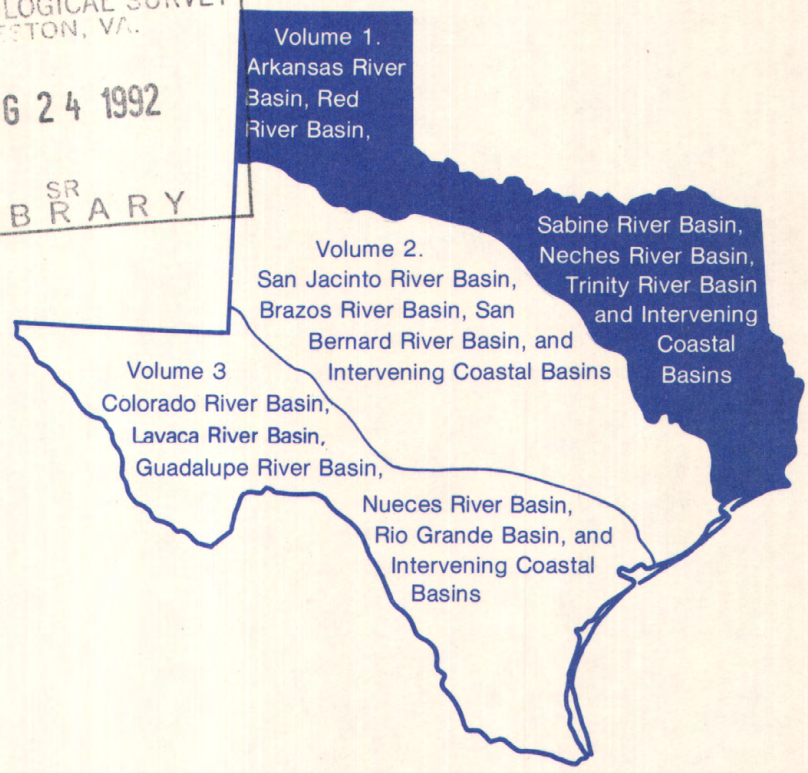
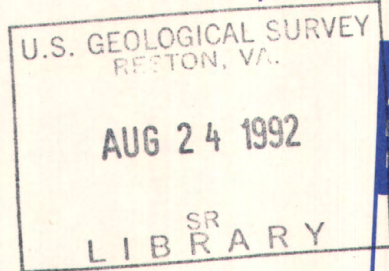


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# Water Resources Data Texas Water Year 1991

Volume 1. Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin, and Intervening Coastal Basins



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-91-1  
Prepared in cooperation with the State of Texas  
and with other agencies



CALENDAR FOR WATER YEAR 1991

1990

OCTOBER							NOVEMBER							DECEMBER						
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S
	1	2	3	4	5	6					1	2	3							1
7	8	9	10	11	12	13	4	5	6	7	8	9	10	2	3	4	5	6	7	8
14	15	16	17	18	19	20	11	12	13	14	15	16	17	9	10	11	12	13	14	15
21	22	23	24	25	26	27	18	19	20	21	22	23	24	16	17	18	19	20	21	22
28	29	30	31				25	26	27	28	29	30		23	24	25	26	27	28	29
														30	31					

1991

JANUARY							FEBRUARY							MARCH							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
		1	2	3	4	5						1	2							1	2
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20	21	22	23	24	25	26	17	18	19	20	21	22	23	17	18	19	20	21	22	23	
27	28	29	30	31			24	25	26	27	28			24	25	26	27	28	29	30	
														31							

APRIL							MAY							JUNE							
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S	
		1	2	3	4	5	6				1	2	3	4							1
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28	29	30					26	27	28	29	30	31		23	24	25	26	27	28	29	
														30							

JULY							AUGUST							SEPTEMBER								
S	M	T	W	T	F	S	S	M	T	W	T	F	S	S	M	T	W	T	F	S		
		1	2	3	4	5	6						1	2	3	1	2	3	4	5	6	7
7	8	9	10	11	12	13	4	5	6	7	8	9	10	8	9	10	11	12	13	14		
14	15	16	17	18	19	20	11	12	13	14	15	16	17	15	16	17	18	19	20	21		
21	22	23	24	25	26	27	18	19	20	21	22	23	24	22	23	24	25	26	27	28		
28	29	30	31				25	26	27	28	29	30	31	29	30							

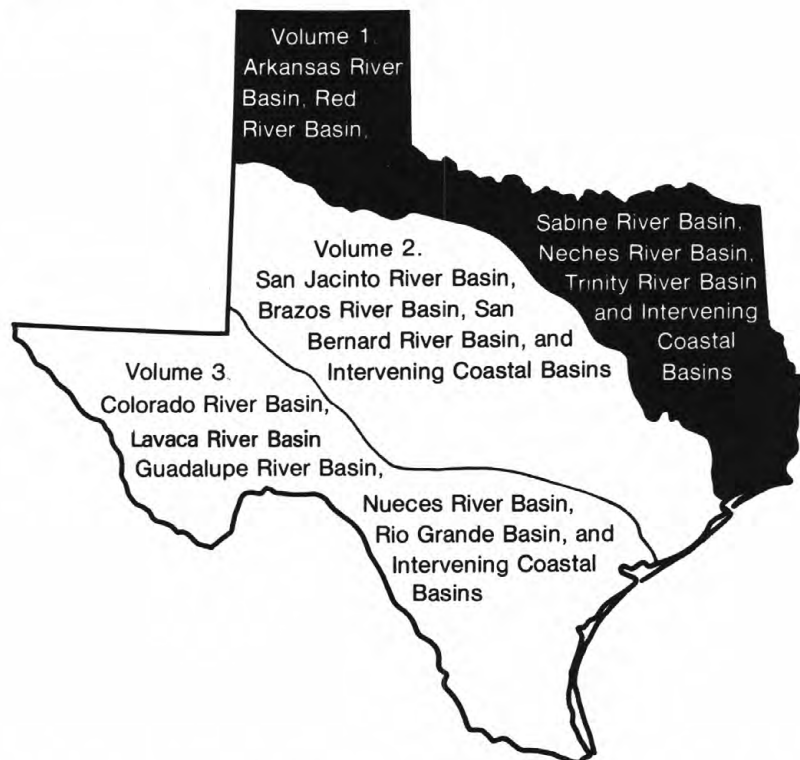




# Water Resources Data Texas Water Year 1991

Volume 1. Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin, and Intervening Coastal Basins

by H.D. Buckner and W.J. Shelby



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-91-1  
Prepared in cooperation with the State of Texas  
and with other agencies



UNITED STATES DEPARTMENT OF THE INTERIOR

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1991



## PREFACE

This edition of the annual hydrologic data report of Texas is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface-water collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water providing the hydrologic information needed by Federal, State, and local agencies, and the private sector for developing and managing land and water resources in Texas are contained in 4 volumes:

- Volume 1. Arkansas River Basin, Red River Basin, Sabine River Basin, Neches River Basin, Trinity River Basin, and intervening Coastal Basins
- Volume 2. San Jacinto River Basin, Brazos River Basin, San Bernard River Basin, and intervening Coastal Basins
- Volume 3. Colorado River Basin, Lavaca River Basin, Guadalupe River Basin, Nueces River Basin, Rio Grande Basin, and intervening Coastal Basins
- Volume 4. Ground-Water Data

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had the primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, most of the data were collected, computed, and processed from Subdistrict and field area offices. The following supervised the collection, processing, and tabulation of the data:

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This report was prepared in cooperation with the State of Texas and other agencies under the supervision of Richard O. Hawkinson, District Chief.



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<b>15. Supplementary Notes</b>  Prepared in cooperation with Federal, State, and local agencies.		<b>14.</b>	
<b>16. Abstract (limit: 200 words)</b>  Water-resources data for the 1991 water year for Texas are presented in four volumes, and consist of records of stage, discharge, and water quality of streams and canals; and stage, contents, and water quality of lakes and reservoirs; and water levels and water quality of ground-water wells. Volume 1 contains records for water discharge at 116 gaging stations; stage only at 11 gaging stations; stage and contents at 37 lakes and reservoirs; water quality at 69 gaging stations; and data for 6 partial-record stations. Also included are lists of discontinued surface-water discharge or stage-only stations and discontinued surface-water-quality stations; crest-stage and flood-hydrograph partial-record stations, reconnaissance partial-record stations, and low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data-collection program, and are published as miscellaneous measurements. Records for a few pertinent stations in bordering States also are included. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating Federal, State, and local agencies in Texas.			
<b>17. Document Analysis a. Descriptors</b>  *Texas, *Hydrologic data, *Surface water, *Water quality, Flow rate, Gaging Stations, Lakes, Reservoirs, Chemical analyses, Sediments, Water temperature, Sampling sites, Water levels, Water analyses  <b>b. Identifiers/Open-Ended Terms</b>          <b>c. COSATI Field/Group</b>			
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GAGING STATIONS, IN DOWNSTREAM ORDER,  
FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

[Type of data collected: (d) discharge; (c) chemical; (b) biological; (t) water temperature;  
(s) sediment; (e) elevation, gage heights, or contents.]

	Station number	Page
<b>LOWER MISSISSIPPI RIVER BASIN</b>		
<b>ARKANSAS RIVER BASIN</b>		
Arkansas River:		
Canadian River at Logan, NM (d) -----	07227000	27
Reuelto Creek near Logan, NM (d) -----	07227100	28
Canadian River near Amarillo (d) (c) (b) (t) -----	07227500	30
Canadian River near Canadian (d) (c) (b) (t) (s) -----	07228000	34
North Canadian River:		
Wolf Creek at Lipscomb (d) -----	07235000	37
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Prairie Dog Town Fork Red River near Childress (d) -----	07299540	41
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Greenbelt Lake near Clarendon (e) -----	07299840	43
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Salt Fork Red River at Mangum, OK (d) -----	07300500	48
North Fork Red River near Shamrock (d) -----	07301300	49
Sweetwater Creek near Kelton (d) -----	07301410	50
Pease River near Childress (d) -----	07307800	51
Red River near Burkburnett (d) (c) (b) (t) (s) -----	07308500	52
North Wichita River (head of Wichita River):		
Bluff Creek:		
Truscott Brine Lake near Truscott (e) -----	07311669	55
North Wichita River near Truscott (d) (c) (b) (t) -----	07311700	56
South Wichita River at low-flow dam near Guthrie (d) (c) (b) (t) -----	07311782	62
South Wichita River below dam near Guthrie (d) (c) (b) (t) -----	07311783	67
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Lake Kemp near Mabelle (e) (c) (t) -----	07312000	76
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South Side Canal near Dundee (d) -----	07312110	85
Beaver Creek near Electra (d) -----	07312200	86
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Wichita River near Charlie (d) (c) (b) (t) -----	07312700	88
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Lake Kickapoo near Archer City (e) -----	07314000	90
Little Wichita River near Archer City (d) -----	07314500	91
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Little Wichita River above Henrietta (d) -----	07314900	93
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Red River near Gainesville (d) -----	07316000	99
Lake Texoma near Denison (e) -----	07331500	100
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Pat Mayse Lake near Chicota (e) -----	07335390	101
Red River at Arthur City (d) -----	07335500	102
Red River near De Kalb (d) (c) (b) (t) (s) -----	07336820	103
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GAGING STATIONS IN DOWNSTREAM ORDER,  
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Big Cypress Creek near Lone Star (c) (b) -----	07345600	129
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Lake O' the Pines above dam near Jefferson (c) (b) -----	07345890	131
Lake O' the Pines near Jefferson (e) -----	07345900	132
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Black Cypress Bayou at Jefferson (d) -----	07346045	135
Little Cypress Creek near Ore City (d) -----	07346050	136
Little Cypress Creek near Jefferson (d) (c) (b) (t) -----	07346070	137
Big Cypress Creek near Karnack (c) (b) -----	07346085	140
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GAGING STATIONS IN DOWNSTREAM ORDER,  
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GAGING STATIONS IN DOWNSTREAM ORDER,  
FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

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	Station number	Page
<b>WESTERN GULF OF MEXICO BASINS—Continued</b>		
<b>TRINITY RIVER BASIN—Continued</b>		
Trinity River below Dallas--Continued		
East Fork Trinity River above Seagoville (c) (b) (t) -----	08061970	359
East Fork Trinity River at Seagoville (c) (b) (t) -----	08061980	366
East Fork Trinity River near Crandall (d) (c) (b) (t) -----	08062000	373
Trinity River near Rosser (d) (c) (b) (t) -----	08062500	382
Trinity River at Trinidad (d) (c) (b) (t) (s) -----	08062700	391
Cedar Creek Reservoir near Trinidad (e) -----	08063010	400
Navarro Mills Lake near Dawson (e) -----	08063050	401
Richland Creek near Dawson (d) -----	08063100	402
Chambers Creek:		
Waxahachie Creek:		
Bardwell Lake near Ennis (e) -----	08063700	403
Waxahachie Creek near Bardwell (d) -----	08063800	404
Chambers Creek near Rice (d) (c) (b) (t) -----	08064100	405
Richland-Chambers Reservoir near Kerens (e) -----	08064550	409
Tehuacana Creek near Streetman (d) (c) (b) (t) -----	08064700	410
Trinity River near Oakwood (d) -----	08065000	413
Upper Keechi Creek near Oakwood (d) -----	08065200	414
Trinity River near Crockett (d) (c) (b) (t) -----	08065350	415
Bedias Creek near Madisonville (d) -----	08065800	424
Kickapoo Creek near Onalaska (d) -----	08066170	425
Livingston Reservoir near Goodrich (e) (c) (t) -----	08066190	426
Livingston Reservoir at outflow weir near Goodrich (d) -----	08066191	433
Trinity River:		
Long King Creek at Livingston (d) -----	08066200	434
Trinity River near Goodrich (d) -----	08066250	435
Menard Creek near Rye (d) (c) (t) -----	08066300	436
Trinity River at Romayor (d) (c) (b) (t) (s) -----	08066500	438
Trinity River at Liberty (d) -----	08067000	442
CIWA Canal near Dayton (d) -----	08067070	443
<b>CEDAR BAYOU BASIN</b>		
Cedar Bayou near Crosby (d) -----	08067500	444



## DISCONTINUED SURFACE-WATER DISCHARGE OR STAGE-ONLY STATIONS

The following continuous-record surface-water discharge or stage-only stations (gaging stations) in Texas have been discontinued. Daily streamflow or stage records were collected and published for the period of record, expressed in water years, shown for each station. Those stations with an asterisk (\*) after the station number are currently operated as crest-stage partial-record stations. Discontinued project stations with less than 3 years of record have not been included. Information regarding these stations may be obtained from the District Office at the address given on the back side of the title page of this report.

[Letters after station name designate the type of data collected: (d) discharge, (e) elevation (stage only).]

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Punta De Agua Creek near Channing (d)	07227448	3,568	1968-73
Canadian River at Tascosa (d)	07227470	18,536	1969-77
Dixon Creek near Borger (d)	07227920	134	1974-89
Palo Duro Creek near Spearman (d)	07233500	960	1941-42
Tierra Blanca Creek above Buffalo Lake near Umbarger (d)	07295500	1,968	1942-54 1967-73
Tierra Blanca Creek below Buffalo Lake near Umbarger (d)	07296100	2,075	1967-73
Prairie Dog Town Fork Red River near Canyon (d)	07297500	3,369	1924-26 1938-49
North Tule Draw at Reservoir near Tulia (d)	07298000	189	1939-40 1941-73
Tule Creek near Silverton (d)	07298200	1,150	1964-86
Prairie Dog Town Fork Red River near Brice (d)	07298500	6,082	1949-51 1961-63
Mulberry Creek near Brice (d)	07299000	N/A	1949-51
Prairie Dog Town Fork Red River near Lakeview (d)	07299200	6,792	1963-80
Little Red River near Turkey (d)	07299300	139	1968-81
Prairie Dog Town Fork Red River near Estelline (d)	07299500	7,293	1924-25 1938-47
Jonah Creek at Weir near Estelline (d)	07299512	65.50	1974-82
Jonah Creek below Wier near Estelline (d)	07299514	66.60	1974-76
Salt Creek near Estelline (d)	07299530	142	1974-79
Red River near Quanah (d)	07299570	8,321	1959-82
Salt Fork Red River near Clarendon (d)	07299850	457	1960-64
McClellan Creek near McLean (d)	07301200*	759	1967-80
Quitaque Creek near Quitaque (d)	07307500	293	1946-59
North Pease River near Childress (d)	07307600	1,434	1973-79
Middle Pease River near Paducah (d)	07307750	1,086	1973-79
Middle Pease River below Paducah (d)	07307760	N/A	1980-82
Pease River near Crowell (d)	07308000	3,037	1924-47
Pease River near Vernon (d)	07308200	3,488	1960-82
North Wichita River near Paducah (d)	07311600	540	1961-82
North Wichita River near Crowell (d)	07311622	591	1969-76
Middle Wichita River near Truscott (d)	07311648	161	1971-76
South Wichita River near Guthrie (d)	07311780	239	1971-76
South Wichita River at Ross Ranch near Benjamin (d)	07311790	499	1971-79
Wichita River near Seymour (d)	07311900	1,874	1959-79
Little Wichita River near Ringgold (d)	07315400	1,350	1959-65
Mineral Creek near Sadler (d)	07316200	26	1967-76
Bois D'Arc Creek near Randolph (d)	07332600	72	1962-85
Sanders Creek near Chicota (d)	07335400	175	1968-86
Little Pine Creek near Kanawha (d)	07336750	75.40	1968-80
Pecan Bayou near Clarksville (d)	07336800	100	1962-77
Cuthand Creek near Bogata (d)	07343300	69	1956-90
Dial Branch near Bagwell (e)	07343350	1	1966-74
Buck Creek near Cookville (e)	07343900	0.78	1966-74
Sulphur River near Darden (d)	07344000	2,774	1924-56
Boggy Creek near Daingerfield (d)	07345000	72	1943-77
Big Cypress Creek near Karnack (e)	07346085	N/A	1980-85
Sabine River near Emory (d)	08017500	888	1953-73
Burke Creek near Yantis (d)	08018730	33.10	1979-89
Prairie Creek near Gladewater (d)	08020200	48.90	1968-77
Sabine River near Longview (d)	08020500	2,947	1904-06
Rabbit Creek at Kilgore (d)	08020700	75.80	1964-77

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Mill Creek near Henderson (d)	08020960	20.30	1979-81
Mill Creek near Longview (d)	08020980	47.90	1979-81
Tiawichi Creek near Longview (d)	08020990	62.70	1978-81
Cherokee Bayou near Elderville	08021000	120	1940-48
Murvaul Bayou near Gary (d)	08022300	134	1958-83
Socagee Creek near Carthage (d)	08022400	82.60	1962-73
Tenaha Creek near Shelbyville (d)	08023200	97.80	1952-82
Sabine River near Milam (d)	08024400	6,508	1939-66
Palo Gaucho Bayou near Hemphill (d)	08024500	123	1952-65
Mill Creek near Burkeville (d)	08025307	18	1974-79
Cypress Creek near Buna (d)	08030000	69.20	1952-83
Cow Bayou near Mauriceville (d)	08031000	83.30	1952-86
Kickapoo Creek near Brownsboro (d)	08031200	232	1962-89
Neches River near Reese (d)	08031500	851	1924-27
Neches River near Alto (d)	08032500	1,945	1944-78
Piney Creek near Groveton (d)	08033300	79	1962-89
Striker Creek near Summerfield (d)	08033700	146	1941-49
East Fork Angelina River near Cushing (d)	08033900	158	1964-89
Mud Creek near Jacksonville (d)	08034500	376	1939-79
Mud Creek at Ponta (d)	08035000	475	1924-27
Angelina River near Lufkin (d)	08037000	1,600	1923-34 1940-79
Arenoso Creek near San Augustine (d)	08037500	75.30	1938-40
Angelina River near Zavalla (d)	08038500	2,892	1952-65
Ayish Bayou at San Augustine (d)	08039000	15.80	1924-26
Angelina River at Horger (d)	08039500	3,486	1928-51 1966-73
North Creek near Jacksboro (d)	08042700	21.60	1956-80
West Fork Trinity River at Bridgeport (d)	08043100	1,113	1985-89
West Fork Trinity River at Bridgeport (d)	08043500	1,147	1910-30
West Fork Trinity River at Lake Worth, Fort Worth (d)	08045500	2,069	1917-18
Clear Fork Trinity River near Aledo (d)	08046000	251	1947-75
Marine Creek at Fort Worth (d)	08048500	16.80	1950-58
Sycamore Creek at I.H. 35W, Fort Worth (d)	08048520	17.70	1970-76
Sycamore Creek Trib. above Seminary Drive, Fort Worth (d)	08048530	0.97	1970-76
Sycamore Creek Trib. at I.H. 35W, Fort Worth (d)	08048540	1.35	1970-76
Dry Branch at Fain Street at Fort Worth (d)	08048600	2.15	1969-76
Big Fossil Creek at Haltom City (d)	08048800*	52.8	1960-73
Little Fossil Creek at I.H. 820, Fort Worth (e)	08048820	5.64	1969-73
Little Fossil Creek at Mesquite Street, Fort Worth (d)	08048850	12.30	1969-76
Village Creek at Kennedale (d)	08048980	100	1986-89
Village Creek near Handley (d)	08049000	126	1925-30
Big Bear Creek near Grapevine (d)	08049550	29.6	1967-79
Trigg Branch at DFW Airport near Euless (d)	08049565	1.73	1983-87
Mountain Creek near Cedar Hill (d)	08049600	119	1961-84
Mountain Creek above Duncanville (e)	08049850	224	1986-87
Mountain Creek near Duncanville (e)	08049900	225	1970-90
Mountain Creek near Grand Prairie (d)	08050000	273	1925-33
Elm Fork Trinity SWS 6-O near Muenster (e)	08050200	0.77	1957-71
Elm Fork Trinity River near Muenster (d)	08050300	46	1957-73
Elm Fork Trinity River near Sanger (d)	08050500	381	1949-84
Isle Du Bois Creek near Pilot Point (d)	08051000	266	1949-84
Elm Fork Trinity River near Denton (d)	08052000	1,084	1924-26
Little Elm Creek SWS #10 near Gunter (e)	08052630	2.10	1966-72
Little Elm Creek near Celina (d)	08052650	46.70	1966-76
Hickory Creek at Denton (d)	08052780	129	1985-87
Denton Creek near Roanoke (d)	08054000	621	1924-27 1939-55
Bachman Branch at Dallas (d)	08055700	10	1964-79
White Rock Creek at Keller Springs Road, Dallas (d)	08057100	29.40	1962-79
White Rock Creek at White Rock Lake, Dallas, Tx (d)	08057300	100	1963-79



Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
White Rock Creek at Scyene Road, Dallas (d)	08057400	122	1963-79
Tenmile Creek at State Hwy. 342 at Lancaster (d)	08057450	52.80	1970-79
Honey Creek near McKinney (d)	08058500	39	1951-73
East Fork Trinity River near McKinney (d)	08059000	190	1950-75
Sister Grove Creek near Princeton (d)	08059500	113	1949-75
East Fork Trinity River above Pilot Grove near Lavon (d)	08060000	324	1949-53
East Fork Trinity River near Lavon (d)	08061000	773	1954-89
East Fork Trinity River near Rockwall (d)	08061500	840	1924-54
South Mesquite Creek at Mercury Road near Mesquite (d)	08061950	23	1969-79
Cedar Creek Reservoir Spillway Outflow near Trinidad (d)	08062650	1,007	1966-82
Cedar Creek near Kemp (d)	08062800	189	1963-87
Kings Creek near Kaufman (d)	08062900	233	1963-87
Lacey Fork near Mabank (d)	08062980	118	1982-84
Cedar Creek near Mabank (d)	08063000	733	1939-66
South Twin Creek near Eustace (d)	08063003	27.40	1983-84
Cedar Creek at Trinidad (d)	08063020	1,011	1965-71
Pin Oak Creek near Hubbard (d)	08063200	17.60	1956-72
Richland Creek near Richland (d)	08063500	734	1939-88
Chambers Creek near Corsicana (d)	08064500	963	1939-84
Richland Creek near Fairfield (d)	08064600	1,957	1972-83
Catfish Creek near Tennessee Colony (d)	08064800	207	1962-89
Trinity River near Midway (d)	08065500	14,450	1939-70
Caney Creek near Madisonville (d)	08065700	112	1963-76
White Rock Creek near Trinity (d)	08066100	222	1965-71
			1974-85
Big Creek near Shepherd	08066400	38.80	1966-89
Sulphur Barge Canal near Wallisville (e)	08067113	N/A	1976-82
Lost River near Wallisville (e)	08067250	N/A	1976-82
Old River (cutoff channel) near Wallisville (e)	08067255	N/A	1976-82
Anahuac Channel at Anahuac (e)	08067301	N/A	1976-82

## DISCONTINUED SURFACE-WATER-QUALITY STATIONS

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The following stations were discontinued as continuous-record surface-water-quality stations prior to the 1991 water year. Daily records of specific conductance, temperature, sediment, color, pH, dissolved oxygen, or chloride were collected and published for the record shown for each station.

[SC, specific conductance; T, temperature; S, sediment; C, color; pH, pH; DO, dissolved oxygen; Cl, chloride.]

Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
Canadian River at Tascosa	07227470	18,536	SC, T	1948-53 1968-77
Canadian River near Canadian	07228000	22,866	SC, T	1974-81
Prairie Dog Town Fork Red River near Wayside	07297910	4,221	SC, T	1968-81
Tule Creek near Silverton	07298200	1,150	SC, T	1967-69
Prairie Dog Town Fork Red River near Brice	07298500	6,082	T S	1950-51 1949-51
Mulberry Creek near Brice	07299000	N/A	T, S	1949-51
Prairie Dog Town Fork Red River near Lakeview	07299200	6,792	SC, T S	1968-80 1979-80
Little Red River near Turkey	07299300	139	SC, T S	1968-81 1979-81
Jonah Creek at Weir near Estelline	07299512	65.50	SC	1974-82
Jonah Creek below Weir near Estelline	07299514	66.60	SC	1974-76
Salt Creek near Estelline	07299530	142	SC	1974-79
Prairie Dog Town Fork Red River near Childress	07299540	7,725	SC, T	1968-82
Salt Fork Red River near Hedley	07299930	744	SC, T	1956-61
North Pease River near Childress	07307600	1,434	SC, T	1973-79
Middle Pease River near Paducah	07307750	1,086	SC T	1973-79 1973-77
Middle Pease River near Paducah	07307760	N/A	SC T	1979-82 1979-80
Pease River near Childress	07307800	2,754	SC, T	1968-82
Pease River near Crowell	07308000	3,037	SC	1942-43
Red River near Burkburnett	07308500	2,057	SC, T	1968-81
North Fork Wichita River near Paducah	07311600	540	SC, T	1967-76
North Wichita River near Crowell	07311622	591	SC T	1970-76 1973-74
Middle Fork Wichita River near Truscott	07311648	161	SC	1970-76
Truscott Brine Lake near Truscott	07311669	N/A	SC, T	1984-89
South Fork Wichita River near Guthrie	07311780	239	SC T	1970-76 1973-74
South Wichita River below Low-Flow Dam near Guthrie	07311783	N/A	SC, T	1986-89
South Fork Wichita River at Ross Ranch near Benjamin	07311790	499	SC	1970-79
Wichita River near Seymour	07311900	1,874	SC, T	1968-79
Beaver Creek near Electra	07312200	652	SC, T	1968-70
Wichita River at Wichita Falls	07312500	3,140	SC, T	1981-89
Wichita River near Charlie	07312700	3,439	SC, T	1967-81
Little Wichita River near Archer City	07314500	481	SC T	1953-55 1953-54
Little Wichita River above Henrietta	07314900	1,037	SC, T	1952-56 1959-66
Little Wichita River near Henrietta	07315000	1,037	SC T	1953-66 1952-56 1959-66
East Fork Little Wichita River near Henrietta	07315200	178	T	1953-54
Little Wichita River near Ringgold	07315400	1,350	SC	1959-62
Red River near Gainesville	07316000	N/A	SC	1944-46 1952-64 1966-89
Red River at Denison Dam near Denison	07331600	3,972	SC T	1944-89 1945-89
Little Pine Creek near Kanawha	07336750	75.40	T	1979-80



Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
South Sulphur River near Cooper	07342500	527	SC, T	1958-66 1967-89
White Oak Creek near Talco	07343500	494	SC, T	1967-89
Sulphur River near Darden	07344000	2,774	SC, T	1947-50
Big Cypress Creek near Pittsburg	07344500	366	SC, T	1968-89
Sabine River near Emory	08017500	888	SC, T	1952-54
Grand Saline Creek near Grand Saline	08018200	91.40	SC, T	1968-73
Lake Fork Creek near Quitman	08019000	585	SC, T	1967-89
Big Sandy Creek near Big Spring	08019500	231	SC, T, S	1984-86
Sabine River at Logansport	08022500	4,842	SC, T	1939-45
Sabine River below Toledo Bend near Burkeville	08026000	7,482	SC, T	1968-86
			C	1969-75
Sabine River near Bon Weir	08028500	8,229	SC, T, C	1969-83
Cow Bayou near Mauriceville	08031000	83.30	SC, T	1952-55
Neches River near Alto	08032500	1,945	SC, T	1959-69
Neches River near Diboll	08033000	2,724	SC, T	1969-81
Neches River near Rockland	08033500	3,636	SC	1941-42 1945-47
Angelina River near Lufkin	08037000	1,600	SC, T	1954-79
Angelina River below Sam Rayburn Dam near Jasper	08039400	3,449	SC, T	1964-79
Village Creek near Kountze	08041500	860	SC, T	1967-70
Pine Island Bayou near Sour Lake	08041700	336	SC, T	1968-89
Big Sandy Creek near Bridgeport	08044000	333	SC, T	1969-77
			S	1968-77
Clear Fork Trinity River at Fort Worth	08047500	518	SC	1948-52
			T	1947-62
Elm Fork Trinity River SWS # 6-0 near Muenster	08050200	0.77	S	1956-66
Elm Fork Trinity River near Muenster	08050300	46	SC	1966-67
			T	1957-67
			S	1957-68
Clear Creek near Sanger	08051500	295	SC	1969-77
			T, S	1968-77
Little Elm Creek near Celina	08052650	46.70	SC, T, S	1966-75
Little Elm Creek near Aubrey	08052700	75.50	SC, T, S	1966-75
Elm Fork Trinity River near Lewisville	08053000	1,673	SC	1981-86
			T	1976-81
Trinity River at Westmoreland Road, Dallas	08056400	6,074	SC, pH, T, DO	1977
Cedar Creek near Mabank	08063000	733	SC, T	1956-57
Pin Oak Creek near Hubbard	08063200	17.60	SC	1965-72
			T	1957-72
			S	1956-60
				1965-72
Richland Creek near Richland	08063500	734	SC, T	1967-69
				1983-89
Chambers Creek near Corsicana	08064500	936	SC, T	1961-70
Richland Creek near Fairfield	08064600	1,957	SC, T	1956-66
				1972-83
Trinity River near Oakwood	08065000	12,833	SC, T	1947-81
			S	1976-81
Bedias Creek near Madisonville	08065800	321	SC, T	1984-87
			S	1984-86
Long King Creek at Livingston	08066200	141	SC, T	1963-72
Trinity River near Goodrich	08066250	16,844	SC, T	1969-73
Trinity River near Moss Bluff	08067100	N/A	SC	1946-65
Old River near Cove	08067200	N/A	SC	1946-65
			T	1965
Trinity River at Anahuac	08067300	N/A	SC	1946-65

# WATER RESOURCES DATA - TEXAS, 1991

## VOLUME 1

### ARKANSAS RIVER BASIN, RED RIVER BASIN, SABINE RIVER BASIN, NECHES RIVER BASIN, TRINITY RIVER BASIN, AND INTERVENING COASTAL BASINS

#### INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with Federal, State, and City agencies, obtains a large amount of data pertaining to the water resources of Texas each water year. Such data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the Geological Survey, the data are published annually in four volumes of this report series entitled "Water Resources Data - Texas."

This report series includes records of stage, discharge, and water quality of streams and canals; stage, contents, and water quality of lakes and reservoirs. Volume 1 contains records for water discharge at 116 gaging stations; stage only at 11 gaging stations; stage and contents at 37 lakes and reservoirs; and water quality at 69 gaging stations. Also included are data for 6 partial-record stations. The data in this report represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating City, State, and Federal agencies in Texas.

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

Prior to introduction of this series and for several water years concurrent with it, water resources data for Texas were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "Surface-Water Supply of the United

States, Parts 7 and 8." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." The above mentioned Water-Supply Papers may be consulted in the libraries of the principal cities of the United States and may be purchased from U.S. Geological Survey, Books and Open-File Reports, Federal Center, Bldg. 41, Box 25425, Denver, CO 80225.

Publications similar to this report are published annually by the Geological Survey for all States. These official Geological Survey reports have an identification number consisting of the two-letter State abbreviation, the last two digits of the water year, and the volume number. For example, this volume is identified as "U.S. Geological Survey Water Data Report TX-91-1." For archiving and general distribution, the reports for the 1971-74 water years also are identified as water-data reports. These water-data reports are for sale in paper copy or may be purchased on microfiche from the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc.

Additional information, including the current prices, for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone (512) 873-3000. A limited number of CD-ROM discs will be available for sale by the Books & Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

## COOPERATION

Federal agencies that assisted the Geological Survey in the collection of data in this report in the form of funds or services in 1991 are:

- Corps of Engineers, U.S. Army.
- International Boundary and Water Commission, United States and Mexico, U.S. Section.
- U.S. Bureau of Reclamation.

Organizations that assisted in the collection of data in this report through joint funding agreements through the Texas Water Development Board or through direct joint funding agreements with the Geological Survey are:

Texas Water Development Board, M.R. Arnold II, Executive Administrator; the cities of Abilene, Arlington, Austin, Carrollton, Corpus Christi, Dallas, Fort Worth, Gainesville, Garland, Graham, Houston, Lubbock, Nacogdoches, Runaway Bay, San Angelo, San Antonio, and Wichita Falls; Bexar, Medina, and Atascosa Counties Water Control and Improvement District No. 1; Brazos River Authority; Coastal Industrial Water Authority; Colorado River Municipal Water District; Dallas Public Works Department; Dallas Utilities Water Department; Edwards Underground Water District; Franklin County Water District; Galveston County; Greenbelt Municipal and Industrial Water Authority; Guadalupe-Blanco River Authority; Harris County Flood Control District; Lavaca-Navidad River Authority; Lower Colorado River Authority; Lower Neches Valley Authority; North Central Texas Municipal Water Authority; Northeast Texas Municipal Water District; North Texas Municipal Water District; Pecos River Commission; Red Bluff Water Power Control District; Red River Authority; Sabine River Authority of Texas; Sabine River Compact Administration; San Antonio City Public Service Board; San Antonio City Water Board; San Antonio River Authority; San Jacinto River Authority; Tarrant County Water Control and Improvement District No. 1; Texas Water Commission; Texas Water Development Board; Titus County Fresh Water Supply District No. 1; Trinity River Authority; Upper Guadalupe River Authority; Upper Neches River Municipal Water Authority; West Central Texas Municipal Water District; and Wichita County Water Improvement District No. 2.

## HYDROLOGIC CONDITIONS

Large variations in precipitation, runoff, and streamflow characterize the usual hydrologic conditions in Texas. In the eastern part of the State, streams typically are deep with wide alluvial flood plains, and streamflow is perennial. In the western part of the State, most streams flow through arroyos, and streamflow usually is ephemeral.

Precipitation distribution for water year 1991 did not follow the long-term precipitation pattern. Greater than normal precipitation occurred over the entire State during the current water year. The distribution was fairly uniform. Precipitation departures from normal (1951-80) for the current water year ranged from a high of 135 percent of normal in the Low Rolling Plains climatic division to a low of 107 percent of normal in Southern Texas and the Lower Rio Grande Valley divisions. In East Texas and the Upper Coast divisions, precipitation was 134 percent of normal. In the Trans Pecos in west Texas, precipitation was 133 percent of normal during the current water year. The remaining four climatic divisions (High Plains, North Central, Edwards Plateau, and South Central) had precipitation departures from 115 to 119 percent above normal for water year 1991.

Precipitation totals for the 10 climatic divisions (fig. 1) for water year 1991 ranged from a high of 61.64 inches in the Upper Coast division to a low of 20.38 inches in the High Plains division. The East Texas division had the second highest precipitation total of 59.86 inches, followed by South Central with 39.60 inches, North Central with 38.34 inches, the Low Rolling Plains with 30.80 inches, the Trans-Pecos with 28.77 inches, the Edwards Plateau with 27.38 inches, the Lower Rio Grande Valley with 27.03 inches, and Southern Texas with 24.95 inches for the water year.

All the greatest individual annual rainfall amounts for the current water year occurred in East or Southeast Texas. The greatest maximum monthly precipitation occurred in April at Carthage with a total monthly rainfall of 17.95 inches. The greatest monthly precipitation totals for 10 months of the water year were recorded in East or Southeast Texas.

Streamflow during the current water year did not follow normal precipitation patterns. Streamflow was above normal (within the highest 25 percent) in East and Southeast Texas, and in the Red River basin in extreme North Central Texas. Streamflow was near normal in all other basins.



Conservation storage in 75 selected reservoirs throughout the State, with a combined conservation capacity of 34,570,000 acre-feet, increased from 85 percent of conservation capacity at the end of water year 1990 to 87 percent at the end of water year 1991. Records from the individual reservoirs indicate that storage increased in 41, decreased in 25, and remained the same in 9.

The area for which water-resources data are presented in volume 1 includes the Texas Panhandle and extends across northern and eastern Texas to southeastern Texas. Normal annual precipitation in this area ranges from about 17 inches in the western part of the Texas Panhandle to more than 56 inches in the extreme southeastern part of the State. Annual runoff ranges from less than 1.0 inch in parts of the Panhandle to as much as 15 inches in southeastern Texas. The area described in volume 1 and the location of selected streamflow-gaging and water-quality stations in the area are shown in figure 2.

**Streamflow**

Streamflow was above normal during water year 1991 in most of the area described in volume 1. No outstanding storms occurred in the area described in volume 1 during the water year; however, there was flooding in the lower Trinity River basin. Four of six selected streamflow stations in the area had streamflow above the normal range during the water year. Only the Panhandle streamflow station (Canadian River near Amarillo) and the upper Trinity River basin station (Trinity River at Dallas) had below normal streamflow. This streamflow pattern resulted from above normal precipitation over the entire area during water year 1991. A comparison of streamflow for water year 1991 with streamflow for the period of record at six selected stations (fig. 2), for which data are included in volume 1, is presented in table 1.

At the four long-term hydrologic index stations in the State, streamflow during water year 1991 was normal to above normal. Monthly mean discharges for water

Table 1.—Streamflow at six selected stations for water year 1991

Station no. and name	Discharge during 1991 water year (cubic feet per second)			Discharge during period of record (cubic feet per second)		
	Max.	Min.	Avg.	Max.	Min.	Avg.
<u>Arkansas River basin</u>						
07227500 Canadian River near Amarillo, Tex.	6,280	0.03	165	135,000	0	303 (1925, 1939-91)
<u>Red River basin</u>						
07308500 Red River near Burkburnett, Tex. <sup>1/</sup>	103,000	148	1,976	166,000	0	1,059 (1961-91)
<u>Sabine River basin</u>						
08022040 Sabine River near Beckville, Tex.	19,600	169	3,684	123,000	2.4	2,365 (1961-91)
<u>Neches River basin</u>						
08033500 Neches River near Rockland, Tex. <sup>2/</sup>	23,000	156	4,503	49,800	1.6	2,144 (1962-91)
<u>Trinity River basin</u>						
08057000 Trinity River at Dallas, Tex.	11,700	313	1,068	184,000	1.2	1,590 (1904-91)
08066500 Trinity River at Romayor, Tex.	63,400	977	8,533	111,000	102	7,755 (1969-91)

<sup>1/</sup> National Stream Quality Accounting Network (NASQAN) site.

<sup>2/</sup> Hydrologic index station.

## WATER RESOURCES DATA - TEXAS, 1991

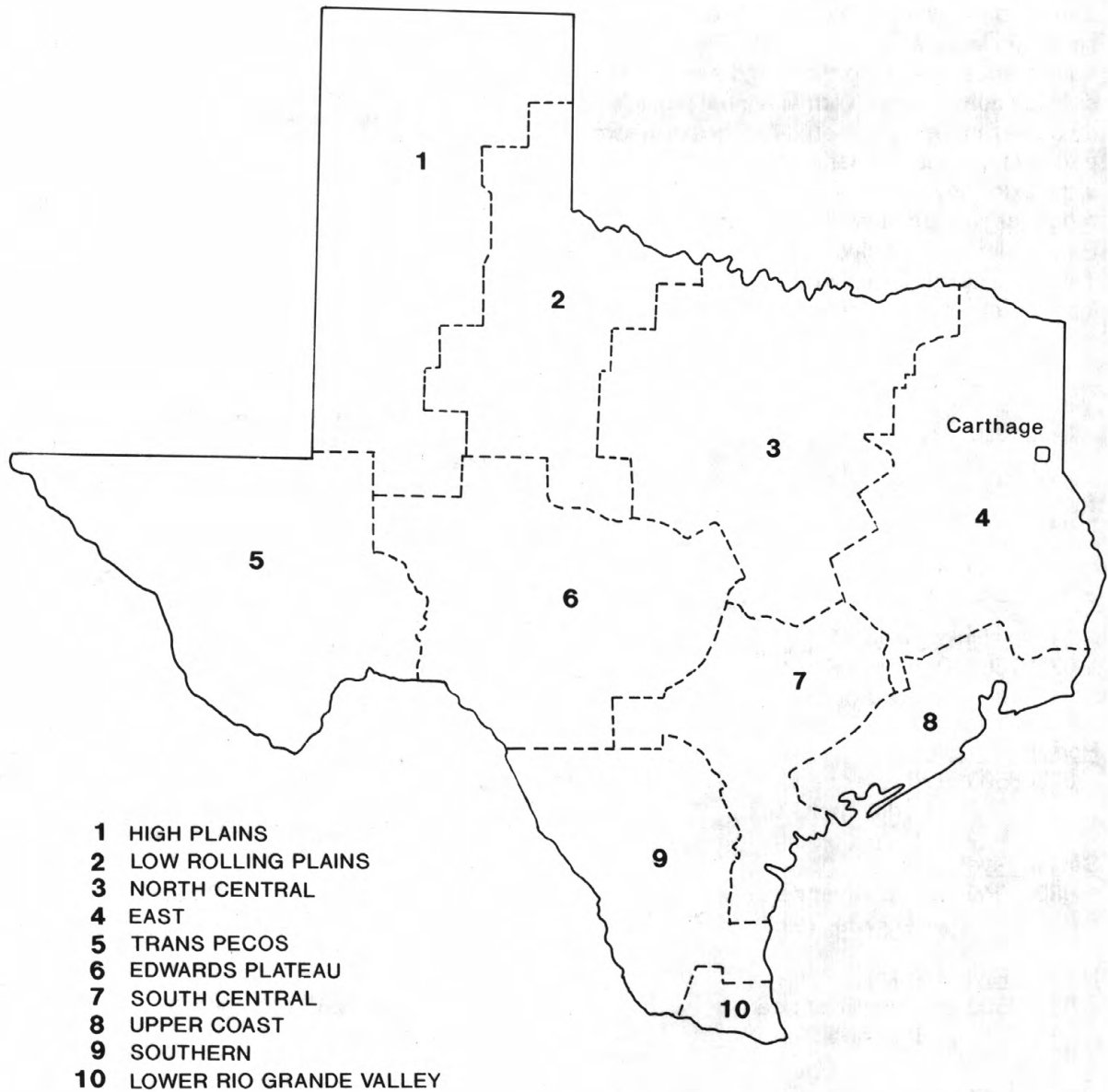


Figure 1.--Ten climatic divisions of the State (Modified from U.S. Department of Commerce, National Oceanic and Atmospheric Administration, 1991, Climatological data, Texas, 1991: National Climatic Data Center, v. 96, no. 9).

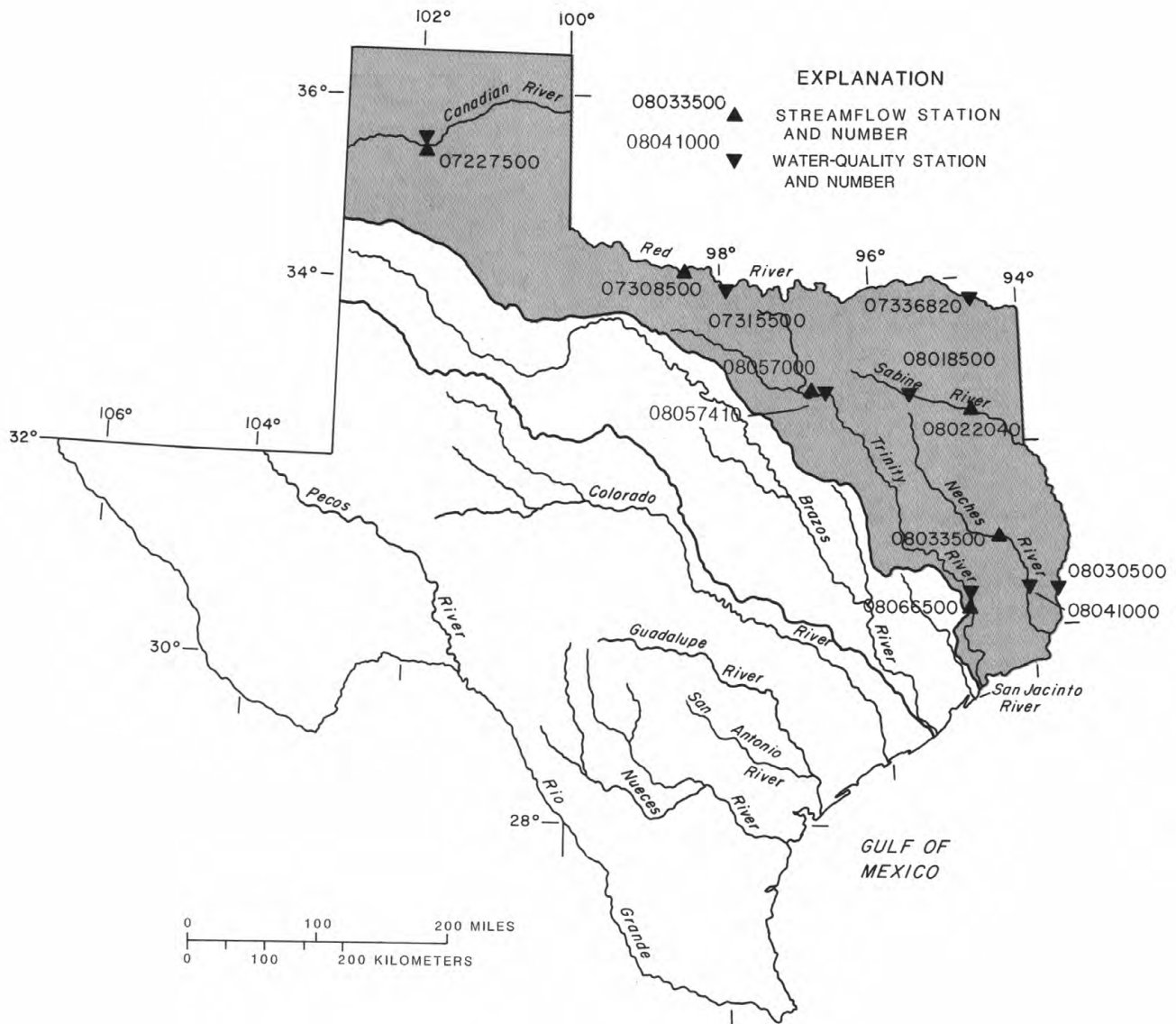


Figure 2.--Area of Texas covered by volume 1 (shaded) and location of selected streamflow and water-quality stations in volume 1.



year 1991 and the median of the long-term monthly means for water years 1951-80 for the four long-term hydrologic index stations in the State are shown in figure 3. Streamflow at the hydrologic index station Neches River near Rockland was above normal (within the highest 25 percent of record) during the water year. For the North Bosque River near Clifton, streamflow was normal from October through May, and July, and above normal during June, August and September. The North Concho River near Carlsbad had above normal streamflow from November through March, then normal for the remaining 7 months. Streamflow for the Guadalupe River near Spring Branch was normal for the entire year.

Conservation storage in 34 selected reservoirs in this area of the State, with a total combined conservation capacity of 21,310,000 acre-feet, increased from 88 percent of capacity at the end of September 1990 to 93 percent of capacity at the end of September 1991. Records from these reservoirs indicate that storage in-

creased in 19, decreased in 12, and remained the same in 3 during the water year.

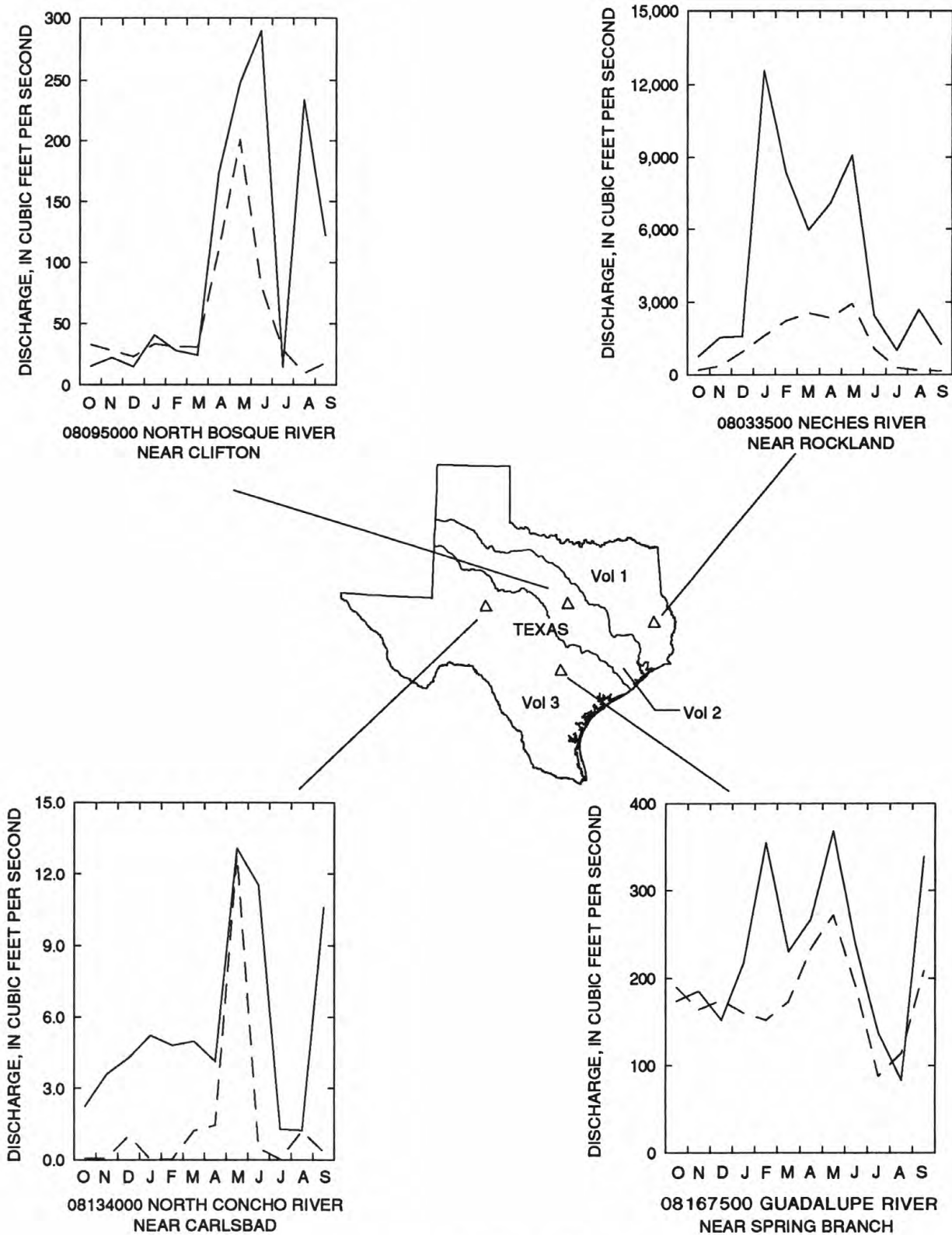
#### Water Quality

Dissolved-solids concentrations in most streams in the State are inversely related to streamflow. During years when precipitation and runoff are less than normal, streamflow commonly is more mineralized than during years when precipitation and runoff are normal or greater than normal. However, for streams where discharge is controlled by reservoirs, the dissolved-solids concentration may remain relatively constant despite substantial fluctuations in precipitation and runoff.

Records of discharge-weighted-average concentrations of dissolved solids for water year 1991 are compared with those for water years 1987-91 for selected long-term daily or continuous-record water-quality stations (fig. 2) in the Arkansas, Red, Sabine, Neches, and Trinity River basins. Results are shown in table 2.

Table 2.—Comparison of records of discharge-weighted-average concentrations of dissolved solids for the 1991 water year

Station no. and name	Mean discharge (cubic feet per second)		Discharge-weighted-average concentration of dissolved solids (milligrams per liter)	
	1991	1987-91	1991	1987-91
<u>Arkansas River basin</u>				
07227500 Canadian River near Amarillo, Tex.	165	176	961	932
<u>Red River basin</u>				
07315500 Red River near Terral, Okla.	2,970	4,478	1,420	1,290
07336820 Red River near DeKalb, Tex.	12,560	18,750	417	475
<u>Sabine River basin</u>				
08018500 Sabine River near Mineola, Tex.	521	817	136	116
08030500 Sabine River near Ruliff, Tex.	12,620	10,510	67	70
<u>Neches River basin</u>				
08041000 Neches River at Evadale, Tex.	10,960	7,694	77	82
<u>Trinity River basin</u>				
08057410 Trinity River below Dallas, Tex.	1,456	3,095	294	241
08066500 Trinity River at Romayor, Tex.	8,533	9,068	173	191



EXPLANATION

- MONTHLY MEAN DISCHARGE FOR 1991 WATER YEAR
- - - MEDIAN OF MONTHLY MEAN DISCHARGE FOR 1951-80 WATER YEARS

Figure 3.--Comparison of monthly mean discharges at four long-term hydrologic index gaging stations during the 1991 water year with median of the monthly mean discharges for 1951-80 water years.

