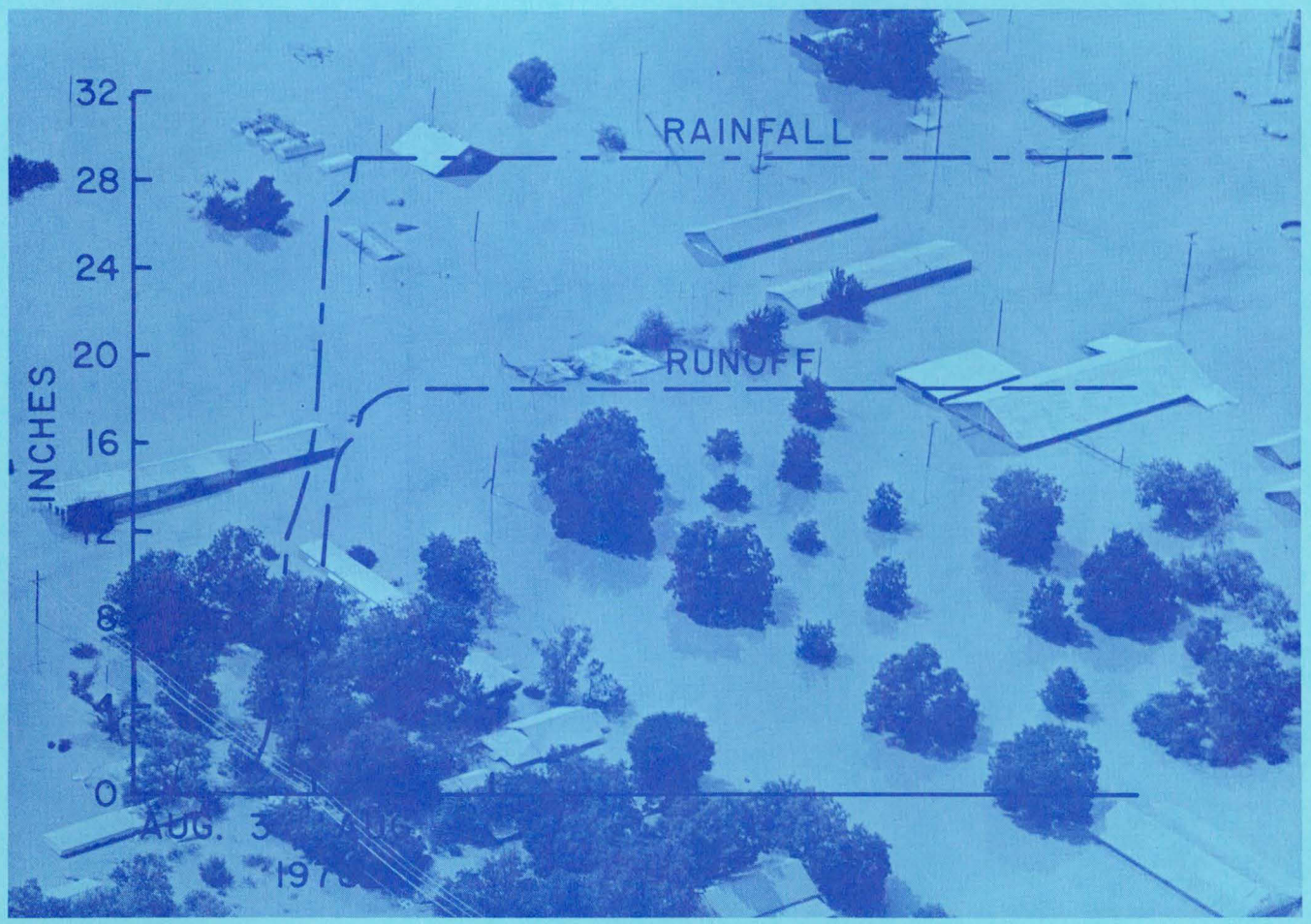
Floods in Central Texas, August 1978

U.S. GEOLOGICAL SURVEY
Open-File Report 79-682



Prepared in cooperation with the State of Texas and other agencies

Cover photograph, Brazos River in flood at Graham,
by Randy Black, Dallas, Texas.

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By E.E. Schroeder, B.C. Massey, and Kidd M. Waddell

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April 1979

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FLOODS IN CENTRAL TEXAS
AUGUST 1978

By
E. E. Schroeder, B. C. Massey
and Kidd M. Waddell

ABSTRACT

Catastrophic floods, which resulted in millions of dollars in property damages and the loss of 33 lives, occurred in Central Texas during August 1-4, 1978, as a result of intense rainfall produced by the remnants of tropical storm Amelia. Rainfall in excess of 30 inches was unofficially reported at several locations, while the highest 24-hour amount recorded by the National Weather Service was 29.05 inches at Albany in Shackelford County.

Major flooding occurred on the Medina River and tributaries above Medina Lake and on the Guadalupe River and tributaries above Canyon Lake. Minor to severe flooding occurred on the tributaries of the Nueces River, on the Clear Fork Brazos River and tributaries, and on the Llano and Pedernales Rivers, which are tributaries of the Colorado River.

Peak discharges at several streamflow stations exceeded the historic peaks, and the flood magnitude and frequency data for the Guadalupe River above Canyon Lake, the Medina River near Pipe Creek, and Clear Fork Brazos River indicate that the August 1978 flood had a recurrence interval in excess of 100 years. The highest unit discharge observed during this flood was 3,010 cubic feet per second from a 14.1-square-mile drainage area of Spring Creek, which is tributary to the Pedernales River.

INTRODUCTION

Purpose and Scope of This Report

The purpose of this report, which was prepared in cooperation with the State of Texas and other agencies, is to present the available flood data in a form that should be of value in assessing the risks involved in developing the flood plains of streams that are subject to chronic flooding. The report presents a description of the storm, a description of the flood by basins, peak stages and discharges, discharge-hydrograph data, flood-frequency estimates, damage estimates, a discussion of the changes in water quality in selected streams and reservoirs in the Brazos River basin, and a discussion of water-level changes in observation wells in the Edwards aquifer.

Definitions of Terms and Abbreviations

Technical terms and abbreviations, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to gaging stations where a continuous record of discharge is obtained.

Crest-stage station is a particular site where limited streamflow data on peak stages are collected systematically over a period of years for use in hydrologic analyses.

Cubic foot per second (ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second. This rate is equivalent to a 24-hour volume of 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons.

Cubic foot per second per square mile [$(ft^3/s)/mi^2$] 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.

Acre-foot is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet, or 325,851 gallons. The term is generally used in relation to storage and volume of runoff.

Runoff, in inches, is the depth to which a drainage area would be covered if all the runoff for a given time period were uniformly distributed on its surface.

Drainage area of a stream at a specified location is that area, measured in a horizontal plane, that is enclosed by a topographic divide so that direct surface runoff from precipitation normally would drain by gravity into the stream above the specified point. Drainage area is expressed in square miles.

Contents is the volume of water in the reservoir or lake and is expressed in acre-feet. Volume is computed on the basis of a level pool and does not include bank storage.

Time of day is expressed in 24-hour time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. All times noted are Central daylight time.

Specific conductance is a measure of the ability of water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and chemical

types of ions in solution, it can be used to determine the approximate concentration of dissolved solids in the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in micromhos per centimeter at 25°C). This relation is not constant from stream to stream, and it may vary in the same stream with changes in the composition of the water.

pH of a solution is a measure of effective hydrogen-ion concentration and is expressed as the negative logarithm of the hydrogen-ion activity in moles per liter. The degree of acidity or alkalinity of water, as indicated by the pH, is related to the corrosive properties of water. A pH of 7.0 indicates that the water is neither acid or alkaline. pH readings progressively lower than 7.0 denote increasing acidity and those progressively higher than 7.0 denote increasing alkalinity.

Dissolved oxygen (DO) content of water in equilibrium with air is a function of atmospheric pressure, dissolved-solids content, and temperature of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved-solids concentration. Photosynthesis and respiration may cause diurnal variations in dissolved-oxygen content in water from streams.

Metric Conversions

The "inch-pound system" units used in this report may be converted to metric units by the following factors:

From		Multiply by	To obtain	
Unit	Abbreviation		Unit	Abbreviation
acre-foot	--	1,233	cubic meter	m^3
cubic foot	ft^3	28.32	liter	--
cubic foot per second	ft^3/s	28.32	liter per second	L/s
cubic foot per second per square mile	$(ft^3/s)/mi^2$	.01093	cubic meter per second per square kilometer	$(m^3/s)/km^2$
foot	--	.3048	meter	m
gallon	--	3.785	liter	--
inch	--	2.54	centimeter	cm
square mile	--	2.590	square kilometer	km^2

DESCRIPTION OF THE STORM

Tropical storm Amelia moved inland on the lower Texas coast during the early morning hours of Monday, July 31, 1978. The position of the poorly defined storm center was estimated at latitude 28.5°N and longitude 97.8°W at 0800 hours Monday. At 1100 hours, the position of the center

had moved one-half degree due north to 29.0°N. This was the last official position report issued.

The remnants of the storm drifted westward and northward across Bexar County and the Edwards Escarpment into south-central Texas, where torrential rains occurred in Bandera, Kendall, and Kerr Counties. With its upper-level circulation apparently still intact, the storm system moved northward across the Pedernales, Llano, San Saba, and Colorado River basins, where some small areas received as much as 20 inches of rainfall. The storm continued to move northward into north-central Texas, where it stalled in the upper Brazos River basin and produced rainfall amounts that were comparable to the amounts that occurred earlier in south-central Texas. The magnitude of the storm in north-central Texas was greater than that of any previously recorded storm.

A more complete description of the storm will be presented in reports being prepared by the U.S. Geological Survey and the National Weather Service.

DESCRIPTION OF THE FLOODS

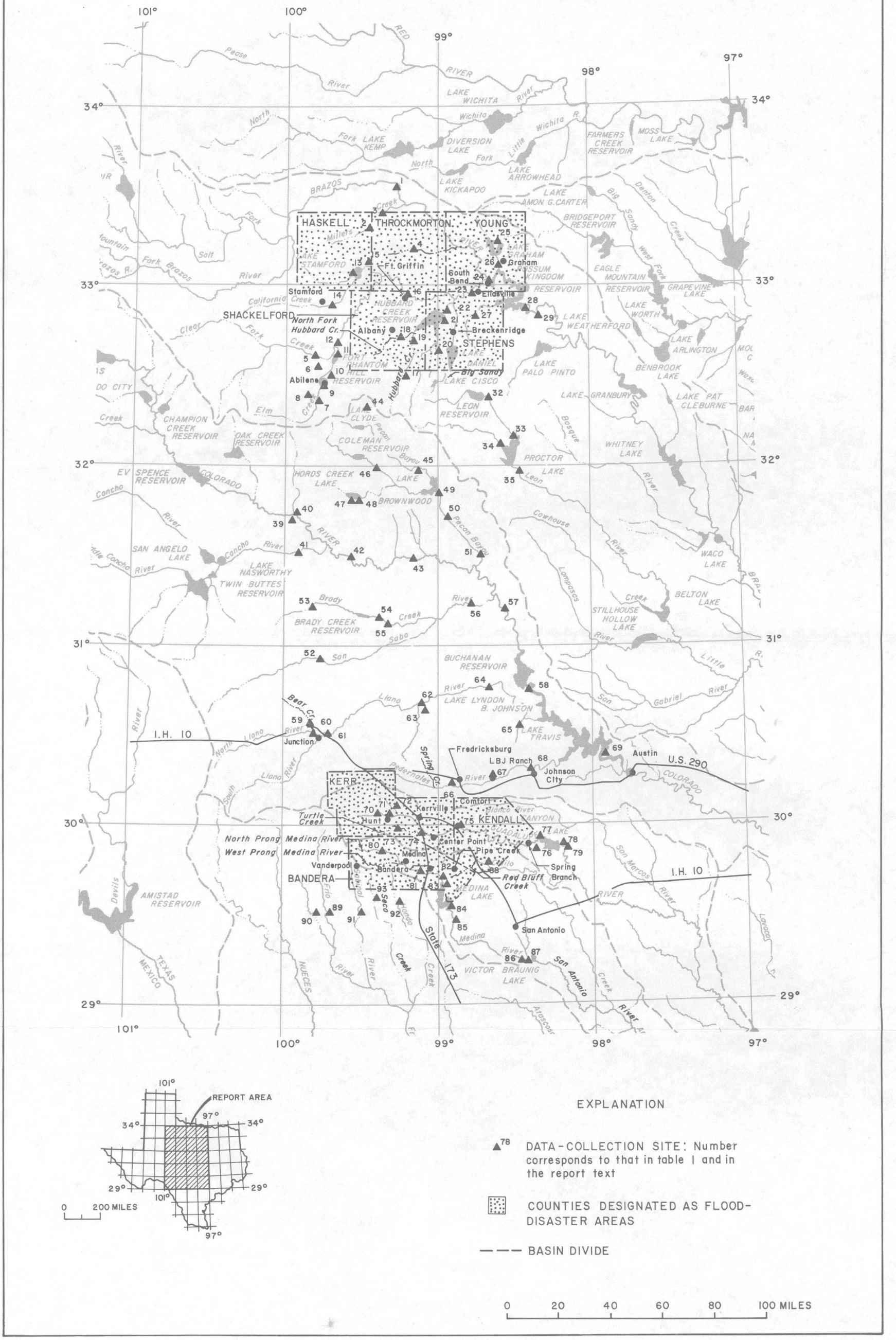
Flooding to some degree occurred in an area of approximately 25,000 square miles in parts of the Nueces, Guadalupe, Colorado, and Brazos River basins. A summary of flood stages and discharges for selected sites is given in table 1; the locations of the sites are shown on figure 1. The locations of discontinued stream-gaging stations and miscellaneous discharge-measurement sites are given in table 2. Station descriptions and discharge data are given in table 6.

Nueces River Basin

During the early part of the storm on August 1, 1978, substantial rain fell on the headwaters of the Sabinal River, Hondo Creek, and Seco Creek in the Nueces River basin. The greatest 24-hour amount recorded by the National Weather Service in this basin was at Vanderpool in Bandera County, where a total of 11.53 inches fell in the 24-hour period ending at 0700 hours on August 2, 1978. Sharp rises occurred on many streams, but flooding was minor.

Guadalupe River Basin

The drainage area of the Guadalupe River above Canyon Lake received the first of the heavy rainfall during the night of August 1 and the morning of August 2. The storm cell, which was centered just west of Kerrville in Kerr County, produced rainfall amounts that resulted in severe flooding on the Guadalupe River and all of its local tributaries. On August 2, the flood crest on the Guadalupe River at Comfort (map no. 75 on fig. 1) exceeded by 0.6 foot the previously known maximum, which occurred in July 1869. When the crest reached the Spring Branch gaging station (no. 76) on August



EXPLANATION

▲78 DATA-COLLECTION SITE: Number corresponds to that in table 1 and in the report text

COUNTIES DESIGNATED AS FLOOD-DISASTER AREAS

——— BASIN DIVIDE

0 20 40 60 80 100 MILES

FIGURE 1.-Locations of streamflow-data sites

3, the peak discharge had attenuated from 240,000 ft^3/s at Comfort to 158,000 ft^3/s at Spring Branch (fig. 2). Secondary peaks occurred at both stations as a result of inflow from tributary streams.

Canyon Lake contained all of the runoff from this flood, so no damage occurred below Canyon Lake. The contents of Canyon Lake increased from 362,200 acre-feet at 2400 hours on August 1 to 588,400 acre-feet at 2400 hours on August 4. This was the maximum storage since closure of the dam on July 21, 1962.

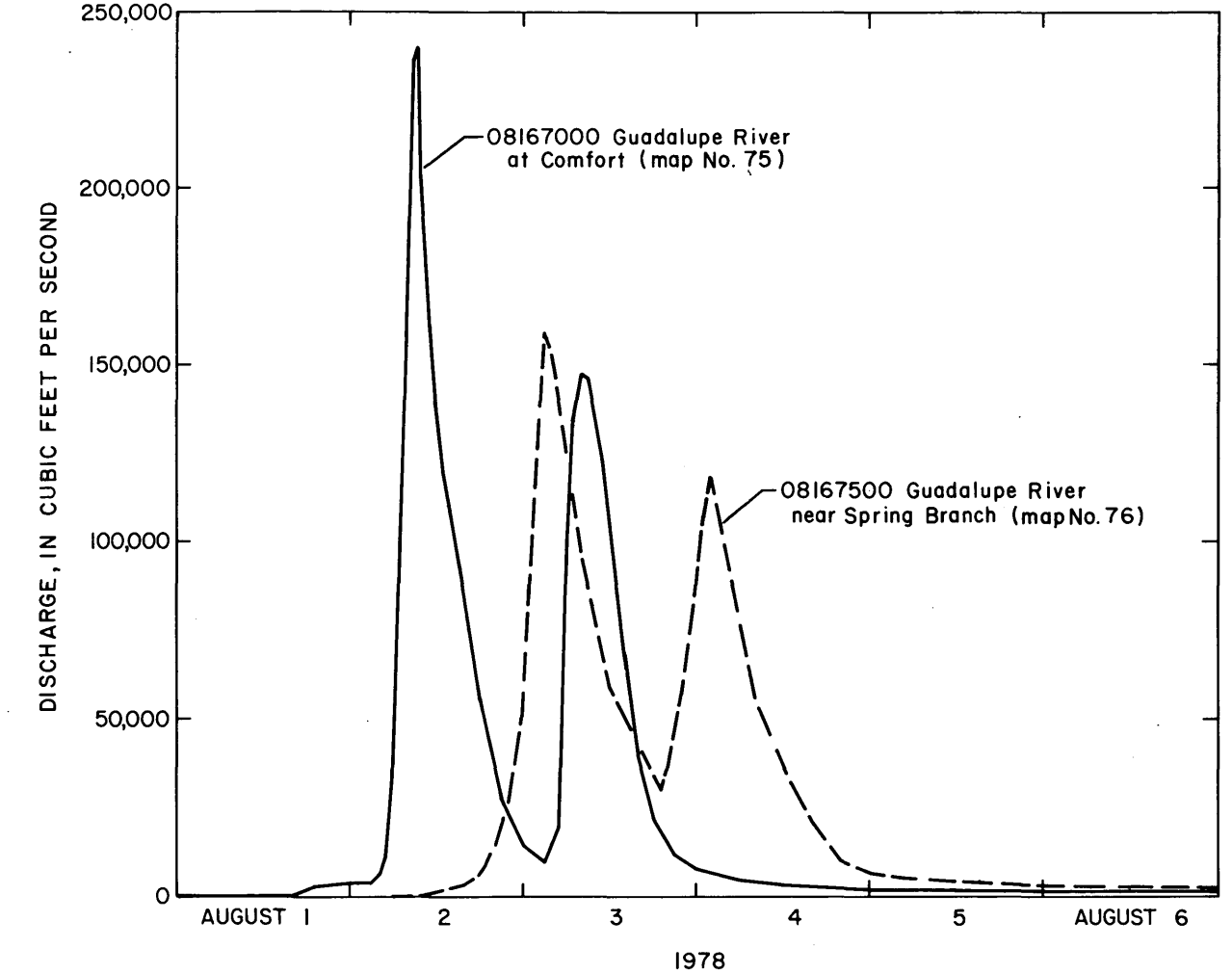
Medina River Basin

A second cell of the storm that caused flooding in the Guadalupe River basin was centered near Medina in Bandera County where the North Prong and the West Prong of the Medina River join. The unofficial total rainfall was in excess of 30 inches, which developed a catastrophic flood on the headwaters of the Medina River. A peak discharge of 123,000 ft^3/s from a drainage area of 67.5 square miles was recorded at a miscellaneous site (no. 80) on the North Prong Medina River about 10 miles upstream from Medina. Field inspection after the flood indicated that the maximum flood peak occurred a short distance downstream from the confluence of the North Prong and West Prong of the Medina River.

When the flood crest reached the stream-gaging station near Pipe Creek (no. 82) on August 2, it exceeded by more than 6 feet the previously known maximum stage since 1880, which occurred in 1919. The peak discharge at the station near Pipe Creek was 281,000 ft^3/s. A reanalysis of the annual peak-flow data for this site shows that a discharge of 281,000 ft^3/s has an apparent recurrence interval greatly in excess of 100 years (fig. 3). Red Bluff Creek (no. 83), which flows into the Medina River just below the Pipe Creek station, received very little runoff and had a peak discharge of only 160 ft^3/s on August 2.

Medina Lake near San Antonio (no. 84) reached a stage of 1,076.67 feet, with 4 feet of flow over the spillway at the maximum stage. Storage in Medina Lake increased from 188,200 acre-feet at 0800 hours on August 1 to 281,000 acre-feet at 1900 hours on August 2.

One of the most striking indications of the severity of the flood was the destruction of the massive cypress trees that lined the low-water banks of the Guadalupe and Medina Rivers and many of the tributaries. These trees ranged in size up to 6 feet in diameter, and the larger trees were estimated to be as much as 600 years old (oral commun., David Riskin, Botanist, Texas Parks and Wildlife Department, September 1978). Entire stands of these picturesque trees were either uprooted or snapped off and floated downstream. Hundreds were left scattered along the flood plains (fig. 4) or lodged in huge piles of debris along the channel banks and beneath the highway bridges. Many of the trees that were not uprooted were left partially down and stripped of their bark and foliage (fig. 5).



Note: Map numbers refer to locations on figure 1 and in table 1

FIGURE 2.-Discharge hydrographs for Guadalupe River at Comfort and Guadalupe River near Spring Branch

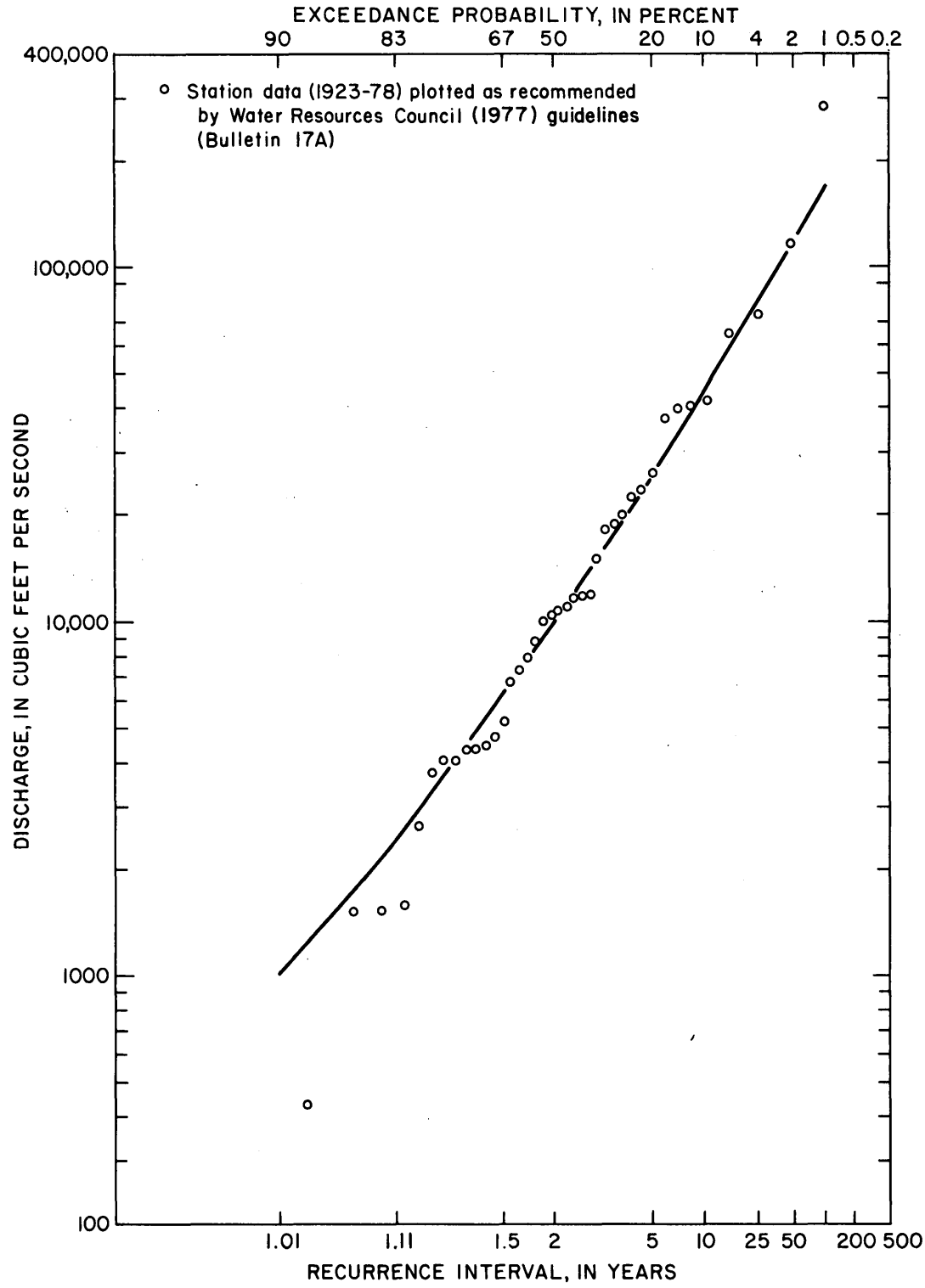


FIGURE 3.-Log Pearson type III frequency curve for Medina River near Pipe Creek

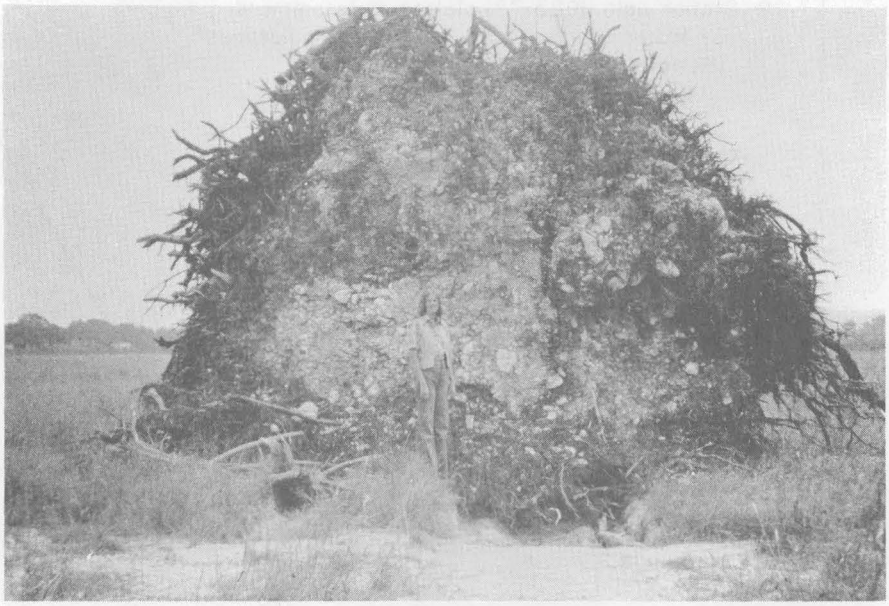
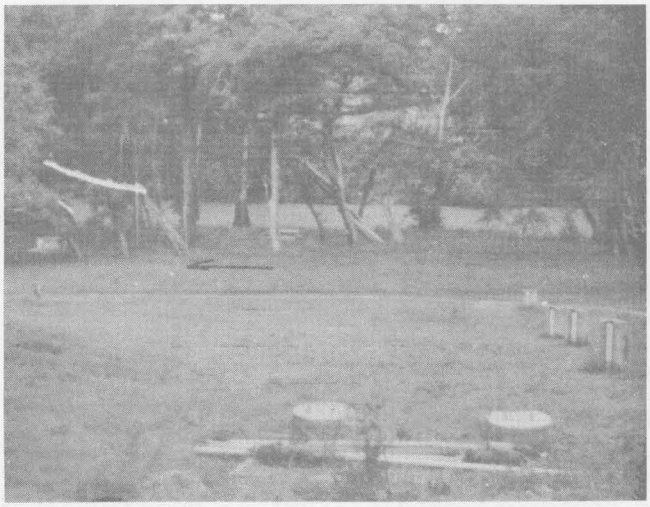


Figure 4.--Cypress tree uprooted by floodwaters on the Medina River (Photograph by Susan Yost, Medina, Tex.)



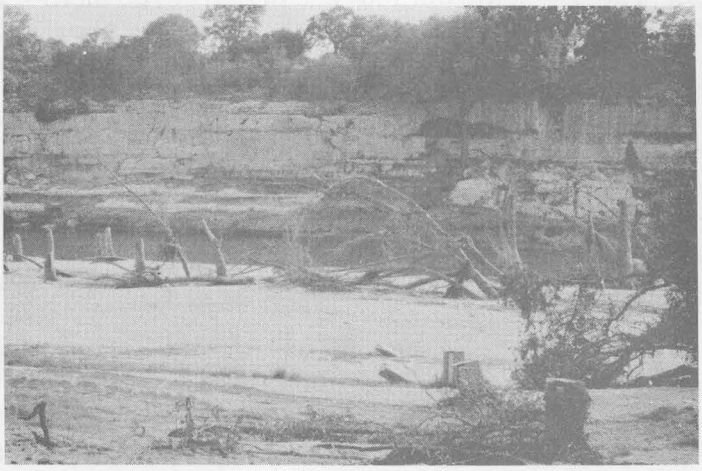


Figure 5.--Medina River near Pipe Creek, before, during, and after the flood

In this area of Central Texas, older trees develop an extensive system of large lateral roots because tap roots cannot penetrate the limestone bedrock beneath the shallow topsoil. When the receeding floodwaters became too shallow to maintain free flotation of the uprooted trees, the lateral roots carved distinctive ruts in the soil as the trees were moved along the flood plain. In field investigations, these straight narrow ruts could be used as indicators of the direction of flow.

Colorado River Basin

Pedernales River

Heavy rainfall was not as widespread in the Colorado River basin as in the Guadalupe and Medina River basins, but the highest unit runoff observed during this storm occurred on Spring Creek, which is tributary to the Pedernales River. Spring Creek, a short distance upstream from the station Spring Creek near Fredericksburg (no. 66), had a peak discharge of 42,500 ft^3/s from a 14.1-square-mile drainage area. The unit discharge was 3,010 $ft^3/s/mi^2$, which is equivalent to 4.67 inches of runoff per hour at the time of the peak.

Overbank flooding occurred on the Pedernales River upstream from the gaging station near Johnson City (no. 68), but the flood crest was about 17 feet lower than the crest of the September 1952 flood.

Llano River

Rainfall in the Llano River basin was generally 5 inches or less except in several small areas near Junction. The peak discharge on Bear Creek (no. 59), which is tributary to the North Llano River just northwest of Junction, was 81,000 ft^3/s from a drainage area of 155 square miles. The floodwaters on Bear Creek inundated Interstate Highway 10, which was closed for several hours.

Brazos River Basin

As the storm moved northward into the Brazos River basin, the rainfall intensified. During the 24-hour period ending at 0700 hours on August 4, 1978, a total of 29.05 inches of rain was recorded by the National Weather Service at Albany in Shackelford County. Record-breaking floods occurred on the Clear Fork Brazos River and on Hubbard Creek and other tributaries of the Clear Fork Brazos River. A peak discharge of 103,000 ft^3/s from a drainage area of 39.3 square miles was recorded at North Fork Hubbard Creek near Albany (no. 18) on August 4. The unit discharge of 2,621 $ft^3/s/mi^2$ was one of the highest ever recorded in Texas for a drainage area of this size. The streamflow station Hubbard Creek below Albany (no. 19) had a peak discharge of 330,000 ft^3/s from a drainage area of 613 square miles.

The contents of Hubbard Creek Reservoir near Breckenridge (no. 21) increased from 185,800 acre-feet at 2400 hours on August 2 to a maximum of 401,500 acre-feet at 0800 hours on August 5. The reservoir effectively contained the floodwaters from the Hubbard Creek basin although it was not

designed for flood control. Sufficient storage capacity was available in the reservoir to contain the flood wave with only moderate releases, which prevented more serious flooding downstream on the Clear Fork Brazos River. The streamflow station Hubbard Creek near Breckenridge (no. 22), downstream from the reservoir and about 11 miles upstream from the Clear Fork Brazos River, had a peak discharge of only 14,600 ft^3/s (fig. 6).

Serious flooding developed on the Clear Fork Brazos River as a result of heavy runoff from tributaries upstream from Hubbard Creek. California Creek near Stamford (no. 14), which has a drainage area of 478 square miles, had a peak discharge of 40,000 ft^3/s. The streamflow station on the Clear Fork Brazos River at Fort Griffin (no. 16) recorded a peak discharge of 149,000 ft^3/s, and the stage exceeded the previously known maximum stage by 0.88 foot. When the flood crest reached the gaging station at Eliasville (no. 23), 13.2 miles upstream from the main stem of the Brazos River, the peak discharge had attenuated to 68,000 ft^3/s.

The streamflow station on the Brazos River near South Bend (no. 24), 1.8 miles downstream from the Clear Fork Brazos River, had a peak discharge of 78,100 ft^3/s. Although this discharge was exceeded by a flood that occurred in May 1941, the peak stage (41.5 feet) was the greatest to occur since at least 1876. Because of changes in the stage-discharge relationship, the peak stage of the August 1978 flood exceeded that of May 1941 by about 14 feet.

Major flooding occurred along the Brazos River from South Bend to Possum Kingdom Reservoir. Possum Kingdom Reservoir was 6.6 feet below the normal pool level, and releases from the reservoir by the Brazos River Authority, in anticipation of the approaching flood wave, reduced the crest of the flood and effectively prevented a more serious flood from occurring downstream. Flood damages in the Brazos River basin downstream from Possum Kingdom Reservoir were minimal, and no flooding occurred on the Brazos River downstream from Lake Whitney, where sufficient storage capacity was available to contain the floodwaters.

MAGNITUDE AND FREQUENCY OF THE FLOODS

The relation of flood-peak magnitude to the proabability of occurrence, or recurrence interval, is generally referred to as a flood-frequency relation. The probability of occurrence is the percent chance of a given flood magnitude being exceeded in any 1 year. The recurrence interval, which is the reciprocal of the probability of occurrence multiplied by 100, is the average number of years between exceedances. It is emphasized that the recurrence interval is an average interval and that the occurrence of floods is assumed to be random in time; no schedule of regularity is implied. The occurrence of a flood having a 50-year recurrence interval (2-percent chance of occurrence) is no guarantee, therefore, that a flood of equal or greater magnitude will not occur the following year, or even the following week.

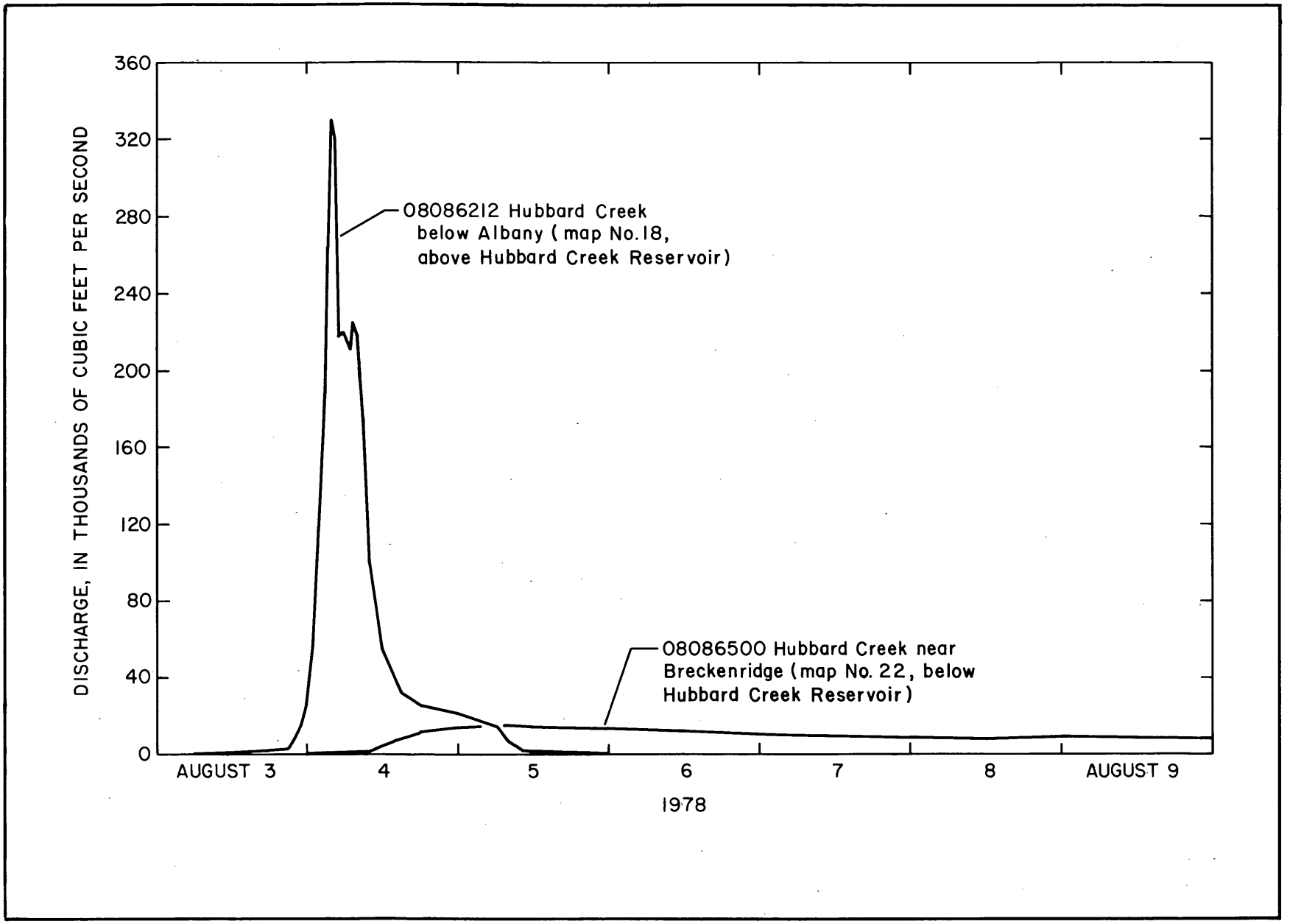


FIGURE 6.-Discharge hydrographs for Hubbard Creek below Albany and Hubbard Creek near Breckenridge

Discharge computations show that the Clear Fork Brazos River, the Guadalupe River above Canyon Lake, and the Medina River above Medina Lake all had peak discharges in excess of the 100-year recurrence interval. The peak discharge for Spring Creek near Fredericksburg (no. 66) was 3.8 times the magnitude of the 100-year regional flood. Flood-frequency data are indicated in table 1 for all stations in the flood area that experienced floods with frequencies of 10 years or more.

FLOOD DAMAGE

Seventeen counties in Central Texas sustained widespread damages from the floods associated with tropical storm Amelia (National Oceanic and Atmospheric Administration, 1978). Eight of these counties (Bandera, Kendall, and Kerr Counties in south-central Texas, and Haskell, Shackelford, Stephens, Throckmorton, and Young Counties in north-central Texas) were declared flood-disaster areas by the Federal government. Ironically, Bandera, Kendall, and Kerr Counties had been declared drought-disaster areas prior to the floods.

In Bandera, Kendall, and Kerr Counties, 25 people were drowned, about 150 people were injured, and property damages were estimated to be at least 50 million dollars. About 175 homes were destroyed and about 650 were damaged. About 350 businesses were destroyed or damaged. Public utilities were disrupted in much of the area and many roadways and bridges were heavily damaged. The bridge on State Highway 173 over the Medina River at Bandera, which was designed to withstand the 50-year flood, was inundated by 18 feet of water (fig. 7). The damage to livestock and crops, to farm and ranch facilities, and to farm and pasture lands was extremely heavy.

A considerable amount of damage was also sustained in Gillespie and Kimble Counties in south-central Texas. Two people were drowned when Spring Creek inundated the bridge on State Highway 290 west of Fredericksburg (fig. 8), and many roadways, bridges, and farm and ranch lands were extensively damaged.

In Haskell, Shackelford, Stephens, Throckmorton, and Young Counties in the Brazos River basin in north-central Texas, the flood damage was comparable to the damage in south-central Texas. Six people were drowned, four were injured, and property damages were estimated to be at least 62 million dollars. About 750 homes and 75 businesses were destroyed or damaged (fig. 9), and the damages to livestock, crops, and farm and ranch lands were extremely severe. In Haskell County alone, these damages were estimated to be about 30 million dollars.

In the total area affected by the storm, 33 people were drowned, 154 were injured, and property damages were estimated to be more than 110 million dollars. The devastation resulting from tropical storm Amelia and the subsequent floods exceeded that of any storm in Central Texas in recent history.

