9	71	20	14	9.9	14	18	47	35	13	35	12	11
10	91	18	13	10	14	18	44	30	13	33	13	18
11	54	17	13	10	14	18	42	27	20	29	12	18
12	57	16	12	10	14	18	41	24	16	26	11	19
13	23	16	11	11	15	18	41	22	12	24	11	19
14	19	16	11	11	15	18	48	20	10	23	11	17
15	17	15	10	11	25	17	48	19	9.0	22	10	15
16	15	15	10	11	67	29	47	17	7.8	21	9.8	14
17	14	15	10	11	46	586	43	16	7.0	24	9.7	13
18	12	15	9.3	e11	30	276	40	15	6.1	24	9.5	17
19	11	15	8.7	e11	24	107	37	13	16	21	9.2	23
20	11	15	8.5	e11	22	62	35	14	33	20	8.7	19
21	12	15	8.3	e12	21	49	34	14	24	19	8.2	21
22	15	15	8.2	e12	20	43	33	13	44	18	7.9	17
23	14	14	8.1	e12	19	786	33	16	40	18	9.0	15
24	12	14	8.2	e12	19	720	33	24	40	17	11	14
25	12	14	8.0	12	19	205	33	30	27	16	11	13
26	11	14	7.9	13	20	121	32	31	18	16	17	12
27	11	13	7.8	13	27	97	31	153	13	16	17	12
28	11	13	7.9	14	42	82	30	112	10	15	15	22
29	10	13	8.0	14	---	73	29	195	207	15	14	95
30	10	13	7.9	14	---	66	29	94	2860	14	13	31
31	10	---	8.0	14	---	64	---	51	---	14	12	---
TOTAL	1278.7	614.8	328.8	340.5	594	3669	1254	1336	3735.9	1681	356.0	539.1
MEAN	41.2	20.5	10.6	11.0	21.2	118	41.8	43.1	125	54.2	11.5	18.0
MAX	487	121	15	14	67	786	61	195	2860	512	17	95
MIN	6.5	9.3	7.8	8.0	13	17	29	13	6.1	14	7.9	9.5
AC-FT	2540	1220	652	675	1180	7280	2490	2650	7410	3330	706	1070

CAL YR 1986 TOTAL 3976.11 MEAN 10.9 MAX 487 MIN .00 AC-FT 7890
WTR YR 1987 TOTAL 15727.8 MEAN 43.1 MAX 2860 MIN 6.1 AC-FT 31200

e Estimated

ARKANSAS RIVER BASIN

07158000 CIMARRON RIVER NEAR WAYNOKA, OK

LOCATION.--Lat 36°31'02", long 98°52'45", in NW 1/4 NE 1/4 sec.35, T.24 N., R.16 W., Woods County, Hydrologic Unit 11050001, near left bank on downstream side of bridge on U.S. Highway 281, 4.0 mi south of Waynoka, and at mile 247.0.

DRAINAGE AREA.--13,334 mi², of which 4,830 mi² is probably noncontributing.

PERIOD OF RECORD.--September 1903 to December 1905 (gage heights and discharge measurements only), October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

GAGE.--Water-stage recorder. Datum of gage is 1,367.35 ft above National Geodetic Vertical Datum of 1929.

September 1903 to December 1905, nonrecording gage at the Atchison, Topeka and Santa Fe Railway Co. bridge 5 mi upstream at different datum. Feb. 4 to Mar. 3, 1938, nonrecording gage and Mar. 4, 1938, to Oct. 24, 1956, water-stage recorder, on former highway bridge 50 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Extensive diversions for irrigation above station.

AVERAGE DISCHARGE.--50 years, (water years 1938-87), 319 ft³/s, 231,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,500 ft³/s, May 16, 1957, gage height, 15.10 ft, from rating curve extended above 45,000 ft³/s on basis of contracted-opening measurement of peak flow; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of about 14 ft occurred probably in 1914.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 23	1915	18,100	9.65	June 30	2115	11,500	8.92
May 27	1830	*21,200	*10.04				

Minimum daily discharge, 3.9 ft³/s, Aug. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	292	222	233	217	249	358	356	217	897	5470	28	78
2	376	217	254	217	245	331	338	213	626	2030	23	65
3	972	225	250	223	238	305	328	212	1020	984	21	49
4	1630	676	242	221	233	285	323	211	643	632	20	35
5	563	1490	237	216	235	272	319	266	376	589	20	27
6	326	972	236	220	237	262	314	5230	270	423	19	34
7	271	684	241	212	238	252	310	2660	207	335	17	70
8	235	401	255	216	237	245	303	1770	180	295	13	66
9	312	318	267	234	229	246	295	906	164	238	13	58
10	459	293	271	248	229	256	287	583	172	185	126	114
11	390	279	266	246	229	255	280	406	218	161	70	153
12	630	269	263	243	229	254	273	312	168	147	45	138
13	345	260	253	249	229	253	277	271	159	137	38	229
14	289	251	244	248	231	253	422	247	160	127	36	162
15	260	250	242	241	632	251	345	230	145	121	30	144
16	243	242	240	236	935	258	325	217	134	115	20	119
17	229	237	240	232	384	985	314	208	125	118	16	101
18	221	247	236	231	333	2350	297	196	116	159	12	190
19	213	239	236	233	301	1150	278	191	147	147	13	306
20	205	237	234	244	288	688	264	188	425	117	9.0	173
21	222	233	229	248	294	423	255	191	264	102	3.9	189
22	330	229	225	245	290	341	246	214	254	92	5.7	206
23	294	227	223	252	283	6130	244	240	339	84	27	164
24	270	224	223	262	282	10100	239	353	222	79	32	137
25	266	223	218	256	289	2910	234	409	205	75	140	125
26	255	223	217	256	307	1340	230	418	175	68	147	115
27	246	223	215	269	522	780	227	9360	158	61	287	106
28	239	223	217	274	620	622	224	7710	140	54	212	136
29	232	224	217	270	---	539	223	6170	131	46	132	265
30	227	224	217	259	---	427	221	2980	3830	40	105	211
31	223	---	217	254	---	357	---	1520	---	35	90	---
TOTAL	11265	10262	7358	7472	9048	33478	8591	44299	12070	13266	1770.6	3965
MEAN	363	342	237	241	323	1080	286	1429	402	428	57.1	132
MAX	1630	1490	271	274	935	10100	422	9360	3830	5470	287	306
MIN	205	217	215	212	229	245	221	188	116	35	3.9	27
AC-FT	22340	20350	14590	14820	17950	66400	17040	87870	23940	26310	3510	7860

CAL YR 1986 TOTAL 58505.87 MEAN 160 MAX 1630 MIN .00 AC-FT 116000

WTR YR 1987 TOTAL 162844.6 MEAN 446 MAX 10100 MIN 3.9 AC-FT 323000

ARKANSAS RIVER BASIN

07159100 CIMARRON RIVER NEAR DOVER, OK

LOCATION.--Lat 35°57'06", long 97°54'51", in SW 1/4 NE 1/4 sec.14, T.17 N., R.7 W., Kingfisher County, Hydrologic Unit 11050002, near right bank on downstream bridge on U.S. Highway 81, 1.0 mi downstream from Turkey Creek, 2.0 mi south of Dover, 2.5 mi upstream from Kingfisher Creek, and at mile 160.6.

DRAINAGE AREA.--15,713 mi², of which 4,926 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1973 to current year.

GAGE.--Water-stage recorder. Datum of gage is 999.19 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' telemeter at station.

AVERAGE DISCHARGE.--14 years, 872 ft³/s, 631,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 423,000 ft³/s, Oct. 3, 1986, gage height, 26.10 ft from high-water mark (HWM); minimum daily, 4.3 ft³/s, Sept. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 12,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	Unknown	*123,000	*26.10 (from HWM)	Mar. 24	2100	20,100	17.85
Oct. 22	2130	18,300	17.42	May 29	0400	38,200	20.20
Nov. 5	1100	35,800	19.94				

Minimum daily discharge, 276 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25000	810	932	665	1330	10100	2510	762	7580	1360	503	532
2	19300	762	932	654	1070	5720	2290	725	5960	5130	495	464
3	80200	734	954	634	940	3720	2150	694	6940	6750	467	420
4	48300	6920	984	637	849	2830	e2050	676	3980	4360	439	382
5	18700	29000	1010	648	784	2350	e2000	654	3650	2840	428	347
6	11000	14500	954	659	803	2060	1960	1900	2900	2150	417	325
7	7560	7210	958	659	855	1860	1920	3520	2430	1920	517	325
8	5590	5410	1030	649	832	1720	1850	4930	2160	1630	400	320
9	4380	3810	1260	810	767	1600	1770	3180	1980	3700	374	314
10	4070	2790	1270	876	698	1560	1690	2230	2040	2900	363	604
11	3880	2330	1140	863	651	1510	1620	1590	3950	2120	363	1600
12	4300	1970	1100	826	613	1460	1550	1260	2190	1530	359	1020
13	3710	1770	1040	804	592	1400	1530	1060	1930	3560	543	1900
14	2690	1590	997	752	591	1320	1580	920	1780	3730	967	1160
15	1780	1530	956	736	4350	1270	1950	650	1610	2000	598	797
16	1450	1450	928	735	8520	1290	2920	573	1540	1400	469	730
17	1270	1420	902	748	9070	7950	2160	522	1470	1510	415	597
18	1160	1380	875	855	4650	8260	1780	470	1390	2340	376	903
19	1070	1310	848	1090	3150	7170	1610	437	1370	1870	359	3210
20	1000	1260	832	1020	2470	4890	1430	430	2500	1300	332	2080
21	1010	1220	811	1110	2120	3370	1270	393	2090	1050	313	1650
22	11300	1160	785	1190	1890	3990	1180	382	2070	914	296	1530
23	9590	1110	774	1220	1730	3170	1120	473	1750	819	276	1000
24	3780	1070	762	1140	1620	13300	1080	1960	1550	756	283	900
25	2240	1040	752	1050	1650	13000	1020	1730	1570	728	303	795
26	1560	1130	745	1010	1660	7350	985	1450	1500	765	310	650
27	1290	1100	735	908	3220	5130	938	19200	1390	710	406	710
28	1150	1040	724	879	10000	4120	891	30200	1330	624	560	2110
29	1030	1000	704	2510	---	3430	848	34100	1220	570	673	5960
30	956	964	695	4150	---	3080	791	18600	1240	e520	864	3060
31	888	---	680	2170	---	2780	---	10800	---	508	653	---
TOTAL	281204	98790	28069	32657	67475	132760	48443	146471	75060	62064	14121	36395
MEAN	9071	3293	905	1053	2410	4283	1615	4725	2502	2002	456	1213
MAX	80200	29000	1270	4150	10000	13300	2920	34100	7580	6750	967	5960
MIN	888	734	680	634	591	1270	791	382	1220	508	276	314
AC-FT	557800	195900	55670	64780	133800	263300	96090	290500	148900	123100	28010	72190

CAL YR 1986 TOTAL 579991 MEAN 1589 MAX 80200 MIN 41 AC-FT 1150000
WTR YR 1987 TOTAL 1023509 MEAN 2804 MAX 80200 MIN 276 AC-FT 2030000

e Estimated

ARKANSAS RIVER BASIN

07159720 COTTONWOOD CREEK NEAR NAVINA, OK

LOCATION.--Lat 35°46'36", long 97°32'45", SW 1/4 NW 1/4 sec.17, T.15 N., R.4 W., Logan County, Hydrologic Unit 11050002 on downstream right bank, 0.5 mi downstream from Deer Creek, 1.7 mi southeast of Navina, 10.7 mi southwest of Guthrie, and at mile 25.0.

DRAINAGE AREA.--247 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1977 to September 1980, March 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 962.10 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Low flow sustained in part by sewage effluent.

AVERAGE DISCHARGE.--8 years (water years 1978-80, 1983-87), 135 ft³/s, 97,810 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,500 ft³/s, May 28, 1987, gage height, 24.64 ft, from high-water mark (HWM), from slope-area measurement; minimum daily discharge, 8.0 ft³/s, Oct. 14, 15, 1977.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	0200	6,410	22.38	Feb. 28	2400	2,540	20.34
Oct. 22	2000	2,620	20.41	Mar. 17	1600	3,040	20.76
Nov. 4	2100	2,490	20.29	May 28	0530	*32,500	*24.64 (from HWM)
Nov. 26	1500	2,450	20.24	June 3	1300	2,160	19.86
Jan. 29	1600	2,030	19.68				

Minimum daily discharge, 28 ft³/s, Aug. 22, and Sept. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2020	141	205	e97	388	1920	116	54	960	222	41	33
2	2210	134	190	e96	356	514	111	52	501	700	e41	32
3	4020	131	167	e96	250	330	104	52	1640	e400	40	31
4	2390	1210	153	95	216	277	100	50	636	e510	40	29
5	998	1430	144	93	234	245	100	53	470	417	37	30
6	609	452	140	94	916	226	100	48	432	300	37	28
7	555	414	158	e92	618	194	99	42	407	234	37	29
8	515	303	198	93	347	194	95	48	388	e165	36	30
9	495	244	355	e110	266	178	93	47	348	116	36	31
10	479	211	222	e265	230	175	91	46	356	105	34	51
11	468	e197	179	197	209	160	88	45	297	86	34	81
12	463	e178	159	158	193	144	87	43	267	84	34	45
13	425	169	144	143	184	147	84	41	147	165	121	79
14	397	160	138	136	178	148	85	39	117	132	178	47
15	373	156	129	120	839	147	86	38	101	e104	88	45
16	358	155	130	e116	1180	142	81	36	91	82	57	119
17	348	149	128	e108	443	2190	80	39	85	241	46	104
18	278	139	120	e105	404	1290	80	43	80	566	41	248
19	155	129	121	e180	297	414	79	42	82	e165	38	277
20	116	138	116	152	253	327	73	47	253	108	32	127
21	105	127	111	e133	227	255	97	98	158	93	29	222
22	1700	119	102	e124	212	210	100	1290	104	79	28	93
23	1850	118	103	e121	195	402	79	566	86	65	48	62
24	577	113	104	e120	183	446	71	370	76	62	63	52
25	364	249	102	e117	203	245	67	291	71	55	119	46
26	284	1360	100	120	190	187	65	234	66	55	61	41
27	241	437	96	138	309	159	62	954	61	54	82	67
28	212	326	93	277	1160	163	59	6980	57	53	65	104
29	180	265	93	1360	---	140	56	2810	54	46	47	110
30	157	231	96	715	---	122	56	1150	313	42	42	56
31	149	---	98	347	---	117	---	634	---	43	38	---
TOTAL	23491	9585	4394	6118	10680	11808	2544	16289	8704	5549	1670	2349
MEAN	758	319	142	197	381	381	84.8	525	290	179	53.9	78.3
MAX	4020	1430	355	1360	1180	2190	116	6980	1640	700	178	277
MIN	105	113	93	92	178	117	56	36	54	42	28	28
AC-FT	46590	19010	8720	12140	21180	23420	5050	32310	17260	11010	3310	4660

CAL YR 1986 TOTAL 81337 MEAN 223 MAX 5510 MIN 27 AC-FT 161300
WTR YR 1987 TOTAL 103181 MEAN 283 MAX 6980 MIN 28 AC-FT 204700

e Estimated

ARKANSAS RIVER BASIN

07159720 COTTONWOOD CREEK NEAR NAVINA, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1977 to November 1980.

WATER TEMPERATURE: October 1977 to November 1980.

REMARKS.--Samples collected monthly. Specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)
OCT										
16...	1300	1028	80020	11.33	358	**518	7.30	20.0	11.5	370
DEC										
12...	1000	1028	80020	8.61	158	1170	7.60	0.0	3.5	22
JAN										
13...	1500	1028	80020	--	*143	1160	7.60	12.0	8.5	11
FEB										
25...	1030	1028	80020	9.30	208	1080	7.80	8.0	11.5	10
MAR										
26...	1230	1028	80020	9.05	189	973	7.60	8.0	10.0	78
APR										
17...	1030	1028	80020	7.17	81	1340	7.70	20.0	17.0	12
MAY										
19...	1130	1028	80020	6.13	42	**1520	7.60	29.0	24.0	34
JUN										
29...	1530	1028	80020	6.54	54	1240	7.70	27.0	25.0	25
JUL										
31...	1030	1028	80020	--	*43	1340	7.70	28.0	26.0	33
AUG										
04...	1500	1028	80020	6.06	40	1360	7.80	30.0	28.0	20
SEP										
14...	1300	1028	80020	6.39	49	842	7.60	27.5	24.0	85
DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
OCT										
16...	740	7.8	74	180	63	46	17	38	30	1
DEC										
12...	740	13.0	101	380	110	91	38	90	34	2
JAN										
13...	730	10.9	98	380	110	89	38	87	33	2
FEB										
25...	740	9.1	86	390	37	85	43	100	36	2
MAR										
26...	740	10.6	97	350	90	82	35	78	32	2
APR										
17...	730	6.2	67	440	120	100	45	110	35	2
MAY										
19...	730	6.1	76	440	160	100	46	140	41	3
JUN										
29...	730	7.5	95	420	130	99	42	110	36	2
JUL										
31...	740	8.0	102	--	--	--	--	--	--	--
AUG										
04...	750	--	--	410	140	93	43	120	38	3
SEP										
14...	740	--	--	250	87	59	24	76	40	2

* MEAN DAILY DISCHARGE

** SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07159720 COTTONWOOD CREEK NEAR NAVINA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT 16...	3.7	146	0	120	84	37	365	299	0.50	353
DEC 12...	3.9	298	0	244	170	85	692	641	0.94	295
JAN 13...	3.4	302	0	248	190	93	696	660	0.95	269
FEB 25...	3.9	--	--	--	100	120	692	664	0.94	389
MAR 26...	3.0	--	--	--	150	78	--	581	0.42	158
APR 17...	3.4	364	0	298	240	120	850	805	1.16	186
MAY 19...	6.3	337	0	276	250	160	949	871	1.29	108
JUN 29...	5.3	346	0	284	230	120	848	781	1.15	124
JUL 31...	--	320	0	262	220	130	823	--	--	--
AUG 04...	6.9	315	0	258	220	140	874	785	1.19	93.7
SEP 14...	5.5	190	0	158	140	76	493	476	0.67	65.2

ARKANSAS RIVER BASIN

07160000 CIMARRON RIVER NEAR GUTHRIE, OK

LOCATION.--Lat 35°55'07", long 97°25'34", near center of east line of sec.29, T.17 N., R.2 W, Logan County, Hydrologic Unit 11050002, on downstream side of second pier from left bank of State Highway 77 bridge, 1.6 mi downstream from Cottonwood Creek, 2.5 mi north of Guthrie, 6.1 mi upstream from Skeleton Creek, and at mile 122.4.

DRAINAGE AREA.--16,892 mi², of which 4,926 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1937 to September 1976, October 1983 to current year. Monthly discharge only for some periods, published in WSP's 1311 and 1731.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 896.50 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers' bench mark). Prior to Mar. 19, 1939, nonrecording gage at railway bridge 1,200 ft upstream at datum 4.00 ft higher. From Mar. 19, 1939 to Sept. 30, 1976, recording gage 125 ft upstream from railway bridge at datum 4.00 ft higher. From Sept. 14, 1967 to Sept. 30, 1976, supplementary water-stage recorder at present site and datum.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--43 years (water years 1938-76, 1984-87), 962 ft³/s, 697,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 158,000 ft³/s, May 17, 1957, gage height, 18.58 ft, site and datum then in use; minimum discharge, 0.1 ft³/s, Nov. 2, 1939.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 4	0500	*116,000	*20.71	Mar. 18	0530	21,300	10.22
Oct. 23	0900	35,600	12.49	Mar. 25	0700	22,200	10.38
Nov. 5	2000	38,000	12.84	May 28	1330	47,000	14.73
Feb. 16	1900	16,700	9.34	July 3	1330	20,600	10.53
Mar. 1	0630	22,500	10.44				

Minimum daily discharge, 370 ft³/s, Aug. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39100	e1000	1390	803	3520	20600	2450	e790	13400	2370	e520	551
2	27900	e900	1280	779	3130	11000	2210	e760	10200	3520	e500	455
3	55100	e840	1220	765	2350	6950	2010	e720	12000	17900	e480	426
4	92000	3000	1170	763	1930	5300	1870	e700	11500	10300	e450	421
5	39600	30500	1160	781	1780	4210	1740	e670	6840	5560	e430	418
6	21700	21400	1150	781	2890	3620	1640	e650	6530	3480	e450	418
7	15900	8280	1170	785	3490	3240	1610	1100	5130	2530	e520	418
8	11700	5310	1290	807	2370	3020	1590	3210	4520	2040	e450	415
9	9040	e4500	1950	1570	1890	2880	1570	3760	e4000	1640	e400	406
10	8080	e4000	2480	2640	1630	2820	1570	2430	e3500	3780	e380	407
11	6900	e3400	1800	1790	1490	2730	1530	1690	4000	2440	e370	466
12	7510	e2800	1480	1400	1400	2670	1480	1210	5100	1820	e500	1300
13	6910	e2500	1360	1270	1380	2600	1440	1040	e4000	1830	e800	946
14	5830	e2100	1260	1190	1400	2560	1430	982	e3500	4270	e1900	1760
15	4070	e1800	1200	1090	4760	2480	1420	931	e2500	3070	e1000	1040
16	3100	e1700	1160	e1000	15500	2450	1500	e820	e2000	1690	e600	755
17	e2700	e1600	1130	e960	13900	9390	2200	e770	e1600	1320	e460	737
18	e2100	1560	1090	e1000	8240	18600	1620	e700	e1400	2680	e440	800
19	e1800	1500	1040	e1200	5120	9710	1390	663	e1700	2760	422	1520
20	1560	1420	999	e1100	3860	8250	1290	722	e3000	1750	418	3390
21	1550	1370	971	e1200	3260	5480	1270	686	e2500	1200	417	2070
22	12400	1300	945	e1320	2930	4520	e1190	2070	e2200	e1000	410	2870
23	29600	1220	910	e1200	2810	4850	1140	2650	e2000	e900	402	1680
24	8590	1160	891	1050	2780	8420	1100	1990	e1800	e800	402	1070
25	3930	1430	887	1030	2760	18400	1070	3390	e1600	e740	403	901
26	2200	5420	871	964	2780	8750	1030	3110	e1500	e800	406	785
27	e1800	5530	848	1050	2910	6260	977	8780	e1350	e700	402	948
28	e1500	2410	829	1440	11500	4840	926	41000	e1250	622	404	1140
29	e1300	1830	808	4290	---	3910	875	36400	e1200	e600	410	3360
30	e1200	1560	802	11400	---	3180	829	26800	1300	e560	428	5710
31	e1100	---	806	5720	---	2750	---	16000	---	e540	577	---
TOTAL	427770	123340	36347	53138	113760	196440	43967	167194	123120	85212	16151	37583
MEAN	13800	4111	1172	1714	4063	6337	1466	5393	4104	2749	521	1253
MAX	92000	30500	2480	11400	15500	20600	2450	41000	13400	17900	1900	5710
MIN	1100	840	802	763	1380	2450	829	650	1200	540	370	406
AC-FT	848500	244600	72090	105400	225600	389600	87210	331600	244200	169000	32040	74550

CAL YR 1986 TOTAL 810729 MEAN 2221 MAX 92000 MIN 149 AC-FT 1608000
WTR YR 1987 TOTAL 1424022 MEAN 3901 MAX 92000 MIN 370 AC-FT 2825000

e Estimated

ARKANSAS RIVER BASIN

07160500 SKELETON CREEK NEAR LOVELL, OK

LOCATION.--Lat 36°03'36", long 97°35'05", in NW 1/4 SW 1/4 sec.1, T.18 N., R.4 W., Logan County, Hydrologic Unit 11050002, near right bank on downstream side of pier of bridge on State Highway 74, 2 mi upstream from Otter Creek, 2.8 mi east of Lovell, and at mile 14.6.

DRAINAGE AREA.--410 mi².

PERIOD OF RECORD.--October 1949 to current year.

GAGE.--Water-stage recorder. Datum of gage is 909.76 ft above National Geodetic Vertical Datum of 1929 (Oklahoma State Highway Department datum). Prior to Dec. 5, 1949, nonrecording gage at site 60 ft downstream at datum 4.70 ft higher. Prior to Oct. 1, 1979, gage at present site and datum 5.00 ft higher.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--38 years, 128 ft³/s, 92,740 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,200 ft³/s, May 16, 1957, gage height, 34.58 ft, at datum then in use; no flow at times in 1953-54, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	1700	*55,400	*36.78	Mar. 1	2000	2,520	19.56
Oct. 22	2400	6,300	26.22	Mar. 17	1630	3,290	21.51
Nov. 5	1600	9,120	29.16	May 28	2300	9,830	29.57
Jan. 30	1500	2,680	19.99	Sept. 29	1450	2,790	20.27

Minimum daily discharge, 18 ft³/s, Sept. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10700	197	177	145	260	1380	158	87	182	e452	41	23
2	3330	189	175	143	236	412	153	84	159	e705	37	22
3	30100	186	174	141	214	303	145	82	e478	e1500	36	20
4	12700	1820	175	146	196	257	143	79	e400	e890	33	22
5	2220	7620	168	147	190	236	142	77	e251	e505	38	21
6	594	4510	165	144	224	220	142	81	e160	e410	35	18
7	524	476	188	141	234	210	140	107	e111	e300	32	18
8	330	294	302	144	234	203	138	124	e92	e248	30	21
9	322	258	564	301	172	191	136	86	e77	e200	32	113
10	625	237	307	261	182	194	134	80	e70	e170	30	130
11	327	215	e200	151	178	185	132	80	e298	e130	27	221
12	821	220	e194	176	171	185	128	74	e890	e110	26	90
13	496	e208	e190	166	171	177	126	72	e490	e160	52	135
14	253	e204	e186	160	174	175	188	73	e300	e250	153	106
15	231	e200	e181	158	745	171	217	68	e201	e160	68	56
16	217	205	177	147	769	193	166	66	e148	86	42	36
17	202	195	174	128	235	2800	136	64	e300	231	33	27
18	200	196	172	112	410	2350	128	61	e1010	1340	29	127
19	201	193	168	92	228	291	123	60	e405	e510	26	172
20	191	189	161	108	273	222	117	95	e600	e250	27	98
21	190	184	161	108	217	201	112	114	e1320	99	24	87
22	4290	179	159	145	220	285	109	82	e695	69	21	56
23	4590	176	155	112	203	558	108	74	e490	63	21	38
24	681	172	158	105	200	1390	107	205	e352	59	24	32
25	291	229	159	99	212	340	106	175	e410	56	30	26
26	252	694	150	108	218	206	102	156	e600	54	24	23
27	237	227	152	155	592	185	99	508	e450	51	29	715
28	224	195	152	166	1300	177	95	6800	e340	48	89	1290
29	215	189	150	1070	---	165	93	5970	e250	47	54	2380
30	202	182	146	2170	---	145	90	1590	e301	43	32	525
31	200	---	149	343	---	154	---	230	---	41	29	---
TOTAL	75956	20239	5889	7692	8658	14161	3913	17504	11830	9237	1204	6648
MEAN	2450	675	190	248	309	457	130	565	394	298	38.8	222
MAX	30100	7620	564	2170	1300	2800	217	6800	1320	1500	153	2380
MIN	190	172	146	92	171	145	90	60	70	41	21	18
AC-FT	150700	40140	11680	15260	17170	28090	7760	34720	23460	18320	2390	13190

CAL YR 1986 TOTAL 149188 MEAN 409 MAX 30100 MIN 1.1 AC-FT 295900
WTR YR 1987 TOTAL 182931 MEAN 501 MAX 30100 MIN 18 AC-FT 362800

e Estimated

07161000 CIMARRON RIVER AT PERKINS, OK

LOCATION.--Lat 35°57'32", long 97°01'49", in SW 1/4 SW 1/4 sec.7, T.17 N., R.3 E., Payne County, Hydrologic Unit 11050003, near right bank at downstream side of bridge on U.S. Highway 177, 1.0 mi south of Perkins, 1.5 mi upstream from Dugout Creek, 4.0 mi downstream from Wildhorse Creek, and at mile 87.3.
DRAINAGE AREA.--17,852 mi² of which 4,962 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1939 to current year. Monthly discharge only for some periods, published in WSP 1311.

Gage-height records collected at same site since 1927 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 814.88 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to June 26, 1940 and Jan. 9 to Apr. 7, 1957, nonrecording gage at same site and datum 5.00 ft higher. Prior to Oct. 1, 1977, at same site and datum 5.00 ft higher.

REMARKS.--Records fair. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--48 years, 1,285 ft³/s, 931,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 162,000 ft³/s, Oct. 4, 1986, gage height, 26.75 ft, from floodmark; minimum discharge, 0.8 ft³/s, Dec. 8, 1954.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 4, 5, 1926, reached a stage of 17.0 ft from floodmarks, information provided by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 16,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 4	1600	*162,000	*26.75	Mar. 25	1300	18,500	15.03
Oct. 23	2000	67,400	19.53	May 29	0400	67,900	19.50
Nov. 5	2300	52,400	18.48	June 4	1000	23,200	14.88
Mar. 1	0200	29,500	16.43	July 4	1330	29,900	15.75
Mar. 18	1200	18,700	15.06				

Minimum daily discharge, 375 ft³/s, Aug. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76000	1870	2480	1660	4950	25500	2900	1330	16500	2040	e605	748
2	45800	1660	2330	1620	4000	14400	2710	1300	14200	2490	e565	777
3	82800	1630	2200	1600	3440	6890	2570	1280	13900	13200	e545	649
4	135000	3820	2140	1560	2950	5340	2470	1240	20600	22400	e530	607
5	86800	27800	2110	1550	2860	4480	2400	1230	10400	10300	e520	555
6	27600	39000	2140	1550	4160	3860	2300	1190	7240	5750	e495	533
7	16300	13500	2350	1530	4360	3510	2230	1160	5900	3520	e475	522
8	11700	7550	2800	1520	3690	3240	2180	1910	4560	2700	e460	517
9	9020	6070	3710	2270	3060	3030	2120	3260	3780	2080	e458	517
10	8250	5030	3770	3270	2710	2910	2080	2730	3370	2280	457	561
11	7450	4170	3560	3090	2460	2790	2030	2150	3230	4840	450	643
12	6550	3500	3000	2490	2370	2690	1970	1720	5660	2430	444	1120
13	7470	3150	2640	2170	2240	2580	1910	1450	4850	2260	507	1820
14	5980	2810	2510	2010	2100	2480	1870	1280	2610	2510	601	1380
15	5220	2620	2440	1900	5560	2410	1960	1130	2200	6590	1310	2110
16	4420	2510	2380	1860	12900	2350	2030	1030	1920	3040	1710	1290
17	3430	2490	2330	1860	12800	9210	2300	950	1630	1860	1000	1100
18	3150	2430	2230	1980	9370	17100	2510	876	1560	1750	755	1410
19	2920	2380	2330	1710	6410	9270	2100	822	2160	4990	631	1370
20	2680	2330	2050	1640	4680	6520	1930	826	3760	3150	544	1870
21	2510	2250	2000	1660	3360	5840	1870	860	6250	1870	413	2940
22	15100	2210	1990	2020	3120	4630	1770	1230	4560	1410	375	2550
23	47900	2110	2000	2020	2980	5000	1700	2390	2600	e1290	462	3190
24	25100	2000	1960	2100	2830	7730	1630	2340	2160	e1150	453	1780
25	6290	1970	1920	2150	2770	15400	1580	2650	1750	e1030	481	1320
26	4600	7840	1890	2040	2810	8240	1530	3080	1550	e950	481	1140
27	3270	7080	1850	2060	3020	5820	1480	4410	1620	e875	533	1500
28	2850	4960	1810	2500	11800	4740	1440	43300	1380	e815	561	3660
29	2570	3100	1770	4060	---	4030	1410	60300	1200	e775	466	6460
30	2330	2680	1720	9430	---	3410	1370	42700	1860	e715	687	9810
31	2120	---	1690	8390	---	3110	---	22000	---	e660	668	---
TOTAL	663180	172520	72100	77270	129760	198510	60350	214124	154960	111720	18642	54449
MEAN	21390	5751	2326	2493	4634	6404	2012	6907	5165	3604	601	1815
MAX	135000	39000	3770	9430	12900	25500	2900	60300	20600	22400	1710	9810
MIN	2120	1630	1690	1520	2100	2350	1370	822	1200	660	375	517
AC-FT	1315000	342200	143000	153300	257400	393700	119700	424700	307400	221600	36980	108000

CAL YR 1986 TOTAL 1268367 MEAN 3475 MAX 135000 MIN 132 AC-FT 2516000
WTR YR 1987 TOTAL 1927585 MEAN 5281 MAX 135000 MIN 375 AC-FT 3823000

e Estimated

ARKANSAS RIVER BASIN

07161000 CIMARRON RIVER AT PERKINS, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950, 1953-63, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1952 to September 1963, June 1965 to January 1982.

WATER TEMPERATURE: October 1962 to September, 1963, June 1965 to January 1982.

INSTRUMENTATION.--Water-quality monitor from April 1969 to September 1980.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	
NOV 26...	1300	1028	80020	13.05	8800	2360	7.90	12.0	6.5	690	725	11.0	
JAN 29...	1230	1028	1028	10.83	3900	6200	8.00	19.0	11.0	--	--	--	
FEB 26...	1400	1028	80020	10.44	2800	4250	8.10	9.5	9.5	67	740	--	
APR 02...	1230	1028	80020	10.61	2720	5230	8.20	12.0	12.0	110	730	9.6	
MAY 19...	1330	1028	80020	9.08	843	6020	8.40	34.0	30.0	11	730	10.4	
MAY 29...	1800	1028	1028	18.53	61200	--	--	25.0	15.5	--	--	--	
JUN 24...	1000	1028	80020	9.77	2240	3650	7.80	29.5	27.0	72	740	6.4	
AUG 18...	1600	1028	1028	8.20	715	4240	8.30	35.0	31.0	--	--	--	
SEP 30...	1100	1028	80020	13.18	8990	1830	7.60	24.5	21.0	420	750	6.9	
DATE		OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH IT FIELD (MG/L AS HC03)
NOV 26...	95	--	--	K4600	320	150	81	29	340	69	9	4.7	227
JAN 29...	--	--	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	--	--	--	--	680	410	170	62	690	69	12	4.9	--
APR 02...	95	210	110	770	500	200	65	880	71	14	5.9	322	
MAY 19...	147	K5	--	680	490	160	68	940	75	16	7.0	--	--
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	84	180	83	460	300	120	40	540	71	11	6.1	185	
AUG 18...	--	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	79	>1200	K3900	190	46	50	15	320	78	11	4.8	108	

ARKANSAS RIVER BASIN

07161000 CIMARRON RIVER AT PERKINS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CARBONATE WATER WH IT FIELD (MG/L AS CO3)	ALKALINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLORIDE, DIS- SOLVED (MG/L AS CL)	FLUORIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITROGEN, NITRATE DIS- SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS- SOLVED (MG/L AS N)
NOV 26...	0	186	170	510	0.30	9.5	1260	1250	1.71	29900	0.980	0.010
JAN 29...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	--	--	450	1000	0.40	12	2600	2560	3.54	19700	0.750	0.040
APR 02...	0	264	520	1300	0.40	15	3190	3160	4.34	23400	1.49	0.010
MAY 19...	--	--	540	2800	0.40	11	3510	4640	4.77	7990	--	<0.010
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	0	152	350	840	0.40	10	2060	2010	2.80	12500	0.480	0.010
AUG 18...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	0	89	120	540	0.30	7.3	1080	1150	1.47	26200	1.46	0.040
DATE	NITROGEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITROGEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DIS- SOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOSPHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOSPHOROUS ORGANIC TOTAL (MG/L AS P)
NOV 26...	0.03	0.990	0.090	--	0.19	2.0	2.1	0.230	0.090	0.080	0.25	0.23
JAN 29...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	0.13	0.790	0.150	0.020	0.03	0.95	1.1	0.150	0.120	0.040	0.12	0.15
APR 02...	0.03	1.50	0.240	0.080	0.10	0.96	1.2	0.110	0.110	0.100	0.31	0.11
MAY 19...	--	<0.100	0.080	0.060	0.08	1.2	1.3	0.230	0.060	0.030	0.09	0.23
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	0.03	0.490	0.110	0.100	0.13	1.4	1.5	0.300	0.100	0.080	0.25	0.30
AUG 18...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	0.13	1.50	0.100	0.130	0.17	3.8	3.9	0.260	0.090	0.070	0.21	0.26
DATE	PHOSPHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUMINUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYLLIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHROMIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 26...	0.01	30	2	200	<2	<3	<1	<9	9	48	6	21
JAN 29...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	0.08	--	--	--	--	--	--	--	--	--	--	--
APR 02...	0.01	<10	2	200	<2	5	<1	<9	19	38	8	47
MAY 19...	0.03	10	4	150	2	3	1	<9	6	<9	<5	61
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	0.02	--	--	--	--	--	--	--	--	--	--	--
AUG 18...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	0.02	270	2	130	<0.5	1	<5	<3	11	190	5	13

ARKANSAS RIVER BASIN

07161000 CIMARRON RIVER AT PERKINS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 26...	32	--	<30	4	1	<1.0	830	<17	50	--	--	--
JAN 29...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	--	--	--	--	--	--	--	--	--	607	4590	45
APR 02...	14	<0.1	<30	5	3	<1.0	2100	<18	97	384	2820	79
MAY 19...	9	0.1	<30	<1	2	<1.0	2100	<18	26	89	203	85
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 24...	--	--	--	--	--	--	--	--	--	248	1500	93
AUG 18...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	6	0.5	<10	<10	<1	<1.0	410	7	18	7970	193000	95

07163000 COUNCIL CREEK NEAR STILLWATER, OK

LOCATION.--Lat 36°06'58", long 96°52'03", in NW 1/4 NE 1/4 sec.22, T.19 N., R.4 E., Payne County, Hydrologic Unit 11050003, on right bank downstream side of bridge on State Highway 51, 10.0 mi east of Stillwater, and at mile 10.0.

DRAINAGE AREA.--31 mi².

PERIOD OF RECORD.--March 1934 to current year.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 828.28 ft above National Geodetic Vertical Datum of 1929. Prior to May 4, 1934, nonrecording gage at same site and datum. Prior to Nov. 9, 1982, gage 200 ft upstream at 10.00 ft higher datum.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--53 years, 11.8 ft³/s, 5.17 in/yr, 8,549 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 25,000 ft³/s, Oct. 2, 1959, gage height, 28.9 ft, present datum, from floodmarks, from rating curve extended above 2,500 ft³/s on basis of slope-area measurements at gage heights 13.4 ft and 17.5 ft; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 27, 1912, reached a stage of 16.6 ft at gage, based on floodmarks set by local resident at site 900 ft downstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	0730	2,720	17.34	Mar. 17	0515	1,570	14.23
Oct. 2	2330	*3,100	*18.21	May 27	2315	2,880	17.71
Nov. 25	2200	2,610	17.06	May 28	2230	1,380	13.63
Feb. 15	0400	1,710	14.63	July 4	1045	1,600	14.34
Feb. 28	1315	1,740	14.73				

Minimum daily discharge, 0.13 ft³/s, Aug. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	596	5.0	13	8.8	45	161	8.1	3.6	15	5.7	.57	.43
2	385	6.4	9.5	8.8	43	40	7.4	3.4	6.4	1.9	.57	.40
3	761	6.4	8.5	8.8	25	28	6.5	3.3	28	1.7	.50	.37
4	64	331	7.2	9.5	19	22	6.9	2.9	7.6	348	.46	.29
5	21	155	6.5	9.4	102	19	6.8	2.8	3.9	27	.50	.26
6	12	29	6.4	9.2	293	16	6.8	2.8	2.8	7.1	.54	.26
7	8.3	15	278	9.2	48	15	6.9	2.8	2.4	3.2	.54	.43
8	5.8	10	144	9.3	29	14	7.2	2.6	2.1	2.0	.49	.50
9	4.7	7.5	119	171	21	13	7.4	2.5	2.0	1.6	.40	.59
10	4.5	7.3	33	46	18	12	8.0	2.6	2.0	1.5	.43	1.6
11	4.5	18	23	21	16	11	8.5	2.3	2.3	1.4	.46	1.1
12	3.7	9.9	20	17	15	10	8.0	2.2	2.4	2.2	.52	1.0
13	2.9	5.9	17	14	13	9.8	7.1	2.0	2.0	15	.90	1.1
14	2.4	5.1	15	13	13	9.9	6.8	2.0	1.9	2.1	.92	.88
15	2.2	5.3	15	11	602	9.1	6.8	1.9	1.8	1.4	.59	.71
16	2.3	5.4	14	e10	117	9.1	6.9	1.7	1.6	1.2	.44	.67
17	2.2	5.4	14	e9.9	48	535	7.3	1.6	1.5	1.1	.41	.66
18	2.3	5.4	12	e9.5	88	46	7.9	1.6	1.5	1.1	.33	4.5
19	2.4	5.2	11	e9.1	87	24	7.2	1.5	1.8	1.1	.32	1.9
20	2.4	5.6	11	e8.6	61	18	6.1	1.4	10	.91	.27	1.3
21	2.4	6.0	11	e8.1	37	15	7.9	1.4	2.9	.87	.27	1.2
22	354	5.4	10	e7.7	28	14	7.7	1.4	1.6	.87	.20	1.0
23	36	5.4	9.6	e7.3	22	30	5.8	1.6	1.4	.78	.15	1.0
24	12	5.1	9.6	e6.6	25	59	5.4	1.9	1.3	.76	.13	1.0
25	6.6	534	9.6	e6.2	33	18	5.2	3.0	1.2	.76	.18	1.0
26	5.1	343	9.6	e5.8	65	12	5.0	2.2	1.4	.67	.26	1.0
27	4.3	34	9.3	51	139	11	4.5	487	1.3	.66	.57	1.0
28	3.8	20	8.8	184	930	10	4.2	678	1.2	.66	.48	5.1
29	3.9	15	8.8	140	---	8.5	4.0	230	1.2	.63	.49	2.7
30	5.7	15	8.8	33	---	8.0	3.7	25	51	.63	.51	e1.0
31	5.4	---	8.8	23	---	8.0	---	13	---	.57	.50	---
TOTAL	2328.8	1626.7	881.0	885.8	2982	1215.4	198.0	1492.0	163.5	435.07	13.90	34.95
MEAN	75.1	54.2	28.4	28.6	106	39.2	6.60	48.1	5.45	14.0	.45	1.16
MAX	761	534	278	184	930	535	8.5	678	51	348	.92	5.1
MIN	2.2	5.0	6.4	5.8	13	8.0	3.7	1.4	1.2	.57	.13	.26
AC-FT	4620	3230	1750	1760	5910	2410	393	2960	324	863	28	69

CAL YR 1986 TOTAL 8360.53 MEAN 22.9 MAX 1800 MIN .00 AC-FT 16580
WTR YR 1987 TOTAL 12257.12 MEAN 33.6 MAX 930 MIN .13 AC-FT 24310

e Estimated

ARKANSAS RIVER BASIN

07164200 KEYSTONE LAKE NEAR SAND SPRINGS, OK

LOCATION.--Lat 36°09'05", long 96°15'05", in SW 1/4 SE 1/4 sec.4, T.19 N., R.10 E., Tulsa County, Hydrologic Unit 11110101, in stair tower of intake structure near left end of Keystone Dam on Arkansas River, 8.5 mi west of Sand Springs, and at mile 538.8.

DRAINAGE AREA.--74,506 mi², of which 12,541 mi² is probably noncontributing.

PERIOD OF RECORD.--September 1964 to current year. Prior to October 1970, published as Keystone Reservoir near Sand Springs.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Nov. 1, 1964, nonrecording gage nearby at same datum.

REMARKS.--Reservoir is formed by rolled-fill earth dam. Spillway is concrete ogee-type weir controlled by 18 40-foot taintor gates. Outlet works consist of nine sluices. Regulated storage began Sept. 11, 1964; power pool was first filled Nov. 20, 1964. Capacity, 1,738,000 acre-ft, at elevation 754.0 ft, top of flood control pool, 557,600 acre-ft, at elevation 723.0 ft, top of power pool, 260,900 acre-ft, at elevation 706.0 ft, minimum power pool. Figures given herein represent total contents. Reservoir is designed for flood control, power development, and conservation. Revised capacity table, based on survey in 1977, used since Oct. 1, 1983.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,886,000 acre-ft, Nov. 6, 1974, elevation, 754.86 ft; minimum since power pool was first filled, 297,800 acre-ft, Jan. 19, 1965, elevation, 705.07 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,840,000 acre-ft, Oct. 6, elevation 755.85 ft; minimum, 524,300 acre-ft, Sept. 30, elevation, 721.55 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

720	490,500	750	1,530,000
730	745,900	760	2,086,000
740	1,088,000		

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1149000	802400	583900	594100	668900	955100	662600	545000	1162000	665900	586900	567400
2	1431000	776400	591300	587800	683700	1048000	663900	537600	1133000	656600	584100	569300
3	1648000	761000	598300	587600	683400	1104000	664800	551000	1110000	655500	581200	571900
4	1682000	782600	605700	585900	683400	1106000	665000	551700	1073000	686500	580200	572200
5	1811000	823800	614400	580500	681700	1076000	663700	550600	1035000	723800	578500	571200
6	1795000	909600	613300	573900	686800	1029000	653000	546600	978200	748300	575600	569500
7	1700000	964000	604100	566900	682300	981800	637200	534700	916100	769300	570700	553600
8	1608000	960400	581700	562800	668300	939300	620800	539000	863200	779800	574800	546800
9	1562000	930300	565000	564500	650100	900300	610300	576800	828700	782600	579500	541100
10	1389000	898600	570500	565900	629000	867200	602400	597800	812600	777600	571600	535800
11	1289000	863900	586100	567100	611800	833600	592800	605400	795800	786700	577800	529000
12	1196000	831900	598800	563100	598100	803700	583400	609500	783500	793900	574400	539700
13	1130000	799900	600800	578500	587400	778900	581700	609200	776400	751900	571900	548500
14	1104000	766800	583900	578300	578700	748000	586900	605700	784200	740400	561600	550600
15	1020000	735700	583200	573900	585400	720600	588800	609000	759200	726800	555200	552900
16	978500	709500	586100	571200	624000	701700	587400	605900	753100	725300	568100	554300
17	962500	688200	586600	570700	672800	728800	582700	600600	749500	716500	574600	552900
18	947000	670000	589100	572400	713300	777900	576500	593100	744600	724700	580700	552000
19	931700	660700	590800	567400	738400	819600	571700	584400	741600	737800	585400	547500
20	918200	662000	592800	565000	751900	822200	572900	571200	751900	686300	583200	544500
21	906800	657700	596100	561400	754600	795100	573100	564700	759500	669200	573400	544700
22	933700	651900	598800	559500	749500	764100	573400	559300	761900	645700	576800	547500
23	991800	645700	602400	559300	736900	747100	573400	566400	750700	620800	575800	548700
24	1043000	641200	606700	557600	723500	735400	572900	578300	735400	614600	570200	549400
25	1028000	620300	610500	559500	707400	741300	571900	586600	720600	626300	566400	548900
26	998300	566900	614400	558100	693100	774800	570000	583900	708900	624000	571000	538500
27	961800	539200	619500	559300	690200	774200	567600	562300	699900	620300	574600	536900
28	924400	536500	628200	564000	769300	742500	571700	643300	691100	614600	569300	535300
29	888800	550800	625800	581400	---	703100	565000	868200	681700	608500	566900	525200
30	857900	568800	610800	599100	---	677500	555700	1075000	673600	596600	571500	549400
31	826700	---	599800	632700	---	666700	---	1156000	---	590300	571700	---
MAX	1811000	964000	628200	632700	769300	1106000	665000	1156000	1162000	793900	586900	572200
MIN	826700	536500	565000	557600	578700	666700	555700	534700	673600	590300	555200	525200
(+)	732.59	723.47	724.73	726.00	730.77	727.26	722.92	741.70	727.51	724.35	723.59	722.65
(++)	-4,200	-257,900	+31,000	+32,900	+136,600	-102,600	-111,000	+600,300	-482,400	-83,300	-18,600	-22,300

CAL YR 1986 MAX 1811000 MIN 513600 (++) -20,800

WTR YR 1987 MAX 1811000 MIN 525200 (++) -281,500

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

LOCATION REVISED.--Lat 36°08'27", long 96°00'21", in SE 1/4 NW 1/4 sec.11, T.19 N., R.12 E., Tulsa County, Hydrologic Unit 111010101, at right abutment on downstream side of 11th Street bridge in Tulsa, 10.1 mi upstream from Polecat Creek, 15.1 mi downstream from Keystone Dam, and at mile 523.7.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1925 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected in this vicinity since 1904 are published in reports of the National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 615.23 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Feb. 2, 1939, nonrecording gage and Feb. 2, 1939 to Sept. 30, 1952, water-stage recorder at datum 3.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Except for 109 mi² intervening area, flow completely regulated by Keystone Lake (station 07164200) since September 1964. Prior to September 1964, minor regulation by John Martin Lake in Colorado and by Great Salt Plains Lake (station 07150000). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Keystone Lake, 39 years (water years 1926-64), 6,554 ft³/s, 4,745,000 acre-ft/yr; since regulation by Keystone Lake, 23 years (water years 1965-87), 7,854 ft³/s, 5,690,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 307,000 ft³/s, Oct. 5, 1986, gage height, 25.21 ft; minimum, 27 ft³/s, Oct. 12, 13, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1904, 22.8 ft, June 13, 1923, present datum, from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 307,000 ft³/s, Oct. 5, gage height, 25.21 ft; minimum daily discharge, 732 ft³/s, Sept. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9020	26600	21500	9630	14000	22000	36300	10800	46500	15300	8110	10300
2	1000	26200	12200	9190	15100	24500	30400	10100	52700	16100	6510	6750
3	33900	25900	12200	8960	18100	33900	31400	2250	51600	18700	7300	8200
4	224000	24900	12200	8440	18100	41400	31400	10400	53300	19400	5730	9080
5	261000	24200	12700	10100	18900	43800	31600	7430	61000	19100	4560	9400
6	175000	26400	8460	11000	20800	51700	33600	8560	59100	21000	4390	6810
7	156000	29500	9190	10000	23000	51100	34400	12500	56300	25600	5130	13400
8	118000	38800	6960	10400	22800	50500	31300	12900	51300	25000	2660	7920
9	115000	39100	6690	10300	22500	48700	23600	12500	40800	23900	890	8020
10	114000	38100	16400	11500	22200	42700	20200	12700	29600	23900	984	4010
11	114000	32700	22900	11600	21800	41500	19400	11900	25700	23800	3600	2220
12	106000	30500	21500	13600	20200	39700	19200	11900	23700	23600	4250	1620
13	92200	27700	13600	5810	16600	36600	13000	11900	21000	23500	5540	732
14	80500	27100	4010	6350	13700	35700	11700	11900	21100	23300	7210	1930
15	68800	26800	5820	11500	12100	34600	11300	9760	20700	23400	8830	4990
16	57400	26700	12200	11400	13800	32800	11200	7020	17500	23400	3040	6270
17	40200	25400	8910	10200	16300	29700	15000	8470	15800	22500	10800	6370
18	32900	22400	9170	11700	23700	29500	15800	9310	12500	21100	10900	6460
19	32600	19300	9580	10500	20600	35100	15700	11900	15800	20500	13100	6170
20	30300	12600	8880	11500	20600	47100	12800	11400	15500	20300	13100	6590
21	27000	12400	9250	11100	20700	54600	12800	8670	15500	21600	13100	3020
22	27900	12600	9920	9120	20800	52700	12800	11400	17100	24200	4980	3840
23	27700	12200	10000	8330	20900	48900	12600	4570	20800	23800	3880	4400
24	32000	12100	10300	10300	20900	42400	12600	3690	20200	19400	5550	4800
25	43600	12700	11300	7210	21100	49500	12800	4340	20700	4860	7980	4590
26	42900	10000	9080	7520	20700	50800	12700	7250	19400	13300	6080	8310
27	42100	12200	10300	7340	20800	54700	12800	18000	15300	13400	3890	5910
28	42300	15500	10800	7730	23900	58700	9640	36900	15300	13800	3960	6410
29	39600	23300	10700	7030	---	55600	10900	44400	15200	13700	6150	16100
30	35200	23100	12000	7590	---	50000	10200	44700	15400	12800	5120	15900
31	32300	---	10500	9970	---	39000	---	44400	---	8610	5200	---
TOTAL	2254420	697000	349220	296920	544700	1329500	569140	433920	866400	602870	192524	200522
MEAN	72720	23230	11270	9578	19450	42890	18970	14000	28880	19450	6210	6684
MAX	261000	39100	22900	13600	23900	58700	36300	44700	61000	25600	13100	16100
MIN	1000	10000	4010	5810	12100	22000	9640	2250	12500	4860	890	732
AC-FT	4472000	1382000	692700	588900	1080000	2637000	1129000	860700	1719000	1196000	381900	397700
CAL YR 1986	TOTAL 5034849		MEAN 13790	MAX 261000	MIN 266	AC-FT 9987000						
WTR YR 1987	TOTAL 8337136		MEAN 22840	MAX 261000	MIN 732	AC-FT 16540000						

ARKANSAS RIVER BASIN

07164500 ARKANSAS RIVER AT TULSA, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1960-61, 1977 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1977 to July 1985.

WATER TEMPERATURE: March 1977 to July 1985.

INSTRUMENTATION.--Water-quality monitor since March 1977.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,820 microsiemens, Feb. 16, 1978; minimum daily, 518 microsiemens, July 27, 1977.

WATER TEMPERATURE: Maximum daily, 32.0 °C, July 3-6, 14, 1978; minimum daily, 0.0 °C on many days during winter periods.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
OCT											
16...	1240	1028	1028	11.04	63000	560	7.80	22.0	22.5	--	--
DEC											
16...	1730	1028	80020	6.62	12800	1650	8.20	9.0	8.0	11	750
JAN											
27...	1214	1028	80020	2.78	1860	2240	8.20	10.0	4.0	3.1	750
MAR											
05...	1145	1028	1028	9.59	40700	1410	8.10	24.0	12.5	--	--
25...	1500	1028	80020	9.88	51500	934	8.20	15.0	13.0	58	740
MAY											
19...	1325	1028	80020	4.96	12500	2220	8.10	35.0	23.0	12	740
JUN											
02...	1515	1028	1028	10.77	54000	760	7.80	--	23.0	--	--
17...	1215	1028	80020	5.90	18100	1180	8.10	32.0	25.5	28	740
SEP											
01...	1615	1028	80020	4.59	11200	1600	8.00	29.0	27.0	6.5	750
DATE		OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO
OCT											
16...	--	--	--	--	--	--	--	--	--	--	--
DEC											
16...	11.0	95	K20	K17	270	120	72	21	230	65	6
JAN											
27...	11.8	92	--	--	340	150	92	27	300	65	7
MAR											
05	--	--	--	--	--	--	--	--	--	--	--
25...	9.2	90	K84	K49	200	79	54	15	110	54	4
MAY											
19...	7.4	90	K4	K10	320	180	83	27	330	69	8
JUN											
02...	--	--	--	--	--	--	--	--	--	--	--
17...	7.8	99	K12	K7	220	40	61	17	140	57	4
SEP											
01...	7.6	98	34	53	270	130	70	24	200	61	5

ARKANSAS RIVER BASIN

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07164500 ARKANSAS RIVER AT TULSA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)	CAR- BONATE WATER WH IT FIELD (MG/L AS C03)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)
OCT 16...	--	--	--	--	--	--	--	--	--	--	--
DEC 16...	4.4	184	0	151	120	350	0.20	10	908	901	1.23
JAN 27...	4.2	233	0	191	150	460	0.30	9.5	1170	1170	1.59
MAR 05...	--	--	--	--	--	--	--	--	--	--	--
MAY 25...	3.7	143	0	117	83	160	0.30	7.5	514	509	0.70
JUN 19...	5.1	176	0	144	190	480	0.30	9.9	1230	1220	1.67
JUN 02...	--	--	--	--	--	--	--	--	--	--	--
SEP 17...	5.5	146	0	120	130	220	0.30	7.6	668	695	0.91
SEP 01...	6.5	154	0	126	170	--	0.40	4.5	903	--	--
DATE	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	
OCT 16...	--	--	--	--	--	--	--	--	--	--	
DEC 16...	31400	--	<0.010	--	0.730	0.070	0.050	0.06	0.43	0.50	
JAN 27...	5880	0.840	0.010	0.03	0.850	0.060	0.060	0.08	0.64	0.70	
MAR 05...	--	--	--	--	--	--	--	--	--	--	
MAY 25...	71500	0.820	0.020	0.07	0.840	0.140	0.120	0.15	0.66	0.80	
JUN 19...	41500	0.460	0.070	0.23	0.530	0.060	0.060	0.08	0.54	0.60	
JUN 02...	--	--	--	--	--	--	--	--	--	--	
SEP 17...	32600	--	<0.010	--	0.590	0.040	0.030	0.04	0.86	0.90	
SEP 01...	--	--	<0.010	--	0.290	0.030	<0.010	--	2.8	2.8	
DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	
OCT 16...	--	--	--	--	--	--	--	--	--	--	
DEC 16...	0.120	0.100	0.070	0.21	0.12	0.03	--	--	--	--	
JAN 27...	0.120	0.090	0.080	0.25	0.12	0.01	20	2	100	<10	
MAR 05...	--	--	--	--	--	--	--	--	--	--	
MAY 25...	0.110	0.090	0.080	0.25	0.11	0.01	30	1	110	<0.5	
JUN 19...	0.110	0.080	0.060	0.18	0.11	0.02	70	2	100	<10	
JUN 02...	--	--	--	--	--	--	--	--	--	--	
SEP 17...	0.150	0.090	0.070	0.21	0.15	0.02	30	1	150	<0.5	
SEP 01...	0.090	0.060	0.030	0.09	0.09	0.03	--	--	--	--	

ARKANSAS RIVER BASIN

07164500 ARKANSAS RIVER AT TULSA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
OCT 16...	--	--	--	--	--	--	--	--	--	--
DEC 16...	--	--	--	--	--	--	--	--	--	--
JAN 27...	<1	<1	<1	4	<10	<5	10	20	0.3	5
MAR 05...	--	--	--	--	--	--	--	--	--	--
25...	<1	<1	<3	3	20	<5	11	3	<0.1	<10
MAY 19...	<1	3	<1	3	<10	<5	20	20	0.2	1
JUN 02...	--	--	--	--	--	--	--	--	--	--
17...	<1	<1	<3	5	21	<5	14	14	0.3	<10
SEP 01...	--	--	--	--	--	--	--	--	--	--

DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 16...	--	--	--	--	--	--	--	--	--
DEC 16...	--	--	--	--	--	--	39	1350	52
JAN 27...	1	1	<1.0	940	7	<10	60	301	79
MAR 05...	--	--	--	--	--	--	--	--	--
25...	1	<1	<1.0	520	<6	<3	106	14700	81
MAY 19...	2	<1	<1.0	880	<16	<10	41	1380	52
JUN 02...	--	--	--	--	--	--	--	--	--
17...	7	1	<1.0	570	<6	11	32	1560	90
SEP 01...	--	--	--	--	--	--	10	302	42

07165000 HEYBURN LAKE NEAR HEYBURN, OK

LOCATION.--Lat 35°56'52", long 96°17'55", in SE 1/4 sec.13, T.17 N., R.9 E., Creek County, Hydrologic Unit 11110101, at intake structure at right abutment of Heyburn Dam on Polecat Creek, 2.5 mi northwest of Heyburn, 3.5 mi upstream from bridge on U.S. Highway 66, 11.0 mi southwest of Sapulpa, and at mile 48.6.

DRAINAGE AREA.--123 mi².

PERIOD OF RECORD.--October 1950 to current year. Prior to October 1970, published as Heyburn Reservoir near Heyburn.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam. Outlet works consist of an 8-foot, 3-inch diameter concrete conduit extending from an uncontrolled concrete drop inlet at the upstream side of dam at a concrete stilling basin near downstream toe of dam and three, 36-inch gated lowflow pipes which drain into the conduit below the drop inlet. Spillway is 200-foot channel in a natural saddle about 1,000 ft west of right abutment. Storage began Sept. 29, 1950; conservation pool was first filled Mar. 10, 1951. Capacity, 147,600 acre-ft, at elevation 802.0 ft maximum pool, 55,400 acre-ft, at elevation 784.0 ft, spillway crest and top of flood control pool, and 7,105 acre-ft, at elevation 761.5, conservation pool. Dead storage, 293 acre-ft, below elevation 740.0 ft, invert of lowflow sluices. Reservoir was designed for flood control and conservation. Figures given herein represent total contents. Revised capacity table, based on survey in 1978, used since Oct. 1, 1984.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 32,210 acre-ft, Nov. 4, 1974, elevation, 776.85 ft; minimum since conservation pool was first filled, 4,070 acre-ft, May 8, 9, 1981, elevation 757.95 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 17,420 acre-ft, Oct. 1, elevation, 769.75 ft; minimum, 6,640 acre-ft, Sept. 9-11, elevation 760.96 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

760	5,880	770	17,820
765	10,770		

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17430	7425	7726	7389	8565	16230	7597	6838	9103	7300	7167	6785
2	14760	7398	7652	7380	8424	13470	7561	7317	8505	7335	7149	6759
3	13350	7371	7597	7407	8205	10930	7543	7309	8364	7326	7131	6742
4	10910	9648	7552	7416	8020	9557	7434	7300	8068	8566	7105	6717
5	9422	9422	7497	7416	8566	8826	7506	7291	7829	8244	7088	6700
6	8648	8773	7898	7425	9705	8404	7506	7282	7689	7953	7070	6683
7	8185	8344	8303	7425	9136	8165	7506	7273	7578	7778	7053	6675
8	7972	8073	8654	7552	8617	8000	7497	7264	7506	7648	7018	6658
9	7736	7905	8847	8857	8274	7886	7488	7245	7443	7524	7000	6641
10	7634	8344	8444	8515	8117	7829	7515	7237	7443	7452	6974	6641
11	7717	8464	8165	8195	7953	7773	7506	7237	7533	7389	6957	6641
12	7736	8175	7972	8000	7858	7708	7497	7237	7524	7416	6922	6700
13	7764	7953	7829	7343	7782	7661	7497	7237	7470	7380	6931	6700
14	7680	7810	7736	7764	7764	7648	7506	7229	7434	7344	6922	6692
15	7597	7717	7698	7689	8659	7648	7488	7220	7380	7309	6896	6759
16	7515	7652	7661	7543	8826	7615	7479	7202	7371	7264	6879	6802
17	7461	7615	7625	7680	8617	9525	7470	7193	7326	7309	6862	6802
18	7425	7552	7587	7717	8700	9028	7461	7184	7300	9071	6845	6879
19	7389	7524	7561	7764	8700	8556	7452	7175	7515	8424	6811	6931
20	7362	7497	7524	7782	8607	8244	7452	7158	7801	8039	6794	6931
21	7344	7461	7506	7801	8454	8073	7625	7158	7708	7810	6759	6931
22	9762	7452	7488	7792	8264	7981	7625	7220	7606	7652	6751	6905
23	9017	7452	7470	7801	8117	8215	7578	7264	7524	7552	6717	6838
24	8464	7407	7461	7843	8107	8638	7488	7416	7461	7470	6700	6853
25	8126	8146	7452	7829	8117	8344	7515	7533	7434	7407	6675	6845
26	7905	8900	7434	7782	8434	8314	7461	7506	7308	7362	6802	6819
27	7754	8464	7425	8107	9158	8314	7425	7736	7335	7317	6845	6811
28	7643	8165	7425	8815	17190	8314	7362	10840	7300	7282	6836	6811
29	7570	7953	7416	9190	---	8304	7371	10870	7264	7237	6819	6802
30	7506	7829	7416	8690	---	7680	7353	9512	7309	7211	6811	6785
31	7461	---	7308	7843	---	7641	---	9659	---	7193	6802	---
MAX	17430	9648	8847	9190	17190	16230	7625	10870	9103	9071	7167	6931
MIN	7344	7371	7308	7343	7764	7615	7353	6838	7264	7193	6675	6641
(+)	761.90	762.30	761.83	762.32	769.61	762.10	761.78	764.06	761.73	761.60	761.15	761.13
(++)	+1,274	+368	-521	+535	+9,347	-9,549	-288	+2,306	-2,350	-116	-391	-17
CAL YR 1986	MAX 17430	MIN 6048	(++)	-17								
WTR YR 1987	MAX 17430	MIN 6641	(++)	+598								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07165570 ARKANSAS RIVER NEAR HASKELL, OK

LOCATION.--Lat 35°49'23", long 95°38'39", in NE 1/4 sec.31, T.16 N., R.16 E., Muskogee County, Hydrologic Unit 11110101, near right bank on downstream side of bridge on State Highway 104, 2.0 mi east of Haskell, 23.5 mi upstream from Verdigris River, and at mile 483.7.

DRAINAGE AREA.--75,473 mi², of which 12,541 mi² probably is noncontributing.

PERIOD OF RECORD.--June 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 530.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Keystone Lake (station 07164200) 55.1 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--15 years, 9,997 ft³/s, 7,243,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 259,000 ft³/s, Oct. 5, 1986, gage height, 22.82 ft; minimum daily, 193 ft³/s, Feb. 26, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 259,000 ft³/s, Oct. 5, gage height, 22.82 ft; minimum daily discharge, 1,100 ft³/s, Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50000	36800	16500	10400	12600	45900	43700	10200	e40500	17900	10100	7130
2	41500	33700	15500	8650	18700	38200	37800	10300	e44700	17700	9110	9830
3	18700	33200	14800	9900	20600	40100	36100	10300	e47000	19800	7920	7750
4	119000	26400	14800	8460	22200	46400	35800	2740	56100	21500	8230	8640
5	243000	24700	11100	8280	22300	47700	35500	6120	e54300	24300	7040	9700
6	179000	31200	12300	10300	23700	52200	35300	8160	e55000	22000	6100	9450
7	175000	35100	11000	11500	28400	54800	38100	8550	60200	26000	5970	8020
8	125000	40700	13000	11000	28500	54900	37700	8920	60500	28100	6240	12300
9	117000	44100	10900	14500	27900	56500	31900	13400	51300	26900	3290	8290
10	115000	44000	11100	16400	27400	54100	25400	8520	39000	27000	1440	8700
11	113000	42200	24300	14000	26800	52600	24200	12400	31600	26900	1100	8730
12	115000	39200	27300	13700	26200	51900	23900	12100	29300	26500	4550	8410
13	95200	34700	21800	14600	22700	49700	23100	11900	25400	26900	5500	3710
14	81800	32800	14200	5350	18100	48400	18000	11900	24300	26100	7600	1530
15	70600	32300	3270	7990	16100	47600	15300	12200	24000	25900	8660	2310
16	61300	30800	8380	12500	17400	46800	15000	9230	22300	25800	8850	6500
17	51200	27400	12900	12600	18900	47000	14800	8420	20300	25700	5090	7760
18	41200	24500	9870	13000	24400	48400	16500	9250	17600	26200	11000	7730
19	39100	16200	10900	13000	28900	44100	18500	9640	17400	23700	11300	7870
20	38700	15800	10800	12400	25900	49700	18100	10700	18900	22500	12800	7480
21	35500	15500	9940	13000	25500	56700	16200	11000	18300	21900	12800	7580
22	34100	15100	10500	12300	25300	59600	14600	9170	18200	25000	12200	5990
23	35500	14900	10600	11200	25100	57000	14400	8420	21600	25600	5440	5790
24	35100	16400	10400	9680	25200	53200	14400	2790	22800	24700	4910	5550
25	43200	16000	10700	10700	25700	52500	14200	3180	23100	15500	7160	5840
26	46000	16400	10900	7620	26000	53200	14200	3830	22800	9690	8830	5600
27	45400	19200	9550	8480	28000	53800	14000	7950	20300	14600	8840	9310
28	45800	28200	10600	8600	39200	56900	11400	e11300	18000	14400	5170	6750
29	46000	27300	10800	11000	---	55900	11100	e29200	17800	14600	5560	9350
30	42900	25800	11000	10000	---	54300	9310	e40000	17900	14400	6650	16500
31	40800	---	12200	9880	---	50700	---	e37000	---	13100	5370	---
TOTAL	2340600	840600	391910	340990	677700	1580800	678510	358790	940500	680890	224820	230100
MEAN	75500	28020	12640	11000	24200	50990	22620	11570	31350	21960	7252	7670
MAX	243000	44100	27300	16400	39200	59600	43700	40000	60500	28100	12800	16500
MIN	18700	14900	3270	5350	12600	38200	9310	2740	17400	9690	1100	1530
AC-FT	4643000	1667000	777400	676400	1344000	3136000	1346000	711700	1865000	1351000	445900	456400
CAL YR 1986	TOTAL 5515670 MEAN 15110 MAX 243000 MIN 326 AC-FT 10940000											
WTR YR 1987	TOTAL 9286210 MEAN 25440 MAX 243000 MIN 1100 AC-FT 18420000											

e Estimated

ARKANSAS RIVER BASIN

07171000 VERDIGRIS RIVER NEAR LENAPAH, OK

LOCATION.--Lat 36°51'05", long 95°35'06", at center of sec.3, T.27 N., R.16 E., Nowata County, Hydrologic Unit 11070103, on right bank on downstream side of county road bridge, 2.8 mi east of Lenapah, 4.5 mi upstream from Cedar Creek, and at mile 144.6.

DRAINAGE AREA.--3,639 mi².

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 977: 1942 (M). WSP 1117: drainage area.

GAGE.--Water-stage recorder. Datum of gage is 644.89 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since April 1949 by Fall River Reservoir in Kansas. Flow regulated since 1960 by Toronto Lake in Kansas. Flow has been further regulated since 1966 by Elk Reservoir in Kansas. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation, 11 years (water years 1939-49), 2,599 ft³/s, 1,833,000 acre-ft/yr; since regulation, 21 years (water years 1967-87), 2,770 ft³/s, 2,007,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137,000 ft³/s, May 20, 1943, gage height, 40.44 ft, from floodmarks; no flow at times in 1939-40, and 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 81,500 ft³/s, Oct. 5, gage height, 38.34 ft; minimum daily discharge, 32 ft³/s, Aug. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42600	10300	5280	1350	4630	27900	3990	627	6630	235	53	352
2	44600	9740	4600	1340	4640	23800	2970	603	7650	236	49	338
3	47400	9460	3710	1340	4190	16100	2220	588	10400	283	44	331
4	60500	9930	3580	1310	2730	7040	1580	489	9960	357	34	321
5	76200	16100	3380	1230	2100	11600	1140	406	9680	1360	32	294
6	69000	11800	2950	1220	5010	13900	1060	3890	10200	3060	52	241
7	47900	7500	4380	1320	5970	11900	1020	10300	10300	1450	73	207
8	40500	5850	11000	1420	4850	6590	984	10300	10100	940	58	172
9	36700	5200	10700	2000	3630	1950	963	4820	9900	1240	54	139
10	29800	4900	9530	2630	3550	1380	938	4610	8840	1230	49	107
11	25900	5090	9100	1980	3520	1240	918	4380	8090	1010	46	93
12	26300	4160	7970	1760	3420	1150	854	3020	6570	827	46	111
13	26100	3160	7170	1990	3340	1080	1130	4630	4590	3010	116	138
14	26000	2260	5640	2450	5260	1010	1660	4420	2700	2750	1910	134
15	24100	1620	4460	3520	21500	945	1800	2700	1950	1530	1650	134
16	20200	1310	3580	4080	22900	888	2450	3240	1750	1180	1100	184
17	18000	1150	3040	3300	12700	5800	2520	2900	1380	1170	1340	297
18	17000	1230	2460	2790	6020	15900	2850	2600	842	1070	1170	222
19	16300	1330	2150	2610	8770	16200	3130	2090	565	723	902	170
20	15600	1330	1870	2590	10300	13900	3250	2460	334	670	959	149
21	15000	1170	1690	2970	10200	13700	4590	1580	284	498	918	194
22	19000	1120	1450	3160	9340	14300	6160	1280	220	343	824	247
23	19400	1120	1300	2980	8020	14300	2950	1250	216	277	583	225
24	13300	1090	1290	2130	7440	14600	1810	1330	173	243	813	216
25	12800	2370	1320	1760	6610	14600	1630	5490	150	197	383	208
26	14500	19500	1290	1730	5460	14000	1450	8620	135	176	329	185
27	14700	20700	1260	1650	5810	12100	1290	3900	193	163	312	140
28	13000	7110	1240	1680	17200	8660	954	17800	461	149	534	138
29	12100	5340	1230	7080	---	6140	724	24800	342	143	1160	129
30	11500	5430	1220	9270	---	5280	673	19600	220	112	1030	93
31	11100	---	1250	5500	---	5100	---	5820	---	65	539	---
TOTAL	867100	178370	121090	82140	209110	303053	59658	160543	124825	26697	17162	5909
MEAN	27970	5946	3906	2650	7468	9776	1989	5179	4161	861	554	197
MAX	76200	20700	11000	9270	22900	27900	6160	24800	10400	3060	1910	352
MIN	11100	1090	1220	1220	2100	888	673	406	135	65	32	93
AC-FT	1720000	353800	240200	162900	414800	601100	118300	318400	247600	52950	34040	11720

CAL YR 1986 TOTAL 1753393 MEAN 4804 MAX 76200 MIN 40 AC-FT 3478000
WTR YR 1987 TOTAL 2155657 MEAN 5906 MAX 76200 MIN 32 AC-FT 4276000

ARKANSAS RIVER BASIN

07171300 OOLOGAH LAKE NEAR OOLOGAH, OK

LOCATION.--Lat 36°25'19", long 95°40'43", in NE 1/4 NW 1/4 sec.2, T.22 N., R.15 E., Rogers County, Hydrologic Unit 11070103, in gage tower 1,000 ft from left end of dam on Verdigris River, 2.0 mi southeast of Oologah, and at mile 90.3.

DRAINAGE AREA.--4,339 mi².

PERIOD OF RECORD.--May 1963 to current year. Prior to October 1970, published as Oologah Reservoir near Oologah.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Spillway is concrete ogee-type weir controlled by 7 taintor gates.

Storage began May 15, 1963, conservation pool was first filled Apr. 4, 1964. Capacity 1,519,000 acre-ft at elevation 661.0 ft, top of flood control pool, 553,400 acre-ft at elevation 638.0 ft, conservation pool. Dead storage 9,260 acre-ft below elevation 592.0 ft. Figures given herein represent total contents. Reservoir is used for flood control and conservation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,751,000 acre-ft, Oct. 9, 1986, elevation, 664.90 ft; minimum since conservation pool first filled 33,750 acre-ft, Aug. 28, and Oct. 27, 1969, elevation, 602.87 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,751,000 acre-ft, Oct. 9, elevation, 664.90 ft; minimum, 516,300 acre-ft, May 4, elevation, 636.71 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

635	469,400	655	1,203,000
640	614,100	660	1,462,000
645	782,400	665	1,757,000
650	978,000		

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	910100	890700	758100	585600	581100	849600	715000	523200	649900	618100	550800	552800
2	1014000	852700	754300	579500	578400	882400	700100	523500	676000	616000	550500	552600
3	1137000	827900	748700	574000	574500	895500	690300	522400	690000	620300	549100	552600
4	1268000	826100	744600	567900	567000	884800	680900	532200	696600	606500	550300	552300
5	1421000	836800	736900	559200	560600	878500	668800	524400	701800	605000	547400	552300
6	1591000	825000	731400	562000	563600	876100	657400	529600	707700	604600	545900	552600
7	1700000	808300	730300	561200	568500	872100	647300	547100	714000	603400	543900	552300
8	1746000	793900	742500	560600	570000	862200	639100	558300	720200	603100	542800	551100
9	1740000	776100	752200	564800	567300	841000	631300	553400	724800	602500	544500	551700
10	1704000	767800	750100	570000	567300	819400	624300	548500	729600	601300	543100	550500
11	1650000	763000	751900	568200	570300	803100	618400	547700	733100	602500	542200	550500
12	1594000	766100	749400	567900	573300	786900	606800	547700	734500	605000	540500	550500
13	1533000	757400	743200	564500	576300	769300	597300	549100	730300	605900	542800	549100
14	1477000	750500	736600	563900	596400	754100	595500	552600	723000	610200	543900	547700
15	1434000	744900	727500	568200	637400	735200	589600	552000	712600	608000	546200	551100
16	1390000	737300	715700	568500	697800	722300	589000	550000	703600	605000	549100	551700
17	1340000	731700	709100	571200	719900	723000	588100	550300	694900	601000	549700	552300
18	1293000	722700	702200	570900	718800	738000	586300	549100	688000	604000	551400	550500
19	1243000	713600	694900	568200	718200	750900	586300	551100	681800	605000	553400	551400
20	1194000	705300	688300	565100	723400	754100	588400	552000	674300	604600	551700	551400
21	1149000	696300	680500	560600	731400	753700	578600	556000	667200	603700	552000	550300
22	1168000	689300	674700	554900	738300	750200	565700	556000	660300	602800	556300	549700
23	1180000	682800	664600	555400	740700	750200	557700	557400	651800	601000	551100	549700
24	1159000	674300	655100	553700	744200	748800	552800	557200	646000	599400	550500	548800
25	1125000	682500	646900	549700	746600	752000	547700	563600	641400	597900	552000	548800
26	1093000	714300	638800	548500	747700	751500	542800	574300	636500	596100	555700	548200
27	1061000	752200	629000	550500	752300	748000	537600	572800	628000	594200	556900	556900
28	1026000	761600	620600	555200	799100	737300	530100	594500	626100	582000	554600	553700
29	994700	759900	612600	571800	---	724800	525000	636200	623300	562400	554900	552000
30	954600	759500	603400	582000	---	711200	525000	666800	623300	553400	554600	549100
31	922000	---	595500	582600	---	709800	---	668800	---	551700	552800	---
MAX	1746000	890700	758100	585600	799100	895500	715000	668800	734500	620300	556900	556900
MIN	910100	674300	595500	548500	560600	709800	525000	522400	623300	551700	540500	547700
(+)	648.65	644.36	639.39	638.97	645.45	642.93	637.01	641.70	640.30	637.94	637.98	637.85
(++)	+128,100	-162,500	-164,000	-12,900	+216,500	-89,300	-184,800	+143,800	-45,500	-71,600	+1,100	-3,700
CAL YR 1986	MAX 1746000	MIN 533000	(++)	-15,600								
WTR YR 1987	MAX 1746000	MIN 522400	(++)	-244,800								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

ARKANSAS RIVER BASIN

07171400 VERDIGRIS RIVER NEAR OOLOGAH, OK

LOCATION.--Lat 36°25'17", long 95°41'01", in NW 1/4 sec.2, T.22 N., R.15 E., Rogers County, Hydrologic Unit 11070105, on right bank 0.2 mi downstream from Oologah Dam, 1.2 mi upstream from Fourmile Creek, 2 mi southeast of Oologah, and at mile 90.0.

DRAINAGE AREA.--4,339 mi².

PERIOD OF RECORD.--June 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 552.00 ft above National Geodetic Vertical Datum of 1929. The datum published in WSP 1921 was in error; the datum is unchanged for period of record.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by several dams in Kansas prior to May 1963, and completely regulated thereafter by Oologah Lake (station 07171300). U.S. Army Corps of Engineers' satellite telemeter is connected to station.

AVERAGE DISCHARGE.--Since regulation by Oologah Lake, 23 years (water years 1965-87), 3,050 ft³/s, 2,210,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,700 ft³/s, Oct. 14, 1986, maximum gage height, 38.23 ft, Oct. 8, 1986, backwater from Caney River; no flow at time in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1943 reached a stage of 65.2 ft, from floodmarks. Flood of May 9, 1961, reached a stage of 52.8 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 53,700 ft³/s, Oct. 14, maximum gage height, 38.23 ft, Oct. 8, backwater from Caney River; minimum daily discharge, 60 ft³/s, Oct. 1-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e60	e28100	6100	5180	6830	7550	5920	819	6330	2090	112	98
2	e60	e27800	6070	4570	6840	7220	7390	818	6330	2090	107	98
3	e60	e24700	6070	3750	6790	10400	7370	813	6740	2090	104	98
4	e60	e17800	5980	3750	6770	14600	7360	460	6410	2110	102	98
5	e60	e17000	6160	2850	6740	14200	7330	118	6380	2110	100	98
6	e4630	e20300	6160	1720	4950	14200	7310	115	6370	2110	98	98
7	e13800	e18500	6200	1710	3700	14200	6380	111	6370	2090	99	99
8	e23800	e15400	6270	1710	3690	14200	5160	3420	6370	1390	98	101
9	e41200	e15400	8090	1900	3680	14200	5140	7230	6370	776	99	100
10	e43700	e13100	10200	1780	3680	12300	5130	7190	6370	766	98	98
11	e49000	e7040	8910	1740	2490	9270	5120	4990	6370	760	99	99
12	e48600	5090	9800	2350	1870	9240	5110	3290	6370	757	98	98
13	e49400	5060	9800	2890	2860	9410	5100	2570	6370	757	101	99
14	e50100	5030	9790	2880	2860	9730	5090	2450	6370	1380	101	102
15	e40800	5010	9800	2880	3100	9690	4400	3040	6370	2200	100	104
16	e38300	4980	9760	2880	3060	9660	3160	3040	6370	2200	99	104
17	e38700	4970	7270	2880	4310	10100	3160	3040	5040	1280	102	104
18	e38900	4970	5360	2890	8030	9850	3160	2520	4110	802	99	104
19	e39100	4950	5350	2890	9780	9820	3170	1630	4100	799	349	104
20	e39000	4940	5350	4000	8350	12300	3170	1070	4100	796	548	102
21	e35400	4920	5340	5740	6290	14700	7840	1070	4100	795	256	101
22	e16400	4900	5320	5730	6280	14700	13200	1060	4100	798	98	101
23	e15200	4900	5300	4070	6270	14800	7770	1050	4090	796	96	101
24	e22100	4880	5290	2750	6270	14900	4440	1050	2970	795	96	102
25	e28000	3630	5280	2740	6270	14900	4060	1090	2090	792	98	105
26	e29400	3020	5270	1360	6290	14700	4050	2990	2090	790	99	106
27	e29800	2750	5260	440	8550	14600	4040	6220	2090	781	274	972
28	e29800	4310	5240	420	10300	14700	4040	6620	2090	5410	621	1950
29	e29400	6140	5220	1230	---	14600	2850	6650	2090	9910	623	384
30	e29000	6100	5220	4610	---	11100	835	6420	2090	4780	620	123
31	e28600	---	5200	6810	---	5270	---	6370	---	114	395	---
TOTAL	852430	295690	206430	93100	156900	371110	158255	89324	147410	55114	5989	6051
MEAN	27500	9856	6659	3003	5604	11970	5275	2881	4914	1778	193	202
MAX	50100	28100	10200	6810	10300	14900	13200	7230	6740	9910	623	1950
MIN	60	2750	5200	420	1870	5270	835	111	2090	114	96	98
AC-FT	1691000	586500	409500	184700	311200	736100	313900	177200	292400	109300	11880	12000

CAL YR 1986 TOTAL 1987744 MEAN 5446 MAX 50100 MIN 14 AC-FT 3943000
WTR YR 1987 TOTAL 2437803 MEAN 6679 MAX 50100 MIN 60 AC-FT 4835000

e Estimated

ARKANSAS RIVER BASIN

07172500 HULAH LAKE NEAR HULAH, OK

LOCATION.--Lat 36°55'44", long 96°05'18", in SE 1/4 sec.2, T.28 N., R.11 E., Osage County, Hydrologic Unit 11070106, in stair tower at right end of Hulah Dam on Caney River, 0.5 mi downstream from Hickory Creek, 2.0 mi west of Hulah, 15.7 mi upstream from Little Caney River, and at mile 96.2.

DRAINAGE AREA.--732 mi².

PERIOD OF RECORD.--April 1950 to current year. Prior to October 1970, published as Hulah Reservoir near Hulah.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Feb. 15, 1951, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by an earth dam. Spillway is 472-foot concrete ogee-type weir controlled by 10 taintor gates. Outlet works consist of nine rectangular sluices, two 24-inch gated pipes, and one 10-inch water-supply pipe. Closure for diversion made Feb. 6, 1950; regulated storage began Oct. 25, 1950; conservation pool was first filled Sept. 24, 1951. Capacity, 289,000 acre-ft, at elevation 765.0 ft, top of taintor gates, 61,360 acre-ft, at elevation 740.0 ft, crest of spillway, and 31,120 acre-ft, at elevation 733.0 ft, conservation pool. Figures given herein represent total contents. Reservoir is used for flood control, conservation, and municipal water supply. Revised capacity table, based on survey in 1973, used since Oct. 1, 1977.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 350,100 acre-ft, Oct. 3, 1986, elevation, 769.41 ft; minimum since conservation pool was first filled, 11,250 acre-ft, Mar. 20, 1957, elevation, 723.22 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 350,100 acre-ft, Oct. 3, elevation 769.41 ft; minimum, 30,650 acre-ft, Sept. 27, elevation 732.87 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

727	13,750	749	120,500
732	27,660	756	184,200
737	47,070	763	263,500
743	78,170	770	358,800

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	185700	79270	78780	42430	39480	125400	40620	31260	91040	33930	31580	31330
2	229700	76240	76420	41020	39040	133400	37140	31220	91380	35740	31480	31330
3	348500	73300	74120	39720	38080	136500	35100	31260	93760	36130	31440	31300
4	293100	77870	71570	38120	35360	134700	33820	31300	91380	41850	31440	31260
5	284600	83070	69150	36750	34870	131200	32530	39880	86790	46850	31300	31220
6	282300	84270	66660	35400	40900	126200	31620	44500	81940	45100	31150	31190
7	272900	83640	72200	34040	41970	120500	31330	43190	76780	42600	31260	31550
8	260500	81870	74000	32780	42100	114600	31300	40050	71630	39960	31190	31480
9	247500	79760	75950	32600	41680	108400	31300	36670	67260	37180	31150	31480
10	232000	77690	75830	32640	41110	104300	31190	33260	63970	35440	31050	31480
11	215500	75120	74290	32380	40450	101800	31260	31330	60950	33860	30940	31300
12	198700	72660	72490	32160	39680	99000	31400	30970	58220	33930	30940	31220
13	181100	69990	70610	32420	39080	96050	32600	34270	55130	33670	31660	31120
14	165100	67540	68590	32750	40940	93010	32380	30650	52190	32970	32750	31080
15	150600	64930	66170	32820	55370	89630	31150	30800	49980	32020	33370	31300
16	137300	62450	64130	33040	61980	86660	31150	30830	48220	31150	33860	31190
17	124700	60850	61880	33110	64930	104600	31660	30870	46490	31480	33820	31190
18	114400	59730	59630	33260	65630	105100	32090	30870	44720	31660	33780	31150
19	106100	58170	58020	33220	66060	107700	32160	30900	43650	31730	31800	31120
20	100000	57030	57030	33040	66010	102500	31120	30870	43230	31840	31300	31050
21	96540	55660	55910	32380	65040	96120	32890	30900	42520	31910	31300	30940
22	99640	54360	54840	31550	63500	89290	31480	30900	41150	31910	31400	30940
23	101400	53030	53690	31300	61570	85300	30970	31620	39640	31980	31370	30900
24	101300	51770	52560	31330	60950	84210	31120	32970	38080	32020	31300	30870
25	99360	58420	51450	31300	60750	79030	31220	33480	37290	32020	31260	30830
26	96890	77570	50250	31260	61310	72260	31300	33110	36520	31980	31980	30760
27	94040	80260	49070	31400	68530	65310	31330	57080	35590	31730	31480	30720
28	91170	81190	47820	32780	106100	58820	31440	86330	34530	31690	31370	30970
29	87840	80630	46540	38240	---	51820	31300	93010	33340	31690	31330	30900
30	84930	79950	45230	39720	---	46540	31220	94940	33670	31660	31300	30690
31	82120	---	43860	39720	---	43440	---	93970	---	31660	31480	---
MAX	348500	84270	78780	42430	106100	136500	40620	94940	93760	46850	33860	31550
MIN	82120	51770	43860	31260	34870	43440	30970	30650	33340	31150	30940	30690
(+)	743.64	743.29	136.26	735.26	747.14	736.16	733.03	745.44	733.70	733.15	733.10	732.88
(++)	+50,640	-2,170	-36,090	-4,140	+66,380	-62,660	-12,220	+62,750	-60,300	-2,010	-180	-790

CAL YR 1986 MAX 348500 MIN 30650 (++) +9,780
WTR YR 1987 MAX 348500 MIN 30650 (++) -790

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-Feet

07173000 CANEY RIVER NEAR HULAH, OK

LOCATION (REVISED).--Lat 36°55'37", long 96°05'05", in SW 1/4 SE 1/4 sec.2, T.28 N., R.11 E., Osage County, Hydrologic Unit 11070106, on left bank 1,200 ft downstream from Hulah Dam, 2.1 mi upstream from Opossum Creek, 2.5 mi west of Hulah, and at mile 95.9.

DRAINAGE AREA.--733 mi².

PERIOD OF RECORD.--October 1937 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 699.00 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 18, 1939, nonrecording gage. Feb. 18, 1939 to Sept. 30, 1948, waterstage recorder at county road bridge, 0.2 mi upstream at datum 14.04 ft lower. Oct. 1, 1948 to Sept. 30, 1972, at site 0.6 mi downstream at datum 17.04 ft lower.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow completely regulated since February 1950 by Hulah Lake (station 07172500). About 5 to 9 ft³/s is diverted from gage pool for municipal water supply by the city of Bartlesville.

AVERAGE DISCHARGE.--Prior to regulation by Hulah Lake, 13 years (water years 1938-50), 413 ft³/s, 299,200 acre-ft/yr; since regulation by Hulah Lake, 37 years (water years 1951-87), 388 ft³/s, 281,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,000 ft³/s, from rating curve extended above 7,000 ft³/s, on basis of relating stage to release records at maximum and lower stages, Oct. 3, 1986, gage height, 26.80 ft; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 40.2 ft occurred at original site and datum, date unknown, from floodmark, information provided by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 58,000 ft³/s, Oct. 3, gage height, 26.80 ft; minimum daily discharge, 1.7 ft³/s, July 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	1880	1340	908	931	37	2070	132	2160	481	32	6.2
2	198	1870	1890	899	928	27	2040	97	2210	481	32	6.2
3	27200	1860	1880	899	929	841	1320	97	1310	481	32	6.2
4	54300	1290	1870	889	923	2620	928	97	2230	237	32	6.2
5	19100	797	1850	880	919	3610	917	80	2890	10	32	6.2
6	5910	799	1840	879	927	4540	717	518	3160	881	22	6.2
7	7560	1380	1850	880	928	4480	363	1450	3140	1640	8.9	6.5
8	9560	1900	1740	877	928	e4300	259	1980	3110	1610	8.5	6.4
9	9270	1890	997	643	928	e4300	259	1950	2660	1600	8.2	8.8
10	11200	1870	1460	461	933	e3300	222	1930	1990	1200	20	8.7
11	12800	1860	1860	458	938	e1750	169	1150	1910	808	29	6.1
12	10400	1830	1850	454	929	e1900	169	428	1810	756	29	6.0
13	10300	1820	1840	454	928	e2000	169	244	1710	245	29	9.1
14	9270	1820	1840	454	931	e2000	557	78	1690	454	28	8.1
15	7220	1810	1820	454	517	e2000	913	35	1250	458	28	7.0
16	6750	1800	1810	454	12	e1980	383	35	890	461	28	6.6
17	6340	1400	1800	454	411	e1980	4.4	37	889	170	288	5.8
18	5610	945	1790	454	1590	e1980	4.9	26	854	2.6	415	5.8
19	4790	938	1340	454	2150	e2900	135	18	851	2.4	415	5.8
20	3220	934	958	587	2140	e4100	344	18	843	2.2	e191	6.1
21	2180	938	948	808	2150	e4800	597	20	843	1.7	e18	6.9
22	705	934	948	804	2140	e4750	949	15	843	2.0	e6.3	6.4
23	59	928	945	531	2120	4040	398	5.8	843	2.0	e6.3	6.0
24	664	921	938	346	1430	2420	107	8.2	843	2.6	e6.3	6.0
25	1590	957	938	346	928	3410	107	16	843	4.6	e6.3	6.0
26	1950	439	936	346	926	4690	107	216	656	4.6	e6.3	6.0
27	1930	38	928	333	948	4640	106	1130	507	18	e6.3	6.4
28	1930	403	926	364	484	4540	105	38	504	31	e6.3	14
29	1910	1030	918	464	---	4450	138	539	497	31	e6.3	8.3
30	1900	1020	919	755	---	3500	163	966	488	30	e6.3	5.0
31	1890	---	914	938	---	2090	---	1460	---	32	6.2	---
TOTAL	237863	38301	43883	18927	30946	93975	14720.3	14814.0	44424	12139.7	1788.5	205.0
MEAN	7673	1277	1416	611	1105	3031	491	478	1481	392	57.7	6.83
MAX	54300	1900	1890	938	2150	4800	2070	1980	3160	1640	415	14
MIN	59	38	914	333	12	27	4.4	5.8	488	1.7	6.2	5.0
AC-FT	471800	75970	87040	37540	61380	186400	29200	29380	88110	24080	3550	407

CAL YR 1986 TOTAL 473846.5 MEAN 1298 MAX 54300 MIN 2.1 AC-FT 939900
WTR YR 1987 TOTAL 551986.5 MEAN 1512 MAX 54300 MIN 1.7 AC-FT 1095000

e Estimated

ARKANSAS RIVER BASIN

07174300 COPAN LAKE NEAR COPAN, OK

LOCATION.--Lat 36°53'13", long 95°57'10", in NW 1/4, NW 1/4 sec.29, T.28 N., R.13 E., Washington County, Hydrologic Unit 11070106, 600 ft northwest of project office, 1.5 mi southwest of Copan and at mile 7.4.

DRAINAGE AREA.--505 mi².

PERIOD OF RECORD.--April 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Spillway is concrete ogee-type weir controlled by 4 taintor gates. A 36-inch diameter low-flow pipe and a 12-inch diameter future water-supply pipe extend through the spillway. Storage began Apr. 1, 1983, conservation pool was first filled Apr. 23, 1983. Capacity 227,700 acre-feet at elevation 732.0 ft, top of flood control pool; 43,400 acre-ft at elevation, 710.0 ft, top of conservation pool. Dead storage 600 acre-ft below elevation 687.5 ft. Figures given herein represent total contents. Reservoir is used for flood control, water conservation, and future water supply.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 278,700 acre-ft, Oct. 4, 1986, elevation, 735.35 ft; minimum since conservation pool first filled, 30,830 acre-ft, Oct. 14, 1983, elevation, 707.17 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 278,700 acre-ft, Oct. 4, elevation, 735.35 ft; minimum, 41,620 acre-ft, Sept. 27, elevation, 709.63 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

705	22,830	725	148,400
710	43,400	730	203,200
715	71,170	735	273,200
720	105,900	740	359,600

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147400	88750	71670	43880	49480	90440	53290	42860	97700	43640	44230	43010
2	181200	85090	68330	43690	48750	98140	50730	42910	97480	43790	44080	42960
3	275600	81650	65840	43540	47620	103100	49270	43060	101300	43830	43880	42860
4	249400	81710	69680	43400	47010	104000	47220	43250	99800	45910	43930	42770
5	240500	84820	66570	43150	46810	103700	45460	43350	96380	53670	43740	42720
6	228400	86260	63640	43490	49110	101400	44180	45410	91850	57250	43690	42670
7	220300	86400	63290	43640	50680	98580	43690	47680	87220	56860	43540	42670
8	214000	84140	65960	44130	51420	95800	43640	47570	82180	55750	43450	42670
9	206700	81310	66930	44960	51260	91850	43540	46760	76970	54000	43450	42620
10	198000	78530	67050	45410	50160	88340	43490	45610	73950	51950	43250	42580
11	189300	74710	65010	45510	49110	84820	43490	44320	70800	49790	43110	42430
12	177800	71670	63110	45660	48080	81110	43400	43450	67780	49060	43010	42380
13	165500	68330	61420	45760	47520	76380	44130	43300	64770	49270	43790	42240
14	154200	65660	59970	45860	47830	72430	45010	43400	61650	47880	43880	42240
15	146500	64170	58490	46010	57090	68760	44670	43300	58890	46110	43790	42290
16	139800	62700	57250	45860	65720	64770	44230	43110	56580	44670	43690	42340
17	134900	61240	56080	46010	70550	63940	43740	42960	54540	44130	43590	42430
18	129400	59860	54710	45860	72740	65720	43010	42670	52910	44620	43490	42430
19	124300	58210	53350	45610	73310	65840	42290	42910	51420	44720	43450	42380
20	119300	56690	52000	45360	71860	65360	42480	42720	49890	44870	43300	42380
21	114900	54980	50520	44910	69990	65070	44420	43300	48440	44870	43200	42290
22	118100	53510	49430	44370	67720	63940	44910	42860	46860	44820	43400	42190
23	119600	51740	48290	43930	65130	63230	44470	43200	45360	44820	43200	42050
24	119600	50260	47930	43590	63110	62700	44130	45060	44230	45060	43010	41950
25	116900	51260	47370	43200	61530	62410	43880	49840	43450	44960	42910	41860
26	113700	61240	46910	43110	60380	61590	43450	50210	43150	44960	43540	41810
27	109500	69310	46410	43300	61360	60840	43350	51790	42910	44870	43300	41720
28	105300	71300	45860	43880	73120	59690	43150	72050	42910	44770	43300	42050
29	100900	72870	45410	47930	---	58780	43110	87640	43010	44570	43250	42000
30	96380	72870	44910	49890	---	57200	43010	95370	43640	44420	43200	41860
31	92350	---	44470	49950	---	55030	---	97850	---	44320	43150	---
MAX	275600	88750	71670	49950	73310	104000	53290	97850	101300	57250	44230	43010
MIN	92350	50260	44470	43110	46810	55030	42290	42670	42910	43640	42910	41720
(+)	718.17	715.27	710.22	711.30	715.31	712.25	709.92	718.93	710.05	710.19	709.95	709.68
(++)	+35,600	-19,480	+28,400	+5,480	+23,170	-18,090	-12,020	+54,840	-54,210	+680	-1,170	-1,290

CAL YR 1986 MAX 275600 MIN 41810 (++) -1,740
WTR YR 1987 MAX 275600 MIN 41720 (++) -14,890

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07174400 CANEY RIVER ABOVE COON CREEK AT BARTLESVILLE, OK

LOCATION.--Lat 36°45'20", long 95°58'21", in NE 1/4 NE 1/4 sec.12, T.26 N, R.12 E, Washington County, Hydrologic Unit 11070103, at right bank in city of Bartlesville water intake tower, 0.2 mi upstream from State Highway 123 bridge and low-water dam, 0.5 mi downstream from Atchison, Topeka, and Santa Fe railroad bridge, 1.0 mi upstream from confluence with Coon Creek, 2.7 mi downstream from confluence with Butler Creek, 5.0 mi upstream from confluence with Sand Creek, and at mile 69.2.

DRAINAGE AREA.--1,392 mi².

PERIOD OF RECORD.--October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 653.33 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Considerable regulation by Hulah Lake (station 07172500) 27.0 mi upstream, and Copan Lake (station 07174300) 12.0 mi upstream. Diversion at gage for municipal water supply by the city of Bartlesville. U.S. Army Corps of Engineers' satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,500 ft³/s, Oct. 4, 1986, gage height, 27.70 ft; minimum daily discharge, 9.2 ft³/s, Sept. 21-26, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 94,500 ft³/s, Oct. 4, gage height, 27.70 ft; minimum daily discharge, 9.2 ft³/s, Sept. 21-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13500	4000	2310	1420	2190	7920	3280	180	3550	590	66	12
2	5870	3910	3310	1410	2240	867	3220	120	4520	607	66	12
3	13400	3860	3610	1170	2190	467	3080	58	5750	607	66	12
4	63500	4260	3620	1080	2110	2540	2150	57	3620	639	66	12
5	64900	4470	3580	1070	1920	4020	1970	60	4380	374	66	12
6	35300	2590	3540	1060	2960	5180	1930	944	5020	498	68	12
7	23400	2240	3900	1010	2280	5700	1300	1090	5180	2090	59	14
8	18700	3550	4200	991	1940	5740	531	2480	5130	2760	32	14
9	17300	3840	3460	1230	1840	5680	362	2800	5120	2780	29	14
10	17100	3840	2850	1180	2090	5570	357	2810	4230	2750	29	14
11	17000	3840	3520	812	2140	4470	286	2730	3520	2260	38	14
12	17300	3800	3630	734	2130	3880	214	1710	3430	2110	67	14
13	17400	3760	3310	717	1820	4040	227	1070	3280	1670	146	13
14	17700	3700	3170	910	1750	4070	267	469	3210	1260	117	11
15	17200	e3200	3110	958	6150	4050	1150	271	3110	1400	93	12
16	14900	e2900	2900	958	2470	4000	1450	211	2320	1400	90	16
17	13100	e2600	2860	958	672	4190	760	200	2110	1060	86	12
18	11500	2270	2840	962	1640	4480	418	198	1820	257	418	14
19	10200	2140	2790	969	3220	4220	388	107	1770	34	621	11
20	9140	2130	2220	976	3820	4740	549	48	1790	20	587	9.7
21	5470	2120	2050	1360	3900	5170	681	42	1780	18	173	9.2
22	5250	2100	2010	1530	3830	5390	1070	41	1760	17	27	9.2
23	1470	2080	1990	1510	3780	5380	1510	52	1740	15	18	9.2
24	543	2080	1600	1000	3580	4270	829	144	1690	14	14	9.2
25	2320	2410	1480	867	2500	3390	368	513	1490	14	11	9.2
26	3930	7960	1470	829	2310	4270	357	172	1350	18	11	9.2
27	4180	1920	1460	606	3080	4670	342	1200	733	20	19	9.4
28	4340	1090	1460	648	5630	4670	201	3860	592	30	16	28
29	4350	1950	1440	1550	---	4610	161	1870	582	59	15	20
30	4340	2270	1440	1310	---	4540	165	1790	590	64	12	18
31	4270	---	1430	2010	---	3830	---	2630	---	66	12	---
TOTAL	458873	92880	82560	33795	76182	136014	29573	29927	85167	25501	3138	385.3
MEAN	14800	3096	2663	1090	2721	4388	986	965	2839	823	101	12.8
MAX	64900	7960	4200	2010	6150	7920	3280	3860	5750	2780	621	28
MIN	543	1090	1430	606	672	467	161	41	582	14	11	9.2
AC-FT	910200	184200	163800	67030	151100	269800	58660	59360	168900	50580	6220	764

CAL YR 1986 TOTAL 999021 MEAN 2737 MAX 64900 MIN 11 AC-FT 1982000
WTR YR 1987 TOTAL 1053995.3 MEAN 2888 MAX 64900 MIN 9.2 AC-FT 2091000

e Estimated

ARKANSAS RIVER BASIN

07174600 SAND CREEK AT OKESA, OK

LOCATION.--Lat 36°43'10", long 96°07'56", in NW 1/4 NW 1/4 sec.21, T.26 N., R.11 E., Osage County, Hydrologic Unit 11070106, on downstream side of left abutment of county road bridge, 0.5 mi northeast of Okesa, 9 mi southwest of Bartlesville, and at mile 17.2.

DRAINAGE AREA.--139 mi².

PERIOD OF RECORD.--October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 689.20 ft above National Geodetic Vertical Datum of 1929. Prior to May 25, 1960, nonrecording gage at same site and datum.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--28 years, 80.7 ft³/s, 58,470 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,500 ft³/s, Mar. 10, 1974, gage height, 28.6 ft; from floodmarks; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	0730	*12,500	*23.03	Feb. 15	1030	5,580	15.15
Nov. 26	0500	7,050	17.04	Feb. 28	2200	8,090	18.32

Minimum daily discharge, 0.36 ft³/s, Sept. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	34	101	25	164	2120	e56	e13	e100	16	3.2	2.1
2	1940	33	93	24	186	367	e52	e13	e80	18	2.9	1.7
3	9620	31	85	24	128	242	e48	e12	e200	63	2.6	1.4
4	1250	893	69	26	93	e200	e44	e150	e100	71	2.1	1.1
5	367	1540	57	27	203	e184	e42	e140	e56	544	2.0	.81
6	200	348	50	27	1170	e169	e39	e170	e40	264	1.8	.72
7	137	193	1320	25	402	e160	e36	e58	e32	77	1.5	.82
8	99	142	640	24	210	e151	e34	e30	e29	39	1.1	.84
9	80	107	420	333	137	e148	e33	e20	e27	27	1.5	.84
10	69	85	220	337	105	e145	e32	e15	25	19	1.4	1.2
11	62	96	141	145	92	e140	e31	e18	24	15	1.0	1.2
12	80	86	110	89	81	e136	e30	e10	23	14	.73	.98
13	75	66	90	79	87	e125	e90	e7.6	23	458	1.8	1.5
14	59	52	77	75	106	e110	e85	e6.0	21	127	4.6	1.7
15	47	49	70	62	2940	e94	e50	e4.5	19	53	5.3	1.5
16	39	48	67	51	806	e84	e29	e3.8	17	32	3.4	1.7
17	33	48	64	48	352	e2700	e23	e3.4	16	25	2.6	1.8
18	30	44	58	53	342	e1100	e21	e3.2	14	30	2.1	2.2
19	27	41	50	61	472	e450	e20	e3.0	13	32	3.3	2.2
20	25	39	45	64	329	e210	e19	e2.8	15	23	2.5	1.9
21	23	35	40	67	246	e290	e45	e2.6	52	16	2.6	1.7
22	1020	33	37	70	188	e220	e38	e2.4	40	13	2.6	1.3
23	405	32	35	68	148	e100	e30	e2.2	23	10	2.7	1.2
24	173	29	34	62	128	e90	e23	e20	17	7.8	2.8	.95
25	121	748	33	52	128	e83	e21	e18	15	6.6	2.6	.55
26	108	3440	32	45	157	e77	e19	e11	14	5.8	2.9	.42
27	89	389	30	50	1120	e74	e17	e1400	12	5.1	4.2	.36
28	67	214	28	260	3980	e69	e15	e2000	11	4.6	3.1	1.1
29	52	152	27	921	---	e65	e14	e1600	11	4.4	2.9	1.1
30	44	121	26	320	---	e62	e14	e600	14	3.7	2.7	1.4
31	39	---	25	161	---	e60	---	e220	---	3.3	2.7	---
TOTAL	17530	9168	4174	3675	14500	10225	1050	6559.5	1083	2027.3	79.23	38.29
MEAN	565	306	135	119	518	330	35.0	212	36.1	65.4	2.56	1.28
MAX	9620	3440	1320	921	3980	2700	90	2000	200	544	5.3	2.2
MIN	23	29	25	24	81	60	14	2.2	11	3.3	.73	.36
AC-FT	34770	18180	8280	7290	28760	20280	2080	13010	2150	4020	157	76

CAL YR 1986 TOTAL 70837.94 MEAN 194 MAX 12900 MIN .98 AC-FT 140500
WTR YR 1987 TOTAL 70109.32 MEAN 192 MAX 9620 MIN .36 AC-FT 139100

e Estimated

07175500 CANEY RIVER NEAR RAMONA, OK

LOCATION.--Lat 36°30'31", long 95°50'36", in NE 1/4 NW 1/4 sec.5, T.23 N., R.14 E., Washington County, Hydrologic Unit 11070106, on left bank near downstream abutment of county road bridge, 1 mi upstream from Buck Creek, 2.2 mi downstream from Double Creek, 4.5 mi southeast of Ramona, and at mile 32.0.

DRAINAGE AREA.--1,955 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1945 to current year. Monthly discharge only for some periods, published in WSP 1311. Previous reports have included Caney River near Collinsville from Oct. 1935 to Feb. 1939; this record has been separated from Ramona.

REVISED RECORDS.--WSP 1117: Drainage area. WSP 1241: 1939.

GAGE.--Water-stage recorder. Datum of gage is 586.43 ft above National Geodetic Vertical Datum of 1929. Sept. 1, 1945 to Feb. 15, 1946, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since February 1950 by Hulah Lake (station 07172500), and since April 1983 by Copan Lake (station 07174300). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Since regulation by Hulah Lake, 32 years (water years 1951-1982), 925 ft³/s, 670,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 85,600 ft³/s, Oct. 5, 1986, gage height, 31.16 ft; no flow Sept. 11 to Nov. 3, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 85,600 ft³/s, Oct. 5, gage height, 31.16 ft; minimum daily discharge, 38 ft³/s, Sept. 25-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	44000	4540	2800	1570	2690	12500	4190	300	3180	710	86	50
2	30600	4250	2890	1560	3160	13800	3620	309	4040	694	87	48
3	23800	4110	3820	1540	2930	8760	3510	255	7220	815	92	47
4	24700	4820	4060	1350	2580	3480	3180	200	7830	729	92	46
5	71700	8940	4010	1270	2520	3830	2360	190	5280	734	92	44
6	55000	9800	3940	1250	5110	4980	2190	607	5050	1170	92	43
7	30900	6560	4370	1240	6430	5990	2050	1340	5530	1320	91	42
8	24900	3610	6740	1180	3860	6500	1410	1580	5690	2470	88	42
9	23100	4110	7220	2000	2590	6550	746	2690	5650	2880	69	42
10	20700	4320	5230	3250	2320	6460	603	2970	5520	2860	56	42
11	20100	4520	3840	2400	2430	6260	596	2940	4580	2730	52	41
12	19900	4350	4080	1510	2410	5140	491	2740	3800	2310	48	41
13	19500	4170	4060	1230	2290	4420	432	1720	3610	2320	66	41
14	19500	4050	3650	1160	2390	4520	452	1100	3440	2080	238	41
15	19400	3860	3470	1310	5400	4540	608	481	3340	1650	168	41
16	19700	3290	3370	1300	9770	4480	1570	290	3100	1550	127	42
17	19600	3070	3180	1280	8150	5290	1620	243	2390	1470	110	60
18	18000	2940	3100	1300	3350	7640	913	222	2140	1050	108	51
19	15600	2440	3040	1370	3840	7100	607	218	1900	323	414	47
20	14100	2280	2900	1400	4800	5650	563	165	1890	133	640	51
21	11800	2250	2390	1410	4970	5670	815	106	1970	102	509	44
22	10600	2220	2220	1810	4770	6210	1170	87	1910	86	192	42
23	11400	2190	2180	1890	4500	6450	1570	84	1880	79	89	40
24	7190	2160	2090	1770	4320	7060	1670	100	1830	69	89	39
25	2770	2430	1770	1320	3880	6170	946	662	1820	62	76	38
26	3640	7750	1670	1160	2940	4600	553	1160	1680	58	57	38
27	4650	10100	1640	1090	4630	5060	510	491	1320	58	55	38
28	4750	7130	1630	1270	8800	5390	467	3600	761	59	95	626
29	4820	2700	1620	3640	---	5340	343	7990	626	60	81	643
30	4760	2730	1600	4340	---	5220	305	5160	621	79	66	237
31	4670	---	1590	2620	---	5050	---	2890	---	86	55	---
TOTAL	605850	131690	100170	52790	117830	190110	40060	42890	99598	30796	4180	2687
MEAN	19540	4390	3231	1703	4208	6133	1335	1384	3320	993	135	89.6
MAX	71700	10100	7220	4340	9770	13800	4190	7990	7830	2880	640	643
MIN	2770	2160	1590	1090	2290	3480	305	84	621	58	48	38
AC-FT	1202000	261200	198700	104700	233700	377100	79460	85070	197600	61080	8290	5330

CAL YR 1986 TOTAL 1329490 MEAN 3642 MAX 71700 MIN 40 AC-FT 2637000
WTR YR 1987 TOTAL 1418650 MEAN 3887 MAX 71700 MIN 38 AC-FT 2814000

ARKANSAS RIVER BASIN

07175500 CANEY RIVER NEAR RAMONA, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952-53, 1955-62, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1966 to April 1982.

WATER TEMPERATURE: October 1966 to April 1982.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET ABOVE DATUM)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)
NOV 18...	1500	1028	80020	11.90	3050	324	8.00	--	10.0	30	750	9.2
DEC 17...	1715	1028	80020	12.34	3140	380	7.70	6.0	7.0	--	750	10.8
JAN 28...	1730	1028	80020	6.74	1240	540	7.80	9.5	2.5	18	740	--
FEB 26...	1645	1028	80020	11.38	2820	493	7.80	10.5	8.0	--	750	10.2
MAR 24...	1500	1028	80020	20.95	7220	343	7.90	7.5	13.5	30	730	9.0
MAY 18...	1315	1028	80020	3.84	215	520	8.00	34.0	27.0	15	740	8.7
JUN 24...	1100	1028	1028	5.49	1770	--	8.50	39.0	28.5	--	--	--
JUN 29...	1415	1028	80020	4.83	620	408	8.20	26.5	28.0	3.0	740	--
JUL 28...	1130	1028	80020	2.81	55	510	7.70	29.0	30.0	--	730	6.2
SEP 08...	1230	1028	80020	2.68	42	608	8.10	25.5	26.5	9.1	750	7.8
SEP 30...	1600	1028	80020	3.64	221	260	7.60	26.0	20.0	--	748	--

DATE	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS./ PER 100 ML)	HARD-NESS (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WHOLE IT-FLD (MG/L)
NOV 18...	83	52	76	140	18	45	6.2	14	18	0.5	4.2	146
DEC 17...	90	--	--	150	25	47	7.2	17	20	0.6	2.8	154
JAN 28...	--	--	--	190	49	59	10	33	27	1	2.3	171
FEB 26...	88	--	--	170	39	55	8.7	26	24	0.9	2.0	162
MAR 24...	90	260	580	140	17	43	6.7	14	18	0.5	1.8	--
MAY 18...	113	48	280	190	35	59	9.8	31	26	1	2.2	187
JUN 24...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 29...	--	78	130	150	17	49	7.1	19	21	0.7	2.4	165
JUL 28...	86	--	--	190	25	62	9.2	28	24	0.9	2.9	206
SEP 08...	99	83	69	200	41	65	9.9	38	28	1	3.6	208
SEP 30...	--	--	--	73	19	23	3.7	16	31	0.9	3.6	70

ARKANSAS RIVER BASIN

07175500 CANEY RIVER NEAR RAMONA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CAR- BONATE WATER WHOLE IT-FLD (MG/L)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS- SOLVED (MG/L AS C02)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)
NOV 18...	0	120	2.3	17	22	0.20	9.6	187	190	0.25	1540	--
DEC 17...	0	126	4.7	22	29	--	8.1	219	210	0.30	1860	--
JAN 28...	0	140	4.3	33	61	0.20	7.7	300	290	0.41	1000	0.360
FEB 26...	0	133	4.1	31	41	--	7.1	251	250	0.34	1910	0.290
MAR 24...	--	--	2.9	22	20	0.20	7.4	201	190	0.27	3920	0.270
MAY 18...	0	153	2.9	26	57	0.20	4.9	277	280	0.38	161	--
JUN 24...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 29...	0	135	1.6	18	33	0.20	7.4	220	220	0.30	368	--
JUL 28...	0	169	6.5	19	48	--	8.1	304	280	0.41	45	--
SEP 08...	0	171	2.5	26	58	0.30	4.1	320	300	0.44	36	--
SEP 30...	0	57	2.6	18	27	--	5.0	141	130	0.19	84	0.240
DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N02)	NITRO- GEN, NO2+N03 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	PHOS- PHORUS, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)
NOV 18...	<0.010	--	0.320	0.040	0.030	0.04	0.46	0.50	0.060	0.030	0.030	0.09
DEC 17...	<0.010	--	0.340	--	0.030	0.04	--	--	--	--	0.010	0.03
JAN 28...	0.020	0.07	0.380	0.150	0.140	0.18	1.0	1.2	0.110	0.040	0.030	0.09
FEB 26...	0.010	0.03	0.300	--	0.040	0.05	--	--	--	--	0.020	0.06
MAR 24...	0.010	0.03	0.280	0.080	0.050	0.06	0.62	0.70	0.050	0.030	0.010	0.03
MAY 18...	<0.010	--	0.200	0.050	0.040	0.05	1.4	1.4	0.120	0.030	0.020	0.06
JUN 24...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 29...	<0.010	--	0.240	0.070	0.030	0.04	0.83	0.90	0.100	0.070	0.020	0.06
JUL 28...	<0.010	--	0.100	--	<0.010	--	--	--	--	--	<0.010	--
SEP 08...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 30...	0.010	0.03	0.250	--	0.200	0.26	--	--	--	--	0.050	0.15

ARKANSAS RIVER BASIN

07175500 CANEY RIVER NEAR RAMONA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
NOV 18...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 17...	--	<1	70	<0.5	<1	<10	<3	<10	63	<10	7	51
JAN 28...	80	<1	75	<0.5	<1	<1	<3	3	92	<5	6	190
FEB 26...	--	<1	68	0.9	<1	<10	<3	<10	57	<10	7	63
MAR 24...	70	<1	55	<0.5	1	<1	<3	2	64	<5	6	8
MAY 18...	10	<1	89	<0.5	<1	2	<3	4	6	7	9	13
JUN 24...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 29...	--	1	79	<0.5	<1	<10	<3	10	15	<10	9	13
JUL 28...	--	1	120	<0.5	<1	10	<3	<10	360	<10	9	120
SEP 08...	20	2	110	<0.5	<1	3	<3	3	9	<5	6	18
SEP 30...	--	1	50	<0.5	<1	<5	<3	<10	91	<10	<4	29

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 18...	--	--	--	--	--	--	--	--	60	494	88
DEC 17...	<0.1	<10	--	--	--	320	<6	7	--	--	--
JAN 28...	0.1	<10	1	<1	<1	470	<6	10	53	177	80
FEB 26...	--	<10	--	--	--	410	<6	7	--	--	--
MAR 24...	<0.1	<10	<1	<1	<1	290	<6	<3	178	3470	85
MAY 18...	<0.1	<10	<1	<1	<1	470	<6	16	58	34	92
JUN 24...	--	--	--	--	--	--	--	--	99	473	90
JUN 29...	0.9	10	--	--	--	360	<6	5	82	137	78
JUL 28...	0.1	<10	--	--	--	470	<6	12	--	--	--
SEP 08...	0.2	<10	1	<1	<1	510	<6	7	38	4.3	82
SEP 30...	0.3	<10	<10	--	1	190	<6	10	--	--	--

07176000 VERDIGRIS RIVER NEAR CLAREMORE, OK

LOCATION.--Lat 36°18'26", long 95°41'52", SE 1/4 SW 1/4 sec.10, T.21 N., R.15 E., Rogers County, Hydrologic Unit 11070105, on left bank on downstream side of bridge on State Highway 20, 2.3 mi downstream from Caney River, 4.5 mi west of Claremore, 12.4 mi upstream from Bird Creek, and at mile 76.0.