## SPECIAL NETWORKS AND PROGRAMS

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

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

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

Radiochemical Program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

### EXPLANATION OF THE RECORDS

The surface-water records published in this report are for the 1991 water year that began October 1, 1990,

and ended September 30, 1991. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, stage and content data for lakes and reservoirs, and water-quality data for surface water. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

### Station Identification Numbers

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

### Downstream Order Numbering

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

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for



each station, such as 08057000, which appears just to the left of the station name, includes the 2-digit Part number "08" plus the 6-digit downstream-order number "057000." The Part number designates the major river basin; for example, Part "08" is the Western Gulf of Mexico basin.

#### **Records of Stage and Water Discharge**

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

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report.

#### **Data Collection and Computation**

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

Continuous records of stage are obtained with analog recorders that trace continuous graphs of stage or with digital recorders that punch stage values on paper

tapes at selected time intervals. Measurements of discharge are made with current meters using methods adopted by the Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, in Water-Supply Paper 2175, and in U.S. Geological Survey Techniques of Water-Resources Investigations, Book 3, Chapter A6.

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

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

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

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

For some gaging stations, there are periods when no gage-height record is obtained, or the recorded gage height is so faulty that it cannot be used to compute daily discharge or contents. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous or following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous or following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

#### Data Presentation

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

**LOCATION.**—Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given. River mileages, given for only a few stations, were deter-

mined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

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

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

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

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

**REMARKS.**—All periods of estimated daily discharge record will either be identified by date in this paragraph of the station description for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remarks statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, to special methods of computation, to conditions that affect natural flow at the station and, possibly, to other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity,

outlet works and spillway, and purpose and use of the reservoir.

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

**AVERAGE DISCHARGE.**—The discharge value given is the arithmetic mean of the water-year mean discharges. It is computed only for those stations having at least 5 water years of complete record, and only water years of complete record are included in the computation. It is not computed for stations where diversions, storage, or other water-use practices cause the value to be meaningless. If water developments significantly altering flow at a station are put into use after the station has been in operation for a period of years, a new average is computed as soon as 5 water years of record have accumulated following the development. The median of yearly mean discharges also is given under this heading for stations having 10 or more water years of record, if the median differs from the average given by more than 10 percent.

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

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

**EXTREMES FOR CURRENT YEAR.**—Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not pub-

lished for canals, ditches, drains, or streams for which the peaks are subject to substantial control by man. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, and 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

**REVISIONS.**—If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error. Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscripts published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the offices whose addresses are given on the back of the title page of this report to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check, because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

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

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



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

### Identifying Estimated Daily Discharge

Estimated daily discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station description.

### Accuracy of the Records

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

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair," within 15 percent.

Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

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

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

### Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables, is on file in the Texas District. Also, most of the daily mean discharges are in computer-readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the published records may be obtained from the offices whose addresses are given on the back of the title page of this report.

### Records of Surface-Water Quality

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

### Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications.

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

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

### Arrangement of Records

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

### On site Measurements and Sample Collection

In obtaining water-quality data, a major concern needs to be assuring that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made onsite when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, in treating the samples to prevent changes in quality pending analysis, and in shipping the samples to the laboratory.

Procedures for on site measurements and for collecting, treating, and shipping samples are given in publications on "Techniques of Water-Resources Investigations," Book 1, Chap. D2; Book 3, Chap. C2; Book 5, Chap. A1, A3, and A4. All of these references are listed under "PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS" which appears at the end of the introductory text. Detailed information on collecting, treating, and shipping samples may be obtained from the Texas Office of the Central Region Office.

One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the

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

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

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

### Water Temperature

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

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the Texas District Office.

### Sediment

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

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided-day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration times 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided-day method. For periods when no samples were collected, daily discharges of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

### Laboratory Measurements

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

Historical and current (1991) dissolved trace-element concentrations are reported herein for water that was collected, processed, and analyzed by using either ultraclean or other than ultraclean techniques. If ultraclean techniques were used, then those concentrations are reported in nanograms per liter. If other than ultraclean techniques were used, then those concentrations are reported in micrograms per liter and could reflect contamination introduced during some phase of the procedure.

### Data Presentation

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

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

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

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

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

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



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

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

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

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

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

**Remark Codes**

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

<u>PRINTED OUTPUT</u>	<u>REMARK</u>
E	Estimated value
>	Actual value is known to be greater than the value shown
<	Actual value is known to be less than the value shown
K	Results based on colony count outside the acceptance range (non-ideal colony count)

Remark codes -- Continued

L	Biological organism count less than 0.5 percent (organism may be observed rather than counted)
D	Biological organism count equal to or greater than 15 percent (dominant)
&	Biological organism estimated as dominant

**ACCESS TO WATSTORE DATA**

The National WATER Data STORAGE and RETRIEVAL System (WATSTORE) was established for handling water data collected through the activities of the U.S. Geological Survey and to provide for more effective and efficient means of releasing the data to the public. The system is operated and maintained on the central computer facilities of the Survey at the National Center in Reston, Virginia.

WATSTORE can provide a variety of useful products ranging from simple data tables to complex statistical analyses. A minimal fee, plus the actual computer cost incurred in producing a desired product, is charged to the requester. Information about the availability of specific types of data, the acquisition of data or products, and user charges can be obtained locally from the District office (see address given on the back of the title page).

General inquiries about WATSTORE may be directed to:

Chief Hydrologist  
 U.S. Geological Survey  
 437 National Center  
 Reston, Virginia 22092

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or 5-1/4 inch floppy disk; and, as noted in the introduction, on CD-ROM discs. All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. A limited number of CD-ROM discs will be available for sale by the Books & Open-File Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

## DEFINITION OF TERMS

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

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

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

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

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

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

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

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

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

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

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

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

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500 °C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in grams per cubic meter ( $\text{g}/\text{m}^3$ ), and periphyton and benthic organisms in grams per square meter ( $\text{g}/\text{m}^2$ ).

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

Organic mass or volatile mass of the living substance is the difference between the dry mass and ash mass and represents the actual mass of the

living matter. The organic mass is expressed in the same units as for ash mass and dry mass.

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

Bottom material: See Bed material.

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

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

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

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

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

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

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

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

Cubic-foot-per-second day [(ft<sup>3</sup>/s)/d] is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, approximately 1.9835 acre-feet, about 646,000 gallons, or 2,445 cubic meters.

Cubic feet per second per square mile [(ft<sup>3</sup>/s)/mi<sup>2</sup>] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming that the runoff is distributed uniformly in time and area.

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

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

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

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

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

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = - \sum_{i=1}^s \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

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

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



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

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

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is computed as the sum of equivalents of polyvalent cations and is expressed as the equivalent concentration of calcium carbonate (CaCO<sub>3</sub>).

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

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Methylene blue active substances (MBAS) are apparent detergents. The determination depends on the formation of a blue color when methylene blue dye reacts with synthetic anionic detergent compounds.

Micrograms per gram (µg/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

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

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

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

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

Organism is any living entity.

Organism count/area refers to the number of organisms collected and enumerated in a sample and ad-

justed to the number per area habitat, usually square meter (m<sup>2</sup>), acre, or hectare. Periphyton, benthic organisms, and macrophytes are expressed in these terms.

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

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

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

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

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

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

<u>Classification</u>	<u>Size (mm)</u>	<u>Method of analysis</u>
Clay	0.00024 - 0.004	Sedimentation
Silt	0.004 - 0.062	Sedimentation
Sand	0.062 - 2.0	Sedimentation or sieve
Gravel	2.0 - 64.0	Sieve

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

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

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

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

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

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

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

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

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

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

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements

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

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

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

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

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

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representa-

tive sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

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

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

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

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

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

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

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



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

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

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

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

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

Sodium-adsorption-ratio (SAR) is the expression of relative activity of sodium ions in exchange reactions within soil and is an index of sodium or alkali hazard to the soil. Waters range in respect to sodium hazard from those which can be used for irrigation on almost all soils to those which are generally unsatisfactory for irrigation.

Solute is any substance that is dissolved in water.

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

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

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

Substrate is the physical surface upon which an organism lives.

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

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

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

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

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

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

required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

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

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

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

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

Kingdom ..... Animal  
Phylum ..... Arthropoda  
Class ..... Insecta  
Order ..... Ephemeroptera  
Family ..... Ephemeridae  
Genus ..... *Hexagenia*  
Species ..... *Hexagenia limbata*

Thermograph is an instrument that continuously records variations of temperature on a chart. The more general term "temperature recorder" is used in the table headings and refers to any instrument that records temperature whether on a chart, a tape, or any other medium.

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

total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

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

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

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

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

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

Tritium Network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In

addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

Water year in Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1991, is called the "water year 1991."

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

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

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

### PUBLICATIONS OF TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey.

Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

- 1-D1. ***Water temperature-influential factors, field measurement, and data presentation***, by H.H. Stevens, Jr., J.F. Ficke, and G.F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 p.
- 1-D2. ***Guidelines for collection and field analysis of ground-water samples for selected unstable constituents***, by W.W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 p.
- 2-D1. ***Application of surface geophysics to ground-water investigations***, by A.A.R. Zohdy, G.P. Eaton, and D.R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 p.
- 2-D2. ***Application of seismic-refraction techniques to hydrologic studies***, by F.P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 p.
- 2-E1. ***Application of borehole geophysics to water-resources investigations***, by W.S. Keys and L.M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 p.
- 2-E2. ***Borehole geophysics applied to ground-water investigations***, by W. Scott Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 p.
- 2-F1. ***Application of drilling, coring, and sampling techniques to test holes and wells***, by Eugene Shuter and Warren E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 p.
- 3-A1. ***General field and office procedures for indirect discharge measurements***, by M.A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 p.
- 3-A2. ***Measurement of peak discharge by the slope-area method***, by Tate Dalrymple and M.A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 p.
- 3-A3. ***Measurement of peak discharge at culverts by indirect methods***, by G.L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 p.
- 3-A4. ***Measurement of peak discharge at width contractions by indirect methods***, by H.F. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 p.
- 3-A5. ***Measurement of peak discharge at dams by indirect methods***, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 p.
- 3-A6. ***General procedure for gaging streams***, by R.W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 p.
- 3-A7. ***Stage measurements at gaging stations***, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A7. 1968. 28 p.
- 3-A8. ***Discharge measurements at gaging stations***, by T.J. Buchanan and W.P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 p.



- 3-A9. **Measurement of time of travel in streams by dye tracing**, by F.A. Kilpatrick, and J.F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 p.
- 3-A10. **Discharge ratings at gaging stations**, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 p.
- 3-A11. **Measurement of discharge by moving-boat method**, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 p.
- 3-A12. **Fluorometric procedures for dye tracing**, by J.F. Wilson, Jr., E.D. Cobb, and F.A. Kilpatrick: USGS--TWRI Book 3, Chapter A12, 1986. 41 p.
- 3-A13. **Computations of continuous records of streamflow**, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A13, 1983. 53 p.
- 3-A14. **Use of flumes in measuring discharge**, by F.A. Kilpatrick and V.R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 p.
- 3-A15. **Computation of water-surface profiles in open channels**, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 p.
- 3-A16. **Measurement of discharge using tracers**, by F.A. Kilpatrick and E.D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 p.
- 3-A17. **Acoustic velocity meter systems**, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 p.
- 3-A18. **Determination of stream reaeration coefficients by use of tracers**, by F.A. Kilpatrick, R.E. Rathbun, N. Yotsukura, G.W. Parker, and L.L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 p.
- 3-A19. **Levels of streamflow gaging stations**, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 p.
- 3-B1. **Aquifer-test design, observation, and data analysis**, by R.W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 p.
- 3-B2. **Introduction to ground-water hydraulics, a programmed text for self instruction**, by G.D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 p.
- 3-B3. **Type curves for selected problems of flow to wells in confined aquifers**, by J.E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 p.
- 3-B4. **Regression modeling of ground-water flow**, by Richard L. Cooley and Richard L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 p.
- 3-B5. **Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction**, by O.L. Franke, T.E. Reilly, and G.D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 p.
- 3-B6. **The principle of superposition and its application in ground-water hydraulics**, by T.E. Reilly, O.L. Franke, and G.D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 p.
- 3-C1. **Fluvial sediment concepts**, by H.P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 p.
- 3-C2. **Field methods for measurement of fluvial sediment**, by H.P. Guy and V.W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 p.
- 3-C3. **Computation of fluvial-sediment discharge**, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 p.
- 4-A1. **Some statistical tools in hydrology**, by H.C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 p.
- 4-A2. **Frequency curves**, by H.C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 p.
- 4-B1. **Low-flow investigations**, by H.C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 p.
- 4-B2. **Storage analyses for water supply**, by H.C. Riggs and C.H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 p.
- 4-B3. **Regional analyses of streamflow characteristics**, by H.C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 p.
- 4-D1. **Computation of rate and volume of stream depletion by wells**, by C.T. Jenkins: USGS--TWRI Book 4, Chapter D1. 1970. 17 p.
- 5-A1. **Methods for determination of inorganic substances in water and fluvial sediments**, by M.J. Fishman and L.C. Friedman: USGS--TWRI Book 5, Chapter A1. 1989. 545 p.
- 5-A2. **Determination of minor elements in water by emission spectroscopy**, by P.R. Barnett and E.C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 p.
- 5-A3. **Methods for the determination of organic substances in water and fluvial sediments**, edited by R.L. Wershaw, M.J. Fishman, R.R. Grabbe, and L.E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 p.
- 5-A4. **Methods for collection and analysis of aquatic biological and microbiological samples**, by L.J. Britton and P.E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 p.
- 5-A5. **Methods for determination of radioactive substances in water and fluvial sediments**, by L.L. Thatcher, V.J. Janzer, and K.W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 p.
- 5-A6. **Quality assurance practices for the chemical and biological analyses of water and fluvial sediments**, by L.C. Friedman and D.E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 p.
- 5-C1. **Laboratory theory and methods for sediment analysis**, by H.P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 p.
- 6-A1. **A modular three-dimensional finite-difference ground-water flow model**, by M.G. McDonald and A.W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 p.
- 7-C1. **Finite difference model for aquifer simulation in two dimensions with results of numerical experiments**, by P.C. Trescott, G.F. Pinder, and S.P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 p.

- 7-C2. **Computer model of two-dimensional solute transport and dispersion in ground water**, by L.F. Konikow and J.D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 p.
- 7-C3. **A model for simulation of flow in singular and interconnected channels**, by R.W. Schaffranek, R.A. Baltzer, and D.E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1983. 110 p.
- 8-A1. **Methods of measuring water levels in deep wells**, by M.S. Garber and F.C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 p.
- 8-A2. **Installation and service manual for U.S. Geological Survey manometers**, by J.D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 p.
- 8-B2. **Calibration and maintenance of vertical-axis type current meters**, by G.F. Smoot and C.E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 p.





## LOWER MISSISSIPPI RIVER BASIN

## ARKANSAS RIVER BASIN

## 07227000 CANADIAN RIVER AT LOGAN, NM

LOCATION.--Lat 35°21'25", long 103°25'03", in NE1/4ne1/4 sec.15, T.13 N., R.33 E., Quay County, Hydrologic Unit 11080006, on left bank 1,100 ft upstream from bridge on U.S. Highway 54, 0.7 mi south of Logan, 1.4 mi upstream from Chicago, Rock Island & Pacific Railroad Co. bridge, 2.0 mi downstream from Ute Dam, 4.3 upstream from Revuelto Creek, and at mile 672.0.

DRAINAGE AREA.--11,141 mi<sup>2</sup>, of which 1,100 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--June 1904 to November 1905 (gage heights and discharge measurements only), December 1908 to September 1909, February 1910, April to July 1910, August 1910 to September 1911 (gage heights and discharge measurements only), October 1911 to May 1914, January to May 1924, September 1924 to July 1925, January 1927 to April 1934, August 1934 to current year. Monthly discharge only for some periods, published in WSP 1311. Records for December 1909, January 1910, and May to July 1934, published in WSP 267, 287, and 762 are unreliable and should not be used. Published as "South Canadian River" June to September 1904.

REVISED RECORDS.--WSP 1087: 1935-36. WSP 1117: Drainage area. WSP 1281: 1912, 1932(M), 1934, 1945-47, 1949-50. WSP 1311: 1931(M). See also PERIOD OF RECORD.

GAGE.--Water-stage recorder. Datum of gage is 3,667.1 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 1, 1987, same site at datum 1 ft higher. See WSP 1311 or 1731 for history of changes prior to Oct. 1, 1934.

REMARKS.--Records poor. Flow regulated by Conchas Lake, 45 mi upstream (station 07223500) and Ute Reservoir, 2 mi upstream (station 07226800). Diversions for irrigation of about 90,000 acres upstream from station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--15 years (water years 1909, 1912-13, 1927-38), prior to completion of Conchas dam, 392 ft<sup>3</sup>/s (284,000 acre-ft/yr); 24 years (water years 1939-62) prior to completion of Ute dam, 257 ft<sup>3</sup>/s (186,200 acre-ft/yr); 29 years (water years 1963-91), 36.0 ft<sup>3</sup>/s (26,080 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD (SINCE 1925).--Maximum discharge 219,000 ft<sup>3</sup>/s Sept. 22, 1941 (gage height, 29.3 ft, from floodmarks), from rating curve extended above 75,000 ft<sup>3</sup>/s; no flow at times prior to completion of Ute dam.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 278,000 ft<sup>3</sup>/s Sept. 30, 1904 (gage height, about 36.5 ft, site and datum used in 1909), from rating curve extended above 14,000 ft<sup>3</sup>/s, from Ninth Biennial Report of New Mexico State Engineer.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,010 ft<sup>3</sup>/s Sept. 12 (gage height, 5.73 ft); minimum daily, 1.4 ft<sup>3</sup>/s May 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	4.2	4.9	3.8	4.0	15	2.4	2.5	4.6	3.5	3.7	4.5
2	3.9	4.3	4.8	3.8	4.1	5.2	3.4	2.9	3.1	3.5	3.7	4.5
3	2.7	5.3	3.4	3.8	4.1	5.4	3.8	2.9	3.1	3.7	3.8	4.5
4	3.7	4.4	3.7	3.9	3.9	5.9	3.6	3.1	3.3	3.7	3.8	4.6
5	4.8	4.7	3.6	3.9	3.9	30	3.6	3.2	3.5	3.4	3.4	4.6
6	4.4	4.7	3.5	3.8	3.9	6.5	3.7	3.3	3.7	3.3	3.4	4.7
7	4.3	4.7	3.7	3.9	3.9	5.3	3.8	3.2	3.9	3.3	3.5	4.5
8	4.2	4.7	3.8	3.9	3.9	4.8	3.9	3.3	3.8	3.4	3.5	4.6
9	4.0	4.4	3.8	4.0	3.9	4.2	4.0	3.5	3.7	3.3	3.8	4.7
10	4.0	4.3	3.8	4.2	3.8	4.5	4.0	3.5	3.7	3.4	3.8	103
11	3.9	4.2	3.8	4.0	3.8	5.5	3.9	3.5	3.7	3.6	3.8	489
12	3.8	4.1	3.8	4.0	3.7	8.8	4.2	3.5	3.6	3.8	4.0	866
13	3.8	4.0	3.8	4.0	3.2	4.2	4.3	3.5	3.5	4.3	4.5	421
14	3.8	4.0	4.2	4.3	3.6	4.0	4.1	3.5	3.4	5.1	4.2	327
15	3.8	3.9	3.9	4.3	3.9	3.8	4.0	3.3	3.4	6.9	4.1	101
16	3.7	3.8	3.8	4.0	4.1	3.9	4.0	3.4	3.5	4.4	4.0	217
17	3.7	3.8	3.8	4.0	4.6	4.1	4.1	3.5	3.5	3.8	3.9	401
18	3.7	3.8	3.8	4.0	4.8	4.0	4.2	3.5	3.6	3.6	4.6	351
19	3.8	3.8	3.8	4.2	4.9	4.4	4.2	3.6	3.5	3.6	5.2	348
20	3.7	3.8	4.0	4.0	5.1	5.6	4.2	3.6	3.4	3.6	4.2	347
21	3.8	3.9	4.1	4.1	5.4	5.5	4.3	7.0	3.3	3.6	4.4	364
22	3.8	4.2	4.0	4.2	5.8	7.1	4.4	5.2	3.2	3.6	4.4	350
23	3.8	4.1	4.0	4.0	6.1	5.2	4.4	1.8	3.2	3.4	4.4	346
24	3.8	4.1	4.0	4.1	6.4	5.2	4.4	1.4	3.4	3.5	4.5	348
25	3.9	4.3	4.1	4.0	6.6	5.5	4.6	1.9	3.4	3.5	4.5	346
26	4.0	4.5	4.2	4.2	6.9	18	12	2.2	3.3	3.7	4.5	345
27	3.9	6.2	4.3	4.2	7.1	16	3.8	2.3	3.4	3.8	4.5	345
28	4.0	5.0	4.1	4.1	7.6	4.1	2.3	2.9	3.6	3.6	4.5	346
29	4.3	5.0	3.9	3.9	---	2.8	2.3	3.4	4.1	3.7	4.5	346
30	4.1	4.7	3.8	4.2	---	2.8	2.2	3.1	3.4	3.8	4.6	347
31	4.2	---	3.8	4.1	---	2.2	---	3.1	---	3.8	4.8	---
TOTAL	121.1	130.9	122.0	124.9	133.0	209.5	122.1	100.6	105.8	117.2	128.5	7495.2
MEAN	3.91	4.36	3.94	4.03	4.75	6.76	4.07	3.25	3.53	3.78	4.15	250
MAX	4.8	6.2	4.9	4.3	7.6	30	12	7.0	4.6	6.9	5.2	866
MIN	2.7	3.8	3.4	3.8	3.2	2.2	2.2	1.4	3.1	3.3	3.4	4.5
AC-FT	240	260	242	248	264	416	242	200	210	232	255	14870
CAL YR 1990	TOTAL	1525.6	MEAN	4.18	MAX	7.4	MIN	2.7	AC-FT	3030		
WTR YR 1991	TOTAL	8910.8	MEAN	24.4	MAX	866	MIN	1.4	AC-FT	17670		

07227100 REVUELTO CREEK NEAR LOGAN, NM

LOCATION.--Lat 35°20'29", long 103°23'37", in SW1/4NW1/4 sec.24, T.13 N., R.33 E., Quay County, Hydrologic Unit 11080008, on right bank 0.3 mi upstream from bridge on State Highway 39, 1.9 mi southeast of Logan, and at mile 2.3.

DRAINAGE AREA.--786 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,660 ft above National Geodetic Vertical Datum of 1929, from topographic map. Prior to Jan. 16, 1981, at site 320 ft upstream at datum 0.56 ft higher.

REMARKS.--Records poor. Low flows supplemented by surface- and ground-water return from irrigation in the vicinity of Tucumcari. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years, 45.1 ft<sup>3</sup>/s (32,670 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,700 ft<sup>3</sup>/s July 9, 1960 (gage height, 14.3 ft, site and datum then in use); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD (1941-47).--Maximum discharge determined, about 13,400 ft<sup>3</sup>/s Sept. 18, 1946, (gage height, 9.04 ft), at site 180 ft downstream at different datum from unpublished records collected by U.S. Bureau of Reclamation.

A peak discharge of 26,100 ft<sup>3</sup>/s, date unknown (gage height, 12.9 ft), at former site and datum, was measured by slope-area method in May 1957.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 22	0030	*10,100	*9.60	Aug. 13	0400	5,220	7.11
July 14	2245	5,770	7.43	Aug. 19	0200	4,730	6.81

Minimum discharge, no flow at times.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	141	4.2	1.4	e.00	2.4	.98	26	5.4	186	8.7	1.1	7.1
2	76	3.7	1.3	e.50	2.0	.81	11	9.2	32	7.1	1.1	6.7
3	37	180	1.1	e2.0	1.9	.74	6.5	8.0	3.6	138	13	5.6
4	19	86	.90	e3.0	1.9	.77	5.1	6.5	1.6	15	25	5.2
5	11	58	2.6	e4.0	2.0	.62	3.7	7.4	.90	e2.0	430	4.9
6	8.6	45	2.4	e5.0	2.4	.38	2.5	9.6	118	e.00	63	98
7	5.0	53	1.8	e6.0	2.5	.29	1.6	8.6	253	e.00	71	182
8	3.3	42	2.5	7.1	2.7	.29	1.1	7.5	57	.00	112	37
9	3.3	29	2.6	4.3	2.4	.42	.78	6.0	21	e.00	54	25
10	3.4	17	2.5	4.2	2.0	.49	.45	7.7	54	e.00	479	764
11	3.7	7.5	2.4	7.2	2.1	.41	.25	7.5	190	e.00	747	1120
12	2.8	4.1	2.2	6.5	2.0	.27	.93	5.4	66	4.2	221	265
13	2.8	2.5	2.1	6.0	1.7	.26	5.3	4.5	43	45	1260	98
14	4.8	1.6	2.3	18	1.6	.27	8.0	4.4	21	1780	1340	25
15	3.6	1.0	1.9	130	1.5	.36	4.3	4.5	10	3080	272	8.2
16	4.2	.85	2.8	37	1.4	.61	5.3	4.1	8.8	1060	96	3.4
17	2.7	.77	4.3	7.4	1.1	.73	6.2	7.4	7.6	380	49	1.7
18	5.1	1.0	2.7	4.3	1.0	.67	6.3	8.0	8.5	141	63	.93
19	8.6	1.1	2.0	2.5	.99	.56	8.4	8.5	5.1	68	843	.61
20	9.8	1.2	e1.3	1.9	1.2	.34	6.7	8.7	3.9	34	299	.55
21	6.6	1.1	e.75	1.4	1.2	.26	5.4	1030	3.1	25	566	.53
22	9.2	.82	e.00	1.8	1.1	.24	3.1	3530	2.6	18	162	e.00
23	11	.87	e.00	1.9	1.1	.24	4.2	1010	2.6	9.3	61	e.00
24	12	.92	e.00	1.5	1.0	.25	6.5	349	1.6	6.9	32	e.00
25	11	.97	e.00	1.3	.99	.25	5.4	71	2.3	10	27	e.00
26	11	.83	e.00	1.7	1.0	.24	5.4	14	1.2	7.1	21	e.00
27	11	.65	e.00	2.1	1.1	.24	4.0	5.4	1.2	59	15	e.00
28	8.0	.64	e.00	1.7	1.0	9.9	4.1	55	2.3	25	11	e.08
29	6.2	1.1	e.00	1.7	---	136	4.5	70	52	5.5	9.6	2.0
30	6.1	1.2	e.00	1.8	---	317	5.0	7.9	17	2.6	8.3	2.4
31	4.9	---	e.00	2.4	---	103	---	2.6	---	1.6	8.0	---
TOTAL	452.7	548.62	43.85	276.20	45.28	577.89	158.01	6283.8	1176.90	6933.00	7360.1	2663.90
MEAN	14.6	18.3	1.41	8.91	1.62	18.6	5.27	203	39.2	224	237	88.8
MAX	141	180	4.3	130	2.7	317	26	3530	253	3080	1340	1120
MIN	2.7	.64	.00	.00	.99	.24	.25	2.6	.90	.00	1.1	.00
AC-FT	898	1090	87	548	90	1150	313	12460	2330	13750	14600	5280
CAL YR 1990	TOTAL	10464.29	MEAN	28.7	MAX	1200	MIN	.00	AC-FT	20760		
WTR YR 1991	TOTAL	26520.25	MEAN	72.7	MAX	3530	MIN	.00	AC-FT	52600		

e Estimated





ARKANSAS RIVER BASIN

07227500 CANADIAN RIVER NEAR AMARILLO, TX

LOCATION.--Lat 35°28'13", long 101°52'45", Potter County, Hydrologic Unit 11090105, on left bank at downstream side of southbound lane of bridge on U.S. Highways 87 and 287, 1,500 ft downstream from Pitcher Creek, 1.4 mi downstream from East Amarillo Creek, 1.7 mi downstream from Panhandle and Santa Fe Railway Co. bridge, 19 mi north of Amarillo, and 537.7 mi upstream from mouth.