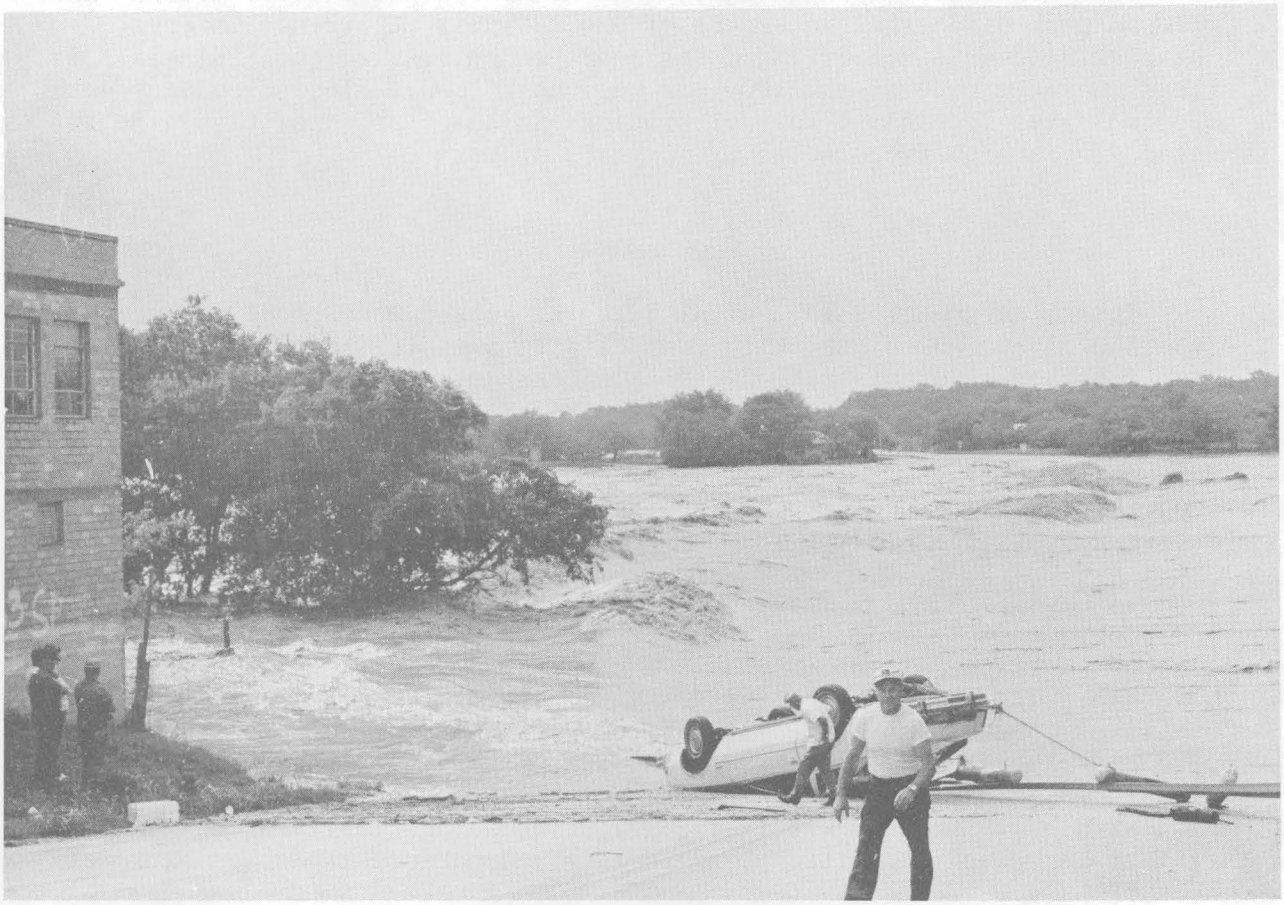


Figure 7.--Inundation of State Highway 173 and the Medina River bridge at Bandera
(Photograph by the Bandera, Tex., Bulletin)

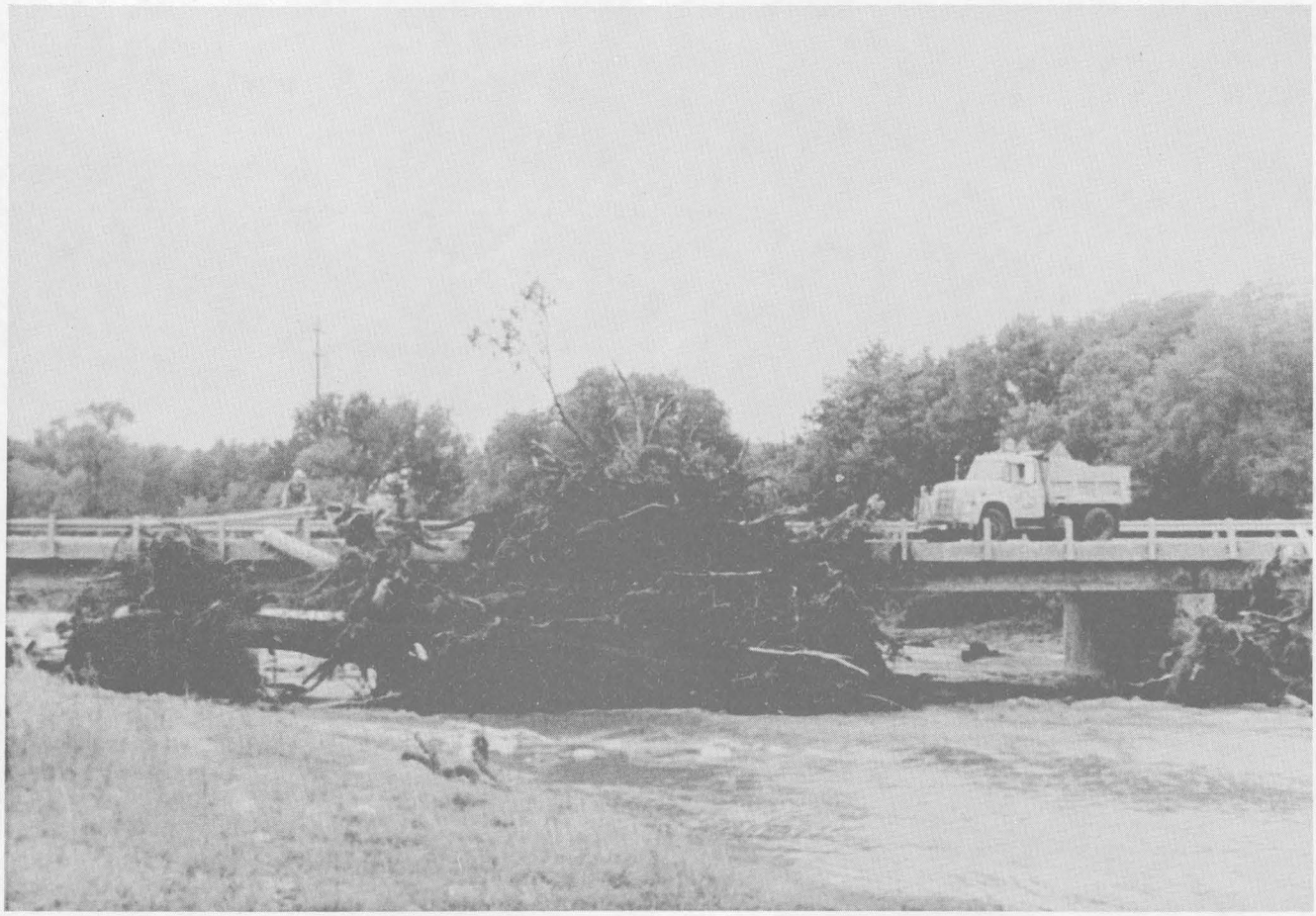


Figure 8.--State Highway 290 flooded by Spring Creek near Fredericksburg
(Photograph by the Fredericksburg, Tex., Standard)

Figure 9.--Aerial view of the Brazos River in flood at Graham
(Photograph by Randy Black, Dallas, Tex.)

WATER-QUALITY CHANGES IN THE BRAZOS RIVER BASIN

The large volume of runoff associated with the floods in the drainage area of the upper Brazos River had a considerable effect on the water quality of the streams and reservoirs. Selected water-quality data from sites on Hubbard Creek Reservoir (fig. 10), Possum Kingdom Reservoir (fig. 11), and Whitney Lake (fig. 12) and from five sites on the Brazos River downstream from Whitney Lake (fig. 13) were compiled to show the water-quality conditions before and after the storm.

The data used to represent water-quality conditions in the reservoirs prior to the flood were collected during June 9-23, 1978, and the data used to represent conditions after the floods were collected during August 29-September 6, 1978. The water-quality data for the reservoirs are given in tables 3-5.

Profiles of specific conductance and density for Hubbard Creek Reservoir, Possum Kingdom Reservoir, and Whitney Lake are shown on figures 14, 15, and 16, respectively. These profiles, which show the water-quality effects of the flooding and subsequent reservoir releases, were prepared from data collected along the centerlines of the drowned river channels upstream from the dams and from data collected at deep sites near the dams of each reservoir. The density profiles were computed from the water temperature and the dissolved-solids concentration as estimated from the specific conductance.

The following table shows the variations, before and after the floods, in the average specific conductance along the centerline section of the three reservoirs and the range of specific conductance at site 08092600 on the Brazos River below Whitney Lake.

	Before flood		After flood	
	Date (1978)	Specific conductance[1/]	Date (1978)	Specific conductance[1/]
Hubbard Creek Reservoir	June 9	1450	Aug. 29	700
Possum Kingdom Reservoir	June 13	4000	Aug. 30	1600
Whitney Lake	June 23	1600	Sept. 5	3000
Brazos River below Whitney Lake	July 1-Aug. 1	1300-1600	Aug. 2-31	1600-3700

1/ In micromhos per centimeter at 25°C.

After the flood in the Hubbard Creek area, the average specific conductance of the water in Hubbard Creek and Possum Kingdom Reservoirs was diluted from 1450 to 700 and from 4000 to 1600 micromhos, respectively (figs. 14 and 15). In Whitney Lake, the most downstream reservoir of the three, the specific conductance increased from 1600 to 3000 micromhos (fig. 16).

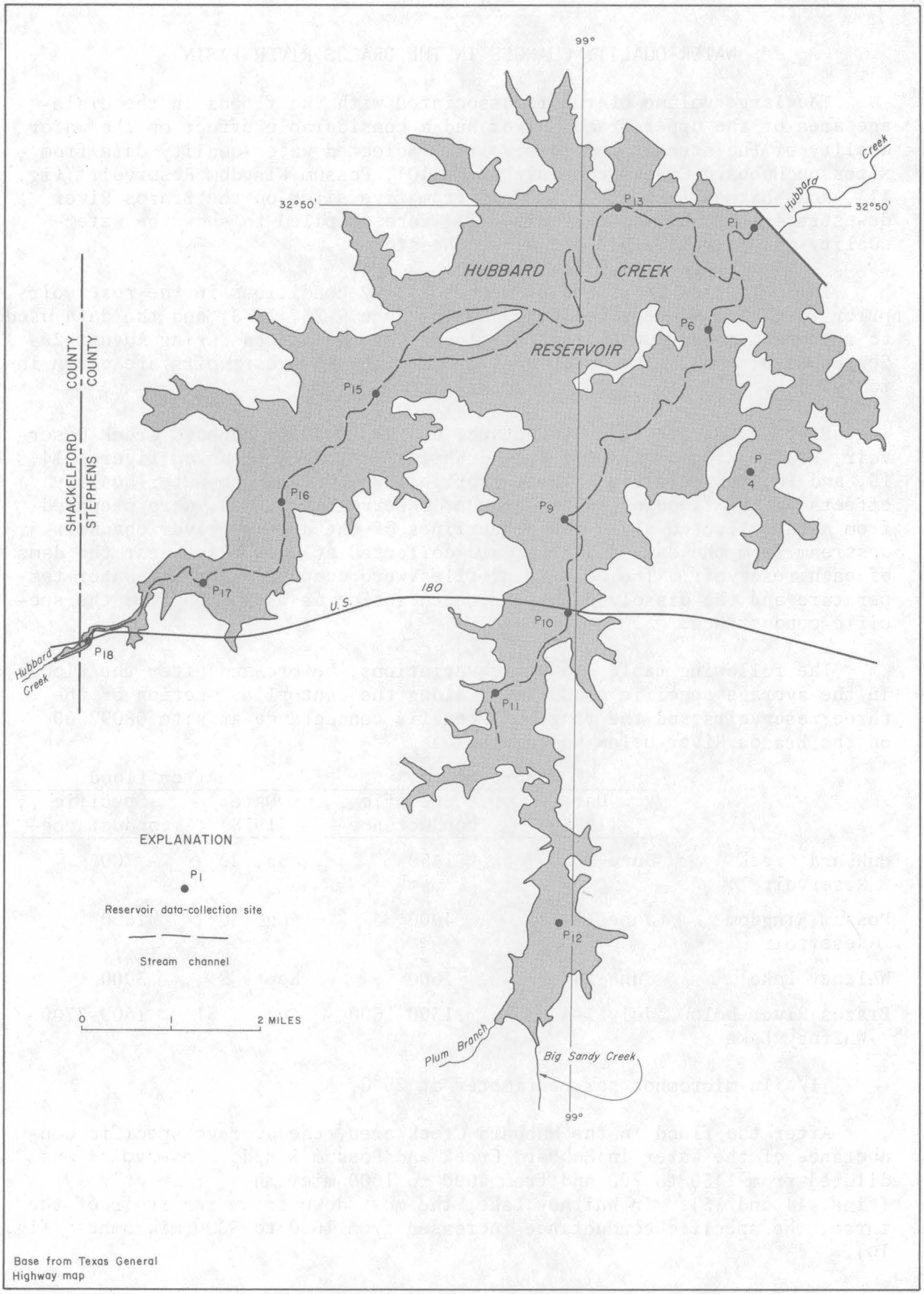


FIGURE 10.-Locations of water-quality data-collection sites on Hubbard Creek Reservoir

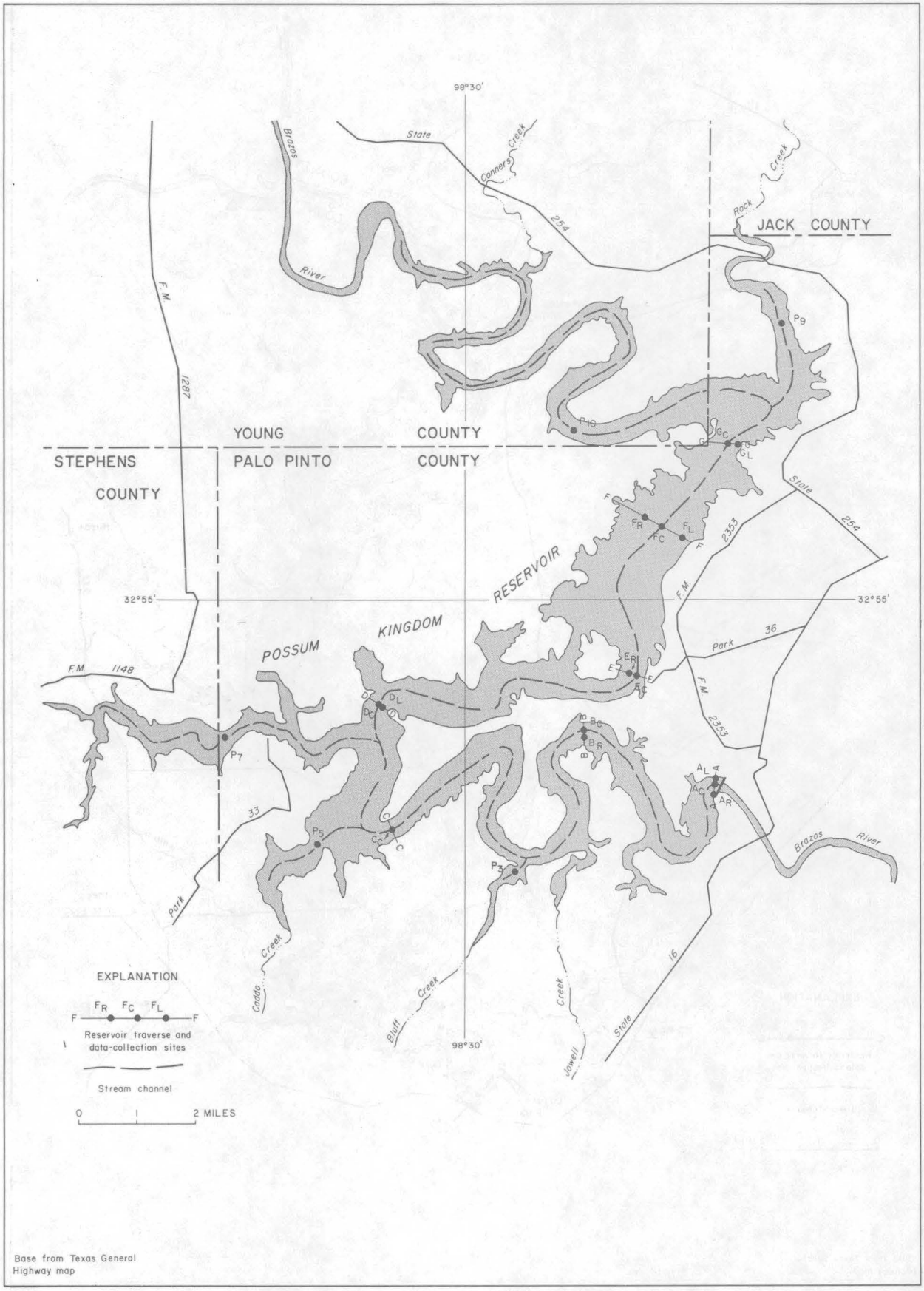


FIGURE 11.-Locations of water-quality data-collection sites on Possum Kingdom Reservoir

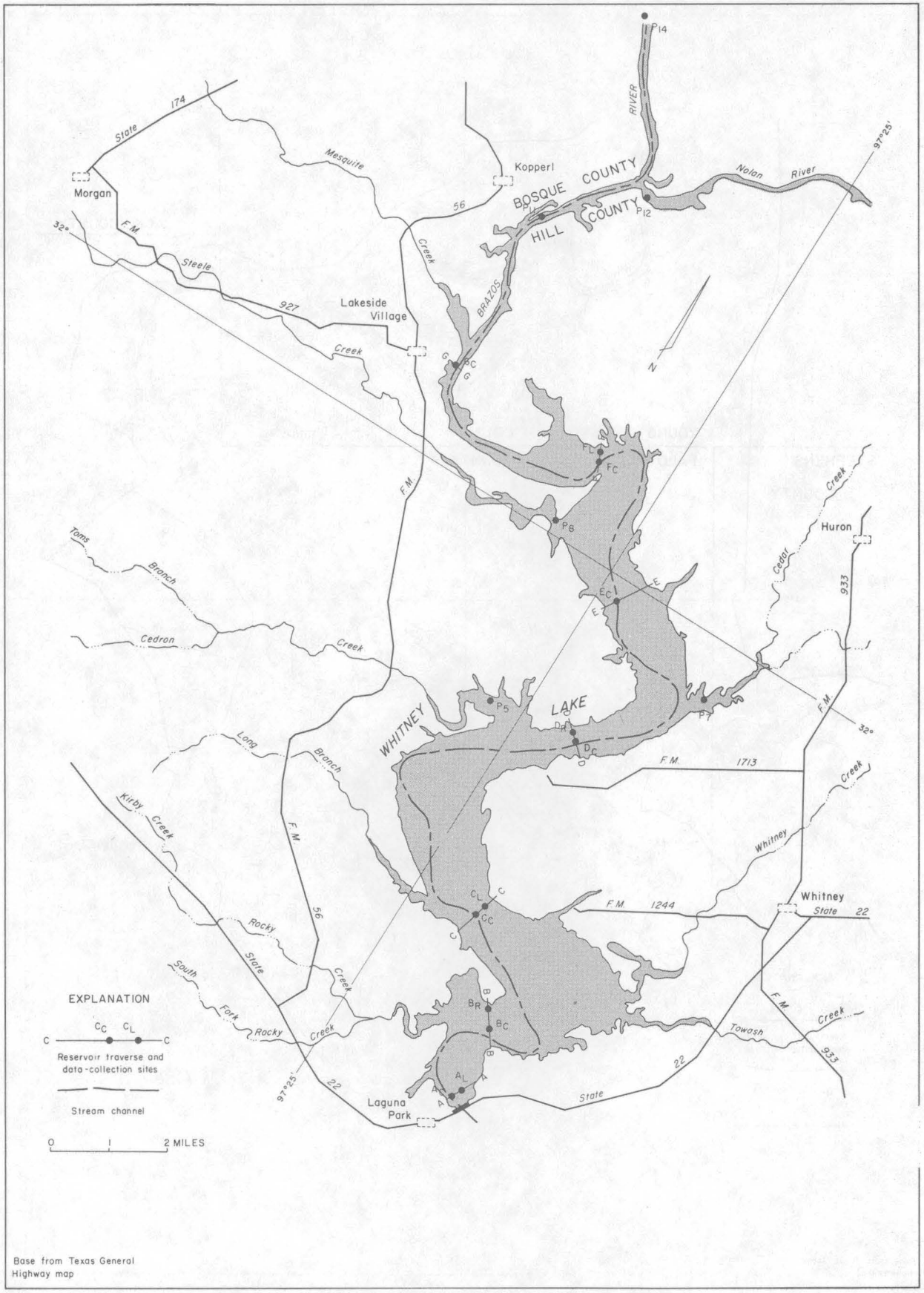


FIGURE 12.-Locations of water-quality data-collection sites on Whitney Lake

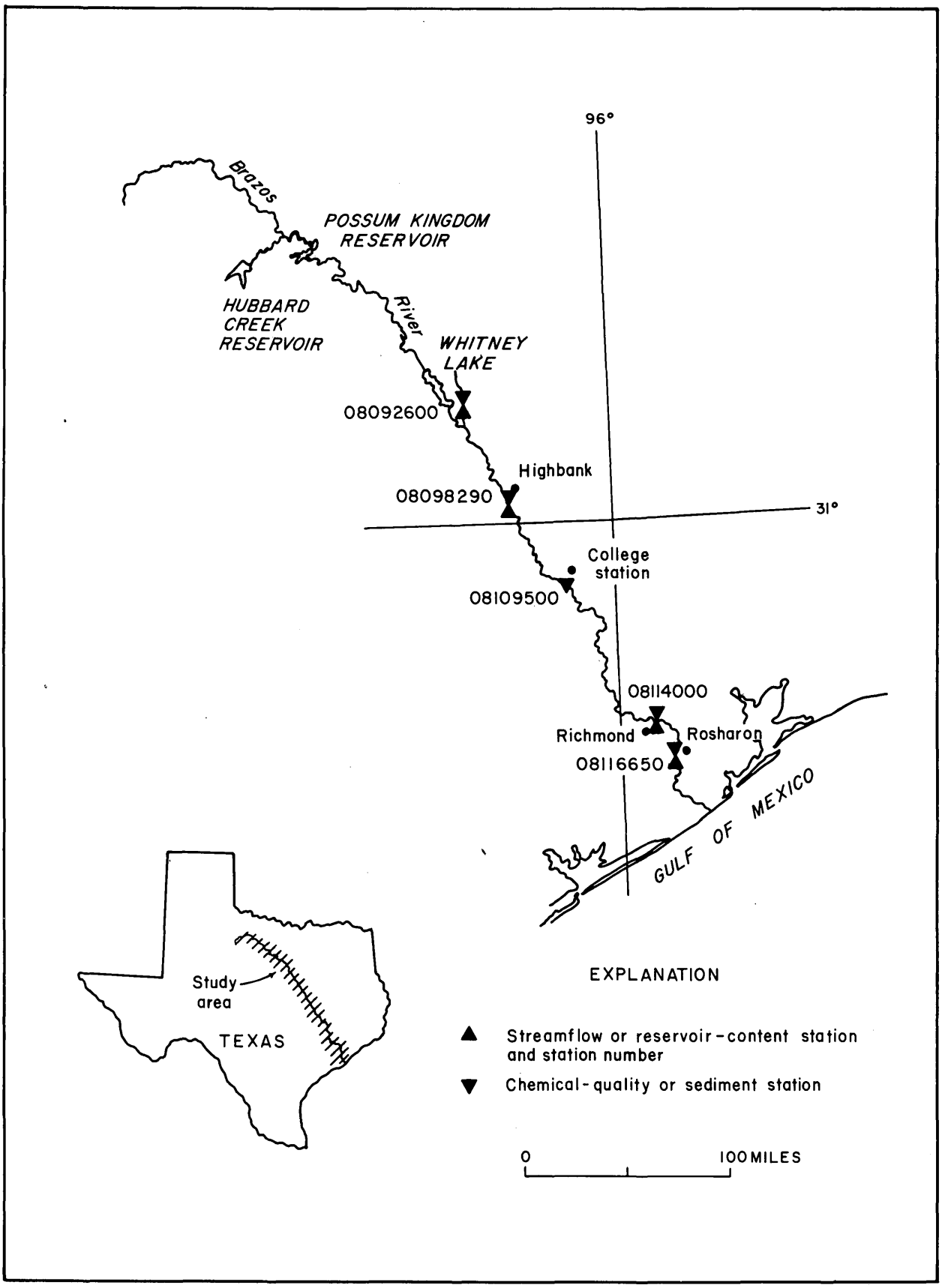
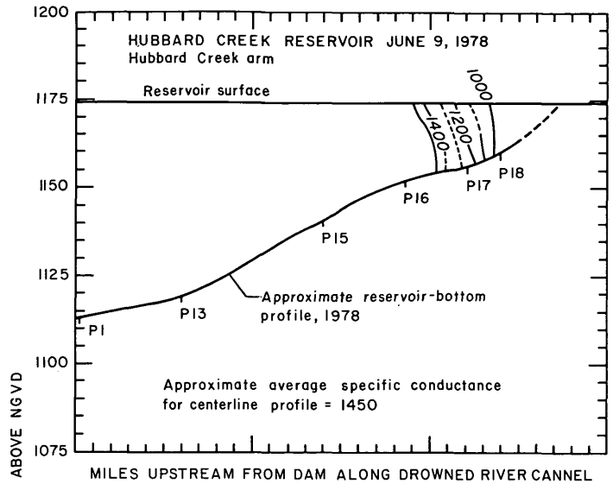
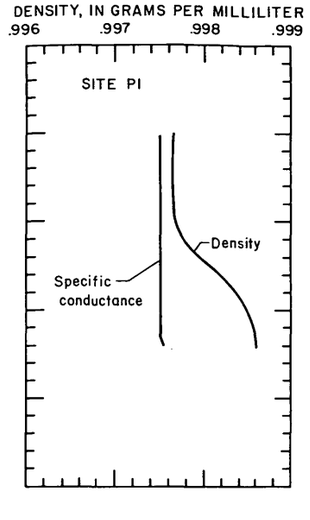
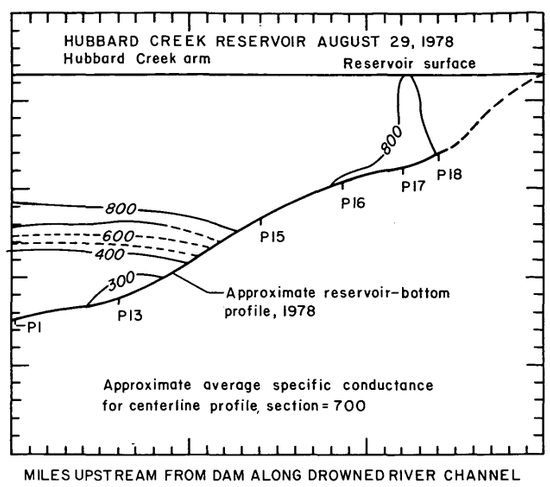
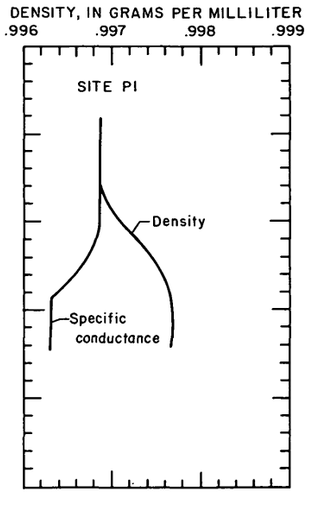


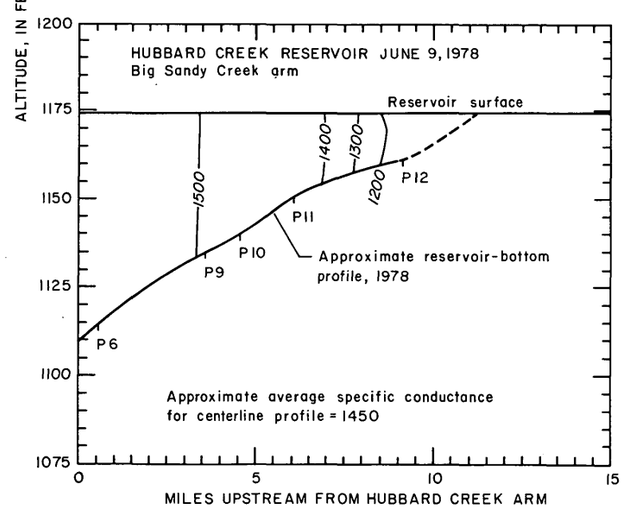
FIGURE 13.-Locations of water-quality data-collection sites on the Brazos River

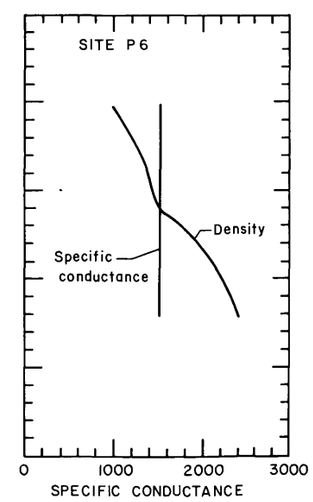


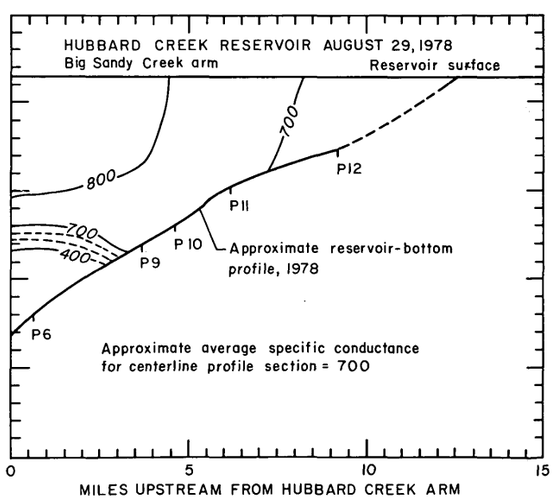


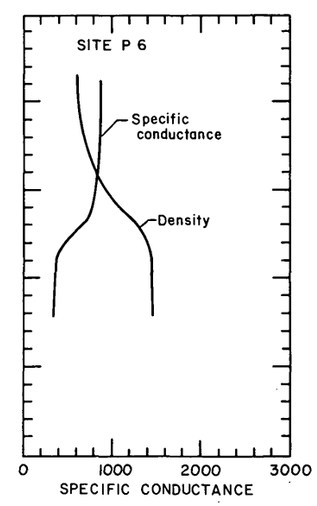












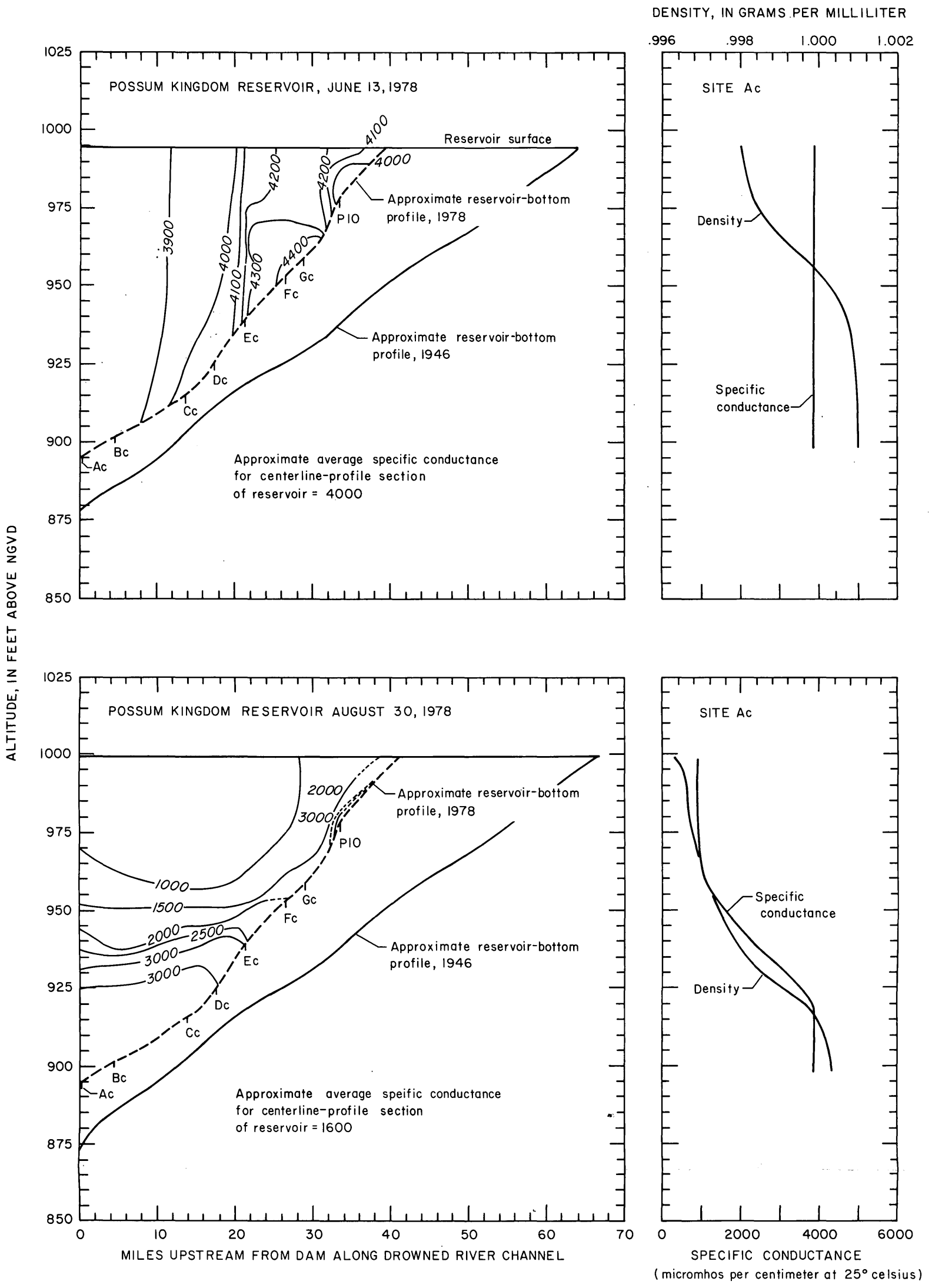
ALTITUDE, IN FEET ABOVE NGVD

EXPLANATION

P16 SAMPLING SITE--See figure 10 for location

—1500— APPROXIMATE LINE OF EQUAL SPECIFIC CONDUCTANCE--Interval 100 micromhos per centimeter at 25° Celsius

FIGURE 14.-Specific conductance and density for Hubbard Creek Reservoir during June and August 1978

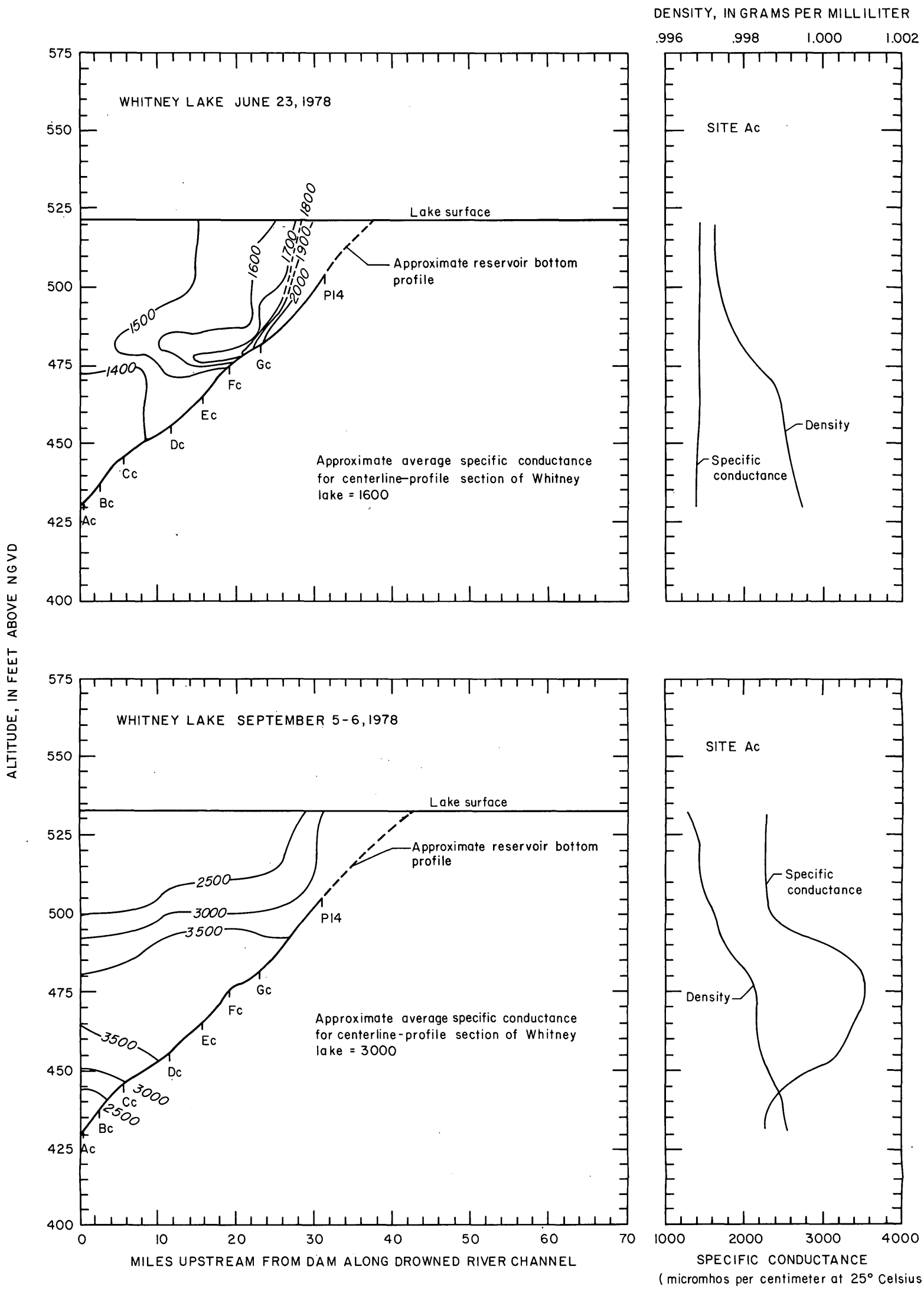


EXPLANATION

Ac — SAMPLING SITE--See figure 11 for location

—1500— APPROXIMATE LINE OF EQUAL SPECIFIC CONDUCTANCE -- Intervals are either 100 or 500 micromhos per centimeter at 25° Celsius

FIGURE 15.-Specific conductance and density for Possum Kingdom Reservoir during June and August 1978



EXPLANATION

Ac — SAMPLING SITE--See figure 12 for location

—1500— APPROXIMATE LINE OF EQUAL SPECIFIC CONDUCTANCE -- Intervals are either 100 or 500 micromhos per centimeter at 25° Celsius

FIGURE 16.-Specific conducrance and density for Whitney Lake during June and September 1978

The daily specific conductance of water at five sites on the Brazos River (fig. 13) below Whitney Lake ranged from about 500 to 1500 micromhos for about a month prior to the flood (fig. 17). A few days after the flood and the increased releases from the upstream reservoirs, the specific conductance increased at each of the five sites and reached a maximum of about 3700 micromhos at site 08092600 below Whitney Dam. The releases from Whitney Lake (as indicated by the data for site 08092600 on the Brazos River) caused two distinct inflections in the specific-conductance curves at the four downstream sampling sites (fig. 17).

WATER-LEVEL CHANGES IN THE EDWARDS AQUIFER

Water-level hydrographs for selected ground-water observation wells in the artesian zone of the Edwards aquifer in south-central Texas (fig. 18) indicate that the water levels rose substantially between July 10 and August 25, 1978. The water levels in these observation wells, which are located near pumping centers, are influenced by changes in the pumping rates. The water-level rises reflect a reduction in pumping and(or) recharge to the aquifer.