DRAINAGE AREA.--6,534 mi².

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 538.62 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 24, 1939, and May 17 to Aug. 24, 1967, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since 1949 by dams in Kansas, and since February 1950 by Hulah Lake (station 07172500). Flow regulated since May 1963 by Oologah Lake (station 07171300), 14.3 mi upstream from station, and since April 1983 by Copan Lake (station 07174300). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Oologah Lake, 27 years (water years 1936-62), 3,723 ft³/s, 2,695,000 acre-ft/yr; since regulation by Oologah Lake, 23 years (water years 1965-87), 4,431 ft³/s, 3,210,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 182,000 ft³/s, May 21, 1943, gage height, 55.05 ft; no flow at times in 1936, 1939-40, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 78,400 ft³/s, Oct. 12; gage height, 44.99 ft; minimum daily discharge, 121 ft³/s, Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21800	30500	9360	7220	10100	20700	10400	1140	9390	2920	211	623
2	31600	29900	9280	6830	10800	19100	11200	1140	9930	3030	201	145
3	31600	28500	9690	5830	10700	21000	10900	1130	12000	3130	187	146
4	24700	22100	10400	5760	10200	22800	10700	792	14200	3680	188	134
5	23200	22400	10600	5020	9880	17800	10100	318	13600	4750	181	121
6	54200	27200	10500	3420	9990	18500	9470	308	11700	3600	173	150
7	70900	26300	10700	3370	10800	19500	8840	964	11900	3580	188	143
8	67500	19500	12500	3340	10100	20200	7000	2940	12300	3380	176	133
9	65700	17900	15400	4600	7610	20400	6340	9160	12300	3630	169	131
10	70900	17500	17100	5760	6800	19400	5960	10100	12200	3770	158	145
11	75200	12600	14100	5510	6200	15700	5890	8730	11900	3720	142	157
12	77500	10000	14100	4680	4060	15100	5840	6130	10800	3390	128	159
13	77700	9660	14400	4850	5830	14100	5730	5100	10200	4000	143	166
14	77100	9470	14100	4630	5710	14200	5690	3750	10100	3730	265	147
15	75300	9360	13800	4610	7050	14200	5160	3980	9920	4140	409	137
16	63400	8920	13600	4710	11900	14200	4200	3560	9800	3880	289	292
17	56100	8500	11800	4720	13900	15400	4800	3420	8500	3140	235	207
18	53300	8390	8980	4780	14800	17100	4450	2990	6580	2280	199	180
19	50900	8080	8860	4840	14300	17400	3940	2040	6360	1680	343	170
20	48800	7670	8790	5520	14300	18000	3820	1310	6190	1160	1120	139
21	46700	7550	8440	7800	12000	20200	8600	1240	6270	1020	1070	140
22	35500	7510	8020	7930	12000	20400	14500	1200	6250	965	575	134
23	27100	7480	7910	7090	11700	20900	9280	1170	6190	952	310	127
24	30300	7420	7830	5260	11400	21700	6150	1200	5390	928	211	127
25	30800	6750	7670	4940	11200	21700	5420	1540	4070	911	191	129
26	30200	9520	7390	3470	10500	20100	4850	3320	3980	947	181	126
27	31100	11800	7320	1970	12500	19300	4700	7140	3690	884	219	124
28	31800	13500	7290	2150	21100	19800	4650	9740	3340	3690	767	3040
29	31600	12100	7270	5010	---	19800	3260	14700	2800	10300	812	4710
30	31300	9170	7250	9090	---	17900	1180	14400	2780	6800	801	1180
31	31000	---	7220	11100	---	10600	---	10600	---	291	755	---
TOTAL	1474800	427250	321670	165810	297430	567200	203020	135252	254630	94278	10997	13462
MEAN	47570	14240	10380	5349	10620	18300	6767	4363	8488	3041	355	449
MAX	77700	30500	17100	11100	21100	22800	14500	14700	14200	10300	1120	4710
MIN	21800	6750	7220	1970	4060	10600	1180	308	2780	291	128	121
AC-FT	2925000	847500	638000	328900	590000	1125000	402700	268300	505100	187000	21810	26700

CAL YR 1986 TOTAL 3388190 MEAN 9283 MAX 77700 MIN 56 AC-FT 6720000
WTR YR 1987 TOTAL 3965800 MEAN 10870 MAX 77700 MIN 121 AC-FT 7866000

ARKANSAS RIVER BASIN

07176460 BIRCH LAKE NEAR BARNSDALL, OK

LOCATION.--Lat 36°32'05", long 96°09'45", in NW 1/4 NE 1/4 sec.30, T.24 N., R.11 E., Osage County, Hydrologic Unit 11070107, 450 ft north of dam on Birch Creek, 1.5 mi south of Barnsdall and at mile 0.8.

DRAINAGE AREA.--66.0 mi².

PERIOD OF RECORD.--March 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 31, 1977 nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth dam with uncontrolled concrete spillway. Storage began Mar. 18, 1977; conservation pool was first filled Mar. 23, 1978. The outlet work is a gated intake structure. Capacity, 58,180 acre-ft at elevation 774.0 ft, crest of uncontrolled spillway and 19,180 acre-ft at elevation 750.5 ft, top of conservation pool. Dead storage, 3,360 acre-ft below elevation 730.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, water supply, water quality, recreation, and fish and wildlife.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 47,400 acre-ft, Oct. 6, 1986, elevation, 769.04 ft; minimum since conservation pool was first filled, 13,080 acre-ft, Oct. 26-29, 1977, elevation, 744.68 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 47,400 acre-ft, Oct. 6, elevation, 769.04 ft; minimum, 18,250 acre-ft, May 21, elevation, 749.67 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

750	18,620	764	37,990
751	19,750	765	39,740
754	23,350	767	43,410
758	28,650	769	47,320
763	36,300	770	49,360

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38720	19370	20470	19250	19500	27170	19210	18760	20180	19000	19530	19150
2	42810	19280	19880	19210	19340	27290	19180	18720	20210	19110	19500	19140
3	47180	19700	19520	19240	19120	27030	19140	18710	20320	19150	19430	19110
4	47380	21080	19520	19270	19070	26370	19110	18690	19980	19520	19410	19070
5	47380	21630	19520	19290	20170	25690	19100	18710	19720	19640	19370	19070
6	47160	21760	19550	19310	21290	25010	19060	18710	19640	19650	19350	19040
7	43280	21400	21120	19290	20570	24300	19040	18670	19530	19640	19310	19040
8	39400	20740	21230	19340	20900	23600	19030	18650	19480	19620	19260	19030
9	35620	20050	21000	20610	20450	22890	19010	18640	19470	19600	19270	19010
10	31940	19550	20460	20840	20440	22190	19010	18600	19470	19550	19240	19010
11	28530	19180	19870	20890	20440	21520	19000	18560	19450	19510	19210	19000
12	25090	19030	19650	20960	20420	20800	18970	18540	19410	19780	19240	18990
13	22340	19020	19680	20730	20400	20220	18980	18510	19390	19870	19270	18980
14	20390	19020	19680	20250	19430	19870	18950	18470	19350	19870	19250	18950
15	19410	19010	19700	19670	22370	19500	18920	18450	19310	19850	19200	19020
16	19350	19010	19730	19450	22760	19290	18910	18390	19260	19830	19180	18990
17	19290	19010	19740	19430	22800	20220	18900	18370	19230	19910	19140	18990
18	19240	18990	19740	19470	22500	20320	18870	18350	19180	19900	19090	19000
19	19170	18990	19740	19470	22150	20320	18850	18310	19170	19890	19330	18980
20	19120	18990	19700	19450	21690	20140	18820	18270	19170	19870	19340	18990
21	19090	18970	19660	19440	21140	19880	18930	18340	19170	19860	19290	18950
22	21690	18950	19640	19440	20580	19550	18950	18340	19180	19820	19260	18920
23	21880	18930	19580	19420	20010	19750	18920	18330	19180	19810	19210	18910
24	21820	18900	19560	19390	19470	20170	18920	18400	19170	19790	19200	18890
25	21480	21280	19520	19350	19270	20020	18910	18440	19140	19750	19190	18890
26	21150	22330	19470	19330	19810	19700	18900	18440	19120	19720	19260	18840
27	20780	22440	19420	19400	20510	19470	18840	18580	19080	19700	19260	18870
28	20400	22240	19370	19850	26660	19430	18830	19520	19070	19660	19240	24520
29	20030	21650	19340	20170	---	19340	18810	20110	19030	19640	19230	24560
30	19660	21080	19290	19900	---	19280	18780	20150	19030	19620	19200	24240
31	19550	---	19260	19570	---	19240	---	20180	---	19570	19180	---
MAX	47380	22440	21230	20960	26660	27290	19210	20180	20320	19910	19530	24560
MIN	19090	18900	19260	19210	19070	19240	18780	18270	19030	19000	19090	18840
(+)	750.82	752.13	750.57	750.84	756.55	750.55	750.15	751.37	751.37	750.84	750.50	754.70
(++)	-18,010	+1,530	-1,820	+310	+7,090	-7,420	-460	+1,400	-1,150	+540	-390	+5,060

CAL YR 1986 MAX 47380 MIN 17980 (++) +320

WTR YR 1987 MAX 47380 MIN 18270 (++) -13,320

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

07176465 BIRCH CREEK BELOW BIRCH LAKE NEAR BARNSDALL, OK

LOCATION.--Lat 36°32'08", long 96°09'38", NW 1/4 NE 1/4 sec.30, T.24 N., R.11 E., Osage County, Hydrologic Unit 11070107, on right bank (revised) 300 ft downstream from Birch Dam, 1.5 mi south of Barnsdall, and at mile 0.7.

DRAINAGE AREA.--66.0 mi².

PERIOD OF RECORD.--February 1977 to current year.

REVISED RECORDS.--WDR OK-86-1: 1984-85.

GAGE.--Water-stage recorder. Datum of gage is 690.00 ft, National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow completely regulated since March 1977 by Birch Lake (station 07176460).

AVERAGE DISCHARGE.--10 years, 45.3 ft³/s, 32,820 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,070 ft³/s, Oct. 7, 1986, gage height, 13.37 ft; maximum gage height, 26.40 ft, June 10, 1985 (backwater from Bird Creek); no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2,070 ft³/s, Oct. 7, gage height, 13.37; maximum gage height, 18.22 ft, Oct. 3 (backwater from Bird Creek); minimum daily discharge, 1.7 ft³/s, June 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.7	31	319	15	172	19	15	11	3.8	4.1	4.6	4.4
2	9.4	31	315	15	172	20	15	10	3.7	4.1	4.6	4.3
3	e9.4	31	186	15	132	193	15	10	63	4.1	4.6	4.3
4	9.7	33	24	15	47	336	15	10	143	4.4	4.6	4.3
5	9.8	35	24	15	17	333	15	10	103	4.6	4.6	4.3
6	204	69	24	15	271	332	15	10	27	4.6	4.4	4.3
7	1990	243	25	15	433	332	14	10	27	4.6	4.3	4.3
8	1960	356	154	15	430	330	13	10	19	4.6	4.3	3.7
9	e1910	354	319	16	191	328	13	10	11	4.6	4.3	3.1
10	1850	299	319	16	37	326	13	9.9	10	4.6	e4.3	3.1
11	1790	212	319	16	33	322	13	9.8	10	4.6	4.3	3.1
12	1210	91	124	16	30	322	13	9.8	10	4.9	4.3	3.1
13	1380	25	14	143	22	265	13	9.6	10	4.9	4.3	3.1
14	904	25	14	234	15	181	13	9.4	10	4.8	4.3	3.1
15	396	25	14	234	e15	181	13	9.4	10	4.8	4.3	3.4
16	33	25	15	146	17	97	13	9.4	9.0	4.8	4.3	4.1
17	33	25	17	37	113	31	13	9.4	8.4	4.8	4.3	4.1
18	33	25	19	37	285	32	13	9.2	3.3	4.8	4.3	4.1
19	32	25	24	37	285	31	14	9.1	1.7	4.8	4.6	4.1
20	21	25	27	37	283	109	14	7.1	2.7	4.8	4.6	4.1
21	15	25	27	37	283	178	13	3.9	2.7	4.8	4.6	3.9
22	17	25	27	36	283	178	13	3.8	3.1	4.7	4.6	3.8
23	16	25	27	36	280	102	13	3.8	4.1	4.6	4.6	3.8
24	93	25	27	36	278	30	13	3.9	4.1	4.6	4.4	3.8
25	166	22	27	36	117	98	13	3.8	4.1	4.6	4.3	3.8
26	166	19	27	36	18	156	13	3.8	4.1	4.6	4.4	3.8
27	166	18	27	36	18	105	12	3.9	4.1	4.6	4.6	3.8
28	166	175	27	36	19	32	12	4.3	4.1	4.6	4.6	3.8
29	166	324	27	105	---	30	11	3.8	4.1	4.6	4.6	4.1
30	166	321	27	172	---	30	11	3.8	4.1	4.6	4.6	149
31	83	---	20	172	---	24	---	3.8	---	4.6	4.6	---
TOTAL	15014.0	2964	2586	1827	4296	5083	399	235.7	524.2	143.2	138.1	260.0
MEAN	484	98.8	83.4	58.9	153	164	13.3	7.60	17.5	4.62	4.45	8.67
MAX	1990	356	319	234	433	336	15	11	143	4.9	4.6	149
MIN	9.4	18	14	15	15	19	11	3.8	1.7	4.1	4.3	3.1
AC-FT	29780	5880	5130	3620	8520	10080	791	468	1040	284	274	516

CAL YR 1986 TOTAL 25829.19 MEAN 70.8 MAX 1990 MIN .80 AC-FT 51230
WTR YR 1987 TOTAL 33470.2 MEAN 91.7 MAX 1990 MIN 1.7 AC-FT 66390

e Estimated

07176500 BIRD CREEK NEAR AVANT, OK

LOCATION.--Lat 36°29'12", long 96°03'50", in NW 1/4 sec.7, T.23 N., R.12 E., Osage County, Hydrologic Unit 11070107, 150 ft upstream from county road bridge at Avant, 1.5 mi upstream from Candy Creek, and at mile 54.2.

DRAINAGE AREA.--364 mi².

PERIOD OF RECORD.--August 1945 to current year.

GAGE.--Water-stage recorder. Datum of gage is 651.28 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow slightly regulated since 1958 by Bluestem Lake. Some regulation since March 1977 by Birch Lake (station 07176460), located on Birch Creek, 12.1 mi upstream. Small diversions upstream for municipal water supply for the cities of Pawhuska and Barnsdall.

AVERAGE DISCHARGE.--42 years, 219 ft³/s, 158,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,400 ft³/s, Oct. 2, 1959, gage height, 31.40 ft; maximum gage height, 32.03 ft, Mar. 11, 1974; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,200 ft³/s, Oct. 1, gage height, 26.84, stage falling, peak occurred Sept. 30, 1986; and peak discharges greater than base discharge of 6,000 ft³/s and maximum peak(*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	0800	*16,400	*23.74	Feb. 15	1600	7,630	10.38
Oct. 22	1300	7,660	10.42	Feb. 28	2400	12,400	18.16
Nov. 5	0700	6,890	9.41	Mar. 17	1700	6,580	9.05
Nov. 26	0900	9,470	13.06	Sept. 27	0900	9,660	13.37

Minimum daily discharge, 3.7 ft³/s, Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9190	227	e680	72	573	7000	156	67	88	13	6.0	5.6
2	1720	190	e620	62	610	924	149	62	62	19	5.6	5.2
3	15400	223	e490	69	460	562	142	59	783	33	5.6	4.8
4	5600	1470	e290	67	301	625	137	57	389	250	5.0	4.7
5	1070	4100	e245	70	788	549	137	120	250	150	4.5	4.4
6	476	825	e710	67	3720	512	141	78	104	251	4.3	4.3
7	2190	575	e1500	66	1690	483	149	56	71	122	4.3	4.3
8	2350	e505	e1100	63	1020	463	153	58	65	59	4.3	3.8
9	2270	e470	e860	1140	605	452	161	67	43	41	4.3	3.7
10	2220	e600	e770	846	349	438	170	51	34	31	4.3	5.0
11	2400	e410	e700	310	305	430	183	38	32	18	4.3	6.4
12	2180	e230	e450	192	229	425	184	33	31	17	28	6.7
13	1860	e190	e290	202	209	399	184	29	28	312	9.6	6.7
14	1200	165	e205	347	296	303	189	27	30	222	4.4	6.9
15	729	162	184	340	5690	297	200	26	27	76	4.1	8.3
16	e540	137	151	292	2180	267	207	22	23	44	4.0	7.9
17	e360	137	142	115	827	3020	212	21	19	33	4.0	7.6
18	e190	132	128	112	980	1220	212	20	16	29	17	8.4
19	e115	121	120	127	1240	469	211	20	15	29	10	8.0
20	94	121	108	135	825	352	204	20	20	22	37	6.4
21	105	120	137	144	750	577	274	16	27	17	22	5.3
22	3620	117	137	151	641	573	242	13	21	14	9.7	5.2
23	1160	112	133	139	516	627	188	12	25	11	7.3	5.2
24	423	108	133	133	491	1290	161	32	18	8.9	6.6	5.2
25	404	1190	133	118	455	458	152	83	13	7.9	51	5.2
26	392	6390	128	102	453	399	147	44	12	7.3	106	5.3
27	395	1980	128	129	2530	342	142	42	12	6.7	15	5450
28	370	e990	128	498	7340	229	130	2530	13	6.3	9.7	1160
29	414	e900	116	1700	---	201	106	1500	12	6.2	8.9	397
30	397	e780	101	834	---	188	78	338	12	6.2	7.3	432
31	300	---	87	479	---	174	---	155	---	6.2	6.3	---
TOTAL	60134	23677	11104	9121	36073	24248	5101	5696	2295	1868.7	420.4	7589.5
MEAN	1940	789	358	294	1288	782	170	184	76.5	60.3	13.6	253
MAX	15400	6390	1500	1700	7340	7000	274	2530	783	312	106	5450
MIN	94	108	87	62	209	174	78	12	12	6.2	4.0	3.7
AC-FT	119300	46960	22020	18090	71550	48100	10120	11300	4550	3710	834	15050

CAL YR 1986 TOTAL 181510 MEAN 497 MAX 24700 MIN 10 AC-FT 360000
WTR YR 1987 TOTAL 187327.6 MEAN 513 MAX 15400 MIN 3.7 AC-FT 371600

e Estimated

ARKANSAS RIVER BASIN

07177400 SKIATOOK LAKE NEAR SKIATOOK, OK

LOCATION.--Lat 36°21'02", long 96°05'13", in NE 1/4 SE 1/4 sec.26, T.22 N., R.11 E., Osage County, Hydrologic Unit 11070107, at right end of dam, 5.0 mi west of Skiatook and at mile 14.3.

DRAINAGE AREA.--354 mi².

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earthfill dam. Spillway is a concrete uncontrolled structure in right abutment. Outlet works consists of a controlled intake structure with a 10-foot, 6-inch diameter tunnel, a 2-foot, 6-inch by 5-foot low-flow sluice and a 36-inch water-supply pipe. Regulated storage began Oct. 31, 1984. Capacity, 893,000 acre-ft, at elevation 750.8 ft, maximum pool; 513,500 acre-ft at elevation 729.0 ft, top of flood control pool; 331,200 acre-ft, at elevation 714.0 ft, top of conservation pool; 11,800 acre-ft, at elevation 657.0 ft, top of inactive pool. Figures given herein represent total contents. Reservoir is designed for flood control, water supply, water quality, recreation and conservation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 268,200 acre-ft, Oct. 14, 1986, elevation 707.64 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 268,200 acre-ft, Oct. 14, elevation 707.64 ft; minimum, 139,660 acre-ft, Dec. 29, elevation 691.05 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

690	133,100	705	244,400
695	166,000	710	290,700
700	203,000	715	341,900

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	227300	200700	155700	139900	160800	236000	192100	187300	204500	187900	187500	186000
2	231400	194400	153000	139800	166000	237800	190800	187100	204600	188600	187300	186300
3	230700	188100	149700	140000	166800	238700	189900	187100	204500	188800	187200	186200
4	263900	187900	146600	140100	167200	237600	189600	187200	203200	192700	186600	185700
5	264500	190300	144800	140500	167900	235000	189300	187700	201000	193600	186600	185600
6	264900	188600	145500	140900	177200	232400	189200	187700	198300	194000	186600	185300
7	265100	186000	149000	140800	181100	229500	189100	187700	196800	189400	186300	185200
8	265100	182200	150500	141000	182200	226700	189000	187700	194800	189000	186200	185200
9	265400	178500	150700	146500	182500	223500	188700	187700	192700	192100	186000	185100
10	265100	175400	149500	148500	182900	220700	188500	187700	190500	191700	185800	184900
11	267600	171900	148100	149100	183400	217500	188300	187700	189300	191300	185700	184900
12	267500	168100	146900	149300	183700	214700	187800	187700	189200	192200	185700	184900
13	268000	164000	145100	149700	184100	212000	187800	187700	189200	194000	186100	184900
14	268100	160500	143500	150100	184200	209300	187500	187700	188800	194000	186000	184900
15	266400	157000	142200	150400	190500	206300	187400	187700	188400	193200	186000	185100
16	263700	153300	141500	149200	196400	203300	187100	187400	188200	192200	185900	185100
17	260200	149800	140900	150700	198100	205600	187200	187400	187800	192100	185800	185100
18	256400	146400	140800	151500	198300	209200	187200	187000	187500	192100	185600	185100
19	252400	144400	140600	151800	199400	208600	187200	187100	187500	191700	185700	185100
20	248200	142200	140600	152000	199700	208700	187400	186700	187500	191400	185800	185100
21	243600	141400	140300	152700	199600	207300	187600	187000	187500	191200	185800	185100
22	254600	141400	140300	153000	199100	205700	187600	187600	187800	190700	185700	185100
23	254400	141200	140200	153300	198300	204100	187600	187600	187800	190300	185400	185100
24	250700	141200	140000	153600	197800	206500	187800	188900	187900	189600	185100	185100
25	245700	145600	140000	153800	197200	205000	187800	189600	188200	189300	185400	185100
26	241000	157300	139900	154100	196900	203000	187800	189700	188200	189000	186000	185100
27	235300	158400	139800	154500	196700	201300	187900	189700	188200	188800	186000	185100
28	228100	158600	139800	156100	212900	199800	187800	198700	187900	188100	186000	208500
29	220300	157900	139700	161100	---	197400	187600	204400	187900	188000	186000	209300
30	213900	157000	139700	162400	---	195300	187500	204800	187900	187700	186000	209300
31	207600	---	139800	162900	---	192700	---	205000	---	187700	186000	---
MAX	268100	200700	155700	162900	212900	238700	192100	205000	204600	194000	187500	209300
MIN	207600	141200	139700	139800	160800	192700	187100	186700	187500	187700	185100	184900
(+)	700.58	693.70	691.07	694.56	701.25	698.66	697.97	700.25	698.03	698.00	697.78	700.80
(++)	+6,200	-50,600	-17,200	+23,100	+50,000	-20,200	-5,200	+17,500	-17,100	-200	-1,700	+23,300

CAL YR 1986 MAX 268100 MIN 80080 (++) +59,720

WTR YR 1987 MAX 268100 MIN 139700 (++) +7,900

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07177410 HOMINY CREEK BELOW SKIATOOK LAKE NEAR SKIATOOK, OK
(Formerly published as Hominy Creek near Skiatook)

LOCATION.--Lat 36°21'01", long 96°04'56", in SW 1/4 SW 1/4 sec.25, T.22 N., R.11 E., Osage County, Hydrologic Unit 11070107, located 300 ft downstream from Skiatook Lake stilling basin on the left bank of outlet channel, about 5.0 mi west of Skiatook, and at mile 14.0 on Hominy Creek.

DRAINAGE AREA.--354 mi².

PERIOD OF RECORD.--October 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 610.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Skiatook Lake (07177400).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,330 ft³/s, Oct. 29, 1986, gage height 22.80 ft; maximum gage height, 25.44 ft, Apr. 30, 1985 (from backwater); minimum daily discharge, 0.03 ft³/s, Nov. 10-14, 1984, and Feb. 22-24, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,330 ft³/s, Oct. 29, gage height, 22.80 ft; minimum daily discharge, 0.40 ft³/s, Aug. 20-25, 29-31, and Sept. 1-14, 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.70	3190	794	e.80	e.70	e.70	e693	e12	e233	e.68	.63	.40
2	e.70	3150	1340	e.70	e.70	e.70	e480	e.70	e233	e.68	.63	.40
3	e.70	3130	1530	e.70	e.70	e.70	e264	e.70	e551	e.68	.63	.40
4	e.70	2810	1530	e.70	e.70	e1270	e116	e.70	e971	.68	.64	.40
5	e.70	2020	1130	e.70	e.70	e1490	e116	e.70	e969	.66	.48	.40
6	e.70	1460	519	e.70	e.70	e1490	e116	e.70	e967	110	.48	.40
7	e.70	1610	570	e.70	e.70	e1490	e116	e.70	e966	275	.48	.40
8	e.70	1900	740	e.70	e.70	e1490	e116	e.70	e964	275	.48	.40
9	e.70	1890	1040	e.70	e.70	e1490	e116	e.70	e962	215	.55	.40
10	e.70	1890	992	e.70	e.70	e1480	e116	e.70	e961	120	.58	.40
11	e.70	1900	982	e.70	e.70	e1480	e116	e.70	e465	120	.58	.40
12	e.70	1870	980	e.70	e.70	e1480	e116	e.70	148	127	.58	.40
13	e.70	1860	977	e.70	e.70	e1480	e116	e.70	e148	188	.98	.40
14	e200	1850	977	e.70	e.70	e1480	e116	e.70	e148	277	.58	.40
15	e800	1850	736	e.70	e.70	e1480	e116	e.70	96	277	.58	.49
16	1280	1840	533	e.70	e.70	e1220	e69	e.70	86	278	.58	.54
17	1810	1840	383	e.70	e177	e730	e29	e.70	54	257	.58	.48
18	2140	1530	192	e.70	e500	e730	e29	e.70	e20	146	.58	.62
19	2110	1280	191	e.70	e500	e485	e29	e.70	e.70	146	.49	.40
20	2100	1020	192	e.70	e500	e380	e14	e.70	e.68	147	.40	.40
21	2090	482	191	e.70	e500	e473	e.70	e.70	e.68	148	.40	.43
22	2210	53	193	e.70	e500	e972	e.70	e.70	e.68	146	.40	.48
23	1630	53	163	e.70	e500	e971	e.70	e.70	e.68	147	.40	.48
24	2050	53	121	e.70	e500	e972	e.70	e.70	e.68	146	.40	.48
25	2580	111	121	e.70	e500	e972	e.70	e.70	e.68	148	.40	.48
26	2560	134	121	e.70	e497	e970	e.70	e94	e.68	147	.50	.48
27	2880	55	121	e.70	e500	e969	e31	e229	e.68	148	.58	.49
28	3640	275	e121	e.70	e194	e967	e53	e230	e.68	149	.42	e.48
29	4060	577	e60	e.70	---	e966	e47	e232	e.68	87	.40	e.48
30	3230	576	e1.0	e.70	---	e964	e23	e233	e.68	.69	.40	e335
31	3210	---	e.90	e.70	---	e693	---	e233	---	.64	.40	---
TOTAL	40589.10	42259	17541.90	21.80	5379.20	31036.10	3157.20	1279.80	8950.18	4228.71	16.21	347.81
MEAN	1309	1409	566	.70	192	1001	105	41.3	298	136	.52	11.6
MAX	4060	3190	1530	.80	500	1490	693	233	971	278	.98	335
MIN	.70	53	.90	.70	.70	.70	.70	.70	.68	.64	.40	.40
AC-FT	80510	83820	34790	43	10670	61560	6260	2540	17750	8390	32	690

CAL YR 1986 TOTAL 104631.11 MEAN 287 MAX 4060 MIN .03 AC-FT 207500
WTR YR 1987 TOTAL 154807.01 MEAN 424 MAX 4060 MIN .40 AC-FT 307100

e Estimated

07177500 BIRD CREEK NEAR SPERRY, OK

LOCATION.--Lat 36°16'42", Long 95°57'14", in NW 1/4 NW 1/4 sec.29, T.21 N., R.13 E., Tulsa County, Hydrologic Unit 11070107, near downstream side of right abutment of county road bridge (revised), 1.5 mi upstream from Delaware Creek, 2.4 mi downstream from Hominy Creek, 2.5 mi southeast of Sperry, and at mile 25.0.

DRAINAGE AREA.--905 mi².

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area. WSP 1921: 1943.

GAGE.--Water-stage recorder. Datum of gage is 579.43 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow slightly regulated since March 1977 by Birch Lake (station 07176460). Flow regulated to some extent since October 1984 by Skiatook Lake (station 07177400). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Skiatook Lake, 46 years (water years 1939-84), 484 ft³/s, 350,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90,000 ft³/s Oct. 3, 1959, gage height, 32.60 ft, from rating curve extended above 49,000 ft³/s; no flow at times in 1939, 1954-57, 1964-66, 1970.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1915 reached a stage similar to flood of Oct. 31, 1941, 30.14 ft, from information provided by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,500 ft³/s, Oct. 1, gage height, 30.82; minimum daily discharge, 15 ft³/s, Aug. 9-12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26600	3850	1180	156	808	10700	1050	107	459	105	18	28
2	15600	3750	1970	110	1240	7630	670	74	395	289	18	25
3	8030	3720	2340	98	743	1450	585	59	925	158	18	23
4	12900	4220	2140	112	503	2320	306	58	1940	1290	17	22
5	9190	7000	1730	122	488	2710	293	73	1380	1300	16	21
6	2150	5250	703	124	3940	2600	289	153	1190	276	16	20
7	1870	2710	1460	117	3720	2520	292	110	1040	504	16	20
8	3490	3000	4510	110	1460	2450	288	83	1020	378	16	20
9	3420	2970	3630	1120	966	2400	280	82	1010	324	15	19
10	3210	2990	2670	2070	496	2360	277	87	988	183	15	20
11	3200	3420	1980	702	343	2330	280	72	826	162	15	20
12	4370	2850	1730	376	296	2310	280	59	221	162	15	20
13	3140	2550	1340	277	258	2290	277	52	202	1710	59	24
14	2250	2370	1180	360	277	2180	273	49	194	767	138	24
15	2180	2340	1050	430	3290	2040	272	45	189	466	53	33
16	2090	2310	729	404	6250	2000	266	41	135	359	28	110
17	2290	2290	691	309	1940	2920	193	39	120	300	21	37
18	2750	2090	383	213	1890	5220	190	36	52	198	17	40
19	2730	1470	356	243	2600	2110	185	34	37	190	51	42
20	2720	1330	342	264	2060	828	181	33	40	189	60	31
21	2700	811	336	276	1590	1630	163	33	61	181	38	27
22	5290	271	327	285	1340	2180	265	36	69	177	55	22
23	6900	213	322	279	1170	1940	202	37	60	174	45	20
24	3080	211	272	262	1090	4390	161	40	50	174	32	22
25	3470	305	264	243	1120	2700	140	304	48	171	27	20
26	3480	5670	259	214	989	1820	129	192	38	175	29	19
27	3480	4800	255	212	3160	1640	121	399	34	168	222	19
28	4040	890	251	690	7090	1440	180	4790	30	165	146	3950
29	4730	1220	247	3080	---	1250	188	6320	29	151	59	5610
30	4200	1200	194	2010	---	1200	131	1710	35	35	40	952
31	3950	---	177	794	---	1170	---	619	---	19	33	---
TOTAL	159500	78071	35018	16062	51117	82728	8407	15826	12817	10900	1348	11260
MEAN	5145	2602	1130	518	1826	2669	280	511	427	352	43.5	375
MAX	26600	7000	4510	3080	7090	10700	1050	6320	1940	1710	222	5610
MIN	1870	211	177	98	258	828	121	33	29	19	15	19
AC-FT	316400	154900	69460	31860	101400	164100	16680	31390	25420	21620	2670	22330

CAL YR 1986 TOTAL 368845 MEAN 1011 MAX 26600 MIN 9.4 AC-FT 731600
WTR YR 1987 TOTAL 483054 MEAN 1323 MAX 26600 MIN 15 AC-FT 958100

ARKANSAS RIVER BASIN

07178050 BIRD CREEK NEAR CATOOSA, OK

LOCATION.--Lat 36°14'21", long 95°50'52", in NW 1/4 SW 1/4 sec.5, T.20 N., R.14 E., Tulsa County, Hydrologic Unit 11070107, at bridge on U.S. Highway 75, approximately 5.5 mi northwest of Catoosa.

DRAINAGE AREA.--1,080 mi².

PERIOD OF RECORD.--Water years 1965 to current year.

REMARKS.--Samples were collected on a monthly basis and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV										
20...	0845	1028	80020	9.43	325	7.70	18.0	10.5	38	750
DEC										
23...	1630	1028	80020	6.18	505	7.90	8.0	7.5	15	740
FEB										
03...	1000	1028	80020	8.47	*369	7.90	16.0	7.0	48	750
26...	1400	1028	80020	8.65	405	7.90	12.0	8.0	26	740
JUN										
10...	1100	1028	80020	8.36	344	7.80	23.5	18.0	29	750
JUL										
09...	1500	1028	80020	5.95	399	7.90	32.0	29.0	33	750
AUG										
25...	1415	1028	80020	4.56	656	7.60	31.0	28.5	11	750
SEP										
02...	1430	1028	80020	4.51	618	7.90	31.0	26.5	14	750

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
NOV										
20...	10.4	95	99	21	29	6.5	20	30	0.9	3.3
DEC										
23...	10.8	93	170	44	50	10	38	33	1	3.6
FEB										
03...	11.3	95	120	34	35	7.7	25	31	1	2.7
26...	10.9	95	120	30	36	8.0	27	32	1	2.9
JUN										
10...	9.9	106	98	22	28	6.8	23	33	1	3.2
JUL										
09...	8.6	114	120	34	34	7.9	30	35	1	3.4
AUG										
25...	7.9	104	160	43	49	10	55	41	2	6.9
SEP										
02...	7.8	99	160	45	47	9.5	53	41	2	7.2

DATE	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)	CAR- BONATE WATER WH IT FIELD (MG/L AS C03)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
NOV									
20...	95	0	78	17	39	181	162	0.25	0.0
DEC									
23...	154	0	126	40	59	302	274	0.41	0.0
FEB									
03...	105	0	86	35	40	207	196	0.28	0.0
26...	115	0	94	31	48	223	209	0.30	0.0
JUN									
10...	93	0	76	24	41	193	172	0.26	0.0
JUL									
09...	107	0	88	25	51	222	202	0.30	0.0
AUG									
25...	164	0	134	60	69	367	322	0.50	0.0
SEP									
02...	142	0	116	50	71	355	305	0.48	0.0

* SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07185000 NEOSHO RIVER NEAR COMMERCE, OK

LOCATION.--Lat 36°55'43", long 94°57'26", in SW 1/4 SE 1/4 sec.5, T.28 N., R.22 E., Ottawa County, Hydrologic Unit 11070206, on downstream side of right pier of county road bridge, 1.3 mi upstream from Mud Creek, 2.2 mi downstream from Four Mile Creek, 4.5 mi west of Commerce, and at mile 153.4.

DRAINAGE AREA.--5,876 mi².

PERIOD OF RECORD.--June 1939 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 748.97 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers' datum).

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated to some extent since 1963 by John Redmond Reservoir in Kansas, 190 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--48 years, 3,600 ft³/s, 2,608,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 267,000 ft³/s, July 15, 1951, computed by flood-routing methods from hydrograph defined at Miami, mile 144.2, by several discharge measurements, gage-height record, and by comparison with computed inflow into Lake O' The Cherokees; maximum gage height, 34.03 ft, July 16, 1951, from floodmark; no flow at times in 1953-54, and 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 6	1400	*103,000	*26.23	Feb. 17	0900	36,100	19.34
Oct. 28	0600	26,200	18.08	Mar. 2	2300	34,500	19.09
Nov. 6	0500	21,500	15.77	Mar. 20	1100	26,300	17.25
Nov. 27	2400	28,100	17.87	May 30	1300	28,900	18.10

Minimum daily discharge, 222 ft³/s, Aug. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47900	12500	2270	2130	5120	28600	11600	2250	6600	3090	331	2190
2	58900	12400	1860	2580	3970	33600	11700	2270	5200	2450	320	2110
3	67900	12200	1650	2870	3210	33600	11900	1600	4190	1870	317	2050
4	72100	12300	1980	2650	2670	29700	11300	1150	5190	1770	311	2000
5	84100	17800	3040	1780	2390	12500	6940	1180	10400	2920	330	1950
6	101000	19500	3330	1160	3470	9100	5330	4380	9810	7280	358	1880
7	92400	12500	3610	1020	5210	12700	5100	15500	8980	6060	378	1370
8	72200	5810	10300	984	6550	13900	4980	15100	8370	3040	325	833
9	53400	3830	15900	1480	5430	13700	4640	5260	7770	4070	262	664
10	39100	3280	13700	2490	4110	13100	3300	3020	6490	7490	238	654
11	24700	3790	7880	1790	3570	12600	2840	2240	3280	7910	222	630
12	17400	3690	7270	1410	2630	12400	2170	1810	2590	6380	238	644
13	16600	4930	6570	1500	2010	12100	2110	1810	2280	7900	296	715
14	16500	4550	5850	2040	3100	11200	3760	2470	1380	8640	468	1150
15	15300	2470	4330	3390	24000	8830	8120	1970	1230	5790	3280	1270
16	13900	1460	3750	4670	34300	7340	10400	1460	1240	2760	2290	1270
17	13100	1160	3490	4290	35700	10200	8020	1710	1190	1580	2190	1370
18	12900	1060	2280	3330	30900	22100	8960	1600	1120	1250	2080	1330
19	12700	981	1470	3450	14400	25200	9090	1360	1070	935	1910	1220
20	12500	925	1220	3020	8730	26100	8570	2110	1670	834	2360	1190
21	12300	856	1480	2980	9850	19100	8130	4640	3130	690	3340	1170
22	12800	808	2310	3480	10200	5030	9190	2880	2830	620	3780	1110
23	18800	887	2330	2910	8690	6580	8580	1810	1900	547	3020	1070
24	15900	2050	2280	2480	6830	10800	4540	1650	1290	497	1940	1060
25	16400	2530	2270	2440	5740	13200	2370	2390	2980	456	4720	949
26	22700	15800	2240	2260	5190	12300	1690	9980	1880	474	3010	666
27	25300	26300	2190	1870	4960	12800	1480	11800	1660	453	2440	467
28	25900	23500	2160	2000	14200	13000	1350	15200	2730	424	2460	479
29	18700	5800	2150	7130	---	12700	1280	26000	3020	403	3130	403
30	10400	3000	2130	15300	---	12500	1750	28600	3110	379	2380	2330
31	11700	---	2100	10400	---	12100	---	20900	---	346	2210	---
TOTAL	1035500	218667	125390	101284	267130	478680	181190	196100	114580	89308	50934	36194
MEAN	33400	7289	4045	3267	9540	15440	6040	6326	3819	2881	1643	1206
MAX	101000	26300	15900	15300	35700	33600	11900	28600	10400	8640	4720	2330
MIN	10400	808	1220	984	2010	5030	1280	1150	1070	346	222	403
AC-FT	2054000	433700	248700	200900	529900	949500	359400	389000	227300	177100	101000	71790

CAL YR 1986 TOTAL 2217180 MEAN 6074 MAX 101000 MIN 196 AC-FT 4398000
WTR YR 1987 TOTAL 2894960 MEAN 7931 MAX 101000 MIN 222 AC-FT 5742000

ARKANSAS RIVER BASIN

07185095 TAR CREEK AT 22ND STREET BRIDGE AT MIAMI, OK

LOCATION.--Lat 36°54'00", long 94°52'05", in NW 1/4 NE 1/4 sec.19, T.28 N., R.23 E., Ottawa County, Hydrologic Unit 11070206, near downstream left abutment of 22nd Street bridge in Miami, 0.5 mi east of intersection of Main and 22nd Street.

DRAINAGE AREA.--44.7 mi².

PERIOD OF RECORD.--January 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 762.23 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,310 ft³/s, Sept. 30, 1986, gage height, 13.73 ft; minimum daily discharge, 0.07 ft³/s, Aug. 15, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,930 ft³/s, Oct. 1, gage height, 12.31 ft, occurred on recession following peak of Sept. 30, 1986; maximum independent peak discharge, 2,320 ft³/s, Feb. 28, gage height, 10.37 ft; minimum daily discharge, 2.3 ft³/s, Aug. 4-9, and Sept. 24, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2710	18	21	11	63	613	21	13	29	160	2.8	3.6
2	453	15	21	9.8	86	150	17	11	20	35	2.5	3.1
3	313	15	16	11	56	69	17	13	29	15	2.4	2.6
4	524	146	14	13	36	44	15	14	25	11	2.3	2.6
5	332	360	13	14	28	34	16	22	14	12	2.3	2.6
6	738	159	16	14	23	29	16	112	12	24	2.3	2.4
7	638	72	46	14	21	24	15	72	9.5	13	2.3	2.7
8	114	44	138	13	20	22	16	19	9.5	8.3	2.3	3.0
9	24	36	158	138	19	20	15	9.3	6.8	6.2	2.3	3.0
10	28	61	76	192	19	17	15	6.9	5.8	5.8	2.4	4.2
11	30	182	36	57	18	15	16	5.2	6.8	5.2	2.4	3.7
12	33	88	31	28	17	14	15	4.4	7.9	5.9	5.1	2.9
13	31	45	20	21	28	14	31	4.4	7.9	13	7.1	2.4
14	35	30	18	18	140	14	44	4.6	7.5	15	9.8	2.4
15	24	25	18	15	1230	14	38	4.1	6.6	9.4	4.3	2.4
16	19	22	19	14	665	13	30	4.1	4.9	7.4	3.2	6.3
17	16	19	20	20	179	356	25	3.9	4.7	5.4	2.7	4.0
18	14	22	18	32	107	590	22	4.1	4.7	4.9	2.6	3.4
19	12	16	17	46	123	176	20	3.9	4.6	4.9	2.6	4.2
20	11	15	16	54	66	66	19	3.9	4.6	4.9	2.6	3.6
21	11	16	15	50	41	41	16	8.4	4.8	4.6	2.6	3.0
22	66	17	13	37	30	178	16	38	5.2	4.0	2.6	2.7
23	123	11	13	28	23	173	16	65	5.5	3.4	249	2.5
24	64	9.6	13	23	19	712	14	112	6.1	3.4	23	2.3
25	485	39	12	19	17	248	14	106	5.8	3.4	5.8	2.4
26	369	311	11	16	17	84	14	26	4.9	3.4	3.7	2.5
27	124	120	9.8	20	59	56	14	102	4.4	3.1	37	2.3
28	61	51	12	85	1590	41	14	917	4.2	3.0	21	189
29	34	33	13	310	---	42	14	730	4.2	3.0	9.2	63
30	25	25	13	134	---	27	14	191	75	2.9	6.3	14
31	20	---	11	48	---	24	---	57	---	2.8	4.7	---
TOTAL	7481	2022.6	867.8	1504.8	4740	3920	569	2687.2	340.9	403.3	431.2	348.8
MEAN	241	67.4	28.0	48.5	169	126	19.0	86.7	11.4	13.0	13.9	11.6
MAX	2710	360	158	310	1590	712	44	917	75	160	249	189
MIN	11	9.6	9.8	9.8	17	13	14	3.9	4.2	2.8	2.3	2.3
AC-FT	14840	4010	1720	2980	9400	7780	1130	5330	676	800	855	692

CAL YR 1986 TOTAL 21855.20 MEAN 59.9 MAX 3340 MIN .46 AC-FT 43350
WTR YR 1987 TOTAL 25316.6 MEAN 69.4 MAX 2710 MIN 2.3 AC-FT 50220

ARKANSAS RIVER BASIN

07188000 SPRING RIVER NEAR QUAPAW, OK

LOCATION.--Lat 36°56'04", long 94°44'45", in NE 1/4 SW 1/4 sec.5, T.28 N., R.24 E., Ottawa County, Hydrologic Unit 11070207, near center of span on downstream side of pier of county road bridge, 0.1 mi upstream from Rock Creek, 3.0 mi southeast of Quapaw, and at mile 13.9. Records include flow of Rock Creek.

DRAINAGE AREA.--2,510 mi², includes that of Rock Creek.

PERIOD OF RECORD.--July 1939 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 746.25 ft above National Geodetic Vertical Datum of 1929.

Nonrecording gage on right bank at same datum used May 20 to Nov. 16, 1943.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Occasional releases from floodgates at old Riverton Hydroelectric plant, 15 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--48 years, 2,041 ft³/s, 11.04 in/yr, 1,479,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 190,000 ft³/s, May 19, 1943, gage height, 43.4 ft, from floodmark, from rating curve extended above 54,000 ft³/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 5.8 ft³/s, July 8, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge 18,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 2	0700	*101,000	*33.11	Mar. 2	0200	35,900	21.25
Feb. 16	0100	26,300	18.48				

Minimum daily discharge, 137 ft³/s, Aug. 7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84700	1370	1710	664	3200	34400	2560	987	1660	2920	289	545
2	96400	1430	1490	849	2810	33500	2320	953	1170	3470	274	577
3	74100	1350	1410	852	2600	17800	2290	921	1290	2150	331	344
4	50500	1950	1410	824	2270	6580	2180	940	1270	2750	365	160
5	41600	5540	1160	789	1900	4670	2090	1150	1120	4770	211	231
6	24000	5270	1210	763	1830	4110	1930	6190	896	4750	194	280
7	10100	3580	1330	729	1680	3690	1910	4600	684	2830	137	295
8	6630	2560	3080	688	1470	3390	1850	2010	710	1830	160	412
9	5240	2330	4060	961	1500	3140	1780	1540	661	998	193	372
10	4670	2300	3500	1390	1410	2910	1730	1320	625	760	238	367
11	4030	2740	2340	1130	1350	2650	1690	1190	619	630	294	347
12	3580	2790	2020	1090	1300	2440	1640	1120	638	651	289	161
13	3860	2480	1850	1110	1270	2400	1770	1040	668	3460	352	152
14	3460	2150	1730	1280	2630	2330	2420	734	641	3130	364	278
15	3100	2000	1660	1730	18300	2240	3110	814	615	1230	334	278
16	2870	2020	1600	1550	25500	2170	2390	939	630	1160	316	267
17	2620	1960	1560	1190	22400	4070	1900	876	589	651	436	784
18	2320	1830	1370	1320	10800	9390	1850	841	535	680	439	988
19	2260	1780	1360	1420	6320	6210	1740	803	522	642	270	540
20	2040	1690	1370	1730	5440	4770	1590	1020	3710	586	407	485
21	1690	1570	1310	1940	4710	3340	1360	1180	1390	531	745	434
22	2150	1340	1250	1810	3850	3030	1370	739	1290	478	790	183
23	3060	1410	1200	1830	3270	3120	1340	877	3180	450	1550	203
24	2690	1360	1160	1720	2930	9630	1270	1230	2710	379	680	191
25	7510	1390	1140	1590	2550	11700	1060	1230	1540	286	1070	208
26	5350	7510	1120	1460	2360	6870	1170	1250	891	386	796	200
27	2960	6660	1110	1200	2500	4400	1180	1050	796	384	921	188
28	2200	3280	1040	1470	22000	3660	1040	5280	780	358	1240	492
29	2040	2030	1010	5210	---	3310	1020	10300	1170	333	556	877
30	1920	1850	989	9000	---	3010	1010	5820	942	278	662	267
31	1610	---	906	5550	---	2790	---	2570	---	267	613	---
TOTAL	461260	77520	49455	54839	160150	207720	52560	61514	33942	44178	15516	11106
MEAN	14880	2584	1595	1769	5720	6701	1752	1984	1131	1425	501	370
MAX	96400	7510	4060	9000	25500	34400	3110	10300	3710	4770	1550	988
MIN	1610	1340	906	664	1270	2170	1010	734	522	267	137	152
AC-FT	914900	153800	98090	108800	317700	412000	104300	122000	67320	87630	30780	22030
CFSM	5.93	1.03	.64	.70	2.28	2.67	.70	.79	.45	.57	.20	.15
IN.	6.84	1.15	.73	.81	2.37	3.08	.78	.91	.50	.65	.23	.16

CAL YR 1986 TOTAL 1132054 MEAN 3102 MAX 96400 MIN 170 AC-FT 2245000 CFSM 1.24 IN. 16.78
WTR YR 1987 TOTAL 1229760 MEAN 3369 MAX 96400 MIN 137 AC-FT 2439000 CFSM 1.34 IN. 18.23

07189000 ELK RIVER NEAR TIFF CITY, MO

LOCATION.--Lat 36°37'50", long 94°35'12", in NE 1/4 sec.22, T.22 N., R.34 W., McDonald County, Hydrologic Unit 11070208, on downstream side of second pier from right bank of bridge on State Highway 43, 0.8 mi downstream from Blackfoot Branch, 2.8 mi upstream from Buffalo Creek, 3.0 mi southeast of Tiff City, and at mile 15.8.

DRAINAGE AREA.--872 mi².

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 927: 1940. WSP 1117: Drainage area.

GAGE.--Water stage recorder. Datum of gage is 750.61 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Sept. 6, 1960 to Aug. 25, 1961, at site 100 ft downstream.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--48 years, 801 ft³/s, 12.47 in/yr, 580,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 137,000 ft³/s, Apr. 19, 1941, gage height, 28.4 ft, from floodmark, from rating curve extended above 60,000 ft³/s on basis of slope-area measurement of peak flow; minimum daily discharge, 5.1 ft³/s, Sept. 5-6, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	0630	*30,500	*20.09	Mar. 18	1300	10,300	11.95

Minimum daily discharge, 75 ft³/s, Aug. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28800	581	405	352	846	7390	1110	574	852	297	112	136
2	17700	545	398	341	902	6070	1030	554	734	284	106	123
3	6340	505	390	336	921	4090	965	534	648	265	99	116
4	4200	501	383	342	913	3210	911	546	563	263	93	108
5	3250	653	367	337	887	2660	862	1120	499	288	93	102
6	2820	885	357	336	855	2310	822	1140	449	294	90	98
7	2330	1010	354	340	816	2050	786	1110	409	266	90	93
8	1990	1060	367	328	774	1880	755	920	373	242	87	94
9	1720	1070	397	384	732	1760	723	786	344	216	84	92
10	1590	1040	586	1280	690	1640	721	687	323	203	78	92
11	1430	1060	774	1750	656	1540	739	612	328	191	75	90
12	1360	1240	800	1560	622	1450	728	554	337	199	75	89
13	e1300	1200	769	1340	600	1380	748	514	323	242	96	95
14	1230	1110	726	1230	752	1320	1670	516	304	378	136	92
15	1110	1040	675	1100	2040	1270	2120	478	283	321	139	92
16	1010	946	646	977	5510	1230	1710	437	265	277	132	119
17	925	875	606	900	5220	1750	1420	413	246	242	122	124
18	855	807	567	945	3720	8010	1280	413	231	e225	176	127
19	799	737	528	1110	2980	5100	1150	405	218	212	203	124
20	744	649	502	1230	2530	3180	1050	374	211	199	184	116
21	707	609	475	1220	2280	2280	964	347	243	184	176	108
22	678	569	450	1210	1940	1950	894	332	251	169	169	99
23	678	532	434	1170	1760	1630	841	332	317	161	154	93
24	669	494	418	1110	1670	1840	793	332	1130	154	136	89
25	911	474	406	1070	1480	2300	753	522	720	146	127	86
26	862	476	395	995	1350	2090	717	646	596	143	116	83
27	795	463	389	931	1300	1830	686	537	475	136	140	81
28	753	449	389	879	2110	1600	653	1020	376	132	163	98
29	710	435	381	857	---	1450	623	1370	328	129	189	102
30	662	421	362	858	---	1310	598	1180	303	122	172	102
31	614	---	357	842	---	1200	---	1000	---	115	153	---
TOTAL	89542	22436	15053	27660	46856	78770	28822	20305	12679	6695	3965	3063
MEAN	2888	748	486	892	1673	2541	961	655	423	216	128	102
MAX	28800	1240	800	1750	5510	8010	2120	1370	1130	378	203	136
MIN	614	421	354	328	600	1200	598	332	211	115	75	81
AC-FT	177600	44500	29860	54860	92940	156200	57170	40270	25150	13280	7860	6080

CAL YR 1986 TOTAL 398272 MEAN 1091 MAX 33700 MIN 72 AC-FT 790000
WTR YR 1987 TOTAL 355846 MEAN 975 MAX 28800 MIN 75 AC-FT 705800

e Estimated

ARKANSAS RIVER BASIN

07190000 LAKE O' THE CHEROKEES AT LANGLEY, OK

LOCATION (REVISED).--Lat 36°28'07", long 95°02'28", in SW 1/4 SW 1/4 sec.14, T.23 N., R.21 E., Mayes County, Hydrologic Unit 11070209, on upstream side of pier at intake structure near right end of Pensacola Dam on Neosho River at Langley, 9.9 mi upstream from Big Cabin Creek, and at mile 77.0.

DRAINAGE AREA.--10,298 mi².

PERIOD OF RECORD.--March 1940 to current year. Prior to October 1940, published as Grand Lake at Langley.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1.10 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers' bench mark). Prior to Nov. 14, 1941, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by multiple-arch concrete dam, with top of taintor-type spillway gates at gage height 755.0 ft. Storage began Mar. 21, 1940; power-pool was first filled Apr. 19, 1941. Capacity between gage heights 682.0 ft, sill of powerhouse penstock, and 745.0 ft, maximum power pool is 1,492,000 acre-ft. Capacity between gage heights 745.0 ft and 755.0 ft is 525,000 acre-ft, and is reserved for flood control. Dead storage below gage height 682.0 ft is 180,200 acre-ft. Figures given herein represent total contents. Reservoir is utilized for power development and flood control.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,213,000 acre-ft, May 25, 1957, gage height, 755.27 ft, minimum since power-pool was first filled, 642,900 acre-ft, Sept. 28, 1954, gage height, 713.41 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,197,000 acre-ft, Oct. 6, gage height, 754.99 ft; minimum, 1,465,000 acre-ft, Sept. 30, gage height, 740.31 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

740	1,452,000	750	1,917,000
745	1,672,000	755	2,198,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1918000	1782000	1680000	1500000	1561000	1849000	1710000	1531000	1690000	1550000	1537000	1516000
2	2053000	1767000	1666000	1494000	1563000	1879000	1706000	1522000	1683000	1548000	1538000	1513000
3	2178000	1759000	1651000	1492000	1562000	1876000	1708000	1511000	1671000	1547000	1538000	1510000
4	2171000	1761000	1639000	1492000	1558000	1866000	1714000	1500000	1660000	1550000	1541000	1508000
5	2179000	1773000	1626000	1488000	1556000	1850000	1711000	1483000	1660000	1547000	1541000	1506000
6	2184000	1785000	1615000	1492000	1555000	1826000	1704000	1479000	1658000	1546000	1541000	1505000
7	2153000	1779000	1605000	1495000	1559000	1814000	1696000	1497000	1654000	1544000	1535000	1504000
8	2113000	1767000	1608000	1494000	1560000	1805000	1688000	1511000	1650000	1540000	1535000	1502000
9	2097000	1749000	1629000	1498000	1561000	1794000	1678000	1504000	1643000	1541000	1537000	1501000
10	2082000	1739000	1643000	1503000	1553000	1781000	1668000	1494000	1637000	1543000	1536000	1501000
11	2035000	1732000	1644000	1504000	1545000	1771000	1656000	1479000	1627000	1547000	1535000	1501000
12	1954000	1728000	1643000	1503000	1540000	1763000	1641000	1480000	1616000	1551000	1535000	1502000
13	1911000	1718000	1638000	1500000	1536000	1755000	1626000	1480000	1611000	1552000	1537000	1503000
14	1903000	1711000	1634000	1500000	1543000	1745000	1621000	1483000	1605000	1555000	1537000	1501000
15	1891000	1699000	1626000	1504000	1609000	1734000	1626000	1483000	1604000	1546000	1541000	1497000
16	1877000	1685000	1616000	1503000	1716000	1721000	1634000	1484000	1602000	1537000	1548000	1491000
17	1862000	1672000	1607000	1501000	1797000	1746000	1635000	1486000	1597000	1536000	1550000	1489000
18	1846000	1659000	1593000	1497000	1840000	1794000	1636000	1486000	1591000	1540000	1552000	1488000
19	1831000	1643000	1578000	1494000	1839000	1811000	1639000	1483000	1584000	1540000	1555000	1486000
20	1816000	1628000	1561000	1495000	1823000	1815000	1637000	1483000	1588000	1542000	1547000	1484000
21	1801000	1621000	1545000	1496000	1816000	1808000	1637000	1489000	1591000	1544000	1547000	1482000
22	1793000	1619000	1532000	1496000	1807000	1771000	1635000	1496000	1589000	1545000	1551000	1480000
23	1798000	1615000	1527000	1501000	1795000	1751000	1635000	1498000	1586000	1544000	1552000	1478000
24	1795000	1613000	1524000	1498000	1778000	1758000	1627000	1500000	1577000	1544000	1543000	1478000
25	1809000	1614000	1521000	1494000	1761000	1774000	1613000	1494000	1567000	1543000	1541000	1477000
26	1827000	1636000	1515000	1489000	1746000	1767000	1598000	1495000	1561000	1544000	1541000	1475000
27	1835000	1676000	1514000	1487000	1733000	1756000	1584000	1513000	1558000	1545000	1541000	1473000
28	1838000	1711000	1513000	1488000	1793000	1738000	1569000	1553000	1557000	1546000	1539000	1473000
29	1829000	1709000	1511000	1501000	---	1729000	1554000	1608000	1554000	1545000	1534000	1467000
30	1807000	1697000	1510000	1534000	---	1717000	1541000	1657000	1550000	1542000	1524000	1466000
31	1794000	---	1503000	1555000	---	1710000	---	1693000	---	1540000	1521000	---
MAX	2184000	1785000	1680000	1555000	1840000	1879000	1714000	1693000	1690000	1555000	1555000	1516000
MIN	1793000	1613000	1503000	1487000	1536000	1710000	1541000	1479000	1550000	1536000	1521000	1466000
(+)	747.55	745.54	741.22	742.42	747.53	745.80	742.08	745.44	742.30	742.07	741.63	740.33
(++)	+30,000	-97,000	-194,000	+52,000	+230,000	-83,000	-169,000	+152,000	-143,000	-10,000	-19,000	-55,000
CAL YR 1986	MAX 2184000	MIN 1490000	(++) -121,000									
WTR YR 1987	MAX 2184000	MIN 1466000	(++) -298,000									

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07190500 NEOSHO RIVER NEAR LANGLEY, OK

LOCATION.--Lat 36°26'15", long 95°02'44", in SE 1/4 sec.27, T.23 N., R.21 E., Mayes County, Hydrologic Unit 11070209, in concrete stilling well on left bank, 0.5 mi upstream from bridge on State Highway 82, 1.5 mi south of Langley, 3.6 mi downstream from Pensacola Dam, 6.3 mi upstream from Big Cabin Creek, and at mile 73.4.

DRAINAGE AREA.--10,335 mi².

PERIOD OF RECORD.--October 1939 to current year.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 607.65 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Feb. 16, 1940, nonrecording gage at site 0.1 mi upstream at same datum. Feb. 10, 1954 to Sept. 30, 1963, water-stage recorder at site 0.5 mi downstream at same datum. Auxiliary water-stage recorders at sites 2.0 and 3.0 mi upstream at same datum.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Low flow values of 25 ft³/s consist of estimated base flow (since July 1964). Flow regulated since 1940 by Lake O' The Cherokees (station 0719000).

AVERAGE DISCHARGE.--48 years, 7,228 ft³/s, 5,237,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 300,000 ft³/s, May 20, 1943, gage height, 45.5 ft, from floodmarks, from computation of outflow from Lake O' The Cherokees; minimum daily, 9 ft³/s, Mar. 25, 1940 (caused by closure of Pensacola Dam).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 135,000 ft³/s, Oct. 4, gage height, 35.17 ft; minimum daily discharge, 25 ft³/s, Aug. 5, 8, 9, and 12-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87300	21000	e11100	5890	9690	43000	e17000	9990	12300	7640	e1380	4610
2	93000	20900	e10100	6900	9270	59600	e15500	8330	12300	7020	e30	4610
3	e106000	19700	e10800	7180	9380	64300	14000	8240	12400	5330	e800	4220
4	e131000	18500	e9900	4210	8440	62900	12600	10600	12400	4130	e40	3240
5	e113000	20900	e10600	4710	8040	35900	12600	11000	12400	8170	e25	2590
6	e108000	24600	e10400	2200	8090	28200	12600	12300	12400	12100	e170	2610
7	e115000	23000	e10800	877	6760	24300	12600	12300	12300	12100	e1960	2710
8	e105000	18700	e10800	2750	8240	23600	12600	12300	12300	9250	e25	1830
9	e81000	18500	e10800	3110	8590	23200	12600	12200	11900	3910	e25	1360
10	64100	14000	e11000	5510	10900	22800	12500	10500	12100	6090	e500	1350
11	67400	11300	e11100	4410	10400	21600	12500	11200	10900	7840	e1200	839
12	60300	11300	e10900	6980	8910	19800	12400	5090	10400	6990	e25	286
13	38500	11400	e11100	5310	7350	19800	12400	2770	7330	10900	e25	438
14	20700	11400	e11100	5710	5620	19500	11700	2750	5500	11800	e25	1560
15	22000	11400	e11000	6230	8630	19400	11800	3780	3710	e11800	e480	3640
16	22400	11300	e11000	7880	11600	19700	12400	1590	3880	e8600	e570	4960
17	22600	e10700	e11100	9680	e26400	16000	12300	1820	4100	e2500	e2880	3510
18	22400	e10700	11000	9590	e30100	18600	12200	2580	4370	e2400	e2210	3260
19	22500	e10600	11400	8820	e30700	31000	12200	3040	3950	e2190	e3550	2350
20	22400	e10600	12000	6970	e25600	35300	12100	2450	4590	e550	e3570	2880
21	22400	e7600	12000	7680	e20300	34800	12200	3010	3730	e50	e2960	2170
22	21900	e5000	11100	6850	e19900	32500	12300	3630	5980	e430	e3460	2310
23	21600	e5000	7870	6440	e19600	25500	12400	2630	7080	e1220	e3130	1810
24	21700	e4900	6270	7760	e19100	20600	12300	3810	9930	e820	e6220	1540
25	21700	e5700	5880	6900	e18400	24500	11700	8630	10100	e1280	e6180	1470
26	22300	e7900	6070	8180	e16900	28800	11700	9630	6450	e30	4300	1410
27	26400	e10900	5080	5550	18100	28300	11000	9850	2650	e220	5750	1500
28	29600	e11300	3920	5590	23000	27100	11000	11100	4410	e400	4520	5010
29	27700	e11300	5910	6470	---	26200	10300	12400	5360	e400	5530	4640
30	23900	e11300	4770	9140	---	24000	9610	12300	7180	e1620	7780	2340
31	21000	---	6050	10600	---	21200	---	12300	---	e1410	5440	---
TOTAL	1584800	391400	292920	196077	408010	902000	371110	234120	244400	149190	74760	77053
MEAN	51120	13050	9449	6325	14570	29100	12370	7552	8147	4813	2412	2568
MAX	131000	24600	12000	10600	30700	64300	17000	12400	12400	12100	7780	5010
MIN	20700	4900	3920	877	5620	16000	9610	1590	2650	30	25	286
AC-FT	3143000	776300	581000	388900	809300	1789000	736100	464400	484800	295900	148300	152800

CAL YR 1986 TOTAL 4037564 MEAN 11060 MAX 131000 MIN 25 AC-FT 8009000
WTR YR 1987 TOTAL 4925840 MEAN 13500 MAX 131000 MIN 25 AC-FT 9770000

e Estimated

07191000 BIG CABIN CREEK NEAR BIG CABIN, OK

LOCATION.--Lat 36°34'06", long 95°09'09" (revised), in NE 1/4 NE 1/4 sec.15, T.24 N., R.20 E., Craig County, Hydrologic Unit 11070209, near downstream side of right bank end of county road bridge, 4.9 mi northeast of Big Cabin, 0.9 mi downstream from White Oak Creek, 6.8 mi upstream from Mustang Creek, and at mile 13.0.

DRAINAGE AREA.--450 mi².

PERIOD OF RECORD.--October 1947 to current year.

GAGE.--Water-stage recorder. Datum of gage is 622.00 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Sept. 30, 1972, water-stage recorder at site 4.5 mi downstream at same datum and present site used as supplemental gage.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Low flow sustained in part by sewage from city of Vinita.

AVERAGE DISCHARGE.--40 years, 325 ft³/s, 9.47 in/yr, 235,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 52,000 ft³/s, Oct. 3, 1959, gage height, 34.55 ft, at former site; maximum gage height, 46.65 ft, Feb. 23, 1985; minimum discharge, 0.10 ft³/s, Oct. 4, 5, 1954, Sept. 12-17, 26-28, Oct. 4-9, 1956, and Oct. 5-7, 1963.

EXTREMES FOR OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1943, reached a stage of 34.96 ft at former site; discharge, 63,000 ft³/s, by slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	001	*32,900	*42.86	Feb. 28	2400	10,600	32.49

Minimum daily discharge, 0.60 ft³/s, Aug. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25700	85	180	64	507	7300	146	20	173	9.3	2.6	2.7
2	7870	75	156	60	964	1040	130	19	124	8.5	1.5	1.8
3	1110	69	133	65	523	538	116	17	287	8.4	1.1	1.4
4	1860	1130	112	92	315	382	107	17	256	48	.91	1.1
5	1020	3520	97	102	226	311	100	17	123	62	.88	.95
6	538	1180	91	93	189	264	95	24	85	37	.82	.87
7	460	468	230	83	160	227	90	74	64	18	.80	.84
8	342	323	914	74	145	203	86	47	51	14	.72	.85
9	214	282	1290	1980	127	185	83	29	40	12	.71	.90
10	155	481	686	1730	112	157	82	20	32	7.7	.73	1.1
11	139	1530	316	538	107	141	99	15	34	5.4	.73	1.2
12	330	602	224	269	101	126	91	13	39	5.3	1.0	1.0
13	344	304	185	235	105	118	86	11	34	46	1.2	.93
14	240	202	158	201	887	114	93	9.9	27	31	.97	.92
15	178	181	145	171	4380	108	120	8.5	21	13	.79	.88
16	128	174	163	156	1930	101	119	8.5	16	7.6	.67	1.5
17	109	166	202	241	954	1890	98	8.5	14	5.3	.63	1.6
18	94	146	185	432	912	5250	84	8.3	12	5.3	.60	1.1
19	98	126	149	472	1320	753	73	7.2	11	5.1	1.3	1.1
20	76	114	125	475	699	394	62	7.7	10	3.2	1.4	1.0
21	65	112	109	415	473	285	55	8.4	10	2.3	.95	.80
22	946	104	100	376	359	495	48	7.6	9.6	2.0	.83	.70
23	1990	96	97	302	284	530	44	12	14	1.8	.73	.88
24	469	88	95	266	234	3340	41	30	15	1.6	.69	1.1
25	324	315	91	230	213	1580	37	148	16	1.3	12	.92
26	369	2630	85	185	212	487	35	173	10	6.9	15	.84
27	289	836	80	228	525	337	31	87	8.1	74	34	.77
28	189	364	75	793	7430	286	28	2640	6.5	45	18	2.1
29	140	255	70	3400	---	225	24	3840	5.4	19	8.7	8.6
30	115	207	69	1270	---	182	23	837	6.2	8.4	9.0	4.9
31	98	---	66	448	---	160	---	292	---	4.6	5.3	---
TOTAL	45999	16165	6678	15446	24393	27509	2326	8456.6	1553.8	519.0	125.26	45.35
MEAN	1484	539	215	498	871	887	77.5	273	51.8	16.7	4.04	1.51
MAX	25700	3520	1290	3400	7430	7300	146	3840	287	74	34	8.6
MIN	65	69	66	60	101	101	23	7.2	5.4	1.3	.60	.70
AC-FT	91240	32060	13250	30640	48380	54560	4610	16770	3080	1030	248	90
CFSM	3.30	1.20	.48	1.11	1.94	1.97	.17	.61	.12	.04	.01	.00
IN.	3.80	1.34	.55	1.28	2.02	2.27	.19	.70	.13	.04	.01	.00

CAL YR 1986 TOTAL 143581.85 MEAN 393 MAX 25700 MIN .84 AC-FT 284800 CFSM .87 IN. 11.87
WTR YR 1987 TOTAL 149216.01 MEAN 409 MAX 25700 MIN .60 AC-FT 296000 CFSM .91 IN. 12.34

07191220 SPAVINAW CREEK NEAR SYCAMORE, OK

LOCATION.--Lat 36°20'07", long 94°38'24", in NE 1/4 NW 1/4 sec.4, T.21 N., R.25 E., Delaware County, Hydrologic Unit 11070209, on right bank 1.8 mi upstream from Cherokee Creek, 4.8 mi northeast of Row, 6.5 mi southeast of Sycamore, and at mile 35.0.

DRAINAGE AREA.--133 mi².

PERIOD OF RECORD.--October 1961 to current year.

REVISED RECORDS.--WSP 2121: 1965 (M).

GAGE.--Water-stage recorder. Elevation of gage is 875 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--26 years, 109 ft³/s, 11.13 in/yr, 78,970 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,800 ft³/s, July 27, 1975, gage height, 22.07 ft; minimum, 1.2 ft³/s, Aug. 9, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--According to local residents, a flood of about the same magnitude as the July 27, 1975 flood occurred in the early 1880's.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	1145	*10,300	*14.52	No other peak greater than base discharge.			
Minimum daily discharge, 17 ft ³ /s, Sept. 11-13.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5920	96	73	68	122	816	159	96	139	62	30	32
2	1440	93	72	68	126	530	152	95	119	60	29	31
3	613	88	71	69	129	392	146	93	105	58	27	28
4	408	89	71	69	129	316	140	91	96	57	26	26
5	310	98	70	69	126	267	136	91	88	56	25	24
6	246	124	69	70	124	232	131	94	83	56	24	22
7	204	131	68	71	121	208	129	103	79	55	24	20
8	174	131	68	71	118	191	126	103	75	49	23	19
9	154	127	70	85	115	178	123	99	72	40	22	18
10	142	122	72	227	112	167	120	95	70	e41	21	18
11	131	118	79	249	109	157	120	89	70	e41	21	17
12	129	113	83	223	107	150	118	86	71	e41	19	17
13	123	108	82	191	106	144	121	82	71	42	19	17
14	115	104	81	164	115	139	158	81	69	42	19	18
15	108	101	80	150	140	136	173	83	68	42	20	20
16	103	100	79	139	295	132	172	85	66	42	20	21
17	99	97	78	133	312	885	163	82	64	41	20	22
18	96	94	78	154	255	1330	153	80	62	40	21	25
19	92	91	77	197	213	602	146	77	61	39	26	26
20	88	88	75	206	185	404	138	75	60	38	27	27
21	84	84	74	198	166	322	130	73	60	36	29	27
22	84	82	73	185	151	271	123	73	59	35	29	26
23	83	81	73	171	139	241	119	73	59	34	28	24
24	82	79	73	159	129	248	115	76	61	32	26	23
25	84	78	72	150	119	258	111	85	67	31	24	21
26	123	78	72	141	114	241	108	90	74	33	22	20
27	143	77	72	138	146	221	106	91	72	36	23	19
28	132	76	71	133	437	205	104	221	69	35	25	21
29	119	75	70	130	---	192	101	237	67	34	28	21
30	108	74	70	126	---	178	99	207	64	32	31	23
31	101	---	69	122	---	167	---	166	---	31	33	---
TOTAL	11838	2897	2285	4326	4460	9920	3940	3172	2240	1311	761	673
MEAN	382	96.6	73.7	140	159	320	131	102	74.7	42.3	24.5	22.4
MAX	5920	131	83	249	437	1330	173	237	139	62	33	32
MIN	82	74	68	68	106	132	99	73	59	31	19	17
AC-FT	23480	5750	4530	8580	8850	19680	7810	6290	4440	2600	1510	1330

CAL YR 1986 TOTAL 55834 MEAN 153 MAX 6130 MIN 23 AC-FT 110700
WTR YR 1987 TOTAL 47823 MEAN 131 MAX 5920 MIN 17 AC-FT 94860

e Estimated

ARKANSAS RIVER BASIN

103

07191400 LAKE HUDSON NEAR LOCUST GROVE, OK

LOCATION.--Lat 36°13'54", long 95°11'36", in SE 1/4 NW 1/4 sec.9, T.20 N., R. 20 E., Mayes County, Hydrologic Unit 11070209, at left side of Robert S. Kerr dam on Neosho River, 2.0 mi northwest of Locust Grove, 3.5 mi downstream from Saline Creek, and at mile 47.3.

DRAINAGE AREA.--11,534 mi².

PERIOD OF RECORD.--October 1964 to current year.

GAGE.--Remote-controlled indicator and non-recording gage. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam and concrete spillway controlled by seventeen 22-foot taintor gates. Storage began Nov. 12, 1963; power pool first filled June 12, 1964. Capacity, 444,500 acre-ft at elevation 636.0 ft, top of taintor gates, 200,300 acre-ft at elevation 619.0 ft, power pool, and 48,630 acre-ft at elevation 599.0 ft, top of spillway crest. Figures given herein represent total contents. Reservoir was designed for flood control and power development.

COOPERATION.--Records provided by Grand River Dam Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 443,600 acre-ft, Oct. 4, 1986, elevation, 635.95 ft; minimum since power pool first filled, 174,300 acre-ft, Apr. 1, 1986, elevation, 616.51 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 443,600 acre-ft, Oct. 4, elevation, 635.95 ft; minimum, 192,900 acre-ft, Apr. 28, elevation, 618.31 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	626.11	286,700	-
Oct. 31.....	624.18	261,400	-25,300
Nov. 30.....	619.03	200,600	-60,800
Dec. 31.....	619.01	200,400	-200
CAL YR 86.....	-	-	-2,600
Jan. 31.....	618.74	197,500	-2,900
Feb. 28.....	622.05	235,100	+37,600
Mar. 31.....	620.32	215,000	-20,100
Apr. 30.....	618.51	195,000	-20,000
May 31.....	619.00	200,300	+5,300
June 30.....	619.17	202,200	+1,900
July 31.....	619.28	203,400	+1,200
Aug. 31.....	619.39	204,600	+1,200
Sept. 30.....	619.12	201,600	-3,000
WTR YR 87.....	-	-	-85,100

07191500 NEOSHO RIVER NEAR CHOUTEAU, OK

LOCATION.--Lat 36°13'45", long 95°10'59", in SE 1/4 NW 1/4 sec.9, T.20 N., R.20 E., Mayes County, Hydrologic Unit 11070209, on left bank, 300 ft downstream from Robert S. Kerr Dam, 2.2 mi northwest of Locust Grove, 10.0 mi northeast of Chouteau, and at mile 47.2.

DRAINAGE AREA.--11,534 mi².

PERIOD OF RECORD.--October 1937 to September 1950, October 1963 to current year.

REVISED RECORDS.--WSP 1117: Drainage area. WDR OK-86-1: 1979.

GAGE.--Water-stage recorder. Datum of gage is 554.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 3, 1941, nonrecording gage at bridge on State Highway 33, 8.2 mi downstream, at datum 17.63 ft lower. Apr. 3, 1941 to Sept. 30, 1950, and Oct. 1963 to Apr. 6, 1964, at site 2.5 mi downstream, at datum 2.17 ft lower. Supplemental water-stage recorder Oct. 4, 1963, to July 10, 1973, at site 8.2 mi downstream.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since 1940 by Lake 0' The Cherokees (station 07190000), and completely regulated since 1963 by Lake Hudson (station 07191400).

AVERAGE DISCHARGE.--Since regulation by Lake Hudson, 24 years (water years 1964-87), 8,445 ft³/s, 6,118,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 400,000 ft³/s, May 20, 1943, gage height, 45.00 ft, site and datum then in use, from rating curve extended above 140,000 ft³/s, on basis of slope-area measurement of peak flow; minimum daily discharge, 12 ft³/s, Nov. 13, 1963 (caused by closure of Robert S. Kerr Dam).

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 132,000 ft³/s, Oct. 5; minimum daily discharge, 229 ft³/s, July 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e108000	27600	13200	e5250	e11100	45900	e27400	e7940	e15100	e8510	1380	6200
2	e111000	28400	12500	e6680	e10100	61500	e16400	e8260	e11800	e5100	302	6510
3	e96000	27300	e13000	e10500	e11100	59900	e17200	e8160	e15700	e7060	258	3940
4	e126000	23400	e11200	e3710	e9430	52200	e13200	e12400	15700	e5090	258	2820
5	e132000	24600	e11700	e3670	e10600	42000	e11900	e12100	11800	e8660	258	2570
6	e115000	23800	e11800	e2560	e9350	35100	e13400	e12900	14100	e10300	978	3300
7	e120000	23000	e14900	e500	e6400	32900	e13700	e13700	14400	e11500	703	4260
8	e120000	22700	e11700	e3390	e9990	32300	e13000	e12700	13100	e11100	268	2760
9	e102000	21900	e16400	e8400	e6270	33000	e13500	e13100	14500	e6320	266	1470
10	e79000	19900	e15100	e8140	e10800	31300	e14500	e12400	11000	4610	266	789
11	e83500	16800	e11900	e7040	e12000	28300	e11500	e14000	13300	7420	1120	1480
12	e84600	18500	e13200	e7930	e14100	23800	e16200	e1430	e11900	8890	835	1420
13	e62200	20300	e13000	e7060	e7100	22900	e12900	e3150	e10100	9220	268	1280
14	e43500	19000	e11200	e8490	e2280	21300	e14900	e2870	e7550	15800	264	1010
15	e37300	12900	e12600	e6700	e14100	23000	e11300	e3200	e880	16100	471	3990
16	e30200	15600	e14500	e10500	e20800	25900	e15400	e2500	e4390	3520	979	6090
17	e29500	12800	e14500	e11400	e23700	25400	e15700	e1520	e2890	4650	296	2970
18	e30000	11600	e10700	e11600	e26500	28100	e10800	e4310	e4480	6050	2980	4780
19	e29200	12800	e12100	e11500	e27600	28200	e12400	e2360	e4020	573	5190	3580
20	e30500	13300	e14000	e8310	e30200	28200	e16700	e2980	e6030	331	2820	3430
21	e26900	11000	e12100	e8100	e27700	30700	e9000	e2870	e3450	234	3300	2130
22	e24300	4720	e13300	e9660	e27400	e32800	e11000	e3390	e5270	229	2700	2360
23	e24600	7470	e7250	e8010	e28100	e29600	e17100	e4370	e7300	639	4360	2360
24	e24700	7400	e6510	e9490	e26600	26500	e16800	e4160	e9230	233	8450	1480
25	e25000	6870	e6810	e7620	e27700	33700	e7720	e8990	e10300	3440	6530	2030
26	e26600	12000	e8820	e9100	e25200	34300	e14900	e12900	e9320	2310	4120	408
27	e23800	14000	e2390	e6600	e22500	e30900	e13900	e9670	e2060	531	8890	1830
28	e27000	13600	e5740	e6890	25800	e28800	e12000	e18800	e4460	258	1980	4620
29	e26900	12400	e5790	e11300	---	e29100	e9900	e22900	e5180	248	4660	4520
30	27800	14000	e4810	e13500	---	e28300	e10300	e19700	e6660	245	10700	2140
31	27900	---	e7960	e14600	---	e27500	---	e13200	---	245	5350	---
TOTAL	1855000	499660	340680	248200	484520	1013400	414620	272930	265970	159416	81200	88527
MEAN	59840	16660	10990	8006	17300	32690	13820	8804	8866	5142	2619	2951
MAX	132000	28400	16400	14600	30200	61500	27400	22900	15700	16100	10700	6510
MIN	23800	4720	2390	500	2280	21300	7720	1430	880	229	258	408
AC-FT	3679000	991100	675700	492300	961000	2010000	822400	541400	527600	316200	161100	175600

CAL YR 1986 TOTAL 4878075 MEAN 13360 MAX 132000 MIN 182 AC-FT 9676000
WTR YR 1987 TOTAL 5724123 MEAN 15680 MAX 132000 MIN 229 AC-FT 11350000

e Estimated

07193000 FORT GIBSON LAKE NEAR FORT GIBSON, OK

LOCATION.--Lat 35°52'16", long 95°13'43", in NW 1/4 NW 1/4 sec.18, T.16 N., R.20 E., Cherokee County, Hydrologic Unit 11070209, in control tower near left end of Fort Gibson Dam on Neosho River, 4.0 mi north of Fort Gibson, and at mile 7.7.

DRAINAGE AREA.--12,492 mi².

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1970, published as Fort Gibson Reservoir near Fort Gibson.

REVISED RECORDS.--WSP 1731: 1950 (M).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Jan. 13, 1950, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by concrete-gravity and earth-fill dam. Spillway is concrete ogee-type weir controlled by thirty 40-foot taintor gates; outlet works consists of ten, 5-foot, 8-inch by 7-foot sluice gates. Regulated storage began Sept. 5, 1949; power pool was first maintained in 1953. Capacity, 1,284,000 acre-ft at elevation 582.0 ft, flood control pool, 365,200 acre-ft at elevation 554.0 ft (maximum power pool), and 311,300 acre-ft at elevation 551.0 ft (minimum power pool). Figures given herein represent total contents. Reservoir was designed for flood control and power development. U.S. Army Corps of Engineers' satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,286,000 acre-ft, Oct. 5, 1986, elevation, 582.04 ft; minimum since first use of power pool, 303,800 acre-ft, May 26, 1955, elevation, 550.56 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,286,000 acre-ft, Oct. 5, elevation, 582.04 ft; minimum, 342,500 acre-ft, July 23, elevation 552.78.

Capacity table (elevation, in feet, and contents, in acre-ft):

550	294,600	571	812,100
557	425,400	578	1,092,700
564	594,300	585	1,443,100

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	989000	536400	374900	373600	390100	566700	448300	361600	459500	376400	348000	377400
2	1226000	528600	371900	372200	389900	657700	426700	353400	444800	377000	347800	373600
3	1239000	524400	370700	385300	388900	704400	414900	347600	440800	378900	346700	371300
4	1254000	524800	369000	386500	385700	721200	404100	356300	439500	377700	347200	367700
5	1286000	521400	368000	378900	384300	720900	391900	370300	431100	379100	347100	369400
6	1274000	506300	377000	372000	379300	711900	382700	372000	424800	374700	347400	371300
7	1277000	491600	392500	359700	368600	704700	377400	375500	419900	377500	347600	374500
8	1266000	476800	395100	361600	365400	696600	374300	375100	413200	380300	347600	372600
9	1249000	460400	401500	382700	358600	678400	372400	377900	408400	374500	348000	369800
10	1183000	451400	404900	390900	363500	652400	374500	378100	398100	366700	348000	367300
11	1146000	467300	400100	382100	367300	624300	370500	384300	392500	366200	348400	367700
12	1108000	446300	397700	381900	377200	581300	374700	365000	390300	369600	349700	365000
13	1059000	450300	395100	380300	374300	535600	372800	356100	388300	372200	350200	367300
14	986500	445000	390100	380900	361800	493100	376000	351900	379100	383300	349100	367100
15	925400	437100	387100	384100	376200	459100	369800	352300	367100	391500	349100	368800
16	859700	435300	386900	386500	397900	434200	373200	358000	360300	380100	348000	371500
17	808600	428300	388500	388300	409900	433400	376800	359700	359700	370100	348700	366500
18	764600	418700	381700	393700	411300	440200	370700	361000	359700	374700	352500	369200
19	718000	410300	378700	396500	413000	443300	367700	356800	363100	368800	360000	372800
20	699100	403900	383900	390900	416600	433200	374500	361000	369000	360100	354000	372600
21	692300	392300	387700	388500	415100	426900	366900	361000	359300	352700	350600	368600
22	681100	375600	388900	384700	412600	417800	360300	364600	361200	346300	354000	369000
23	667900	366500	388300	380700	413800	415500	365800	370900	371100	342500	360200	366700
24	646600	365400	384300	377000	410500	424100	375100	378900	375500	342700	361500	366200
25	620400	371300	381900	369000	411100	444600	367100	379300	374700	347900	358100	362000
26	605900	378500	387100	368600	419700	466400	372200	380300	372600	350800	361300	364400
27	593800	384500	378500	365600	425000	466600	376600	378500	366200	348700	370400	366000
28	577000	384700	376400	366200	482500	454500	376800	403900	366000	348700	368300	369600
29	564400	379900	373600	375300	---	444600	372400	446600	366900	348700	375000	375500
30	552400	376000	368400	382500	---	438200	368800	467300	368800	346300	382400	373000
31	543600	---	369000	388300	---	440400	---	465500	---	346300	377600	---
MAX	1286000	536400	404900	396500	482500	721200	448300	467300	459500	391500	382400	377400
MIN	543600	365400	368000	359700	358600	415500	360300	347600	359300	342500	346700	362000
(+)	562.08	554.57	554.20	555.19	559.58	557.70	554.19	558.83	554.19	552.99	554.65	554.47
(++)	-65,300	-167,600	-7,000	+19,300	+94,200	-42,100	-71,600	+96,700	-96,700	-22,500	+31,300	-4,600
CAL YR 1986	MAX 1286000	MIN 342700	(++)	-31,500								
WTR YR 1987	MAX 1286000	MIN 342500	(++)	-235,900								

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-Feet

07193500 NEOSHO RIVER BELOW FORT GIBSON LAKE NEAR FORT GIBSON, OK

LOCATION.--Lat 35°51'15", Long 95°13'45", in SE 1/4 NW 1/4 sec.19, T.16 N., R.20 E., Cherokee County, Hydrologic Unit 11070209, on left bank 1.1 mi downstream from Fort Gibson Dam, 3.5 mi north of Fort Gibson, and at mile 6.6.

DRAINAGE AREA.--12,495 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1950 to current year. Prior to October 1970, published as Neosho River below Fort Gibson "Reservoir" near Fort Gibson.

GAGE.--Water-stage recorder. Datum of gage is 483.75 ft above National Geodetic Vertical Datum of 1929. May 11, 1950 to Aug. 20, 1951, nonrecording gage and Aug. 21, 1951 to June 11, 1952, water-stage recorder, at site 4.4 mi downstream at datum 8.00 ft lower and used as auxiliary gage since June 10, 1971.

REMARKS.--Records fair above 100 ft³/s and poor below. Flow completely regulated by Fort Gibson Lake (station 07193000). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--37 years, 8,370 ft³/s, 6,064,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 223,000 ft³/s, May 26, 1957, gage height, 37.60 ft; minimum 12 ft³/s, Oct. 10, 1957, Aug. 23, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1943 reached a stage of 43.0 ft, from high-water profile by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 144,000 ft³/s, Oct. 8, maximum gage height, 33.88 ft, Oct. 6; minimum daily discharge, 15 ft³/s, May 16, 17, 20, 23, 24, July 24-26, 28-31, Aug. 1, 2, 4-9, 22, 23, 29, and Sept. 15, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	536	31000	14900	3870	12500	11800	26800	e11000	e17800	5000	15	10800
2	12800	30600	14000	7570	12200	21500	27600	e11000	e19400	7030	15	6200
3	89400	29000	12900	4720	12400	37400	23400	e11000	17200	6570	618	5500
4	129000	26500	12000	3690	12400	42900	18800	e5150	16400	7440	15	4650
5	136000	27800	12200	7420	12500	39900	18600	e6100	16600	6970	15	1630
6	140000	31000	6920	7660	12400	34500	18400	e11000	17000	11200	15	1280
7	142000	31100	7150	8050	12200	31000	17100	e11000	16800	12000	15	1970
8	142000	30300	12100	2450	12000	30900	14600	e11000	16500	10100	15	3410
9	133000	29900	13200	2480	10200	36600	13700	e11000	16600	10600	15	2720
10	121000	25300	14900	6870	8840	40200	e12900	e11000	16300	8100	50	2910
11	114000	21400	14500	12100	10000	39300	e12900	e11000	16000	6960	122	15
12	113000	18800	14500	9320	10300	42900	e12900	e11000	13700	8140	32	3610
13	104000	16600	14600	14800	9520	44200	e12900	e7810	11800	7890	104	78
14	92400	16700	14600	8580	10100	42200	e12900	e3550	12200	8950	891	52
15	78800	16700	14700	7550	8680	40400	e12900	e2100	9040	12200	281	4080
16	69700	16700	15000	9500	12200	37200	e12900	e15	6140	9020	1400	5890
17	62200	16700	14600	12700	18700	32800	e12900	e15	4790	10300	363	5460
18	54000	16600	14900	12500	27200	28800	e12900	e3800	3040	5350	18.0	3160
19	51800	16700	13400	12700	27000	28900	e12900	e4200	2250	4630	814	1510
20	39700	16900	12300	12600	27300	34400	e12900	e15	4590	5110	5230	3910
21	30500	16900	12000	12500	27500	35700	e12900	e3100	10600	4200	4690	4070
22	30300	14200	12100	12600	27300	35500	e12900	e2100	2960	3770	15	1730
23	30800	12000	9210	12700	27300	31300	e12200	e15	3540	2510	15	3150
24	33700	6940	7660	12800	27500	27400	e11100	e15	6900	15	8120	2350
25	36400	4980	8070	12800	27400	27600	e11100	e7600	9740	15	7240	3470
26	30800	8490	6820	11300	24100	28000	e11100	e11700	11400	15	4060	573
27	29000	12000	7470	8710	21700	31100	e11000	e11200	6620	1540	6540	15
28	32100	13800	7610	9600	15900	34000	e10900	e10100	3950	15	3970	3550
29	32000	15600	7190	8780	---	33900	e10900	e7900	5350	15	15	2250
30	31900	15800	7020	10800	---	30700	e11000	e11100	4010	15	6480	2800
31	31400	---	6820	12500	---	27000	---	e11100	---	15	7110	---
TOTAL	2174240	587010	355340	292220	477340	1040000	436000	218685	319220	175685	58298.0	92793
MEAN	70140	19570	11460	9426	17050	33550	14530	7054	10640	5667	1881	3093
MAX	142000	31100	15000	14800	27500	44200	27600	11700	19400	12200	8120	10800
MIN	536	4980	6820	2450	8680	11800	10900	15	2250	15	15	15
AC-FT	4313000	1164000	704800	579600	946800	2063000	864800	433800	633200	348500	115600	184100

CAL YR 1986 TOTAL 5520994. MEAN 15130 MAX 142000 MIN 15 AC-FT 10950000
WTR YR 1987 TOTAL 6226827. MEAN 17060 MAX 142000 MIN 15 AC-FT 12350000

e Estimated

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

WATER TEMPERATURE: October 1951 to September 1963, October 1973 to January 1982.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible]

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 09...	<0.1	<10	1	<1	<1	150	<6	8	21	652	84
JAN 13...	<0.1	<10	4	<1	<1	190	<6	6	14	427	87
FEB 25...	--	--	--	--	--	--	--	--	16	1130	90
APR 09...	<0.1	<10	5	<1	<1	180	<6	13	17	610	86
JUN 03...	--	--	--	--	--	--	--	--	11	481	66
SEP 01...	--	--	--	--	--	--	--	--	2	61	76

07195500 ILLINOIS RIVER NEAR WATTS, OK

LOCATION.--Lat 36°07'48", long 94°34'12", in NE 1/4 sec.18, T.19 N., R.26 E., Adair County, Hydrologic Unit 11110103, near right bank on downstream side of pier of bridge on U.S. Highway 59, 1.5 mi north of Watts, 4.5 mi downstream from Cincinnati Creek, and at mile 106.2.

DRAINAGE AREA.--635 mi².

PERIOD OF RECORD.--August 1955 to current year.

GAGE.--Water-stage recorder. Datum of gage is 893.78 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation at low flow by Lake Frances Dam, 0.8 mile upstream from station. Since July 2, 1957, small diversion for municipal water supply for city of Siloam Springs, Ark., upstream from station. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--32 years, 585 ft³/s, 12.52 in/yr, 423,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 68,000 ft³/s, July 25, 1960, gage height, 25.96 ft, from rating curve extended above 51,000 ft³/s; minimum, 8.6 ft³/s, Oct. 26, 1955, Sept. 19, Oct. 14, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	1245	*42,300	*24.47	Mar. 18	0700	14,100	16.22
Apr. 4	1945	9,000	13.20	Apr. 14	1200	13,300	15.80

Minimum discharge, 135 ft³/s, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34500	502	366	278	607	5340	831	460	460	295	178	161
2	17200	477	358	278	819	2850	780	414	438	329	169	154
3	4470	458	354	289	771	1980	742	405	361	301	159	152
4	3520	556	342	309	693	1550	708	457	323	287	149	149
5	2530	2010	335	332	662	1320	673	444	309	279	148	145
6	2020	1520	328	324	630	1170	648	414	293	270	147	141
7	1690	1100	327	322	618	1040	631	463	278	251	146	138
8	1460	962	338	317	589	953	614	504	259	237	142	136
9	1140	892	390	1290	579	879	590	466	251	227	140	135
10	938	788	480	2740	572	827	569	414	251	220	139	142
11	841	736	431	1580	569	774	565	367	259	209	138	161
12	1200	725	407	1220	568	732	557	328	258	201	145	187
13	1150	657	389	1040	562	698	662	320	252	212	152	270
14	972	607	372	912	1080	673	6940	283	241	215	151	271
15	838	583	364	821	1440	635	2360	293	230	210	149	227
16	747	563	365	761	2700	640	1620	306	220	205	145	382
17	687	541	365	740	1950	3110	1170	309	215	204	144	494
18	644	516	358	1360	1550	8810	972	309	209	229	169	326
19	604	496	352	1970	1380	3300	889	309	209	294	188	271
20	569	468	343	1440	1210	2120	744	293	211	257	199	239
21	543	455	335	1220	1090	1620	662	283	220	235	195	213
22	543	438	324	1060	982	1400	615	288	207	221	173	196
23	616	420	320	952	898	1290	576	301	457	212	159	187
24	666	416	317	863	833	2390	551	347	1580	216	151	179
25	647	409	314	796	787	1940	527	426	800	231	147	171
26	867	408	306	745	757	1440	508	414	531	281	141	164
27	761	415	299	736	848	1240	498	378	425	243	169	160
28	674	399	295	675	3570	1110	495	414	358	217	250	185
29	610	385	289	618	---	1060	495	1070	315	204	234	204
30	569	377	285	608	---	982	488	998	299	195	196	202
31	535	---	284	582	---	898	---	590	---	188	174	---
TOTAL	84751	19279	10732	27178	29314	54771	28680	13067	10719	7375	5086	6142
MEAN	2734	643	346	877	1047	1767	956	422	357	238	164	205
MAX	34500	2010	480	2740	3570	8810	6940	1070	1580	329	250	494
MIN	535	377	284	278	562	635	488	283	207	188	138	135
AC-FT	168100	38240	21290	53910	58140	108600	56890	25920	21260	14630	10090	12180

CAL YR 1986 TOTAL 320805 MEAN 879 MAX 34500 MIN 80 AC-FT 636300
WTR YR 1987 TOTAL 297094 MEAN 814 MAX 34500 MIN 135 AC-FT 589300

ARKANSAS RIVER BASIN

07196000 FLINT CREEK NEAR KANSAS, OK

LOCATION.--Lat 36°11'54", long 94°42'30", in SW 1/4 sec.24, T.20 N., R.24 E., Delaware County, Hydrologic Unit 11110103, at bridge on State Highway 33, 6.0 mi southeast of Kansas, 6.0 mi downstream from Sager Creek, and at mile 2.8.

DRAINAGE AREA.--110 mi².

PERIOD OF RECORD.--August 1955 to September 1976, April 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 854.59 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Small diversion above station for irrigation.

AVERAGE DISCHARGE.--29 years, (water years 1956-76, 80-87), 117 ft³/s 14.44 in/yr, 84,770 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,400 ft³/s, June 8, 1974, gage height, 19.42 ft; minimum daily discharge, 0.6 ft³/s, Oct. 11-13, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	1200	*6,060	*10.21	Mar. 17	1515	4,470	9.46

Minimum daily discharge, 20 ft³/s, multiple days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4540	120	80	63	116	667	155	72	108	40	23	28
2	1570	115	80	62	121	445	136	69	93	39	22	27
3	831	110	78	69	117	350	132	68	82	39	20	25
4	581	134	76	72	116	290	126	68	74	39	20	26
5	453	187	74	71	111	250	120	70	67	46	20	25
6	377	177	74	71	108	224	114	70	61	45	20	25
7	327	165	75	70	104	203	111	82	56	41	20	25
8	291	171	80	70	101	186	108	67	52	35	21	24
9	262	162	90	192	98	171	108	62	51	33	20	24
10	236	155	90	291	96	155	103	60	49	32	20	27
11	221	145	89	236	93	142	96	58	53	30	20	29
12	226	135	88	204	89	132	93	57	54	28	31	29
13	205	129	86	182	99	124	106	56	54	33	26	35
14	191	124	83	162	233	118	141	55	50	32	24	32
15	179	122	84	143	240	114	137	57	47	30	22	35
16	165	115	86	133	384	118	131	54	47	29	20	61
17	155	112	86	138	316	1750	123	51	44	29	21	52
18	147	109	82	273	257	1390	115	50	43	29	22	41
19	136	105	80	306	226	607	109	49	43	27	25	40
20	129	99	78	262	204	434	103	47	51	25	27	34
21	125	94	75	232	188	347	96	45	69	25	27	31
22	128	92	74	213	172	297	91	101	56	25	24	29
23	135	88	74	196	157	270	87	85	61	26	23	28
24	125	87	74	183	145	300	84	76	65	27	24	26
25	160	89	72	166	136	265	82	77	52	28	27	26
26	219	91	70	153	130	240	80	72	46	27	26	25
27	189	87	70	141	136	223	78	64	43	25	60	24
28	167	84	67	132	664	207	77	159	40	25	67	65
29	147	83	66	126	---	191	76	240	38	28	46	83
30	136	81	66	120	---	179	74	179	38	27	35	57
31	127	---	65	113	---	170	---	133	---	23	30	---
TOTAL	12880	3567	2412	4845	4957	10559	3192	2453	1687	967	833	1038
MEAN	415	119	77.8	156	177	341	106	79.1	56.2	31.2	26.9	34.6
MAX	4540	187	90	306	664	1750	155	240	108	46	67	83
MIN	125	81	65	62	89	114	74	45	38	23	20	24
AC-FT	25550	7080	4780	9610	9830	20940	6330	4870	3350	1920	1650	2060
CFSM	3.78	1.08	.71	1.42	1.61	3.10	.97	.72	.51	.28	.24	.31
IN.	4.36	1.21	.82	1.64	1.68	3.57	1.08	.83	.57	.33	.28	.35

CAL YR 1986	TOTAL 66860	MEAN 183	MAX 7570	MIN 29	AC-FT 132600	CFSM 1.67	IN. 22.6
WTR YR 1987	TOTAL 49390	MEAN 135	MAX 4540	MIN 20	AC-FT 97970	CFSM 1.23	IN. 16.7

ARKANSAS RIVER BASIN

111

07196500 ILLINOIS RIVER NEAR TAHLEQUAH, OK

LOCATION.--Lat 35°55'17", long 94°55'15", in SE 1/4 sec.26, T.17 N., R.22 E., Cherokee County, Hydrologic Unit 11110103, near center of channel on downstream side of pier of bridge, 0.2 mi downstream from U.S. Highway 62, 2.2 mi northeast of Tahlequah, 6.5 mi upstream from Baron Fork, and at mile 55.8.

DRAINAGE AREA.--959 mi².

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 664.14 ft, U.S. Army Corps of Engineers datum. Prior to Feb. 23, 1939, nonrecording gage.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--52 years, 895 ft³/s, 12.67 in/yr, 648,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 150,000 ft³/s, May 10, 1950, gage height, 27.94 ft, from rating curve extended above 77,000 ft³/s, on basis of slope-area measurement of peak flow; minimum daily, 0.1 ft³/s, Oct. 10-14, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of January 1916 reached a stage of about 26 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	1400	*56,800	*22.54	Mar. 19	0700	10,700	13.16

Minimum discharge, 196 ft³/s, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46600	1100	895	792	1190	4680	1330	827	1170	409	259	252
2	45300	1060	881	786	1190	5510	1250	804	979	394	251	235
3	16600	1030	867	793	1300	3490	1180	773	863	398	242	223
4	5910	1070	858	804	1330	2640	1130	759	777	430	233	215
5	4600	1210	846	818	1260	2190	1090	760	721	409	224	210
6	3560	2390	835	840	1200	1900	1050	775	684	392	216	206
7	2980	2240	832	843	1160	1710	1020	749	656	382	211	203
8	2600	1930	832	845	1120	1570	990	754	634	369	208	200
9	2330	1750	842	943	1090	1450	969	781	615	352	206	196
10	2010	1650	867	2030	1060	1360	951	767	597	340	209	197
11	1780	1550	946	3370	1040	1290	929	743	588	326	223	203
12	1700	1450	947	2570	1020	1220	913	709	588	317	204	213
13	1900	1410	925	2180	1000	1160	922	687	585	319	207	270
14	1880	1340	908	1950	1070	1130	1230	675	578	314	211	274
15	1690	1270	893	1760	1390	1090	4850	645	565	310	210	310
16	1550	1220	885	1630	2020	1050	2510	632	553	304	206	387
17	1440	1180	880	1550	3110	1330	1900	632	537	300	213	385
18	1360	1140	880	1670	2650	6200	1570	630	522	300	218	470
19	1290	1110	872	2430	2220	8160	1380	621	516	293	224	430
20	1230	1080	868	2940	1990	3840	1240	617	513	311	233	367
21	1180	1040	859	2520	1810	2750	1140	611	516	326	235	329
22	1160	1020	851	2220	1650	2240	1060	633	520	312	235	298
23	1150	993	840	2010	1510	2000	996	674	535	302	231	276
24	1170	972	833	1840	1410	2060	954	665	799	291	222	260
25	1230	962	831	1690	1320	2830	922	674	2180	285	212	251
26	1240	956	823	1580	1250	2380	892	705	930	289	209	244
27	1410	946	820	1480	1220	1990	871	717	648	301	288	236
28	1380	940	812	1420	1500	1780	855	1250	529	309	279	241
29	1290	925	804	1350	---	1610	847	1620	467	293	283	281
30	1210	908	801	1270	---	1510	835	1870	432	281	296	320
31	1150	---	792	1220	---	1420	---	1530	---	272	273	---
TOTAL	161880	37842	26625	50144	41080	75540	37776	25289	20797	10230	7171	8182
MEAN	5222	1261	859	1618	1467	2437	1259	816	693	330	231	273
MAX	46600	2390	947	3370	3110	8160	4850	1870	2180	430	296	470
MIN	1150	908	792	786	1000	1050	835	611	432	272	204	196
AC-FT	321100	75060	52810	99460	81480	149800	74930	50160	41250	20290	14220	16230
CFSM	5.45	1.32	.90	1.69	1.53	2.54	1.31	.85	.72	.34	.24	.28
IN.	6.28	1.47	1.03	1.95	1.59	2.93	1.47	.98	.81	.40	.28	.32

CAL YR 1986 TOTAL 529949 MEAN 1452 MAX 46600 MIN 162 AC-FT 1051000 CFSM 1.51 IN. 20.6
WTR YR 1987 TOTAL 502556 MEAN 1377 MAX 46600 MIN 196 AC-FT 996800 CFSM 1.44 IN. 19.5

ARKANSAS RIVER BASIN

07197000 BARON FORK AT ELDON, OK

LOCATION.--Lat 35°55'16", long 94°50'18", in SE 1/4 sec.27, T.17 N., R.23 E., Cherokee County, Hydrologic Unit 11110103, on downstream side of second pier from left bank of bridge on State Highway 51, 0.4 mi southeast of Eldon, 6.0 mi downstream from Tyner Creek, and at mile 8.8.

DRAINAGE AREA.--307 mi².

PERIOD OF RECORD.--October 1948 to current year. Prior to October 1970 published as Barren Fork at Eldon.

GAGE.--Water-stage recorder. Datum of gage is 701.14 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Dec. 14, 1948, nonrecording gage at same site and datum.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--39 years, 300 ft³/s, 13.27 in/yr, 217,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,500 ft³/s, Oct. 1, 1986, gage height, 25.78 ft; minimum, 1.7 ft³/s, Oct. 25, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 15, 1945, reached a stage of 23.8 ft, from information provided by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	1545	*55,500	*25.78	Mar. 17	2330	14,700	16.71
Feb. 28	1800	8,840	13.54	Apr. 14	0245	6,850	12.14

Minimum daily discharge, 29 ft³/s, Aug. 9-10, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34300	241	186	101	307	3410	488	195	363	e127	42	47
2	8630	230	180	96	389	2040	443	188	306	e120	41	44
3	3160	216	174	96	415	1430	404	182	260	e115	39	41
4	2570	242	167	106	376	1080	372	179	223	e111	37	39
5	1810	1450	159	118	344	867	344	179	198	e143	35	37
6	1350	1190	155	121	325	728	320	184	176	e115	33	36
7	1060	877	150	121	310	619	303	246	167	e95	32	36
8	869	763	150	118	295	540	284	270	e161	88	31	36
9	745	702	160	252	274	479	276	212	e158	76	29	34
10	658	625	181	1850	259	427	248	185	e153	69	29	36
11	598	571	191	1220	245	386	252	173	e149	63	30	36
12	760	544	186	976	235	353	235	169	e147	61	31	36
13	767	480	e178	823	224	322	461	167	e143	62	40	41
14	662	428	e169	715	620	300	3270	167	e141	61	41	40
15	575	393	e163	631	826	282	1560	179	e138	61	39	45
16	506	369	e159	546	1430	269	1130	188	e133	60	36	135
17	460	343	e154	501	1220	3460	845	168	e133	57	33	163
18	416	321	e151	745	952	6430	688	167	e130	60	32	151
19	384	299	e148	1320	821	3010	580	164	e128	71	34	128
20	353	275	e144	1060	734	2090	484	164	e127	78	34	111
21	326	257	e139	890	654	1570	434	164	e123	66	33	99
22	311	242	136	782	587	1240	384	161	e121	60	33	87
23	381	228	134	692	529	1060	343	176	e120	54	33	78
24	464	212	129	631	471	1310	310	174	554	49	31	72
25	394	202	129	567	426	1170	286	175	241	54	30	66
26	374	202	124	506	389	963	266	170	166	77	29	62
27	350	218	118	453	385	839	251	167	e153	72	59	61
28	322	212	116	406	3200	745	233	317	e147	61	62	64
29	296	198	111	372	---	680	220	1050	e139	54	59	75
30	272	188	108	340	---	610	207	776	e132	48	55	72
31	257	---	103	313	---	542	---	478	---	45	51	---
TOTAL	64380	12718	4652	17468	17242	39251	15921	7534	5430	2333	1173	2008
MEAN	2077	424	150	563	616	1266	531	243	181	75.3	37.8	66.9
MAX	34300	1450	191	1850	3200	6430	3270	1050	554	143	62	163
MIN	257	188	103	96	224	269	207	161	120	45	29	34
AC-FT	127700	25230	9230	34650	34200	77850	31580	14940	10770	4630	2330	3980
CFSM	6.76	1.38	.49	1.84	2.01	4.12	1.73	.79	.59	.25	.12	.22
IN.	7.80	1.54	.56	2.12	2.09	4.76	1.93	.91	.66	.28	.14	.24

CAL YR 1986 TOTAL 195760 MEAN 536 MAX 34300 MIN 42 AC-FT 388300 CFSM 1.75 IN. 23.72
WTR YR 1987 TOTAL 190110 MEAN 521 MAX 34300 MIN 29 AC-FT 377100 CFSM 1.70 IN. 23.04

e Estimated

07197500 TENKILLER FERRY LAKE NEAR GORE, OK

LOCATION.--Lat 35°35'43", long 95°02'57", in SE 1/4 SW 1/4 sec.14, T.13 N., R.21 E., Sequoyah County, Hydrologic Unit 11110103, at gage tower on right bank, 0.6 mi upstream from Tenkiller Ferry Dam on Illinois River, 6.0 mi northeast of Gore, and at mile 12.8.

DRAINAGE AREA.--1,610 mi².

PERIOD OF RECORD.--July 1952 to current year. Prior to October 1970, published as Tenkiller Ferry Reservoir near Gore.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Apr. 5, 1953, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth dam. Spillway consists of 590 ft concrete modified ogee-type weir in right abutment controlled by ten taintor gates. Outlet works consist of a 19-foot diameter tunnel in right abutment controlled by two vertical lift gates. A similar tunnel conducts water to two hydroelectric turbines. Closure was made for diversion in July 1950 and regulated storage began in July 1952; conservation pool was first filled Apr. 9, 1953. Capacity, 1,231,000 acre-ft at elevation 667.0 ft, flood-control pool, 791,900 acre-ft at elevation, 642.0 ft, spillway crest, 628,700 acre-ft at elevation 630.0 ft, maximum power pool, and 283,100 acre-ft at elevation 594.5 ft, conservation and minimum power pool. Figures given herein represent total contents. Reservoir is used for flood control and for power development.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,218,000 acre-ft, June 5, 1957, elevation, 666.36 ft; minimum since conservation pool was first filled, 305,700 acre-ft, Oct. 21, 1954, elevation, 597.50 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,195,000 acre-ft, Oct. 9, 10, elevation 665.25 ft; minimum, 632,600 acre-ft, Aug. 26, elevation 630.32 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

630	628,700	642	791,900
634	680,300	646	852,000
638	734,700	650	915,600

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	923900	791800	685100	665900	654500	710000	705800	642400	664800	652000	640400	633400
2	1064000	784000	683300	665100	655900	726500	701500	641800	664600	652100	639600	633100
3	1126000	776200	682800	661700	655900	734700	697500	641100	664700	651700	639300	633300
4	1147000	773700	680300	663400	655800	737900	693400	638900	663900	654200	639200	633400
5	1162000	770400	678100	664600	656200	739300	689100	641400	663300	655000	638900	633500
6	1162000	768400	677300	661300	653700	739700	684900	642700	664600	652800	638800	633600
7	1182000	765700	677200	658800	652900	739300	679800	644100	665800	651900	638500	633700
8	1189000	762400	674700	656300	655000	737900	674800	645700	664700	650700	638500	633700
9	1195000	757900	671900	653800	657600	736200	669800	647200	663800	650400	638500	633900
10	1187000	755100	671800	655500	655500	733900	667100	648500	662700	648500	638900	634100
11	1168000	752800	671300	660100	655100	731200	664800	648600	661300	648700	639000	634000
12	1147000	750300	669600	667600	654200	727100	663100	647700	660400	649500	639000	635500
13	1127000	746200	667200	669600	653300	724100	662900	646800	661300	649500	638300	635600
14	1106000	743300	666800	668100	652700	723400	665600	645100	662000	649600	637100	635800
15	1084000	740400	666700	666300	654900	719400	673600	645800	661000	649900	636900	637100
16	1060000	737100	666700	663800	657900	715700	673000	646900	659100	649800	636900	639900
17	1042000	732600	666700	660500	659100	724400	670600	647800	656500	649400	637700	641100
18	1024000	730100	666400	661000	661700	749000	669200	645700	655000	651100	637900	643000
19	1006000	725700	665800	663700	663000	770100	666900	643500	652700	651300	638000	644300
20	987600	721600	666000	665900	668100	770300	662400	641300	653400	649500	637900	645300
21	969000	717500	665800	668400	672700	764000	660300	639300	653700	649000	637400	646000
22	951500	712900	667100	668500	677400	756000	658000	639200	651600	646400	637700	646600
23	933600	708700	666300	667500	677700	749600	655400	641700	649500	643600	637700	645300
24	915900	703800	665800	665600	686500	743200	652900	642800	649500	643900	637600	644700
25	897400	699600	665100	666300	687500	737300	653200	644400	651700	644500	634700	641700
26	880800	696200	666400	666300	686500	728300	653400	641900	652000	644700	633700	641500
27	863900	694200	665800	664600	686300	720800	651300	639400	653700	643900	634800	641900
28	846400	691800	666900	661000	656500	718300	649400	644400	654600	643100	635200	643100
29	828600	689700	668100	658000	---	715200	647300	652400	653200	642300	635500	641300
30	811300	687800	667600	655900	---	711600	644900	659300	653200	641500	636000	641400
31	799000	---	666800	654000	---	708600	---	665000	---	641300	633900	---
MAX	1195000	791800	685100	669600	687500	770300	705800	665000	665800	655000	640400	646600
MIN	799000	687800	665100	653800	652700	708600	644900	638900	649500	641300	633700	633100
(+)	642.48	634.57	632.97	631.99	634.47	636.12	631.30	632.83	631.93	631.02	630.42	631.03
(++)	+81,100	-111,200	-21,000	-12,800	+2,500	+52,100	-63,700	+20,100	-11,800	-11,900	-7,400	+7,500
CAL YR 1986	MAX 1195000	MIN 634700	(++) -14,200									
WTR YR 1987	MAX 1195000	MIN 633100	(++) -76,500									

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-Feet

ARKANSAS RIVER BASIN

07198000 ILLINOIS RIVER NEAR GORE, OK

LOCATION.--Lat 35°34'23", long 95°04'07", in NE 1/4 SW 1/4 sec.27, T.13 N., R.21 E., Sequoyah County, Hydrologic Unit 11110104, on right bank 4.5 mi downstream from Tenkiller Ferry Dam, 4.5 mi northeast of Gore, and at mile 8.5.

DRAINAGE AREA.--1,626 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1924 to April 1926, April 1939 to current year. Monthly discharge only for some periods, published in WSP 1311.

GAGE.--Water-stage recorder. Datum of gage is 473.00 ft above National Geodetic Vertical Datum of 1929. See WSP 1921 for history of changes prior to Feb. 19, 1952.