DRAINAGE AREA.--19,445 mi<sup>2</sup>, of which 4,069 mi<sup>2</sup> probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1924 to December 1925, January 1938 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,989.16 ft above National Geodetic Vertical Datum of 1929. Jan. 16, 1924, to Dec. 31, 1925, and Apr. 3 to June 1, 1938, nonrecording gage at site of old bridge 20 ft upstream at same datum. June 2 to Dec. 5, 1938, nonrecording gage at present site and datum.

REMARKS.--Records good except those for periods of estimated daily discharges which are poor. There is some regulation by Conchas and Ute Reservoirs in New Mexico, total capacity 439,000 acre-feet. Conchas and Bell Ranch Canals divert water from Conchas Reservoir upstream for irrigation.

AVERAGE DISCHARGE.--54 years (water years 1925, 1939-91), 303 ft<sup>3</sup>/s (219,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 135,000 ft<sup>3</sup>/s July 25, 1941 (gage height, 15.7 ft), from rating curve extended above 100,000 ft<sup>3</sup>/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1914 reached a stage of 24 ft; a higher stage probably occurred during a flood in October 1904, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 14,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Aug. 20	0650	*6,280	*5.46				

Minimum discharge, 0.03 ft<sup>3</sup>/s July 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	476	22	26	35	53	16	30	2.5	664	1.6	74	106
2	242	22	26	34	43	15	111	2.6	440	1.5	67	30
3	264	68	26	e30	43	15	96	2.7	264	1.9	97	23
4	210	283	25	e24	40	16	65	2.3	126	1.6	341	50
5	181	163	26	e32	37	15	42	2.2	168	.36	197	26
6	118	102	26	e23	33	12	43	2.6	105	.37	106	54
7	100	139	25	e35	32	13	22	2.5	246	.27	118	80
8	90	136	25	47	30	15	15	2.8	607	.22	148	29
9	102	131	24	e40	29	15	16	2.7	440	.11	499	19
10	84	123	23	e30	29	15	16	2.1	489	.05	278	39
11	69	92	24	e43	27	13	12	1.6	1220	1.5	537	199
12	53	85	25	47	24	11	5.2	1.2	227	1.2	985	1100
13	44	82	25	54	23	11	4.9	.98	115	4.1	1830	756
14	37	78	26	108	22	11	6.6	1.3	52	21	1520	442
15	26	72	24	127	21	11	5.6	.33	40	1320	1640	284
16	28	72	27	160	20	12	5.0	.38	34	3590	1250	169
17	23	73	30	167	20	12	4.8	.30	23	2230	782	114
18	24	66	34	144	19	12	4.9	.25	16	1130	494	80
19	21	63	37	170	18	13	4.8	.20	64	702	877	46
20	18	60	34	158	19	12	4.7	.17	222	461	2600	451
21	16	50	e25	124	19	9.9	3.9	.32	363	345	1130	317
22	17	44	e20	100	20	8.3	2.6	693	150	436	803	218
23	16	41	e18	83	18	8.2	3.2	2650	83	236	731	197
24	15	39	e22	73	17	8.1	2.9	821	36	216	523	191
25	14	37	26	65	16	7.2	2.6	693	17	190	409	189
26	13	35	21	61	16	7.1	2.2	258	10	198	287	193
27	12	32	19	61	16	5.8	2.3	205	6.4	759	221	207
28	13	30	23	53	16	6.2	2.7	111	3.9	274	146	209
29	17	29	42	54	---	9.1	2.6	530	2.7	179	97	203
30	23	28	e44	58	---	9.5	2.4	626	1.9	122	77	196
31	25	---	46	69	---	12	---	215	---	90	147	---
TOTAL	2391	2297	844	2309	720	356.4	541.9	6834.03	6235.9	12513.78	19011	6217
MEAN	77.1	76.6	27.2	74.5	25.7	11.5	18.1	220	208	404	613	207
MAX	476	283	46	170	53	16	111	2650	1220	3590	2600	1100
MIN	12	22	18	23	16	5.8	2.2	.17	1.9	.05	67	19
AC-FT	4740	4560	1670	4580	1430	707	1070	13560	12370	24820	37710	12330
CAL YR 1990	TOTAL	27490.54	MEAN	75.3	MAX	6800	MIN	.00	AC-FT	54530		
WTR YR 1991	TOTAL	60271.01	MEAN	165	MAX	3590	MIN	.05	AC-FT	119500		

e Estimated

07227500 CANADIAN RIVER NEAR AMARILLO, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: July 1948 to October 1949, February 1950 to current year. Chemical and biochemical analyses: March 1968 to current year. Pesticide analyses: March 1968 to June 1981.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1950 to current year.

WATER TEMPERATURE: August 1949 to current year.

SUSPENDED SEDIMENT DISCHARGE: August 1949 to September 1952.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 9,180 microsiemens June 8, 1990; minimum daily, 346 microsiemens Oct. 29, 1964.

WATER TEMPERATURE (1949-76, 1988 to current year): Maximum daily, 39.0°C July 7, 1973; minimum daily, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,300 microsiemens July 11; minimum daily, 420 microsiemens Aug. 20.

WATER TEMPERATURE; Maximum daily, 24.0°C July 21, 23, 26; minimum daily, 0.0°C on several days during December.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN DEMAND, (PER-CENT SATUR-ATION)	OXYGEN BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV	06...	127	2800	8.3	6.5	13.3	122	1.5	400	230	93	40
JAN	16...	146	4280	8.1	0.5	13.6	106	0.2	480	250	110	49
MAR	19...	17	4860	8.0	14.5	8.9	100	1.4	580	390	120	67
MAY	08...	3.5	5210	8.2	10.5	8.9	90	1.7	770	580	180	77
JUL	16...	3590	723	7.8	25.5	6.8	92	3.2	40	0	9.8	3.7
AUG	13...	1340	522	8.5	22.5	7.7	99	0.5	25	0	5.9	2.5

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
NOV	470	10	5.0	170	340	650	0.30	9.5	1710	0.210	0.090	0.300
JAN	700	14	5.5	220	400	990	0.40	11	2400	0.660	0.040	0.700
MAR	800	15	6.6	190	600	1200	0.70	17	2930	--	<0.010	<0.050
MAY	850	13	8.6	190	690	1200	0.80	17	3140	0.560	0.150	0.710
JUL	130	9	2.5	110	80	99	0.50	8.4	398	0.500	0.020	0.520
AUG	95	8	2.1	96	60	62	0.40	8.2	294	--	<0.010	0.470

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
NOV	0.070	0.23	0.30	0.260	0.030	3	300	--	<1.0	<1	--	5
JAN	0.220	0.28	0.50	0.240	0.230	--	--	--	--	--	--	--
MAR	<0.010	--	0.40	<0.010	<0.010	--	--	--	--	--	--	--
MAY	0.040	0.86	0.90	0.730	0.690	--	--	--	--	--	--	--
JUL	0.120	0.28	0.40	15.0	<0.010	9	62	<0.5	1.0	<5	<3	<10
AUG	<0.010	--	1.1	9.80	<0.010	--	--	--	--	--	--	--

## ARKANSAS RIVER BASIN

07227500 CANADIAN RIVER NEAR AMARILLO, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 06...	60	<1	--	40	<0.1	--	--	<1	<1.0	--	--	<10
JAN 16...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 19...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 08...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	150	<10	17	5	0.3	<10	10	<1	<1.0	240	39	9
AUG 13...	--	--	--	--	--	--	--	--	--	--	--	--

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	2391	2040	1210	7820	410	2650	260	1690	300
NOV. 1990	2297	3160	1880	11700	690	4260	400	2510	450
DEC. 1990	844	4520	2700	6160	1100	2440	580	1310	620
JAN. 1991	2309	3790	2260	14100	860	5330	480	3020	530
FEB. 1991	720	4660	2790	5420	1100	2170	590	1150	630
MAR. 1991	356.4	5390	3230	3110	1400	1310	690	661	710
APR. 1991	541.9	4430	2650	3880	1100	1550	570	828	600
MAY 1991	6834.03	1970	1170	21600	390	7150	250	4660	290
JUNE 1991	6235.9	1340	795	13400	250	4210	170	2910	200
JULY 1991	12513.78	1070	630	21300	190	6480	140	4630	160
AUG. 1991	19011	1070	636	32600	200	10200	140	7090	160
SEPT 1991	6217	1550	917	15400	290	4880	200	3340	230
TOTAL	60271.01	**	**	156000	**	52600	**	33800	**
WTD.AVG.	165	1620	961	**	320	**	210	**	240



ARKANSAS RIVER BASIN

07227500 CANADIAN RIVER NEAR AMARILLO, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1640	4370	4730	4590	4120	5060	4890	6820	1360	4430	4240	3090
2	1130	4370	4670	4690	4540	5310	4970	5780	890	4130	4370	3360
3	1160	4070	4660	5060	4430	5200	4460	6180	850	4590	4690	3290
4	1360	1980	4640	4780	4450	5140	3600	6590	1410	2380	2260	3640
5	1450	1390	4600	4740	4350	5170	3050	6630	2230	4160	1270	2820
6	1710	2300	4600	4230	4490	5430	3150	6500	3430	e3800	2210	2800
7	1960	3380	4700	3960	4510	5440	3500	5480	2360	e2000	3290	2540
8	2340	3970	4480	3440	4530	5260	3980	5610	1570	1790	2790	2420
9	2440	3440	4540	3790	4880	5190	4400	5120	1350	3440	2860	2530
10	2700	2180	4530	e3900	5080	5060	4800	5620	1440	5810	1340	2530
11	2750	2590	4470	e3800	4660	5340	5260	6290	560	7300	2010	2810
12	2980	3120	4510	4110	4660	5540	5590	4870	1050	4230	1900	1810
13	3110	3530	4500	4020	4620	5730	5710	5600	1390	2240	1010	900
14	3330	3330	4500	3830	4610	5690	5730	6590	1950	3100	780	940
15	3600	3370	4590	3830	5050	5620	5830	7010	2560	1670	790	1080
16	3490	3540	4350	3010	5100	5920	5990	6540	3290	850	740	1150
17	3600	3180	4830	2930	4780	5500	5880	5930	3390	640	660	1210
18	3480	3360	4370	3630	4870	4980	5810	5480	2960	790	740	1280
19	3800	3520	4160	3660	4930	4940	5710	5620	3040	830	630	1390
20	4070	3540	4230	4800	4900	5050	5640	5550	1620	900	420	1470
21	4300	3980	e4300	3420	4850	5220	5590	5570	1200	1000	600	1600
22	4040	4180	e4200	2770	4770	5530	5570	3540	1260	1160	710	1450
23	3940	4310	e4300	3090	4790	5690	5650	2290	2440	1150	910	1460
24	4130	4360	e4500	3330	4850	5720	5270	1310	2260	1640	1180	1480
25	4220	4390	e4700	3650	4860	5790	5980	1390	2640	1870	1050	e1480
26	4290	4440	e4900	4150	4870	5630	6570	1380	2860	1210	1210	e1490
27	4440	4550	5150	4030	4930	6010	5760	1200	3260	1100	1610	1500
28	4710	4600	3580	4270	4830	6090	6420	1480	4210	1950	1930	1500
29	4710	4640	4170	4650	---	5620	6470	1750	4520	2800	2300	1490
30	4040	4720	4790	4770	---	5740	6550	1070	5130	3160	2210	1500
31	4150	---	4820	4420	---	5330	---	1590	---	3410	2950	---
MEAN	3200	3620	4520	3980	4730	5450	5260	4590	2280	2570	1800	1930

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	10.0	4.0	3.0	11.0	7.0	13.0	7.0	17.0	20.0	22.0	22.0
2	20.0	14.0	2.0	2.0	9.0	8.0	10.0	12.0	19.0	21.0	22.0	22.0
3	17.0	8.0	5.0	1.0	10.0	3.0	10.0	11.0	18.0	20.0	22.0	22.0
4	16.0	4.0	7.0	1.0	12.0	15.0	12.0	10.0	19.0	20.0	22.0	21.0
5	18.0	4.0	2.0	4.0	13.0	10.0	12.0	9.0	21.0	21.0	21.0	21.0
6	21.0	7.0	3.0	1.0	10.0	9.0	12.0	11.0	19.0	e21.0	22.0	22.0
7	13.0	3.0	2.0	2.0	12.0	6.0	13.0	12.0	18.0	e21.0	22.0	22.0
8	15.0	4.0	5.0	3.0	14.0	8.0	12.0	12.0	20.0	21.0	22.0	22.0
9	13.0	6.0	13.0	2.0	10.0	6.0	10.0	12.0	20.0	21.0	20.0	22.0
10	15.0	7.0	10.0	e1.0	12.0	6.0	10.0	18.0	20.0	21.0	21.0	22.0
11	18.0	7.0	3.0	e1.0	7.0	8.0	13.0	19.0	19.0	21.0	22.0	22.0
12	16.0	8.0	4.0	4.0	15.0	5.0	11.0	20.0	20.0	20.0	21.0	21.0
13	18.0	6.0	6.0	5.0	7.0	4.0	9.0	15.0	19.0	20.0	20.0	21.0
14	21.0	9.0	5.0	3.0	15.0	5.0	9.0	16.0	19.0	20.0	21.0	22.0
15	20.0	10.0	3.0	5.0	14.0	5.0	9.0	18.0	19.0	21.0	19.0	21.0
16	20.0	7.0	6.0	4.0	5.0	7.0	9.0	13.0	20.0	22.0	20.0	20.0
17	20.0	5.0	7.0	6.0	7.0	4.0	10.0	14.0	20.0	22.0	21.0	20.0
18	9.0	5.0	4.0	4.0	6.0	6.0	12.0	17.0	20.0	23.0	21.0	19.0
19	10.0	7.0	4.0	3.0	6.0	14.0	13.0	17.0	19.0	22.0	22.0	19.0
20	12.0	9.0	1.0	2.0	5.0	11.0	12.0	18.0	19.0	23.0	21.0	19.0
21	8.0	10.0	.0	5.0	14.0	8.0	10.0	19.0	20.0	24.0	22.0	19.0
22	12.0	6.0	.0	5.0	5.0	5.0	10.0	16.0	21.0	23.0	22.0	18.0
23	9.0	5.0	.0	6.0	7.0	6.0	12.0	19.0	22.0	24.0	21.0	18.0
24	8.0	5.0	.0	6.0	12.0	5.0	13.0	18.0	20.0	22.0	22.0	19.0
25	11.0	5.0	.0	4.0	14.0	10.0	14.0	20.0	21.0	22.0	22.0	e19.0
26	11.0	7.0	.0	3.0	5.0	9.0	11.0	20.0	20.0	24.0	22.0	e20.0
27	10.0	5.0	.0	6.0	5.0	6.0	9.0	19.0	20.0	23.0	22.0	20.0
28	8.0	10.0	6.0	7.0	7.0	10.0	10.0	19.0	20.0	22.0	23.0	19.0
29	10.0	3.0	1.0	2.0	---	7.0	9.0	19.0	21.0	22.0	22.0	19.0
30	11.0	3.0	1.0	3.0	---	5.0	8.0	20.0	20.0	21.0	22.0	19.0
31	9.0	---	3.0	3.0	---	4.0	---	17.0	---	22.0	23.0	---
MEAN	14.1	6.6	3.5	3.5	9.6	7.2	10.9	15.7	19.7	21.6	21.5	20.4

e Estimated

## ARKANSAS RIVER BASIN

07228000 CANADIAN RIVER NEAR CANADIAN, TX  
(National stream-quality accounting network)

LOCATION.--Lat 35°56'06", long 100°22'13", Hemphill County, Hydrologic Unit 11090106, on left abutment at downstream side of upstream bridge on U.S. Highways 60 and 83, 600 ft downstream from Panhandle and Santa Fe Railway Co. bridge, 1.2 mi downstream from Red Deer Creek, 1.6 mi northeast of Canadian, and 433.9 mi upstream from mouth.

DRAINAGE AREA.--22,866 mi<sup>2</sup>, of which 4,688 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to August 1925 (gage heights only), January 1938 to current year. Prior to April 1938, monthly discharges only, published in WSP 1311.

REVISED RECORDS.--WSP 1341: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2,301.50 ft above National Geodetic Vertical Datum of 1929. July 1, 1924, to Aug. 31, 1925, and Apr. 21 to Dec. 15, 1938, nonrecording gage; Dec. 16, 1938, to Sept. 30, 1953, water-stage recorder and nonrecording gages; all at site 300 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Extreme low flow is maintained by springs that enter river about 600 ft upstream from the gage. There is some regulation and diversions from Lake Meredith (07227900) 75 mi upstream. Gage-height telemeter at station via Sutron data collection platform.

AVERAGE DISCHARGE.--26 years (water years 1939-64) prior to completion of Lake Meredith, 549 ft<sup>3</sup>/s (397,800 acre-ft/yr); 27 years (water years 1965-91) regulated, 86.8 ft<sup>3</sup>/s (62,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 122,000 ft<sup>3</sup>/s Sept. 23, 1941 (gage height, 9.8 ft), from graph based on gage readings, and from rating curves for two channels extended above 8,000 and 54,000 ft<sup>3</sup>/s; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage, 20.0 ft Oct. 2, 1904. Floods of May 2, 1914, and Oct. 5, 1923, reached stages of 12 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,160 ft<sup>3</sup>/s June 23 at 0600 hours (gage height, 5.07 ft); minimum, 9.1 ft<sup>3</sup>/s July 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	26	31	e37	66	48	59	29	113	21	21	21
2	25	25	32	39	59	46	55	33	298	20	19	25
3	30	28	29	e35	60	48	53	42	241	27	16	25
4	28	32	29	e32	61	48	53	35	193	24	15	36
5	24	33	30	e32	58	48	51	31	161	19	16	30
6	21	33	30	e35	57	45	48	30	417	15	14	33
7	19	32	31	e34	56	45	47	28	270	14	12	38
8	20	36	33	e44	58	45	46	33	301	12	11	37
9	25	36	33	e50	57	47	43	33	271	11	11	33
10	24	36	33	47	56	46	40	32	175	9.9	11	31
11	23	35	35	75	55	48	39	55	245	11	10	29
12	22	34	36	67	55	47	38	51	318	21	11	26
13	22	33	36	62	53	45	37	41	217	61	13	26
14	21	33	37	59	51	47	38	42	125	81	17	25
15	20	33	35	62	50	47	36	38	88	125	18	23
16	20	31	38	62	51	51	35	32	91	121	34	22
17	19	31	42	62	54	60	35	27	66	110	54	21
18	18	32	43	63	51	58	35	26	58	76	54	21
19	18	32	44	61	50	57	36	24	50	60	46	20
20	19	34	42	62	50	57	39	23	46	52	40	19
21	19	32	e35	61	51	53	41	22	50	43	36	20
22	20	31	e28	62	51	54	41	40	441	36	31	19
23	20	31	e24	60	50	51	39	48	668	32	28	18
24	21	32	e22	62	47	49	40	94	232	38	25	17
25	21	33	e20	58	46	47	41	134	121	38	22	16
26	22	34	e20	56	46	46	39	103	68	33	20	15
27	22	32	e27	58	48	43	34	68	43	32	18	13
28	22	30	e29	56	48	46	33	47	31	37	17	13
29	22	30	e33	52	---	68	30	47	25	33	16	12
30	23	31	e27	57	---	64	30	65	23	29	15	11
31	25	---	e24	63	---	64	---	93	---	24	20	---
TOTAL	679	961	988	1665	1495	1568	1231	1446	5446	1265.9	691	695
MEAN	21.9	32.0	31.9	53.7	53.4	50.6	41.0	46.6	182	40.8	22.3	23.2
MAX	30	36	44	75	66	68	59	134	668	125	54	38
MIN	18	25	20	32	46	43	30	22	23	9.9	10	11
AC-FT	1350	1910	1960	3300	2970	3110	2440	2870	10800	2510	1370	1380
CAL YR 1990	TOTAL	21581.19	MEAN	59.1	MAX	362	MIN	.08	AC-FT	42810		
WTR YR 1991	TOTAL	18130.9	MEAN	49.7	MAX	668	MIN	9.9	AC-FT	35960		

e Estimated

ARKANSAS RIVER BASIN

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07228000 CANADIAN RIVER NEAR CANADIAN, TX--Continued  
(National stream-quality accounting network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: August 1966 to current year. Pesticide analyses: October 1970 to June 1982.

PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: October 1974 to September 1981.  
WATER TEMPERATURE: October 1974 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: Maximum daily, 4,480 microsiemens Aug. 12, 1979; minimum daily, 461 microsiemens Sept. 8, 1980.  
WATER TEMPERATURE: Maximum daily, 39.0°C June 28, 1979; minimum daily, 0.0°C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)
NOV 07...	1200	35	2610	8.1	5.5	2.4	14.1	123	0.7	100	120	470
JAN 16...	1430	72	2810	8.3	8.0	4.8	16.8	155	0.1	K31	130	460
MAR 20...	1045	57	2910	8.1	11.0	10	9.9	100	2.3	100	120	470
MAY 07...	1240	36	2860	8.2	15.0	0.50	9.1	99	0.9	88	K45	480
JUL 16...	0915	97	2170	8.1	25.0	10	6.8	89	1.2	210	330	410
AUG 13...	1145	5.7	3510	8.2	24.0	3.0	7.6	99	1.1	300	240	550

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
NOV 07...	380	110	47	380	8	6.0	0	114	236	190	640
JAN 16...	230	110	46	350	7	6.5	0	289	237	190	600
MAR 20...	260	100	52	410	8	6.9	0	251	206	260	710
MAY 07...	290	100	55	430	9	6.6	0	234	192	210	700
JUL 16...	220	98	39	290	6	8.6	0	221	181	230	460
AUG 13...	400	120	61	530	10	11	0	192	158	330	830

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
NOV 07...	2.7	21	1480	1460	--	--	<0.010	0.010	<0.100	<0.100	0.010
JAN 16...	3.1	22	1460	1470	0.470	0.470	0.030	0.030	0.500	0.500	0.180
MAR 20...	3.8	12	1600	1680	--	--	<0.010	<0.010	<0.050	<0.050	0.010
MAY 07...	2.4	9.5	1710	1630	--	--	0.010	<0.010	<0.050	<0.050	0.010
JUL 16...	2.8	15	1250	1250	--	--	<0.010	<0.010	<0.050	<0.050	0.090
AUG 13...	4.1	7.7	2090	1990	--	--	<0.010	<0.010	<0.050	<0.050	<0.010

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P04)	SEDI-MENT, SUS-PENDED (MG/L)
NOV 07...	<0.010	0.19	--	--	0.20	0.020	0.020	<0.010	0.010	--	11
JAN 16...	0.160	0.42	--	--	0.60	0.020	0.020	0.030	0.030	0.09	22
MAR 20...	0.020	0.59	--	--	0.60	0.020	0.030	<0.010	<0.010	--	149
MAY 07...	<0.010	0.29	--	--	0.30	0.010	0.010	<0.010	<0.010	--	24
JUL 16...	0.020	0.91	0.48	0.50	1.0	0.020	0.010	<0.010	<0.010	--	93
AUG 13...	<0.010	--	--	0.40	0.50	0.030	0.010	<0.010	<0.010	--	27

## ARKANSAS RIVER BASIN

07228000 CANADIAN RIVER NEAR CANADIAN, TX--Continued  
(National stream-quality accounting network)

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SEDI- MENT, DIS- CHARGE, SUS- PEN- DED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
NOV 07...	1.0	56	<10	2	500	<10	<1.0	<1	<1	2	40
JAN 16...	4.3	86	--	--	--	--	--	--	--	--	--
MAR 20...	23	20	<10	<1	500	<10	<1.0	<1	<1	2	20
MAY 07...	2.3	60	<10	1	200	<10	<1.0	2	1	14	<10
JUL 16...	24	92	--	--	--	--	--	--	--	--	--
AUG 13...	0.42	73	<10	2	100	<10	<1.0	<1	<1	2	10

DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 07...	1	80	30	<0.1	1	2	<1	<1.0	1800	12	<10
JAN 16...	--	--	--	--	--	--	--	--	--	--	--
MAR 20...	<1	100	10	<0.1	5	4	1	<1.0	2000	13	<10
MAY 07...	<1	80	20	0.2	4	1	<1	<1.0	2000	16	<10
JUL 16...	--	--	--	--	--	--	--	--	--	--	--
AUG 13...	<1	100	10	0.1	4	3	<1	<1.0	2600	19	<10



ARKANSAS RIVER BASIN

07235000 WOLF CREEK AT LIPSCOMB, TX

LOCATION.--Lat 36°14'19", Long 100°16'31", Lipscomb County, Hydrologic Unit 11100203, on right bank at downstream side of State Highway 305, 0.3 mi north of Lipscomb, 0.6 mi downstream from Sand Creek, 2 mi upstream from Plum Creek, and 61.2 mi upstream from mouth.

DRAINAGE AREA.--697 mi<sup>2</sup>, of which 222 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--October 1937 to September 1942, October 1961 to current year. Prior to 1941, monthly discharges only, published in WSP 1311.  
Water-quality records.--Chemical and biochemical analyses: May 1980.

REVISED RECORDS.--WSP 1311: 1938-39, drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 2,371.29 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 25, 1938, nonrecording gage, Feb. 25, 1938, to Sept. 30, 1942, water-stage recorder at present site at datum 5.77 ft higher.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. There are small diversions upstream from station for irrigation and recreation.