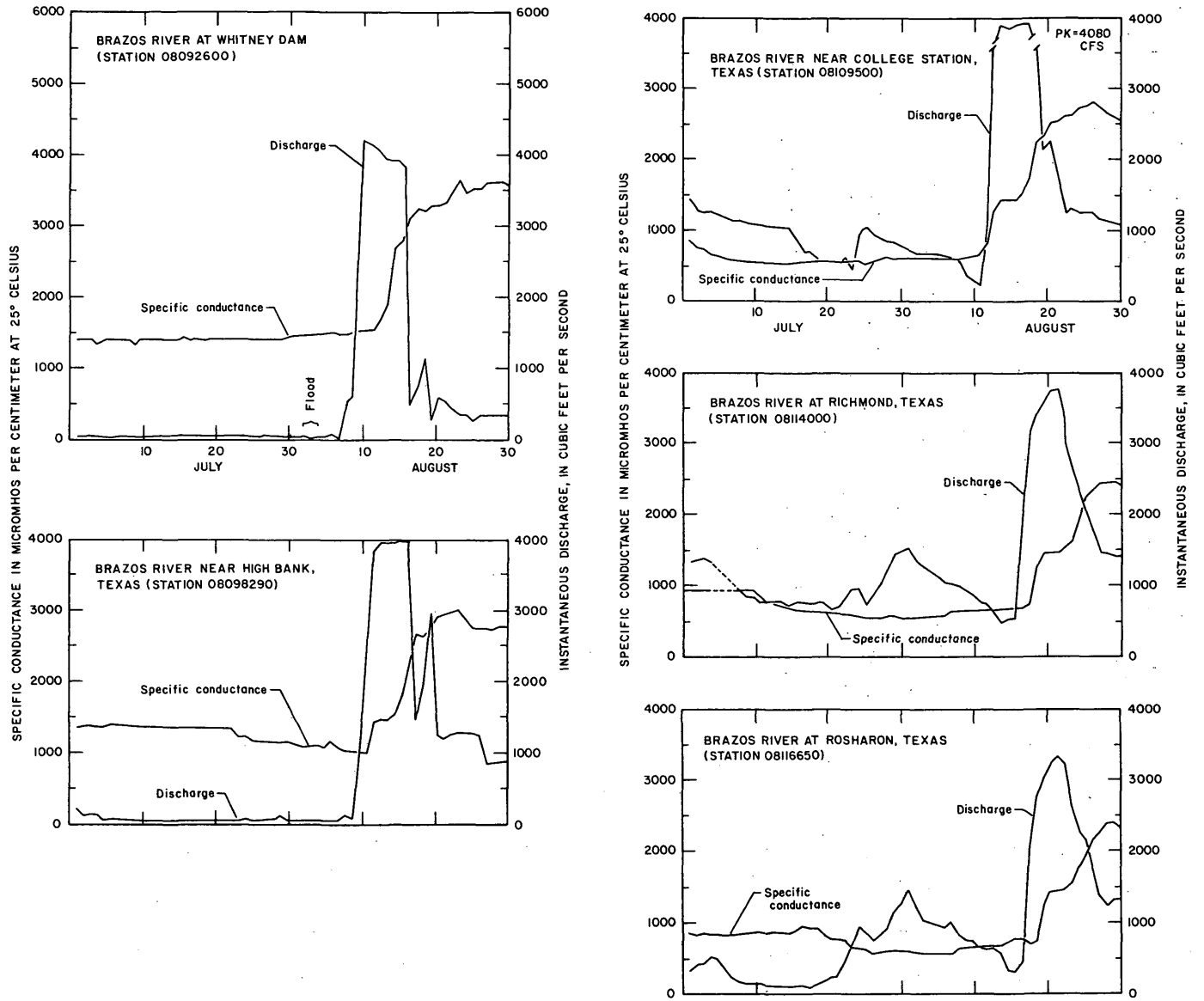
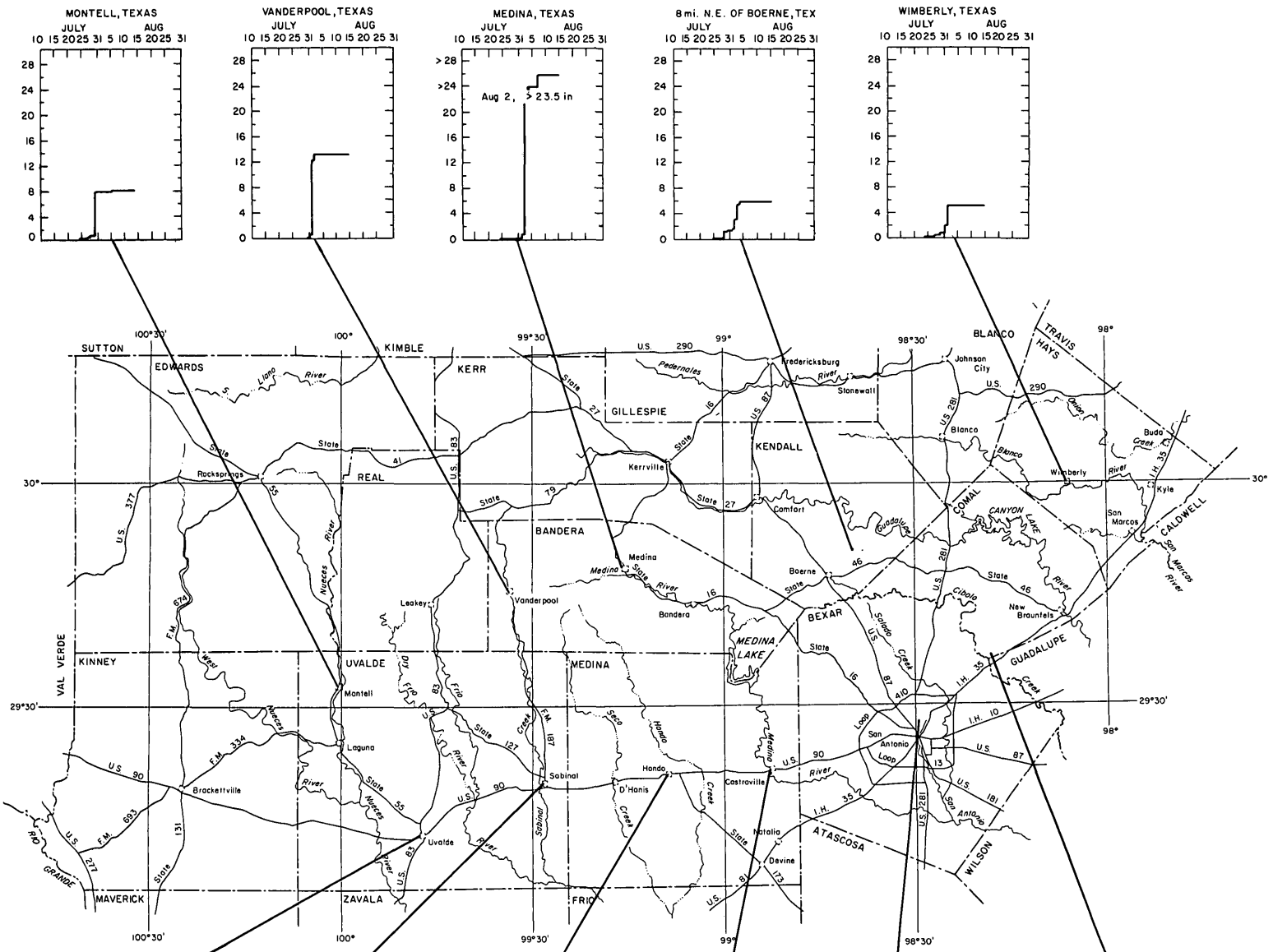
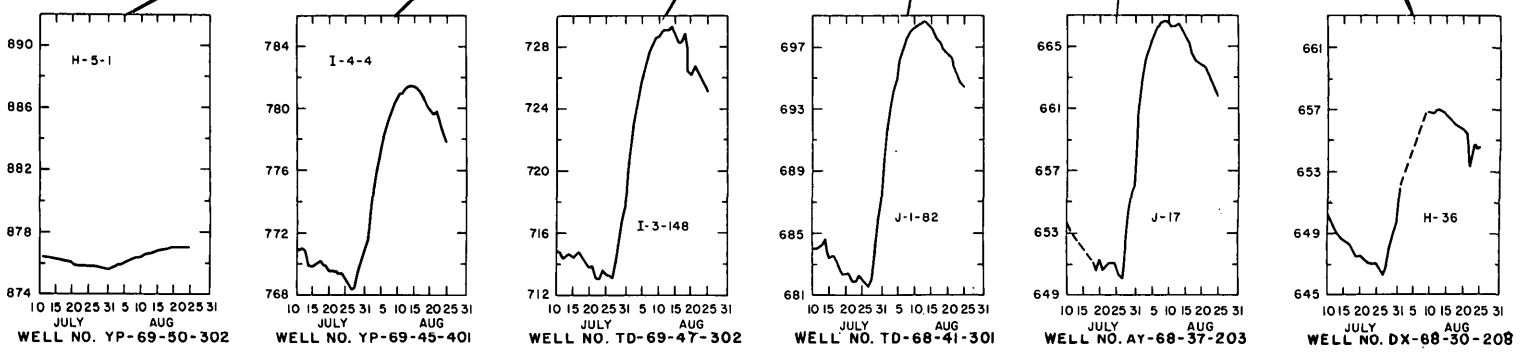


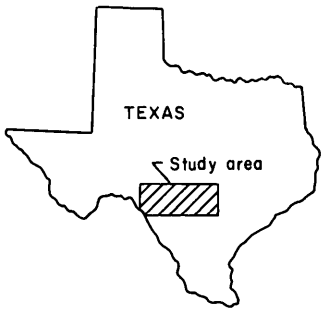
FIGURE 17.-Daily specific conductance and instantaneous discharge for five sites on the Brazos River downstream from Whitney Lake, July and August 1978

ACCUMULATED RAINFALL IN INCHES, JULY 10 - AUGUST 15, 1978





ALTITUDE OF WATER LEVELS IN WELLS IN FEET ABOVE NGVD, JULY 10 - AUGUST 25, 1978



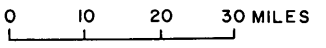


FIGURE 18.-Water-level changes in wells in the Edwards aquifer, July 10-August 25, 1978

SELECTED REFERENCES

Ellsworth, C. E., 1923, The floods in central Texas in September 1921: U.S. Geological Survey Water-Supply Paper 488, 56 p.

National Oceanic and Atmospheric Administration, 1978, Storm data, August 1978: Environmental Data and Information Service, National Climatic Center, 24 p.

Schroeder, E. E., Grozier, R. U., Hahl, D. C., and Hulme, A. E., 1974, Floods of September-October 1967 in south Texas and northeastern Mexico: U.S. Geological Survey Water-Supply Paper 1880-B, 111 p.

Schroeder, E. E., and Massey, B. C., 1977, Techniques for estimating the magnitude and frequency of floods in Texas: U.S. Geological Survey Water-Resources Investigations 77-110, 22 p.

U.S. Water Resources Council, 1977, Guidelines for determining flood flow frequency: Hydrology Committee, Bulletin 17A, 26 p., 14 apps.

Yost, I. D., 1963, Floods of April-June 1957 in Texas and adjacent states: U.S. Geological Survey Water-Supply Paper 1652-B, 321 p.

Table 1.--Summary of flood stages and discharges

Map number	WRD station number	Stream and place of determination	Contributing drainage area (mi^2)	Period of known floods	Maximum flood previously known			Maximum during present flood			Recurrence interval (years)
					Date	Stage (feet)	Discharge (ft^3/s)	Date (1978)	Stage (feet)	Discharge (ft^3/s)	
		BRAZOS RIVER BASIN									
1	08082500	Brazos River at Seymour	5,972	1906-78	Sept. 28, 1955	23.00	71,200	Aug. 5	14.20	28,200	--
2	08082700	Millers Creek near Munday	104	1883-1978	June 13, 1930	>18.0	1/	Aug. 4	17.53	34,600	>100
3	08082800	Millers Creek Reservoir near Bomarton	240	1974	June 3, 1977	1,309.89	2/ 3,440	Aug. 6	1,335.30	2/ 34,480	--
4	08082900	North Elm Creek near Throckmorton 3/	3.58	1966	Apr. 30, 1966	26.28	1,350	Aug. 4	30.6	5,000	>100
5	08083240	Clear Fork Brazos River at Hawley	1,416	1915	1932	4/	1/	Aug. 4	14.64	2,540	--
6	08083245	Mulberry Creek near Hawley	205	1932	1957	16.0	1/	Aug. 4	13.98	1,770	--
7	08083300	Elm Creek near Abilene	133	1963	Sept. 18, 1974	18.68	4,570	Aug. 3	13.26	1,830	--
8	08083400	Little Elm Creek near Abilene	39.1	1903	1913	15.0	1/	Aug. 3	9.50	1,340	--
9	08083420	Cat Claw Creek at Abilene	13.0	1970	Sept. 18, 1974	6.41	1,200	Aug. 3	6.60	1,310	--
10	08083470	Cedar Creek at Abilene	119	1970	Sept. 18, 1974	12.54	4,670	Aug. 3	11.93	3,830	--
11	08083500	Fort Phantom Hill Reservoir near Nugent	470	1940	May 25, 1957	58.7	2/ 89,910	Aug. 6-10	48.4	2/ 50,370	--
12	08084000	Clear Fork Brazos River at Nugent	2,199	1876	1876	30.0	1/	Aug. 4	9.97	2,840	--
13	08084500	Lake Stamford near Haskell	368	1953	Sept. 9-10, 1962	1,416.6	2/ 74,100	Aug. 5	1,422.18	2/ 103,600	--
14	08084800	California Creek near Stamford	478	1897	June 10, 1962	29.6	1/	Aug. 4	31.00	40,000	>100
15	08085300	Humphries Draw near Haskell 3/	3.51	1966	Aug. 5, 1971	19.41	1,840	Aug. 4	19.36	1,830	10
16	08085500	Clear Fork Brazos River at Fort Griffin	3,988	1876	Sept. 1900	38.0	1/	Aug. 4	38.88	149,000	>100
17	08086050	Deep Creek at Moran 3/	228	1888	June 6, 1961	25.6	1/	--	21.80	13,000	10
18	08086150	North Fork Hubbard Creek near Albany	39.3	1940	June 10, 1940 July 18, 1953	21.0	1/	Aug. 4	23.3	103,000	>100
19	08086212	Hubbard Creek below Albany	613	1966	Jan. 21, 1968	25.10	27,200	Aug. 4	41.41	330,000	>100

See footnotes at end of table.

Table 1.--Summary of flood stages and discharges--Continued

Map number	WRD station number	Stream and place of determination	Contributing drainage area (mi^2)	Period of known floods	Maximum flood previously known			Maximum during present flood			Recurrence interval (years)
					Date	Stage (feet)	Discharge (ft^3/s)	Date (1978)	Stage (feet)	Discharge (ft^3/s)	
20	08086290	Big Sandy Creek above Breckenridge	280	1949	May 16, 1949 July 20, 1953 Apr. 29, 1957	24.6	1/	Aug. 4	21.86	5,140	--
21	08086400	Hubbard Creek Reservoir near Breckenridge	1,085	1962	Feb. 3, 1975	1,183.61	2/ 327,200	Aug. 5	1,188.06	2/ 401,500	--
22	08086500	Hubbard Creek near Breckenridge	1,089	1925	July 20, 1953	34.2	1/	Aug. 5	30.66	14,600	--
23	08087300	Clear Fork Brazos River at Eliasville	5,697	1877	Sept. 1900 May 1, 1957	35.0	1/	Aug. 6	37.04	68,000	>100
24	08088000	Brazos River at South Bend	13,107	1876	1876	36.2	1/	Aug. 6	41.50	78,100	25
25	08088300	Briar Creek near Graham	24.2	1900	Sept. 1955	15.2	1/	Aug. 5	.78	1.6	--
26	08088400	Lake Graham near Graham	221	1958	Apr. 30, 1970	1,077.77	2/ 61,120	Aug. 5	1,067.61	2/ 36,090	--
27	08088450	Big Cedar Creek near Ivan	97.0	1964	July 8, 1968	22.39	9,590	Aug. 5	4.11	3.0	--
28	08088500	Possum Kingdom Reservoir near Graford	14,030	1941	Oct. 5, 1941	1,001.0	2/ 743,700	Aug. 12	999.69	2/ 564,800	--
29	08089000	Brazos River near Palo Pinto	14,245	1876	1876	5/	1/	Aug. 8	22.93	54,500	--
30	08092600	Brazos River at Whitney Dam near Whitney	16,950	1853	May 9, 1922	45.0	1/	Aug. 10	12.81	6/ 5,710	--
31	08098290	Brazos River near Highbank	20,870	1909	Dec. 1913	42.0	1/	Aug. 13	5.90	4,000	--
32	08099000	Leon Reservoir near Ranger	259	1955	June 13, 1967	1,382.2	2/5/ 40,640	Aug. 6-8	1,369.80	2/ 20,000	--
33	08099100	Leon River near De Leon	479	1908	May 1908	19.3	1/	Aug. 4	2.47	17	--
34	08099300	Sabana River near De Leon	264	1890	May 1908	24.0	1/	Aug. 4	8.80	617	--
35	08099400	Proctor Lake near Proctor	1,259	1963	Jan. 26, 1968	1,174.84	2/ 137,500	Aug. 4-7	1,154.48	2/ 31,170	--
36	08109500	Brazos River near College Station	30,033	--	--	--	--	Aug. 18	--	7/ 4,120	--
37	08114000	Brazos River at Richmond	35,441	1852	Dec. 10, 1913	51.2	1/	Aug. 20	6.90	3,850	--
38	08116650	Brazos River near Rosharon	35,773	1884	Dec. 11, 1913	56.4	1/	Aug. 21	13.29	3,270	--

See footnotes at end of table.

Table 1.--Summary of flood stages and discharges--Continued

Map number	WRD station number	Stream and place of determination	Contributing drainage area (mi^2)	Period of known floods	Maximum flood previously known			Maximum during present flood			Recurrence interval (years)
					Date	Stage (feet)	Discharge (ft^3/s)	Date (1978)	Stage (feet)	Discharge (ft^3/s)	
		COLORADO RIVER BASIN									
39	08126500	Colorado River at Ballinger	5,240	1882	1884	36.0	1/	Aug. 3	23.95	16,600	--
40	08127000	Elm Creek at Ballinger	471	1904	Aug. 1906 Oct. 13, 1957	8/ 14.50 14.20	1/ 50,000	Aug. 3	9.17	23,400	15
41	08136500	Concho River at Paint Rock	5,132	1853	Sept. 17, 1936	43.4	301,000	Aug. 3	19.11	12,700	--
42	08136700	Colorado River near Stacy	11,160	1882	Sept. 18, 1936	64.59	356,000	Aug. 4	22.50	35,700	--
43	08138000	Colorado River at Winchell	11,700	1882	Sept. 19, 1936	62.20	1/	Aug. 5	31.88	29,600	--
44	08140600	Lake Clyde near Clyde	37.9	1970	May 28, 1975	1,873.4	2/ 6,370	Aug. 4	1,875.50	2/ 7,420	--
45	08140700	Pecan Bayou near Cross Cut	532	1900	1908	26.5	1/	Aug. 4	24.90	16,200	
46	08140800	Jim Ned Creek near Coleman	333	1961	May 6, 1969	9.08	5,020	Aug. 4	5.77	1,830	--
47	08141000	Hords Creek Lake near Valera	48	1948	May 1, 1956	1,906.86	2/ 12,790	Aug. 5	1,887.90	2/ 3,570	--
48	08141500	Hords Creek near Valera	53	1900	July 3, 1932	23.0	1/	Aug. 3	11.06	2,360	--
49	08143000	Lake Brownwood near Brownwood	1,535	1933	May 2, 1956	1,431.4	2/ 192,300	Aug. 16-24, 29, 30	1,424.4	2/ 138,500	--
50	08143500	Pecan Bayou at Brownwood	1,614	1900	July 3, 1932	--	9/ 235,000	Aug. 4	1.05	47	--
51	08143600	Pecan Bayou near Mullin	2,034	1967	Jan. 23, 1968	29.26	13,700	Aug. 3	6.50	1,690	--
52	08144500	San Saba River at Menard	1,151	1880	June 6, 1899	23.3	1/	Aug. 2	17.36	35,400	25
53	08144800	Brady Creek near Eden	97	1884	July 1938	15.8	1/	Aug. 3	1.3	2.1	--
54	08144900	Brady Creek Reservoir near Brady	513	1963	Sept. 24, 1971	1,747.7	2/ 40,880	Aug. 3	1,738.12	2/ 21,570	--
55	08145000	Brady Creek at Brady	575	1882	July 23, 1938	29.1	86,000	Aug. 2	8.31	536	--
56	08146000	San Saba River at San Saba	3,042	1899	July 23, 1938	39.3	203,000	Aug. 3	28.38	27,000	--
57	08147000	Colorado River near San Saba	17,720	1878	July 23, 1938	63.2	224,000	Aug. 4	22.59	28,100	--
58	08148000	Lake Buchanan near Burnet	18,370	1937	Jan. 24, 1968	1,020.8	2/ 1,010,000	Aug. 8	1,011.94	2/ 814,700	

See footnotes at end of table.

Table 1.--Summary of flood stages and discharges--Continued

Map number	WRD station number	Stream and place of determination	Contributing drainage area (mi^2)	Period of known floods	Maximum flood previously known			Maximum during present flood			Recurrence interval (years)
					Date	Stage (feet)	Discharge (ft^3/s)	Date (1978)	Stage (feet)	Discharge (ft^3/s)	
59	--	Bear Creek at Interstate Highway 10 near Junction 10/	155	1936	Sept. 16, 1936	--	31,300	Aug. 3	--	81,000	--
60	08148500	North Llano River near Junction 3/	914	1875	Sept. 16, 1936	29.2	94,800	Aug. 2	23.50	64,800	10
61	08150000	Llano River near Junction	1,874	1875	June 14, 1935	43.3	319,000	Aug. 2	22.14	76,700	--
62	08150700	Llano River near Mason	3,280	1875	June 14, 1935	--	11/ 388,000	Aug. 3	21.35	92,500	--
63	08150800	Beaver Creek near Mason	218	1963	May 16, 1965	13.58	23,200	Aug. 3	24.00	66,900	>100
64	08151500	Llano River at Llano	4,233	1879	June 14, 1935	41.5	380,000	Aug. 3	25.61	139,000	15
65	08152000	Sandy Creek near Kingsland	327	1881	Sept. 11, 1952	34.2	163,000	Aug. 2	8.89	3,610	--
66	08152800	Spring Creek near Fredericksburg 3/	15.2	1967	Aug. 28, 1974	8.42	7,530	Aug. 3	17.0	42,500	>100
67	08153100	Cane Branch at Stonewall 3/	1.37	--	--	--	--	Aug. 3	--	<10	--
68	08153500	Pedernales River near Johnson City	947	1859	Sept. 11, 1952	42.5	441,000	Aug. 3	24.9	127,000	25
69	08154500	Lake Travis near Austin	25,250	1940	May 18, 1957	707.4	2/ 1,770,000	Aug. 4	662.9	2/ 868,200	--
		GUADALUPE RIVER BASIN									
70	08165300	North Fork Guadalupe River near Hunt	168	1900	July 1, 1932	37.3	140,000	Aug. 3	26.8	39,300	--
71	08165500	Guadalupe River at Hunt	288	1900	July 2, 1932	36.6	206,000	Aug. 2	23.5	62,900	10
72	08166000	Johnson Creek near Ingram	114	1852	July 2, 1932	35.0	138,000	Aug. 3	21.4	73,900	60
73	--	Turtle Creek at State Highway 16 near Kerrville 10/	26.5	--	--	--	--	Aug. 2	--	32,700	--
74	08166300	Turtle Creek tributary near Kerrville 3/	.46	--	--	--	--	--	11.2	605	--
75	08167000	Guadalupe River at Comfort	838	1848	July 1869	40.3	1/	Aug. 2	40.9	240,000	>100
76	08167500	Guadalupe River near Spring Branch	1,315	1859	1869	53.0	1/	Aug. 3	45.25	158,000	>100

See footnotes at end of table.

Table 1.--Summary of flood stages and discharges--Continued

Map number	WRD station number	Stream and place of determination	Contributing drainage area (mi^2)	Period of known floods	Maximum flood previously known			Maximum during present flood			Recurrence interval (years)
					Date	Stage (feet)	Discharge (ft^3/s)	Date (1978)	Stage (feet)	Discharge (ft^3/s)	
77	08167600	Rebecca Creek near Spring Branch	10.9	1885	Sept. 1952	25.5	1/	Aug. 1	2.06	1.5	--
78	08167700	Canyon Lake near New Braunfels	1,432	1962	Apr. 22, 1977	917.96	2/460,400	Aug. 4	12/930.61	2/588,400	--
79	08167800	Guadalupe River at Sattler	1,436	1962	Feb. 11, 1975	8.18	13/5,390	Aug. 5	8.31	5,850	--
80	--	North Prong Medina River near Medina 10/	67.5	1932	July 1, 1932	--	40,200	Aug. 2	--	123,000	--
81	08178900	Bandera Creek tributary near Bandera 3/	.27	--	--	--	--	Aug. 2	10.9	120	--
82	08179000	Medina River near Pipe Creek	474	1880	1919	43.0	14/115,000	Aug. 2	49.6	281,000	>100
83	08179100	Red Bluff Creek near Pipe Creek	56.3	1905	Sept. 27, 1964	22.64	46,900	Aug. 2	3.7	160	--
84	08179500	Medina Lake near San Antonio	634	1913	Sept. 16, 1919	1,078.0	2/288,000	Aug. 2	1,076.67	2/281,000	--
85	08180500	Medina River near Rio Medina 3/	650	1922	July 15, 1973	23.2	28,600	Aug. 2	20.0	20,100	--
86	08180800	Medina River near Somerset	967	1890	July 17, 1973	29.39	30,500	Aug. 4	22.35	12,800	--
87	08181500	Medina River at San Antonio	1,317	1939	July 17, 1973	43.59	31,900	Aug. 4	29.95	1,030	--
88	08183900	Cibolo Creek near Boerne	68.4	1892	Sept. 27, 1964	19.15	36,400	Aug. 2	3.65	462	--
		NUECES RIVER BASIN									
89	08195000	Frio River at Concan	405	1869	July 1, 1932	34.44	162,000	Aug. 2	6.9	3,350	--
90	08196000	Dry Frio River near Reagan Wells	117	1875	1880	33.0	1/	Aug. 1	5.23	1,500	--
91	08198000	Sabinal River near Sabinal	206	1892	July 2, 1932	33.0	1/	Aug. 2	19.43	23,200	--
92	08200000	Hondo Creek near Tarpley	86.2	1907	June 17, 1958	28.2	69,800	Aug. 2	13.10	13,200	--
93	08201500	Seco Creek at Miller Ranch near Utopia	43.1	1901	June 17, 1958	16.4	52,600	Aug. 2	8.40	10,600	--

1/ Discharge not determined.
2/ Contents in acre-feet.
3/ Discontinued site, see table 2.
4/ The maximum stage since 1915 occurred in 1932 and the second highest stage occurred in 1959, 2,510 feet.
5/ The maximum stage occurred in 1876 and was several feet higher than flood of June 16, 1930, 30 feet, 95,600 ft^3/s.
6/ Stage and discharge data at site 08093100.
7/ At site 6.5 miles downstream.
8/ Backwater from Colorado River.
9/ Prior to completion of Lake Brownwood.
10/ Miscellaneous site, see table 2.
11/ At site 17 miles downstream.
12/ Elevation at 2400 hours.
13/ Maximum since closure of Canyon Dam on July 21, 1962.
14/ From rating extended above 32,000 ft^3/s on basis of slope-area measurement of 64,000 ft^3/s.

Table 2.--Locations of discontinued stream-gaging stations and miscellaneous discharge-measurement sites

Map number	Station number	Name and location
		BRAZOS RIVER BASIN
4	08082900	North Elm Creek near Throckmorton. Lat 33°10'50", long 99°22'05, Throckmorton County, Hydrologic Unit 12060101, at culvert on State Highway 24, and 11.3 miles (18.2 kilometers) west of Throckmorton.
15	08085300	Humphries Draw near Haskell. Lat 33°10'40", long 99°34'30", Haskell County, Hydrologic Unit 12060101, at culvert on State Highway 24, and 9.3 miles (15.0 kilometers) east of Haskell.
17	08086050	Deep Creek at Moran. Lat 32°33'33", long 99°10'11", Shackelford County, Hydrologic Unit 12060105, at downstream side of bridge on U.S. Highway 380, 0.8 mile (1.3 kilometer) north of Moran, and 10.8 miles (17.4 kilometers) upstream from Hubbard Creek.
		COLORADO RIVER BASIN
59	--	Bear Creek at Interstate Highway 10 near Junction. Lat 30°31'57", long 99°50'11", Kimble County, Hydrologic Unit 12090202, 1.3 miles (2.1 kilometers) upstream from Interstate Highway 10, 1.5 miles (2.4 kilometers) upstream from mouth, and 3.4 miles (5.5 kilometers) west of Junction.
60	08148500	North Llano River near Junction. Lat 30°31'06", long 99°48'39", Kimble County, Hydrologic Unit 12090202, 1,000 feet (305 meters) upstream from remains of old Wilson Dam, 2.1 miles (3.4 kilometers) northwest of Junction, and 4 miles (6 kilometers) upstream from confluence with South Llano River.
66	08152800	Spring Creek near Fredericksburg. Lat 30°18'10", long 99°03'20", Gillespie County, Hydrologic Unit 12090206, downstream side of bridge on U.S. Highway 290, and 11 miles (18 kilometers) west of Fredericksburg.
67	08153100	Cane Branch at Stonewall. Lat 30°14'07", long 98°39'21", Gillespie County, Hydrologic Unit 12090206, at culvert on U.S. Highway 290 at Stonewall, and 0.6 mile (1.0 kilometer) upstream from Pedernales River.
		GUADALUPE RIVER BASIN
73	--	Turtle Creek at State Highway 16 near Kerrville. Lat 29°57'41", long 99°12'35", Kerr County, Hydrologic Unit 12100201, 0.1 mile (0.2 kilometer) upstream from Lambs Creek, at State Highway 16 and 9.0 miles (14.5 kilometers) southwest of Kerrville.
74	08166300	Turtle Creek tributary near Kerrville. Lat 29°58'11", long 99°11'02", Kerr County, Hydrologic Unit 12100201, at culvert on Farm Road 2771, and 5.9 miles (9.5 kilometers) south of Kerrville.
80	--	North Prong Medina River near Medina. Lat 29°51'49", long 99°22'18", Bandera County, Hydrologic Unit 12100302, 0.5 mile (0.8 kilometer) upstream from Lima School, and 12.0 miles (19.3 kilometers) upstream from mouth.
81	08178900	Bandera Creek tributary near Bandera. Lat 29°50'51", long 99°06'12", Bandera County, Hydrologic Unit 12100302, at culvert on Farm Road 689, and 10 miles (16 kilometers) north of Bandera.
85	08180500	Medina River near Rio Medina. Lat 29°29'53", long 98°54'16", Medina County, Hydrologic Unit 12100302, on left bank 233 feet (71 meters) upstream from bridge at Haby's crossing, 4.2 miles (6.8 kilometers) northwest of Rio Medina, and 10.4 miles (16.7 kilometers) upstream from San Geronimo Creek.

Table 3.--Water-quality data for Hubbard Creek, June 9 and August 29, 1978

Site	June 9, 1978 Elevation: 1174.13 feet Contents: 201,200 acre-feet						August 29, 1978 Elevation: 1181.80 feet Contents: 299,900 acre-feet					
	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation
P_1	1	1510	8.1	25.0	7.0	90	1	894	8.0	27.0	5.8	73
	10	1510	8.1	25.0	7.0	90	10	894	8.0	27.0	5.2	66
	20	1510	8.1	25.0	6.9	88	20	894	7.9	26.5	5.1	65
	30	1510	8.1	24.5	6.8	87	30	860	7.4	26.0	2.0	38
	40	1510	7.3	22.5	1.9	23	40	700	7.3	24.5	1.0	12
	50	1510	7.2	21.5	.7	8	50	333	7.4	23.0	.5	6
	60	1530	7.2	21.0	.2	2	60	333	7.3	23.0	.4	5
							65	333	7.3	23.0	.3	4
P_4	1	1520	8.1	25.5	7.1	92	1	894	8.4	28.0	6.7	86
	13	1520	8.1	25.0	7.0	90	10	894	8.2	27.5	6.3	81
							20	894	7.6	26.0	3.2	40
							25	840	7.5	26.0	2.7	34
P_6	1	1510	8.1	27.5	7.3	97	1	890	8.3	28.0	6.5	83
	10	1510	8.1	26.5	7.4	97	10	880	8.3	28.0	6.2	79
	20	1510	8.1	26.0	7.0	91	20	850	8.1	27.5	5.9	76
	30	1510	7.9	25.0	6.1	78	30	820	7.8	27.0	5.1	65
	40	1510	7.2	23.5	1.4	18	40	730	7.4	25.0	1.9	23
	50	1510	7.2	22.5	.3	4	50	390	7.4	24.0	.3	4
	59	1510	7.2	22.0	.3	4	60	380	7.4	24.0	.3	4
							67	370	7.3	24.0	.3	4
P_9	1	1500	8.1	27.5	7.3	97	1	831	8.3	28.5	7.1	92
	10	1500	8.1	26.5	7.2	95	10	831	8.2	28.0	6.7	86
	20	1500	8.1	26.5	6.9	91	20	821	8.1	28.0	6.2	79
	30	1500	8.0	26.0	6.3	82	30	754	7.3	26.5	1.8	23
	42	1500	7.4	25.5	3.0	39	40	754	7.3	26.5	1.2	15
							47	754	7.3	26.5	1.2	15
P_{10}	1	1490	8.1	26.0	7.1	92	1	793	8.1	27.5	6.5	83
	10	1490	8.0	25.5	6.6	86	10	780	8.0	27.0	6.0	76
	20	1490	8.0	25.5	6.3	82	20	740	7.7	27.0	5.1	65
	33	1490	7.8	25.5	5.2	68	30	740	7.6	27.0	4.2	53
							41	740	7.3	27.0	1.9	24
P_{11}	1	1470	8.1	28.0	7.0	93	1	750	7.9	28.0	6.1	78
	10	1470	8.0	26.5	6.5	86	10	739	7.7	27.5	5.3	68
	23	1470	8.0	26.5	6.3	83	20	725	7.4	27.5	3.3	42
							32	720	7.3	27.5	1.8	23
P_{12}	1	1160	8.1	27.5	8.2	109	1	661	7.5	28.0	4.6	59
	12	1210	7.7	26.5	5.6	74	10	640	7.3	27.0	3.2	41
							21	625	7.0	26.5	.3	4
P_{13}	1	1510	8.1	25.5	7.2	94	1	890	8.3	28.0	6.6	85
	10	1510	8.1	25.0	7.0	90	10	890	8.2	28.0	6.3	81
	20	1510	8.1	25.0	6.8	87	20	886	8.1	27.5	5.8	74
	30	1510	8.0	24.5	6.2	79	30	841	7.4	26.5	1.8	23
	40	1510	7.3	23.0	2.1	26	40	635	7.3	25.0	.4	5
	55	1510	7.2	22.0	1.1	13	50	350	7.3	26.0	.3	4
							58	280	7.4	26.5	.4	5
P_{15}	1	1510	8.0	26.5	6.8	89	1	870	8.1	28.0	6.0	77
	10	1510	8.0	26.0	6.4	83	10	865	7.9	27.5	5.5	71
	20	1510	7.9	26.0	5.8	75	20	856	7.7	27.5	4.6	59
	33	1510	7.5	25.5	3.3	43	30	850	7.6	28.0	4.1	53
							36	845	7.4	28.0	3.4	44
P_{16}	1	1510	8.1	26.5	7.1	93	1	851	7.6	28.0	5.0	64
	10	1510	8.0	25.5	6.4	83	10	845	7.6	27.5	4.5	58
	22	1510	7.9	25.0	6.1	78	20	840	7.5	27.5	4.1	53
							31	793	7.2	27.5	.5	6

Table 3.--Water-quality data for Hubbard Creek, June 9 and August 29, 1978--Continued

Site	June 9, 1978 Elevation: 1174.13 feet Contents: 201,200 acre-feet						August 29, 1978 Elevation: 1181.80 feet Contents: 299,900 acre-feet					
	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation
P_{17}	1	1180	8.1	27.0	7.1	93	1	801	7.4	28.0	4.7	60
	10	1200	7.4	26.0	3.1	40	10	797	7.1	27.5	1.2	15
	18	1310	7.2	26.0	.6	8	24	725	7.1	27.0	.4	5
P_{18}	1	978	7.7	26.0	5.8	75	1	858	7.4	28.0	3.9	50
	11	987	7.3	25.5	2.7	35	10	858	7.2	28.0	.9	12
							22	804	7.1	26.5	.3	4

Table 4.--Water-quality data for Possum Kingdom Reservoir, June 13 and August 30, 1978

Site	June 13, 1978 Elevation: 994.84 feet Contents: 486,400 acre-feet						August 30, 1978 Elevation: 999.17 feet Contents: 555,800 acre-feet					
	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation
A_R	1	3860	8.0	27.0	8.1	107	1	887	8.8	29.0	9.2	121
	10	3860	8.0	26.5	8.3	109	10	887	8.6	28.0	7.6	97
	20	3860	8.0	25.5	8.5	109	20	940	7.4	27.5	2.8	36
	30	3860	7.9	23.0	8.3	102	30	980	7.3	27.0	1.2	15
	40	3860	7.8	17.0	7.3	80	40	1170	7.2	26.0	.4	5
	50	3860	7.5	14.5	6.5	68	50	1620	7.2	25.5	.3	4
	60	3860	7.3	14.5	5.8	60	60	2140	7.2	26.0	.3	4
							65	2440	7.3	26.0	.4	5
A_C	1	3860	8.0	27.0	8.1	107	1	887	8.9	29.0	9.2	121
	10	3860	8.0	26.5	8.2	108	10	887	8.6	28.0	7.8	100
	20	3860	8.0	26.0	8.2	106	20	945	7.4	27.5	2.4	31
	30	3860	8.0	23.5	8.3	104	30	1000	7.3	27.0	1.1	14
	40	3860	7.9	17.0	7.3	80	40	1030	7.3	26.5	.5	6
	50	3860	7.6	17.0	6.5	71	50	1730	7.2	26.0	.2	2
	60	3860	7.4	14.0	6.2	64	60	2350	7.2	25.5	.2	2
	70	3860	7.2	12.5	5.1	51	70	3200	7.2	24.0	.2	2
	80	3860	7.2	12.0	4.6	46	80	3820	7.2	20.5	.2	2
	90	3860	7.2	12.0	4.2	42	90	3820	7.1	17.5	.2	2
	100	3860	7.0	12.0	2.6	26	102	3820	7.0	16.5	.3	3
B_R	1	3890	8.0	27.0	8.0	105	1	790	8.7	28.5	8.1	105
	10	3890	8.0	27.0	8.0	105	10	800	8.6	28.0	7.7	99
	20	3890	8.0	25.5	8.2	102	20	810	7.3	27.5	5.5	71
	30	3890	7.9	22.5	7.7	94	30	820	7.3	26.5	1.6	20
	40	3890	7.4	16.0	4.9	53	40	1070	7.3	26.0	.3	4
	50	3890	7.2	14.0	4.0	41	50	1710	7.2	25.5	.3	4
	60	3890	7.2	14.0	3.9	40	60	2250	7.2	25.5	.3	4
	70	3890	7.2	14.0	3.7	38	67	2910	7.2	25.5	.4	5
B_C	1	3890	8.0	27.0	8.0	105	1	790	8.6	28.0	7.6	97
	10	3890	8.0	26.5	8.1	107	10	800	8.4	28.0	6.0	77
	20	3890	8.0	25.0	8.1	104	20	800	8.2	27.5	6.0	77
	30	3890	7.9	19.5	7.3	85	30	820	7.3	27.0	1.8	23
	40	3890	7.5	16.0	5.2	56	40	1030	7.2	26.0	.2	2
	50	3890	7.2	14.0	4.1	42	50	1640	7.2	25.5	.3	4
	60	3890	7.2	14.0	4.1	42	60	1940	7.2	25.0	.3	4
	70	3890	7.2	13.0	4.1	41	70	3390	7.2	24.0	.3	4
	80	3890	7.2	13.0	3.8	38	80	3820	7.2	20.5	.3	3
	91	3890	7.2	13.0	3.8	38	90	3820	7.1	17.5	.3	3
							96	3820	7.0	17.0	.8	9
P_3	1	3890	8.0	28.0	8.0	107	1	760	8.9	29.0	9.9	130
	10	3890	8.0	27.5	8.1	108	10	760	8.9	28.5	9.1	118
	20	3890	8.0	24.0	8.2	102	20	760	8.7	28.0	8.3	106
	30	3890	7.4	22.5	4.6	56	30	801	7.4	27.0	2.4	30
	40	3890	7.2	17.5	3.0	33	40	965	7.3	26.0	1.0	12
	50	3890	7.0	15.0	1.4	15	50	1470	7.2	25.5	.3	4
	56	3890	7.0	15.0	1.2	13	59	1780	7.2	25.5	.4	5
C_C	1	4010	8.0	27.0	7.9	104	1	710	8.6	28.0	8.3	106
	10	4010	8.0	26.5	7.9	104	10	710	8.6	28.0	7.7	99
	20	4010	7.9	25.0	7.5	96	20	710	8.4	27.5	7.4	95
	30	4010	7.5	20.0	5.3	62	30	750	7.4	26.5	3.4	43
	40	4010	7.2	15.0	2.3	24	40	950	7.3	26.0	1.5	19
	50	4010	7.1	14.0	2.0	21	50	1770	7.2	25.5	.3	4
	60	4010	7.1	13.5	2.1	21	60	2970	7.1	25.5	.3	4
	70	4010	7.1	13.0	2.1	21	70	3680	7.1	24.5	.3	4
	78	4010	7.1	13.0	2.3	23	80	3800	7.0	21.0	.5	6

Table 4.--Water-quality data for Possum Kingdom Reservoir, June 13 and August 30, 1978--Continued

Site	June 13, 1978 Elevation: 994.84 feet Contents: 486,400 acre-feet						August 30, 1978 Elevation: 999.17 feet Contents: 555,800 acre-feet					
	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation
P_5	1	3940	8.0	27.5	7.7	103	1	720	8.6	28.0	8.2	105
	10	3940	8.0	27.0	7.7	101	10	720	8.5	28.0	8.1	104
	20	3940	7.8	26.5	7.2	95	20	720	8.5	28.0	8.0	103
	30	3940	7.8	25.5	5.0	64	30	720	8.5	27.5	8.1	104
	34	3940	7.7	25.5	6.1	78	40	830	7.3	27.0	2.3	29
P_7	1	3930	8.0	27.5	7.6	101	1	770	8.6	28.0	7.6	97
	10	3930	8.0	27.0	7.5	99	10	770	8.6	28.0	7.2	92
	20	3930	7.8	26.0	7.4	96	20	770	8.4	27.0	6.6	84
	30	3930	7.6	23.0	5.1	63	30	870	7.2	27.0	1.0	13
	40	3930	7.0	23.0	1.7	21	40	1130	7.2	26.0	.3	4
	50	3930	7.0	22.0	.9	11	54	770	7.2	26.0	.5	6
	60	3930	7.0	22.0	.9	11						
D_C	1	3970	8.0	27.5	7.7	103	1	732	8.4	27.5	7.1	91
	10	3970	8.0	27.5	7.7	103	10	742	8.4	27.5	6.9	88
	20	3970	8.0	26.5	7.7	101	20	742	8.3	27.5	6.8	87
	30	3970	7.2	23.0	3.4	42	30	762	7.5	27.0	3.6	46
	40	3970	7.2	16.0	1.1	12	40	970	7.2	25.5	1.2	15
	50	4030	7.2	14.5	.9	9	50	1740	7.2	25.5	.2	2
	60	4030	7.2	14.5	.8	8	60	3180	7.1	25.5	.3	4
	65	4030	7.2	14.5	1.1	11	72	3440	7.0	24.5	.3	4
E_C	1	4150	8.0	27.0	7.9	104	1	779	8.5	29.5	7.8	103
	10	4150	8.0	26.5	7.7	101	10	779	8.4	29.0	7.5	99
	20	4150	7.8	25.5	7.0	90	20	779	8.0	28.0	5.7	73
	30	4380	7.0	23.0	1.0	12	30	810	7.3	27.0	1.4	18
	40	4380	7.0	18.0	.3	3	40	1020	7.2	26.5	.5	6
	50	4380	7.0	16.5	.4	4	50	2170	7.2	26.0	.3	4
							58	2430	7.2	26.0	.4	5
F_C	1	4250	8.1	28.0	8.0	107	1	770	8.5	29.0	8.0	105
	10	4250	8.0	27.0	7.5	99	10	840	8.3	29.0	7.0	92
	20	4250	7.8	26.5	6.9	91	20	960	7.9	28.0	4.4	56
	30	4320	7.2	24.5	3.8	48	30	1410	7.2	27.0	.3	4
	43	4420	6.9	20.0	.3	3	42	1570	7.2	27.0	.3	4
G_C	1	4210	8.0	28.0	8.0	107	1	1080	8.5	29.5	8.1	107
	10	4240	8.0	27.0	7.5	99	10	1030	8.0	28.5	5.6	73
	20	4240	7.7	26.5	6.0	79	20	1030	7.8	28.0	4.5	58
	34	4440	7.4	25.8	4.7	61	30	1420	7.2	27.0	.3	4
							40	1640	7.2	26.5	.3	4
P_9	1	4240	8.1	28.0	9.1	121	1	1300	7.9	29.0	5.8	76
	10	4240	8.1	27.5	8.6	115	10	1300	7.6	28.5	4.2	55
	20	4290	7.2	26.5	3.3	43	20	1480	7.2	27.5	.9	12
	30	4290	7.2	26.5	3.0	39	33	1480	7.2	27.5	.5	6
P_{10}	1	4110	8.1	29.5	9.8	132	1	1120	8.7	30.0	8.7	116
	10	3960	7.9	28.0	8.3	111	10	1330	8.5	29.0	7.3	96
	14	3960	7.9	28.0	7.8	104	19	3350	7.8	29.0	4.8	63