REMARKS.--No estimated daily discharges. Records fair. Except for 16 mi² intervening area, flow completely regulated since July 1952 by Tenkiller Ferry Lake (station 07197500). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--49 years (water years 1925, 1940-87), 1,525 ft³/s, 1,105,000 acre-ft/yr adjusted for storage.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 180,000 ft³/s May 11, 1950, gage height, 29.6 ft, from floodmark, present site and datum, from rating curve extended above 42,000 ft³/s by velocity-area studies; minimum discharge, 2.0 ft³/s, Sept. 16, 1959.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 14,200 ft³/s, Oct. 11, gage height, 12.96 ft; minimum daily discharge, 72 ft³/s, Aug. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2750	4930	2000	1020	1250	4020	3760	2160	1890	965	469	343
2	386	4950	1680	2110	1800	2560	3770	1190	1620	568	380	304
3	413	4980	951	241	1800	2720	3800	1250	1070	567	268	85
4	486	5170	1820	108	1520	3460	3810	1900	1350	109	189	77
5	408	5170	1790	2170	2750	3390	3830	199	1220	99	107	87
6	389	5080	1050	2000	2040	3370	3810	147	127	1420	99	81
7	376	5050	1000	1970	514	3370	3870	125	115	848	86	87
8	381	5070	2080	1990	92	3370	3910	125	1150	800	90	95
9	1050	5090	2230	2680	2260	3360	3860	134	1010	441	95	73
10	6740	4640	971	1440	1480	3410	2710	127	1110	1140	88	80
11	12600	3290	2210	1230	1700	3400	2460	736	1220	115	77	175
12	14000	3330	1750	2760	1670	3910	2060	1170	1010	96	74	85
13	13800	3330	971	3670	1580	3320	2480	1090	117	444	507	80
14	13600	3320	910	3650	552	1890	3030	1360	161	157	531	77
15	13500	3220	925	3640	1020	3690	3900	249	945	98	83	82
16	13400	3290	762	3780	2830	3480	5100	121	1330	196	92	267
17	12000	3200	1030	2350	3760	3790	4940	120	1550	332	308	121
18	11300	3290	1030	2320	3770	3660	3440	1510	1040	103	100	89
19	11000	3390	780	3230	1360	4980	3460	1550	1510	118	84	75
20	10900	3370	809	3250	1060	7870	3780	1580	133	1060	173	73
21	10800	3320	192	3800	116	8760	3680	1410	159	545	282	79
22	10800	3380	1000	3810	95	8580	2650	1160	1300	1420	83	78
23	10700	3280	986	3810	1080	8560	2740	147	1570	1490	73	967
24	10600	3290	965	2470	2080	8610	2710	102	647	122	72	560
25	10400	3370	116	2210	2280	8240	1130	91	1540	107	1330	1860
26	10400	3160	935	2660	2260	8910	1090	1680	1150	107	1130	172
27	10400	1870	108	3790	2210	7720	2140	2150	110	618	302	107
28	10500	2010	107	3010	3220	4390	2050	1930	94	572	76	100
29	10500	1990	822	2780	---	4380	2020	309	1140	596	76	1200
30	10500	1830	1010	2630	---	4130	2200	129	815	516	82	236
31	8050	---	983	1120	---	3750	---	141	---	308	1210	---
TOTAL	253129	110660	33973	77699	48149	149050	94190	26092	28203	16077	8616	7795
MEAN	8165	3689	1096	2506	1720	4808	3140	842	940	519	278	260
MAX	14000	5170	2230	3810	3770	8910	5100	2160	1890	1490	1330	1860
MIN	376	1830	107	108	92	1890	1090	91	94	96	72	73
AC-FT	502100	219500	67390	154100	95500	295600	186800	51750	55940	31890	17090	15460

CAL YR 1986 TOTAL 964851 MEAN 2643 MAX 14000 MIN 11 AC-FT 1914000
WTR YR 1987 TOTAL 853633 MEAN 2339 MAX 14000 MIN 72 AC-FT 1693000

ARKANSAS RIVER BASIN

07198000 ILLINOIS RIVER NEAR GORE, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948, 1952, 1954 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1947 to September 1948, October 1953 to September 1963.

WATER TEMPERATURE: October 1947 to September 1948, October 1953 to September 1963.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)
OCT										
15...	1515	1028	80020	12.62	13200	149	7.30	25.5	21.0	22
NOV										
12...	1530	1028	80020	6.66	3360	177	7.20	18.0	15.0	11
DEC										
02...	1300	1028	80020	6.16	2470	186	7.00	19.0	12.0	6.7
JAN										
12...	1700	1028	80020	6.92	3760	220	7.50	18.0	10.0	3.8
FEB										
25...	1215	1028	80020	6.79	3540	220	7.60	16.0	10.0	4.5
MAR										
16...	1530	1028	80020	6.96	3730	*184	6.60	17.0	13.0	1.8
APR										
16...	1400	1028	80020	8.26	5830	*193	7.70	26.0	14.0	4.7
JUN										
04...	1300	1028	80020	6.81	3420	196	7.00	22.0	12.0	2.6
30...	1400	1028	80020	6.03	2320	200	7.50	26.0	14.0	1.3
JUL										
31...	1400	1028	80020	4.26	637	222	7.50	29.0	21.0	0.80
AUG										
13...	1730	1028	80020	6.69	3020	*205	7.20	28.0	24.0	0.40
SEP										
17...	1500	1028	80020	4.46	749	*234	7.90	24.5	16.0	1.6
DATE		BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
OCT										
15...	770	12.4	138	66	4	24	1.4	2.9	8	0.2
NOV										
12...	762	10.1	100	64	3	23	1.5	3.2	9	0.2
DEC										
02...	735	11.4	110	77	7	28	1.8	4.9	12	0.3
JAN										
12...	735	10.6	97	77	13	28	1.7	3.7	9	0.2
FEB										
25...	734	--	--	76	6	28	1.5	3.8	9	0.2
MAR										
16...	732	--	--	79	9	29	1.6	3.6	9	0.2
APR										
16...	730	--	--	93	19	32	3.1	16	27	0.8
JUN										
04...	732	9.8	95	91	18	31	3.2	13	23	0.6
30...	732	--	--	84	7	31	1.7	3.9	9	0.2
JUL										
31...	730	--	--	91	12	33	2.2	9.5	18	0.5
AUG										
13...	730	--	--	96	17	34	2.8	11	19	0.5
SEP										
17...	751	--	--	89	9	33	1.7	7.0	14	0.3

* SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07198000 ILLINOIS RIVER NEAR GORE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
OCT										
15...	3.1	78	0	64	8.8	5.6	104	83	0.14	3710
NOV										
12...	2.7	73	0	60	9.7	4.6	102	81	0.14	925
DEC										
02...	3.0	84	0	69	10	5.9	105	96	0.14	700
JAN										
12...	2.4	--	--	--	8.1	5.7	104	88	0.14	1060
FEB										
25...	6.0	79	0	65	15	11	103	113	0.14	984
MAR										
16...	2.5	--	--	--	9.4	5.9	97	94	0.13	977
APR										
16...	2.3	79	0	65	11	--	99	115	0.13	1560
JUN										
04...	2.7	--	--	--	11	12	114	117	0.16	1050
30...	2.1	90	0	74	10	11	109	106	0.15	--
JUL										
31...	2.6	--	--	--	20	31	178	146	0.24	306
AUG										
13...	3.1	--	--	--	13	8.0	113	120	0.15	921
SEP										
17...	2.1	104	0	85	9.9	10	117	112	0.16	237

ARKANSAS RIVER BASIN

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07228500 CANADIAN RIVER AT BRIDGEPORT, OK

LOCATION.--Lat 35°32'37", long 98°19'03", SE 1/4 NW 1/4 sec.1, T.12 N., R.11 W., Caddo County, Hydrologic Unit 11090202, on downstream side of pier near center of bridge on U.S. Highway 281, 3.3 mi east of Bridgeport, 1.6 mi downstream from Lumpmouth Creek, and at mile 263.3.

DRAINAGE AREA.--25,276 mi², of which 4,801 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1944 to September 1964; October 1969 to current year.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,360.00 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1947, at site 3.8 mi upstream at datum 24.25 ft higher. Oct. 1, 1947 to Sept. 30, 1948, nonrecording gage and Oct. 1, 1948 to September 1964, Oct. 1, 1969 to Dec. 17, 1980 at site 4.0 mi upstream and at datum 24.25 ft higher.

REMARKS.--Records poor. Flow regulated since October 1964 by Lake Meredith (station 07227900) located in Texas.

AVERAGE DISCHARGE.--Prior to regulation by Lake Meredith in Texas, 20 years (water years 1945-64), 469 ft³/s, 339,800 acre-ft/yr; since regulation by Lake Meredith, 18 years (water years 1970-87), 281 ft³/s, 203,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 150,000 ft³/s, June 23, 1948, gage height, 14.60 ft, at former site and datum, from floodmarks, from rating curve extended above 50,000 ft³/s; no flow at times in 1946, 1951-56, 1964, 1970, 1984, and 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1914 reached a stage of about 19.4 ft, a higher stage probably occurred during flood in October 1904.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 66,600 ft³/s, Oct. 3, gage height, 17.35 (from HWM); minimum daily discharge, 44 ft³/s, Aug. 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3760	e255	258	352	305	833	819	325	e6000	e500	e56	102
2	3010	e245	280	289	329	427	773	331	e2000	e476	e54	95
3	e3000	e230	299	293	350	312	719	343	e1000	e457	e50	85
4	e8000	e2000	276	328	354	263	689	357	e810	e1500	e47	80
5	e2500	e9800	278	300	356	299	564	361	e780	e1300	e46	78
6	e900	e2500	287	308	383	323	484	361	e700	e800	e46	77
7	e700	e900	342	292	401	332	417	343	e685	e730	e45	80
8	e600	e450	384	298	418	359	389	276	e599	e650	e44	82
9	e500	e350	442	422	460	378	350	309	e579	e610	e44	80
10	e400	e330	463	430	427	337	294	333	e540	e530	e48	95
11	e380	e300	447	414	422	297	262	326	e710	e450	e47	115
12	e400	e320	463	384	424	286	255	306	e800	e430	e45	192
13	e490	e310	455	414	473	305	277	306	e720	e420	e8130	332
14	e380	e300	425	435	440	312	382	346	e700	e415	e5630	105
15	e330	e280	421	441	313	310	677	377	e680	e410	e1000	92
16	e305	e300	419	463	329	309	736	388	e890	e400	e150	84
17	e290	e290	383	e430	325	1320	580	415	e720	e415	e110	80
18	e285	e300	372	e410	255	2420	453	439	e770	e420	e100	182
19	e288	e300	357	e400	278	1950	391	421	e700	e430	e92	252
20	e280	308	358	e410	303	1260	369	390	e1550	e450	e86	130
21	e318	266	364	e420	311	1090	366	415	e950	e440	e86	297
22	e11900	237	367	453	306	890	327	891	e700	e420	e85	343
23	e2700	261	351	466	314	879	317	2570	e660	e320	e84	265
24	e800	223	329	473	323	2420	297	1540	e500	e220	e84	484
25	e500	256	309	465	363	3580	269	2060	e470	e165	e83	213
26	e350	408	305	465	383	2880	262	1010	e440	e130	e82	114
27	e300	351	312	406	659	2170	274	13600	e390	e100	e140	108
28	e288	299	321	289	1680	1740	289	e22800	e350	e90	114	207
29	e285	292	342	674	---	1370	307	e42100	e1210	e89	99	481
30	e275	264	331	401	---	1220	314	e27800	e685	e70	92	205
31	e263	---	339	270	---	1020	---	e8000	---	e60	91	---
TOTAL	74777	22925	11079	12295	11684	31891	12902	129839	28288	13897	16910	5135
MEAN	2412	764	357	397	417	1029	430	4188	943	448	545	171
MAX	33000	9800	463	674	1680	3580	819	42100	6000	1500	8130	484
MIN	263	223	258	270	255	263	255	276	350	60	44	77
AC-FT	148300	45470	21980	24390	23180	63260	25590	257500	56110	27560	33540	10190

CAL YR 1986 TOTAL 203370.4 MEAN 557 MAX 33000 MIN 4.4 AC-FT 403400
WTR YR 1987 TOTAL 371622 MEAN 1018 MAX 42100 MIN 44 AC-FT 737100

e Estimated

ARKANSAS RIVER BASIN

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-61, 1964, 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1948 to September 1960, October 1969 to April 1982.

WATER TEMPERATURE: October 1948 to September 1960, October 1969 to April 1982.

REMARKS: Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT 23...	1430	1028	80020	--	*2700	830	7.20	25.0	16.0	720	9.0	97
NOV 18...	0930	1028	80020	--	*310	2540	8.00	23.0	8.0	730	12.0	107
DEC 30...	1300	1028	80020	9.45	326	2400	8.00	9.0	6.5	750	10.8	90
JAN 28...	1230	1028	80020	10.18	246	2270	7.80	6.0	2.0	720	12.8	99
FEB 26...	1230	1028	80020	9.85	362	1960	8.10	8.0	8.5	730	10.2	92
MAR 30...	1430	1028	80020	10.83	1210	2000	8.00	12.0	3.5	730	12.8	101
MAY 08...	1250	1028	80020	10.08	258	1980	8.30	34.0	23.5	730	8.4	104
27...	1945	1028	80020	15.14	28900	512	8.20	16.0	18.0	730	8.0	88
JUN 26...	1130	1028	80020	--	*440	1930	8.00	27.0	25.5	730	7.9	102
JUL 30...	1100	1028	80020	9.18	70	1800	8.20	29.0	28.0	730	7.1	95
AUG 26...	1100	1028	80020	--	*82	1140	8.00	26.5	25.0	730	7.3	93
SEP 24...	1400	1028	80020	10.40	610	1630	7.80	26.0	22.0	730	8.0	96
DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH IT FIELD (MG/L AS HC03)	CAR-BONATE WATER WH IT FIELD (MG/L AS C03)	ALKA-LINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS S04)
OCT 23...	280	280	76	21	60	--	2	--	117	0	96	--
NOV 18...	810	550	210	69	200	35	3	5.8	--	--	--	610
DEC 30...	810	810	210	68	200	--	3	--	261	0	214	--
JAN 28...	640	410	160	59	220	42	4	4.5	310	0	254	460
FEB 26...	720	720	180	64	200	--	3	--	--	--	--	--
MAR 30...	640	380	160	59	210	41	4	4.9	337	0	276	430
MAY 08...	830	690	210	74	140	27	2	5.4	--	--	--	760
27...	210	210	61	14	25	--	0.8	--	105	0	86	--
JUN 26...	720	680	180	65	160	32	3	6.2	220	0	180	620
JUL 30...	700	560	180	60	130	29	2	6.2	151	12	144	610
AUG 26...	520	520	140	40	55	--	1	--	134	0	110	--
SEP 24...	600	460	160	47	140	34	3	7.3	193	0	158	420

* MEAN DAILY DISCHARGE

ARKANSAS RIVER BASIN

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CHLORIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N02)	NITRO- GEN, N02+N03 TOTAL (MG/L AS N)
OCT 23...	--	9.2	--	--	--	--	0.250	0.330	0.050	0.010	0.03	0.300
NOV 18...	290	20	1620	1570	2.20	1360	0.020	0.810	0.780	0.010	0.03	0.800
DEC 30...	--	18	--	--	--	--	0.780	0.780	0.020	0.020	0.07	0.800
JAN 28...	320	17	1450	1380	1.97	963	0.380	0.350	0.020	0.010	0.03	0.400
FEB 26...	--	16	--	--	--	--	0.470	0.550	0.030	0.020	0.07	0.500
MAR 30...	290	19	1370	1340	1.86	4480	0.440	0.490	0.060	0.010	0.03	0.500
MAY 08...	200	13	1590	1500	2.16	1110	0.270	0.310	0.030	0.030	0.10	0.300
27...	--	7.1	--	--	--	--	0.270	0.310	0.030	0.030	0.10	0.300
JUN 26...	240	18	1420	1320	1.93	1690	--	0.110	0.020	0.020	0.07	<0.100
JUL 30...	170	18	1320	1260	1.80	251	--	--	<0.010	<0.010	--	<0.100
AUG 26...	--	11	--	--	--	--	--	--	<0.010	<0.010	--	<0.100
SEP 24...	180	12	1180	1050	1.60	1940	0.280	0.320	0.020	0.020	0.07	0.300

DATE	NITRO- GEN, N02+N03 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	PHOS- PHORUS, ORTHO, TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)
OCT 23...	0.340	0.280	0.110	0.14	0.080	0.010	0.03	8	1	170	<0.5
NOV 18...	0.820	0.150	0.170	0.22	0.050	0.040	0.12	4	4	220	<0.5
DEC 30...	0.800	0.120	0.110	0.14	0.040	0.040	0.12	3	3	160	<1
JAN 28...	0.360	0.180	0.180	0.23	0.040	0.030	0.09	5	2	150	<0.5
FEB 26...	0.570	0.120	0.110	0.14	0.050	--	--	4	2	150	0.9
MAR 30...	0.500	0.280	0.090	0.12	0.140	0.010	0.03	5	4	150	<0.5
MAY 08...	0.340	0.090	0.080	0.10	0.010	<0.010	--	4	3	140	<0.5
27...	0.340	0.160	0.170	0.22	0.040	0.050	0.15	2	1	390	<0.5
JUN 26...	0.130	0.020	0.100	0.13	0.020	<0.050	--	5	4	200	<0.5
JUL 30...	<0.100	0.040	0.060	0.08	0.020	<0.010	--	5	4	210	<0.5
AUG 26...	<0.100	0.050	0.020	0.03	0.040	0.030	0.09	6	5	180	<0.5
SEP 24...	0.340	0.140	0.140	0.18	0.050	0.030	0.09	2	2	250	<0.5

ARKANSAS RIVER BASIN

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CADMIUM TOTAL RECOV- ERABLE (UG/L AS CD)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 23...	<1	2	26	<10	<3	<10	32	34	10	24	29
NOV 18...	<1	1	3	<10	<3	<10	8	5	<10	69	44
DEC 30...	<1	4	8	<10	<9	<30	10	<5	<30	73	44
JAN 28...	<1	<1	16	<10	<3	<10	69	17	<10	67	110
FEB 26...	2	2	<1	<10	<3	<10	19	<5	<10	66	38
MAR 30...	<1	<1	36	<10	<3	<10	7	10	<10	69	28
MAY 08...	<1	2	3	<10	<3	<10	9	<5	<10	63	18
27...	<1	<1	<36	<10	<3	<10	100	17	<10	13	58
JUN 26...	<1	<1	9	<10	<3	<10	4	10	<10	54	8
JUL 30...	<1	<1	3	<5	<3	<10	<3	<5	<10	38	8
AUG 26...	<1	3	<1	<5	<3	<10	5	<5	<10	<4	13
SEP 24...	1	<1	<1	<5	<3	<10	14	11	<10	36	5

DATE	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	PCB, DIS- SOLVED (UG/L)	PCB, TOTAL (UG/L)	PCN DISSOLV (UG/L)
OCT 23...	0.10	<0.1	<10	--	--	670	7	27	<0.1	<0.1	<0.10
NOV 18...	<0.10	<0.1	<10	--	--	2400	8	23	--	<0.1	--
DEC 30...	<0.10	<0.1	<30	--	--	2400	<18	10	--	--	--
JAN 28...	<0.10	<0.1	<10	--	--	1900	<6	13	--	--	--
FEB 26...	<0.10	<0.1	<10	--	--	2300	6	15	--	--	--
MAR 30...	<0.10	<0.1	<10	--	--	2000	7	6	--	--	--
MAY 08...	<0.10	0.1	<10	--	--	2700	9	24	--	--	--
27...	<0.10	<0.1	<10	--	--	500	6	86	--	<0.1	--
JUN 26...	<0.10	<0.1	<10	--	--	2200	14	12	--	--	--
JUL 30...	0.20	<0.1	<10	<10	1.0	2100	18	4	--	--	--
AUG 26...	0.20	<0.1	<10	<10	1.0	1300	14	6	--	--	--
SEP 24...	<0.10	<0.1	<10	<10	2.0	1700	10	4	--	--	--

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible][illegible]

ARKANSAS RIVER BASIN

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible][illegible]

07228500 CANADIAN RIVER AT BRIDGEPORT, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible]

07229200 CANADIAN RIVER AT PURCELL, OK

LOCATION.--Lat 35°00'50", long 97°20'50", in NW 1/4 sec.7, T.6 N., R.1 W., Cleveland County, Hydrologic Unit 11090202, near left bank on downstream side of pier of U.S. Highway 77, 0.5 mi east of Purcell, 1.0 mi upstream from Walnut Creek, and at mile 184.9.

DRAINAGE AREA.--25,939 mi², of which 4,801 mi² probably is noncontributing.

PERIOD OF RECORD.--October 1959 to June 1961, October 1979 to September 1983, October 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,017.14 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Flow regulated since October 1964 by Lake Meredith (station 07227900) located in Texas. U.S. Army Corps of Engineers' satellite telemeter located at site. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--Since regulation by Lake Meredith, 6 years (water years 1980-83, 1986-87), 774 ft³/s, 560,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 102,000 ft³/s, May 29, 1987, gage height, 14.75 ft (from HWM), no flow at times in 1980.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1904 reached a stage of 14.18 ft and flood in 1914 reached a stage of 12.98 ft, from information by the Atchison, Topeka, and Santa Fe Railway Co.

EXTREMES FOR CURRENT PERIOD.--Maximum discharge, 102,000 ft³/s, May 29, gage height, 14.75 ft (from HWM); minimum daily discharge, 112 ft³/s, Sept. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20500	e860	e990	e850	3050	8610	e1100	e435	2480	1500	e440	e123
2	17200	e830	1150	e790	2940	3920	e990	e415	1620	e2500	e420	e120
3	29100	e780	e950	1020	1840	3080	e910	e400	e1300	e4000	e390	e118
4	22900	6190	e900	916	974	2710	e840	e385	4060	e1800	e370	116
5	34600	13900	e850	837	1190	2010	e750	e450	e1570	e1400	e350	e112
6	13400	10400	1100	e820	3860	1410	e720	e395	e1330	e1230	e340	e150
7	3620	6290	2110	e810	2740	1160	690	e350	e1200	e1120	e320	e285
8	2360	4040	2820	1110	998	872	e625	e330	e1100	e1000	e315	e170
9	1880	2970	2690	5320	e850	e795	e600	e315	e1050	e920	e310	e115
10	1740	2150	2610	4110	e810	e750	e550	e310	e1100	e860	e350	e380
11	2320	2000	1860	2310	e790	e850	e540	e340	e1550	e840	e315	e230
12	2660	1360	1400	1420	777	e820	e520	e300	e1450	e820	e300	e260
13	2420	1200	e1120	1090	797	e800	e510	e280	e1240	1060	e280	e140
14	2040	1270	e800	1410	782	e770	e560	e270	e1180	e2670	e800	e120
15	1510	925	e1300	e1190	2610	e745	e530	255	e1130	e1300	e500	e180
16	1190	e850	e1200	e1000	4220	1510	e520	e290	e1070	e900	e370	e140
17	1070	e750	e1010	e2100	2630	7950	e500	e340	e1050	e750	e300	e120
18	e1060	e710	e920	e4500	2420	6670	e480	e260	e1000	e3000	e270	e850
19	e1030	e690	e870	e2200	2080	5840	e470	221	e1400	e1720	e235	e700
20	e1000	e720	e790	e770	1860	2870	e465	e285	e3700	e1130	e220	e460
21	e990	e670	e720	e670	1560	1480	e2000	e250	e2100	e880	e205	e600
22	11400	e650	e690	e640	e900	1030	e1550	e960	e1400	e820	e190	500
23	21200	e630	e680	620	e760	887	e1200	e4600	e1110	e760	e180	e360
24	9470	680	e660	859	e910	2410	e1000	e3900	e1010	e730	e170	e340
25	4690	1880	e650	e700	e870	3710	e750	e7000	e990	e680	e160	e330
26	2490	8140	e640	e580	1150	4620	e600	e5050	e950	e640	e150	e310
27	1580	3660	e630	2110	2550	3480	e550	e4600	e940	e600	e310	e340
28	e1230	2050	e620	3730	5300	1880	e500	61000	e920	e560	e180	e400
29	e1080	1150	e630	8440	---	e1600	e475	71000	e1450	e530	e140	e600
30	e950	1060	e620	6540	---	e1400	e450	15100	e2050	e500	e130	e460
31	e900	---	e930	4250	---	e1250	---	4650	---	e470	e128	---
TOTAL	219580	79455	34910	63712	52218	77889	21945	184736	44500	37690	9138	9129
MEAN	7083	2648	1126	2055	1865	2513	731	5959	1483	1216	295	304
MAX	34600	13900	2820	8440	5300	8610	2000	71000	4060	4000	800	850
MIN	900	630	620	580	760	745	450	221	920	470	128	112
AC-FT	435500	157600	69240	126400	103600	154500	43530	366400	88270	74760	18130	18110

CAL YR 1986 TOTAL 475412 MEAN 1302 MAX 34600 MIN 46 AC-FT 943000
WTR YR 1987 TOTAL 834902 MEAN 2287 MAX 71000 MIN 112 AC-FT 1656000

e Estimated

07229300 WALNUT CREEK AT PURCELL, OK

LOCATION.--Lat 34°59'56", long 97°22'00", NW 1/4 NW 1/4 sec.13, T.6 N., R.2 W., McClain County, Hydrologic Unit 11090202, on downstream side of right bank pier of bridge on U.S. Highway 77, at south edge of Purcell, and at mile 1.0.

DRAINAGE AREA.--202 mi².

PERIOD OF RECORD.--Water years 1951-55, 1958-65 (occasional low-flow measurements). October 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,014.57 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1984, datum 3.00 ft higher.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--22 years (water years 1966-87), 71.1 ft³/s, 51,510 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 67,700 ft³/s, Oct. 20, 1983, gage height, 21.40 ft (datum then in use), from rating curve extended above 20,000 ft, on basis of multiple contracted opening measurement at peak; no flow at times in 1966-67, and 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 2	1100	9,080	14.18	Feb. 28	1345	6,270	12.32
Oct. 22	1015	5,230	11.54	Mar. 17	0815	13,300	15.56
Nov. 4	1430	4,900	11.25	May 29	0215	*21,100	*17.37
Nov. 25	2400	5,410	11.68	July 2	1530	10,800	14.63
Jan. 9	0415	3,010	9.78	July 18	0015	10,200	14.36

Minimum daily discharge, 12 ft³/s, Sept. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	297	e74	135	e112	150	763	e215	e60	e350	129	45	28
2	3930	e72	e128	e111	145	312	e200	e55	e200	3670	43	27
3	2280	81	e122	e122	137	e220	e190	e51	e110	449	43	26
4	442	1580	e120	e118	136	e190	e180	e49	e80	173	42	24
5	1100	295	e116	e115	512	e180	e178	e47	e70	128	41	23
6	206	157	e112	e111	1160	e160	e180	e46	e65	105	41	24
7	105	e120	415	e111	356	e155	174	e45	e62	94	40	43
8	e99	e100	231	156	210	e150	e160	e42	e60	88	39	35
9	e90	e90	250	1220	180	e160	e150	e40	e56	85	38	27
10	e80	e140	e170	194	e160	e170	e140	e38	e100	79	38	65
11	99	187	e168	139	e150	e160	e130	e38	e250	75	38	38
12	127	127	e163	e126	e160	e155	e120	e37	e150	72	37	42
13	100	e110	e155	e120	190	e159	e130	e36	e110	90	36	37
14	74	e105	e150	e114	193	e170	e120	e37	e90	81	49	26
15	66	e102	e145	e110	441	e160	e112	e36	e80	72	38	26
16	64	e100	e140	e107	448	e170	e110	e35	e70	79	41	23
17	65	e98	e136	e114	269	5710	e106	e34	e60	1110	45	22
18	64	e101	e133	143	e200	500	e100	e35	e50	1670	36	224
19	63	e98	e127	166	e180	e350	e94	e36	e1000	122	34	47
20	63	e96	e120	153	e162	e300	e128	e45	e500	80	32	24
21	80	e95	e126	131	e150	e250	260	e40	e350	70	31	19
22	2200	e93	e121	e120	e140	e230	164	e45	e250	66	30	17
23	273	e91	e125	e110	e150	e330	e120	e42	e170	66	30	15
24	135	105	e120	141	e145	e400	e110	e50	e130	63	29	14
25	107	935	e118	129	e140	e300	e100	230	e115	59	30	13
26	98	1310	e120	e120	301	e280	e95	e180	103	57	29	12
27	89	191	e118	206	358	e265	e90	e110	e97	55	38	15
28	85	e149	e116	541	3080	e240	e80	7160	e94	52	33	27
29	e78	e146	e112	384	---	e234	e70	5380	90	51	31	27
30	e77	e140	e111	149	---	e232	e54	1640	346	49	30	19
31	e75	---	e117	138	---	e225	---	1110	---	47	29	---
TOTAL	12711	7088	4540	5831	10003	13280	4060	16829	5258	9086	1136	1009
MEAN	410	236	146	188	357	428	135	543	175	293	36.6	33.6
MAX	3930	1580	415	1220	3080	5710	260	7160	1000	3670	49	224
MIN	63	72	111	107	136	150	54	34	50	47	29	12
AC-FT	25210	14060	9010	11570	19840	26340	8050	33380	10430	18020	2250	2000

CAL YR 1986 TOTAL 47091 MEAN 129 MAX 4220 MIN 15 AC-FT 93400
WTR YR 1987 TOTAL 90831 MEAN 249 MAX 7160 MIN 12 AC-FT 180200

e Estimated

07229427 CANADIAN SANDY CREEK NEAR ADA, OK

LOCATION.--Lat 34°47'04", long 96°42'49", SW 1/4 SE 1/4 sec.30, T.4 N., R.6 E., Pontotoc County, Hydrologic Unit 11090202, located 1.0 mi west of Ada on Sandy Creek Road, and 0.2 mi downstream from J.A. Richardson Expressway (loop).

DRAINAGE AREA.--198 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1986 to current year.

REVISED RECORDS.--WSP 1341: Drainage area. WSP 1731: 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 861.67 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,900 ft³/s, May 28, 1987, gage height, 27.50 ft; minimum daily discharge, 0.60 ft³/s, Sept. 8, 9, 13, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 13,900 ft³/s, May 28, gage height, 27.50 ft; minimum daily discharge, 0.60 ft³/s, Sept. 8, 9, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	168	2.2	74	35	164	2180	158	26	829	22	2.5	1.0
2	50	1.9	58	34	412	793	137	25	757	209	2.5	1.0
3	23	210	49	34	213	645	119	23	703	302	2.3	e.90
4	8.6	1160	42	34	151	506	109	22	642	215	2.0	e.80
5	4.7	336	39	34	126	461	100	21	564	104	2.0	e.70
6	4.0	154	37	34	166	427	94	20	470	66	1.7	e.70
7	3.6	103	38	33	253	381	87	22	422	49	1.7	e.65
8	4.0	76	66	29	188	346	82	21	370	37	1.4	e.60
9	4.5	60	171	477	140	306	75	18	332	28	1.2	e.60
10	3.5	46	111	435	123	269	73	16	316	23	1.8	1.1
11	25	34	76	213	110	249	67	15	291	19	2.8	e.80
12	32	25	63	149	102	219	65	14	263	16	1.6	e.70
13	16	20	55	116	97	196	62	12	251	43	1.2	e.60
14	6.5	16	51	97	94	175	57	12	192	27	e1.0	4.6
15	3.5	13	49	82	436	160	56	10	167	20	e.85	36
16	2.6	11	48	102	1380	145	52	12	144	16	e.70	6.8
17	2.6	9.2	48	267	513	934	51	27	118	41	1.2	2.6
18	1.8	6.6	45	979	366	611	49	19	110	41	2.5	27
19	1.7	5.9	45	515	290	364	46	21	96	22	1.9	65
20	1.2	5.9	45	445	243	288	42	20	114	15	1.4	25
21	2.1	5.2	46	345	218	245	42	16	89	12	1.1	13
22	191	5.6	46	395	198	841	43	144	74	9.8	e.95	7.4
23	75	6.2	46	297	169	628	40	132	72	8.0	e.85	3.9
24	32	6.8	45	259	190	483	38	94	77	6.8	e.65	2.5
25	19	260	40	234	268	367	38	400	51	10	e.65	1.8
26	12	912	39	185	255	319	35	218	40	15	.85	1.1
27	7.7	315	37	154	679	272	33	173	32	8.8	5.0	2.0
28	5.3	162	37	141	2320	243	31	10100	26	5.4	2.1	39
29	3.5	111	37	129	---	213	29	6210	21	3.7	1.8	63
30	3.1	95	37	111	---	190	27	1210	22	3.4	1.5	10
31	2.6	---	36	97	---	172	---	913	---	2.8	1.0	---
TOTAL	720.1	4174.5	1656	6491	9864	13628	1937	19986	7655	1400.7	50.70	320.85
MEAN	23.2	139	53.4	209	352	440	64.6	645	255	45.2	1.64	10.7
MAX	191	1160	171	979	2320	2180	158	10100	829	302	5.0	65
MIN	1.2	1.9	36	29	94	145	27	10	21	2.8	.65	.60
AC-FT	1430	8280	3280	12870	19570	27030	3840	39640	15180	2780	101	636

WTR YR 1987 TOTAL 67883.85 MEAN 186 MAX 10100 MIN .60 AC-FT 134600

e Estimated

ARKANSAS RIVER BASIN

07229427 CANADIAN SANDY CREEK NEAR ADA, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1986 to current year.

REMARKS.--Samples were collected monthly. Specific conductance, pH, water temperature, air temperature, dissolved oxygen, and alkalinity were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT												
09...	1300	1028	80020	4.18	3.5	864	--	20.0	21.0	5.2	744	8.4
NOV												
19...	1445	1028	80020	4.66	5.8	*644	7.70	18.0	11.0	17	720	10.2
DEC												
10...	1100	1028	80020	5.49	110	*403	--	-2.0	1.5	61	734	9.1
MAR												
05...	1200	1028	80020	7.85	471	419	7.50	24.0	11.0	55	749	9.1
APR												
21...	1400	1028	80020	4.98	43	690	7.60	17.0	16.5	5.2	755	8.4
MAY												
20...	1100	1028	80020	4.71	20	654	7.30	24.0	22.5	12	732	8.4
28...	1600	1028	80020	27.06	12900	121	6.70	19.0	12.0	160	740	--
29...	0930	1028	80020	23.94	7080	147	7.10	19.0	17.0	110	740	--
29...	1730	1028	80020	20.48	3780	171	6.80	20.0	20.5	120	740	--
JUN												
22...	1300	1028	80020	5.20	74	473	7.60	31.0	27.5	52	735	7.9
JUL												
09...	1400	1028	80020	4.82	29	490	7.30	36.0	27.0	4.5	734	7.8
AUG												
18...	1500	1028	80020	4.13	2.5	808	7.00	33.0	31.5	4.3	742	7.7
SEP												
16...	1300	1028	80020	4.40	7.2	710	7.40	23.0	22.0	28	749	8.2
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)
OCT												
09...	97	190	0	52	15	79	43	3	25	293	0	240
NOV												
19...	98	270	0	75	21	44	25	1	9.0	346	0	284
DEC												
10...	68	160	0	46	12	20	20	0.7	5.7	--	--	--
MAR												
05...	84	170	0	51	9.8	13	14	0.5	3.2	229	0	188
APR												
21...	87	300	10	85	22	35	20	0.9	5.6	376	0	308
MAY												
20...	101	260	0	69	22	35	22	1	6.5	361	0	296
28...	--	46	0	14	2.7	3.0	11	0.2	3.4	59	0	48
29...	--	60	0	18	3.6	3.3	10	0.2	3.5	72	0	59
29...	--	72	0	22	4.2	4.4	11	0.2	3.8	88	0	72
JUN												
22...	104	210	0	60	15	18	15	0.6	4.8	266	0	218
JUL												
09...	102	250	0	69	18	23	17	0.7	5.2	--	--	--
AUG												
18...	108	260	0	65	23	65	33	2	28	405	0	332
SEP												
16...	96	180	0	48	14	58	36	2	33	251	0	206

*SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07229427 CANADIAN SANDY CREEK NEAR ADA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
OCT 09...	32	68	1.3	12	460	453	0.63	4.33	0.200	0.40	0.60
NOV 19...	25	47	0.50	13	397	399	0.54	6.20	<0.100	0.70	--
DEC 10...	19	21	0.30	9.6	253	235	0.34	75.1	0.200	1.2	1.4
MAR 05...	19	14	0.20	8.7	228	223	0.31	290	0.200	1.3	1.5
APR 21...	27	32	0.30	9.3	382	392	0.52	43.9	<0.100	0.30	--
MAY 20...	18	30	0.40	12	379	369	0.52	21.0	0.100	1.5	1.6
28...	<5.0	3.1	0.10	5.9	108	--	--	--	0.300	2.2	2.5
29...	<5.0	3.2	0.10	7.9	105	--	--	--	0.200	1.9	2.1
29...	<5.0	3.6	0.10	8.5	118	--	--	--	0.200	1.8	2.0
JUN 22...	13	15	0.30	12	268	270	0.36	53.4	0.200	1.1	1.3
JUL 09...	16	18	0.30	12	318	319	0.43	25.1	0.400	1.4	1.8
AUG 18...	45	38	1.0	15	448	461	0.61	3.05	0.100	0.50	0.60
SEP 16...	49	--	1.0	13	406	--	--	--	0.500	1.1	1.6
DATE	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 09...	2.7	0.120	0.12	600	40	5	96	<0.10	13	0.12	88
NOV 19...	--	0.060	0.06	120	27	<5	61	<0.10	16	0.25	33
DEC 10...	6.2	0.070	0.07	60	100	8	10	<0.10	92	27	92
MAR 05...	6.6	0.110	0.11	40	180	<5	24	<0.10	126	160	96
APR 21...	--	2.30	2.3	80	58	7	26	0.20	50	5.8	54
MAY 20...	7.1	0.060	0.06	110	3	<5	38	<0.10	72	4.0	89
28...	11	0.380	0.38	20	140	130	5	0.60	113	3940	49
29...	9.3	0.270	0.27	30	140	75	5	0.20	293	5600	70
29...	8.9	0.260	0.26	20	140	100	6	0.20	196	2000	88
JUN 22...	5.8	0.170	0.17	50	26	60	16	<0.10	136	27	96
JUL 09...	8.0	0.630	0.63	60	13	16	35	--	8	0.65	91
AUG 18...	2.7	0.090	0.09	400	35	<5	120	--	11	0.07	67
SEP 16...	7.1	0.160	0.16	400	210	<5	55	--	71	1.4	97

ARKANSAS RIVER BASIN

129

07229900 LAKE THUNDERBIRD NEAR NORMAN, OK

LOCATION.--Lat 35°13'15", long 97°13'05", in NW 1/4 SE 1/4 sec.29, T.9 N., R.1 E., Cleveland County, Hydrologic Unit 11090203, near center of dam on Little River, just downstream from Hog Creek, 13 mi east of Norman, and at mile 96.4.

DRAINAGE AREA.--256 mi².

PERIOD OF RECORD.--March 1965 to current year.

GAGE.--Nonrecording gage at outlet structure and at pump house. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. Regulated storage began Mar. 1, 1965; minimum conservation pool first filled September 1965. Capacity, 196,200 acre-ft at elevation 1,049.4 ft, crest of drop inlet; 119,600 acre-ft at elevation 1,039.0 ft, top of conservation pool; 13,640 acre-ft at elevation 1,010.0 ft, minimum conservation pool. Dead storage, 1,200 acre-ft below elevation 997.0 ft, sill of gated outlet. Figures given herein represent total contents. Reservoir is used for flood control, irrigation (inactive), and municipal water supplies diverted to Del City, Midwest City, and Norman.

COOPERATION.--Elevations and data on diversions furnished by Central Oklahoma Master Conservancy District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 172,900 acre-ft, Mar. 5, 1985, elevation, 1,046.61 ft; minimum since conservation pool first reached, 15,370 acre-ft, Nov. 30, 1965, elevation, 1,011.0 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 147,400 acre-ft, Oct. 6, elevation, 1,043.23 ft; minimum, 113,700 acre-ft, Sept. 6, elevation, 1,038.02 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)*	Contents (acre-feet)	Change in contents (acre-feet)	Diversions (acre-feet)
Sept. 30.....	1040.16	126,800	-	-
Oct. 31.....	1039.65	123,600	-3,200	1,209
Nov. 30.....	1040.30	127,700	+4,100	1,197
Dec. 31.....	1039.23	121,000	-6,700	1,151
CAL YR 86.....	-	-	+500	16,533
Jan. 31.....	1039.66	123,600	+2,600	1,201
Feb. 28.....	1039.37	121,900	-1,700	1,059
Mar. 31.....	1039.08	120,100	-1,800	1,103
Apr. 30.....	1038.94	119,200	-900	1,357
May 31.....	1042.50	142,300	+23,100	1,722
June 30.....	1039.32	121,500	-20,800	1,479
July 31.....	1039.07	120,000	-1,500	1,750
Aug. 31.....	1038.18	114,700	-5,300	2,163
Sept. 30.....	1038.23	115,000	+300	1,502
WTR YR 87.....	-	-	-11,800	16,893

*Elevation at 0800 on the following day.

ARKANSAS RIVER BASIN

351307097132401 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 1

LOCATION.--Lat 35°13'07", Long 97°13'24".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
19...	1009	1028	1028	1.00	121000	310	7.70	7.0	740	10.8	92
19...	1013	1028	1028	5.00	121000	344	7.60	7.0	740	10.8	91
19...	1015	1028	1028	10.0	121000	344	7.50	7.0	740	10.8	91
19...	1017	1028	1028	15.0	121000	340	7.50	7.0	740	10.9	92
19...	1019	1028	1028	20.0	121000	340	7.40	6.5	740	10.6	89
19...	1022	1028	1028	25.0	121000	344	7.40	6.5	740	10.6	89
19...	1025	1028	1028	30.0	121000	344	7.40	6.5	740	10.7	90
19...	1029	1028	1028	35.0	121000	345	7.40	6.5	740	11.0	93
19...	1032	1028	1028	40.0	121000	346	7.40	6.5	740	10.6	89
19...	1035	1028	1028	45.0	121000	357	7.40	6.5	740	10.6	89
19...	1038	1028	1028	48.0	121000	387	7.40	6.5	740	9.8	82
MAR											
31...	0942	1028	1028	1.00	120000	394	8.00	10.0	740	9.9	90
31...	0947	1028	1028	5.00	120000	391	7.70	9.5	740	9.5	86
31...	0949	1028	1028	10.0	120000	397	7.70	9.5	740	9.5	86
31...	0951	1028	1028	15.0	120000	397	7.60	9.5	740	9.3	84
31...	0954	1028	1028	20.0	120000	397	7.60	9.5	740	9.6	87
31...	0957	1028	1028	25.0	120000	397	7.50	9.5	740	9.6	87
31...	1002	1028	1028	32.0	120000	395	7.60	9.5	740	9.6	87
JUN											
24...	0954	1028	1028	1.00	120000	393	7.60	28.5	730	8.2	111
24...	0955	1028	1028	5.00	120000	372	7.70	28.5	730	8.5	115
24...	0956	1028	1028	10.0	120000	387	7.70	28.0	730	7.5	101
24...	0957	1028	1028	15.0	120000	388	7.60	27.5	730	5.7	75
24...	0958	1028	1028	20.0	120000	390	7.50	26.5	730	3.8	50
24...	0959	1028	1028	25.0	120000	386	7.30	25.0	730	1.7	22
24...	1001	1028	1028	30.0	120000	382	7.10	21.5	730	1.1	13
24...	1003	1028	1028	35.0	120000	376	6.90	21.0	730	0.6	7
24...	1005	1028	1028	40.0	120000	376	6.90	19.5	730	0.4	5
24...	1007	1028	1028	45.0	120000	390	6.90	19.0	730	0.4	5
SEP											
29...	1042	1028	1028	1.00	115000	398	7.40	23.0	740	6.8	82
29...	1044	1028	1028	5.00	115000	410	7.50	23.0	740	6.8	82
29...	1046	1028	1028	10.0	115000	410	7.60	23.0	740	6.8	82
29...	1047	1028	1028	15.0	115000	413	7.60	23.0	740	6.7	80
29...	1049	1028	1028	20.0	115000	412	7.60	23.0	740	6.8	82
29...	1051	1028	1028	25.0	115000	416	7.60	23.0	740	6.8	82
29...	1052	1028	1028	30.0	115000	416	7.50	23.0	740	6.7	80
29...	1053	1028	1028	37.0	115000	417	7.50	23.0	740	6.7	80

ARKANSAS RIVER BASIN

351320097131801 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 2

LOCATION.--Lat 35°13'20", Long 97°13'18".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Samples were collected in a Kemmerer sampler. Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
DEC										
19...	1051	1028	80020	1.00	121000	345	7.80	7.0	10	740
19...	1057	1028	1028	5.00	121000	341	7.70	7.0	--	740
19...	1058	1028	1028	10.0	121000	346	7.60	7.0	--	740
19...	1101	1028	1028	15.0	121000	341	7.60	6.5	--	740
19...	1102	1028	1028	20.0	121000	343	7.60	6.5	--	740
19...	1104	1028	80020	25.0	121000	345	7.60	6.5	10	740
19...	1106	1028	1028	30.0	121000	346	7.50	6.5	--	740
19...	1109	1028	1028	35.0	121000	345	7.50	6.5	--	740
19...	1112	1028	1028	40.0	121000	342	7.60	6.5	--	740
19...	1116	1028	1028	45.0	121000	363	7.60	6.5	--	740
19...	1119	1028	80020	52.0	121000	375	7.50	6.5	28	740
MAR										
31...	1015	1028	80020	1.00	120000	390	7.60	10.0	--	740
31...	1024	1028	1028	5.00	120000	386	7.60	10.0	20	740
31...	1026	1028	1028	10.0	120000	390	7.60	9.5	--	740
31...	1028	1028	1028	15.0	120000	393	7.60	9.5	--	740
31...	1031	1028	80020	20.0	120000	389	7.60	10.0	20	740
31...	1038	1028	1028	25.0	120000	396	7.60	9.5	--	740
31...	1041	1028	1028	30.0	120000	394	7.60	10.0	--	740
31...	1044	1028	80020	36.0	120000	390	7.80	10.0	28	740
JUN										
24...	1033	1028	80020	1.00	120000	388	7.50	28.5	2.4	730
24...	1034	1028	1028	5.00	120000	384	7.70	28.5	--	730
24...	1035	1028	1028	10.0	120000	402	7.70	28.0	--	730
24...	1036	1028	1028	15.0	120000	387	7.40	27.0	--	730
24...	1038	1028	1028	20.0	120000	384	7.40	26.5	--	730
24...	1041	1028	80020	25.0	120000	383	7.30	24.5	6.2	730
24...	1044	1028	1028	30.0	120000	374	7.10	22.0	--	730
24...	1047	1028	1028	35.0	120000	376	7.10	20.5	--	730
24...	1049	1028	1028	40.0	120000	391	7.70	20.5	--	730
24...	1050	1028	1028	45.0	120000	384	7.40	19.5	--	730
24...	1051	1028	80020	50.0	120000	387	7.10	18.5	18	730
SEP										
29...	1101	1028	80020	1.00	115000	416	7.60	22.5	38	740
29...	1107	1028	1028	5.00	115000	420	7.60	22.5	--	740
29...	1110	1028	1028	10.0	115000	421	7.60	22.5	--	740
29...	1112	1028	1028	15.0	115000	420	7.60	22.5	--	740
29...	1114	1028	80020	20.0	115000	418	7.60	23.0	5.7	740
29...	1116	1028	1028	25.0	115000	419	7.60	22.5	--	740
29...	1119	1028	1028	30.0	115000	418	7.60	22.5	--	740
29...	1121	1028	1028	35.0	115000	418	7.60	22.5	--	740
29...	1122	1028	1028	40.0	115000	420	7.60	22.5	--	740
29...	1124	1028	80020	46.0	115000	421	7.60	22.5	37	740

ARKANSAS RIVER BASIN

351320097131801 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 2--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)
DEC										
19...	11.4	97	160	8	33	18	12	14	0.4	3.7
19...	10.5	89	--	--	--	--	--	--	--	--
19...	11.2	95	--	--	--	--	--	--	--	--
19...	10.5	88	--	--	--	--	--	--	--	--
19...	11.0	93	--	--	--	--	--	--	--	--
19...	10.4	88	160	7	33	18	12	14	0.4	3.7
19...	10.3	87	--	--	--	--	--	--	--	--
19...	10.8	91	--	--	--	--	--	--	--	--
19...	10.4	87	--	--	--	--	--	--	--	--
19...	10.5	88	--	--	--	--	--	--	--	--
19...	9.8	82	170	2	35	19	14	15	0.5	3.5
MAR										
31...	10.2	93	94	--	27	6.4	7.2	14	0.3	3.0
31...	9.9	90	--	--	--	--	--	--	--	--
31...	10.0	91	--	--	--	--	--	--	--	--
31...	9.7	88	--	--	--	--	--	--	--	--
31...	9.8	89	170	1	37	20	14	15	0.5	3.3
31...	9.8	89	--	--	--	--	--	--	--	--
31...	10.1	92	--	--	--	--	--	--	--	--
31...	9.9	91	180	4	37	21	15	15	0.5	3.0
JUN										
24...	8.2	111	180	--	36	21	18	18	0.6	2.9
24...	8.4	113	--	--	--	--	--	--	--	--
24...	8.6	115	--	--	--	--	--	--	--	--
24...	6.1	80	--	--	--	--	--	--	--	--
24...	5.4	70	--	--	--	--	--	--	--	--
24...	4.5	57	180	3	36	21	14	14	0.5	3.0
24...	4.3	51	--	--	--	--	--	--	--	--
24...	4.2	49	--	--	--	--	--	--	--	--
24...	4.1	48	--	--	--	--	--	--	--	--
24...	1.3	15	--	--	--	--	--	--	--	--
24...	0.4	4	180	1	37	21	14	14	0.5	2.9
SEP										
29...	6.8	81	180	9	36	23	16	16	0.5	3.3
29...	6.7	80	--	--	--	--	--	--	--	--
29...	6.6	79	--	--	--	--	--	--	--	--
29...	6.6	79	--	--	--	--	--	--	--	--
29...	6.6	79	180	5	36	22	16	16	0.5	3.2
29...	6.4	76	--	--	--	--	--	--	--	--
29...	6.6	79	--	--	--	--	--	--	--	--
29...	6.4	77	--	--	--	--	--	--	--	--
29...	6.2	74	--	--	--	--	--	--	--	--
29...	5.8	69	180	5	36	22	16	16	0.5	3.3

ARKANSAS RIVER BASIN

351320097131801 LAKE THUNDERBIRD DAMSITE CROSS SECTION SITE NO. 2--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
DEC									
19...	188	0	154	16	22	186	194	0.25	0.0
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	188	0	154	10	18	189	185	0.26	0.0
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	188	0	154	12	20	203	202	0.28	0.0
MAR									
31...	210	0	172	5.6	20	222	173	0.30	0.0
31...	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--
31...	210	0	172	13	20	225	212	0.31	0.0
31...	--	--	--	--	20	--	--	--	--
31...	--	--	--	--	--	--	--	--	--
31...	210	0	172	13	--	221	214	0.30	0.0
JUN									
24...	215	0	176	10	16	217	211	0.30	0.0
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	205	0	168	10	16	212	204	0.29	0.0
24...	--	--	--	--	16	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--
24...	220	0	180	15	--	221	213	0.30	0.0
SEP									
29...	215	0	176	11	18	<1	213	0.29	0.0
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	11	18	215	212	0.29	0.0
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--
29...	--	--	--	11	19	224	213	0.30	0.0

ARKANSAS RIVER BASIN

351333097131201 LAKE THUNDERBIRD DAMSITE CROSS SECTION NO. 3

LOCATION.--Lat 35°13'33", Long 97°13'12".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	SAM-PLING DEPTH (FEET)	RESER-VOIR STORAGE (AC-FT)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
DEC											
19...	1211	1028	1028	1.00	121000	338	7.80	7.5	740	11.7	101
19...	1213	1028	1028	5.00	121000	332	7.70	7.5	740	10.2	87
19...	1215	1028	1028	10.0	121000	338	7.70	7.0	740	10.0	85
19...	1217	1028	1028	15.0	121000	342	7.70	7.0	740	10.5	89
19...	1219	1028	1028	20.0	121000	340	7.70	7.0	740	11.2	95
19...	1222	1028	1028	25.0	121000	344	7.60	7.0	740	10.8	91
19...	1225	1028	1028	30.0	121000	343	7.60	7.0	740	11.4	96
19...	1228	1028	1028	35.0	121000	344	7.60	6.5	740	11.0	93
19...	1231	1028	1028	41.0	121000	341	7.60	7.0	740	11.2	95
MAR											
31...	1149	1028	1028	1.00	120000	381	8.10	11.0	740	10.1	94
31...	1153	1028	1028	5.00	120000	385	8.10	10.5	740	9.4	86
31...	1155	1028	1028	10.0	120000	385	8.00	10.0	740	9.7	89
31...	1158	1028	1028	15.0	120000	387	8.00	10.0	740	9.8	89
31...	1200	1028	1028	20.0	120000	387	8.00	10.0	740	9.9	90
31...	1202	1028	1028	25.0	120000	386	8.00	10.0	740	9.9	90
31...	1205	1028	1028	30.0	120000	387	8.00	10.0	740	10.0	91
31...	1208	1028	1028	38.0	120000	387	7.90	10.0	740	9.9	90
JUN											
24...	1126	1028	1028	1.00	120000	377	8.00	29.0	730	7.2	98
24...	1127	1028	1028	5.00	120000	386	8.00	28.5	730	7.3	99
24...	1128	1028	1028	10.0	120000	387	8.00	27.5	730	6.4	85
24...	1129	1028	1028	15.0	120000	387	8.00	26.5	730	5.0	65
24...	1130	1028	1028	20.0	120000	401	7.90	26.5	730	3.6	47
24...	1132	1028	1028	25.0	120000	378	7.70	25.0	730	2.5	32
24...	1134	1028	1028	30.0	120000	384	7.50	22.5	730	1.1	13
24...	1136	1028	1028	35.0	120000	379	7.50	21.0	730	0.8	9
24...	1138	1028	1028	40.0	120000	380	7.50	19.0	730	0.5	6
24...	1140	1028	1028	42.0	120000	380	7.50	19.0	730	0.2	2
SEP											
29...	1156	1028	1028	1.00	115000	420	7.80	23.0	740	6.2	74
29...	1158	1028	1028	5.00	115000	419	7.80	23.0	740	6.5	78
29...	1200	1028	1028	10.0	115000	415	7.80	23.0	740	6.4	77
29...	1202	1028	1028	15.0	115000	417	7.80	23.0	740	6.6	79
29...	1204	1028	1028	20.0	115000	415	7.80	23.0	740	6.2	74
29...	1206	1028	1028	25.0	115000	418	7.80	23.0	740	6.2	74
29...	1208	1028	1028	30.0	115000	417	7.80	23.0	740	6.3	76
29...	1210	1028	1028	35.0	115000	418	7.80	23.0	740	6.3	76
29...	1212	1028	1028	41.0	115000	415	7.80	22.5	740	6.3	75

ARKANSAS RIVER BASIN

351317097145101 LAKE THUNDERBIRD LITTLE RIVER CROSS SECTION

LOCATION.--Lat 35°13'17", long 97°14'51".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
19...	1322	1028	1028	1.00	121000	351	7.90	7.0	740	11.9	101
19...	1323	1028	1028	5.00	121000	350	7.80	7.0	740	10.6	90
19...	1324	1028	1028	10.0	121000	351	7.80	7.0	740	10.6	90
19...	1326	1028	1028	15.0	121000	351	7.80	7.0	740	10.6	90
19...	1329	1028	1028	20.0	121000	353	7.80	7.0	740	11.0	93
19...	1331	1028	1028	25.0	121000	352	7.70	7.0	740	10.8	91
19...	1335	1028	1028	32.0	121000	355	7.70	7.0	740	10.8	92
MAR											
31...	1244	1028	1028	1.00	120000	400	7.70	10.5	740	10.2	94
31...	1246	1028	1028	5.00	120000	401	7.70	10.0	740	9.8	90
31...	1248	1028	1028	10.0	120000	402	7.70	10.0	740	9.8	90
31...	1250	1028	1028	15.0	120000	402	7.70	10.0	740	10.0	91
31...	1252	1028	1028	20.0	120000	401	7.70	10.0	740	9.9	90
31...	1254	1028	1028	25.0	120000	406	7.70	9.5	740	10.0	91
31...	1256	1028	1028	33.0	120000	409	7.70	9.5	740	9.8	88
JUN											
24...	1225	1028	1028	1.00	120000	387	8.20	29.0	730	7.6	103
24...	1227	1028	1028	5.00	120000	387	8.00	28.5	730	7.2	98
24...	1228	1028	1028	10.0	120000	383	7.90	28.0	730	6.4	86
24...	1229	1028	1028	15.0	120000	380	7.40	27.5	730	5.8	77
24...	1230	1028	1028	20.0	120000	385	7.30	26.5	730	2.9	38
24...	1232	1028	1028	25.0	120000	389	7.20	25.0	730	1.4	18
24...	1234	1028	1028	30.0	120000	364	7.20	22.0	730	0.7	8
24...	1236	1028	1028	35.0	120000	379	7.20	20.5	730	0.2	2
24...	1238	1028	1028	42.0	120000	380	6.80	19.5	730	0.2	2
SEP											
29...	1245	1028	1028	1.00	115000	415	7.90	23.0	740	7.0	85
29...	1247	1028	1028	5.00	115000	419	7.90	23.0	740	7.4	89
29...	1249	1028	1028	10.0	115000	415	7.80	23.0	740	7.2	87
29...	1251	1028	1028	15.0	115000	417	7.80	23.0	740	7.3	88
29...	1252	1028	1028	20.0	115000	417	7.80	23.0	740	7.1	85
29...	1254	1028	1028	25.0	115000	416	7.80	23.0	740	6.9	83
29...	1256	1028	1028	30.0	115000	416	7.80	23.0	740	7.0	84

ARKANSAS RIVER BASIN

351255097151001 LAKE THUNDERBIRD CLEAR CREEK CROSS SECTION

LOCATION.--Lat 35°12'55", long 97°15'10".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
19...	1343	1028	1028	1.00	121000	347	7.80	7.0	740	10.7	91
19...	1344	1028	1028	5.00	121000	350	7.80	7.0	740	10.7	91
19...	1346	1028	1028	10.0	121000	350	7.80	7.0	740	10.2	86
19...	1348	1028	1028	15.0	121000	350	7.80	7.0	740	11.4	96
19...	1351	1028	1028	20.0	121000	349	7.70	7.0	740	10.8	91
19...	1353	1028	1028	25.0	121000	349	7.70	7.0	740	10.7	90
19...	1355	1028	1028	29.0	121000	348	7.70	7.0	740	10.4	88
MAR											
31...	1305	1028	1028	1.00	120000	409	7.80	10.0	740	10.0	92
31...	1307	1028	1028	5.00	120000	408	7.80	10.0	740	9.6	88
31...	1309	1028	1028	10.0	120000	408	7.80	10.0	740	9.8	89
31...	1311	1028	1028	15.0	120000	409	7.80	10.0	740	10.0	91
31...	1314	1028	1028	20.0	120000	409	7.80	10.0	740	10.2	93
31...	1316	1028	1028	25.0	120000	409	7.80	9.5	740	9.9	90
31...	1318	1028	1028	30.0	120000	408	7.80	9.5	740	9.8	88
JUN											
24...	1309	1028	1028	1.00	120000	392	8.00	29.0	730	7.8	106
24...	1310	1028	1028	5.00	120000	389	7.90	28.5	730	7.4	100
24...	1312	1028	1028	10.0	120000	391	7.80	28.5	730	7.2	97
24...	1314	1028	1028	15.0	120000	391	7.70	28.0	730	4.2	56
24...	1315	1028	1028	20.0	120000	392	7.70	26.5	730	3.8	50
24...	1316	1028	1028	25.0	120000	405	7.50	25.5	730	1.2	15
24...	1318	1028	1028	30.0	120000	399	7.40	22.0	730	0.8	10
SEP											
29...	1307	1028	1028	1.00	115000	418	8.20	23.0	740	7.4	89
29...	1309	1028	1028	5.00	115000	417	8.00	23.0	740	7.5	90
29...	1311	1028	1028	10.0	115000	418	7.90	23.0	740	7.2	86
29...	1313	1028	1028	15.0	115000	418	7.90	23.0	740	7.3	88
29...	1315	1028	1028	20.0	115000	418	7.90	23.0	740	7.0	84
29...	1317	1028	1028	25.0	115000	420	7.90	23.0	740	7.0	84
29...	1319	1028	1028	30.0	115000	419	7.80	23.0	740	6.8	82

ARKANSAS RIVER BASIN

137

351318097155901 LAKE THUNDERBIRD LITTLE RIVER ABOVE CLEAR CREEK

LOCATION.--Lat 35°13'18", Long 97°15'59".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature, and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
19...	1404	1028	1028	1.00	121000	355	7.80	7.0	740	11.0	93
19...	1405	1028	1028	5.00	121000	356	7.80	7.0	740	10.8	91
19...	1407	1028	1028	10.0	121000	357	7.80	7.0	740	10.5	89
19...	1408	1028	1028	15.0	121000	358	7.80	7.0	740	10.6	90
19...	1410	1028	1028	20.0	121000	354	7.80	7.0	740	11.2	95
19...	1412	1028	1028	27.0	121000	369	7.70	7.0	740	10.4	88
MAR											
31...	1330	1028	1028	1.00	120000	412	7.80	10.0	740	10.2	94
31...	1331	1028	1028	5.00	120000	413	7.80	10.0	740	9.8	90
31...	1333	1028	1028	10.0	120000	412	7.80	10.0	740	10.0	91
31...	1335	1028	1028	15.0	120000	413	7.80	10.0	740	10.2	93
31...	1338	1028	1028	22.0	120000	421	7.80	9.5	740	9.8	89
JUN											
24...	1252	1028	1028	1.00	120000	391	8.00	29.0	730	7.8	106
24...	1253	1028	1028	5.00	120000	389	8.00	29.0	730	7.5	102
24...	1255	1028	1028	10.0	120000	392	8.00	28.5	730	7.3	99
24...	1256	1028	1028	15.0	120000	390	7.60	28.5	730	7.2	97
24...	1257	1028	1028	20.0	120000	385	7.10	25.5	730	3.7	48
24...	1259	1028	1028	27.0	120000	374	6.90	23.5	730	0.5	6
SEP											
29...	1325	1028	1028	1.00	115000	399	8.00	23.0	740	7.9	95
29...	1327	1028	1028	5.00	115000	420	8.00	23.0	740	7.0	84
29...	1330	1028	1028	10.0	115000	419	8.00	23.0	740	7.2	87
29...	1331	1028	1028	15.0	115000	421	8.00	23.0	740	7.1	85
29...	1333	1028	1028	20.0	115000	421	8.00	23.0	740	7.2	86
29...	1334	1028	1028	26.0	115000	419	8.00	23.0	740	7.0	84

ARKANSAS RIVER BASIN

351442097140201 LAKE THUNDERBIRD HOG CREEK CROSS SECTION

LOCATION.--Lat 35°14'42", long 97°14'02".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured quarterly in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
19...	1242	1028	1028	1.00	121000	345	7.80	7.0	740	11.3	95
19...	1244	1028	1028	5.00	121000	344	7.80	7.0	740	10.5	89
19...	1246	1028	1028	10.0	121000	340	7.80	6.5	740	11.2	94
19...	1249	1028	1028	15.0	121000	344	7.80	6.5	740	10.8	91
19...	1251	1028	1028	20.0	121000	345	7.80	6.5	740	10.7	90
19...	1254	1028	1028	25.0	121000	340	7.80	6.5	740	11.4	96
19...	1257	1028	1028	30.0	121000	340	7.80	6.5	740	11.5	97
MAR											
31...	1219	1028	1028	1.00	120000	374	7.70	10.5	740	9.8	90
31...	1222	1028	1028	5.00	120000	378	7.70	10.0	740	9.4	86
31...	1224	1028	1028	10.0	120000	379	7.80	10.0	740	9.7	88
31...	1225	1028	1028	15.0	120000	379	7.80	9.5	740	9.8	89
31...	1229	1028	1028	20.0	120000	379	7.80	10.0	740	10.1	92
31...	1231	1028	1028	28.0	120000	379	7.70	9.5	740	9.8	89
JUN											
24...	1201	1028	1028	1.00	120000	386	7.90	29.0	730	7.6	104
24...	1202	1028	1028	5.00	120000	382	7.90	28.5	730	7.5	101
24...	1204	1028	1028	10.0	120000	386	8.00	28.5	730	6.4	86
24...	1205	1028	1028	15.0	120000	385	7.70	26.5	730	4.0	52
24...	1207	1028	1028	20.0	120000	376	7.50	24.5	730	1.5	19
24...	1209	1028	1028	25.0	120000	372	7.40	23.0	730	1.1	13
SEP											
29...	1225	1028	1028	1.00	115000	418	8.00	23.0	740	8.6	103
29...	1229	1028	1028	5.00	115000	418	7.90	22.5	740	7.7	92
29...	1230	1028	1028	10.0	115000	417	7.90	23.0	740	7.8	94
29...	1232	1028	1028	15.0	115000	417	7.90	22.5	740	7.4	89
29...	1234	1028	1028	22.0	115000	415	7.80	23.0	740	7.3	88

ARKANSAS RIVER BASIN

07230000 LITTLE RIVER BELOW LAKE THUNDERBIRD NEAR NORMAN, OK

LOCATION.--Lat 35°13'18", long 97°12'49", in NE 1/4 SE 1/4 sec.29, T.9 N., R.1 E., Cleveland County, Hydrologic Unit, 11090203, at right bank of outlet channel, 170 ft upstream from State Highway 9, 1,200 ft downstream from Lake Thunderbird, 1.0 mi upstream from Prairie Creek, 13.0 mi east of Norman, and at mile 96.2.

DRAINAGE AREA.--257 mi².

PERIOD OF RECORD.--October 1952 to current year. Prior to October 1964, published as Little River below Hog Creek near Norman.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 965.62 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 28, 1956, nonrecording gage 800 ft downstream at same datum. Nov. 28, 1956 to Oct. 14, 1964, water-stage recorder at site 800 ft downstream at same datum. Oct. 15, 1964 to Sept. 1, 1965, nonrecording gage at site 170 ft downstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Lake Thunderbird since March 1965 (station 07229900). In prior years, occasional small diversions above station for irrigation.

AVERAGE DISCHARGE.--Prior to regulation by Lake Thunderbird, 12 years (water years 1953-64), 58.9 ft³/s, 42,640 acre-ft/yr; since regulation by Lake Thunderbird, 22 years (water years 1966-87), 41.6 ft³/s, 30,140 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,600 ft³/s, May 25, 1957, gage height, 28.85 ft, from high-water mark, at site then in use, from rating curve extended above 15,000 ft³/s; no flow at times in 1954-56, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 833 ft³/s, Oct. 28, gage height, 7.33 ft; minimum daily discharge, 0.45 ft³/s, Nov. 17-24, and Apr. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.98	483	613	281	284	1.8	.53	.61	359	.66	.56	.53
2	1.6	483	701	172	284	215	.53	.62	399	1.3	.56	.53
3	.62	249	697	1.1	334	482	.53	.61	396	152	.56	.53
4	.55	1.2	694	1.1	371	640	.53	.61	394	282	.59	.53
5	.54	169	389	.98	370	681	.53	.65	461	280	.61	.53
6	194	399	.57	.97	232	678	.53	.62	509	280	.61	.53
7	401	558	.68	.97	441	676	.53	.61	508	279	.59	.76
8	561	605	.65	1.3	644	674	.50	.61	505	279	.54	.54
9	561	601	225	1.4	683	640	.53	.61	504	279	.55	.61
10	561	601	585	1.1	680	416	.53	.61	503	166	.54	.64
11	561	600	605	1.1	388	112	.53	.55	498	.72	.57	.53
12	558	598	277	161	.61	.61	.53	.53	495	.71	.55	.62
13	557	277	1.3	366	.60	.60	.53	.53	493	.75	.58	.53
14	553	.53	1.3	472	.68	.61	.49	.53	492	.69	.57	.67
15	620	.53	1.3	469	1.0	.59	.48	.53	490	.69	.53	.62
16	721	.50	1.3	371	.61	.74	.49	.53	489	.72	.79	.53
17	768	.45	1.3	282	.53	1.1	.48	.53	484	.84	.60	.53
18	763	.45	1.2	281	266	227	.45	.53	271	.71	.56	.77
19	760	.45	1.3	281	461	528	.47	.53	377	.65	.53	.53
20	754	.45	1.3	281	459	632	.50	.53	7.7	.61	.53	.57
21	669	.45	1.2	328	457	674	24	.53	174	.61	.53	.53
22	74	.45	1.2	363	456	498	140	.58	416	.61	.53	.53
23	185	.45	1.2	190	201	115	373	.53	542	.61	.53	.53
24	439	.45	1.2	1.2	2.6	199	320	.54	329	.61	.55	.60
25	510	1.2	1.2	1.1	2.3	543	287	.65	.65	.68	.56	.56
26	578	.55	1.2	1.1	2.1	597	195	.53	.61	.69	.54	.53
27	685	.51	1.2	1.0	1.8	298	.64	1.3	.61	.69	.68	.75
28	786	219	1.1	.97	2.5	.56	.61	1.5	.65	.65	.59	.66
29	824	487	163	.87	---	.52	.61	.67	.65	.61	.53	.52
30	818	484	283	163	---	.53	.61	181	1.0	.57	.53	.53
31	698	---	282	284	---	.53	---	299	---	.55	.53	---
TOTAL	15163.29	6821.62	5535.70	4761.26	7026.33	9533.19	1351.69	498.31	10099.87	2012.93	17.62	17.37
MEAN	489	227	179	154	251	308	45.1	16.1	337	64.9	.57	.58
MAX	824	605	701	472	683	681	373	299	542	282	.79	.77
MIN	.54	.45	.57	.87	.53	.52	.45	.53	.61	.55	.53	.52
AC-FT	30080	13530	10980	9440	13940	18910	2680	988	20030	3990	35	34

CAL YR 1986 TOTAL 46659.26 MEAN 128 MAX 824 MIN .45 AC-FT 92550
WTR YR 1987 TOTAL 62839.18 MEAN 172 MAX 824 MIN .45 AC-FT 124600

ARKANSAS RIVER BASIN

07230500 LITTLE RIVER NEAR TECUMSEH, OK

LOCATION.--Lat 35°10'25", long 96°55'55", near northwest corner sec.18, T.8 N., R.4 E., Pottawatomie County, Hydrologic Unit 11090203, on downstream side of center pier of bridge on U.S. Highway 177, 1.5 mi downstream from Dance Creek, 5.0 mi south of Tecumseh, and at mile 77.2.

DRAINAGE AREA.--456 mi².

PERIOD OF RECORD.--October 1943 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 898.52 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated or diverted since 1965 by Lake Thunderbird, 19.2 mi upstream (station 07229900). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Lake Thunderbird, 21 years (water years 1944-64), 149 ft³/s, 107,900 acre-ft/yr; since regulation by Lake Thunderbird, 22 years (water years 1966-87), 116 ft³/s, 84,040 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,400 ft³/s, May 25, 1957, gage height, 18.84 ft, maximum gage height, 19.68 ft, May 18, 1949; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1932 reached a stage of 25.58 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,480 ft³/s, May 29, gage height, 15.73 ft; minimum daily discharge, 7.4 ft³/s, Aug. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1620	600	613	325	474	909	83	e50	705	65	e16	9.0
2	1290	598	728	303	360	448	76	e44	780	1060	e15	8.5
3	493	461	723	69	361	640	73	e43	770	346	e14	8.4
4	464	1450	716	47	426	740	70	e40	684	411	e13	8.5
5	198	590	609	42	468	780	69	e39	684	357	e13	8.2
6	167	567	94	41	754	786	71	e38	818	327	e12	8.0
7	387	674	426	37	517	725	68	e37	791	306	e12	27
8	667	758	313	41	713	705	66	e36	770	293	e11	17
9	669	717	358	744	763	683	61	e35	762	287	e11	11
10	644	779	600	155	767	516	59	e34	779	273	10	16
11	1070	741	714	91	654	299	57	e33	764	43	11	14
12	757	666	440	116	99	141	56	e32	754	25	10	16
13	713	473	93	340	74	129	54	e30	747	41	9.4	19
14	666	78	73	519	86	124	55	e29	732	27	14	12
15	720	68	74	503	1540	119	53	e28	724	23	11	27
16	793	65	74	468	683	119	49	e26	718	28	8.8	16
17	789	61	78	350	247	2090	51	e25	741	169	15	11
18	763	55	66	370	290	513	48	e23	483	571	12	93
19	777	50	59	363	532	700	43	22	476	82	10	36
20	774	49	56	386	509	739	40	28	591	51	10	20
21	801	45	52	411	494	772	380	25	166	e40	8.4	31
22	1580	45	50	498	476	743	140	85	521	e35	7.9	14
23	388	45	50	408	366	547	499	42	741	e32	7.7	e12
24	814	40	48	175	148	320	504	120	808	e28	7.4	e11
25	887	1010	47	129	144	694	374	256	e100	e26	7.7	e10
26	827	853	44	105	235	715	366	76	e50	e24	9.0	e9.0
27	795	230	41	136	281	465	100	221	e45	e22	21	52
28	848	208	41	159	2320	145	62	2860	e40	e20	14	26
29	927	559	78	138	---	96	58	2480	31	e19	10	17
30	922	547	262	129	---	89	55	726	220	e18	9.8	16
31	858	---	303	339	---	87	---	773	---	e17	9.4	---
TOTAL	24068	13082	7923	7937	14781	16578	3740	8336	16995	5066	350.5	583.6
MEAN	776	436	256	256	528	535	125	269	566	163	11.3	19.5
MAX	1620	1450	728	744	2320	2090	504	2860	818	1060	21	93
MIN	167	40	41	37	74	87	40	22	31	17	7.4	8.0
AC-FT	47740	25950	15720	15740	29320	32880	7420	16530	33710	10050	695	1160

CAL YR 1986 TOTAL 85189.7 MEAN 233 MAX 2560 MIN 2.3 AC-FT 169000
WTR YR 1987 TOTAL 119440.1 MEAN 327 MAX 2860 MIN 7.4 AC-FT 236900

e Estimated

ARKANSAS RIVER BASIN

07230597 LITTLE RIVER NEAR BOWLEGS, OK

LOCATION.--Lat 35°06'19", long 96°40'06", in NW 1/4 SE 1/4 sec.3, T.7 N., R.6 E., Seminole County, Hydrologic Unit 11090203, on the right downstream abutment of state highways 3 and 99, 6.7 miles south of Seminole and at mile 57.8.

DRAINAGE AREA.--550 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1983 to current year.

GAGE.--Water-stage recorder and a crest stage gage. Datum of gage is 826.20 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Flow regulated by Lake Thunderbird (station 07229900) 38.8 mi upstream.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft³/s, Oct. 22, 1983, gage height, 24.84 ft. No flow at times in 1983, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,280 ft³/s, May 29, gage height, 22.30 ft; minimum daily discharge, 8.0 ft³/s, Aug. 23 and Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2400	e900	646	e340	630	e3630	e140	59	1020	136	18	e9.0
2	e2200	e640	785	e330	497	e1730	e130	54	e860	732	17	e8.6
3	1340	e540	779	e300	410	880	e120	52	e840	e690	16	e8.5
4	e1000	e800	773	e110	486	939	e115	51	e800	e500	15	e8.4
5	e700	e2200	755	e80	488	956	e110	47	e720	456	14	e8.2
6	e500	e1400	e580	e68	1030	916	105	46	e800	382	13	e8.0
7	e300	e960	e265	e60	647	886	e100	46	e850	358	13	e25
8	e700	e820	e400	e56	764	885	e97	45	e820	339	13	e18
9	e700	e800	e1300	e1000	820	878	e94	42	e800	334	12	e12
10	e700	e740	e720	e800	814	745	90	39	e810	327	11	e15
11	e900	e780	e900	e350	800	440	86	38	e780	182	11	e15
12	e1200	e820	e880	158	288	264	83	35	e770	37	11	e16
13	e900	e760	e470	252	171	233	81	34	e760	44	11	e19
14	e740	e520	e150	504	159	221	78	29	e750	e40	11	e14
15	637	e170	119	522	1680	213	76	27	e730	e31	14	e25
16	e760	e120	e112	536	2340	208	72	e28	e720	26	12	e20
17	e810	e90	e105	355	753	2300	67	e29	e700	57	11	e12
18	826	e82	e101	571	403	e1300	71	e28	e640	857	13	e100
19	812	e74	e108	520	638	e900	61	27	e520	298	10	e50
20	781	e68	e100	562	635	e920	54	28	e900	108	e9.8	e23
21	809	60	e94	546	610	e940	242	35	e200	64	e9.0	e40
22	2000	e58	e88	669	593	e900	e200	126	e520	48	e8.2	e20
23	997	e58	e84	582	561	e800	e250	118	e770	40	e8.0	e13
24	740	57	e80	375	296	e600	e400	83	e800	37	e9.0	e12
25	e900	513	e76	262	312	e700	e450	309	e150	32	e8.5	e11
26	e865	1840	e72	215	396	e780	e400	188	51	31	11	e9.4
27	e850	528	e68	223	731	e700	237	100	36	27	22	e50
28	e850	328	e64	308	2550	e400	79	2590	e35	26	20	e30
29	e920	605	e70	282	---	e180	63	4130	e33	24	12	26
30	e940	651	e100	181	---	e160	60	3080	99	22	e9.7	17
31	e940	---	e330	374	---	e150	---	1310	---	20	e9.5	---
TOTAL	29717	17982	11174	11491	20502	25754	4211	12853	18284	6305	382.7	643.1
MEAN	959	599	360	371	732	831	140	415	609	203	12.3	21.4
MAX	2400	2200	1300	1000	2550	3630	450	4130	1020	857	22	100
MIN	300	57	64	56	159	150	54	27	33	20	8.0	8.0
AC-FT	58940	35670	22160	22790	40670	51080	8350	25490	36270	12510	759	1280

CAL YR 1986 TOTAL 105176.8 MEAN 288 MAX 3550 MIN 1.6 AC-FT 208600
WTR YR 1987 TOTAL 159298.8 MEAN 436 MAX 4130 MIN 8.0 AC-FT 316000

e Estimated

ARKANSAS RIVER BASIN

07230597 LITTLE RIVER NEAR BOWLEGS, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1953, 1959, 1961, February 1983 to current year.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT												
15...	1200	1028	80020	13.83	637	394	7.60	19.5	17.0	120	740	8.7
NOV												
24...	1300	1028	1028	12.13	56	1200	8.00	8.0	7.5	--	750	11.9
DEC												
15...	1600	1028	80020	12.72	119	1040	7.60	8.0	7.5	23	750	11.9
JAN												
12...	1400	1028	80020	13.01	158	748	8.00	20.0	5.0	54	750	13.6
MAR												
17...	1400	1028	80020	20.45	2650	282	6.80	15.0	8.0	750	730	10.2
APR												
15...	1200	1028	80020	13.08	76	1250	7.90	18.5	16.0	7.0	740	10.0
MAY												
19...	1300	1028	80020	12.54	26	1390	8.00	28.0	29.0	4.9	740	--
28...	2100	1028	80020	21.54	3550	226	6.60	14.0	17.5	660	740	--
29...	1400	1028	80020	22.33	4320	192	6.80	20.0	19.5	550	740	--
30...	1130	1028	80020	21.08	3160	255	6.80	26.0	22.0	360	740	--
JUN												
01...	0930	1028	80020	17.11	1090	405	7.20	20.0	22.0	200	740	--
JUL												
27...	1530	1028	1028	12.51	26	962	7.80	28.0	35.0	--	740	6.6
AUG												
17...	0930	1028	80020	12.27	11	1500	7.90	25.0	27.5	1.6	740	7.8
SEP												
29...	1500	1028	80020	12.58	28	725	7.40	22.0	24.0	300	750	7.7
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)
OCT												
15...	93	160	8	34	18	18	19	0.6	3.1	182	0	149
NOV												
24...	101	--	--	--	--	--	--	--	--	378	0	310
DEC												
15...	101	320	63	69	35	96	39	2	3.0	310	0	254
JAN												
12...	108	240	48	52	27	64	36	2	3.0	234	0	192
MAR												
17...	90	91	5	21	9.4	20	32	0.9	2.7	89	0	73
APR												
15...	105	370	81	77	42	120	42	3	1.9	370	0	301
MAY												
19...	--	330	96	55	48	150	49	4	1.9	314	0	257
28...	--	72	--	17	7.1	15	30	0.8	3.1	79	0	65
29...	--	68	--	16	6.7	9.9	23	0.5	3.2	79	0	65
30...	--	84	3	20	8.3	15	27	0.7	3.2	92	0	75
JUN												
01...	--	140	13	32	15	25	27	0.9	3.4	155	0	127
JUL												
27...	98	--	--	--	--	--	--	--	--	300	0	246
AUG												
17...	102	300	83	44	47	190	57	5	5.6	268	0	220
SEP												
29...	93	170	23	35	19	68	46	2	3.9	170	0	140

ARKANSAS RIVER BASIN

07230597 LITTLE RIVER NEAR BOWLEGS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
OCT 15...	11	27	0.20	5.3	272	207	0.37	468	0.300	0.40	0.70
NOV 24...	--	--	--	--	--	--	--	--	--	--	--
DEC 15...	30	180	0.30	11	592	577	0.81	190	<0.100	0.60	--
JAN 12...	26	110	0.20	9.0	412	407	0.56	176	0.100	0.40	0.50
MAR 17...	11	36	0.20	7.0	159	159	0.22	1140	0.200	1.8	2.0
APR 15...	31	200	0.30	12	672	655	0.91	138	<0.100	0.20	--
MAY 19...	46	280	0.40	14	749	739	1.02	52.8	<0.100	0.80	--
28...	5.0	22	0.20	7.1	156	122	0.21	1500	0.200	2.5	2.7
29...	<5.0	13	0.10	6.9	127	--	--	--	0.100	2.0	2.1
30...	6.0	24	0.20	7.1	163	133	0.22	1390	<0.100	1.8	--
JUN 01...	8.0	42	0.20	7.3	238	210	0.32	700	<0.100	1.5	--
JUL 27...	--	--	--	--	--	--	--	--	--	--	--
AUG 17...	57	310	0.40	12	850	799	1.16	25.2	<0.100	0.70	--
SEP 29...	23	110	0.30	8.3	398	353	0.54	29.7	0.100	0.80	0.90

DATE	NITRO- GEN, TOTAL (MG/L AS NO3)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	BORON, DIS- SOLVED (UG/L AS B)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 15...	3.1	0.120	0.12	90	31	--	9	0.30	746	1280	58
NOV 24...	--	--	--	--	--	--	--	--	46	7.0	60
DEC 15...	--	0.010	0.01	160	12	<5	20	0.20	46	15	79
JAN 12...	2.2	0.090	0.09	150	63	<5	14	--	653	279	41
MAR 17...	8.9	0.150	0.15	90	450	22	25	0.10	3070	22000	59
APR 15...	--	0.030	0.03	220	6	<5	37	1.1	26	5.3	71
MAY 19...	--	0.020	0.02	330	5	<5	3	<0.10	40	2.8	77
28...	12	0.300	0.30	60	300	20	32	<0.10	1690	16200	82
29...	9.3	0.240	0.24	60	310	20	15	0.20	1070	12500	82
30...	--	0.160	0.16	70	150	<5	19	0.20	672	5730	75
JUN 01...	--	0.160	0.16	100	95	9	17	<0.10	403	1190	87
JUL 27...	--	--	--	--	--	--	--	--	14	0.98	81
AUG 17...	--	0.030	0.03	440	<3	<5	8	0.20	21	0.62	31
SEP 29...	4.0	0.040	0.04	180	21	<5	3	0.20	422	31	99

ARKANSAS RIVER BASIN

07231000 LITTLE RIVER NEAR SASAKWA, OK

LOCATION.--Lat 34°59'02", long 96°33'01", NE 1/4 sec.22, T.6 N., R.7 E., Seminole County, Hydrologic Unit 11090203, near left abutment on downstream side of county road bridge, 2.8 mi northwest of Sasakwa, 8.7 mi downstream from Salt Creek, and at mile 24.1.

DRAINAGE AREA.--865 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1942 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 744.34 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 11, 1946, nonrecording gage at same site and datum. Prior to Oct. 1, 1979, gage at same site and datum, 4.87 ft higher.

REMARKS.--Records good. Flow regulated by Lake Thunderbird (station 07229900) 72.3 mi upstream since March 1965.

AVERAGE DISCHARGE.--Prior to regulation by Lake Thunderbird, 22 years (water years 1943-64), 410 ft³/s, 296,800 acre-ft/yr; since regulation by Lake Thunderbird, 22 years (water years 1966-87), 303 ft³/s, 219,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,600 ft³/s, May 11, 1950, gage height, 33.48 ft; no flow at times most years after 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,720 ft³/s, May 29, gage height, 23.56 ft; minimum daily discharge, 7.9 ft³/s, Aug. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2680	954	865	369	757	5870	303	93	3330	229	42	e18
2	2470	665	923	367	1240	4970	278	89	2290	647	38	e17
3	2440	660	1010	345	795	2680	249	86	1580	1780	34	e16
4	1440	2290	986	164	688	1790	231	84	1280	878	32	e17
5	850	2880	976	113	722	1630	219	79	1070	658	29	e16
6	527	2020	747	103	1150	1520	215	75	976	537	26	e16
7	339	1160	286	99	1470	1390	211	74	995	e480	27	e52
8	459	1160	1190	97	996	1300	206	75	936	e430	28	e34
9	690	1090	1440	1460	1110	1240	199	68	892	383	25	e22
10	741	971	960	1420	1120	1160	198	65	903	370	24	e32
11	716	1010	1070	576	1100	899	183	62	929	351	23	e28
12	1360	980	1070	378	909	579	174	60	940	203	19	e32
13	1050	868	699	356	336	379	166	61	830	187	17	e38
14	817	614	297	614	271	335	159	59	776	164	16	e24
15	736	218	227	771	1770	311	155	56	738	115	17	e54
16	765	166	223	821	3580	294	150	51	715	83	20	e32
17	873	151	207	966	2990	2550	146	62	692	94	33	e22
18	935	138	197	1780	1460	3050	143	52	795	1500	33	240
19	923	124	180	1160	1070	2480	143	53	710	1240	22	309
20	915	114	163	1230	1160	1600	132	57	1560	568	23	169
21	905	106	148	1120	1050	1430	169	48	1150	353	16	91
22	1730	97	139	1300	985	2100	508	126	438	e275	12	69
23	2220	94	132	1100	928	2240	279	152	533	199	9.9	61
24	959	89	130	1040	818	1590	452	244	717	154	7.9	38
25	897	508	126	665	583	984	498	931	730	125	19	30
26	883	2670	122	458	671	1160	388	593	e250	104	18	24
27	863	2030	117	376	1930	1210	369	370	e135	84	e40	20
28	948	841	111	416	5500	893	205	6460	e108	73	e28	29
29	1030	698	111	426	---	466	114	7100	93	64	e20	90
30	1070	921	143	368	---	361	99	6190	100	55	e18	49
31	1070	---	361	299	---	325	---	4020	---	49	e18	---
TOTAL	34301	26287	15356	20757	37159	48786	6941	27595	27191	12432	734.8	1689
MEAN	1106	876	495	670	1327	1574	231	890	906	401	23.7	56.3
MAX	2680	2880	1440	1780	5500	5870	508	7100	3330	1780	42	309
MIN	339	89	111	97	271	294	99	48	93	49	7.9	16
AC-FT	68040	52140	30460	41170	73700	96770	13770	54730	53930	24660	1460	3350

CAL YR 1986 TOTAL 166374.2 MEAN 456 MAX 5580 MIN 1.2 AC-FT 330000
WTR YR 1987 TOTAL 259228.8 MEAN 710 MAX 7100 MIN 7.9 AC-FT 514200

e Estimated

ARKANSAS RIVER BASIN

07231000 LITTLE RIVER NEAR SASAKWA, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1955 to April 1982.

WATER TEMPERATURE: October 1955 to April 1982.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT												
16...	1230	1028	80020	9.07	734	426	7.60	22.0	17.0	750	9.1	96
NOV												
21...	1230	1028	80020	6.27	107	1420	7.80	16.0	11.0	750	11.2	104
DEC												
16...	1300	1028	80020	6.94	218	1290	7.80	13.0	8.0	750	11.7	101
JAN												
27...	1500	1028	80020	7.78	373	1170	7.70	19.0	4.5	750	14.2	112
FEB												
27...	1400	1028	80020	12.22	1940	716	7.60	12.0	10.5	740	10.4	96
MAR												
16...	1400	1028	80020	7.14	291	1490	7.80	16.5	14.5	740	10.0	102
APR												
16...	1300	1028	80020	6.32	151	1740	7.90	22.0	17.5	740	9.6	104
MAY												
18...	1500	1028	80020	5.64	51	2570	7.90	28.0	30.0	740	8.0	110
JUN												
29...	1630	1028	80020	5.99	90	1330	7.90	31.0	29.0	740	7.4	100
JUL												
30...	1200	1028	80020	5.67	53	1330	7.70	35.0	31.0	740	7.2	100
AUG												
14...	1300	1028	80020	5.23	15	1840	7.80	33.0	32.0	740	8.4	119

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH IT FIELD (MG/L AS HC03)	CAR-BONATE WATER WH IT FIELD (MG/L AS C03)	ALKA-LINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS S04)
OCT												
16...	160	160	35	18	22	--	0.8	--	188	0	154	--
NOV												
21...	360	360	79	39	150	--	4	--	325	0	266	--
DEC												
16...	330	100	74	36	140	47	3	3.4	300	0	246	27
JAN												
27...	300	300	68	32	120	--	3	--	246	0	202	--
FEB												
27...	200	47	45	21	66	42	2	2.7	184	0	151	21
MAR												
16...	390	390	88	41	160	--	4	--	334	0	274	--
APR												
16...	430	140	93	48	190	49	4	2.7	382	0	313	36
MAY												
18...	390	390	74	50	290	--	7	--	318	0	261	--
JUN												
29...	340	100	74	37	140	47	3	3.8	305	0	250	24
JUL												
30...	--	--	--	--	--	--	--	--	295	0	242	--
AUG												
14...	380	130	70	50	220	55	5	3.8	312	0	256	49

ARKANSAS RIVER BASIN

07231000 LITTLE RIVER NEAR SASAKWA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CHLORIDE, DIS- SOLVED (MG/L AS CL)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHROMIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)
OCT 16...	--	5.2	--	--	--	--	1	240	<0.5	1	<10	<3
NOV 21...	--	11	--	--	--	--	<1	--	<0.5	2	<10	<3
DEC 16...	260	9.8	755	692	1.03	444	<1	360	<0.5	<1	<10	<3
JAN 27...	--	8.4	--	--	--	--	<1	270	<0.5	<1	<10	<3
FEB 27...	130	8.3	414	387	0.56	2170	<1	190	<0.5	<1	10	<3
MAR 16...	--	10	--	--	--	--	--	360	3	<1	<10	<3
APR 16...	370	11	953	930	1.30	389	<1	400	<0.5	<1	<10	<3
MAY 18...	--	9.6	--	--	--	--	2	390	<1	<3	<10	<9
JUN 29...	290	9.0	743	720	1.01	182	<1	340	<0.5	1	<10	<3
JUL 30...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	410	10	1000	966	1.36	40.5	1	370	<0.5	<1	<5	<3

DATE	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGANESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYBDENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SILVER, DIS- SOLVED (UG/L AS AG)	STRONTIUM, DIS- SOLVED (UG/L AS SR)	VANADIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 16...	<10	17	10	7	1	<0.1	<10	--	--	260	<6	13
NOV 21...	<10	16	<10	15	41	<0.1	<10	--	--	760	<6	20
DEC 16...	<10	3	<10	14	21	--	<10	--	--	740	<6	<3
JAN 27...	<10	38	<10	10	16	<0.1	<10	--	--	670	<6	7
FEB 27...	<10	160	<10	8	9	<0.1	<10	--	--	390	<6	11
MAR 16...	<10	10	30	32	35	0.2	<10	--	--	890	<6	6
APR 16...	<10	55	10	24	43	0.3	<10	--	--	1100	<6	<3
MAY 18...	<30	<9	<30	<12	34	0.1	<30	--	--	1200	<18	<9
JUN 29...	10	38	<10	9	11	<0.1	<10	--	--	820	<6	28
JUL 30...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 14...	<10	8	<10	15	98	0.3	<10	<10	<1.0	960	<6	10

07231500 CANADIAN RIVER AT CALVIN, OK

LOCATION.--Lat 34°58'32", long 96°14'24", in NE 1/4 SW 1/4 sec.22, T.6 N., R.10 E., Hughes County, Hydrologic Unit 11090202, near left bank on downstream side of pier of bridge on old U.S. Highway 75, 0.5 mi northeast of Calvin, 2.4 mi upstream from Shawnee Creek, 8.5 mi downstream from Little River, and at mile 93.9.

DRAINAGE AREA.--27,952 mi², of which 4,801 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1905 to December 1908 (gauge heights and discharge measurements only, except for period July 1905 to December 1906), October 1938 to September 1942, July 1944 to current year. Monthly discharge only for some periods, published in WSP 1311. Gauge-height records collected in this vicinity since 1904 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area. WSP 1391: 1941.

GAGE.--Water-stage recorder and nonrecording gage. Datum of gage is 682.72 ft above National Geodetic Vertical Datum of 1929. January 1905 to December 1908, nonrecording gage at site 0.8 mi upstream at datum 4.00 ft higher. Oct. 1, 1938 to Aug. 12, 1944, nonrecording gage at present site and datum. Aug. 13, 1944 to July 31, 1977, water-stage recorder at present site and datum 2.00 ft higher.

REMARKS.--Records fair. Occasional slight regulation by dams in New Mexico and Texas since 1964; Lake Thunderbird (station 07229900) since March 1965. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--48 years (water years 1906, 1939-42, 1945-87), 1,641 ft³/s, 1,189,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 174,000 ft³/s May 11, 1950, gage height, 17.35 ft, maximum gage height, 21.00 ft, Aug. 7, 1906, from floodmark, site and datum then in use; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 25,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 6	1330	51,900	9.90	Feb. 16	0830	34,200	8.44
Oct. 23	1030	30,600	8.11	Feb. 28	1730	66,700	10.92
Nov. 5	1030	30,400	8.09	Mar. 17	2400	41,500	9.08
Nov. 26	1700	26,400	7.73	May 29	0500	*154,000	*15.88

Minimum daily discharge 155 ft³/s, Sept. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36500	2950	2350	1660	5940	40400	2570	687	14000	3180	405	197
2	30800	2000	2270	1860	6760	22500	2450	610	9520	4260	396	215
3	36000	1650	2230	1750	5200	12100	2190	684	6600	19700	396	203
4	42200	12300	2230	1220	2480	7460	1740	1920	6810	10900	382	185
5	31400	25600	2270	949	2000	6190	1560	713	10000	5800	295	170
6	43000	24000	2230	1060	3800	6060	1320	474	5030	3610	287	161
7	8860	15500	4890	1360	12900	5880	1280	e380	3440	2350	278	155
8	2960	10200	8800	1720	5730	5480	1370	e360	2580	1730	262	158
9	2290	7490	7140	13100	3930	5200	1360	e350	2060	1410	246	194
10	2160	5520	4880	15300	2570	4800	1360	e330	2010	1180	243	255
11	2130	4400	4340	5720	2570	4200	1430	e320	1850	1030	257	226
12	4740	4890	3930	e2500	2210	3420	1670	e310	2230	883	256	208
13	4670	3580	2190	e2000	2030	2640	1740	e400	3110	1370	229	288
14	2900	2440	979	1880	1320	2240	1820	e380	2210	1150	221	258
15	2330	1410	685	2070	8890	2110	1840	e330	1680	3940	220	461
16	2210	1230	782	2600	28400	2090	1780	e300	1360	1510	e225	444
17	2020	1150	1140	4160	14600	17600	1550	e290	1050	896	565	324
18	1990	1180	1230	12800	5840	24900	1660	e400	1340	6860	484	319
19	1820	1370	1360	7350	4050	12500	2720	e380	2430	6780	322	1500
20	1790	1420	1510	4000	4600	9290	1790	e385	2830	3450	291	799
21	1610	1360	1380	3000	3370	8090	1450	390	12800	1800	250	446
22	3350	1270	1090	3000	e2790	9430	3890	1470	6100	1210	220	334
23	28000	1020	878	3620	e2470	11700	3600	2710	3210	1080	201	300
24	20900	925	819	4000	3160	8680	2230	2280	2450	844	189	270
25	8340	2660	819	4000	2970	6640	2190	9260	2350	851	175	261
26	3890	17900	819	2850	3590	7280	2230	7640	1660	729	179	258
27	3590	14700	770	2070	9630	8010	1870	5690	1040	627	340	290
28	3340	5350	839	1930	39800	6360	1700	84900	1090	546	289	334
29	3290	2410	875	5870	---	5720	1250	140000	735	496	277	457
30	3300	2450	898	11500	---	4170	851	56800	901	452	244	445
31	3180	---	1350	8520	---	2990	---	24000	---	419	215	---
TOTAL	345560	180325	67973	135419	193600	276130	56461	345143	114476	91043	8839	10115
MEAN	11150	6011	2193	4368	6914	8907	1882	11130	3816	2937	285	337
MAX	43000	25600	8800	15300	39800	40400	3890	140000	14000	19700	565	1500
MIN	1610	925	685	949	1320	2090	851	290	735	419	175	155
AC-FT	685400	357700	134800	268600	384000	547700	112000	684600	227100	180600	17530	20060

CAL YR 1986 TOTAL 1119590 MEAN 3067 MAX 43000 MIN 80 AC-FT 2221000
WTR YR 1987 TOTAL 1825080 MEAN 5000 MAX 140000 MIN 155 AC-FT 3620000

e Estimated

ARKANSAS RIVER BASIN

07231500 CANADIAN RIVER AT CALVIN, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1950-53, 1960-61, 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1965 to January 1982.

WATER TEMPERATURE: July 1965 to January 1982.

REMARKS.--Samples were collected on a 6-week schedule. Specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)
OCT											
17...	1200	1028	1028	--	4.85	2040	1150	8.30	18.0	17.0	--
NOV											
19...	1300	1028	80020	--	4.80	1290	1500	7.90	8.0	8.5	220
JAN											
14...	1430	1028	80020	--	4.98	1950	1120	7.90	11.0	9.0	140
FEB											
25...	1300	1028	80020	--	5.20	2780	1080	7.90	8.5	9.5	130
APR											
08...	1400	1028	80020	--	4.84	1330	1500	8.00	21.0	18.0	97
MAY											
21...	1400	1028	80020	--	4.40	392	--	8.10	26.5	28.0	--
JUN											
30...	1633	1028	80020	--	2.66	1200	1330	7.90	28.5	27.0	120
JUL											
28...	0930	1028	80020	--	2.12	578	1230	7.80	27.5	30.0	--
28...	0931	1028	1028	50.0	--	--	1230	7.80	--	--	--
28...	0932	1028	1028	113	--	--	1240	7.80	--	--	--
28...	0933	1028	1028	165	--	--	1240	7.80	--	--	--
AUG											
12...	1100	1028	80020	--	1.36	248	1140	7.80	34.0	32.0	12
DATE		BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCEI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
OCT											
17...	750	--	--	--	--	--	--	--	--	--	--
NOV											
19...	740	11.4	101	300	K800	520	240	130	48	130	35
JAN											
14...	740	11.7	105	280	620	360	130	89	34	87	34
FEB											
25...	750	10.3	92	K850	450	370	140	90	35	87	34
APR											
08...	750	9.5	102	K38	K26	540	240	130	51	140	36
MAY											
21...	740	--	--	--	--	570	350	120	64	170	39
JUN											
30...	740	7.8	101	250	220	460	280	110	44	110	34
JUL											
28...	750	7.5	101	--	--	410	240	96	41	110	37
28...	--	7.5	--	--	--	--	--	--	--	--	--
28...	--	7.4	--	--	--	--	--	--	--	--	--
28...	--	7.5	--	--	--	--	--	--	--	--	--
AUG											
12...	740	9.4	133	K8	990	340	160	58	46	120	43

ARKANSAS RIVER BASIN

07231500 CANADIAN RIVER AT CALVIN, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT 17...	--	--	--	--	--	--	--	--	--	--	--
NOV 19...	3	5.4	366	0	300	280	190	0.60	14	1010	973
JAN 14...	2	4.4	293	0	240	160	130	0.40	10	686	659
FEB 25...	2	3.7	284	0	233	100	130	0.40	10	666	598
APR 08...	3	4.2	400	0	329	230	210	0.60	13	975	958
MAY 21...	3	5.2	270	0	224	360	270	--	12	1170	1130
JUN 30...	2	5.3	230	0	190	310	170	0.50	11	884	869
JUL 28...	2	5.0	210	0	173	250	160	--	11	820	775
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
AUG 12...	3	5.2	210	0	172	200	170	0.50	11	758	716

DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)
OCT 17...	--	--	--	--	--	--	--	--	--	--
NOV 19...	1.37	3520	0.730	0.030	0.10	0.760	0.240	0.310	0.40	0.46
JAN 14...	0.93	3610	0.600	0.010	0.03	0.610	0.240	0.350	0.45	0.56
FEB 25...	0.91	5000	0.540	0.020	0.07	0.560	0.180	0.160	0.21	2.3
APR 08...	1.33	3500	0.570	0.010	0.03	0.580	0.040	0.040	0.05	1.3
MAY 21...	1.59	1240	--	<0.010	--	<0.100	--	0.030	0.04	--
JUN 30...	1.20	2860	--	<0.010	--	<0.100	0.060	0.050	0.06	1.7
JUL 28...	1.12	1280	--	<0.010	--	<0.100	--	<0.010	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
AUG 12...	1.03	508	--	<0.010	--	<0.100	<0.010	0.020	0.03	--

ARKANSAS RIVER BASIN

07231500 CANADIAN RIVER AT CALVIN, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
OCT 17...	--	--	--	--	--	--	--	--	--	--
NOV 19...	0.70	0.140	0.170	0.160	0.49	0.14	0.01	20	4	430
JAN 14...	0.80	0.090	0.110	0.080	0.25	0.09	0.03	--	--	--
FEB 25...	2.5	0.340	0.090	--	--	0.34	0.09	20	2	250
APR 08...	1.3	0.510	0.110	0.080	0.25	0.51	0.03	10	3	320
MAY 21...	--	--	--	0.060	0.18	--	--	--	5	330
JUN 30...	1.8	0.330	0.030	0.030	0.09	0.33	0.0	--	4	390
JUL 28...	--	--	--	0.030	0.09	--	--	--	4	360
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
AUG 12...	1.6	0.650	0.010	0.020	0.06	0.65	0.0	<10	4	280

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT 17...	--	--	--	--	--	--	--	--	--	--
NOV 19...	0.5	<1	<1	<3	5	4	<5	35	14	<0.1
JAN 14...	--	--	--	--	--	--	--	--	--	--
FEB 25...	<0.5	<1	<1	<3	2	27	<5	21	9	<0.1
APR 08...	<0.5	<1	2	<3	<1	10	<5	35	13	<0.1
MAY 21...	0.6	<1	<10	<3	<10	5	<10	41	5	0.1
JUN 30...	<0.5	1	<10	<3	10	7	<10	32	<1	<0.1
JUL 28...	<0.5	<1	<10	<3	<10	4	<10	29	2	<0.1
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
AUG 12...	<0.5	<1	2	<3	1	6	<5	16	2	0.2

ARKANSAS RIVER BASIN

07231500 CANADIAN RIVER AT CALVIN, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 17...	--	--	--	--	--	--	--	--	--	--
NOV 19...	<10	1	1	<1.0	1400	7	5	782	2720	71
JAN 14...	--	--	--	--	--	--	--	1980	10400	36
FEB 25...	<10	2	<1	<1.0	890	<6	6	2020	15200	20
APR 08...	<10	<1	<1	<1.0	1400	8	9	1850	6640	15
MAY 21...	<10	--	--	--	1600	14	4	--	--	--
JUN 30...	<10	--	--	--	1300	12	15	361	1170	93
JUL 28...	<10	--	--	--	1100	12	4	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
AUG 12...	<10	1	<1	<1.0	950	11	6	60	40	64

ARKANSAS RIVER BASIN

07232500 BEAVER RIVER NEAR GUYMON, OK
(Headwater of the North Canadian River)

LOCATION (REVISED).--Lat 36°43'17", long 101°29'21", SW 1/4 SW 1/4 sec.18, T.3 N., R.15 E., Texas County, Hydrologic Unit 11100101, near center of span on downstream side of pier of bridge on U.S. Highway 64 at Dry Sand Draw, 1.2 mi upstream from Goff Creek, 2.5 mi north of Guymon, and at mile 650.7.

DRAINAGE AREA.--2,139 mi², which includes that of Dry Sand Draw, and of which 964 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1970, published as North Canadian River near Guymon.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,970.69 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Natural flow affected by irrigation development. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--50 years, 21.0 ft³/s, 15,210 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 55,400 ft³/s, June 15, 1964, gage height, 13.68 ft; maximum gage height, 13.82 ft, Sept 23, 1941, from floodmark; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,400 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
May 27	0600	*29	*4.82	No peak greater than base discharge.			
No flow most days.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	11	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	9.7	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	5.7	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	2.9	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.88	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.95	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	5.5	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	1.1	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	57.03	0.00	0.00	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.00	.00	1.84	.00	.00	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	.0	113	.0	.0	.0	.0

CAL YR 1986 TOTAL 101.24 MEAN .28 MAX 2.5 MIN .00 AC-FT 201
WTR YR 1987 TOTAL 57.03 MEAN .16 MAX 18 MIN .00 AC-FT 113

ARKANSAS RIVER BASIN

07232900 COLDWATER CREEK NR GUYMON, OK

LOCATION.--Lat 36°34'19", long 101°22'52", NW 1/4 NW 1/4 sec.7, T.1 N., R.16 E., Texas County, Hydrologic Unit 11100103, near left bank on downstream side of pier of bridge on county road, 0.3 mi downstream from Frisco Creek, 4.0 mi east and 7.5 mi south of Guymon, and at mile 18.0.

DRAINAGE AREA.--1,903 mi², of which 1,178 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage 2,870.83 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Natural flow affected by irrigation development.

AVERAGE DISCHARGE.--7 years, 1.84 ft³/s, 1,330 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,800 ft³/s, June 20, 1982, gage height, 14.34 ft; no flow each year.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
May 5	1800	*141	*10.26	No peak greater than base discharge.			
No flow most days.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	59	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	61	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	2.5	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	122.50	0.00	0.24	0.00	0.00
MEAN	.00	.00	.00	.00	.00	.00	.00	3.95	.00	.008	.00	.00
MAX	.00	.00	.00	.00	.00	.00	.00	61	.00	.22	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.0	.0	.0	.0	.0	.0	.0	243	.0	.5	.0	.0

CAL YR 1986 TOTAL 0.00 MEAN .00 MAX .00 MIN .00 AC-FT .0
WTR YR 1987 TOTAL 122.74 MEAN .34 MAX 61 MIN .00 AC-FT 243

ARKANSAS RIVER BASIN

07233200 OPTIMA LAKE NEAR HARDESTY, OK

LOCATION.--Lat 36°39'23", long 101°08'13", in NE 1/4 NE 1/4 sec.8, T.2 N., R.18 E., Texas County, Hydrologic Unit 11100102, in control tower for dam on Beaver River, 4.5 mi northeast of Hardesty, and at mile 623.2.

DRAINAGE AREA.--5,029 mi², of which 2,688 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers).

REMARKS.--Reservoir is formed by earth dam having a concrete gate tower with a 12- by 16-foot, 5-inch oblong conduit. Discharges are controlled by two drum-hoist operated tractor-type service gates and a 36-inch low-flow control pipe. Closure for storage was made Oct. 2, 1978. Capacity, 618,500 acre-ft at elevation 2,814.2 ft, maximum pool; 382,500 acre-ft at elevation 2,796.0 ft, uncontrolled spillway crest; 229,500 acre-ft at elevation 2,779.0 ft, top of flood-control pool; 129,000 acre-ft at elevation 2,763.5 ft, top of conservation pool. Figures given herein represent total contents. Reservoir is used for flood control, sediment control, and water supply. Capacity table based on original survey.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 7,610 acre-ft, May 30 to June 2, 1980, elevation, 2,722.90 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,590 acre-ft, Apr. 13-21 and May 4-7, elevation, 2,715.35 ft; minimum, 1,864 acre-ft, Sept. 29, 30, elevation, 2,713.35 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

2,712	526	2,715	1,430
2,713	760	2,716	1,890
2,714	1,060	2,717	2,450

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1390	1300	1430	1430	1410	1430	1540	1520	1470	1340	1010	924
2	1390	1300	1430	1430	1410	1430	1540	1520	1470	1320	1010	924
3	1390	1300	1430	1430	1410	1470	1540	1540	1450	1320	999	910
4	1390	1340	1430	1430	1410	1470	1540	1590	1450	1300	999	894
5	1370	1500	1430	1430	1410	1470	1540	1590	1430	1300	985	894
6	1370	1520	1430	1430	1410	1470	1540	1590	1410	1280	969	894
7	1370	1520	1430	1430	1410	1470	1570	1590	1390	1280	954	894
8	1370	1520	1430	1430	1410	1470	1570	1570	1390	1260	954	879
9	1350	1520	1430	1430	1410	1470	1570	1570	1390	1260	954	879
10	1350	1520	1430	1430	1410	1470	1570	1570	1370	1240	954	879
11	1350	1520	1430	1430	1410	1470	1570	1570	1370	1260	939	894
12	1350	1520	1430	1430	1410	1470	1570	1540	1370	1260	985	910
13	1350	1520	1430	1430	1410	1470	1590	1540	1350	1260	999	910
14	1350	1520	1430	1430	1410	1470	1590	1540	1340	1280	999	910
15	1340	1500	1430	1430	1410	1470	1590	1540	1320	1280	985	910
16	1340	1510	1430	1430	1410	1470	1590	1540	1320	1280	969	894
17	1340	1500	1430	1430	1410	1520	1590	1540	1300	1260	954	894
18	1340	1470	1430	1430	1410	1520	1590	1520	1320	1240	954	924
19	1340	1450	1430	1430	1410	1520	1590	1520	1320	1230	954	924
20	1340	1450	1430	1430	1410	1520	1590	1520	1320	1190	939	924
21	1340	1450	1430	1430	1410	1520	1590	1520	1320	1170	939	924
22	1340	1450	1430	1430	1410	1520	1570	1520	1300	1150	924	924
23	1340	1450	1430	1430	1410	1520	1570	1520	1340	1130	939	910
24	1340	1450	1430	1430	1410	1520	1570	1520	1390	1130	939	910
25	1340	1450	1430	1430	1410	1520	1570	1520	1390	1110	939	894
26	1320	1450	1430	1430	1430	1520	1570	1540	1390	1100	939	894
27	1320	1450	1430	1430	1430	1540	1540	1540	1370	1080	939	879
28	1320	1430	1430	1430	1430	1540	1540	1540	1350	1060	924	879
29	1320	1430	1430	1410	---	1540	1540	1520	1350	1040	924	864
30	1320	1430	1430	1410	---	1540	1520	1520	1350	1030	924	864
31	1320	---	1430	1410	---	1540	---	1500	---	1030	924	---
MAX	1390	1520	1430	1430	1430	1540	1590	1590	1470	1340	1010	924
MIN	1320	1300	1430	1410	1410	1430	1520	1500	1300	1030	924	864
(+)	2,714.70	2,715.00	2,715.00	2,714.95	2,715.00	2,715.25	2,715.20	2,715.15	2,714.80	2,713.90	2,713.55	2,713.35
(++)	-70	+110	0	-20	+20	+110	-20	-20	-150	-320	-116	-60
CAL YR 1986	MAX 2850	MIN 1300	(++)	-1,410								
WTR YR 1987	MAX 1590	MIN 864	(++)	-526								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

ARKANSAS RIVER BASIN

07234000 BEAVER RIVER AT BEAVER, OK
(Headwater of the North Canadian River)

LOCATION (REVISED).--Lat 36°49'20", long 100°31'08", SW 1/4 sec.7, T.4 N., R.24 E., Beaver County, Hydrologic Unit 11100201, near right bank on downstream side of pier of bridge on U.S. Highway 270 at Beaver, 1.1 mi downstream from Home Creek, 5.0 mi upstream from Clear Creek, and at mile 576.0.

DRAINAGE AREA.--7,955 mi², of which 4,270 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1904 to December 1905 (gage heights only), October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Published as Beaver Creek at Beaver 1904-5, and October 1937 to September 1970 as North Canadian River at Beaver.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,368.16 ft, National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Mar. 29, 1904 to Dec. 31, 1905, nonrecording gage at same vicinity at different datum. Mar. 1, 1938 to Sept. 30, 1946, water-stage recorder at present site at datum 3.0 ft higher.

REMARKS.--Records fair except for periods of ice effect, which are poor. Natural flow affected by irrigation development upstream from station. Flow regulated by Optima Dam (station 07233200) 47.0 mi upstream, since Oct. 1978. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Optima Dam, 41 years (water years 1938-78), 103 ft³/s, 74,620 acre-ft/yr; since regulation by Optima Dam, 9 years (water years 1979-87), 18.9 ft³/s, 13,690 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 70,000 ft³/s, Oct. 8, 1946, maximum gage height, 14.55 ft by slope-area measurement of peak flow in overflow section and extension of rating curve for main channel above 42,000 ft³/s; no flow at times most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 961 ft³/s, June 19, gage height, 6.99 ft; minimum daily discharge, 0.04 ft³/s, Sept. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.41	.15	3.0	e3.6	6.6	11	33	7.6	70	85	.33	.08
2	.49	.15	e2.9	e3.6	6.3	8.0	30	7.2	62	66	.28	.07
3	10	.18	e2.8	e4.1	6.0	7.4	30	6.5	91	103	.23	.05
4	4.7	.28	e2.9	e4.4	5.8	6.9	27	14	60	133	.23	.04
5	1.3	.74	3.7	5.2	5.5	7.1	26	39	46	69	.21	.09
6	.58	1.1	4.6	5.0	5.4	7.3	25	44	36	53	.17	.08
7	.86	1.1	6.1	4.5	5.6	7.3	24	264	32	43	.14	.07
8	1.5	.74	7.0	5.1	5.5	7.1	23	423	28	37	.14	.08
9	.65	.62	7.8	5.9	5.5	7.9	22	208	23	32	.24	.06
10	.42	1.2	e4.5	e3.9	6.1	7.4	20	128	20	28	.17	.05
11	.35	e1.2	e3.1	e2.9	6.0	7.9	20	86	20	24	.14	.07
12	.20	e1.3	e2.7	e4.3	6.2	7.8	19	64	32	21	2.7	38
13	.15	e.70	e4.7	5.8	7.7	8.7	21	54	111	20	12	241
14	.13	e.52	e5.2	5.5	7.9	12	27	45	92	19	7.2	147
15	.16	e1.6	5.3	e3.6	10	11	24	37	52	19	2.4	82
16	.16	3.6	5.1	e.98	9.7	16	22	32	38	16	.67	77
17	.16	3.1	5.2	e.91	8.5	36	20	27	26	82	.24	58
18	.15	2.5	5.1	e.89	8.0	36	18	23	20	54	.17	60
19	.15	2.5	4.8	e.94	7.6	27	16	20	342	37	.16	58
20	.15	2.8	4.8	e1.1	7.6	21	14	20	247	27	.13	43
21	.18	2.7	4.9	e.99	7.9	17	13	18	98	20	.10	53
22	.17	3.2	4.6	e1.7	7.0	18	13	18	61	16	.09	108
23	.15	2.6	4.9	e2.6	7.3	41	13	17	77	13	.15	82
24	.15	e1.7	5.2	e2.1	7.9	46	12	15	73	11	.15	209
25	.15	e1.6	4.9	e5.6	8.0	43	11	16	119	8.5	.16	185
26	.15	e2.3	4.4	e7.4	9.1	50	10	21	532	6.3	.16	107
27	.15	e1.7	4.6	8.5	13	48	9.3	37	232	4.5	.15	78
28	.15	e1.8	4.9	6.6	14	39	9.2	608	137	2.9	.12	78
29	.15	3.2	4.5	6.4	---	e29	8.7	256	130	1.6	.11	101
30	.15	3.3	e3.9	6.1	---	e31	7.9	142	148	.70	.10	70
31	.15	---	e3.8	6.5	---	37	---	98	---	.42	.09	---
TOTAL	24.37	50.18	141.9	126.71	211.7	659.8	568.1	2795.3	3055	1052.92	29.33	1875.74
MEAN	.79	1.67	4.58	4.09	7.56	21.3	18.9	90.2	102	34.0	.95	62.5
MAX	10	3.6	7.8	8.5	14	50	33	608	532	133	12	241
MIN	.13	.15	2.7	.89	5.4	6.9	7.9	6.5	20	.42	.09	.04
AC-FT	48	100	281	251	420	1310	1130	5540	6060	2090	58	3720

CAL YR 1986 TOTAL 1268.22 MEAN 3.47 MAX 36 MIN .00 AC-FT 2520
WTR YR 1987 TOTAL 10591.05 MEAN 29.0 MAX 608 MIN .04 AC-FT 21010

e Estimated

ARKANSAS RIVER BASIN

07234000 BEAVER RIVER AT BEAVER, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1958-59, 1962-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to January 1982.