AVERAGE DISCHARGE.--35 years (water years 1938-42, 1962-91), 13.2 ft<sup>3</sup>/s (0.38 in/yr), 9,560 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,000 ft<sup>3</sup>/s Oct. 21, 1941 (gage height, 11.57 ft, present datum), from rating curve extended above 14,000 ft<sup>3</sup>/s on basis of velocity-area studies; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1890, 15.5 ft June 23, 1957, present site and datum, from flood-marks. A flood in May 1955 reached a stage of 12.1 ft, present site and datum, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 1	2400	*7.0	*2.83				

Minimum discharge, 0.20 ft<sup>3</sup>/s July 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	.62	1.3	e1.6	e2.2	2.7	2.7	1.7	4.4	.69	.45	.51
2	.68	.62	1.4	e1.7	2.7	2.6	2.5	1.9	6.3	.70	.34	.50
3	.81	.66	1.4	e1.8	2.8	2.6	2.4	2.5	5.7	.99	.41	.45
4	.78	.83	1.3	1.9	2.7	2.7	2.4	2.4	4.8	.85	.43	.47
5	.68	.94	1.3	1.8	2.8	2.6	2.6	2.3	4.1	.65	.40	.47
6	.62	.95	1.6	1.9	2.9	2.4	2.5	2.1	3.8	.51	.33	.49
7	.62	.85	1.5	1.9	2.9	2.4	2.5	2.0	3.6	.44	.33	.52
8	.62	1.0	1.5	2.0	2.9	2.4	2.5	2.2	3.6	.40	.32	.46
9	.62	1.1	1.5	2.1	2.7	2.4	2.6	2.1	3.2	.34	.35	.44
10	.62	1.1	1.7	2.4	2.7	2.4	2.5	2.1	3.1	.31	.37	.45
11	.62	1.1	1.9	2.5	2.7	2.4	2.5	2.5	3.4	.65	.35	.47
12	.62	1.0	2.0	2.6	2.8	2.5	2.4	2.6	3.4	.89	.40	.44
13	.62	1.0	1.8	2.5	2.9	2.5	2.3	2.4	3.3	.85	.56	.47
14	.62	1.1	1.9	2.6	2.9	2.5	2.3	2.0	3.0	1.0	.56	.50
15	.62	1.0	2.0	2.6	2.9	2.4	2.4	1.6	2.8	1.2	.50	.50
16	.62	.99	2.1	2.6	2.7	2.5	2.3	1.4	2.6	1.5	.45	.52
17	.62	.95	2.3	2.7	2.7	2.8	2.3	1.1	2.4	1.8	.40	.54
18	.62	.97	2.4	2.7	2.8	2.7	2.5	1.0	2.2	1.8	.38	.50
19	.62	.95	2.4	2.6	2.9	2.5	2.3	.92	2.0	1.6	.41	.50
20	.62	1.0	2.4	2.5	2.8	2.4	2.4	.76	2.0	1.4	.40	.52
21	.62	1.1	e1.8	2.5	2.9	2.3	2.5	.69	1.9	1.2	.39	.51
22	.62	1.0	e1.4	2.5	2.8	2.4	2.5	1.0	1.8	.99	.36	.47
23	.62	.99	e1.4	2.5	2.7	2.4	2.5	1.3	1.8	.88	.35	.47
24	.62	1.1	e1.4	2.5	2.6	2.4	2.5	2.3	1.7	.87	.32	.47
25	.62	1.2	e1.8	2.5	2.6	2.4	2.5	2.4	1.5	.86	.30	.43
26	.62	1.2	2.1	2.5	2.5	2.5	2.5	3.5	1.3	.81	.30	.42
27	.62	1.2	2.1	2.5	2.6	2.5	2.5	6.2	1.1	.78	.28	.44
28	.62	1.1	2.3	2.5	2.7	2.6	2.2	5.6	.98	.77	.26	.40
29	.62	1.2	2.5	2.5	---	3.0	1.8	4.2	.87	.85	.34	.40
30	.62	1.2	e1.7	e2.0	---	2.7	1.8	5.3	.76	.67	.33	.41
31	.62	---	e1.4	e2.0	---	2.7	---	4.4	---	.58	.43	---
TOTAL	19.69	30.02	55.6	71.5	76.8	78.3	72.2	74.47	83.41	27.83	11.80	14.14
MEAN	.64	1.00	1.79	2.31	2.74	2.53	2.41	2.40	2.78	.90	.38	.47
MAX	.81	1.2	2.5	2.7	2.9	3.0	2.7	6.2	6.3	1.8	.56	.54
MIN	.62	.62	1.3	1.6	2.2	2.3	1.8	.69	.76	.31	.26	.40
AC-FT	39	60	110	142	152	155	143	148	165	55	23	28
CFSM	.00	.00	.00	.00	.01	.01	.01	.01	.01	.00	.00	.00
IN.	.00	.00	.00	.01	.01	.01	.01	.01	.01	.00	.00	.00

CAL YR 1990	TOTAL	1208.89	MEAN	3.31	MAX	13	MIN	.61	AC-FT	2400	CFSM	.01	IN.	.09
WTR YR 1991	TOTAL	615.76	MEAN	1.69	MAX	6.3	MIN	.26	AC-FT	1220	CFSM	.00	IN.	.05

e Estimated

## RED RIVER BASIN

07297910 PRAIRIE DOG TOWN FORK RED RIVER NEAR WAYSIDE, TX  
(National stream-quality accounting network)

LOCATION.--Lat 34°50'15", long 101°24'49", Armstrong County, Hydrologic Unit 11120103, on left bank at downstream side of bridge on Farm Road 284, 13 mi northeast of Wayside, 26 mi south of Claude, and at mile 1,145.

DRAINAGE AREA.--4,211 mi<sup>2</sup>, of which 3,281 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,463.74 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. There are several small diversions upstream from station. Sewage effluent released into river above station by the city of Amarillo.

AVERAGE DISCHARGE.--24 years, 27.0 ft<sup>3</sup>/s (19,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,000 ft<sup>3</sup>/s Aug. 28, 1968 (gage height, 13.0 ft, from floodmark); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 25	0230	*3,100	*9.30				

Minimum discharge, 0.01 ft/s July 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	3.5	e4.5	e4.3	2.3	1.8	7.3	1.2	160	.52	.49	2.8
2	12	4.2	e5.2	4.7	2.2	1.6	6.4	1.4	30	.54	.42	1.7
3	6.9	4.6	6.9	e5.2	2.6	1.6	6.1	1.4	6.8	.58	.42	3.1
4	4.8	4.6	e6.4	4.9	2.4	1.7	4.7	1.1	3.5	.42	.55	97
5	3.4	4.5	6.0	e4.2	2.3	1.4	4.8	1.1	71	.38	5.5	5.2
6	2.7	4.2	e6.4	e3.9	2.3	1.3	3.8	.99	240	.32	1.1	25
7	2.2	4.7	10	3.4	2.3	1.4	3.2	23	22	.26	.47	129
8	3.7	6.1	e9.4	e3.4	2.3	1.5	2.9	9.5	27	.22	3.0	7.4
9	6.9	3.3	e7.3	3.4	2.1	1.5	3.3	2.5	12	.15	2.9	3.4
10	4.0	1.8	5.2	e3.4	2.1	1.5	3.3	2.3	5.0	.10	.85	2.6
11	3.5	1.5	e4.5	3.6	2.1	1.7	3.4	5.3	20	6.0	2.3	2.3
12	2.3	1.3	3.6	e3.6	2.1	1.5	3.0	12	4.4	74	1.1	1.9
13	2.0	1.1	e3.9	e3.4	1.8	2.0	3.5	3.2	2.5	236	1.1	2.7
14	1.5	.99	6.0	3.4	1.8	2.6	4.1	2.0	2.0	485	.62	2.4
15	1.5	2.6	e5.6	3.4	1.8	3.0	3.8	1.4	1.8	21	.40	2.2
16	1.3	4.7	e4.9	3.1	1.8	6.3	3.6	.86	1.7	9.4	.41	2.2
17	1.0	5.0	4.5	3.1	1.7	5.0	3.9	.74	1.9	5.7	23	3.1
18	.96	5.8	e3.9	3.0	1.7	4.0	4.8	.76	1.3	2.3	2.9	49
19	.99	5.9	3.6	3.0	1.7	4.0	4.7	.65	1.2	1.4	2.2	4.5
20	2.3	6.1	e3.4	2.5	1.8	4.2	5.0	.67	1.1	1.2	25	2.5
21	2.0	4.6	e3.2	2.5	1.9	4.3	4.5	.62	.94	1.1	18	1.6
22	4.5	4.1	e2.9	2.6	1.8	4.3	4.2	35	.95	.88	1.2	1.2
23	e4.2	4.5	e2.7	2.5	1.8	4.4	3.6	22	1.8	.88	.45	1.5
24	4.4	e4.5	e2.5	2.5	1.7	4.5	11	44	17	9.2	.28	1.5
25	e4.4	e4.5	e2.3	2.4	1.7	4.3	6.2	364	3.4	1.5	.20	1.7
26	4.5	4.9	e2.2	2.6	1.8	6.1	2.4	25	2.0	1.1	.16	1.4
27	e4.6	e4.9	e2.9	3.0	1.8	5.2	1.8	8.3	1.5	8.7	.12	1.3
28	e4.5	4.9	e4.6	2.6	1.9	7.8	1.5	3.9	.95	4.2	.09	1.1
29	4.3	e4.9	e4.9	2.2	---	20	1.3	4.3	.64	1.1	.07	1.1
30	3.2	4.5	e4.3	2.7	---	8.6	1.2	4.5	.54	.73	1.9	1.1
31	3.3	---	e4.0	2.4	---	8.2	---	1.6	---	.57	39	---
TOTAL	118.85	122.79	147.7	100.9	55.6	127.3	123.3	585.29	644.92	875.45	136.20	363.5
MEAN	3.83	4.09	4.76	3.25	1.99	4.11	4.11	18.9	21.5	28.2	4.39	12.1
MAX	12	6.1	10	5.2	2.6	20	11	364	240	485	39	129
MIN	.96	.99	2.2	2.2	1.7	1.3	1.2	.62	.54	.10	.07	1.1
AC-FT	236	244	293	200	110	252	245	1160	1280	1740	270	721
CAL YR 1990	TOTAL	4279.33	MEAN	11.7	MAX	897	MIN	.00	AC-FT	8490		
WTR YR 1991	TOTAL	3401.80	MEAN	9.32	MAX	485	MIN	.07	AC-FT	6750		

e Estimated

RED RIVER BASIN

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07297910 PRAIRIE DOG TOWN FORK RED RIVER NEAR WAYSIDE, TX--Continued  
(National stream-quality accounting network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year. Chemical and biochemical analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: October 1968 to September 1981.  
WATER TEMPERATURE: October 1968 to September 1981.

INSTRUMENTATION.--Specific conductance was recorded continuously at this station from April 1968 to September 1976.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: Maximum daily, 51,100 microsiemens July 30, 1978; minimum daily, 417 microsiemens July 10, 1975.  
WATER TEMPERATURE: Maximum daily, 38.0°C Oct. 14, 1968, June 13, 1975; minimum daily, 0.0°C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLL-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	
NOV 06...	1120	3.6	7230	8.3	9.5	2.4	12.0	119	0.8	100	42
JAN 15...	1530	3.5	8340	8.3	12.0	1.6	13.2	138	0.1	K12	K12
MAR 19...	1030	4.2	6510	8.1	10.0	2.9	9.7	97	1.9	K1000	62
MAY 08...	1120	9.1	4610	8.0	20.0	1300	8.1	98	2.0	>1200	490
JUL 16...	1800	7.8	8240	8.1	31.0	13	6.3	94	0.5	350	920
AUG 14...	0920	0.77	22800	8.2	23.0	8.5	7.8	107	0.1	820	220

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS SO4)
NOV 06...	1400	1300	410	96	1100	13	20	0	187	153	1200
JAN 15...	1500	1300	430	97	1300	15	23	0	171	140	1500
MAR 19...	1400	1200	400	95	970	11	19	0	194	159	--
MAY 08...	1200	1100	350	85	660	8	16	0	165	136	1500
JUL 16...	1200	1100	350	82	1300	16	21	0	185	151	1300
AUG 14...	2300	2100	620	170	4500	41	63	0	188	154	2400

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
NOV 06...	1700	1.0	20	4920	4650	--	<0.010	<0.010	<0.100	<0.100	0.030
JAN 15...	1800	0.70	17	5690	5250	--	<0.010	<0.010	<0.100	<0.100	0.030
MAR 19...	--	1.1	18	4610	--	--	<0.010	<0.010	<0.050	<0.050	0.030
MAY 08...	830	0.90	20	3440	3550	0.230	--	0.030	0.250	0.260	0.310
JUL 16...	1800	1.4	22	5070	4970	--	<0.010	<0.010	0.120	0.120	0.040
AUG 14...	6700	1.7	27	15200	14600	--	0.010	<0.010	<0.050	<0.050	0.050

## RED RIVER BASIN

07297910 PRAIRIE DOG TOWN FORK RED RIVER NEAR WAYSIDE, TX--Continued  
(National stream-quality accounting network)

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)
NOV 06...	0.030	0.27	--	0.30	0.230	0.210	0.240	0.240	0.74	19	0.18
JAN 15...	0.020	--	--	<0.20	0.050	0.050	0.050	0.060	0.15	13	0.12
MAR 19...	0.030	0.37	--	0.40	0.110	0.120	0.070	0.100	0.21	11	0.12
MAY 08...	0.090	2.5	--	2.8	2.10	0.050	0.030	0.930	0.09	2460	60
JUL 16...	0.060	0.26	<0.20	0.30	0.130	0.140	0.100	0.060	0.31	131	2.8
AUG 14...	0.060	--	<0.20	<0.20	0.020	0.010	<0.010	<0.010	--	43	0.09

DATE	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM- INIUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)
NOV 06...	48	10	5	100	<10	<2.0	<1	2	8	<10	<2
JAN 15...	50	--	--	--	--	--	--	--	--	--	--
MAR 19...	44	20	4	100	<10	<1.0	<1	<1	1	20	<1
MAY 08...	97	60	6	300	<10	<1.0	<1	<1	2	10	<1
JUL 16...	91	--	--	--	--	--	--	--	--	--	--
AUG 14...	90	110	8	200	<10	<5.0	3	<1	<5	30	<5

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 06...	130	150	0.1	8	<2	<1	<2.0	5600	36	<10
JAN 15...	--	--	--	--	--	--	--	--	--	--
MAR 19...	160	100	<0.1	8	2	<2	<1.0	7700	28	<10
MAY 08...	130	130	<0.1	6	2	<1	1.0	7200	22	<10
JUL 16...	--	--	--	--	--	--	--	--	--	--
AUG 14...	120	660	<0.1	5	<5	1	<1.0	11000	96	<10



RED RIVER BASIN

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07299540 PRAIRIE DOG TOWN FORK RED RIVER NEAR CHILDRESS, TX

LOCATION.--Lat 34°34'09", long 100°11'37", Childress County, Hydrologic Unit 11120105, on left bank at downstream side of bridge on U.S. Highways 62 and 83, 3.1 mi downstream from Salt Creek, 10.0 mi north of Childress, and at mile 1,061.

DRAINAGE AREA.--7,725 mi<sup>2</sup>, of which 4,769 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--December 1964 to March 1965 (gage heights only), April 1965 to current year.  
Water-quality records: September 1948 to April 1963, January 1969 to September 1986. Chemical and biochemical analyses: January 1978 to September 1986.

GAGE.--Water-stage recorder. Datum of gage is 1,628.4 ft above National Geodetic Vertical Datum of 1929 (from Texas State Department of Highways and Public Transportation bench mark).

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Many small diversions upstream from station. Flow is affected at times by discharge from the flood-detention pools of 23 floodwater-retarding structures with a combined detention capacity of 20,010 acre-ft. These structures control runoff from 95.2 mi<sup>2</sup> in the drainage basin above station.

AVERAGE DISCHARGE.--26 years (water years 1966-91), 113 ft<sup>3</sup>/s (81,870 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 86,400 ft<sup>3</sup>/s May 28, 1978 (gage height, 13.47 ft, from floodmark), from rating curve extended above 33,000 ft<sup>3</sup>/s; maximum gage height, 13.94 ft May 21, 1977; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1899, 16.9 ft in May or June 1957, from information by local residents and State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 7,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
July 15	unknown	*7,980	*a10.37	No other peak greater than base discharge.			
Minimum daily discharge, 0.20 ft <sup>3</sup> /s July 13.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	414	2.8	6.4	e11	12	8.3	5.3	4.3	400	e.55	6.1	12
2	199	2.9	6.9	e8.0	12	6.8	5.5	7.7	1120	e.52	2.8	27
3	165	26	7.0	e7.0	12	5.9	4.8	33	875	e.50	2.1	22
4	77	151	6.1	e6.6	14	5.7	4.8	12	373	e.48	2.3	641
5	69	53	5.8	e8.8	15	6.1	4.9	6.4	129	e.45	6.4	734
6	54	25	5.6	e10	19	5.4	4.9	5.1	1700	e.40	3.0	140
7	29	21	5.8	e11	14	5.4	4.8	45	3390	e.40	2.0	1360
8	37	117	6.1	e10	13	5.5	4.8	193	1380	e.38	1.2	463
9	41	83	7.0	e14	12	6.2	4.3	47	1020	e.35	1.9	143
10	30	63	7.7	e25	11	6.2	3.7	17	434	e.32	1.9	29
11	15	50	8.5	e22	11	6.2	3.9	13	409	e.30	1.6	11
12	12	37	9.4	e18	11	5.8	4.2	145	381	e.25	2.3	5.0
13	10	32	9.2	e15	10	5.0	4.1	271	363	e.20	39	3.1
14	7.2	23	10	e13	8.2	4.3	4.8	39	191	e4.1	32	2.4
15	6.3	18	10	e12	7.2	4.8	4.4	15	118	e1870	16	24
16	6.1	13	32	e11	7.7	7.3	3.2	11	82	e254	12	25
17	4.4	10	46	e11	8.8	9.9	3.4	7.2	70	e127	33	20
18	4.1	9.7	30	e20	8.1	7.4	3.6	6.1	60	e44	13	1650
19	4.1	10	16	e24	7.3	6.0	3.6	5.9	217	e14	22	1960
20	4.1	11	11	e20	6.7	6.2	3.4	5.9	70	5.3	17	297
21	3.9	12	e11	e18	7.3	6.0	3.4	5.8	11	1.8	7.0	74
22	3.4	9.8	e9.4	e17	8.2	5.5	4.4	24	6.8	.39	76	89
23	3.3	8.3	e7.0	17	8.2	4.8	4.4	1290	e5.2	.45	43	71
24	3.4	8.0	e7.5	16	7.6	4.8	7.3	2510	e1.4	1.4	13	73
25	3.1	8.4	8.8	15	7.3	4.8	9.7	3490	e1.2	71	5.8	53
26	3.0	8.5	9.1	14	6.8	5.2	5.5	622	e1.2	109	2.6	31
27	2.2	8.4	10	14	7.7	4.7	4.7	137	e.92	90	2.2	21
28	2.1	7.0	e16	14	8.0	4.9	4.1	75	e.67	186	1.6	16
29	2.6	6.5	e12	13	---	5.0	3.7	59	e.57	187	11	13
30	2.1	6.4	e17	11	---	5.1	4.0	607	e.57	65	7.7	12
31	2.6	---	e17	11	---	5.0	---	296	---	15	3.7	---
TOTAL	1220.0	841.7	371.3	437.4	281.1	180.2	137.6	10005.4	12811.53	3050.54	391.2	8021.5
MEAN	39.4	28.1	12.0	14.1	10.0	5.81	4.59	323	427	98.4	12.6	267
MAX	414	151	46	25	19	9.9	9.7	3490	3390	1870	76	1960
MIN	2.1	2.8	5.6	6.6	6.7	4.3	3.2	4.3	.57	.20	1.2	2.4
AC-FT	2420	1670	736	868	558	357	273	19850	25410	6050	776	15910
CAL YR 1990	TOTAL	23868.96	MEAN	65.4	MAX	5470	MIN	.14	AC-FT	47340		
WTR YR 1991	TOTAL	37749.47	MEAN	103	MAX	3490	MIN	.20	AC-FT	74880		

e Estimated

RED RIVER BASIN

07299670 GROESBECK CREEK AT STATE HIGHWAY 6 NEAR QUANAH, TX

LOCATION.--Lat 34°21'16", long 99°44'24", Hardeman County, Hydrologic Unit 11130101, near left bank at downstream side of bridge on State Highway 6, 2 mi downstream from confluence of North and South Groesbeck Creeks, 4 mi north of Quanah, and 9 mi upstream from mouth.

DRAINAGE AREA.--303 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1961 to current year. Prior to October 1974, published as "at State Highway 283".

GAGE.--Water-stage recorder. Datum of gage is 1,425.69 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. There are several diversions upstream from station for farm and ranch use and for a gypsum plant. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--29 years (water years 1963-91), 17.7 ft<sup>3</sup>/s (0.79 in/yr), 12,820 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,000 ft<sup>3</sup>/s Oct. 20, 1983 (gage height, 24.78 ft), from rating curve extended above 7,970 ft<sup>3</sup>/s; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--The highest stage known occurred in June 1891; and the highest stage since 1891 occurred in September 1929, stages unknown. Other large floods are reported to have occurred in 1912, 1936, 1946, 1951, 1955, and 1957, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 3	1030	*8,820	*21.24	Sept. 7	1250	3,390	17.38
July 27	1130	1,300	14.71	Sept. 19	0345	2,610	16.60

Minimum daily discharge, 6.8 ft<sup>3</sup>/s Dec. 24 (result of ice effect).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	12	11	9.7	9.7	11	9.7	8.6	8.6	9.8	19	17	19		
2	11	11	9.5	9.7	11	9.5	8.6	9.3	6680	19	16	16		
3	11	12	9.7	9.7	11	9.5	8.4	38	3650	18	15	15		
4	12	12	10	e9.4	11	9.3	8.8	22	866	18	15	15		
5	11	12	10	10	11	9.6	9.2	10	199	18	15	15		
6	10	11	10	10	11	9.1	9.9	9.2	110	17	14	14		
7	10	11	10	10	10	9.1	10	8.8	438	17	14	1520		
8	10	14	9.7	10	10	9.1	10	38	156	16	14	523		
9	10	16	10	11	10	9.0	11	25	59	16	16	218		
10	10	12	11	14	10	9.2	11	13	41	16	15	44		
11	10	11	11	12	10	9.2	11	10	35	16	14	23		
12	9.8	11	11	11	10	9.0	11	103	32	16	14	19		
13	9.7	11	10	10	10	9.2	9.7	116	29	15	15	19		
14	9.7	10	10	10	10	9.3	8.9	66	27	15	15	17		
15	10	11	9.8	10	10	9.4	8.6	18	26	20	14	17		
16	10	11	9.9	10	10	9.8	8.6	9.8	26	17	22	16		
17	10	10	10	10	10	9.6	8.5	9.1	25	15	17	16		
18	10	11	10	11	10	9.4	8.3	8.4	24	14	15	444		
19	10	11	10	12	10	9.3	8.3	8.3	23	14	14	2210		
20	9.8	11	9.8	11	9.7	9.3	8.3	8.0	23	14	13	699		
21	9.6	11	e9.4	10	9.5	9.4	8.7	7.9	22	14	13	80		
22	9.9	11	e8.4	10	9.3	9.5	8.7	7.8	22	13	13	30		
23	10	11	e7.2	10	9.3	9.8	8.8	7.9	21	13	13	23		
24	10	11	e6.8	10	9.3	10	9.9	8.6	22	13	13	21		
25	11	10	e9.2	10	9.2	9.4	25	14	21	13	13	19		
26	11	10	9.7	11	9.3	9.1	17	77	20	192	13	19		
27	10	11	9.8	10	9.4	8.7	11	50	20	788	13	17		
28	11	11	9.9	10	9.6	8.7	9.8	16	20	249	13	16		
29	11	10	9.8	10	---	8.5	9.3	10	19	43	37	16		
30	11	10	9.7	11	---	8.6	8.9	9.6	19	22	16	16		
31	11	---	e9.4	11	---	8.6	---	8.8	---	18	14	---		
TOTAL	321.5	336	300.4	323.5	280.6	286.9	303.8	756.1	12684.8	1708	475	6136		
MEAN	10.4	11.2	9.69	10.4	10.0	9.25	10.1	24.4	423	55.1	15.3	205		
MAX	12	16	11	14	11	10	25	116	6680	788	37	2210		
MIN	9.6	10	6.8	9.4	9.2	8.5	8.3	7.8	9.8	13	13	14		
AC-FT	638	666	596	642	557	569	603	1500	25160	3390	942	12170		
CFSM	.03	.04	.03	.03	.03	.03	.03	.08	1.40	.18	.05	.68		
IN.	.04	.04	.04	.04	.03	.04	.04	.09	1.56	.21	.06	.75		
CAL YR 1990	TOTAL	6510.6	MEAN	17.8	MAX	569	MIN	6.8	AC-FT	12910	CFSM	.06	IN.	.80
WTR YR 1991	TOTAL	23912.6	MEAN	65.5	MAX	6680	MIN	6.8	AC-FT	47430	CFSM	.22	IN.	2.94

e Estimated

07299840 GREENBELT LAKE NEAR CLARENDON, TX

LOCATION.--Lat 35°00'02", long 100°53'40", Donley County, Hydrologic Unit 11120201, on upstream side near right end of dam on Salt Fork Red River and 4.3 mi north of Clarendon.

DRAINAGE AREA.--457 mi<sup>2</sup>, of which 191 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--August 1967 to current year. Prior to October 1973, published as Greenbelt Reservoir. Water-quality records: Chemical analyses: October 1969 to September 1984.

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

REMARKS.--The lake is formed by a rolled earthfill dam 5,800 ft long. Deliberate impoundment began Dec. 5, 1966, and the dam was completed in August 1967. The dam is the property of Greenbelt Municipal and Industrial Water Authority and was built to impound water for municipal and industrial uses by the cities of Childress, Clarendon, Crowell, Hedley, and Quanah. The spillway is an uncontrolled open cut through natural ground, 1,450 ft wide and located at the left end of dam, designed to discharge 184,000 ft<sup>3</sup>/s at an elevation of 2,684.0 ft. A morning-glory-type drop inlet with a 26-foot 8.5-inch-diameter opening at crest discharges into a 7- by 7-foot concrete conduit. The outlet works consists of a 36-inch pipe that is controlled by two 20-inch valves that control the discharge into a stilling basin and to a water treatment plant. The capacity table, dated April 1964, is based on Geological Survey topographic maps dated 1962. 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.....	2,686.0	-
Design flood.....	2,683.0	105,600
Crest of spillway.....	2,674.0	81,760
Crest of morning-glory-type drop inlet.....	2,663.65	59,110
Lowest gated outlet (invert).....	2,597.0	900

COOPERATION.--Records of diversion and capacity table provided by Greenbelt Municipal and Industrial Water Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 44,650 acre-ft June 26-28, 1975 (elevation, 2,655.71 ft); minimum, 2,950 acre-ft Aug. 29, 30, 1967 (elevation, 2,607.37 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 33,520 acre-ft Sept. 9 at 1300 hours (elevation, 2,648.39 ft); minimum, 30,820 acre-ft May 22 (elevation, 2,646.35 ft).