Table 5.--Water-quality data for Whitney Lake, June 23 and September 5-6, 1978

Site	June 23, 1978 Elevation: 521.69 feet Contents: 406,100 acre-feet						September 5-6, 1978 Elevation: 532.44 feet Contents: 615,000 acre-feet					
	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation
A_L	1	1410	8.0	26.6	6.3	82	1	2240	8.3	30.0	7.9	105
	10	1410	8.0	26.6	6.3	82	10	2240	8.3	29.5	7.9	105
	20	1410	8.0	26.5	5.9	77	20	2240	8.2	29.0	7.3	96
	34	1410	7.4	24.8	1.0	13	30	2240	7.8	28.0	5.3	69
							42	3130	7.2	28.0	.5	6
A_C	1	1410	8.1	26.7	6.8	88	1	2240	8.3	30.0	7.8	105
	10	1410	8.1	26.6	6.7	87	10	2240	8.3	29.0	7.8	103
	20	1410	8.0	26.3	5.4	70	20	2240	8.2	29.0	7.4	97
	30	1410	7.6	25.3	2.4	31	30	2290	7.6	28.0	4.0	53
	40	1410	7.4	22.8	.2	2	40	2950	7.2	28.0	.3	4
	50	1400	7.4	20.7	.2	2	50	3490	7.1	26.5	.3	4
	60	1400	7.4	19.6	.2	2	60	3500	7.1	25.5	.3	4
	70	1390	7.4	18.7	.2	2	70	3320	7.1	25.5	.3	4
	80	1380	7.4	17.4	.2	2	80	3060	7.1	24.0	.4	5
	89	1370	7.4	16.6	.2	2	90	2360	7.1	21.0	.4	5
							101	2240	7.1	20.0	.6	7
B_C	1	1450	8.2	27.4	6.8	89	1	2220	8.3	29.5	7.8	100
	10	1450	8.3	27.2	6.8	89	10	2220	8.3	29.0	7.6	100
	20	1480	8.0	26.8	5.2	68	20	2220	8.2	28.5	6.7	87
	30	1460	7.9	26.5	4.5	58	30	2270	7.7	28.0	4.4	57
	40	1410	7.4	22.8	.2	2	40	3210	7.2	27.5	.2	3
	50	1400	7.4	20.9	.2	2	50	3520	7.1	26.5	.2	3
	60	1390	7.4	20.0	.2	2	60	3600	7.1	26.0	.3	4
	70	1390	7.4	19.2	.2	2	70	3500	7.1	25.0	.3	4
	80	1380	7.2	18.3	.2	2	80	3190	7.1	24.0	.3	4
	85	1370	7.4	17.5	.2	2	90	2640	7.1	21.5	.4	5
							96	2470	7.1	21.0	.5	6
C_C	1	1460	8.2	28.0	6.8	91	1	2200	8.3	29.5	7.7	101
	10	1460	8.3	28.0	6.8	91	10	2200	8.3	28.5	7.2	94
	20	1460	8.2	27.9	6.7	88	20	2200	8.1	28.5	6.2	81
	30	1460	8.2	27.6	6.6	87	30	2260	7.8	28.0	4.9	63
	40	1520	7.5	25.9	1.3	17	40	3240	7.2	27.5	.2	3
	50	1390	7.4	21.3	.2	2	50	3560	7.1	26.5	.3	4
	60	1380	7.4	20.1	.2	2	60	3580	7.1	26.0	.3	4
	70	1370	7.4	19.0	.2	2	70	3520	7.1	25.5	.3	4
	78	1360	7.4	19.0	.2	2	80	3300	7.1	24.5	.3	4
							90	3000	7.1	22.5	.5	6
D_C	1	1470	8.2	28.4	6.8	88	1	2180	8.4	29.5	7.9	107
	10	1470	8.3	28.5	6.8	88	10	2210	8.2	28.5	6.4	86
	20	1480	8.3	28.6	6.7	87	20	2280	7.6	28.0	3.6	48
	30	1510	8.2	28.3	6.3	84	30	2930	7.2	28.0	.2	3
	40	1660	7.6	27.4	2.8	37	40	3510	7.2	27.0	.3	4
	50	1500	7.4	22.5	.1	1	50	3670	7.1	26.5	.3	4
	60	1440	7.4	20.9	.1	1	60	3720	7.1	26.0	.3	4
	66	1430	7.4	20.9	.1	1	70	3680	7.1	25.5	.3	4
							76	3660	7.1	25.5	.4	5
E_C	1	1510	8.1	29.2	6.7	91	1	2210	8.3	29.0	7.5	99
	10	1510	8.2	29.1	6.7	91	10	2220	8.1	28.5	6.5	86
	20	1510	8.2	29.0	6.7	91	20	2230	7.9	28.5	5.2	69
	30	1510	8.2	28.9	6.7	91	30	3290	7.2	28.0	.2	3
	40	1540	8.1	28.2	5.9	79	40	3590	7.1	27.0	.2	3
	45	1740	7.6	28.1	2.6	35	50	3680	7.1	26.5	.2	3
	50	1470	7.4	24.0	.2	2	60	3680	7.1	26.0	.3	4
	54	1450	7.4	22.5	.2	2	67	3680	7.1	26.0	.5	6

Table 5.--Water-quality data for Whitney Lake, June 23 and September 5-6, 1978--Continued

Site	June 23, 1978 Elevation: 521.69 feet Contents: 406,100 acre-feet						September 5-6, 1978 Elevation: 532.44 feet Contents: 615,000 acre-feet					
	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation	Depth (feet)	Specific conductance (micromhos)	pH (units)	Temperature (°C)	Dissolved oxygen (mg/L)	Percent saturation
P_5	1	1450	8.3	29.6	7.2	97	1	2120	8.0	29.5	7.0	92
	10	1450	8.3	29.4	7.2	97	10	2240	7.8	28.5	5.3	69
	16	1450	8.1	28.8	5.7	77	20	2280	7.6	28.5	4.0	52
							27	2360	7.2	28.5	.8	10
P_7	1	1480	8.3	30.1	7.1	96	1	2200	8.3	29.5	7.7	105
	10	1480	8.3	29.4	6.9	93	10	2210	7.8	28.5	4.8	64
	20	1480	8.2	29.0	6.7	91	20	2270	7.4	28.0	2.9	39
	30	1480	7.9	28.9	4.2	57	30	3260	7.2	28.0	.2	3
	36	1480	7.5	28.5	1.3	17	40	3480	7.1	27.0	.3	4
							49	3620	7.1	27.0	.4	5
F_C	1	1510	8.2	29.5	6.9	93	1	2220	8.2	29.5	6.7	91
	10	1510	8.2	29.4	6.9	93	10	2240	7.9	29.0	5.5	72
	20	1510	8.2	29.2	6.8	92	20	2360	7.3	28.5	2.5	34
	30	1510	8.2	28.8	6.7	91	30	2640	7.1	28.0	.2	3
	40	1510	8.2	28.6	6.7	89	40	3540	7.1	27.0	.2	3
	46	1510	8.2	28.4	6.4	85	55	3650	7.0	26.5	.3	4
G_C	1	1580	8.2	29.2	6.6	89	1	2290	7.8	29.0	6.0	79
	10	1610	8.0	29.0	5.4	73	10	2320	7.7	29.0	5.6	74
	20	1640	8.0	28.7	5.3	71	20	2480	7.2	28.5	1.7	22
	30	1730	7.8	28.7	4.2	56	30	2870	7.1	28.5	.2	3
	41	2000	7.4	28.5	1.6	21	40	3490	7.1	27.5	.2	3
							50	3660	7.0	27.5	.4	5
P_8	1	1510	8.2	29.1	6.9	93	1	2200	8.2	29.0	7.2	95
	10	1510	8.3	28.9	6.9	93	10	2200	8.1	28.5	6.8	87
	20	1510	8.2	28.8	6.8	92	20	2210	7.4	28.0	2.8	37
	30	1510	8.2	28.7	6.4	85	30	3050	7.1	28.0	.4	5
							42	3470	7.0	27.0	.5	6
P_{12}	1	2490	8.4	30.8	8.4	115	1	2740	7.8	30.0	6.1	82
	10	2480	8.1	29.7	5.6	76	10	2740	7.6	29.5	4.5	61
	16	2430	7.7	29.5	3.7	50	20	2980	7.1	29.0	.2	3
							27	3050	7.0	29.0	.3	4
P_{14}	1	2650	8.3	30.3	7.4	100	1	3030	7.9	29.5	6.6	89
	10	2720	8.1	29.8	6.3	85	10	3030	7.6	29.0	4.8	63
	20	2770	8.0	29.6	5.5	74	20	3040	7.1	28.5	.2	3
	27	2770	7.9	29.6	5.0	68	27	3050	7.1	28.5	.2	3

Table 6.--Station descriptions and discharge data

(1) 08082500 BRAZOS RIVER AT SEYMOUR, TX
(National stream-quality accounting network)

LOCATION.--Lat 33°34'51", long 99°16'02", Baylor County, Hydrologic Unit 12060101, on left bank at upstream side of bridge on U.S. Highways 277 and 283, 0.8 mi (1.3 km) upstream from Wichita Valley Railway bridge, 1.0 mi (1.6 km) southwest of courthouse in Seymour, and at mile 847.4 (1,363.5 km).

DRAINAGE AREA.--15,538 mi² (40,243 km²), approximately, of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--November 1923 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,238.97 ft (377.638 m) National Geodetic Vertical Datum of 1929. Prior to Apr. 6, 1972, at datum 2.00 ft (0.610 m) higher.

REMARKS.--Small diversions above station for irrigation and oilfield operation. National Weather Service gage-height telemeter at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 28,200 ft³/s (799 m³/s) Aug. 5, 1978, gage height, 14.20 ft (4.328 m).
FOR PERIOD 1923 to July 1978.--Maximum discharge, 95,400 ft³/s (2,700 m³/s) Oct. 16, 1926, gage height, 17.16 ft (5.230 m), from floodmarks, present datum, from rating curve extended above 48,000 ft³/s (1,360 m³/s) on basis of slope-area measurement of 95,400 ft³/s (2,700 m³/s); maximum gage height, 23.00 ft (7.010 m), present datum, Sept. 28, 1955, discharge 71,200 ft³/s (2,020 m³/s).
HISTORIC.--Maximum stage since 1906 was that of Sept. 28, 1955, and the maximum discharge was that of Oct. 16, 1926. A flood in 1906 reached about the same stage as flood in 1955.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	923	16...	94	24...	73
2....	.00	9....	575	17...	85	25...	58
3....	.42	10...	412	18...	72	26...	51
4....	3,590	11...	500	19...	58	27...	47
5....	19,200	12...	543	20...	47	28...	42
6....	4,380	13...	286	21...	50	29...	38
7....	1,940	14...	193	22...	62	30...	37
		15...	139	23...	83	31...	36
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1,080
MONTHLY TOTAL ACRE-FEET.....							66,700
RUNOFF, IN INCHES.....							.08

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	0600	1.80	22	Aug. 4 -	2000	9.00	9,000	Aug. 6 -	0600	7.85	5,810
	1200	2.31	110		2400	10.75	14,700		1200	7.16	4,250
	2400	2.23	92						1800	6.69	3,450
				Aug. 5 -	0200	12.10	19,800		2400	6.31	2,860
Aug. 4 -	0200	2.17	79		0400	13.50	25,400				
	0400	2.32	113		0600	14.20	28,200	Aug. 7 -	1200	5.56	1,900
	0600	2.62	200		0800	14.00	27,400		2400	4.93	1,260
	0800	3.24	437		1200	12.50	21,400				
	1200	4.00	792		1800	10.60	14,200	Aug. 8 -	1200	4.47	907
	1400	5.75	2,280		2400	8.92	8,750		2400	4.14	711
	1600	7.15	4,270								

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	19,200	9,060	4,430
1925 to July 1978----------	62,600	35,200	17,800

(2) 08082700 MILLERS CREEK NEAR MUNDAY, TX

LOCATION.--Lat 33°19'45", long 99°27'53", Throckmorton County, Hydrologic Unit 12060101, near right bank on downstream side of bridge on Farm Road 1720, 12.7 mi (20.4 km) southeast of Munday, and 24.6 mi (39.6 km) upstream from Brazos River.

DRAINAGE AREA.--104 mi² (269 km²).

PERIOD OF RECORD.--July 1963 to August 1978.

GAGE.--Water-stage recorder. Altitude of gage is 1,350 ft (411 m), from topographic map.

REMARKS.--No diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 34,600 ft³/s (980 m³/s) Aug. 4, 1978, gage height, 17.53 ft (5.343 m).
FOR PERIOD 1963 to July 1978.--Maximum discharge, 1,040 ft³/s (29.5 m³/s) Aug. 26, 1971, gage height, 14.75 ft (4.496 m).
HISTORIC.--Maximum stage since at least 1883 occurred June 13, 1930, and exceeded 18.0 ft (5.49 m); maximum stage since 1930, 18.0 ft (5.49 m) in October 1962, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	6.5	16...	.01	24...	.00
2....	.00	9....	4.0	17...	.01	25...	.00
3....	.00	10...	2.3	18...	.00	26...	.00
4....	8,730	11...	4.5	19...	.00	27..	.00
5....	3,370	12...	1.4	20...	.00	28...	.00
6....	369	13...	.22	21...	.00	29...	.00
7....	20	14...	.09	22...	.00	30...	.00
		15...	.03	23...	.00	31...	.00

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	403
MONTHLY TOTAL ACRE-FEET	24,800
RUNOFF, IN INCHES	4.47

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 4 -	0300	0.52	0	Aug. 4 -	1400	17.53	34,600	Aug. 5 -	2400	12.63	790
	0400	.52	1.0		1500	17.34	30,600				
	0500	1.01	2.0		1600	17.05	25,400	Aug. 6 -	0600	11.27	589
	0600	2.76	32		1800	16.32	15,600		1200	8.35	366
	0800	3.96	82		2200	15.58	8,910		1800	4.49	114
	0900	5.84	216		2400	15.40	7,690		2400	3.08	42
	1000	8.45	372								
	1100	10.94	555	Aug. 5 -	0600	14.95	5,280	Aug. 7 -	0600	2.53	25
	1200	13.86	2,080		1200	14.18	2,750		1800	1.99	13
	1300	17.07	25,700		1800	13.52	1,530		2400	1.78	9.9

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	8,730	4,160	1,790
1964 to July 1978	973	802	376

(3) 08082800 MILLERS CREEK RESERVOIR NEAR BOMARTON, TX

LOCATION.--Lat 33°24'32", long 99°23'19", Baylor County, Hydrologic Unit 12060101, at intake tower on left bank of Millers Creek, 1.1 mi (1.8 km) upstream from dam, 7.1 mi (11.4 km) southeast of Bomarton, and 13.2 mi (21.2 km) upstream from mouth.

DRAINAGE AREA.--240 mi² (622 km²).

PERIOD OF RECORD.--August 1974 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (Freese, Nichols, & Endress Consulting Engineers bench mark).

REMARKS.--The reservoir is formed by an earthfill dam 9,250 ft (2,820 m) long. The dam was completed in 1974 and storage began in July 1974. The reservoir is used for municipal, mining, and industrial water supply. The uncontrolled emergency spillway is an open cut 3,000 ft (910 m) wide located on left bank about 800 ft (240 m) upstream from leveel. The service spillway is an uncontrolled morning-glory-type drop inlet 16.5 ft (5.0 m) square that discharges through a 5.0-foot-square (1.5 m) concrete conduit. Low-flow releases are made by valves in the outlet vault of the drop inlet. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,355.0	0
Crest of spillway	1,340.1	49,080
Crest of spillway	1,331.2	25,180
Lowest gated outlet (invert)	1,305.0	1,660
Dead storage	1,303.4	1,240

COOPERATION.--The area-capacity tables, prepared from data of Sept. 17, 1965, were furnished by Freese, Nichols, and Endress, Consulting Engineers. Record of diversions furnished by North Central Texas Municipal Water Authority.

MAXIMA: FOR AUGUST 1978.--Contents, 34,480 acre-ft (42.5 hm³) Aug. 6, 1978, elevation, 1,335.30 ft (406.99 m).
FOR PERIOD 1974 to July 1978.--Maximum contents, 3,440 acre-ft (4.24 hm³) June 3, 1977, elevation, 1,309.89 ft (399.254 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	1,100	8....	30,480	16...	26,060	24...	24,950
2....	1,100	9....	29,180	17...	25,900	25...	24,800
3....	1,160	10...	28,210	18...	25,760	26...	24,690
4....	27,250	11...	27,590	19...	25,560	27..	24,570
5....	27,340	12...	27,130	20...	25,460	28...	24,420
6....	33,760	13...	26,710	21...	25,300	29...	24,310
7....	31,760	14...	26,480	22...	25,260	30...	24,190
		15...	26,240	23...	25,180	31...	24,060
CHANGE IN CONTENTS, IN ACRE-FEET							22,960

(5) 08083240 CLEAR FORK BRAZOS RIVER AT HAWLEY, TX

LOCATION.--Lat 32°35'53", long 99°48'53", Jones County Hydrologic Unit 12060102, on right bank 90 ft (27 m) upstream from upstream bridge on U.S. Highways 83 and 277, 0.8 mi (1.3 km) south of Hawley, 7.4 mi (11.9 km) upstream from Mulberry Creek, and 188.6 mi (303.5 km) upstream from mouth.

DRAINAGE AREA.--1,416 mi² (3,667 km²).

PERIOD OF RECORD.--October 1967 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,612.45 ft (491.475 m) National Geodetic Vertical Datum of 1929. Prior to Dec. 21, 1973, at datum 0.80 ft (0.244 m) higher.

REMARKS.--Lake Sweetwater, capacity 11,900 acre-ft (14.7 hm³) is located on a tributary upstream from gage.

MAXIMA: FOR AUGUST 1978.--Discharge 2,540 ft³/s (71.9 m³/s) Aug. 4, 1978, gage height, 14.64 ft (4.462 m).
FOR PERIOD 1967 to July 1978.--Maximum discharge, 6,170 ft³/s (175 m³/s) Sept. 11, 1969, gage height, 19.31 ft (5.886 m), present datum.
HISTORIC.--Maximum stage since at least 1915 occurred in 1932; second highest stage in 1957, 25.0 ft (7.62 m), present datum, from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.03	8....	12	16...	3.3	24...	2.2
2....	.02	9....	9.2	17...	3.0	25...	2.2
3....	428	10...	7.6	18...	2.8	26...	2.4
4....	2,010	11...	6.3	19...	2.6	27...	3.0
5....	350	12...	5.3	20...	2.5	28...	2.3
6....	49	13...	4.7	21...	2.4	29...	2.3
7....	19	14...	4.1	22...	2.3	30...	2.2
		15...	3.7	23...	2.2	31...	2.2
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							95.1
MONTHLY TOTAL ACRE-FEET.....							5,850
RUNOFF, IN INCHES.....							.08

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days*		
	1	3	7
August 1978----------	2,010	929	411
1968 to July 1978----------	4,860	3,530	1,690

(6) 08083245 MULBERRY CREEK NEAR HAWLEY, TX

LOCATION.--Lat 32°34'04", long 99°47'32", Jones County, Hydrologic Unit 12060102, on right bank at downstream side of downstream bridge on U.S. Highways 83 and 277, 3.3 mi (5.3 km) south of Hawley, and 5.8 mi (9.3 km) upstream from Clear Fork Brazos River.

DRAINAGE AREA.--205 mi² (531 km²).

PERIOD OF RECORD.--December 1967 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,615.98 ft (492.551 m) National Geodetic Vertical Datum of 1929.

REMARKS.--No known diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 1,770 ft³/s (50.1 m³/s) Aug. 4, 1978, gage height, 13.98 ft (4.261 m).
FOR PERIOD 1967 to July 1978.--Maximum discharge, 2,500 ft³/s (70.8 m³/s) July 21, 1975, gage height, 15.53 ft (4.734 m).
HISTORIC.--Maximum stage since at least 1932, about 16.0 ft (4.88 m) in 1957, from floodmarks.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	9.1	16...	2.0	24...	.00
2....	.00	9....	7.5	17...	1.2	25...	.00
3....	513	10...	6.8	18...	.71	26...	.00
4....	1,330	11...	6.2	19...	.37	27...	.00
5....	76	12...	5.4	20...	.19	28...	.00
6....	23	13...	4.4	21...	.09	29...	.00
7....	12	14...	3.6	22...	.04	30...	.00
		15...	2.7	23...	.01	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							64.7
MONTHLY TOTAL ACRE-FEET							3,980
RUNOFF, IN INCHES							.36

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	1,330	640	282
1969 to July 1978	1,630	922	537

BRAZOS RIVER BASIN

(7) 08083300 ELM CREEK NEAR ABILENE, TX

LOCATION.--Lat 32°21'08", long 99°48'27", Taylor County, Hydrologic Unit 12060102, on right bank at upstream side of bridge on Farm Road 707, 2.8 mi (4.5 km) southeast of Caps, 7.5 mi (12.1 km) southwest of Abilene, and 35.1 mi (56.5 km) upstream from mouth.

DRAINAGE AREA.--133 mi² (344 km²).

PERIOD OF RECORD.--September 1963 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,804.15 ft (549.90 m) National Geodetic Vertical Datum of 1929 (Texas Department of Highways and Public Transportation bridge plans).

REMARKS.--Since 1921, flow largely regulated by Lake Abilene, capacity 7,900 acre-ft (9.74 hm³), 12 mi (19 km) upstream. Rain gage located at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 1,830 ft³/s (51.8 m³/s) Aug. 3, 1978, gage height, 13.26 ft (4.042 m).
FOR PERIOD 1963 to July 1978.--Maximum discharge, 4,570 ft³/s (129 m³/s) Sept. 18, 1974, gage height, 18.68 ft (5.694 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.00	16...	.00	24...	.00
2....	.00	9....	.00	17...	.00	25...	.00
3....	1,050	10...	.00	18...	.00	26...	.00
4....	177	11...	.00	19...	.00	27...	.00
5....	1.9	12...	.00	20...	.00	28...	.00
6....	.10	13...	.00	21...	.00	29...	.00
7....	.00	14...	.00	22...	4.6	30...	.00
		15...	.00	23...	.35	31...	.00

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	39.8
MONTHLY TOTAL ACRE-FEET	2,450
RUNOFF, IN INCHES	.35

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	1,050	410	176
1965 to July 1978	1,630	1,030	566

(8) 08083400 LITTLE ELM CREEK NEAR ABILENE, TX

LOCATION.--Lat 32°23'29", long 99°51'08", Taylor County, Hydrologic Unit 12060102, on right bank at downstream side of bridge on Farm Road 707, 1.2 mi (1.9 km) north of Caps, 4.6 mi (7.4 km) southwest of intersection of U.S. Highways 277 and 83 in Abilene, and 10.3 mi (16.6 km) upstream from mouth.

DRAINAGE AREA.--39.1 mi^2 (101.3 km^2).

PERIOD OF RECORD.--September 1963 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,786.12 ft (544.409 m) National Geodetic Vertical Datum of 1929.

REMARKS.--No known diversion above station. Rain gage located at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 1,340 ft^3/s (37.9 m^3/s) Aug. 3 1978, gage height, 9.50 ft (2.896 m).
FOR PERIOD 1963 to July 1978.--Maximum discharge, 2,180 ft^3/s (61.7 m^3/s) Sept. 18, 1974, gage height, 11.52 ft (3.511 m).
HISTORIC.--Maximum stage since at least 1903, about 15 ft (4.6 m) in 1913, from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.00	16...	.00	24...	.00
2....	.00	9....	.00	17...	.00	25...	.00
3....	698	10...	.00	18...	.00	26...	.00
4....	96	11...	.00	19...	.00	27...	.00
5....	1.4	12...	.00	20...	.00	28...	.00
6....	.05	13...	.00	21...	.00	29...	.00
7....	.00	14...	.00	22...	.00	30...	.00
		15...	.00	23...	.00	31...	.00

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	25.7
MONTHLY TOTAL ACRE-FEET	1,580
RUNOFF, IN INCHES	.76

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	698	265	114
1965 to July 1978	948	421	189

BRAZOS RIVER BASIN

(9) 08083420 CAT CLAW CREEK AT ABILENE, TX

LOCATION.--Lat 32°28'31", long 99°44'56", Taylor County, Hydrologic Unit 12060102, in Sears Park 320 ft (98 m) downstream from bridge on Ambler Street in Abilene and 1.8 mi (2.9 km) upstream from mouth.

DRAINAGE AREA.--13.0 mi² (33.7 km²).

PERIOD OF RECORD.--October 1970 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,682.32 ft (512.77 m), Corps of Engineers bench mark.

MAXIMA: FOR AUGUST 1978.--Discharge, 1,310 ft³/s (37.1 m³/s) Aug. 3, 1978, gage height, 6.60 ft (2.012 m).
FOR PERIOD 1970 to July 1978.--Maximum discharge, 1,200 ft³/s (34.0 m³/s) Sept. 18, 1974, gage height, 6.41 ft (1.954 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.00	16...	.00	24...	.00
2....	.00	9....	.74	17...	.00	25...	.00
3....	431	10...	.06	18...	.00	26...	.00
4....	115	11...	.00	19...	.00	27...	.00
5....	5.9	12...	.00	20...	.00	28...	1.9
6....	.43	13...	.00	21...	.73	29...	.06
7....	.00	14...	.00	22...	.13	30...	.00
		15...	.00	23...	.00	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							17.9
MONTHLY TOTAL ACRE-FEET.....							1,100
RUNOFF, IN INCHES.....							1.59

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days*		
	1	3	7
August 1978----------	431	184	79
1971 to July 1978----------	480	221	117

(10) 08083470 CEDAR CREEK AT ABILENE, TX

LOCATION.--Lat 32°26'56", long 99°43'13", Taylor County, Hydrologic Unit 12060102, on right bank at upstream side of North Second Street Bridge and State Highway 355 at Abilene, 0.2 mi (0.3) downstream from Lytle Creek, 4.1 mi (6.6 km) downstream from Buttonwillow Creek, 5.9 mi (9.5 km) upstream from Rainy Creek, 7.2 mi (11.6 km) downstream from Kirby Lake, and 9.8 mi (15.8 km), upstream from mouth.

DRAINAGE AREA.--119 mi² (308 km²).

PERIOD OF RECORD.--October 1970 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,677.67 ft (511.354 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Flow is partly regulated by Ltyle Lake, capacity of 1,200 acre-ft (1.48 hm³), and Lake Kirby, capacity 7,620 acre-ft (9.40 hm³).

MAXIMA: FOR AUGUST 1978.--Discharge, 3,830 ft³/s (108 m³/s) Aug. 3, 1978, gage height, 11.93 ft (3.636 m).
FOR PERIOD 1970 to July 1978.--Maximum discharge, 4,670 ft³/s (132 m³/s) Sept. 18, 1974, gage height, 12.54 ft (3.822 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.76	8....	2.3	16...	.62	24...	.21
2....	.94	9....	5.6	17...	.53	25...	.20
3....	931	10...	1.3	18...	.85	26...	.28
4....	882	11...	1.1	19...	.54	27...	.30
5....	55	12...	1.7	20...	.32	28...	1.5
6....	9.6	13...	1.2	21...	2.2	29...	.32
7....	4.7	14...	2.0	22...	1.1	30...	.66
		15...	1.9	23...	.22	31...	.64
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							61.7
MONTHLY TOTAL ACRE-FEET.....							3,790
RUNOFF, IN INCHES.....							.60

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	931	623	270
1971 to July 1978----------	1,710	937	531

(11) 08083500 FORT PHANTOM HILL RESERVOIR NEAR NUGENT, TX

LOCATION.--Lat 32°36'58", long 99°40'05", Jones County, Hydrologic Unit 12060102, at outlet gate tower near right bank, 120 ft (37 m) upstream from dam on Elm Creek, 4.3 mi (6.9 km) upstream from mouth, and 5.4 mi (8.7 km) south of Nugent.

DRAINAGE AREA.--470 mi² (1,217 km²).

PERIOD OF RECORD.--July 1940 to August 1978. Prior to October 1965, monthend contents only.

GAGE.--Nonrecording gage. Datum of gage is 1,580.78 ft (481.822 m) National Geodetic Vertical Datum of 1929.

REMARKS.--The reservoir is formed by a rock-faced earthfill dam 3,740 ft (1,140 m) long. The dam was completed and storage began in October 1938. The uncontrolled service spillway is a cut channel through natural ground with a concrete ogee weir located 0.7 mi (1.1 km) from right end of dam. The service outlet works consist of a concrete tower with a 4.0- by 7.0-foot (1.2 by 2.1 m) conduit. The service tower contains five gated openings at various elevations. The dam and lake are owned by the city of Abilene and were built to impound water for municipal use. Since July 1974, the West Texas Utility Co. has operated a steam generating powerplant on the reservoir. During the year, the city of Abilene diverted 4,400 acre-ft (5.43 hm³) from Clear Fork Brazos River into Fort Phantom Hill Reservoir and an undetermined amount of floodflow was diverted by gravity ditch from Deadman Creek into the reservoir. The capacity table was based on a survey of Oct. 2, 1953. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	69.2	-
Crest of spillway	55.1	74,310
Highest gated outlet (invert)	28.0	10,330
Lowest gated outlet (invert)	1.6	-

COOPERATION.--Records of gage heights and diversions furnished by the city of Abilene. Capacity table furnished by Soil Conservation Service.

MAXIMA (at 0800): FOR AUGUST 1978.--Contents, 50,370 acre-ft (62.1 hm³) Aug. 6-10, 1978, gage height, 48.4 ft (14.75 m).
FOR PERIOD 1940 to July 1978.--Maximum contents observed, 89,910 acre-ft (111 hm³) May 25, 1957, gage height, 58.7 ft (17.89 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	26,780	8....	50,370	16...	49,750	24...	48,530
2....	26,590	9....	50,370	17...	49,440	25...	48,530
3....	26,780	10...	50,370	18...	49,440	26...	48,530
4....	38,590	11...	50,060	19...	49,440	27..	48,230
5....	49,130	12...	50,060	20...	49,130	28...	48,230
6....	50,370	13...	50,060	21...	48,830	29...	48,230
7....	50,370	14...	49,750	22...	48,830	30...	47,940
		15...	49,750	23...	48,830	31...	47,940
CHANGE IN CONTENTS, IN ACRE-FEET							20,970

(12) 08084000 CLEAR FORK BRAZOS RIVER AT NUGENT, TX

LOCATION.--Lat 32°41'24", long 99°40'09", Jones County, Hydrologic Unit 12060102, on right bank 33 ft (10 m) downstream from bridge on Farm Road 600 at Nugent, 2 mi (3 km) downstream from Elm Creek, 4 mi (6 km) upstream from Deadman Creek, and 167.8 mi (270.0 km) upstream from mouth.

DRAINAGE AREA.--2,199 mi² (5,695 km²).

PERIOD OF RECORD.--February 1924 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,531.91 ft (466.926 m) National Geodetic Vertical Datum of 1929 (levels by Brazos River Authority). Prior to Dec. 12, 1933, nonrecording gage at site 575 ft (175 m) downstream at same datum.

REMARKS.--Flow affected by four reservoirs with a capacity of 103,600 acre-ft (128 hm³). Numerous diversions above station for municipal supply and oilfield operation materially affect low flow.

MAXIMA: FOR AUGUST 1978.--Discharge, 2,840 ft³/s (80.4 m³/s) Aug. 4, 1978, gage height, 9.97 ft (3.039 m).
FOR PERIOD 1924 to July 1978.--Maximum discharge observed, 47,000 ft³/s (1,330 (m³/s) Sept. 8, 1932, gage height, 27.05 ft (8.245 m), site then in use, from rating curve extended above 25,000 ft³/s (708 m³/s).
HISTORIC.--Maximum stage, 30 ft (9.1 m) in 1876; floods in 1900 and May 1923 reached stages of 24 and 24.5 ft (7.3 and 7.47 m), respectively, from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.01	8....	20	16...	4.7	24...	2.5
2....	.02	9....	26	17...	4.5	25...	2.3
3....	537	10...	26	18...	4.6	26...	2.6
4....	2,370	11...	8.2	19...	4.5	27...	3.0
5....	1,010	12...	6.8	20...	4.0	28...	3.1
6....	145	13...	5.5	21...	4.5	29...	3.2
7....	42	14...	5.7	22...	11	30...	2.8
		15...	5.0	23...	3.3	31...	2.7
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							138
MONTHLY TOTAL ACRE-FEET.....							8,470

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	2,370	1,310	593
1938 to July 1978----------	18,800	15,100	8,710

(13) 08084500 LAKE STAMFORD NEAR HASKELL, TX

LOCATION.--Lat 33°04'44", long 99°34'52", Haskell County, Hydrologic Unit 12060103, on left bank at intake structure of West Texas Utilities Co. steam powerplant at Lake Stamford on Paint Creek, 1.0 mi (1.6 km) upstream from dam, 1.7 mi (2.7 km) upstream from California Creek, 10 mi (16 km) southeast of Haskell, and 21.8 mi (35.1 km) upstream from mouth.

DRAINAGE AREA.--368 mi² (953 km²).

PERIOD OF RECORD.--July 1953 to August 1978.

GAGE.--Nonrecording gage read once daily. Datum of gage is 2.77 ft (0.84 m) National Geodetic Vertical Datum of 1929 (levels by Freese, Nichols, and Endress, Consulting Engineers).

REMARKS.--The lake is formed by a rolled-fill earthen dam 3,600 ft (1,097 m) long. The dam was completed in March 1953, and deliberate impoundment began in June 1953. The emergency spillway is an uncontrolled natural channel located near right end of dam. The service spillway is an uncontrolled channel excavated through natural ground, 169 ft (52 m) wide, located 900 ft (270 m) to left of left end of dam. The service outlet is a controlled 24-inch-diameter (610 mm) concrete pipe that is used for low-flow releases. During the current year, the cities of Stamford and Hamlin diverted 1,840 acre-ft (2.27 hm³) for municipal use. The capacity table is based on sedimentation survey of 1966. Gage-height record was furnished by West Texas Utilities Co. from their powerplant 1.0 mi (1.6 km) upstream from dam. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,434.0	-
Crest of spillway	1,425.8	-
Crest of spillway	1,414.0	53,070
Lowest gated outlet (invert)	1,380.0	358

COOPERATION.--The capacity table furnished by the Soil Conservation Service. The diversions furnished by city of Stamford.

MAXIMA (at 0800): FOR AUGUST 1978.--Contents, 103,600 acre-ft (128 hm³) Aug. 5, 1978, gage height, 1,422.18 ft (433.480 m).
FOR PERIOD 1953 to July 1978.--Maximum contents, 74,100 acre-ft (91.4 hm³) Sept. 9, 10, 1962, gage height, 1,416.6 ft (431.78 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	16,800	8....	80,640	16...	62,020	24...	57,920
2....	16,800	9....	75,610	17...	61,500	25...	57,420
3....	16,610	10...	72,020	18...	60,460	26...	56,920
4....	75,610	11...	69,700	19...	58,930	27...	56,430
5....	102,100	12...	66,880	20...	58,930	28...	56,430
6....	94,460	13...	64,690	21...	58,420	29...	56,430
7....	86,620	14...	64,150	22...	58,420	30...	55,940
		15...	63,080	23...	57,920	31...	55,940
CHANGE IN CONTENTS, IN ACRE-FEET							39,140

(14) 08084800 CALIFORNIA CREEK NEAR STAMFORD, TX

LOCATION.--Lat 32°55'51", long 99°38'32", Jones County, Hydrologic Unit 12060103, near right bank at downstream side of bridge on Farm Road 142, 9 mi (14 km) east of Stamford, and 19.4 mi (31.2 km) upstream from Paint Creek.

DRAINAGE AREA.--478 mi² (1,238 km²).

PERIOD OF RECORD.--October 1962 to August 1978.

GAGE.--Water-stage recorder. Altitude of gage is 1,470 ft (448 m), from topographic map.

REMARKS.--Three small diversions above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 40,000 ft³/s (1,130 m³/s) Aug. 4, 1978, gage height, 31.00 ft (9.449 m).
FOR PERIOD 1962 to July 1978.--Maximum discharge, 7,420 ft³/s (210 m³/s) May 6, 1969, gage height, 27.12 ft (8.266 m), from rating curve extended above 21.0 ft (6.40 m) on basis of indirect discharge measurement of peak flow.
HISTORIC.--Maxumum stage since at least 1897, 31.00 ft (9.449 m) Aug. 4, 1978. Other large floods occurred June 10, 1962, gage height 29.6 ft (9.02 m), and July 1961 (stage unknown).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	11	16...	3.7	24...	2.5
2....	.00	9....	8.2	17...	3.5	25...	2.5
3....	895	10...	5.7	18...	3.3	26...	2.4
4....	20,400	11...	4.6	19...	3.1	27...	2.4
5....	2,280	12...	4.1	20...	2.9	28...	2.3
6....	84	13...	3.5	21...	2.7	29...	2.2
7....	28	14...	3.4	22...	2.8	30...	2.2
		15...	3.4	23...	2.7	31...	2.1

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	767
MONTHLY TOTAL ACRE-FEET	47,200
RUNOFF, IN INCHES	1.85

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	1000	6.38	0.44	Aug. 4 -	0200	29.25	15,700	Aug. 5 -	0600	24.82	4,640
	1100	6.67	6.3		0400	30.20	24,800		0900	21.00	2,500
	1200	7.38	44		0600	30.94	38,600		1200	15.20	941
	1400	8.40	107		0700	31.00	40,000		1500	12.25	485
	1600	10.33	270		0800	30.92	38,200		2000	10.13	251
	1800	13.14	600		1200	30.07	23,000		2400	9.38	185
	2000	16.31	1,190		1500	29.34	16,400				
	2200	24.38	4,260		2000	28.14	10,500	Aug. 6 -	0400	8.37	105
	2400	27.90	9,670		2400	27.17	7,550		0800	7.73	64
									1200	7.33	40
									2400	7.30	38

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	20,400	7,860	3,380
1963 to July 1978	5,820	4,950	3,040

(16) 08085500 CLEAR FORK BRAZOS RIVER AT FORT GRIFFIN, TX

LOCATION.--Lat 32°56'04", long 99°13'27", Shackelford County, Hydrologic Unit 12060104, on right bank just downstream from pier of bridge on old Fort Griffin-Throckmorton Road, 0.4 mi (0.6 km) northeast of Fort Griffin, 1.0 mi (1.6 km) upstream from bridge on U.S. Highway 283, 1.7 mi (2.7 km) upstream from Mill Creek, and 74.6 mi (120.0 km) upstream from mouth.

DRAINAGE AREA.--3,988 mi² (10,329 km²).

PERIOD OF RECORD.--December 1923 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,174.09 ft (357.863 m) National Geodetic Vertical Datum of 1929. Prior to June 23, 1932, nonrecording gage at same site and datum.

REMARKS.--Diversions above station for irrigation, municipal supply and oilfield operations materially affect low flow. Gage-height telemeter at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 149,000 ft³/s (4,220 m³/s) Aug. 4, 1978, gage height, 38.88 ft (11.851 m).
FOR PERIOD 1923 to July 1978.--Maximum discharge, 33,600 ft³/s (952 m³/s) Sept. 10, 1932, gage height, 35.09 ft (10.695 m).
HISTORIC.--Maximum stage since at least 1876, 38.88 ft (11.851 m) Aug. 4, 1978. Flood in September 1900 reached a stage of 38.0 ft (11.58 m); flood in July 1876 was probably higher; from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	4,090	16...	601	24...	177
2....	.00	9....	2,880	17...	484	25...	166
3....	988	10...	2,240	18...	395	26...	154
4....	72,800	11...	2,240	19...	326	27...	64
5....	67,900	12...	1,440	20...	272	28...	2.7
6....	19,800	13...	1,110	21...	235	29...	65
7....	7,430	14...	762	22...	206	30...	101
		15...	730	23...	192	31...	94
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							6,060
MONTHLY TOTAL ACRE-FEET.....							373,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	2100	1.54	0	Aug. 4 -	1700	38.10	108,000	Aug. 6 -	2400	28.05	10,400
	2200	6.28	1,360		1900	38.81	142,000				
	2300	19.20	13,900		2100	38.88	149,000	Aug. 7 -	1200	21.55	7,340
	2400	25.20	16,900		2400	38.76	141,000		2400	16.15	5,160
Aug. 4 -	0100	28.81	20,800	Aug. 5 -	0400	38.18	107,000	Aug. 8 -	1200	13.17	4,040
	0500	35.66	43,200		1200	36.75	59,600		2400	11.48	3,360
	0800	36.56	57,000		2400	34.40	28,600				
	1200	35.58	39,500					Aug. 9 -	1200	10.18	2,850
	1500	36.32	52,000	Aug. 6 -	1200	32.80	20,800		2400	9.19	2,500

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	72,800	53,500	25,400
1925 to July 1978----------	30,800	24,000	15,300

(18) 08086150 NORTH FORK HUBBARD CREEK NEAR ALBANY, TX

LOCATION.--Lat 32°42'27", long 99°16'29", Shackelford County, Hydrologic Unit 12060105, on downstream side of bridge on U.S. Highway 380, 1.7 mi (2.7 km) southeast of Albany, and 2.0 mi (3.2 km) upstream from Salt Prong Hubbard Creek.

DRAINAGE AREA.--39.3 mi^2 (101.8 km^2).