WATER TEMPERATURE: October 1967 to January 1982.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
DEC 16...	1400	1028	80020	3.01	6.0	5850	8.30	10.5	6.0	51	700
FEB 12...	1500	1028	80020	2.98	6.3	6200	8.30	14.0	9.0	12	701
APR 08...	1600	1028	1028	2.96	24	5950	8.10	18.5	21.0	--	--
MAY 12...	1230	1028	80020	3.53	64	2420	8.10	24.0	24.5	250	698
JUL 29...	1400	1028	80020	2.42	1.7	6070	8.10	33.0	32.5	3.3	698
DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
DEC 16...	11.9	106	K32	K100	810	570	180	87	870	70	14
FEB 12...	10.9	105	K21	K41	840	620	180	93	920	70	14
APR 08...	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	7.1	94	K9300	K16000	400	200	100	35	320	63	7
JUL 29...	7.2	111	93	72	1100	840	240	110	900	65	12
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE IT-FLD (MG/L AS HCO3)	CAR- BONATE IT-FLD (MG/L AS CO3)	ALKA- LINITY, CARBON- ATE IT-FLD (MG/L AS CACO3)	CARBON DIOXIDE DIS- SOLVED (MG/L AS CO2)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)			
DEC 16...	8.3	266	15	242	2.1	500	1500	1.4			
FEB 12...	8.4	255	7.0	221	2.0	530	1600	1.5			
APR 08...	--	--	--	--	--	--	--	--			
MAY 12...	18	240	0	198	3.0	170	520	1.0			
JUL 29...	13	270	0	219	3.4	660	1600	1.2			

ARKANSAS RIVER BASIN

07234000 BEAVER RIVER AT BEAVER, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
DEC 16...	25	3320	3340	4.52	54.2	--	<0.010	--	0.200	0.110	0.090
FEB 12...	21	3640	3500	4.95	62.1	--	<0.010	--	<0.100	0.050	0.050
APR 08...	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	21	1320	1310	1.80	230	0.210	0.140	0.46	0.350	1.30	1.20
JUL 29...	26	3760	3690	5.11	17.3	--	<0.010	--	<0.100	0.030	0.020
DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)
DEC 16...	0.12	0.69	0.80	0.040	0.010	0.010	0.03	0.04	0.0	<10	2
FEB 12...	0.06	1.4	1.4	0.030	<0.010	<0.010	--	0.03	--	10	2
APR 08...	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	1.5	2.0	3.3	0.820	0.510	0.460	1.4	0.82	0.05	20	10
JUL 29...	0.03	1.1	1.1	0.070	0.020	0.020	0.06	0.07	0.0	10	6
DATE	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
DEC 16...	200	<10	<1	<1	<1	<1	20	<5	140	40	0.2
FEB 12...	100	40	<1	<1	<1	2	20	<5	150	60	<0.1
APR 08...	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	300	<10	<1	<1	<1	5	20	<5	60	10	0.2
JUL 29...	300	<10	<1	20	<1	3	20	<5	140	50	0.1
DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	
DEC 16...	8	1	<1	<1.0	3600	<150	10	1780	29	94	
FEB 12...	3	<1	<1	<1.0	3800	24	10	50	0.85	97	
APR 08...	--	--	--	--	--	--	--	--	--	--	
MAY 12...	3	3	<1	<1.0	1400	<40	10	--	--	--	
JUL 29...	5	3	<1	<1.0	4100	24	20	15	0.07	55	

ARKANSAS RIVER BASIN

07234100 CLEAR CREEK NEAR ELMWOOD, OK

LOCATION.--Lat 36°38'42", long 100°30'07", SW 1/4 SW 1/4 sec.8, T.2 N., R.24 E., Beaver County, Hydrologic Unit 11100201, on downstream side of concrete pier of county road bridge (revised), 2.8 mi northeast of Elmwood, and at mile 16.9.

DRAINAGE AREA.--170 mi².

PERIOD OF RECORD.--October 1965 to current year.

REVISED RECORDS.--WSP 2121: 1966.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2,541.26 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Low flows sustained by nearby springs; natural flows affected by diversion ponds and occasional diversion for irrigation.

AVERAGE DISCHARGE.--22 years, 6.07 ft³/s, 4,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft³/s, Oct. 16, 1969, gage height, 13.97 ft, from floodmark, from rating curve extended above 12,500 ft³/s, on basis of slope-area measurement at gage height, 13.15 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
June 19	0830	*20	*4.64	No peak greater than base discharge.			
Minimum daily discharge, 0.91 ft ³ /s, Aug. 2.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	2.3	2.0	2.0	2.0	1.7	2.6	1.9	1.8	1.7	.94	1.2
2	2.3	2.3	2.0	2.1	2.0	1.7	2.4	1.9	1.8	1.6	.91	1.2
3	2.2	2.4	2.0	2.1	2.0	1.7	2.4	1.8	1.8	1.7	.92	1.2
4	2.0	3.3	2.0	2.1	2.0	1.7	2.5	1.9	1.7	1.6	.98	1.1
5	1.9	2.5	2.0	2.1	2.0	1.7	2.5	3.1	1.6	1.5	1.1	1.1
6	1.8	2.3	2.0	2.1	1.9	1.8	2.4	2.0	1.6	1.4	1.0	1.2
7	1.8	2.4	2.2	2.1	1.9	1.8	2.5	1.8	1.6	1.4	.97	1.2
8	1.8	2.3	2.1	2.1	1.9	1.8	2.5	1.7	1.6	1.4	.96	1.2
9	1.8	2.2	2.0	2.1	1.9	1.8	2.6	1.7	1.6	1.3	1.3	1.2
10	1.9	2.3	1.9	2.0	1.9	1.8	2.6	1.6	1.8	1.3	1.2	1.2
11	2.0	2.2	2.0	2.0	1.9	1.8	2.7	1.6	1.6	1.3	1.1	1.2
12	1.9	2.2	2.0	2.1	2.0	1.8	2.7	1.6	1.7	1.3	1.2	1.3
13	1.9	2.2	2.0	2.1	2.1	1.8	2.9	1.6	1.6	1.4	1.4	1.3
14	1.9	2.2	2.0	2.1	2.0	1.8	3.1	1.6	1.5	1.4	1.3	1.3
15	1.8	2.3	2.0	2.1	2.8	1.9	2.7	1.6	1.5	1.5	1.2	1.3
16	1.8	2.3	2.0	2.2	2.2	2.0	2.7	1.5	1.4	1.4	1.1	1.3
17	1.7	2.2	2.0	2.2	2.0	2.9	2.6	1.4	1.3	1.4	1.1	1.3
18	1.7	2.1	2.0	2.2	2.0	2.5	2.5	1.4	1.2	1.4	1.1	2.2
19	1.7	2.2	2.1	2.2	2.0	2.2	2.4	1.5	6.9	1.3	1.1	1.6
20	1.8	2.2	2.0	2.2	1.9	2.1	2.3	1.7	2.1	1.3	1.1	1.5
21	2.1	2.2	2.0	2.2	1.8	2.0	2.3	1.6	2.0	1.2	1.1	1.4
22	2.2	2.1	2.0	2.2	1.8	2.2	2.3	1.6	2.0	1.2	1.1	1.4
23	2.1	2.0	2.0	2.2	1.8	3.5	2.3	1.6	1.7	1.2	1.1	1.5
24	2.1	2.0	2.0	2.2	1.8	3.3	2.2	1.6	1.8	1.1	1.2	1.4
25	2.0	2.0	2.0	2.2	1.8	2.9	2.3	1.7	1.7	1.1	1.3	1.3
26	2.1	2.0	2.0	2.2	1.9	2.8	2.2	2.1	1.6	1.1	1.4	1.2
27	2.1	2.0	2.1	2.2	2.0	2.9	2.1	2.2	1.6	1.1	1.4	1.3
28	2.1	2.0	2.1	2.1	1.8	2.8	2.0	2.0	1.5	1.1	1.2	2.4
29	2.0	2.0	2.0	2.0	---	2.4	1.9	1.9	1.6	.99	1.2	1.5
30	2.0	1.9	2.0	2.0	---	2.4	1.9	1.8	1.7	.97	1.2	1.4
31	2.2	---	2.0	2.0	---	2.5	---	1.9	---	.95	1.1	---
TOTAL	61.0	66.6	62.5	65.7	55.1	68.0	73.1	54.9	54.9	40.61	35.28	40.9
MEAN	1.97	2.22	2.02	2.12	1.97	2.19	2.44	1.77	1.83	1.31	1.14	1.36
MAX	2.3	3.3	2.2	2.2	2.8	3.5	3.1	3.1	6.9	1.7	1.4	2.4
MIN	1.7	1.9	1.9	2.0	1.8	1.7	1.9	1.4	1.2	.95	.91	1.1
AC-FT	121	132	124	130	109	135	145	109	109	81	70	81

CAL YR 1986 TOTAL 818.81 MEAN 2.24 MAX 124 MIN .77 AC-FT 1620
WTR YR 1987 TOTAL 678.59 MEAN 1.86 MAX 6.9 MIN .91 AC-FT 1350

ARKANSAS RIVER BASIN

07236500 FORT SUPPLY LAKE NEAR FORT SUPPLY, OK

LOCATION.--Lat 36°33'14", long 99°34'16", in NE 1/4 SE 1/4 sec.17, T.24 N., R.22 W., Woodward County, Hydrologic Unit 11100203, in control tower at left end of Fort Supply Dam on Wolf Creek, 1.5 mi south (revised) of Fort Supply and at mile 5.5.

DRAINAGE AREA.--1,735 mi², of which 241 mi² is probably noncontributing.

PERIOD OF RECORD.--June 1942 to current year. Prior to October 1970, published as Fort Supply Reservoir near Fort Supply.

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage at National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam. Outlet works consist of a 540-foot uncontrolled gravity-type concrete weir, one 36-inch diameter gated bypass, and one 18-foot oval-shaped conduit controlled by three vertical-lift sluice gates. Regulated storage began May 4, 1942; conservation pool first filled in June 1942. Capacity, 100,700 acre-ft at elevation 2,028.0 ft, crest of spillway, 13,890 acre-ft at elevation 2,004.0 ft, conservation pool designated in 1965. No storage below elevation 1,987.0 ft. Figures given herein represent total contents. Reservoir is used for flood control and conservation. Revised capacity table, based on survey in 1969, used since Oct. 1, 1972. U.S. Army Corps of Engineers' satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 99,500 acre-ft, June 25, 1957, elevation, 2,026.97 ft; no contents at times November 1942 to January 1943.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 18,930 acre-ft, June 1, elevation, 2,006.47 ft; minimum, 12,990 acre-ft, Apr. 20, elevation 2,003.50 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

2,003	12,080	2,006	17,890
2,004	13,890	2,007	20,100
2,005	15,830	2,008	22,490

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13870	13820	14410	14320	13930	13730	15690	14360	18820	14610	13850	13750
2	14160	13800	14570	14300	13850	13650	15460	14300	18550	14940	13850	13800
3	14220	13820	14590	14320	13800	13600	15170	14240	18310	15070	13760	13840
4	14280	14180	14510	14430	13710	13670	14860	14200	18020	15150	13840	13840
5	14340	14470	14450	14390	13670	13670	14530	14240	17750	15190	13870	13850
6	14390	14860	14410	14280	13710	13730	14220	14280	17480	14960	13890	13970
7	14390	14780	14320	14260	13710	13750	14010	14260	17130	14430	13870	14030
8	14260	14530	14300	14340	13710	13670	14050	14260	16880	14010	13820	14060
9	14200	14260	14200	14260	13780	13760	14010	14240	16740	13580	13990	14100
10	14200	13910	14160	14100	13710	13840	14080	14180	16610	13290	14030	14140
11	14100	13670	14060	13950	13710	13890	14100	14120	16410	13380	14060	14180
12	14120	13560	13990	13870	13710	13990	14060	14080	16200	13290	14080	14300
13	14180	13750	13950	13910	13730	14160	14010	14030	16040	13380	14120	14360
14	14120	13820	13850	13870	13780	13850	14340	13950	15830	13460	14240	14300
15	14060	13950	13800	13850	14080	13780	14320	13910	15620	13530	14200	14140
16	14010	14080	13800	13910	14280	14030	14080	13910	15440	13620	14120	13990
17	13930	14220	13780	13910	14450	15090	13800	13890	15130	13950	14160	13890
18	13890	14370	13820	13930	14510	16390	13550	13850	14960	14010	14120	14050
19	13820	14320	13870	13930	14430	16590	13290	13850	15000	14030	14140	14050
20	13840	14300	13910	13950	14360	15970	13080	13850	14800	14080	14180	14080
21	14120	14280	13970	13990	14260	15400	13270	13820	14840	14050	14100	14080
22	14140	14080	14050	14010	14180	14740	13470	13870	14880	13950	13990	14100
23	14240	14010	14080	14010	14100	15170	13650	14010	14760	13820	14010	14100
24	14260	13990	14140	14030	13970	16610	13850	14180	14610	13780	14160	14080
25	14220	13780	14200	14030	13850	17290	14050	14300	14510	13840	14300	14100
26	14180	13840	14260	14050	13850	17290	14220	14690	14390	13840	14510	14060
27	14140	13970	14320	14060	13820	17110	14300	15420	14240	13840	14450	14160
28	14060	14060	14360	14120	13750	16700	14370	16820	14060	13840	14200	15890
29	14050	14300	14370	14100	---	16530	14370	17790	14010	13840	14010	16260
30	14080	14280	14370	14050	---	16340	14340	18440	14030	13840	13800	16220
31	13850	---	14340	13990	---	16060	---	18800	---	13850	13670	---
MAX	14390	14860	14590	14430	14510	17290	15690	18800	18820	15190	14510	16260
MIN	13820	13560	13780	13850	13670	13600	13080	13820	14010	13290	13670	13750
(†)	2,003.98	2,004.20	2,004.23	2,004.05	2,003.92	2,005.11	2,004.23	2,006.41	2,004.07	2,003.98	2,003.88	2,005.19
(††)	+10	+430	+60	-350	-240	+2,310	-1,720	+4,460	-4,770	-180	-180	+2,550

CAL YR 1986 MAX 15350 MIN 13400 (††) +590
WTR YR 1987 MAX 18820 MIN 13080 (††) +2,380

(†) ELEVATION, IN FEET, AT END OF MONTH
(††) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07237000 WOLF CREEK NEAR FORT SUPPLY, OK

LOCATION.--Lat 36°34'00", long 99°33'05", SE 1/4 SE 1/4 sec.9, T.24 N., R.22 W., Woodward County, Hydrologic Unit 11100203, on left bank on downstream side of U.S. Highway 270 (revised), 1.0 mi southeast of Fort Supply, 1.6 mi downstream from Fort Supply Dam, and at mile 3.9.

DRAINAGE AREA.--1,739 mi², of which 241 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year. Prior to October 1, 1941, published as "Near Supply".

REVISED RECORDS.--WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,958.38 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). See WSP 1921 for history of changes prior to Sept. 30, 1962.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow completely regulated since May 1942 by Fort Supply Lake (station 07236500).

AVERAGE DISCHARGE.--Prior to regulation by Fort Supply Lake, 5 years (water years 1938-42), 104 ft³/s, 73,350 acre-ft/yr; since regulation by Fort Supply Lake, 45 years (water years 1943-87), 54.9 ft³/s, 39,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft³/s, June 24, 1939, gage height, 15.60 ft, present datum, from rating curve extended above 8,000 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 19.6 ft, present datum, was reached prior to October 1937, from information provided by Oklahoma State Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 481 ft³/s, Mar. 18, 19; minimum daily discharge, 1.8 ft³/s, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	57	2.1	61	99	128	284	88	122	61	2.8	3.8
2	3.6	57	2.0	61	100	128	285	87	233	63	2.4	2.8
3	4.2	57	51	62	101	101	281	84	239	62	7.5	2.3
4	3.8	62	97	62	100	68	276	88	243	62	3.0	2.1
5	3.6	59	98	62	79	66	273	89	241	63	2.3	2.1
6	3.6	58	98	63	64	66	273	88	243	189	2.6	2.1
7	32	92	99	64	63	66	200	86	242	316	2.5	2.1
8	68	215	98	64	63	65	111	85	199	267	2.3	2.0
9	68	223	98	93	63	65	109	84	152	277	3.1	2.0
10	67	223	98	129	63	66	110	83	150	202	2.6	2.0
11	67	220	98	129	63	65	110	83	147	15	3.0	11
12	67	128	98	102	63	66	110	82	148	13	2.6	21
13	67	6.4	97	65	64	91	109	80	147	13	2.5	21
14	67	6.3	96	64	64	123	108	80	147	13	2.2	41
15	66	6.3	82	64	66	124	229	65	146	13	2.0	70
16	66	6.3	65	64	64	99	273	57	144	10	1.9	71
17	65	6.3	64	64	64	69	272	56	143	11	2.0	57
18	63	3.8	45	63	85	295	274	56	143	9.1	2.1	28
19	62	51	27	63	130	477	276	56	145	9.7	4.6	27
20	31	100	26	62	130	463	166	56	140	10	2.5	26
21	5.6	99	26	62	131	454	31	56	142	38	2.0	26
22	5.6	99	26	62	131	451	8.9	55	142	62	1.9	26
23	5.6	98	25	62	131	183	6.7	55	140	63	1.9	26
24	30	98	25	62	134	44	5.7	55	139	35	2.5	26
25	56	98	25	62	130	190	5.6	54	137	11	2.3	26
26	56	53	25	62	130	304	5.6	54	136	11	2.4	26
27	56	3.5	25	62	130	303	21	30	136	14	86	26
28	56	2.5	25	63	128	299	62	6.5	139	12	162	68
29	56	2.2	38	85	---	292	72	4.7	117	11	122	199
30	57	2.0	63	99	---	287	90	4.0	63	11	122	205
31	57	---	62	99	---	285	---	4.2	---	4.0	84	---
TOTAL	1317.4	2192.6	1804.1	2241	2633	5783	4437.5	1911.4	4805	1950.8	645.5	1050.3
MEAN	42.5	73.1	58.2	72.3	94.0	187	148	61.7	160	62.9	20.8	35.0
MAX	68	223	99	129	134	477	285	89	243	316	162	205
MIN	1.8	2.0	2.0	61	63	44	5.6	4.0	63	4.0	1.9	2.0
AC-FT	2610	4350	3580	4450	5220	11470	8800	3790	9530	3870	1280	2080

CAL YR 1986 TOTAL 12719.1 MEAN 34.8 MAX 223 MIN 1.1 AC-FT 25230

WTR YR 1987 TOTAL 30771.6 MEAN 84.3 MAX 477 MIN 1.8 AC-FT 61040

07237500 NORTH CANADIAN RIVER AT WOODWARD, OK

LOCATION (REVISED).--Lat 36°26'12", long 99°16'41", SW 1/4 SW 1/4 sec.30, T.23 N., R.19 W., Woodward County, Hydrologic Unit 11100301, near right bank on downstream side of pier of bridge on State Highway 15, 200 ft downstream from The Atchison, Topeka and Santa Fe Railway Co. bridge, 6.0 mi east of Woodward, 7.2 mi upstream from Indian Creek, 27.5 mi downstream from Wolf Creek, and at mile 460.2.

DRAINAGE AREA.--11,589 mi², of which 4,812 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1903 to September 1905 (gage heights only), October 1905 to June 1906, October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311. Published as Canadian River (North Fork) near Woodward 1903-06. Gage-height records collected in this vicinity since 1919 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area. WSP 1731: 1951(M).

GAGE.--Water-stage recorder. Datum of gage is 1,829.95 ft above National Geodetic Vertical Datum of 1929.

Prior to July 1906, nonrecording gage at railway bridge 200 ft upstream at different datum. Oct. 1, 1938 to Oct. 26, 1943, nonrecording gage and Oct. 27, 1943 to July 12, 1951, water-stage recorder, at site 7.8 mi upstream at datum 37.01 ft higher than present datum.

REMARKS.--Records good. Some regulation since May 1942 by Fort Supply Lake (station 07236500) on Wolf Creek, 33.0 mi upstream. Flow regulated since October 1978 by Optima Lake (station 07233200), 163.0 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Optima Lake, 40 years (water years 1939-78), 194 ft³/s, 140,600

acre-ft/yr; since regulation by Optima Lake, 9 years (water years 1979-87), 112 ft³/s, 81,140 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,000 ft³/s Oct. 10, 1946, gage height, 9.80 ft, site and datum then in use; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 12, 1923, reached a stage of 11.0 ft, site and datum then in use; from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,040 ft³/s, May 27, gage height, 7.69 ft; minimum daily discharge, 27 ft³/s, Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	88	79	103	146	261	608	188	340	389	65	111
2	37	86	79	103	148	252	575	186	406	419	62	66
3	46	92	77	107	147	249	556	183	451	375	59	54
4	38	188	91	106	147	223	537	182	432	355	58	48
5	40	175	122	107	146	191	518	206	415	307	56	45
6	37	150	126	106	133	182	509	196	401	276	53	48
7	34	134	134	106	124	176	501	226	392	331	50	47
8	36	137	134	109	121	173	453	238	377	452	47	42
9	72	200	139	117	118	172	339	216	343	404	47	40
10	79	213	136	129	118	170	313	205	324	390	52	39
11	124	213	136	150	118	168	301	217	305	324	49	36
12	101	215	137	155	118	171	290	278	290	193	45	51
13	94	152	136	140	119	174	289	257	277	167	45	52
14	92	99	135	121	121	188	348	234	270	152	43	52
15	90	89	135	115	178	216	343	221	261	143	41	57
16	89	84	127	e104	196	235	403	203	251	135	39	77
17	89	78	118	e92	198	421	467	186	253	182	38	82
18	89	74	114	e83	180	410	460	177	266	150	36	108
19	88	71	106	e79	193	451	448	169	297	135	35	83
20	87	84	97	e93	217	656	436	168	300	124	33	96
21	103	117	94	e98	222	643	334	163	315	116	32	96
22	76	124	91	e108	224	638	227	220	380	126	30	85
23	64	126	91	120	222	867	194	202	454	144	31	81
24	62	126	90	119	225	822	178	202	472	141	35	80
25	65	128	90	119	226	688	168	223	412	121	37	79
26	86	129	89	122	232	579	160	248	365	99	39	81
27	88	110	89	126	265	660	152	800	337	91	60	81
28	87	87	88	125	270	628	153	496	315	87	74	101
29	88	81	88	125	---	611	172	550	316	81	141	212
30	88	79	91	133	---	597	179	410	417	75	129	439
31	89	---	103	144	---	638	---	334	---	71	129	---
TOTAL	2285	3729	3362	3564	4872	12510	10611	7984	10434	6555	1690	2569
MEAN	73.7	124	108	115	174	404	354	258	348	211	54.5	85.6
MAX	124	215	139	155	270	867	608	800	472	452	141	439
MIN	27	71	77	79	118	168	152	163	251	71	30	36
AC-FT	4530	7400	6670	7070	9660	24810	21050	15840	20700	13000	3350	5100

CAL YR 1986 TOTAL 29357.6 MEAN 80.4 MAX 227 MIN 7.1 AC-FT 58230
WTR YR 1987 TOTAL 70165 MEAN 192 MAX 867 MIN 27 AC-FT 139200

e Estimated

ARKANSAS RIVER BASIN

07237500 NORTH CANADIAN RIVER AT WOODWARD, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1955, 1958-59, 1961-63, 1975 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1974 to January 1982.

WATER TEMPERATURE: October 1974 to January 1982.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	BARO-METRIC PRES-SURE (MM OF HG)
NOV 17...	1630	1028	80020	3.35	75	2140	8.10	18.0	12.0	10	705
DEC 15...	1630	1028	80020	3.77	136	1560	8.20	11.0	9.0	27	714
FEB 11...	1500	1028	80020	3.63	116	1820	8.00	20.5	11.5	12	711
MAY 11...	1600	1028	80020	4.50	221	1990	8.00	30.5	24.5	42	709
JUL 28...	1400	1028	80020	3.49	84	2250	8.10	33.0	30.0	18	711

DATE	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO
NOV 17...	9.6	97	15	32	690	460	190	52	220	41	4
DEC 15...	10.8	100	K26	K23	440	210	120	34	150	42	3
FEB 11...	11.1	110	K19	K6	490	270	130	40	180	44	4
MAY 11...	9.1	118	K64	K41	440	230	110	39	230	53	5
JUL 28...	8.8	126	1700	K120	580	380	150	50	260	49	5

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE IT-FLD (MG/L AS HCO3)	CAR-BONATE IT-FLD (MG/L AS CO3)	ALKA-LINITY, CARBON-ATE IT-FLD (MG/L AS CAC03)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV 17...	4.8	283	0	232	3.6	400	330	0.70
DEC 15...	4.3	276	0	226	2.8	230	220	0.70
FEB 11...	4.2	276	0	226	4.4	290	270	0.80
MAY 11...	5.2	250	0	204	4.0	240	380	0.80
JUL 28...	6.4	250	0	203	3.1	360	350	0.80

07237500 NORTH CANADIAN RIVER AT WOODWARD, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DLS- DLS- (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
NOV 17...	28	1390	1370	1.89	282	0.570	0.020	0.07	0.590	0.290	0.240
DEC 15...	19	862	916	1.17	317	0.430	0.020	0.07	0.450	0.160	0.160
FEB 11...	21	1090	1080	1.48	341	0.470	0.020	0.07	0.490	0.160	0.150
MAY 11...	17	1170	1150	1.59	698	--	0.020	0.07	<0.100	0.250	0.060
JUL 28...	27	1360	1330	1.85	310	--	<0.010	--	0.280	0.020	0.040

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN- ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA+ ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (UG/L AS P04)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)
NOV 17...	0.31	0.51	0.80	0.060	0.040	0.060	0.18	0.06	0.0	10	3
DEC 15...	0.21	1.3	1.5	0.060	0.030	0.020	0.06	0.06	0.01	--	--
FEB 11...	0.19	0.84	1.0	0.100	0.050	0.060	0.18	0.10	0.0	10	2
MAY 11...	0.08	1.8	2.1	0.120	0.010	0.020	0.06	0.12	0.0	<10	4
JUL 28...	0.05	1.2	1.2	0.160	<0.010	<0.010	--	0.16	--	--	--

[illegible]

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM % FINER THAN .062 MM
NOV 17...	5	<1	<1	<1.0	1600	9	10	81	16	61
DEC 15...	--	--	--	--	--	--	--	139	51	44
FEB 11...	<10	1	<1	<1.0	1300	<6	67	41	13	78
MAY 11...	<10	<1	<1	<1.0	1300	<6	<3	--	--	--
JUL 28...	--	--	--	--	--	--	--	70	16	80

ARKANSAS RIVER BASIN

07238000 NORTH CANADIAN RIVER NEAR SEILING, OK

LOCATION.--Lat 36°11'00" (revised), long 98°55'15", in NW 1/4 sec.26, T.20 N., R.16 W., Major County, Hydrologic Unit 11100301, near center of span on downstream side of pier of bridge on U.S. Highway 60, 2.0 mi upstream from Seiling Creek, 2.2 mi north of Seiling, 2.8 mi downstream from Deep Creek, and at mile 422.6.

DRAINAGE AREA.--12,261 mi², of which 4,847 mi is probably noncontributing.

PERIOD OF RECORD.--July 1946 to current year.

REVISED RECORDS.--WSP 1341: Drainage area. WSP 1731: 1951 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,675.53 ft above National Geodetic Vertical Datum of 1929. July 1, 1946 to Aug. 17, 1964, at site 60 ft downstream and prior to Oct. 1, 1954, at datum 5.00 ft higher.

REMARKS.--Records good except for period affected by ice, which is poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation since May 1942 by Fort Supply Lake (station 07236500) on Wolf Creek, 70.6 mi upstream. Flow regulated since October 1978 by Optima Lake (07233200), 201.0 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Optima Lake, 32 years (water years 1947-78), 215 ft³/s, 155,800 acre-ft/yr; since regulation by Optima Lake, 9 years (water years 1979-87, 146 ft³/s, 105,800 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,000 ft³/s, May 19, 1951, gage height, 15.61 ft, present datum; maximum gage height, 16.00 ft, Oct. 11, 1946, present datum; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,670 ft³/s, Oct. 3, gage height, 12.89 ft; minimum daily discharge, 26 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	136	121	137	149	220	470	679	245	539	473	86	134
2	1030	117	138	152	223	391	647	251	488	481	81	123
3	2640	122	137	158	225	364	616	248	505	471	74	81
4	546	1540	137	161	221	349	604	244	515	419	69	64
5	268	1590	153	163	219	320	586	273	486	394	69	56
6	197	856	186	165	219	289	570	299	464	348	68	54
7	159	459	199	161	204	276	562	278	443	317	61	59
8	131	339	218	164	193	269	551	291	429	352	55	62
9	250	293	227	180	188	266	512	294	414	437	52	57
10	243	319	223	191	184	271	430	273	412	401	53	53
11	156	313	210	196	183	270	403	261	407	386	57	49
12	288	309	206	222	181	268	390	268	377	333	57	54
13	230	295	204	235	183	268	379	312	352	244	62	66
14	160	238	204	219	191	270	423	296	333	215	57	69
15	139	197	205	192	297	277	524	276	320	197	50	68
16	130	185	206	179	608	302	472	266	306	184	45	68
17	127	177	196	e156	510	438	497	251	294	185	43	83
18	124	168	181	e150	357	802	533	236	299	248	41	364
19	119	160	175	e145	304	797	515	228	323	229	39	196
20	116	150	164	e157	304	609	494	226	387	183	35	202
21	150	155	152	e166	318	708	479	225	389	166	31	478
22	345	189	149	e171	318	684	390	221	476	151	28	184
23	226	194	146	e175	314	1210	314	292	491	150	29	144
24	150	191	143	e178	313	1590	280	324	505	169	34	131
25	127	194	140	e180	314	1510	263	343	508	164	41	122
26	117	196	137	194	347	857	249	495	450	145	44	115
27	129	193	135	211	604	712	238	1330	406	122	58	111
28	129	171	134	240	664	742	229	1590	370	113	75	127
29	126	146	133	252	---	692	229	2040	348	106	73	151
30	124	140	131	214	---	661	242	1350	389	100	128	212
31	124	---	136	211	---	644	---	737	---	93	134	---
TOTAL	8936	9717	5242	5687	8406	17576	13300	14263	12425	7976	1829	3737
MEAN	288	324	169	183	300	567	443	460	414	257	59.0	125
MAX	2640	1590	227	252	664	1590	679	2040	539	481	134	478
MIN	116	117	131	145	181	266	229	221	294	93	28	49
AC-FT	17720	19270	10400	11280	16670	34860	26380	28290	24640	15820	3630	7410

CAL YR 1986 TOTAL 55105 MEAN 151 MAX 2640 MIN 11 AC-FT 109300
WTR YR 1987 TOTAL 109094 MEAN 299 MAX 2640 MIN 28 AC-FT 216400

e Estimated

07238500 CANTON LAKE NEAR CANTON, OK

LOCATION.--Lat 36°05'03", long 98°36'05", in SE 1/4 NE 1/4 sec.32, T.19 N., R.13 W., Blaine County, Hydrologic Unit 11100301, near right end of Canton Dam on North Canadian River, 2.0 mi northwest of Canton, and at mile 394.3.

DRAINAGE AREA.--12,483 mi², of which 4,883 mi² is probably noncontributing.

PERIOD OF RECORD.--April 1948 to current year. Prior to October 1970, published as Canton Reservoir near Canton.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam. The outlet works consists of a concrete gravity, chute-type weir spillway controlled by 16 taintor gates with net length of 640 ft, three sluice gates and two 24-inch valved pipes. Regulated storage began Apr. 15, 1948; conservation pool was first filled July 4, 1948. Capacity, 377,100 acre-ft at elevation 1,638.0 ft (flood-control pool), 109,700 acre-ft at elevation 1,615.2 ft. (Normal water-supply pool designated in 1965), 93,180 acre-ft at elevation 1,613.0 ft (crest of spillway), and 14,140 acre-ft at elevation 1,596.5 ft (conservation pool). Figures given herein represent total contents. Reservoir was designed for flood control, irrigation, and conservation, but owing to a lack of facilities, it is not being used for irrigation at this time. Revised capacity table, based on survey in 1980, used since Oct. 1, 1981.

U.S. Army Corps of Engineers' satellite telemeter at site.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 258,600 acre-ft, May 25, 1951, elevation, 1,628.05 ft; minimum since conservation pool was first filled, 867 acre-ft, May 5, 1955, elevation, 1,585.66 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 138,500 acre-ft, June 1, elevation, 1,618.61 ft; minimum, 77,270 acre-ft, Oct. 1, elevation, 1,610.68 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

1,607	55,450	1,615	108,200
1,611	79,350	1,617	124,400
1,613	93,180	1,619	142,000

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77240	107300	112900	111100	112900	114100	121100	110400	138400	111600	109300	107800
2	79900	107300	112700	111100	112700	114400	120500	110500	137800	112300	109200	107800
3	85630	108200	112600	111200	112500	114400	119900	110300	137100	112300	109200	107800
4	91300	110700	112600	111200	112400	114200	119800	110600	136300	112300	109200	107700
5	94190	113100	112300	111100	112300	114100	119500	111500	135600	112300	109100	107700
6	95280	116100	112000	111300	112000	113900	119100	111900	134600	111800	109000	107800
7	96000	118600	112300	111300	111800	113600	118800	112000	133900	110900	108700	107800
8	96520	119000	112300	111600	111600	113300	118300	112200	133100	110000	108900	107900
9	97000	118500	112200	111700	110900	113200	117900	112400	132100	109100	108700	107600
10	97560	118200	111800	111600	111100	112700	117300	112600	131400	109000	108600	108200
11	98400	117300	111800	111600	111100	112300	116700	112800	130300	109600	108500	108000
12	98600	117000	111500	111700	111100	112000	116300	112900	129300	113300	108700	108600
13	99100	116000	111300	111900	111200	111900	116700	113100	128100	113600	109100	108600
14	99260	115600	111300	112200	111500	112900	115400	113300	126900	114100	109100	108600
15	99700	115200	111300	112500	112700	113400	114600	113500	125700	114400	108700	108600
16	99930	114600	111500	112500	113000	114300	114300	113600	124300	114100	108800	108500
17	100200	114000	111600	112600	113500	115500	113600	113700	123200	113400	108800	108600
18	100500	113300	111600	112600	113700	116000	112900	113500	121200	113000	108800	109700
19	100800	112800	111600	112500	113900	116100	112300	113500	120300	112500	108300	109900
20	101000	112000	111700	112300	113500	116800	112300	113000	119400	111800	108100	111200
21	102500	111600	111700	112500	113200	117300	111500	112900	119200	111000	107900	111600
22	103000	112000	111700	112500	112700	117600	111500	112800	117500	110200	107900	112000
23	104100	112000	111600	112500	112300	118200	111400	113700	116400	109400	107600	112200
24	105100	112000	111600	112800	112200	119600	111200	114000	115300	109100	107500	112400
25	105200	112600	111600	112800	112000	120600	111200	114200	114300	109300	107400	112500
26	105600	112300	111600	113000	112000	121900	111100	117700	113600	109400	107900	112400
27	105800	112300	111600	113100	112700	122000	110900	122000	113000	109400	107800	112600
28	105800	112400	111500	113300	113700	122700	110800	127500	112600	109400	107700	113500
29	106400	112300	111600	113400	---	122100	110600	131700	112000	109400	107600	113600
30	106400	112500	111400	113200	---	121400	110600	135400	111800	109400	107700	113800
31	106600	---	111400	112900	---	121000	---	137800	---	109400	107800	---
MAX	106600	119000	112900	113400	113900	122700	121100	137800	138400	114400	109300	113800
MIN	77240	107300	111300	111100	110900	111900	110600	110300	111800	109000	107400	107600
(+)	1,614.80	1,615.55	1,615.41	1,615.60	1,615.70	1,616.60	1,615.31	1,618.53	1,615.46	1,615.16	1,614.95	1,615.71
(++)	+30,300	+5,900	-1,100	+1,500	+800	+7,300	-10,400	+27,200	-26,000	-2,400	-1,600	+6,000
CAL YR 1986	MAX 119000	MIN 72490	(++)	+200								
WTR YR 1987	MAX 138400	MIN 77240	(++)	+37,500								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

360544098354701 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 1

LOCATION.--Lat 36°05'44", long 98°35'47".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Samples were collected in a Kemmerer sampler. Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)
DEC										
16...	1219	1028	80020	1.00	111000	1480	7.90	7.0	6.0	13
16...	1235	1028	1028	5.00	111000	1560	7.80	--	5.0	--
16...	1239	1028	1028	10.0	111000	1570	7.80	--	5.5	--
16...	1240	1028	80020	15.0	111000	1560	7.80	7.0	5.0	13
16...	1243	1028	1028	20.0	111000	1540	7.80	--	5.5	--
16...	1247	1028	1028	25.0	111000	1570	7.80	--	5.0	--
16...	1249	1028	80020	28.0	111000	1560	7.80	7.0	5.0	35
MAR										
27...	1048	1028	80020	1.00	122000	1460	8.20	10.5	9.5	1.5
27...	1053	1028	1028	5.00	122000	1460	8.20	--	9.5	--
27...	1056	1028	1028	10.0	122000	1490	8.20	--	9.5	--
27...	1057	1028	80020	15.0	122000	1500	8.20	10.5	9.5	17
27...	1058	1028	1028	20.0	122000	1500	8.20	--	9.5	--
27...	1101	1028	1028	25.0	122000	1490	8.20	--	9.5	--
27...	1105	1028	80020	29.0	122000	1490	8.30	10.5	9.5	300
JUN										
23...	1211	1028	80020	26.0	117000	--	8.10	--	25.5	85
23...	1214	1028	1028	20.0	117000	1440	8.20	--	25.0	--
23...	1220	1028	80020	15.0	117000	1440	8.20	--	25.0	6.9
23...	1222	1028	1028	10.0	117000	1450	8.30	--	25.5	--
23...	1223	1028	1028	5.00	117000	1440	8.40	--	25.5	--
23...	1226	1028	80020	1.00	117000	1450	8.60	--	27.5	2.6
SEP										
28...	1213	1028	80020	1.00	113000	1420	7.70	--	21.5	13
28...	1225	1028	1028	5.00	113000	1400	7.80	--	21.5	--
28...	1230	1028	1028	10.0	113000	1430	7.80	--	21.5	--
28...	1233	1028	80020	15.0	113000	1380	7.80	--	21.5	16
28...	1235	1028	1028	20.0	113000	1400	7.80	--	21.0	--
28...	1239	1028	1028	25.0	113000	1420	7.80	--	21.5	--
28...	1242	1028	80020	32.0	113000	1460	7.80	--	21.0	110

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB TOT FLD MG/L AS CACO3	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
DEC									
16...	720	10.7	92	400	250	97	38	140	43
16...	720	10.6	89	--	--	--	--	--	--
16...	720	10.6	89	--	--	--	--	--	--
16...	720	10.6	89	400	250	98	38	140	43
16...	720	10.6	89	--	--	--	--	--	--
16...	720	10.6	89	--	--	--	--	--	--
16...	720	10.6	89	--	--	--	--	--	--
MAR									
27...	710	9.2	87	440	250	110	40	140	41
27...	710	9.2	87	--	--	--	--	--	--
27...	710	9.2	87	--	--	--	--	--	--
27...	710	9.2	87	440	250	110	40	140	41
27...	710	9.2	87	--	--	--	--	--	--
27...	710	9.2	87	--	--	--	--	--	--
27...	710	9.0	85	440	260	110	41	140	40
JUN									
23...	710	6.1	81	450	270	110	43	130	38
23...	710	6.2	81	--	--	--	--	--	--
23...	710	6.3	82	390	220	95	38	130	41
23...	710	6.5	86	--	--	--	--	--	--
23...	710	8.6	114	--	--	--	--	--	--
23...	710	8.5	116	390	210	95	38	130	41
SEP									
28...	720	6.4	77	390	230	94	38	150	45
28...	720	6.6	79	--	--	--	--	--	--
28...	720	7.1	85	--	--	--	--	--	--
28...	720	6.7	81	400	240	96	39	150	44
28...	720	6.3	76	--	--	--	--	--	--
28...	720	6.5	78	--	--	--	--	--	--
28...	720	6.5	78	400	240	96	39	160	46

ARKANSAS RIVER BASIN

360544098354701 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 1--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
DEC										
16...	6.8	--	--	--	300	200	881	874	1.20	0.0
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	6.6	--	--	--	290	200	876	864	1.19	0.0
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	879	--	--	--
MAR										
27...	5.7	--	--	--	300	200	914	907	1.24	0.0
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	6.1	220	0	180	300	200	910	907	1.24	0.0
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	5.7	--	--	--	300	200	942	909	1.28	0.0
JUN										
23...	6.2	218	0	179	260	200	865	856	1.18	0.0
23...	--	--	--	--	--	--	--	--	--	--
23...	5.7	207	7	182	250	190	867	816	1.18	0.0
23...	--	--	--	--	--	--	--	--	--	--
23...	--	--	--	--	--	--	--	--	--	--
23...	6.8	134	49	190	290	180	906	848	1.23	0.0
SEP										
28...	6.6	229	0	188	260	200	879	847	1.20	0.0
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	7.5	--	--	--	270	200	882	861	1.20	0.0
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	6.8	--	--	--	260	210	880	870	1.20	0.0

ARKANSAS RIVER BASIN

360558098351501 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 2

LOCATION.--Lat 36°05'58", long 98°35'15".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1311	1028	1028	1.00	111000	1580	8.00	5.5	720	10.5	88
16...	1314	1028	1028	5.00	111000	1590	7.90	5.5	720	10.6	89
16...	1316	1028	1028	10.0	111000	1580	8.00	5.5	720	10.2	86
16...	1318	1028	1028	15.0	111000	1580	8.00	5.0	720	10.6	89
16...	1320	1028	1028	20.0	111000	1580	8.00	5.0	720	10.5	88
16...	1322	1028	1028	25.0	111000	1600	8.00	5.0	720	10.5	88
16...	1327	1028	1028	27.0	111000	1590	8.00	5.0	720	10.3	86
MAR											
27...	1120	1028	1028	1.00	122000	1470	8.20	9.5	710	9.2	87
27...	1122	1028	1028	5.00	122000	1490	8.40	9.5	710	9.0	85
27...	1124	1028	1028	10.0	122000	1480	8.30	9.5	710	9.0	85
27...	1126	1028	1028	15.0	122000	1500	8.20	9.5	710	9.0	85
27...	1127	1028	1028	20.0	122000	1500	8.30	9.5	710	9.0	85
27...	1129	1028	1028	25.0	122000	1500	8.20	9.5	710	9.0	85
27...	1132	1028	1028	28.0	122000	1500	8.30	9.5	710	9.0	85
JUN											
23...	1241	1028	1028	29.0	117000	1440	8.30	25.0	710	3.3	43
23...	1246	1028	1028	25.0	17100	1420	8.40	25.0	710	4.9	64
23...	1247	1028	1028	20.0	117000	1440	8.40	25.0	710	5.8	76
23...	1248	1028	1028	15.0	117000	1380	8.50	25.0	710	6.1	80
23...	1250	1028	1028	10.0	117000	1350	8.50	25.5	710	6.2	82
23...	1251	1028	1028	5.00	117000	1450	8.70	26.5	710	8.3	112
23...	1252	1028	1028	1.00	117000	1440	8.80	27.5	710	10.6	145
SEP											
28...	1251	1028	1028	1.00	113000	1480	7.80	21.5	720	6.1	73
28...	1254	1028	1028	5.00	113000	1470	7.80	21.5	720	6.3	76
28...	1256	1028	1028	10.0	113000	1460	7.80	21.5	720	6.4	77
28...	1258	1028	1028	15.0	113000	1460	7.90	21.0	720	6.4	77
28...	1300	1028	1028	20.0	113000	1460	7.90	21.0	720	6.3	75
28...	1302	1028	1028	25.0	113000	1460	7.90	21.0	720	6.1	73
28...	1304	1028	1028	29.0	113000	1450	7.90	21.0	720	6.3	75

ARKANSAS RIVER BASIN

360612098344001 CANTON LAKE CROSS SECTION NO. 1 SITE NO. 3

LOCATION.--Lat 36°06'12", long 98°34'40".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1334	1028	1028	1.00	111000	1580	8.00	5.5	720	10.5	88
16...	1336	1028	1028	5.00	111000	1570	8.00	5.5	720	10.5	88
16...	1338	1028	1028	10.0	111000	1560	8.00	5.0	720	10.6	89
16...	1341	1028	1028	15.0	111000	1580	8.00	5.5	720	10.6	89
16...	1343	1028	1028	20.0	111000	1560	8.00	5.0	720	10.5	88
16...	1346	1028	1028	25.0	111000	1580	8.00	5.0	720	10.5	88
MAR											
27...	1140	1028	1028	1.00	122000	1490	8.30	9.5	710	9.0	85
27...	1142	1028	1028	5.00	122000	1500	8.40	9.5	710	9.2	87
27...	1144	1028	1028	10.0	122000	1500	8.30	9.5	710	9.0	85
27...	1145	1028	1028	15.0	122000	1500	8.40	9.5	710	9.0	85
27...	1146	1028	1028	20.0	122000	1500	8.40	9.5	710	9.2	87
27...	1149	1028	1028	25.0	122000	1500	8.40	9.5	710	9.0	85
27...	1151	1028	1028	27.0	122000	1500	8.40	9.5	710	9.0	85
JUN											
23...	1304	1028	1028	25.0	117000	1340	8.40	25.0	710	4.4	58
23...	1307	1028	1028	20.0	117000	1360	8.40	25.0	710	5.8	76
23...	1309	1028	1028	15.0	117000	1340	8.50	25.0	710	5.9	77
23...	1310	1028	1028	10.0	117000	1330	8.60	26.0	710	6.0	80
23...	1312	1028	1028	5.00	117000	1410	8.70	27.0	710	8.6	117
23...	1313	1028	1028	1.00	117000	1360	8.80	27.5	710	11.0	151
SEP											
28...	1308	1028	1028	1.00	113000	1450	7.90	21.5	720	6.1	73
28...	1309	1028	1028	5.00	113000	1450	7.90	21.5	720	5.9	71
28...	1311	1028	1028	10.0	113000	1450	7.90	21.5	720	5.9	71
28...	1313	1028	1028	15.0	113000	1450	7.90	21.5	720	5.8	70
28...	1315	1028	1028	20.0	113000	1450	7.90	21.0	720	5.8	70
28...	1316	1028	1028	24.0	113000	1450	8.00	21.0	720	5.9	71

ARKANSAS RIVER BASIN

360744098364101 CANTON LAKE CROSS SECTION NO. 2 SITE NO. 1

LOCATION.--Lat 36°07'44", long 98°36'41".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1405	1028	1028	1.00	111000	1580	8.20	5.5	720	10.5	89
16...	1408	1028	1028	5.00	111000	1570	8.10	5.5	720	10.8	91
16...	1410	1028	1028	10.0	111000	1570	8.10	5.5	720	10.7	90
16...	1412	1028	1028	15.0	111000	1600	8.00	5.5	720	10.6	89
16...	1414	1028	1028	17.0	111000	1600	8.00	5.5	720	10.5	88
MAR											
27...	1208	1028	1028	1.00	122000	1500	8.30	10.0	710	9.0	86
27...	1210	1028	1028	5.00	122000	1500	8.40	9.5	710	9.0	85
27...	1212	1028	1028	10.0	122000	1500	8.40	9.5	710	9.2	87
27...	1215	1028	1028	15.0	122000	1500	8.20	9.5	710	9.0	85
27...	1217	1028	1028	20.0	122000	1500	8.20	9.5	710	9.0	85
JUN											
23...	1331	1028	1028	20.0	117000	1370	8.40	25.0	710	1.0	13
23...	1334	1028	1028	15.0	117000	1440	8.70	27.0	710	6.4	87
23...	1335	1028	1028	10.0	117000	1430	8.80	27.0	710	9.6	130
23...	1337	1028	1028	5.00	117000	1430	8.80	27.5	710	10.0	137
23...	1338	1028	1028	1.00	117000	1450	8.80	27.5	710	10.2	140
SEP											
28...	1331	1028	1028	1.00	113000	1430	8.20	21.5	720	6.7	81
28...	1333	1028	1028	5.00	113000	1420	8.20	21.5	720	6.5	79
28...	1334	1028	1028	10.0	113000	1420	8.20	21.5	720	6.5	79
28...	1336	1028	1028	15.0	113000	1430	8.20	21.5	720	6.2	75
28...	1338	1028	1028	20.0	113000	1410	8.00	21.5	720	6.1	74

360808098362101 CANTON LAKE CROSS SECTION NO. 2 SITE NO. 2

LOCATION.--Lat 36°08'08", long 98°36'21".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1420	1028	1028	1.00	111000	1570	8.10	5.5	720	10.7	90
16...	1423	1028	1028	5.00	111000	1560	8.00	5.5	720	10.7	90
16...	1425	1028	1028	10.0	111000	1560	8.00	5.5	720	10.6	89
16...	1427	1028	1028	15.0	111000	1580	8.00	5.5	720	10.6	89
16...	1429	1028	1028	19.0	111000	1620	8.00	5.5	720	10.5	88
MAR											
27...	1226	1028	1028	1.00	122000	1500	8.30	9.5	710	9.2	87
27...	1229	1028	1028	5.00	122000	1490	8.30	9.5	710	9.0	85
27...	1230	1028	1028	10.0	122000	1500	8.30	9.5	710	9.0	85
27...	1231	1028	1028	15.0	122000	1500	8.30	9.5	710	9.2	87
27...	1233	1028	1028	20.0	122000	1500	8.30	9.5	710	9.0	85
JUN											
23...	1350	1028	1028	20.0	117000	1440	8.40	25.0	710	1.0	13
23...	1352	1028	1028	15.0	17100	1370	8.50	25.5	710	6.4	85
23...	1353	1028	1028	10.0	117000	1330	8.50	25.5	710	7.0	92
23...	1355	1028	1028	5.00	17100	1350	8.80	27.0	710	8.8	119
23...	1356	1028	1028	1.00	17100	1330	9.00	28.0	710	13.4	185
SEP											
28...	1343	1028	1028	1.00	113000	1400	8.20	21.5	720	6.2	75
28...	1345	1028	1028	5.00	113000	1420	8.10	21.5	720	6.1	74
28...	1346	1028	1028	10.0	113000	1420	8.10	21.5	720	6.0	73
28...	1347	1028	1028	15.0	113000	1430	8.10	21.5	720	5.9	71
28...	1348	1028	1028	21.0	113000	1420	8.00	21.5	720	5.6	68

ARKANSAS RIVER BASIN

360828098360501 CANTON LAKE CROSS SECTION NO. 2 SITE NO. 3

LOCATION.--Lat 36°08'28", long 98°36'05".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.-- Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1437	1028	1028	1.00	111000	1600	8.00	5.5	720	10.6	89
16...	1439	1028	1028	5.00	111000	1590	8.00	5.5	720	10.5	88
16...	1440	1028	1028	10.0	111000	1600	8.00	5.5	720	10.7	90
16...	1443	1028	1028	15.0	111000	1600	8.00	5.5	720	10.7	90
16...	1445	1028	1028	18.0	111000	1600	8.00	5.5	720	10.6	89
MAR											
27...	1242	1028	1028	1.00	122000	1490	8.30	9.5	710	9.0	85
27...	1243	1028	1028	5.00	122000	1490	8.30	9.5	710	9.0	85
27...	1244	1028	1028	10.0	122000	1500	8.30	9.5	710	9.0	85
27...	1246	1028	1028	15.0	122000	1500	8.30	9.5	710	9.0	85
27...	1248	1028	1028	19.0	122000	1500	8.30	9.5	710	9.2	87
JUN											
23...	1410	1028	1028	13.0	117000	1420	8.50	26.0	710	5.4	72
23...	1412	1028	1028	10.0	117000	1430	8.60	26.0	710	6.2	83
23...	1413	1028	1028	5.00	117000	1430	8.80	26.5	710	8.0	108
23...	1415	1028	1028	1.00	117000	1420	8.90	28.0	710	10.7	148
SEP											
28...	1355	1028	1028	1.00	113000	1430	8.20	21.5	720	6.6	80
28...	1356	1028	1028	5.00	113000	1440	8.20	21.5	720	6.4	77
28...	1358	1028	1028	10.0	113000	1440	8.20	21.5	720	6.3	76
28...	1359	1028	1028	15.0	113000	1430	8.10	21.5	720	6.0	72
28...	1401	1028	1028	21.0	113000	1440	8.00	21.5	720	5.9	71

360809098391601 CANTON LAKE CROSS SECTION NO. 3 SITE NO. 1

LOCATION.--Lat 36°08'09", long 98°39'16".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1457	1028	1028	1.00	111000	1600	8.20	5.5	720	10.7	91
16...	1500	1028	1028	5.00	111000	1600	8.10	5.5	720	10.6	89
16...	1502	1028	1028	10.0	111000	1600	8.00	5.5	720	10.6	89
16...	1504	1028	1028	12.0	111000	1600	8.00	5.5	720	10.6	89
MAR											
27...	1300	1028	1028	1.00	122000	1490	8.30	10.0	710	9.0	86
27...	1302	1028	1028	5.00	122000	1490	8.40	9.5	710	9.0	85
27...	1303	1028	1028	10.0	122000	1490	8.40	9.5	710	9.0	85
27...	1304	1028	1028	12.0	122000	1490	8.40	9.5	710	9.0	85
JUN											
23...	1427	1028	1028	16.0	117000	1420	8.40	25.0	710	1.6	21
23...	1430	1028	1028	10.0	117000	1420	8.80	27.5	710	9.2	126
23...	1431	1028	1028	5.00	117000	1420	8.80	27.5	710	9.3	127
23...	1432	1028	1028	1.00	117000	1300	8.80	28.0	710	9.4	130
SEP											
28...	1409	1028	1028	1.00	113000	1430	8.20	21.5	720	6.5	79
28...	1411	1028	1028	5.00	113000	1430	8.20	21.5	720	6.3	76
28...	1413	1028	1028	10.0	113000	1430	8.20	21.5	720	6.1	74
28...	1415	1028	1028	16.0	113000	1300	8.20	21.5	720	5.7	69

ARKANSAS RIVER BASIN

360828098390701 CANTON LAKE CROSS SECTION NO. 3 SITE NO. 2

LOCATION.--Lat 36°08'28", long 98°39'07".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1510	1028	1028	1.00	111000	1660	8.10	5.5	720	10.6	90
16...	1512	1028	1028	5.00	111000	1650	8.00	5.5	720	10.6	90
16...	1514	1028	1028	10.0	111000	1650	8.00	5.5	720	10.5	88
MAR											
27...	1313	1028	1028	1.00	122000	1490	8.40	10.0	710	9.0	86
27...	1315	1028	1028	5.00	122000	1470	8.40	10.0	710	9.0	86
27...	1316	1028	1028	10.0	122000	1460	8.40	10.0	710	9.0	86
27...	1317	1028	1028	14.0	122000	1460	8.40	10.0	710	9.4	89
JUN											
23...	1441	1028	1028	15.0	117000	1430	8.40	25.5	710	3.4	45
23...	1443	1028	1028	10.0	117000	1410	8.70	27.0	710	8.8	119
23...	1445	1028	1028	5.00	117000	1420	8.80	27.0	710	9.0	122
23...	1446	1028	1028	1.00	117000	1430	8.80	28.0	710	9.4	130
SEP											
28...	1419	1028	1028	1.00	113000	1440	8.20	21.5	720	6.4	78
28...	1421	1028	1028	5.00	113000	1440	8.20	22.0	720	6.3	76
28...	1422	1028	1028	10.0	133000	1440	8.20	21.5	720	6.3	76
28...	1424	1028	1028	17.0	133000	1440	8.20	21.5	720	6.2	75

360844098390000 CANTON LAKE CROSS SECTION NO. 3 SITE NO. 3

LOCATION.--Lat 36°08'44", long 98°39'00".

PERIOD OF RECORD.--Water years 1980 to current year.

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
16...	1520	1028	1028	1.00	111000	1670	8.00	5.5	720	10.6	90
16...	1523	1028	1028	5.00	111000	1670	8.00	5.5	720	10.5	89
16...	1525	1028	1028	10.0	111000	1660	8.00	5.5	720	10.6	90
16...	1528	1028	1028	13.0	111000	1650	8.00	5.5	720	10.6	90
MAR											
27...	1326	1028	1028	1.00	122000	1490	8.40	10.0	710	9.0	86
27...	1328	1028	1028	5.00	122000	1490	8.40	10.0	710	9.0	86
27...	1329	1028	1028	10.0	122000	1480	8.40	10.0	710	9.2	88
27...	1330	1028	1028	15.0	122000	1490	8.40	9.5	710	9.0	85
JUN											
23...	1458	1028	1028	15.0	117000	1430	8.40	25.5	710	4.4	58
23...	1459	1028	1028	10.0	117000	1430	8.60	26.0	710	5.6	75
23...	1501	1028	1028	5.00	117000	1430	8.70	26.0	710	6.6	88
23...	1502	1028	1028	1.00	117000	1420	8.90	28.5	710	9.0	126
SEP											
28...	1427	1028	1028	1.00	133000	1440	8.20	21.5	720	6.4	77
28...	1430	1028	1028	5.00	133000	1440	8.20	21.5	720	6.3	76
28...	1432	1028	1028	10.0	133000	1550	8.20	21.5	720	6.3	76
28...	1433	1028	1028	14.0	133000	1440	8.20	21.5	720	6.1	74

ARKANSAS RIVER BASIN

07239000 NORTH CANADIAN RIVER AT CANTON, OK

LOCATION.--Lat 36°04'45", long 98°35'25", in NE 1/4 SW 1/4 sec.33, T.19 N., R.13 W., Blaine County, Hydrologic Unit 11100301, on right bank 2,700 ft downstream from Canton Lake, 1.5 mi northwest of Canton, 4.8 mi upstream from Minnehaha Creek, and at mile 393.8.

DRAINAGE AREA.--12,484 mi², of which 4,883 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected in this vicinity since 1914 are contained in reports of National Weather Service.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,562.50 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Oct. 1, 1937 to Jan. 5, 1955, water-stage recorder at site 2.5 mi downstream at datum 1.91 ft lower prior to Oct. 1, 1950 and at datum 6.91 ft lower thereafter.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow partly regulated by Fort Supply Lake (station 07236500) for period May 1942 to April 1948 and completely regulated thereafter by Canton Lake (station 07238500). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Canton Lake, 11 years (water years 1938-48), 256 ft³/s, 185,500 acre-ft/yr; since regulation by Canton Lake, 39 years (water years 1949-87), 158 ft³/s, 114,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,800 ft³/s, Oct. 12, 1946, gage height, 12.83 ft, site and datum then in use; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 13, 1923, reached a stage of 16.8 ft, at site 300 ft upstream from former site at datum 1.91 ft lower than present datum, from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,070 ft³/s, June 18; gage height, 9.08 ft; minimum daily discharge, 8.9 ft³/s, Oct. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	e9.1	163	172	371	276	796	246	642	479	12	12
2	23	e9.0	163	171	368	393	793	245	906	481	12	11
3	84	e9.1	162	172	368	498	786	243	907	480	12	11
4	39	e9.4	161	171	369	493	782	217	904	477	11	11
5	25	e10	251	171	369	491	779	178	901	474	11	11
6	19	e9.5	319	171	368	490	777	166	893	595	11	11
7	15	60	319	171	367	486	773	158	885	758	11	11
8	13	419	321	171	365	484	769	152	880	744	11	11
9	12	612	322	173	362	490	764	148	925	728	11	11
10	12	637	320	173	271	485	763	146	1020	466	11	12
11	11	634	318	172	200	478	756	144	1010	111	11	12
12	11	630	316	171	199	473	752	143	1000	68	11	12
13	e11	615	315	171	200	293	751	142	986	72	14	12
14	e10	604	315	171	204	102	752	141	974	47	12	12
15	10	597	240	172	207	59	735	141	959	33	12	12
16	e9.8	591	176	173	204	37	728	140	946	191	12	12
17	e9.5	582	177	174	203	28	771	140	991	426	12	11
18	e9.4	574	176	173	261	208	806	240	1050	480	12	13
19	e9.4	562	176	173	370	521	794	312	997	521	e11	13
20	e9.4	552	176	170	501	526	793	311	914	549	e11	12
21	e9.3	360	175	168	553	535	662	310	904	564	e11	12
22	e11	172	175	167	553	535	495	308	961	566	e11	12
23	e10	172	175	167	554	550	489	313	996	560	e11	12
24	e9.6	171	174	166	552	599	423	315	978	361	e35	12
25	e9.5	168	174	166	551	682	353	318	963	81	e30	12
26	e9.3	168	173	166	550	749	350	309	866	46	23	11
27	e9.3	167	173	166	438	816	368	65	764	30	15	11
28	e9.0	166	172	166	281	826	289	40	749	23	12	12
29	e8.9	165	173	217	---	822	245	38	610	19	12	12
30	e9.0	164	172	339	---	800	245	221	485	14	12	12
31	e9.0	---	172	373	---	796	---	430	---	12	12	---
TOTAL	470.4	9598.1	6794	5697	10159	15021	19339	6420	26966	10456	415	351
MEAN	15.2	320	219	184	363	485	645	207	899	337	13.4	11.7
MAX	84	637	322	373	554	826	806	430	1050	758	35	13
MIN	8.9	9.0	161	166	199	28	245	38	485	12	11	11
AC-FT	933	19040	13480	11300	20150	29790	38360	12730	53490	20740	823	696

CAL YR 1986 TOTAL 59296.5 MEAN 162 MAX 916 MIN 8.9 AC-FT 117600
WTR YR 1987 TOTAL 111686.5 MEAN 306 MAX 1050 MIN 8.9 AC-FT 221500

e Estimated

ARKANSAS RIVER BASIN

07239300 NORTH CANADIAN RIVER BELOW WEAVERS CREEK NEAR WATONGA, OK

LOCATION.--Lat 35°48'43", long 98°25'14", NE 1/4, NE 1/4, sec.1, T.15 N., R.12 W., Blaine County, Hydrologic Unit 11100301, on downstream pier on U.S. Highway 281 bridge, 2.0 mi south of intersection of U.S. Highway 281 and State Highway 33 and at mile 361.2.

DRAINAGE AREA.--12,736 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,453.60 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except for estimated periods which are poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,740 ft³/s, Oct. 3, 1986, gage height, 19.24; minimum daily discharge, 5.0 ft³/s, Sept. 26-27, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,740 ft³/s, Oct. 3, gage height, 19.24 ft; minimum daily discharge, 24 ft³/s, Aug. 11, 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	903	e40	216	e216	456	462	908	274	660	631	e73	37
2	1240	e39	216	e220	459	408	902	271	723	747	e61	36
3	7540	e38	216	e220	458	533	895	265	961	710	e50	35
4	3070	1220	216	e228	456	614	891	259	949	687	e43	33
5	681	859	214	e233	457	603	885	215	936	637	e38	32
6	523	292	260	237	457	597	881	176	932	603	e33	32
7	392	170	341	235	455	591	878	169	921	659	e30	31
8	305	152	373	274	454	588	876	162	900	759	e28	31
9	244	285	391	365	451	587	870	156	895	742	e26	31
10	204	463	389	329	448	592	862	154	939	730	e25	34
11	155	590	384	289	410	575	859	153	1010	646	e24	37
12	e132	651	382	268	340	570	849	151	1010	443	e24	54
13	e102	663	380	257	303	564	847	151	999	350	e30	76
14	e84	662	379	248	285	282	855	149	983	e265	53	e53
15	e58	656	380	242	293	122	842	149	966	e211	e47	e44
16	e45	654	347	238	350	165	813	148	953	e180	e43	e38
17	e39	648	281	236	329	511	812	148	937	e162	e38	e36
18	e34	642	251	237	308	298	872	147	1020	343	e35	46
19	e32	637	240	243	316	383	908	252	1070	462	e33	65
20	e30	630	236	250	380	618	885	307	1240	511	e32	63
21	201	622	234	251	563	623	876	303	1110	536	e31	68
22	1460	540	234	249	644	630	696	349	972	550	e30	80
23	529	358	234	246	643	667	565	649	959	554	e29	68
24	193	268	232	243	655	711	554	547	1000	555	e29	59
25	126	235	231	237	655	721	478	486	995	504	e31	52
26	e102	228	229	250	673	790	414	429	972	330	35	48
27	e81	221	227	322	902	876	401	2100	918	e210	36	44
28	e66	218	226	337	800	952	402	1430	818	e155	37	54
29	e52	216	228	404	---	947	328	1760	793	e129	37	66
30	e47	216	e220	408	---	901	281	977	770	e109	36	60
31	e43	---	e218	444	---	888	---	658	---	e89	36	---
TOTAL	18713	13113	8605	8456	13400	18369	22385	13544	28311	14199	1133	1443
MEAN	604	437	278	273	479	593	746	437	944	458	36.5	48.1
MAX	7540	1220	391	444	902	952	908	2100	1240	759	73	80
MIN	30	38	214	216	285	122	281	147	660	89	24	31
AC-FT	37120	26010	17070	16770	26580	36430	44400	26860	56150	28160	2250	2860

CAL YR 1986 TOTAL 85808 MEAN 235 MAX 7540 MIN 18 AC-FT 170200
WTR YR 1987 TOTAL 161671 MEAN 443 MAX 7540 MIN 24 AC-FT 320700

e Estimated

07239500 NORTH CANADIAN RIVER NEAR EL RENO, OK

LOCATION.--Lat 35°33'44", long 97°57'32", on east line of sec.32, T.13 N., R.7 W., Canadian County, Hydrologic Unit 11100301, near left bank on downstream side of pier of bridge on old U.S. Highway 81, 2.0 mi north of courthouse in El Reno, 2.2 mi downstream from Target Creek, and at mile 307.4.

DRAINAGE AREA.--13,042 mi² of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1902 to April 1908, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at site 1.0 mi upstream March 1914 to March 1934 and at present site thereafter are contained in reports of National Weather Service. Published as Canadian River (North Fork) near El Reno 1902-4.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,299.02 ft above National Geodetic Vertical Datum of 1929. October 1902 to April 1908, nonrecording gage at site about 50 ft downstream at different datum.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by Fort Supply Lake (station 07236500) for period May 1942 to April 1948 and by Canton Lake (station 07238500) thereafter. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Canton Lake, 16 years (water years 1903-07, 1938-48), 264 ft³/s, 191,300 acre-ft/yr; since regulation by Canton Lake, 39 years (water years 1949-87), 201 ft³/s, 145,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,000 ft³/s, Oct. 28, 1941, gage height, 15.98 ft; maximum gage height, 18.20 ft, Sept. 21, 1965; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 15, 1923, reached an elevation of 1,326.3 ft above mean sea level at railroad bridge 1.0 mi above station, from reports of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,910 ft³/s, Oct. 5, gage height, 15.52 ft; minimum daily discharge, 25 ft³/s, Aug. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6170	162	e175	150	382	1380	1030	447	1210	782	e80	e55
2	5070	150	e170	146	349	880	1030	425	946	1060	e70	e52
3	6260	142	e180	146	316	697	1030	407	1300	1180	e60	e45
4	5910	1410	163	147	291	692	1030	389	1320	923	e50	e42
5	8210	2970	162	147	283	803	1020	e360	1200	822	e40	e40
6	7000	2060	161	147	286	772	1010	e330	1150	e780	e35	e39
7	2600	835	183	145	284	750	1000	e300	1100	e750	e32	e38
8	877	470	239	149	272	734	999	e270	1080	e850	e30	e37
9	541	324	341	281	261	721	987	e250	1060	e840	e28	e37
10	392	457	300	223	252	713	981	e228	1060	827	e26	e45
11	339	648	266	186	248	716	977	e204	1110	822	e25	e66
12	576	673	249	170	217	690	967	e193	1230	389	e30	e100
13	427	626	239	165	179	675	953	e182	1210	e350	1450	148
14	274	590	234	161	178	667	952	e180	1210	e300	898	e84
15	230	579	231	157	792	516	963	e176	1170	e250	408	e76
16	202	563	230	153	599	300	944	e174	1140	e200	e90	74
17	181	554	208	153	356	1230	915	e170	1100	e180	e74	67
18	168	541	174	151	269	1150	913	e168	1120	e220	e67	84
19	156	519	168	e148	216	811	946	e165	1180	e260	e63	144
20	142	506	164	e146	186	543	991	e163	1470	e280	e60	136
21	163	485	162	e144	182	777	968	276	1450	e300	e58	114
22	3570	473	160	e142	274	779	960	303	1200	e305	e52	99
23	3730	363	160	e141	374	884	798	578	1120	e310	e46	116
24	3060	274	160	e140	384	925	641	929	1130	e300	e43	83
25	1010	235	159	e140	402	893	615	774	1190	297	e42	77
26	554	305	157	e139	450	860	592	660	1150	259	e43	73
27	354	272	154	e141	859	909	554	2000	1100	e200	e42	70
28	269	232	153	155	1600	966	519	6960	997	e170	e45	72
29	225	204	152	1300	---	1070	495	5590	860	e140	e46	144
30	196	183	150	702	---	1090	473	4340	1020	e120	e50	111
31	176	---	151	404	---	1060	---	2610	---	e94	e54	---
TOTAL	59032	17805	5955	6819	10741	25653	26253	30201	34583	14560	4137	2368
MEAN	1904	593	192	220	384	828	875	974	1153	470	133	78.9
MAX	8210	2970	341	1300	1600	1380	1030	6960	1470	1180	1450	148
MIN	142	142	150	139	178	300	473	163	860	94	25	37
AC-FT	117100	35320	11810	13530	21300	50880	52070	59900	68600	28880	8210	4700

CAL YR 1986 TOTAL 145322.1 MEAN 398 MAX 8210 MIN 7.4 AC-FT 288200
WTR YR 1987 TOTAL 238107 MEAN 652 MAX 8210 MIN 25 AC-FT 472300

e Estimated

ARKANSAS RIVER BASIN

07240000 LAKE HEFNER CANAL NEAR OKLAHOMA CITY, OK

LOCATION.--Lat 35°33'11", long 97°37'11", in SW 1/4 SW 1/4 sec.34, T.13 N., R.4 W., Oklahoma County, Hydrologic Unit 11050002, attached to left wing wall just downstream from outlet of inverted siphon, 2,600 ft upstream from Lake Hefner, 3.0 mi northeast of Bethany, and 7.6 mi northwest of the State Capitol in Oklahoma City.

PERIOD OF RECORD.--March 1944 to current year.

REVISED RECORDS.--WDR OK-80-1: 1968-80 (Datum).

GAGE.--Water stage recorder and concrete control. Datum of gage is 1,196.06 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 8, 1947, nonrecording gage at site 2.7 mi upstream at different datum. Apr. 8, 1947 to Apr. 30, 1950, water-stage recorder at site 3.0 mi upstream at different datum. May 1, 1950 to May 19, 1954, Apr. 26, 1957 to Feb. 19, 1968 at present site and datum 4.90 ft higher. May 20, 1954 to Apr. 25, 1957, water-stage recorder and concrete control at site 2,500 ft downstream at datum 2.10 ft higher than present datum.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Use of canal began in March 1944. Canal diverts water from North Canadian River just upstream from Lake Overholser (station 07240500) and delivers water to Lake Hefner, capacity, 80,600 acre-ft, for municipal water supply of Oklahoma City. Subsequent to April 1950, small ground-water seepage, when head gates are closed, included in records.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 1,500 ft³/s, May 28, 1955; no flow at times in each year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	48	.03	.93	.45	2.4	2.6	.86	.15	.71	.50	1.3	.00
2	98	.34	.85	.56	1.2	.97	.72	.07	1.2	32	1.3	.00
3	48	.55	.75	.43	1.0	.85	.77	.00	6.3	3.2	1.3	.00
4	25	28	.61	.47	.93	.83	.68	.00	.55	.69	1.3	.00
5	23	4.9	.63	.51	3.8	1.1	.66	.00	.65	78	1.3	.00
6	23	.83	.67	.49	11	1.4	.65	.00	.84	53	3.8	.00
7	24	.68	.91	.46	1.5	.86	.64	.00	.82	22	5.5	.00
8	30	.53	1.4	.76	1.1	.87	.61	.00	.48	20	5.6	.00
9	5.2	.44	.92	416	1.0	.85	.80	.00	.77	20	5.6	.00
10	.69	.86	.56	731	.88	.84	1.3	.00	1.3	20	6.0	.00
11	1.2	.56	.67	23	.81	.78	1.3	.00	4.6	19	6.2	.00
12	1.0	.46	.60	20	.76	.75	1.3	.00	.89	19	6.1	.00
13	.67	.45	.74	19	.76	.78	1.3	.00	.61	17	6.5	.00
14	.55	.60	.77	45	1.4	.84	1.3	.00	.61	17	351	.00
15	.47	.58	.79	1.7	16	.72	1.3	.00	.57	16	404	.00
16	.45	.59	.68	1.2	3.6	7.0	1.2	.00	.52	16	170	.00
17	.55	.62	.59	1.1	1.0	30	.52	.00	.55	119	1.2	.00
18	.18	.47	.65	.36	.85	1.3	.71	.00	.57	248	.00	.08
19	.07	.57	.66	1.9	.79	.98	.51	.00	.90	22	.00	.38
20	.02	.45	.65	.97	.79	.98	.55	.00	11	19	.00	1.6
21	.25	.46	.59	.67	.86	.84	.74	.00	.72	19	.00	365
22	23	.50	.61	.73	.84	1.1	.51	22	.54	18	.00	396
23	.58	.40	.65	.89	.82	5.7	.48	227	.49	17	.00	80
24	.25	.44	.61	.86	1.2	1.1	.60	411	.49	16	.00	.65
25	.18	12	.56	.80	1.1	.84	.94	653	.45	16	.00	.57
26	.15	106	.54	.82	1.6	.99	.73	410	.45	15	.00	.52
27	.15	481	.51	1.1	1.5	45	.35	19	.43	14	.00	1.8
28	.14	321	.50	8.3	18	2.4	.31	46	.40	3.1	.00	4.1
29	.11	2.1	.49	392	---	1.0	.23	17	.40	1.2	.00	.44
30	.09	1.1	1.7	564	---	1.0	.19	1.2	1.2	1.3	.00	.36
31	.06	---	4.8	2.2	---	.92	---	.73	---	1.3	.00	---
TOTAL	355.01	967.51	26.59	2358.51	77.49	116.19	22.76	1807.15	40.01	883.29	978.00	851.50
MEAN	11.5	32.3	.86	76.1	2.77	3.75	.76	58.3	1.33	28.5	31.5	28.4
MAX	98	481	4.8	731	18	45	1.3	653	11	248	404	396
MIN	.02	.03	.49	.36	.76	.72	.19	.00	.40	.50	.00	.00
AC-FT	704	1920	53	4680	154	230	45	3580	79	1750	1940	1690

CAL YR 1986 TOTAL 15104.64 MEAN 41.4 MAX 910 MIN .00 AC-FT 29960
WTR YR 1987 TOTAL 8483.95 MEAN 23.2 MAX 731 MIN .00 AC-FT 16830

ARKANSAS RIVER BASIN

07240500 LAKE OVERHOLSER NEAR OKLAHOMA CITY, OK

LOCATION.--Lat 35°29'11", long 97°39'58", on north line of SW 1/4 sec.30, T.12 N., R.4 W., Oklahoma County, Hydrologic Unit 11100301, at control tower at left end of dam on North Canadian River, 2.9 mi upstream from Mustang Creek, 9.0 mi west of State Capitol in Oklahoma City, and at mile 281.5.

DRAINAGE AREA.--13,221 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1937 to current year.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Oklahoma City Water Department). Prior to Oct. 1, 1955, at same site at datum, 1,065.77 ft elevation. Oct. 1, 1955 to Sept. 30, 1962, water-stage recorder at same site and present datum.

REMARKS.--Reservoir is formed by Ambursen-type dam flanked by long earth-fill sections. Outlet facilities are twenty-three taintor gates and one uncontrolled spillway. Storage began in 1917. Dam was partly washed out in 1923 and rebuilt in 1924. Capacity, 17,100 acre-ft below elevation 1,242.27 ft, top of spillway gates. Dead storage, 1,400 acre-ft below elevation 1,229.77 ft, sill of outlet works. Figures given herein represent total contents. Water diverted for municipal water supply by Oklahoma City. Revised capacity table used since Oct. 1, 1950.

COOPERATION.--Elevations and capacity table provided by Oklahoma City Water Department.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 20,900 acre-ft, June 14, 1944, elevation, 1,242.67 ft, from capacity table then in use; minimum observed, 1,870 acre-ft, May 14, 1955, elevation, 1,230.62 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 19,150 acre-ft, Oct. 4, elevation, 1,243.60 ft; minimum, 12,120 acre-ft, May 20, elevation, 1,239.00 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)	Contents (acre-feet)	Change in contents (acre-feet)
Sept. 30.....	1240.00	13,640	-
Oct. 31.....	1241.80	16,390	+2,750
Nov. 30.....	1241.50	15,930	-460
Dec. 31.....	1241.50	15,930	0
CAL YR 86.....	-	-	+760
Jan. 31.....	1241.50	15,930	0
Feb. 28.....	1241.60	16,090	+160
Mar. 31.....	1241.00	15,170	-920
Apr. 30.....	1239.70	13,180	-1,990
May 31.....	1241.90	16,550	+3,370
June 30.....	1241.40	15,780	-770
July 31.....	1240.80	14,940	-840
Aug. 31.....	1240.80	14,860	-80
Sept. 30.....	1241.70	16,240	+1,380
WTR YR 87.....	-	-	+2,600

ARKANSAS RIVER BASIN

07241000 NORTH CANADIAN RIVER BELOW LAKE OVERHOLSER, NEAR OKLAHOMA CITY, OK

LOCATION.--Lat 35°28'46", long 97°39'47", in SE 1/4 SW 1/4 sec.30, T.12 N., R.4 W., Oklahoma County, Hydrologic Unit 11100301, on left bank 200 ft upstream from bridge on State Highway 4, 0.5 mi downstream from Lake Overholser, 2.4 mi upstream from Mustang Creek, 9.1 mi southwest of State Capitol in Oklahoma City, and at mile 281.0.

DRAINAGE AREA.--13,222 mi², of which 4,899 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1952 to September 1968, October 1969 to September 1972, October 1973 to September 1987 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,194.66 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1961, at datum 10.00 ft higher and through Mar. 24, 1971, at site 200 ft downstream.

REMARKS.--Records poor. Flow regulated by Canton Lake (station 07238500) and Lake Overholser (station 07240500). Diversions upstream from station into Lake Overholser and Lake Hefner Canal (station 07240000). Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--33 years (water years 1953-68, 1970-72, 1974-87), 125 ft³/s, 90,560 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,700 ft³/s, May 28, 1987, gage height, 29.85 ft, from high-water mark; no flow at times in 1952-57.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 40.9 ft, present datum, was reached in October 1923 from information provided by Oklahoma State Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 18,700 ft³/s, May 28, gage height, 29.85 ft, from high-water mark; minimum daily discharge, 0.82 ft³/s, Sept. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5570	548	513	497	688	1920	641	343	2260	827	167	118
2	9420	535	480	506	709	863	637	323	1370	999	165	163
3	10100	494	536	508	699	592	626	321	1180	1580	162	104
4	7240	1170	515	505	530	552	626	306	1020	813	118	51
5	5930	2340	515	504	623	619	620	306	979	716	e70	55
6	5730	2440	515	495	650	572	618	300	1050	583	e69	62
7	5610	1400	518	485	724	556	611	297	961	530	e68	55
8	2650	800	537	487	568	595	612	292	810	465	e67	48
9	1400	621	594	486	558	593	607	173	852	487	e67	49
10	868	714	600	505	553	582	602	171	873	527	e68	119
11	995	698	550	424	550	549	597	255	852	540	e70	141
12	933	681	550	473	507	531	594	245	707	533	e66	147
13	735	671	550	505	466	563	578	238	775	358	150	143
14	695	665	540	504	539	575	e578	230	840	272	250	153
15	572	650	524	494	1010	555	578	210	1020	391	e50	159
16	549	638	551	468	1270	550	578	190	656	290	e15	98
17	556	637	548	475	714	1480	579	180	971	210	e7.0	2.7
18	558	623	545	478	546	1150	569	270	720	e145	4.0	29
19	538	620	544	467	511	703	567	280	837	401	e4.3	3.1
20	508	639	530	427	513	564	594	310	868	324	e4.5	9.2
21	508	605	490	407	513	559	421	340	1050	389	5.1	6.7
22	1610	622	492	442	538	556	432	472	873	418	5.6	1.6
23	3540	590	500	456	577	705	478	147	771	365	4.8	2.2
24	2770	549	511	458	577	642	432	147	786	360	143	4.3
25	1910	682	509	462	599	563	391	151	861	361	175	3.3
26	770	926	509	464	623	603	434	371	786	359	108	3.3
27	673	429	509	464	628	625	409	1940	700	345	80	3.9
28	626	401	507	467	1710	630	387	11500	752	160	79	10
29	566	556	499	491	---	683	375	11700	726	e93	83	1.6
30	545	553	495	915	---	666	361	4750	867	88	83	.82
31	544	---	497	1250	---	666	---	3350	---	115	83	---
TOTAL	75219	23497	16273	15969	18693	21562	16132	40108	27773	14044	2491.3	1746.72
MEAN	2426	783	525	515	668	696	538	1294	926	453	80.4	58.2
MAX	10100	2440	600	1250	1710	1920	641	11700	2260	1580	250	163
MIN	508	401	480	407	466	531	361	147	656	88	4.0	.82
AC-FT	149200	46610	32280	31670	37080	42770	32000	79550	55090	27860	4940	3460

CAL YR 1986 TOTAL 168233.56 MEAN 461 MAX 10100 MIN 3.2 AC-FT 333700
WTR YR 1987 TOTAL 273507.50 MEAN 749 MAX 11700 MIN .82 AC-FT 542500

e Estimated

ARKANSAS RIVER BASIN

179

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK

LOCATION.--Lat 35°30'08", long 97°10'52", in SW 1/4 NE 1/4 sec.22, T.12 N., R.1 E., Oklahoma County, Hydrologic Unit 11100302, on upstream left end of bridge on access road to O.G.& E. power plant, 1.8 mi northwest of Harrah, 4.6 mi downstream from Choctaw Creek, and at mile 229.2.

DRAINAGE AREA.--13,501 mi², of which 4,899 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,055.69 ft above National Geodetic Vertical Datum of 1929. Prior to June 19, 1981, gage 0.8 mi upstream at same datum.

REMARKS.--Records fair. Flow regulated by Canton Lake (station 07238500) and by Lake Overholser (station 07240500) where diversions are made into Lake Hefner Canal (station 07240000). Low flow sustained in part by sewage effluent from Oklahoma City. U.S. Army Corps of Engineers' satellite telemeter located at station.

AVERAGE DISCHARGE.--19 years, 370 ft³/s, 268,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,200 ft³/s, May 29, 1987, gage height, 19.60 ft; minimum, 23 ft³/s, Aug. 8, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 27,200 ft³/s, May 29, gage height, 19.60 ft; minimum daily discharge, 195 ft³/s, Aug. 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6390	719	899	e520	1250	5610	1050	646	e7400	e2500	e380	e200
2	7270	699	796	e510	1140	3410	1030	634	e4900	e3950	e350	e197
3	9490	688	630	e540	1120	1750	1010	608	e3200	e1200	e338	e200
4	12400	1940	793	e610	951	1170	1010	603	e1520	e1050	e330	e197
5	9920	4970	709	e580	1010	1000	1010	612	e1360	e1000	e324	e199
6	8270	3800	693	e550	2790	1070	1010	563	e1200	e940	e315	e220
7	7050	3540	813	e510	1870	1010	1010	553	e1110	e910	e302	e255
8	7090	2180	1040	e520	1290	975	1000	518	e1070	e870	e292	e247
9	4860	1310	1290	1600	1000	1010	1000	488	e1040	e850	e289	e242
10	2490	997	1070	1200	969	1010	1010	339	e1010	e830	e285	e240
11	1760	1390	984	643	942	993	1000	290	e1030	e820	e280	e239
12	2150	1160	848	640	909	929	999	389	e1280	e830	e270	e241
13	1700	994	824	672	793	850	1000	603	e1190	e850	e262	e246
14	1400	1000	810	668	706	921	1000	471	e1100	e860	e255	e265
15	1200	999	790	655	1340	957	1010	456	e1020	e810	e250	312
16	990	987	696	607	3140	930	991	443	e990	e830	e265	e333
17	937	958	795	650	2110	2990	991	450	e980	e790	e300	e350
18	922	988	832	679	1360	3820	985	329	e950	e750	e260	e370
19	909	1020	763	651	988	2030	966	510	910	e740	e249	e375
20	830	e990	594	643	892	1320	954	541	e3450	e790	e239	e368
21	779	e960	e580	564	868	1000	1120	528	e2450	e720	e224	e355
22	2460	e950	570	575	836	997	1010	1630	e1900	e670	e212	e330
23	4780	e960	671	644	876	1090	997	1960	e1500	e640	e203	e305
24	4510	980	672	657	998	1960	959	652	e1280	e590	195	e290
25	4160	1000	638	635	1000	1230	827	585	e1120	e570	e260	e275
26	2880	4060	621	622	1010	995	792	807	e1030	e550	e350	e255
27	1400	2440	606	668	1230	1050	753	721	e990	e540	e270	e240
28	1030	945	577	988	2820	1130	721	7930	e970	e525	e237	e290
29	989	658	547	1780	---	1090	659	20000	e980	e500	e225	320
30	861	858	544	1540	---	1220	640	e14800	1380	e485	e215	310
31	764	---	e540	1830	---	1030	---	e10900	---	430	e204	---
TOTAL	112641	45140	23235	24151	36208	46547	28514	70559	50310	28390	8430	8266
MEAN	3634	1505	750	779	1293	1502	950	2276	1677	916	272	276
MAX	12400	4970	1290	1830	3140	5610	1120	20000	7400	3950	380	375
MIN	764	658	540	510	706	850	640	290	910	430	195	197
AC-FT	223400	89540	46090	47900	71820	92330	56560	140000	99790	56310	16720	16400

CAL YR 1986 TOTAL 292480 MEAN 801 MAX 12400 MIN 126 AC-FT 580100
WTR YR 1987 TOTAL 482391 MEAN 1322 MAX 20000 MIN 195 AC-FT 956800

e Estimated

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1968 to current year.

WATER TEMPERATURE: October 1968 to current year.

REMARKS.--Samples were collected by a local observer on a daily basis; partial analyses were made on those samples on or near the 5th, 15th, and 25th of each month. Additional samples were collected biweekly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,700 microsiemens, Sept. 25, 1980; minimum daily, 262 microsiemens, June 9, 1974.

WATER TEMPERATURE: Maximum daily, 36.0 °C, July 11, 1982; minimum daily, 0.0 °C on several days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,740 microsiemens, Sept. 8; minimum daily, 325 microsiemens, Oct. 7.

WATER TEMPERATURE: Maximum daily, 35.5 °C, Aug. 2; minimum daily, 2.0 °C, Jan. 18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
OCT											
05...	1730	1028	80020	15.76	9500	384	7.50	--	20.0	--	--
15...	1825	1028	80020	6.38	1020	982	7.50	--	17.0	--	--
21...	1000	1028	80020	5.37	804	1420	7.40	20.0	17.5	--	740
25...	1730	1028	80020	11.20	3890	428	7.80	--	15.5	--	--
29...	1130	1028	1028	6.02	998	970	7.20	20.5	14.5	--	740
NOV											
05...	1640	1028	80020	12.61	5000	506	8.00	--	13.0	--	--
12...	1115	1028	80020	6.55	1080	1400	7.80	-1.0	9.0	--	750
12...	1725	1028	80020	6.15	1000	997	8.40	--	3.0	--	--
18...	1730	1028	80020	5.88	971	1350	7.90	--	10.0	--	--
24...	1300	1028	80020	5.90	978	1460	7.60	12.5	8.5	--	730
DEC											
05...	1715	1028	80020	5.03	695	1420	7.70	--	10.0	--	--
08...	1230	1028	80020	6.36	1010	902	7.30	5.0	9.0	--	730
14...	1730	1028	80020	5.38	807	1380	7.80	--	8.0	--	--
22...	1100	1028	80020	4.55	557	1520	7.60	0.0	7.5	--	740
25...	1725	1028	80020	4.72	604	1470	7.50	--	10.0	--	--
JAN											
05...	1817	1028	80020	--	*580	1460	8.20	--	6.0	--	--
13...	1030	1028	80020	4.94	667	1300	7.40	9.0	6.5	--	730
15...	1639	1028	80020	4.89	653	1350	7.90	--	9.0	--	--
25...	1410	1028	80020	4.83	635	1430	7.20	--	5.5	--	--
29...	1200	1028	80020	8.46	2100	888	7.30	12.5	7.5	--	730
FEB											
06...	1700	1028	80020	9.92	3010	662	7.50	--	7.0	--	--
15...	1800	1028	80020	7.85	1780	--	8.00	--	9.0	--	--
18...	1130	1028	80020	7.06	1420	822	7.20	2.0	6.0	--	740
25...	1400	1028	80020	6.17	1460	--	7.60	9.0	9.5	--	740
25...	1540	1028	80020	6.13	1400	1410	7.40	--	10.5	--	--
MAR											
08...	1730	1028	80020	5.94	992	1370	7.70	--	15.5	--	--
15...	1700	1028	80020	5.79	941	1450	7.80	--	14.0	--	--
25...	1030	1028	80020	6.68	1170	989	7.20	8.0	10.5	--	730
25...	1700	1028	80020	6.28	1010	1060	7.40	--	21.5	--	--
31...	1030	1028	80020	6.46	1020	1420	7.60	8.0	9.5	--	740
APR											
07...	1800	1028	80020	6.12	1000	1410	7.90	--	14.0	--	--
15...	1200	1028	80020	6.08	992	1420	7.80	15.0	12.5	--	730
15...	1830	1028	80020	6.08	1000	1380	8.10	--	17.0	--	--
25...	1720	1028	80020	5.33	790	1440	7.80	--	24.0	--	--
28...	1200	1028	80020	5.01	688	1530	7.80	24.0	21.0	--	740

* MEAN DAILY DISCHARGE

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	BARO- METRIC PRES- SURE (MM OF HG)
MAY											
05...	1800	1028	80020	4.59	568	1540	7.80	--	23.5	99	--
08...	1300	1028	80020	4.48	538	1370	7.60	25.0	22.5	--	740
15...	1725	1028	80020	4.15	450	1550	7.40	--	29.0	38	--
25...	1755	1028	80020	4.60	571	860	7.00	--	24.0	21	--
29...	1230	1028	80020	22.15	23800	--	7.30	20.0	18.5	--	740
JUN											
08...	1720	1028	80020	--	*1070	1320	7.50	--	--	--	--
14...	1635	1028	80020	--	*1100	1340	8.30	--	29.0	--	--
19...	1000	1028	80020	7.03	955	1170	7.60	29.0	27.5	--	730
25...	1230	1028	80020	--	*1120	1370	7.70	--	28.0	--	--
30...	1100	1028	80020	8.17	1380	1270	7.90	22.0	24.5	--	730
JUL											
05...	1930	1028	80020	--	*1000	940	8.20	--	26.0	--	--
15...	1708	1028	80020	--	*810	1220	8.40	--	27.0	--	--
30...	2130	1028	80020	--	*485	1400	8.60	--	32.0	--	--
31...	1400	1028	80020	6.04	430	1320	8.10	34.0	29.0	--	740
AUG											
05...	1945	1028	80020	--	*324	1520	8.20	--	32.0	--	--
15...	1715	1028	80020	--	*250	1050	7.70	--	29.0	--	--
24...	1500	1028	80020	--	*195	1270	8.30	30.0	27.5	--	740
24...	1815	1028	80020	--	*195	1270	8.10	--	28.0	--	--
31...	1400	1028	80020	5.48	214	1280	8.50	28.0	26.0	--	740
SEP											
05...	1800	1028	80020	--	*199	1370	7.90	--	30.0	--	--
15...	1300	1028	80020	5.70	312	1300	8.00	23.0	24.5	--	730
15...	1725	1028	80020	--	*312	1380	7.60	--	26.0	--	--
25...	1700	1028	80020	--	*275	1350	8.30	--	28.0	--	--
30...	1200	1028	80020	5.37	310	895	7.40	22.0	20.0	--	740

* MEAN DAILY DISCHARGE

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCHI KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB TOT FLD MG/L AS CAC03	CALCIUM DIS- SOLVED (MG/L AS CA)
OCT										
05...	--	--	--	--	--	--	--	140	33	43
15...	--	--	--	--	--	--	--	300	99	78
21...	10.1	109	37	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	150	41	42
29...	8.6	87	--	--	K19000	K1500	340	--	--	--
NOV										
05...	--	--	--	--	--	--	--	180	54	47
12...	9.4	83	31	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	320	100	82
18...	--	--	--	--	--	--	--	390	180	98
24...	10.4	93	26	--	K1	<200	K40	--	--	--
DEC										
05...	--	--	--	--	--	--	--	400	400	100
08...	11.2	101	38	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	410	160	100
22...	12.2	105	24	--	K210	<80	K8	--	--	--
25...	--	--	--	--	--	--	--	440	170	110
JAN										
05...	--	--	--	--	--	--	--	440	180	110
13...	11.5	98	30	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	400	150	98
25...	--	--	--	--	--	--	--	400	170	99
29...	8.2	72	52	--	>8000	K14000	9200	--	--	--
FEB										
06...	--	--	--	--	--	--	--	200	68	52
15...	--	--	--	--	--	--	--	400	160	98
18...	11.9	99	66	--	--	--	--	--	--	--
25...	7.2	65	25	--	4600	K45	560	--	--	--
25...	--	--	--	--	--	--	--	410	180	100
MAR										
08...	--	--	--	--	--	--	--	410	160	100
15...	--	--	--	--	--	--	--	440	190	110
25...	6.8	64	36	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	310	120	77
31...	11.9	108	38	--	K1400	K5	K70	--	--	--
APR										
07...	--	--	--	--	--	--	--	430	200	110
15...	9.4	93	30	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	400	180	100
25...	--	--	--	--	--	--	--	440	210	110
28...	12.8	149	34	--	K8000	K210	240	--	--	--
MAY										
05...	--	--	--	--	--	--	--	410	160	100
08...	6.8	81	37	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	400	160	96
25...	--	--	--	--	--	--	--	220	220	60
29...	7.2	79	<10	--	210000	24000	55000	--	--	--
JUN										
08...	--	--	--	--	--	--	--	380	160	98
14...	--	--	--	--	--	--	--	400	190	100
19...	6.1	81	49	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	370	170	97
30...	7.4	93	<10	19	310000	K80000	46000	--	--	--
JUL										
05...	--	--	--	--	--	--	--	250	82	64
15...	--	--	--	--	--	--	--	360	110	92
30...	--	--	--	--	--	--	--	340	98	85
31...	8.2	110	--	20	K11000	K540	K100	--	--	--
AUG										
05...	--	--	--	--	--	--	--	410	140	99
15...	--	--	--	--	--	--	--	280	110	65
24...	7.9	104	22	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	290	93	75
31...	7.9	101	29	--	K9400	K820	K35	--	--	--
SEP										
05...	--	--	--	--	--	--	--	350	100	85
15...	7.7	97	29	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	350	120	84
25...	--	--	--	--	--	--	--	310	83	83
30...	8.3	94	26	14	220000	57000	6300	--	--	--

ARKANSAS RIVER BASIN

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07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD MG/L AS HCO3	CAR- BONATE WATER WH IT FIELD MG/L AS CO3	ALKA- LINITY WAT WH TOT IT FIELD MG/L AS CACO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)
OCT										
05...	7.9	24	26	0.9	5.3	--	--	--	45	27
15...	25	88	38	2	7.5	--	--	--	150	110
21...	--	--	--	--	--	210	0	172	--	110
25...	10	30	30	1	5.3	--	--	--	57	32
29...	--	--	--	--	--	229	0	188	--	--
NOV										
05...	14	42	34	1	4.6	--	--	--	71	48
12...	--	--	--	--	--	224	0	184	--	--
12...	28	89	37	2	5.6	--	--	--	150	100
18...	36	130	41	3	6.4	--	--	--	220	170
24...	--	--	--	--	--	244	0	200	--	190
DEC										
05...	36	130	41	3	6.0	--	--	--	220	180
08...	--	--	--	--	--	195	0	160	--	110
14...	38	130	40	3	8.1	--	--	--	220	180
22...	--	--	--	--	--	312	0	256	--	180
25...	40	140	41	3	5.8	--	--	--	230	190
JAN										
05...	40	150	42	3	5.8	--	--	--	230	190
13...	--	--	--	--	--	237	0	194	--	--
15...	37	120	39	3	6.3	--	--	--	210	170
25...	37	130	41	3	5.5	--	--	--	210	200
29...	--	--	--	--	--	210	0	172	--	110
FEB										
06...	17	52	36	2	4.2	--	--	--	92	67
15...	37	120	39	3	5.3	--	--	--	210	160
18...	--	--	--	--	--	178	0	146	--	88
25...	--	--	--	--	--	--	--	--	--	--
25...	40	140	42	3	5.8	--	--	--	230	190
MAR										
08...	38	130	41	3	6.4	--	--	--	210	180
15...	40	140	41	3	6.2	--	--	--	240	190
25...	--	--	--	--	--	203	0	166	--	110
25...	29	94	39	2	5.6	--	--	--	180	120
31...	--	--	--	--	--	254	0	208	--	190
APR										
07...	38	130	39	3	5.8	--	--	--	260	190
15...	--	--	--	--	--	251	0	206	--	--
15...	37	130	41	3	5.8	--	--	--	250	190
25...	39	140	41	3	6.4	--	--	--	260	200
28...	--	--	--	--	--	271	0	222	--	190
MAY										
05...	39	150	44	3	6.7	--	--	--	240	220
08...	--	--	--	--	--	--	--	--	--	210
15...	39	160	46	4	7.6	--	--	--	230	220
25...	18	77	42	2	6.5	--	--	--	86	120
29...	--	--	--	--	--	129	0	106	--	24
JUN										
08...	32	110	38	3	6.8	--	--	--	220	160
14...	36	150	45	3	7.0	--	--	--	210	190
19...	--	--	--	--	--	271	0	222	--	170
25...	32	120	41	3	6.5	--	--	--	230	170
30...	--	--	--	--	--	256	0	210	--	180
JUL										
05...	22	83	41	2	6.4	--	--	--	140	110
15...	31	120	42	3	7.1	--	--	--	160	180
30...	32	140	46	3	8.1	--	--	--	160	170
31...	--	--	--	--	--	298	0	244	--	--
AUG										
05...	40	170	47	4	8.1	--	--	--	190	200
15...	28	110	46	3	6.0	--	--	--	170	120
24...	--	--	--	--	--	240	7	206	--	200
24...	26	140	50	4	8.9	--	--	--	99	190
31...	--	--	--	--	--	251	22	242	--	200
SEP										
05...	34	150	47	4	8.7	--	--	--	180	170
15...	--	--	--	--	--	278	0	228	--	160
15...	33	150	48	4	7.8	--	--	--	180	180
25...	26	150	50	4	9.0	--	--	--	100	210
30...	--	--	--	--	--	193	0	158	--	--

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	RESIDUE VOLA- TILE, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
OCT										
05...	241	216	0.33	6180	--	--	--	--	--	--
15...	603	578	0.82	1660	--	--	--	--	--	--
21...	608	--	--	--	203	114	1.03	0.070	0.23	1.10
25...	268	239	0.36	2810	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
NOV										
05...	352	299	0.48	4750	--	--	--	--	--	--
12...	589	--	--	--	216	74	1.03	0.070	0.23	1.10
12...	610	586	0.83	1650	--	--	--	--	--	--
18...	834	789	1.13	2190	--	--	--	--	--	--
24...	855	--	--	--	160	136	1.04	0.060	0.20	1.10
DEC										
05...	876	672	1.19	1640	--	--	--	--	--	--
08...	516	--	--	--	176	99	1.03	0.070	0.23	1.10
14...	861	822	1.17	1880	--	--	--	--	--	--
22...	892	--	--	--	84	159	1.67	0.130	0.43	1.80
25...	916	877	1.25	1490	--	--	--	--	--	--
JAN										
05...	908	880	1.23	1420	--	--	--	--	--	--
13...	724	--	--	--	106	127	1.45	0.050	0.16	1.50
15...	833	789	1.13	1470	--	--	--	--	--	--
25...	868	822	1.18	1490	--	--	--	--	--	--
29...	517	--	--	--	314	93	0.950	0.050	0.16	1.00
FEB										
06...	375	363	0.51	3050	--	--	--	--	--	--
15...	792	772	1.08	3810	--	--	--	--	--	--
18...	510	--	--	--	606	76	1.06	0.040	0.13	1.10
25...	872	--	--	--	107	122	1.13	0.070	0.23	1.20
25...	867	848	1.18	3280	--	--	--	--	--	--
MAR										
08...	861	814	1.17	2310	--	--	--	--	--	--
15...	925	877	1.26	2350	--	--	--	--	--	--
25...	595	--	--	--	202	117	0.780	0.060	0.20	0.840
25...	654	621	0.89	1780	--	--	--	--	--	--
31...	868	--	--	--	362	110	0.940	0.050	0.16	0.990
APR										
07...	914	871	1.24	2480	--	--	--	--	--	--
15...	902	--	--	--	190	142	0.700	0.050	0.16	0.750
15...	883	845	1.20	2380	--	--	--	--	--	--
25...	928	891	1.26	1980	--	--	--	--	--	--
28...	882	--	--	--	184	113	1.15	0.150	0.49	1.30
MAY										
05...	939	904	1.28	1440	--	--	--	--	--	--
08...	935	--	--	--	105	134	1.22	0.180	0.59	1.40
15...	952	900	1.29	1160	--	--	--	--	--	--
25...	500	367	0.68	771	--	--	--	--	--	--
29...	162	--	--	--	--	43	0.290	0.040	0.13	0.330
JUN										
08...	804	755	1.09	2320	--	--	--	--	--	--
14...	836	817	1.14	2480	--	--	--	--	--	--
19...	807	--	--	--	366	132	0.660	0.170	0.56	0.830
25...	831	780	1.13	2510	--	--	--	--	--	--
30...	783	--	--	--	304	126	0.480	0.090	0.30	0.570
JUL										
05...	566	527	0.77	1530	--	--	--	--	--	--
15...	767	738	1.04	1680	--	--	--	--	--	--
30...	827	743	1.12	1080	--	--	--	--	--	--
31...	736	--	--	--	72	126	--	--	--	<0.100
AUG										
05...	893	868	1.21	781	--	--	--	--	--	--
15...	622	602	0.85	420	--	--	--	--	--	--
24...	717	--	--	--	9	64	3.84	0.160	0.53	4.00
24...	691	660	0.94	364	--	--	--	--	--	--
31...	774	--	--	--	29	726	2.06	0.040	0.13	2.10
SEP										
05...	819	778	1.11	440	--	--	--	--	--	--
15...	784	--	--	--	44	706	2.10	0.100	0.33	2.20
15...	823	769	1.12	693	--	--	--	--	--	--
25...	781	717	1.06	580	--	--	--	--	--	--
30...	472	--	--	--	62	390	2.35	0.150	0.49	2.50

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	CADMIUM DIS- SOLVED (UG/L AS CD)
OCT										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
21...	0.240	0.31	0.46	0.70	0.600	0.590	1.8	0.01	--	--
25...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
NOV										
05...	--	--	--	--	--	--	--	--	--	--
12...	0.200	0.26	1.1	1.3	0.470	0.410	1.3	0.06	--	--
12...	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--
24...	0.320	0.41	0.68	1.0	0.540	0.490	1.5	0.05	4	<1
DEC										
05...	--	--	--	--	--	--	--	--	--	--
08...	0.350	0.45	0.75	1.1	0.370	0.340	1.0	0.03	--	--
14...	--	--	--	--	--	--	--	--	--	--
22...	0.800	1.0	0.80	1.6	1.00	0.960	2.9	0.04	--	--
25...	--	--	--	--	--	--	--	--	--	--
JAN										
05...	--	--	--	--	--	--	--	--	--	--
13...	0.640	0.82	0.76	1.4	0.650	0.570	1.7	0.08	--	--
15...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
29...	1.50	1.9	3.4	4.9	0.460	0.410	1.3	0.05	--	--
FEB										
06...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
18...	0.750	0.97	1.3	2.1	0.330	0.310	0.95	0.02	--	--
25...	0.710	0.91	1.1	1.8	0.500	0.450	1.4	0.05	3	1
25...	--	--	--	--	--	--	--	--	--	--
MAR										
08...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
25...	0.270	0.35	0.53	0.80	0.330	0.250	0.77	0.08	--	--
25...	--	--	--	--	--	--	--	--	--	--
31...	0.410	0.53	0.69	1.1	0.450	0.370	1.1	0.08	--	--
APR										
07...	--	--	--	--	--	--	--	--	--	--
15...	0.540	0.70	1.3	1.8	0.380	0.300	0.92	0.08	--	--
15...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
28...	0.560	0.72	0.64	1.2	0.730	0.690	2.1	0.04	--	--
MAY										
05...	--	--	--	--	--	--	--	--	--	--
08...	0.820	1.1	0.88	1.7	0.580	0.490	1.5	0.09	--	--
15...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
29...	0.190	0.24	0.41	0.60	0.080	0.070	0.21	0.01	2	1
JUN										
08...	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--
19...	0.220	0.28	1.3	1.5	0.280	0.240	0.74	0.04	--	--
25...	--	--	--	--	--	--	--	--	--	--
30...	0.240	0.31	0.66	0.90	0.400	0.340	1.0	0.06	--	--
JUL										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	<0.20	0.040	--	--	0.04	--	--
AUG										
05...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
24...	0.050	0.06	1.2	1.2	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--
31...	0.020	0.03	1.2	1.2	2.00	1.60	4.9	0.40	--	--
SEP										
05...	--	--	--	--	--	--	--	--	--	--
15...	0.170	0.22	0.93	1.1	1.70	1.30	4.0	0.40	--	--
15...	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--
30...	0.150	0.19	1.0	1.2	1.60	--	--	1.6	--	--

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

	DATE	CHROMIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGANESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELENIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	PHENOLS TOTAL (UG/L)
OCT											
	05...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	21...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	29...	--	--	--	--	--	--	--	--	--	--
NOV											
	05...	--	--	--	--	--	--	--	--	--	--
	12...	--	--	--	--	--	--	--	--	--	--
	12...	--	--	--	--	--	--	--	--	--	--
	18...	--	--	--	--	--	--	--	--	--	--
	24...	<10	2	40	<5	30	<0.1	<1	20	--	2
DEC											
	05...	--	--	--	--	--	--	--	--	--	--
	08...	--	--	--	--	--	--	--	--	--	--
	14...	--	--	--	--	--	--	--	--	--	--
	22...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
JAN											
	05...	--	--	--	--	--	--	--	--	--	--
	13...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	29...	--	--	--	--	--	--	--	--	--	--
FEB											
	06...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	18...	--	--	--	--	--	--	--	--	--	--
	25...	30	2	12	<5	32	<0.1	<1	7	--	2
	25...	--	--	--	--	--	--	--	--	--	--
MAR											
	08...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	31...	--	--	--	--	--	--	--	--	--	--
APR											
	07...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	28...	--	--	--	--	--	--	--	--	--	--
MAY											
	05...	--	--	--	--	--	--	--	--	--	--
	08...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	29...	<10	6	200	<5	10	<0.1	<1	10	--	<1
JUN											
	08...	--	--	--	--	--	--	--	--	--	--
	14...	--	--	--	--	--	--	--	--	--	--
	19...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	30...	--	--	--	--	--	--	--	--	12	--
JUL											
	05...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	30...	--	--	--	--	--	--	--	--	--	--
	31...	--	--	--	--	--	--	--	--	--	--
AUG											
	05...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	24...	--	--	--	--	--	--	--	--	--	--
	24...	--	--	--	--	--	--	--	--	--	--
	31...	<10	--	<10	--	20	0.2	1	<10	--	2
SEP											
	05...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	15...	--	--	--	--	--	--	--	--	--	--
	25...	--	--	--	--	--	--	--	--	--	--
	30...	--	--	--	--	--	--	--	--	--	--

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	OCT 29, 86
TIME	1130
TOTAL CELLS/ML	16000
	CELLS PER- /ML CENT
CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	800 5
...SCENEDESMACEAE	
....SCENEDESMUS	1000 6
..VOLVOCALES	
...CHLAMYDOMONADACEAE	
....CHLAMYDOMONAS	1200 8
CHRYSOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...NAVICULACEAE	
....NAVICULA	1800 11
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	9800 61
..OSCILLATORIALES	
...OSCILLATORIA	600 4
EUGLENOPHYTA (EUGLENIDS)	
.EUGLENOPHYCEAE	
..EUGLENALES	
...EUGLENACEAE	
....EUGLENA	400 3

DATE	NOV 24, 86
TIME	1300
TOTAL CELLS/ML	10000
	CELLS PER- /ML CENT
CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	400 4
...SCENEDESMACEAE	
....SCENEDESMUS	400 4
..VOLVOCALES	
...CHLAMYDOMONADACEAE	
....CHLAMYDOMONAS	1200 12
CHRYSOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...NAVICULACEAE	
....NAVICULA	600 6
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	6800 68
..OSCILLATORIALES	
...OSCILLATORIA	600 6

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	DEC 22, 86
TIME	1100
TOTAL CELLS/ML	7600

CELLS PER-
/ML CENT

CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	1600 21
...SCENEDESMACEAE	
....SCENEDESMUS	200 3
..VOLVOCALES	
...CHLAMYDOMONADACEAE	
....CHLAMYDOMONAS	400 5
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...NAVICULACEAE	
....NAVICULA	400 5
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	4600 61
..OSCILLATORIALES	
...OSCILLATORIAEAE	
....OSCILLATORIA	200 3
EUGLENOPHYTA (EUGLENOIDS)	
.EUGLENOPHYCEAE	
..EUGLENALES	
...EUGLENACEAE	
....EUGLENA	200 3

DATE	JAN 29, 87
TIME	1200
TOTAL CELLS/ML	13000

CELLS PER-
/ML CENT

CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	800 6
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...NAVICULACEAE	
....NAVICULA	400 3
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	11000 85
..OSCILLATORIALES	
...OSCILLATORIAEAE	
....OSCILLATORIA	400 3

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE FEB 25, 87
TIME 1400

TOTAL CELLS/ML 10000
CELLS PER-
/ML CENT

CHLOROPHYTA (GREEN ALGAE)
.CHLOROPHYCEAE
..CHLOROCOCCALES
...OOCYSTACEAE
....ANKISTRODESMUS 800 8
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)
.BACILLARIOPHYCEAE
..PENNALES
...NAVICULACEAE
....NAVICULA 600 6
CYANOPHYTA (BLUE-GREEN ALGAE)
.CYANOPHYCEAE
..CHROOCOCCALES
...CHROOCOCCACEAE
....ANACYSTIS 8800 88
..OSCILLATORIALES
...OSCILLATORIA
....OSCILLATORIA 200 2

DATE MAR 31, 87
TIME 1030

TOTAL CELLS/ML 26000
CELLS PER-
/ML CENT

CHLOROPHYTA (GREEN ALGAE)
.CHLOROPHYCEAE
..CHLOROCOCCALES
...OOCYSTACEAE
....ANKISTRODESMUS 3400 13
..VOLVOCALES
...CHLAMYDOMONADACEAE
....CHLAMYDOMONAS 2200 8
CHRYSTOPHYTA (YELLOW-GREEN ALGAE)
.BACILLARIOPHYCEAE
..PENNALES
...FRAGILARIACEAE
....FRAGILARIA 400 2
...NAVICULACEAE
....NAVICULA 2400 9
CYANOPHYTA (BLUE-GREEN ALGAE)
.CYANOPHYCEAE
..CHROOCOCCALES
...CHROOCOCCACEAE
....ANACYSTIS 17000 65
..OSCILLATORIALES
...OSCILLATORIA
....OSCILLATORIA 200 <1

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	APR 28, 87
TIME	1200

TOTAL CELLS/ML	27000
	CELLS PER- /ML CENT

CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	1800 7
..SCENEDESMACEAE	
....SCENEDESMUS	2200 8
..VOLVOCALES	
...CHLAMYDOMONADACEAE	
....CHLAMYDOMONAS	800 3
CHRYSOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..CENTRALES	
...COSCINODISCACEAE	
....CYCLOTELLA	200 <1
..PENNALES	
...FRAGILARIACEAE	
....FRAGILARIA	400 1
...NAVICULACEAE	
....NAVICULA	1200 4
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	18000 67
..OSCILLATORIALES	
...OSCILLATORIA	
....OSCILLATORIA	800 3
EUGLENOPHYTA (EUGLENOIDS)	
.EUGLENOPHYCEAE	
..EUGLENALES	
...EUGLENACEAE	
....EUGLENA	1400 5

DATE	MAY 29, 87
TIME	1230

TOTAL CELLS/ML	12000
	CELLS PER- /ML CENT

CHLOROPHYTA (GREEN ALGAE)	
.CHLOROPHYCEAE	
..CHLOROCOCCALES	
...OOCYSTACEAE	
....ANKISTRODESMUS	600 5
..VOLVOCALES	
...CHLAMYDOMONADACEAE	
....CHLAMYDOMONAS	400 3
CHRYSOPHYTA (YELLOW-GREEN ALGAE)	
.BACILLARIOPHYCEAE	
..PENNALES	
...NAVICULACEAE	
....NAVICULA	1400 12
CYANOPHYTA (BLUE-GREEN ALGAE)	
.CYANOPHYCEAE	
..CHROOCOCCALES	
...CHROOCOCCACEAE	
....ANACYSTIS	9200 77
..OSCILLATORIALES	
...OSCILLATORIA	
....OSCILLATORIA	800 7

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

PHYTOPLANKTON ANALYSES, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE JUN 30, 87
TIME 1100

TOTAL CELLS/ML 22000

CELLS PER-
/ML CENT

CHLOROPHYTA (GREEN ALGAE)

.CHLOROPHYCEAE
..CHLOROCOCCALES
...OOCYSTACEAE
....ANKISTRODESMUS 800 4
...SCENEDESMACEAE
....SCENEDESMUS 1800 8
..VOLVOCALES
...CHLAMYDOMONADACEAE
....CHLAMYDOMONAS 2000 9

CHRYSTOPHYTA (YELLOW-GREEN ALGAE)

.BACILLARIOPHYCEAE
..PENNALES
...NAVICULACEAE
....NAVICULA 1000 5

CYANOPHYTA (BLUE-GREEN ALGAE)

.CYANOPHYCEAE
..CHROOCOCCALES
...CHROOCOCCACEAE
....ANACYSTIS 15000 68
..OSCILLATORIALES
...NOSTOCACEAE
....ANABAENA 200 <1
...OSCILLATORIA
....OSCILLATORIA 600 3

EUGLENOPHYTA (EUGLENOIDS)

.EUGLENOPHYCEAE
..EUGLENALES
...EUGLENACEAE
....EUGLENA 200 <1

DATE JUL 31, 87
TIME 1400

TOTAL CELLS/ML 39000

CELLS PER-
/ML CENT

CHLOROPHYTA (GREEN ALGAE)

.CHLOROPHYCEAE
..CHLOROCOCCALES
...HYDRODICTYACEAE
....PEDIASTRUM 400 1
...OOCYSTACEAE
....ANKISTRODESMUS 12000 31
...CHLORELLA 2200 6
...SCENEDESMACEAE
....SCENEDESMUS 8000 21
..VOLVOCALES
...CHLAMYDOMONADACEAE
....CHLAMYDOMONAS 7000 18
..ZYGNEATALES
...DESMIDIACEAE
....STAUSTRUM 1600 4

CHRYSTOPHYTA (YELLOW-GREEN ALGAE)

.BACILLARIOPHYCEAE
..PENNALES
...NAVICULACEAE
....NAVICULA 400 1

CYANOPHYTA (BLUE-GREEN ALGAE)

.CYANOPHYCEAE
..CHROOCOCCALES
...CHROOCOCCACEAE
....AGMENELLUM
....A. QUADRUPLICATUM 600 2
....ANACYSTIS 4600 12
..OSCILLATORIALES
...OSCILLATORIA
....OSCILLATORIA 1600 4

EUGLENOPHYTA (EUGLENOIDS)

.EUGLENOPHYCEAE
..EUGLENALES
...EUGLENACEAE
....EUGLENA 800 2

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	543	1320	1320	1520	826	569	1410	1530	490	1010	1460	1390
2	522	1360	1330	1510	914	708	1400	1520	550	754	1460	1400
3	385	1330	1210	1470	893	826	1400	1520	810	548	1470	1440
4	384	775	1370	1480	1100	994	1410	1530	---	672	1480	1440
5	388	541	1420	1460	1160	1140	1410	1540	---	940	1520	1370
6	338	506	1440	1460	662	1270	1400	1530	---	972	1420	1450
7	325	470	1330	1440	810	1300	1410	1530	---	1160	1420	1480
8	345	551	957	969	1000	1370	1400	1530	1320	1240	1440	1740
9	508	662	827	960	1170	1370	1400	1570	1300	1290	1450	1440
10	631	789	1110	963	1290	1370	1400	1440	1280	1350	1460	803
11	774	781	1240	966	1350	1380	1400	1600	1120	1390	1410	795
12	920	997	1270	963	1380	1390	1420	1710	910	1390	1470	1320
13	846	1270	1330	1240	1380	1410	1420	1550	1190	1380	1440	928
14	1010	1270	1380	1310	1410	1430	1410	1530	1340	1220	1460	1220
15	982	1330	1370	1350	1290	1450	1380	1550	---	1290	1050	1380
16	---	1340	1410	1380	708	1440	1420	1540	---	1360	990	1260
17	---	1330	1390	1370	770	517	1420	1560	---	1270	1200	---
18	---	1330	1410	1330	941	655	1410	1190	1240	666	1280	983
19	---	1350	1410	1340	1160	754	1420	1700	1230	899	1330	466
20	1340	---	1420	1350	1140	753	1420	1510	1230	1180	1330	732
21	1440	---	1450	1410	1290	900	1410	1400	1230	1320	1460	1080
22	658	---	1460	1450	1350	990	1360	680	1230	1350	1350	706
23	538	---	1460	1470	1390	1180	1410	500	1200	1350	1240	1030
24	434	---	1470	1460	1380	880	1430	750	1310	1370	1270	1300
25	428	---	1470	1430	1410	1060	1440	860	1370	1390	642	1350
26	496	---	1470	1430	1370	1330	1440	590	1380	1390	---	1390
27	644	---	1470	1420	1330	1340	1450	880	1440	---	768	857
28	874	---	1470	1240	778	1340	1440	---	1460	1400	770	616
29	1030	---	1460	746	---	1340	1450	---	1500	1390	1160	728
30	1150	---	1480	837	---	1340	1480	---	1270	1400	1280	1000
31	1240	---	1470	752	---	1410	---	---	---	1410	1410	---
MEAN	---	---	1360	1270	1130	1140	1420	---	---	---	---	---
MAX	---	---	1480	1520	1410	1450	1480	---	---	---	---	---
MIN	---	---	827	746	662	517	1360	---	---	---	---	---

ARKANSAS RIVER BASIN

07241550 NORTH CANADIAN RIVER NEAR HARRAH, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	19.0	10.5	7.0	9.0	7.0	4.0	25.0	21.0	29.0	35.0	---
2	24.0	17.0	10.0	6.5	9.0	7.5	---	25.5	21.0	27.0	35.5	24.0
3	23.0	17.0	10.0	5.5	10.5	10.5	---	25.0	21.0	26.0	32.0	29.0
4	21.0	15.0	9.0	6.5	11.5	11.5	13.0	22.5	---	26.0	32.0	29.0
5	20.0	13.0	10.0	6.0	11.0	15.5	13.0	23.5	---	26.0	32.0	30.0
6	20.5	13.0	10.0	5.5	7.0	15.5	13.0	22.0	---	26.0	32.0	30.0
7	21.0	14.0	10.0	7.0	7.5	15.5	14.0	22.0	---	---	33.0	28.0
8	20.5	13.0	9.0	4.0	9.0	15.5	16.0	23.5	29.0	---	34.0	28.0
9	20.0	14.0	7.0	4.0	8.0	11.5	17.5	24.5	27.0	28.0	34.0	28.0
10	19.0	9.0	6.0	4.0	10.5	9.0	18.0	27.5	24.0	28.0	33.0	28.0
11	19.0	8.0	10.0	5.5	12.5	10.0	21.0	27.0	25.0	28.0	33.0	26.0
12	14.0	3.0	7.5	8.0	14.0	12.0	22.0	26.0	25.0	28.0	33.0	24.0
13	16.0	6.0	9.0	8.0	14.0	13.0	14.0	27.5	26.0	27.0	30.0	26.0
14	17.0	6.0	8.0	9.0	14.0	15.0	14.0	29.0	29.0	33.0	29.0	27.0
15	17.0	6.5	8.0	9.0	12.0	14.0	17.0	29.0	---	27.0	29.0	26.0
16	---	7.5	10.0	4.0	9.0	14.0	20.0	29.5	---	28.0	29.0	25.5
17	---	9.0	10.0	4.0	9.0	10.0	20.0	29.0	---	27.0	29.0	---
18	---	10.0	13.0	2.0	7.5	10.0	24.0	29.0	---	27.0	26.0	24.0
19	---	10.0	10.0	---	11.0	18.0	26.0	26.5	---	30.0	27.0	24.0
20	20.0	---	12.0	3.0	10.5	19.0	23.0	27.5	---	30.0	32.0	25.0
21	18.0	---	9.0	4.0	10.5	19.0	20.0	28.5	---	29.0	30.0	24.0
22	16.0	---	9.0	5.5	10.5	19.0	20.5	22.0	---	30.0	30.0	24.0
23	17.0	---	7.0	6.0	10.5	18.0	24.0	22.0	---	30.0	28.0	23.0
24	14.0	---	---	5.5	10.5	18.0	23.0	22.5	---	30.0	---	27.0
25	15.5	---	10.0	5.5	10.5	21.5	24.0	24.0	28.0	29.0	28.0	28.0
26	18.0	---	10.0	6.0	10.0	7.5	24.0	25.0	27.0	30.0	---	27.0
27	16.5	---	10.0	7.0	11.0	8.0	25.0	21.5	29.0	---	25.0	---
28	16.5	---	9.0	8.0	7.0	6.5	24.0	---	28.0	30.0	---	21.0
29	18.0	---	9.0	7.0	---	6.5	24.0	---	28.0	30.0	27.0	25.0
30	18.0	---	9.0	9.0	---	5.5	25.0	---	29.0	32.0	27.0	24.0
31	18.0	---	9.0	6.5	---	5.0	---	---	---	34.0	---	---
MEAN	---	---	---	---	10.2	12.5	---	---	---	---	---	---
MAX	---	---	---	---	14.0	21.5	---	---	---	---	---	---
MIN	---	---	---	---	7.0	5.0	---	---	---	---	---	---

ARKANSAS RIVER BASIN

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK

LOCATION.--Lat 35°15'56", long 96°12'22" (revised), in center of SW 1/4 sec.12, T.9 N., R.10 E., Hughes County, Hydrologic Unit 11100302, on left downstream side of bridge on U.S. Highway 75, 2.3 mi upstream from Wewoka Creek, 2.5 mi northeast of Wetumka, and at mile 84.4.