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

2,646.0	30,370	2,648.0	32,990
2,647.0	31,660	2,649.0	34,360

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	32290	31780	31690	31530	31780	31770	31470	30990	31690	31900	32830	32620
2	32360	31770	31620	31520	31770	31670	31470	30990	31750	31860	32780	32620
3	32420	31740	31620	31530	31790	31750	31450	31000	31780	31810	32790	32710
4	32400	31770	31620	31540	31790	31740	31450	30950	31780	31770	32780	32750
5	32380	31770	31580	31540	31790	31730	31440	30920	31940	31740	32740	32760
6	32360	31730	31580	31560	31810	31710	31430	30890	32170	31620	32710	32860
7	32340	31750	31580	31560	31810	31700	31410	30990	32430	31600	32670	33370
8	32290	31750	31580	31560	31810	31710	31430	30990	32580	31570	32620	33470
9	32270	31790	31580	31660	31810	31700	31390	30980	32630	31510	32590	33500
10	32270	31790	31580	31670	31820	31670	31350	30980	32660	31430	32550	33470
11	32260	31790	31580	31690	31820	31530	31350	31000	32640	31380	32520	33440
12	32230	31780	31570	31700	31830	31630	31260	31110	32640	31510	32480	33430
13	32210	31780	31580	31700	31820	31610	31290	31090	32590	31730	32560	33460
14	32170	31770	31580	31700	31820	31610	31320	31090	32540	32790	32540	33430
15	32170	31780	31570	31740	31810	31600	31300	31080	32510	33090	32520	33460
16	32090	31770	31580	31740	31790	31620	31270	30980	32480	33150	32680	33410
17	32090	31770	31600	31750	31750	31630	31270	31010	32470	33110	32760	33410
18	32050	31770	31600	31770	31790	31630	31270	30980	32430	33090	32760	33460
19	32020	31770	31600	31740	31790	31610	31250	30990	32390	33060	32750	33430
20	31930	31770	31570	31750	31780	31580	31230	30960	32350	33020	32900	33410
21	31950	31780	31530	31750	31790	31570	31220	30910	32340	33000	32920	33410
22	31950	31770	31530	31770	31780	31570	31220	30990	32310	32960	32920	33400
23	31910	31770	31510	31770	31750	31560	31200	31010	32250	32950	32880	33390
24	31930	31750	31510	31770	31770	31530	31200	31210	32270	32910	32870	33330
25	31910	31770	31490	31780	31770	31530	31200	31300	32210	32880	32830	33320
26	31910	31690	31480	31780	31770	31500	31120	31290	32170	32840	32800	33310
27	31890	31730	31480	31780	31770	31490	31130	31250	32090	32990	32760	33260
28	31870	31710	31490	31790	31750	31480	31030	31200	32030	32980	32710	33240
29	31820	31690	31490	31770	---	31480	31040	31360	31980	32950	32670	33220
30	31810	31690	31490	31770	---	31470	31010	31490	31930	32920	32640	33210
31	31790	---	31510	31770	---	31470	---	31630	---	32860	32640	---
MAX	32420	31790	31690	31790	31830	31770	31470	31630	32660	33150	32920	33500
MIN	31790	31690	31480	31520	31750	31470	31010	30890	31690	31380	32480	32620
(↑)	2647.10	2647.02	2646.88	2647.08	2647.07	2646.85	2646.50	2646.98	2647.20	2647.90	2647.74	2648.16
(Φ)	-470	-100	-180	+260	-20	-280	-460	+620	+300	+930	-220	+570
(↑↑)	257	221	250	240	218	262	317	292	323	410	358	273
CAL YR 1990	MAX	35890	MIN	31480	(Φ)	-1280	(↑↑)	3509				
WTR YR 1991	MAX	33500	MIN	30890	(Φ)	+950	(↑↑)	3421				

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.  
(↑↑) Diversions, in acre-feet, for municipal and industrial uses by Greenbelt Municipal Water Authority.

## RED RIVER BASIN

07300000 SALT FORK RED RIVER NEAR WELLINGTON, TX

LOCATION.--Lat 34°57'27", long 100°13'14", Collingsworth County, Hydrologic Unit 11120202, near center of stream at downstream side of bridge on U.S. Highway 83, 4 mi downstream from Fort Worth and Denver (Burlington) Railway Co. bridge, 4.5 mi south of Lutie, and 7.2 mi north of Wellington.

DRAINAGE AREA.--1,222 mi<sup>2</sup>, of which 209 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,941.41 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. There are several small diversions upstream from gage for irrigation. There is some regulation for municipal use by Greenbelt Lake (station 07299840), capacity 59,100 acre-ft, 42 mi upstream.

AVERAGE DISCHARGE.--14 years (water years 1953-66) prior to completion of Greenbelt Lake, 72.6 ft<sup>3</sup>/s (52,600 acre-ft/yr); 25 years (water years 1967-91) regulated, 48.7 ft<sup>3</sup>/s (35,280 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 146,000 ft<sup>3</sup>/s May 16, 1957 (gage height, 19.00 ft), from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of slope-area measurement of 63,400 ft<sup>3</sup>/s; minimum, 0.1 ft<sup>3</sup>/s June 19, 1952.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,850 ft<sup>3</sup>/s May 30 at 0600 hours (gage height, 7.21 ft); minimum, 2.2 ft<sup>3</sup>/s Aug. 25, 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	13	21	40	42	29	20	6.5	120	9.7	9.5	6.5
2	12	14	22	35	34	29	18	13	374	11	8.9	6.3
3	19	20	19	e25	32	27	16	18	404	12	9.2	6.9
4	12	35	18	e18	34	26	15	7.7	140	12	8.9	81
5	9.7	22	19	e28	31	22	15	6.5	80	10	8.4	32
6	8.7	20	20	e29	30	16	17	5.7	886	10	8.3	34
7	8.6	22	22	e29	29	16	16	15	1130	9.9	9.3	92
8	10	44	23	37	29	17	16	56	284	9.3	9.3	78
9	15	45	25	53	28	18	14	28	133	8.5	9.2	31
10	13	38	26	60	27	19	13	22	83	7.6	7.9	27
11	11	33	27	79	31	20	13	19	193	7.1	6.9	20
12	10	33	27	53	28	17	13	27	81	9.5	6.9	15
13	10	32	24	47	25	12	12	28	38	24	307	15
14	9.4	30	25	44	23	11	12	20	27	214	226	25
15	9.0	29	28	41	23	15	12	9.3	21	409	56	38
16	9.4	29	33	34	23	24	10	5.7	22	81	18	29
17	8.5	29	38	29	23	34	10	4.8	19	43	22	25
18	8.8	28	40	21	22	36	10	4.8	15	25	60	299
19	9.6	24	32	25	21	30	9.0	4.6	32	18	15	166
20	9.5	25	31	22	21	28	10	4.6	97	13	11	81
21	9.3	26	21	20	22	25	10	4.5	39	9.8	7.1	54
22	10	24	e16	25	22	20	11	18	29	9.0	4.7	48
23	10	24	e14	36	22	18	10	83	24	8.8	3.9	48
24	10	23	e17	40	21	18	13	63	21	17	2.8	29
25	11	24	20	40	20	18	16	53	21	32	2.8	25
26	12	24	23	40	24	16	13	32	15	27	2.8	25
27	11	21	29	42	29	16	9.1	19	11	29	2.9	25
28	12	20	34	43	31	16	7.7	15	9.0	31	3.2	23
29	12	19	44	41	---	22	6.9	12	8.7	21	3.7	21
30	12	20	e35	37	---	22	7.4	2620	8.9	15	3.9	20
31	13	---	e40	38	---	22	---	325	---	11	4.2	---
TOTAL	337.5	790	813	1151	747	659	375.1	3550.7	4365.6	1154.2	859.7	1425.7
MEAN	10.9	26.3	26.2	37.1	26.7	21.3	12.5	115	146	37.2	27.7	47.5
MAX	19	45	44	79	42	36	20	2620	1130	409	307	299
MIN	8.5	13	14	18	20	11	6.9	4.5	8.7	7.1	2.8	6.3
AC-FT	669	1570	1610	2280	1480	1310	744	7040	8660	2290	1710	2830
CAL YR 1990	TOTAL	20414.9	MEAN	55.9	MAX	4900	MIN	3.0	AC-FT	40490		
WTR YR 1991	TOTAL	16228.5	MEAN	44.5	MAX	2620	MIN	2.8	AC-FT	32190		

e Estimated



07300000 SALT FORK RED RIVER NEAR WELLINGTON, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: February 1951 to October 1954, October 1967 to current year. Chemical and biochemical analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: June 1952 to September 1954, October 1967 to September 1991 (discontinued).

WATER TEMPERATURE: June 1952 to September 1954, October 1967 to September 1991 (discontinued).

INSTRUMENTATION.--From September 1968 to September 1974, specific conductance was continuously recorded at this station.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,510 microsiemens Dec. 20, 1990; minimum daily, 330 microsiemens July 30, 1982.

WATER TEMPERATURE: Maximum daily, 40.0°C July 20, 1981; minimum daily, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,510 microsiemens Dec. 20; minimum daily, 1,100 microsiemens May 30.

WATER TEMPERATURE: Maximum daily, 34.5.0°C July 18; minimum daily, 0.0°C Jan. 29.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DEMAND, (PER-CENT SATUR-ATION)	OXYGEN BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)
NOV 07...	1520	23	3360	8.0	6.5	12.7	113	1.1	120	170	1600
JAN 17...	0850	29	2940	8.2	1.0	15.8	120	0.1	92	350	1200
MAR 20...	1455	29	3110	8.1	11.0	8.6	86	1.5	K20	110	1300
MAY 07...	0850	15	3240	8.0	15.5	9.3	101	2.0	280	56	1700
JUL 15...	2015	134	1720	8.2	30.0	6.6	94	0.6	K1200	K2000	560
AUG 13...	0825	7.5	2530	7.9	22.0	7.6	93	0.5	>2000	560	1400

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV 07...	1400	500	86	230	3	3.6	180	1600	310	0.30
JAN 17...	1000	360	71	220	3	4.2	180	1100	290	0.20
MAR 20...	1100	370	82	220	3	3.9	150	1200	300	0.50
MAY 07...	1600	550	87	180	2	3.8	160	1500	250	0.60
JUL 15...	440	150	45	160	3	6.1	120	540	190	0.70
AUG 13...	1200	430	68	160	2	3.9	120	1300	190	0.50

DATE	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 07...	20	2860	1.69	0.010	1.70	0.060	0.34	0.40	0.040	0.010
JAN 17...	19	2170	1.07	0.030	1.10	0.060	0.14	0.20	0.020	0.030
MAR 20...	21	2290	1.08	0.020	1.10	0.020	0.48	0.50	<0.010	<0.010
MAY 07...	17	2680	1.77	0.030	1.80	0.030	0.47	0.50	0.010	<0.010
JUL 15...	16	1180	0.200	0.020	0.220	0.130	1.4	1.5	0.330	<0.010
AUG 13...	16	2240	1.37	0.030	1.40	0.080	0.32	0.40	0.010	<0.010

## RED RIVER BASIN

07300000 SALT FORK RED RIVER NEAR WELLINGTON, TX--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	337.5	3480	2850	2600	310	281	1600	1450	1700
NOV. 1990	790	3310	2680	5720	300	639	1500	3140	1600
DEC. 1990	813	3270	2650	5820	300	650	1500	3200	1600
JAN. 1991	1151	2950	2330	7230	280	864	1200	3830	1400
FEB. 1991	747	3130	2500	5040	290	584	1300	2720	1500
MAR. 1991	659	3360	2730	4850	300	537	1500	2680	1600
APR. 1991	375.1	3460	2830	2870	310	311	1600	1600	1700
MAY 1991	3550.7	1560	1130	10800	160	1570	520	5020	630
JUNE 1991	4365.6	2080	1540	18200	210	2510	740	8760	870
JULY 1991	1154.2	2310	1750	5450	230	712	880	2740	1000
AUG. 1991	859.7	2190	1650	3840	220	507	820	1910	940
SEPT 1991	1425.7	2720	2130	8210	260	996	1100	4310	1200
TOTAL	16228.5	**	**	80600	**	10200	**	41400	**
WTD.AVG.	45	2390	1840	**	230	**	940	**	1100

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e3480	e3280	3340	e3360	2790	3280	3330	3250	e2800	3350	3460	e3350
2	3480	3240	3310	e3400	e2900	e3350	3430	e3400	2380	3340	3370	3400
3	3460	e3100	e3260	3340	e3100	3390	3560	3600	2340	e3380	3340	3380
4	3520	e3050	3240	e3270	3050	e3390	3400	3690	2850	e3430	e3360	2240
5	4260	e3250	3290	3270	3090	3400	3480	3520	2980	e3460	3380	e3000
6	3460	e3300	3350	3020	3120	3330	e3500	3190	e1600	e3500	3420	3180
7	3500	e3360	3210	3070	e3130	e3340	e3550	3240	1580	3540	3440	2670
8	e3400	3210	e3200	2880	e3140	3360	3610	e3000	1940	3490	3410	3020
9	3550	3280	3270	2430	3150	3340	3600	3240	e2300	3340	3410	3150
10	3500	3530	3240	e2400	3110	3360	3580	3310	2620	e3380	3320	3230
11	e3500	3190	3200	2570	3120	3310	e3540	e3320	2000	e3400	e3380	e3270
12	3480	3350	3170	2650	3080	3500	3480	3340	2590	3430	3440	e3310
13	3520	3260	e3140	2860	3200	3430	e3440	3370	e2850	e2900	1360	3350
14	e3500	3390	3110	2900	3230	e3430	e3400	3140	3260	2000	2130	3470
15	3350	3360	3220	2890	3240	3360	3360	e3200	e3200	1610	e2600	2610
16	3500	e3400	3080	2910	3220	e3370	3380	e3250	e3100	1960	3280	3150
17	3550	3480	2980	2950	3200	3380	3420	e3300	3070	2470	3480	3330
18	3460	3300	2970	3000	3130	3110	3360	3320	3270	2990	2200	1500
19	3500	3390	2960	2980	3220	3170	3380	e3400	3090	3060	3040	3110
20	3400	3360	4510	3130	3240	3110	3440	3480	2600	3190	3280	3300
21	3440	3240	e4300	3040	3190	e3300	e3480	3380	e2800	e3180	e3310	2870
22	3440	e3270	e4100	3030	e3190	3450	3510	2890	3200	3170	e3340	e3000
23	3400	3270	e3800	3070	3190	3300	3570	2830	e3400	3170	3370	3110
24	3360	3400	3520	e3010	3170	3480	3090	2860	3510	3190	3290	3130
25	3440	e3350	3250	3010	3230	3460	3430	3080	3440	e3200	3390	3330
26	3430	3310	e3000	3230	3240	3480	e3450	e3200	3480	e3200	3270	e3360
27	e3380	3360	e3000	e3200	3190	3510	3470	3420	e3480	3210	3360	3390
28	3330	e3360	2970	e3180	3250	e3510	e3480	3420	3490	3060	3360	e3400
29	3450	3360	e2900	3150	---	3520	e3520	3420	3620	3140	e3340	e3400
30	3450	3380	3510	2980	---	e3500	3570	1100	3600	3230	e3310	3400
31	3320	---	3360	2940	---	e3400	---	2270	---	3320	3270	---
MEAN	3480	3310	3310	3000	3150	3370	3460	3180	2880	3110	3180	3110

e Estimated

RED RIVER BASIN

07300000 SALT FORK RED RIVER NEAR WELLINGTON, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e17.0	e18.0	15.0	e2.0	13.0	15.0	7.0	11.0	e19.0	22.0	33.0	e22.0
2	17.0	18.0	11.0	e2.0	e12.0	e15.0	6.0	e25.0	19.0	30.0	23.0	23.0
3	18.0	e18.0	e11.0	1.0	e12.0	15.0	7.0	27.0	19.0	e28.0	22.0	22.0
4	18.0	e17.0	12.0	e3.0	7.0	e17.0	7.0	10.0	21.0	e28.0	e22.0	23.0
5	18.0	e12.0	5.0	5.0	13.0	18.0	7.0	20.0	27.0	e29.0	23.0	e25.0
6	18.0	e8.0	6.0	2.0	10.0	15.0	e20.0	18.0	e26.0	e30.0	32.0	27.0
7	17.0	e6.0	11.0	5.0	e12.0	e14.0	e22.0	15.5	25.0	30.0	23.0	29.0
8	e17.0	10.0	e11.0	10.0	e14.0	8.0	24.0	e18.0	24.0	23.0	22.0	22.0
9	17.0	15.0	10.0	8.0	17.0	17.0	23.0	18.0	e24.0	23.0	23.0	31.0
10	22.0	13.0	14.0	e9.0	14.0	18.0	24.0	19.0	24.0	e25.0	22.0	25.0
11	e20.0	16.0	15.0	9.0	15.0	14.0	e23.0	e19.0	30.0	e26.0	e21.0	e27.0
12	18.0	20.0	3.0	9.0	19.0	14.0	23.0	20.0	23.0	27.0	21.0	e27.0
13	21.0	10.0	e3.0	5.0	15.0	15.0	e23.0	21.0	e23.0	e23.0	27.0	30.0
14	e19.0	8.0	4.0	9.0	16.0	e15.0	e24.0	19.0	24.0	22.0	21.0	21.0
15	18.0	7.0	3.0	10.0	15.0	15.0	25.0	e20.0	e25.0	32.0	e22.0	18.0
16	24.0	e7.0	9.0	13.0	e14.0	e14.0	26.0	e20.0	e26.0	24.0	23.0	18.0
17	20.0	14.0	13.0	e10.0	14.0	13.0	26.0	e21.0	26.0	27.0	25.0	17.0
18	8.0	14.0	6.0	10.0	13.0	22.0	25.0	21.0	26.0	34.5	24.0	12.0
19	19.0	19.0	7.0	10.0	15.0	13.0	25.0	e21.0	24.0	23.0	28.0	11.0
20	17.0	20.0	5.0	9.0	16.0	e11.0	26.0	21.0	25.0	22.0	26.0	15.0
21	12.0	16.0	e2.0	10.0	17.0	e14.0	e26.0	20.0	e26.0	e26.0	e28.0	15.0
22	10.0	e15.0	e1.0	12.0	e17.0	16.0	25.0	20.0	26.0	28.0	e30.0	e20.0
23	21.0	12.0	e1.0	9.0	18.0	15.0	24.0	18.0	e25.0	27.0	33.0	23.0
24	8.0	10.0	3.0	e3.0	7.0	16.0	19.0	21.0	24.0	26.0	23.0	21.0
25	8.0	e13.0	3.0	3.0	10.0	15.0	20.0	20.0	24.0	e26.0	23.0	20.0
26	9.0	18.0	e4.0	1.0	14.0	22.0	e20.0	e20.0	25.0	e26.0	25.0	e22.0
27	e10.0	13.0	e4.0	e1.0	e15.0	7.0	21.0	20.0	e25.0	26.0	31.0	22.0
28	14.0	e12.0	5.0	e1.0	17.0	e7.0	e21.0	21.0	25.0	27.0	30.0	e22.0
29	13.0	e12.0	e4.0	.0	---	6.0	e21.0	24.0	26.0	20.0	e29.0	e22.0
30	20.0	12.0	2.0	1.0	---	e7.0	21.0	18.0	24.0	24.0	e29.0	22.0
31	16.0	---	3.0	10.0	---	e7.0	---	23.0	---	34.0	21.0	---
MEAN	16.3	13.4	6.6	6.2	14.0	13.9	20.4	19.7	24.3	26.4	25.3	21.8

e Estimated

## RED RIVER BASIN

07300500 SALT FORK RED RIVER AT MANGUM, OK

LOCATION.--Lat 34°51'30", long 99°30'30", in SW1/4SE 1/4 sec.34. T.5 N, R.22 W., Greer County, OK, Hydrologic Unit 11120202, near left bank at downstream side of pier of bridge on State Highway 34, 0.5 mi south of Mangum, 13.0 mi downstream from Fish Creek, and at mile 35.5.

DRAINAGE AREA.--1,566 mi<sup>2</sup>, of which 209 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.-- April 1905 to June 1906, October 1937 to current year. Monthly discharge only for some periods, published in WSP 1311.

REVISED RECORDS.-- WSP 1211: Drainage area. WSP 1241: 1938.

GAGE.-- Water-stage recorder. Datum of gage is 1,490.87 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Bureau of Reclamation). Apr. 11, 1905 to June 30, 1906, nonrecording gage at site 0.2 mi upstream at different datum. Oct. 1, 1937 to Nov. 8, 1938, nonrecording gage at present site and datum.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--54 years (water years 1938-91), 85.0 ft<sup>3</sup>/s (61,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 72,000 ft<sup>3</sup>/s May 16, 1957 (gage height, 14.55 ft); maximum gage height, 14.7 ft June 16, 1938; no flow at times in most years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 6,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 7	0515	*4,740	*8.31				

Minimum daily discharge, 0.26 ft<sup>3</sup>/s Aug. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	13	28	e35	43	29	29	e19	85	11	6.6	.39
2	17	13	28	e33	39	28	26	37	127	13	4.8	.44
3	19	15	29	e35	40	27	24	114	264	16	3.6	1.7
4	18	31	28	e38	41	28	23	e54	204	15	4.5	1.4
5	17	39	28	e42	39	27	22	e41	110	12	4.0	1.4
6	16	35	28	e45	38	24	22	e35	604	9.4	2.7	3.2
7	13	29	28	e50	38	23	21	e32	2800	7.3	2.2	63
8	12	43	29	58	37	22	21	123	671	5.8	1.9	492
9	12	52	29	67	34	21	20	469	296	4.6	1.8	175
10	14	52	30	96	33	22	19	222	179	3.7	1.7	50
11	15	44	31	116	34	23	18	162	136	3.1	1.7	27
12	15	37	33	108	34	24	18	148	175	2.8	2.0	18
13	14	34	33	84	35	24	17	149	150	3.1	3.8	19
14	13	30	34	74	33	23	17	168	100	2.7	135	17
15	12	30	35	66	31	23	16	e110	72	5.9	53	15
16	11	31	40	60	31	24	15	e107	62	192	11	14
17	10	29	44	55	31	29	15	e104	60	89	3.2	18
18	9.3	29	45	52	30	31	15	e100	57	49	1.6	54
19	8.6	30	45	53	28	30	15	e84	50	26	1.1	447
20	8.0	29	e38	52	27	32	15	e67	46	18	1.8	169
21	7.6	30	e33	50	27	31	15	e51	49	12	3.2	103
22	8.0	30	e31	48	27	28	17	e35	63	8.0	1.4	76
23	8.6	30	e30	45	26	26	19	1060	41	5.7	1.1	60
24	9.0	29	e36	45	29	24	173	760	32	5.0	.77	e54
25	9.7	29	40	47	26	23	233	305	27	5.8	.62	e50
26	11	29	41	48	26	24	e80	410	23	5.3	.47	e46
27	11	29	41	47	27	23	e32	100	20	6.6	.37	e40
28	11	28	e38	45	27	23	e28	80	18	11	.26	e36
29	11	28	e32	43	---	38	e24	68	15	8.7	.31	e34
30	12	28	e30	42	---	34	e21	957	12	8.1	.28	e32
31	12	---	e33	38	---	31	---	632	---	8.8	.30	---
TOTAL	379.8	935	1048	1717	911	819	1030	6803	6548	574.4	257.08	2117.53
MEAN	12.3	31.2	33.8	55.4	32.5	26.4	34.3	219	218	18.5	8.29	70.6
MAX	19	52	45	116	43	38	233	1060	2800	192	135	492
MIN	7.6	13	28	33	26	21	15	19	12	2.7	.26	.39
AC-FT	753	1850	2080	3410	1810	1620	2040	13490	12990	1140	510	4200
CAL YR 1990	TOTAL	26627.76	MEAN	73.0	MAX	5630	MIN	.00	AC-FT	52820		
WTR YR 1991	TOTAL	23139.81	MEAN	63.4	MAX	2800	MIN	.26	AC-FT	45900		

e Estimated



RED RIVER BASIN

07301300 NORTH FORK RED RIVER NEAR SHAMROCK, TX

LOCATION.--Lat 35°15'51", long 100°14'29", Wheeler County, Hydrologic Unit 11120302, on left bank at downstream side of bridge on U.S. Highway 83, 2.5 mi north of Shamrock, 16 mi upstream from Texas-Oklahoma State line, and 23 mi downstream from McClellan Creek.

DRAINAGE AREA.--1,082 mi<sup>2</sup>, of which 379 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--1951-63 (occasional low-flow measurements), February 1964 to current year.  
Water-quality records.--Chemical analyses: October 1964 to September 1981.

Gage.--Water-stage recorder. Datum of gage is 2,165.55 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. There is some regulation by Lake McClellan (capacity, 5,000 acre-ft) 41 miles upstream. Flow affected at times by discharge from the flood-detention pools of 11 floodwater-retarding structures with a combined detention capacity of 18,290 acre-ft. These structures control runoff from 165 mi<sup>2</sup>. Gage-height telemeter at station.

AVERAGE DISCHARGE.--27 years, 33.0 ft<sup>3</sup>/s (23,910 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,400 ft<sup>3</sup>/s May 29, 1975 (gage height, 7.47 ft), from rating curve extended above 3,800 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1915, 16.1 ft in May 1957, from information by State Department of Highways and Public Transportation and by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,620 ft<sup>3</sup>/s June 5 at 2330 hours (gage height, 4.45 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	.00	2.9	e2.5	40	12	14	.03	173	.00	.00	.56
2	1.4	.02	3.0	e2.9	27	9.6	7.0	8.1	456	.00	.00	.01
3	16	.83	1.3	e2.9	24	8.1	.81	103	346	.00	.00	25
4	5.5	6.7	.51	e2.5	24	11	.86	19	251	.00	.00	178
5	1.0	6.8	.68	e3.1	19	10	1.1	8.0	410	.00	.00	100
6	.03	7.8	2.7	e3.1	16	7.2	2.0	.76	444	.00	.00	72
7	.01	52	2.1	e3.0	15	3.9	3.2	89	270	.00	.00	146
8	.31	151	3.1	e2.8	16	5.2	2.6	207	242	.00	.00	128
9	2.5	66	5.3	e3.2	18	7.3	1.2	120	148	.00	.00	33
10	.24	42	8.2	e80	18	9.2	.39	80	92	.00	.00	12
11	.02	24	9.8	172	19	9.1	.04	50	118	.00	.00	5.9
12	.01	17	9.4	195	19	5.4	.08	130	47	.03	.00	2.0
13	.01	13	6.8	68	18	2.7	.01	84	26	25	69	1.9
14	.00	8.6	7.4	40	14	1.6	.07	35	7.2	365	8.2	8.9
15	.00	6.2	8.3	45	13	3.2	.05	9.1	8.7	574	7.0	11
16	.00	5.5	11	39	13	12	.06	2.4	4.9	89	.68	2.6
17	.00	3.4	15	34	15	26	.18	.30	1.6	52	2.0	1.2
18	.00	3.5	14	28	14	29	.06	.01	.28	30	11	390
19	.00	4.4	11	36	11	20	.02	.02	95	13	2.3	153
20	.00	7.7	6.8	30	11	17	.19	.04	1.2	3.8	4.0	110
21	.00	11	2.6	26	13	10	.20	.04	5.1	.74	.80	73
22	.00	5.8	e2.4	28	15	3.2	4.7	1.0	2.8	.06	.12	45
23	.00	3.3	e2.2	29	16	2.1	6.1	113	.63	.00	.01	28
24	.00	3.8	e2.0	25	12	2.4	6.6	293	.13	.68	.00	35
25	.00	4.8	e2.3	23	9.4	2.8	11	252	.01	.03	.00	25
26	.00	6.1	e2.3	24	9.6	2.9	11	128	.00	.00	.00	16
27	.00	4.9	e2.5	19	11	1.1	.90	59	.00	11	.00	11
28	.00	1.6	e2.7	29	13	1.2	.26	7.7	.00	20	.00	6.5
29	.00	1.1	e2.9	18	---	12	.05	.17	.00	2.5	.00	4.2
30	.00	1.5	e2.3	15	---	35	.06	538	.00	.10	.00	3.0
31	.00	---	e2.0	8.6	---	22	---	255	---	.00	1.1	---
TOTAL	27.14	470.35	155.49	1037.6	463.0	304.2	74.79	2592.67	3150.55	1186.94	106.21	1627.77
MEAN	.88	15.7	5.02	33.5	16.5	9.81	2.49	83.6	105	38.3	3.43	54.3
MAX	16	151	15	195	40	35	14	538	456	574	69	390
MIN	.00	.00	.51	2.5	9.4	1.1	.01	.01	.00	.00	.00	.01
AC-FT	54	933	308	2060	918	603	148	5140	6250	2350	211	3230
CAL YR 1990	TOTAL	10218.19	MEAN	28.0	MAX	385	MIN	.00	AC-FT	20270		
WTR YR 1991	TOTAL	11196.71	MEAN	30.7	MAX	574	MIN	.00	AC-FT	22210		

e Estimated

## RED RIVER BASIN

07301410 SWEETWATER CREEK NEAR KELTON, TX

LOCATION.--Lat 35°28'23", long 100°07'14", Wheeler County, Hydrologic Unit 11120302, near center of stream at downstream side of bridge on Farm Road 592, 5 mi north of Kelton, 8 mi upstream from Texas-Oklahoma State line, and 8.5 mi northeast of Wheeler.