PERIOD OF RECORD.--November 1962 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,340.54 ft (408.597 m) National Geodetic Vertical Datum of 1929.

REMARKS.--No diversion above station. Rain gage located at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 103,000 ft^3/s (2,920 m^3/s) Aug. 4, 1978, gage height, 23.3 ft (7.10 m).
FOR PERIOD 1962 to July 1978.--Maximum discharge, 9,520 ft^3/s (270 m^3/s) May 5, 1969, gage height, 19.22 ft (5.858 m), from rating curve extended above 1,500 ft^3/s (42.5 m^3/s) on basis of slope-area measurement of 4,570 ft^3/s (129 m^3/s) and contracted-opening measurement of 9,520 ft^3/s (270 m^3/s).
HISTORIC.--Flood information begins in 1940. Maximum flood since 1940, 23.3 ft (7.10 m) Aug. 4, 1978. Floods of June 10, 1940, and July 18, 1953, reached stages of about 21 ft (6.4 m), from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	7.4	16...	1.9	24...	1.2
2....	.00	9....	6.6	17...	2.0	25...	1.2
3....	6,760	10...	5.6	18...	1.9	26...	1.1
4....	13,100	11...	8.3	19...	1.6	27...	1.1
5....	67	12...	6.2	20...	1.2	28...	1.1
6....	31	13...	4.1	21...	1.2	29...	.97
7....	15	14...	3.1	22...	1.2	30...	.97
		15...	2.2	23...	1.2	31...	1.1
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							646
MONTHLY TOTAL ACRE-FEET							39,700
RUNOFF, IN INCHES							18.97

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	1100	1.95	0.00	Aug. 3 -	2400	22.80	53,600	Aug. 4 -	1000	11.00	4,080
	1300	2.74	9.2						1100	7.20	1,670
	1400	2.93	25	Aug. 4 -	0100	22.55	42,000		1200	5.40	816
	1600	2.98	31		0200	23.30	103,000		1300	4.50	456
	1800	3.18	58		0300	22.70	48,600		1800	3.73	207
	1900	6.60	1,360		0400	21.20	13,000		2400	3.38	115
	2000	12.00	4,780		0500	21.10	12,800				
	2100	19.60	10,100		0600	22.30	30,700	Aug. 5 -	0600	3.24	82
	2200	22.70	48,600		0700	21.50	13,600		1200	3.13	63
	2300	23.05	70,200		0800	16.00	7,460		2400	3.01	42

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	13,100	6,640	2,860
1964 to July 1978----------	1,570	754	361

(19) 08086212 HUBBARD CREEK BELOW ALBANY, TX

LOCATION.--Lat 32°43'58", long 99°08'25", Shackelford County, Hydrologic Unit 12060105, on left bank 0.5 mi (0.8 km) downstream from Salt Prong Hubbard Creek, 2.8 mi (4.5 km) upstream from Newcomb Creek, 4.5 mi (7.2 km) upstream from U.S. Highway 180, 9.1 mi (14.6 km) east of Albany, and 35.2 mi (56.6 km) upstream from mouth. Water-quality sampling site on left bank 0.5 mi (0.8 km) downstream.

DRAINAGE AREA.--613 mi² (1,588 km²).

PERIOD OF RECORD.--October 1966 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,184.99 ft (361.185 m) National Geodetic Vertical Datum of 1929. Prior to June 12, 1968, water-stage recorder at site 2.1 mi (3.4 km) downstream at datum 7.63 ft (2.326 m) lower.

MAXIMA: FOR AUGUST 1978.--Discharge, 330,000 ft³/s (9,350 m³/s) Aug. 4, 1978, gage height, 41.41 ft (12.622 m).
FOR PERIOD 1966 to July 1978.--Maximum discharge, 27,200 ft³/s (770 m³/s) Jan. 21, 1968, gage height, 25.10 ft (7.650 m), at former site and datum, from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurement of peak flow.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	98	16...	17	24...	5.7
2....	.00	9....	64	17...	14	25...	5.3
3....	2,150	10...	91	18...	12	26...	5.0
4....	94,700	11...	64	19...	10	27...	4.8
5....	6,400	12...	52	20...	8.5	28...	4.6
6....	333	13...	36	21...	7.2	29...	4.4
7....	175	14...	27	22...	6.6	30...	4.2
		15...	20	23...	6.1	31...	4.0

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	3,370
MONTHLY TOTAL ACRE-FEET	207,000
RUNOFF, IN INCHES	6.33

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	0400	3.31	0.00	Aug. 4 -	0300	39.89	189,000	Aug. 5 -	0600	23.30	14,400
	0600	3.81	3.8		0400	41.41	330,000		0800	18.00	7,920
	1200	4.04	6.9		0430	41.15	300,000		1000	11.40	2,970
	1300	7.37	681		0500	40.29	218,000		1200	9.40	1,840
	1500	8.13	1,020		0600	40.33	221,000		1800	7.80	942
	1800	9.74	1,980		0700	40.19	210,000		2400	7.19	657
	2100	12.72	3,760		0730	40.39	226,000				
	2200	18.01	7,890		0800	40.01	196,000	Aug. 6 -	1200	6.52	391
	2300	23.88	15,300		1000	38.11	112,000		2400	6.04	250
	2400	30.17	26,300		1200	35.72	56,000				
					1500	32.44	33,700	Aug. 7 -	1200	5.65	164
Aug. 4 -	0100	35.79	56,700		1800	29.94	25,900		2400	5.40	122
	0200	38.29	118,000		2400	27.67	21,600				

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	94,700	34,400	14,800
1967 to July 1978	20,100	14,600	6,670

(20) 08086290 BIG SANDY CREEK ABOVE BRECKENRIDGE, TX

LOCATION.--Lat 32°38'54", long 99°00'15", Stephens County, Hydrologic Unit 12060105, on left bank 600 ft (180 m) downstream from Battle Creek, 1.6 mi (2.6 km) upstream from bridge on Farm Road 576, 9.8 mi (15.8 km) southwest of Breckenridge, and about 14.6 mi (23.5 km) upstream from Hubbard Creek Dam.

DRAINAGE AREA.--280 mi² (725 km²).

PERIOD OF RECORD.--February 1962 to August 1978. Prior to October 1975, published as "near Breckenridge."

GAGE.--Water-stage recorder. Datum of gage is 1,185.83 ft (361.441 m) National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1975, at site 1.6 mi (2.6 km) downstream at datum 7.41 ft (2.259 m) lower.

REMARKS.--Flow is affected by Lake Cisco, capacity, 25,600 acre-ft (31.6 hm³).

MAXIMA: FOR AUGUST 1978.--Discharge, 5,140 ft³/s (146 m³/s) Aug. 4, 1978, gage height, 21.86 ft (6.663 m).
FOR PERIOD 1962 to July 1978.--Maximum discharge, 8,170 ft³/s (231 m³/s) May 13, 1965, gage height, 23.30 ft (7.102 m).
HISTORIC.--According to information from State Highway Department, the floods of May 16, 1949, July 20, 1953, and Apr. 29, 1957, each reached a stage of 24.6 ft (7.50 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	18	16...	.07	24...	.03
2....	.55	9....	9.5	17...	.06	25...	.03
3....	2,710	10...	4.2	18...	.06	26...	.03
4....	3,290	11...	1.6	19...	.04	27...	.02
5....	334	12...	.52	20...	.04	28...	.01
6....	128	13...	.21	21...	.04	29...	.01
7....	40	14...	.13	22...	.04	30...	.00
		15...	.09	23...	.03	31...	.00

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	211
MONTHLY TOTAL ACRE-FEET	13,000
RUNOFF, IN INCHES	.87

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	0100	1.60	41	Aug. 3 -	2400	20.95	4,760	Aug. 4 -	2400	6.40	788
	0200	2.35	124								
	0300	3.35	253	Aug. 4 -	0500	21.60	5,030	Aug. 5 -	0600	5.10	541
	0500	5.15	550		0700	21.86	5,140		1200	4.25	394
	0700	8.75	1,260		0900	21.55	5,010		2400	3.09	217
	1000	13.70	2,430		1400	15.90	3,010				
	1600	18.90	3,940		1800	10.10	1,560	Aug. 6 -	1200	2.35	124
									2400	1.82	63

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	3,290	2,110	933
1963 to July 1978----------	5,610	4,720	2,380

(21) 08086400 HUBBARD CREEK RESERVOIR NEAR BRECKENRIDGE, TX

LOCATION.--Lat 32°49'53", long 98°58'03", Stephens County, Hydrologic Unit 12060105, on left bank just upstream from dam on Hubbard Creek, 1.4 mi (2.3 km) upstream from U.S. Highway 183, 6.5 mi (10.5 km) northwest of Breckenridge, and 12.6 mi (20.3 km) upstream from mouth.

DRAINAGE AREA.--1,085 mi² (2,810 km²).

PERIOD OF RECORD.--October 1962 to August 1978.

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

REMARKS.--The reservoir is formed by a rolled earthfill dam 5,630 ft (1,720 m) long. There are two additional levees, the north and south, making an overall length of 3.5 mi (5.6 km). Storage began September 1962 and the dam was completed in December 1962. The emergency spillway is a 2,000-foot-wide (610 m) cut through natural ground near the left end of dam. The service spillway is a partially controlled morning-glory type with 12 lift gates designed to discharge 30,000 ft³/s (850 m³/s) with a 17.5-foot (5.3 m) head through a 22.0-foot-diameter (6.7 m) concrete conduit. The dam is the property of the West Central Texas Municipal Water District. The District has a permit to divert 56,000 acre-ft (69.0 hm³) annually for municipal, mining, and industrial uses. Diversions during the current year are as follows: 842 acre-ft (1.04 hm³) for municipal use, 3,870 acre-ft (4.77 hm³) for oil-field operation, and 1,250 acre-ft (1.54 hm³) for irrigation and domestic uses. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,208.0	-
Crest of spillway	1,194.0	515,800
Top of gates	1,185.1	350,900
Top of conservation pool	1,183.0	317,800
Crest of spillway	1,176.6	230,100
Sill of gate	1,138.0	5,580
Lowest gated outlet (invert)	1,136.0	3,470

MAXIMA: FOR AUGUST 1978.--Contents, 401,500 acre-ft (495 hm³) Aug. 5, 1978, elevation, 1,188.06 ft (362.121 m).
FOR PERIOD 1962 to July 1978.--Maximum contents, 327,200 acre-ft (403 hm³) Feb. 3, 1975, elevation, 1,183.61 ft (360.764 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	186,100	8....	339,300	16...	303,800	24...	301,300
2....	185,900	9....	323,500	17...	303,100	25...	301,000
3....	196,800	10...	311,000	18...	302,600	26...	300,700
4....	399,000	11...	305,600	19...	301,700	27..	300,300
5....	389,300	12...	305,300	20...	302,200	28...	299,700
6....	371,000	13...	304,600	21...	301,700	29...	299,100
7....	355,400	14...	304,100	22...	301,900	30...	298,800
		15...	304,000	23...	301,600	31...	298,700
CHANGE IN CONTENTS, IN ACRE-FEET							112,500

Elevation, in feet, and contents, in acre-feet, at indicated time, 1978

Date	Hour	Elevation	Contents	Date	Hour	Elevation	Contents	Date	Hour	Elevation	Contents
Aug. 3	0400	1172.72	185,800	Aug. 4	1800	1187.53	392,100	Aug. 6	1200	1186.84	380,100
	1200	1172.89	187,600		2400	1187.92	399,000		2400	1186.31	371,000
	2400	1173.74	196,800	Aug. 5	0400	1188.02	400,800	Aug. 7	1200	1185.84	363,100
Aug. 4	0300	1174.47	205,000		0800	1188.06	401,500		2400	1185.37	355,400
	0600	1178.40	252,800		1200	1187.94	399,400				
	0900	1182.96	317,200		2400	1187.37	389,300	Aug. 8	1200	1184.98	348,900
	1200	1185.60	359,200						2400	1184.38	339,300

(22) 08086500 HUBBARD CREEK NEAR BRECKENRIDGE, TX

LOCATION.--Lat 32°50'13", long 98°56'52", Stephens County, Hydrologic Unit 12060105, on downstream side of pier of bridge on U.S. Highway 183, 1.4 mi (2.3 km) downstream from Hubbard Creek Reservoir, 6.8 mi (10.9 km) northwest of Breckenridge, 8.2 mi (13.2 km) upstream from Gonzales Creek, and 11.2 mi (18.0 km) upstream from Clear Fork Brazos River.

DRAINAGE AREA.--1,089 mi^3 (2,821 km^3), of which 1,085 mi^2 (2,810 km^2) is above Hubbard Creek Dam.

PERIOD OF RECORD.--April 1955 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,092.10 ft (332.872 m) National Geodetic Vertical Datum of 1929. Prior to July 16, 1959, at site 300 ft (91 m) upstream at same datum.

REMARKS.--Flow is regulated by Hubbard Creek Reservoir (station 08086400).

MAXIMA: FOR AUGUST 1978.--Discharge, 14,600 ft^3/s (413 m^3/s) Aug. 5, 1978, gage height, 30.66 ft (9.345 m).
FOR PERIOD 1955 to July 1978.--Maximum discharge, 34,500 ft^3/s (977 m^3/s) May 26, 1957, gage height, 34.00 ft (10.363 m).
HISTORIC.--Maximum stage since at least 1925, 34.2 ft (10.42 m) July 20, 1953, from information by local resident and Texas Department of Highways and Public Transportation.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	9,250	16...	2.3	24...	.89
2....	.00	9....	8,760	17...	1.5	25...	1.3
3....	.40	10...	7,260	18...	1.6	26...	.83
4....	5,740	11...	3,690	19...	.77	27...	.64
5....	13,800	12...	121	20...	.91	28...	.92
6....	12,000	13...	206	21...	1.3	29...	.52
7....	9,950	14...	89	22...	1.3	30...	.35
		15...	3.3	23...	.98	31...	.32
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							2,290
MONTHLY TOTAL ACRE-FEET.....							140,600

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 4 -	0100	4.63	11	Aug. 5 -	1200	30.62	14,500	Aug. 9 -	2400	28.12	7,990
	0400	4.73	14		1800	30.40	14,000				
	0700	5.03	27		2400	30.21	13,000	Aug. 10-	1200	27.39	7,280
	0900	5.02	26						2400	26.46	6,470
	1000	12.74	1,240	Aug. 6 -	1200	29.73	12,000				
	1100	19.01	3,180		2400	29.25	10,800	Aug. 11-	1200	25.10	5,400
	1200	22.50	4,760						1400	19.77	3,070
	1400	25.99	7,580	Aug. 7 -	1200	28.75	9,990		1600	14.92	1,630
	1800	29.07	11,700		2400	28.21	8,910		1800	10.06	655
	2400	30.41	14,000						1900	7.88	315
				Aug. 8 -	1200	27.67	8,250		2000	6.42	122
Aug. 5 -	0400	30.59	14,400		2400	29.48	9,850		2100	5.70	60
	0800	30.66	14,600						2200	5.33	37
				Aug. 9 -	1200	28.79	8,680		2400	4.92	18

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	13,800	11,900	9,540
1963 to July 1978----------	4,910	4,270	3,330

(23) 08087300 CLEAR FORK BRAZOS RIVER AT ELIASVILLE, TX

LOCATION.--Lat 32°57'36", long 98°45'59", Young County, Hydrologic Unit 12060104, on right bank 5 ft (2 m) upstream from old mill dam 180 ft (55 m) upstream from bridge on Farm Road 1974, 400 ft (122 m) northwest of U.S. Post Office at Eliasville, and 13.2 mi (21.2 km) upstream from mouth.

DRAINAGE AREA.--5,697 mi² (14,755 km²).

PERIOD OF RECORD.--November 1915 to April 1920, December 1923 to August 1925, July 1928 to September 1951, October 1961 to August 1978. Monthly discharge only for some periods published in WSP 1312 as "near Crystal Falls".

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,027.77 ft (313.264 m) National Geodetic Vertical Datum of 1929. See WSP 1922 for history of changes prior to Dec. 18, 1961.

REMARKS.--Many small diversions above station for municipal supply and oilfield operations.

MAXIMA: FOR AUGUST 1978.--Discharge, 68,000 ft³/s (1,930 m³/s) Aug. 6, 1978, gage height, 37.04 ft (11.290 m).
FOR PERIOD 1915 to July 1978.--Maximum discharge, 35,800 ft³/s (1,010 m³/s) June 11, 1941, gage height, 33.45 ft (10.196 m), site and datum then in use, from rating curve extended above 23,000 ft³/s (651 m³/s).
HISTORIC.-Maximum stage since 1877, 37.04 ft (11.290 m) Aug. 5, 1978. Flood in May 1, 1957 reached a stage of 35 ft (11 m), present site and datum; flood in September 1900 reached the same stage, from information by Texas Department of Highways and Public Transportation and local residents. Other floods are reported to have occurred in 1876, Apr. 27, 1890, 1932, 1941, and 1955.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.08	8....	31,300	16...	707	24...	254
2....	.08	9....	21,900	17...	590	25...	227
3....	.06	10...	13,000	18...	505	26...	217
4....	4,180	11...	9,670	19...	441	27...	194
5....	46,000	12...	3,220	20...	387	28...	166
6....	55,200	13...	1,780	21...	327	29...	152
7....	38,100	14...	1,310	22...	296	30...	145
		15...	885	23...	270	31...	129
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							7,470
MONTHLY TOTAL ACRE-FEET.....							459,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 4 -	0030	7.56	0.04	Aug. 5 -	1800	36.63	61,900	Aug. 8 -	2400	30.51	27,500
	0500	7.84	.93		2400	36.98	67,100				
	0600	7.98	4.3					Aug. 9 -	1200	27.83	21,900
	0700	8.25	29	Aug. 6 -	0100	37.04	68,000		2400	24.53	16,100
	0900	8.72	132		0200	36.93	66,300				
	1000	9.10	289		0600	36.71	63,100	Aug. 10-	1200	22.01	12,700
	1100	10.25	1,160		1200	36.08	54,500		2400	20.37	11,300
	1200	11.29	2,920		1800	35.48	47,400				
	1400	12.40	4,570		2400	34.92	43,300	Aug. 11-	1200	18.22	9,630
	1900	16.90	8,650						2400	15.20	7,310
	2400	24.19	15,600	Aug. 7 -	1200	34.05	37,600				
					2400	33.24	34,800	Aug. 12-	0400	12.28	4,420
Aug. 5 -	0600	31.70	30,200						1200	11.23	2,820
	1200	35.44	47,100	Aug. 8 -	1200	32.10	31,300		2400	10.83	2,040

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	55,200	46,400	30,700
1917 to July 1978----------	32,400	23,200	16,600

(24) 08088000 BRAZOS RIVER NEAR SOUTH BEND, TX

LOCATION.--Lat 33°01'27", long 98°38'37", Young County, Hydrologic Unit 12060201, on left bank 225 ft (69 m) downstream from bridge on State Highway 67, 1.8 mi (2.9 km) downstream from Clear Fork Brazos River, 2.0 mi (3.2 km) northeast of South Bend, and at mile 758.2 (1,219.9 km).

DRAINAGE AREA.--22,673 mi² (58,723 km²), of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--September 1938 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,002.98 ft (305.708 m) National Geodetic Vertical Datum of 1929. Prior to Feb. 23, 1939, nonrecording gage at site 225 ft (69 m) upstream. Feb. 23, 1939, to Mar. 9, 1969, water-stage recorder at site 225 ft (69 m) upstream.

REMARKS.--National Weather Service gage-height telemeter at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 78,100 ft³/s (2,210 m³/s) at 1200 hours Aug. 6, 1978; maximum gage height, 41.50 ft (12.649 m) at 1800 hours Aug. 6, 1978.
FOR PERIOD 1938 to July 1978.--Maximum discharge, 87,400 ft³/s (2,480 m³/s) May 4, 1941, gage height, 27.35 ft (8.336 m); maximum gage height, 32.70 ft (9.967 m) Aug. 29, 1957.
HISTORIC.--Maximum stage since at least 1876, 41.50 ft (12.649 m) Aug. 6, 1978.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	1.2	8....	43,000	16...	1,490	24...	524
2....	1.2	9....	29,700	17...	1,290	25...	472
3....	3.2	10...	18,200	18...	1,120	26...	450
4....	1,460	11...	11,200	19...	996	27...	379
5....	29,500	12...	4,210	20...	886	28...	295
6....	74,700	13...	2,600	21...	768	29...	259
7....	61,000	14...	2,260	22...	676	30...	235
		15...	1,780	23...	582	31...	223
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							9,360
MONTHLY TOTAL ACRE-FEET.....							576,000
RUNOFF, IN INCHES.....							.48

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 4 -	0200	5.28	9.5	Aug. 6 -	0800	40.50	76,300	Aug. 9 -	1200	28.92	29,500
	1200	5.47	16		1200	41.20	78,100		2400	26.14	23,300
	1400	5.45	16		1800	41.50	77,000				
	1600	8.76	1,450		2400	41.12	72,700	Aug. 10-	1200	23.17	18,000
	1800	10.88	3,160						2400	20.67	14,100
	2000	12.20	4,440	Aug. 7 -	1200	39.05	61,700				
	2400	14.10	6,440		2400	36.40	50,100	Aug. 11-	1200	18.83	11,300
									2400	17.19	8,300
Aug. 5 -	0600	18.19	12,600	Aug. 8 -	1200	33.90	42,900				
	1200	23.76	22,600		2400	31.46	35,700	Aug. 12-	1200	12.40	3,380
	1800	31.06	48,000						2400	10.73	2,610
	2400	36.91	63,800								

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	74,700	59,600	38,200
1940 to July 1978----------	84,300	64,800	46,000

(25) 08088300 BRIAR CREEK NEAR GRAHAM, TX

LOCATION.--Lat 33°12'43", long 98°37'06", Young County, Hydrologic Unit 12060201, near right bank on downstream side of bridge on Farm Road 1769, 3.7 mi (6.0 km) upstream from mouth, and 7.0 mi (11.3 km) northwest of Graham.

DRAINAGE AREA.--24.2 mi^2 (62.7 km^2).

PERIOD OF RECORD.--April 1958 to August 1978. Prior to October 1965, published as Oak Creek near Graham.

GAGE.--Water-stage recorder. Altitude of gage is 1,090 ft (332 m), from topographic map.

REMARKS.--No diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 1.6 ft^3/s (0.045 m^3/s) Aug. 5, 1978, gage height, 0.78 ft (0.238 m).
FOR PERIOD 1958 to July 1978.--Maximum discharge, 2,730 ft^3/s (77.3 m^3/s) Sept. 19, 1976, gage height, 12.31 ft (3.752 m).
HISTORIC.--Maximum stage since at least 1900, 15.2 ft (4.63 m) in September 1955. Flood in May 1957 reached a stage of 15.0 ft (4.57 m), from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.00	16...	.00	24...	.00
2....	.00	9....	.00	17...	.00	25...	.00
3....	.00	10...	1.4	18...	.00	26...	.00
4....	.00	11...	1.1	19...	24	27...	.00
5....	1.6	12...	.02	20...	2.3	28...	.00
6....	.61	13...	.00	21...	.46	29...	.00
7....	.04	14...	.00	22...	.04	30...	.00
		15...	.00	23...	.00	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							1.02
MONTHLY TOTAL ACRE-FEET							62.6
RUNOFF, IN INCHES							.05

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	24	8.9	6.6
1959 to July 1978	1,190	877	380

(26) 08088400 LAKE GRAHAM NEAR GRAHAM, TX

LOCATION.--Lat 33°08'04", long 98°36'48", Young County, Hydrologic Unit 12060201, near left end of earthen dam on Salt Creek, 2.2 mi (3.5 km) northwest of Graham, 5 mi (8 km) downstream from Briar Creek, and 9.5 mi (15.3 km) upstream from mouth.

DRAINAGE AREA.--221 mi² (572 km²).

PERIOD OF RECORD.--March 1958 to September 1963 (unpublished record), October 1963 to August 1978. Prior to October 1965, monthend contents only.

GAGE.--Water-stage recorder. Datum of gage (Salt Creek datum) is 1.30 ft (0.396 m) National Geodetic Vertical Datum of 1929. Prior to October 1963, nonrecording gage at same site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 5,000 ft (1,500 m) long. Lake Graham was connected with Lake Eddleman in 1959 by a cut channel at a gage height of 1,050.0 ft (320.04 m). Deliberate impoundment began Apr. 28, 1958, and the dam was completed in July 1958. The uncontrolled emergency spillway is a 1,050-foot-wide (320 m) cut at the right end of dam. The spillway is designed to discharge 136,500 ft³/s (3,870 m³/s) at a gage height of 1,087.5 ft (331.47 m). The dam is the property of the city of Graham and was built to impound water for municipal and industrial uses. In addition, water is used by Texas Electric Service Co. for operation of their steam generating powerplant. The capacity table is based on an original survey of Lake Eddleman in 1928 and a Salt Creek survey of 1953. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,092.0	-
Crest of spillway	1,075.0	53,680
Bottom of interconnecting channel	1,050.0	8,670
Lowest gated outlet (invert)	1,050.0	8,670

COOPERATION.--Capacity table was furnished by Freese, Nichols, and Endress, Consulting Engineers. Record of diversions furnished by the city of Graham and Texas Electric Service Co.

MAXIMA: FOR AUGUST 1978.--Contents, 36,090 acre-ft (44.5 hm³) Aug. 5, 1978, gage height, 1,067.61 ft (325.408 m).
FOR PERIOD 1958 to July 1978.--Maximum contents, 61,120 acre-ft (75.4 hm³) Apr. 30, 1970, gage height, 1,077.77 ft (328.504 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	35,200	8....	36,000	16...	35,500	24...	35,090
2....	35,110	9....	35,960	17...	35,370	25...	35,070
3....	35,440	10...	35,940	18...	35,300	26...	35,020
4....	35,540	11...	35,890	19...	35,300	27..	34,910
5....	36,090	12...	35,830	20...	35,280	28...	34,800
6....	36,090	13...	35,740	21...	35,260	29...	34,760
7....	36,070	14...	35,700	22...	35,200	30...	34,720
		15...	35,610	23...	35,130	31...	34,590
CHANGE IN CONTENTS, IN ACRE-FEET							-690

(27) 08088450 BIG CEDAR CREEK NEAR IVAN, TX

LOCATION.--Lat 32°49'39", long 98°43'25", Stephens County, Hydrologic Unit 12060201, on left bank at downstream side of bridge on Farm Road 717, 3.2 mi (5.1 km) south of Ivan, 8.2 mi (13.2 km) northwest of Caddo, and 11.6 mi (18.7 km) northeast of Breckenridge.

DRAINAGE AREA.--97.0 mi² (251.2 km²).

PERIOD OF RECORD.--December 1964 to August 1978.

GAGE.--Water-stage recorder. Altitude of gage is 1,090 ft (332 m), from topographic map.

REMARKS.--No regulation or diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 3.0 ft³/s (0.085 m³/s) Aug. 5, 1978, gage height, 4.11 ft (1.253).
FOR PERIOD 1964 to July 1978.--Maximum discharge, 9,590 ft³/s (272 m³/s) July 8, 1968, gage height, 22.39 ft (6.824 m), from rating curve extended above 1,000 ft³/s (28.3 m³/s) on basis of slope-area measurement of 7,980 ft³/s (226 m³/s).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.10	16...	.01	24...	.01
2....	.00	9....	.02	17...	.01	25...	.01
3....	.00	10...	.02	18...	.01	26...	.02
4....	.00	11...	.02	19...	.01	27...	.02
5....	.88	12...	.02	20...	.01	28...	.02
6....	.81	13...	.02	21...	.04	29...	.03
7....	.25	14...	.03	22...	.02	30...	.04
		15...	.02	23...	.01	31...	.04
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							.08
MONTHLY TOTAL ACRE-FEET							4.95
RUNOFF, IN INCHES							.00

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	0.9	0.6	0.3
1966 to July 1978	3,160	1,120	571

(28) 08088500 POSSUM KINGDOM RESERVOIR NEAR GRAFORD, TX

LOCATION.--Lat 32°52'20", long 98°25'32", Palo Pinto County, Hydrologic Unit 12060201, at dam on Brazos River, 2.6 mi (4.2 km) upstream from Loving Creek, 11.3 mi (18.2 km) southwest of Graford, and at mile 687.5 (1,106.2 km).

DRAINAGE AREA.--23,596 mi² (61,114 km²), approximately, of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--March 1941 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 0.10 ft (0.030 m) National Geodetic Vertical Datum of 1929 (levels by Brazos River Authority). Prior to Mar. 19, 1968, mercury U-tube in powerhouse at present site and datum.

REMARKS.--The reservoir is formed by reinforced concrete dam, Ambursen-type, massive buttress with flat-slab deck, a controlled spillway, two bulkhead sections, and an earthen-dike section. Total length of dam is 2,740 ft (835 m) long. The dam was completed and storage began Mar. 21, 1941. The spillway has nine roof-weir gates (modified bear-trap type) that are 73.66- by 13-foot (22.45 by 4 m) each and are designed to discharge about 100,000 ft³/s (2,830 m³/s) at a gage height of 1,000.0 ft (304.80 m). The outlet works consist of one controlled 54-inch-diameter (1,372 mm) conduit. Water is used for power development, municipal, industrial, irrigation, and recreational purposes. Two generators located in the powerhouse at dam can produce 22,500 kilowatts at a 1,000 ft (305 m) gage height. Eleven major reservoirs, with a combined capacity of 607,800 acre-ft (749 hm³), largely regulate the inflow. The capacity curve is based on recomputation of survey made in 1974. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,024.0	-
Design flood (top of gates)	1,000.0	570,200
Crest of spillway	987.0	383,300
Invert of penstock	911.5	4,560
Lowest gated outlet (invert)	874.8	0

COOPERATION.--Capacity table 3-C furnished by Brazos River Authority.

MAXIMA: FOR AUGUST 1978.--Contents, 564,800 acre-ft (696 hm³) Aug. 12, 1978, gage height, 999.69 ft (304.706 m).
FOR PERIOD 1941 to July 1978.--Maximum contents observed, 743,700 acre-ft (917 hm³) Oct. 5, 1941, gage height, 1,001.0 ft (305.10 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1	465,900	8	541,400	16	552,800	24	553,900
2	465,800	9	547,600	17	550,300	25	554,600
3	468,600	10	549,600	18	548,300	26	554,700
4	466,200	11	560,400	19	549,300	27	555,400
5	464,900	12	554,700	20	550,500	28	555,300
6	493,800	13	556,100	21	551,000	29	555,600
7	534,700	14	557,200	22	552,500	30	555,600
		15	555,400	23	553,400	31	555,300
CHANGE IN CONTENTS, IN ACRE-FEET							88,800

(29) 08089000 BRAZOS RIVER NEAR PALO PINTO, TX

LOCATION.--Lat 32°51'45", long 98°18'08", Palo Pinto County, Hydrologic Unit 12060201, on right bank 100 ft (30 m) upstream from bridge on Farm Road 4, 300 ft (91 m) downstream from Dark Valley Creek, 6.5 mi (10.5 km) north of Palo Pinto, and at mile 667.3 (1,073.7 km).

DRAINAGE AREA.--23,811 mi² (61,670 km²), of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--January 1924 to August 1978. Monthly discharge only for some periods, published in WSP 1312. Published as "near Mineral Wells" 1924-33.

GAGE.--Water-stage recorder. Datum of gage is 831.23 ft (253.359 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 15, 1933, nonrecording gage at site 19 mi (31 km) downstream at datum 38.19 ft (11.640 m) lower.

REMARKS.--Since 1941, flow largely regulated by Possum Kingdom Reservoir (station 08088500) 20 mi (32 km) upstream.

MAXIMA: FOR AUGUST 1978.--Discharge, 54,500 ft³/s (1,540 m³/s) Aug. 8, 1978, gage height, 22.93 ft (6.989 m).
FOR PERIOD 1924 to July 1978.--Maximum discharge, 95,600 ft³/s (2,710 m³/s) June 16, 1930, at site 19 mi (31 km) downstream from Mineral Wells, gage height, 30 ft (9.1 m), present site and datum.
HISTORIC.--Maximum stage occurred in 1876, from data by Corps of Engineers, and was several feet higher than the flood of June 16, 1930, which reached a stage of about 30 ft (9.1 m) and was the highest since 1876.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	7.8	8....	52,800	16...	3,000	24...	48
2....	7.8	9....	39,900	17...	2,530	25...	46
3....	54	10...	30,000	18...	2,570	26...	43
4....	62	11...	21,700	19...	921	27...	39
5....	2,580	12...	12,500	20...	123	28...	35
6....	6,280	13...	9,340	21...	73	29...	34
7....	34,400	14...	2,930	22...	62	30...	33
		15...	2,970	23...	55	31...	32
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							7,260
MONTHLY TOTAL ACRE-FEET.....							447,000

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 5 -	0100	0.27	47	Aug. 6 -	2000	9.17	13,600	Aug. 9 -	2400	15.72	30,700
	0200	.95	176		2400	12.13	22,400				
	0300	3.40	1,360					Aug. 10-	0400	15.30	29,300
	0400	4.22	2,200	Aug. 7 -	1200	15.05	31,000		1600	15.61	30,300
	0800	4.69	2,940		1800	19.44	43,800		2400	15.60	30,300
	1300	4.78	3,100		2300	21.23	49,200				
	2400	4.74	3,030					Aug. 11-	1200	14.66	27,800
				Aug. 8 -	1200	22.51	53,200		1600	11.23	17,400
Aug. 6 -	0400	4.73	3,010		2400	22.93	54,500		1900	8.23	9,080
	1600	4.74	3,030						2100	6.59	5,170
	1700	4.89	3,300	Aug. 9 -	1200	21.99	51,100		2400	5.44	2,900
	1800	6.36	6,380								

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	52,800	42,400	28,700
1940 to July 1978----------	81,700	76,700	62,700

(30) 08092600 BRAZOS RIVER AT WHITNEY DAM NEAR WHITNEY, TX

LOCATION.--Lat 31°52'00", long 97°22'00", Hill County, Hydrologic Unit 12060202, immediately below Whitney Dam, 3.4 mi (5.5 km) upstream from gaging station near Whitney, 4.0 mi (6.4 km) upstream from Iron Creek, and 7.4 mi (11.9 km) southwest of Whitney.

DRAINAGE AREA.--26,190 mi² (67,830 km²), of which 9,240 mi² (23,930 km²) probably is noncontributing.

PERIOD OF RECORD.--Chemical analysis: October 1947 to August 1978.

REMARKS.--Records of discharge are available for gaging station 08093100, located 9.0 mi (14.5 km) downstream, for period October 1938 to August 1978 in other reports of the Geological Survey.

MAXIMA: FOR AUGUST 1978.--Maximum daily specific conductance, 3,620 micromhos Aug. 24.
FOR PERIOD 1947 to July 1978.--Maximum daily specific conductance, 2,660 micromhos Oct. 1, 1948.

(31) 08098290 BRAZOS RIVER NEAR HIGHBANK, TX
(National stream-quality accounting network)

LOCATION.--Lat 31°08'02", long 96°49'29", Falls County, Hydrologic Unit 12070101, near right bank 45 ft (14 m) downstream from bridge on Farm Road 413, 1.4 mi (2.3 km) downstream from Highbank Slough and Spring Branch, 2.6 mi (4.2 km) south of Highbank, and at mile 346.6 (557.7 km).

DRAINAGE AREA.--30,436 mi² (78,829 km²), of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--Chemical analysis: November 1967 to August 1978. Discharge records: October 1965 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 279.29 ft (85.128 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Many diversions for municipal supply, irrigation, and industrial uses above gage. Flow affected by 20 upstream reservoirs with a combined capacity of 4,181,000 acre-ft (5.16 km³).

MAXIMA: FOR AUGUST 1978.--Maximum daily specific conductance, 3,000 micromhos Aug. 24.
FOR PERIOD 1967 to July 1978.--Maximum daily specific conductance, 2,170 micromhos Dec. 8, 1972.

BRAZOS RIVER BASIN

(32) 08099000 LEON RESERVOIR NEAR RANGER, TX

LOCATION.--Lat 32°21'46", long 98°40'32", Eastland County, Hydrologic Unit 12070201, at outlet works near left end of dam on Leon River, 7.4 mi (11.9 km) south of Ranger, 8.7 mi (14.0 km) southeast of Eastland, and 274.1 mi (441.1 km) upstream from mouth.

DRAINAGE AREA.--259 mi² (671 km²).

PERIOD OF RECORD.--January 1955 to August 1978. Prior to October 1965, monthend contents only.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--The reservoir is formed by a rolled earthfill dam 3,700 ft (1,130 m) long. Storage began in April 1954 and dam was completed in June 1954. The emergency spillway is a 1,200-foot-wide (366 m) cut through natural ground near the left end of dam. The service spillway is an uncontrolled circular concrete drop inlet designed for a maximum discharge of 5,000 ft³/s (142 m³/s) through an 11-foot-diameter (3 m) concrete conduit. The dam is the property of Eastland County Water Supply District and was built to impound water for municipal use by the cities of Ranger, Olden, and Eastland. The capacity table is based on a survey made in 1952. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,398.0	-
Crest of spillway	1,382.0	40,210
Crest of spillway (top of conservation pool)	1,375.0	27,290
Lowest gated outlet (invert for water supply)	1,335.0	869

COOPERATION.--Elevation and diversion records furnished by Eastland County Water Supply District.

MAXIMA (at 1000): FOR AUGUST 1978.--Contents, 20,000 acre-ft (24.7 hm³) Aug. 6-8, 1978, elevation, 1,369.80 ft (417.515 m).
FOR PERIOD 1955 to July 1978.--Maximum contents observed, 40,640 acre-ft (50.1 hm³) June 13, 1967, elevation, 1,382.2 ft (421.29 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 1000

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	16,850	8....	20,000	16...	19,640	24...	19,390
2....	16,850	9....	19,880	17...	19,640	25...	19,390
3....	17,300	10...	19,880	18...	19,640	26...	19,390
4....	18,210	11...	19,880	19...	19,510	27..	19,270
5....	19,880	12...	19,880	20...	19,510	28...	19,270
6....	20,000	13...	19,760	21...	19,510	29...	19,270
7....	20,000	14...	19,760	22...	19,510	30...	19,270
		15...	19,760	23...	19,390	31...	19,150
CHANGE IN CONTENTS, IN ACRE-FEET							2,190

(33) 08099100 LEON RIVER NEAR DE LEON, TX

LOCATION.--Lat 32°10'25", long 98°31'58", Comanche County, Hydrologic Unit 12070201, on left bank at downstream end of bridge on State Highway 16, 1.5 mi (2.4 km) upstream from Flat Creek, 4.4 mi (7.1 km) northeast of De Leon, 6 mi (10 km) downstream from Hog Creek, and 250.1 mi (402.4 km) upstream from mouth.

DRAINAGE AREA.--479 mi² (1,241 km²).

PERIOD OF RECORD.--September 1960 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,209.93 ft (368.787 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 22, 1960, nonrecording gage at same site and datum.

REMARKS.--Flow partly regulated by Leon Reservoir (station 08099000). Numerous diversions above station for municipal, steam power-plant operation, and other uses. Recording rain gage located at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 17 ft³/s (0.48 m³/s) Aug. 4, 1978, gage height, 2.47 ft (0.753 m).
FOR PERIOD 1960 to July 1978.--Maximum discharge, 7,540 ft³/s (214 m³/s) Jan. 21, 1968, gage height, 15.50 ft (4.724 m).
HISTORIC.--A stage of 19.3 ft (5.88 m) occurred in May 1908 at a point 2,000 ft (610 m) downstream from gage site and is the highest since that time, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.00	16...	.00	24...	.00
2....	.00	9....	.00	17...	.00	25...	.00
3....	.49	10...	.00	18...	.00	26...	.00
4....	14	11...	.00	19...	.00	27...	.00
5....	2.3	12...	.00	20...	.00	28...	.00
6....	.00	13...	.00	21...	.00	29...	.00
7....	.00	14...	.00	22...	.00	30...	.00
		15...	.00	23...	.00	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							.54
MONTHLY TOTAL ACRE-FEET.....							33.3

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	14	5.6	2.4
1961 to July 1978----------	6,970	6,420	4,100

(34) 08099300 SABANA RIVER NEAR DE LEON, TX

LOCATION.--Lat 32°06'50", long 98°36'19", Comanche County, Hydrologic Unit 12070201, on left bank at downstream end of bridge on Farm Road 587, 0.6 mi (1.0 km) downstream from Spring Branch, 4.0 mi (6.4 km) west of De Leon, 4.2 mi (6.8 km) upstream from Turkey Creek, and 12.2 mi (19.6 km) upstream from mouth.

DRAINAGE AREA.--264 mi² (684 km²).

PERIOD OF RECORD.--September 1960 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,209.59 ft (368.683 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 22, 1960, nonrecording gage at present site and datum.

REMARKS.--Flow is affected by Nabors Lake (capacity unknown) on Spring Branch. Recording rain gage located at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 617 ft³/s (17.5 m³/s) Aug. 4, 1978, gage height, 8.80 ft (2.682 m).
FOR PERIOD 1960 to July 1978.--Maximum discharge, 10,800 ft³/s (306 m³/s) June 12, 1967, gage height, 22.05 ft (6.721 m).
HISTORIC.--Maximum stage since at least 1890, 24 ft (7.3 m) in May 1908, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.19	16...	.00	24...	.31
2....	.00	9....	.00	17...	.00	25...	.00
3....	.00	10...	.00	18...	.00	26...	.00
4....	333	11...	.00	19...	.00	27...	.00
5....	36	12...	.00	20...	.00	28...	.00
6....	9.1	13...	.00	21...	.00	29...	.00
7....	2.2	14...	.00	22...	15	30...	.00
		15...	.00	23...	4.8	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							12.9
MONTHLY TOTAL ACRE-FEET							795
RUNOFF, IN INCHES							.06

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	333	126	54
1961 to July 1978	6,310	5,060	2,450

(35) 08099400 PROCTOR LAKE NEAR PROCTOR, TX

LOCATION.--Lat 31°58'07", long 98°29'09", Comanche County, Hydrologic Unit 12070201, in intake structure at Proctor Lake on Leon River, 2.0 mi (3.2 km) upstream from U.S. Highways 67 and 377, 3.5 mi (5.6 km) west of Proctor, and 228.1 mi (367.0 km) upstream from mouth.