DRAINAGE AREA.--14,290 mi² of which 4,899 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 977: 1942. WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 683.28 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 19, 1939, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Some regulation by Lake Overholser (station 07240500) and other dams upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--50 years, 711 ft³/s, 515,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,000 ft³/s, Apr. 15, 1945, gage height, 26.40 ft, no flow Aug. 27 to Oct. 11, 1954, Aug. 25 to Oct. 22, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1923 reached a stage of 26.9 ft, from information provided by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,100 ft³/s, Oct. 1, gage height, 13.72 ft; minimum daily discharge, 277 ft³/s, Aug. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12000	1450	1590	876	2610	12300	1590	956	8150	1480	766	475
2	14500	1240	1400	843	3110	8210	1670	913	11700	1740	622	397
3	8970	1120	1390	839	2570	5940	1550	887	13900	3430	539	361
4	6080	2650	1330	858	2060	5750	1520	874	10700	3530	494	331
5	6040	5860	1190	863	1910	5010	1490	856	6810	3690	472	311
6	6400	4610	1040	870	2010	2890	1460	806	4050	3810	480	303
7	8340	3880	1160	859	2840	2210	1440	791	2880	2670	477	348
8	9660	4070	1480	856	3350	1970	1440	752	2270	1940	464	375
9	9290	3790	2620	1960	2980	1960	1410	719	2160	1620	445	344
10	8220	3130	2330	2790	2290	1770	1410	708	1960	1430	414	321
11	6880	2350	1960	2270	1890	1690	1390	701	1810	1300	395	303
12	6690	2060	1900	2100	1680	1700	1380	675	1790	1170	380	297
13	4530	1940	1660	1510	1540	1650	1360	608	2080	1200	367	295
14	3080	1920	1500	1190	1940	1560	1330	507	2200	1250	356	338
15	2630	1730	1370	1110	2860	1450	1300	458	1940	1300	353	441
16	1990	1660	1310	1140	5490	1360	1290	556	1490	1340	350	421
17	1880	1550	1280	1290	4160	3520	1290	658	1520	1120	390	471
18	1680	1530	1230	2350	3880	6080	1310	570	1580	1320	530	446
19	1460	1510	1140	1820	3720	4570	1280	541	1630	1110	642	544
20	1310	1490	1150	1900	2630	4380	1260	526	1880	974	434	597
21	1230	1460	1170	1850	2080	4060	1250	511	4080	1130	340	544
22	1400	1420	1140	2000	1720	2920	1300	472	3360	887	315	459
23	3310	1390	1020	1770	1550	2740	1560	603	3580	793	291	555
24	3060	1360	956	1640	1560	3180	1480	716	2570	935	350	396
25	3370	1420	942	1690	1810	2290	1360	1710	2130	832	277	381
26	3800	2970	938	1580	1830	2350	1270	1920	1700	953	289	374
27	4010	3100	942	1350	3710	2330	1220	1230	1530	889	900	316
28	4110	3310	930	1340	8650	1790	1110	3920	1450	866	737	366
29	2750	3280	914	1900	---	1630	1020	8280	1480	860	698	439
30	1960	2210	907	2220	---	1600	992	7060	1450	846	546	322
31	1690	---	904	2300	---	1570	---	5810	---	831	633	---
TOTAL	152320	71460	40793	47934	78430	102430	40732	46294	105830	47246	14746	11871
MEAN	4914	2382	1316	1546	2801	3304	1358	1493	3528	1524	476	396
MAX	14500	5860	2620	2790	8650	12300	1670	8280	13900	3810	900	597
MIN	1230	1120	904	839	1540	1360	992	458	1450	793	277	295
AC-FT	302100	141700	80910	95080	155600	203200	80790	91820	209900	93710	29250	23550

CAL YR 1986 TOTAL 516219 MEAN 1414 MAX 14500 MIN 158 AC-FT 1024000
WTR YR 1987 TOTAL 760086 MEAN 2082 MAX 14500 MIN 277 AC-FT 1508000

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952, 1954 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1953 to current year.

WATER TEMPERATURE: October 1953 to current year.

REMARKS.--Samples were collected by a local observer on a daily basis. Samples were collected on a 6-week schedule. Specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 37,100 microsiemens, Dec. 31, 1954; minimum daily, 98 microsiemens, Apr. 30, 1977.

WATER TEMPERATURE: Maximum daily, 39.0 °C, July 5, 1971; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,600 microsiemens, May 17; minimum daily, 155 microsiemens, Oct. 1.

WATER TEMPERATURE: Maximum daily, 30.0 °C on Aug. 1, 2; minimum daily, 0.5 °C, Jan. 18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT												
21...	1400	1028	1028	3.38	1230	948	8.10	22.0	18.0	--	750	--
NOV												
18...	1600	1028	80020	3.90	1520	1120	7.70	9.5	9.0	150	750	12.2
JAN												
13...	1400	1028	80020	3.79	1470	566	7.30	11.0	5.5	250	750	14.8
FEB												
24...	1400	1028	80020	3.83	1510	948	7.60	8.0	8.5	100	750	10.8
APR												
07...	1430	1028	80020	3.63	1440	1350	7.80	16.5	15.0	130	750	9.9
MAY												
20...	1500	1028	80020	2.23	521	1330	8.40	29.0	27.5	--	740	--
JUN												
30...	1200	1028	80020	3.55	1450	1210	7.70	27.5	26.5	170	740	7.2
JUL												
29...	1000	1028	80020	2.57	859	1280	7.90	37.0	32.0	--	740	8.9
AUG												
11...	1200	1028	80020	1.60	412	*1370	8.00	29.5	32.5	25	740	8.4
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)
OCT												
21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
18...	108	230	K640	340	120	89	29	100	38	2	5.8	276
JAN												
13...	119	2100	2200	170	43	43	14	53	40	2	3.8	149
FEB												
24...	94	330	210	290	81	74	25	86	39	2	4.7	259
APR												
07...	100	K62	K40	420	190	110	36	130	40	3	5.3	287
MAY												
20...	--	--	--	370	140	88	36	150	47	4	5.4	305
JUN												
30...	93	K450	2100	350	150	92	30	120	42	3	6.0	254
JUL												
29...	126	--	--	380	140	96	33	130	42	3	5.8	285
AUG												
11...	120	K23	K59	370	87	91	35	140	45	3	6.5	353

* SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CARBONATE WATER WH IT FIELD (MG/L AS CO3)	ALKALINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLORIDE, DIS- SOLVED (MG/L AS CL)	FLUORIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITROGEN, NITRATE DIS- SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS- SOLVED (MG/L AS N)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 18...	0	226	160	140	0.50	14	702	679	0.95	2880	1.08	0.020
JAN 13...	0	122	62	75	0.30	8.3	348	338	0.47	1380	1.08	0.020
FEB 24...	0	212	85	120	0.40	11	562	538	0.76	2290	1.17	0.030
APR 07...	0	235	180	180	0.50	10	846	802	1.15	3290	--	<0.010
MAY 20...	0	250	170	210	--	6.0	830	803	1.13	1170	--	<0.010
JUN 30...	0	208	180	180	0.60	10	753	749	1.02	2950	--	<0.010
JUL 29...	0	234	170	190	--	10	790	781	1.07	1830	--	<0.010
AUG 11...	0	289	130	210	0.70	8.9	810	796	1.10	901	--	<0.010
DATE	NITROGEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITROGEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DIS- SOLVED (MG/L AS P)	PHOSPHOROUS ORTHOPHOSPHATE, DIS- SOLVED (MG/L AS P)	PHOSPHOROUS ORTHOPHOSPHATE, DIS- SOLVED (MG/L AS PO4)	PHOSPHOROUS ORGANIC TOTAL (MG/L AS P)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 18...	0.07	1.10	0.080	0.070	0.09	0.92	1.0	0.370	0.360	0.330	1.0	0.37
JAN 13...	0.07	1.10	0.070	0.060	0.08	1.4	1.5	0.500	0.250	0.140	0.43	0.50
FEB 24...	0.10	1.20	0.120	0.100	0.13	1.8	1.9	0.530	0.270	0.230	0.71	0.53
APR 07...	--	1.10	0.050	0.030	0.04	1.5	1.5	0.360	0.310	0.240	0.74	0.36
MAY 20...	--	<0.100	--	0.010	0.01	--	--	--	--	0.210	0.64	--
JUN 30...	--	0.680	0.060	0.080	0.10	2.1	2.2	0.600	0.240	0.230	0.71	0.60
JUL 29...	--	<0.100	--	0.040	0.05	--	--	--	--	0.410	1.3	--
AUG 11...	--	<0.100	0.020	0.020	0.03	1.5	1.5	0.480	0.410	0.360	1.1	0.48
DATE	PHOSPHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUMINUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYLLIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHROMIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 18...	0.03	40	4	57	<0.5	2	1	<3	8	--	<5	30
JAN 13...	0.11	--	--	--	--	--	--	--	--	--	--	--
FEB 24...	0.04	10	2	200	1	3	<1	<3	3	18	<5	24
APR 07...	0.07	80	3	250	<0.5	<1	<1	<3	<1	6	<5	35
MAY 20...	--	--	6	180	0.5	<1	<10	<3	<10	8	<10	41
JUN 30...	0.01	--	4	290	<0.5	1	10	<3	<10	10	<10	35
JUL 29...	--	--	8	250	<0.5	<1	<5	<3	<10	7	<10	43
AUG 11...	0.05	<10	5	220	<0.5	<1	1	<3	1	<3	<5	49

ARKANSAS RIVER BASIN

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07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 21...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 18...	10	<0.1	<10	4	<1	1.0	770	<6	13	1220	5010	36
JAN 13...	--	--	--	--	--	--	--	--	--	1250	4960	40
FEB 24...	12	<0.1	<10	3	<1	1.0	730	<6	21	1260	5140	24
APR 07...	7	<0.1	<10	1	<1	<1.0	1000	<6	10	729	2830	52
MAY 20...	2	<0.1	10	--	--	--	1100	14	10	--	--	--
JUN 30...	<1	<1.0	<10	--	--	--	950	11	6	779	3050	80
JUL 29...	<1	<0.1	<10	<10	--	<1.0	1100	18	<3	--	--	--
AUG 11...	2	0.2	<10	<1	<1	<1.0	1200	16	5	103	115	59

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	155	---	624	1350	774	282	1210	1440	340	1260	1380	1160
2	178	---	700	1350	577	339	1300	1430	378	1290	1390	974
3	243	---	826	1350	708	460	1260	1440	395	1220	1380	948
4	420	---	997	1350	662	492	1300	1430	407	625	1330	1030
5	476	428	1120	1330	737	580	1340	1470	454	581	1260	---
6	474	---	1160	1350	830	608	1350	1480	524	524	1340	1340
7	444	479	1140	1340	709	712	1350	1430	632	584	1340	1320
8	424	495	1050	1310	738	818	1350	1440	718	624	1420	1300
9	407	515	916	1300	697	936	1360	1490	822	794	1350	1400
10	387	507	720	732	654	1080	1350	1490	957	876	1320	1400
11	368	529	734	693	753	1150	1360	1430	1070	---	1400	1360
12	387	577	764	755	896	1180	1340	1480	1110	1120	1410	1210
13	456	625	950	623	992	1230	1350	1430	1130	1160	1430	1260
14	536	642	995	640	1040	1260	1350	1350	1240	1220	1420	1310
15	648	708	1090	779	1020	1260	1360	1240	1080	1290	1450	1280
16	760	1060	1100	860	534	1250	1380	1230	878	1290	1390	1150
17	754	1120	1140	912	418	1160	1360	1600	1050	1300	1330	896
18	828	1200	1180	816	597	631	1380	1400	1200	1160	1360	1250
19	957	1200	1220	736	630	519	---	1430	1290	1020	1370	940
20	996	1230	1260	800	652	702	1340	1430	1270	1230	1460	1030
21	995	1220	1280	774	674	543	1380	1430	826	1280	1030	1190
22	994	1240	1270	734	809	664	1370	1440	695	1220	1090	822
23	844	1250	1270	766	941	652	1320	1420	813	989	1140	846
24	630	1270	1270	764	974	578	1230	1360	650	907	976	980
25	516	919	1270	813	928	625	1330	1310	875	1160	1240	785
26	506	788	1300	850	1010	801	1280	730	1090	1200	1210	1030
27	495	576	1320	934	805	1060	1330	610	1090	1310	820	1040
28	466	553	1340	1040	671	916	1360	440	1210	1330	646	884
29	477	523	1330	828	---	981	1340	380	1290	1370	903	573
30	515	582	1340	802	---	1100	1380	260	1280	1370	1050	951
31	---	---	1340	794	---	1230	---	310	---	1370	808	---
MEAN	---	---	1100	951	765	832	---	1230	892	---	1240	---
MAX	---	---	1340	1350	1040	1260	---	1600	1290	---	1460	---
MIN	---	---	624	623	418	282	---	260	340	---	646	---

ARKANSAS RIVER BASIN

07242000 NORTH CANADIAN RIVER NEAR WETUMKA, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0	---	7.5	5.0	6.5	8.0	10.0	22.0	22.0	26.0	30.0	22.0
2	22.0	---	6.5	4.0	7.0	7.0	9.0	22.0	23.0	26.0	30.0	22.0
3	23.5	---	7.0	5.5	8.0	8.0	9.0	23.0	24.0	26.5	29.0	23.0
4	23.0	---	7.5	4.5	8.5	8.5	9.5	22.0	23.0	26.0	29.5	24.0
5	21.0	13.5	8.0	4.0	9.5	10.0	10.5	22.0	23.0	26.0	29.0	---
6	20.0	---	8.5	6.0	9.0	10.5	11.0	22.0	23.0	26.0	29.0	25.0
7	20.0	13.0	9.0	6.0	8.0	11.0	12.0	22.5	23.5	27.0	29.5	25.0
8	20.0	12.0	8.0	6.0	8.5	13.5	13.0	22.0	25.0	27.5	29.0	25.0
9	20.0	11.5	7.0	6.0	7.0	13.0	14.0	22.5	25.0	27.0	29.0	25.0
10	20.0	11.5	6.0	6.0	7.0	10.0	15.0	22.5	25.0	27.0	28.5	24.5
11	19.5	4.5	7.0	4.0	9.0	9.5	17.0	23.0	24.5	---	28.5	24.5
12	17.0	6.5	6.0	4.0	10.0	9.0	17.0	23.5	24.0	27.0	29.0	23.0
13	17.0	4.5	6.0	4.0	10.5	10.0	17.0	24.0	25.0	27.0	29.0	22.5
14	15.0	1.5	6.5	6.5	13.0	11.0	15.0	24.5	27.0	24.5	29.0	25.0
15	14.0	5.5	6.0	7.0	12.0	13.0	13.5	25.0	28.0	25.0	29.5	24.5
16	14.0	7.0	6.0	6.0	9.0	14.0	14.5	24.0	28.0	26.5	29.0	23.0
17	15.0	8.0	9.0	5.0	4.0	14.0	16.5	24.0	29.5	27.0	29.0	23.0
18	15.5	8.5	8.0	.5	5.0	13.0	18.5	25.0	28.5	26.0	27.0	23.0
19	16.0	8.0	7.0	4.0	4.0	13.0	---	26.0	28.0	27.0	28.0	20.0
20	17.0	9.0	7.0	1.0	6.0	14.5	21.0	24.0	23.5	27.0	29.0	20.5
21	17.0	9.5	6.5	1.0	5.5	15.0	21.0	24.5	24.0	27.0	27.0	20.0
22	17.5	10.0	7.0	1.0	6.5	15.0	17.0	25.0	26.0	27.5	27.0	20.0
23	17.5	11.0	6.0	1.0	6.5	16.5	18.0	23.5	27.0	28.0	27.0	19.5
24	16.0	9.0	5.0	1.0	9.0	14.0	18.0	23.0	27.0	29.0	24.0	20.0
25	16.0	9.0	5.5	2.0	9.0	11.0	19.0	23.0	28.0	29.0	27.0	21.0
26	16.0	9.0	6.5	1.0	9.5	11.0	20.0	23.0	26.5	28.0	27.0	22.0
27	15.0	7.0	6.5	3.0	10.0	10.5	20.5	24.0	25.0	29.0	25.0	23.0
28	14.0	6.5	6.0	4.0	10.5	10.0	20.5	22.0	27.0	29.0	21.5	21.0
29	15.0	8.0	5.5	4.5	---	10.0	21.0	19.0	27.0	29.0	22.0	20.0
30	15.0	7.0	5.0	6.0	---	6.0	21.5	19.0	26.0	29.0	23.0	20.0
31	---	---	5.0	6.0	---	7.0	---	21.0	---	29.0	22.0	---
MEAN	---	---	6.7	4.0	8.1	11.2	---	23.0	25.5	---	27.5	---
MAX	---	---	9.0	7.0	13.0	16.5	---	26.0	29.5	---	30.0	---
MIN	---	---	5.0	.5	4.0	6.0	---	19.0	22.0	---	21.5	---

07242340 ARCADIA LAKE NEAR ARCADIA, OK

LOCATION.--Lat 35°38'54", long 97°21'47", in NW 1/4 SE 1/4 sec.36, T.14 N., R.2 W., Oklahoma County, Hydrologic Unit 11100303, 2.0 mi southwest of Arcadia and at mile 213.8.

DRAINAGE AREA.--105 mi².

PERIOD OF RECORD.--November 1986 to September 1987.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earth dam. An uncontrolled saddle spillway is located on the left end of the dam. Outlet works consist of a 7- by 10-foot conduit and an 18-inch water-supply pipe. Impoundment began Nov. 9, 1986; conservation pool first filled May 29, 1987. Capacity 92,101 acre-ft at elevation 1,029.5 ft, top of flood-control pool and spillway crest; 27,580 acre-ft at elevation 1,006.0 ft, top of conservation pool. Dead storage 190 acre-ft below elevation 970.0 ft. Figures given herein represent total contents. Reservoir is used for flood control, water-quality control, recreation, fish and wildlife, and future water supply. U.S. Army Corps of Engineers' satellite telemeter located at station.

EXTREMES FOR CURRENT PERIOD.--Maximum contents 40,600 acre-ft, June 4, elevation 1,012.34 ft; minimum contents since conservation pool first filled, 15,000 acre-ft, July 29, elevation, 97.91 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

980	1,630	1,030	93,937
990	6,989	1,040	138,717
1,000	17,841	1,050	197,302
1,010	35,428	1,060	272,330
1,020	60,273	1,070	367,981

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	5160	7460	11500	21100	16000	15000	39900	32200	15100	15200
2	---	---	5230	7500	11600	21200	15600	15000	40100	36500	15000	15200
3	---	---	5290	7530	11700	21400	15400	15100	40400	36400	15000	15200
4	---	---	5330	7570	11700	21400	15300	15100	40600	36200	15000	15200
5	---	---	5390	7620	12500	21500	15300	15100	40600	35800	15000	15200
6	---	---	5500	7650	13400	21500	15200	15100	40400	35000	15000	15200
7	---	---	5760	7660	13600	21400	15200	15100	40100	33500	15100	15200
8	---	---	6080	7910	13700	21200	15200	15100	39800	31800	15000	15200
9	---	2080	6330	8620	13800	20900	15100	15100	39400	30900	15000	15200
10	---	2260	6440	8720	13900	20500	15100	15100	39500	29200	15000	15600
11	---	2360	6540	8820	14000	20000	15100	15100	42200	25900	15000	15700
12	---	2420	6600	8910	14000	19400	15100	15100	42100	24100	15000	15800
13	---	2460	6660	8970	14200	18900	15100	15100	41500	22500	15100	15800
14	---	2500	6710	9020	14600	18400	15100	15100	40800	20600	15200	15800
15	---	2540	6760	9050	16800	17800	15000	15100	40100	18800	15200	16000
16	---	2590	6820	9130	17200	17800	15000	15100	39400	17800	15100	16200
17	---	2630	6860	9220	17400	19600	15000	15100	38700	17600	15200	16200
18	---	2590	6900	9310	17400	19700	15000	15100	38100	17700	15100	16800
19	---	2340	6940	9380	17400	19700	15000	15300	37600	17500	15100	16800
20	---	2090	6980	9460	17300	19500	15000	15300	39600	17200	15100	16800
21	---	2030	7010	9530	17100	19300	15000	15500	39100	17100	15100	16800
22	---	e2030	7060	9640	17000	19000	15000	17600	38500	16700	15100	16500
23	---	e2040	7120	9720	16800	19200	15000	17800	37700	16500	15100	16200
24	---	2060	7160	9810	16800	19200	15100	17900	36600	16200	15900	16000
25	---	3920	7200	9890	16700	18700	15100	18600	35400	16000	15900	15800
26	---	4780	7250	9980	16700	18400	15000	18600	34300	15700	15800	15400
27	---	4890	7280	10200	17000	18000	15000	24300	33100	15500	15900	16300
28	---	4970	7330	10800	20800	17600	15000	35500	32000	15200	15600	16400
29	---	5050	7370	11100	---	17200	15000	37800	31000	15000	15600	16400
30	---	5130	7400	11300	---	16800	15000	38000	32400	15000	15400	16000
31	---	---	7430	11300	---	16400	---	39500	---	15100	15300	---
MAX	---	---	7430	11300	20800	21500	16000	39500	42200	36500	15900	16800
MIN	---	---	5160	7460	11500	16400	15000	15000	31000	15000	15000	15200
(+)	---	987.35	990.56	994.77	1,001.95	998.94	997.93	1,011.88	1,008.53	997.97	998.14	998.69
(++)	---	---	+2,304	+3,910	+9,460	-4,400	-1,400	+24,500	-7,100	-17,300	+200	+700

e Estimated

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

ARKANSAS RIVER BASIN

07242350 DEEP FORK NEAR ARCADIA, OK

LOCATION.--Lat 35°38'50", long 97°21'35", in NE 1/4 SW 1/4 sec.36, T.14 N., R.2 W., Oklahoma County, Hydrologic Unit 11100303, on right bank 400 ft downstream from Arcadia Dam, 2.0 mi southwest of Arcadia, 2.6 mi upstream from Coffee Creek, and at mile 213.7.

DRAINAGE AREA.--105 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to current year.

REVISED RECORDS.--WDR OK-77-1: 1975 (M) (gage height only), WDR OK-84-1: 1983 (m).

GAGE.--Water-stage recorder. Datum of gage is 900.00 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 1, 1974, at site 0.9 mi downstream at datum 41.65 ft higher. May 2, 1978 to May 14, 1979, the gage was temporarily moved 1.9 mi downstream to county road bridge at datum 36.65 ft higher. May 15, 1979 to March 10, 1987, at site 0.6 mi downstream at datum 41.65 ft higher.

REMARKS.--Records poor Oct. 1 to Mar. 10, good Mar. 11 to Sept. 30. Regulation since November 1986 by Arcadia Lake (station 07242340), 400 ft upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Arcadia Lake, 17 years (water years 1970-86), 66.3 ft³/s, 48,030 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,300 ft³/s, Nov. 2, 1974, gage height, 26.9 ft from floodmark at former site and datum; minimum daily, 0.06 ft³/s, multiple days in 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,120 ft³/s, July 9, gage height, 56.84 ft; minimum daily discharge, 0.06 ft³/s, multiple days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	870	e4.1	.23	e.36	.40	.62	246	.26	.79	315	.07	22
2	866	e3.6	.23	e.36	.40	.42	245	.26	.25	398	.06	.06
3	1030	e3.3	.23	e.34	.40	.42	153	.26	.33	251	.07	.07
4	905	3.9	.23	e.32	.40	1.2	51	.29	26	251	.08	.06
5	602	e1.5	.23	e.30	.94	2.2	51	.24	92	251	.07	.06
6	93	e.97	.24	e.30	.71	16	50	.25	145	472	.06	.06
7	10	e.76	.32	e.28	.49	24	50	.26	145	854	.06	.06
8	7.3	e.66	.38	e.40	.56	24	51	.26	202	984	.06	.06
9	6.3	5.0	.29	e.54	.47	40	51	.26	260	1060	.06	.06
10	6.7	e.59	.21	e.50	.49	67	33	.26	260	1100	.07	.06
11	6.5	e.34	.20	e.40	.52	178	22	.27	264	1090	.06	.06
12	21	e.25	.20	e.30	.58	353	22	.27	325	1080	.06	.06
13	9.3	.24	.20	.26	.51	352	22	.27	403	1080	.07	.06
14	6.6	e.24	.20	e.26	.62	352	22	.26	402	1060	.06	.06
15	5.2	e.25	.20	e.24	.97	349	23	.47	392	969	.06	.06
16	4.9	e.24	.21	e.30	e.60	168	22	.25	387	672	.06	.09
17	4.4	.26	.23	e.28	e.40	.97	23	.23	387	340	.07	32
18	e4.0	12	.23	e.48	25	.14	22	.23	384	164	.07	103
19	e3.0	37	.25	e.46	111	71	23	.37	381	164	.07	132
20	2.7	37	.30	e.44	100	177	23	.23	381	163	.07	132
21	3.1	22	.29	e.44	95	177	22	.21	381	164	.06	132
22	409	.24	.26	e.45	92	177	22	1.1	382	164	.06	132
23	288	.20	.27	e.46	88	79	23	.24	450	164	.06	132
24	64	.21	.45	e.48	84	89	23	.37	601	162	.07	131
25	8.2	1.7	e.43	e.48	81	251	23	.73	654	161	67	131
26	6.5	.37	e.42	e.50	51	251	23	121	649	160	146	129
27	5.7	.21	e.40	e.56	.44	251	10	194	632	160	164	132
28	5.3	.21	e.40	.42	5.0	247	.29	3.6	628	161	128	49
29	4.9	.21	e.40	.42	---	246	.27	.25	625	57	70	62
30	4.5	.23	e.38	.40	---	245	.26	.18	274	.08	70	333
31	4.4	---	e.38	.39	---	244	---	.21	---	.08	69	---
TOTAL	5267.5	137.78	8.89	12.12	741.90	4433.97	1351.82	327.34	10112.77	14071.16	715.56	1784.9
MEAN	170	4.59	.29	.39	26.5	143	45.1	10.6	337	454	23.1	59.5
MAX	1030	37	.45	.56	111	353	246	194	654	1100	164	333
MIN	2.7	.20	.20	.24	.40	.14	.26	.18	.19	.08	.06	.06
AC-FT	10450	273	18	24	1470	8790	2680	649	20060	27910	1420	3540

CAL YR 1986 TOTAL 19418.70 MEAN 53.2 MAX 1180 MIN .20 AC-FT 38520
WTR YR 1987 TOTAL 38965.44 MEAN 107 MAX 1100 MIN .06 AC-FT 77290

e Estimated

ARKANSAS RIVER BASIN

201

07242350 DEEP FORK NEAR ARCADIA, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1969 to January 1980.

WATER TEMPERATURE: October 1969 to January 1980.

REMARKS.--A sample was collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	
OCT 29...	1345	1028	80020	1.48	4.9	930	7.80	24.0	17.0	740	9.8	105	
NOV 13...	0945	1028	80020	0.64	0.24	857	7.60	-15.5	1.5	760	13.4	96	
DEC 08...	1000	1028	80020	0.63	0.23	635	7.60	5.0	7.0	740	11.5	98	
JAN 13...	1300	1028	80020	0.64	0.26	730	8.20	12.0	10.5	730	6.4	60	
FEB 18...	1400	1028	80020	0.64	0.28	541	8.00	9.0	13.0	740	12.4	121	
MAR 25...	1300	1028	80020	53.68	249	589	7.80	9.0	12.5	730	10.1	99	
APR 16...	1400	1028	80020	51.53	23	608	8.10	25.0	13.0	730	10.7	106	
MAY 19...	1400	1028	80020	50.27	0.22	610	8.40	31.0	27.0	730	15.2	200	
JUN 12...	1300	1028	80020	53.76	263	252	7.30	30.0	25.5	740	7.6	96	
16...	1020	1028	1028	54.36	406	350	8.10	32.5	21.5	--	--	--	
29...	1345	1028	1028	55.30	617	390	7.40	27.0	24.5	--	--	--	
JUL 09...	1430	1028	80020	56.84	1210	401	7.60	28.0	26.5	740	7.7	99	
AUG 31...	1200	1028	80020	52.31	68	503	7.60	27.0	25.0	750	8.0	99	
SEP 14...	1600	1028	80020	50.18	0.06	828	8.20	30.0	32.0	740	--	--	
DATE		OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORGANIC DIS-SOLVED (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MERCURY DIS-SOLVED (UG/L AS HG)
OCT 29...	150	190	46	68	0.890	0.060	0.08	0.110	0.11	<10	<100	<0.1	
NOV 13...	--	150	37	22	5.80	0.110	0.14	0.170	0.17	10	<100	<0.1	
DEC 08...	18	120	29	17	3.80	0.020	0.03	0.090	0.09	40	<100	<0.1	
JAN 13...	16	130	32	20	4.30	0.030	0.04	0.030	0.03	<10	<100	<0.1	
FEB 18...	18	110	26	11	2.20	0.060	0.08	0.040	0.04	20	<100	<0.1	
MAR 25...	24	91	22	54	0.470	0.090	0.12	0.110	0.11	30	<100	<0.1	
APR 16...	17	21	5.0	55	0.340	0.060	0.08	0.100	0.10	20	<100	<0.1	
MAY 19...	<10	120	28	--	3.80	0.150	0.19	0.310	0.31	20	<100	<0.1	
JUN 12...	<10	35	8.6	13	0.290	0.300	0.39	0.190	0.19	50	<100	0.1	
16...	--	--	--	--	--	--	--	--	--	--	--	--	
29...	--	--	--	--	--	--	--	--	--	--	--	--	
JUL 09...	39	62	15	30	<0.100	0.160	0.21	0.060	0.06	30	<100	0.3	
AUG 31...	22	86	21	39	0.100	0.340	0.44	0.040	0.04	20	--	<0.1	
SEP 14...	28	220	54	26	23.0	0.030	0.04	0.040	0.04	810	<5	<0.1	

ARKANSAS RIVER BASIN

07242380 DEEP FORK NEAR WARWICK, OK

LOCATION.--Lat 35°40'05", long 90°00'33", NE 1/4 NW 1/4 sec. 20, T.14 N., R.3 E., Lincoln County, Hydrologic Unit 11100303, on left downstream abutment on U.S. Highway 66, 0.5 mi southwest of Warwick, and at mile 189.3.

DRAINAGE AREA.--532 mi².

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 823.05 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Considerable regulation by Arcadia Lake (station 07242340), 42.4 miles upstream, since November 1986. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,700 ft³/s Oct. 21, 1983, gage height, 22.05 ft, from high-water mark; minimum daily discharge, 0.05 ft³/s Aug. 23, 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 11,300 ft³/s, Feb. 28, gage height, 18.74 ft; minimum daily discharge, 0.05 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5420	174	e280	104	364	4810	475	119	1040	432	4.7	57
2	3180	154	e250	101	315	1260	472	117	561	1090	3.9	8.9
3	4040	148	202	104	231	994	449	114	1010	544	3.2	2.2
4	e2020	3280	186	103	188	868	304	108	470	461	2.2	1.5
5	e1500	1410	177	100	798	717	280	105	421	421	2.0	1.3
6	e900	648	173	102	2230	574	285	102	420	484	2.0	1.3
7	651	e460	424	96	681	582	292	105	386	884	1.5	1.5
8	551	e376	539	154	418	517	291	99	356	1020	1.0	1.6
9	493	e287	713	907	288	511	288	96	391	962	.65	1.2
10	e450	e511	311	277	234	555	277	91	397	949	.56	3.4
11	e400	e488	237	191	215	581	256	86	502	892	.45	3.1
12	e450	e274	207	170	215	542	253	88	382	861	.30	2.3
13	e350	e200	177	156	200	536	249	84	393	966	1.1	3.8
14	e250	e180	167	106	210	534	244	79	358	863	17	2.4
15	e210	e160	172	94	1950	520	242	75	326	799	2.7	3.1
16	e190	e130	170	94	1270	488	228	75	297	619	1.1	21
17	e170	e110	160	110	582	3450	222	75	278	414	.72	6.0
18	e140	e100	147	e75	468	923	214	72	381	225	.45	181
19	e125	e150	141	e100	409	621	207	69	337	163	.55	192
20	e120	e150	135	e125	359	624	189	89	1740	152	.55	141
21	115	e100	127	e120	324	551	238	76	751	160	.30	150
22	3050	e90	122	e130	300	515	214	481	623	163	.11	104
23	1420	e88	122	e140	274	641	199	325	557	171	e.05	96
24	773	e80	121	164	302	549	188	292	696	171	3.8	91
25	388	1730	115	135	322	551	184	511	762	168	46	88
26	290	3020	109	126	412	532	174	307	748	171	126	90
27	251	744	105	244	523	515	165	2640	708	168	176	502
28	242	556	104	780	6110	506	138	8950	693	164	160	404
29	221	416	104	1050	---	453	131	5340	685	144	89	178
30	207	318	105	351	---	439	125	1050	1260	22	73	268
31	195	---	105	238	---	447	---	1220	---	7.4	66	---
TOTAL	28762	16532	6207	6747	20192	25906	7473	23040	17929	14710.4	786.89	2606.6
MEAN	928	551	200	218	721	836	249	743	598	475	25.4	86.9
MAX	5420	3280	713	1050	6110	4810	475	8950	1740	1090	176	502
MIN	115	80	104	75	188	439	125	69	278	7.4	.05	1.2
AC-FT	57050	32790	12310	13380	40050	51380	14820	45700	35560	29180	1560	5170

CAL YR 1986 TOTAL 109071 MEAN 299 MAX 8010 MIN 12 AC-FT 216300
WTR YR 1987 TOTAL 170891.89 MEAN 468 MAX 8950 MIN .05 AC-FT 339000

e Estimated

07243000 DRY CREEK NEAR KENDRICK, OK

LOCATION.--Lat 35°46'55", long 96°51'20", in NW 1/4 NW 1/4 sec.14, T.15 N., R.4 E., Lincoln County, Hydrologic Unit 11100303, near left bank on downstream side of county road bridge, 1.0 mi downstream from Beaver Creek and 4.5 mi west of Kendrick.

DRAINAGE AREA.--69.0 mi².

PERIOD OF RECORD.--October 1955 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 820 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Oct. 1, 1981, gage at same site and datum 5.00 ft higher.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--32 years, 23.7 ft³/s, 17,170 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft³/s, Nov. 2, 1974, gage height, 24.20 ft present datum; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 1	0515	2,950	16.41	Mar. 17	0530	3,440	17.61
Oct. 22	0830	2,050	14.21	May 27	2345	2,130	14.36
Nov. 4	1200	2,440	15.20	May 28	2200	*4,000	*18.65
Nov. 25	2300	2,830	16.11				

Minimum daily discharge, 0.35 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	829	6.9	22	15	168	e900	13	3.5	66	5.7	1.1	1.9
2	183	6.7	20	15	87	76	10	3.4	29	4.8	1.1	1.6
3	216	7.0	18	16	54	50	10	3.3	190	4.2	1.0	1.5
4	31	749	17	15	44	35	10	3.0	31	4.2	.95	.92
5	11	219	16	15	303	29	10	3.1	19	3.4	.99	.38
6	7.8	42	17	15	499	26	10	3.0	e18	3.0	.99	.42
7	6.4	25	281	14	127	22	9.9	3.0	e17	2.8	.93	1.1
8	5.7	18	202	32	76	21	9.7	2.8	e16	2.7	.75	2.0
9	5.4	14	196	312	58	18	9.5	2.7	e15	2.5	.68	2.0
10	5.1	36	55	58	53	20	9.8	2.6	e14	2.4	.68	3.3
11	100	38	40	32	48	17	9.3	2.5	14	2.6	.75	3.3
12	38	18	32	28	43	15	9.1	2.4	12	3.5	.82	2.9
13	14	13	27	25	42	14	8.6	2.3	11	2.4	1.9	3.5
14	8.4	13	26	24	264	15	8.7	2.2	9.8	2.3	1.5	3.0
15	6.3	13	27	21	917	13	8.2	2.0	9.0	2.2	1.0	3.3
16	5.6	13	26	21	191	14	7.8	1.9	8.3	3.3	.67	9.1
17	5.3	13	24	25	138	1210	7.6	1.8	8.0	3.2	.61	2.9
18	5.0	12	22	54	111	101	7.1	1.8	7.5	2.2	.72	15
19	4.7	12	21	83	e90	44	6.4	1.8	198	2.0	1.0	4.7
20	4.7	12	20	69	e75	32	5.8	1.9	25	1.9	.96	3.6
21	4.7	10	19	43	e50	25	9.4	1.6	10	1.9	.74	5.6
22	618	12	19	39	e45	23	6.3	2.6	7.3	1.8	.50	5.5
23	58	10	19	36	e40	52	5.7	3.5	5.8	1.7	.35	5.7
24	22	9.6	19	37	e60	38	5.1	3.5	6.5	1.8	.70	4.7
25	15	554	18	29	e55	21	4.8	9.3	5.4	1.7	1.6	3.9
26	12	507	17	28	e50	17	4.5	2.9	4.5	1.5	1.6	4.2
27	9.9	64	17	102	e90	17	4.2	168	3.9	1.4	2.7	6.6
28	8.7	37	17	322	e200	15	3.9	1220	3.5	1.4	3.1	11
29	7.8	29	17	237	---	13	3.8	639	7.1	1.3	1.7	9.7
30	7.4	25	16	70	---	12	3.6	67	4.9	1.2	1.4	9.3
31	7.4	---	16	51	---	13	---	96	---	1.1	2.5	---
TOTAL	2263.3	2538.2	1303	1883	3978	2918	231.8	2264.4	776.5	78.1	35.99	132.62
MEAN	73.0	84.6	42.0	60.7	142	94.1	7.73	73.0	25.9	2.52	1.16	4.42
MAX	829	749	281	322	917	1210	13	1220	198	5.7	3.1	15
MIN	4.7	6.7	16	14	40	12	3.6	1.6	3.5	1.1	.35	.38
AC-FT	4490	5030	2580	3730	7890	5790	460	4490	1540	155	71	263

CAL YR 1986 TOTAL 13840.62 MEAN 37.9 MAX 2480 MIN .00 AC-FT 27450
WTR YR 1987 TOTAL 18402.91 MEAN 50.4 MAX 1220 MIN .35 AC-FT 36500

e Estimated

07243500 DEEP FORK NEAR BEGGS, OK

LOCATION.--Lat 35°40'31", long 96°03'55", NW 1/4 SW 1/4 sec.20, T.14 N., R.12 E., Okmulgee County, Hydrologic Unit 11100303, on right bank 1,000 ft downstream from county road bridge, 2.8 mi upstream from Adams Creek, 4.0 mi south of Beggs, 8.2 mi downstream from Flat Rock (Checkerboard) Creek, and at mile 84.8.

DRAINAGE AREA.--2,018 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1938 to current year.

REVISED RECORDS.--WSP 957: 1941. WSP 1117: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 632.55 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 29, 1939, nonrecording gage at site 550 ft upstream at same datum. Aug. 29, 1939 to June 22, 1953, nonrecording gage at site 1,000 ft upstream and same datum. June 23, 1953 to July 15, 1981, recording gage at site 1,000 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records fair. Some regulation by Arcadia Lake (station 07242340) since November 1986. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--49 years, 868 ft³/s, 628,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft³/s, May 11, 1943, gage height, 34.55 ft; no flow at times in 1939, 1954, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 2	1700	*14,800	*25.07	Feb. 21	2200	6,200	19.90
Nov. 11	2100	4,970	18.30	Mar. 5	1200	13,400	24.45
Dec. 3	1100	3,540	14.86	Mar. 24	0700	6,240	19.94
Jan. 10	1700	3,220	14.00	June 3	1500	12,900	24.22

Minimum daily discharge, 37 ft³/s, Aug. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6680	560	2970	464	2810	8900	1190	329	5970	865	223	181
2	14200	439	3360	461	3320	12800	1110	301	10400	979	182	139
3	13200	370	3500	456	3590	12400	1060	290	12700	1150	124	112
4	11600	1000	2640	485	3730	12400	1010	276	12200	914	93	102
5	11100	3340	1260	501	3460	12900	962	260	10100	1370	77	96
6	10600	3650	896	486	2990	12200	912	250	7850	1120	68	84
7	10000	3760	945	469	2980	10000	808	237	6070	804	63	65
8	9110	3810	1980	453	2910	7860	747	233	4910	648	59	52
9	7940	3920	2870	2080	2790	6220	718	233	3870	611	55	45
10	6710	4360	2910	3200	2890	5070	704	220	2030	812	52	43
11	5640	4850	2750	3170	3180	4260	692	207	1220	969	51	43
12	4900	4880	2620	3050	3470	3200	688	193	1080	1030	45	44
13	4170	4410	2610	2940	3480	2210	663	183	1010	1070	48	43
14	2940	3500	2500	2950	2540	1810	619	174	1010	1110	50	42
15	1800	2420	1720	2660	1740	1630	602	168	934	1130	50	45
16	1290	1480	1170	1590	3100	1520	595	156	852	1160	80	50
17	930	1070	1030	1240	3380	2580	571	150	769	1160	109	52
18	701	905	936	1900	3620	3710	548	142	694	1130	86	62
19	565	798	855	2110	3950	3910	522	136	649	1120	76	74
20	477	706	784	1960	4590	4050	498	132	764	949	62	142
21	400	646	729	1930	5860	4260	474	128	1350	633	52	164
22	489	644	679	2090	6030	5250	795	135	1630	457	47	250
23	1670	705	636	2170	5290	5980	1240	141	1790	388	42	236
24	2110	694	606	2150	4590	6150	1120	159	2020	339	40	213
25	2100	679	588	2160	3890	5420	778	652	2250	303	37	202
26	2110	1730	573	2000	3140	4550	570	1220	1860	284	40	174
27	2350	2430	551	1840	3440	3540	482	1180	1160	268	86	165
28	2580	2280	530	2000	4490	2460	434	2080	972	257	343	161
29	2690	2270	503	2390	---	1790	396	3630	879	251	246	165
30	1790	2570	484	2570	---	1490	361	3900	847	242	189	379
31	810	---	475	2530	---	1320	---	4490	---	232	202	---
TOTAL	143652	64876	46660	56455	101250	171840	21869	21985	99840	23755	2977	3625
MEAN	4634	2163	1505	1821	3616	5543	729	709	3328	766	96.0	121
MAX	14200	4880	3500	3200	6030	12900	1240	4490	12700	1370	343	379
MIN	400	370	475	453	1740	1320	361	128	649	232	37	42
AC-FT	284900	128700	92550	112000	200800	340800	43380	43610	198000	47120	5900	7190

CAL YR 1986 TOTAL 559166 MEAN 1532 MAX 14200 MIN 20 AC-FT 1109000
WTR YR 1987 TOTAL 758784 MEAN 2079 MAX 14200 MIN 37 AC-FT 1505000

ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1952 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1951 to current year.

WATER TEMPERATURE: November 1951 to current year.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 10,500 microsiemens, Jan. 12, 1955; minimum daily, 74 microsiemens, Oct. 21, 1983.

WATER TEMPERATURE (1951-85): Maximum daily, 38.5 °C, Aug. 8, 1970; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,190 microsiemens, May 15-17, 19; minimum daily, 89 microsiemens, Oct. 2.

WATER TEMPERATURE: Maximum daily, 33.0 °C, June 22, Aug. 2-4, 8-9, 11-12; minimum daily, 4.0 °C, Jan. 19-28.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

											BARO- METRIC PRES- SURE	OXYGEN, DIS- SOLVED	
DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	(MM OF HG)	(MG/L)	
DEC 08...	1550	1028	80020	10.66	2030	463	7.60	6.0	9.0	73	760	12.3	
JAN 12...	1300	1028	1028	13.52	3060	379	7.60	19.0	5.5	--	--	--	
MAR 05...	1145	1028	80020	24.23	13000	200	6.90	23.0	15.0	210	770	9.5	
APR 10...	1130	1028	80020	5.45	716	789	8.20	20.5	16.0	--	760	--	
MAY 05...	1050	1028	80020	3.20	249	1020	8.10	25.5	24.0	--	740	7.3	
JUN 02...	1030	1028	80020	22.75	10200	213	8.40	28.0	23.0	120	740	5.7	
JUN 29...	1130	1028	80020	6.42	907	494	7.90	29.5	28.0	--	740	6.7	
JUL 14...	1007	1028	1028	7.40	1110	518	7.90	28.0	28.0	--	--	--	
AUG 24...	1650	1028	80020	1.26	39	1200	8.50	31.0	29.5	--	750	7.8	
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)
DEC 08...	107	K6500	7800	160	43	34	17	45	38	2	3.8	--	--
JAN 12...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR 05...	93	K1300	870	71	6	16	7.6	12	26	0.6	3.0	78	--
APR 10...	--	--	--	290	50	60	35	69	34	2	2.4	310	--
MAY 05...	90	--	--	310	47	61	38	90	39	2	2.7	317	--
JUN 02...	69	350	1600	71	7	16	7.4	13	28	0.7	3.0	--	--
JUN 29...	88	--	--	180	11	39	20	33	28	1	3.2	--	--
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	104	--	--	310	29	55	42	120	45	3	3.5	--	--

ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CARBONATE WATER WH IT FIELD (MG/L AS CO3)	ALKALINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLORIDE, DIS- SOLVED (MG/L AS CL)	FLUORIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITROGEN, NITRATE DIS- SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS- SOLVED (MG/L AS N)
DEC 08...	--	--	22	81	0.20	9.4	302	282	0.41	1660	--	<0.010
JAN 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 05...	0	64	10	17	0.10	6.6	125	113	0.17	4390	0.180	0.020
APR 10...	0	254	31	110	--	8.7	472	464	0.64	912	--	0.010
MAY 05...	0	260	33	170	--	6.6	569	560	0.77	383	--	<0.010
JUN 02...	--	--	24	21	0.20	6.7	132	131	0.18	3640	0.200	0.020
JUN 29...	--	--	20	49	--	8.8	280	277	0.38	686	--	<0.010
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	--	--	50	180	--	7.3	620	628	0.84	66.1	--	<0.010
DATE	NITROGEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITROGEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DIS- SOLVED (MG/L AS P)	PHOSPHOROUS ORTHOPHOSPHATE, DIS- SOLVED (MG/L AS P)	PHOSPHATE, ORTHOPHOSPHATE, DIS- SOLVED (MG/L AS PO4)	PHOSPHOROUS ORGANIC TOTAL (MG/L AS P)
DEC 08...	--	0.230	0.160	--	0.59	0.74	0.90	0.050	0.030	0.020	0.06	0.05
JAN 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 05...	0.07	0.200	0.100	0.130	0.17	1.5	1.6	0.160	0.030	0.020	0.06	0.16
APR 10...	0.03	<0.100	--	0.040	0.05	--	--	--	--	0.010	0.03	--
MAY 05...	--	<0.100	--	0.030	0.04	--	--	--	--	0.010	0.03	--
JUN 02...	0.07	0.220	0.160	0.110	0.14	1.3	1.5	0.330	0.030	<0.010	--	0.33
JUN 29...	--	0.380	--	0.060	0.08	--	--	--	--	0.030	0.09	--
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	--	<0.100	--	0.010	0.01	--	--	--	--	0.020	0.06	--
DATE	PHOSPHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUMINUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYLLIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHROMIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
DEC 08...	0.01	80	<1	94	<0.5	<1	<1	<3	4	110	<5	8
JAN 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 05...	0.01	90	<1	57	<0.5	1	<1	<3	3	180	<5	4
APR 10...	--	--	<1	160	<0.5	<1	<10	<3	<10	10	<10	10
MAY 05...	--	--	<1	180	<0.5	<1	<10	<3	<10	29	<10	7
JUN 02...	0.03	50	<1	61	<0.5	<1	<1	<3	4	78	<5	<4
JUN 29...	--	--	2	140	<0.5	1	<10	<3	<10	73	<10	7
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	--	--	1	210	0.5	<1	<5	<3	<10	8	<10	5

ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 08...	170	0.4	<10	4	<1	<1.0	310	<6	14	64	351	88
JAN 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 05...	8	0.3	<10	2	<1	<1.0	110	<6	11	31	1090	93
APR 10...	130	0.2	<10	--	--	--	540	<6	7	--	--	--
MAY 05...	24	0.1	<10	--	--	--	600	<6	14	--	--	--
JUN 02...	8	0.2	<10	5	<1	<1.0	130	<6	<7	108	2970	94
JUN 29...	12	<0.1	<10	--	--	--	350	6	15	--	--	--
JUL 14...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 24...	19	--	<10	<10	--	<1.0	650	<6	<3	--	--	--

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	133	422	420	844	386	342	555	900	210	518	679	731
2	89	505	418	877	374	277	609	890	210	521	693	784
3	90	521	412	871	366	234	635	910	250	526	708	807
4	92	564	396	885	366	168	672	900	250	577	739	712
5	94	608	471	925	406	176	720	920	260	600	780	713
6	107	683	523	880	446	203	734	890	280	648	753	715
7	130	263	573	885	440	261	763	890	350	605	762	731
8	145	258	626	875	432	279	773	1000	370	585	780	724
9	177	261	405	478	428	309	785	1070	390	560	786	723
10	213	284	408	404	423	375	788	1040	430	539	---	723
11	236	291	412	371	378	404	798	1050	---	531	805	755
12	296	314	427	360	399	444	826	1070	360	523	876	772
13	304	335	425	311	429	480	852	1140	430	505	891	788
14	339	412	422	363	462	514	875	1170	510	504	---	800
15	376	480	419	383	612	509	877	1190	550	502	989	810
16	390	524	416	404	530	505	858	1190	580	501	1000	808
17	401	563	525	446	445	506	870	1190	540	501	1020	805
18	420	590	560	466	393	497	878	1180	580	499	1040	868
19	428	646	592	500	336	440	905	1190	320	498	1080	867
20	426	670	647	528	318	405	886	1160	570	511	1120	894
21	471	680	692	499	296	343	884	1180	570	520	1120	901
22	509	691	715	560	323	332	889	1160	568	524	1130	865
23	418	626	743	505	349	313	891	1170	569	529	1120	830
24	379	608	782	508	381	298	809	1160	474	534	1100	813
25	336	588	818	514	408	333	714	1150	427	565	1100	792
26	308	484	821	518	484	372	770	1130	376	607	990	763
27	336	484	841	522	454	409	780	870	378	623	892	574
28	353	457	858	526	388	438	800	740	429	651	828	687
29	360	442	875	426	---	452	830	510	510	658	738	599
30	385	438	888	461	---	505	871	430	451	666	742	615
31	404	---	897	418	---	554	---	220	---	673	747	---
MEAN	295	490	594	565	409	377	797	989	---	558	---	766
MAX	509	691	897	925	612	554	905	1190	---	673	---	901
MIN	89	258	396	311	296	168	555	220	---	498	---	574

ARKANSAS RIVER BASIN

07243500 DEEP FORK NEAR BEGGS, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	17.0	9.0	8.0	6.0	9.0	11.0	23.0	24.0	28.0	32.0	26.0
2	25.0	17.0	8.0	7.0	7.0	9.0	11.0	24.0	24.0	28.0	33.0	26.0
3	25.0	17.0	8.0	7.0	7.0	10.0	11.0	25.0	24.0	28.0	33.0	26.0
4	24.0	17.0	8.0	6.0	8.0	10.0	11.0	25.0	24.0	29.0	33.0	26.0
5	24.0	17.0	8.0	6.0	8.0	10.0	12.0	25.0	24.0	29.0	32.0	26.0
6	25.0	17.0	8.0	6.0	8.0	10.0	13.0	24.0	25.0	29.0	32.0	26.0
7	24.0	17.0	8.0	6.0	9.0	11.0	14.0	24.0	26.0	30.0	32.0	26.0
8	23.0	16.0	8.0	6.0	9.0	11.0	15.0	24.0	26.0	30.0	33.0	27.0
9	22.0	15.0	8.0	6.0	9.0	12.0	15.0	25.0	26.0	30.0	33.0	27.0
10	20.0	14.0	8.0	5.0	9.0	11.0	15.0	25.0	26.0	30.0	---	27.0
11	19.0	13.0	8.0	5.0	9.0	11.0	15.0	26.0	---	30.0	33.0	27.0
12	18.0	13.0	7.0	5.0	10.0	12.0	16.0	26.0	27.0	30.0	33.0	27.0
13	17.0	10.0	7.0	6.0	11.0	12.0	17.0	26.0	28.0	29.0	32.0	26.0
14	15.0	9.0	7.0	6.0	11.0	12.0	17.0	26.0	29.0	29.0	---	26.0
15	16.0	9.0	7.0	6.0	11.0	12.0	17.0	26.0	27.0	29.0	32.0	26.0
16	16.0	9.0	7.0	6.0	10.0	13.0	17.0	27.0	30.0	29.0	31.0	26.0
17	---	9.0	7.0	5.0	10.0	14.0	18.0	27.0	30.0	29.0	31.0	25.0
18	17.0	10.0	5.0	5.0	8.0	13.0	18.0	27.0	31.0	29.0	31.0	25.0
19	17.0	10.0	8.0	4.0	8.0	14.0	19.0	27.0	27.0	28.0	31.0	25.0
20	17.0	10.0	8.0	4.0	8.0	15.0	19.0	27.0	32.0	29.0	31.0	24.0
21	17.0	10.0	8.0	4.0	6.0	15.0	20.0	27.0	32.0	30.0	31.0	24.0
22	16.0	10.0	8.0	4.0	7.0	15.0	19.0	27.0	33.0	30.0	31.0	24.0
23	16.0	10.0	8.0	4.0	8.0	15.0	19.0	26.0	28.0	30.0	31.0	24.0
24	15.0	10.0	8.0	4.0	9.0	15.0	20.0	25.0	32.0	31.0	30.0	24.0
25	16.0	10.0	8.0	4.0	9.0	15.0	20.0	25.0	31.0	31.0	30.0	24.0
26	16.0	10.0	8.0	4.0	9.0	14.0	21.0	24.0	30.0	31.0	29.0	24.0
27	16.0	9.0	8.0	4.0	9.0	14.0	22.0	24.0	30.0	32.0	25.0	24.0
28	16.0	9.0	8.0	4.0	9.0	14.0	22.0	24.0	32.0	32.0	25.0	24.0
29	16.0	9.0	8.0	5.0	---	13.0	22.0	24.0	29.0	32.0	25.0	23.0
30	17.0	9.0	8.0	5.0	---	13.0	23.0	24.0	28.0	32.0	26.0	23.0
31	17.0	---	8.0	6.0	---	12.0	---	24.0	---	32.0	26.0	---
MEAN	---	12.1	7.7	5.3	8.6	12.5	17.0	25.3	---	29.8	---	25.3
MAX	---	17.0	9.0	8.0	11.0	15.0	23.0	27.0	---	32.0	---	27.0
MIN	---	9.0	5.0	4.0	6.0	9.0	11.0	23.0	---	28.0	---	23.0

07244800 EUFAULA LAKE NEAR BROOKEN, OK

LOCATION.--Lat 35°18'25", long 95°21'45", in SW 1/4 sec.25, T.10 N., R.18 E., McIntosh County, Hydrologic Unit 11090204, in intake structure near left end of dam on Canadian River, 4.0 mi northeast of Brooken, and at mile 27.0.

DRAINAGE AREA.--47,522 mi², of which 9,700 mi² is probably noncontributing.

PERIOD OF RECORD.--February 1964 to current year. Prior to October 1970, published as Eufaula Reservoir near Brooken.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earthen dam having a gated, concrete, ogee-type spillway weir controlled by eleven 40-foot taintor gates. Closure for diversion was made Feb. 1, 1963, and regulated storage began Feb. 10, 1964; minimum power pool was first filled June 17, 1964. Capacity, 3,825,400 acre-ft at elevation 597.0 ft, top of flood-control pool; 2,314,600 acre-ft at elevation 585.0 ft, top of power pool, and 851,600 acre-ft at elevation 565.0 ft, bottom of power pool. Dead storage is negligible. Figures given herein represent total contents. Reservoir is used for flood control, sediment control, power development, and other water uses. Revised capacity table, based on survey 1977, used since Oct. 1, 1983. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 3,791,000 acre-ft, Apr. 25, 1973, elevation, 596.95 ft; minimum since power pool first filled, 1,182,000 acre-ft, Nov. 4, 1964, elevation, 570.23 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,234,000 acre-ft, Oct. 14, elevation, 592.78 ft; minimum, 2,212,000 acre-ft, May 23, elevation, 584.01 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

581	1,923,000	587	2,533,000
583	2,111,000	589	2,764,000
585	2,315,000	591	3,006,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2396000	2750000	2546000	2352000	2410000	2896000	2444000	2275000	2915000	2469000	2325000	2270000
2	2520000	2693000	2533000	2348000	2410000	2973000	2431000	2266000	2899000	2471000	2322000	2267000
3	2615000	2648000	2520000	2358000	2406000	2972000	2416000	2261000	2873000	2484000	2312000	2253000
4	2719000	2667000	2509000	2361000	2399000	2949000	2409000	2260000	2855000	2404000	2304000	2258000
5	2804000	2682000	2497000	2360000	2392000	2935000	2395000	2256000	2838000	2452000	2302000	2258000
6	2887000	2681000	2495000	2355000	2384000	2920000	2383000	2259000	2813000	2507000	2292000	2255000
7	2962000	2678000	2500000	2350000	2383000	2905000	2375000	2257000	2784000	2489000	2285000	2254000
8	3015000	2667000	2501000	2341000	2386000	2885000	2371000	2255000	2768000	2427000	2283000	2255000
9	3066000	2652000	2502000	2392000	2381000	2852000	2362000	2251000	2756000	2476000	2285000	2252000
10	3111000	2647000	2499000	2431000	2370000	2807000	2361000	2248000	e2725000	2466000	2283000	2254000
11	3171000	2637000	2495000	2457000	2360000	2755000	2361000	2247000	e2700000	2457000	2282000	2250000
12	3202000	2622000	2481000	2460000	2348000	2698000	2361000	2246000	e2675000	2447000	2279000	2250000
13	3224000	2614000	2467000	2450000	2339000	2645000	2369000	2240000	e2650000	2453000	2270000	2256000
14	3216000	2601000	2456000	2436000	2329000	2603000	2368000	2237000	e2625000	2434000	2267000	2268000
15	3197000	2586000	2445000	2427000	2338000	2553000	2354000	2237000	e2600000	2426000	2266000	2266000
16	3165000	2571000	2444000	2425000	2373000	2514000	2350000	2244000	2578000	2420000	2265000	2272000
17	3134000	2555000	2438000	2443000	2403000	2559000	2341000	2244000	2554000	2413000	2273000	2277000
18	3112000	2541000	2435000	2522000	2412000	2619000	2333000	2240000	2536000	2415000	2270000	2278000
19	3092000	2529000	2430000	2545000	2425000	2626000	2326000	2234000	2515000	2430000	2273000	2284000
20	3071000	2517000	2424000	2552000	2439000	2603000	2316000	2229000	2500000	2423000	2266000	2285000
21	3048000	2505000	2418000	2551000	2456000	2576000	2309000	2220000	2489000	2419000	2261000	2281000
22	3039000	2494000	2411000	2544000	2470000	2542000	2300000	2214000	2487000	2410000	2259000	2280000
23	3029000	2482000	2404000	2529000	2477000	2541000	2297000	2220000	2499000	2403000	2258000	2275000
24	3020000	2466000	2397000	2516000	2489000	2544000	2296000	2229000	2507000	2392000	2249000	2265000
25	2985000	2477000	2389000	2495000	2497000	2525000	2297000	2235000	2501000	2387000	2253000	2258000
26	2954000	2486000	2383000	2475000	2524000	2511000	2299000	2236000	2499000	2329000	2278000	2259000
27	2931000	2514000	2366000	2454000	2541000	2499000	2292000	2262000	2495000	2373000	2281000	2278000
28	2910000	2527000	2369000	2440000	2729000	2514000	2289000	2394000	2487000	2360000	2284000	2274000
29	2881000	2536000	2361000	2425000	---	2500000	2284000	2671000	2474000	2348000	2287000	2275000
30	2846000	2544000	2356000	2414000	---	2487000	2282000	2872000	2482000	2337000	2278000	2275000
31	2803000	---	2352000	2404000	---	2468000	---	2926000	---	2328000	2275000	---
MAX	3224000	2750000	2546000	2552000	2729000	2973000	2444000	2926000	2915000	2507000	2325000	2285000
MIN	2396000	2466000	2352000	2341000	2329000	2468000	2282000	2214000	2474000	2328000	2249000	2250000
(+)	589.33	587.10	585.35	585.84	588.70	586.42	584.69	590.35	586.55	585.13	584.62	584.62
(++)	+545,000	-259,000	-192,000	+52,000	+325,000	-261,000	-186,000	+644,000	-444,000	-154,000	-53,000	0
CAL YR 1986	MAX 3224000	MIN 2020000	(++) -55,000									
WTR YR 1987	MAX 3224000	MIN 2214000	(++) +17,000									

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-Feet

e Estimated

ARKANSAS RIVER BASIN

07245000 CANADIAN RIVER NEAR WHITEFIELD, OK

LOCATION.--Lat 35°15'50", long 95°14'21", in SE 1/4 SE 1/4 sec.12, T.9 N., R.19 E., Haskell County, Hydrologic Unit 11090204, on left downstream bank at end of bridge on State Highway 2, 0.8 mi north of Whitefield, 5.5 mi upstream from Taloka (Snake) Creek, 8.2 mi downstream from Eufaula Dam, and at mile 18.8.

DRAINAGE AREA.--47,576 mi², of which 9,700 mi² is probably noncontributing.

PERIOD OF RECORD.--July 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1177: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 473.16 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 11, 1939, nonrecording gage and Jan. 11, 1939 to Dec. 10, 1941, June 12, 1947 to Sept. 30, 1948, water-stage recorder, all at site 2.1 mi downstream at datum 2.20 ft higher. Dec. 11, 1941 to June 1, 1947, and Oct. 1, 1948 to Sept. 30, 1978, water-stage recorder at site 400 ft upstream and at datum 5.00 ft higher. Oct. 1, 1978 to July 26, 1983, water-stage recorder at site 400 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Prior to February 1964, occasional slight regulation by Conchas Lake in New Mexico and, except for 54 mi² of intervening area, completely regulated thereafter by Eufaula Lake (station 07244800). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Eufaula Dam, 25 years (water years 1939-63), 6,005 ft³/s, 4,347,000 acre-ft/yr; since regulation by Eufaula Dam, 20 years (water years 1968-87), 5,793 ft³/s, 4,197,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 281,000 ft³/s, May 10, 1943, gage height, 25.5 ft datum then in use; minimum daily discharge, 0.4 ft³/s, Oct. 8, 1956.

EXTREMES FOR OUTSIDE PERIOD OF RECORD.--Maximum stage since 1898, that of May 10, 1943, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 43,800 ft³/s, Mar. 10, gage height, 15.90 ft; minimum daily discharge, 44 ft³/s, Oct. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	178	32700	9930	3770	15700	16900	18100	5500	34100	8630	2690	2930
2	82	32500	10300	3830	15700	21200	18100	6440	37000	11600	1940	2590
3	57	28800	13600	1230	15700	32500	15200	5470	36800	8260	4830	3180
4	70	22500	15100	337	15700	38500	11700	8520	35700	7560	5600	3450
5	55	24000	13500	4350	15700	35400	13700	5370	32400	8440	841	1450
6	49	28700	7640	5790	15700	32000	13000	3450	32000	8650	3880	561
7	46	27300	8250	5630	13400	32300	10400	3350	32000	15500	5320	259
8	45	23400	9040	6110	10800	32900	8220	3870	28500	13400	1150	1360
9	45	23300	11000	9080	14900	36300	6390	3520	21600	8670	88	1360
10	45	21200	15200	5070	15700	40100	6430	2900	21500	8340	69	1400
11	44	16500	15200	3830	15800	42700	4020	3370	21400	8640	1190	1380
12	70	16300	15300	9250	14800	42300	4090	3060	23000	9710	2050	570
13	4910	16100	15300	15200	15000	39800	7370	2790	26200	10200	3290	255
14	16100	16100	15400	15000	15500	33300	7150	2680	26200	7320	4230	214
15	23300	16100	14900	15100	13600	33000	7620	829	22900	9180	753	1280
16	24600	16100	8240	15400	15400	30000	7330	334	16800	9060	261	2430
17	24800	15500	7490	9370	15800	24800	9510	238	16600	8700	1430	2080
18	15000	10500	8280	7860	15600	23900	8340	3670	16500	4450	213	356
19	15000	12500	7200	10500	12700	27500	7040	4760	15800	4720	64	78
20	14900	12200	7200	11600	8200	33000	10500	3920	16400	8550	2730	58
21	14900	9270	7700	15300	6370	32800	7780	5880	15800	8210	3810	53
22	14900	10100	7260	14800	6140	32600	7320	6710	15500	7010	621	50
23	20300	10100	8150	15700	7840	29300	7060	2000	7540	7400	90	3330
24	30300	10600	7500	18900	10400	24300	6900	240	6510	7450	92	2240
25	32600	11200	6910	18900	10800	24100	4460	228	9500	6280	6430	5230
26	27400	8160	6430	18900	10900	23900	3520	4850	9570	5180	7830	6030
27	22300	8220	7090	18100	15200	22400	6440	5080	9880	6930	1330	3900
28	22500	7050	7200	15700	22200	17800	6290	7390	7330	8040	1750	1750
29	24500	7290	7020	15700	---	16900	5640	14300	8990	7740	686	2640
30	27800	6970	6800	15600	---	17800	4320	18500	7530	7650	199	1350
31	29100	---	4630	15600	---	18200	---	23800	---	7280	4260	---
TOTAL	405996	501260	304760	341507	381250	908500	253940	163019	611550	258750	69717	53814
MEAN	13100	16710	9831	11020	13620	29310	8465	5259	20380	8347	2249	1794
MAX	32600	32700	15400	18900	22200	42700	18100	23800	37000	15500	7830	6030
MIN	44	6970	4630	337	6140	16900	3520	228	6510	4450	64	50
AC-FT	805300	994200	604500	677400	756200	1802000	503700	323300	1213000	513200	138300	106700

CAL YR 1986 TOTAL 3213520 MEAN 8804 MAX 33800 MIN 42 AC-FT 6374000
WTR YR 1987 TOTAL 4254060 MEAN 11650 MAX 42700 MIN 44 AC-FT 8438000

ARKANSAS RIVER BASIN

07246400 ROBERT S. KERR LOCK AND DAM (ARKANSAS RIVER) NEAR SALLISAW, OK

LOCATION.--Lat 35°20'57", long 94°46'43", in SW 1/4 SW 1/4, sec. 9, T.10 N., R.24 E., LeFlore County, Hydrologic Unit 11110104, from lock wall at dam, 0.5 mi upstream from gage on bridge on U.S. Highway 59, 3.5 mi downstream from Sans Bois Creek, 7.5 mi south of Sallisaw, and at mile 395.4.

DRAINAGE AREA.--147,756 mi² of which 22,241 mi² is probably noncontributing.

PERIOD OF RECORD.--Water years 1970 to current year.

REVISED RECORDS.--WDR OK-77-1: Drainage area.

REMARKS.--Samples were collected monthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	
OCT													
16...	1115	1028	80020	437.30	264	7.30	15.5	18.0	--	760	13.5	143	
NOV													
13...	1100	1028	80020	419.97	*539	7.40	20.0	15.0	--	760	10.1	101	
DEC													
01...	1330	1028	80020	418.68	754	7.60	14.0	10.0	--	732	--	--	
JAN													
13...	1300	1028	80020	414.69	*786	--	20.0	12.0	--	732	--	--	
FEB													
26...	1540	1028	80020	419.98	*700	7.60	14.5	11.0	--	733	--	--	
MAR													
16...	1600	1028	80020	419.57	560	7.70	17.5	13.0	25	732	--	--	
APR													
16...	1050	1028	80020	416.97	820	7.40	21.0	14.0	--	728	--	--	
JUN													
04...	1300	1028	80020	425.36	*694	7.40	23.0	14.0	--	731	--	--	
JUL													
01...	1330	1028	80020	414.64	*742	7.90	28.0	16.0	--	732	--	--	
31...	1100	1028	80020	413.20	*934	7.60	28.0	21.0	--	732	--	--	
AUG													
07...	1500	1028	80020	413.02	*970	7.50	--	28.0	--	737	--	--	
SEP													
17...	1140	1028	80020	412.97	*840	7.90	24.0	17.0	--	732	--	--	
DATE		OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS TOTAL (MG/L AS CAC03)	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	ACIDITY (MG/L AS H)	ACIDITY (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICARBONATE WATER WH IT FIELD (MG/L AS HC03)
OCT													
16...	23	85	18	--	--		27	4.2	21	34	1	3.4	85
NOV													
13...	24	130	39	--	--		38	8.3	70	53	3	3.9	105
DEC													
01...	13	150	53	--	--		43	11	92	56	3	4.2	--
JAN													
13...	--	170	57	--	--		49	12	94	54	3	3.7	--
FEB													
26...	20	170	49	--	--		49	11	67	46	2	3.4	--
MAR													
16...	34	160	160	--	--		47	10	48	39	2	3.1	171
APR													
16...	19	180	67	--	--		51	13	100	54	3	4.0	137
JUN													
04...	16	160	60	--	--		44	12	72	49	3	4.1	122
JUL													
01...	<10	190	67	--	--		52	14	78	47	3	4.3	141
31...	--	200	82	0.8	40		53	16	110	54	4	3.3	163
AUG													
07...	16	210	90	--	--		56	16	110	53	3	2.9	--
SEP													
17...	--	190	66	--	--		52	14	83	48	3	3.6	113

*SPECIFIC CONDUCTANCE, LAB (US/CM)

ARKANSAS RIVER BASIN

07246400 ROBERT S. KERR LOCK AND DAM (ARKANSAS RIVER) NEAR SALLISAW, OK

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	BORON, DIS- SOLVED (UG/L AS B)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 16...	0	70	24	31	163	151	0.22	0.0	--	--	--
NOV 13...	0	86	48	110	357	332	0.49	0.0	--	--	--
DEC 01...	--	--	62	140	419	412	0.57	0.0	--	--	--
JAN 13...	--	--	57	140	431	425	0.59	0.0	--	--	--
FEB 26...	--	--	63	110	387	375	0.53	0.0	--	--	--
MAR 16...	0	140	52	64	294	224	0.40	0.0	--	--	--
APR 16...	0	112	88	150	493	474	0.67	0.0	--	--	--
JUN 04...	0	100	74	100	387	366	0.53	0.0	--	--	--
JUL 01...	0	116	84	110	417	415	0.57	0.0	--	--	--
31...	0	134	110	150	528	513	0.72	0.0	80	9	<1
AUG 07...	--	--	120	160	559	534	0.76	0.0	--	--	--
SEP 17...	0	92	100	120	493	446	0.67	0.0	--	--	--

ARKANSAS RIVER BASIN

07247500 FOURCHE MALINE NEAR RED OAK, OK

LOCATION.--Lat 34°54'45", long 95°09'20", in NW 1/4 NW 1/4 sec.13, T.5 N., R.20 E., Latimer County, Hydrologic Unit 11110105, on downstream side of left abutment of county road bridge, 0.1 mi downstream from Little Fourche Maline, 5.0 mi southwest of Red Oak, and at mile 41.2.

DRAINAGE AREA.--122 mi².

PERIOD OF RECORD.--October 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1117: Drainage area. WSP 1631: 1940.

GAGE.--Water-stage recorder. Datum of gage is 540.80 ft above National Geodetic Vertical Datum of 1929. Prior to April 25, 1939, nonrecording gage at same site and datum.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by several flood-retarding structures.

AVERAGE DISCHARGE.--49 years, 127 ft³/s, 14.14 in/yr, 92,010 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 41,500 ft³/s, May 19, 1960, gage height, 24.79 ft, from floodmarks, from rating curve extended above 25,000 ft³/s; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1935 reached a stage of 25.4 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 17	1912	*1,490	*11.31	No peak greater than base discharge.			
Minimum daily discharge, 0.12 ft ³ /s, Nov. 19-20.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	1.8	.68	.55	15	1160	111	21	363	73	4.1	15
2	5.6	1.4	.61	.44	20	722	92	18	225	41	4.1	12
3	5.7	1.2	.68	.84	20	415	77	17	130	45	4.4	9.8
4	6.9	7.5	.83	2.2	16	183	66	16	79	36	4.0	8.3
5	7.0	14	1.1	2.3	12	111	59	16	58	29	4.0	7.4
6	6.6	6.9	.75	1.7	9.8	76	52	18	50	23	3.8	6.0
7	8.8	13	2.1	1.8	8.6	61	46	19	45	18	4.0	5.7
8	8.1	10	8.5	2.1	7.5	52	42	17	40	13	4.2	5.6
9	8.5	3.9	16	233	6.4	45	38	16	36	11	4.5	5.2
10	8.5	.98	11	320	5.8	38	34	15	33	11	4.6	7.3
11	8.1	.64	10	94	5.1	34	31	13	30	9.6	5.6	9.5
12	8.5	.62	6.9	64	4.4	29	28	12	26	8.2	9.5	8.0
13	9.0	.42	4.3	50	4.7	26	226	11	23	21	7.6	10
14	9.5	.30	3.0	35	4.5	23	776	11	19	15	6.4	16
15	9.3	.27	9.7	30	8.7	23	485	11	16	11	5.5	16
16	86	.20	8.3	39	30	27	273	10	13	9.3	4.9	44
17	47	.18	4.9	38	29	809	155	10	11	8.1	5.2	41
18	27	.13	3.7	212	28	1170	117	9.8	9.5	8.6	6.2	33
19	16	.12	2.9	400	24	713	93	9.4	9.4	7.8	8.0	44
20	12	.12	1.8	188	21	483	76	9.6	18	8.1	7.3	41
21	9.7	.21	1.1	96	19	221	67	11	18	e8.2	6.6	32
22	8.8	.16	.79	61	18	144	60	10	20	e8.4	6.0	26
23	8.1	.19	.60	48	16	154	53	17	172	e8.6	5.0	22
24	7.2	.16	.50	41	28	297	48	21	418	e8.8	4.7	19
25	6.8	.18	.43	37	44	258	43	27	276	8.7	8.9	13
26	6.0	.32	.34	34	65	156	39	34	76	6.7	8.8	10
27	6.0	.42	.33	30	171	127	35	30	40	5.0	10	44
28	5.7	.58	.38	21	634	109	30	162	29	4.6	19	250
29	4.3	.67	.32	18	---	215	26	425	22	4.4	21	163
30	3.2	.64	.22	16	---	204	24	411	67	4.2	19	89
31	2.3	---	.17	15	---	144	---	403	---	3.9	18	---
TOTAL	371.9	67.21	102.93	2131.93	1275.5	8229	3302	1830.8	2371.9	478.2	234.9	1012.8
MEAN	12.0	2.24	3.32	68.8	45.6	265	110	59.1	79.1	15.4	7.58	33.8
MAX	86	14	16	400	634	1170	776	425	418	73	21	250
MIN	2.3	.12	.17	.44	4.4	23	24	9.4	9.4	3.9	3.8	5.2
AC-FT	738	133	204	4230	2530	16320	6550	3630	4700	949	466	2010

CAL YR 1986 TOTAL 52029.64 MEAN 143 MAX 2920 MIN .12 AC-FT 103200
WTR YR 1987 TOTAL 21409.07 MEAN 58.7 MAX 1170 MIN .12 AC-FT 42460

e Estimated

ARKANSAS RIVER BASIN

07248000 WISTER LAKE NEAR WISTER, OK

LOCATION.--Lat 34°56'10", long 94°43'10", in SE 1/4 NE 1/4 sec.1, T.5 N., R.24 E., Le Flore County, Hydrologic Unit 11110105, in control tower near right end of Wister Dam on Poteau River, 2.0 mi south of Wister, 2.7 mi upstream from Caston Creek, and at mile 60.9.

DRAINAGE AREA.--993 mi².

PERIOD OF RECORD.--October 1949 to current year. Prior to October 1970, published as Wister Reservoir near Wister.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by an earth dam with outlets of an uncontrolled, concrete, chute-type spillway and six 7- by 12-foot vertical liftgates. Regulated storage began Oct. 4, 1949, conservation pool was first filled Dec. 19, 1949. Capacity, 427,900 acre-ft at elevation 502.5 ft crest of spillway and 27,060 acre-ft at elevation 471.6 ft conservation pool. Figures given herein represent total contents. Reservoir is used for flood control and recreation. Revised capacity table used since Oct. 1, 1973.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 507,400 acre-ft, May 27, 1957, elevation, 505.73 ft; minimum since conservation pool was first filled, 4,020 acre-ft, Oct. 16, 1961, elevation, 456.97 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 133,400 acre-ft, Mar. 20, elevation, 485.46 ft; minimum, 40,320 acre-ft, Apr. 13, elevation, 474.46 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

471	24,720	485	128,100
475	43,240	495	274,700
479	69,990	505	487,900

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58570	62150	65160	41340	42320	79080	46480	40800	104900	66720	59640	59280
2	58560	62150	62710	41180	43080	87120	43350	40800	98980	66880	59350	59210
3	58670	62140	60640	41780	43410	91310	42260	40860	94500	66720	59140	59140
4	58960	63550	58370	42430	43300	93020	42160	40800	88210	66520	58780	58990
5	60000	64600	55980	43240	43350	93500	42100	40640	83370	66260	58570	58850
6	60570	65500	53800	43520	43240	93220	41830	41880	80160	65730	58230	58780
7	60780	65950	52230	43750	42910	92640	41610	42160	76740	65450	58940	58710
8	60930	65960	53340	44030	42540	91680	41290	42750	73260	64980	58780	58570
9	61070	65880	55430	48430	42100	90280	41020	42910	70960	64600	59690	58450
10	61070	66120	55100	54640	41670	88980	40910	42860	69470	64060	59280	59140
11	61210	66100	52360	57820	41230	86580	40640	42750	68150	63570	59090	58990
12	61500	66570	49820	58570	41070	82540	40480	42480	67340	63120	59280	59070
13	61640	66800	47600	56660	41450	77710	42860	42260	66800	63090	59070	58990
14	61570	66880	45450	53660	41340	71840	45840	42050	66100	62810	58850	58930
15	61640	66960	43690	50560	42210	65800	47130	41990	65350	62660	58640	59430
16	61570	66960	42430	48780	45840	59640	46950	41990	64560	62430	58440	59570
17	61640	66960	41560	47840	48190	83530	46010	42260	63780	62510	59210	59570
18	61720	66880	41400	50130	48310	120900	44770	42250	63330	62220	59210	60070
19	61720	66800	41560	52750	47900	131700	43300	42250	63630	62070	59130	60210
20	61720	66670	41610	53340	47370	131700	42210	42250	63560	61930	59070	60210
21	61720	66430	41720	51850	46540	125500	41670	42140	63480	61720	58990	60280
22	61720	66330	41780	49570	45730	117500	41290	542260	63410	61500	58780	60280
23	62200	66180	41830	47490	44650	109600	41130	43080	64680	61360	58570	60280
24	62290	65950	41780	45840	44430	102000	41130	43690	65760	61290	58480	60210
25	62260	66250	41780	44090	44600	94180	41130	44710	66760	61140	58300	60210
26	62220	65880	41720	42590	45840	85950	41070	45440	66960	61000	58100	60140
27	62220	66100	41610	41880	49940	77200	40960	45960	66770	60780	59280	60140
28	62220	66180	41560	41670	62580	68590	40860	69400	66410	60550	59210	60360
29	62220	66260	41510	41450	---	60140	40860	97500	66030	60360	59140	60930
30	62220	66180	41400	41340	---	54380	40860	104600	66830	60070	59280	61210
31	62220	---	41340	41610	---	50500	---	106900	---	59780	59350	---
MAX	62290	66960	65160	58570	62580	131700	47130	106900	104900	66880	59690	61210
MIN	58560	62140	41340	41180	41070	50500	40480	40640	63330	59780	58100	58450
(+)	477.98	478.51	474.65	474.70	478.03	476.24	474.56	483.04	478.59	477.64	477.58	477.84
(++)	+3,920	+3,960	-24,840	+270	+20,970	-12,080	-9,640	+66,040	-40,070	-7,050	-430	+1,860
CAL YR 1986	MAX 236000	MIN 39520	(++)	-6,810								
WTR YR 1987	MAX 131700	MIN 40480	(++)	+2,910								

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

RED RIVER BASIN

07300500 SALT FORK RED RIVER AT MANGUM, OK

LOCATION.--Lat 34°51'32", long 99°30'28", in SW 1/4 SE 1/4 sec.34. T.5 N, R.22 W., Greer County, Hydrologic Unit 11120202, near left bank on downstream side of pier of bridge on State Highway 34, 0.5 mi south of Mangum, 13.0 mi downstream from Fish Creek, and at mile 35.5.

DRAINAGE AREA.--1,566 mi² of which 209 mi² is probably noncontributing.

PERIOD OF RECORD.--April 1905 to June 1906, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1938.

GAGE.--Water-stage recorder. Datum of gage is 1,490.87 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Apr. 11, 1905 to June 30, 1906, nonrecording gage at site 0.2 mi upstream at different datum. Oct. 1, 1937 to Nov. 8, 1938, nonrecording gage at present site and datum.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--50 years, (water years 1938-87), 86.4 ft³/s, 62,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,000 ft³/s, May 16, 1957, gage height, 14.55 ft; maximum gage height, 14.7 ft, June 16, 1938; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	1415	*21,400	*14.66	No other peak greater than base discharge.			
Minimum daily discharge, 13 ft ³ /s, Aug. 25.							

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	318	123	140	111	127	176	91	62	344	128	19	34
2	665	120	140	106	121	159	95	61	305	98	19	32
3	12900	122	136	106	119	165	91	59	258	89	18	26
4	1740	666	134	105	117	151	85	56	218	88	18	22
5	687	625	137	104	123	138	82	56	274	80	19	20
6	606	260	141	102	121	132	87	57	200	75	25	25
7	493	224	152	101	119	127	91	59	189	70	22	24
8	353	202	171	106	116	124	94	57	183	67	20	27
9	282	191	186	111	112	125	95	56	175	66	18	29
10	245	185	179	115	107	136	89	55	719	68	18	26
11	638	172	167	124	107	145	88	53	404	61	17	30
12	1040	159	148	108	107	158	85	51	339	57	17	51
13	389	165	142	100	108	152	83	49	323	60	18	115
14	191	164	136	97	107	149	81	49	353	158	20	57
15	161	164	133	99	177	142	79	62	215	86	26	39
16	127	187	135	99	170	141	75	49	175	69	23	34
17	94	185	139	90	164	334	74	46	148	208	20	30
18	87	169	139	e82	142	133	73	44	129	90	18	26
19	88	164	135	e90	132	123	70	48	127	85	17	24
20	81	163	140	e94	129	105	70	57	116	58	16	24
21	429	159	141	e100	139	93	69	59	129	48	15	54
22	1500	154	137	e110	153	90	71	61	183	42	14	81
23	289	152	137	120	144	148	71	157	189	38	14	71
24	177	147	138	132	137	151	70	125	348	34	14	45
25	133	151	135	146	137	129	68	190	284	32	13	60
26	119	149	130	141	174	129	67	249	132	30	17	34
27	131	147	127	167	493	114	65	733	126	28	22	30
28	138	141	127	174	259	105	63	1960	114	25	53	28
29	132	139	123	155	---	98	63	1470	101	23	42	25
30	125	141	118	137	---	95	62	475	285	21	32	24
31	123	---	115	125	---	89	---	560	---	20	36	---
TOTAL	24481	5890	4358	3557	4161	4256	2347	7125	7085	2102	660	1147
MEAN	790	196	141	115	149	137	78.2	230	236	67.8	21.3	38.2
MAX	12900	666	186	174	493	334	95	1960	719	208	53	115
MIN	81	120	115	82	107	89	62	44	101	20	13	20
AC-FT	48560	11680	8640	7060	8250	8440	4660	14130	14050	4170	1310	2280

CAL YR 1986 TOTAL 66637 MEAN 183 MAX 12900 MIN 1.7 AC-FT 132200
WTR YR 1987 TOTAL 67169 MEAN 184 MAX 12900 MIN 13 AC-FT 133200

e Estimated

RED RIVER BASIN

07301110 SALT FORK RED RIVER NEAR ELMER, OK

LOCATION.--Lat 34°28'44", long 99°22'55", in NW 1/4 NE 1/4 sec.15, T.1 S., R.21 W., Jackson County, Hydrologic Unit 11120202, on right bank at bridge on State Highway 5, 1.7 mi west of Elmer, and at mile 3.5.

DRAINAGE AREA.--1,878 mi², of which 209 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,258.55 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor.

AVERAGE DISCHARGE.--8 years, 220 ft³/s, 159,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,900 ft³/s, October 20, 1983, gage height, 15.35 ft from high-water mark (HWM); maximum gage height, 16.06 ft, May 29, 1987 (from high-water mark); minimum daily discharge, 0.08 ft³/s, Sept. 4, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 4	Unknown	19,500	13.86 (from HWM)	May 29	Unknown	*28,800	*16.06 (from HWM)
Oct. 22	Unknown	13,200	12.01 (from HWM)	June 30	0547	7,670	9.99

Minimum daily discharge, 59 ft³/s, Sept. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1250	e480	e310	246	703	1070	218	106	e1060	1190	71	118
2	e2000	e485	298	248	532	581	213	104	e746	425	62	127
3	e5000	e500	293	245	412	451	216	106	e632	327	74	120
4	13400	e800	277	245	351	401	217	96	e535	244	74	116
5	e5200	e2000	275	248	535	394	210	89	e498	200	184	107
6	e1500	e1200	283	250	614	398	209	87	e498	185	260	108
7	1090	e940	298	247	413	384	215	93	e472	164	208	109
8	e1030	e850	320	252	358	385	222	89	e433	147	178	100
9	e900	e720	356	348	343	378	225	89	419	145	152	101
10	e820	e650	396	335	328	374	225	86	859	138	149	96
11	e700	e630	365	311	323	373	214	101	2160	130	133	97
12	e3000	e620	339	318	314	348	204	104	1550	127	116	101
13	e1800	e610	316	304	310	369	194	111	769	130	110	123
14	984	e590	306	286	305	358	186	121	623	126	113	186
15	e810	e580	303	e240	312	348	185	129	606	213	190	166
16	e720	e580	300	e210	620	352	180	152	547	187	197	110
17	e700	e610	298	e260	526	688	171	148	507	240	166	111
18	e650	e900	293	e200	457	533	167	126	490	425	138	93
19	e650	e940	295	e170	397	369	161	125	485	228	135	70
20	e630	e790	298	e190	393	292	155	148	482	189	147	59
21	e1200	746	299	233	413	257	139	158	474	149	145	105
22	5500	e680	301	289	427	246	134	193	486	132	139	243
23	e1500	e620	301	423	439	287	132	2130	543	118	138	138
24	e940	e550	301	410	414	587	128	2360	542	109	135	146
25	e800	e480	299	408	404	414	125	1570	686	100	110	107
26	e700	e430	291	417	442	354	122	1560	665	98	109	83
27	e660	e400	280	392	1170	307	119	2870	541	93	124	70
28	e900	e360	272	487	2300	274	114	9720	509	85	119	167
29	590	e330	264	576	---	258	110	19800	533	80	117	180
30	e550	e315	257	539	---	244	108	5570	4210	77	137	70
31	e500	---	251	421	---	231	---	e1630	---	75	119	---
TOTAL	56674	20386	9335	9748	14555	12305	5218	49771	23560	6276	4249	3527
MEAN	1828	680	301	314	520	397	174	1606	785	202	137	118
MAX	13400	2000	396	576	2300	1070	225	19800	4210	1190	260	243
MIN	500	315	251	170	305	231	108	86	419	75	62	59
AC-FT	112400	40440	18520	19340	28870	24410	10350	98720	46730	12450	8430	7000

CAL YR 1986 TOTAL 154828.0 MEAN 424 MAX 13400 MIN 6.8 AC-FT 307100
WTR YR 1987 TOTAL 215604 MEAN 591 MAX 19800 MIN 59 AC-FT 427700

e Estimated

RED RIVER BASIN

07301110 SALT FORK RED RIVER NEAR ELMER, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1978 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1978 to January 1982.

WATER TEMPERATURE: October 1978 to January 1982.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
OCT 29...	1200	1028	80020	3.31	590	3420	8.00	25.0	19.5	--	730
DEC 18...	1300	1028	80020	3.77	295	3750	8.20	9.0	9.0	--	735
FEB 04...	1235	1028	80020	3.96	362	3560	8.00	20.0	13.0	42	730
MAR 12...	1110	1028	1028	3.95	350	3660	7.80	7.0	8.5	--	--
APR 21...	1445	1028	80020	3.60	136	4380	7.80	13.0	16.0	4.5	730
JUN 09...	1600	1028	80020	2.56	425	3360	7.70	23.0	23.0	34	720
JUL 28...	1815	1028	1028	2.47	83	5310	7.70	31.0	33.0	--	730
AUG 25...	1400	1028	80020	2.76	116	3280	--	--	30.0	--	--
SEP 16...	1430	1028	80020	2.95	110	2330	7.80	36.0	27.0	110	720
DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
OCT 29...	7.7	89	180	640	--	--	--	--	--	--	--
DEC 18...	9.7	88	440	110	--	--	--	--	--	--	--
FEB 04...	10.0	100	K240	92	1500	1300	370	130	290	30	3
MAR 12...	--	--	--	--	--	--	--	--	--	--	--
APR 21...	9.0	97	31	23	1800	1600	480	140	370	31	4
JUN 09...	7.9	99	--	--	1500	1400	390	120	290	30	3
JUL 28...	7.7	114	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--	--
SEP 16...	7.9	106	K4	84	780	670	210	62	160	31	3

RED RIVER BASIN

07301110 SALT FORK RED RIVER NEAR ELMER, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	BROMIDE DIS- SOLVED (MG/L AS BR)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT 29...	--	254	0	208	--	--	--	--	--	--	--
DEC 18...	--	212	0	174	--	--	--	--	--	--	--
FEB 04...	7.2	193	0	158	1300	480	0.50	--	14	2860	2720
MAR 12...	--	--	--	--	--	--	--	--	--	--	--
APR 21...	6.5	163	0	134	1600	570	0.50	--	8.2	3640	3270
JUN 09...	7.0	--	--	--	1400	450	0.40	--	15	2870	2720
JUL 28...	--	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	510	--	1.1	--	--	--
SEP 16...	6.5	139	0	114	750	240	0.50	--	9.8	1630	1510
DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	
OCT 29...	--	--	1.29	0.010	0.03	1.30	0.150	0.150	0.19	0.75	
DEC 18...	--	--	1.98	0.020	0.07	2.00	0.190	0.150	0.19	1.5	
FEB 04...	3.89	2800	1.87	0.030	0.10	1.90	0.240	0.190	0.24	0.46	
MAR 12...	--	--	--	--	--	--	--	--	--	--	
APR 21...	4.95	1340	1.08	0.020	0.07	1.10	0.280	0.230	0.30	0.52	
JUN 09...	3.90	3290	--	<0.010	--	0.770	0.160	0.150	0.19	1.3	
JUL 28...	--	--	--	--	--	--	--	--	--	--	
AUG 25...	--	--	--	--	--	--	--	--	--	--	
SEP 16...	2.22	484	1.28	0.020	0.07	1.30	0.100	0.060	0.08	1.2	
DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	
OCT 29...	0.90	0.050	0.050	0.030	0.09	0.05	0.02	--	--	--	
DEC 18...	1.7	0.020	0.010	0.010	0.03	0.02	0.0	--	--	--	
FEB 04...	0.70	0.120	0.050	0.040	0.12	0.12	0.01	20	2	76	
MAR 12...	--	--	--	--	--	--	--	--	--	--	
APR 21...	0.80	0.010	0.010	<0.010	--	0.01	0.01	--	--	--	
JUN 09...	1.5	0.080	0.030	<0.010	--	0.08	0.03	<10	5	99	
JUL 28...	--	--	--	--	--	--	--	--	--	--	
AUG 25...	--	--	--	--	--	--	--	--	--	--	
SEP 16...	1.3	<0.010	0.010	<0.010	--	--	0.01	--	--	--	

RED RIVER BASIN

07301110 SALT FORK RED RIVER NEAR ELMER, OK--Continued

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
OCT 29...	--	--	--	--	--	--	--	--	--	--
DEC 18...	--	--	--	--	--	--	--	--	--	--
FEB 04...	<0.5	<1	<1	<3	4	9	<5	99	32	<0.1
MAR 12...	--	--	--	--	--	--	--	--	--	--
APR 21...	--	--	--	--	--	--	--	--	--	--
JUN 09...	<1	<3	<1	<9	3	<9	<5	120	44	<0.1
JUL 28...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--
SEP 16...	--	--	--	--	--	--	--	--	--	--

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 29...	--	--	--	--	--	--	--	922	1470	34
DEC 18...	--	--	--	--	--	--	--	182	145	69
FEB 04...	<10	<1	5	<1.0	4200	<6	18	160	156	90
MAR 12...	--	--	--	--	--	--	--	--	--	--
APR 21...	--	--	--	--	--	--	--	67	25	75
JUN 09...	<30	<1	5	<1.0	4400	<18	20	141	162	75
JUL 28...	--	--	--	--	--	--	--	--	--	--
AUG 25...	--	--	--	--	--	--	--	--	--	--
SEP 16...	--	--	--	--	--	--	--	261	78	100

RED RIVER BASIN

07301420 SWEETWATER CREEK NEAR SWEETWATER, OK

LOCATION.--Lat 35°25'25", long 99°58'08", on east-west line of north boundary, in NW 1/4 NE 1/4 sec.20, T.11 N, R.26 W., Roger Mills-Beckham County line, Hydrologic Unit 11120302, on right bank downstream bridge piling of State Highway 152, 0.4 mi downstream from Freezeout Creek, 3.3 mi west of Sweetwater, and at mile 16.0.

DRAINAGE AREA.--424 mi², of which 20 mi² is probably noncontributing.

PERIOD OF RECORD.--April 1986 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,087.76 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 270 ft³/s, May 28, 1987, gage height, 11.70; minimum daily discharge, 0.17 ft³/s, Aug. 22, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 270 ft³/s, May 28, gage 11.70 ft; minimum daily discharge, 1.5 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	119	30	36	30	43	91	64	28	88	36	5.1	3.4
2	111	28	36	30	49	69	59	27	70	31	4.8	3.4
3	175	29	36	32	45	60	56	26	58	32	4.4	2.9
4	201	139	36	32	40	54	55	25	50	28	4.2	2.4
5	124	196	35	32	38	51	53	25	45	24	4.1	2.0
6	73	179	36	32	35	48	52	25	40	21	3.9	2.9
7	50	135	41	32	34	46	51	25	37	18	3.6	4.4
8	38	97	51	33	34	44	50	25	33	17	3.3	6.8
9	31	75	56	44	32	44	51	24	32	16	3.4	6.2
10	28	64	54	53	32	52	49	22	36	15	3.2	5.5
11	62	58	46	46	32	57	47	21	40	14	3.2	5.1
12	99	53	43	42	31	64	46	19	37	13	3.2	6.0
13	80	48	39	40	31	72	45	18	34	12	3.8	7.3
14	63	49	38	39	33	63	46	18	30	12	3.5	8.7
15	46	50	38	37	50	55	47	18	26	11	3.6	8.2
16	37	51	38	34	102	83	46	17	23	11	3.0	7.6
17	31	49	38	34	80	107	45	17	22	29	2.7	6.5
18	28	47	37	34	58	93	43	16	19	25	2.3	6.8
19	26	44	36	39	51	78	42	16	19	22	2.1	7.1
20	24	42	36	46	52	68	40	16	19	15	2.0	13
21	41	42	35	44	56	61	38	16	19	12	1.8	30
22	164	42	35	47	53	57	36	16	20	11	1.6	34
23	161	40	35	39	47	81	36	19	29	10	1.5	24
24	101	37	35	40	44	145	35	25	30	9.2	1.9	19
25	71	35	35	40	44	134	33	34	117	8.6	1.9	15
26	58	36	34	44	53	103	33	106	83	8.0	2.0	13
27	50	34	33	61	103	88	32	161	51	7.5	2.8	11
28	43	35	32	67	134	84	31	211	37	7.0	2.8	10
29	38	35	32	59	---	78	29	194	30	6.4	2.8	10
30	34	35	32	49	---	68	29	159	29	6.0	3.0	9.9
31	32	---	31	42	---	65	---	117	---	5.5	3.9	---
TOTAL	2239	1834	1175	1273	1436	2263	1319	1486	1203	493.2	95.4	292.1
MEAN	72.2	61.1	37.9	41.1	51.3	73.0	44.0	47.9	40.1	15.9	3.08	9.74
MAX	201	196	56	67	134	145	64	211	117	36	5.1	34
MIN	24	28	31	30	31	44	29	16	19	5.5	1.5	2.0
AC-FT	4440	3640	2330	2520	2850	4490	2620	2950	2390	978	189	579

WTR YR 1987 TOTAL 15108.7 MEAN 41.4 MAX 211 MIN 1.5 AC-FT 29970

RED RIVER BASIN

07301500 NORTH FORK RED RIVER NEAR CARTER, OK

LOCATION.--Lat 35°10'05", long 99°30'25", in NW 1/4 SE 1/4 sec.15, T.8 N., R.22 W., Beckham County, Hydrologic Unit 11120302, near left bank on downstream side of pier of bridge on State Highway 34, 3.0 mi south of Carter, 10.8 mi downstream from Timber Creek, and at mile 110.5.

DRAINAGE AREA.--2,337 mi², of which 399 mi² is probably noncontributing.

PERIOD OF RECORD.--October 1944 to September 1962. Annual maximum and occasional low-flow measurements, water years 1963-64. August 1964 to current year.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,673.71 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--41 years, (water years 1945-62, 1965-87) 120 ft³/s, 86,940 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,400 ft³/s, May 26, 1959, maximum gage height, 14.98 ft, May 17, 1977; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	0200	*15,900	*12.88	Nov. 5	0045	4,840	8.32
Oct. 22	0545	7,290	9.73	May 27	1245	7,230	9.70

Minimum daily discharge, 14 ft³/s, Aug. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	e90	162	e150	179	517	276	120	555	455	e34	180
2	2130	e85	160	e148	183	389	246	109	e315	e160	e33	129
3	14000	e80	155	e150	194	288	243	103	e250	e112	e32	101
4	6380	2380	152	e148	197	e240	278	94	e200	e106	e31	80
5	1660	3020	147	e150	196	e220	323	97	e280	e100	e30	e50
6	672	846	151	e152	193	e210	345	98	373	e92	e29	e40
7	240	e500	175	e150	189	e200	352	99	321	e84	e28	e35
8	97	e300	221	e152	180	e190	372	96	e230	78	e27	e30
9	49	e220	321	e151	176	e200	371	94	e180	71	e26	e26
10	34	165	314	e152	175	e194	372	89	554	66	e25	e23
11	105	e150	252	e163	172	e192	352	87	587	62	e24	e20
12	527	e140	215	e158	171	e230	338	77	e370	74	e23	551
13	177	137	e190	e150	169	280	319	71	e300	185	e30	275
14	e90	132	e180	148	169	292	314	65	e250	95	e45	e170
15	e77	137	e170	148	176	289	313	65	e200	79	e35	e110
16	e64	161	e160	143	488	275	304	63	e170	68	e27	e80
17	e54	140	e165	143	237	1700	280	61	e150	1030	e24	e61
18	e50	131	e160	143	183	853	257	58	e120	597	22	196
19	e47	126	e154	141	175	522	239	56	e100	485	18	e140
20	e45	127	e160	143	175	377	e230	59	e90	304	20	e158
21	1100	147	e150	144	179	e330	e220	67	e80	e150	18	875
22	5630	190	e160	149	182	e300	217	63	e70	e109	16	615
23	1180	190	e157	153	189	1410	198	140	e60	e90	14	341
24	516	177	e154	153	182	1450	182	247	e100	e84	15	228
25	e248	181	e150	153	186	869	171	322	522	e62	201	e160
26	e170	185	e154	153	241	652	162	796	300	e54	85	e140
27	e130	172	e159	180	1100	491	152	6040	e180	e48	769	e120
28	e118	167	e155	263	806	403	140	4180	287	e46	311	e110
29	e110	166	e151	250	---	318	134	5360	159	e43	190	e96
30	e100	164	e158	207	---	262	127	1890	280	e40	134	e90
31	e95	---	e155	185	---	259	---	1060	---	e38	265	---
TOTAL	37045	10806	5467	4973	7042	14402	7827	21826	7633	5067	2581	5230
MEAN	1195	360	176	160	251	465	261	704	254	163	83.3	174
MAX	14000	3020	321	263	1100	1700	372	6040	587	1030	769	875
MIN	34	80	147	141	169	190	127	56	60	38	14	20
AC-FT	73480	21430	10840	9860	13970	28570	15520	43290	15140	10050	5120	10370

CAL YR 1986 TOTAL 74895 MEAN 205 MAX 14000 MIN .00 AC-FT 148600
WTR YR 1987 TOTAL 129899 MEAN 356 MAX 14000 MIN 14 AC-FT 257700

e Estimated

RED RIVER BASIN

07302500 LAKE ALTUS AT LUGERT, OK

LOCATION.--Lat 34°53'15", long 99°17'47", in SW 1/4 SE 1/4 sec.22, T.5 N., R.20 W., Kiowa County, Hydrologic Unit 11120302, on upstream face of Altus Dam on North Fork Red River, 1.0 mi west of Lugert, 2.6 mi upstream from Elm Fork of North Fork, and at mile 73.5.

DRAINAGE AREA.--2,515 mi², of which 399 mi² is probably noncontributing.

PERIOD OF RECORD.--December 1943 to September 1950 (monthly records only), October 1950 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Prior to Nov. 19, 1948, nonrecording or float gage at same site and datum.

REMARKS.--Reservoir is formed by concrete and coursed masonry dam. Storage began in December 1943. Capacity, 134,500 acre-ft at elevation 1,559.0 ft, crest of uncontrolled spillway, and 72,400 acre-ft at elevation 1,547.0 ft, crest of controlled spillway. Dead storage, 1,660 acre-ft below elevation 1,517.5 ft, sill of headgate at irrigation canal. Figures given herein represent total contents. Reservoir is used for flood control, municipal water supply for city of Altus, and irrigation of about 48,000 acres. Revised capacity table used since Jan. 1, 1969. From 1927 to 1943, a dam to form reservoir for municipal water supply was at same site. Elevation of crest was 1,514.31 ft. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Data on diversions provided by U.S. Bureau of Reclamation.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 170,600 ft³/s, May 19, 1951, elevation 1,562.10 ft; minimum after initial storage, 4,690 acre-ft, Aug. 25, 1944, elevation, 1,520.2 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 150,000 acre-ft, May 30, elevation 1,561.40 ft; minimum, 42,090 acre-ft, Oct. 1, elevation, 1,538.50 ft.

Capacity table (elevation, in feet, and contents, in acre-feet):

1520	3,844	1540	46,780
1525	10,710	1548	76,580
1529	18,130	1559	134,500
1534	29,620	1563	161,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	45400	137000	135300	135400	135300	138400	135800	134800	136000	136400	135800	109500
2	47900	136900	135100	135400	135200	137600	135300	134600	135100	137000	134700	108900
3	58680	137000	134800	135400	135100	136700	135400	134600	135400	137100	133300	108200
4	79650	140100	134600	135300	134900	135500	135500	134600	135500	136900	132100	107500
5	89220	144500	134800	135100	134800	134900	135600	134900	135200	136900	130600	107100
6	90810	144900	134900	135300	134600	134400	135700	134900	134900	136700	129000	107000
7	93090	144700	135700	135300	134700	134600	135600	135000	134600	136600	127300	106900
8	94080	142800	135800	135600	134800	134800	135100	135100	134700	136600	126200	106700
9	95270	140800	135600	135500	134700	135100	134900	134700	134900	136500	125200	106500
10	96040	139000	135500	135200	135000	135200	134900	134400	135800	136300	124300	106300
11	97530	137100	135400	134900	135100	135400	135000	133900	136300	136200	123500	106100
12	99590	135800	135200	134900	135100	135800	135300	133400	135600	136600	123100	106600
13	100900	135100	135000	134900	135200	135600	135500	132800	135000	136400	122500	106800
14	102000	135200	134800	135100	135300	135800	134900	133000	134600	136300	121300	107000
15	102700	135100	134700	135000	136100	135800	134900	132300	134600	136300	121000	107200
16	106100	135200	134700	135100	136400	136200	134900	131600	134400	136200	120700	107300
17	106700	135300	134900	135300	136600	138200	134900	130900	134300	137800	119900	107200
18	107200	135100	134800	135200	136600	138000	134400	130100	134900	138500	119400	107600
19	107800	135200	134900	135000	136500	136800	134500	129600	135200	138800	118400	107700
20	108300	135100	135000	134800	136300	136100	134700	128800	135300	138700	117200	108300
21	110800	134800	135200	134900	136100	135300	134500	128300	135700	138500	115900	109000
22	123200	135000	135200	134900	135700	134900	134700	128200	135600	138200	114700	110400
23	129000	134800	135200	135100	135300	136800	135000	129500	135100	138100	113400	110700
24	131600	134600	135300	135300	135000	137300	135300	130300	134600	137800	112700	111100
25	133100	135000	135300	135500	134800	136800	135400	130600	134600	137300	110800	111200
26	134200	135000	135400	135600	135500	135600	135600	131200	135100	136800	110100	111300
27	135300	135100	135400	135600	138600	135500	135900	137600	135200	136700	110400	111300
28	136100	135300	135500	135900	139100	135100	135800	145800	135400	136600	110400	113000
29	136300	135300	135400	135900	---	134800	135400	150000	135900	136400	110300	113100
30	136400	135700	135400	135600	---	134600	135000	146400	136200	136200	110200	113300
31	136800	---	135400	135200	---	134900	---	140600	---	136000	109900	---
MAX	136800	144900	135800	135900	139100	138400	135900	150000	136300	138800	135800	113300
MIN	45400	134600	134600	134800	134600	134400	134400	128200	134300	136000	109900	106100
(+)	1,559.36	1,559.19	1,559.15	1,559.11	1,559.73	1,559.06	1,559.08	1,559.96	1,559.27	1,559.24	1,154.81	1,555.42
(++)	+95,160	-1,100	-300	-200	+3,900	-4,200	+100	+5,600	-4,400	-200	-26,100	+3,400
(+++)	0	0	0	0	0	386	0	9,795	0	668	26,278	4,179
CAL YR 1986	MAX 144900	MIN 30210	(++) +104,880	(+++)	0							
WTR YR 1987	MAX 150000	MIN 45400	(++) +71,660	(+++)	41,306							

(+) Elevation, in feet, at end of month

(++) Change in contents, in acre-feet

(+++)

RED RIVER BASIN

07303000 NORTH FORK RED RIVER BELOW ALTUS DAM, NEAR LUGERT, OK

LOCATION.--Lat 34°53'26", long 99°18'22", in SW 1/4 sec.22, T.5 N., R.20 W., Greer County, Hydrologic Unit 11120303, on right bank at State Highway 44A bridge, 3,500 ft downstream from Altus Dam, 1.9 mi upstream from Elm Fork of North Fork, 2.0 mi west of Lugert, and at mile 72.8.

DRAINAGE AREA.--2,515 mi², of which 399 mi² is probably noncontributing.