DRAINAGE AREA.--287 mi<sup>2</sup>, of which 20 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--November 1961 to current year.  
Water-quality records.--Chemical analyses: October 1969 to June 1985.

GAGE.--Water-stage recorder. Elevation of gage is 2,230 ft above National Geodetic Vertical Datum of 1929, from topographic map.

REMARKS.--Records good except those for estimated daily discharges, which are fair. There are many small diversions upstream from station for ranch use. Gage-height telemeter at station via Sutron data collection platform.

AVERAGE DISCHARGE.--29 years (water years 1963-91), 13.5 ft<sup>3</sup>/s (0.69 in/yr), 9,780 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,890 ft<sup>3</sup>/s May 20, 1977 (gage height, 15.73 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1882, about 20 ft May 16, 1957.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 22	0900	*116	*8.85				

Minimum discharge, 1.0 ft<sup>3</sup>/s Aug. 6-9, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	4.5	8.1	e10	14	12	14	9.8	10	4.1	1.6	1.4
2	2.7	4.8	8.4	e11	15	11	14	12	12	3.8	1.3	2.2
3	3.8	5.7	9.1	e8.0	15	11	13	16	19	4.1	1.2	2.5
4	3.6	8.1	9.1	e6.0	15	12	12	13	14	4.0	1.1	11
5	3.0	7.2	9.3	e10	14	12	12	11	11	3.3	1.1	5.1
6	2.6	6.6	9.6	e10	13	12	11	10	14	3.0	1.1	3.8
7	2.6	6.3	9.5	e10	13	11	11	10	24	2.8	1.0	8.1
8	3.3	7.3	9.8	e10	13	11	11	15	19	e2.6	1.0	7.5
9	3.7	8.0	9.9	e10	13	11	11	15	20	e2.4	1.2	5.1
10	4.0	7.1	9.8	12	13	11	12	13	13	e2.1	1.3	4.2
11	3.8	6.9	10	14	13	12	12	13	12	e2.1	1.2	3.6
12	3.7	6.8	10	16	13	12	11	13	11	e2.1	1.2	3.1
13	3.7	6.8	10	17	12	11	11	12	9.1	e2.1	7.1	3.1
14	3.6	6.8	10	17	12	11	11	10	7.8	4.6	7.7	3.0
15	3.5	6.8	10	17	12	12	12	9.6	7.3	6.0	3.3	3.1
16	3.4	6.6	10	16	12	12	11	9.2	7.0	15	2.5	2.9
17	3.4	6.7	11	16	12	14	11	8.2	6.5	16	2.3	3.1
18	3.3	6.8	11	16	12	13	11	7.7	5.9	9.1	2.2	4.8
19	3.5	6.9	10	16	11	13	10	7.4	11	6.7	2.0	10
20	3.7	7.1	10	15	12	13	10	7.0	11	5.0	1.9	6.0
21	3.8	7.1	e9.0	14	12	12	11	6.7	11	4.0	1.9	5.4
22	3.9	7.0	e5.0	14	12	12	11	7.0	47	3.1	1.8	5.1
23	4.2	7.0	e2.4	14	12	12	11	7.6	22	2.7	1.8	5.0
24	4.5	7.0	e2.0	14	12	11	10	9.8	11	2.6	1.7	4.9
25	4.6	7.2	e6.0	15	12	11	11	11	9.1	2.9	1.5	4.8
26	4.7	7.3	e9.0	15	12	12	11	9.9	7.4	2.7	1.4	4.7
27	4.6	7.3	e9.6	15	12	12	9.6	8.1	6.5	2.6	1.3	4.6
28	4.5	7.3	10	14	12	12	9.4	6.6	5.5	2.8	1.2	4.2
29	4.6	7.3	12	14	---	16	9.3	6.0	4.9	2.3	1.1	4.0
30	4.6	7.7	e9.0	15	---	16	9.7	39	4.7	2.0	1.1	3.8
31	4.6	---	e7.0	15	---	e15	---	19	---	1.8	1.1	---
TOTAL	116.2	206.0	275.6	416.0	355	378	334.0	352.6	373.7	130.4	59.2	140.1
MEAN	3.75	6.87	8.89	13.4	12.7	12.2	11.1	11.4	12.5	4.21	1.91	4.67
MAX	4.7	8.1	12	17	15	16	14	39	47	16	7.7	11
MIN	2.6	4.5	2.0	6.0	11	11	9.3	6.0	4.7	1.8	1.0	1.4
AC-FT	230	409	547	825	704	750	662	699	741	259	117	278
CAL YR 1990	TOTAL	4562.10	MEAN	12.5	MAX	83	MIN	.73	AC-FT	9050		
WTR YR 1991	TOTAL	3136.8	MEAN	8.59	MAX	47	MIN	1.0	AC-FT	6220		

e Estimated

RED RIVER BASIN

51

07307800 PEASE RIVER NEAR CHILDRESS, TX

LOCATION.--Lat 34°13'39", long 100°04'24", Cottle County, Hydrologic Unit 11130105, near right bank at downstream side of bridge on Farm Road 104, 0.8 mi upstream from Catfish Creek, 4.4 mi downstream from confluence of North and Middle Forks, 17 mi southeast of Childress, and 71.0 mi upstream from mouth.

DRAINAGE AREA.--2,754 mi<sup>2</sup>, of which 559 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--December 1959 to September 1962, and October 1967 to current year.  
Water-quality records.--Chemical analyses: July 1968 to September 1982.

GAGE.--Water-stage recorder. Datum of gage is 1,492.98 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 21, 1959, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. There are three small diversions for irrigation above station. Flow is affected at times by discharge from the flood-detention pools of six flood-water-retarding structures with a combined detention capacity of 1,360 acre-ft. These structures control runoff from 6.27 mi<sup>2</sup> in the Kent Creek drainage basin.

AVERAGE DISCHARGE.--26 years (water years 1961-62, 1967-91), 61.9 ft<sup>3</sup>/s (0.38 in/yr), 44,850 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,000 ft<sup>3</sup>/s June 9, 1960 (gage height, 13.59 ft), from rating curve extended above 4,000 ft<sup>3</sup>/s on basis of runoff comparisons with nearby stations; maximum gage height, 14.83 ft Oct. 20, 1983; no flow Aug. 10-22, 1969, May 25, 26, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1909, 22 ft June 1, 1957; flood in May 1935 reached a stage of 18 ft and was the second highest, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,200 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 2	1400	*10,800	*12.48	Sept. 18	2245	5,400	10.94
July 15	0200	2,930	10.18				

Minimum discharge, 2.7 ft<sup>3</sup>/s Aug. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	7.6	12	6.3	10	10	7.7	5.8	6.9	81	18	13	28		
2	7.0	12	6.1	9.2	10	6.9	5.4	14	6940	19	10	52		
3	20	15	5.1	8.0	10	6.8	5.4	64	2270	18	8.9	28		
4	11	57	5.2	8.2	10	7.0	5.5	20	829	17	7.9	34		
5	8.8	26	5.7	8.8	9.4	6.6	5.6	14	466	17	6.7	298		
6	8.6	15	5.4	9.9	8.7	5.7	5.7	11	344	16	6.1	257		
7	8.2	14	5.7	11	8.7	5.5	6.2	13	517	15	11	225		
8	12	89	6.1	10	8.9	5.7	5.7	105	370	14	3.8	202		
9	18	66	6.4	15	8.6	6.0	5.6	98	269	13	5.5	86		
10	10	22	6.3	55	8.7	5.9	5.9	54	187	12	4.4	49		
11	9.1	17	6.6	29	8.8	6.1	5.9	29	156	11	4.3	33		
12	8.6	14	6.2	18	8.7	5.1	5.9	47	134	11	26	24		
13	9.0	12	5.9	15	8.4	5.1	5.9	116	119	12	66	48		
14	8.1	12	6.3	13	8.0	5.4	5.5	32	106	22	293	26		
15	8.1	10	6.4	12	8.0	5.9	5.7	20	74	643	101	38		
16	9.6	8.5	12	11	8.0	7.0	5.6	16	65	108	38	31		
17	8.4	8.0	17	11	8.2	8.0	5.4	11	42	74	110	47		
18	7.7	8.2	12	19	7.8	6.8	5.4	9.8	34	25	55	1830		
19	8.6	8.2	8.8	25	7.3	6.5	5.4	8.7	31	15	20	2040		
20	8.5	8.6	7.3	14	6.6	6.6	5.4	8.2	28	11	16	988		
21	7.6	7.9	e7.0	13	7.1	6.3	5.4	8.4	42	8.7	12	620		
22	8.6	6.7	e6.2	12	7.1	5.3	5.4	8.1	31	7.4	9.8	421		
23	9.9	6.6	e5.4	12	7.0	5.0	5.5	14	24	6.4	8.9	269		
24	10	6.8	e7.0	12	6.8	5.0	22	29	65	7.9	8.6	220		
25	9.6	7.0	e9.6	11	6.6	5.0	28	324	42	18	8.0	186		
26	10	7.6	e12	11	6.9	5.0	12	326	28	190	8.0	147		
27	11	6.9	14	10	7.0	4.3	9.1	113	23	628	8.0	117		
28	10	6.1	14	9.8	7.2	4.4	8.3	40	21	271	8.3	89		
29	11	6.5	11	9.3	---	4.6	7.8	22	20	51	10	73		
30	11	6.8	e9.0	9.1	---	5.0	7.4	16	18	24	374	65		
31	11	---	e8.0	9.7	---	6.0	---	11	---	17	49	---		
TOTAL	306.6	503.4	250.0	431.0	228.5	182.2	223.8	1609.1	13376	2320.4	1311.2	8571		
MEAN	9.89	16.8	8.06	13.9	8.16	5.88	7.46	51.9	446	74.9	42.3	286		
MAX	20	89	17	55	10	8.0	28	326	6940	643	374	2040		
MIN	7.0	6.1	5.1	8.0	6.6	4.3	5.4	6.9	18	6.4	3.8	24		
AC-FT	608	998	496	855	453	361	444	3190	26530	4600	2600	17000		
CFSM	.00	.01	.00	.01	.00	.00	.00	.02	.20	.03	.02	.13		
IN.	.01	.01	.00	.01	.00	.00	.00	.03	.23	.04	.02	.15		
CAL YR 1990	TOTAL	11211.4	MEAN	30.7	MAX	1050	MIN	1.7	AC-FT	22240	CFSM	.01	IN.	.19
WTR YR 1991	TOTAL	29313.2	MEAN	80.3	MAX	6940	MIN	3.8	AC-FT	58140	CFSM	.04	IN.	.50

e Estimated

## RED RIVER BASIN

07308500 RED RIVER NEAR BURKBURNETT, TX

LOCATION.--Lat 34°06'36", long 98°31'53", Cotton County, Okla., Hydrologic Unit 11130102, on left bank at downstream side of bridge on U.S. Highways 277 and 281, 2.5 mi northeast of Burkburnett, and at mile 933.

DRAINAGE AREA.--20,570 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to August 1925 (monthly discharge only), December 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 952.57 ft above National Geodetic Vertical Datum of 1929. July 11, 1924, to Aug. 31, 1925, nonrecording gage at site 1,000 ft downstream at same datum. Dec. 16, 1959, to Jan. 11, 1960, nonrecording gage at present site and datum.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. There are many small diversions upstream from station for irrigation, but total amounts are unknown.

AVERAGE DISCHARGE.--31 years (water years 1961-91), 1,059 ft<sup>3</sup>/s (767,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 166,000 ft<sup>3</sup>/s Oct. 21, 1983 (gage height, 16.90 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 3, 1957, reached a stage of 13.54 ft, from levels to floodmarks. According to local residents, higher stages occurred in 1891 and June 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 13	1300	10,600	8.72	June 13	1700	16,300	8.76
May 26	1100	22,900	9.95	July 28	0400	25,500	9.85
June 4	1100	*103,000	*13.78	Sept. 19	2200	18,300	9.80
June 8	1300	55,500	11.38				

Minimum daily discharge, 148 ft<sup>3</sup>/s Oct. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	234	161	262	204	367	231	448	459	860	e1320	1220	600
2	317	166	247	308	366	230	377	521	3520	1260	831	522
3	965	174	247	423	376	237	347	1520	31500	1240	602	575
4	543	258	247	352	379	244	284	1190	91800	1210	476	852
5	421	325	247	285	362	234	269	1430	52200	1120	396	1900
6	386	442	236	354	336	222	258	1020	20600	889	348	2540
7	363	433	222	493	331	213	257	765	27700	770	319	1130
8	364	544	227	517	329	213	234	722	51600	684	298	1530
9	369	624	237	519	326	214	219	755	39000	629	305	2580
10	372	867	237	622	322	215	208	1350	17800	575	299	2850
11	358	1140	227	716	309	214	202	1780	7390	525	301	2000
12	262	1180	e222	792	304	207	198	1430	4660	475	333	1880
13	223	794	e222	839	288	184	192	4990	9170	452	334	1450
14	207	637	227	681	271	181	185	2600	7470	454	317	1920
15	206	578	294	617	260	182	175	2430	6870	418	327	1800
16	200	505	338	551	249	207	164	1820	2950	2300	505	1140
17	187	e488	366	494	237	251	167	1240	2710	4240	711	931
18	175	e472	378	485	232	295	176	938	2510	2630	798	1440
19	174	464	423	502	242	302	177	781	2250	1720	1810	e11700
20	163	404	415	512	241	302	183	708	2130	1210	1140	e14700
21	161	354	e357	520	237	289	183	681	2050	957	832	7040
22	160	342	e296	479	239	284	174	658	2080	687	596	3380
23	159	323	e247	438	237	275	183	735	2190	573	647	2800
24	159	316	e279	421	238	267	212	2300	2250	531	787	1900
25	153	313	294	447	233	259	614	16300	e2180	460	471	1300
26	153	305	363	427	239	257	2300	20000	e2040	588	320	976
27	151	294	370	396	223	266	1540	10200	e2040	3960	286	883
28	148	279	379	384	232	224	1210	3990	e1870	20400	261	785
29	151	279	514	387	---	229	860	2310	e1640	5780	229	719
30	151	269	453	366	---	209	640	1500	e1430	3500	215	696
31	153	---	217	370	---	247	---	1030	---	2000	221	---
TOTAL	8188	13730	9290	14901	8005	7384	12636	88153	404460	63557	16535	74519
MEAN	264	458	300	481	286	238	421	2844	13480	2050	533	2484
MAX	965	1180	514	839	379	302	2300	20000	91800	20400	1810	14700
MIN	148	161	217	204	223	181	164	459	860	418	215	522
CAL YR 1990	TOTAL	418818	MEAN	1147	MAX	25800	MIN	135				
WTR YR 1991	TOTAL	721358	MEAN	1976	MAX	91800	MIN	148				

e Estimated



07308500 RED RIVER NEAR BURKBURNETT, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: May 1968 to September 1974. Chemical and biochemical analyses: October 1974 to current year. Pesticide analyses: October 1973 to September 1982.

PERIOD OF DAILY RECORD.--

SECIFIC CONDUCTANCE: July 1968 to September 1981.

WATER TEMPERATURE: July 1968 to September 1981.

INSTRUMENTATION.--From December 1968 to September 1979, specific conductance was continuously recorded at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 17,400 microsiemens July 30, 1972; minimum daily, 889 microsiemens Sept. 24, 1970.

WATER TEMPERATURE: Maximum daily, 35.5°C June 29, 1980; minimum daily, 0.0°C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CaCO3)
NOV 09...	0950	639	8050	8.0	9.0	3.5	12.1	113	2.0	600	>1000	1200
JAN 18...	1500	710	9670	7.8	7.0	42	12.2	108	0.8	150	220	1400
MAR 21...	1435	268	8200	8.2	21.5	15	9.4	115	6.6	K54	170	1400
MAY 09...	1440	752	4740	8.2	25.5	71	9.6	123	5.3	410	K60	880
JUL 17...	1450	1580	10800	7.8	30.0	2800	5.8	82	1.1	K6000	9100	1600
AUG 15...	1420	319	6360	8.2	28.5	10	6.8	92	5.3	K47	130	1200

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)
NOV 09...	1100	330	96	1300	16	8.5	0	144	118	880	2200
JAN 18...	1200	390	110	1700	20	9.0	0	216	177	1100	2500
MAR 21...	1300	340	130	1300	15	9.5	0	147	120	1400	2000
MAY 09...	790	220	80	720	11	8.9	0	116	95	810	1100
JUL 17...	1500	470	98	1800	20	14	0	112	92	1500	2800
AUG 15...	1100	280	110	880	11	8.9	0	108	88	1100	1400

DATE	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 (MG/L AS N)	NITRO-GEN, DIS-SOLVED TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
NOV 09...	<0.10	5.7	5020	4900	0.680	--	0.020	<0.010	0.700	0.700	0.090
JAN 18...	<0.10	8.0	6110	5930	1.36	1.37	0.040	0.030	1.40	1.40	0.140
MAR 21...	0.60	6.0	5190	5260	--	--	0.010	<0.010	<0.050	<0.050	0.020
MAY 09...	0.40	2.1	3040	3000	--	--	0.020	<0.010	<0.050	<0.050	0.020
JUL 17...	0.90	11	6940	6750	0.450	0.500	0.100	0.060	0.550	0.560	0.180
AUG 15...	0.60	7.0	3940	3840	--	--	0.010	<0.010	<0.050	<0.050	<0.010

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, TOTAL (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	SEDI-MENT, SUS-PENDED (MG/L)
NOV 09...	0.070	0.51	--	--	0.60	0.040	<0.010	<0.010	0.020	--	236
JAN 18...	0.120	0.66	--	--	0.80	0.030	0.050	0.020	0.030	0.06	55
MAR 21...	0.210	1.1	--	--	1.1	0.060	0.070	<0.010	0.030	--	49
MAY 09...	0.010	1.8	--	--	1.8	0.150	0.010	<0.010	0.110	--	197
JUL 17...	0.120	0.42	1.8	1.9	0.60	0.040	0.040	0.010	0.020	0.03	12700
AUG 15...	<0.010	--	--	0.40	0.90	0.090	0.010	<0.010	0.020	--	61

## RED RIVER BASIN

07308500 RED RIVER NEAR BURKBURNETT, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
NOV 09...	407	97	80	2	300	<10	<2.0	10	<2	6	50
JAN 18...	105	97	--	--	--	--	--	--	--	--	--
MAR 21...	35	88	30	<1	<100	<10	<1.0	<1	<1	1	20
MAY 09...	400	88	40	2	200	<10	<1.0	<1	1	4	10
JUL 17...	54200	100	--	--	--	--	--	--	--	--	--
AUG 15...	53	68	90	2	100	<10	5.0	<1	<1	<2	80
DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 09...	<2	60	20	0.1	3	2	2	<2.0	4500	28	<10
JAN 18...	--	--	--	--	--	--	--	--	--	--	--
MAR 21...	<1	100	10	0.2	4	2	4	<1.0	4600	54	10
MAY 09...	<1	50	<10	0.1	5	2	1	1.0	3200	32	<10
JUL 17...	--	--	--	--	--	--	--	--	--	--	--
AUG 15...	<1	70	10	<0.1	3	<2	3	<1.0	4200	45	<10

07311669 TRUSCOTT BRINE LAKE NEAR TRUSCOTT, TX

LOCATION.--Lat 33°47'52", long 99°50'11", Knox County, Hydrologic Unit 11130204, in gage house on top and near center of dam on Bluff Creek, 3.0 mi northeast of Truscott, and 3.6 mi upstream from mouth.

DRAINAGE AREA.--26.2 mi<sup>2</sup>.

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

Water-quality records.--Chemical analyses: October 1984 to September 1989. Specific conductance: October 1984 to September 1989. Water Temperature: October 1984 to September 1989.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--The lake is formed by a rolled-filled earthen structure with a 2-foot thick blanket of soil cement normal to the upstream slope. The dam is 16,080 ft long with a maximum height of 107 ft above the streambed. The uncontrolled spillway is a saddle-type sodded spillway on right end of dam 1,000 ft wide. Elevation-spillway discharge points furnished by U.S. Army Corps of Engineers show a discharge of 13,200 and 35,400 ft<sup>3</sup>/s at elevations of 1,502.00 and 1,508.00 ft, respectively. The lake is operated and maintained by the U.S. Army Corps of Engineers for the purpose of storage and evaporation of water pumped from the South and Middle Wichita Rivers as part of Red River Chloride project. Gage-height telemeter at station. 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.....	1,512.5	-
Crest of spillway.....	1,499.0	107,000

COOPERATION.--The area and capacity tables 1-A and 1-C are provided by the U.S. Army Corps of Engineers, Tulsa District.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 22,930 acre-ft Sept. 21, 1991 (elevation, 1,460.00 ft); minimum, 1,190 acre-ft Oct. 18, 19, 1984 (elevation, 1,429.47 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 22,930 acre-ft Sept. 21 at 1600 hours (elevation, 1,460.00 ft); minimum, 20,000 acre-ft Oct. 28 (elevation, 1,457.73 ft).

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

1,457.0	19,110	1,459.0	21,610
1,458.0	20,330	1,460.0	22,930

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20200	20040	20180	20280	20830	20970	20900	20880	21190	22490	22420	22100
2	20180	20100	20200	20270	20840	20930	20900	21030	22110	22490	22400	22110
3	20240	20170	20170	20260	20850	20940	20900	21060	22490	22470	22400	22110
4	20260	20180	20150	20260	20870	20960	20910	21060	22530	22450	22390	22180
5	20260	20220	20160	20280	20890	20980	20920	21020	22530	22420	22360	22190
6	20260	20210	20130	20290	20910	20940	20920	21010	22560	22400	22360	22220
7	20220	20200	20120	20310	20910	20930	20930	21100	22630	22380	22340	22240
8	20220	20210	20150	20340	20920	20930	20920	21110	22710	22350	22340	22260
9	20200	20220	20160	20480	20930	20920	20870	21140	22720	22320	22300	22260
10	20200	20220	20160	20510	20920	20920	20830	21140	22730	22280	22270	22240
11	20180	20210	20170	20520	20930	20970	20840	21140	22750	22270	22240	22230
12	20170	20210	20170	20550	20970	20920	20850	21140	22750	22240	22220	22220
13	20180	20200	20150	20580	20930	20890	20830	21120	22750	22240	22190	22270
14	20160	20210	20170	20570	20930	20870	20820	21100	22730	22220	22180	22280
15	20160	20210	20170	20600	20890	20880	20820	21100	22710	22220	22190	22300
16	20170	20180	20210	20610	20920	20910	20800	21090	22690	22220	22200	22360
17	20130	20180	20260	20680	20940	20920	20800	21090	22710	22200	22230	22380
18	20120	20200	20270	20730	20930	20930	20800	21090	22690	22200	22230	22900
19	20110	20210	20280	20780	20910	20930	20780	21070	22690	22150	22200	22920
20	20070	20230	20230	20750	20920	20930	20770	21060	22680	22120	22200	22920
21	20050	20220	20200	20750	20930	20970	20750	21060	22650	22090	22190	22930
22	20040	20210	20170	20780	20940	20930	20770	21030	22640	22070	22180	22910
23	20040	20220	20170	20780	20960	20940	20800	21050	22650	22060	22180	22900
24	20040	20230	20180	20790	20920	20940	20980	21140	22670	22010	22170	22880
25	20030	20230	20180	20800	20920	20960	21010	21200	22650	21990	22160	22890
26	20040	20260	20200	20790	20920	20950	21000	21170	22640	22020	22150	22900
27	20040	20220	20220	20830	20940	20940	20980	21140	22610	22420	22120	22890
28	20020	20210	20260	20830	20980	20920	20930	21100	22590	22440	22110	22900
29	20020	20200	20220	20790	---	20890	20910	21090	22550	22440	22110	22890
30	20020	20200	20210	20790	---	20870	20890	21090	22510	22450	22100	22920
31	20040	---	20240	20820	---	20880	---	21060	---	22430	22090	---
MAX	20260	20260	20280	20830	20980	20980	21010	21200	22750	22490	22420	22930
MIN	20020	20040	20120	20260	20830	20870	20750	20880	21190	21990	22090	22100
(†)	1457.76	1457.89	1457.93	1458.38	1458.51	1458.43	1458.44	1458.57	1459.68	1459.62	1459.36	1459.99
(Φ)	-130	+160	+40	+580	+160	-100	+10	+170	+1450	-80	-340	+830
CAL YR 1990	MAX	21020	MIN	13610	(Φ)	+6570						
WTR YR 1991	MAX	22930	MIN	20020	(Φ)	+2750						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## RED RIVER BASIN

07311700 NORTH WICHITA RIVER NEAR TRUSCOTT, TX

LOCATION.--Lat 33°49'14", long 99°47'10", Foard-Knox County line, Hydrologic Unit 11130204, near right bank at downstream side of bridge on State Highway 6, 4.5 mi north of Truscott, about 47.6 mi upstream from confluence with South Wichita River, and 188.4 mi upstream from mouth.

DRAINAGE AREA.--937 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1952-57 (occasional low-flow measurements), December 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,351.78 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 2, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. There is one small diversion for irrigation upstream from station. Gage-height telemeter at station via Sutron data collection platform.

AVERAGE DISCHARGE.--31 years (water years 1961-91), 64.4 ft<sup>3</sup>/s (0.93 in/yr), 46,660 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,900 ft<sup>3</sup>/s Sept. 19, 1965 (gage height, 21.96 ft); minimum, 0.01 ft<sup>3</sup>/s July 25, 1964, and Aug. 22, 23, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900 occurred in September 1919; the next highest flood occurred in May 1954, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 3	0900	*11,400	*19.98	Sept. 19	2100	8,350	19.13
June 9	0200	1,600	12.90				

Minimum daily discharge, 10 ft<sup>3</sup>/s Dec. 23, 24 (due to freeze-up).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	17	20	e18	24	19	15	15	93	36	36	33
2	21	18	21	e20	23	18	14	136	1440	36	31	39
3	29	32	22	21	24	18	12	193	8160	35	27	29
4	37	40	21	e20	23	18	12	58	2510	35	24	95
5	26	32	21	22	22	17	12	35	445	36	22	223
6	20	28	20	23	22	17	14	25	239	36	20	121
7	18	27	20	26	21	17	15	25	601	36	18	104
8	42	72	20	23	21	18	16	60	734	35	17	76
9	39	64	20	34	21	18	15	240	705	33	18	100
10	31	39	19	63	20	18	14	63	174	32	53	58
11	26	29	19	50	20	18	13	43	121	31	42	37
12	23	26	19	35	20	18	15	32	100	30	34	29
13	21	25	19	29	20	16	15	28	151	31	36	28
14	20	24	19	28	20	16	14	26	189	31	37	29
15	19	22	18	28	19	16	14	24	93	88	80	33
16	19	21	22	27	19	20	13	23	74	37	63	52
17	18	21	24	27	20	22	13	22	66	32	195	51
18	17	19	25	36	19	21	14	22	62	28	132	1120
19	17	18	22	41	18	20	15	20	58	25	66	4670
20	19	19	19	36	19	19	16	20	56	22	42	3350
21	20	19	17	30	18	19	15	19	54	20	30	534
22	21	19	12	28	18	19	16	19	52	18	27	290
23	21	19	e10	26	18	17	17	21	51	18	25	175
24	21	19	e10	26	18	15	76	36	54	17	23	137
25	22	19	e20	26	18	15	57	98	48	18	20	113
26	22	20	26	25	19	16	23	55	45	23	19	98
27	22	20	26	25	19	15	18	36	43	34	19	88
28	21	21	25	24	19	14	16	29	41	29	18	81
29	20	20	22	24	---	13	15	24	40	155	18	75
30	19	20	15	25	---	15	16	23	38	77	16	70
31	19	---	e12	24	---	17	---	23	---	50	16	---
TOTAL	713	789	605	890	562	539	550	1493	16537	1164	1224	11938
MEAN	23.0	26.3	19.5	28.7	20.1	17.4	18.3	48.2	551	37.5	39.5	398
MAX	42	72	26	63	24	22	76	240	8160	155	195	4670
MIN	17	17	10	18	18	13	12	15	38	17	16	28
AC-FT	1410	1560	1200	1770	1110	1070	1090	2960	32800	2310	2430	23680
CAL YR 1990	TOTAL	29267.3	MEAN	80.2	MAX	4110	MIN	8.3	AC-FT	58050		
WTR YR 1991	TOTAL	37004	MEAN	101	MAX	8160	MIN	10	AC-FT	73400		

e Estimated



RED RIVER BASIN

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07311700 NORTH WICHITA RIVER NEAR TRUSCOTT, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: February 1954 to March 1959, July 1968 to December 1989, September 1990 to current year. Sediment analyses: April 1978 to December 1989 .