DRAINAGE AREA.--1,259 mi² (3,261 km²).

PERIOD OF RECORD.--January 1963 to August 1978. Prior to October 1970, published as Proctor Reservoir.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 28, 1963, nonrecording gage at same site and datum.

REMARKS.--The lake is formed by a reinforced concrete gated structure and rolled earthfill section, total length 13,460 ft (4,103 m). The lake was operated as a detention basin from Jan. 30 to July 5, 1963. The gates were closed July 6, 1963, but lake was operated to elevation 1,156.0 ft (352.35 m) until construction was completed. Deliberate impoundment began Sept. 30, 1963. The spillway is a gated concrete gravity structure located on the left bank, with an ogee weir section and stilling basin. The spillway is controlled by eleven 40.0- by 35.0-foot (12.2 by 10.7 m) tainter gates. The spillway was designed to discharge 431,800 ft³/s (12,200 m³/s) at an elevation of 1,201.0 ft (366.06 m). The lake is operated for flood control and water conservation. One major reservoir partly regulates the inflow (see station 08099000). Inflow is affected at times by discharge from the flood-detention pools of 21 floodwater-retarding structures with combined detention capacity of 32,950 acre-ft (40.6 hm³). These structures control runoff from 131 mi² (339 km²) in the Leon River and Rush Creek watersheds. The capacity table is based on a survey made in 1946. Borrow is not included in capacity totals. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,206.0	-
Design flood	1,201.0	427,500
Top of gates	1,197.0	374,200
Crest of spillway (top of conservation pool)	1,162.0	59,400
Lowest gated outlet (invert)	1,128.0	68

COOPERATION.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

MAXIMA: FOR AUGUST 1978.--Contents, 31,170 acre-ft (38.4 hm³) Aug. 4-7, 1978, elevation, 1,154.48 ft (351.886 m).
FOR PERIOD 1963 to July 1978.--Maximum contents, 137,500 acre-ft (170 hm³) Jan. 26, 1968, elevation, 1,174.84 ft (358.091 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	30,960	8....	31,110	16...	29,850	24...	28,710
2....	30,850	9....	31,050	17...	29,600	25...	28,550
3....	31,340	10...	30,990	18...	29,430	26...	28,410
4....	31,170	11...	30,880	19...	29,290	27..	28,220
5....	31,170	12...	30,700	20...	29,210	28...	28,060
6....	31,170	13...	30,500	21...	29,070	29...	28,010
7....	31,170	14...	30,300	22...	28,960	30...	27,880
		15...	30,050	23...	28,850	31...	27,720
CHANGE IN CONTENTS, IN ACRE-FEET							-3,510

(36) 08109500 BRAZOS RIVER NEAR COLLEGE STATION, TX

LOCATION.--Lat 30°32'33", long 96°25'21", Brazos County, Hydrologic Unit 12070101, at bridge on Farm Road 60, 6.5 mi (10.5 km) south of College Station, 9 mi (14 km) downstream from gaging station near Bryan, and at mile 271.9 (437.6 km).

DRAINAGE AREA.--39,599 mi² (102,561 km²), of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--Chemical analysis: August 1961 to August 1978.

REMARKS.--Records of discharge are available for gaging station 08109000, located 9 mi (14 km) upstream, for period June 1926 to August 1978 in other reports of the Geological Survey.

MAXIMA: FOR AUGUST 1978.--Maximum daily specific conductance, 2,810 micromhos Aug. 27.
FOR PERIOD 1961 to July 1978.--Maximum daily specific conductance, 2,030 micromhos Oct. 1, 1963.

(37) 08114000 BRAZOS RIVER AT RICHMOND, TX

LOCATION.--Lat 29°34'56", long 95°45'27", Fort Bend County, Hydrologic Unit 12070104, on right bank at downstream side of downstream bridge on U.S. Highway 59 in Richmond, 925 ft (282 m) downstream from Texas and New Orleans Railroad Co. bridge, and at mile 92.0 (148.0 km).

DRAINAGE AREA.--45,007 mi² (116,568 km²), approximately, of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--Chemical analysis: October 1945 to August 1978. Discharge records: October 1922 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 37.94 ft (11.564 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Considerable water diverted above station for irrigation and municipal supply.

MAXIMA: FOR AUGUST 1978.--Maximum daily specific conductance, 2,480 micromhos Aug. 30.
FOR PERIOD 1945 to July 1978.--Maximum daily specific conductance, 2,540 micromhos Sept. 4, 1951.

(38) 08116650 BRAZOS RIVER NEAR ROSHARON, TX
(National stream-quality accounting network)

LOCATION.--Lat 29°20'58", long 95°34'56", Fort Bend-Brazoria County line, Hydrologic Unit 12070104, on right bank at downstream side of bridge on Farm Road 1462, 2.0 mi (3.2 km) downstream from Big Creek, 2.1 mi (3.4 km) upstream from Cow Creek, 7.3 mi (11.7 km) west of Rosharon, and at mile 56.7 (91.2 km).

DRAINAGE AREA.--45,339 mi² (117,428 km²), approximately, of which 9,566 mi² (24,776 km²) probably is noncontributing.

PERIOD OF RECORD.--Chemical analysis: October 1967 to August 1978. Discharge records: April 1967 to August 1978.

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

REMARKS.--Water diverted above station for irrigation, industrial, and municipal use.

MAXIMA: FOR AUGUST 1978.--Maximum daily specific conductance, 2,400 micromhos Aug. 29, 30.
FOR PERIOD 1967 to July 1978.--Maximum daily specific conductance, 4,430 micromhos Aug. 8, 1971.

(39) 08126500 COLORADO RIVER AT BALLINGER, TX

LOCATION.--Lat 31°43'58", long 99°57'13", Runnels County, Hydrologic Unit 12090101, on left bank at downstream side of bridge on U.S. Highway 67 in Ballinger, 1.3 mi (2.1 km) upstream from Elm Creek, and at mile 660.2 (1,062.3 km).

DRAINAGE AREA.--16,840 mi² (43,620 km²), approximately, of which 11,600 mi² (30,040 km²) probably is noncontributing.

PERIOD OF RECORD.--June 1907 to August 1978. Monthly discharge only for some periods published in WSP 1312. Gage-height records collected in this vicinity from 1903-29 are contained in reports of the National Weather Service.

GAGE.--Water-stage recorder. Datum of gage is 1,593.74 ft (485.772 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 29, 1930, nonrecording gages at several sites near present site at various datums. Nov. 29, 1930, to May 1, 1975, water-stage recorder at site 0.8 mi (1.3 km) downstream at same datum.

REMARKS.--Diversions above station for irrigation, municipal supplies, and oilfield operation. Flow is affected by E. V. Spence and Oak Creek Reservoirs (see stations 08123950 and 08125500) and at times by discharge from the flood-detention pools of 25 floodwater-retarding structures with a combined detention capacity of 26,640 acre-ft (32.8 hm³). These structures control runoff from 133 mi² (344 km²) in the Kickapoo and Valley Creeks drainage basins.

MAXIMA: FOR AUGUST 1978.--Discharge, 16,600 ft³/s (470 m³/s) Aug. 3, 1978, gage height, 23.95 ft (7.300 m).
FOR PERIOD 1907 to July 1978.--Maximum discharge, 75,400 ft³/s (2,140 m³/s) Sept. 18, 1936, gage height, 28.6 ft (8.72 m).
HISTORIC.--Maximum stage since at least 1882, about 36 ft (11.0 m) sometime in 1884, at former site and datum, from information by local residents. Flood of Aug. 6, 1906, reached a stage of about 32.0 ft (9.75 m), at former site and datum, from floodmarks (backwater from Elm Creek).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	23	16...	9.6	24...	7.1
2....	3.3	9....	18	17...	9.1	25...	7.2
3....	9,850	10...	16	18...	8.3	26...	6.8
4....	4,180	11...	16	19...	7.6	27...	7.0
5....	190	12...	28	20...	7.5	28...	7.4
6....	86	13...	15	21...	7.2	29...	6.8
7....	37	14...	12	22...	7.1	30...	6.9
		15...	9.8	23...	6.9	31...	7.1
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							471
MONTHLY TOTAL ACRE-FEET.....							29,000

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	9,850	4,740	2,050
1968 to July 1978----------	6,150	4,410	2,260

COLORADO RIVER BASIN

(40) 08127000 ELM CREEK AT BALLINGER, TX

LOCATION.--Lat 31°44'57", long 99°56'51", Runnels County, Hydrologic Unit 12090101, on right bank 1,000 ft (305 m) upstream from storage dam at Ballinger and 1.9 mi (3.1 km) upsream from mouth.

DRAINAGE AREA.--471 mi² (1,220 km²).

PERIOD OF RECORD.--April 1932 to August 1978.

GAGE.--Water-stage recorder and masonry dam control. Datum of gage is 1,617.72 ft (493.081 m) National Geodetic Vertical Datum of 1929.

MAXIMA: FOR AUGUST 1978.--Discharge, 23,400 ft³/s (663 m³/s) Aug. 3, 1978, gage height, 9.17 ft (2.795 m).
FOR PERIOD 1932 to July 1978.--Maximum discharge, 50,000 ft³/s (1,420 m³/s) Oct. 13, 1957, gage height, 14.20 ft (4.328 m), from floodmark.
HISTORIC.--Flood in August 1906 reached a stage of 14.5 ft (4.42 m); affected by backwater from Colorado River; highest stage not affected by backwater from Colorado River since at least 1904 was that of Oct. 13, 1957, from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	71	16...	13	24...	1.8
2....	.00	9....	58	17...	11	25...	1.7
3....	8,760	10...	49	18...	9.2	26...	1.6
4....	12,200	11...	41	19...	7.2	27...	2.0
5....	1,270	12...	32	20...	4.7	28...	1.9
6....	230	13...	25	21...	3.3	29...	1.6
7....	108	14...	20	22...	2.5	30...	1.1
		15...	16	23...	1.9	31...	.80

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	740
MONTHLY TOTAL ACRE-FEET	45,500
RUNOFF, IN INCHES	1.81

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 3 -	0500	3.51	0.00	Aug. 3 -	2300	9.16	23,300	Aug. 5 -	0300	5.53	2,540
	0515	4.37	361		2400	9.03	22,200		0800	4.92	1,320
	0530	4.76	1,050						1400	4.61	761
	0600	5.06	1,590	Aug. 4 -	0300	8.31	14,300		2400	4.37	361
	0700	5.52	2,520		1200	7.68	9,700				
	1100	5.80	3,160		1300	7.96	11,600	Aug. 6 -	1200	4.26	215
	1200	6.79	6,000		1500	8.47	15,800		2400	4.19	141
	1500	7.86	10,900		1545	8.48	15,900				
	1800	8.48	15,900		1700	8.35	14,600	Aug. 7 -	1200	4.15	109
	2100	8.95	21,400		2100	7.50	8,760		2400	4.11	83
	2200	9.17	23,400		2400	6.32	4,540				

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	12,200	7,410	3,240
1933 to July 1978----------	21,400	8,800	4,870

(41) 08136500 CONCHO RIVER AT PAINT ROCK, TX

LOCATION.--Lat 31°30'57", long 99°55'09", Concho County, Hydrologic Unit 12090105, near left bank on downstream end of pier of bridge on U.S. Highway 83, 0.5 mi (0.8 km) north of Concho County Courthouse in Paint Rock, 2.7 mi (4.3 km) downstream from Kickapoo Creek, and 19.6 mi (31.5 km) upstream from station.

DRAINAGE AREA.--6,415 mi² (16,615 km²), of which 1,283 mi² (3,323 km²) probably is noncontributing.

PERIOD OF RECORD.--September 1915 to August 1978. Prior to October 1970, published as "near Paint Rock".

GAGE.--Water-stage recorder with masonry dam control. Datum of gage is 1,574.36 ft (479.865 m) National Geodetic Vertical Datum of 1929. See WSP 1922 for history of changes prior to Jan. 15, 1940.

REMARKS.--Many diversions above station for irrigation and municipal supply. Flow is regulated by Twin Buttes Reservoir (station 08131200) on the South Concho River and by O. C. Fisher Lake (station 08134500) on the North Concho River.

MAXIMA: FOR AUGUST 1978.--Discharge, 12,700 ft³/s (360 m³/s) Aug. 3, 1978, gage height, 19.11 ft (5.825 m).
FOR PERIOD 1915 to July 1978.--Maximum discharge, 301,000 ft³/s (8,520 m³/s) Sept. 17, 1936, gage height, 43.4 ft (13.23 m), from floodmarks, from rating curve extended above 98,000 ft³/s (2,780 m³/s) on basis of slope-area measurements of 144,000 and 301,000 ft³/s (4,080 and 8,520 m³/s).
HISTORIC.--Maximum stage since at least 1853, that of Sept. 17, 1936. Flood in August 1882 reached a stage of about 39.9 ft (12.16 m), and flood in August 1906 reached a stage of 39.5 ft (12.04 m), from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	22	8....	58	16...	28	24...	18
2....	28	9....	46	17...	27	25...	26
3....	4,350	10...	39	18...	25	26...	27
4....	1,750	11...	35	19...	23	27...	34
5....	306	12...	53	20...	24	28...	36
6....	143	13...	39	21...	23	29...	62
7....	82	14...	35	22...	23	30...	52
		15...	31	23...	21	31...	42
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							242
MONTHLY TOTAL ACRE-FEET.....							14,900

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	4,350	2,140	962
1962 to July 1978----------	5,630	3,880	3,220

COLORADO RIVER BASIN

(42) 08136700 COLORADO RIVER NEAR STACY, TX
(National stream-quality accounting network)

LOCATION.--Lat 31°29'37", long 99°34'25", Coleman-McCulloch County line, Hydrologic Unit 12090106, on left bank at downstream side of bridge on Farm Road 503, 1.2 mi (1.9 km) upstream from Bois d'Arc Creek, 1.8 mi (2.9 km) northeast of Stacy, 24 mi (39 km) downstream from Concho River, and at mile 604.8 (973.1 km).

DRAINAGE AREA.--24,040 mi² (62,260 km²), approximately, of which 12,880 mi² (33,360 km²) probably is noncontributing.

PERIOD OF RECORD.--March 1968 to August 1978. Prior to October 1970, published as "at Stacy".

GAGE.--Water-stage recorder. Datum of gage is 1,394.66 ft (425.092 m) National Geodetic Vertical Datum of 1929 (Texas Department of Highways and Public Transportation bridge plans).

REMARKS.--Many diversions above station for municipal, irrigation, and oilfield operation uses. Effluent from numerous sewage plants is returned to the river. Flow is affected by reservoirs upstream (see station 08126500) and at times by discharge from the flood-detention pools of 40 floodwater-retarding structures with a combined detention capacity of 54,040 acre-ft (66.6 hm³). These structures control runoff from 260 mi² (673 km²).

MAXIMA: FOR AUGUST 1978.--Discharge, 35,700 ft³/s (1,010 m³/s) Aug. 4, 1978, gage height, 22.50 ft (6.858 m).
FOR PERIOD 1968 to July 1978.--Maximum discharge, 22,200 ft³/s (629 m³/s) Sept. 19, 1974, gage height, 16.68 ft (5.084 m).
HISTORIC.--Maximum stage since since at least 1882, 356,000 ft³/s (10,100 m³/s) Sept. 18, 1936, gage height, 64.59 ft (19.687 m), by slope-area measurement of peak flow. The flood, of Sept. 18, 1936, was 4 ft (1.2 m) higher than the 1906 flood and 7 to 8 ft (2.1 to 2.4 m) higher than the 1882 flood, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	14	8....	406	16...	120	24...	72
2....	34	9....	300	17...	106	25...	69
3....	6,250	10...	239	18...	98	26...	64
4....	28,000	11...	196	19...	90	27...	58
5....	7,540	12...	172	20...	86	28...	62
6....	1,460	13...	155	21...	82	29...	75
7....	625	14...	162	22...	78	30...	81
		15...	138	23...	76	31...	97
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1,520
MONTHLY TOTAL ACRE-FEET.....							93,200

Period	*Highest mean discharge in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	28,000	13,900	6,370
1969 to July 1978----------	14,400	7,330	4,480

(43) 08138000 COLORADO RIVER AT WINCHELL, TX

LOCATION.--Lat 31°28'04", long 99°09'43", McCulloch-Brown County line, Hydrologic Unit 12090106, near left bank on downstream end of pier of bridge on U.S. Highway 377, 0.3 mi (0.5 km) south of Winchell, 5.9 mi (9.5 km) downstream from Home Creek, and at mile 560.7 (902.2 km).

DRAINAGE AREA.--24,580 mi² (63,660 km²), approximately, of which 12,880 mi² (33,360 km²) probably is noncontributing.

PERIOD OF RECORD.--November 1923 to September 1934 (published as "near Milburn"), January 1939 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,264.86 ft (385.529 m) National Geodetic Vertical Datum of 1929. November 1923 to September 1934, nonrecording gage at site 4.2 mi (6.8 km) downstream at datum 10.14 ft (3.091 m) lower. Jan. 13, 1939, to Mar. 24, 1940, nonrecording gage at present site and datum.

REMARKS.--Many diversions above station for irrigation, municipal supply, and oilfield operation. Flow is affected by reservoirs upstream (see station 08126500) and at times by discharge from flood-dentention pools of 85 floodwater-retarding structures with combined detention capacity of 100,320 acre-ft (124 hm³). These structures control runoff from 486 mi² (1,259 km²).

MAXIMA: FOR AUGUST 1978.--Discharge, 29,600 ft³/s (838 m³/s) Aug. 5, 1978, gage height, 31.88 ft (9.717 m).
FOR PERIOD 1923 to July 1978.--Maximum discharge, 76,100 ft³/s (2,160 m³/s) Oct. 15, 1930, gage height, 51.8 ft (15.79 m), present site and datum.
HISTORIC.--Maximum stage since at least 1882, 62.2 ft (18.96 m) Sept. 19, 1936.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.01	8....	621	16...	94	24...	36
2....	16	9....	422	17...	77	25...	33
3....	1,060	10...	389	18...	63	26...	32
4....	18,100	11...	336	19...	55	27...	31
5....	19,500	12...	163	20...	49	28...	31
6....	2,770	13...	131	21...	45	29...	93
7....	1,020	14...	108	22...	42	30...	77
		15...	105	23...	39	31...	60
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1,470
MONTHLY TOTAL ACRE-FEET.....							90,400

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	19,500	13,500	6,210
1925 to July 1978----------	67,000	55,100	33,600

(44) 08140600 LAKE CLYDE NEAR CLYDE, TX

LOCATION.--Lat 32°19'05", long 99°28'43", Callahan County, Hydrologic Unit 12090107, at Clyde pump station, 0.6 mi (1.0 km) west of dam on North Prong Pecan Bayou, 2.1 mi (3.4 km) downstream from bridge on Farm Road 604, and 7.0 mi (11.3 km) southeast of Clyde.

DRAINAGE AREA.--37.9 mi² (98.2 km²).

PERIOD OF RECORD.--January 1970 to August 1978.

GAGE.--Nonrecording gage. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--The lake is formed by a rolled-fill earthen dam 3,950 ft (1,204 m) long. Appreciable storage began in April 1970, and the dam was completed in May 1970. The emergency spillways are two 200-foot-wide (61 m) cut channels through natural ground located at left end of dam. The service spillway is an uncontrolled 3.5- by 10.5-foot (1.1 by 3.2 m) reinforced concrete drop inlet that is connected to a 42-inch (1,067 mm) concrete outlet pipe. A 14-inch (356 mm) controlled drain pipe is connected to the drop inlet. There are four 4.83- by 3.50-foot (1.47 by 1.07 m) rectangular slots, two on each side, divided by a 10-inch (254 mm) concrete web. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,888.9	16,530
Crest of spillway	1,881.4	10,840
Crest of spillway (invert of drop inlet)	1,872.0	5,720
Lowest gated outlet (invert)	1,842.2	60

COOPERATION.--Capacity table furnished by the Soil Conservation Service.

MAXIMA (at 0900): FOR AUGUST 1978.--Contents, 7,420 acre-ft (9.15 hm³) Aug. 4, 1978, elevation, 1,875.50 ft (571.652 m).
FOR PERIOD 1970 to July 1978.--Maximum contents, 6,370 acre-ft (7.85 hm³) May 28, 1975, elevation, 1,873.4 ft (571.01 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 0700

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	1,460	8....	5,990	16...	5,720	24...	5,760
2....	1,460	9....	5,900	17...	5,670	25...	5,760
3....	2,740	10...	5,860	18...	5,670	26...	5,760
4....	7,420	11...	5,810	19...	5,670	27..	5,720
5....	6,660	12...	5,760	20...	5,670	28...	5,720
6....	6,320	13...	5,720	21...	5,670	29...	5,720
7....	6,230	14...	5,720	22...	5,760	30...	5,720
		15...	5,720	23...	5,760	31...	5,720
CHANGE IN CONTENTS, IN ACRE-FEET							4,240

(45) 08140700 PECAN BAYOU NEAR CROSS CUT, TX

LOCATION.--Lat 31°58'21", long 99°07'48", Brown County, Hydrologic Unit 12090107, on right bank at downstream side of bridge on State Highway 279, 1.2 mi (1.9 km) downstream from Turkey Creek, and 4.2 mi (6.8 km) south of Cross Cut.

DRAINAGE AREA.--532 mi^2 (1,378 km^2).

PERIOD OF RECORD.--April 1968 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,453.35 ft (442.981 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Several small diversions above station. Flow is affected at times by discharge from flood-detention pools of 32 floodwater-retarding structures with combined detention capacity of 39,200 acre-ft (48.3 hm^3). These structures control runoff from 200 mi^2 (518 km^2) in the Turkey Creek and upper Pecan Bayou drainage basins. National Weather Service gage-height telemeter and rain gage at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 16,200 ft^3/s (459 m^3/s) Aug. 4, 1978, gage height, 24.90 ft (7.590 m).
FOR PERIOD 1968 to July 1978.--Maximum discharge, 7,330 ft^3/s (208 m^3/s) Oct. 19, 1971, gage height, 19.68 ft (5.998 m).
HISTORIC.--Flood in 1908 reached a stage of 26.5 ft (8.08 m) and was exceeded by a flood in 1900, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	1,020	16...	101	24...	8.6
2....	79	9....	899	17...	45	25...	6.3
3....	3,840	10...	822	18...	27	26...	4.6
4....	5,700	11...	741	19...	21	27...	3.6
5....	6,160	12...	626	20...	18	28...	7.0
6....	1,620	13...	390	21...	14	29...	18
7....	1,210	14...	190	22...	14	30...	5.0
		15...	134	23...	12	31...	2.7
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							766
MONTHLY TOTAL ACRE-FEET							47,100
RUNOFF, IN INCHES							1.66

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 2 -	1800	1.36	0.00	Aug. 3 -	0800	8.59	2,390	Aug. 4 -	2330	24.90	16,200
	1830	3.02	135		1000	8.24	2,290		2400	24.83	16,000
	1930	3.23	184		1200	11.57	3,200				
	2000	2.99	129		1600	17.31	5,450	Aug. 5 -	0100	24.81	15,900
	2200	2.40	35		2100	20.37	7,480		0600	22.14	9,630
	2230	4.15	534		2400	19.42	6,720		0900	18.02	5,840
	2300	4.93	905						1200	12.75	3,590
	2400	5.07	977	Aug. 4 -	0600	13.68	3,900		1800	7.71	2,140
					1100	9.21	2,560		2400	7.18	1,970
Aug. 3 -	0300	3.99	466		1600	14.61	4,200				
	0400	4.97	925		2000	20.60	7,670	Aug. 6 -	1200	6.32	1,600
	0500	5.88	1,380		2100	22.85	10,800		2400	5.79	1,330
	0700	8.31	2,310		2300	24.66	15,400				

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	6,160	5,230	2,920
1969 to July 1978----------	5,680	2,940	1,450

(46) 08140800 JIM NED CREEK NEAR COLEMAN, TX

LOCATION.--Lat 31°58'59", long 99°24'52", Coleman County, Hydrologic Unit 12090108, on right bank 77 ft (23 m) downstream from centerline of U.S. Highway 283, 1.4 mi (2.3 km) downstream from Turtle Bayou, 7.4 mi (11.9 km) downstream from Lake Coleman, and 10.8 mi (17.4 km) north of Coleman.

DRAINAGE AREA.--333 mi² (862 km²), of which 299 mi² (774 km²) is above Lake Coleman.

PERIOD OF RECORD.--October 1961 to September 1964 (miscellaneous measurements only), March 1965 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,592.31 ft (485.336 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Since March 1966 when deliberate impoundment began, flow has been largely controlled by Lake Coleman, capacity, 40,000 acre-ft (49.3 hm³) at service spillway; elevation, 1,717.5 ft (523.49 m).

MAXIMA: FOR AUGUST 1978.--Discharge, 1,830 ft³/s (51.8 m³/s) Aug. 4, 1978, gage height, 5.77 ft (1.759 m).
FOR PERIOD 1961 to July 1978.--Maximum discharge, 5,020 ft³/s (142 m³/s) May 6, 1969, gage height, 9.08 ft (2.768 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	1,540	16...	176	24...	23
2....	.00	9....	994	17...	144	25...	17
3....	31	10...	719	18...	109	26...	12
4....	967	11...	577	19...	82	27...	8.4
5....	1,770	12...	469	20...	64	28...	5.6
6....	1,740	13...	364	21...	49	29...	6.8
7....	1,730	14...	278	22...	39	30...	6.1
		15...	220	23...	31	31...	2.7
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							393
MONTHLY TOTAL ACRE-FEET.....							24,100
RUNOFF, IN INCHES.....							1.36

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	1,770	1,750	1,350
1966 to July 1978----------	3,000	2,420	1,680

(47) 08141000 HORDS CREEK LAKE NEAR VALERA, TX

LOCATION.--Lat 31°49'58", long 99°33'38", Coleman County, Hydrologic Unit 12090108, at outlet-works structure near right end of dam on Hords Creek, 5.6 mi (9.0 km) north of Valera, and 8.8 mi (14.2 km) west of Coleman.

DRAINAGE AREA.--48 mi² (124 km²), approximately.

PERIOD OF RECORD.--April 1948 to August 1978. Prior to October 1970, published as Hords Creek Reservoir.

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

REMARKS.--The lake is formed by a rolled earthfill dam 6,800 ft (2,070 m) long, including spillway. The deliberate impoundment of water began Apr. 7, 1948, and the dam was completed in June 1948. The emergency spillway is an excavated channel through natural ground, 500 ft (150 m) wide, located about 600 ft (180 m) from the right end of dam. The service spillway consists of three concrete conduits; two controlled by slide gates 5.0 by 6.0 ft (1.5 by 1.8 m), and the third an uncontrolled ogee spillway 4.0 ft (1.2 m) wide and 19.5 ft (5.9 m) high. The lake is operated for flood control and municipal water supply for the city of Coleman. The capacity table of August 1974 is based on a sedimentatieon survey made in 1968. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,939.0	-
Design flood	1,933.6	-
Crest of spillway	1,920.0	24,730
Crest of spillway (top of conservation pool)	1,900.0	8,110
Lowest gated outlet (invert)	1,856.0	3

COOPERATION.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

MAXIMA: FOR AUGUST 1978.--Contents, 3,570 acre-ft (4.40 hm³) Aug. 5, 1978, elevation, 1,887.90 ft (575.432 m).
FOR PERIOD 1948 to July 1978.--Maximum contents, 12,790 acre-ft (15.8 hm³) May 1, 1956, elevation, 1,906.86 ft (581.211 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	2,540	8....	3,540	16...	3,470	24...	3,410
2....	2,550	9....	3,530	17...	3,460	25...	3,400
3....	3,490	10...	3,520	18...	3,460	26...	3,390
4....	3,550	11...	3,520	19...	3,450	27..	3,390
5....	3,570	12...	3,510	20...	3,440	28...	3,380
6....	3,550	13...	3,500	21...	3,430	29...	3,380
7....	3,550	14...	3,490	22...	3,420	30...	3,370
		15...	3,480	23...	3,410	31...	3,360
CHANGE IN CONTENTS, IN ACRE-FEET							820

(48) 08141500 HORDS CREEK NEAR VALERA, TX

LOCATION.--Lat 31°50'03", long 99°32'04", Coleman County, Hydrologic Unit 12090108, on left bank 2,500 ft (762 m) downstream from Farm Road 503, 1.6 mi (2.6 km) downstream from Hords Creek Dam, 5.7 mi (9.2 km) north of Valera, 7.0 mi (11.3 km) west of Coleman, and 21.8 mi (35.1 km) upstream from mouth.

DRAINAGE AREA.--53 mi² (137 km²), approximately, of which 48 mi² (124 km²) is above Hords Creek Dam.

PERIOD OF RECORD.--April 1947 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,819.88 ft (554.699 m) National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark).

REMARKS.--Flow regulated by Hords Creek Lake (station 08141000).

MAXIMA: FOR AUGUST 1978.--Discharge, 2,360 ft³/s (66.8 m³/s) Aug. 3, 1978, gage height, 11.06 ft (3.371 m).
FOR PERIOD 1947 to July 1978.--Maximum discharge, 3,860 ft³/s (109 m³/s) Apr. 30, 1956, gage height, 14.73 ft (4.490 m), from rating curve extended above 1,900 ft³/s (53.8 m³/s).
HISTORIC.--Maximum stage since at least 1900, 23.0 ft (7.01 m) July 3, 1932.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	32	16...	.00	24...	.00
2....	.00	9....	18	17...	.00	25...	.00
3....	417	10...	9.1	18...	.00	26...	.00
4....	169	11...	3.9	19...	.00	27...	.00
5....	119	12...	1.2	20...	.00	28...	.00
6....	83	13...	.12	21...	.00	29...	.00
7....	54	14...	.00	22...	.00	30...	.00
		15...	.00	23...	.00	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							29.2
MONTHLY TOTAL ACRE-FEET.....							1,800

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	417	235	127
1948 to July 1978----------	864	469	385

(49) 08143000 LAKE BROWNWOOD NEAR BROWNWOOD, TX

LOCATION.--Lat 31°50'13", long 99°00'13", Brown County, Hydrologic Unit 12090107, at outlet structure for irrigation canal just upstream from right end of dam on Pecan Bayou, 0.2 mi (0.4 km) downstream from Jim Ned Creek, 8 mi (13 km) north of Brownwood, and 57.1 mi (91.9 km) upstream from mouth.

DRAINAGE AREA.--1,535 mi² (3,976 km²).

PERIOD OF RECORD.--July 1933 to June 1934, April 1935 to September 1940, November 1944 to August 1978. Prior to October 1970, published as Brownwood Reservoir.

GAGE.--Nonrecording gage read once daily. Datum of gage is 0.50 ft (0.152 m) below National Geodetic Vertical Datum of 1929. Prior to November 1944, nonrecording gages or water-stage recorder at various sites at dam at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam, 1,580 ft (482 m) long. The dam was completed in 1933 and deliberate impoundment began in July 1933. Capacity table is based on 1959 survey. The uncontrolled spillway is a broad-crested weir 479 ft (146 m) long located 800 ft (240 m) to the left of dam. The controlled spillway consists of two 12-foot (4 m) horseshoe-shaped concrete conduits. Water is released into Brown County canal through a 5-foot (2 m) circular conduit that is controlled by a slide gate in a service structure located near the right end of dam. Water is used for irrigation and for municipal and industrial supply by the city of Brownwood (see station 08142500). Flow is affected at times by discharge from flood-detention pools of 59 floodwater-retarding structures with combined capacity of 73,310 acre-ft (90.4 hm³). These structures control runoff from 353 mi² (914 km²) in the Jim Ned Creek and Pecan Bayou drainage basins. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,450.0	-
Crest of spillway	1,425.1	143,400
Lowest gated outlet to irrigation canal (invert)	1,406.0	46,510
Lowest gated outlet (invert)	1,330.0	-

COOPERATION.--Capacity table furnished by Corps of Engineers and Soil Conservation Service.

MAXIMA (at 1800): FOR AUGUST 1978.--Contents, 138,500 acre-ft (171 hm³) Aug. 16-24, 29, 30, 1978, gage height, 1,424.4 ft (434.16 m).
FOR PERIOD 1933 to July 1978.--Maximum contents, 192,300 acre-ft (237 hm³) May 2, 1956, gage height, 1,431.4 ft (436.29 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 1800

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	59,500	8....	121,700	16...	138,500	24...	138,500
2....	59,120	9....	126,600	17...	138,500	25...	137,800
3....	62,980	10...	130,800	18...	138,500	26...	137,800
4....	79,880	11...	132,900	19...	138,500	27..	137,800
5....	100,700	12...	135,000	20...	138,500	28...	137,800
6....	110,300	13...	137,100	21...	138,500	29...	138,500
7....	116,300	14...	137,800	22...	138,500	30...	138,500
		15...	137,800	23...	138,500	31...	138,500
CHANGE IN CONTENTS, IN ACRE-FEET							79,000

(50) 08143500 PECAN BAYOU AT BROWNWOOD, TX

LOCATION.--Lat 31°43'54", long 98°58'25", Brown County, Hydrologic Unit 12090107, on right bank at Brownwood, 502 ft (153 m) upstream from city dam, 6.3 mi (10.1 km) downstream from Salt Creek, 10 mi (16 km) downstream from Lake Brownwood, and 47.5 mi (76.4 km) upstream from mouth.

DRAINAGE AREA.--1,614 mi² (4,180 km²).

PERIOD OF RECORD.--May 1917 to June 1918, October 1923 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,318.58 ft (401.903 m) National Geodetic Vertical Datum of 1929. See WSP 1922 for history of changes prior to Apr. 2, 1962.

REMARKS.--Flow regulated by Lake Brownwood (station 08143000). Brown County Water Improvement District No. 1 canal (station 08142500) diverts water from Lake Brownwood 10 mi (16 km) upstream. Flow from 20.8 mi² (53.9 km²) above this station and below Lake Brownwood is partly controlled by nine floodwater-retarding structures with a combined detention capacity of 4,720 acre-ft (5.82 hm³). National Weather Service gage-height telemeter at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 47 ft³/s (1.33 m³/s) Aug. 4, 1978, gage height, 1.05 ft (0.320 m).
FOR PERIOD 1923 to July 1978.--Maximum discharge, 31,600 ft³/s (895 m³/s) Oct. 14, 1930, gage height, 16.92 ft (5.157 m).
HISTORIC.--Maximum stage, 21.7 ft (6.61 m) in September 1900, from information by Gulf, Colorado, and Santa Fe Railway Co. Flood of July 3, 1932, probably the greatest, reached a discharge of about 235,000 ft³/s (6,660 m³/s) as it entered Lake Brownwood (computed from rate of change of contents in lake; data furnished by engineers of Brown County Water Improvement District No. 1).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	1.6	16...	.54	24...	.00
2....	.00	9....	1.2	17...	.31	25...	.00
3....	.00	10...	1.2	18...	.19	26...	.00
4....	21	11...	1.1	19...	.16	27...	.00
5....	6.0	12...	.93	20...	.10	28...	.00
6....	3.3	13...	.82	21...	.06	29...	.00
7....	2.2	14...	.77	22...	.06	30...	.00
		15...	.63	23...	.01	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1.36
MONTHLY TOTAL ACRE-FEET.....							83.7

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	21	10	5.2
1934 to July 1978----------	22,600	15,000	7,820

COLORADO RIVER BASIN

(51) 08143600 PECAN BAYOU NEAR MULLIN, TX

LOCATION.--Lat 31°31'02", long 98°44'25", Mills County, Hydrologic Unit 12090107, on right bank 44 ft (13 m) downstream from bridge on Farm Road 573, 0.6 mi (1.0 km) downstream from Blanket Creek, 5.5 mi (8.8 km) southwest of Mullin, and 10 mi (16 km) upstream from Colorado River.

DRAINAGE AREA.--2,034 mi² (5,268 km²).

PERIOD OF RECORD.--October 1967 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,202.93 ft (366.653 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Flow is affected by Lake Brownwood 47 mi (76 km) upstream (see station 08143000). Flow from 139 mi² (360 km²) above this station and below Lake Brownwood is partly controlled by 38 floodwater-retarding structures with a combined detention capacity of 30,690 acre-ft (37.8 hm³) below the flood-spillway crests.

MAXIMA: FOR AUGUST 1978.--Discharge, 1,690 ft³/s (47.9 m³/s) Aug. 3, 1978, gage height, 6.50 ft (1.981 m).
FOR PERIOD 1967 to July 1978.--Maximum discharge, 13,700 ft³/s (388 m³/s) Jan. 23, 1968, gage height, 29.26 ft (8.918 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	7.4	16...	1.4	24...	8.5
2....	.00	9....	5.4	17...	1.2	25...	7.0
3....	958	10...	4.0	18...	1.1	26...	5.3
4....	225	11...	3.7	19...	1.1	27...	4.5
5....	72	12...	3.0	20...	1.2	28...	3.8
6....	32	13...	2.1	21...	1.3	29...	26
7....	14	14...	1.6	22...	22	30...	23
		15...	1.4	23...	6.0	31...	4.8
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							46.7
MONTHLY TOTAL ACRE-FEET.....							2,870

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	958	418	188
1968 to July 1978----------	12,700	11,000	7,450

(52) 08144500 SAN SABA RIVER AT MENARD, TX

LOCATION.--Lat 30°55'08", long 99°47'07", Menard County, Hydrologic Unit 12090109, on downstream side of bridge on U.S. Highway 83 in Menard, 1.1 mi (1.8 km) downstream from Las Moras Creek, 1.9 mi (3.1 km) upstream from Volkmann Draw, and 110.4 mi (177.6 km) upstream from mouth.

DRAINAGE AREA.--1,151 mi² (2,981 km²).

PERIOD OF RECORD.--September 1915 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,863.05 ft (567.858 m) National Geodetic Vertical Datum of 1929. Sept. 14, 1915, to Mar. 12, 1924, nonrecording gage at site 635 ft (194 m) downstream at datum 2.20 ft (0,671 m) lower. Mar. 13, 1924, to Feb. 21, 1939, nonrecording gage at site 1,000 ft (305 m) upstream at datum 2.00 ft (0.610 m) higher. Feb. 22, 1939, to Jan. 25, 1940 nonrecording gage at present site and datum. Jan. 26, 1940, to Sept. 19, 1957, water-stage recorder at site 240 ft (73 m) to right at present datum. Feb. 8, 1962, to Jan. 22, 1963, nonrecording gage at site 600 ft (180 m) downstream at present datum.

REMARKS.--Since about 1890, low flow duringf irrigation season regulated by diversions to Noyes Canal 4.5 mi (7.2 km) upstream and diversions by pumping at several locations upstream. Records of the Texas Water Rights Commission show permits have been granted to irrigate 3,338 acres (1,400 hm²) above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 35,400 ft³/s (1,000 m³/s) Aug. 2, 1978, gage height, 17.36 ft (5.291 m).
FOR PERIOD 1915 to July 1978.--Maximum discharge, 130,000 ft³/s (3,680 m³/s) July 23, 1938, gage height, 22.2 ft (6.77 m), present site and datum, from floodmark, from rating curve extended above 56,000 ft³/s (1,590 m³/s) on basis of slope-area measurement of peak flow.
HISTORIC.--Maximum stage since at least 1880, 23.3 ft (7.10 m) June 6, 1899, present site and datum, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	25	8....	97	16...	54	24...	33
2....	5,240	9....	97	17...	49	25...	38
3....	5,460	10...	87	18...	46	26...	38
4....	315	11...	82	19...	42	27...	40
5....	151	12...	210	20...	40	28...	44
6....	113	13...	250	21...	39	29...	51
7....	103	14...	111	22...	41	30...	47
		15...	76	23...	36	31...	45

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	423
MONTHLY TOTAL ACRE-FEET	26,000
RUNOFF, IN INCHES	.42

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 2	0500	3.63	26	Aug. 2	2330	17.09	33,300	Aug. 3	1300	7.42	1,840
	1745	3.83	44		2400	16.34	28,100		1700	6.61	958
	1800	8.06	2,240						2400	5.96	526
	1845	9.16	3,780	Aug. 3	0100	14.43	17,400				
	1900	10.41	5,870		0300	12.48	11,100	Aug. 4	1200	5.45	304
	1930	12.58	10,500		0500	12.89	12,200		2400	5.08	190
	2000	13.69	14,200		0600	12.37	10,900				
	2200	16.57	29,700		0900	9.39	5,470	Aug. 5	1200	4.89	147
	2230	17.14	33,700		1100	8.23	3,210		2400	4.77	124
	2300	17.36	35,400								

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	5,460	3,670	1,640
1917 to July 1978	53,300	41,200	22,400

(53) 08144800 BRADY CREEK NEAR EDEN, TX

LOCATION.--Lat 31°11'05", long 99°50'29", Concho County, Hydrologic Unit 12090110, on right bank at upstream side of bridge on U.S. Highway 83, 0.8 mi (1.3 km) downstream from Fitzgerald Creek, 2.2 mi (3.5 km) south of Eden, 2.4 mi (3.9 km) upstream from Hardin Branch, and 69.3 mi (111.5 km) upstream from mouth.

DRAINAGE AREA.--97 mi² (251 km²).

PERIOD OF RECORD.--April 1962 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 2,000.99 ft (609.902 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Flow is affected at times by discharge from the flood-detention pools of five floodwater-retarding structures with combined detention capacity of 22,190 acre-ft (27.4 hm³). These structures control runoff from 65.0 mi² (168.4 km²) above this station.

MAXIMA: FOR AUGUST 1978.--Discharge, 2.1 ft³/s (0.059 m³/s) Aug. 3, 1978, gage height, 1.30 ft (0.396 m).
FOR PERIOD 1962 to July 1978.--Maximum discharge, 5,110 ft³/s (145 m³/s) Apr. 28, 1966, gage height, 7.08 ft (2.158 m).
HISTORIC.--Maximum stage since at least 1884, 15.8 ft (4.82 m) in July 1938, from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.16	8....	.71	16...	.19	24...	.18
2....	.73	9....	.57	17...	.15	25...	.17
3....	1.7	10...	.53	18...	.19	26...	.21
4....	1.0	11...	.42	19...	.19	27...	.22
5....	.71	12...	.47	20...	.23	28...	.22
6....	.98	13...	.51	21...	.18	29...	.22
7....	.93	14...	.36	22...	.16	30...	.17
		15...	.35	23...	.17	31...	.13
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							.42
MONTHLY TOTAL ACRE-FEET							26.0
RUNOFF, IN INCHES							.01

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days*		
	1	3	7
August 1978	1.7	1.1	1.0
1963 to July 1978	485	254	111

COLORADO RIVER BASIN

(54) 08144900 BRADY CREEK RESERVOIR NEAR BRADY, TX

LOCATION.--Lat 31°08'17", long 99°23'07", McCulloch County, Hydrologic Unit 12090110, at mouth of Bear Creek on Brady Creek, 280 ft (85 m) upstream from Farm Road 3022 over Brady Creek Dam, 3.0 mi (4.8 km) west of Brady, and 34.1 mi (54.9 km) upstream from mouth.