PERIOD OF RECORD.--March 1930 to December 1932 (published as "at Lugert Dam"), December 1943 to September 1950 (published as spill from Lake Altus), October 1950 to September 1962, August 1964 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1311: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,471.81 ft above National Geodetic Vertical Datum of 1929. Mar. 19, 1930 to Dec. 21, 1932, nonrecording gage at former Lugert Dam, 0.7 mi upstream at datum 1,504.31 ft National Geodetic Vertical Datum of 1929, unadjusted.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation at low flow by Lugert Lake prior to December 1943, capacity 13,500 acre-ft and completely regulated thereafter by Lake Altus (station 07302500). Diversions at Lake Altus bypass most of streamflow. Seepage from Altus Dam not included for period February 1953 to September 1977.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft³/s, May 18, 1951, gage height, 12.70 ft, maximum gage height, 16.37 ft, May 21, 1977 (backwater from Elm Fork of the North Fork Red River); no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 16, 1928, reached a stage of 14.5 ft, site and datum in use 1930-32, discharge, 14,300 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,500 ft³/s, May 29, gage height, 13.76 ft (backwater from Elm Fork of the North Fork Red River); no flow at times.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.88	270	e330	192	370	1110	238	216	3610	33	15	.27
2	1.0	328	355	192	367	1030	257	216	1260	57	6.8	.18
3	1600	677	351	201	364	960	239	73	365	71	1.5	.30
4	238	1160	304	191	361	989	252	1.5	440	64	1.4	.35
5	.64	1590	134	189	365	727	246	2.5	438	59	.76	.49
6	.12	2160	4.3	189	328	521	252	4.0	433	54	.52	.52
7	.00	2060	111	196	165	311	396	4.4	378	49	.30	.55
8	.00	1860	305	196	181	234	466	3.2	261	52	.15	.39
9	.00	1610	389	282	170	251	377	3.4	265	42	.13	.40
10	.00	1480	381	375	175	245	230	2.4	387	31	.12	.37
11	.33	1100	378	363	176	246	227	1.5	729	26	.10	.26
12	.58	900	e350	274	178	262	234	.90	849	26	.00	.63
13	.63	658	e300	176	178	382	244	.78	616	37	.01	.52
14	.59	398	e250	179	182	436	246	.89	438	32	.14	.43
15	.57	345	e190	204	322	443	221	1.5	267	31	.13	.61
16	.51	346	e180	200	390	556	220	1.0	202	25	.00	.41
17	.53	357	e180	197	407	944	221	.82	64	55	.00	.34
18	.71	346	175	195	411	1210	228	.68	5.8	144	.00	.43
19	2.3	346	175	178	415	1140	227	.69	11	174	.00	.41
20	2.2	353	178	177	470	1060	228	.85	7.3	176	.00	.50
21	1.4	343	185	175	525	900	200	.85	14	171	.00	1.1
22	1.1	252	187	177	513	540	2.6	1.2	302	154	.00	.83
23	1.1	178	182	180	499	712	3.6	2.5	445	135	.00	.58
24	1.1	177	184	191	494	1110	4.8	1.0	378	121	.00	.47
25	1.7	181	189	192	394	1250	6.9	1.2	98	103	.00	.25
26	.48	184	189	322	399	1380	10	.80	2.9	65	.34	.38
27	224	218	190	385	758	907	15	139	5.5	50	.46	.51
28	234	367	192	491	1150	653	157	e2360	6.7	41	.37	1.2
29	237	355	192	550	---	559	234	e5500	11	34	.21	.68
30	265	e330	192	541	---	307	222	e5370	28	28	.16	.55
31	276	---	196	481	---	221	---	e4900	---	21	.27	---
TOTAL	3139.99	20929	7098.3	8031	10707	21596	6104.9	18812.56	12317.2	2161	28.87	14.91
MEAN	101	698	229	259	382	697	203	607	411	69.7	.93	.50
MAX	1600	2160	389	550	1150	1380	466	5500	3610	176	15	1.2
MIN	.00	177	4.3	175	165	221	2.6	.68	2.9	21	.00	.18
AC-FT	6230	41510	14080	15930	21240	42840	12110	37310	24430	4290	57	30

CAL YR 1986 TOTAL 31188.55 MEAN 85.4 MAX 2160 MIN .00 AC-FT 61860
WTR YR 1987 TOTAL 110940.22 MEAN 304 MAX 5500 MIN .00 AC-FT 220000

e Estimated

RED RIVER BASIN

07304500 ELK CREEK NEAR HOBART, OK

LOCATION.--Lat 34°54'51", long 99°06'49", in NE 1/4 NE 1/4 sec.17, T.5 N., R.18 W., Kiowa County, Hydrologic Unit 11120303, near right bank on downstream side of pier of county road bridge, 7.0 mi downstream from Little Elk Creek, 7.5 mi south of Hobart, and at mile 10.9.

DRAINAGE AREA.--549 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1904 to March 1908, October 1949 to current year.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1905. WDR OK-86-1: 1984 (M).

GAGE.--Water-stage recorder. Datum of gage is 1,429.4 ft above National Geodetic Vertical Datum of 1929. See WSP 1920 for history of changes prior to Apr. 28, 1954.

REMARKS.--Records fair. Part of high flows are diverted 1.0 mi upstream from station, by means of a breach canal (U.S. Bureau of Reclamation), into Tom Steed Reservoir.

AVERAGE DISCHARGE.--41 years, (water years 1905-07, 1950-87), 83.2 ft³/s, 60,280 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,000 ft³/s, Oct. 3, 1986, gage height, 31.53 ft; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,200 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	1930	*28,000	*31.53	May 23	1830	4,700	26.68
Oct. 23	0230	8,440	29.76	May 29	Unknown	22,400	31.21 (from HWM)

Minimum daily discharge, 26.0 ft³/s, Aug. 24-25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1620	e260	174	123	540	e170	192	67	1060	141	40	83
2	1120	e210	183	120	372	e165	184	115	738	120	41	104
3	8780	e290	161	116	255	e160	189	61	589	111	37	63
4	11200	1270	154	126	166	e150	172	61	556	106	33	48
5	3840	1990	151	115	168	e148	164	61	364	99	31	41
6	2070	1150	151	113	161	e145	161	53	306	94	31	39
7	1720	597	160	114	164	e145	163	56	266	88	30	38
8	1520	437	195	117	235	e145	157	54	243	81	30	40
9	1230	391	290	159	e450	e140	144	56	224	77	29	42
10	1050	350	255	161	e540	e145	154	52	285	71	122	37
11	982	320	205	139	e330	e140	152	50	341	68	40	35
12	1160	300	178	120	e170	e140	133	50	326	65	34	38
13	680	280	169	e115	e160	e142	135	48	263	102	34	41
14	518	260	161	e110	e155	e142	138	50	230	74	117	45
15	402	250	159	e110	e150	e140	140	675	210	67	91	39
16	310	240	157	124	e140	e450	121	238	207	54	48	34
17	299	235	155	118	e140	e1600	106	57	182	607	41	32
18	260	228	157	102	e140	e860	97	52	553	530	38	235
19	240	223	146	97	e145	e590	93	49	245	251	36	710
20	260	215	141	116	e140	e476	89	49	214	134	33	128
21	1310	214	140	120	e140	393	88	49	194	106	30	497
22	5410	201	142	130	e138	311	93	53	222	87	28	485
23	6520	200	139	124	e140	433	84	2690	196	74	27	179
24	2390	203	132	122	e145	873	76	1890	162	66	26	116
25	1400	184	132	122	e148	524	74	1840	213	57	26	114
26	1070	202	132	122	e600	380	69	859	165	54	28	113
27	837	194	128	131	e350	313	68	1220	127	49	30	113
28	616	177	126	195	e240	369	70	6350	117	46	269	154
29	491	174	124	631	---	276	69	13000	108	43	106	397
30	365	175	126	531	---	248	67	3830	344	42	63	160
31	320	---	121	281	---	206	---	1550	---	40	50	---
TOTAL	59990	11420	4944	4924	6622	10519	3642	35285	9250	3604	1619	4200
MEAN	1935	381	159	159	236	339	121	1138	308	116	52.2	140
MAX	11200	1990	290	631	600	1600	192	13000	1060	607	269	710
MIN	240	174	121	97	138	140	67	48	108	40	26	32
AC-FT	119000	22650	9810	9770	13130	20860	7220	69990	18350	7150	3210	8330

CAL YR 1986 TOTAL 118168.6 MEAN 324 MAX 11200 MIN 7.1 AC-FT 234400
WTR YR 1987 TOTAL 156019 MEAN 427 MAX 13000 MIN 26 AC-FT 309500

e Estimated

RED RIVER BASIN

07304500 ELK CREEK NEAR HOBART, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1949-52, 1954-63, 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1949 to September 1951, October 1958 to September 1963, November 1969 to current year.

WATER TEMPERATURE: October 1949 to September 1951, October 1958 to September 1963, November 1969 to current year.

REMARKS.--Samples were collected by a local observer on a daily basis. Additional samples were collected periodically and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,030 microsiemens, May 8, 1985; minimum daily, 108 microsiemens, Oct. 19, 1983.

WATER TEMPERATURE: Maximum daily, 35.0 °C, July 8, 1951; minimum daily, -0.5 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,680 microsiemens, Dec. 9; minimum daily, 225 microsiemens, Oct. 3.

WATER TEMPERATURE: Maximum daily, 29.0 °C on several days during summer months; minimum daily, 3.0 °C, Jan. 11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)
OCT											
30...	1430	1028	80020	8.21	365	*1470	8.00	26.5	16.0	730	9.4
NOV											
19...	1745	1028	80020	6.79	223	1860	7.60	13.0	11.0	710	9.6
JAN											
15...	1230	1028	80020	5.88	110	2290	8.00	7.0	6.0	720	11.7
MAR											
20...	1300	1028	80020	8.65	476	1100	7.80	15.5	13.5	720	10.0
MAY											
20...	1445	1028	80020	4.77	49	*2220	8.30	31.5	24.0	720	14.5
JUL											
13...	1700	1028	80020	5.16	68	1960	8.50	26.5	26.0	730	8.3

DATE	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)	CAR- BONATE WATER WH IT FIELD (MG/L AS C03)
OCT											
30...	100	610	320	120	75	85	23	2	5.3	337	0
NOV											
19...	94	--	--	--	--	--	--	--	--	332	0
JAN											
15...	100	950	580	200	110	150	25	2	3.6	481	0
MAR											
20...	102	470	230	96	55	71	25	1	5.5	301	0
MAY											
20...	184	900	600	180	110	160	28	2	4.8	410	15
JUL											
13...	108	790	610	120	120	160	30	3	3.5	229	7

*SPECIFIC CONDUCTANCE, LAB (US/CM)

RED RIVER BASIN

07304500 ELK CREEK NEAR HOBART, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	ALKA- LITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)
OCT 30...	276	410	94	0.30	14	1030	979	1.40	1020	--	--
NOV 19...	272	--	--	--	--	--	--	--	--	10	3
JAN 15...	394	720	170	0.50	11	1700	1590	2.31	505	<10	3
MAR 20...	247	290	71	0.40	8.4	766	741	1.04	984	50	2
MAY 20...	360	660	160	0.50	9.9	1650	1470	2.24	218	<10	5
JUL 13...	200	670	170	0.40	3.1	1440	1360	1.96	263	--	--

DATE	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 30...	--	--	--	--	--	--	--	--	--	--	--
NOV 19...	300	2	<10	4	7	11	95	<0.1	--	2	13
JAN 15...	370	<1	<10	1	<10	<5	150	<0.1	<1	4	<10
MAR 20...	160	<1	<10	3	35	<5	7	<0.1	3	1	15
MAY 20...	480	<1	<10	4	20	<5	40	0.1	2	4	10
JUL 13...	--	--	--	--	--	--	--	--	--	--	--

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	469	1560	2030	2210	1450	889	1720	2320	670	1760	2160	1400
2	572	1570	2000	2180	1630	1100	1800	2300	800	1720	2150	1430
3	225	1650	1810	2040	1880	1330	1640	2250	930	1790	2170	833
4	318	---	2010	2020	1990	1420	1720	2280	970	1800	2160	1090
5	446	---	1990	2120	2030	1510	1810	2330	1080	1810	2170	1090
6	455	---	2030	2210	2030	1670	1780	2220	1350	1980	2160	1270
7	468	---	2020	2240	2090	1660	1820	2320	1530	1830	2210	1440
8	530	1190	2280	2130	2200	1720	1820	2330	1630	1970	2240	1560
9	579	1370	2680	2000	2080	1700	1760	2350	1700	2060	2280	1640
10	614	1480	2120	2240	2150	1730	1800	2330	1730	2040	2160	1680
11	811	1660	1910	2130	2160	1820	1760	2310	1530	2060	1570	1740
12	932	1590	1870	2160	2310	1890	1770	2310	1480	2070	2030	1750
13	497	1700	2000	2080	2300	1900	1880	2410	1410	2090	2010	1740
14	1160	1760	1980	2200	2280	1820	1760	2380	1570	2110	2270	1750
15	1350	1850	2040	2100	2270	1930	1700	710	1660	2090	1310	1720
16	1440	1890	2070	2070	2230	1900	1860	830	1680	2130	1780	---
17	1540	1950	2050	---	2120	966	1820	2190	1760	1510	1750	---
18	1640	2030	2070	---	2070	700	1890	2160	1000	774	1750	---
19	1670	1900	2000	---	1950	793	1830	2420	1680	1010	1940	---
20	1710	1920	2070	---	2130	1110	1930	2340	1340	1110	2020	---
21	1760	1860	2190	---	2280	1320	1960	2350	1530	1430	2070	---
22	368	1880	2120	---	2250	1500	2100	2280	1740	1620	2160	---
23	327	1990	2080	---	2260	1660	1950	1200	1440	1790	2230	---
24	488	2040	2130	---	2230	1170	1940	560	1790	1930	2250	---
25	627	1970	2200	---	2290	978	2020	540	1540	2030	2290	---
26	720	2170	2240	---	2200	1240	2070	590	1750	2100	2320	---
27	799	2210	2240	---	1140	1460	2020	840	1850	2130	2340	---
28	897	2130	2210	---	753	1590	2140	330	1900	2160	1290	---
29	1230	2170	2220	---	---	1630	2170	---	1890	2220	834	---
30	1460	2150	2210	---	---	1620	2160	430	1100	2190	1020	---
31	1580	---	2180	---	---	1650	---	620	---	2170	1230	---
MEAN	893	---	2100	---	2030	1460	1880	---	1470	1850	1950	---
MAX	1760	---	2680	---	2310	1930	2170	---	1900	2220	2340	---
MIN	225	---	1810	---	753	700	1640	---	670	774	834	---

RED RIVER BASIN

07304500 ELK CREEK NR HOBART, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20.5	15.5	7.0	5.0	15.0	8.5	10.0	20.5	21.5	23.0	26.5	21.0
2	21.0	13.0	6.0	4.5	9.0	8.0	10.0	21.0	22.5	25.0	29.0	22.0
3	20.0	13.0	5.5	5.5	12.0	9.5	9.5	24.0	22.0	25.0	27.0	22.0
4	18.0	---	6.0	4.5	12.0	11.0	10.0	19.5	21.0	25.0	27.0	22.0
5	18.0	---	7.0	4.5	11.0	10.0	11.0	20.0	21.0	28.0	27.0	21.0
6	18.5	---	8.5	5.0	9.0	12.0	10.0	19.0	22.0	25.0	26.0	22.0
7	19.0	---	10.0	5.0	7.0	13.0	11.0	18.0	22.0	25.5	27.0	23.0
8	19.0	12.0	8.0	6.0	9.0	13.0	11.5	19.5	23.0	26.0	27.0	22.0
9	19.0	12.0	7.0	5.0	10.0	12.0	13.0	19.0	23.0	25.0	27.0	22.5
10	18.5	11.5	5.5	3.5	8.0	8.0	14.5	20.0	23.0	25.0	25.0	22.0
11	14.0	7.5	5.0	3.0	9.5	7.0	15.0	21.0	22.5	24.5	26.0	22.0
12	12.0	7.0	5.0	4.5	10.5	8.5	16.0	22.0	25.0	26.0	27.0	22.0
13	21.5	4.5	5.0	5.5	11.0	9.5	15.0	22.0	24.0	23.0	27.0	22.0
14	12.0	4.0	6.0	6.5	11.0	11.0	12.0	23.0	27.0	22.0	26.0	23.0
15	13.0	5.5	8.0	5.5	12.0	12.0	12.0	18.0	26.0	23.0	25.0	23.0
16	13.0	7.0	9.0	4.0	8.0	14.0	14.0	22.0	28.0	24.0	29.0	---
17	15.0	8.0	10.0	---	7.5	13.0	16.0	24.0	29.0	24.0	26.0	---
18	15.5	9.0	9.0	---	7.0	12.0	18.0	25.0	23.0	25.0	25.0	---
19	16.0	9.0	6.5	---	6.5	12.0	22.0	24.0	25.0	25.5	27.0	---
20	15.5	10.0	6.0	---	5.5	13.0	20.5	21.0	26.0	26.0	26.0	---
21	16.0	9.5	8.0	---	5.5	12.0	17.0	22.0	25.0	25.0	25.0	---
22	14.0	10.0	6.0	---	8.0	15.0	16.0	23.0	24.0	25.0	25.0	---
23	16.0	9.0	6.0	---	8.0	15.0	16.5	20.0	24.5	26.0	25.0	---
24	15.5	8.0	5.0	---	9.0	11.0	16.5	22.0	25.0	26.0	23.0	---
25	14.0	8.0	6.0	---	9.0	9.5	22.0	20.0	24.0	26.0	25.0	---
26	13.5	7.0	6.5	---	10.0	---	18.0	22.0	24.0	28.0	25.0	---
27	14.0	6.5	6.0	---	10.0	10.0	18.5	22.0	24.0	25.0	22.0	---
28	14.0	5.5	6.0	---	11.0	10.0	19.0	19.0	26.0	26.0	20.0	---
29	14.5	7.0	6.5	---	---	8.0	20.0	---	24.0	26.0	21.0	---
30	14.5	8.0	5.0	---	---	5.0	20.0	21.0	23.0	25.0	22.0	---
31	15.5	---	5.5	---	---	7.0	---	22.0	---	26.0	21.0	---
MEAN	16.1	---	6.7	---	9.3	---	15.1	---	24.0	25.1	25.4	---
MAX	21.5	---	10.0	---	15.0	---	22.0	---	29.0	28.0	29.0	---
MIN	12.0	---	5.0	---	5.5	---	9.5	---	21.0	22.0	20.0	---

RED RIVER BASIN

07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK

LOCATION.--Lat 34°38'04", long 99°05'47", in NW 1/4 NE 1/4 sec.21, T.2 N., R.18 W., Tillman County, Hydrologic Unit 11120303, near left bank on downstream side of pier of bridge on old U.S. Highway 62, 2.5 mi east of Headrick, 12.9 mi upstream from Otter Creek, and at mile 33.0.

DRAINAGE AREA.--4,244 mi², of which 399 mi² is probably noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--April 1905 to March 1908, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to July 1905, published as "near Snyder".

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1905-07.

GAGE.--Water-stage recorder. Datum of gage is 1,294.83 ft above National Geodetic Vertical Datum of 1929. Prior to July 18, 1905, nonrecording gage at site 0.2 mi downstream at different datum. July 18, 1905 to Mar. 30, 1908, nonrecording gage at Navajo dam site 10.4 mi upstream at different datum. Oct. 1, 1937 to Jan. 29, 1969, water-stage recorder at present site at datum 5.0 ft higher.

REMARKS.--No estimated daily discharges. Records fair. Flow regulated since December 1943 by storage and diversion at Lake Altus, 39.5 mi upstream from station (station 07302500). Diversions for irrigation of about 48,000 acres upstream from station; some return flow may re-enter at Stinking Creek, 16 mi downstream from station. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Lake Altus, 8 years (1906-07, 1938-43), 455 ft³/s, 329,600 acre-ft/yr; since regulation by Lake Altus, 43 years (water years 1945-87), 286 ft³/s, 207,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59,000 ft³/s, Oct. 4, 1986, gage height, 19.07 ft, present datum; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 21.1 ft, present datum, occurred sometime prior to 1927, from information provided by Oklahoma State Highway Department.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 59,000 ft³/s, Oct. 4, gage height, 19.07 ft; minimum daily discharge, 134 ft³/s, Aug. 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9470	1300	920	693	1240	4150	906	419	8380	716	249	244
2	2980	1260	880	696	1230	2250	885	413	4900	944	236	288
3	6870	1220	926	693	1020	1770	892	408	2360	676	225	275
4	30200	2270	920	695	923	1610	856	364	1580	551	207	215
5	23300	5280	861	699	1120	1540	842	295	1400	505	199	192
6	8150	5550	765	692	1140	1360	828	288	1190	473	189	182
7	3990	3140	693	689	911	1200	820	285	838	445	180	178
8	3050	2870	724	732	764	1080	907	281	693	418	172	179
9	2540	2790	900	872	726	1020	964	277	819	401	170	177
10	2160	2620	1080	833	715	1010	906	274	963	381	189	177
11	2180	2390	1050	892	696	1010	800	268	1540	367	272	170
12	3080	2220	998	870	689	893	784	264	7070	354	192	177
13	2440	1930	977	810	688	887	766	261	2390	349	171	185
14	1590	1510	946	725	682	949	762	260	1540	341	168	348
15	1350	1150	931	715	693	980	760	314	1200	328	266	251
16	1160	1080	931	714	900	979	746	606	817	325	267	196
17	1090	1070	787	728	1150	1630	729	371	856	528	203	173
18	993	1060	736	729	1050	4320	718	289	895	1270	178	310
19	504	1050	732	723	956	3120	708	274	747	921	166	341
20	841	1040	712	676	925	1970	694	271	654	646	159	602
21	993	1040	698	671	962	1680	496	269	616	520	152	535
22	13700	1020	698	692	1020	1430	485	290	616	463	147	866
23	17000	988	698	718	1000	1170	406	2200	915	431	142	892
24	18700	962	696	719	993	1740	357	5450	988	405	137	476
25	3880	946	693	723	987	2480	344	2980	875	376	134	345
26	2740	962	691	723	1120	1880	335	2690	906	357	141	291
27	2360	920	688	779	1840	1770	329	3890	683	353	158	262
28	1990	885	685	855	4860	1400	322	9460	551	308	163	515
29	1680	900	685	1120	---	1240	355	32300	501	288	381	732
30	1480	880	687	1450	---	1160	425	32500	853	274	343	521
31	1390	---	691	1230	---	990	---	14200	---	262	250	---
TOTAL	173851	52303	25079	24556	31000	50668	20127	112711	48336	14976	6206	10295
MEAN	5608	1743	809	792	1107	1634	671	3636	1611	483	200	343
MAX	30200	5550	1080	1450	4860	4320	964	32500	8380	1270	381	892
MIN	504	880	685	671	682	887	322	260	501	262	134	170
AC-FT	344800	103700	49740	48710	61490	100500	39920	223600	95870	29700	12310	20420

CAL YR 1986 TOTAL 326802 MEAN 895 MAX 30200 MIN 12 AC-FT 648200
WTR YR 1987 TOTAL 570108 MEAN 1562 MAX 32500 MIN 134 AC-FT 1131000

07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1951-52, 1954-63, 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1959 to September 1963, July 1968 to current year.

WATER TEMPERATURE: November 1959 to September 1963, July 1968 to current year.

INSTRUMENTATION.--Water-quality monitor from August 1959 to September 1981.

REMARKS.--Samples were collected by a local observer on a daily basis. Additional samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 23,300 microsiemens, June 8, 1974; minimum daily, 302 microsiemens, Oct. 20, 1983.

WATER TEMPERATURE: Maximum daily, 38.0 °C, July 19, 1969, Aug. 4, 1977; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,210 microsiemens, Aug. 16; minimum daily, 573 microsiemens, Oct. 1.

WATER TEMPERATURE: Maximum daily, 30.0 °C, on several days during summer; minimum daily, 0.0 °C on several days during winter period.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)
DEC 16...	1610	1028	80020	--	6.96	927	3740	8.20	10.0	10.0	29
FEB 03...	1715	1028	80020	--	7.24	977	2980	8.40	28.0	12.0	--
MAR 12...	1604	1028	1028	--	7.32	890	3850	7.80	11.0	11.0	--
APR 21...	1045	1028	80020	--	6.87	492	4220	7.80	19.0	15.0	16
JUN 09...	1130	1028	1028	--	7.55	899	3350	8.00	22.0	25.0	--
JUL 28...	1240	1028	1028	25.0	5.94	316	4160	8.00	30.0	29.0	--
28...	1241	1028	1028	55.0	5.94	316	4260	7.80	30.0	30.0	--
28...	1242	1028	1028	140	5.94	316	4310	7.80	30.0	30.0	--
28...	1243	1028	1028	165	5.94	316	4290	7.80	30.0	30.0	--
SEP 15...	1115	1028	80020	--	5.58	280	3440	7.70	29.0	24.0	370

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD MG/L AS CAC03	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT
DEC 16...	730	10.0	94	180	62	940	720	240	82	500	54
FEB 03...	725	10.0	99	500	240	--	--	--	--	--	--
MAR 12...	--	--	--	--	--	--	--	--	--	--	--
APR 21...	730	9.8	103	57	K9	1100	870	260	98	570	54
JUN 09...	--	--	--	--	--	--	--	--	--	--	--
JUL 28...	730	9.8	135	--	--	--	--	--	--	--	--
28...	730	9.9	139	--	--	--	--	--	--	--	--
28...	730	9.9	139	--	--	--	--	--	--	--	--
28...	730	9.8	138	--	--	--	--	--	--	--	--
SEP 15...	720	8.3	106	K290	190	800	690	240	49	400	52

RED RIVER BASIN

07305000 NORTH FORK RED RIVER NER HEADRICK, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT MG/L AS HCO3	CAR- BONATE WATER WH IT MG/L AS CO3	ALKA- LINITY WAT WH TOT IT MG/L AS CACO3	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
DEC 16...	7	6.3	239	0	196	750	710	0.40	11	3220	2440
FEB 03...	--	--	185	2	156	--	--	--	--	--	--
MAR 12...	--	--	--	--	--	--	--	--	--	--	--
APR 21...	8	5.9	259	0	212	890	900	0.40	5.3	2870	2850
JUN 09...	--	--	--	--	--	--	--	--	--	--	--
JUL 28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--	--
SEP 15...	6	9.3	139	0	114	740	630	0.30	11	2200	2160
DATE	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	
DEC 16...	4.38	8060	1.99	0.010	0.03	2.00	0.080	0.060	0.08	0.82	
FEB 03...	--	--	1.78	0.020	0.07	1.80	0.080	0.090	0.12	1.1	
MAR 12...	--	--	--	--	--	--	--	--	--	--	
APR 21...	3.90	3810	1.29	0.010	0.03	1.30	0.130	0.080	0.10	0.47	
JUN 09...	--	--	--	--	--	--	--	--	--	--	
JUL 28...	--	--	--	--	--	--	--	--	--	--	
28...	--	--	--	--	--	--	--	--	--	--	
28...	--	--	--	--	--	--	--	--	--	--	
28...	--	--	--	--	--	--	--	--	--	--	
SEP 15...	2.99	1660	--	<0.010	--	0.910	0.080	0.090	0.12	1.6	
DATE	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	
DEC 16...	0.90	0.070	0.040	0.040	0.12	0.07	0.0	<10	2	110	
FEB 03...	1.2	0.140	0.060	0.050	0.15	0.14	0.01	--	--	--	
MAR 12...	--	--	--	--	--	--	--	--	--	--	
APR 21...	0.60	0.020	0.010	<0.010	--	0.02	0.01	<10	1	100	
JUN 09...	--	--	--	--	--	--	--	--	--	--	
JUL 28...	--	--	--	--	--	--	--	--	--	--	
28...	--	--	--	--	--	--	--	--	--	--	
28...	--	--	--	--	--	--	--	--	--	--	
28...	--	--	--	--	--	--	--	--	--	--	
SEP 15...	1.7	<0.010	0.020	<0.010	--	--	0.02	510	1	74	

RED RIVER BASIN

07305000 NORTH FORK RED RIVER NEAR HEADRICK, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)
DEC 16...	<1	<3	<1	<9	1	13	<5	69	<3	<0.1
FEB 03...	--	--	--	--	--	--	--	--	--	--
MAR 12...	--	--	--	--	--	--	--	--	--	--
APR 21...	<1	<3	1	<9	4	<9	<5	86	9	<0.1
JUN 09...	--	--	--	--	--	--	--	--	--	--
JUL 28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
SEP 15...	<0.5	<1	<1	<3	8	260	<5	28	10	<0.1

DATE	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
DEC 16...	<30	<1	3	<1.0	2600	<18	20	58	145	94
FEB 03...	--	--	--	--	--	--	--	575	1520	80
MAR 12...	--	--	--	--	--	--	--	--	--	--
APR 21...	40	<1	4	<1.0	3100	<18	<9	105	139	75
JUN 09...	--	--	--	--	--	--	--	--	--	--
JUL 28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
28...	--	--	--	--	--	--	--	--	--	--
SEP 15...	<10	2	2	<1.0	2300	6	13	958	724	97

RED RIVER BASIN

07305000 NORTH FORK RED RIVER NR HEADRICK, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	573	4230	4590	4510	2860	1580	3720	4470	1960	2730	5050	4830
2	839	---	4580	4490	2330	1860	3860	4530	2210	5580	5160	4490
3	1160	---	3930	4540	3040	2300	3730	4590	2430	2650	5300	4260
4	699	---	4010	4530	3510	2600	3830	4570	2710	3730	---	---
5	1070	1800	4120	4550	2810	2740	3870	4450	2700	4240	5260	4580
6	1280	1930	4580	3870	2450	2850	3990	6120	2680	4580	5670	5020
7	2180	1690	4500	3100	3510	3140	3960	6310	2930	4580	5880	5840
8	2580	2270	5470	3880	3770	3380	4160	6380	---	4580	5970	6150
9	2780	2400	4520	2160	4040	3720	3600	6310	3290	4630	6160	6660
10	3160	2520	4040	2100	4080	3890	3470	6340	3380	4640	5360	6010
11	3320	2620	3770	2900	4240	3900	3880	6380	3250	---	5290	6640
12	2550	2770	3700	3000	4220	3930	3950	6430	1200	4750	4620	6630
13	3070	2820	3680	3360	4230	3980	4050	6520	1790	4990	5560	6900
14	3420	3150	3780	4040	4260	3930	4130	6600	2430	5140	5870	6370
15	3560	3540	3850	1990	4190	3730	4110	6680	3010	4860	5890	3410
16	4450	3970	3870	4440	4210	3610	4070	2250	3000	4840	7210	3530
17	4960	4060	3890	3730	3270	3450	4120	4280	3400	4960	6840	6080
18	5280	4050	4470	3820	3460	1920	4200	4800	2710	4720	6040	1430
19	5540	4020	4500	3980	3130	1820	4230	6250	3120	3050	5980	5980
20	5680	3910	4520	3700	3300	2070	4130	6490	3660	1810	6370	1540
21	4340	4050	4490	4190	3530	2500	4190	6610	4120	2750	6500	---
22	1030	4100	4580	2850	3520	2770	4270	6940	4490	3270	6610	2380
23	990	4120	4550	4330	3600	3030	3910	3670	---	3460	6710	1990
24	902	4160	4510	4200	3480	3380	5480	700	3440	3550	6700	2090
25	1460	4080	4550	4680	3490	2250	5350	870	2650	3320	6650	2660
26	2300	3780	4580	4560	3220	2210	5490	960	4140	3930	6580	3330
27	2820	4430	4580	4570	2270	2500	5480	1580	3500	4120	6240	3930
28	3150	4560	4490	3790	1570	2650	5600	720	3470	4470	8690	3700
29	3560	4600	4540	3520	---	3100	5110	700	3280	3870	3780	1280
30	3900	4590	4550	2810	---	3130	4380	860	3730	4800	5490	1680
31	4070	---	4570	2570	---	3240	---	1470	---	5020	4170	---
MEAN	2800	---	4330	3700	3410	2940	4280	4380	---	---	---	---
MAX	5680	---	5470	4680	4260	3980	5600	6940	---	---	---	---
MIN	573	---	3680	1990	1570	1580	3470	700	---	---	---	---

RED RIVER BASIN

07305000 NORTH FORK RED RIVER NR HEADRICK, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.0	13.0	9.0	6.0	7.0	9.0	12.0	23.0	24.0	29.0	28.0	28.0
2	24.0	---	10.0	6.0	9.0	10.0	10.0	22.0	24.0	26.0	28.0	28.0
3	25.0	---	10.0	7.0	10.0	12.0	12.0	20.0	23.0	26.0	29.0	28.0
4	23.0	---	7.0	6.0	10.0	12.0	12.0	19.0	24.0	28.0	---	---
5	27.0	11.0	10.0	7.0	9.0	11.0	9.0	22.0	25.0	27.0	28.0	27.0
6	23.0	12.0	9.0	7.0	9.0	14.0	12.0	20.0	24.0	28.0	29.0	27.0
7	21.0	13.0	10.0	7.0	13.0	16.0	12.0	20.0	25.0	28.0	29.0	28.0
8	20.0	12.0	8.0	7.0	11.0	11.0	22.0	19.0	---	26.0	29.0	28.0
9	20.0	12.0	7.0	6.0	---	10.0	15.0	26.0	25.0	27.0	28.0	27.0
10	19.0	12.0	5.0	6.0	11.0	6.0	12.0	26.0	24.0	25.0	30.0	---
11	19.0	7.0	6.0	2.0	10.0	9.0	16.0	20.0	25.0	---	25.0	---
12	13.0	7.0	6.0	5.0	11.0	9.0	17.0	28.0	25.0	27.0	29.0	---
13	13.0	6.0	8.0	5.0	12.0	11.0	12.0	28.0	26.0	28.0	30.0	24.0
14	12.0	4.0	7.0	6.0	12.0	15.0	13.0	25.0	25.0	25.0	29.0	26.0
15	13.0	5.0	10.0	4.0	10.0	10.0	13.0	24.0	26.0	---	28.0	25.0
16	14.0	6.0	10.0	3.0	9.0	11.0	17.0	24.0	26.0	26.0	28.0	27.0
17	15.0	6.0	9.0	.0	7.0	11.0	20.0	25.0	26.0	26.0	29.0	27.0
18	14.0	7.0	9.0	2.0	5.0	10.0	22.0	25.0	25.0	27.0	30.0	24.0
19	12.0	7.0	10.0	.0	7.0	12.0	23.0	27.0	27.0	26.0	26.0	26.0
20	15.0	10.0	7.0	.0	6.0	15.0	23.0	24.0	26.0	28.0	29.0	25.0
21	14.0	9.0	7.0	.0	7.0	12.0	16.0	24.0	25.0	28.0	28.0	---
22	12.0	10.0	6.0	.0	7.0	15.0	15.0	23.0	28.0	29.0	29.0	25.0
23	16.0	9.0	9.0	.0	10.0	15.0	15.0	23.0	---	28.0	27.0	23.0
24	12.0	7.0	9.0	.0	9.0	12.0	15.0	23.0	26.0	28.0	27.0	24.0
25	12.0	10.0	7.0	.0	10.0	10.0	20.0	23.0	26.0	29.0	29.0	23.0
26	12.0	7.0	7.0	1.0	9.0	10.0	23.0	23.0	26.0	28.0	27.0	23.0
27	12.0	7.0	7.0	2.0	10.0	10.0	25.0	23.0	26.0	30.0	27.0	19.0
28	12.0	7.0	---	5.0	9.0	10.0	25.0	24.0	27.0	29.0	28.0	19.0
29	13.0	11.0	7.0	7.0	---	8.0	27.0	23.0	26.0	27.0	28.0	25.0
30	15.0	10.0	6.0	5.0	---	5.0	21.0	24.0	29.0	28.0	28.0	26.0
31	14.0	---	6.0	7.0	---	10.0	---	24.0	---	27.0	28.0	---
MEAN	16.5	---	---	3.8	---	11.0	16.9	23.4	---	---	---	---
MAX	27.0	---	---	7.0	---	16.0	27.0	28.0	---	---	---	---
MIN	12.0	---	---	.0	---	5.0	9.0	19.0	---	---	---	---

RED RIVER BASIN

07305500 WEST OTTER CREEK AT SNYDER LAKE, NEAR MOUNTAIN PARK, OK

LOCATION.--Lat 34°44'02", long 98°59'10", in SE 1/4 NE 1/4 sec.16, T.3 N., R.17 W., Kiowa County, Hydrologic Unit 11120303, near east end of Snyder Dam, 0.8 mi upstream from small tributary, 3 mi northwest of Mountain Park, and at mile 26.0.

DRAINAGE AREA.--132 mi².

PERIOD OF RECORD.--April 1903 to March 1908, October 1951 to September 1971, July 1972 to current year. Published as Otter Creek near Mountain Park 1903-8 and as Otter Creek at Snyder Lake, near Mountain Park 1951-60. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1731: 1960 (M). WSP 1920: 1959-60. WDR OK-78-2: 1977.

GAGE.--Water-stage recorder and broad-crested masonry spillway. Datum of gage is 1,361.06 ft above National Geodetic Vertical Datum of 1929. April 1903 to March 1908, nonrecording gage at site 1.8 mi downstream at different datum. October 1951 to September 1971 at intake tower at same site and datum. July 1972 to August 1976, 700 ft downstream at datum 1,344.00 ft.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. The city of Snyder diverted about 130 acre-ft annually prior to October 1958 and none thereafter. Flow completely regulated since June 1975 by Tom Steed Reservoir.

AVERAGE DISCHARGE.--Prior to regulation by Tom Steed Reservoir, 26 years (water years 1904-7, 1952-71, 1973-74), 23.0 ft³/s, 16,660 acre-ft/yr; since regulation by Tom Steed Reservoir, 12 years (water years 1976-87), 13.7 ft³/s, 9,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft³/s, June 6, 1953, gage height, 19.50 ft, from floodmarks, from rating curve extended above 1,600 ft³/s on basis of contracted-opening and flow-over-dam measurements of peak flow; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,300 ft³/s, May 29, gage height, 15.44 ft; no flow at times.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	295	282	.00	.50	100	.00	.00	1470	30	.00	.00
2	4.9	283	281	.00	.50	101	.00	.00	1240	37	.00	.00
3	12	288	281	.00	132	155	.00	.00	1220	30	.00	.00
4	.23	146	279	e.00	218	268	.00	.00	1240	50	.00	.00
5	.00	25	280	e.00	86	262	.00	.00	983	50	.00	.00
6	.00	73	278	e.00	40	223	.00	.00	595	50	.00	.00
7	.00	193	276	e.00	124	137	.00	.00	598	47	.00	.00
8	.00	278	231	e.00	270	137	.00	.00	601	18	.00	.00
9	.00	272	95	e.00	303	124	.00	.00	579	.00	.00	.00
10	70	264	303	e.00	303	63	.00	.00	565	.00	.00	.00
11	142	263	147	e.00	307	.11	.00	.00	429	.00	.00	.00
12	136	258	.37	e.00	303	.07	.00	.00	315	.00	.00	.00
13	141	259	.15	e.00	303	.06	.00	.00	319	.00	.00	.00
14	143	288	.20	e.00	293	.06	.00	.00	320	.00	.00	.00
15	151	312	.20	e.00	256	.03	.00	.00	324	.00	.00	.00
16	156	313	.20	e.00	230	2.2	.00	.00	325	.00	.00	.00
17	172	315	.19	e.00	256	1.7	.00	.00	325	.00	.00	.00
18	181	310	.00	e.00	287	78	.00	.00	121	.00	.00	.00
19	180	314	.04	e.00	302	136	.00	.00	108	.00	.00	.00
20	180	311	.10	e.00	300	135	.00	.00	176	.00	.00	.00
21	133	315	.08	e.00	168	93	.00	.00	176	.00	.00	.00
22	16	315	.00	e.00	.29	.16	.00	.00	176	.00	.00	.00
23	23	304	.00	e.00	59	.49	.00	.00	148	.00	.00	.00
24	63	308	.00	e.00	102	.00	.00	.31	84	.00	.00	.00
25	63	281	.00	e.00	99	.00	.00	7.5	69	.00	.00	.00
26	80	1.3	.00	e.04	100	.00	.00	93	39	.00	.00	.00
27	119	111	.00	e.08	102	.00	.00	637	39	.00	.00	.00
28	223	292	.00	.19	99	.00	.00	3480	39	.00	.00	.00
29	285	292	.00	.10	---	.00	.00	3030	17	.00	.00	.00
30	292	291	.00	.00	---	.00	.00	2750	3.0	.00	.00	.00
31	297	---	.00	.07	---	.00	---	1910	---	.00	.00	---
TOTAL	3263.13	7570.3	2734.53	0.48	5043.29	2016.88	0.00	11907.81	12643.0	312.00	0.00	0.00
MEAN	105	252	88.2	.015	180	65.1	.00	384	421	10.1	.00	.00
MAX	297	315	303	.19	307	268	.00	3480	1470	50	.00	.00
MIN	.00	1.3	.00	.00	.29	.00	.00	.00	3.0	.00	.00	.00
AC-FT	6470	15020	5420	1.0	10000	4000	.0	23620	25080	619	.0	.0

CAL YR 1986 TOTAL 13657.31 MEAN 37.4 MAX 315 MIN .00 AC-FT 27090
WTR YR 1987 TOTAL 45491.42 MEAN 125 MAX 3480 MIN .00 AC-FT 90230

e Estimated

RED RIVER BASIN

07307028 NORTH FORK RED RIVER NEAR TIPTON, OK

LOCATION.--Lat 34°30'25", long 99°12'28", in NW 1/4 NE 1/4 sec.5. T.1 S, R.19 W., Tillman County, Hydrologic Unit 11120303, near left bank on downstream side of bridge pier on State Highway 5, 3.8 mi west of intersection of State Highways 5 and 5C in Tipton, 4.8 mi downstream from Otter Creek, and at mile 15.3.

DRAINAGE AREA.--4,691 mi² of which 399 mi² is probably noncontributing.

PERIOD OF RECORD.--June 1983 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,234.45 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since December 1943 by storage and diversion at Lake Altus 54.2 mi upstream (station 07302500). Diversions for irrigation of about 48,000 acres upstream from station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,200 ft³/s, Oct. 5, 1986, gage height, 19.15 ft (from HWM); minimum daily discharge, 3.7 ft³/s, Sept. 7, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 57,200 ft³/s, Oct. 5, gage height, 19.15 ft (from HWM); minimum daily discharge, 210 ft³/s, Sept. 10-11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e9400	e1500	e1350	551	1490	7370	931	465	12900	1930	278	359
2	e3100	e1430	e1300	551	1550	4080	885	451	9740	1330	277	e330
3	e5800	e1500	1270	534	1060	3090	876	441	6560	1790	275	e300
4	e15000	e2500	1190	534	946	2690	870	428	4720	902	273	e320
5	30000	e4100	1150	533	1570	2640	850	343	4340	e710	302	e300
6	11800	e7000	1030	520	2480	2370	844	329	3890	e640	275	e280
7	5960	e4800	948	510	1690	1930	839	326	3280	570	273	e250
8	3870	e3700	957	560	1030	1550	848	325	2680	506	270	e230
9	3110	e3300	1180	1240	981	1320	982	323	2260	468	270	e220
10	2470	e3000	1280	1280	989	1240	946	321	2670	425	270	e210
11	2750	e2800	1390	865	984	1170	855	320	5450	395	300	e210
12	4380	e2700	1170	767	973	1080	e810	317	7300	372	289	e220
13	3650	e2500	945	715	963	1060	e800	317	5000	366	270	e240
14	2120	e2300	900	589	957	1070	e780	317	2840	355	275	e260
15	1370	e2200	876	549	986	1210	e760	315	2180	355	1140	e280
16	1070	e2100	860	537	1080	1210	e760	664	1800	353	1390	257
17	916	e1900	829	556	1610	1660	e750	477	1500	558	570	250
18	807	e1800	697	593	1530	5140	e740	428	1690	1660	e360	293
19	732	e1700	679	600	1310	5320	e730	401	1760	2720	e320	478
20	661	e1550	660	540	1250	3200	e720	395	1070	1040	e290	605
21	2740	e1500	639	501	1230	2610	e700	389	963	641	e280	909
22	11000	e1400	629	532	1260	2350	e600	383	914	528	e265	827
23	12800	e1380	623	548	1080	1810	426	4170	992	464	e250	1080
24	13700	e1340	619	554	1080	1850	388	6820	1480	432	e240	611
25	e11000	e1370	608	555	1130	3600	364	6430	1220	e372	e235	454
26	e7000	e1390	598	551	1480	2810	350	5810	1150	e335	e235	428
27	e3500	e1400	593	585	3390	2550	340	5170	974	e311	e230	407
28	e2600	e1400	586	903	5920	2160	334	17900	716	e290	e250	679
29	e2300	e1370	576	1510	---	1600	332	e32800	696	e276	e300	989
30	e2000	e1350	569	2100	---	1480	436	39100	2390	286	374	573
31	e1700	---	561	1530	---	1200	---	22700	---	281	374	---
TOTAL	179306	68280	27262	22993	41999	74420	20846	149375	95125	21661	11000	12849
MEAN	5784	2276	879	742	1500	2401	695	4819	3171	699	355	428
MAX	30000	7000	1390	2100	5920	7370	982	39100	12900	2720	1390	1080
MIN	661	1340	561	501	946	1060	332	315	696	276	230	210
AC-FT	355700	135400	54070	45610	83310	147600	41350	296300	188700	42960	21820	25490

CAL YR 1986 TOTAL 380307 MEAN 1042 MAX 30000 MIN 29 AC-FT 754300
WTR YR 1987 TOTAL 725116 MEAN 1987 MAX 39100 MIN 210 AC-FT 1438000

e Estimated

RED RIVER BASIN

07308500 RED RIVER NEAR BURKBURNETT, TX

LOCATION.--Lat 34°06'36", long 98°31'53", Cotton County, Okla., Hydrologic Unit 11130102, on left bank at downstream side of bridge on U.S. Highways 277 and 281, 2.5 mi northeast of Burkburnett, and at mile 933.0.
 DRAINAGE AREA.--20,570 mi², of which 5,936 mi² probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to August 1925 (monthly discharge only), December 1959 to current year.
 GAGE.--Water-stage recorder. Datum of gage is 952.57 ft above National Geodetic Vertical Datum of 1929. July 11, 1924, to Aug. 31, 1925, nonrecording gage at site 1,000 ft downstream, at same datum. December 16, 1959, to Jan. 11, 1960, non-recording gage at present site and datum.
 REMARKS.--Records fair, except those for periods when manometer was out of operation, which are poor. There are many small diversions for irrigation upstream from station.
 AVERAGE DISCHARGE.--27 years (water years 1961-87), 1,014 ft³/s, 734,600 acre-ft/yr.
 EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 166,000 ft³/s, Oct. 21, 1983, gage height, 16.90 ft; no flow at times.
 EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 3, 1957, reached a stage of 13.54 ft, from levels to floodmarks. According to local residents, higher stages occurred in 1891 and June 1941.
 EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 1	1145	24,900	10.39	Mar. 21	0845	10,000	8.46
Oct. 5	0030	46,700	12.10	May 24	1415	16,300	8.94
Oct. 13	0200	15,900	9.35	May 29	2000	*98,700	*13.78
Oct. 23	2000	38,600	11.37	June 12	0100	14,600	8.05
Nov. 6	1215	21,700	9.95	July 1	0115	15,500	8.33
Feb. 6	1430	10,000	8.60				

Minimum discharge, 350 ft³/s, Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22400	5220	3060	1520	3830	9470	1730	588	36500	11000	530	920
2	18100	5170	2720	1460	3300	7920	1640	621	17700	6640	464	1010
3	23100	5090	2560	1430	3910	4350	1590	715	10200	3250	426	654
4	33700	5870	2610	1360	3510	3570	1550	702	6700	2620	404	533
5	43700	11600	2670	1300	3380	3130	1550	689	4000	2500	390	515
6	41700	19700	2820	1270	7300	3220	1520	688	3720	1530	411	474
7	30200	10800	2860	1240	4750	3170	1490	624	3750	1250	456	443
8	8760	5970	2930	1160	2920	2860	1470	530	3750	1110	521	428
9	6540	5230	2890	1570	2000	2670	1460	489	3400	1020	601	399
10	6200	5190	2650	2220	1850	2380	1450	469	3240	931	639	379
11	10600	5090	2670	2570	1870	2190	1670	456	7740	822	601	352
12	9270	4880	2730	2060	1910	2320	1650	447	12300	756	538	489
13	14200	4920	2730	1740	2000	2470	1440	429	9320	848	530	539
14	8890	4660	2450	1760	2070	2520	1290	439	7960	837	521	814
15	5520	4260	2230	1720	2130	2500	1180	444	4070	768	521	748
16	5090	3980	2220	1620	2060	2590	1140	455	3300	748	547	903
17	5000	3890	2160	1620	2210	4340	1140	461	2780	1290	1670	1040
18	4880	3740	2090	1620	3120	3720	1110	570	2270	3240	2370	1220
19	4800	3710	2070	1510	3370	5390	1060	904	2140	3120	1540	1490
20	4570	3120	2020	1470	2350	5130	1000	761	2630	5600	940	866
21	4420	2720	1950	1530	2280	3420	986	635	2510	4230	710	997
22	23800	2460	1930	1600	2370	5250	981	661	1910	2630	611	1370
23	35500	2490	1910	1750	2460	4750	941	860	1670	1710	496	1970
24	30700	2410	1910	2060	2360	2630	923	12400	1620	1320	456	1820
25	20100	2530	1910	2310	2250	2500	878	12400	2040	1080	404	1930
26	11600	3860	1840	2260	2820	3690	757	13200	2340	945	390	1210
27	6050	3600	1820	2400	3620	3120	710	10400	2490	816	505	756
28	5550	2480	1740	2690	6660	2810	669	52900	2210	721	709	663
29	5810	1870	1680	2880	---	2440	645	88100	1680	689	609	1140
30	5640	2290	1660	3540	---	1880	620	87500	2840	649	498	2050
31	5450	---	1560	4230	---	1710	---	69300	---	574	599	---
TOTAL	461840	148800	71050	59470	84660	110110	36240	359837	168780	65244	20607	28122
MEAN	14900	4960	2292	1918	3024	3552	1208	11610	5626	2105	665	937
MAX	43700	19700	3060	4230	7300	9470	1730	88100	36500	11000	2370	2050
MIN	4420	1870	1560	1160	1850	1710	620	429	1620	574	390	352
AC-FT	916100	295100	140900	118000	167900	218400	71880	713700	334800	129400	40870	55780
CAL YR 1986	TOTAL	979048	MEAN	2682	MAX	43700	MIN	74	AC-FT	1942000		
WTR YR 1987	TOTAL	1614760	MEAN	4424	MAX	88100	MIN	352	AC-FT	3203000		

RED RIVER BASIN

07308500 RED RIVER NEAR BURKBURNETT, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: July 1968 to September 1974. Chemical and biochemical: October 1974 to current year. Pesticide analyses: October 1974 to September 1982.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1968 to September 1981.

WATER TEMPERATURES: July 1968 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 17,400 microsiemens, July 30, 1972; minimum daily, 889 microsiemens, Sept. 24, 1970.

WATER TEMPERATURES: Maximum daily, 35.5 °C, June 29, 1980; minimum daily, 0.0 °C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN,	OXYGEN	COLI-	STREP-	HARD- NESS (MG/L AS CAC03)
								DIS- SOLVED (PER- CENT SATUR- ATION)	DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	TOCOCCI FECAL, KF AGAR (COLS./ PER 100 ML)	
NOV												
13...	1400	5090	4200	8.00	3.0	490	11.8	91	1.1	870	2500	930
JAN												
08...	1330	1160	7400	8.30	5.5	33	11.6	99	1.3	84	340	1300
MAR												
06...	1320	3220	4360	8.00	15.0	220	9.7	101	0.7	--	--	980
MAY												
20...	1310	592	4350	7.80	25.5	290	7.3	95	2.5	200	630	900
JUL												
09...	1445	878	5720	7.90	30.0	0.60	9.4	132	0.8	740	30	1100
AUG												
27...	1540	592	5920	8.10	23.5	55	10.8	135	1.0	420	70	980
DATE	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
NOV												
13...	730	250	74	600	9	7.4	199	720	920	0.40	11	2780
JAN												
08...	1000	340	110	1100	14	8.0	257	1200	1600	0.40	11	4880
MAR												
06...	790	250	86	590	8	8.0	195	800	940	0.50	9.8	2980
MAY												
20...	790	230	79	580	9	7.5	115	790	920	0.40	8.1	2870
JUL												
09...	1100	290	98	890	12	8.9	59	1000	1500	0.40	10	3740
AUG												
27...	880	230	97	950	14	8.8	100	940	1400	0.40	7.7	3840
DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, DIS- SOLVED TOTAL (MG/L AS P)	PHOS- PHORUS, ORTHOPHOS- PHATE, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHOPHOS- PHATE, DIS- SOLVED (MG/L AS P04)	
NOV												
13...	2700	1.08	0.020	1.10	0.120	0.140	0.28	0.40	0.070	0.070	0.030	0.09
JAN												
08...	4500	1.68	0.020	1.70	0.150	0.150	0.65	0.80	0.020	0.010	0.030	0.09
MAR												
06...	2800	1.09	0.010	1.10	0.340	0.090	0.96	1.3	0.490	0.150	0.030	0.09
MAY												
20...	2700	0.850	0.020	0.870	0.150	0.140	2.9	3.0	0.360	0.010	<0.010	--
JUL												
09...	3800	--	<0.010	<0.100	0.130	0.100	1.4	1.5	0.230	0.010	0.010	0.03
AUG												
27...	3700	--	<0.010	<0.100	0.070	0.040	0.93	1.0	0.110	0.020	<0.010	--

RED RIVER MAIN STEM

07308500 RED RIVER NEAR BURKBURNETT, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
NOV 13...	1070	14700	83	<10	3	100	<10	<1	<1	<1	3	<10
JAN 08...	180	564	83	--	--	--	--	--	--	--	--	--
MAR 06...	556	4830	91	20	2	200	<10	<1	<1	1	3	20
MAY 20...	402	643	96	20	2	100	<10	<1	<1	<1	4	40
JUL 09...	262	621	95	--	--	--	--	--	--	--	--	--
AUG 27...	132	211	98	10	3	<100	<10	<1	4	<1	1	50

DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 13...	94	50	30	<0.1	8	2	2	<1	3000	10	<10
JAN 08...	--	--	--	--	--	--	--	--	--	--	--
MAR 06...	<5	50	20	<0.1	<1	4	3	<1	3100	<100	10
MAY 20...	<5	60	20	0.3	2	<1	3	<1	3200	<10	200
JUL 09...	--	--	--	--	--	--	--	--	--	--	--
AUG 27...	<5	70	<10	0.3	4	<1	1	<1	3800	30	40

RED RIVER BASIN

07311000 EAST CACHE CREEK NEAR WALTERS, OK

LOCATION.--Lat 34°21'44", long 98°16'56", on south line of SE 1/4 SE 1/4 sec.19, T.2 S., R.10 W., Cotton County, Hydrologic Unit 11130202, at right bank on downstream side of bridge on State Highway 53, 1.8 mi east of Walters, 12.2 mi upstream from West Cache Creek, and at mile 19.7.

DRAINAGE AREA.--675 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1938 to December 1963; October 1969 to current year. Prior to October 1969, published as Cache Creek near Walters.

GAGE.--Water-stage recorder. Datum of gage is 938.2 ft above National Geodetic Vertical Datum of 1929 (Oklahoma State Highway Department). Prior to Jan. 8, 1939, nonrecording gage at same site and datum.

REMARKS.--Records poor. Flow partly regulated by Lake Lawtonka, capacity, 42,300 acre-ft on Medicine Creek prior to late 1953, and 63,000 acre-ft thereafter by Lake Thomas, capacity 8,300 acre-ft on Little Medicine Creek; and since March 1961 by Lake Ellsworth, capacity 94,500 acre-ft on East Cache Creek. Low flow sustained by sewage effluent from cities of Lawton and Walters.

AVERAGE DISCHARGE.--43 years, 192 ft³/s, 139,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,900 ft³/s, Oct. 21, 1983, gage height, 30.66 ft; no flow at times in 1939-40.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1906 reached an approximate stage of 29.7 ft, information from local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 37,500 ft³/s, May 28, gage height, 29.75 ft; minimum daily discharge, 45 ft³/s, Aug. 13, Sept. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1800	862	e510	e127	1350	3950	176	e62	4170	1950	e60	352
2	e4100	e790	475	146	1120	3110	156	e61	1780	1150	e59	326
3	e3000	e740	e420	180	1070	1420	171	e60	1050	e580	e58	333
4	e2150	e7000	362	e200	902	1230	182	e59	1070	606	e57	335
5	e1600	e1700	325	220	1480	1180	197	e59	1090	e300	e55	339
6	e1200	e980	387	e205	3320	1150	221	e58	1020	e180	e54	345
7	e1100	e900	383	e198	3460	1130	221	e57	980	155	e54	340
8	e1000	e880	1020	211	1960	1170	165	e57	960	e130	e55	337
9	e950	e870	e1590	1110	997	1140	131	e56	940	184	e53	337
10	e910	e1800	1350	2800	804	1130	122	e56	952	e130	83	e250
11	e2000	497	958	2030	739	1120	114	e55	2930	e102	68	e135
12	1700	1170	e511	801	712	1040	146	e55	4030	e95	54	e94
13	1580	826	356	462	725	658	144	e56	2500	e94	45	e72
14	e1320	e366	421	460	815	685	121	57	1530	162	e53	56
15	e1180	e249	e435	610	804	391	161	e109	889	266	e62	48
16	e1050	e186	420	946	1700	367	213	e78	774	e170	e75	45
17	e990	e158	436	574	1850	884	e100	e71	553	e155	586	49
18	e940	184	e470	e485	905	1500	e87	e66	1070	244	90	75
19	e910	279	534	e430	813	1170	e77	e60	1820	993	76	247
20	e1250	472	598	e385	794	823	e62	e250	1250	839	60	113
21	e4500	e440	570	361	804	611	e108	e160	934	371	57	70
22	e2600	e420	545	386	945	1170	e95	e350	667	136	115	62
23	7680	e385	514	445	965	902	e87	e620	e500	99	103	190
24	e2970	e365	288	542	952	818	e81	e570	e400	89	182	153
25	e1640	e350	e222	576	894	761	e78	e970	e560	83	187	66
26	1360	e1100	e180	522	917	420	e73	678	e420	e76	207	54
27	1300	e940	e160	562	2600	265	e70	859	e350	e72	341	51
28	1230	e770	e140	884	3570	216	e67	25500	e320	68	397	192
29	e1160	e660	122	844	---	196	e66	27500	e1000	e65	384	434
30	1170	e595	115	934	---	214	e64	15100	1920	63	385	161
31	e1130	---	115	1210	---	226	---	8520	---	e62	383	---
TOTAL	57470	26934	14932	19846	37967	31047	3756	82269	38429	9669	4498	5661
MEAN	1854	898	482	640	1356	1002	125	2654	1281	312	145	189
MAX	7680	7000	1590	2800	3570	3950	221	27500	4170	1950	586	434
MIN	910	158	115	127	712	196	62	55	320	62	45	45
AC-FT	114000	53420	29620	39360	75310	61580	7450	163200	76220	19180	8920	11230

CAL YR 1986 TOTAL 186777 MEAN 512 MAX 7800 MIN 13 AC-FT 370500
WTR YR 1987 TOTAL 332478 MEAN 911 MAX 27500 MIN 45 AC-FT 659500

e Estimated

RED RIVER BASIN

07311000 EAST CACHE CREEK NEAR WALTERS, OK

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947, 1948, 1951-55, 1958-63, 1970 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1951 to September 1953, October 1969 to March 1977.

WATER TEMPERATURE: October 1951 to September 1953, October 1969 to March 1977.

REMARKS.--Samples were collected bimonthly. Specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV											
12...	1630	1028	80020	15.25	1350	*400	7.40	-2.0	10.0	120	750
JAN											
09...	1200	1028	80020	13.16	1000	550	8.00	4.0	6.0	300	740
26...	1345	1028	80020	10.08	514	662	7.90	0.0	3.5	30	740
MAR											
19...	0830	1028	80020	14.32	1190	500	7.70	11.5	12.0	--	730
MAY											
14...	1300	1028	1028	6.17	57	935	7.70	30.0	23.5	--	--
29...	2000	1028	1028	29.34	28000	217	7.60	21.5	20.5	--	--
JUL											
07...	1300	1028	80020	7.61	152	821	7.70	33.0	26.5	--	740
SEP											
23...	1230	1028	80020	8.53	265	705	7.60	25.0	21.5	140	740
DATE		OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	
NOV											
12...	9.6	86	150	17	46	8.7	20	22	0.7	3.2	
JAN											
09...	11.3	94	150	24	45	10	49	40	2	4.1	
26...	11.4	89	220	40	65	14	50	33	2	3.6	
MAR											
19...	9.4	91	200	42	59	12	30	25	1	3.4	
MAY											
14...	--	--	--	--	--	--	--	--	--	--	
29...	--	--	--	--	--	--	--	--	--	--	
JUL											
07...	7.2	93	290	20	87	18	73	35	2	4.0	
SEP											
23...	8.0	94	220	23	65	13	62	38	2	6.2	
DATE		BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
NOV											
12...	--	--	--	51	14	256	223	0.35	933	--	
JAN											
09...	--	--	--	43	61	306	290	0.42	826	--	
26...	161	0	132	81	43	389	365	0.53	540	--	
MAR											
19...	--	--	--	76	23	308	299	0.42	990	0.680	
MAY											
14...	--	--	--	--	--	--	--	--	--	--	
29...	--	--	--	--	--	--	--	--	--	--	
JUL											
07...	323	0	265	84	56	515	491	0.70	211	1.40	
SEP											
23...	254	0	208	71	55	426	388	0.58	305	--	

* SPECIFIC CONDUCTANCE, LAB (US/CM)

RED RIVER BASIN

07311200 BLUE BEAVER CREEK NEAR CACHE, OK
(Hydrologic bench-mark station)

LOCATION.--Lat 34°37'24", long 98°33'48", in NE 1/4 NE 1/4 sec.28, T.2 N., R.13 W., Comanche County, Hydrologic Unit 11130203, on downstream side of right bank pier on old U.S. Highway 62, 3,000 ft upstream from St. Louis-San Francisco Railway Co. bridge, 4.0 mi east of Cache, and at mile 12.0.

DRAINAGE AREA.--24.6 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,215.26 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Minor regulation by Lake Rush, Lake Jed Johnson, and Lake Ketch, combined surface-area 132 acres.

AVERAGE DISCHARGE.--23 years, 12.3 ft³/s, 8,910 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft³/s, Aug. 28, 1977, gage height, 18.02 ft, from floodmark, from rating curve extended above 250 ft³/s on basis of contracted-opening measurement; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1907, that of Aug. 28, 1977, according to local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 2	0900	4,550	13.98	Nov. 4	0800	1,600	11.35
Oct. 3	0645	2,070	11.90	May 27	2015	*5,000	*14.28
Oct. 22	0345	3,580	13.27	May 28	1700	4,880	14.20

No flow at times during year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	20	28	6.2	26	102	9.8	1.5	49	29	.37	.03
2	1410	18	25	5.9	26	63	10	1.5	37	21	.36	.01
3	1010	17	20	5.7	23	51	11	1.4	29	18	.24	.00
4	222	570	18	5.8	21	44	8.0	1.4	24	14	.21	.00
5	98	189	17	5.2	164	39	7.1	1.4	19	10	.26	.00
6	88	81	16	4.6	159	35	6.2	1.4	15	7.2	.23	.00
7	59	59	105	4.1	72	30	5.4	1.3	12	4.8	.15	.04
8	45	48	101	31	53	27	5.4	1.3	11	3.7	.11	.01
9	36	40	78	181	39	25	5.1	1.3	9.6	4.1	.10	.00
10	30	43	51	63	35	26	4.3	1.3	10	2.5	.42	.00
11	48	64	42	41	32	21	4.1	1.1	27	2.0	.27	.00
12	60	47	36	34	28	18	3.9	1.1	81	1.8	.22	.03
13	49	37	31	29	26	17	3.8	1.1	85	1.6	.17	.03
14	40	30	27	26	25	16	3.8	1.1	44	1.5	.16	.00
15	32	29	26	22	114	14	3.9	1.0	28	1.3	.14	.00
16	27	27	24	21	58	17	3.8	1.1	20	1.3	.11	.00
17	22	24	24	18	43	96	3.8	1.1	15	2.6	.12	.00
18	19	21	23	20	35	51	3.4	1.0	32	6.2	.15	.55
19	16	20	20	19	32	37	2.9	1.0	19	9.4	.10	.10
20	13	17	18	20	35	30	2.6	1.1	15	4.6	.07	.06
21	206	16	17	23	33	27	2.5	.93	11	2.7	.05	.10
22	1750	13	15	31	30	23	2.5	1.1	9.1	1.9	.04	.06
23	285	12	15	33	28	29	2.5	1.8	6.9	1.4	.03	.05
24	124	12	13	37	46	31	2.3	1.3	4.9	1.2	.04	.04
25	72	86	12	30	52	25	2.3	7.7	8.7	.96	.02	.04
26	55	126	11	31	239	21	2.1	2.0	8.3	.79	.02	.03
27	45	58	9.8	36	204	18	1.9	1270	4.9	.64	.04	.03
28	38	43	8.7	39	201	16	1.8	1980	3.4	.57	.04	.64
29	31	36	8.2	37	---	16	1.8	508	2.9	.52	.04	.38
30	28	31	7.9	30	---	14	1.6	137	46	.44	.04	.12
31	23	---	7.3	26	---	12	---	70	---	.41	.04	---
TOTAL	5986.8	1834	854.9	915.5	1879	991	129.6	4004.33	687.7	158.13	4.36	2.35
MEAN	193	61.1	27.6	29.5	67.1	32.0	4.32	129	22.9	5.10	.14	.078
MAX	1750	570	105	181	239	102	11	1980	85	29	.42	.64
MIN	5.8	12	7.3	4.1	21	12	1.6	.93	2.9	.41	.02	.00
AC-FT	11870	3640	1700	1820	3730	1970	257	7940	1360	314	8.6	4.7

CAL YR 1986 TOTAL 11294.58 MEAN 30.9 MAX 1750 MIN .00 AC-FT 22400
WTR YR 1987 TOTAL 17447.67 MEAN 47.8 MAX 1980 MIN .00 AC-FT 34610

RED RIVER BASIN

07311200 BLUE BEAVER CREEK NEAR CACHE, OK--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1965 to current year.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, dissolved oxygen, and alkalinity were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)	BARO- METRIC PRES- SURE (MM OF HG)
NOV											
14...	1545	1028	1028	7.33	30	104	--	11.5	10.0	--	--
DEC											
16...	1330	1028	80020	7.28	24	130	7.40	10.0	11.0	7.1	730
JAN											
28...	1100	1028	1028	7.47	37	128	7.70	3.0	5.0	--	--
MAR											
31...	1330	1028	80020	7.08	12	158	7.70	13.0	13.0	19	730
MAY											
14...	0900	1028	1028	6.73	1.2	243	7.30	22.0	23.0	--	--
JUN											
25...	1230	1028	80020	7.07	11	190	7.20	28.5	24.5	5.6	740

DATE	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
NOV											
14...	--	--	--	--	--	--	--	--	--	--	--
DEC											
16...	11.2	106	58	47	39	0	11	2.9	8.2	30	0.6
JAN											
28...	--	--	--	--	--	--	--	--	--	--	--
MAR											
31...	13.4	133	49	K10	50	0	14	3.6	10	30	0.6
MAY											
14...	--	--	--	--	--	--	--	--	--	--	--
JUN											
25...	7.9	98	K800	K790	66	0	19	4.5	11	26	0.6

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)	CAR- BONATE WATER WH IT FIELD (MG/L AS C03)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)
NOV											
14...	--	--	--	--	--	--	--	--	--	--	--
DEC											
16...	1.3	--	--	--	11	3.8	0.30	14	91	80	0.12
JAN											
28...	--	--	--	--	--	--	--	--	--	--	--
MAR											
31...	1.0	61	0	50	13	5.4	0.30	14	101	93	0.14
MAY											
14...	--	--	--	--	--	--	--	--	--	--	--
JUN											
25...	1.5	92	0	75	12	5.3	0.40	17	108	116	0.15

07311200 BLUE BEAVER CREEK NEAR CACHE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 16...	5.80	0.090	0.020	0.07	0.110	0.010	0.060	0.08	0.19	0.20
JAN 28...	--	--	--	--	--	--	--	--	--	--
MAR 31...	3.16	--	<0.010	--	<0.100	0.050	0.040	0.05	0.35	0.40
MAY 14...	--	--	--	--	--	--	--	--	--	--
JUN 25...	3.32	--	<0.010	--	<0.100	0.020	0.040	0.05	0.68	0.70
DATE	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 16...	0.010	0.010	<0.010	--	0.01	0.01	170	<1	41	<0.5
JAN 28...	--	--	--	--	--	--	--	--	--	--
MAR 31...	0.020	0.010	<0.010	--	0.02	0.01	80	<1	46	<0.5
MAY 14...	--	--	--	--	--	--	--	--	--	--
JUN 25...	<0.010	0.020	0.020	0.06	--	0.0	170	<1	62	<0.5
DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
NOV 14...	--	--	--	--	--	--	--	--	--	--
DEC 16...	3	<1	<3	8	130	<5	<4	11	--	<10
JAN 28...	--	--	--	--	--	--	--	--	--	--
MAR 31...	<1	<1	<3	5	76	<5	<4	10	0.1	<10
MAY 14...	--	--	--	--	--	--	--	--	--	--
JUN 25...	<1	<1	<3	1	71	<5	5	23	<0.1	<10
DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	
NOV 14...	--	--	--	--	--	--	--	--	--	
DEC 16...	<1	<1	<1.0	48	<6	25	--	--	--	
JAN 28...	--	--	--	--	--	--	--	--	--	
MAR 31...	2	<1	<1.0	59	<6	8	<0.4	0.4	1.8	
MAY 14...	--	--	--	--	--	--	--	--	--	
JUN 25...	<1	<1	<1.0	79	<6	180	--	--	--	

RED RIVER BASIN

07311200 BLUE BEAVER CREEK NEAR CACHE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/ YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/ YT-90)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM DIS- SOLVED, EXTRAC- TION (UG/L)	SEDI- MENT, CHARGE, SUS- PENDE (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 14...	--	--	--	--	--	--	--
DEC 16...	--	--	--	--	--	8	0.51
JAN 28...	--	--	--	--	--	--	--
MAR 31...	0.5	1.5	0.5	0.06	0.07	22	0.69
MAY 14...	--	--	--	--	--	--	--
JUN 25...	--	--	--	--	--	--	--

RED RIVER BASIN

07311500 DEEP RED RUN NEAR RANDLETT, OK

LOCATION.--Lat 34°13'15", long 98°27'10", in SW 1/4 SW 1/4 sec.10, T.4 S., R.12 W., Cotton County, Hydrologic Unit 11130203, near right bank on downstream side of pier of bridge on U.S. Highway 277, 2.8 mi north of Randlett, and at mile 4.8.

DRAINAGE AREA.--617 mi².

PERIOD OF RECORD.--October 1949 to current year.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1631: 1956. WSP 1920: 1951.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 924.49 ft above National Geodetic Vertical Datum of 1929 (Oklahoma State Highway Department). Prior to Nov. 10, 1949, nonrecording gage at same site and datum.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by numerous flood-retarding structures.

AVERAGE DISCHARGE.--38 years, 149 ft³/s, 108,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,300 ft³/s, Oct. 20, 1983, gage height, 28.89 ft, from rating curve extended above 13,000 ft³/s on basis of contracted-opening measurement at 27.51 ft in 1969; maximum gage height, 29.58 ft, May 29, 1987 (backwater from W. Cache Creek and the Red River); no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1908 reached a stage somewhat exceeding 27 ft, from information provided by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 3	1700	23,300	25.97	Mar. 17	0530	3,190	20.26
Oct. 23	0400	22,800	25.93	Mar. 23	0445	2,240	17.69
Nov. 6	0345	5,650	23.20	May 29	0630	*52,900	*29.58 (backwater from W. Cache Creek and Red River)
Nov. 27	1645	4,820	22.45				
Feb. 7	1115	4,370	22.00	June 11	1615	1,520	25.13
Feb. 27	1545	5,090	22.79	July 3	0245	3,470	20.84

Minimum daily discharge, 3.7 ft³/s, Sept. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7130	281	328	66	243	2160	73	18	3380	2630	e14	73
2	4360	209	252	64	185	705	65	16	2350	2510	e13	254
3	10800	165	200	62	157	457	60	16	1880	3170	e12	34
4	12500	1350	164	58	141	356	e55	16	1740	1370	12	20
5	7200	4360	141	e54	758	301	e51	17	1660	582	10	14
6	4180	5150	121	e50	3560	263	e48	16	1310	310	10	9.2
7	2610	2560	113	e47	4270	231	e45	15	844	195	9.3	7.0
8	1880	756	397	e45	2280	197	44	16	698	128	8.2	5.5
9	1600	494	1000	570	724	168	42	15	618	86	7.6	4.9
10	1070	350	815	1550	513	147	40	14	567	57	6.6	4.1
11	770	280	515	1480	391	127	36	14	6060	37	6.7	3.7
12	1040	265	331	533	321	109	33	14	5130	26	5.7	4.2
13	1580	247	256	348	275	98	30	13	1340	74	5.7	4.6
14	896	229	209	260	226	90	27	13	399	189	5.1	5.3
15	556	178	183	205	440	83	25	13	208	84	4.6	11
16	404	132	160	168	484	1280	26	13	148	29	5.2	12
17	319	121	140	142	257	2530	26	13	107	17	59	8.1
18	213	112	123	128	185	751	24	11	80	518	134	43
19	155	101	135	124	149	451	23	11	419	600	68	498
20	121	94	140	130	e125	397	22	13	402	427	50	230
21	199	87	129	138	e115	251	21	14	185	306	39	73
22	7900	79	111	173	e105	977	20	14	118	e212	33	409
23	16400	73	97	241	e100	2010	19	14	87	e141	26	280
24	5930	69	89	310	217	1250	18	215	66	e86	21	91
25	3560	301	85	343	661	500	20	652	123	e54	17	50
26	1980	2680	81	285	3150	252	20	853	596	e40	17	38
27	1350	4580	76	324	4700	183	19	1320	341	e29	34	33
28	885	3250	72	795	3840	153	19	31000	106	e22	30	46
29	800	831	70	841	---	115	18	35900	63	e18	40	368
30	632	423	67	638	---	100	18	11500	953	e16	27	853
31	399	---	66	386	---	e88	---	5040	---	e15	19	---
TOTAL	99419	29807	6666	10558	28572	16780	987	86809	31978	13978	749.7	3486.6
MEAN	3207	994	215	341	1020	541	32.9	2800	1066	451	24.2	116
MAX	16400	5150	1000	1550	4700	2530	73	35900	6060	3170	134	853
MIN	121	69	66	45	100	83	18	11	63	15	4.6	3.7
AC-FT	197200	59120	13220	20940	56670	33280	1960	172200	63430	27730	1490	6920

CAL YR 1986 TOTAL 193258.8 MEAN 529 MAX 16400 MIN 1.5 AC-FT 383300

WTR YR 1987 TOTAL 329790.3 MEAN 904 MAX 35900 MIN 3.7 AC-FT 654100

e Estimated

07313400 WAURIKA LAKE NEAR WAURIKA, OK

LOCATION.--Lat 34°13'57", long 98°02'51", in SW 1/4 SW 1/4 sec.4, T.4 S., R.8 W., Jefferson County, Hydrologic Unit 11130208, 3,050 ft east of outlet works on Beaver Creek, 5.5 mi north of Waurika and at mile 27.0.

DRAINAGE AREA.--562 mi².

PERIOD OF RECORD.--August 1977 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Aug. 26, 1977, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by an earth dam with a concrete outlet structure and emergency spillway. Storage began Aug. 1, 1977. Capacity 469,300 acre-ft at elevation 970.0 ft, crest of uncontrolled spillway and 203,100 acre-ft at elevation 951.4 ft, top of conservation pool. Dead storage, 3,400 acre-ft below elevation 910.0 ft. Reservoir is used for flood control, irrigation, water supply, water quality, fish and wildlife, and recreation. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 368,600 acre-ft, May 30, 1987, elevation, 964.14 ft; minimum since first major filling, 59,170 acre-ft, Dec. 4-5, 1978, elevation, 931.56 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 368,600 acre-ft, May 30, elevation, 964.14 ft; minimum, 197,400 acre-ft, Sept. 27, elevation, 950.86 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

949	178,800	959	293,800
951	198,900	961	321,600
953	220,400	963	351,100
956	255,300	965	382,400

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	205700	222300	210200	204500	204700	235000	205600	204600	361000	235400	203300	199700
2	211900	218200	206000	204300	204000	236800	204200	204500	356400	232700	204000	199800
3	227300	214300	204200	204800	203700	235100	204100	204700	351700	231700	203800	199800
4	237000	220600	203600	204700	203600	232000	204800	204500	345000	228100	204000	199600
5	240900	227100	203600	204800	209100	228200	205200	204500	341100	224100	202900	199300
6	241900	229500	203800	205000	215600	224900	205500	204600	336100	219700	203200	199100
7	244200	228800	206400	205000	218600	221300	204600	204400	331000	215300	203000	199000
8	244000	226200	207800	205200	217800	218000	205700	203700	326000	211700	202500	198700
9	242000	222500	209700	209600	215600	215600	204800	203500	320500	209700	203100	198100
10	236900	220000	208900	210900	213400	211500	205200	203500	316200	207900	202000	198600
11	233000	214800	207400	210600	211500	207400	205300	203300	314000	206900	201600	198600
12	228800	212900	206400	210000	209600	205800	206000	203900	315200	208500	202300	198700
13	225300	208200	206000	208800	208800	205200	207000	203200	315200	207900	202000	198500
14	222100	206800	205800	208400	209000	205300	205300	203100	311600	206800	201900	197900
15	218500	206300	205700	207900	210400	205000	204700	203400	306600	206500	201700	198400
16	215100	205200	205300	206600	209900	205600	204600	203500	301700	205800	201600	198300
17	211000	204600	205100	206600	208700	207900	204400	203200	297400	205500	201700	198100
18	208500	204900	205000	205600	207600	209200	204300	203200	293100	206400	202100	198700
19	206300	204200	204800	205300	206600	208900	204200	203400	288400	205500	201400	199300
20	204400	204600	204800	205200	206400	209000	204900	202900	282900	205300	201200	199100
21	206500	204500	204900	205100	205300	208500	205300	202700	277900	205700	199700	199400
22	218700	205700	205100	204700	205100	209300	204300	204200	272800	205700	200700	199400
23	236600	205200	204600	205000	204400	212200	204800	203500	268300	204900	201100	198800
24	240800	205100	204400	206300	204300	211500	204500	204800	263400	204500	200300	198400
25	241500	209900	204500	205800	204300	209600	204500	204800	258900	205500	199700	198500
26	241300	213200	204700	206000	207600	207800	204400	204800	255200	204900	200900	197800
27	239500	216800	204600	205900	212600	206400	204600	208500	250200	205200	201000	197700
28	236700	217300	204500	206500	225400	207200	204300	315000	244900	204300	199900	198500
29	233400	214800	204700	207200	---	207600	204400	358900	240000	204800	200700	198900
30	229400	212000	204600	206600	---	204600	204200	368200	238400	204200	200100	199400
31	225400	---	204700	205300	---	204400	---	365500	---	204300	200600	---
MAX	244200	229500	210200	210900	225400	236800	207000	368200	361000	235400	204000	199800
MIN	204400	204200	203600	204300	203600	204400	204100	202700	238400	204200	199700	197700
(+)	953.45	952.24	951.56	951.62	953.45	951.53	951.51	963.95	954.58	951.52	951.16	951.05
(++)	+22,900	-13,400	-7,300	+600	+20,100	-21,000	-200	+161,300	-127,100	-34,100	-3,700	-1,200

CAL YR 1986 MAX 244200 MIN 190200 (++) +1,600
WTR YR 1987 MAX 368200 MIN 197700 (++) -3,100

(+) Elevation, in feet, at end of month
(++) Change in contents, in acre-feet

RED RIVER BASIN

07313500 BEAVER CREEK NEAR WAURIKA, OK

LOCATION.--Lat 34°13'00", long 98°02'57", on north line of NW 1/4 NW 1/4 sec.16, T.4 S., R.8 W., Jefferson County, Hydrologic Unit 11130208, on left bank on downstream side of bridge on State Highway 5, 4.5 mi northwest of Waurika, 6.2 mi upstream from Cow Creek, and at mile 25.8.

DRAINAGE AREA.--563 mi².

PERIOD OF RECORD.--June 1953 to current year.

REVISED RECORDS.--WSP 1731: 1954 (M).

GAGE.--Water-stage recorder. Datum of gage is 874.17 ft, Oklahoma State Highway Department datum. Prior to Apr. 5, 1966, water-stage recorder at same site at datum 5.00 ft higher.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Waurika Lake (07313400) 1.2 mi upstream beginning August 1977. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Waurika Lake, 23 years (water years 1954-76), 107 ft³/s, 77,520 acre-ft/yr; since regulation by Waurika Lake, 10 years (water years 1978-87), 156 ft³/s, 113,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,200 ft³/s, May 20, 1955, gage height, 27.42 ft, present datum; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 18, 1951, reached a stage of 27.7 ft, present datum, from floodmark, discharge 65,300 ft³/s by contracted-opening measurement of peak flow. A similar stage was reached prior to 1889, from information provided by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,710 ft³/s, June 9, gage height, 23.04 ft; minimum daily discharge, 0.52 ft³/s, Oct. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.86	1960	1700	149	703	.88	162	29	2370	2190	9.2	7.8
2	.71	1970	1630	120	648	396	163	29	2580	2150	9.2	7.6
3	.72	1910	1140	41	530	1270	127	29	2580	2190	9.0	7.6
4	.52	1400	467	41	526	1820	33	29	2580	2200	8.7	7.6
5	.58	44	46	41	526	1970	32	29	2580	2190	8.8	7.6
6	.62	247	46	152	526	1990	32	28	2580	2200	8.8	7.8
7	.68	760	47	268	541	1970	32	29	2580	2190	8.8	7.8
8	426	1650	44	268	558	1950	32	29	2630	1930	8.6	7.8
9	1250	2010	331	343	900	1930	33	28	2690	1100	8.5	7.8
10	1820	2000	844	554	1320	1960	34	28	2610	649	8.5	7.8
11	2030	2020	1030	553	1320	1670	34	19	2580	445	8.5	7.8
12	2030	2010	784	646	1210	980	35	3.5	2580	445	8.5	7.9
13	1890	1620	409	789	712	459	107	3.5	2580	450	8.4	7.8
14	1880	783	408	781	396	300	216	3.4	2580	354	8.6	7.6
15	1990	634	410	773	423	303	216	3.4	2570	246	8.5	9.5
16	1950	635	412	647	390	237	216	3.5	2570	247	8.3	12
17	1740	487	412	436	504	33	185	3.4	2560	205	8.3	11
18	1220	314	412	439	710	32	151	3.4	2580	130	8.4	8.9
19	1250	170	341	439	711	289	151	3.4	2570	130	8.3	7.5
20	949	39	264	440	621	705	151	3.4	2580	89	8.2	7.4
21	370	43	264	447	437	710	151	3.4	2570	35	8.1	7.6
22	71	44	264	455	436	723	151	3.6	2560	35	8.1	7.4
23	44	45	264	400	436	822	97	3.5	2550	35	8.1	7.4
24	44	45	202	e250	435	972	28	3.7	2490	26	8.1	7.4
25	44	70	149	e250	431	980	28	4.1	2240	13	8.1	7.4
26	386	62	149	e350	470	983	28	5.6	2230	13	8.5	7.4
27	972	44	149	532	206	740	29	3.6	2220	12	9.1	7.4
28	1520	477	149	533	139	402	29	312	2210	9.5	8.2	9.1
29	1890	1400	149	586	---	402	29	136	2210	9.3	8.1	7.7
30	1980	1700	149	703	---	403	29	442	2210	9.1	7.9	7.5
31	1980	---	149	703	---	288	---	1900	---	9.0	7.8	---
TOTAL	29730.69	26593	13214	13129	16765	27689.88	2741	3154.4	75020	21935.9	262.2	240.9
MEAN	959	886	426	424	599	893	91.4	102	2501	708	8.46	8.03
MAX	2030	2020	1700	789	1320	1990	216	1900	2690	2200	9.2	12
MIN	.52	39	44	41	139	.88	28	3.4	2210	9.0	7.8	7.4
AC-FT	58970	52750	26210	26040	33250	54920	5440	6260	148800	43510	520	478

CAL YR 1986 TOTAL 96590.27 MEAN 265 MAX 2030 MIN .26 AC-FT 191600
WTR YR 1987 TOTAL 230475.06 MEAN 631 MAX 2690 MIN .52 AC-FT 457100

e Estimated

RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK

LOCATION.--Lat 33°52'43", long 97°56'03", Jefferson County, Hydrologic Unit 11130201, on left bank at downstream side of bridge abutment on U.S. Highway 81, 0.5 mi downstream from Chicago, Rock Island, and Railroad Co. bridge, 1.2 mi south of Terral, 3.6 mi downstream from Little Wichita River, and at mile 872.0.

DRAINAGE AREA.--28,723 mi², of which 5,936 mi² probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 770.31 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 12, 1939, nonrecording gage at same site and datum.

REMARKS.--Records fair except those for periods of estimated daily discharges, which are poor. There are many small diversions for irrigation, oil field, and municipal uses upstream from station. Gage-height telemeter at station via Sutron Data Collection platform.

AVERAGE DISCHARGE.--49 years (water years 1939-86), 2,307 ft³/s, 1,671,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 225,000 ft³/s, May 30, 1987, gage height, 32.65 ft; maximum gage height, 33.60 ft, Oct. 22, 1983, minimum, 43 ft³/s, Mar. 15, 1939. Maximum stage since at least 1891, that of Oct. 22, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1935, reached a stage of 27.2 ft, although floods in 1891 and on May 1, 1908, are reported to have reached about the same stage.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 21,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 6	1500	72,000	21.85	Mar. 1	2100	43,400	18.80
Oct. 13	2000	27,300	17.80	May 30	0700	*225,000	*32.65
Oct. 24	1500	85,800	23.42	June 13	1200	37,000	18.24
Nov. 6	1500	36,800	19.21	July 1	2330	30,500	17.17
Feb. 6	1700	28,500	17.00	July 3	0730	28,200	16.75

Minimum discharge, 671 ft³/s, Sept. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17000	4420	5850	2090	8150	38500	3610	1290	94700	18300	1380	1230
2	30100	3830	5510	e2060	9020	32100	3440	1250	62600	23100	1330	1240
3	33400	3270	4910	2000	6920	20300	3150	1210	37100	24000	1270	1450
4	46100	4800	4180	2030	6210	12100	3070	1200	24700	14500	1360	1400
5	65700	21000	3720	1850	7290	10900	2660	1230	19200	10500	1160	1010
6	69400	34700	3540	1830	20300	10800	2620	1200	17000	8370	1150	867
7	56400	30400	3750	1880	24100	10600	2350	1200	15300	6600	1150	834
8	27400	21700	5160	1980	17000	8910	2270	1210	11700	5630	1150	793
9	16600	15000	7420	2640	11700	7770	2160	1260	8870	5110	1230	747
10	14800	11700	8530	7560	7530	6620	2090	1100	8220	4220	1370	750
11	13400	9470	7110	9020	6670	5850	1880	1040	8180	3610	1400	716
12	16200	8480	5900	7710	6060	4830	1940	1010	20800	3200	1460	711
13	22500	9650	4870	5170	5480	4000	2010	991	33400	3060	1420	740
14	22800	7990	4260	4600	5240	3140	1920	1080	21800	3000	1380	830
15	11000	5360	3780	4250	5780	2310	1990	1060	14800	3080	1420	882
16	7800	4650	3330	3940	6210	1950	1940	943	9740	2690	1380	1040
17	5720	4400	3090	e3810	7180	1940	1900	931	8700	2680	1330	1030
18	4420	4090	3070	e3850	7260	6710	1950	923	8520	2740	1630	1090
19	3510	3910	3270	e3980	7180	10200	1940	908	9280	4150	3360	1360
20	3400	3920	3250	e4170	6560	10200	1820	964	9670	5350	2390	1630
21	2630	4050	3150	4610	5800	8120	1830	1170	10600	5710	1470	1940
22	8080	4000	2990	4570	5080	6280	1830	1110	8740	6280	1150	1360
23	36900	3930	2940	4360	4630	11400	1790	1140	7970	5770	997	1280
24	76300	3910	2990	4360	4760	12600	1720	1340	7300	3410	915	1780
25	57200	4100	2780	4720	5310	9220	1650	9970	7390	2510	832	2030
26	28000	9890	2620	4850	7450	7240	1600	11600	7680	2000	837	1890
27	16100	17000	2420	4700	17700	8510	1510	13800	8170	1890	892	1750
28	9980	13300	2420	5100	28400	6320	1420	20800	7800	1730	912	1390
29	6980	11300	2350	6780	---	4520	1360	123000	7560	1610	1060	1190
30	5950	7180	2340	6700	---	4150	1310	211000	7680	1490	1250	1390
31	5120	---	2240	6340	---	3960	---	145000	---	1440	1250	---
TOTAL	740890	291400	123740	133510	260970	292050	62730	561930	525170	187730	41285	36350
MEAN	23900	9713	3992	4307	9320	9421	2091	18130	17510	6056	1332	1212
MAX	76300	34700	8530	9020	28400	38500	3610	211000	94700	24000	3360	2030
MIN	2630	3270	2240	1830	4630	1940	1310	908	7300	1440	832	711
AC-FT	1470000	578000	245400	264800	517600	579300	124400	1115000	1042000	372400	81890	72100
CAL YR 1986	TOTAL	1786150	MEAN	4894	MAX	76300	MIN	273	AC-FT	3543000		
WTR YR 1987	TOTAL	3257750	MEAN	8925	MAX	211000	MIN	711	AC-FT	6462000		

e Estimated

RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to current year.

WATER TEMPERATURES: October 1967 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,000 microsiemens, June 15, 1984; minimum daily, 255 microsiemens, Jan. 1.

WATER TEMPERATURES: Maximum daily, 35.0 °C, Aug. 13, 16, 17, 1983; minimum daily, 0.0 °C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,800 microsiemens, Sept. 17; minimum daily, 450 microsiemens, May 29.

WATER TEMPERATURES: Maximum daily, 30.0 °C, July 31, Aug. 2, 5, 7, 10, 13; minimum daily, 5.0 °C, on several days during November and January.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT									
14...	1145	22400	3000	7.70	15.5	550	430	160	37
24...	1400	84100	1110	7.50	19.0	220	130	64	14
JAN									
13...	1200	5150	2500	8.30	5.5	530	400	140	44
MAR									
02...	1030	33400	1270	9.60	10.0	260	210	69	21
23...	1150	12600	2270	8.50	17.0	530	440	140	45
MAY									
29...	1725	181000	450	7.30	18.0	110	37	34	6.6

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT									
14...	410	8	6.6	120	430	650	0.30	9.4	1800
24...	140	4	5.2	90	130	210	0.30	9.5	630
JAN									
13...	310	6	6.6	134	370	530	0.30	6.6	1500
MAR									
02...	160	4	5.1	49	160	280	0.20	8.6	730
23...	270	5	5.2	95	370	450	0.30	6.9	1300
MAY									
29...	40	2	3.8	75	44	55	0.20	7.0	240

RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1986 TO SEPTEMBER 1987

MONTH	YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT.	1986	740890	1730	1030	2060000	350	695800	220	437600	340
NOV.	1986	291400	2720	1640	1287000	570	449800	340	270000	530
DEC.	1986	123740	3770	2290	764000	830	277900	470	157900	710
JAN.	1987	133510	3270	1980	713000	710	256200	410	148000	620
FEB.	1987	260970	2460	1480	1042000	510	361600	310	219200	480
MAR.	1987	292050	2260	1360	1069000	460	365000	290	226100	450
APR.	1987	62730	4480	2730	463000	1000	171400	560	95000	830
MAY	1987	561930	1000	597	906000	200	305900	130	192500	200
JUNE	1987	525170	1620	965	1368000	320	455800	210	292000	330
JULY	1987	187730	2720	1640	831000	580	293000	340	173700	520
AUG.	1987	41285	4940	3030	338000	1100	127200	620	68700	900
SEPT	1987	36350	4510	2760	271000	1000	101700	560	55300	820
TOTAL		3257755	**	**	11100000	**	3861000	**	2336000	**
WTD. AVG.		8925	2100	1260	**	440	**	270	**	410

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4000	2750	2320	5450	4090	1850	3700	4950	940	2660	4970	3540
2	1170	3040	2830	5230	3580	1740	4070	4980	1240	1550	4980	3430
3	936	3310	3010	4970	3060	1650	4050	5060	1360	1270	5010	3440
4	875	3150	3150	5220	3200	1620	4180	5120	1550	1780	4980	3980
5	1230	2440	3590	5500	2950	1770	4380	5100	1590	2100	5000	4730
6	1380	2160	4320	5080	1830	1940	4430	5180	1520	2590	5030	4910
7	1480	2640	4250	5210	1310	2210	4540	5220	1510	2520	5110	4700
8	1550	2190	3540	5010	1480	2560	4500	5210	1680	2300	5070	4820
9	1620	2320	3420	3440	1530	2600	4450	5090	1860	2390	5300	5180
10	1850	2470	2610	1950	1540	2640	4550	5140	1870	2870	5320	5220
11	2120	2590	2580	990	1990	2710	4670	5190	1990	3380	5120	4830
12	2500	2640	3000	1380	2410	2970	4850	5220	1650	3650	5230	4680
13	3910	2800	3400	1820	2660	3070	4900	5250	1490	3730	5450	4660
14	3170	3170	3870	2320	2990	3410	4800	5010	1460	3680	5750	4820
15	2590	3730	3880	2600	3500	3790	4530	5030	1500	3730	5800	4800
16	2670	3660	3900	2980	3220	3850	4580	5170	2050	3930	5560	6870
17	3100	3820	4130	3150	2740	3750	4590	5230	2300	4110	5310	7800
18	3530	4130	4170	3370	2630	2900	4570	5280	2470	4030	5160	7750
19	4160	4410	4100	3440	3490	2750	4530	5310	2310	4630	5020	6990
20	4540	4620	4240	3580	3920	2660	4500	5240	2010	5530	4440	5890
21	4550	4670	4250	3470	3700	2600	4490	4970	2090	5070	4060	3350
22	3580	4780	4290	3330	3520	2340	4470	5040	2150	3680	4420	3520
23	1710	4770	4550	3470	3530	2260	4680	4960	2180	3160	4920	4480
24	1070	4730	4830	3620	3510	1750	4730	4530	2350	3250	4980	4070
25	1480	4680	5120	3690	3500	2070	4790	3250	2560	3430	4800	3570
26	1590	3640	5540	4080	3000	2130	4600	2710	2860	3660	4820	3270
27	1750	2100	5760	4420	2780	2930	4790	2160	2990	3890	4620	3300
28	2080	1580	5680	4210	1430	3160	4710	1540	2970	4170	4360	3790
29	2150	1710	5090	3670	---	3240	4780	450	3070	4440	4300	3820
30	2250	1820	5700	3520	---	3440	4920	646	2820	4640	4250	4080
31	2440	---	5850	3820	---	3450	---	750	---	4700	3490	---
MEAN	2360	3220	4100	3680	2820	2640	4540	4320	2010	3440	4920	4680

RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	18.0	8.0	7.0	12.0	10.0	13.0		25.0	24.0	29.0	25.0
2	24.0	14.0	7.0	---	10.0	11.0	11.0		25.0	26.0	30.0	25.0
3	24.0	14.0	8.0	7.0	12.0	13.0	10.0		24.0	26.0	29.0	25.0
4	---	16.0	8.0	7.0	11.0	13.0	11.0		23.0	26.0	29.0	26.0
5	21.0	13.0	8.0	7.0	11.0	14.0	12.0		24.0	28.0	30.0	25.0
6	20.0	12.0	10.0	8.0	11.0	13.0	13.0		24.0	27.0	29.0	26.0
7	19.0	14.0	10.0	8.0	8.0	15.0	14.0		25.0	27.0	30.0	24.0
8	20.0	15.0	11.0	9.0	10.0	15.0	15.0		25.0	27.0	28.0	28.0
9	21.0	14.0	10.0	9.0	9.0	13.0	16.0		25.0	27.0	29.0	24.0
10	20.0	14.0	7.0	5.0	8.0	10.0	16.0		24.0	27.0	30.0	25.0
11	21.0	10.0	7.0	5.0	12.0	12.0	17.0		25.0	27.0	29.0	28.0
12	---	10.0	8.0	6.0	14.0	13.0	23.0		25.0	27.0	29.0	28.0
13	15.0	5.0	11.0	9.0	14.0	12.0	18.0		26.0	27.0	30.0	24.0
14	18.0	6.0	7.0	10.0	14.0	12.0	16.0		27.0	26.0	28.0	24.0
15	18.0	9.0	9.0	9.0	13.0	16.0	15.0		26.0	26.0	29.0	28.0
16	16.0	9.0	11.0	7.0	9.0	17.0	21.0		27.0	26.0	---	24.0
17	16.0	12.0	11.0	---	8.0	13.0	21.0		28.0	26.0	29.0	24.0
18	18.0	12.0	10.0	---	9.0	15.0	---		26.0	26.0	29.0	---
19	18.0	11.0	8.0	---	9.0	---	---		28.0	27.0	27.0	23.0
20	19.0	12.0	8.0	7.0	9.0	16.0	---		26.0	27.0	29.0	23.0
21	19.0	12.0	10.0	5.0	8.0	17.0	---		25.0	28.0	27.0	27.0
22	18.0	14.0	8.0	5.0	11.0	17.0	18.0		27.0	28.0	27.0	28.0
23	18.0	8.0	7.0	5.0	11.0	15.0	21.0		28.0	28.0	29.0	23.0
24	17.0	9.0	9.0	5.0	11.0	13.0	18.0		28.0	28.0	27.0	23.0
25	21.0	10.0	10.0	5.0	10.0	10.0	22.0		26.0	29.0	27.0	27.0
26	16.0	8.0	10.0	6.0	11.0	13.0	22.0		27.0	28.0	---	23.0
27	16.0	9.0	11.0	6.0	13.0	13.0	23.0		28.0	28.0	26.0	23.0
28	17.0	8.0	9.0	7.0	12.0	14.0	26.0		28.0	29.0	26.0	27.0
29	18.0	8.0	10.0	10.0	---	9.0	25.0		27.0	29.0	26.0	23.0
30	17.0	10.0	8.0	10.0	---	8.0	26.0		28.0	29.0	27.0	26.0
31	17.0	---	7.0	9.0	---	12.0	---		---	30.0	26.0	---
MEAN	19.0	11.0	9.0	7.0	10.5	13.0	18.0		26.0	27.0	28.5	25.0

RED RIVER BASIN

07315700 MUD CREEK NEAR COURTNEY, OK

LOCATION.--Lat 34°00'20", long 97°34'00", in NW 1/4 SE 1/4 sec.25, T.6 S., R.4 W., Jefferson County, Hydrologic Unit, 11130201, on downstream side of bridge on State Highway 89, 4.0 mi downstream from North Mud Creek, 6.0 mi northwest of Courtney, and at mile 11.5.

DRAINAGE AREA.--572 mi².

PERIOD OF RECORD.--October 1960 to current year.

REVISED RECORDS.--WDR OK-78-2: Maximum gage height.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 727.72 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1968, auxiliary water-stage recorder 2.0 mi downstream from base gage.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--27 years, 155 ft³/s, 112,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,800 ft³/s, May 29, 1987, gage height, 33.14 ft; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1957, reached a stage of 30.6 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Nov. 6	0145	3,540	24.86	Feb. 28	2345	7,500	27.39
Nov. 28	1900	1,610	21.63	Mar. 18	0415	4,190	25.44
Dec. 10	0800	2,980	24.29	Mar. 25	1500	2,530	23.60
Jan. 10	1645	2,250	23.11	May 29	1000	*38,800	*33.14
Feb. 7	1215	5,170	26.19	July 3	2045	1,800	22.12

Minimum daily discharge, 2.9 ft³/s, Sept. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	28	131	50	170	6710	188	39	3400	81	31	9.5
2	488	26	106	48	821	5040	179	e36	1630	335	31	11
3	291	24	86	47	678	3380	168	e34	309	1470	28	11
4	102	484	72	46	280	1670	157	e32	211	1160	22	6.9
5	153	2270	62	46	432	423	149	e30	161	994	20	5.2
6	120	3110	55	45	2550	318	119	e28	132	440	e17	4.3
7	58	2910	200	44	4820	280	110	e27	112	152	e15	3.9
8	39	1010	1660	47	3880	269	107	e27	98	107	e14	3.6
9	32	181	2540	614	2460	248	104	e25	85	82	e13	3.1
10	30	124	2870	2020	498	230	100	e24	85	67	e12	4.0
11	25	94	1480	1950	279	213	95	e23	259	57	e11	3.2
12	22	75	277	1140	230	200	91	e22	167	50	e10	3.1
13	25	62	188	221	196	193	87	e21	120	51	e9.7	2.9
14	24	52	144	161	174	187	81	e20	175	53	e9.2	3.2
15	26	47	122	134	178	185	75	e19	192	158	e9.0	119
16	22	45	111	116	802	204	71	e18	94	88	e10	26
17	18	44	106	126	1200	1930	69	e17	68	58	e15	14
18	15	43	107	615	1000	3740	68	e17	106	154	84	21
19	13	40	113	727	305	2630	66	e16	119	341	39	129
20	11	39	131	747	217	2290	63	e16	501	127	e15	360
21	9.9	36	123	893	191	465	59	e18	201	76	e13	145
22	10	35	99	724	183	335	80	19	105	57	e10	46
23	277	34	84	574	175	886	104	19	63	48	e6.0	24
24	956	32	76	376	247	1370	80	27	48	44	4.2	16
25	936	44	73	280	762	2370	63	97	42	41	3.4	12
26	181	724	69	239	1110	1660	55	160	39	38	3.1	9.1
27	88	1280	64	170	2620	498	50	183	37	36	5.5	6.9
28	57	1510	59	140	4970	410	47	4040	33	35	9.8	7.5
29	42	775	55	133	---	303	44	31200	30	34	24	44
30	35	184	52	119	---	235	42	14800	36	33	23	201
31	31	---	51	104	---	202	---	5060	---	30	14	---
TOTAL	4190.9	15362	11366	12696	31428	39074	2771	56114	8658	6497	530.9	1255.4
MEAN	135	512	367	410	1122	1260	92.4	1810	289	210	17.1	41.8
MAX	956	3110	2870	2020	4970	6710	188	31200	3400	1470	84	360
MIN	9.9	24	51	44	170	185	42	16	30	30	3.1	2.9
AC-FT	8310	30470	22540	25180	62340	77500	5500	111300	17170	12890	1050	2490

CAL YR 1986 TOTAL 77800.99 MEAN 213 MAX 6670 MIN .00 AC-FT 154300
WTR YR 1987 TOTAL 189943.2 MEAN 520 MAX 31200 MIN 2.9 AC-FT 376800

e Estimated

07316000 RED RIVER NEAR GAINESVILLE, TX

LOCATION.--Lat 33°43'40", long 97°09'35", in SW 1/4 sec.36, T.9 S., R.1 E., Love County, OK, Hydrologic Unit 11130201, on downstream right bank near end of bridge on Interstate 35, 0.2 mi downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 5.0 mi downstream from Fish Creek, 4.5 mi southwest of Thackerville, OK, 7.0 mi north of Gainesville, and at mile 791.5.

DRAINAGE AREA.--30,782 mi² of which 5,936 mi² probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1936 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 627.91 ft, National Geodetic Vertical Datum of 1929. Prior to Jan. 17, 1939, and Feb. 13, 1965 to Nov. 14, 1966, nonrecording gage at same site and datum.

REMARKS.--Records poor. Flow slightly regulated by Lake Kemp (station 07312000 in Texas), since 1943 by Lake Altus (station 07302500 in Oklahoma), since 1946 by Lake Kickapoo (station 07314000 in Texas), since 1967 by Lake Arrowhead (station 07314800 in Texas) and Moss Lake (station 07315950 in Texas). U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 11 discharge measurements provided by U.S. Army Corps of Engineers, records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--51 years, 2,981 ft³/s, 2,160,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 265,000 ft³/s May 31, 1987, gage height, 40.08 ft; minimum discharge, 48 ft³/s, Jan. 27, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 24,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage height (ft)	Date	Time	Discharge (ft ³ /s)	Gage height (ft)
Oct. 8	0330	66,300	22.51	May 31	1800	*265,000	*40.08
Oct. 14	1500	32,400	17.22	June 14	0500	47,800	21.72 (backwater)
Oct. 26	0600	75,400	23.77	June 20	2200	30,849	17.45 (backwater)
Nov. 7	1200	37,300	17.99	July 1	0200	47,000	19.63
Nov. 28	1100	30,700	16.95	July 4	1100	47,000	19.63
Mar. 2	--	59,600	21.59 (from floodmark)				

Minimum daily discharge, 392 ft³/s, May 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3530	11900	e8000	e3610	7590	e58000	e4400	810	231000	40100	2100	1640
2	16700	e11000	7380	e3400	7800	60300	e3900	769	151000	21400	1970	1640
3	34100	10200	10000	e3080	11500	44300	e3400	757	81800	34500	1890	1630
4	36000	10600	11700	e2810	10600	23000	3130	816	46600	44800	1790	1580
5	43900	14300	11100	e2750	7990	13200	3090	697	31400	28300	1710	1610
6	55400	29300	e10500	2680	10300	11000	2870	656	23800	15400	e1620	1710
7	63200	36400	e9900	2540	11600	11000	2450	676	23400	11200	e1530	1390
8	65000	29500	e12000	2510	e10000	9970	2240	685	20900	8540	e1470	1200
9	39200	13000	16500	3260	e9400	9460	2150	670	15200	7040	e1410	1110
10	21700	8740	e18100	5060	e9000	e8600	2060	651	11100	6180	e1340	1150
11	20400	7320	19000	8870	8600	e7900	1980	658	10800	5280	e1300	1150
12	18600	6540	20700	12500	8470	7150	e1880	574	14800	4560	e1240	1140
13	21500	6010	17800	11600	8580	6920	e1780	509	39400	4170	e1180	1040
14	29800	6670	14400	7810	8330	6680	e1680	480	45000	3920	e1140	989
15	23700	7040	e12000	6340	7960	e6300	1560	747	33800	3820	e1100	1450
16	14600	e7400	e10800	5430	7700	e6000	1570	696	24100	3780	e1050	2220
17	12000	e7800	e9900	4670	e8000	e5700	1520	735	15800	3740	e1000	1940
18	10600	7280	e9000	4510	e8400	e16000	1460	493	13000	3550	e980	2000
19	9340	7020	e8200	e4200	e8800	e22000	1390	429	13100	3400	e940	1920
20	7880	6540	e7800	e3900	9480	e20000	1360	409	13400	3450	1250	1730
21	7330	6320	e7400	e3700	8970	12800	1420	392	22400	4730	2790	1740
22	6750	6220	e7000	e3500	8530	11200	1340	411	13300	5350	2570	1820
23	16500	6120	e6600	e3300	7520	7870	1260	556	10400	6360	2020	2050
24	44800	5970	e6200	e3100	6880	e10000	1220	638	9460	5010	1690	1660
25	64800	6070	e5600	e2900	7150	e13000	1180	733	10400	4090	1490	1480
26	72300	6320	e5200	5590	10000	12400	1110	5200	9470	3540	e1450	1730
27	40600	16000	e4600	5860	15400	9640	1060	13300	9440	3160	1420	2020
28	18000	e19000	e4200	5920	e35000	e8200	1010	32400	9130	2820	1420	1990
29	15100	e14000	e3890	5830	---	e6400	941	71900	12200	2550	1360	1920
30	13300	e11000	e3750	6250	---	5500	873	114000	44400	2370	1340	1660
31	12300	---	e3680	7610	---	e4900	---	232000	---	2230	1440	---
TOTAL	858930	341580	302900	155090	279550	455390	57284	484447	1010000	299340	47000	48309
MEAN	27710	11390	9771	5003	9984	14690	1909	15630	33670	9656	1516	1610
MAX	72300	36400	20700	12500	35000	60300	4400	232000	231000	44800	2790	2220
MIN	3530	5970	3680	2510	6880	4900	873	392	9130	2230	940	989
AC-FT	1704000	677500	600800	307600	554500	903300	113600	960900	2003000	593700	93220	95820
CAL YR 1986	TOTAL 2471670	MEAN 6772	MAX 72300	MIN 288	AC-FT 4903000							
WTR YR 1987	TOTAL 4339820	MEAN 11890	MAX 232000	MIN 392	AC-FT 8608000							

e Estimated

RED RIVER BASIN

07316000 RED RIVER NEAR GAINESVILLE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1964, October 1966 to current year. Chemical and biochemical analyses: January 1968 to September 1986. Pesticide analyses: April 1968 to September 1982. Sediment analyses: January 1978 to September 1986.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1944 to April 1946, October 1952 to September 1964, October 1966 to current year.
WATER TEMPERATURES: October 1952 to September 1963, October 1966 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 11,100 microsiemens, July 16, 1972, June 19, 1984; minimum daily, 176 microsiemens, Nov. 4, 1958.

WATER TEMPERATURES: Maximum daily, 35.0 °C on several days during summer months; minimum daily, 0.0 °C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 5,830 microsiemens, Sept. 21; minimum daily, 455 microsiemens, May 30.
WATER TEMPERATURES: Maximum daily, 32.0 °C, July 30, Aug. 16; minimum daily, 3.0 °C, Jan. 19, 22, 23.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)
OCT 22...	1400	6750	3810	690	540	190	52	560
JAN 28...	1130	5920	3530	710	460	180	63	510
JUN 02...	1410	172000	869	210	120	62	14	98
JUL 21...	1115	4730	3800	720	570	180	65	550

DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT 22...	10	7.7	152	460	900	0.40	8.8	2300
JAN 28...	9	6.7	248	440	840	0.30	9.3	2200
JUN 02...	3	5.3	97	100	150	0.30	9.2	500
JUL 21...	9	6.6	149	510	880	0.40	9.0	2300

RED RIVER BASIN

07316000 RED RIVER NEAR GAINESVILLE, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1986 TO SEPTEMBER 1987

MONTH	YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT.	1986	858930	1800	1040	2419000	410	958700	210	489200	340
NOV.	1986	341580	2670	1560	1443000	630	577900	320	290600	500
DEC.	1986	302900	3250	1920	1568000	770	632600	390	315000	600
JAN.	1987	155090	3200	1890	793000	760	320100	380	159200	590
FEB.	1987	279550	2400	1400	1057000	560	421400	280	213100	450
MAR.	1987	455390	1770	1030	1260000	410	498300	210	255100	340
APR.	1987	57284	3760	2230	345000	900	139600	450	69100	690
MAY	1987	484447	870	502	657000	200	258800	100	133200	170
JUNE	1987	1010000	1340	773	2109000	300	829800	160	427700	260
JULY	1987	299340	2560	1500	1212000	600	485100	300	244100	480
AUG.	1987	46990	4430	2650	336000	1100	137300	530	67200	800
SEPT	1987	48309	3810	2270	296000	920	120000	450	59200	700
TOTAL		4339810	**	**	13495000	**	5379000	**	2723000	**
WTD.AVG.		11890	1970	1150	**	460	**	230	**	370

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4120	2130	1630	5220	3330	1000	3140	4430	740	3060	4100	4130
2	3850	2310	1950	5250	3710	1180	3140	4410	850	2690	4110	3940
3	1370	2690	2430	5190	3200	1290	3140	4460	885	2010	4230	3810
4	940	2790	2760	5200	3140	1340	3650	4310	1200	1390	4350	3420
5	1000	2680	3160	5160	2830	1300	3410	4640	1260	1530	4460	3270
6	1390	2060	3070	5230	2910	1460	3740	4700	1480	1860	4490	3460
7	1600	1850	3240	4990	1640	1610	3780	4870	1470	2210	4530	3900
8	1440	2390	3360	5130	1530	1760	3870	4820	1440	2750	4580	4130
9	1450	2060	3880	4000	1360	1990	3910	4900	1460	2650	4580	4210
10	1480	2100	2980	3920	1320	2320	3910	4740	1680	2460	4600	4250
11	1640	2290	2440	2690	1440	2440	3900	4750	1760	2420	4170	4090
12	1840	2370	2460	1790	1600	2480	3870	4700	1620	2630	4530	4100
13	2320	2440	2490	2190	1800	2560	3980	4510	1810	3110	4860	4200
14	3470	2800	2450	2330	2180	2700	4080	4640	1500	3370	4950	4420
15	3000	2810	2840	2350	2380	2860	4210	3630	1430	3460	4790	3340
16	2590	3010	3200	2440	2820	3080	4360	3270	1330	3530	4700	3110
17	2420	3440	3670	2650	2920	3070	4240	4480	1720	3430	4820	2660
18	2570	3590	3680	2660	2820	1530	3950	3460	1970	3420	5090	1970
19	2910	3690	3680	2640	2510	2550	3940	4570	2140	3680	5320	3160
20	3330	3830	3890	2420	2490	2930	3990	4980	2080	3840	4440	4460
21	3700	4160	3950	2760	3140	2240	4000	5130	1760	3630	4260	5830
22	3950	4390	3960	2590	3700	2130	3760	5240	1570	5590	4400	5600
23	4490	4470	4010	2640	3550	2240	3970	4870	1860	5160	4760	5110
24	1390	4550	4020	2650	3090	2130	4080	4970	2170	4140	4210	3780
25	1230	4510	4640	2860	3030	1680	3750	4860	2310	3300	3800	3290
26	1350	4470	4860	3120	2680	1670	3710	4140	2400	3200	4090	3760
27	1530	4120	5090	3250	2160	1710	4150	2560	2560	3230	4390	4250
28	1600	2030	5250	3660	1470	1990	4350	1280	2900	3320	4340	3750
29	1920	1700	5470	4000	---	2760	4300	968	3180	3460	4260	3080
30	2010	1610	5370	3920	---	2900	4360	455	3130	3720	4380	2980
31	2040	---	5350	3860	---	3000	---	569	---	3790	4150	---
MEAN	2260	2980	3590	3510	2530	2130	3890	4010	1790	3160	4480	3850

RED RIVER BASIN

07316000 RED RIVER NEAR GAINESVILLE, TX--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	17.0	7.0	7.0	10.0	10.0	14.0	---	22.0	28.0	28.0	24.0
2	26.0	15.0	8.0	6.0	12.0	10.0	10.0	23.0	24.0	26.0	29.0	23.0
3	25.0	17.0	8.0	7.0	11.0	12.0	9.0	23.0	23.0	25.0	31.0	24.0
4	24.0	16.0	8.0	6.0	13.0	12.0	11.0	24.0	24.0	26.0	---	---
5	22.0	16.0	8.0	6.0	12.0	11.0	10.0	27.0	22.0	27.0	30.0	26.0
6	22.0	14.0	7.0	10.0	10.0	11.0	14.0	25.0	24.0	29.0	31.0	26.0
7	20.0	---	---	8.0	8.0	13.0	16.0	26.0	24.0	29.0	30.0	25.0
8	20.0	14.0	10.0	8.0	9.0	13.0	13.0	23.0	26.0	29.0	31.0	25.0
9	20.0	14.0	10.0	10.0	7.0	14.0	19.0	24.0	25.0	27.0	29.0	24.0
10	21.0	14.0	8.0	5.0	8.0	11.0	16.0	23.0	25.0	27.0	29.0	27.0
11	22.0	11.0	7.0	5.0	10.0	10.0	17.0	26.0	24.0	26.0	21.0	25.0
12	18.0	9.0	6.0	6.0	13.0	10.0	19.0	28.0	24.0	26.0	29.0	24.0
13	17.0	6.0	6.0	5.0	11.0	10.0	18.0	29.0	25.0	27.0	---	28.0
14	17.0	5.0	6.0	7.0	13.0	14.0	14.0	---	26.0	28.0	28.0	26.0
15	17.0	10.0	8.0	8.0	13.0	14.0	13.0	23.0	27.0	25.0	29.0	23.0
16	18.0	8.0	9.0	6.0	10.0	16.0	14.0	24.0	27.0	26.0	32.0	24.0
17	18.0	10.0	10.0	5.0	8.0	16.0	16.0	25.0	30.0	26.0	28.0	25.0
18	18.0	11.0	9.0	---	8.0	14.0	24.0	28.0	28.0	27.0	---	22.0
19	18.0	10.0	10.0	3.0	7.0	15.0	21.0	27.0	28.0	27.0	28.0	24.0
20	20.0	10.0	8.0	4.0	7.0	14.0	25.0	28.0	27.0	27.0	27.0	23.0
21	20.0	10.0	8.0	4.0	8.0	14.0	19.0	29.0	27.0	28.0	28.0	23.0
22	18.0	12.0	8.0	3.0	9.0	---	22.0	25.0	29.0	28.0	29.0	21.0
23	18.0	12.0	9.0	3.0	10.0	16.0	17.0	24.0	30.0	28.0	---	20.0
24	18.0	10.0	9.0	6.0	10.0	15.0	17.0	24.0	31.0	28.0	27.0	21.0
25	18.0	8.0	10.0	4.0	10.0	14.0	22.0	25.0	31.0	29.0	27.0	22.0
26	18.0	8.0	10.0	5.0	9.0	12.0	23.0	26.0	27.0	29.0	27.0	24.0
27	18.0	8.0	8.0	5.0	10.0	11.0	26.0	25.0	29.0	29.0	26.0	22.0
28	18.0	8.0	---	8.0	10.0	13.0	28.0	19.0	28.0	29.0	23.0	23.0
29	18.0	8.0	9.0	11.0	---	9.0	27.0	19.0	27.0	28.0	25.0	21.0
30	18.0	8.0	7.0	10.0	---	9.0	22.0	20.0	28.0	32.0	26.0	20.0
31	17.0	---	7.0	8.0	---	10.0	---	20.0	---	29.0	27.0	---
MEAN	19.5	11.0	8.0	6.5	10.0	12.5	18.0	24.5	26.5	27.5	28.0	23.5

07316500 WASHITA RIVER NEAR CHEYENNE, OK

LOCATION.--Lat 35°37'35", long 99°40'05", in SE 1/4 sec.5, T.13 N., R.23 W., Roger Mills County, Hydrologic Unit 11130301, on left bank on downstream side of bridge on U.S. Highway 283, 0.5 mi downstream from Sergeant Major Creek, 1.0 mi north of Cheyenne, 5.2 mi upstream from Dead Indian Creek, and at mile 543.9.

DRAINAGE AREA.--794 mi².

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,900.98 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). May 1, 1938 to Nov. 16, 1946, and Oct. 1, 1947 to Jan. 11, 1948, nonrecording gage at site 50 ft upstream and datum 5.00 ft higher. Jan. 12, 1948 to Dec. 31, 1976, at site 50 ft upstream and datum 5.00 ft higher. Jan. 1, 1976 to Dec. 20, 1979, at site 50 ft upstream at same datum.

REMARKS.--Records poor. Flow regulated since 1961 by numerous flood-retarding structures. U.S. Army Corps of Engineers' satellite telemeter at site. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--Prior to regulation by numerous flood-retarding structures, 23 years (water years 1938-60), 41.7 ft³/s, 30,190 acre-ft/yr; since regulation by numerous flood-retarding structures, 26 years (water years 1962-87), 16.0 ft³/s, 11,590 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 69,800 ft³/s, Apr. 29, 1954, gage height, 15.24 ft (datum then in use); from rating curve extended above 27,000 ft³/s on basis of contracted-opening measurement of peak flow; no flow at times in most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 3, 1934, reached a stage of 1.0 ft lower than that in 1954, at site on upstream side of highway fill (at old bridge site).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 600 ft³/s, May 26, gage height, 9.70 ft; minimum daily discharge, 3.2 ft³/s, Sept. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e400	e19	e40	e27	e52	e62	e78	39	112	e36	9.7	6.0
2	e300	e18	e40	e27	e50	e52	e76	39	94	e33	9.2	5.8
3	e200	e25	e39	e26	e47	e47	76	36	85	e30	8.2	4.2
4	e130	e80	e38	e26	e44	e44	e71	34	78	e27	7.5	3.5
5	e95	e200	e38	e27	e42	e42	e70	34	68	e25	7.3	3.2
6	e61	e150	e37	e28	e41	e40	e69	34	61	e24	6.8	4.2
7	e47	e120	e37	e30	e40	e39	e68	34	55	23	6.1	4.7
8	e39	e100	e37	e32	e39	e37	e69	32	44	21	5.4	4.7
9	e48	e89	e39	e31	e38	e50	e80	31	44	21	6.1	4.4
10	e42	e83	42	e30	e37	e43	e72	30	57	19	6.1	4.0
11	e35	e78	e40	e30	e36	e39	e70	29	62	17	5.6	3.8
12	e30	e72	e38	e32	e35	e54	e69	26	57	14	5.5	7.8
13	e27	e68	e37	e35	e35	e47	e71	30	51	14	8.0	7.5
14	e23	e64	e36	40	e34	e44	e62	24	47	13	6.6	5.9
15	e22	e60	e35	e37	e80	e50	e62	32	39	13	5.7	5.6
16	21	e58	e34	e38	e62	e130	e61	32	38	12	4.8	5.2
17	e20	e55	e33	e56	e50	130	e58	25	35	237	4.6	4.6
18	e19	e53	e32	e100	e45	e100	e56	23	32	125	4.3	5.8
19	e18	e51	e31	e80	e41	93	e54	21	29	76	3.9	7.4
20	e17	e50	e31	e70	e40	e84	e54	26	34	55	3.9	6.7
21	e60	49	e30	e64	e39	e76	e52	22	38	43	3.7	11
22	e180	e47	e30	e60	e37	e70	e50	23	61	36	3.6	13
23	e110	e45	e29	e56	e36	e130	48	34	61	30	3.4	12
24	e71	e44	e29	e52	e36	e160	e46	34	49	26	3.9	9.4
25	e60	e43	e29	e50	e35	e120	e45	48	42	22	3.6	8.2
26	e47	e43	e29	e46	e58	e100	e46	173	38	19	3.8	7.9
27	e40	e42	e28	e50	e100	e98	46	176	43	17	4.7	7.6
28	e30	e41	e28	e80	e73	e89	44	247	e49	15	4.8	14
29	e25	e41	e27	e70	---	e86	43	218	e45	13	4.5	15
30	e23	e41	e27	e62	---	e82	41	173	e40	12	4.3	14
31	e20	---	e27	e60	---	e80	---	143	---	11	4.6	---
TOTAL	2260	1929	1047	1452	1302	2318	1807	1902	1588	1079	170.2	217.1
MEAN	72.9	64.3	33.8	46.8	46.5	74.8	60.2	61.4	52.9	34.8	5.49	7.24
MAX	400	200	42	100	100	160	80	247	112	237	9.7	15
MIN	17	18	27	26	34	37	41	21	29	11	3.4	3.2
AC-FT	4480	3830	2080	2880	2580	4600	3580	3770	3150	2140	338	431

CAL YR 1986 TOTAL 8685.92 MEAN 23.8 MAX 400 MIN .00 AC-FT 17230
WTR YR 1987 TOTAL 17071.3 MEAN 46.8 MAX 400 MIN 3.2 AC-FT 33860

e Estimated

RED RIVER BASIN

07324200 WASHITA RIVER NEAR HAMMON, OK

LOCATION.--Lat 35°39'23", long 99°18'21", on west line of sec.26, T.14 N., R.20 W., Custer County, Hydrologic Unit 11130301, on right bank near county road bridge, 2.2 mi downstream from Quartermaster Creek, 4.7 mi northeast of Hammon, and at mile 494.5.

DRAINAGE AREA.--1,387 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1969 to September 1987 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 1,643.22 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Flow regulated since 1961 by numerous flood-retarding structures.

AVERAGE DISCHARGE.--18 years, 42.3 ft³/s, 30,650 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft³/s, May 17, 1982, gage height, 23.44 ft, from rating curve extended above 2,500 ft³/s on basis of slope-area measurement; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 2,980 ft³/s, Oct. 3, gage height, 21.33 ft (from HWM); minimum daily discharge, 32 ft³/s, Aug. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e100	145	e132	92	146	319	e360	128	858	198	49	40
2	835	137	e131	91	144	e260	e350	125	699	171	46	38
3	2360	131	e130	92	143	e220	e330	120	592	155	43	43
4	e1000	786	e129	94	140	e200	e320	112	513	148	43	40
5	e600	930	e129	95	136	e190	e300	124	462	138	43	37
6	e450	590	e128	95	129	e186	e290	119	431	123	43	38
7	e350	471	e128	92	126	e182	e280	120	364	109	42	38
8	e260	415	e128	91	125	180	e270	117	325	99	39	38
9	e400	352	e160	98	120	e178	e270	111	291	93	37	36
10	e350	306	132	108	118	e240	e265	104	309	88	39	34
11	e250	262	126	105	116	e220	e262	98	333	82	40	36
12	e200	237	121	104	113	e200	e260	93	307	77	41	40
13	e150	215	114	103	112	e190	e252	89	281	80	48	42
14	e120	202	110	102	113	e185	e250	85	250	76	57	41
15	e100	e190	110	100	142	182	e242	82	225	72	49	39
16	80	e180	109	96	275	e177	e232	84	192	70	43	38
17	72	e170	109	87	243	472	e224	90	168	234	41	36
18	65	e164	107	e130	215	906	e220	82	153	464	39	34
19	59	e159	106	e200	190	526	e212	74	192	472	39	39
20	56	154	105	e300	181	422	e200	75	228	274	39	43
21	145	e150	103	e230	180	376	e190	77	228	174	36	49
22	668	e148	100	e180	177	344	181	75	315	145	34	46
23	881	e146	101	e160	169	439	175	104	324	126	33	45
24	602	e142	102	e147	164	1030	165	162	296	109	32	44
25	415	e140	101	e130	160	669	158	153	255	96	33	42
26	323	e139	99	120	174	e570	152	408	227	86	35	39
27	278	e138	97	137	402	e520	146	2050	196	77	38	36
28	221	e136	96	159	4600	e480	141	1640	178	70	37	38
29	183	e135	95	181	---	442	136	1670	171	62	38	39
30	168	e134	90	166	---	e400	133	1330	203	57	44	41
31	155	---	93	151	---	364	---	1100	---	54	43	---
TOTAL	11896	7604	3521	4036	9053	11269	6966	10801	9566	4279	1263	1189
MEAN	384	253	114	130	323	364	232	348	319	138	40.7	39.6
MAX	2360	930	160	300	4600	1030	360	2050	858	472	57	49
MIN	56	131	90	87	112	177	133	74	153	54	32	34
AC-FT	23600	15080	6980	8010	17960	22350	13820	21420	18970	8490	2510	2360

CAL YR 1986 TOTAL 28325 MEAN 77.6 MAX 2360 MIN 1.2 AC-FT 56180
WTR YR 1987 TOTAL 81443 MEAN 223 MAX 4600 MIN 32 AC-FT 161500

e Estimated

WATER-QUALITY RECORDS

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1969 to September 1979.

WATER TEMPERATURE: October 1969 to September 1979.

REMARKS.--Samples were collected by a local observer on a weekly basis. A partial analysis was made bimonthly on one of these samples. Additional samples were collected semiannually and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA. WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT												
02...	1930	1028	80020	13.88	1170	340	7.90	--	--	--	--	--
NOV												
20...	1730	1028	80020	7.64	154	1800	7.90	20.0	11.0	720	10.2	99
DEC												
25...	1530	1028	80020	7.08	99	1980	7.70	--	10.0	--	--	--
JAN												
04...	1330	1028	80020	6.98	90	2010	7.70	--	10.5	--	--	--
11...	1711	1028	80020	7.08	98	1890	7.70	--	6.0	--	--	--
13...	1740	1028	1028	7.18	104	1910	7.80	17.0	6.0	--	--	--
MAR												
15...	1530	1028	80020	7.89	182	1920	7.80	--	16.0	--	--	--
17...	1911	1028	1028	12.75	967	1210	8.30	11.0	12.0	--	--	--
25...	1810	1028	1028	10.95	629	1460	7.70	17.0	8.5	--	--	--
MAY												
12...	1000	1028	80020	6.91	92	2120	7.80	30.0	23.0	720	7.6	95
27...	1800	1028	1028	19.16	2210	660	7.50	20.0	18.0	--	--	--
31...	1400	1028	80020	13.35	1080	1400	7.80	--	26.0	--	--	--
JUN												
21...	1600	1028	80020	8.33	241	2210	7.80	--	29.0	--	--	--
JUL												
07...	1725	1028	1028	7.28	108	2040	8.10	35.0	29.0	--	--	--
SEP												
27...	1400	1028	80020	6.23	44	2350	7.70	--	25.0	--	--	--

[illegible]

07324200 WASHITA RIVER NEAR HAMMON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N02)	NITROGEN, N02+N03 DIS-SOLVED (MG/L AS N)	ALUMINUM, DIS-SOLVED (UG/L AS AL)
OCT 02...	7.6	--	--	222	--	--	--	--	--	--	--	--
NOV 20...	61	0.50	22	1570	1480	2.14	653	0.570	0.010	0.03	0.580	<10
DEC 25...	67	--	--	1630	--	--	--	--	--	--	--	--
JAN 04...	66	--	--	1630	--	--	--	--	--	--	--	--
11...	66	--	--	1540	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 15...	66	--	--	1570	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--	--	--
25...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 12...	64	0.50	19	1950	1810	2.65	486	0.440	0.020	0.07	0.460	10
27...	--	--	--	--	--	--	--	--	--	--	--	--
31...	48	--	--	1040	--	--	--	--	--	--	--	--
JUN 21...	52	--	--	1870	--	--	--	--	--	--	--	--
JUL 07...	--	--	--	--	--	--	--	--	--	--	--	--
SEP 27...	51	--	--	2010	--	--	--	--	--	--	--	--

[illegible]

RED RIVER BASIN

261

07324200 WASHITA RIVER NEAR HAMMON, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	1660	---	---	---	---	---	---
2	340	---	---	---	1920	---	---	---	---	---	2440	---
3	---	---	---	---	---	---	2210	---	---	---	---	---
4	---	---	---	2010	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	2240	---	---
6	---	---	---	---	---	---	2040	---	---	---	2170	---
7	---	---	---	---	---	---	---	---	1810	---	---	---
8	---	---	---	---	1890	1940	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	2270	---	---	2330	---
11	---	---	---	1890	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	2340	---	---
13	---	---	---	---	---	---	2090	---	---	---	---	2390
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	1920	---	---	---	---	---	---
16	---	---	---	---	---	---	---	2220	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	2430
21	---	---	---	---	---	---	---	---	2210	---	---	---
22	---	---	---	---	---	1810	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	1980	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	2170	---	---	2310	2400	2350
28	---	---	---	---	---	---	---	---	2210	---	---	---
29	---	---	---	---	---	1780	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	2420	---
31	---	---	---	---	---	---	---	1400	---	---	---	---

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	11.0	---	---	---	---	---	---
2	---	---	---	---	14.5	---	---	---	---	---	31.0	---
3	---	---	---	---	---	---	24.0	---	---	---	---	---
4	22.0	---	---	10.5	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	31.0	---	---
6	---	---	---	---	---	---	14.5	---	---	---	24.5	---
7	---	---	---	---	---	---	---	---	27.0	---	---	---
8	---	---	---	---	13.0	16.0	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	25.0	---	---	25.0	---
11	---	---	---	6.0	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	29.0	---	---
13	---	---	---	---	---	---	16.0	---	---	---	---	29.0
14	20.0	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	16.0	---	---	---	---	---	---
16	---	---	---	---	---	---	---	28.0	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	23.0
21	---	---	---	---	---	---	---	---	29.0	---	---	---
22	---	---	---	---	---	18.0	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	10.0	---	---	---	---	---	---	---	---	---
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	25.0	---	---	31.0	23.0	25.0
28	---	---	---	---	---	---	---	---	27.0	---	---	---
29	---	---	---	---	---	8.0	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	25.0	---
31	---	---	---	---	---	---	---	26.0	---	---	---	---

RED RIVER BASIN

07324300 FOSS RESERVOIR NEAR FOSS, OK

LOCATION.--Lat 35°32'18", long 99°10'40", in S 1/2 sec.2, T.12 N., R.19 W., Custer County, Hydrologic Unit 11130301, near right end of dam on Washita River, 0.5 mi upstream from Oak Creek, 3.5 mi west of Stafford, 6.0 mi north of Foss, and at mile 474.4.

DRAINAGE AREA.--1,496 mi².

PERIOD OF RECORD.--February 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Prior to October, 1961, nonrecording gage at same site and datum.

REMARKS.--Reservoir is formed by earth dam. Outlet consists of four 6- by 7-foot, 6-inch high pressure gates and one uncontrolled spillway. Storage began Feb. 13, 1961. Capacity, 436,500 acre-ft, at elevation 1,668.6 ft, crest of drop inlet and 256,100 acre-ft, at elevation 1,652.0 ft, conservation pool. Dead storage, 12,420 acre-ft below elevation 1,597.2 ft, sill of gated outlet. Figures given herein represent total contents. Reservoir is designed for flood control, municipal water supply (inactive), and irrigation release. Revised capacity table used after Sept. 30, 1964. Water-quality samples were collected at 3 profile sites in the Reservoir. U.S. Army Corps of Engineers' telemeter at station.

COOPERATION.--Elevations and data on diversions provided by Foss Reservoir Master Conservancy District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 208,300 acre-ft, June 11, 1987, elevation, 1,646.20 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 208,300 acre-ft, June 11, elevation, 1,646.20 ft; minimum, 136,500 acre-ft, Oct. 1, elevation, 1,635.30 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)*	Contents (acre-feet)	Change in contents (acre-feet)	Diversions (acre-feet)
Sept. 30.....	1635.40	137,100	-	-
Oct. 31.....	1639.40	161,000	+24,000	157
Nov. 30.....	1642.10	178,600	+17,500	121
Dec. 31.....	1642.22	179,400	+800	133
CAL YR 86.....	-	-	+45,600	1,619
Jan. 31.....	1641.80	176,600	-2,800	113
Feb. 28.....	1643.00	184,800	+8,200	93
Mar. 31.....	1644.30	194,200	+9,400	120
Apr. 30.....	1643.35	187,300	-6,900	121
May 31.....	1645.10	200,100	+12,800	141
June 30.....	1645.65	204,200	+4,100	144
July 31.....	1644.20	193,400	-10,800	124
Aug. 31.....	1641.95	177,600	-15,800	131
Sept. 30.....	1642.30	180,000	+2,400	65
WTR YR 87.....	-	-	+42,900	1,463

* Elevation at 0800 on the following day.

RED RIVER BASIN

353325099111000 FOSS RESERVOIR AT SITE NO. 1 NEAR FOSS, OK

LOCATION.--Lat 35°33'25", long 99°11'10", in SW 1/4 sec.35, T.13 N., R.19 W., Custer County, Hydrologic Unit 11130301, over old river channel, 600 ft from left edge of water on a bearing of 250° from concrete structure at north end of dam.

PERIOD OF RECORD.--Water year 1980 to September 1987 (discontinued).

REMARKS.--Samples were collected in a Kemmerer sampler near bottom, mid-depth, and surface. Specific conductance, water temperature, pH, and dissolved oxygen were determined in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)
DEC										
17...	1025	1028	80020	1.00	178000	1560	7.80	7.0	7.0	1.5
17...	1036	1028	1028	5.00	178000	1560	8.20	--	6.5	--
17...	1039	1028	1028	10.0	178000	1630	8.20	--	7.0	--
17...	1043	1028	1028	15.0	178000	1600	8.10	--	7.0	--
17...	1045	1028	1028	20.0	178000	1550	8.10	--	7.0	--
17...	1047	1028	80020	25.0	178000	1600	8.10	7.0	6.5	1.4
17...	1049	1028	1028	30.0	178000	1560	8.20	--	6.5	--
17...	1052	1028	1028	35.0	178000	1570	8.20	--	6.5	--
17...	1054	1028	1028	40.0	178000	1580	8.20	--	7.0	--
17...	1056	1028	1028	45.0	178000	1600	8.20	--	6.5	--
17...	1100	1028	1028	50.0	178000	1630	8.20	--	7.0	--
17...	1103	1028	80020	55.0	178000	1600	8.20	7.0	7.0	5.5
MAR										
26...	1039	1028	80020	1.00	190000	1570	8.00	8.0	9.0	2.2
26...	1042	1028	1028	5.00	190000	1590	7.80	--	9.0	--
26...	1045	1028	1028	10.0	190000	1600	7.80	--	9.0	--
26...	1047	1028	1028	15.0	190000	1600	7.80	--	9.0	--
26...	1049	1028	1028	20.0	190000	1620	7.90	--	9.0	--
26...	1052	1028	80020	25.0	190000	1620	7.90	8.0	9.0	3.5
26...	1054	1028	1028	30.0	190000	1640	7.90	--	9.0	--
26...	1056	1028	1028	35.0	190000	1640	8.00	--	9.0	--
26...	1058	1028	1028	40.0	190000	1650	8.00	--	9.0	--
26...	1100	1028	1028	45.0	190000	1630	8.00	--	9.0	--
26...	1103	1028	1028	50.0	190000	1640	8.00	--	9.0	--
26...	1105	1028	80020	53.0	190000	1640	8.00	8.0	9.0	3.4
JUN										
22...	1425	1028	80020	1.00	207000	1670	8.10	--	26.0	1.2
22...	1439	1028	1028	5.00	207000	1640	8.20	--	26.0	--
22...	1440	1028	1028	10.0	207000	1650	8.30	--	25.5	--
22...	1441	1028	1028	15.0	207000	1660	8.30	--	25.0	--
22...	1442	1028	80020	20.0	207000	1660	8.40	--	25.5	1.4
22...	1443	1028	1028	25.0	207000	1660	8.40	--	25.0	--
22...	1444	1028	1028	30.0	207000	1570	8.40	--	25.0	--
22...	1445	1028	1028	35.0	207000	1720	8.10	--	21.5	--
22...	1446	1028	80020	43.0	207000	1720	8.00	--	21.5	6.1

RED RIVER BASIN

353325099111000 FOSS RESERVOIR AT SITE NO. 1 NEAR FOSS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO
DEC										
17...	720	11.2	98	760	630	140	100	80	18	1
17...	720	11.5	100	--	--	--	--	--	--	--
17...	720	11.5	100	--	--	--	--	--	--	--
17...	720	11.4	99	--	--	--	--	--	--	--
17...	720	11.3	99	--	--	--	--	--	--	--
17...	720	11.4	99	750	620	140	98	76	18	1
17...	720	11.2	97	--	--	--	--	--	--	--
17...	720	11.4	99	--	--	--	--	--	--	--
17...	720	11.4	99	--	--	--	--	--	--	--
17...	720	11.2	97	--	--	--	--	--	--	--
17...	720	11.3	99	--	--	--	--	--	--	--
17...	720	11.2	98	760	630	140	100	80	18	1
MAR										
26...	720	9.7	90	780	610	150	98	77	18	1
26...	720	9.6	89	--	--	--	--	--	--	--
26...	720	10.2	94	--	--	--	--	--	--	--
26...	720	10.1	93	--	--	--	--	--	--	--
26...	720	10.2	94	--	--	--	--	--	--	--
26...	720	10.2	93	780	610	150	98	78	18	1
26...	720	10.4	96	--	--	--	--	--	--	--
26...	720	10.3	95	--	--	--	--	--	--	--
26...	720	10.6	97	--	--	--	--	--	--	--
26...	720	10.4	95	--	--	--	--	--	--	--
26...	720	10.5	96	--	--	--	--	--	--	--
26...	720	10.5	96	790	620	150	100	78	18	1
JUN										
22...	710	7.2	96	760	590	150	94	70	16	1
22...	710	7.2	96	--	--	--	--	--	--	--
22...	710	7.0	93	--	--	--	--	--	--	--
22...	710	6.8	89	--	--	--	--	--	--	--
22...	710	6.7	89	770	590	150	95	74	17	1
22...	710	6.6	86	--	--	--	--	--	--	--
22...	710	3.5	46	--	--	--	--	--	--	--
22...	710	2.7	33	--	--	--	--	--	--	--
22...	710	2.1	26	770	590	150	96	72	17	1

RED RIVER BASIN

353325099111000 FOSS RESERVOIR AT SITE NO. 1 NEAR FOSS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HCO3)	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)
DEC										
17...	11	--	--	--	770	50	1310	1230	1.78	0.0
17...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
17...	11	124	0	102	720	49	1310	1170	1.78	0.0
17...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
17...	--	--	--	--	--	--	--	--	--	--
17...	11	--	--	--	740	49	1320	1200	1.80	0.0
MAR										
26...	9.2	--	--	--	720	51	1310	1210	1.78	0.0
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	9.1	200	0	164	720	50	1300	1210	1.77	0.0
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	8.8	--	--	--	730	52	1310	1220	1.78	0.0
JUN										
22...	8.4	207	2	174	700	49	1260	1170	1.71	0.0
22...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--
22...	8.1	205	5	176	700	48	1250	1180	1.70	0.0
22...	--	--	--	--	--	--	--	--	--	--
22...	--	--	--	--	--	--	--	--	--	--
22...	8.4	222	0	182	730	51	1330	1220	1.81	0.0

RED RIVER BASIN

353405099132500 FOSS RESERVOIR AT SITE NO. 2 NEAR FOSS OK

LOCATION.--Lat 35°34'05", long 99°13'25", in SE 1/4 sec.28, T.13 N., R.19 W., Custer County, Hydrologic Unit 11130301, over old river channel, 900 ft from left edge of water on a bearing 155° from campgrounds on north shore.

PERIOD OF RECORD.--Water years 1980 to September 1987 (discontinued).

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	SAM-PLING DEPTH (FEET)	RESER-VOIR STORAGE (AC-FT)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
DEC											
17...	1134	1028	1028	1.00	178000	1640	8.30	6.5	720	11.5	100
17...	1136	1028	1028	5.00	178000	1620	8.30	6.5	720	11.3	98
17...	1138	1028	1028	10.0	178000	1640	8.30	6.5	720	11.4	99
17...	1140	1028	1028	15.0	178000	1630	8.20	6.5	720	11.4	99
17...	1142	1028	1028	20.0	178000	1630	8.30	6.5	720	11.3	98
17...	1144	1028	1028	25.0	178000	1620	8.30	6.5	720	11.3	98
17...	1146	1028	1028	30.0	178000	1620	8.30	6.5	720	11.3	98
17...	1149	1028	1028	35.0	178000	1630	8.30	6.5	720	11.2	97
17...	1151	1028	1028	40.0	178000	1620	8.30	6.5	720	11.3	98
MAR											
26...	1139	1028	1028	1.00	190000	1640	8.00	9.0	720	10.4	96
26...	1140	1028	1028	5.00	190000	1640	8.20	9.0	720	10.2	94
26...	1141	1028	1028	10.0	190000	1630	8.10	9.0	720	10.4	96
26...	1146	1028	1028	15.0	190000	1650	8.20	9.0	720	10.2	94
26...	1148	1028	1028	20.0	190000	1630	8.20	9.0	720	10.2	94
26...	1150	1028	1028	25.0	190000	1630	8.20	9.0	720	10.2	94
26...	1152	1028	1028	30.0	190000	1630	8.20	9.0	720	10.3	95
26...	1154	1028	1028	35.0	190000	1640	8.20	9.0	720	10.2	94
26...	1157	1028	1028	40.0	190000	1630	8.20	9.0	720	10.2	94
26...	1200	1028	1028	42.0	190000	1640	8.20	9.0	720	10.2	94
JUN											
22...	1527	1028	1028	1.00	207000	1640	8.50	26.5	710	7.5	101
22...	1529	1028	1028	5.00	207000	1550	8.50	26.0	710	7.6	101
22...	1531	1028	1028	10.0	207000	1540	8.50	26.0	710	7.7	103
22...	1533	1028	1028	15.0	207000	1650	8.50	25.5	710	7.2	95
22...	1535	1028	1028	20.0	207000	1560	8.50	25.5	710	7.2	95
22...	1538	1028	1028	25.0	207000	1640	8.40	25.0	710	3.5	46
22...	1541	1028	1028	31.0	20700	1650	8.10	21.5	710	2.0	24

RED RIVER BASIN

353615099135000 FOSS RESERVOIR AT SITE NO. 3 NEAR FOSS, OK

LOCATION.--Lat 35°36'15", long 99°13'50", in SE 1/4 sec.17, T.13 N., R.19 W., Custer County, Hydrologic Unit 11130301, over old river channel, 600 ft from left edge of water on a bearing 240° from small tributary on north shore.

PERIOD OF RECORD.--Water years 1980 to September 1987 (discontinued).

REMARKS.--Specific conductance, pH, water temperature and dissolved oxygen were measured in the field at 5-foot intervals.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	SAM- PLING DEPTH (FEET)	RESER- VOIR STORAGE (AC-FT)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
DEC											
17...	1210	1028	1028	1.00	178000	1640	8.30	6.5	720	11.4	98
17...	1213	1028	1028	5.00	178000	1630	8.30	6.5	720	11.4	98
17...	1216	1028	1028	10.0	178000	1620	8.30	6.5	720	11.3	98
17...	1218	1028	1028	15.0	178000	1630	8.30	6.5	720	11.3	98
17...	1221	1028	1028	20.0	178000	1640	8.30	6.5	720	11.2	97
17...	1223	1028	1028	24.0	178000	1650	8.30	6.5	720	11.1	96
MAR											
26...	1215	1028	1028	1.00	190000	1630	8.20	10.0	720	10.2	96
26...	1217	1028	1028	5.00	190000	1630	8.30	10.0	720	10.4	98
26...	1218	1028	1028	10.0	190000	1620	8.20	10.0	720	10.3	97
26...	1220	1028	1028	15.0	190000	1640	8.20	10.0	720	10.1	95
26...	1221	1028	1028	20.0	190000	1630	8.20	9.5	720	10.2	96
26...	1223	1028	1028	23.0	190000	1640	8.30	9.5	720	10.4	97
JUN											
22...	1558	1028	1028	30.0	207000	1660	8.00	23.0	710	2.3	29
22...	1602	1028	1028	25.0	207000	1640	8.20	24.5	710	4.0	52
22...	1604	1028	1028	20.0	207000	1590	8.40	25.5	710	6.5	86
22...	1605	1028	1028	15.0	207000	1620	8.40	25.5	710	6.2	82
22...	1607	1028	1028	10.0	207000	1600	8.40	26.0	710	7.2	96
22...	1609	1028	1028	5.00	207000	1620	8.40	26.0	710	7.2	96
22...	1610	1028	1028	1.00	207000	1630	8.40	26.5	710	7.4	100

RED RIVER BASIN

07324400 WASHITA RIVER NEAR FOSS, OK

LOCATION.--Lat 35°32'20", long 99°10'10", in SW 1/4 SW 1/4 sec.1, T.12 N., R.19 W., Custer County, Hydrologic Unit 11130302, on right bank at upstream side county road bridge, 0.4 mi downstream from Oak Creek, 0.9 mi downstream from Foss Dam, 2.5 mi west of Stafford, 6.0 mi north of Foss, and at mile 473.5.

DRAINAGE AREA.--1,551 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1956 to April 1957, February to December 1958, July 1961 to September 1987 (discontinued).

GAGE.--Water-stage recorder. Elevation of gage is 1,560 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records poor. Except for 55 mi² intervening area, flow completely regulated since 1961 by Foss Reservoir (station 07324300).

AVERAGE DISCHARGE.--26 years, (water years 1962-87), 31.6 ft³/s, 22,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 14,000 ft³/s, Apr. 9, 1957, gage height, 20.40 ft, from rating curve extended above 3,600 ft³/s, on basis of velocity-area study; no flow at times in 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1959 reached a stage of 23.4 ft, from floodmark.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,350 ft³/s, Oct. 3, gage height, 21.56 ft; minimum daily discharge, 1.6 ft³/s, Sept. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	246	81	421	24	e23	e200	36	429	369	371	334	11
2	501	73	433	22	e22	e265	32	429	357	371	335	8.4
3	1090	68	496	21	e20	e365	170	429	357	371	332	6.6
4	459	218	255	22	e19	e510	395	380	333	371	331	5.7
5	368	250	26	23	e19	e520	494	210	315	371	332	4.8
6	338	181	24	23	e18	e520	540	154	305	371	331	5.4
7	316	109	38	22	e18	e520	455	154	297	371	331	6.3
8	297	87	37	e20	e18	e400	434	158	334	372	330	6.7
9	290	78	e36	e19	e18	e170	435	152	352	298	329	5.6
10	283	71	35	e18	e17	e120	438	157	342	89	329	3.7
11	272	65	36	e30	e16	e120	438	157	384	305	329	2.6
12	259	64	34	e17	e16	e120	435	291	407	346	330	4.6
13	242	63	32	17	e16	e120	433	511	404	360	339	3.6
14	220	62	29	e16	e16	e120	436	599	399	351	330	3.1
15	214	55	27	136	e15	e120	435	597	397	350	330	3.4
16	188	50	27	301	e15	e120	435	595	397	349	329	2.0
17	134	45	26	323	e15	e200	317	594	396	399	328	1.6
18	110	43	25	e470	e42	e270	82	519	383	395	329	4.0
19	74	42	25	e490	e170	e265	20	417	428	350	329	2.5
20	49	91	25	e490	e200	268	18	337	392	349	329	64
21	171	323	24	e490	e200	e270	17	419	338	350	328	96
22	384	440	24	e490	e205	e265	16	342	336	348	327	14
23	426	403	24	e490	e205	e265	76	315	397	281	325	9.3
24	304	500	23	e490	e200	e260	308	299	397	346	270	7.1
25	295	550	22	e490	e200	258	428	317	397	353	107	5.7
26	255	502	22	e490	e190	e255	432	448	379	352	9.9	4.4
27	208	528	21	e490	e200	e250	432	716	371	350	30	4.0
28	190	519	21	e490	e170	e65	430	571	371	339	25	6.1
29	159	546	21	e180	---	e36	430	452	371	337	21	5.3
30	118	438	22	e45	---	e35	429	390	371	336	15	3.9
31	95	---	24	e25	---	e35	---	380	---	336	13	---
TOTAL	8555	6545	2335	6674	2283	7307	9476	11918	11076	10638	8086.9	311.4
MEAN	276	218	75.3	215	81.5	236	316	384	369	343	261	10.4
MAX	1090	550	496	490	205	520	540	716	428	399	339	96
MIN	49	42	21	16	15	35	16	152	297	89	9.9	1.6
AC-FT	16970	12980	4630	13240	4530	14490	18800	23640	21970	21100	16040	618

CAL YR 1986 TOTAL 20620.2 MEAN 56.5 MAX 1090 MIN 2.1 AC-FT 40900
WTR YR 1987 TOTAL 85205.3 MEAN 233 MAX 1090 MIN 1.6 AC-FT 169000

e Estimated

RED RIVER BASIN

07324400 WASHITA RIVER NEAR FOSS, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1947-48, 1950-51, 1956, 1958, 1970 to September 1987 (discontinued).

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1946 to September 1948, October 1969 to September 1976.

WATER TEMPERATURE: October 1946 to September 1948, October 1969 to September 1976.

REMARKS.--Samples were collected by a local observer on a weekly basis. A partial analysis was made bimonthly on one of these samples. Additional samples were collected semiannually and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COLLECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
OCT 20...	0900	1028	80020	9.00	50	989	8.30	--	19.0	--	--	--
NOV 20...	1415	1028	80020	8.69	31	1170	7.60	20.0	13.0	720	9.8	99
DEC 15...	0900	1028	80020	8.06	28	1420	8.10	--	9.0	--	--	--
JAN 13...	1519	1028	1028	7.64	17	1490	7.80	17.0	9.0	--	--	--
FEB 09...	0900	1028	80020	--	*18	1480	8.10	--	6.0	--	--	--
MAR 20...	1107	1028	1028	10.95	268	1180	8.50	21.0	13.0	--	--	--
MAY 11...	1740	1028	80020	9.71	159	1690	8.00	37.0	18.0	720	9.8	110
25...	0900	1028	80020	12.10	342	1250	7.80	--	20.0	--	--	--
JUL 08...	1840	1028	1028	12.81	385	1760	8.00	36.0	23.0	--	--	--
20...	0900	1028	80020	12.36	347	1640	8.10	--	24.0	--	--	--
AUG 03...	0900	1028	80020	12.21	331	1660	7.90	--	25.0	--	--	--
18...	1000	1028	1028	12.19	316	1750	8.00	33.5	30.0	--	--	--

DATE	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARBONATE (MG/L AS CaCO3)	CALCIUM DISSOLVED (MG/L AS Ca)	MAGNESIUM DISSOLVED (MG/L AS Mg)	SODIUM DISSOLVED (MG/L AS Na)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM DISSOLVED (MG/L AS K)	BICARBONATE WATER FIELD (MG/L AS HCO3)	CARBONATE WATER FIELD (MG/L AS CO3)	ALKALINITY (MG/L AS CaCO3)	SULFATE DISSOLVED (MG/L AS SO4)
OCT 20...	--	--	--	--	--	--	--	--	--	--	--	230
NOV 20...	580	250	110	75	53	16	1	4.4	--	--	--	320
DEC 15...	--	--	--	--	--	--	--	--	--	--	--	430
JAN 13...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 09...	--	--	--	--	--	--	--	--	--	--	--	460
MAR 20...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 11...	810	610	160	100	76	17	1	8.1	241	0	198	750
25...	--	--	--	--	--	--	--	--	--	--	--	440
JUL 08...	--	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--	610
AUG 03...	--	--	--	--	--	--	--	--	--	--	--	670
18...	--	--	--	--	--	--	--	--	--	--	--	--

*MEAN DAILY DISCHARGE

RED RIVER BASIN

07324400 WASHITA RIVER NEAR FOSS, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible][illegible]

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SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

[illegible]

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

[illegible]

RED RIVER BASIN

07325000 WASHITA RIVER NEAR CLINTON, OK

LOCATION.--Lat 35°31'51", long 98°58'00" (revised), in SW 1/4 NE 1/4 sec.11, T.12 N., R.17 W., Custer County, Hydrologic Unit 11130302, on downstream side of pier of bridge on U.S. Highway 183, 0.5 mi north of Clinton, 0.8 mi upstream from Beaver Creek, 4.8 mi downstream from Barnitz Creek, and at mile 447.4.

DRAINAGE AREA.--1,977 mi².

PERIOD OF RECORD.--October 1935 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1221: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,467.44 ft above National Geodetic Vertical Datum of 1929. See WSP 1920 for history of changes prior to Mar. 19, 1941.

REMARKS.--No estimated daily discharges. Records fair. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since February 1961 by Foss Reservoir (station 07324300) and by numerous flood-retarding structures. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Foss Reservoir, 25 years (water years 1936-60), 146 ft³/s, 105,700 acre-ft/yr; since regulation by Foss Reservoir, 26 years (water years 1962-87), 76.9 ft³/s, 55,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 66,800 ft³/s, May 16, 1951, gage height, 31.09 ft, from rating curve extended above 7,900 ft³/s, by contracted-opening measurement of peak flow; no flow at times in 1952-56, 1964, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 3-4, 1934, reached a stage of 33.9 ft, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,600 ft³/s, Oct. 3, gage height, 25.93 ft; minimum daily discharge, 59 ft³/s, Sept. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1540	360	653	127	177	565	203	491	1170	507	406	98
2	1190	320	611	124	162	513	194	490	982	495	404	89
3	7710	304	584	135	150	569	178	487	1360	488	401	80
4	4680	1060	481	124	140	632	361	486	1070	488	397	75
5	2720	1710	256	123	134	696	537	371	828	484	397	70
6	2150	898	188	127	132	686	618	279	717	477	397	68
7	1820	657	184	119	124	673	621	224	623	470	393	72
8	1560	511	189	111	123	666	555	207	560	462	390	70
9	1370	420	203	124	114	390	552	195	574	457	388	67
10	1110	365	197	137	119	139	552	184	695	296	387	70
11	974	343	185	121	117	140	538	177	793	256	388	64
12	932	316	177	116	109	140	538	173	701	417	388	83
13	812	276	169	112	79	139	533	420	665	486	481	79
14	711	266	166	110	149	152	558	604	622	444	418	70
15	610	264	157	107	115	158	542	631	592	436	399	66
16	530	252	153	291	141	158	534	645	571	431	392	68
17	465	245	153	481	136	263	524	642	553	664	388	64
18	392	237	147	504	121	720	297	626	561	606	384	59
19	341	225	146	529	221	776	168	522	764	502	381	64
20	286	227	148	544	259	567	146	364	1060	472	378	64
21	406	271	143	540	263	447	126	441	697	454	374	751
22	2730	441	139	541	266	388	117	556	617	442	372	271
23	2990	563	136	534	265	553	113	822	586	423	370	148
24	2290	593	136	536	269	636	182	803	558	390	368	107
25	1410	602	132	524	274	474	441	973	568	429	249	92
26	1050	612	127	531	304	388	488	734	544	437	150	82
27	811	604	123	531	715	364	492	3540	520	432	240	76
28	681	601	122	543	1020	283	491	3480	508	426	185	96
29	601	629	122	413	---	260	492	3610	498	416	125	109
30	498	646	123	245	---	207	495	2280	523	413	108	80
31	411	---	130	195	---	207	---	1670	---	409	101	---
TOTAL	45781	14818	6580	9299	6198	12949	12186	27127	21080	14009	10599	3252
MEAN	1477	494	212	300	221	418	406	875	703	452	342	108
MAX	7710	1710	653	544	1020	776	621	3610	1360	664	481	751
MIN	286	225	122	107	79	139	113	173	498	256	101	59
AC-FT	90810	29390	13050	18440	12290	25680	24170	53810	41810	27790	21020	6450

CAL YR 1986 TOTAL 79361 MEAN 217 MAX 7710 MIN 6.2 AC-FT 157400
WTR YR 1987 TOTAL 183878 MEAN 504 MAX 7710 MIN 59 AC-FT 364700

07325500 WASHITA RIVER AT CARNEGIE, OK

LOCATION.--Lat 35°07'02", long 98°33'49", in NW 1/4 NW 1/4 sec.3, T.7 N., R.13 W., Caddo County, Hydrologic Unit 11130302, on downstream side of right pier of bridge on State Highway 9, 1,300 ft upstream from Running Creek, 2.7 mi east of Carnegie, and at mile 353.9. Records include flow of Running Creek.

DRAINAGE AREA.--3,129 mi², includes that of Running Creek.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1937 to current year.

REVISED RECORDS.--WSP 1087: 1938. WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,244.23 ft above National Geodetic Vertical Datum of 1929.

Prior to October 1942, water-stage recorder at site 8.0 mi upstream at datum 24.57 ft higher. Prior to Aug. 7, 1985, datum 5.00 ft higher.

REMARKS.--Records poor. Some diversion for irrigation upstream from station. October 1942 to May 1949, occasional fluctuation caused by powerplant at Carnegie, 7.5 mi upstream from station. Flow regulated by Foss Reservoir since February 1961 (station 07324300), and by numerous flood-retarding structures. U.S. Army Corps of Engineers' satellite telemeter at site.

AVERAGE DISCHARGE.--Prior to regulation by Foss Reservoir, 23 years (water years 1938-60), 314 ft³/s, 277,500 acre-ft/yr; since regulation by Foss Reservoir, 26 years (water years 1962-87), 289 ft³/s, 209,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft³/s, May 18, 1949, gage height, 26.21 ft at datum then in use, from rating curve extended above 35,500 ft³/s on basis of contracted-opening measurement of peak flow, maximum gage height, 26.70 ft³/s at datum then in use, Oct. 20, 1983; no flow at times in 1956 and 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 23, 1903, reached a stage of about 29 ft, at former site and datum, from information provided by local resident; flood of May 18, 1949, reached a stage of 20.9 ft, from floodmark, at that site and datum.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Oct. 5	Unknown	*25,200	*29.57 (from HWM)	Nov. 6	Unknown	4,840	22.94 (from HWM)
Oct. 23	Unknown	10,100	27.51 (from HWM)	May 28	2400	22,000	29.23

Minimum daily discharge, 194 ft³/s, Sept. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e9360	1700	847	430	1280	2760	623	677	6230	1110	524	287
2	6800	1390	957	431	1670	2200	607	675	5790	969	514	249
3	e8620	1190	965	425	1140	1460	592	670	5440	898	502	238
4	10300	1970	916	423	795	1210	571	660	4940	864	494	227
5	22100	3920	887	420	766	1160	550	653	4860	836	486	217
6	10700	4630	871	414	1490	1150	562	651	3730	811	479	212
7	7180	4200	683	414	1520	1160	734	567	2940	783	475	207
8	6410	2760	674	415	867	1130	827	472	2580	753	467	204
9	5730	2040	931	627	743	1100	890	458	2310	730	459	203
10	5060	1640	775	886	657	1070	860	441	2240	710	463	201
11	4080	1370	683	665	612	988	819	427	2210	688	490	199
12	3320	1180	635	550	581	900	816	412	2220	578	467	211
13	3120	1060	616	502	554	867	793	399	2040	647	487	211
14	2630	953	589	478	542	846	800	393	1800	699	691	241
15	2140	891	e574	455	563	837	792	524	1580	744	719	226
16	1890	858	561	446	592	921	802	689	1410	671	542	207
17	1590	826	543	433	580	1460	786	737	1310	673	496	204
18	e1330	791	525	470	546	2490	775	758	1550	969	474	194
19	1100	e760	514	615	530	2720	733	756	1630	1210	463	656
20	934	731	505	744	518	2190	607	748	1580	942	452	486
21	1280	710	496	807	561	1540	494	679	2300	764	441	1050
22	4670	704	489	781	611	1200	453	600	1610	697	436	2230
23	8810	715	481	771	612	1030	436	1320	1360	658	429	1130
24	7600	799	477	771	614	1050	423	2630	1170	630	424	602
25	6170	908	474	765	615	1220	413	3460	1120	597	423	454
26	5880	1180	470	757	686	1140	448	3290	1060	564	421	383
27	5140	1280	460	758	1430	935	573	4080	1020	591	371	331
28	3700	1120	451	853	2210	841	673	9750	951	585	337	312
29	2730	1000	444	1650	---	788	679	15000	906	568	371	428
30	2290	866	440	2140	---	704	677	9310	1230	553	320	367
31	1990	---	435	1540	---	664	---	6610	---	535	280	---
TOTAL	164654	44142	19368	21836	23885	39731	19808	68496	71117	23027	14397	12367
MEAN	5311	1471	625	704	853	1282	660	2210	2371	743	464	412
MAX	22100	4630	965	2140	2210	2760	890	15000	6230	1210	719	2230
MIN	934	704	435	414	518	664	413	393	906	535	280	194
AC-FT	326600	87560	38420	43310	47380	78810	39290	135900	141100	45670	28560	24530

CAL YR 1986 TOTAL 289727 MEAN 794 MAX 22100 MIN 27 AC-FT 574700
WTR YR 1987 TOTAL 522828 MEAN 1432 MAX 22100 MIN 194 AC-FT 1037000

e Estimated

RED RIVER BASIN

07325500 WASHITA RIVER AT CARNEGIE, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1948 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1953 to September 1976.

WATER TEMPERATURE: October 1953 to September 1976.

REMARKS.--Samples were collected by a local observer on a weekly basis. A partial analysis was made bimonthly on one of these samples. Additional samples were collected semiannually. Specific conductance, pH, water temperature, and dissolved oxygen was determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANALYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
OCT 31...	1100	1028	80020	14.78	1980	1190	8.00	--	16.0	--	--	--
NOV 14...	1200	1028	80020	11.57	953	1850	7.80	0.0	3.0	730	11.9	93
DEC 23...	1600	1028	80020	9.14	480	2380	7.70	--	10.0	--	--	--
JAN 29...	1330	1028	1028	14.14	1820	1800	--	14.0	5.0	--	--	--
MAR 12...	1700	1028	80020	10.92	899	1930	8.10	--	12.0	--	--	--
MAR 25...	1445	1028	1028	12.35	1790	1700	7.90	10.0	12.0	--	--	--
MAY 07...	1430	1028	80020	9.01	549	*2070	8.00	21.0	20.0	740	8.6	98
MAY 21...	1700	1028	80020	9.74	684	1930	7.80	--	25.0	--	--	--
JUN 17...	1300	1028	1028	12.55	1470	1340	7.90	33.0	30.0	--	--	--
JUL 16...	1400	1028	80020	9.66	655	1760	7.90	--	26.0	--	--	--
AUG 07...	1100	1028	80020	8.75	469	2010	8.00	--	29.0	--	--	--
SEP 23...	1730	1028	1028	11.07	970	1860	8.10	26.5	23.0	--	--	--
DATE		HARDNESS TOTAL (MG/L AS CAC03)	HARDNESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	BICARBONATE WATER WH IT FIELD (MG/L AS HC03)	CARBONATE WATER WH IT FIELD (MG/L AS C03)	ALKALINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS S04)
OCT 31...	--	--	--	--	--	--	--	--	--	--	--	410
NOV 14...	930	650	230	87	82	16	1	4.7	298	0	244	750
DEC 23...	--	--	--	--	--	--	--	--	--	--	--	1100
JAN 29...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 12...	--	--	--	--	--	--	--	--	--	--	--	810
MAR 25...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 07...	940	710	210	100	87	17	1	6.9	280	0	234	870
MAY 21...	--	--	--	--	--	--	--	--	--	--	--	950
JUN 17...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--	--	660
AUG 07...	--	--	--	--	--	--	--	--	--	--	--	820
SEP 23...	--	--	--	--	--	--	--	--	--	--	--	--

* SPECIFIC CONDUCTANCE, LAB (US/CM)

07325500 WASHITA RIVER AT CARNEGIE, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible][illegible]

07325500 WASHITA RIVER AT CARNEGIE, OK--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

[illegible]

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

[illegible]

RED RIVER BASIN

07325800 COBB CREEK NEAR EAKLY, OK

LOCATION.--Lat 35°17'26", long 98°35'38", in NW 1/4 NE 1/4 sec.5, T.9 N., R.13 W., Caddo County, Hydrologic Unit 11130302, near left downstream abutment of bridge, on State Highway 152, 0.5 mi downstream from Fivemile Creek, 2.4 mi southwest of Eakly, 3.0 mi upstream from Fort Cobb Reservoir, and at mile 22.9.

DRAINAGE AREA.--132 mi².

PERIOD OF RECORD.--October 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,369.70 ft above National Geodetic Vertical Datum of 1929. Oct. 29, 1980 to Aug. 11, 1982 gage at site 0.5 mi downstream at same datum.

REMARKS.--Records poor. Flow regulated since 1957 by numerous floodwater-retarding structures. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--19 years, 24.5 ft³/s, 17,750 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 10,000 ft³/s, Sept. 29, 1986, gage height, 24.38 ft; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,960 ft³/s, May 28, gage height, 17.92 ft; minimum daily, 11 ft³/s, multiple days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1200	e47	33	27	46	49	22	19	139	49	14	13
2	e800	e43	33	27	39	38	22	18	94	41	14	13
3	e2500	e40	31	27	34	33	22	18	1790	40	14	12
4	e900	e600	30	26	31	30	21	18	395	39	13	11
5	e350	e400	30	27	30	28	21	18	253	37	13	11
6	e170	e225	31	27	29	28	22	18	115	35	13	11
7	e110	e110	35	26	28	26	23	19	81	33	13	12
8	e80	e80	72	28	27	26	23	17	67	30	13	12
9	e66	e60	72	58	26	26	23	17	61	29	12	12
10	e56	e50	41	41	25	28	22	17	80	28	31	14
11	e50	e45	37	35	25	27	23	16	71	25	23	14
12	e47	e40	35	33	24	26	23	16	60	25	18	17
13	e250	37	33	32	24	25	23	15	49	38	201	23
14	e150	39	33	31	24	25	26	15	41	33	132	19
15	e100	40	33	30	26	25	24	16	37	30	67	17
16	e80	40	33	29	26	27	22	17	34	27	34	16
17	e70	40	32	27	23	219	22	19	32	34	23	15
18	e60	39	32	27	22	126	22	15	45	33	17	63
19	e54	39	31	36	22	61	21	14	254	29	14	62
20	e50	39	30	32	24	46	20	17	454	25	13	65
21	e45	38	30	30	24	38	20	50	311	23	12	277
22	e1300	37	30	30	23	34	20	296	251	22	11	93
23	e500	36	30	30	23	39	20	674	162	20	11	55
24	e250	35	30	30	28	36	19	233	75	18	11	37
25	e150	37	30	28	29	31	19	164	57	17	12	25
26	e110	48	28	27	48	28	19	87	46	18	12	17
27	e90	38	28	29	71	27	19	2040	42	17	18	15
28	e72	36	28	41	75	25	19	2700	37	16	17	52
29	e64	35	28	95	---	25	19	882	38	16	15	31
30	e56	34	27	61	---	23	19	353	89	15	15	18
31	e50	---	27	46	---	22	---	255	---	15	14	---
TOTAL	9830	2427	1053	1073	876	1247	640	8073	5260	857	840	1052
MEAN	317	80.9	34.0	34.6	31.3	40.2	21.3	260	175	27.6	27.1	35.1
MAX	2500	600	72	95	75	219	26	2700	1790	49	201	277
MIN	45	34	27	26	22	22	19	14	32	15	11	11
AC-FT	19500	4810	2090	2130	1740	2470	1270	16010	10430	1700	1670	2090

CAL YR 1986 TOTAL 22189.0 MEAN 60.8 MAX 3750 MIN 4.5 AC-FT 44010
WTR YR 1987 TOTAL 33228 MEAN 91.0 MAX 2700 MIN 11 AC-FT 65910

e Estimated

RED RIVER BASIN

07325900 FORT COBB RESERVOIR NEAR FORT COBB, OK

LOCATION.--Lat 35°09'30", long 98°27'40", in SE 1/4 sec.21, T.8 N., R.12 W., Caddo County, Hydrologic Unit 11130382, in control house at right center of dam on Cobb Creek, 4.0 mi northwest of Fort Cobb, and at mile 7.5.

DRAINAGE AREA.--304 mi².

PERIOD OF RECORD.--March 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Prior to October, 1961, nonrecording gage at same datum.

REMARKS.--Reservoir is formed by earth dam. Outlet consists of two sets of controlled 5- by 5-foot steel gates and an uncontrolled concrete spillway. Storage began Mar. 30, 1959. Conservation pool was first filled in June 1962. Capacity, 143,700 acre-ft at elevation 1,354.8 ft, crest of drop inlet, 80,010 acre-ft at elevation 1,342.0 ft, conservation pool, and 1,664 acre-ft at elevation 1,300.0 ft, crest of gated outlet. Figures given herein represent total contents. Reservoir is used for flood control, for municipal and industrial water supply, and for irrigation releases. Revised capacity table used since May 1, 1964. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Elevations and data on diversions provided by Fort Cobb Reservoir Master Conservancy District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 114,200 acre-ft, June 4, 1982, elevation, 1,349.44 ft; minimum since conservation pool was first filled, 54,650 acre-ft, Oct. 19, 1972, elevation 1,335.06 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 122,400 acre-ft, June 7, elevation, 1,351.01 ft; minimum, 79,700 acre-ft, May 20, elevation 1,341.92 ft.

MONTHEND ELEVATION AND CONTENTS, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

Date	Elevation (feet)*	Contents (acre-feet)	Charge in contents (acre-feet)	Diversions (acre-feet)
Sept. 30.....	1,346.60	100,300	-	-
Oct. 31.....	1,347.59	105,000	+4,700	809
Nov. 30.....	1,342.35	81,450	-23,550	449
Dec. 31.....	1,342.88	83,660	+2,210	788
CAL YR 86.....	-	-	+14,540	9,343
Jan. 31.....	1,342.44	81,820	-1,840	604
Feb. 28.....	1,342.45	81,860	+40	785
Mar. 31.....	1,341.97	79,880	-1,980	738
Apr. 30.....	1,342.10	80,420	+540	689
May 31.....	1,349.06	80,250	-170	846
June 30.....	1,343.61	86,780	+6,530	850
July 31.....	1,342.87	83,620	-3,160	1,020
Aug. 31.....	1,342.50	82,070	-1,550	991
Sept. 30.....	1,342.00	80,010	-2,060	847
WTR YR 87.....	-	-	-20,290	9,416

* Elevation at 0800 on following day.

RED RIVER BASIN

279

07326000 COBB CREEK NEAR FORT COBB, OK

LOCATION.--Lat 35°08'37", long 98°26'33", in NE 1/4 NE 1/4 sec.27, T.8 N., R.12 W., Caddo County, Hydrologic Unit 11130302, on left bank 10 ft upstream from county road bridge, 0.3 mi upstream from Punjo Creek, 1.2 mi downstream from Fort Cobb Dam, 3.0 mi north of Fort Cobb, and at mile 5.8.

DRAINAGE AREA.--313 mi². Area at site used prior to Oct. 1, 1969, 319 mi².

PERIOD OF RECORD.--October 1939 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1960, published as Pond Creek near Fort Cobb.

REVISED RECORDS.--WSP 1087: 1938. WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,254.49 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Oct. 1, 1969 to Sept. 30, 1982 gage at same site and datum 5.00 ft higher. Oct. 1, 1939 to Aug. 29, 1940, nonrecording gage and Aug. 30, 1940 to Sept. 30, 1969, water-stage recorder at site 0.8 mi downstream at datum 1.92 ft lower.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated since March 1959 by Fort Cobb Reservoir (station 07325900).

AVERAGE DISCHARGE.--Prior to regulation by Fort Cobb Reservoir, 19 years (water years 1940-58), 50.2 ft³/s, 36,340 acre-ft/yr; since regulation by Fort Cobb Reservoir, 29 years (water years 1959-87), 22.4 ft³/s, 16,230 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,000 ft³/s, May 17, 1949, gage height, 18.72 ft, from floodmark in gage well at former site and datum, from rating curve extended above 4,300 ft³/s, on basis of contracted-opening measurements at gage heights 16.62 ft, 17.58 ft, and 18.72 ft, at former site and datum; minimum daily, 0.2 ft³/s, Sept. 20, 24-28, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 15, 1937, reached a stage of 19.3 ft, site and datum used in 1939, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,280 ft³/s, June 23, gage height, 16.72 ft; maximum gage height, 17.44 ft, Nov. 13 (debris in channel); minimum daily discharge, 2.1 ft³/s, Sept. 6, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	1110	11	32	210	5.4	e3.5	2.9	30	189	3.8	2.6
2	21	1100	11	31	108	105	e3.6	2.8	29	266	3.5	2.5
3	30	1100	11	32	7.9	289	e3.4	2.7	98	340	3.5	2.3
4	5.5	668	11	32	7.2	289	e3.5	2.7	27	340	3.4	2.2
5	4.3	389	10	32	7.0	289	e3.6	2.7	24	340	3.4	2.2
6	4.2	5.6	10	32	6.9	289	e3.5	2.7	23	268	3.3	2.1
7	3.9	4.0	11	32	6.6	123	e3.5	3.3	25	96	3.2	2.2
8	3.7	261	11	55	6.5	6.5	e3.5	3.3	219	13	3.2	2.1
9	3.4	926	11	89	6.4	5.7	e3.4	3.3	737	11	3.4	2.2
10	3.1	1160	9.7	88	6.4	5.4	e3.5	3.2	810	9.7	3.4	2.4
11	3.6	1170	9.5	88	6.0	4.9	e3.4	3.0	1110	9.4	3.4	2.6
12	199	1180	9.5	88	6.0	4.6	e3.5	3.0	1190	9.1	3.2	3.1
13	742	1050	9.3	88	69	4.6	3.6	3.1	1250	9.1	3.6	2.7
14	908	887	9.3	88	186	4.6	3.4	2.9	1250	8.5	2.9	2.4
15	954	894	9.3	88	188	4.3	3.4	2.9	1250	8.0	2.9	2.4
16	944	901	9.3	106	188	4.5	3.4	3.1	1240	7.5	2.7	2.4
17	929	834	8.9	148	187	5.8	3.5	3.0	1220	7.4	2.9	2.4
18	919	744	7.5	148	187	4.6	3.4	3.0	1210	6.3	2.7	2.4
19	914	745	9.3	148	187	4.2	3.3	3.0	1040	5.8	2.6	2.56
20	913	637	11	148	187	186	3.3	3.0	757	5.5	2.5	2.56
21	802	277	12	169	187	385	3.1	2.6	759	5.4	2.5	2.58
22	38	14	12	208	187	385	3.1	2.7	900	5.0	2.5	2.58
23	6.2	12	12	206	187	294	3.1	5.0	1270	4.8	3.0	2.58
24	5.0	12	13	206	89	124	3.1	3.3	1260	4.8	3.0	2.59
25	4.3	14	13	206	6.0	63	3.2	4.3	1260	4.7	3.0	120
26	4.0	13	13	206	6.5	5.2	3.0	2.9	1180	4.5	2.6	3.5
27	3.3	11	13	206	5.9	4.6	4.1	105	1110	4.4	2.8	2.9
28	3.3	11	13	206	11	e4.0	3.1	295	1100	4.2	2.9	2.8
29	251	11	13	207	---	e3.7	2.9	58	802	4.2	2.8	2.5
30	958	11	21	206	---	e3.7	3.3	35	193	4.1	2.6	2.3
31	1120	---	32	206	---	e3.6	---	32	---	4.0	2.6	---
TOTAL	10706.3	16151.6	366.6	3825	2443.3	2910.9	101.2	605.4	23373	1999.4	93.8	1743.8
MEAN	345	538	11.8	123	87.3	93.9	3.37	19.5	779	64.5	3.03	58.1
MAX	1120	1180	32	208	210	385	4.1	295	1270	340	3.8	259
MIN	3.1	4.0	7.5	31	5.9	3.6	2.9	2.6	23	4.0	2.5	2.1
AC-FT	21240	32040	727	7590	4850	5770	201	1200	46360	3970	186	3460

CAL YR 1986 TOTAL 29169.3 MEAN 79.9 MAX 1180 MIN 2.4 AC-FT 57860
WTR YR 1987 TOTAL 64320.3 MEAN 176 MAX 1270 MIN 2.1 AC-FT 127600

e Estimated

RED RIVER BASIN

07326500 WASHITA RIVER AT ANADARKO, OK

LOCATION.--Lat 35°05'06", long 98°14'35", in NW 1/4 sec.15, T.7 N., R.10 W., Caddo County, Hydrologic Unit 11130302 at left bank 100 ft upstream from bridge on U.S. Highway 281 at north edge of Anadarko, 8.1 mi upstream from Sugar Creek, and at mile 305.2.

DRAINAGE AREA.--3,656 mi².

PERIOD OF RECORD.--October 1902 to September 1908; June 1924 to June 1925, published as "near Anadarko", October 1935 to February 1938; October 1963 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1311: 1903, 1907-08, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,150.00 ft above National Geodetic Vertical Datum of 1929.

October 26, 1902 to June 30, 1908, nonrecording gage at former bridge 125 ft downstream at datum estimated to be 2.8 ft higher. May 25, 1924 to June 30, 1925, nonrecording gage at county road bridge 14 mi downstream at different datum. Jan. 10, 1936 to Mar. 7, 1938, non-recording gage on upstream side of bridge on U.S. Highway 281 at datum 1.88 ft higher.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by low-water dams upstream and since March 1959, by Fort Cobb Reservoir (station 07325900), since February 1961, by Foss Reservoir (station 07324300), and by numerous flood-retarding structures. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation by Fort Cobb and Foss Reservoirs, 8 years (water years 1903-08, 1936-37), 595 ft³/s, 430,800 acre-ft/yr; since regulation by Fort Cobb and Foss Reservoirs, 24 years (water years 1964-87), 350 ft³/s, 253,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,700 ft³/s, Oct. 21, 1983, gage height, 25.20 ft (from HWM); no flow Aug. 1, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1949, reached an elevation of 1,176.7 ft, from floodmark, at right bank on downstream side of bridge on U.S. Highway 281.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,200 ft³/s, May 30, gage height, 24.73 ft; minimum daily discharge, 331 ft³/s, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4510	3460	e1100	562	1860	e2000	787	737	8070	1750	910	518
2	5080	3180	e1160	557	1780	3050	737	730	7150	1600	922	524
3	5490	2950	e1210	554	1870	2410	663	720	6690	1570	904	464
4	5700	3010	1170	551	1320	1880	686	710	6330	1490	871	428
5	6390	3540	e1150	549	1080	1680	667	697	5680	1450	869	402
6	16600	4500	e1120	549	1130	1610	655	685	5230	1420	865	378
7	13200	4750	e950	547	1770	1590	739	678	4130	1350	860	368
8	8250	4550	e920	550	1580	1380	852	613	3510	1220	847	349
9	6820	3430	e1400	671	1090	1260	921	552	3290	1160	847	331
10	6330	e3000	e1200	898	932	1220	911	504	3380	1120	855	347
11	5690	e2650	e1050	1020	779	1180	866	481	3440	1100	863	334
12	4410	e2350	e960	913	735	1120	859	465	3540	1080	875	334
13	4130	e2060	e840	725	708	997	854	451	3560	1010	857	358
14	4260	e1870	e760	685	763	949	840	438	3380	1040	880	354
15	3800	e1690	720	655	1250	919	833	434	3120	1090	1050	388
16	3460	e1500	e700	638	1090	928	832	545	2880	1130	1130	391
17	3190	e1380	e680	631	888	1130	842	681	2700	1080	957	338
18	2940	e1290	656	655	830	1650	825	717	2620	1080	882	363
19	2730	e1200	646	679	803	1750	813	734	2920	1290	845	358
20	2550	e1150	634	794	787	2010	794	738	2770	1490	816	997
21	2450	e1090	623	914	775	2470	710	724	2690	1300	797	1210
22	3660	e1020	613	977	820	2030	602	672	3200	1160	776	1700
23	4900	e1000	606	1030	855	1750	562	637	2760	1090	768	2460
24	5670	e1030	641	1030	847	1420	544	1430	2680	1060	770	1580
25	6780	e1100	608	1030	780	1290	530	e2200	2500	1040	770	1180
26	6610	e1400	598	1030	774	1400	519	e2600	2430	1020	766	979
27	6350	e2000	591	1100	1100	1240	540	3340	2320	968	766	797
28	6140	e1500	583	1080	e1500	1050	703	5960	2220	975	682	652
29	4540	e1310	572	1290	---	933	742	10300	2150	965	614	582
30	3580	e1200	565	2170	---	870	743	20400	1930	945	667	653
31	3670	---	559	2400	---	799	---	12100	---	920	597	---
TOTAL	169880	66160	25585	27434	30496	45965	22171	72673	109270	36963	25878	20117
MEAN	5480	2205	825	885	1089	1483	739	2344	3642	1192	835	671
MAX	16600	4750	1400	2400	1870	3050	921	20400	8070	1750	1130	2460
MIN	2450	1000	559	547	708	799	519	434	1930	920	597	331
AC-FT	337000	131200	50750	54420	60490	91170	43980	144100	216700	73320	51330	39900

CAL YR 1986 TOTAL 333375 MEAN 913 MAX 16600 MIN 50 AC-FT 661200
WTR YR 1987 TOTAL 652592 MEAN 1788 MAX 20400 MIN 331 AC-FT 1294000

e Estimated

RED RIVER BASIN

07328070 WINTER CREEK NEAR ALEX, OK

LOCATION.--Lat 34°59'35", long 97°45'40", in NE 1/4 sec.18, T.6 N., R.5 W., Grady County, Hydrologic Unit 11130303, at left bank 1,000 ft downstream from county road bridge, 0.7 mi downstream from East Winter Creek, 3.2 mi upstream from mouth, and 5.5 mi north of Alex.

DRAINAGE AREA.--33 mi².

PERIOD OF RECORD.--October 1964 to May 1987 (discontinued).

GAGE.--Water-stage recorder and broad crest V-notch weir. Datum of gage is 1,040.00 ft above National Geodetic Datum of 1929. Prior to Oct. 1, 1977, at datum 8.20 ft higher.

REMARKS.--Records fair, except for estimated days which are poor. Flow regulated since 1966 by 16 flood-retarding structures, combined capacity, 1,050 acre-ft. Minor diversions for irrigation upstream from station. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--22 years (water years 1965-86), 10.3 ft³/s, 7,460 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,080 ft³/s, May 27, 1978, gage height, 17.35 ft; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October 1986 to May 1987, 908 ft³/s, Mar. 18, gage height, 13.69 ft; minimum daily discharge, 4.7 ft³/s, Oct. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	12	19	14	e26	86	e24	e13	---	---	---	---
2	88	11	16	13	e23	69	23	e13	---	---	---	---
3	86	9.8	e15	e12	e21	56	22	e12	---	---	---	---
4	50	66	e14	e12	e18	46	21	e12	---	---	---	---
5	32	47	e13	e11	51	39	e20	e12	---	---	---	---
6	23	36	e12	e11	69	34	e19	e11	---	---	---	---
7	17	26	23	e12	62	31	e19	e11	---	---	---	---
8	12	20	28	22	49	27	e19	e11	---	---	---	---
9	9.2	17	e26	68	37	24	e19	e10	---	---	---	---
10	7.6	21	e24	40	31	e22	e19	e10	---	---	---	---
11	9.3	e23	e23	31	27	e20	e19	e10	---	---	---	---
12	8.7	18	e22	25	25	e19	e18	e10	---	---	---	---
13	8.7	15	e20	23	24	e19	e18	e10	---	---	---	---
14	7.7	14	e19	20	24	e18	e17	e10	---	---	---	---
15	6.3	e13	e18	18	26	e18	e17	---	---	---	---	---
16	5.7	e13	e18	18	26	38	e17	---	---	---	---	---
17	5.3	e12	e17	19	24	282	e16	---	---	---	---	---
18	5.0	e12	e16	22	e23	129	e16	---	---	---	---	---
19	4.7	e11	e15	23	e22	106	e16	---	---	---	---	---
20	5.2	e10	e15	19	e21	92	18	---	---	---	---	---
21	11	e9.8	e15	19	e21	75	44	---	---	---	---	---
22	118	e9.5	e13	18	e21	63	34	---	---	---	---	---
23	77	e9.2	e13	e17	e21	66	28	---	---	---	---	---
24	53	e9.0	e12	e16	e20	57	24	---	---	---	---	---
25	36	55	e12	e15	e20	47	20	---	---	---	---	---
26	24	67	e12	e15	24	41	18	---	---	---	---	---
27	18	47	e12	e18	27	37	17	---	---	---	---	---
28	14	37	e12	53	119	34	16	---	---	---	---	---
29	19	28	15	47	---	29	15	---	---	---	---	---
30	18	22	18	35	---	26	e14	---	---	---	---	---
31	15	---	16	e30	---	25	---	---	---	---	---	---
TOTAL	800.0	700.3	523	716	902	1675	607	---	---	---	---	---
MEAN	25.8	23.3	16.9	23.1	32.2	54.0	20.2	---	---	---	---	---
MAX	118	67	28	68	119	282	44	---	---	---	---	---
MIN	4.7	9.0	12	11	18	18	14	---	---	---	---	---
AC-FT	1590	1390	1040	1420	1790	3320	1200	---	---	---	---	---

CAL YR 1986 TOTAL 4832.7 MEAN 13.2 MAX 129 MIN 1.1 AC-FT 9590

e Estimated

07328500 WASHITA RIVER NEAR PAULS VALLEY, OK

LOCATION.--Lat 34°45'17", long 97°15'04", in SE 1/4 sec.1, T.3 N., R.1 W., Garvin County, Hydrologic Unit 11130303, on downstream side of left pier of bridge on U.S. Highway 77, 2.0 mi northwest of Pauls Valley, 6.0 mi downstream from Owl Creek, 7.0 mi upstream from Washington Creek, and at mile 146.5.

DRAINAGE AREA.--5,330 mi².

PERIOD OF RECORD.--May to December 1899 (gage heights only), October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311. Published as "at Pauls Valley, Indian Territory" in 1899.

GAGE.--Water-stage recorder. Datum of gage is 854.61 ft above National Geodetic Vertical Datum of 1929. During 1899, nonrecording gage at site 9 mi downstream, at different datum. Mar. 29, 1938 to Jan. 25, 1939, nonrecording gage and Jan. 26, 1939 to Oct. 6, 1948, water-stage recorder at site 0.7 mi upstream, at datum 1.53 ft higher. Mar. 11, 1975 to Jan. 26, 1981, water-stage recorder at site 200 ft upstream, and at same datum.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some diversion for irrigation upstream from station. Some regulation since March 1959, by Fort Cobb Reservoir (station 07325900); since February 1961, by Foss Reservoir (station 07324300); and by numerous flood-retarding structures. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--Prior to regulation, 21 years (water years 1938-58), 829 ft³/s, 600,200 acre-ft/yr; since regulation, 26 years (water years 1962-87), 716 ft³/s, 518,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,600 ft³/s, May 29, 1987, gage height, 28.72 ft; maximum gage height, 29.88 ft, May 11, 1950; no flow in 1956, 1964, 1966-67, 1970-72.

EXTREMES OUTSIDE PERIOD OF RECORD.--Stream is reported to have receded to no flow in 1882 and in 1897 (information provided by local resident).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 43,600 ft³/s, May 29, gage height, 28.72 ft; minimum daily discharge, 850 ft³/s, Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5440	4640	2160	1310	3330	7990	2200	1430	26600	4820	1520	1000
2	6720	3960	1870	1280	3470	6220	2110	1460	24100	7460	1430	938
3	10200	3900	1720	1270	3170	5040	2030	1460	21900	11000	1410	930
4	13800	5030	1670	1260	2920	4810	1940	1450	16900	6640	1300	921
5	17000	7270	1670	1240	3170	4160	1840	1450	13900	4420	1320	869
6	12400	6960	1630	1260	5110	3740	1860	1430	11800	3340	1320	1000
7	9070	5150	1620	1270	4550	3340	1830	1420	9140	2960	1260	985
8	9150	5080	2300	1290	3460	2950	1820	1430	7940	2680	1250	966
9	12200	5150	2280	2720	3220	2850	1820	1420	6150	2440	1250	960
10	13800	4680	2030	3980	3060	2730	1840	1390	5550	2160	1230	1320
11	11600	4070	1590	3000	2670	2620	1910	1330	5380	2010	1250	1860
12	10200	3990	1570	1930	2430	2650	1970	1270	5630	1930	1230	1350
13	8720	3360	1600	1820	2260	2470	1890	1230	5520	1880	1200	1200
14	7060	3100	1600	1580	2180	2360	1870	1210	5230	1910	1200	1150
15	5220	2970	1550	1300	3300	2320	1890	1210	4860	1830	1380	1140
16	4650	2820	1550	1250	5300	2260	1880	1210	4570	1940	1320	1140
17	4060	2610	1500	1230	4440	8780	1890	1200	4170	1890	1380	1130
18	3640	2430	1440	1300	3120	6030	1810	1170	3850	7070	1560	2270
19	3080	2330	1400	1170	2690	6730	1800	1270	3710	3510	1380	2830
20	2850	2190	1390	1250	2470	6720	1750	1460	6370	2880	1300	1820
21	2730	2130	1360	1300	2350	6720	2000	1530	7770	2780	1190	1650
22	5250	2040	1340	1400	2310	6720	2050	1890	4670	2720	1180	1520
23	9150	1820	1320	1530	2280	6720	1860	1610	4230	2470	1110	1580
24	7730	1650	1320	1760	2250	5170	1650	1590	3960	2320	1060	1890
25	6230	1700	1320	2270	2250	3850	1510	1850	3530	2940	e1350	2400
26	6090	4090	1330	2240	2390	3640	1430	2360	3380	1910	1460	2060
27	6770	5100	1330	2260	2880	2780	1380	5030	3170	1820	1270	e1500
28	8010	3110	1300	2540	5150	2670	1340	30400	3040	1750	1390	e1200
29	8370	2600	1280	2980	---	2570	1300	41700	2910	1640	1310	e1000
30	7910	e2300	1280	3770	---	2390	1320	41000	3040	1640	1210	e850
31	6850	---	1300	3290	---	2290	---	32500	---	1640	1130	---
TOTAL	245950	108230	48620	58050	88180	132290	53790	188360	232970	98400	40150	41429
MEAN	7934	3608	1568	1873	3149	4267	1793	6076	7766	3174	1295	1381
MAX	17000	7270	2300	3980	5300	8780	2200	41700	26600	11000	1560	2830
MIN	2730	1650	1280	1170	2180	2260	1300	1170	2910	1640	1060	850
AC-FT	487800	214700	96440	115100	174900	262400	106700	373600	462100	195200	79640	82170

CAL YR 1986 TOTAL 625611 MEAN 1714 MAX 17000 MIN 182 AC-FT 1241000
WTR YR 1987 TOTAL 1336419 MEAN 3661 MAX 41700 MIN 850 AC-FT 2651000

e Estimated

07329000 RUSH CREEK AT PURDY, OK

LOCATION.--Lat 34°41'42", long 97°35'54", in SE 1/4 SE 1/4 sec.27, T.3 N., R.4 W., on left downstream bank near end of bridge on State Highway 76, 0.8 mi south of Purdy, 8.5 mi south of Lindsay, and at mile 27.3.

DRAINAGE AREA.--145 mi².

PERIOD OF RECORD.--October 1939 to December 1953, February 1982 to current year. Prior to May 1940 monthly discharges only, published in WSP 1311.

REVISED RECORD.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 1,004.12 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1942, nonrecording gage, at site 1.2 mi downstream, at datum 9.42 ft lower. Oct. 1, 1942 to Aug. 22, 1943, and May 11, 1950 to Sept. 18, 1952, nonrecording gage, 1.2 mi downstream, at datum 14.42 ft lower. Aug. 23, 1943 to May 10, 1950, and Sept. 19, 1952 to Dec. 31, 1953, water-stage recorder, at site 1.2 mi downstream, at datum 14.42 ft lower.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow partially regulated since 1960 by numerous soil-conservation reservoirs.

AVERAGE DISCHARGE.--Prior to regulation by soil-conservation reservoirs, 14 years (water years 1940-53), 23.1 ft³/s, 52,130 acre-ft; since regulation by soil-conservation reservoirs, 5 years (water years 1983-87), 97.5 ft³/s, 70,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30,000 ft³/s, May 10, 1950, gage height, 27.00 ft at site and datum then in use, from floodmark, and from rating extended above 5,000 ft³/s on the basis of a slope-area measurement, at 27.00 ft. No flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,000 ft³/s, May 28, gage height, 33.69 ft (from HWM); minimum daily discharge, 8.1 ft³/s, Aug. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	176	46	75	58	e120	813	e98	39	1510	110	29	e20
2	1640	43	69	57	e140	480	e94	40	1400	1010	e27	e17
3	1320	42	63	59	e130	e250	e88	36	1320	1060	e25	e16
4	e350	336	60	58	e123	e200	e82	34	1250	658	e23	e15
5	e200	300	58	58	244	e160	e80	37	1150	386	e21	e14
6	e300	171	58	58	e180	e140	77	36	1030	228	e20	e13
7	e150	121	188	56	e150	e130	77	37	919	141	e19	e12
8	e90	95	216	64	e130	e120	77	35	785	110	e17	e11
9	e70	77	177	365	e110	e110	76	32	704	93	e16	e10
10	e54	67	128	191	e107	e98	75	32	665	83	e15	35
11	e200	64	105	136	e105	e94	72	31	653	76	e15	41
12	e120	61	89	113	e102	e89	71	29	740	54	e14	45
13	e90	55	80	98	e100	e84	70	29	849	59	e13	42
14	e70	52	75	88	e98	e81	69	27	621	58	e12	38
15	e58	51	73	81	e150	e79	70	26	e530	56	e11	37
16	e50	52	75	80	e130	335	64	26	e480	53	e11	33
17	42	52	77	85	e114	1640	65	26	443	96	e10	29
18	37	62	82	106	e107	843	63	25	e250	88	e9.8	174
19	28	55	77	105	e100	e450	61	25	e200	74	e9.6	183
20	26	53	73	92	e97	e300	58	38	e170	64	e9.4	90
21	42	49	69	88	e110	373	77	29	e130	56	e9.0	53
22	904	49	66	93	e100	629	68	33	e110	64	e8.8	40
23	572	48	65	92	e96	e450	61	43	e95	68	e8.6	35
24	283	46	64	104	e110	e300	54	44	e82	63	e8.4	28
25	174	188	64	93	116	e200	52	79	77	61	e8.3	e23
26	114	397	63	87	171	e160	50	63	68	57	e8.1	e20
27	86	182	61	110	193	e140	47	169	60	53	30	26
28	71	131	60	e100	976	e130	44	8740	55	51	32	34
29	61	103	60	e90	---	e120	43	3190	51	46	38	34
30	55	85	60	e98	---	e110	40	1770	121	42	36	31
31	49	---	60	e106	---	e102	---	1600	---	34	23	---
TOTAL	7482	3133	2590	3069	4409	9210	2023	16400	16518	5152	537.0	1199
MEAN	241	104	83.5	99.0	157	297	67.4	529	551	166	17.3	40.0
MAX	1640	397	216	365	976	1640	98	8740	1510	1060	38	183
MIN	26	42	58	56	96	79	40	25	51	34	8.1	10
AC-FT	14840	6210	5140	6090	8750	18270	4010	32530	32760	10220	1070	2380

CAL YR 1986 TOTAL 24966.6 MEAN 68.4 MAX 1640 MIN 4.3 AC-FT 49520
WTR YR 1987 TOTAL 71722.0 MEAN 196 MAX 8740 MIN 8.1 AC-FT 142300

e Estimated

RED RIVER BASIN

07329700 WILDHORSE CREEK NEAR HOOVER, OK

LOCATION.--Lat 34°32'29", long 97°14'49", on west line of SW 1/4 sec.19, T.1 N., R.1 E., Garvin County, Hydrologic Unit 11130303, on downstream left bank at bridge on State Highway 19A, 1.5 mi north of Hoover, 1.8 mi downstream from Sandy Creek, and at mile 7.9.

DRAINAGE AREA.--604 mi².

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1944, 1951-69. October 1969 to current year.

GAGE.--Water-stage recorder. Datum of gage is 803.3 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Flow regulated by Duncan, Clear Creek, Humphries and Fuqua Lakes, combined surface-area, 3,340 acres, and capacity, 44,800 acre-ft, and numerous flood-retarding structures.

AVERAGE DISCHARGE.--18 years, 223 ft³/s, 161,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36,000 ft³/s, May 29, 1987, gage height, 25.54 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Nov. 4	1200	8,500	17.05	Mar. 17	0800	5,820	14.23
Feb. 6	0430	10,200	18.43	Mar. 22	0745	8,210	16.62
Feb. 15	1945	5,280	13.65	May 29	0345	*36,000	*25.54
Feb. 28	1445	10,300	18.51				

Minimum daily discharge, 28 ft³/s, Sept. 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1000	174	302	163	492	3410	385	104	3080	529	75	35
2	e800	159	283	182	515	1740	356	100	2530	1290	65	34
3	e600	206	243	181	413	1200	336	95	2220	1610	71	31
4	e500	3960	231	192	375	1000	301	88	1990	e1500	65	30
5	e450	1830	227	163	1210	816	284	97	1800	e1100	60	29
6	e420	980	161	161	3260	688	273	90	1650	e1300	55	28
7	394	723	547	159	1370	598	268	87	1490	e1460	53	29
8	354	545	1000	169	859	534	254	85	1360	e1200	53	29
9	302	414	975	1560	689	484	259	78	1210	e1100	51	29
10	269	354	575	774	591	446	214	74	1190	e700	60	86
11	254	328	462	536	536	398	209	71	1130	521	55	125
12	378	276	385	438	514	366	200	70	1050	452	49	52
13	290	250	334	377	449	345	188	67	1080	466	50	48
14	201	217	290	340	407	332	187	65	959	413	49	41
15	168	201	274	313	2250	320	197	63	855	335	51	43
16	151	188	263	315	1990	325	173	63	836	296	44	64
17	125	176	260	336	830	3400	167	62	744	316	44	46
18	122	166	275	617	641	1600	160	58	843	496	45	442
19	109	160	272	513	556	922	148	56	782	308	45	396
20	103	153	253	632	496	760	138	59	779	261	40	148
21	196	146	242	583	452	643	282	59	671	234	35	103
22	1620	139	227	602	409	4560	254	118	632	219	38	81
23	1190	133	224	481	377	2570	189	155	601	206	33	66
24	832	136	218	473	405	1660	165	157	590	188	35	57
25	651	806	190	434	489	1040	149	180	565	170	33	62
26	518	2140	187	386	931	832	141	165	552	158	35	72
27	382	808	184	370	1490	727	132	160	527	114	80	73
28	315	566	171	372	5640	619	125	10900	504	97	77	92
29	271	441	168	360	---	531	117	27000	469	99	44	111
30	238	357	167	346	---	469	110	8820	534	88	38	29
31	201	---	161	317	---	412	---	4480	---	83	36	---
TOTAL	13404	17132	9751	12845	28636	33747	6361	53726	33223	17309	1564	2511
MEAN	432	571	315	414	1023	1089	212	1733	1107	558	50.5	83.7
MAX	1620	3960	1000	1560	5640	4560	385	27000	3080	1610	80	442
MIN	103	133	161	159	375	320	110	56	469	83	33	28
AC-FT	26590	33980	19340	25480	56800	66940	12620	106600	65900	34330	3100	4980

CAL YR 1986 TOTAL 71716.4 MEAN 196 MAX 3960 MIN 3.1 AC-FT 142200
WTR YR 1987 TOTAL 230209 MEAN 631 MAX 27000 MIN 28 AC-FT 456600

e Estimated

RED RIVER BASIN

07329849 ANTELOPE SPRING AT SULPHUR, OK

LOCATION.--Lat 34°30'16", long 96°56'28", in NW 1/4 NE 1/4 sec.1, T.1 S., R.3E., Murray County, Hydrologic Unit 11130303, 10 ft downstream from spring in the Chickasaw National Park, 1.1 mi up the self-guiding nature trail from the nature center.

PERIOD OF RECORD.--November 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,080 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6.4 ft³/s, May 23-24, 1986, gage height, 0.64 ft; maximum gage height, 0.68 ft, June 15-22, 1987; minimum discharge 1.3 ft³/s, many days in 1987.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5.8 ft³/s, June 15-22, gage height, 0.68 ft; minimum discharge, 1.3 ft³/s, many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	1.9	3.6	4.0	4.7	4.3	4.7	3.3	4.7	4.3	3.6	3.3
2	2.4	1.7	3.6	4.3	4.7	4.7	4.7	3.0	4.7	4.3	3.6	3.0
3	2.4	1.7	3.6	4.3	4.7	5.2	4.7	3.3	4.7	4.3	4.0	3.0
4	2.4	1.9	3.6	4.3	4.7	5.2	4.7	3.3	4.7	4.3	3.6	3.0
5	2.4	1.9	3.6	4.3	4.7	5.2	4.7	3.3	5.2	4.3	3.3	3.0
6	2.4	2.1	3.3	4.3	4.7	5.2	5.2	3.3	5.2	4.3	3.3	3.0
7	2.4	2.1	3.3	4.3	4.0	5.2	5.2	3.6	5.2	4.3	3.3	3.0
8	2.4	2.1	3.3	4.3	4.0	5.2	5.2	3.6	5.2	4.3	3.3	3.0
9	2.4	2.1	3.3	4.3	4.0	5.2	4.7	3.6	5.2	4.0	3.3	3.0
10	2.4	2.1	3.3	4.0	4.0	5.2	4.7	3.6	5.2	4.0	3.3	3.0
11	2.4	2.1	3.6	4.0	4.0	5.2	4.7	4.0	5.2	4.0	3.3	3.3
12	2.4	2.1	3.6	4.0	4.0	5.2	4.7	4.0	5.2	4.0	3.3	3.3
13	2.4	2.1	3.6	4.3	4.0	4.7	4.7	4.0	5.2	4.0	3.6	3.3
14	2.7	2.4	3.6	4.3	4.0	4.7	4.7	4.0	5.2	4.0	3.6	2.7
15	2.4	2.4	4.0	4.3	4.0	5.2	4.7	3.6	5.8	4.0	3.6	3.0
16	2.4	2.4	4.0	4.3	4.0	5.2	4.3	4.0	5.8	4.0	3.6	3.0
17	2.1	2.4	4.0	4.3	4.0	5.2	4.7	4.0	5.8	4.0	3.6	3.0
18	1.7	2.4	4.0	4.3	4.0	5.2	4.0	4.3	5.8	4.0	3.6	3.0
19	1.7	2.4	4.0	4.7	4.0	4.7	3.3	4.3	5.8	3.6	3.6	3.0
20	1.4	2.4	4.0	4.7	4.3	4.7	3.0	4.3	5.8	3.6	3.6	3.0
21	1.4	2.4	3.6	4.7	4.0	4.7	3.3	4.3	5.8	3.6	3.0	3.0
22	1.4	2.4	3.6	4.7	4.0	4.7	3.3	4.3	5.8	3.6	3.3	3.0
23	1.3	2.4	4.0	4.7	4.0	4.7	2.7	4.3	5.2	3.6	3.0	3.0
24	1.3	2.4	4.0	5.2	4.3	4.7	2.6	4.3	4.7	3.6	2.7	3.0
25	1.3	2.4	4.0	5.2	4.3	4.7	3.0	4.3	4.7	3.6	2.7	3.0
26	1.3	2.4	4.0	4.7	4.3	4.3	3.0	4.3	4.7	3.6	2.7	2.7
27	1.3	2.4	4.0	5.2	4.0	4.7	2.7	4.3	4.7	3.6	3.0	2.7
28	1.3	2.7	4.0	4.7	4.0	4.7	3.0	4.3	4.7	3.6	3.0	2.7
29	1.3	3.3	4.0	4.7	---	4.7	3.0	4.3	4.3	3.6	3.3	2.7
30	1.7	3.6	4.0	5.2	---	4.7	3.3	4.7	4.3	3.6	3.0	2.7
31	1.9	---	4.0	4.7	---	5.2	---	4.7	---	3.6	3.3	---
TOTAL	61.1	69.1	116.1	139.3	117.4	152.4	121.2	122.5	154.5	121.2	103.0	89.4
MEAN	1.97	2.30	3.75	4.49	4.19	4.92	4.04	3.95	5.15	3.91	3.32	2.98
MAX	2.7	3.6	4.0	5.2	4.7	5.2	5.2	4.7	5.8	4.3	4.0	3.3
MIN	1.3	1.7	3.3	4.0	4.0	4.3	2.6	3.0	4.3	3.6	2.7	2.7
AC-FT	121	137	230	276	233	302	240	243	306	240	204	177

CAL YR 1986 TOTAL 1358.8 MEAN 3.72 MAX 6.4 MIN 1.3 AC-FT 2700
WTR YR 1987 TOTAL 1367.2 MEAN 3.75 MAX 5.8 MIN 1.3 AC-FT 2710

RED RIVER BASIN

07329851 VENDOME WELL AT SULPHUR, OK

LOCATION.--Lat 34°30'21", long 96°58'19", in NW 1/4 NE 1/4 sec.3, T.1 S., R.3E., Murray County, Hydrologic Unit 11130303, .2 mi west and 300 ft south of intersection of State Highways 7 and 177, in Sulphur.

PERIOD OF RECORD.--November 1985 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 950 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1.6 ft³/s at times each year; minimum discharge 0.80, Aug. 28-30, 1986.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1.6 ft³/s at times; minimum discharge, 1.1 ft³/s, Dec. 2-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.6	1.6	1.4	1.4	1.4
2	1.4	1.4	1.1	1.4	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.4
3	1.4	1.4	1.1	1.4	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.4
4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4	1.6	1.4	1.4	1.4
5	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4	1.6	1.4	1.4	1.4
6	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4
7	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4
8	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4
9	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4
10	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.4	1.4	1.4
11	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.6	1.6	1.4	1.4	1.6
12	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
13	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
14	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
15	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
16	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
17	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
18	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
19	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
20	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
21	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
22	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
23	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
24	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
25	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
26	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.4	1.4	1.4	1.6
27	1.4	1.4	1.4	1.4	1.6	1.4	1.6	1.6	1.4	1.4	1.4	1.6
28	1.4	1.4	1.4	1.4	1.4	1.4	1.6	1.6	1.4	1.4	1.4	1.6
29	1.4	1.4	1.4	1.4	---	1.4	1.6	1.6	1.4	1.4	1.4	1.6
30	1.4	1.4	1.4	1.4	---	1.4	1.6	1.6	1.4	1.4	1.4	1.6
31	1.4	---	1.4	1.6	---	1.4	---	1.6	---	1.4	1.4	---
TOTAL	43.4	42.0	42.8	43.6	43.0	43.4	46.0	48.2	47.0	43.4	43.4	46.0
MEAN	1.40	1.40	1.38	1.41	1.54	1.40	1.53	1.55	1.57	1.40	1.40	1.53
MAX	1.4	1.4	1.4	1.6	1.6	1.4	1.6	1.6	1.6	1.4	1.4	1.6
MIN	1.4	1.4	1.1	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4	1.4
AC-FT	86	83	85	86	85	86	91	96	93	86	86	91

CAL YR 1986 TOTAL 495.10 MEAN 1.36 MAX 1.6 MIN .80 AC-FT 982
WTR YR 1987 TOTAL 532.2 MEAN 1.46 MAX 1.6 MIN 1.1 AC-FT 1060

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LOCATION.--Lat 34°14'03", long 96°58'32", in NW 1/4 SW 1/4 sec.3, T.4 S., R.3 E., Carter County, Hydrologic Unit 11130303, near left bank on downstream side of bridge on U.S. Highway 177, 1.3 mi downstream from Caddo Creek, 3.2 mi north of Dickson, 12.0 mi northeast of Ardmore, and at mile 63.4.
DRAINAGE AREA.--7,202 mi².

PERIOD OF RECORD.--August 1928 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to Oct. 1, 1979, published as Washita River near Durwood.

GAGE.--Water-stage recorder. Datum of gage is 650.57 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Feb. 16, 1939, nonrecording gage, at same site and datum. Dec. 15, 1950 to Feb. 19, 1952, nonrecording gage, at site 500 ft upstream, at same datum. Apr. 24, 1975 to May 8, 1986, water-stage recorder, at site 500 ft upstream, at same datum.

AVERAGE DISCHARGE.--Prior to regulation, 30 years (water years 1929-58), 1,573 ft³/s, 1,139,600 acre-ft/yr; since regulation by Fort Cobb and Foss reservoirs, 26 years (water years 1962-87), 1,401 ft³/s, 1,015,000 acre-ft/yr.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 105,000 ft³/s, May 30, gage height, 45.24 ft; minimum daily discharge, 1,060 ft³/s, Sept. 9.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8110	6290	4070	1900	3810	30500	2960	1980	53300	3850	1380	1260
2	6490	4740	3480	1870	5050	19700	3030	2080	38500	8910	1320	1180
3	10300	4370	3170	1870	4650	14100	2980	2190	35500	20500	1280	1170
4	12200	8000	3110	1860	4140	11300	2670	2270	28500	13900	1260	1190
5	14200	17800	2930	1850	3930	9480	2630	2330	23100	7990	1230	1140
6	15000	12400	2720	1810	8000	8110	2350	2400	19200	5870	1200	1090
7	10700	8770	2890	1760	9480	6060	2230	2470	16300	4890	1180	1080
8	9690	6790	6380	1760	6760	5190	2150	2490	14200	4170	1170	1080
9	9820	6640	6520	5500	5500	4410	2140	2490	12600	3550	1160	1060
10	11200	6150	5300	8520	4850	3780	2100	2490	10800	2980	1150	1170
11	11500	5600	4300	6320	4330	3070	2170	2520	9370	2520	1180	1500
12	10500	3880	4080	4350	3750	3130	2170	2560	9080	2170	1180	2040
13	9720	4940	2850	3670	3360	2920	2180	2560	8690	2210	1170	1620
14	8590	4700	2610	3290	3050	2870	2120	2540	8310	2220	1160	1490
15	6140	4100	2600	2990	4210	2740	2040	2540	7840	2010	1160	1720
16	5160	4000	2720	2820	11500	2730	2000	2540	7410	1880	1240	1460
17	4850	3670	2610	2930	8950	10100	2010	2590	6950	1810	1480	1180
18	4400	3550	2560	5690	6240	17300	1970	2650	6320	2590	1580	1330
19	3970	3180	2560	5280	4920	11500	1920	2610	6300	5590	1540	4180
20	3570	3130	2470	4620	4040	8200	1970	2680	6650	3460	1450	3060
21	3180	2880	2330	4250	3610	7920	2460	3000	6980	2820	1260	1920
22	4450	2730	2240	4270	3390	11800	2930	3440	6600	2690	1190	1700
23	10600	2770	2210	4110	3270	13400	2670	3850	6240	2590	1170	1530
24	9050	2650	2150	3840	3270	11000	2380	3400	5910	2290	1150	1780
25	7600	2580	2130	3870	3610	8540	2090	3680	5270	2050	1140	2030
26	7100	12900	2110	3640	3730	6780	1980	4310	4690	1910	1150	2270
27	7060	10000	2060	3000	7650	5010	1970	4720	4280	1790	1530	1890
28	7710	7300	2010	3000	18600	4680	1980	25400	3900	1660	1470	1680
29	8190	5350	1940	3190	---	4130	1960	81100	3540	1560	1490	1620
30	7770	4510	1920	3740	---	3610	1950	93400	3350	1470	1450	1500
31	7670	---	1900	4020	---	3210	---	70700	---	1400	1330	---
TOTAL	256490	176370	92930	111590	157650	257270	68160	345980	379680	125300	39800	48920
MEAN	8274	5879	2998	3600	5630	8299	2272	11160	12660	4042	1284	1631
MAX	15000	17800	6520	8520	18600							

CAL YR 1986	TOTAL	874052	MEAN	2395	MAX	17800	MIN	216	AC-FT	1734000
WTR YR 1987	TOTAL	2060140	MEAN	5644	MAX	93400	MIN	1060	AC-FT	4086000

RED RIVER BASIN

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued
(National stream-quality accounting network station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1944 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1944 to January 1982, February 1984 to current year.

WATER TEMPERATURE: April 1947 to January 1982, February 1984 to current year.

REMARKS.--Samples were collected bimonthly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,120 microsiemens, Nov. 15, 1963; minimum daily, 95 microsiemens, Nov. 2, 1951.

WATER TEMPERATURE: Maximum daily, 38.0 °C, July 16, 1985; minimum daily, 0.0 °C on many days during winter periods.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,780 microsiemens, May 5; minimum daily, 270 microsiemens, May 29.

WATER TEMPERATURE: Maximum daily, 34.0 °C, July 31, Aug. 2-4, 7; minimum daily, 4.0 °C, Jan. 20.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	AGENCY ANA-LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	
NOV 20...	1500	1028	80020	11.40	3150	*1130	7.90	18.0	18.0	260	722	9.8	
JAN 28...	1500	1028	80020	11.29	2800	1430	8.20	22.0	9.5	110	743	9.2	
FEB 26...	1000	1028	1028	11.76	3470	1320	7.60	12.5	9.0	--	--	--	
APR 20...	1400	1028	80020	10.21	1870	1550	7.50	34.0	24.0	11	745	8.4	
MAY 29...	2115	1028	1028	44.86	99100	245	7.40	26.0	19.5	--	--	--	
JUN 23...	1300	1028	80020	12.25	6510	942	7.00	33.0	27.5	880	743	8.1	
AUG 17...	1500	1028	80020	8.39	1270	1650	7.10	31.0	30.5	32	745	8.1	
SEP 15...	1300	1028	80020	8.53	1730	1070	7.10	24.0	23.0	470	743	8.1	
DATE		OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER WH IT FIELD (MG/L AS HCO3)
NOV 20...	110	--	--	--	570	330	140	52	54	17	1	4.9	--
JAN 28...	83	--	--	--	610	610	150	58	62	18	1	3.7	--
FEB 26...	--	--	--	--	--	--	--	--	--	--	--	--	--
APR 20...	103	68	72	760	500	170	80	84	19	1	5.1	--	--
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--	--
JUN 23...	106	160	320	390	230	97	36	38	17	0.9	5.3	195	195
AUG 17...	111	45	73	770	610	160	90	88	20	1	6.1	215	215
SEP 15...	97	64	--	430	260	99	43	54	21	1	5.3	202	202

*SPECIFIC CONDUCTANCE, LAB (US/CM)

RED RIVER BASIN

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	CAR- BONATE WATER WH IT FIELD (MG/L AS CO3)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
NOV 20...	--	--	370	55	0.40	12	871	838	1.18	7410	1.18	0.020
JAN 28...	--	--	420	70	0.40	10	946	778	1.29	7150	0.910	0.010
FEB 26...	--	--	--	--	--	--	--	--	--	--	--	--
APR 20...	--	--	510	83	0.40	11	1180	1110	1.60	5960	0.990	0.010
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 23...	0	160	280	38	0.40	10	651	610	0.89	11400	0.900	0.020
AUG 17...	0	176	620	82	0.40	11	1270	1150	1.73	4350	--	<0.010
SEP 15...	0	166	260	--	0.60	11	662	--	--	--	0.840	0.010

DATE	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS NO2)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS NH4)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHOROUS TOTAL (MG/L AS P)	PHOS- PHOROUS DIS- SOLVED (MG/L AS P)	PHOS- PHOROUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	PHOS- PHOROUS ORGANIC TOTAL (MG/L AS P)
NOV 20...	0.07	1.20	0.200	0.090	0.12	0.70	0.90	0.240	0.070	0.060	0.18	0.24
JAN 28...	0.03	0.920	0.090	0.080	0.10	1.3	1.4	0.160	0.080	0.050	0.15	0.16
FEB 26...	--	--	--	--	--	--	--	--	--	--	--	--
APR 20...	0.03	1.00	0.080	0.100	0.13	1.1	1.2	0.050	0.050	0.030	0.09	0.05
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 23...	0.07	0.920	0.100	0.050	0.06	3.8	3.9	1.70	0.060	0.040	0.12	1.7
AUG 17...	--	<0.100	0.050	0.020	0.03	1.9	1.9	0.020	0.030	0.010	0.03	0.02
SEP 15...	0.03	0.850	0.050	0.070	0.09	2.3	2.4	0.150	0.100	0.070	0.21	0.15

DATE	PHOS- PHOROUS ORGANIC DIS- SOLVED (MG/L AS P)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
NOV 20...	0.01	<10	3	220	1	2	<1	<3	9	13	<5	25
JAN 28...	0.03	--	--	--	--	--	--	--	--	--	--	--
FEB 26...	--	--	--	--	--	--	--	--	--	--	--	--
APR 20...	0.02	<10	3	210	1	2	<1	<3	1	14	<5	45
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 23...	0.02	230	2	210	<0.5	<1	<1	<3	8	220	18	22
AUG 17...	0.02	--	--	--	--	--	--	--	--	--	--	--
SEP 15...	0.03	230	2	170	<0.5	<1	<1	<3	7	290	5	10

RED RIVER BASIN

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
NOV 20...	4	<0.1	<10	2	1	<1.0	1500	7	32	2620	22300	86
JAN 28...	--	--	--	--	--	--	--	--	--	290	2190	97
FEB 26...	--	--	--	--	--	--	--	--	--	--	--	--
APR 20...	6	<0.1	<10	2	1	<1.0	2100	7	12	376	1900	90
MAY 29...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 23...	19	0.1	<10	6	<1	<1.0	980	9	18	3300	58000	97
AUG 17...	--	--	--	--	--	--	--	--	--	336	1150	82
SEP 15...	32	0.1	<10	2	1	<1.0	1100	10	18	3230	15100	86

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	463	---	1100	1700	1100	529	1100	1540	470	1110	1420	1390
2	607	---	1190	1510	1030	670	1110	1580	450	1030	1570	1530
3	369	---	1240	1550	1170	734	1100	1660	460	534	1590	1530
4	455	817	1260	1630	1130	874	1150	1750	512	550	1600	1540
5	426	504	1360	1470	1210	976	1290	1780	520	602	1600	1530
6	491	814	1320	1640	858	982	1340	1650	570	740	1600	1570
7	558	658	1320	1550	741	996	1440	1650	582	870	1550	1600
8	540	---	965	1680	809	1020	1450	1650	598	926	1610	1570
9	542	940	898	1230	961	1070	1360	1660	633	1020	1600	1500
10	507	928	908	721	1170	1180	1380	1650	623	1120	1580	1360
11	524	804	1070	957	1070	1150	1500	1670	688	1190	1590	1440
12	477	833	1080	838	1190	1330	1550	1650	732	1220	1580	1320
13	583	958	1190	986	1080	1370	---	1640	789	1230	1570	1010
14	645	996	1220	1140	1170	1240	1580	1600	788	1240	1570	944
15	667	1020	1280	1180	1210	1430	1560	1570	779	1380	1560	968
16	702	1060	1390	1150	552	1400	1550	1560	861	1310	1600	1120
17	752	1100	1260	798	1050	---	1550	1560	848	1400	1660	1290
18	777	1110	1260	805	947	584	1570	1570	867	1340	1490	804
19	785	1190	1300	1150	1030	657	1560	1610	874	619	1410	764
20	831	1200	1460	917	983	827	1560	1620	920	850	1620	760
21	863	1260	1430	934	1080	1070	1200	1660	941	1020	1600	668
22	866	1240	1410	1040	1180	804	1380	1750	969	1090	1660	786
23	---	1290	1510	1010	1190	762	1350	1500	955	1130	1580	999
24	---	1280	1440	1110	1250	834	1300	1350	977	1330	1530	1190
25	---	1280	1410	1150	1100	791	---	1420	1110	1210	1610	1420
26	---	530	1590	1330	1130	816	1450	1420	1000	1240	1620	944
27	---	595	1600	1130	789	878	1460	1320	987	1220	1610	1050
28	---	826	---	1250	580	979	1440	400	1020	1350	1600	828
29	---	850	1430	1250	---	1020	1430	270	1100	1420	1480	895
30	---	1100	1660	1270	---	1140	1450	280	1060	1480	1460	951
31	---	---	1650	1170	---	1260	---	420	---	1360	1410	---
MEAN	---	---	---	1200	1030	---	---	1430	789	1100	1570	1180
MAX	---	---	---	1700	1250	---	---	1780	1110	1480	1660	1600
MIN	---	---	---	721	552	---	---	270	450	534	1410	668

RED RIVER BASIN

07331000 WASHITA RIVER NEAR DICKSON, OK--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	---	9.0	8.0	12.0	10.0	15.0	25.0	26.0	26.0	31.0	28.0
2	25.0	---	9.0	9.0	13.0	11.0	12.0	25.0	24.0	24.0	34.0	29.0
3	25.0	---	10.0	8.0	12.0	10.0	13.0	27.0	27.0	25.0	34.0	30.0
4	23.0	17.0	8.0	8.0	13.0	12.0	15.0	25.0	24.0	21.0	34.0	29.0
5	23.0	15.0	10.0	9.0	10.0	13.0	13.0	26.0	24.0	20.0	31.0	29.0
6	22.0	15.0	9.0	10.0	10.0	14.0	15.0	25.0	26.0	30.0	30.0	29.0
7	23.0	14.0	10.0	10.0	10.0	13.0	17.0	23.0	26.0	29.0	34.0	29.0
8	22.0	---	10.0	10.0	12.0	15.0	17.0	24.0	28.0	29.0	30.0	28.0
9	23.0	14.0	10.0	9.0	11.0	15.0	17.0	24.0	26.0	30.0	32.0	28.0
10	23.0	14.0	8.0	7.0	12.0	12.0	17.0	27.0	25.0	30.0	32.0	28.0
11	19.0	13.0	8.0	7.0	12.0	9.0	20.0	27.0	25.0	30.0	33.0	27.0
12	22.0	13.0	8.0	7.0	15.0	14.0	22.0	27.0	26.0	29.0	30.0	24.0
13	26.0	7.0	10.0	7.0	15.0	14.0	---	28.0	29.0	27.0	31.0	27.0
14	17.0	6.0	9.0	9.0	14.0	11.0	16.0	27.0	31.0	29.0	32.5	26.0
15	19.0	10.0	9.0	9.0	13.0	13.0	18.0	27.0	27.0	30.0	30.0	26.0
16	19.0	11.0	11.0	7.0	10.0	15.0	19.0	28.0	21.0	29.0	33.0	30.0
17	19.0	11.0	12.0	5.0	9.0	---	22.0	28.0	31.0	29.0	32.0	30.0
18	18.0	11.0	10.0	4.5	9.0	15.0	22.0	29.0	30.0	29.0	30.0	24.0
19	19.0	11.0	12.0	6.0	8.0	14.0	24.5	28.0	29.0	29.0	33.0	26.0
20	19.0	13.0	11.0	4.0	8.0	17.0	25.0	28.0	28.0	30.0	31.0	26.0
21	18.0	13.0	12.0	5.0	10.0	17.0	23.0	29.0	29.0	30.0	31.0	25.0
22	18.0	10.0	9.0	5.0	13.0	19.0	20.0	28.0	28.0	31.0	31.0	25.0
23	---	13.0	8.0	8.0	10.0	18.0	22.0	25.0	30.0	32.0	30.0	22.0
24	---	12.0	8.0	6.0	12.0	15.0	21.0	25.0	31.0	32.0	30.0	22.0
25	---	10.0	8.0	7.0	12.0	15.0	---	25.0	30.0	32.0	31.0	25.0
26	---	11.0	10.0	7.0	11.0	13.0	24.0	26.0	30.0	31.0	33.0	24.0
27	---	10.0	8.0	---	10.0	16.0	23.0	25.0	30.0	31.0	27.0	25.0
28	---	13.0	---	9.0	12.0	15.0	23.0	26.0	31.0	33.0	24.0	25.0
29	---	16.0	10.0	11.0	---	11.0	26.0	16.0	29.0	33.0	24.0	25.0
30	---	10.0	9.0	10.0	---	10.0	26.0	19.0	29.0	34.0	28.0	24.0
31	---	---	9.0	10.0	---	13.0	---	22.0	---	33.0	27.0	---
MEAN	---	---	---	---	11.4	---	---	25.6	27.7	29.3	30.8	26.5
MAX	---	---	---	---	15.0	---	---	29.0	31.0	34.0	34.0	30.0
MIN	---	---	---	---	8.0	---	---	16.0	21.0	20.0	24.0	22.0

07331500 LAKE TEXOMA NEAR DENISON, TX

LOCATION.--Lat 33°49'05", long 96°34'20", in NE 1/4 sec.33, T.8 S., R.7 E., Bryan County, Okla., Hydrologic Unit 11130210, in control tower of Denison Dam on Red River, 1.2 mi upstream from Shawnee Creek, 1.8 mi upstream from Sand Creek, 4.0 mi northwest of Denison, 6.0 mi southwest of Colbert, and at mile 725.9.

DRAINAGE AREA.--39,719 mi² of which 5,936 mi² is probably noncontributing.

PERIOD OF RECORD.--July 1942 to current year. Month-end contents only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 30, 1944, nonrecording gage at same site and datum. Prior to Oct. 1, 1948, supplementary nonrecording gage in Cumberland pool at the same datum.

REMARKS.--Reservoir is formed by a rolled earthfill dam. The controlled outlet consists of eight 20-foot diameter conduits and the uncontrolled outlet is a concrete, ogee-type weir spillway. Flow was diverted through conduits July 27, 1942; regulated storage began Oct. 31, 1943; power pool was first filled March 15, 1945. Capacity, based on 1969 survey, 5,312,000 acre-ft at elevation 640.0 ft, crest of spillway, 2,643,000 acre-ft at elevation 617.0 ft maximum power pool; 1,031,000 acre-ft at elevation 590.0 ft, minimum power pool, in Denison pool. Dead storage, 11,000 acre-ft at elevation 610.0 ft in Cumberland pool. When contents are below 2,105,000 acre-ft, the reservoir is divided into two pools by protective levees around the Cumberland oil field on the Washita River arm with bottom outlet channel for the upper pool (known as Cumberland pool) at elevation 610 ft. At higher elevations the two pools are considered as being at a common level, contents being computed from gage in Denison pool. Figures given herein represent total contents of both pools. Reservoir is used principally for flood control and power development. Revised capacity table, based on survey in 1969, used since Oct. 1, 1977. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 5,991,300 acre-ft, June 5, 1957, elevation, 643.18 ft.

Minimum contents since power pool was first filled, 1,565,100 acre-ft, Sept. 16, 1964; minimum elevation, 599.96 ft, Mar. 1, 2, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 4,635,000 acre-ft, June 5, 6, elevation, 635.09 ft. Minimum, 2,514,000 acre-ft, Sept. 12, elevation, 615.47 ft.

Capacity table (elevation, in feet, and contents, in acre-ft)

614	2,399,000	627	3,649,000
618	2,733,000	632	4,240,000
622	3,117,000	637	4,891,000

RESERVOIR STORAGE (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2654000	2830000	2822000	2640000	2704000	2938000	2679000	2629000	3902000	3171000	2665000	2531000
2	2666000	2804000	2801000	2624000	2704000	3034000	2663000	2630000	4312000	3146000	2662000	2529000
3	2713000	2785000	2784000	2640000	2704000	3116000	2656000	2636000	4532000	3150000	2657000	2527000
4	2802000	2801000	2775000	2641000	2708000	3140000	2650000	2645000	4614000	3149000	2650000	2524000
5	2863000	2798000	2762000	2641000	2713000	3140000	2642000	2647000	4635000	3127000	2643000	2522000
6	2933000	2822000	2756000	2641000	2716000	3123000	2643000	2638000	4634000	3090000	2636000	2522000
7	3037000	2859000	2759000	2635000	2743000	3099000	2643000	2636000	4615000	3037000	2630000	2525000
8	3117000	2891000	2768000	2634000	2787000	3070000	2644000	2634000	4584000	2981000	2623000	2524000
9	3152000	2897000	2765000	2657000	2804000	3037000	2645000	2632000	4541000	2924000	2616000	2520000
10	3118000	2894000	2754000	2669000	2802000	2990000	2647000	2629000	4487000	2884000	2608000	2521000
11	3088000	2869000	2747000	2683000	2785000	2930000	2650000	2628000	4428000	2856000	2601000	2518000
12	3043000	2849000	2740000	2700000	2765000	2868000	2661000	2624000	4373000	2824000	2592000	2516000
13	3006000	2823000	2735000	2711000	2751000	2822000	2679000	2621000	4334000	2809000	2589000	2516000
14	2979000	2814000	2727000	2713000	2751000	2791000	2671000	2623000	4314000	2801000	2581000	2528000
15	2957000	2817000	2717000	2715000	2746000	2758000	2669000	2621000	4280000	2790000	2575000	2542000
16	2918000	2815000	2706000	2713000	2741000	2752000	2668000	2619000	4231000	2778000	2569000	2541000
17	2890000	2810000	2701000	2713000	2743000	2755000	2667000	2620000	4167000	2771000	2566000	2536000
18	2866000	2801000	2700000	2725000	2743000	2764000	2662000	2618000	4117000	2764000	2564000	2533000
19	2841000	2793000	2692000	2735000	2743000	2772000	2661000	2616000	4040000	2760000	2560000	2534000
20	2815000	2793000	2686000	2735000	2740000	2789000	2658000	2614000	3980000	2756000	2557000	2539000
21	2799000	2788000	2679000	2734000	2732000	2805000	2658000	2614000	3925000	2751000	2553000	2538000
22	2793000	2786000	2674000	2734000	2724000	2809000	2649000	2614000	3860000	2748000	2553000	2532000
23	2798000	2783000	2672000	2731000	2710000	2824000	2647000	2619000	3795000	2744000	2553000	2524000
24	2829000	2777000	2667000	2736000	2708000	2825000	2646000	2624000	3721000	2739000	2546000	2522000
25	2873000	2791000	2672000	2729000	2704000	2826000	2643000	2632000	3645000	2734000	2544000	2516000
26	2944000	2792000	2669000	2724000	2709000	2820000	2641000	2627000	3563000	2724000	2540000	2515000
27	2979000	2802000	2664000	2720000	2735000	2802000	2637000	2632000	3484000	2713000	2545000	2517000
28	2951000	2823000	2662000	2711000	2833000	2788000	2635000	2717000	3398000	2699000	2541000	2528000
29	2912000	2829000	2659000	2712000	---	2756000	2634000	2852000	3316000	2692000	2538000	2533000
30	2871000	2833000	2650000	2706000	---	2720000	2633000	3006000	3248000	2672000	2535000	2529000
31	2848000	---	2646000	2700000	---	2696000	---	3322000	---	2668000	2536000	---
MAX	3152000	2897000	2843000	2736000	2833000	3140000	2679000	3322000	4635000	3171000	2665000	2542000
MIN	2654000	2777000	2646000	2624000	2704000	2696000	2633000	2614000	3248000	2668000	2535000	2515000
(+)	619.24	619.08	617.03	617.63	619.08	617.59	616.88	623.99	623.28	617.27	615.74	615.65
(++)	+219,000	-15,000	-187,000	+54,000	+133,000	-137,000	-63,000	+689,000	-74,000	-580,000	-132,000	-7,000

CAL YR 1986 MAX 3152000 MIN 2335000 (++) +102,000

WTR YR 1987 MAX 4635000 MIN 2515000 (++) -100,000

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-FEET

07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX

LOCATION.--Lat 33°49'08", long 96°33'47", Grayson County, Hydrologic Unit 11140101, on right bank 1,800 ft downstream from Denison Dam powerhouse, 0.4 mi upstream from Shawnee Creek (spillway flow return), 4.5 mi north of Denison, and at mile 725.5.
 DRAINAGE AREA.--39,720 mi², of which 5,936 mi² is probably noncontributing. At site used prior to October 1961, drainage area was 39,777 mi², of which 5,936 mi² probably was noncontributing.