DRAINAGE AREA.--513 mi² (1,329 km²).

PERIOD OF RECORD.--May 1963 to August 1978.

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

REMARKS.--The reservoir is formed by a compacted earthfill dam 8,400 ft (2,560 m) long. The dam was completed and storage began in May 1963. The dam was built by the city of Brady in cooperation with the Soil Conservation Service and the Farmers Home Administration for flood control, municipal, and industrial water supply. The spillway is a cut channel through natural ground 1,000 ft (305 m) wide located at right end of dam. The top of conservation pool is an uncontrolled concrete drop-inlet structure that discharges through a 7.0- by 7.0-foot (2.1 by 2.1 m) concrete box conduit and is designed to discharge 4,000 ft³/s (113 m³/s) at a 19.4-foot (5.9 m) head. The gated outlet is a 36-inch (915 mm) pipe that extends through the embankment and is equipped with three sluice gates for controlled releases downstream. Flow into reservoir is affected at times by discharge from the flood-detention pools of 35 floodwater-retarding structures with combined detention capacity of 82,180 acre-ft (101 hm³). These structures were built during the period February 1955 to July 1962 and control runoff from 263 mi² (681 km²) in the Brady Creek watershed above this station. Capacity curve is based on Geological Survey topographic map (1960 edition) and was not adjusted for borrow. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	1,783.0	-
Crest of spillway	1,762.4	90,310
Crest of spillway (top of conservation pool)	1,743.0	30,430
Lowest gated outlet (invert)	1,712.0	1,320

COOPERATION.--Capacity curve furnished by the city of Brady.

MAXIMA: FOR AUGUST 1978.--Contents, 21,570 acre-ft (26.6 hm³) Aug. 3, 1978, elevation, 1,738.12 ft (529.779 m).
FOR PERIOD 1963 to July 1978.--Maximum contents, 40,880 acre-ft (50.4 hm³) Sept. 24, 1971, elevation, 1,747.70 ft (532.669 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	19,970	8....	21,500	16...	21,230	24...	20,950
2....	21,180	9....	21,490	17...	21,180	25...	20,920
3....	21,570	10...	21,450	18...	21,150	26...	20,870
4....	21,570	11...	21,440	19...	21,120	27..	20,840
5....	21,540	12...	21,400	20...	21,090	28...	20,780
6....	21,550	13...	21,350	21...	21,040	29...	20,810
7....	21,540	14...	21,320	22...	21,010	30...	20,790
		15...	21,280	23...	20,980	31...	20,790
CHANGE IN CONTENTS, IN ACRE-FEET							810

COLORADO RIVER BASIN

(55) 08145000 BRADY CREEK AT BRADY, TX

LOCATION.--Lat 31°08'17", long 99°20'05", McCulloch County, Hydrologic Unit 12090110, on left bank just upstream from bridge on U.S. Highway 377 on North Bridge Street in Brady, 0.4 mi (0.6 km) downstream from Live Oak Creek, and 29.5 mi (47.5 km) upstream from mouth.

DRAINAGE AREA.--575 mi² (1,489 km²).

PERIOD OF RECORD.--May 1939 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,646.50 ft (501.853 m) National Geodetic Vertical Datum of 1929. Prior to July 9, 1940, nonrecording gage at site 3,600 ft (1,100 m) upstream at datum 8.24 ft (2.512 m) higher.

REMARKS.--The city of Brady, which obtains its water supply from ground-water sources, reported that 505 acre-ft (623,000 m³) of sewage effluent was returned to Brady Creek downstream from the gage during the current year. Flow largely controled since May 22, 1962, by Brady Creek Reservoir (station 08144900). Flow from 24.2 mi² (62.7 km²) above this station and below Brady Creek Reservoir is partly controlled by six floodwater-retarding structures with a combined capacity of 6,440 acre-ft (7.94 hm³) below flood-spillway crests.

MAXIMA: FOR AUGUST 1978.--Discharge, 536 ft³/s (15.2 m³/s) Aug. 2, 1978, gage height, 8.31 ft (2.533 m).
FOR PERIOD 1939 to July 1978.--Maximum discharge, 39,100 ft³/s (1,110 m³/s) Sept. 10, 1952, gage height, 24.80 ft (7.559 m).
HISTORIC.--Maximum stage since at least 1882, 29.1 ft (8.87 m) July 23, 1938, present site and datum, discharge at site 5 mi (8 km) downstream, 86,000 ft³/s (2,440 m³/s) by slope-area measurement. Flood of Oct. 6, 1930 (second highest since 1882), reached a stage of 25.9 ft (7.89 m), discharge 50,300 ft³/s (1,420 m³/s), present site and datum, from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	1.2	16...	.04	24...	.02
2....	153	9....	.53	17...	.03	25...	.02
3....	261	10...	.29	18...	.02	26...	.02
4....	36	11...	.18	19...	.02	27...	.01
5....	16	12...	.13	20...	.02	28...	.34
6....	5.8	13...	.10	21...	.02	29...	2.5
7....	2.8	14...	.07	22...	.02	30...	.35
		15...	.05	23...	.02	31...	.12
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							15.5
MONTHLY TOTAL ACRE-FEET.....							954

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	261	150	68
1940 to July 1978----------	21,100	9,450	4,160

(56) 08146000 SAN SABA RIVER AT SAN SABA, TX

LOCATION.--Lat 31°12'47", long 98°43'09", San Saba County County, Hydrologic Unit 12090109, on right bank at downstream side of bridge on State Highway 16, 1.2 mi (1.9 km) north of San Saba, 2.7 mi (4.3 km) upstream from Mill Creek, 4.8 mi (7.7 km) downstream from China Creek, and 16.6 mi (26.7 km) upstream form mouth.

DRAINAGE AREA.--3,042 mi² (7,879 km²).

PERIOD OF RECORD.--December 1904 to December 1906 (gage heights only), September 1915 to August 1978. Published as "near San Saba" December 1904 to December 1906 and September 1915 to August 1930.

GAGE.--Water-stage recorder. Datum of gage is 1,162.16 ft (354.226 m) National Geodetic Vertical Datum of 1929. See WSP 1922 for history of changes prior to July 8, 1953. Since Oct. 1, 1956, supplementary water-stage recorder 2,780 ft (847 m) to right of main-channel gage used for floodflows.

REMARKS.--Many diversions above station for irrigation and municipal use affect low flow. Flow partly affected by Brady Creek Reservoir (see station 08144900), capacity 90,300 acre-ft (111 hm³).

MAXIMA: FOR AUGUST 1978.--Discharge, 27,000 ft³/s (765 m³/s) Aug. 3, 1978, gage height, 28.38 ft (8.650 m).
FOR PERIOD 1915 to July 1978.--Maximum discharge, 203,000 ft³/s (5,750 m³/s) July 23, 1938, gage height, 39.3 ft (11.98 m), present site and datum, from rating curve extended above 41,000 ft³/s (1,160 m³/s) on basis of slope-area measurement of peak flow.
HISTORIC.--Maximum stage since at least 1899, that of July 23, 1938. Flood of June 6, 1899, reached a stage of 36.7 ft (11.19 m), present site and datum, from information by by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	21	8....	376	16...	264	24...	136
2....	34	9....	298	17...	213	25...	127
3....	8,620	10...	256	18...	183	26...	124
4....	8,520	11...	242	19...	160	27..	124
5....	1,020	12...	261	20...	148	28...	117
6....	601	13...	212	21...	142	29...	126
7....	470	14...	295	22...	140	30...	148
		15...	367	23...	141	31...	134
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							775
MONTHLY TOTAL ACRE-FEET.....							47,600
RUNOFF, IN INCHES.....							.29

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	8,620	6,050	2,840
1917 to July 1978----------	117,000	99,200	51,700

(57) 08147000 COLORADO RIVER NEAR SAN SABA, TX

LOCATION.--Lat 31°13'04", long 98°33'51", San Saba-Lampasas County, Hydrologic Unit 12090201, near left bank at downstream side of pier of bridge on U.S. Highway 190, 5.2 mi (8.4 km) dowstream from San Saba River, 9.2 mi (14.8 km) east of San Saba, and at mile 474.3 (763.1 km).

DRAINAGE AREA.--30,600 mi² (79,250 km²), approximately, of which 12,880 mi² (33,360 km²) probably is noncontributing.

PERIOD OF RECORD.--October 1915 to October 1922 (published as "near Chadwick") October 1923 to August 1930 (published as "near Tow"), September 1930 to August 1978. Monthly discharge only for some periods, published in WSP 1312.

GAGE.--Water-stage recorder. Datum of gage is 1,096.22 ft (334.128 m) National Geodetic Vertical Datum of 1929. See WSP 1922 for history of changes prior to May 23, 1940.

REMARKS.--Many diversion above station for irrigation, municipal use, and oilfield operation. Flow is affected by four reservoirs upstream from Winchell and one reservoir in the San Saba River and Pecan Bayou basins; combined capacity, 1,973,000 acre-ft (2.43 km³). Flow is affected at times by discharge from the flood-detention pools of 181 floodwater-retarding structures with combined detention capacity of 194,770 acre-ft (240 hm³). These structures control runoff from 891 mi² (2,308 km²).

MAXIMA: FOR AUGUST 1978.--Discharge, 28,100 ft³/s (796 m³/s) Aug. 4, 1978, gage height, 22.59 ft (6.685 m).
FOR PERIOD 1930 to July 1978.--Maximum discharge, 224,000 ft³/s (6,340 m³/s) July 23, 1938, gage height, 63.2 ft (19.26 m), present site, based on floodmarks at site then in use.
HISTORIC.--Maximum stage during period 1878 to July 22, 1938, 58.4 ft (17.80 m) Sept. 25, 1900, discharge, 184,000 ft³/s (5,210 m³/s), present site, from floodmarks at former site.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	30	8....	1,820	16...	393	24...	150
2....	41	9....	1,160	17...	307	25...	143
3....	3,020	10...	836	18...	266	26...	130
4....	19,700	11...	635	19...	224	27...	127
5....	11,400	12...	547	20...	198	28...	124
6....	17,700	13...	439	21...	178	29...	121
7....	9,060	14...	357	22...	167	30...	127
		15...	520	23...	156	31...	162
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							2,270
MONTHLY TOTAL ACRE-FEET.....							139,000

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	19,700	16,300	7,950
1931 to July 1978----------	191,000	184,000	130,000

(58) 08148000 LAKE BUCHANAN NEAR BURNET, TX

LOCATION.--Lat 30°45'04", long 98°25'06", Burnet County, Hydrologic Unit 12090201, in powerhouse at Buchanan Dam on Colorado River, 1.3 mi (2.1 km) upstream from bridge on State Highway 29, 11 mi (18 km) west of Burnet, and at mile 413.6 (665.6 km).

DRAINAGE AREA.--31,250 mi² (80,940 km²), approximately, of which 12,880 mi² (33,360 km²) probably is noncontributing.

PERIOD OF RECORD.--May 1937 to August 1978. Prior to Oct. 1, 1968, published as Buchanan Reservoir.

GAGE.--Nonrecording gage. Datum of gage is 0.48 ft (0.146 m) National Geodetic Vertical Datum of 1929 (levels by Lower Colorado River Authority). Prior to July 1938, temporary staff and float gages at same site and datum.

REMARKS.--The lake is formed by two reinforced concrete multiple-arch sections, three banks of tainter gates, a 1,100-foot (335 m) uncontrolled concrete spillway section, and natural ground. A net opening of 1,270 ft (387 m) is controlled by thirty 33- by 15-foot (10 by 5 m) and by seven 40- by 15-foot (12 by 5 m) tainter gates. The dam was completed and storage began May 20, 1937. Water is used for power development and for irrigation below Columbus. The power generating features consist of three generating units, each with a 12,677 kilowatt capacity. A pump-back unit (capacity, 840 ft³/s or 23.8 m³/s) returns water from Inks Lake to Lake Buchanan during off-peak power demand periods. Inflow is largely regulated by twelve major reservoirs with a combined capacity of 2,438,000 acre-ft (3.01 km³), of which 1,091,000 acre-ft (1.35 km³) is for flood control. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see Colorado River near San Saba (station 08147000). The capacity table is based on a 1925 survey. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,025.5	-
Crest of gravity overflow spillway (top of conservation storage)	1,020.0	992,000
Crest of spillway (15-foot gates)	1,005.0	678,000
Crest of spillway (25-foot gates)	995.0	505,000
Invert of three 12-foot-diameter penstocks	937.0	36,800

COOPERATION.--Gage-height record furnished by Lower Colorado River Authority.

MAXIMA (at 2400): FOR AUGUST 1978.--Contents, 814,700 acre-ft (1,000 hm³) Aug. 8, 1978, gage height, 1,011.94 ft (308.439 m).
FOR PERIOD 1937 to July 1978.--Maximum contents, 1,010,000 acre-ft (1.25 km³) Jan. 24, 1968, gage height, 1,020.8 ft (311.14 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	698,900	8....	813,900	16...	791,000	24...	761,000
2....	700,800	9....	813,900	17...	787,000	25...	757,000
3....	700,800	10...	813,900	18...	783,000	26...	757,000
4....	733,100	11...	811,800	19...	779,000	27..	755,000
5....	755,000	12...	807,600	20...	775,000	28...	751,000
6....	787,000	13...	801,300	21...	773,000	29...	751,000
7....	811,800	14...	799,200	22...	769,000	30...	751,000
		15...	795,000	23...	765,000	31...	751,000
CHANGE IN CONTENTS, IN ACRE-FEET							52,100

COLORADO RIVER BASIN

(60) 08148500 NORTH LLANO RIVER NEAR JUNCTION, TX

LOCATION.--Lat 30°31'06", long 99°48'39", Kimble County, Hydrologic Unit 12090202, on left bank 1,000 ft (305 m) upstream from remains of old Wilson Dam, 2.1 mi (3.4 km) northwest of Junction, and 4.1 mi (6.6 km) upstream from confluence with South Llano River.

DRAINAGE AREA.--914 mi^2 (2,367 km^2).

PERIOD OF RECORD.--September 1915 to September 1977, August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,699.92 ft (518.136 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 1, 1925, nonrecording gage at site 550 ft (168 m) downstream at same datum. Aug. 1, 1925, to Sept. 15, 1936, water-stage recorder 520 ft (158 m) downstream at same datum. Sept. 16, 1936, to June 22, 1940, nonrecording gages at various sites at same datum.

REMARKS.--Diversions for irrigation of about 500 acres (202 hm^2) will materially affect low flow.

MAXIMA: FOR AUGUST 1978.--Discharge, 64,800 ft^3/s (1,840 m^3/s) Aug. 2, 1978, gage height, 23.50 ft (7.163 m).
FOR PERIOD 1915 to 1977.--Maximum discharge, 94,800 ft^3/s (2,680 m^3/s) Sept. 16, 1936, gage height, 29.2 ft (8.90 m), present site, based on gage-height relation curve, from rating curve extended above 68,000 ft^3/s (1,930 m^3/s) on basis of slope-area measurement of peak flow.
HISTORIC.--Maximum stage since at least 1875, that of Sept. 16, 1936; maximum stage during period 1875 to Sept. 15, 1936, 27 ft (8.2 m) in 1889, from information by local resident.

(61) 08150000 LLANO RIVER NEAR JUNCTION, TX

LOCATION.--Lat 30°29'45", long 99°43'19", Kimble County, Hydrologic Unit 12090204, on right bank 600 ft (180 m) north of Farm Road 2169, 1.4 mi (2.3 km) east of Junction, 3.6 mi (5.8 km) downstream from bridge on Interstate Highway 10, 3.9 mi (6.3 km) downstream from confluence of North and South Llano Rivers, 4.3 mi (6.9 km) upstream from Johnson Fork, and 106.7 mi (171.7 km) upstream from mouth.

DRAINAGE AREA.--1,874 mi² (4,854 km²).

PERIOD OF RECORD.--September 1915 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,630.32 ft (496.922 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 14, 1925, nonrecording gage, and Aug. 14, 1925, to May 17, 1940, water-stage recorder at present site and datum. May 18, 1940, to Aug. 17, 1944, water-stage recorder at site 5,330 ft (1,620 m) upstream at datum 6.0 ft (1.83 m) higher. Since Aug. 18, 1944, gage at site 5,330 ft (1,620 m) upstream has been used as a supplementary gage.

REMARKS.--Diversions above station for irrigation

MAXIMA: FOR AUGUST 1978.--Discharge, 76,700 ft³/s (2,170 m³/s) Aug. 2, 1978, gage height, 22.14 ft (6.748 m).
FOR PERIOD 1915 to July 1978.--Maximum discharge, 319,000 ft³/s (9,030 m³/s) June 14, 1935, gage height, 43.3 ft (13.20 m) at regular gage, 41.4 ft (12.62 m) at supplementary gage, from floodmarks, from curve extended above 54,000 ft³/s (1,530 m³/s) on basis of slope-area rating measurements of 154,000 and 319,000 ft³/s (4,360 and 9,030 m³/s).
HISTORIC.--Maximum stage since at least 1875, that of June 14, 1935. There was a major flood in 1889 which was the highest known prior to June 14, 1935.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	93	8....	200	16...	134	24...	112
2....	14,800	9....	173	17...	131	25...	111
3....	6,030	10...	160	18...	128	26...	109
4....	610	11...	177	19...	124	27...	108
5....	338	12...	172	20...	123	28...	107
6....	258	13...	151	21...	120	29...	113
7....	226	14...	143	22...	116	30...	115
		15...	138	23...	113	31...	118
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							824
MONTHLY TOTAL ACRE-FEET.....							50,700
RUNOFF, IN INCHES.....							.51

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 2 -	0200	1.38	94	Aug. 2 -	1900	12.40	26,600	Aug. 3 -	0200	9.17	14,600
	1200	1.51	132		2000	7.63	10,200		0400	7.13	8,870
	1400	1.54	141		2100	6.08	6,440		1000	5.56	5,330
	1430	12.68	27,600		2130	8.95	13,900		1400	4.07	2,620
	1500	15.95	42,500		2200	11.11	21,400		1800	3.30	1,550
	1600	20.56	67,400		2300	12.97	28,900		2400	2.72	956
	1630	22.14	76,700		2400	13.43	30,900				
	1700	21.76	74,400					Aug. 4 -	1200	2.26	574
	1800	18.29	54,800	Aug. 3 -	0100	11.92	24,600		2400	2.05	427

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	14,800	7,150	3,210
1917 to July 1978----------	124,000	47,700	21,200

(62) 08150700 LLANO RIVER NEAR MASON, TX

LOCATION.--Lat 30°39'35", long 99°06'29", Mason County, Hydrologic Unit 12090204, on right bank 98 ft (30 m) downstream from downstream bridge on U.S. Highway 87, 1.0 mi (1.6 km) upstream from Beaver Creek, 9.1 mi (14.6 km) southeast of Mason, 10.2 mi (16.4 km) downstream from James River, and 54.5 mi (87.7 km) upstream from mouth.

DRAINAGE AREA.--3,280 mi² (8,500 km²).

PERIOD OF RECORD.--March 1968 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,230.36 ft (375.014 m) National Geodetic Vertical Datum of 1929. Prior to Jan. 19, 1971, at site 190 ft (58 m) upstream at same datum.

MAXIMA: FOR AUGUST 1978.--Discharge, 92,500 ft³/s (2,620 m³/s) Aug. 3, 1978, gage height, 21.35 ft (6.507 m).
FOR PERIOD 1968 to July 1978.--Maximum discharge, 151,000 ft³/s (4,280 m³/s) Oct. 13, 1973, gage height, 26.30 ft (8.016 m), from rating curve extended above 59,000 ft³/s (1,670 m³/s) on basis of slope-area measurement of peak flow.
HISTORIC.--Maximum flood since at least 1875 occurred June 14, 1935, discharge 388,000 ft³/s (11,000 m³/s), by slope-area measurement of peak flow at site 17.0 mi (27.4 km) downstream.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	95	8....	362	16...	138	24...	95
2....	4,430	9....	295	17...	128	25...	90
3....	30,300	10...	255	18...	120	26...	86
4....	2,240	11...	221	19...	115	27...	85
5....	947	12...	201	20...	110	28...	82
6....	647	13...	188	21...	106	29...	77
7....	526	14...	177	22...	105	30...	75
		15...	155	23...	101	31...	73

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	1,380
MONTHLY TOTAL ACRE-FEET	84,500
RUNOFF, IN INCHES	.48

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 2	0100	1.68	96	Aug. 2	2300	10.98	19,900	Aug. 3	0800	17.53	38,800
	0600	1.87	143		2330	15.63	45,100		1200	11.52	21,100
	0900	2.19	260		2400	17.26	56,600		1800	9.03	11,400
	1200	2.81	640						2400	6.96	5,630
	1300	2.91	712	Aug. 3	0100	17.67	59,800				
	1400	4.13	1,490		0300	14.89	40,400	Aug. 4	0400	5.84	3,370
	1430	4.81	2,270		0400	14.46	37,700		1200	4.74	1,860
	1500	6.22	4,620		0500	16.60	51,700		2400	4.06	1,160
	2000	7.61	7,900		0530	19.09	71,500				
	2100	7.64	7,980		0600	21.35	92,500	Aug. 5	1200	3.41	906
	2200	7.23	6,910		0630	21.07	89,700		2400	3.17	749
	2230	6.86	6,010		0700	19.75	77,300				

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	30,300	12,300	5,640
1969 to July 1978	56,800	28,300	13,500

COLORADO RIVER BASIN

(63) 08150800 BEAVER CREEK NEAR MASON, TX

LOCATION (revised).--Lat 30°38'36", long 99°05'44", Mason County, Hydrologic Unit 12090204, on left bank at upstream side of bridge on U.S. Highway 87, 1.4 mi (2.3 km) upstream from Llano River, 6.4 mi (10.3 km) downstream from Spring Creek, and 11.1 mi (17.9 km) southeast of Mason.

DRAINAGE AREA.--218 mi² (565 km²).

PERIOD OF RECORD.--July 1963 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,253.24 ft (381.988 m) National Geodetic Vertical Datum of 1929. Prior to Aug. 3, 1978, at site 300 ft (91 m) upstream at same datum.

REMARKS.--No known regulation or diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 66,900 ft³/s (1,890 m³/s) Aug. 3, 1978, gage height, 24.0 ft (7.315 m).
FOR PERIOD 1963 to July 1978.--Maximum discharge, 23,200 ft³/s (657 m³/s) May 16, 1965, gage height, 13.58 ft (4.139 m), from rating curve extended above 7,400 ft³/s (210 m³/s) on basis of slope-area measurement of 20,100 ft³/s (569 m³/s).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.89	8....	22	16...	5.0	24...	1.4
2....	616	9....	18	17...	3.4	25...	1.3
3....	12,800	10...	16	18...	2.7	26...	1.2
4....	73	11...	14	19...	2.5	27...	1.1
5....	35	12...	13	20...	2.2	28...	1.0
6....	29	13...	11	21...	2.1	29...	1.4
7....	25	14...	9.7	22...	1.9	30...	3.8
		15...	7.1	23...	1.5	31...	3.4
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							443
MONTHLY TOTAL ACRE-FEET.....							27,200
RUNOFF, IN INCHES.....							2.34

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 2 -	0100	1.85	1.2	Aug. 2 -	2400	3.76	270	Aug. 3 -	1300	5.97	4,060
	0300	1.98	3.8						1400	5.25	2,840
	0500	2.10	7.7	Aug. 3 -	0200	3.82	281		1600	4.35	1,420
	0800	2.30	18		0300	5.29	1,100		1800	3.76	770
	1000	2.72	58		0400	13.37	23,500		2000	3.35	470
	1100	4.54	590		0500	18.91	43,600		2200	3.03	308
	1200	5.54	1,360		0600	24.00	66,900		2400	2.77	211
	1300	6.22	2,310		0700	20.00	48,200				
	1500	6.07	2,070		0900	13.90	25,200	Aug. 4 -	0200	2.56	151
	1800	5.07	912		1100	11.10	16,700		0600	2.28	93
	2100	4.23	440		1200	9.00	10,900		1200	2.00	59
									2400	1.68	40

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	12,800	4,500	1,940
1964 to July 1978----------	5,040	2,090	919

COLORADO RIVER BASIN

(64) 08151500 LLANO RIVER AT LLANO, TX

LOCATION.--Lat 30°45'10", long 98°40'10", Llano County, Hydrologic Unit 12090204, on right bank in Llano, 0.4 mi (0.6 km) downstream from bridge on State Highway 16, 7 mi (11 km) upstream from Little Llano River, and 24.2 mi (38.9 km) upstream from mouth.

DRAINAGE AREA.--4,233 mi² (10,963 km²).

PERIOD OF RECORD.--September 1939 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 970.01 ft (295.659 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Many small diversions above station. Part of low flow of Llano River disappears into various formations, many of which are faulted, between stations near Junction and Llano. National Weather Service gage-height telemeter at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 139,000 ft³/s (3,940 m³/s) Aug. 3, 1978, gage height, 25.61 ft (7.806 m).
FOR PERIOD 1939 to July 1978.--Maximum discharge, 232,000 ft³/s (6,570 m³/s) Sept. 10, 1952, gage height, 32.6 ft (9.94 m), from rating curve extended above 129,000 ft³/s (3,650 m³/s) on basis of slope-area measurement of peak flow.
HISTORIC.--Maximum stage since at least 1879, 41.5 ft (12.65 m) June 14, 1935, discharge, 380,000 ft³/s (10,800 m³/s), from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	107	8....	618	16...	189	24...	115
2....	233	9....	399	17...	175	25...	105
3....	54,300	10...	314	18...	161	26...	104
4....	6,000	11...	268	19...	147	27...	101
5....	2,090	12...	225	20...	141	28...	101
6....	1,760	13...	210	21...	141	29...	106
7....	949	14...	215	22...	132	30...	101
		15...	217	23...	117	31...	95
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							2,260
MONTHLY TOTAL ACRE-FEET							139,000
RUNOFF, IN INCHES							.61

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 2 -	1200	1.93	219	Aug. 3 -	0700	24.50	126,000	Aug. 3 -	2400	9.14	12,600
	2400	2.38	377		0800	25.00	132,000				
					0900	25.61	139,000	Aug. 4 -	0600	7.63	7,290
Aug. 3 -	0100	6.05	4,570		1000	24.50	126,000		1200	6.92	5,300
	0300	7.00	6,560		1200	21.40	92,400		2400	5.93	3,100
	0400	10.00	15,700		1500	17.00	54,600				
	0500	17.60	59,100		1700	14.20	36,100	Aug. 5 -	1200	5.25	2,000
	0600	21.00	88,400		2000	10.65	18,300		2400	4.82	1,420

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	54,300	20,800	9,450
1941 to July 1978----------	54,900	35,500	15,500

(65) 08152000 SANDY CREEK NEAR KINGSLAND, TX

LOCATION.--Lat 30°33'30", long 98°28'19", Llano County, Hydrologic Unit 12090201, on left bank at downstream side of bridge on State Highway 71, 3.9 mi (6.3 km) upstream from Lake Lyndon B. Johnson, and 7.3 mi (11.7 km) south of kingsland.

DRAINAGE AREA.--327 mi² (847 km²).

PERIOD OF RECORD.--October 1966 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 862.31 ft (262.832 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Some diversions above station for irrigation, amount unknown.

MAXIMA: FOR AUGUST 1978.--Discharge, 3,610 ft³/s (102 m³/s) Aug. 2, 1978, gage height, 8.89 ft (2.710 m).
FOR PERIOD 1966 to July 1978.--Maximum discharge, 21,200 ft³/s (600 m³/s) Apr. 15, 1977, gage height, 15.86 ft (4.834 m).
HISTORIC.--The flood of Sept. 11, 1952, which was the highest since at least 1881, reached a stage of 34.2 ft (10.42 m), discharge 163,000 ft³/s (4,620 m³s), from slope-area measurement at gage site.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	22	8....	9.3	16...	1.3	24...	.63
2....	1,140	9....	7.4	17...	1.1	25...	.63
3....	498	10...	5.9	18...	.66	26...	.63
4....	212	11...	5.0	19...	.46	27...	.55
5....	55	12...	4.0	20...	.46	28...	.61
6....	30	13...	3.2	21...	.60	29...	.34
7....	17	14...	2.5	22...	.71	30...	.34
		15...	1.8	23...	.63	31...	.34
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							65.3
MONTHLY TOTAL ACRE-FEET							4,010
RUNOFF, IN INCHES							.23

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	1,140	617	282
1967 to July 1978	6,670	3,810	1,990

(68) 08153500 PEDERNALES RIVER NEAR JOHNSON CITY, TX

LOCATION.--Lat 30°17'27", long 98°24'01", Blanco County, Hydrologic Unit 12090206, near center of span at downstream side of bridge on U.S. Highway 281, 0.2 mi (0.3 km) downstream from Towhead Creek, 1.1 mi (1.8 km) northeast of Johnston City, 3.4 mi (5.5 km) downstream from Buffalo Creek, and 48.2 mi (77.6 km) upstream from mouth.

DRAINAGE AREA.--947 mi² (2,453 km²).

PERIOD OF RECORD.--May 1939 to August 1978.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,096.70 ft (334.274 m) National Geodetic Vertical Datum of 1929. May 4 to Sept. 13, 1939, nonrecording gage, and Sept. 14, 1939, to Sept. 10, 1952, water-stage recorder at upstream side of bridge at same datum. Sept. 11, 1952, to June 29, 1953, nonrecording gage, and June 30, 1953, to Oct. 7, 1954, water-stage recorder at site 360 ft (110 m) downstream at same datum.

MAXIMA: FOR AUGUST 1978.--Discharge, 127,000 ft³/s (3,597 m³/s) Aug. 3, 1978, gage height, 24.9 ft (7.59 m).
FOR PERIOD 1939 to July 1978.--Maximum discharge, 441,000 ft³/s (12,500 m³/s) Sept. 11, 1952, gage height, 42.5 ft (12.95 m), from floodmark, from rating curve extended above 116,000 ft³/s (3,290 m³/s) on basis of slope-area measurement of 441,000 ft³/s (12,500 m³/s).
HISTORIC.--Maximum stage since at least 1859, 42.5 ft (12.95 m) Sept. 11, 1952; flood of July 1869 reached a stage of 33 ft (10.1 m), from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	123	8....	455	16...	113	24...	70
2....	22,400	9....	277	17...	102	25...	64
3....	30,100	10...	220	18...	96	26...	64
4....	2,580	11...	191	19...	88	27...	57
5....	743	12...	166	20...	87	28...	57
6....	451	13...	148	21...	83	29...	54
7....	1,230	14...	133	22...	76	30...	51
		15...	123	23...	72	31...	54
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1,950
MONTHLY TOTAL ACRE-FEET.....							120,000
RUNOFF, IN INCHES.....							2.38

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0800	10.44	40	Aug. 2 -	1230	14.62	16,500	Aug. 3 -	1230	22.77	100,000
	1200	10.48	64		1300	16.43	30,200		1300	23.17	105,000
	1700	10.52	96		1400	19.05	56,500		1315	24.90	127,000
	1800	10.63	202		1500	19.86	65,500		1330	24.50	122,000
	1900	10.72	327		1600	20.20	69,400		1400	24.00	115,000
	2300	10.67	252		1700	19.42	60,600		1500	21.79	88,200
	2330	10.69	280		1900	17.64	41,400		1700	19.27	58,900
	2400	11.01	994		2100	15.70	24,200		1900	16.48	30,600
					2400	14.30	14,500		2100	14.69	17,000
Aug. 2 -	0100	11.15	1,380						2400	13.02	7,900
	0500	10.99	935	Aug. 3 -	0200	13.42	9,640				
	0515	11.62	2,850		0600	12.00	4,130	Aug. 4 -	0400	11.94	3,910
	0530	12.29	5,100		1100	11.38	2,070		0800	11.51	2,500
	0600	12.79	6,970		1130	11.35	1,970		1200	11.32	1,880
	0700	13.13	8,370		1145	18.30	48,200		1800	11.15	1,380
	1000	12.69	6,580		1200	20.79	76,400		2400	11.03	1,060
	1200	13.54	10,200								

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	30,100	18,400	8,280
1940 to July 1978----------	129,000	61,800	26,700

(69) 08154500 LAKE TRAVIS NEAR AUSTIN, TX

LOCATION.--Lat 30°23'29", long 97°54'24", Travis County, Hydrologic Unit 12090205, in powerhouse at Mansfield Dam on Colorado River, 7.3 mi (11.7 km) downstream from Sandy Creek, 12 mi (19 km) northwest of Austin, and at mile 318.0 (511.7 km).

DRAINAGE AREA.--38,130 mi² (98,760 km²), approximately, of which 12,880 mi² (33,360 km²) probably is noncontributing.

PERIOD OF RECORD.--September 1940 to August 1978. Prior to October 1948, published as Marshall Ford Reservoir near Austin.

GAGE.--Nonrecording gage. Datum of gage is 0.12 ft (0.037 m) National Geodetic Vertical Datum of 1929 (levels by Bureau of Reclamation). Prior to Dec. 26, 1940, staff gages on left bank near dam, datum is NGVD. Dec. 26, 1940, to February 1942, mercury manometer in powerhouse, datum is NGVD.

REMARKS.--The lake is formed by a 7,098-foot-long (2,163 m) concrete gravity, earth, and rockfill dam. Storage began Sept. 9, 1940, and dam was completed in early 1942. Capacity curve is based on October 1939 survey. Capacity between gage heights 681.0 and 714.0 ft (207.57 and 217.63 m) is 778,000 acre-ft (959 hm³) and is reserved for flood control. Water is used for power development and for irrigation below Columbus. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam (roadway)	750.1	-
Design flood	748.9	3,223,000
Crest of spillway	714.0	1,950,000
Top of power storage	681.0	1,172,000
Lowest gated outlet (invert)	535.8	27,900

COOPERATION.--Records of daily gage heights and capacity curve furnished by Lower Colorado River Authority.

MAXIMA (at 2400): FOR AUGUST 1978.--Contents, 868,200 acre-ft (1.07 km³) Aug. 4, 1978, gage height, 662.90 ft (202.052 m).
FOR PERIOD 1940 to July 1978.--Maximum contents, 1,770,000 acre-ft (2.18 km³) May 18, 1957, gage height, 707.4 ft (215.62 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	652,500	8....	862,200	16...	866,700	24...	857,400
2....	682,400	9....	864,000	17...	865,800	25...	855,000
3....	814,600	10...	865,200	18...	865,800	26...	852,200
4....	868,200	11...	866,600	19...	864,600	27..	848,000
5....	863,900	12...	867,500	20...	862,800	28...	846,200
6....	861,900	13...	865,500	21...	862,100	29...	840,000
7....	860,900	14...	865,800	22...	861,000	30...	834,200
		15...	866,000	23...	858,500	31...	828,900
CHANGE IN CONTENTS, IN ACRE-FEET							181,200

(70) 08165300 NORTH FORK GUADALUPE RIVER NEAR HUNT, TX

LOCATION.--Lat 30°03'36", long 99°23'40", Kerr County, Hydrologic Unit 12100201, on right bank 410 ft (125 m) downstream from Ranch Road 1340, 1.3 mi (2.1 km) downstream from Bear Creek, 3.7 mi (6.0 km) west of Hunt, and 4.1 mi (6.6 km) upsteam from Honey Creek.

DRAINAGE AREA.--168 mi² (435 km²).

PERIOD OF RECORD.--August 1967 to August 1978.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 1,800.10 ft (548.670 m) National Geodetic Vertical Datum of 1929.

REMARKS--There is a permit upstream from station issued by the Texas Department of Water Resources to impound and use 20.33 acre-ft (25,100 m³) of water on a game preserve.

MAXIMA: FOR AUGUST 1978.--Discharge, 39,300 ft³/s (1,110 m³/s) Aug. 3, 1978, gage height, 26.8 ft (8.17 m).
FOR PERIOD 1967 to July 1978.--Maximum discharge, 38,400 ft³/s (1,090 m³/s) Oct 13, 1973, gage height, 26.55 ft (8.092 m), from rating curve extended above 170 ft³/s (4.81 m³/s) on basis of slope-area measurements of 7,460 and 38,400 ft³/s (211 and 1,090 m³/s).
HISTORIC.--Maximum stage since at least 1900 occured July 1, 1932, gage height, 37.3 ft (11.37 m), discharge, 140,000 ft³/s (3,960 m³/s), by slope-area measurements, combined flow of North Fork Guadalupe River 5 mi (8 km) upstream and Bear Creek 2 mi (3 km) upstream from mouth, and adjusted for difference in drainage area.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	44	8....	95	16...	46	24...	35
2....	6,370	9....	86	17...	44	25...	35
3....	5,870	10...	79	18...	43	26...	34
4....	194	11...	72	19...	41	27...	33
5....	135	12...	65	20...	39	28...	32
6....	120	13...	60	21...	38	29...	32
7....	109	14...	59	22...	37	30...	33
		15...	52	23...	36	31...	32
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							452
MONTHLY TOTAL ACRE-FEET.....							27,800
RUNOFF, IN INCHES.....							3.10

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0100	4.14	15	Aug. 2 -	0900	22.07	23,100	Aug. 3 -	0400	19.03	16,100
	0800	4.43	26		1000	18.34	14,800		0500	20.82	20,100
	1200	4.70	41		1200	15.45	10,000		0700	15.70	10,400
	2400	5.06	76		1400	11.43	4,660		0800	12.31	5,720
					1600	9.46	2,550		1000	9.37	2,460
Aug. 2 -	0100	5.81	234		1800	8.29	1,520		1200	8.05	1,340
	0200	6.15	333		2100	7.12	755		1500	6.96	670
	0300	8.31	1,530		2400	6.66	527		1800	6.45	440
	0400	9.30	2,390						2400	5.94	269
	0500	15.47	10,000	Aug. 3 -	0100	8.20	1,450				
	0600	14.43	8,560		0200	20.24	18,700	Aug. 4 -	1200	5.61	187
	0700	16.36	11,400		0300	26.80	39,300		2400	5.44	152
	0800	24.80	31,900								

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	6,370	4,140	1,840
1968 to July 1978----------	8,640	3,120	1,390

(71) 08165500 GUADALUPE RIVER AT HUNT, TX

LOCATION.--Lat 30°04'08", long 99°19'23", Kerr County, Hydrologic Unit 12100201, on right bank 56 ft (17 m) upstream and 137 ft (42 m) right of right end of bridge on State Highway 39, 0.6 mi (1.0 km) downstream from confluence of North and South Forks, 0.8 mi (1.3 km) east of Hunt, and at mile 430.9 (693.3 km),

DRAINAGE AREA.--288 mi² (746 km²).

PERIOD OF RECORD.--October 1941 to September 1949, discharge not computed above 600 ft³/s (17.0 m³/s), and April 1965 to August 1978. Occasional discharge measurements made 1950 to 1964.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 1,722.7 ft (525.08 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Numerous diversions for irrigation above station, amounts unknown.

MAXIMA: FOR AUGUST 1978.--Discharge, 62,900 ft³/s (1,780 m³/s) Aug. 2, 1978, gage height, 23.50 ft (7.163 m).
FOR PERIOD 1965 to July 1978.--Maximum discharge, 47,000 ft³/s (1,330 m³/s) Aug. 13, 1966, gage height, 21.4 ft (6.52 m), from floodmark, from rating curve extended above 3,700 ft³/s (105 m³/s) on basis of channel geometry and flow-over-dam measurement of peak flow.
HISTORIC.--Maximum stage since 1900, 36.6 ft (11.16 m) July 2, 1932, from information by local resident, discharge 206,000 ft³/s (5,830 m³/s), determined by slope-area measurement 4.5 mi (7.2 km) downstream from gage.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	621	8....	234	16...	111	24...	76
2....	16,300	9....	189	17...	106	25...	70
3....	9,460	10...	171	18...	102	26...	71
4....	687	11...	151	19...	97	27...	73
5....	424	12...	141	20...	94	28...	71
6....	342	13...	129	21...	95	29...	69
7....	324	14...	116	22...	85	30...	84
		15...	117	23...	82	31...	74
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							992
MONTHLY TOTAL ACRE-FEET.....							61,000
RUNOFF, IN INCHES.....							3.97

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0700	1.02	23	Aug. 2 -	0300	11.00	5,050	Aug. 3 -	0200	11.00	5,050
	0800	1.16	36		0400	13.62	9,760		0300	16.00	17,500
	0900	1.63	99		0500	14.79	13,100		0400	20.00	37,600
	1000	2.03	174		0600	20.81	42,800		0500	22.25	52,800
	1030	4.33	757		0700	23.50	62,900		0600	20.20	38,800
	1100	7.82	1,960		0800	21.16	45,300		0700	16.60	19,900
	1130	9.73	3,420		1000	22.25	52,800		0800	14.70	12,800
	1200	9.58	3,270		1100	20.20	38,800		1000	11.20	5,310
	1300	7.71	1,910		1200	16.60	19,900		1200	9.60	3,290
	1500	5.37	1,050		1300	14.70	12,800		1600	7.75	1,930
	1900	3.51	543		1400	12.90	8.150		2400	5.70	1,160
	2300	2.91	380		1500	11.20	5,310				
	2400	3.35	498		1800	9.20	2,910	Aug. 4 -	0600	4.55	813
					2400	6.70	1,510		1200	3.83	628
Aug. 2 -	0100	5.47	1,080						2400	3.40	512
	0200	9.85	3,540	Aug. 3 -	0100	6.13	1,310				

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	16,300	8,820	4,020
1966 to July 1978----------	15,700	6,090	2,710

(72) 08166000 JOHNSON CREEK NEAR INGRAM, TX

LOCATION.--Lat 30°06'00", long 99°16'58", Kerr County, Hydrologic Unit 12100201, on right bank 1.6 mi (2.6 km) upstream from Henderson Branch, 3.4 mi (5.5 km) northwest of Ingram, 3.8 mi (6.1 km) upstream from mouth, and 9.2 mi (14.8 km) northwest of Kerrville.