WATER DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1311. Prior to October 1934, published as "near Denison, TX", and October 1934 to September 1961, published as "near Colbert, OK". Gage-height records collected at various sites in this vicinity 1892-93, 1906-28, 1931-49 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 807: 1935 (M). WSP 1211: Drainage area. WSP 1241: 1924-29, 1932-33, 1934 (M), 1935.

GAGE.--Water-stage recorder. Datum of gage is 500.00 ft above National Geodetic Vertical Datum of 1929. Oct. 9, 1923 to Sept. 24, 1934, nonrecording gage, and July 29, 1942 to Sept. 30, 1961, water-stage recorder, at county road bridge 2.5 mi downstream. Prior to Oct. 1, 1931, at datum 6.85 ft higher; Oct. 1, 1931 to Sept. 24, 1934, at datum 7.07 ft higher; and July 29, 1942 to Sept. 30, 1961, at datum 2.64 ft lower; Sept. 25, 1934 to July 28, 1942, water-stage recorder at railway bridge 1.9 mi downstream at datum 7.36 ft higher.

REMARKS.--Records good. Flow regulated since October 1943 by Lake Texoma (station 07331500).

COOPERATION.--Gage-height record and 4 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Denison Dam, 20 years (water years 1924-43) 5,684 ft³/s, 4,118,000 acre-ft/yr; since regulation by Denison Dam, 43 years (water years 1945-87), 4,718 ft³/s, 3,418,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 201,000 ft³/s May 21, 1935, gage height, 31.8 ft (at site and datum then in use); maximum gage height, 32.0 ft, Apr. 25, 1942 (at site and datum used in 1943); minimum daily discharge, 12 ft³/s Jan. 10, 1944.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 26, 1908, reached a stage of 45.5 ft (at site and datum used July 29, 1942 to Sept. 30, 1961); from record of National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 53,100 ft³/s, June 19, gage height, 18.94 ft; minimum daily, 65 ft³/s, Apr. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5590	24400	18300	7330	10600	17600	16600	e3600	40800	46800	3570	3240
2	6710	24300	18400	7390	10600	22900	14200	e3200	40800	37200	3570	3030
3	10400	20700	16400	2390	10600	27500	e10400	e2800	44800	33400	4730	2950
4	10600	17500	13600	1880	10600	31000	e10500	e2830	48100	38000	4740	3060
5	12900	17400	12800	3220	10600	31000	e10500	4580	48200	42200	4750	2200
6	19400	20100	10500	5840	12200	31000	e7740	5880	48200	42200	4740	2160
7	11700	24900	10400	6410	15300	31000	e5760	5380	48200	42200	4770	241
8	28200	24800	10400	6610	15300	30900	e5780	5350	49600	42200	4740	2880
9	36300	24800	13500	6740	17700	30900	e5740	4020	51100	37700	4750	3130
10	41100	24800	17700	6560	21100	34500	e5840	4010	51000	28400	4750	2970
11	41100	24700	17700	6520	21100	40100	e2780	3800	51000	20900	4890	2930
12	41000	24700	16000	6850	19400	40200	e65	3990	51200	20900	4830	2930
13	41100	22500	13700	9460	14400	32200	e3060	3990	51000	16600	4750	2920
14	41300	16200	13700	10500	12800	23800	e5770	421	50900	10400	4740	3460
15	41400	13100	13700	10600	12800	23800	e5780	3740	51000	10300	3840	5710
16	39300	13100	12700	10500	12800	21600	e5660	2520	51000	10300	3860	6040
17	30200	13100	10500	10500	12800	16900	e5700	2440	50700	10300	3770	6190
18	24000	13100	10000	10800	12800	16600	e5210	2460	50000	9620	3740	6030
19	23900	12400	10500	10500	13700	16600	e5820	2090	51100	9540	3710	3430
20	22300	10400	9590	10500	14500	16600	e5780	2770	50700	9480	3720	3310
21	16400	10400	9500	10500	14500	16500	e7000	2050	50400	9380	3720	5900
22	13600	10400	9080	10500	14500	16600	e7890	2300	50200	9400	2590	6000
23	15200	10400	6820	10500	13600	16500	e6030	2120	50100	9440	2540	5950
24	23800	10400	7530	10500	12400	17000	e6170	168	49300	9460	3800	3310
25	37600	10600	3580	10500	12400	20900	e6190	2080	49800	9450	3740	5750
26	40500	11300	6710	10500	12500	24700	e6070	5310	49700	9470	2970	2520
27	40500	13600	7130	10500	12400	24800	e6150	9470	49700	9450	2960	2430
28	40500	15700	6360	10600	12500	24700	e4060	10000	49600	9470	2970	140
29	40600	18400	7010	10600	---	24600	e3740	16200	49500	9470	2950	99
30	38000	18400	7110	10600	---	24700	e3660	28300	49400	8760	2940	5720
31	28400	---	7400	10600	---	19900	---	36000	---	4750	2950	---
TOTAL	863600	516600	348320	267000	386500	767600	195645	183869	1477100	617140	121090	106630
MEAN	27860	17220	11240	8613	13800	24760	6521	5931	49240	19910	3906	3554
MAX	41400	24900	18400	10800	21100	40200	16600	36000	51200	46800	4890	6190
MIN	5590	10400	3580	1880	10600	16500	65	168	40800	4750	2540	99
AC-FT	1713000	1025000	690900	529600	766600	1523000	388100	364700	2930000	1224000	240200	211500

CAL YR 1986 TOTAL 2922150 MEAN 8006 MAX 41400 MIN 69 AC-FT 5796000
 WTR YR 1987 TOTAL 5851090 MEAN 16030 MAX 51200 MIN 65 AC-FT 11610000

e Estimated

RED RIVER BASIN

07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1944 to current year. Chemical and biochemical analyses: October 1974 to September 1986. Sediment analyses: October 1974 to September 1986.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1944 to current year.

WATER TEMPERATURES: October 1945 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,520 microsiemens, Aug. 14, 1944; minimum daily, 656 microsiemens, Oct. 16, 1945.

WATER TEMPERATURES (1945-69): Maximum daily, 31.0 °C, July 17, 1969; minimum daily, 3.0 °C, Feb. 2-4, 7, 1966.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,930 microsiemens, Jan. 7; minimum daily, 1,040 microsiemens, July 8.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	HARD- NESS (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)
OCT 22...	1100	13600	1610	310	210	86	23	200
JAN 28...	0940	10600	1790	410	220	110	32	230
JUN 02...	1140	40800	1680	430	280	110	38	180
JUL 21...	0950	9380	1160	300	180	79	25	120
DATE	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WH WAT TOTAL FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT 22...	5	6.4	100	220	320	0.30	5.9	920
JAN 28...	5	5.8	189	270	330	0.30	7.7	1100
JUN 02...	4	4.9	148	260	300	0.30	7.9	990
JUL 21...	3	4.8	121	180	180	0.30	8.2	670

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1986 TO SEPTEMBER 1987

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1986	863600	1590	919	2142000	310	734000	210	495800	350
NOV. 1986	516600	1600	922	1286000	320	440500	210	297600	350
DEC. 1986	348320	1740	1010	950000	350	326000	230	220600	370
JAN. 1987	267000	1830	1060	766000	360	263000	250	178100	380
FEB. 1987	386500	1830	1060	1111000	370	381500	250	258300	380
MAR. 1987	767600	1710	988	2049000	340	702600	230	475200	360
APR. 1987	195645	1620	936	494000	320	169400	220	114500	350
MAY 1987	183869	1680	969	481000	330	165000	220	111600	360
JUNE 1987	1477100	1460	837	3339000	290	1143000	190	770900	320
JULY 1987	617140	1120	633	1055000	220	359900	150	241700	260
AUG. 1987	121090	1520	872	285000	300	97700	200	65900	330
SEPT 1987	106630	1550	890	256000	310	87800	210	59300	340
TOTAL	5851094	**	**	14214000	**	4870000	**	3289000	**
WTD.AVG.	16030	1560	900	**	310	**	210	**	340

RED RIVER BASIN

07331600 RED RIVER AT DENISON DAM NEAR DENISON, TX--Continued

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1610	1680	1660	1860	1790	1870	1610	1660	1700	1120	1330	1360
2	1580	1660	1670	1830	1780	1870	1610	1670	1710	1120	1330	1430
3	1600	1630	1680	1820	1790	1870	1630	1680	1710	1110	1330	1770
4	1580	1670	1640	1820	1770	1880	1620	1680	1720	1100	1320	1760
5	1580	1600	1640	1810	1820	1860	1620	1610	1730	1090	1310	1760
6	1560	1630	1700	1880	1780	1850	1610	1590	1700	1080	1360	1760
7	1550	1640	1780	1930	1790	1800	1610	1580	1650	1060	1360	1760
8	1540	1600	1820	1780	1810	1750	1610	1630	1610	1040	1360	1760
9	1550	1560	1730	1770	1820	1710	1620	1640	1610	1060	1350	1750
10	1550	1590	1720	1800	1820	1500	1620	1640	1600	1090	1350	1750
11	1570	1550	1740	1810	1850	1510	1650	1650	1590	1080	1390	1750
12	1590	1520	1740	1830	1850	1610	1670	1650	1470	1080	1500	1740
13	1590	1540	1760	1840	1850	1660	1690	1680	1430	1070	1430	1740
14	1610	1550	1780	1840	1850	1700	1640	1710	1420	1070	1650	1740
15	1610	1550	1790	1880	1840	1740	1610	1730	1410	1140	1650	1650
16	1610	1550	1760	1850	1840	1770	1610	1730	1430	1370	1660	1510
17	1580	1560	1770	1840	1840	1700	1620	1730	1420	1250	1660	1510
18	1600	1560	1750	1830	1850	1670	1630	1730	1410	1220	1670	1480
19	1600	1570	1720	1830	1850	1720	1630	1730	1400	1210	1690	1450
20	1610	1570	1750	1810	1840	1700	1630	1730	1380	1190	1710	1430
21	1620	1580	1780	1810	1830	1690	1630	1710	1380	1160	1660	1420
22	1640	1600	1810	1810	1820	1690	1620	1700	1370	1180	1640	1430
23	1690	1600	1720	1810	1820	1680	1620	1700	1390	1200	1620	1430
24	1640	1600	1720	1820	1810	1660	1610	1700	1300	1230	1390	1430
25	1600	1600	1740	1820	1860	1640	1600	1690	1240	1220	1530	1430
26	1570	1620	1770	1830	1870	1630	1630	1690	1250	1210	1780	1430
27	1550	1620	1800	1820	1870	1650	1650	1680	1250	1250	1820	1430
28	1560	1630	1830	1810	1870	1660	1640	1680	1250	1280	1730	1430
29	1630	1650	1840	1810	---	1660	1640	1680	1250	1230	1740	1430
30	1640	1650	1880	1810	---	1670	1650	1690	1180	1270	1750	1430
31	1710	---	1910	1800	---	1650	---	1690	---	1330	1760	---
MEAN	1600	1600	1750	1830	1830	1710	1630	1680	1470	1160	1540	1570

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	---	13.0	---	---	---	13.0	---	---	24.0	---	27.0
2	26.0	---	13.0	10.0	8.0	8.0	13.0	19.0	---	---	---	27.0
3	26.0	20.0	12.0	---	8.0	9.0	13.0	---	---	---	26.0	26.0
4	---	20.0	12.5	---	8.0	9.0	---	14.0	---	---	26.0	25.0
5	---	20.0	12.0	8.0	8.0	10.0	---	16.0	21.0	---	27.0	---
6	25.0	19.0	---	---	8.0	10.0	13.0	16.0	---	25.0	27.0	---
7	25.0	19.0	---	9.0	---	---	13.0	16.0	---	25.0	27.0	---
8	24.0	---	12.0	9.0	---	---	13.0	15.0	21.0	25.0	---	25.0
9	24.0	14.5	12.0	9.0	8.0	11.0	13.0	---	21.0	25.0	---	25.0
10	24.0	18.0	12.0	---	8.0	11.0	13.0	---	---	25.0	21.0	---
11	---	---	12.0	---	8.0	11.0	---	16.0	21.0	---	24.0	26.0
12	---	17.0	11.0	9.0	---	11.0	---	16.0	---	---	27.0	---
13	---	16.0	---	9.0	---	11.0	13.0	---	---	26.0	27.0	---
14	22.0	15.5	---	9.0	---	---	13.0	---	---	26.0	25.0	26.0
15	22.0	---	11.0	9.0	---	---	13.0	16.0	22.0	26.0	---	---
16	22.0	---	11.0	---	---	9.0	14.0	---	21.0	26.0	---	27.0
17	22.0	15.0	11.0	---	9.0	---	---	---	---	26.0	---	---
18	---	15.0	11.0	---	9.0	12.0	13.0	14.0	22.0	---	26.0	---
19	---	14.5	11.0	---	9.0	11.0	---	14.0	22.0	---	26.0	---
20	22.0	---	---	8.0	---	11.0	---	15.0	---	26.0	26.0	---
21	22.0	14.5	---	8.0	---	---	15.0	15.0	---	26.0	---	27.0
22	21.0	14.5	10.0	8.0	---	---	---	15.0	22.0	26.0	---	27.0
23	20.0	---	10.0	8.0	10.0	12.0	---	16.0	22.0	26.0	---	---
24	20.0	14.5	10.0	---	10.0	---	---	---	23.0	26.0	27.0	26.0
25	---	15.0	---	---	10.0	12.0	16.0	---	23.0	---	26.0	---
26	---	---	---	8.0	10.0	11.0	---	15.0	24.0	26.0	26.0	---
27	20.0	---	---	8.0	10.0	12.0	14.0	16.0	---	---	26.0	---
28	20.0	---	---	8.0	---	---	12.0	---	---	26.0	26.0	---
29	20.0	---	10.0	8.0	---	---	---	---	23.0	26.0	---	25.0
30	19.0	---	9.0	8.0	---	13.0	15.0	---	24.0	26.0	---	25.0
31	20.0	---	9.0	---	---	13.0	---	---	---	26.0	25.0	---
MEAN	22.5	16.5	11.0	8.5	9.0	11.0	13.5	15.5	22.0	25.5	26.0	26.0

RED RIVER BASIN

07332400 BLUE RIVER AT MILBURN, OK

LOCATION.--Lat 34°15'04", long 96°33'05", in SW 1/4 SW 1/4 sec.35, T.3 S., R.7 E., Johnston County, Hydrologic Unit 11140102, on downstream side of left pier of bridge on State Highway 48A, 0.5 mi north of Milburn, and at mile 84.9.

DRAINAGE AREA.--203 mi².

PERIOD OF RECORD.--Occasional low-flow measurements made in water years 1956-61. October 1965 to June 1987 (discontinued). Prior to October 1975 published as Blue Creek near Milburn.

GAGE.--Water-stage recorder. Datum of gage is 649.65 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office.

AVERAGE DISCHARGE.--21 years (water years 1966-86), 140 ft³/s, 9.37 in/yr, 101,430 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,100 ft³/s, Oct. 8, 1970, gage height, 27.87 ft; minimum daily discharge, 15 ft³/s Aug. 22, 24, 25, Sept. 1, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge during period October 1986 to June 1987, 1,720 ft³/s, Mar. 10; minimum daily discharge, 54 ft³/s, Oct. 20, 31, Nov. 1, 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	62	54	113	e110	187	758	217	127	323	---	---	---
2	60	54	107	150	185	512	215	129	292	---	---	---
3	60	55	102	152	185	428	205	152	252	---	---	---
4	73	372	99	153	182	355	197	231	229	---	---	---
5	70	257	96	152	180	258	195	260	242	---	---	---
6	63	139	95	150	177	238	192	215	197	---	---	---
7	59	121	246	152	170	214	190	163	180	---	---	---
8	58	146	449	160	163	203	190	140	159	---	---	---
9	59	105	215	982	159	329	190	133	147	---	---	---
10	59	92	163	890	155	1720	188	129	146	---	---	---
11	59	104	143	214	150	783	183	119	147	---	---	---
12	75	93	129	210	146	490	182	112	183	---	---	---
13	68	87	119	200	143	359	182	104	291	---	---	---
14	62	86	114	195	146	251	183	102	310	---	---	---
15	58	87	e115	197	178	231	180	100	278	---	---	---
16	56	87	e119	208	658	233	174	97	261	---	---	---
17	56	85	e125	244	709	231	170	95	229	---	---	---
18	55	83	e135	247	507	228	170	92	516	---	---	---
19	55	81	e135	247	418	224	170	94	507	---	---	---
20	54	82	e120	249	287	224	169	95	317	---	---	---
21	55	79	e110	254	219	219	169	95	231	---	---	---
22	60	79	e102	251	210	226	169	100	167	---	---	---
23	62	79	e99	242	212	386	166	97	147	---	---	---
24	59	80	e94	233	219	325	164	97	146	---	---	---
25	56	399	e92	226	210	279	163	97	141	---	---	---
26	57	518	e90	210	207	337	156	102	138	---	---	---
27	56	220	e87	233	208	285	147	143	138	---	---	---
28	55	152	e85	190	582	245	140	1300	136	---	---	---
29	55	133	e84	185	---	242	140	1560	136	---	---	---
30	55	121	e84	185	---	237	133	659	135	---	---	---
31	54	---	e86	185	---	222	---	369	---	---	---	---
TOTAL	1845	4130	3952	7656	7152	11272	5289	7308	6721	---	---	---
MEAN	59.5	138	127	247	255	364	176	236	224	---	---	---
MAX	75	518	449	982	709	1720	217	1560	516	---	---	---
MIN	54	54	84	110	143	203	133	92	135	---	---	---
AC-FT	3660	8190	7840	15190	14190	22360	10490	14500	13330	---	---	---
CFSM	.29	.68	.63	1.22	1.26	1.79	.87	1.16	1.10	---	---	---
IN.	.34	.76	.72	1.40	1.31	2.07	.97	1.34	1.23	---	---	---

CAL YR 1986 TOTAL 42605 MEAN 117 MAX 1220 MIN 45 AC-FT 84510 CFSM .58 IN. 7.81

e Estimated

07332500 BLUE RIVER NEAR BLUE, OK

LOCATION.--Lat 33°59'49", long 96°14'27", on line between sec.27 and 34, T.6 S., R.10 E., Bryan County, Hydrologic Unit 11140102, near left bank on downstream side of pier of bridge on U.S. Highway 70, 1.0 mi west of Blue, 7.0 mi east of Durant, 7.7 mi upstream from Caddo Creek, and at mile 38.8.

DRAINAGE AREA.--476 mi².

PERIOD OF RECORD.--June 1936 to current year. Monthly discharge only for some periods, published in WSP 1311, 1731.

REVISED RECORDS.--WSP 957: 1938. WSP 1241: 1936, drainage area.

GAGE.--Water-stage recorder. Datum of gage is 503.36 ft above National Geodetic Vertical Datum of 1929.

Prior to Mar. 13, 1945, nonrecording gage and Mar. 13, 1945 to Feb. 2, 1960, water-stage recorder at site 1.2 mi downstream at datum 5.00 ft lower.

REMARKS.--Records fair. Some regulation at low flow by a State fish hatchery, 16.0 mi upstream from station. Small diversion for municipal water supply for city of Durant upstream from station. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 4 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--51 years, 298 ft³/s, 8.50 in/yr, 215,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,200 ft³/s, Oct. 14, 1981, gage height, 44.20 ft, from high-water mark; no flow Aug. 3, 4, 1936, result of regulation at fish hatchery, and no flow Sept. 19 to Oct. 16, 1956.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 1	0130	*4,800	*20.55	May 29	1600	4,350	19.05

Minimum daily discharge, 30 ft³/s, Nov. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	403	30	124	93	160	4600	214	110	566	299	59	46
2	1380	30	113	91	223	3240	207	108	390	832	58	46
3	100	30	102	97	217	675	192	107	296	879	54	41
4	245	795	101	148	182	444	185	131	326	282	52	39
5	263	1050	97	156	161	360	181	187	227	191	51	38
6	87	284	92	120	157	311	179	138	195	156	56	36
7	60	148	122	108	162	277	177	122	180	137	59	33
8	51	103	e300	101	187	252	174	194	167	122	52	34
9	46	125	e500	270	169	233	169	122	161	114	53	35
10	43	93	e250	299	146	215	165	109	173	109	52	37
11	43	168	226	299	143	201	166	103	183	106	49	50
12	52	108	187	276	140	192	160	100	179	102	54	47
13	73	94	156	222	139	183	168	98	220	671	59	51
14	62	73	139	206	135	179	162	95	177	239	61	43
15	49	67	135	200	181	175	155	93	204	133	54	103
16	42	63	140	204	e600	173	151	92	327	112	49	444
17	39	63	142	289	e350	1890	156	97	180	247	42	186
18	37	63	176	386	e250	2700	153	91	162	214	44	85
19	36	e62	e200	395	227	817	150	88	553	138	48	155
20	34	e62	184	412	223	392	147	88	1660	110	54	142
21	33	e61	148	387	247	312	144	86	462	99	49	149
22	33	e61	132	e340	219	274	142	109	223	92	44	95
23	36	e60	122	e320	209	336	140	124	176	88	40	66
24	39	e60	117	e300	258	416	137	193	191	85	40	55
25	38	e400	112	e270	386	314	135	168	172	102	39	50
26	35	e700	108	e240	592	257	132	176	144	82	43	47
27	34	e350	104	e220	1740	262	128	142	131	79	39	45
28	33	e200	100	e200	3370	268	119	629	122	77	73	44
29	33	e150	98	171	---	261	116	3860	116	68	58	44
30	32	e135	96	150	---	234	113	3940	570	65	52	44
31	32	---	95	153	---	221	---	1370	---	62	45	---
TOTAL	3523	5688	4718	7123	11173	20664	4717	13070	8833	6092	1582	2330
MEAN	114	190	152	230	399	667	157	422	294	197	51.0	77.7
MAX	1380	1050	500	412	3370	4600	214	3940	1660	879	73	444
MIN	32	30	92	91	135	173	113	86	116	62	39	33
AC-FT	6990	11280	9360	14130	22160	40990	9360	25920	17520	12080	3140	4620
CFSM	.24	.40	.32	.48	.84	1.40	.33	.89	.62	.41	.11	.16
IN.	.28	.44	.37	.56	.87	1.61	.37	1.02	.69	.48	.12	.18

CAL YR 1986 TOTAL 103101 MEAN 282 MAX 6340 MIN 30 AC-FT 204500 CFSM .59 IN. 8.06
WTR YR 1987 TOTAL 89513 MEAN 245 MAX 4600 MIN 30 AC-FT 177500 CFSM .52 IN. 7.00

e Estimated

07334000 MUDDY BOGGY CREEK NEAR FARRIS, OK

LOCATION.--Lat 34°16'17", long 95°54'43", in NE 1/4 NW 1/4 sec.26, T.3 S., R.13 E., Atoka County, Hydrologic Unit 11140103, on downstream left bank of bridge on State Highway 3, 1.3 mi downstream from McGee Creek, 2.8 mi northwest of Farris, and at mile 57.7.

DRAINAGE AREA.--1,087 mi².

PERIOD OF RECORD.--October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 444.58 ft above National Geodetic Vertical Datum of 1929.

Prior to Mar. 13, 1945, nonrecording gage, and Mar. 13, 1945 to Sept. 30, 1961, water-stage recorder at same site at datum 2.00 ft higher.

REMARKS.--Records fair. Some regulation since June 1959 by Atoka Reservoir, capacity, 125,000 acre-ft, on North Boggy Creek, drainage area, 176 mi²; pipeline diversions to Oklahoma City since November 1963, normal capacity, 60 Mgal/d. McGee Creek Reservoir construction upstream from station. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height records and 3 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--50 years, 876 ft³/s, 634,700 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 61,900 ft³/s, June 17, 1945, gage height, 44.94 ft, datum then in use, from rating curve extended above 37,000 ft³/s; no flow at times in many years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 10,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 31	0200	*12,300	*30.62	May 29	1600	10,700	28.62

Minimum daily discharge, 5.4 ft³/s, Oct. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	259	7.6	262	57	159	11600	393	20	10100	259	13	30
2	131	6.4	198	53	199	9350	297	18	4860	203	13	25
3	167	5.7	158	75	473	8820	228	17	1780	216	13	19
4	117	884	129	172	511	5560	152	19	972	981	12	16
5	61	2390	105	180	327	1420	125	145	639	746	12	14
6	38	2590	90	152	252	877	110	298	473	356	11	12
7	55	1390	130	128	241	672	102	134	336	205	11	11
8	48	372	1490	115	294	547	96	74	246	123	11	11
9	30	301	3680	3760	380	469	85	50	189	80	10	10
10	19	286	1910	6680	263	435	77	36	248	61	12	10
11	14	265	1010	5310	197	339	73	28	290	50	15	10
12	21	236	579	1860	161	269	72	23	255	41	13	9.8
13	28	207	386	743	141	222	111	18	287	309	40	10
14	252	186	293	533	125	197	113	16	268	164	30	11
15	132	133	243	428	282	187	111	15	209	70	20	53
16	76	100	222	415	1770	180	87	18	e600	280	15	69
17	45	77	207	719	4230	3030	68	40	957	363	12	37
18	27	62	233	5150	2880	6500	56	62	546	183	12	33
19	18	52	307	6610	924	6100	51	29	1200	101	11	168
20	13	48	282	4700	560	2580	45	18	1590	62	10	152
21	10	41	224	1700	433	1180	39	14	1440	46	10	59
22	9.0	38	181	975	354	949	39	15	896	37	9.6	38
23	8.9	41	151	662	301	1040	44	36	564	30	9.4	37
24	8.9	38	135	516	284	1380	36	160	1190	24	9.2	30
25	8.5	38	122	414	431	1370	30	262	1830	21	9.5	23
26	7.3	e39	103	346	1500	930	27	344	640	19	9.9	18
27	6.3	e100	89	291	3620	761	27	513	352	17	21	16
28	5.6	e300	80	248	8250	628	26	3560	186	16	12	14
29	5.4	590	73	221	---	977	22	10100	113	16	9.9	13
30	7.4	363	67	193	---	784	20	9470	108	15	9.4	12
31	7.8	---	61	169	---	538	---	9450	---	14	10	---
TOTAL	1636.1	11186.7	13200	43575	29542	69891	2762	35002	33364	5108	415.9	970.8
MEAN	52.8	373	426	1406	1055	2255	92.1	1129	1112	165	13.4	32.4
MAX	259	2590	3680	6680	8250	11600	393	10100	10100	981	40	168
MIN	5.4	5.7	61	53	125	180	20	14	108	14	9.2	9.8
AC-FT	3250	22190	26180	86430	58600	138600	5480	69430	66180	10130	825	1930

CAL YR 1986 TOTAL 251618.5 MEAN 689 MAX 11300 MIN 1.3 AC-FT 499100
WTR YR 1987 TOTAL 246653.5 MEAN 676 MAX 11600 MIN 5.4 AC-FT 489200

e Estimated

RED RIVER BASIN

07334200 BYRD'S MILL SPRING NEAR FITTSTOWN, OK

LOCATION.--Lat 34°35'45", long 96°39'55", in SW 1/4 SW 1/4 sec.34, T.2 N., R.6 E., Pontotoc County, Hydrologic Unit 11140104, upstream from weir outlet of spring, 0.5 mi upstream from Big Spring Creek, 2.0 mi west of Fittstown, and 12.0 mi south of Ada.

PERIOD OF RECORD.--April 1959 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir. Datum of gage is 1,021.17 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Records do not include diversion of about 6 to 10 ft³/s by city of Ada for municipal water supply, a part of which is discharged as effluent to Sandy Creek, tributary to Canadian River. Records of zero flow do not include seepage of up to 0.10 ft³/s.

AVERAGE DISCHARGE.--28 years, 7.63 ft³/s, 5,528 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 30 ft³/s, May 30, 1960, gage height, 3.22 ft; no flow at times in several years.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20 ft³/s, Mar. 14, 17-31, gage height, 3.11 ft; minimum daily discharge, 5.8 ft³/s, Nov. 2, 3, and Aug. 31 to Sept. 3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	6.2	6.9	8.1	11	17	18	15	15	14	8.0	5.8
2	7.3	5.8	6.9	8.1	11	17	18	14	15	14	7.9	5.8
3	7.3	5.8	6.9	8.1	11	17	18	14	15	14	7.9	5.8
4	7.3	6.1	6.9	8.1	11	17	18	13	15	14	7.9	6.8
5	7.3	6.2	6.9	8.1	11	18	18	13	15	14	7.9	9.0
6	7.3	6.2	6.9	8.1	12	18	17	13	15	14	7.7	8.7
7	6.9	6.2	6.9	8.1	12	18	17	13	15	14	7.6	8.7
8	6.9	6.2	7.1	8.1	12	18	17	13	15	14	7.5	8.6
9	6.9	6.2	7.3	8.3	12	19	17	13	15	14	7.5	8.6
10	7.0	6.2	7.4	8.6	12	19	17	12	15	14	7.5	8.6
11	6.9	6.2	7.3	8.6	12	19	17	13	15	14	7.5	8.6
12	6.9	6.2	7.5	8.6	12	19	16	13	15	13	7.3	8.6
13	6.9	6.2	7.7	8.6	12	19	16	12	15	13	7.3	8.6
14	6.7	6.2	7.7	8.9	12	19	16	12	15	14	7.2	8.6
15	6.6	6.2	7.7	9.0	12	19	16	12	15	14	7.1	8.6
16	6.6	6.2	7.7	9.0	13	19	16	12	15	13	6.9	8.6
17	6.6	6.2	8.0	9.0	13	19	16	12	15	13	6.9	8.3
18	6.6	6.2	7.9	9.0	13	20	16	12	15	13	6.9	8.2
19	6.6	6.2	8.1	9.3	13	20	16	12	15	13	6.9	8.1
20	6.6	6.2	8.1	9.5	13	20	16	12	15	13	6.9	8.1
21	6.6	6.2	8.1	9.5	13	20	17	12	15	13	6.6	8.1
22	6.6	6.2	8.1	9.6	14	20	16	13	15	12	6.6	8.1
23	6.6	6.2	8.1	10	14	20	16	14	15	11	6.5	8.1
24	6.6	6.2	8.1	10	14	20	16	14	15	10	6.5	8.1
25	6.6	6.2	8.1	10	14	20	16	14	14	10	6.3	8.1
26	6.3	6.6	8.1	11	14	20	16	14	14	10	6.2	8.1
27	6.2	6.6	8.1	11	14	20	16	14	14	10	6.2	8.1
28	6.2	6.6	8.1	11	15	20	16	14	14	10	6.2	8.1
29	6.2	6.6	8.1	11	---	20	15	16	14	10	6.2	8.0
30	6.2	6.7	8.1	11	---	20	16	15	14	10	6.0	8.1
31	6.2	---	8.1	11	---	19	---	15	---	9.1	5.8	---
TOTAL	208.8	187.2	236.9	286.3	352	590	496	410	444	388.1	217.4	241.6
MEAN	6.74	6.24	7.64	9.24	12.6	19.0	16.5	13.2	14.8	12.5	7.01	8.05
MAX	7.3	6.7	8.1	11	15	20	18	16	15	14	8.0	9.0
MIN	6.2	5.8	6.9	8.1	11	17	15	12	14	9.1	5.8	5.8
AC-FT	414	371	470	568	698	1170	984	813	881	770	431	479

CAL YR 1986 TOTAL 3597.1 MEAN 9.86 MAX 15 MIN 4.1 AC-FT 7130
WTR YR 1987 TOTAL 4058.3 MEAN 11.1 MAX 20 MIN 5.8 AC-FT 8050

RED RIVER BASIN

07335000 CLEAR BOGGY CREEK NEAR CANEY, OK

LOCATION.--Lat 34°15'09", long 96°12'19", in NW 1/4 SE 1/4 sec.36, T.3 S., R.10 E., Atoka County, Hydrologic Unit 11140104, on downstream side of left pier of bridge on old U.S. Highways 69 and 75, 0.5 mi downstream from Caney Creek, 1.5 mi north of Caney, and at mile 24.1.

DRAINAGE AREA.--720 mi².

PERIOD OF RECORD.--October 1942 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 485.05 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Mar. 13, 1945, nonrecording gage at same site and datum.

REMARKS.--Records poor. Some regulation since 1964 by numerous floodwater-retarding structures.

COOPERATION.--Gage-height record and 2 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--45 years, 493 ft³/s, 9.30 in/yr, 357,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,500 ft³/s, Oct. 14, 1981, gage height, 26.60 ft, maximum gage height, 26.77 ft, Dec. 11, 1946; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 26.9 ft occurred in February 1938, information provided by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,500 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 1	2200	*8,550	*22.49	May 30	2100	7,400	22.18

Minimum daily discharge, 25 ft³/s, Sept. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	48	e200	e54	273	7200	309	61	3560	584	65	42
2	79	47	e175	e54	327	7610	286	58	1710	448	63	33
3	77	46	e150	e52	417	5770	261	55	1400	458	76	30
4	69	509	e120	e52	349	2460	239	144	1060	437	73	29
5	61	1460	e100	e50	298	1790	224	243	768	392	72	28
6	57	933	e90	e48	274	1400	212	134	600	313	64	27
7	55	512	e100	e48	320	1170	202	94	501	232	46	26
8	53	e250	e400	e46	453	939	196	77	432	189	43	26
9	50	e200	e300	e60	366	770	191	70	379	160	40	25
10	47	e180	e250	e1600	313	671	183	79	368	139	39	29
11	47	e170	e200	e1200	278	584	170	70	363	125	36	31
12	59	e150	e175	e900	255	527	161	64	356	115	33	31
13	59	e130	e140	715	239	e470	157	62	343	371	51	30
14	56	e110	e120	e600	229	e420	150	58	308	252	53	33
15	71	e90	e100	e500	310	e380	139	63	318	199	44	51
16	70	e80	e90	e300	2100	e330	129	77	734	157	38	103
17	64	e70	e85	e1000	2970	e700	122	68	392	209	36	172
18	59	e66	e80	e2100	1310	e1500	117	86	333	182	34	176
19	53	e63	e75	e2500	941	e1200	112	72	804	127	34	198
20	52	e70	e70	e1600	728	e1000	105	68	1280	109	37	273
21	47	e64	e68	1140	586	872	103	65	779	97	46	163
22	45	e60	e66	864	506	687	94	62	509	95	42	103
23	47	e58	e64	690	455	655	91	127	428	95	38	77
24	49	e56	e62	587	423	693	91	292	792	85	65	64
25	50	e100	e60	511	633	649	89	224	471	78	61	57
26	57	e1000	e58	449	989	512	85	223	301	63	39	51
27	58	e750	e58	404	2960	484	78	222	236	81	37	45
28	56	e500	e56	370	5350	461	74	1150	193	89	43	42
29	53	e300	e56	343	---	424	68	5940	158	77	52	39
30	50	e250	e56	314	---	371	64	6770	524	70	84	38
31	49	---	e54	286	---	335	---	6730	---	65	57	---
TOTAL	1779	8322	3678	19437	24652	43034	4502	23508	20400	6093	1541	2072
MEAN	57.4	277	119	627	880	1388	150	758	680	197	49.7	69.1
MAX	80	1460	400	2500	5350	7610	309	6770	3560	584	84	273
MIN	45	46	54	46	229	330	64	55	158	63	33	25
AC-FT	3530	16510	7300	38550	48900	85360	8930	46630	40460	12090	3060	4110
CFSM	.08	.39	.16	.87	1.22	1.93	.21	1.05	.94	.27	.07	.10
IN.	.09	.43	.19	1.00	1.27	2.22	.23	1.21	1.05	.31	.08	.11

CAL YR 1986 TOTAL 134282.8 MEAN 368 MAX 5000 MIN 7.6 AC-FT 266300 CFSM .51 IN. 6.94
WTR YR 1987 TOTAL 159018 MEAN 436 MAX 7610 MIN 25 AC-FT 315400 CFSM .61 IN. 8.22

e Estimated

RED RIVER BASIN

07335300 MUDDY BOGGY CREEK NEAR UNGER, OK

LOCATION.--Lat 34°01'36", long 95°45'00", in SE 1/4 SE 1/4 sec.17, T.6 S., R.15 E., Choctaw County, Hydrologic Unit 11140103, at bridge on U.S. Highway 70, 3.5 mi west of Soper, 1.8 mi east of Unger and at mile 18.6.

DRAINAGE AREA.--2,273 mi².

PERIOD OF RECORD.--August 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is 392.72 ft above National Geodetic Vertical Datum of 1929. Auxiliary gage 7.4 mi downstream. Prior to Sept. 19, 1985, gage 500 ft downstream at same datum.

REMARKS.--Records poor. Several unpublished observations of water temperature, specific conductance, and pH were made during the year and are available at the District Office. Some regulation by Atoka Reservoir, capacity, 125,000 acre-ft, on North Boggy Creek, drainage area 176 mi².

AVERAGE DISCHARGE.--5 years, 1,737 ft³/s, 1,259,000 acre-ft/year.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,000 ft³/s, Apr. 26, 1985, gage height, 44.05 ft; minimum daily discharge, 1.8 ft³/s, Sept. 8, 1984.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 17,100 ft³/s, Mar. 4, gage height, 40.07 ft; maximum gage height, 40.40 ft, June 3 (backwater from Red River); minimum daily discharge, 34 ft³/s, Aug. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	496	e88	1440	312	752	8480	1460	178	e11000	e1100	e140	53
2	956	e84	1110	300	801	11300	1150	168	e12000	e1000	e160	67
3	1430	591	930	378	896	15000	998	163	e9000	e1500	e180	78
4	777	1100	779	548	1150	16600	828	177	e5000	e2000	e175	76
5	950	2870	594	677	1190	e10200	677	210	e3500	e1600	e170	63
6	635	4490	513	626	976	e7000	611	349	e2400	e1200	e150	53
7	349	4280	465	529	858	e4000	565	633	e1900	e900	e130	46
8	245	2320	929	456	870	e2500	524	460	e1500	e600	e110	42
9	e200	1330	3640	1900	1040	e2000	498	348	e1200	e450	e95	39
10	e170	1140	5440	5660	1120	e1700	473	270	e1000	e380	e90	40
11	e130	e1000	4520	7310	1050	e1500	451	217	e960	e550	e80	42
12	e170	e900	2590	8070	977	e1350	432	184	e1000	e900	e70	40
13	e250	e800	1690	7880	889	e1200	421	166	e940	e1200	60	39
14	e400	e700	1220	4880	722	e1150	469	148	e900	e800	58	41
15	e494	e600	1020	1970	792	1170	518	146	e1500	e640	76	67
16	e400	458	956	1520	1140	1110	458	168	e2100	e800	75	136
17	e300	370	919	1530	3330	4830	412	143	e2100	e1000	70	194
18	e220	332	1030	3560	5830	7450	370	192	e1600	e800	61	184
19	e170	303	1200	6520	5840	8430	339	194	e2080	e640	52	232
20	e140	278	1150	7780	3330	9360	316	206	e2500	e520	45	310
21	e110	237	967	8510	2080	9350	293	180	e2000	e400	39	359
22	e95	221	781	8270	1660	7640	273	160	e1600	e270	36	314
23	e90	212	656	5900	1400	3800	261	152	e1900	e230	34	218
24	e92	206	558	2460	1330	2630	258	681	e2200	e200	35	157
25	e96	2250	503	1710	1390	2650	253	704	e3200	e180	38	127
26	e100	5740	458	1420	2010	2500	247	914	e2300	e160	37	104
27	e110	7040	410	1230	4520	2130	234	851	e1500	e180	54	88
28	e110	7090	379	1070	6980	1930	218	1540	e1200	e200	66	78
29	e100	5180	355	971	---	1800	203	6430	e800	e170	67	69
30	e92	2260	337	888	---	2020	189	7740	e1200	e150	58	61
31	e90	---	326	804	---	1810	---	9620	---	e140	48	---
TOTAL	9967	54470	37865	95639	54923	154590	14399	33692	82080	20860	2559	3417
MEAN	322	1816	1221	3085	1962	4987	480	1087	2736	673	82.5	114
MAX	1430	7090	5440	8510	6980	16600	1460	9620	12000	2000	180	359
MIN	90	84	326	300	722	1110	189	143	800	140	34	39
AC-FT	19770	108000	75110	189700	108900	306600	28560	66830	162800	41380	5080	6780

CAL YR 1986 TOTAL 600282 MEAN 1645 MAX 14600 MIN 21 AC-FT 1191000
WTR YR 1987 TOTAL 564461 MEAN 1546 MAX 16600 MIN 34 AC-FT 1120000

e Estimated

RED RIVER BASIN

07335500 RED RIVER AT ARTHUR CITY, TX

LOCATION.--Lat 33°52'32", long 95°30'08", in NW 1/4 sec.11, T.8 S., R.17 E., Choctaw County, OK, Hydrologic Unit 11140101, on right downstream bank of bridge on U.S. Highway 271 at Arthur City, 10.6 mi downstream from Muddy Boggy River, 26.0 mi upstream from Kiamichi River, and at mile 633.1.

DRAINAGE AREA.--44,531 mi², of which 5,936 mi² probably is noncontributing.

PERIOD OF RECORD.--January to September 1905 (gage heights and discharge measurements only), October 1905 to December 1911, July 1936 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at same site since 1891 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1241: Drainage area. WSP 1311: 1906-11.

GAGE.--Water-stage recorder. Datum of gage is 380.07 ft above National Geodetic Vertical Datum of 1929. From 1905-11 nonrecording gage at St. Louis-San Francisco Railway Co. bridge 200 ft upstream at same datum. July 1, 1936 to Mar. 24, 1940, nonrecording gage at present site and datum.

REMARKS.--Records fair. Flow regulated since October 1943 by Lake Texoma (station 07331500), 92.8 mi upstream from station. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 7 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Denison Dam, 13 years (water years 1906-11, 1937-43), 9,266 ft³/s, 6,713,000 acre-ft/yr; since regulation by Denison Dam, 43 years (water years 1945-87), 8,256 ft³/s, 5,981,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 400,000 ft³/s, May 28, 1908, gage height, 43.2 ft, from rating curve extended above 41,000 ft³/s, on basis of records for later years; minimum, 130 ft³/s, Dec. 11-12, 1956, gage height, 4.49 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 62,700 ft³/s, June 5, gage height, 18.91 ft; maximum gage height, 19.59 ft, June 21, minimum daily discharge, 1,750 ft³/s, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6680	32700	22700	8350	12400	39800	26400	4380	53500	54500	7010	3230
2	6880	28400	22100	8400	12600	e45000	21300	4260	56200	52700	5520	3220
3	9770	28000	21900	8660	13000	e48000	20000	4210	56600	46200	4520	3460
4	10600	27900	21100	8500	13200	e45000	15200	3450	58000	38600	4370	3350
5	12700	25800	17700	5340	13300	e45000	13700	3260	61300	38000	5120	3230
6	15700	27600	16900	4670	12800	e46000	13600	3230	57500	44900	5130	3220
7	19300	25500	13800	5420	12500	e47000	12600	4940	49400	44100	5130	2810
8	17500	29500	12400	7040	17400	e49000	9910	6450	49100	42800	5100	2480
9	23400	29400	15800	9450	19400	e48000	9290	5860	49900	42400	5090	1750
10	35500	28600	19900	19700	19700	e46000	9070	5390	52400	39800	5070	1890
11	41000	30200	24400	21300	23400	e44000	8930	4620	52600	31800	5110	3140
12	40800	30600	23100	18800	24200	e45000	8690	4460	52400	22900	5130	3240
13	39500	28700	21300	17700	23400	e44000	6340	4250	52600	21600	5330	3200
14	38900	27000	18100	17400	20100	42700	5660	4310	53400	20600	5320	3320
15	40000	21900	17500	14500	17600	33300	5590	4290	52600	13600	5140	4290
16	41700	17900	17400	14100	17600	33000	6550	2770	53000	11300	5060	7360
17	41300	16500	17200	14100	18700	45600	6580	3170	53800	10900	4380	7950
18	36700	16200	15600	17600	21300	52300	6530	3880	54100	10900	4290	7130
19	36300	16100	16600	24900	21700	42600	6480	3690	53200	10500	4200	8210
20	32300	15800	16800	24000	20000	35200	5890	3490	56600	9890	4080	8660
21	26800	12400	14200	21200	19700	32400	6330	3290	61100	9670	4050	6320
22	21900	11200	11600	20600	20500	31500	6320	3420	57800	9510	4020	4940
23	18500	11100	10900	19500	19700	27100	7860	3110	56400	9350	4010	6190
24	17500	10900	8940	16600	19200	23700	7340	3460	57800	9420	3270	6460
25	23100	16100	8930	14500	18500	22700	6230	4040	55400	9570	2980	6390
26	36700	29500	8160	13600	18700	26300	6140	3500	54700	9380	3680	4830
27	42100	28900	6180	13300	24600	30300	6100	3080	53500	9300	3990	5370
28	41200	25300	8010	13000	31700	32900	6050	6610	53000	9230	3660	3800
29	40000	22800	7970	12800	---	31800	5600	21200	53000	9180	3360	3060
30	39800	23300	7800	12600	---	31500	4740	34200	53600	9180	3320	1940
31	38700	---	8110	12500	---	30300	---	45300	---	9170	3300	---
TOTAL	892830	695800	473100	440130	526900	1197000	281020	215570	1634500	710950	139740	134440
MEAN	28800	23190	15260	14200	18820	38610	9367	6954	54480	22930	4508	4481
MAX	42100	32700	24400	24900	31700	52300	26400	45300	61300	54500	7010	8660
MIN	6680	10900	6180	4670	12400	22700	4740	2770	49100	9170	2980	1750
AC-FT	1771000	1380000	938400	873000	1045000	2374000	557400	427600	3242000	1410000	277200	266700

CAL YR 1986 TOTAL 4506320 MEAN 12350 MAX 45600 MIN 749 AC-FT 8938000
WTR YR 1987 TOTAL 7341980 MEAN 20120 MAX 61300 MIN 1750 AC-FT 14560000

e Estimated

RED RIVER BASIN

303

07335700 KIAMICHI RIVER NEAR BIG CEDAR, OK
(Hydrologic bench-mark station)

LOCATION.--Lat 34°38'18", long 94°36'45", in SW 1/4 SE 1/4 sec.18, T.2 N., R.26 E., Le Flore County, Hydrologic Unit 11140105, in Ouachita National Forest, on downstream side of right bank pier of bridge on State Highway 63, 0.2 mi upstream from Rattlesnake Creek, 1.1 mi upstream from Big Branch, 2.1 mi east of Big Cedar, and at mile 157.6.

DRAINAGE AREA.--40.1 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1965 to current year.

GAGE.--Water-stage recorder. Datum of gage is 886.97 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good.

AVERAGE DISCHARGE.--22 years, 78.5 ft³/s, 26.58 in/yr, 56,870 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,500 ft³/s, Dec. 10, 1971, gage height, 17.08 ft; from rating curve extended above 9,000 ft³/s; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 17	1145	*6,390	*12.72	May 28	0545	3,050	10.36

No flow at times.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	10	33	25	50	488	64	12	80	4.1	.45	.69
2	.00	8.9	29	23	66	266	57	11	57	4.0	.13	.27
3	.00	9.0	25	41	55	188	53	11	125	4.3	.00	.12
4	46	56	22	54	52	149	48	10	89	4.3	.00	.02
5	41	83	19	48	49	124	45	10	61	4.0	.00	.00
6	15	56	18	48	49	107	43	16	43	3.7	.00	.00
7	8.3	45	24	47	48	93	41	17	31	3.5	.15	.00
8	6.2	41	97	44	45	82	38	12	23	3.1	2.4	.00
9	5.1	34	238	130	42	73	36	10	18	2.7	1.0	.00
10	4.2	39	151	160	40	64	34	9.1	15	2.5	.23	.85
11	3.8	116	122	132	38	57	32	8.3	14	2.2	.03	1.3
12	13	86	99	111	37	51	31	8.0	12	1.8	.07	.92
13	13	65	80	95	35	46	65	18	11	5.4	.12	.34
14	12	52	69	83	34	42	69	14	8.3	4.3	.00	.08
15	11	43	67	73	80	41	59	15	6.7	3.4	.00	.63
16	9.3	36	64	68	134	39	54	11	6.5	2.9	.00	7.6
17	7.6	30	58	61	129	1650	50	11	5.9	2.5	2.7	5.0
18	6.5	25	59	109	115	480	47	10	5.2	2.4	4.1	5.8
19	5.6	22	58	137	102	247	43	8.9	4.5	2.1	3.6	6.0
20	4.9	20	56	125	94	176	39	7.8	4.4	1.7	3.8	5.2
21	4.7	18	53	111	89	141	36	7.1	4.1	1.4	3.3	5.3
22	5.9	16	50	98	85	117	33	10	3.7	1.2	2.5	5.6
23	7.4	14	48	86	82	132	30	11	6.8	1.1	1.9	4.6
24	20	14	45	76	117	171	27	39	18	1.1	1.4	4.2
25	23	19	42	68	128	135	25	35	8.8	2.2	1.3	3.7
26	18	31	38	59	154	117	23	32	6.0	1.7	1.0	3.3
27	15	35	35	53	186	105	20	26	4.5	2.1	2.4	3.1
28	12	37	32	48	577	93	18	1160	3.7	1.5	2.2	3.4
29	11	38	31	45	---	85	15	423	3.1	1.4	1.4	3.8
30	10	36	28	42	---	78	14	175	4.6	1.2	1.1	3.0
31	9.9	---	27	39	---	71	---	110	---	.92	.97	---
TOTAL	349.40	1134.9	1817	2339	2712	5708	1189	2258.2	683.8	80.72	38.25	74.82
MEAN	11.3	37.8	58.6	75.5	96.9	184	39.6	72.8	22.8	2.60	1.23	2.49
MAX	46	116	238	160	577	1650	69	1160	125	5.4	4.1	7.6
MIN	.00	8.9	18	23	34	39	14	7.1	3.1	.92	.00	.00
AC-FT	693	2250	3600	4640	5380	11320	2360	4480	1360	160	76	148
CFSM	.28	.94	1.46	1.88	2.42	4.59	.99	1.82	.57	.06	.03	.06
IN.	.32	1.05	1.69	2.17	2.52	5.30	1.10	2.09	.63	.07	.04	.07

CAL YR 1986 TOTAL 23307.45 MEAN 63.9 MAX 2250 MIN .00 AC-FT 46230 CFSM 1.59 IN. 21.62
WTR YR 1987 TOTAL 18385.09 MEAN 50.4 MAX 1650 MIN .00 AC-FT 36470 CFSM 1.26 IN. 17.06

RED RIVER BASIN

07335700 KIAMICHI RIVER NEAR BIG CEDAR, OK--Continued
(Hydrologic bench-mark station)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1966 to current year.

REMARKS.--Samples were collected quarterly and specific conductance, pH, water temperature, and dissolved oxygen were determined in the field.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

											BARO- METRIC PRES- SURE (MM OF HG)	OXYGEN, DIS- SOLVED (MG/L)	
DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	AGENCY ANA- LYZING SAMPLE (CODE NUMBER)	GAGE HEIGHT (FEET)	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE AIR (DEG C)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (FTU)			
DEC 08...	1500	1028	80020	4.06	83	43	7.10	10.0	10.0	11	713	9.4	
JAN 21...	1450	1028	1028	4.12	112	49	7.00	2.0	4.0	--	--	--	
MAR 17...	1400	1028	80020	12.47	5980	22	--	18.0	14.0	22	728	9.6	
JUN 02...	1630	1028	80020	3.91	57	*30	6.70	24.0	16.0	7.9	728	9.1	
JUL 29...	1300	1028	1028	2.99	1.4	86	6.70	30.0	20.0	--	728	--	
DATE		OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CAC03)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	BICAR- BONATE WATER WH IT FIELD (MG/L AS HC03)
DEC 08...	89	--	--	6	1	1.1	0.80	2.1	38	0.4	1.0	--	--
JAN 21...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR 17...	98	2600	3300	5	1	1.0	0.60	1.1	27	0.2	1.1	5	
JUN 02...	97	70	80	5	--	1.0	0.60	1.9	36	0.4	1.8	--	
JUL 29...	--	--	--	--	--	--	--	--	--	--	--	--	--
DATE		CAR- BONATE WATER WH IT FIELD (MG/L AS C03)	ALKA- LINITY WAT WH TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	SOLIDS, DIS- SOLVED (TONS PER AC-FT)	SOLIDS, DIS- SOLVED (TONS PER DAY)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
DEC 08...	--	--	7.4	3.0	0.10	8.0	25	28	0.03	5.60	0.090	0.010	
JAN 21...	--	--	--	--	--	--	--	--	--	--	--	--	--
MAR 17...	0	4	11	0.90	<0.10	4.1	--	23	0.03	365	--	<0.010	
JUN 02...	--	--	6.3	2.2	<0.10	8.8	21	27	0.03	3.26	--	<0.010	
JUL 29...	--	--	--	--	--	--	--	--	--	--	--	--	--

* SPECIFIC CONDUCTANCE, LAB (US/CM)

07335700 KIAMICHI RIVER NEAR BIG CEDAR, OK--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

[illegible]

RED RIVER BASIN

07335775 SARDIS LAKE NEAR CLAYTON, OK

LOCATION.--Lat 34°37'45", long 95°21'03", in NE 1/4 SW 1/4 sec.19. T.2 N, R.19 E., Pushmataha County, Hydrologic Unit 11140105, on the northeast end of parking area on top of dam, 2.5 mi north of Clayton, and at mile 2.8.

DRAINAGE AREA.--275 mi².

PERIOD OF RECORD.--December 27, 1982 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by earth dam. The controlled outlet consists of two sluice gates and the uncontrolled outlet is a concrete spillway. Flow was diverted through control structure May 4, 1981; regulated storage began Dec. 27, 1982; conservation pool first filled Oct. 20, 1984. Capacity, 735,800 acre-ft at elevation 624.0 ft, maximum pool; 468,100 acre-ft, at elevation 611.0 ft, spillway crest; 396,900 acre-ft at elevation 607.0 ft, top of flood pool; 274,300 acre-ft, at elevation 599.0 ft, top of conservation pool. Figures given herein represent total contents. Reservoir is designed for flood control, water supply, water-quality control and conservation. Capacity table used since Dec. 27, 1982. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 345,400 acre-ft, Oct. 28, 1984, elevation, 603.84 ft; minimum since conservation pool was first filled, 219,200 acre-ft, Oct. 9-12, 1985, elevation, 594.65 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 322,200 acre-ft, May 31, elevation, 602.38 ft; minimum contents, 259,300 acre-ft, Nov. 3, elevation, 597.87 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

592	189,100	598	260,900
594	211,600	601	302,500
596	235,500	604	347,900

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	265900	259400	259800	264700	274700	291400	277100	272100	322500	273000	271900	266700
2	265200	259400	259900	264700	275300	292900	276300	271800	320200	273100	271700	266400
3	264300	259300	259800	264700	275400	290600	276300	271800	315800	273300	271300	266300
4	263500	260800	259600	264800	275400	286800	276300	271900	311300	273300	271000	266200
5	262300	261600	259600	265000	275400	283300	276300	272200	307100	273300	270700	266000
6	261700	261200	259600	265400	275600	279600	276300	272300	302400	273100	270300	265900
7	261500	260900	260600	265500	275700	278100	276100	272300	298700	273100	270200	265800
8	261500	260900	261700	266300	276000	276600	276300	272200	292900	273000	270000	265500
9	261300	260900	262000	270000	276000	275400	276600	272100	288200	272700	269600	265200
10	261100	261600	262000	271800	275900	274300	276700	271900	283900	272700	270900	266000
11	261500	261200	262100	271900	275900	273800	276800	271800	280900	272300	270600	265900
12	261200	260700	262100	272200	276000	273800	277200	271700	279700	274300	270300	265600
13	260900	260200	262100	272500	276000	273900	279900	271500	277800	274200	270000	265500
14	260800	260000	262300	272600	276300	273900	280200	271500	275600	274100	269900	266600
15	260800	259900	262300	273800	277000	273900	279500	271500	274200	273900	269800	267600
16	260800	259900	262400	274600	277200	275400	277800	271700	273700	273700	269600	268200
17	260800	259900	262800	276000	277200	287100	275900	271800	273400	273700	269500	268300
18	260700	259900	263000	282200	277200	289800	274900	271700	272900	273900	269400	269600
19	260600	259500	263000	283200	276700	290800	274300	271700	271800	273900	269400	270000
20	260300	259500	263100	284200	276100	288800	274100	272900	271400	273900	268300	270400
21	259800	259500	263200	282200	275600	285600	273400	272900	271100	273800	269100	270400
22	259500	259500	263400	279300	274700	282100	272900	274200	271000	273700	268600	270400
23	259800	259500	263500	277500	274200	278500	272900	274100	271900	273400	268300	270200
24	259900	259500	263600	277500	274300	276400	272700	274100	271900	273100	268000	270000
25	259900	259600	263800	276300	275000	274900	272700	276100	272100	273100	267500	269900
26	259900	259900	263900	275400	276400	274200	272700	277100	271700	273000	267500	269600
27	259900	259600	264000	275000	279200	274100	272700	276800	271400	272900	267900	269500
28	259800	259500	264200	274200	286700	274300	272600	299500	271100	272700	267900	271400
29	259800	259500	264300	274700	---	274700	272300	318900	270900	272600	267400	271300
30	259500	259500	264400	274700	---	275000	272100	322100	273100	272300	267000	270900
31	259500	---	264400	274700	---	275000	---	322200	---	272200	267000	---
MAX	265900	261600	264400	284200	286700	292900	280200	322200	322500	274300	271900	271400
MIN	259500	259300	259600	264700	274200	273800	272100	271500	270900	272200	267000	265200
(+)	597.89	597.89	598.26	599.03	599.89	599.05	598.83	602.33	598.91	598.84	598.45	598.74
(++)	-6,000	0	+4,900	+10,300	+12,000	-11,700	-2,900	+50,100	-49,100	-900	-5,200	+3,900
CAL YR 1986	MAX 329600		MIN 235900	(++) +27,900								
WTR YR 1987	MAX 322500		MIN 259300	(++) +5,400								

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-FEET

RED RIVER BASIN

07335790 KIAMICHI RIVER NEAR CLAYTON, OK

LOCATION.--Lat 34°34'30", long 95°20'26", in NE 1/4 SE 1/4 sec.7, T.1 N., R.19 E., Pushmataha County, Hydrologic Unit 11140105, on left bank near downstream bridge abutment on U.S. Highway 271, approximately 1 mi southeast of Clayton, and at mile 101.6.

DRAINAGE AREA.--708 mi².

PERIOD OF RECORD.--November 1980 to current year.

GAGE.--Water-stage recorder. Datum of gage is 520.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Some regulation since December 1982 by Sardis Lake (station 07335775), on Jackfork Creek 4.5 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--6 years (water years 1982-87), 996 ft³/s, 721,600 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,800 ft³/s, June 7, 1981, gage height, 20.21 ft; no flow Oct. 3-18, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 15,600 ft³/s, May 29, gage height, 15.26 ft; minimum daily discharge, 1.9 ft³/s, Aug. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.2	38	131	112	221	5180	335	89	1240	138	7.9	4.5
2	141	33	131	117	451	2780	302	82	2180	78	7.7	4.2
3	708	30	131	116	455	2940	269	79	2870	140	6.4	3.5
4	715	168	128	353	346	3240	243	78	2820	108	5.8	8.6
5	715	847	114	381	282	2960	230	71	2820	81	5.6	10
6	426	518	111	294	254	2350	211	67	2720	64	4.3	7.9
7	123	379	125	250	251	1550	199	60	2670	47	3.6	5.7
8	133	300	1310	234	254	1490	188	60	2630	34	2.9	4.7
9	91	248	1430	1410	241	1260	180	95	2600	26	2.4	3.5
10	68	218	1230	2290	213	725	169	77	2580	21	2.4	4.1
11	53	264	793	1180	199	583	156	64	2420	16	2.6	6.8
12	54	470	582	801	188	297	154	58	1670	13	2.5	189
13	59	447	447	617	182	270	253	48	1340	118	2.1	116
14	73	352	368	512	176	247	1820	51	1330	90	2.0	60
15	101	296	319	521	281	232	1400	52	1090	40	1.9	39
16	111	259	289	658	1280	216	1450	48	376	58	2.0	48
17	91	227	276	680	1020	4960	1190	60	88	182	2.7	222
18	81	204	261	2090	1050	9150	835	50	210	349	3.3	760
19	70	177	258	2220	1010	3410	802	80	694	141	3.2	351
20	59	159	255	1500	1070	2770	660	145	636	75	2.5	297
21	49	140	225	2080	819	3000	483	65	72	48	3.1	179
22	42	130	205	2320	784	2750	348	370	38	32	18	120
23	40	119	192	1810	693	2450	168	171	38	23	23	89
24	53	107	181	932	559	2050	155	475	38	17	19	65
25	91	101	173	855	1200	1620	143	1340	32	15	11	46
26	71	100	159	784	1040	1140	132	1170	24	18	7.2	33
27	48	105	149	733	1940	814	124	834	19	24	5.8	24
28	38	111	140	695	4090	503	115	4130	16	25	5.5	20
29	34	123	133	502	---	431	105	14700	15	19	4.6	108
30	36	131	128	246	---	388	96	6130	224	12	4.5	206
31	38	---	115	223	---	362	---	1580	---	9.3	4.5	---
TOTAL	4419.2	6801	10489	27516	20549	62118	12915	32379	35500	2061.3	180.0	3035.5
MEAN	143	227	338	888	734	2004	430	1044	1183	66.5	5.81	101
MAX	715	847	1430	2320	4090	9150	1820	14700	2870	349	23	760
MIN	7.2	30	111	112	176	216	96	48	15	9.3	1.9	3.5
AC-FT	8770	13490	20800	54580	40760	123200	25620	64220	70410	4090	357	6020

CAL YR 1986 TOTAL 314728.6 MEAN 862 MAX 14300 MIN 2.0 AC-FT 624300
WTR YR 1987 TOTAL 217963.0 MEAN 597 MAX 14700 MIN 1.9 AC-FT 432300

07336200 KIAMICHI RIVER NEAR ANTLERS, OK

LOCATION.--Lat 34°14'55", long 95°36'18", in SW 1/4 sec.35, T.3 S., R.16 E., Pushmataha County, Hydrologic Unit 11140105, on right bank, 50 ft downstream from bridge on U.S. Highway 271 and State Highway 2, 2.0 mi northeast of Antlers, 7.7 mi downstream from Tenmile Creek, 5.4 mi upstream from Cedar Creek and at mile 59.6.

DRAINAGE AREA.--1,138 mi².

PERIOD OF RECORD.--October 1972 to current year.

GAGE.--Water-stage recorder. Datum of gage is 419.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Some regulation since December 1982 by Sardis Lake (station 07335775), located on Jackfork Creek, 42.0 miles upstream from station. Small diversion for municipal water supply for city of Antlers upstream from station. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record, 6 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Sardis Lake, 10 years (water years 1973-82), 1,484 ft³/s, 17.70 in/yr, 1,075,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 50,000 ft³/s, Mar. 28, 1977, gage height, 38.33 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 25,700 ft³/s, May 29, gage height, 26.50 ft; minimum daily discharge, 2.8 ft³/s, Aug. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	29	188	134	291	10500	604	86	1840	106	27	13
2	18	24	166	113	327	5500	511	80	1630	151	23	11
3	40	23	160	193	511	3480	434	77	2680	171	19	9.7
4	167	1170	150	395	507	3720	378	75	2870	122	16	8.8
5	484	1210	134	516	406	3460	331	76	2760	115	14	7.4
6	444	941	117	e533	340	3140	298	75	2640	116	13	6.3
7	423	801	778	e536	316	2050	272	69	2540	98	13	5.8
8	167	358	1090	e740	350	1620	252	68	2470	84	12	5.2
9	106	265	2930	2210	308	1500	230	68	2430	71	9.7	4.7
10	87	251	2100	e5000	268	1100	214	61	2410	66	10	3.8
11	74	400	1280	e5260	256	735	200	54	2400	44	17	4.5
12	111	360	841	e5750	247	597	187	54	2050	45	14	6.3
13	115	453	621	3800	214	356	177	53	1320	55	10	6.8
14	65	380	484	782	212	311	799	46	1150	44	7.6	7.3
15	56	288	450	660	396	288	1440	56	1110	51	6.0	70
16	50	242	395	e652	939	267	1410	54	830	115	5.3	135
17	45	211	358	e644	1640	6340	1320	41	402	95	4.7	108
18	53	187	391	1670	1210	16000	968	39	212	90	4.0	90
19	e53	168	434	4500	1110	e12000	743	39	143	167	4.0	750
20	52	153	361	e5200	1280	e9000	691	39	469	e181	4.0	349
21	46	135	312	2620	920	e6000	544	39	520	142	3.9	245
22	40	121	270	2560	856	e4000	420	66	256	87	3.6	192
23	40	111	238	2440	817	3350	338	354	134	64	3.4	142
24	e40	104	216	1500	804	2920	187	374	112	49	3.2	107
25	35	1780	199	461	1080	2250	156	590	116	60	3.2	82
26	33	2390	184	462	1770	1650	141	2150	128	50	2.8	66
27	32	738	172	223	3440	1330	126	1090	89	52	4.1	54
28	41	385	161	747	6900	991	116	6300	71	45	7.7	46
29	e41	273	155	701	---	897	105	23100	59	36	13	39
30	e41	220	140	528	---	891	96	19400	92	32	14	34
31	32	---	130	310	---	711	---	3780	---	30	14	---
TOTAL	3041	14171	15605	51840	27715	106954	13688	58453	35933	2634	306.2	2609.6
MEAN	98.1	472	503	1672	990	3450	456	1886	1198	85.0	9.88	87.0
MAX	484	2390	2930	5750	6900	16000	1440	23100	2870	181	27	750
MIN	10	23	117	113	212	267	96	39	59	30	2.8	3.8
AC-FT	6030	28110	30950	102800	54970	212100	27150	115900	71270	5220	607	5180
CFSM	.09	.42	.44	1.47	.87	3.03	.40	1.66	1.05	.07	.01	.08
IN.	.10	.46	.51	1.69	.91	3.50	.45	1.91	1.17	.09	.01	.09

CAL YR 1986 TOTAL 516589.9 MEAN 1415 MAX 26700 MIN 4.0 AC-FT 1025000 CFSM 1.24 IN. 16.89
WTR YR 1987 TOTAL 332949.8 MEAN 912 MAX 23100 MIN 2.8 AC-FT 660400 CFSM .80 IN. 10.88

e Estimated

RED RIVER BASIN

309

07336600 HUGO LAKE NEAR HUGO, OK

LOCATION.--Lat 34°00'42", long 95°22'49", in NW 1/4 SW 1/4 sec.25, T.6 S., R.18 E., Choctaw County, Hydrologic Unit 11140105, on upstream face of Hugo Dam on Kiamichi River, 700 ft to left of spillway, 7.0 mi east of Hugo, and at mile 17.6.

DRAINAGE AREA.--1,709 mi².

PERIOD OF RECORD.--January 1974 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earth dam. The outlet works consists of a gate-controlled concrete gravity ogee-type weir with six 40- by 50-foot gates. Regulated storage began Jan. 18, 1974; conservation pool was first filled Mar. 12, 1974. Total capacity, 1,561,500 acre-ft, at elevation 452.5 ft, top of dam, 966,700 acre-ft, at elevation 437.5 ft, top of flood control pool. Dead storage 21,080 acre-ft, at elevation 387.5 ft, crest of gated spillway. Figures given herein represent total contents. Reservoir is used for flood control, water supply, recreation and conservation. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 577,800 acre-ft, June 17, 1982, elevation, 425.00 ft; minimum since conservation pool was first filled, 88,860 acre-ft, Nov. 15, 1978, elevation, 398.47 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 307,400 acre-ft, May 31, elevation, 413.70 ft; minimum, 145,800 acre-ft, Sept. 14, elevation, 403.60 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

401	115,000	415	334,000
407	192,700	420	447,100
410	239,900	425	577,800

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150800	158500	197800	186800	159000	224500	200900	199900	297900	203600	195500	151100
2	150600	158600	192700	186800	158500	233400	200700	199900	286800	203600	192800	150400
3	150400	158200	187700	190200	158400	229500	201300	200000	281100	204200	190300	150300
4	153800	167000	184000	191700	159300	219500	201600	200600	279400	204200	187700	149700
5	154700	172900	183100	192700	159300	206100	202100	200700	277300	203900	184700	149300
6	155100	175700	183700	191500	159300	194900	202500	200900	275000	203600	182900	148800
7	155500	177900	185600	189700	158800	184600	202500	200700	272700	203300	179400	148900
8	156600	179700	192100	187200	158500	173100	202700	200700	271500	203000	176500	148700
9	156700	180600	199400	198700	157800	164300	202700	200700	268500	202500	174500	147900
10	156700	183200	200600	211900	158000	159200	202800	200100	266700	202400	171800	147600
11	159000	185300	198700	215600	158900	158000	202400	200100	265000	201800	169300	147200
12	158900	189000	196100	214700	159800	158900	202400	200100	264300	201300	167200	146800
13	158100	187800	192400	211600	160700	159400	203000	199600	264400	203900	165800	146200
14	158100	189000	188300	205200	160900	160400	202700	199600	260200	204300	163600	146200
15	158200	190600	186900	198200	167700	161200	202700	199600	255800	204000	162000	146700
16	158100	191700	188100	193700	170400	162300	202700	199900	251300	203600	160200	147100
17	158200	191800	189900	193400	173100	205400	203100	199900	245100	203600	159600	147100
18	158100	190600	192000	202700	171600	237100	203300	199700	238600	203300	158500	148300
19	158100	188900	192700	212900	169900	257800	202100	199600	232800	203400	158200	148900
20	157800	187500	192600	212900	169300	255300	201200	199400	227400	203600	157500	149400
21	157700	186800	195100	205400	167800	246200	201300	199400	221600	203400	157700	150100
22	158100	187100	193300	195700	165700	235400	200400	199400	215300	202800	157000	149900
23	158900	188400	193300	189000	162500	226500	200700	199900	210700	202400	156200	149600
24	158900	189400	192100	185300	162300	217600	200700	202100	206700	201900	155400	149300
25	158900	200100	190000	178000	161600	206700	200400	205100	204800	201900	154600	149100
26	158900	210000	188300	171600	166500	197600	200400	207800	203000	201900	153600	148800
27	158800	213200	186800	167600	175900	194500	200700	204900	202500	201900	153100	148400
28	158500	211600	185600	164300	200100	197500	200600	213100	202100	201800	152800	147500
29	158800	207000	185600	162000	---	198400	200300	262700	201500	201900	152300	148100
30	158500	202800	185000	160700	---	198200	200000	299900	203400	199600	152100	147600
31	158500	---	186200	159200	---	198700	---	306800	---	197800	152100	---
MAX	159000	213200	200600	215600	200100	257800	203300	306800	297900	204300	195500	151100
MIN	150400	158200	183100	159200	157800	158000	200000	199400	201500	197800	152100	146200
(+)	404.57	407.68	406.56	404.62	407.50	407.40	407.49	413.66	407.72	407.34	404.10	403.74
(++)	+7,400	+44,300	-16,600	-27,000	+40,900	-1,400	+1,300	+106,800	-103,400	-5,600	-45,700	-4,500
CAL YR 1986	MAX 345400	MIN 128600	(++) +28,400									
WTR YR 1987	MAX 306800	MIN 146200	(++) -3,500									

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-FEET

07336820 RED RIVER NEAR DE KALB, TX

LOCATION.--Lat 33°41'15", long 94°41'39", Bowie County, TX-McCurtain County, Okla. state line, Hydrologic Unit 11140106, near left bank at downstream side of bridge on U.S. Highway 259, 4.8 mi upstream from North Mill Creek, 13 mi north of De Kalb, and at mile 556.9.

DRAINAGE AREA.--47,348 mi², of which 5,936 mi² probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 302.92 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. At times, flood peaks may be affected by storage in Lake Texoma (station 07331500) located approximately 169 mi upstream, and low flows may be affected by releases for generation of electric power. Storage and/or releases from Lake Hugo on the Kiamichi River, a tributary to the Red River about 45 miles upstream, may also affect flows. Gage-height telemeter located at station.

AVERAGE DISCHARGE.--19 years (water years 1969-87), 12,710 ft³/s, 9,208,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 189,000 ft³/s, Dec. 11, 1971, gage height, 31.55 ft, from graph based on gage readings; minimum, 213 ft³/s, Nov. 30, 1979, from graph based on gage readings.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1957, 205,000 ft³/s, June 1957, gage height, 32.2 ft, from rating curve extended above 186,500 ft³/s. The greatest flood since 1936 occurred in February 1938, stage unknown.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 72,300 ft³/s, June 3 at 2015 hours, gage height, 23.84 ft; minimum daily, 2,920 ft³/s, Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7350	41700	29500	9380	14200	50700	33500	5440	58700	63600	11900	4760
2	7100	34800	28700	9540	14300	57200	28600	4840	66700	64500	11300	4580
3	6870	30000	27800	10000	14400	55200	22200	4590	70700	63800	9040	4490
4	8250	31200	27200	11100	14400	57800	20300	4540	69100	58100	7760	4520
5	11800	35200	24900	11100	14200	60500	16900	4170	67900	51300	7120	4680
6	12900	30500	19600	9010	14300	63700	14600	3660	70100	49600	7460	4540
7	14300	30900	17400	7930	14100	62000	14000	3500	67700	54700	7670	4450
8	17400	29500	16100	7750	13800	58300	13300	4160	63900	56200	7620	4410
9	19400	32100	15200	9790	15600	52400	10800	6210	63100	55100	7580	3960
10	22000	33900	17600	14600	19100	47600	9290	6520	63900	54800	7530	3650
11	36900	40700	23900	22800	20000	42800	8730	5990	66500	52600	7470	2920
12	45500	40200	30300	24000	23400	42600	8430	5160	66800	44700	7490	3570
13	45600	38800	29000	22600	26300	48800	8160	4660	66200	34300	7440	4380
14	44200	36100	25900	22000	25100	50000	7330	4450	66100	30200	7150	4480
15	43000	32300	22300	21100	21900	40800	5820	4350	66300	27900	7160	4570
16	42600	25600	20000	19200	18800	31000	6120	4590	66000	19900	7060	4840
17	42800	20700	18700	17800	17800	41100	8040	4200	66900	15700	6900	6680
18	41400	18600	19500	17500	19300	64600	8400	2970	68300	14600	6340	9680
19	35800	18500	20200	21800	23100	68100	8340	3800	68400	14200	5710	9240
20	31000	18200	19800	30700	25200	60500	8250	3850	68000	13800	5600	9380
21	28900	17900	20000	31200	23900	52500	7720	3680	70800	13000	5450	10900
22	28400	16100	17800	29900	22800	50000	7300	5150	74400	12600	5370	9230
23	23600	14200	15600	29400	23500	48300	7380	3730	72600	12400	5350	7090
24	19700	14100	14500	25400	23400	43400	7400	5160	72500	12200	5310	6720
25	17600	14600	12700	20900	23400	38700	8530	4680	71700	12100	5060	7560
26	21500	21500	11700	19100	23100	37100	7170	4060	68600	12200	4450	7620
27	37100	36000	11300	18400	26100	37400	6670	4880	67000	12100	4490	7000
28	44800	36200	9190	17100	37700	36300	6500	6090	65100	11900	5130	5800
29	44800	33400	9750	15800	---	36100	6400	8470	63500	11800	5180	5980
30	43900	30200	10100	15400	---	35700	6270	24400	63200	11700	4880	4620
31	43700	---	9220	14800	---	35200	---	45600	---	11700	4730	---
TOTAL	890170	853700	595460	557100	573200	1506400	332450	207550	2020700	973300	208700	176300
MEAN	28720	28460	19210	17970	20470	48590	11080	6695	67360	31400	6732	5877
MAX	45600	41700	30300	31200	37700	68100	33500	45600	74400	64500	11900	10900
MIN	6870	14100	9190	7750	13800	31000	5820	2970	58700	11700	4450	2920
AC-FT	1766000	1693000	1181000	1105000	1137000	2988000	659400	411700	4008000	1931000	414000	349700
CAL YR 1986	TOTAL	6079870	MEAN	16660	MAX	62700	MIN	1440	AC-FT	12060000		
WTR YR 1987	TOTAL	8895030	MEAN	24370	MAX	74400	MIN	2920	AC-FT	17640000		

RED RIVER BASIN

07336820 RED RIVER NEAR DE KALB, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: October 1970 to September 1981. Sediment analyses: November 1979 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1968 to current year.

WATER TEMPERATURES: January 1968 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationship between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,140 microsiemens, July 13, 1980; minimum daily, 114 microsiemens, Oct. 31, 1984.

WATER TEMPERATURES: Maximum daily, 34.0 °C on several days during July and August 1969-70; minimum daily, 0.0 °C, Jan. 11, 1977.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,740 microsiemens, Feb. 13; minimum daily, 515 microsiemens, May 29.

WATER TEMPERATURES: Maximum daily, 30.0 °C on several days during July and August; minimum daily, 4.0 °C, Jan. 23.

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	STREAM- FLOW, INSTAN- TANEOUS (CFS)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	HARD- NESS (MG/L AS CACO3)	HARD- NESS NONCARB WH WAT TOT FLD (MG/L AS CACO3)	CALCIUM DIS- SOLVED (MG/L AS CA)
OCT											
08...	0945	14500	1260	7.90	22.0	7.5	87	1.4	260	170	68
NOV											
18...	1730	18400	1420	7.90	15.5	9.0	92	4.4	310	210	86
JAN											
07...	0905	8410	1060	7.80	8.0	11.0	94	0.3	260	140	72
FEB											
24...	1430	23300	1320	8.20	9.5	11.4	102	1.0	310	190	86
APR											
14...	1500	7430	1290	8.30	16.5	9.3	98	0.8	340	190	90
JUN											
02...	1500	69	1040	7.60	23.5	7.0	85	1.0	250	140	66
JUL											
21...	1715	13	1240	8.40	30.0	9.2	125	1.8	300	170	81

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WH WAT TOTAL FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)
OCT											
08...	21	150	4	5.3	88	160	240	0.30	2.0	700	0.180
NOV											
18...	23	180	5	5.2	102	220	280	0.30	6.1	860	0.390
JAN											
07...	19	120	3	4.2	115	140	200	0.20	7.4	630	--
FEB											
24...	24	150	4	4.4	121	200	240	0.30	7.3	780	0.390
APR											
14...	28	130	3	4.1	152	190	210	0.30	6.8	750	0.270
JUN											
02...	21	110	3	4.0	112	150	170	0.20	7.1	600	0.380
JUL											
21...	24	130	3	4.6	130	180	210	0.30	7.1	720	--

07336820 RED RIVER NEAR DE KALB, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS, TOTAL (MG/L AS P)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
OCT 08...	0.020	0.200	0.030	1.2	1.2	0.170	651	25500	72	--	--
NOV 18...	0.010	0.400	0.040	0.26	0.30	0.070	456	22700	42	--	--
JAN 07...	<0.010	0.300	0.030	0.67	0.70	0.030	427	9700	19	1	120
FEB 24...	0.010	0.400	0.020	1.3	1.3	0.080	--	--	--	--	--
APR 14...	0.030	0.300	0.060	0.74	0.80	0.070	642	12900	16	--	--
JUN 02...	0.020	0.400	0.070	1.2	1.3	0.120	2210	412	42	--	--
JUL 21...	<0.010	<0.100	<0.010	--	0.90	0.140	289	10	57	2	160

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 08...	--	--	--	--	--	--	--	--	--	--
NOV 18...	--	--	--	--	--	--	--	--	--	--
JAN 07...	<1	<10	1	47	<5	24	0.2	<1	<1	13
FEB 24...	--	--	--	--	--	--	--	--	--	--
APR 14...	--	--	--	--	--	--	--	--	--	--
JUN 02...	--	--	--	--	--	--	--	--	--	--
JUL 21...	<1	<10	1	4	<5	1	0.6	1	<1	<3

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1986 TO SEPTEMBER 1987

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (US/CM)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1986	890170	1530	879	2111000	290	686200	200	482300	340
NOV. 1986	853700	1320	754	1737000	240	546500	170	387000	300
DEC. 1986	595460	1320	754	1213000	240	378100	170	268400	300
JAN. 1987	557100	996	563	847000	170	250400	120	180000	240
FEB. 1987	573200	1450	832	1288000	270	414100	190	291800	320
MAR. 1987	1506400	1100	625	2541000	190	765800	130	548000	260
APR. 1987	332450	1340	763	685000	240	214600	170	152100	310
MAY 1987	207550	1100	623	349000	190	105800	130	75600	260
JUNE 1987	2020700	1250	709	3869000	220	1190100	160	847400	290
JULY 1987	973300	1090	615	1616000	180	478100	130	343700	260
AUG. 1987	208700	1180	670	378000	200	114200	140	81600	280
SEPT 1987	176300	1260	718	342000	220	105300	160	74900	290
TOTAL	8895030	**	**	16976000	**	5249000	**	3733000	**
WTD. AVG.	24370	1240	707	**	220	**	160	**	290

RED RIVER BASIN

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07336820 RED RIVER NEAR DE KALB, TX--Continued

SPECIFIC CONDUCTANCE, (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
EQUIVALENT MEAN

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1500	1620	1110	1570	1440	921	1460	1450	887	1130	1200	1330
2	1500	1630	1290	1610	1490	792	1480	1440	1010	1100	1150	1320
3	1440	1650	1350	1630	1470	602	1410	1420	1120	1050	1080	1300
4	1440	1720	1380	1600	1480	841	1390	1410	1120	1050	1010	1310
5	1230	1460	1390	1570	1510	957	1380	1420	1240	1060	997	1290
6	1230	1390	1420	1400	1510	1060	1360	1380	1320	1060	1020	1290
7	1430	1310	1460	1140	1530	1120	1420	1290	1400	1120	1110	1300
8	1270	1240	1490	1000	1560	1170	1430	1290	1490	1130	1110	1300
9	1500	1380	1500	1080	1580	1230	1390	1320	1520	1050	1110	1330
10	1380	1530	1510	1110	1670	1340	1280	1340	1500	1030	1120	1310
11	1420	1340	1230	710	1650	1480	1310	1360	1460	1030	1100	1320
12	1470	1340	1150	710	1720	1520	1330	1440	1410	1040	1130	1350
13	1530	1320	1200	610	1740	1410	1340	1320	1490	1040	1120	1380
14	1540	1290	1260	628	1700	1470	1330	1380	1580	1110	1160	1410
15	1560	1380	1320	665	1660	1480	1080	1400	1310	1060	1180	1340
16	1590	1380	1320	914	1620	1490	990	1400	1280	980	1200	1340
17	1590	1390	1470	1110	1580	1580	870	1400	1260	974	1220	1340
18	1580	1390	1500	1090	1630	1190	980	1400	1240	1050	1200	1330
19	1570	1390	1360	1070	1370	851	1080	1160	1230	1100	1240	1330
20	1550	1400	1310	1050	1260	699	1190	1390	1140	1140	1290	1330
21	1570	1400	1260	721	1160	753	1190	1400	1130	1220	1300	1150
22	1600	1420	1210	720	1280	807	1200	1350	1120	1300	1330	1060
23	1600	1430	1220	750	1400	861	1310	1360	1120	1240	1290	990
24	1640	1460	1380	790	1350	883	1330	1360	1140	1190	1290	941
25	1640	1420	1340	935	1340	993	1340	1370	1140	1180	1300	1230
26	1650	1050	1310	1080	1340	1050	1360	1310	1150	1170	1310	1330
27	1540	912	1270	1150	1180	1090	1370	1200	1150	1160	1310	1290
28	1550	646	1220	1180	1050	1210	1420	913	1150	1120	1330	1260
29	1560	762	1180	1340	---	1340	1430	515	1160	1150	1320	1240
30	1540	880	1430	1360	---	1460	1430	639	1160	1190	1300	1240
31	1540	---	1520	1380	---	1480	---	763	---	1210	1290	---
MEAN	1510	1330	1330	1090	1470	1130	1300	1280	1250	1110	1200	1280

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
ONCE-DAILY

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25.0	18.0	10.0	7.0	---	---	10.0	22.0	21.0	25.0	30.0	25.0
2	25.0	---	10.0	7.0	9.0	9.0	12.0	---	22.0	25.0	---	25.0
3	25.0	18.0	10.0	7.0	9.0	10.0	11.0	---	22.0	24.0	30.0	25.0
4	---	18.0	9.0	---	10.0	10.0	---	22.0	21.0	---	30.0	26.0
5	---	17.0	10.0	6.0	10.0	10.0	---	22.0	22.0	---	30.0	26.0
6	22.0	16.0	---	7.0	10.0	10.0	12.0	23.0	---	26.0	30.0	---
7	20.0	16.0	---	8.0	---	---	13.0	23.0	---	25.0	30.0	---
8	21.0	16.0	10.0	8.0	---	---	14.0	23.0	23.0	25.0	30.0	26.0
9	21.0	---	---	8.0	8.0	12.0	14.0	---	23.0	26.0	---	27.0
10	21.0	16.0	9.0	6.0	8.0	11.0	15.0	---	23.0	26.0	30.0	27.0
11	---	14.0	8.0	---	9.0	10.0	---	23.0	22.0	---	30.0	27.0
12	---	13.0	8.0	6.0	10.0	10.0	---	23.0	22.0	---	30.0	---
13	20.0	11.0	---	6.0	11.0	10.0	11.0	23.0	---	27.0	30.0	---
14	18.0	9.0	---	7.0	---	10.0	16.0	24.0	---	26.0	30.0	25.0
15	18.0	9.0	9.0	8.0	---	---	15.0	25.0	24.0	26.0	---	25.0
16	19.0	---	9.0	8.0	10.0	13.0	15.0	---	24.0	26.0	---	---
17	19.0	12.0	10.0	8.0	9.0	13.0	17.0	---	24.0	26.0	30.0	---
18	---	---	10.0	---	7.0	13.0	---	23.0	24.0	26.0	30.0	---
19	---	14.0	9.0	---	8.0	13.0	---	25.0	24.0	---	---	---
20	19.0	13.0	---	5.0	---	13.0	20.0	25.0	25.0	27.0	30.0	---
21	19.0	13.0	---	5.0	7.0	---	21.0	25.0	---	---	30.0	24.0
22	19.0	---	9.0	5.0	---	---	20.0	26.0	25.0	28.0	---	---
23	---	---	9.0	4.0	8.0	16.0	19.0	---	25.0	28.0	---	22.0
24	---	12.0	8.0	5.0	8.0	14.0	19.0	---	25.0	29.0	29.0	22.0
25	---	12.0	---	---	9.0	13.0	---	24.0	---	---	29.0	23.0
26	18.0	12.0	9.0	5.0	9.0	13.0	---	24.0	25.0	---	29.0	24.0
27	18.0	11.0	---	5.0	10.0	13.0	21.0	24.0	---	20.0	28.0	---
28	18.0	10.0	---	6.0	---	---	22.0	24.0	---	29.0	27.0	---
29	18.0	---	8.0	9.0	---	---	21.0	23.0	---	---	25.0	---
30	18.0	---	8.0	9.0	---	10.0	22.0	---	25.0	30.0	---	---
31	---	---	7.0	9.0	---	9.0	---	---	---	30.0	25.0	---
MEAN	20.0	13.5	9.0	6.5	9.0	11.5	16.5	23.5	23.5	26.5	29.0	25.0

07337300 PINE CREEK LAKE NEAR WRIGHT CITY, OK

LOCATION.--Lat 34°06'43", long 95°04'46", in NE 1/4 NW 1/4 sec.23, T.5 S., R.21 E., McCurtain County, Hydrologic Unit 11140107, at left of outlet works of dam on Little River, 4.7 mi upstream from bridge on State Highway 98, 5.0 mi northwest of Wright City, and at mile 145.3.

DRAINAGE AREA.--635 mi².

PERIOD OF RECORD.--June 1969 to current year. Prior to October 1970, published as Pine Creek Reservoir near Wright City.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by rolled earth dam; regulated storage began June 1, 1969; conservation pool was first filled Jan. 7, 1970. Total capacity, 1,136,000 acre-ft at elevation 509.0 ft, top of dam, 465,800 acre-ft at elevation 480.0 ft, crest of spillway, 53,800 acre-ft at elevation 438.0 ft top of conservation pool, 7,140 acre-ft dead storage at elevation 414.0 ft. Figures given herein represent total contents. Reservoir is designed for flood control, municipal and industrial water supply, and recreation. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 356,500 acre-ft, Nov. 4, 1984, elevation, 473.13 ft; minimum since conservation pool was first filled, 28,220 acre-ft, Oct. 21, 1972, elevation, 429.34 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 115,500 acre-ft, May 30, elevation, 450.01 ft; minimum 53,240 acre-ft, Sept. 16, elevation, 437.86 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

436	46,650	448	102,600
439	57,610	462	217,470
442	70,490	474	369,400

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HR VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	53940	54750	53790	54600	54950	83250	64080	72860	105900	73710	64640	56450
2	53830	54640	53790	54710	55520	87900	64300	72860	100800	73810	64170	56220
3	53790	54480	53830	55410	55410	89060	64720	72860	94640	74000	63650	56030
4	54130	58060	53830	56990	55100	82830	65030	72950	88730	74090	63090	55760
5	54750	61560	53860	57490	54910	75280	65450	72950	84130	74000	62790	55450
6	55520	61720	54020	55870	54640	68950	65750	72910	80320	73760	62370	55180
7	55990	60910	54790	54440	54520	64770	65930	72910	76430	73710	62070	54980
8	55870	59600	59240	54600	54170	60540	66150	72860	73330	73660	61890	54790
9	55790	57890	63740	57450	54130	56990	66470	72810	72530	73430	61560	54520
10	55450	57070	64680	63820	54330	55330	66690	72810	72380	73290	61430	54290
11	55140	58790	64380	66060	54710	54910	66830	72670	72240	73190	61270	54060
12	54980	59770	63270	66960	54830	54370	67050	72620	73140	73000	61030	53830
13	55060	58910	61560	66100	55140	54560	68550	72480	74850	73520	60820	53600
14	55450	58100	59730	64120	55330	55100	71010	72620	75530	73850	60540	52390
15	55450	57890	57850	61810	55950	55560	72670	72620	75580	74090	60300	53350
16	55490	57690	55990	60250	57260	56060	73380	72530	75730	73900	60010	53460
17	55330	57150	54910	59930	58790	84240	73850	72380	75530	73570	59730	53710
18	55060	56450	55490	61390	58300	101100	74040	72290	75430	74090	59520	56490
19	54710	55680	56180	65450	55990	107100	74040	72240	75330	74190	59320	59520
20	54370	54870	56610	65670	54790	108600	74040	72240	75230	73570	59070	60460
21	54060	54410	56880	64770	54910	104700	73810	72200	75090	72860	58790	60780
22	54100	54440	56760	62580	54950	99050	73480	72100	74850	71820	58590	60340
23	54440	54680	55330	60540	54950	93210	73290	72530	74850	70680	58260	59890
24	54640	54830	54980	58710	55560	87900	73100	73240	75040	69680	58020	59360
25	54910	55290	55140	56640	57070	82520	73100	75330	75090	69130	57730	58830
26	55180	56060	55290	54980	59520	76730	73100	76980	74900	68360	57450	58180
27	55370	55760	55370	54330	64170	72240	73290	76230	74610	67550	57220	57490
28	55600	55220	55370	54170	75980	68680	73190	78420	74230	66920	56950	56910
29	55370	54560	55250	53710	---	64940	73190	113300	74000	66290	56760	56220
30	55100	54020	55060	53900	---	63090	73100	115000	73810	65670	56840	55370
31	54870	---	54830	54210	---	63390	---	110800	---	64850	56680	---
MAX	55990	61720	64680	66960	75980	108600	74040	115000	105900	74190	64640	60780
MIN	53790	54020	53790	53710	54130	54370	64080	72100	72240	64850	56680	52390
(+)	438.29	438.07	438.28	438.12	443.15	440.40	442.55	449.29	442.70	440.74	438.76	438.42
(++)	+810	-850	+810	-620	+21,770	-12,590	+9,710	+37,700	-36,990	-8,960	-8,170	-1,310

CAL YR 1986 MAX 154200 MIN 53790 (++) +730
WTR YR 1987 MAX 115000 MIN 52390 (++) +1,310

(+) ELEVATION, IN FEET, AT END OF MONTH
(++) CHANGE IN CONTENTS, IN ACRE-FEET

RED RIVER BASIN

07337500 LITTLE RIVER NEAR WRIGHT CITY, OK

LOCATION.--Lat 34°04'10", long 95°02'47", in NE 1/4 NW 1/4 sec.6, T.6 S., R.22 E., McCurtain County, Hydrologic Unit 11140107, on left bank on downstream side of bridge on State Highway 98, 1.8 mi upstream from White Oak Creek, 2.0 mi west of Wright City, 4.7 mi downstream from Pine Creek Lake, and at mile 140.6.

DRAINAGE AREA.--645 mi².

PERIOD OF RECORD.--October 1929 to September 1931, October 1944 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 346.76 ft above National Geodetic Vertical Datum of 1929. Oct. 12, 1929 to Sept. 30, 1931, nonrecording gage at railroad bridge 1.0 mi downstream at datum 4.15 ft higher. Dec. 6, 1944 to July 30, 1951, nonrecording gage at present site and datum.

REMARKS.--Records good. Except for 10 mi² intervening area, flow completely regulated since June 1969 by Pine Creek Lake (station 07337300). U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 5 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Pine Creek Lake, 26 years (water years 1930-31, 1945-68), 907 ft³/s, 656,600 acre-ft/yr; since regulation by Pine Creek Lake, 17 years (water years 1971-87), 902 ft³/s, 653,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 78,200 ft³/s, May 6, 1961, gage height, 45.60 ft; maximum gage height, 45.77 ft, Sept. 16, 1950; no flow at times in 1930, 1954, 1956, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,380 ft³/s, Mar. 5, gage height, 19.20 ft; minimum daily discharge, 7.5 ft³/s, May 21-22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	186	655	233	239	778	221	16	3430	196	237	68
2	23	151	487	225	241	1010	73	18	3370	194	193	67
3	16	134	385	160	448	3190	44	18	3350	199	182	67
4	27	211	315	124	565	4450	34	18	3310	197	178	63
5	58	384	272	125	603	5350	33	19	2860	205	167	61
6	31	955	150	779	617	4620	33	18	2180	206	113	61
7	18	1300	59	1090	554	2750	31	17	2070	192	83	62
8	81	1390	55	927	505	2630	30	19	1920	117	75	63
9	164	1410	340	879	456	2480	29	16	746	91	68	65
10	214	1410	1200	875	300	1810	24	16	203	84	67	67
11	237	1170	1490	830	205	1230	e20	16	196	81	67	64
12	249	959	1560	857	162	656	e18	16	225	79	67	64
13	253	1220	1590	1470	146	436	e17	16	86	89	68	72
14	257	1360	1600	1720	141	238	e16	14	67	90	67	73
15	256	1060	1610	1780	159	116	15	14	67	106	67	82
16	255	913	1620	1760	155	70	10	12	152	267	67	96
17	257	844	1500	1320	205	e69	25	11	176	331	64	81
18	257	805	831	1160	844	e68	162	10	182	352	64	88
19	257	776	717	1120	1460	263	222	9.1	170	362	65	89
20	257	761	650	1190	1590	405	233	8.9	176	375	63	82
21	254	728	607	1720	913	2910	242	7.5	182	519	63	87
22	159	524	602	1920	729	3600	224	7.5	182	576	62	202
23	102	404	930	1960	673	3580	216	7.5	176	589	60	302
24	91	328	989	1790	677	3560	213	16	203	592	60	339
25	72	294	500	1680	681	3500	62	21	195	594	59	355
26	57	289	350	1620	777	3440	27	52	189	593	60	369
27	44	462	291	1320	1400	2930	20	525	189	570	59	383
28	41	588	268	897	1440	2260	19	866	191	404	59	387
29	106	642	258	721	---	2220	19	1110	189	345	64	386
30	181	669	250	595	---	1600	17	1910	198	336	63	371
31	226	---	242	355	---	291	---	3380	---	322	66	---
TOTAL	4542	22327	22373	33202	16885	62510	2349	8204.5	26830	9253	2697	4606
MEAN	147	744	722	1071	603	2016	78.3	265	894	298	87.0	154
MAX	257	1410	1620	1960	1590	5350	242	3380	3430	594	237	387
MIN	16	134	55	124	141	68	10	7.5	67	79	59	61
AC-FT	9010	44290	44380	65860	33490	124000	4660	16270	53220	18350	5350	9140

CAL YR 1986 TOTAL 343137 MEAN 940 MAX 5940 MIN 15 AC-FT 680600
WTR YR 1987 TOTAL 215778.5 MEAN 591 MAX 5350 MIN 7.5 AC-FT 428000

e Estimated

07337900 GLOVER CREEK NEAR GLOVER, OK

LOCATION.--Lat 34°05'51", long 94°54'07", in NW 1/4 NE 1/4 sec.28, T.5 S., R.23 E., McCurtain County, Hydrologic Unit 11140107, on right downstream end of bridge on State Highways 3 and 7, 2.0 mi north of Glover, 11.0 mi northwest of Broken Bow, and at mile 9.2.

DRAINAGE AREA.--315 mi².

PERIOD OF RECORD.--October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 378.70 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 4 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--26 years, 452 ft³/s, 19.49 in/yr, 327,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 98,600 ft³/s, Dec. 10, 1971, gage height, 29.72 ft; no flow at times in several years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1961 reached a stage of 28.84 ft, from floodmark. Flood in 1908 was higher than in May 1961, from information provided by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft³/s and maximum (*):

Date	Time	Discharge (ft ³ /s)	Gage Height (ft)	Date	Time	Discharge (ft ³ /s)	Gage Height (ft)
Mar. 17	1900	*17,700	*13.49	No other peak above base discharge.			

Minimum daily discharge, 2.1 ft³/s on Sept. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	71	187	103	133	3480	159	23	304	278	11	6.5
2	14	61	163	81	225	1290	138	21	229	263	11	6.0
3	13	51	143	149	277	742	122	20	179	455	10	5.1
4	159	1520	123	315	246	533	111	19	303	387	9.5	4.6
5	2260	2200	105	310	212	428	100	18	224	267	8.9	3.8
6	573	785	94	275	187	356	89	17	148	191	8.2	3.3
7	313	520	100	258	172	306	84	18	106	138	7.5	3.0
8	241	423	597	235	155	269	76	18	81	105	6.6	3.2
9	184	358	2360	880	138	233	69	22	67	88	5.9	3.7
10	158	372	919	1220	125	198	64	38	61	75	5.8	3.3
11	137	1340	595	672	113	170	62	28	57	64	7.4	2.7
12	121	811	462	503	105	150	57	21	59	57	6.9	2.2
13	561	535	377	420	100	131	260	18	418	59	5.9	2.2
14	377	420	318	360	93	116	917	17	285	63	5.0	2.1
15	287	353	295	316	131	107	324	16	171	63	4.3	3.5
16	228	309	299	288	369	98	229	16	106	61	3.6	6.5
17	169	275	295	273	416	7740	160	16	77	62	5.6	6.1
18	131	241	371	373	344	4070	123	14	61	52	14	96
19	103	208	465	627	294	1200	98	13	54	44	12	1200
20	82	176	411	513	266	671	81	18	51	37	11	349
21	68	160	356	437	263	487	68	23	46	33	9.4	202
22	56	143	313	376	267	398	58	20	42	31	8.2	127
23	54	133	285	326	257	348	50	32	43	30	7.1	87
24	57	147	261	293	312	398	45	47	62	71	6.0	67
25	192	205	233	270	570	358	42	129	144	276	5.0	52
26	238	293	200	238	701	305	37	167	132	73	4.3	43
27	192	299	175	207	1650	278	33	155	89	39	3.7	36
28	154	269	153	184	3360	258	31	155	65	26	3.7	31
29	127	243	137	166	---	235	29	1600	50	19	5.0	27
30	104	213	124	149	---	203	25	793	69	14	6.0	24
31	86	---	112	113	---	181	---	436	---	12	6.4	---
TOTAL	7455	13134	11028	10930	11481	25737	3741	3948	3783	3433	224.9	2408.8
MEAN	240	438	356	353	410	830	125	127	126	111	7.25	80.3
MAX	2260	2200	2360	1220	3360	7740	917	1600	418	455	14	1200
MIN	13	51	94	81	93	98	25	13	42	12	3.6	2.1
AC-FT	14790	26050	21870	21680	22770	51050	7420	7830	7500	6810	446	4780
CFSM	.76	1.39	1.13	1.12	1.30	2.64	.40	.40	.40	.35	.02	.25
IN.	.88	1.55	1.30	1.29	1.36	3.04	.44	.47	.45	.41	.03	.28

CAL YR 1986 TOTAL 150323.3 MEAN 412 MAX 9620 MIN 3.5 AC-FT 298200 CFSM 1.31 IN. 17.75
WTR YR 1987 TOTAL 97303.7 MEAN 267 MAX 7740 MIN 2.1 AC-FT 193000 CFSM .85 IN. 11.49

LOCATION.--Lat 33°56'28", long 94°45'30", in SE 1/4 SE 1/4 sec.14, T.7 S., R.24 E., McCurtain County, Hydrologic Unit 11140107, on left bank at downstream side of bridge on U.S. Highway 70 just downstream from Lukfata Creek, 5.0 mi northeast of Idabel, and at mile 103.4.

PERIOD OF RECORD.--October 1946 to current year.

REVISÉD RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 312.08 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1946 to Oct. 26, 1950, and for stages below 9.0 ft Oct. 26, 1950 to Oct. 10, 1951, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. Flow regulated since June 1969 by Pine Creek Lake (station 07337300), 41.9 mi upstream. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 7 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Pine Creek Lake, 22 years (water years 1947-68), 1,622 ft³/s, 1,174,000 acre-ft/yr; since regulation by Pine Creek Lake, 17 years (water years 1971-87), 1,719 ft³/s, 1,245,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 103,000 ft³/s, Dec. 10, 1971, gage height, 39.39 ft; minimum discharge, 0.4 ft³/s, Sept. 15-16, and Sept. 21 to Oct. 1, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in February 1938 reached a stage of 39.7 ft, from information provided by local resident, discharge, 86,000 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,100 ft³/s, Mar. 18, gage height, 25.66 ft; minimum daily discharge, 53 ft³/s, Sept. 6, 7, 13.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	135	378	1090	452	422	6450	702	104	3880	324	357	60
2	75	253	822	435	588	5210	586	100	3810	572	259	57
3	66	198	534	496	907	3810	424	99	3770	725	214	56
4	74	419	479	809	1150	4550	369	98	3770	870	207	59
5	1530	3780	451	833	1040	5270	339	95	3690	714	205	56
6	1770	3500	413	1080	981	5740	316	92	2920	562	193	53
7	777	2610	281	1670	871	5020	291	92	2340	464	121	53
8	509	2180	422	1430	736	3580	270	92	2250	389	81	54
9	531	1980	1750	1570	697	3210	258	123	1770	258	73	56
10	548	2130	3690	3140	573	2640	245	123	725	187	74	57
11	508	4360	3220	2930	385	1600	228	102	379	160	69	56
12	1080	3720	2650	2070	354	895	209	101	343	145	72	54
13	950	2530	2350	2110	339	557	191	97	598	177	73	53
14	973	2270	2170	2530	334	499	869	91	919	179	73	54
15	749	1810	2110	2450	643	346	1060	88	560	166	72	57
16	619	1320	2170	2370	969	282	610	87	394	163	72	78
17	532	1220	2180	1960	1070	5070	446	110	378	347	69	77
18	478	1150	2020	1750	1400	10900	387	108	336	395	65	71
19	440	1080	1930	2260	2010	9970	488	94	304	390	66	392
20	403	1030	1680	2300	2300	5280	464	84	294	384	68	934
21	375	990	1390	2550	1790	3030	435	76	286	429	72	473
22	356	818	1200	2810	1200	4070	411	93	266	634	70	301
23	217	521	1330	4070	1140	4380	375	112	257	657	67	438
24	160	580	1670	2400	1220	4420	358	434	366	663	65	454
25	163	766	1130	2110	1760	4410	347	448	468	765	60	422
26	207	1010	687	2030	2070	4240	215	454	387	928	58	402
27	295	1140	619	1730	3730	4050	145	740	389	771	62	387
28	265	1320	571	1140	5240	3350	127	1410	335	649	62	379
29	226	1220	529	871	---	2820	115	1950	294	425	61	368
30	356	1130	497	837	---	2770	111	3420	281	383	61	355
31	403	---	472	626	---	1620	---	3630	---	372	58	---
TOTAL	15770	47413	42507	55819	35919	120039	11391	14747	36759	14247	3179	6366
MEAN	509	1580	1371	1801	1283	3872	380	476	1225	460	103	212
MAX	1770	4360	3690	4070	5240	10900	1060	3630	3880	928	357	934
MIN	66	198	281	435	334	282	111	76	257	145	58	53
AC-FT	31280	94040	84310	110700	71250	238100	22590	29250	72910	28260	6310	12630
CAL YR 1986	TOTAL 619944		MEAN 1698	MAX 11000								

07338900 BROKEN BOW LAKE NEAR BROKEN BOW, OK

LOCATION.--Lat 34°08'35", long 94°41'00", in SW 1/4 sec.3, T.5 S., R.25 E., McCurtain County, Hydrologic Unit 11140108, at intake structure on upstream side of dam on Mountain Fork, 9.0 mi northeast of Broken Bow, and at mile 20.3.

DRAINAGE AREA.--754 mi².

PERIOD OF RECORD.--October 1968 to current year. Prior to October 1970, published as Broken Bow Reservoir near Broken Bow.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Reservoir is formed by a rolled earth and gravel structure. Outlet works consists of power-generated turbines and a concrete ogee-type weir controlled by eight 40- by 40-foot taintor gates. Regulated storage began Oct. 3, 1968; conservation pool was first filled Jan. 30, 1969. Total capacity, 1,368,000 acre-ft at elevation 627.5 ft, top of flood pool and spillway gates, 918,100 acre-ft at elevation 599.5 ft, top of power pool, and 448,200 acre-ft at elevation 559.0 ft, bottom of power pool. Figures given herein represent total contents. Reservoir is used for flood control, power development and water supply. U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Records provided by U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,244,400 acre-ft, Nov. 3, 4, 1984, elevation, 620.40 ft; minimum since conservation pool was first filled, 672,000 acre-ft, Oct. 21, 1972, elevation 580.48 ft.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 981,400 acre-ft, Mar. 20, elevation 603.87 ft; minimum 820,900 acre-ft, Sept. 30, elevation, 592.41 ft.

Capacity table (elevation, in feet, and contents, in acre-ft):

590	789,300	607	1,028,500
594	842,100	615	1,154,600
598	897,000	621	1,254,600

RESERVOIR STORAGE, (AC-FT), WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
2400-HRS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	863600	879000	921200	918500	918400	922300	904400	870900	882200	880300	858900	835200
2	863600	879000	921100	918200	916500	929500	896800	870800	882800	880700	858700	833900
3	862600	878100	920400	920200	916000	929000	891900	870900	884300	880300	857400	833800
4	869500	887200	918800	922600	915500	926800	886000	870200	885000	880500	857000	832300
5	875200	894200	917900	922900	915400	923800	880500	870100	885100	880400	855500	832200
6	877000	898200	918500	922500	914500	919800	875700	869900	885300	879400	855200	831900
7	877900	900000	919900	921200	913800	917500	875900	869900	885700	879400	853400	831000
8	878500	902100	924000	919400	916100	916000	876400	869000	885100	878300	853000	830700
9	878900	903400	928300	922300	914100	909300	877100	869000	884400	878200	852700	829500
10	878600	907500	925600	926000	913300	903800	876000	868800	884400	877000	852300	828800
11	878500	911700	921500	926600	912000	898900	876600	868000	885000	877000	852100	828200
12	880000	914100	919400	924800	910600	897900	877100	868000	885300	876800	850300	827900
13	879700	912600	921600	923300	909700	896900	876000	867100	885700	876700	850000	827600
14	880300	907800	923300	922100	909600	896300	876000	867100	886100	876600	849000	826800
15	880100	909000	921500	917200	913300	896800	876300	866200	886000	875000	848800	827200
16	880000	910700	920600	916400	917000	896400	876700	866900	885100	874900	848400	827100
17	879900	911800	920500	918200	919200	950800	876700	867100	884300	873500	847500	826300
18	879900	913000	919200	920400	915700	971400	876800	864700	884100	873400	846400	827900
19	879900	912600	918500	920800	911300	979200	876800	863200	883200	873400	845200	828200
20	879000	913600	920400	920400	907800	977600	877200	861300	883200	872400	843700	828400
21	878900	912700	922200	919600	903800	971800	875900	861200	883200	872300	842300	828300
22	878100	913600	921600	917700	901600	966600	875000	861600	882200	871200	842100	826800
23	878600	914400	919800	917700	894600	962200	875000	862600	882500	871200	841800	824300
24	878900	914400	917900	919600	892800	954600	874200	862800	881700	870400	840600	824100
25	879000	915700	918500	920800	892100	945600	874100	864200	881800	870800	840200	823400
26	879700	917100	917500	918500	894600	935500	874100	864500	880600	870500	838900	823100
27	880100	918700	918100	917900	899800	925900	873700	865200	880500	868800	838700	823100
28	880100	918800	918800	917900	910200	925000	873200	871300	880100	865300	836900	822700
29	880000	920100	917800	917400	---	924200	872000	877700	878900	863000	836900	822100
30	879900	921500	918400	916000	---	915700	871700	881400	880000	860400	836400	820900
31	879000	---	917900	916400	---	910000	---	883200	---	859000	835400	---
MAX	880300	921500	928300	926600	919200	979200	904400	883200	886100	880700	858900	835200
MIN	862600	878100	917500	916000	892100	896300	871700	861200	878900	859000	835400	820900
(+)	596.71	599.74	599.49	599.38	598.94	598.93	596.18	597.01	596.78	595.25	593.50	592.41
(++)	+14,700	+42,500	-3,600	-1,500	-6,200	-200	-38,300	+11,500	-3,200	-21,000	-23,600	-14,500

CAL YR 1986 MAX 1033000 MIN 862600 (++) +200

WTR YR 1987 MAX 979200 MIN 820900 (++) -43,400

(+) ELEVATION, IN FEET, AT END OF MONTH

(++) CHANGE IN CONTENTS, IN ACRE-Feet

07339000 MOUNTAIN FORK NEAR EAGLETOWN, OK

LOCATION.--Lat 34°02'30", long 94°37'15", in SE 1/4 SE 1/4 sec.7, T.6 S., R.26 E., McCurtain County, Hydrologic Unit 11140108, near center of span on downstream side of pier of bridge on U.S. Highway 70, 2.0 mi west of Eagletown, 10.7 mi downstream from Broken Bow Dam, and at mile 8.9.

DRAINAGE AREA.--787 mi².

PERIOD OF RECORD.--March 1924 to December 1925, October 1929 to current year. Published as Mountain Fork River near Broken Bow 1924-25 and as Mountain Fork River near Eagletown 1929-60. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area. WSP 1241: 1924-26, 1930 (M), 1936-37 (M), 1938, 1939 (M) 1942 (M).

GAGE.--Water-stage recorder. Datum of gage is 333.87 ft above National Geodetic Vertical Datum of 1929. See WSP 1920 for history of changes prior to July 23, 1950.

REMARKS.--No estimated daily discharges. Records good. Except for 33 mi² intervening area, flow completely regulated since October 1968 by Broken Bow Lake (station 07338900). U.S. Army Corps of Engineers' satellite telemeter at station.

COOPERATION.--Gage-height record and 5 discharge measurements provided by U.S. Army Corps of Engineers; records computed by U.S. Geological Survey.

AVERAGE DISCHARGE.--Prior to regulation by Broken Bow Lake, 40 years (water years 1925, 1930-68), 1,291 ft³/s, 934,600 acre-ft/yr; since regulation by Broken Bow Lake, 18 years (water years 1970-87), 1,398 ft³/s, 1,013,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 101,000 ft³/s, May 20, 1960, gage height, 26.73 ft; from rating curve extended above 65,000 ft³/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Aug. 18-19, 1915, reached a stage of 26.4 ft, from information provided by local resident, discharge, 92,500 ft³/s.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,350 ft³/s, Mar. 17, gage height, 7.73 ft; minimum daily discharge, 162 ft³/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	215	359	308	215	221	4280	3580	226	462	196	528	187
2	467	191	336	316	939	731	3490	326	580	346	183	315
3	262	450	826	233	1650	2880	2650	221	548	201	184	190
4	341	428	884	519	925	3400	2860	212	512	380	344	473
5	210	374	969	1510	957	3260	3070	264	277	197	248	205
6	189	439	272	1650	906	3160	3790	243	368	190	412	181
7	176	212	202	1420	753	3050	748	355	198	260	403	218
8	162	497	599	1550	343	1900	245	291	220	263	462	191
9	176	202	1910	1250	814	3700	224	439	505	324	176	384
10	176	395	1980	1390	872	3510	532	216	517	273	180	359
11	262	1410	2860	2070	1180	3080	311	208	202	383	300	305
12	372	1230	2840	1990	1220	1610	233	377	263	190	324	210
13	254	1010	550	2410	870	768	583	292	382	187	502	191
14	387	1030	211	1730	552	1110	318	369	199	239	236	191
15	255	729	1260	291	661	336	236	240	203	248	329	265
16	440	399	1720	1290	1300	625	342	332	434	409	175	209
17	227	190	1520	1280	1040	3930	271	196	562	243	169	411
18	325	195	1630	1290	2500	1500	411	696	419	352	287	412
19	190	194	1930	1170	2940	555	240	918	272	183	495	231
20	179	309	481	499	3160	2430	229	873	358	177	686	194
21	284	406	250	217	2950	4970	400	815	195	236	609	182
22	206	255	736	1320	2730	3880	533	442	217	208	597	455
23	328	194	1520	1140	3730	3930	501	501	363	286	172	1300
24	225	295	1860	604	3220	5510	313	209	220	217	249	335
25	412	291	744	217	2420	6010	327	232	348	294	252	326
26	201	503	850	755	2530	6010	230	204	235	179	230	225
27	186	298	300	1160	2430	6000	238	366	320	338	184	187
28	202	512	202	869	4350	2540	307	615	187	1260	608	176
29	193	288	679	608	---	965	238	563	187	1270	199	193
30	306	198	220	905	---	3530	629	213	252	1500	177	281
31	191	---	301	373	---	3200	---	194	---	1060	249	---
TOTAL	7999	13483	30950	32241	48163	92360	28079	11648	10005	12089	10149	8982
MEAN	258	449	998	1040	1720	2979	936	376	333	390	327	299
MAX	467	1410	2860	2410	4350	6010	3790	918	580	1500	686	1300
MIN	162	190	202	215	221	336	224	194	187	177	169	176
AC-FT	15870	26740	61390	63950	95530	183200	55690	23100	19840	23980	20130	17820

CAL YR 1986 TOTAL 408766 MEAN 1120 MAX 7860 MIN 124 AC-FT 810800
WTR YR 1987 TOTAL 306148 MEAN 839 MAX 6010 MIN 162 AC-FT 607200

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FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	2.54×10^1	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^0	kilometers (km)
<i>Area</i>		
acres	4.047×10^3	square meters (m ²)
	4.047×10^{-1}	square hectometers (hm ²)
	4.047×10^{-3}	square kilometers (km ²)
square miles (mi ²)	2.590×10^0	square kilometers (km ²)
<i>Volume</i>		
gallons (gal)	3.785×10^0	liters (L)
	3.785×10^0	cubic decimeters (dm ³)
	3.785×10^{-3}	cubic meters (m ³)
million gallons	3.785×10^3	cubic meters (m ³)
	3.785×10^{-3}	cubic hectometers (hm ³)
cubic feet (ft ³)	2.832×10^1	cubic decimeters (dm ³)
	2.832×10^{-2}	cubic meters (m ³)
cfs-days	2.447×10^3	cubic meters (m ³)
	2.447×10^{-3}	cubic hectometers (hm ³)
acre-feet (acre-ft)	1.233×10^3	cubic meters (m ³)
	1.233×10^{-3}	cubic hectometers (hm ³)
	1.233×10^{-6}	cubic kilometers (km ³)
<i>Flow</i>		
cubic feet per second (ft ³ /s)	2.832×10^1	liters per second (L/s)
	2.832×10^1	cubic decimeters per second (dm ³ /s)
	2.832×10^{-2}	cubic meters per second (m ³ /s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm ³ /s)
	6.309×10^{-5}	cubic meters per second (m ³ /s)
million gallons per day	4.381×10^1	cubic decimeters per second (dm ³ /s)
	4.381×10^{-2}	cubic meters per second (m ³ /s)
<i>Mass</i>		
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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