DRAINAGE AREA.--114 mi² (295 km²).

PERIOD OF RECORD.--September 1941 to November 1959, October 1961 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,721.30 ft (524.652 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Numerous small diversions above station for irrigation.

MAXIMA: FOR AUGUST 1978.--Discharge, 73,900 ft³/s (2,090 m³/s) Aug. 3, 1978, gage height, 21.4 ft (6.52 m).
FOR PERIOD 1941 to July 1978.--Maximum discharge, 95,900 ft³/s (2,720 m³/s) Oct. 4, 1959, gage height, 24.25 ft (7.391 m), from rating curve extended above 4,400 ft³/s (125 m³/s) on basis of slope-area measurements of 9,100 and 16,000 ft³/s (258 and 453 m³/s) and conveyance study.
HISTORIC.--Maximum stage since at least 1852, 35 ft (10.7 m) July 2, 1932, from information by local resident; discharge, 138,000 ft³/s (3,910 m³/s), by slope-area measurement at point 0.5 mi (0.8 km) downstream from State fish hatchery and 6 or 7 mi (10 or 11 m) upstream from gage. Flood of June 14, 1935, reached a stage of 31 or 32 ft (9.4 or 9.8 m), from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	30	8....	87	16...	41	24...	29
2....	3,710	9....	79	17...	39	25...	28
3....	17,200	10...	73	18...	37	26...	25
4....	215	11...	66	19...	36	27...	24
5....	130	12...	61	20...	34	28...	24
6....	106	13...	58	21...	32	29...	22
7....	97	14...	53	22...	30	30...	27
		15...	46	23...	29	31...	26
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							726
MONTHLY TOTAL ACRE-FEET.....							44,600
RUNOFF, IN INCHES.....							7.34

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0600	1.43	7.9	Aug. 2 -	0800	8.30	6,080	Aug. 3 -	0300	17.98	50,100
	0800	1.44	9.2		0900	10.00	10,000		0400	18.42	53,000
	0900	1.50	19		1000	11.08	13,500		0600	18.04	50,500
	1000	1.60	42		1100	10.00	10,000		0700	20.32	66,200
	1400	1.65	56		1300	8.80	7,120		0800	14.39	28,300
	1800	1.59	40		1400	7.30	4,370		0900	10.50	11,500
	2200	1.57	33		1500	6.00	2,630		1000	8.12	5,730
	2400	1.64	53		1700	4.30	1,120		1200	5.79	2,390
					2000	3.13	582		1400	4.46	1,190
Aug. 2 -	0100	2.05	188		2200	2.80	457		1800	3.36	597
	0200	5.00	1,590		2300	2.90	496		2400	2.78	348
	0300	6.17	2,830		2400	7.20	4,220				
	0400	6.36	3,070					Aug. 4 -	1200	2.42	205
	0600	5.56	2,140	Aug. 3 -	0100	10.00	10,000		2400	2.26	148
	0700	6.70	3,510		0200	21.40	73,900				

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	17,200	7,040	3,080
1943 to July 1978----------	4,050	1,710	845

(75) 08167000 GUADALUPE RIVER AT COMFORT, TX

LOCATION.--Lat 29°57'55", long 98°53'49", Kendall County, Hydrologic Unit 12100201, on left bank at downstream side of pier of bridge on U.S. Highway 87, 0.1 mi (0.2 km) downstream from Cypress Creek, and at mile 396.6 (638.1 km).

DRAINAGE AREA.--838 mi² (2,170 km²).

PERIOD OF RECORD.--May 1939 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,372.05 ft (418.201 m) National Geodetic Vertical Datum of 1929. Prior to Nov. 27, 1939, nonrecording gage.

REMARKS.--Many small diversions above station for irrigation.

MAXIMA: FOR AUGUST 1978.--Discharge, 240,000 ft³/s (6,800 m³/s) Aug. 2, 1978, gage height, 40.90 ft (12.466 m).
FOR PERIOD 1939 to July 1978.--Maximum discharge, 111,000 ft³/s (3,140 m³/s) Oct. 4, 1959, gage height, 33.15 ft (10.104 m), from rating curve extended above 65,000 ft³/s (1,840 m³/s) on basis of slope-area measurement of 182,000 ft³/s (5,150 m³/s), gage height, 38.4 ft (11.70 m), made at former gaging station "near Comfort" 5 mi (8 km) upstream.
HISTORIC.--Maximum stage since at least 1848, 40.90 ft (12.466 m) Aug. 2, 1978, discharge 240,000 ft³/s (6,800 m³/s). Flood of July 1869 reached a stage of 40.3 ft (12.28 m) from report by Corps of Engineers.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	873	8....	936	16...	416	24...	274
2....	74,200	9....	772	17...	398	25...	257
3....	55,100	10...	695	18...	371	26...	250
4....	3,820	11...	619	19...	357	27...	241
5....	1,800	12...	561	20...	341	28...	235
6....	1,270	13...	519	21...	326	29...	234
7....	1,330	14...	480	22...	311	30...	249
		15...	450	23...	292	31...	259

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	4,780
MONTHLY TOTAL ACRE-FEET	294,000
RUNOFF, IN INCHES	6.58

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0900	4.10	50	Aug. 2 -	1000	38.82	203,000	Aug. 3 -	1400	27.83	69,200
	1500	4.14	56		1100	36.07	161,000		1600	23.67	39,900
	1600	4.36	103		1200	34.19	137,000		1800	19.87	21,700
	1700	6.12	1,040		1500	30.89	98,600		2100	16.45	12,000
	1800	8.25	1,990		1800	26.23	56,400		2400	14.52	7,870
	1900	9.85	2,760		2100	21.36	28,000				
	2400	11.26	3,580		2400	17.58	14,600	Aug. 4 -	0600	12.31	4,520
									1200	10.88	3,330
Aug. 2 -	0300	11.74	3,960	Aug. 3 -	0300	15.20	9,260		2400	9.00	2,340
	0400	13.24	5,710		0500	19.38	20,100				
	0500	15.85	10,700		0600	30.76	97,200	Aug. 5 -	1200	8.00	1,770
	0600	22.97	36,000		0700	33.98	134,000		2400	7.49	1,450
	0700	30.98	99,500		0800	35.08	148,000				
	0800	37.55	183,000		0900	34.87	145,000	Aug. 6 -	1200	7.18	1,260
	0900	40.90	240,000		1100	33.00	122,000		2400	7.04	1,170

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	74,200	44,400	19,800
1940 to July 1978----------	27,300	13,700	6,840

(76) 08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX

LOCATION.--Lat 29°51'38", long 98°22'58", Comal County, Hydrologic Unit 12100201, on right bank at downstream side of bridge on county road, 226 ft (69 m), downstream from bridge on Ranch Road 311, 1.9 mi (3.1 km) southeast of Spring Branch Post Office, 7.5 mi (12.1 km) downstream from Curry Creek, and at mile 334.4 (538.0 km).

DRAINAGE AREA.--1,315 mi² (3,406 km²).

PERIOD OF RECORD.--June 1922 to August 1978.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 948.10 ft (288.981 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Several small diversions above station for irrigation. Guadalupe-Blanco River Authority gage-height telemeter at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 158,000 ft³/s (4,470 m³/s) Aug. 3, 1978, gage height, 45.25 ft (13.792 m).
FOR PERIOD 1922 to July 1978.--Maximum discharge, 121,000 ft³/s (3,430 m³/s) July 3, 1932 (gage height, 42.10 ft or 12.832 m), from rating curve extended above 70,000 ft³/s (1,980 m³/s).
HISTORIC.--Maximum stage since at least 1859, about 53 ft (16.2 m) in 1869; flood in July 1900 reached a stage of about 49 ft (14.9 m), from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	62	8....	2,020	16...	608	24...	396
2....	6,730	9....	1,500	17...	569	25...	375
3....	76,500	10...	1,240	18...	545	26...	356
4....	46,300	11...	1,020	19...	508	27...	344
5....	4,290	12...	881	20...	483	28...	332
6....	2,550	13...	806	21...	456	29...	322
7....	2,280	14...	735	22...	438	30...	326
		15...	664	23...	421	31...	332

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	4,980
MONTHLY TOTAL ACRE-FEET	306,000
RUNOFF, IN INCHES	4.37

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0300	2.20	40	Aug. 2 -	2400	34.00	54,400	Aug. 4 -	0200	40.60	118,000
	1200	2.37	64						0300	39.40	108,000
	2400	2.55	95	Aug. 3 -	0100	37.80	94,500		0800	32.30	56,300
					0200	42.00	130,000		1200	27.80	36,400
Aug. 2 -	0300	2.57	99		0300	45.25	158,000		1600	21.40	21,300
	0600	2.77	144		0400	44.40	152,000		2000	14.00	10,400
	1000	3.07	232		0800	38.00	96,100		2400	11.00	6,920
	1100	3.90	611		1200	32.70	58,800				
	1200	5.10	1,290		1900	25.60	30,100	Aug. 5 -	0400	9.40	5,340
	1400	6.60	2,320		2000	28.00	37,000		1200	8.00	4,100
	1600	8.25	3,580		2200	32.60	58,100		2400	6.90	3,240
	1800	10.95	6,050		2400	37.00	88,300				
	2000	17.70	14,400					Aug. 6 -	1200	5.87	2,420
	2200	25.30	27,600	Aug. 4 -	0100	39.20	106,000		2400	5.85	2,400

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	76,500	43,200	20,100
1923 to July 1978	66,100	32,700	14,900

GUADALUPE RIVER BASIN

(77) 08167600 REBECCA CREEK NEAR SPRING BRANCH, TX

LOCATION.--Lat 29°55'06", long 98°22'10", Comal County, Hydrologic Unit 12100201, on right bank 72 ft (22 m) upstream from private road crossing, 2.9 mi (4.7 km) upstream from mouth, 3.7 mi (6.0 km) northeast of Spring Branch Post Office, and 6.3 mi (10.1 km) south of Twin Sisters.

DRAINAGE AREA.--10.9 mi² (28.2 km²).

PERIOD OF RECORD.--January 1960 to August 1978.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 985.55 ft (300.396 m) National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark).

REMARKS.--Six dams forming recreational lakes at housing developments upstream control runoff from 3.13 mi² (8.11 km²) drainage area. Amount of impoundment unknown. Recording rain gage located at station.

MAXIMA: FOR AUGUST 1978.--Discharge, 1.5 ft³/s (0.042 m³/s) Aug. 1, 1978, gage height, 2.06 ft (0.628 m).
FOR PERIOD 1960 to July 1978.--Maximum discharge, 9,300 ft³/s (263 m³/s) Oct. 18, 1965, gage height, 7.97 ft (2.429 m), from rating curve extended above 420 ft³/s (11.9 m³/s) on basis of critical-depth measurement of 4,340 ft³/s (123 m³/s).
HISTORIC.--Maximum stage since at least 1885, 25.5 ft (7.77 m) in September 1952. Flood in 1947 or 1948 was about 4.5 ft (1.4 m) lower than flood in 1952, from infromation by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.54	8....	.40	16...	.47	24...	.40
2....	1.4	9....	.40	17...	.40	25...	.40
3....	.95	10...	.40	18...	.40	26...	.40
4....	.93	11...	.40	19...	.40	27...	.40
5....	.69	12...	.60	20...	.40	28...	.40
6....	.40	13...	.59	21...	.40	29...	.40
7....	.40	14...	.56	22...	.40	30...	.40
		15...	.54	23...	.40	31...	.40
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							.51
MONTHLY TOTAL ACRE-FEET							31.1
RUNOFF, IN INCHES							.05

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	1.4	1.1	0.8
1961 to July 1978	637	337	206

(78) 08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX

LOCATION.--Lat 29°52'07", long 98°11'55", Comal County, Hydrologic Unit 12100201, in intake structure of Canyon Dam on Guadalupe River, 12 mi (19 km) northwest of New Braunfels, and at mile 303.0 (487.5 km).

DRAINAGE AREA.--1,432 mi² (3,709 km²).

PERIOD OF RECORD.--July 1962 to August 1978. Prior to October 1970, published as Canyon Reservoir.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). Prior to Sept. 24, 1964, nonrecording gage at present site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 6,830 ft (2,082 m) long, consisting of the main dam 4,410 ft (1,344 m) long, an earthen dike 210 ft (64 m) long, a 1,260-foot (384 m) long uncontrolled broad-crested type spillway, and a 950-foot (290 m) concrete and earthen nonoverflow section. Deliberate impoundment of water began June 16, 1964, and main part of dam was completed in August 1964. The flood-control outlet works consist of a 10.0-foot-diameter (3.0 m) conduit controlled by two 5.7- by 10.0-foot (1.7 by 3.0 m) hydraulically operated slide gates. The lake was built for water conservation and flood control. Capacity table beginning Oct. 1, 1974, is based on a sedimentation survey of August 1972. Small diversions above the lake for irrigation. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam	974.0	-
Crest of spillway	943.0	736,700
Top of conservation pool	909.0	382,000
Lowest gated outlet (invert)	775.0	240

COOPERATION.--Records furnished by Corps of Engineers and reviewed by Geological Survey.

MAXIMA: FOR AUGUST 1978.--Contents, 588,400 acre-ft (725 hm³) Aug. 4, 1978, elevation, 930.61 ft (283.650 m).
FOR PERIOD 1962 to July 1978.--Maximum contents, 460,400 acre-ft (568 hm³) Apr. 22, 1977, elevation, 917.96 ft (279.794 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 2400

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1....	362,200	8....	563,600	16...	494,500	24...	422,700
2....	369,800	9....	555,600	17...	485,300	25...	416,600
3....	500,800	10...	547,300	18...	475,500	26...	415,400
4....	588,400	11...	538,300	19...	467,500	27..	414,200
5....	583,400	12...	530,100	20...	458,400	28...	413,000
6....	577,600	13...	520,700	21...	449,500	29...	411,500
7....	570,500	14...	512,400	22...	441,100	30...	410,100
		15...	503,500	23...	431,100	31...	409,100
CHANGE IN CONTENTS, IN ACRE-FEET							48,600

GUADALUPE RIVER BASIN

(79) 08167800 GUADALUPE RIVER AT SATTLER, TX

LOCATION.--Lat 29°51'32", long 98°10'47", Comal County, Hydrologic Unit 12100202, on right bank 200 ft (61 m) upstream from Horseshoe Falls, 0.8 mi (1.3 km) north of Sattler, 1.8 mi (2.9 km) downstream from Canyon Dam, 2.3 mi (3.7 km) upstream from Heiser Hollow, 11.2 mi (18.0 km) north of New Braunfels, and at mile 301.2 (484.6 km).

DRAINAGE AREA.--1,436 mi² (3,719 km²), 1,432 mi² (3,709 km²) is above Canyon Dam.

PERIOD OF RECORD.--March 1960 to August 1978.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 742.24 ft (226.235 m) National Geodetic Vertical Datum of 1929 (Corps of Engineers bench mark).

REMARKS.--Flow completely regulated since July 21, 1962, by Canyon Lake (station 08167700) 1.8 mi (2.9 km) upstream. Small diversions above station for irrigation.

MAXIMA: FOR AUGUST 1978.--Discharge, 5,850 ft³/s (166 m³/s) Aug. 5, 1978, gage height, 8.31 ft (2.533 m).
FOR PERIOD 1960 to July 1978.--Maximum discharge, 20,800 ft³/s (589 m³/s) Oct. 29, 1960, gage height, 12.20 ft (3.719 m). Maximum discharge since closure of Canyon Dam on July 21, 1962, 5,390 ft³/s (153 m³/s) Feb. 11, 1975, gage height, 8.18 ft (2.493 m).
HISTORIC.--Maximum stage since closure of Canyon Dam, 8.31 ft (2.533 m) Aug. 5, 1978, discharge 5,850 ft³/s (166 m³/s).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	123	8....	5,550	16...	5,390	24...	5,210
2....	99	9....	5,520	17...	5,360	25...	3,610
3....	98	10...	5,390	18...	5,330	26...	939
4....	1,820	11...	5,380	19...	5,320	27...	936
5....	5,680	12...	5,410	20...	5,290	28...	939
6....	5,620	13...	5,420	21...	5,260	29...	946
7....	5,570	14...	5,440	22...	5,260	30...	946
		15...	5,420	23...	5,240	31...	946
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							3,850
MONTHLY TOTAL ACRE-FEET.....							237,000

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	5,680	5,620	5,530
1961 to July 1978----------	10,000	6,380	5,220

(82) 08179000 MEDINA RIVER NEAR PIPE CREEK, TX

LOCATION.--Lat 29°40'31", long 98°58'33", Bandera County, Hydrologic Unit 12100302, on right bank 500 ft (150 m) upstream from Bandera Falls, 0.6 mi (1.0 km) upstream from Red Bluff Creek, and 4.1 mi (6.6 km) southwest of Pipe Creek.

DRAINAGE AREA.--474 mi² (1,228 km²).

PERIOD OF RECORD.--October 1922 to June 1935, October 1952 to August 1978. Monthly discharge only for some periods, published in WSP 1312 and 1732.

GAGE.--Water-stage recorder. Datum of gage is 1,067.37 ft (325.334 m) National Geodetic Vertical Datum of 1929. December 1922 to June 1935, water-stage recorder at site 1.9 mi (3.1 km) upstream at different datum.

REMARKS.--Small diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 281,000 ft³/s (7,960 m³/s) Aug. 2, 1978, gage height, 49.6 ft (15.118 m).
FOR PERIOD 1922 to July 1978.--Maximum discharge, 72,900 ft³/s (2,060 m³/s) July 15, 1973, gage height, 37.3 ft (11.37 m), from floodmark, from rating curve extended above 32,000 ft³/s (906 m³/s) on basis of slope-area measurement of 64,000 ft³/s (1,810 m³/s).
HISTORIC.--Maximum stage since at least 1880, 49.6 ft (15.118 m) Aug. 2, 1978, discharge, 281,000 ft³/s (7,960 m³/s).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	27	8....	776	16...	336	24...	236
2....	41,700	9....	816	17...	321	25...	227
3....	15,000	10...	581	18...	304	26...	221
4....	3,680	11...	478	19...	288	27...	214
5....	2,870	12...	449	20...	274	28...	207
6....	2,030	13...	413	21...	266	29...	202
7....	1,420	14...	387	22...	254	30...	205
		15...	356	23...	244	31...	205

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	2,420
MONTHLY TOTAL ACRE-FEET	149,000
RUNOFF, IN INCHES	5.89

Gage height, in feet, and discharge, in cubic feet per second, at indicated time, 1978

Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge	Date	Hour	Gage height	Discharge
Aug. 1 -	0600	3.88	16	Aug. 2 -	1200	45.00	160,000	Aug. 3 -	2400	10.70	6,710
	1200	3.96	26		1300	38.70	95,100				
	1900	3.96	26		1400	33.20	64,200	Aug. 4 -	1200	8.60	4,260
	2400	4.22	60		1600	25.20	36,100		2400	7.80	3,450
					1900	18.40	19,800				
Aug. 2 -	0300	4.20	57		2400	15.55	14,300	Aug. 5 -	1200	7.15	2,840
	0400	7.10	1,060						2400	6.65	2,410
	0500	8.20	1,810	Aug. 3 -	0200	15.00	13,300				
	0700	9.75	3,230		0300	20.70	24,900	Aug. 6 -	1200	6.15	2,000
	0800	11.65	5,360		0400	23.00	30,400		2400	5.80	1,720
	0900	27.95	39,000		0500	21.20	26,000				
	1000	43.60	119,000		1200	15.80	14,700	Aug. 7 -	1200	5.45	1,460
	1100	49.60	281,000		1800	13.40	10,600		2400	5.20	1,260

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	41,700	20,100	9,640
1924 to July 1978	23,000	15,000	7,900

(83) 08179100 RED BLUFF CREEK NEAR PIPE CREEK, TX

LOCATION.--Lat 29°40'51", long 98°57'19", Bandera County, Hydrologic Unit 12100302, on left bank 0.8 mi (1.3 km) upstream from bridge on Farm Road 1283, 1.8 mi (2.9 km) downstream from Pipe Creek, 1.9 mi (3.1 km) upstream from mouth, and 3.2 mi (5.1 km) south of Pipe Creek.

DRAINAGE AREA.--56.3 mi² (145.8 km²).

PERIOD OF RECORD.--April 1956 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,107.2 ft (337.475 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Small dams on upstream tributaries affect flow during time of storm runoff. No known diversion.

MAXIMA: FOR AUGUST 1978.--Discharge, 160 ft³/s (4.53 m³/s) Aug. 2, 1978, gage height, 3.7 ft (1.13 m).
FOR PERIOD 1956 to July 1978.--Maximum discharge, 46,900 ft³/s (1,330 m³/s) Sept. 27, 1964, gage height, 22.64 ft (6.901 m), from rating curve extended above 2,000 ft³/s (56.6 m³/s) on basis of slope-area measurement of peak flow.
HISTORIC.--Maximum stage since at least 1905, that of Sept. 27, 1964. A stage of about 17 ft (5.2 m) was reached in July 1937. Flood in October 1953 reached a stage of 13.8 ft (4.21 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	.00	8....	.00	16...	.00	24...	.00
2....	70	9....	.00	17...	.00	25...	.00
3....	5.4	10...	.00	18...	.00	26...	.00
4....	.01	11...	.00	19...	.00	27...	.00
5....	.00	12...	.00	20...	.00	28...	.00
6....	.00	13...	.00	21...	.00	29...	.00
7....	.00	14...	.00	22...	.00	30...	.00
		15...	.00	23...	.00	31...	.00
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							2.43
MONTHLY TOTAL ACRE-FEET.....							150
RUNOFF, IN INCHES.....							.05

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	70	25	11
1957 to July 1978----------	4,090	1,830	993

(84) 08179500 MEDINA LAKE NEAR SAN ANTONIO, TX

LOCATION.--Lat 29°32'24", long 98°56'01", Medina County, Hydrologic Unit 12100302, at gate operating platform, 576 ft (176 m) from left end of Medina Dam on Medina River, 4.2 mi (6.8 km) upstream from Medina diversion dam, 13 mi (21 km) north of Castroville, 28 mi (45 km) west of San Antonio, and 70.4 mi (113.3 km) upstream from mouth. Water-quality sampling site at the center of low-water bridge 0.6 mi (1.0 km) downstream.

DRAINAGE AREA.--634 mi² (1,642 km²).

PERIOD OF RECORD.--May 1913 to August 1978. Prior to October 1965, monthend contents only.

GAGE.--Nonrecording gage read once daily if stage changing materially, otherwise intermittently. Datum of gage is 7.80 ft (2.377 m) below National Geodetic Vertical Datum of 1929.

REMARKS.--The lake is formed by a gravity-type concrete dam 1,580 ft (482 m) long. The dam was completed and storage began May 7, 1913. The uncontrolled spillway section is a cut through natural rock 880 ft (268 m) long, with a 3-foot-wide (1 m) cutoff wall, located near right end of dam. The dam and lake are owned by the Bexar-Medina-Atascosa Counties Water Improvement District No. 1, which has a permit from he Texas Water Rights Commission to irrigate 150,000 acres (60,700 hm²) annually. An undetermined amount of water from the lake enters the Edwards and associated limestones in the Balcones Fault Zone, part of which is above and part below the dam. Water is released downstream to Medina Diversion Reservoir where it is diverted into Medina Canal by the Water District. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam	1,084.0	-
Crest of spillway	1,072.0	254,000
Water-supply outlet pipes (invert)	966.5	4,780
Lowest gated outlet (invert)	920.0	0

COOPERATION.--Capacity table, based on survey made prior to June 1912, and gage height record furnished by Bexar-Medina-Atascosa Counties Water Improvement District No. 1.

MAXIMA (at 0800): FOR AUGUST 1978.--Contents, 281,000 acre-ft (346 hm³) Aug. 2, 1978, gage height, 1,076.67 ft (328.169 m).
FOR PERIOD 1913 to July 1978.--Maximum contents observed, 288,800 acre-ft (356 hm³) Sept. 16, 1919, gage height, 1,078.0 ft (328.57 m).

CONTENTS, IN ACRE-FEET, AUGUST 1978
INSTANTANEOUS OBSERVATIONS AT 0800

DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS	DAY	CONTENTS
1	188,200	8	265,000	16	255,700	24	254,600
2	198,100	9	262,100	17	255,200	25	254,600
3	280,100	10	259,200	18	255,200	26	254,600
4	278,300	11	256,900	19	255,200	27	254,600
5	274,300	12	256,300	20	255,200	28	254,000
6	271,400	13	255,700	21	255,200	29	254,000
7	268,500	14	255,700	22	255,200	30	254,000
		15	255,700	23	254,600	31	254,000
CHANGE IN CONTENTS, IN ACRE-FEET							65,400

GUADALUPE RIVER BASIN

(86) 08180800 MEDINA RIVER NEAR SOMERSET, TX

LOCATION.--Lat 29°15'45", long 98°34'56", Bexar County, Hydrologic Unit 12100302, on left bank 300 ft (91 m) upstream from bridge on State Highway 16, 2.1 mi (3.4 km) upstream from Elm Creek, 4.9 mi (7.9 km) downstream from Medio Creek, 5.2 mi (8.4 km) northeast of Somerset, and 14.1 mi (22.7 km) upstream from mouth.

DRAINAGE AREA.--967 mi² (2,505 km²), 634 mi² (1,642 km²) above dam forming Medina Lake.

PERIOD OF RECORD.--October 1970 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 493.56 ft (150.437 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Flow is regulated by Medina Lake (station 08179500) 56 mi (90 km) upstream and by Medina Diversion Lake, capacity 4,500 acre-ft (5.55 hm³). A large part of the streamflow is lost into the Edwards and associated limestones in the Balcones Fault Zone which crosses the basin between the upstream end of Medina Lake and about 5 mi (8 km) downstream from Medina Dam or 0.9 mi (1.4 km) downstream from the diversion dam. There are several small diversions below Medina Diversion Dam.

MAXIMA: FOR AUGUST 1978.--Discharge, 12,800 ft³/s (362 m³/s) Aug. 4, 1978, gage height, 22.35 ft (6.812 m).
FOR PERIOD 1970 to July 1978.--Maximum discharge, 30,500 ft³/s (864 m³/s) July 17, 1973 gage height, 29.39 ft (8.958 m).
HISTORIC.--Maximum stage since about 1890, that of July 17, 1973.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	62	8....	1,880	16...	536	24...	196
2....	268	9....	1,570	17...	477	25...	162
3....	2,260	10...	1,170	18...	420	26...	145
4....	10,700	11...	974	19...	372	27...	133
5....	6,450	12...	848	20...	327	28...	125
6....	3,470	13...	746	21...	289	29...	120
7....	2,190	14...	664	22...	263	30...	118
		15...	595	23...	231	31...	121
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1,220
MONTHLY TOTAL ACRE-FEET.....							75,100

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	10,700	6,870	4,070
1971 to July 1978----------	24,800	15,900	9,540

(87) 08181500 MEDINA RIVER AT SAN ANTONIO, TX

LOCATION.--Lat 29°15'14", long 98°28'20", Bexar County, Hydrologic Unit 12100302, near left bank on downstream side of pier of upstream bridge of two bridges on U.S. Highway 281 in San Antonio and 6.8 mi (10.9 km) upstream from mouth.

DRAINAGE AREA.--1,317 mi² (3,411 km²), 634 mi² (1,642 km²) is above dam forming Medina Lake.

PERIOD OF RECORD.--October 1929 to December 1930, July 1939 to August 1978. October 1929 to December 1930 records below about 50 ft³/s (1.42 m³/s) in connection with seepage investigation (published as "at Losoya"). Published as "near San Antonio" July 1939 to September 1970.

GAGE.--Water-stage recorder. Datum of gage is 439.0 ft (133.81 m) National Geodetic Vertical Datum of 1929 (levels by Corps of Engineers). October 1929 to December 1930 nonrecording gage at Losoya 1.5 mi (2.4 km) downstream at different datum.

REMARKS.--Flow is slightly regulated by Medina Lake (station 08179500) 60 mi (97 km) upstream and diversion dam reservoir, capacity 4,500 acre-ft (5.55 hm³). For statement concerning losses into the Edwards and associated limestones formation, see Medina River near Somerset (station 08180800).

MAXIMA: FOR AUGUST 1978.--Discharge, 1,030 ft³/s (29.2 m³/s) Aug. 4, 1978, gage height, 29.95 ft (9.129 m).
FOR PERIOD 1939 to July 1978.--Maximum discharge, 31,900 ft³/s (903 m³/s) Sept. 17, 1973, gage height, 43.59 ft (13.286 m).
HISTORIC.--Maximum stage, 55 ft (16.8 m) sometime prior to construction of Medina Dam in 1913, from information by Texas Department of Highways and Public Transportation.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	247	8....	1,650	16...	630	24...	339
2....	788	9....	1,500	17...	558	25...	312
3....	434	10...	1,210	18...	508	26...	287
4....	7,760	11...	1,100	19...	462	27...	262
5....	6,250	12...	977	20...	428	28...	256
6....	3,370	13...	856	21...	397	29...	251
7....	2,140	14...	762	22...	387	30...	256
		15...	689	23...	366	31...	255
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							1,150
MONTHLY TOTAL ACRE-FEET.....							70,800

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	7,760	5,790	3,410
1941 to July 1978----------	28,300	18,600	10,600

(88) 08183900 CIBOLO CREEK CREEK NEAR BOERNE, TX

LOCATION.--Lat 29°46'26", long 98°41'50", Kendall County, Hydrologic Unit 12100304, on left bank 0.6 mi (1.0 km) upstream from Southern Pacific Lines bridge, 0.9 mi (1.4 km) downstream from Menger Creek, and 2.5 mi (4.0 km) southeast of Boerne.

DRAINAGE AREA.--68.4 mi² (177.2 km²).

PERIOD OF RECORD.--March 1962 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,339.61 ft (408.313 m) National Geodetic Vertical Datum of 1929.

REMARKS.--No known diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 462 ft³/s (13.1 m³/s) Aug. 2, 1978, gage height, 3.65 ft (1.113 m).
FOR PERIOD 1962 to July 1978.--Maximum discharge, 36,400 ft³/s (1,030 m³/s) Sept. 27, 1964, gage height, 19.15 ft (5.837 m), from floodmark, from rating curve extended above 2,500 ft³/s (70.8 m³/s) on basis of slope-area measurement at 12,000 ft³/s (340 m³/s) and contracted-opening measurement of 36,400 ft³/s (1,030 m³/s).
HISTORIC.--Maximum stage since at least 1892, that of Sept. 27, 1964. Second highest flood in 1952 reached a stage of 16.3 ft (4.97 m), discharge 25,600 ft³/s (725 m³/s), from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	21	8....	1.5	16...	.88	24...	1.2
2....	97	9....	.97	17...	.96	25...	1.2
3....	4.7	10...	.88	18...	1.0	26...	1.3
4....	2.0	11...	.89	19...	1.1	27...	1.2
5....	1.2	12...	.93	20...	1.1	28...	1.1
6....	1.1	13...	1.0	21...	1.2	29...	1.4
7....	2.7	14...	1.0	22...	1.2	30...	2.3
		15...	.90	23...	1.2	31...	3.4

MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND	5.15
MONTHLY TOTAL ACRE-FEET	316
RUNOFF, IN INCHES	.09

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	97	41	19
1963 to July 1978	3,830	1,510	831

NUECES RIVER BASIN

(89) 08195000 FRIO RIVER AT CONCAN, TX

LOCATION.--Lat 29°29'18", long 99°42'16", Uvalde County, Hydrologic Unit 12110106, on left bank 0.7 mi (1.1 km) southeast of Concan Post Office, 15 mi (24 km) upstream from Dry Frio River, and 224.1 mi (360.6 km) upstream from mouth.

DRAINAGE AREA.--405 mi^2 (1,049 km^2).

PERIOD OF RECORD.--October 1923 to September 1929, October 1930 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,203.71 ft (366.891 m) National Geodetic Vertical Datum of 1929. Oct. 26, 1923, to July 28, 1924, nonrecording gage at site 86 ft (26 m) upstream at datum 5.08 ft (1.548 m) lower. July 29, 1924, to Oct. 3, 1930, nonrecording gage, and Oct. 4, 1930, to May 18, 1939, water-stage recorder, at site 130 ft (40 m) downstream at present datum. gage at

REMARKS.--Many small diversion for irrigation above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 3,350 ft^3/s (94.9 m^3/s) Aug. 2, 1978, gage height, 6.90 ft (2.103 m).
FOR PERIOD 1923 to July 1978.--Maximum discharge, 162,000 ft^3/s (4,590 m^3/s) July 1, 1932, gage height, 34.44 ft (10.497 m), from floodmarks, from rating curve extended above 44,000 ft^3/s (1,250 m^3/s) on basis of flow-over-dam measurement of 56,600 ft^3/s (1,600 m^3/s) and slope-area measurement of 162,000 ft^3/s (4,590 m^3/s).
HISTORIC.--Maximum stage since at least 1869, that of July 1, 1932.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	65	8....	165	16...	105	24...	81
2....	834	9....	151	17...	101	25...	79
3....	616	10...	139	18...	97	26...	77
4....	415	11...	133	19...	95	27...	77
5....	280	12...	129	20...	91	28...	74
6....	207	13...	126	21...	88	29...	75
7....	184	14...	118	22...	86	30...	75
		15...	110	23...	83	31...	75
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							162
MONTHLY TOTAL ACRE-FEET.....							9,980
RUNOFF, IN INCHES.....							.46

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	834	622	386
1926 to July 1978	52,000	23,700	11,000

(90) 08196000 DRY FRIO RIVER NEAR REAGAN WELLS, TX

LOCATION.--Lat 29°30'16", long 99°46'52", Uvalde County, Hydrologic Unit 12110106, on right bank 2.3 mi (3.7 km) upstream from bridge on U.S. Highway 83, 3.1 mi (5.0 km) upstream from Rocky Creek, and 4.3 mi (6.9 km) southeast of Reagan Wells.

DRAINAGE AREA.--117 mi² (303 km²).

PERIOD OF RECORD.--September 1952 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,335.2 ft (406.97 m) National Geodetic Vertical Datum of 1929.

REMARKS.--Several small diversions above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 1,500 ft³/s (42.5 m³/s) Aug. 1, 1978, gage height, 5.23 ft (1.594 m).
FOR PERIOD 1952 to July 1978.--Maximum discharge, 123,000 ft³/s (3,480 m³/s) Aug. 13, 1966, gage height, 27.6 ft (8.41 m), from floodmark, from rating curve extended above 900 ft³/s (25.5 m³/s) on basis of slope-area measurements of 11,400, 30,700, 64,700, and 123,000 ft³/s (323, 869, 1,830, and 3,480 m³/s).
HISTORIC.--Maximum stage since at least 1875 occurred in 1880, about 33 ft (10.1 m). Flood of June 14, 1935, reached a stage of 26.0 ft (7.92 m), discharge at site 2.6 mi (4.2 km) upstream, 64,700 ft³/s (1,830 m³/s), and that of July 1, 1932, reached a stage of 23 ft (7.0 m), discharge at site 2.0 mi (3.2 km) upstream, 30,700 ft³/s (869 m³/s), from information by local residents.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	334	8....	29	16...	16	24...	7.6
2....	136	9....	27	17...	15	25...	7.2
3....	68	10...	25	18...	14	26...	5.6
4....	46	11...	22	19...	12	27...	5.5
5....	36	12...	18	20...	9.8	28...	6.2
6....	32	13...	15	21...	12	29...	14
7....	32	14...	15	22...	8.8	30...	6.7
		15...	15	23...	8.1	31...	6.3
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							32.4
MONTHLY TOTAL ACRE-FEET							1,990
RUNOFF, IN INCHES							.32

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978	334	179	98
1953 to July 1978	8,100	3,160	1,440

NUECES RIVER BASIN

(91) 08198000 SABINAL RIVER NEAR SABINAL, TX

LOCATION.--Lat 29°29'35", long 99°29'49", Uvalde County, Hydrologic Unit 12110106, on right bank 108 ft (33 m) upstream from concrete dam, 2.3 mi (3.7 km) downstream from mouth of Onion Creek, and 12.5 mi (20.1 km) north of Sabinal.

DRAINAGE AREA.--206 mi² (534 km²).

PERIOD OF RECORD.--October 1942 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,131.20 ft (344.790 m) National Geodetic Vertical Datum of 1929. Prior to Apr. 9, at 1971, site 0.3 mi (0.5 km) downstream at same datum.

REMARKS.--Several small diversions above station for irrigation.

MAXIMA: FOR AUGUST 1978.--Discharge, 23,200 ft³/s (657 m³/s) Aug. 2, 1978, gage height, 19.43 ft (5.922 m).
FOR PERIOD 1942 to July 1978.--Maximum discharge, 55,200 ft³/s (1,560 m³/s) June 17, 1958 gage height, 28.3 ft (8.63 m), from floodmark at present site, from rating curve extended above 6,900 ft³/s (195 m³/s) on basis of slope-are measurement of 55,200 ft³/s (1,560 m³/s).
HISTORIC.--Maximum stage since at least 1892, about 33 ft (10.1 m) July 2, 1932, from information by local residents. There is a legend that a flood in the middle 1800's reached a stage of nearly 63 ft (19.2 m).

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	49	8....	96	16...	52	24...	36
2....	5,710	9....	86	17...	49	25...	29
3....	1,480	10...	78	18...	45	26...	32
4....	331	11...	73	19...	42	27...	48
5....	186	12...	68	20...	40	28...	46
6....	135	13...	63	21...	38	29...	49
7....	111	14...	61	22...	37	30...	49
		15...	56	23...	35	31...	52
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							299
MONTHLY TOTAL ACRE-FEET.....							18,400
RUNOFF, IN INCHES.....							1.67

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days*		
	1	3	7
August 1978----------	5,710	2,510	1,150
1943 to July 1978----------	13,000	5,020	2,540

NUECES RIVER BASIN

(92) 08200000 HONDO CREEK NEAR TARPLEY, TX

LOCATION.--Lat 29°34'10", long 99°14'47", Medina County, Hydrologic Unit 12110107, on left bank 460 ft (140 m) downstream from bridge on Ranch Road 462, 6.3 mi (10.1 km) southeast of Tarpley, and 16.6 mi (26.7 km) northwest of Hondo.

DRAINAGE AREA.--86.2 mi^2 (223.3 km^2).

PERIOD OF RECORD.--August 1952 to August 1978.

GAGE.--Water-stage recorder. Datum of gage is 1,169.1 ft (356.34 m) National Geodetic Vertical Datum of 1929 (Magnolia Oil Co. bench mark).

REMARKS.--Several small diversions for irrigation above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 13,200 ft^3/s (374 m^3/s) Aug. 2, 1978, gage height, 13.10 ft (3.993 m).
FOR PERIOD 1952 to July 1978.--Maximum discharge, 69,800 ft^3/s (1,980 m^3/s) June 17, 1958, gage height, 28.2 ft (8.60 m), from floodmark, from rating curve extended above 2,600 ft^3/s (73.6 m^3/s) on basis of slope-area measurements of 18,600 and 69,800 ft^3/s (527 and 1,980 m^3/s).
HISTORIC.--Maximum stage since at least 1907, that of June 17, 1958. Flood in July 1932, reached a stage of about 26 ft (7.9 m), discharge 58,500 ft^3/s (1,660 m^3/s), from information by local resident.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	84	8....	82	16...	40	24...	32
2....	3,120	9....	70	17...	39	25...	31
3....	488	10...	62	18...	37	26...	31
4....	234	11...	56	19...	37	27...	30
5....	152	12...	53	20...	35	28...	28
6....	114	13...	48	21...	34	29...	31
7....	97	14...	46	22...	34	30...	35
		15...	42	23...	31	31...	31
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND							170
MONTHLY TOTAL ACRE-FEET							10,500
RUNOFF, IN INCHES							2.28

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	3,120	1,280	613
1953 to July 1978----------	11,900	4,440	2,350

(93) 08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX

LOCATION.--Lat 29°34'23", long 99°24'10", Medina County, Hydrologic Unit 12110107, on right bank 200 ft (61 m) upstream from county road crossing, 4.5 mi (7.2 km) downstream from Cascade Creek, and 7.9 mi (12.7 km) southeast of Utopia.

DRAINAGE AREA.--43.1 mi² (111.6 km²).

PERIOD OF RECORD.--May 1961 to August 1978.

GAGE.--Water-stage recorder, crest-stage gages, and concrete control. Datum of gage is 1,265.8 ft (385.82 m) National Geodetic Vertical Datum of 1929 (Magnolia Oil Co. bench mark).

REMARKS.--No known diversion above station.

MAXIMA: FOR AUGUST 1978.--Discharge, 10,600 ft³/s (300 m³/s) Aug. 2, 1978, gage height, 8.40 ft (2.560 m).
FOR PERIOD 1961 to July 1978.--Maximum discharge, 38,500 ft³/s (1,090 m³/s) July 15,1973, gage height, 14.4 ft (4.39 m), from floodmark, from rating curve extended above 910 ft³/s (25.8 m³/s) on basis of field estimate of flow over and around end of dam, 14,100 ft³/s (399 m³/s), and slope-area measurement of 52,600 ft³/s (1,490 m³/s).
HISTORIC.--Maximum stage since at least 1901, 16.4 ft (5.00 m) June 17, 1958, from floodmarks, discharge 52,600 ft³/s (1,490 m³/s), by slope-area measurement of peak flow.

MEAN DISCHARGE, IN CUBIC FEET PER SECOND, AUGUST 1978

DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE	DAY	DISCHARGE
1....	28	8....	32	16...	14	24...	7.9
2....	1,070	9....	26	17...	13	25...	7.4
3....	140	10...	24	18...	13	26...	7.4
4....	75	11...	22	19...	11	27...	7.0
5....	53	12...	20	20...	11	28...	6.8
6....	41	13...	18	21...	10	29...	7.3
7....	36	14...	17	22...	9.5	30...	7.8
		15...	16	23...	8.8	31...	6.9
MONTHLY MEAN DISCHARGE, IN CUBIC FEET PER SECOND.....							57.0
MONTHLY TOTAL ACRE-FEET.....							3,500
RUNOFF, IN INCHES.....							1.52

Period	*Highest mean discharge, in cubic feet per second for the indicated number of consecutive days* 1	3	7
August 1978----------	1,070	428	207
1962 to July 1978----------	3,200	1,510	816