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1968 to December 1989, September 1990 to September 1991 (discontinued).  
WATER TEMPERATURE: July 1968 to December 1989, September 1990 to September 1991 (discontinued).

INSTRUMENTATION.--From August 1968 to December 1989, September 1990 to September 1991, specific conductance was recorded continuously at this station. From June 1982 to December 1989, September 1990 to September 1991, water temperature was recorded continuously at this station.

REMARKS.--Where maximum and minimum specific conductance values are not shown, mean values are estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 35,800 microsiemens Oct. 9, 1982; minimum, 400 microsiemens June 7, 8, 1985.  
WATER TEMPERATURE: Maximum, 39.0°C Aug. 21, 23, 1969, Aug. 22, 1973; minimum, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 20,900 microsiemens Apr. 17, 18; minimum, 500 microsiemens June 3, Sept. 19.  
WATER TEMPERATURE: Maximum, 34.5°C July 8; minimum, 0.0°C on several days during December and January.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)
NOV 05...	1400	34	17100	7.9	11.5	14.1	148	1.2	2400	2300	710
JAN 14...	1315	24	14200	8.3	6.0	14.2	128	0.2	2200	2100	640
MAR 18...	1330	21	18800	7.9	16.5	9.5	109	1.5	2800	2700	840
APR 25...	1125	35	6540	--	16.5	--	--	--	1200	1200	380
MAY 06...	1410	24	11800	8.3	24.0	8.1	104	1.5	2200	2100	630
10...	1025	63	4070	--	20.5	--	--	--	650	600	190
13...	1125	28	8430	--	26.5	--	--	--	1400	1300	410
JUL 15...	1155	78	6850	7.7	27.0	6.6	88	0.6	1300	1300	400
AUG 12...	1120	27	16100	8.0	25.5	7.3	98	0.8	2300	2200	660

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 05...	160	3000	26	13	84	1900	4900	<0.10	1.0	10700
JAN 14...	150	2400	22	12	150	1900	3700	1.1	7.6	8900
MAR 18...	180	3200	26	16	100	2300	5200	2.0	--	11900
APR 25...	72	950	12	11	55	1200	1500	0.50	5.9	4150
MAY 06...	150	2200	20	14	82	1700	3600	0.60	2.6	8350
10...	43	580	10	15	56	680	930	0.60	6.3	2480
13...	86	1300	15	12	56	1600	2100	0.60	3.7	5550
JUL 15...	75	1100	13	11	48	1200	1700	0.60	4.8	4520
AUG 12...	150	2800	26	17	110	2000	4200	1.0	4.3	9900

## RED RIVER BASIN

07311700 NORTH WICHITA RIVER NEAR TRUSCOTT, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)
NOV 05...	--	<0.010	<0.100	0.050	0.15	0.20	0.010	0.010	2	300
JAN 14...	0.880	0.020	0.900	0.170	0.33	0.50	<0.010	<0.010	--	--
MAR 18...	0.130	0.010	0.140	0.080	0.32	0.40	0.020	<0.010	--	--
APR 25...	--	--	--	--	--	--	--	--	--	--
MAY 06...	--	0.040	<0.050	0.040	0.66	0.70	0.100	0.110	--	--
10...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
JUL 15...	0.280	0.020	0.300	0.190	8.3	8.5	0.510	<0.010	6	<100
AUG 12...	--	0.020	<0.050	0.100	0.30	0.40	0.050	0.020	--	--

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 05...	<4.0	<2	4	<10	4	30	0.1	2	<4.0	<10
JAN 14...	--	--	--	--	--	--	--	--	--	--
MAR 18...	--	--	--	--	--	--	--	--	--	--
APR 25...	--	--	--	--	--	--	--	--	--	--
MAY 06...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--
JUL 15...	<1.0	3	7	410	<1	30	0.2	1	<1.0	10
AUG 12...	--	--	--	--	--	--	--	--	--	--

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	713	16800	11400	22000	4900	9390	2400	4660	*
NOV. 1990	789	15400	10400	22200	4400	9350	2200	4770	*
DEC. 1990	605	17100	11600	19000	5000	8110	2500	4010	*
JAN. 1991	890	14900	10100	24200	4200	10200	2200	5250	*
FEB. 1991	562	17500	11900	18100	5100	7730	2500	3800	*
MAR. 1991	539	18700	12800	18600	5500	8050	2600	3850	*
APR. 1991	550	17800	12100	18000	5200	7770	2500	3740	*
MAY 1991	1493	10100	6730	27100	2800	11100	1500	6110	*
JUNE 1991	16537	2350	1540	68800	600	26600	370	16700	400
JULY 1991	1164	12400	8390	26400	3500	11100	1800	5730	*
AUG. 1991	1224	9450	6310	20800	2600	8470	1400	4750	1500
SEPT 1991	11938	2480	1620	52300	620	20100	400	12800	420
TOTAL	37004	**	**	337000	**	138000	**	76200	**
WTD. AVG.	101	5050	3380	**	1400	**	760	**	810

RED RIVER BASIN

07311700 NORTH WICHITA RIVER NEAR TRUSCOTT, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	18000	17800	17900	18600	18300	18400	17400	17000	17300	---	---	e16200
2	18000	17400	17900	18600	18500	18600	17400	16900	17300	17100	16300	16700
3	17300	16500	17100	18600	6760	16800	17600	17300	17400	17100	16300	16700
4	17700	16800	17400	14400	7960	12400	17700	17300	17500	17000	16300	16700
5	18800	17200	18300	17800	14100	15100	17600	17300	17500	16700	16400	16600
6	19000	16100	18400	18800	17200	17900	17700	17300	17500	16500	15600	16200
7	17200	14300	16500	20400	17800	19500	17800	17400	17600	16500	16000	16200
8	16200	5220	13800	19400	6980	12200	18000	17300	17600	16500	16200	16400
9	13700	8840	11600	13500	8620	12000	18000	17500	17800	16500	9700	15200
10	15400	13900	14700	13900	12400	13200	18100	17600	17900	---	---	e12000
11	16700	15200	16000	14000	13100	13600	18000	17400	17700	---	---	e12600
12	15800	14800	15300	14600	13100	13700	17900	17500	17600	---	---	e13100
13	16300	15000	15600	15700	13900	14800	17700	17400	17600	---	---	e13600
14	17300	15200	16400	16200	15400	15800	17500	17100	17400	---	---	e14200
15	17200	16400	16900	---	---	e15900	17400	17200	17400	---	---	e14300
16	18100	16500	17200	16100	15800	16000	17300	16600	16800	---	---	e14400
17	18900	16900	18300	16100	15700	15900	16800	16100	16400	---	---	e14500
18	18400	17300	17900	16600	15800	16200	16600	16200	16400	---	---	e14200
19	17300	16900	17100	16600	15700	16300	16800	16500	16600	---	---	e14000
20	17400	16700	17200	16700	15600	16200	16700	16600	16700	---	---	e14300
21	17900	17100	17700	16900	16300	16700	17400	16400	16900	---	---	e14600
22	18100	17800	18000	17000	16700	16800	18100	16800	17700	---	---	e15000
23	18200	18000	18100	17100	16700	17000	19100	18100	18800	15200	14900	15000
24	18200	18000	18100	17200	16800	17000	19500	13900	18200	15800	15300	15500
25	18200	18000	18100	17200	16900	17100	19200	6860	15400	16100	14100	15400
26	18200	17800	18100	17300	16800	17000	18800	16900	18000	16400	14100	15800
27	18200	17700	18000	17400	16900	17100	17300	16400	16900	16400	15700	16300
28	18100	17700	17900	17400	16900	17200	16500	15400	16200	16900	16300	16500
29	---	---	e18000	17400	17000	17200	15800	15600	15700	17000	16700	16900
30	---	---	e18100	17400	16900	17200	---	---	e15700	17000	16700	16900
31	---	---	e18300	---	---	---	---	---	e16000	17100	16700	17000
MONTH	19000	5220	17100	20400	6760	16000	19500	6860	17100	17100	9700	15300
e Estimated												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	17200	16700	17000	18000	17700	17900	19600	19100	19400	20300	19600	19900
2	17200	16800	17100	18200	17800	18000	19600	19100	19400	20000	5400	14700
3	17300	17000	17200	18200	17800	18000	19800	19200	19500	---	---	e5000
4	17200	16900	17100	18200	17700	18000	19800	19200	19600	---	---	e8000
5	17100	16900	17000	18400	17700	18200	19800	19300	19600	---	---	e10000
6	17200	16800	17000	18400	18000	18300	19800	19300	19600	---	---	e12000
7	17500	17000	17200	18400	18000	18300	19800	19100	19500	---	---	e11000
8	17400	17000	17200	18400	18000	18200	20000	19200	19700	---	---	e8000
9	17300	16900	17200	18400	18100	18200	20100	19200	19700	---	---	e6000
10	17300	17000	17200	18500	18200	18300	20200	19600	19900	4900	4000	4500
11	17400	17000	17300	---	---	e18600	20400	20000	20200	---	---	e5800
12	17500	17000	17300	---	---	e19000	20600	20100	20400	---	---	e7100
13	17700	17200	17400	19200	18900	19000	20700	19700	20300	9440	8300	8500
14	17700	17300	17500	19300	19100	19200	20600	19700	20300	10700	9440	10100
15	17700	17500	17600	19500	18700	19200	20600	20200	20400	11700	10600	11100
16	17800	17300	17600	19200	18400	18800	20800	20000	20500	12700	11600	12000
17	17900	17300	17600	18800	18100	18600	20900	20500	20700	13500	12600	13000
18	18000	17600	17700	18900	18300	18700	20900	20200	20600	14500	13500	14100
19	18100	17700	17900	19100	18600	18800	20700	20100	20400	15300	14500	14900
20	18100	17600	17900	19000	18300	18700	20400	19800	20100	15900	15200	15600
21	18000	17800	17900	18800	17900	18500	20500	20000	20200	16800	15900	16500
22	18100	17800	18000	19200	18400	18800	20500	19900	20200	17800	16700	17300
23	18100	17600	17900	19300	18700	19000	20200	19600	20000	17900	17500	17700
24	18000	17700	17900	19400	18900	19100	19800	3600	15600	17900	14700	17300
25	18000	17600	17900	19500	19000	19300	13200	6200	9100	11500	3830	8610
26	18100	17800	18000	19500	19100	19300	14800	10700	13200	14600	12100	13800
27	18000	17800	17900	19600	18400	19300	17400	14500	16000	14700	13800	14200
28	18100	17700	17900	19600	19200	19400	18900	17600	18200	16200	14800	15500
29	---	---	---	19800	19300	19500	19300	18700	18900	17400	16100	16800
30	---	---	---	19600	19400	19500	20000	19000	19400	18800	17400	18200
31	---	---	---	19600	19300	19500	---	---	---	18500	16700	17900
MONTH	18100	16700	17500	19800	17700	18700	20900	3600	19000	20300	3830	12400
e Estimated												

## 07311700 NORTH WICHITA RIVER NEAR TRUSCOTT, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	16600	1510	12900	15200	14900	15100	6700	5860	6240	15500	14000	14600
2	7430	1270	3410	15300	14800	15200	7500	6700	7120	18100	15600	16600
3	1530	500	706	15600	15000	15300	8200	7500	7860	18000	17600	17800
4	1600	700	1030	16000	15200	15600	8900	8200	8550	17800	2800	9340
5	4400	1700	3170	16100	15300	15800	9400	8900	9120	---	---	e5000
6	6500	4200	5280	16300	15400	15900	10000	9300	9660	---	---	e6000
7	6100	3000	3910	16600	15900	16300	10800	10000	10300	---	---	e6000
8	5460	1460	3840	16900	16200	16500	11700	10700	11200	---	---	e7000
9	3830	1250	2410	17300	16400	16800	12200	11500	11700	---	---	e6500
10	6450	3930	5260	17600	16600	17100	15600	12100	13500	---	---	e6600
11	7620	6460	6970	17700	16900	17200	16400	15800	16100	---	---	e6700
12	8490	7620	7980	17900	17100	17500	16200	14600	15900	---	---	e6800
13	8460	4640	6550	18000	17400	17700	16400	14000	16000	---	---	e7000
14	11500	6560	9760	18200	17400	17800	16500	11300	13800	---	---	e7400
15	9950	5580	6740	18400	4940	11200	11200	9800	10300	---	---	e7800
16	6890	5700	6220	9800	5290	7440	16300	11600	15000	8500	3090	6700
17	7980	6890	7400	12300	9900	11200	16300	2120	9040	12100	8720	11500
18	9180	7980	8550	15400	11700	13800	5050	2330	3380	9620	1300	2500
19	10300	9180	9680	16300	15400	15900	3050	2850	2950	2400	500	1240
20	11300	10300	10800	16800	16100	16500	6640	3050	4810	1900	600	953
21	12200	11300	11700	17200	16500	16900	6870	6540	6700	4000	1900	3070
22	12700	12100	12500	17600	16900	17300	7510	6870	7260	4800	4100	4490
23	13100	12500	12800	18000	17400	17700	8150	7400	7710	6000	4900	5440
24	13500	11200	12800	18000	17800	17900	9100	8150	8680	6700	6000	6340
25	13500	12700	13100	18000	17600	17700	10100	9110	9600	7500	6700	7140
26	13700	13200	13400	17600	16800	17100	11100	10100	10600	8200	7600	7890
27	14200	13400	13800	17000	16100	16500	12400	11200	11800	8700	8100	8440
28	14400	13900	14200	---	---	e16000	13300	12300	12800	9100	8600	8890
29	14700	14300	14500	---	---	e2500	13700	13100	13400	9500	9000	9250
30	15200	14600	14800	4610	3600	3840	14200	13600	13900	9800	9400	9590
31	---	---	---	5900	4630	5310	14500	13900	14200	---	---	---
MONTH	16600	500	8540	18400	3600	14700	16500	2120	10300	18100	500	7490

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	24.0	18.0	21.0	---	---	e19.0	10.5	6.5	8.5	2.5	.0	1.0
2	22.0	20.5	21.5	20.5	16.5	18.5	8.5	6.5	7.5	4.0	.5	2.5
3	26.0	19.0	22.5	17.5	9.0	15.5	7.5	4.0	5.5	2.0	.0	1.0
4	26.0	20.5	23.5	10.0	8.5	9.0	6.5	2.0	4.5	.0	.0	2.0
5	26.0	21.0	23.5	12.0	7.0	9.5	7.5	2.5	5.5	4.5	.0	2.0
6	27.0	21.5	24.5	14.0	10.0	11.5	8.0	5.0	6.5	4.0	2.0	3.0
7	24.0	20.5	23.0	11.0	6.5	8.0	7.5	3.0	5.5	3.5	1.5	2.5
8	20.0	14.0	17.5	7.0	5.5	6.0	8.5	3.0	6.0	6.5	2.5	4.5
9	16.5	12.0	14.0	10.5	6.0	8.5	9.0	4.0	7.0	7.0	4.5	6.0
10	17.5	11.0	14.0	12.5	7.0	10.0	9.5	5.0	7.5	5.5	3.5	4.5
11	19.0	13.0	16.0	14.5	9.5	12.0	10.5	5.5	8.0	7.5	5.0	6.0
12	20.0	13.5	17.0	15.5	10.5	13.5	11.0	6.5	8.5	7.5	5.0	6.5
13	21.0	14.0	17.5	15.5	11.0	13.5	8.5	7.0	8.0	9.0	5.0	7.0
14	21.0	15.5	18.0	---	---	e13.0	9.5	6.0	8.0	7.0	5.0	6.5
15	22.0	15.0	18.5	---	---	e13.5	9.5	7.5	8.5	9.5	5.5	7.5
16	24.0	17.0	20.5	13.5	11.5	13.0	8.0	7.5	7.5	9.0	5.0	7.0
17	22.5	16.5	20.0	14.5	11.0	12.5	9.5	7.5	8.5	9.0	7.5	8.5
18	18.5	13.0	16.0	17.0	12.5	14.5	10.0	6.5	8.5	8.5	7.5	8.0
19	19.0	13.0	16.0	17.0	11.5	14.5	10.0	6.0	8.0	10.0	6.0	8.0
20	20.5	14.0	16.5	19.0	15.0	17.0	8.5	3.0	6.0	9.0	5.5	7.0
21	16.0	11.5	13.5	18.0	15.0	17.0	2.5	.0	.5	7.0	4.5	5.5
22	15.5	8.5	12.0	15.0	12.0	14.0	.0	.0	.0	7.5	3.0	5.5
23	17.0	10.0	14.0	14.0	9.5	12.0	.0	.0	.0	7.5	4.5	6.0
24	18.0	11.5	15.0	14.0	9.0	11.5	.0	.0	.0	8.5	4.5	6.5
25	18.0	12.0	15.0	14.0	9.5	12.0	.5	.0	.0	9.0	4.5	6.5
26	19.5	13.5	16.5	17.0	12.5	14.5	.5	.0	.0	6.0	4.0	5.0
27	20.0	14.0	17.0	16.0	11.5	14.5	1.5	.0	.5	9.5	4.0	6.5
28	19.0	13.5	16.5	11.5	8.0	9.5	5.0	.0	2.0	9.5	4.0	7.0
29	---	---	e17.0	10.0	5.5	8.0	5.5	.0	4.0	8.0	3.0	6.5
30	---	---	e18.0	10.0	5.5	8.0	2.0	.0	.5	6.0	.5	3.0
31	---	---	e18.5	---	---	---	1.5	.0	.5	7.5	1.0	4.5
MONTH	27.0	8.5	18.0	20.5	5.5	12.5	11.0	.0	5.0	10.0	.0	5.0

e Estimated



RED RIVER BASIN

07311700 NORTH WICHITA RIVER NEAR TRUSCOTT, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.0	3.5	6.5	17.0	11.5	14.5	20.0	11.0	15.5	24.5	15.0	19.5
2	8.5	5.5	7.0	17.0	11.5	14.5	21.0	13.5	17.0	20.0	17.5	18.5
3	11.0	5.5	8.0	16.5	9.0	12.5	22.5	14.0	18.0	25.0	18.0	20.5
4	12.5	9.0	10.5	18.0	9.5	13.5	24.0	15.0	19.5	25.5	20.5	22.5
5	11.5	10.0	10.5	18.5	11.5	15.5	23.5	16.0	19.5	22.5	17.5	20.5
6	14.0	8.5	11.0	17.0	12.5	15.5	23.0	16.5	20.0	24.0	17.0	20.0
7	13.5	7.5	10.5	15.0	10.0	12.5	25.5	17.0	21.0	24.0	16.5	20.0
8	13.5	7.5	10.5	16.0	8.0	12.0	25.5	17.5	21.5	23.0	16.5	19.5
9	14.0	8.5	11.0	17.0	8.5	12.5	23.5	16.0	20.0	23.0	18.5	20.5
10	13.0	9.0	11.0	16.0	9.5	13.0	21.5	13.5	17.5	25.5	20.5	23.0
11	13.5	9.0	11.0	---	---	e13.0	26.0	17.0	21.0	---	---	e24.0
12	17.5	11.5	14.5	---	---	e13.0	27.5	20.0	23.5	---	---	e26.0
13	17.0	12.5	14.5	16.5	10.0	13.0	25.5	17.5	21.5	---	---	e27.0
14	16.0	10.5	13.0	16.0	9.5	12.5	23.5	17.5	20.5	29.5	22.0	27.0
15	12.5	8.0	10.0	17.0	9.5	12.5	24.0	14.5	19.0	30.0	21.5	27.0
16	11.0	6.5	9.0	12.5	10.5	11.5	24.5	15.5	20.0	29.5	21.5	26.5
17	16.0	9.0	12.5	17.0	8.5	12.5	21.5	19.0	20.0	31.5	23.5	28.5
18	16.0	10.5	13.0	19.0	10.5	14.5	23.5	16.0	19.5	33.0	23.5	30.5
19	13.5	9.0	11.0	16.0	13.0	14.5	24.5	18.0	21.0	30.0	22.5	27.5
20	13.5	5.5	9.5	15.0	12.0	13.5	23.5	15.5	19.5	30.5	24.0	28.5
21	13.5	6.5	10.5	20.0	11.5	15.5	21.0	15.5	18.0	29.5	23.5	27.5
22	15.5	8.5	12.0	17.0	12.0	14.5	21.0	15.5	18.0	30.5	23.0	27.5
23	15.0	9.5	12.5	19.0	10.0	14.5	23.5	14.5	18.5	29.5	24.0	27.5
24	13.0	8.5	11.0	20.5	11.5	16.0	19.0	17.0	18.0	31.0	26.0	29.0
25	13.0	6.5	9.5	22.0	14.0	18.0	23.5	16.0	19.0	29.5	22.0	27.0
26	13.5	6.5	10.0	23.0	18.0	20.5	26.5	20.0	23.0	32.0	24.0	28.0
27	15.0	7.5	11.0	21.0	14.0	17.5	26.5	17.5	21.5	32.0	23.5	27.5
28	15.0	9.5	12.5	20.0	13.5	16.0	23.5	17.5	20.0	31.0	23.0	27.0
29	---	---	---	17.5	12.0	14.5	24.5	14.0	19.0	32.0	23.0	27.0
30	---	---	---	12.5	8.5	10.0	25.0	15.5	20.0	30.0	23.5	26.5
31	---	---	---	17.5	6.5	12.0	---	---	---	30.5	23.5	26.5
MONTH	17.5	3.5	11.0	23.0	6.5	14.0	27.5	11.0	19.5	33.0	15.0	25.0
e Estimated												
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	29.5	20.0	24.5	31.0	24.0	27.0	32.0	25.0	28.5	26.5	24.0	25.5
2	---	---	e24.0	33.0	25.0	29.0	32.0	25.0	28.0	30.5	24.0	27.0
3	---	---	e20.0	31.5	26.0	28.5	33.0	25.0	28.5	29.5	25.0	27.0
4	---	---	e24.0	32.5	24.5	28.5	33.0	25.5	29.0	27.0	22.5	24.0
5	28.5	24.0	25.5	33.5	25.0	29.0	32.5	25.5	29.0	24.0	23.0	23.5
6	27.5	24.0	25.5	34.0	25.0	29.0	31.5	25.5	28.5	25.0	23.0	24.5
7	25.5	21.5	24.0	34.0	25.5	29.0	32.5	25.0	28.5	25.0	24.5	25.0
8	24.5	21.0	23.0	34.5	25.0	29.5	33.5	25.5	29.5	27.5	24.0	25.5
9	25.5	20.5	22.5	33.0	25.0	29.0	29.0	26.0	27.0	27.0	25.0	26.0
10	27.5	23.5	25.5	33.0	25.0	28.5	29.0	24.0	26.5	27.5	24.0	25.5
11	28.5	23.5	26.0	32.5	25.0	28.5	27.5	24.0	25.5	28.5	25.0	26.5
12	30.5	23.5	26.5	32.5	25.5	28.5	27.0	23.0	25.0	27.5	25.0	26.5
13	29.0	23.5	26.0	32.0	25.0	28.5	25.5	24.0	25.0	---	---	e26.5
14	30.0	25.5	27.5	32.5	25.0	28.5	25.0	23.0	24.0	---	---	e26.0
15	30.0	23.5	26.5	31.5	24.5	28.0	28.5	21.5	25.0	---	---	e26.0
16	30.5	25.0	27.5	33.0	25.5	29.0	31.5	24.0	28.0	---	---	e25.0
17	30.0	24.5	27.0	33.5	26.5	29.5	28.5	24.0	26.0	25.5	22.5	23.5
18	31.0	24.5	28.0	34.0	26.5	30.0	31.0	25.5	28.0	23.0	15.5	17.0
19	30.0	25.0	28.0	33.0	25.5	29.0	31.0	25.5	28.5	15.5	14.0	14.5
20	31.5	25.5	28.0	32.0	24.5	28.0	31.5	26.0	28.5	15.0	14.0	14.0
21	30.5	23.5	27.0	33.0	25.0	28.5	32.0	24.5	28.0	19.0	15.0	16.5
22	31.5	25.5	28.5	33.5	25.0	29.0	32.0	25.5	28.5	20.0	19.0	19.5
23	33.0	26.0	29.0	32.5	25.5	29.0	32.0	25.0	28.5	21.0	18.5	19.5
24	32.0	25.0	28.5	30.0	25.0	27.5	31.0	25.5	28.0	20.0	19.0	19.5
25	33.0	26.0	29.0	28.5	24.0	25.5	30.5	24.5	27.5	22.0	16.5	19.0
26	32.0	25.5	28.5	27.5	25.0	26.0	30.5	24.0	27.0	23.0	18.0	20.5
27	32.5	25.0	28.5	---	---	e26.0	30.5	24.5	27.0	22.5	18.5	20.5
28	32.0	25.0	28.0	---	---	e27.0	30.5	24.0	27.0	23.5	18.5	21.0
29	31.0	24.5	27.5	---	---	e25.0	31.5	24.5	28.0	23.5	18.5	21.5
30	31.5	24.0	27.5	---	---	e26.0	30.0	25.0	27.5	22.5	18.5	21.0
31	---	---	---	32.0	---	e27.0	29.5	24.5	26.5	---	---	---
MONTH	33.0	20.0	26.5	34.5	24.0	28.0	33.5	21.5	27.5	30.5	14.0	22.5
e Estimated												

## RED RIVER BASIN

## 07311782 SOUTH WICHITA RIVER AT LOW FLOW DAM NEAR GUTHRIE, TX

LOCATION.--Lat 33°37'19", long 100°12'31", King County, Hydrologic Unit 11130205, on right bank 1.0 mi downstream from ranch road crossing, 2.9 mi upstream from Willow Creek, 6.6 mi east of Guthrie, and 91.5 mi upstream from confluence with North Wichita River.

DRAINAGE AREA.--223 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1984 to September 1985, May 1987 to current year (discharge to 07311669 Truscott Brine Lake near Truscott).

GAGE.--Water-stage recorder. Datum of gage is 1,590.0 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Discharge represents flow diverted by pumping from South Wichita River at Low Flow dam near Guthrie (station 07311782) via pipeline to Truscott Brine Lake near Truscott (station 07311669). Flow is determined from digital recorder monitoring flowmeter in pipeline. From May 1987 to current year, specific conductivity and discharge values collected at this station have been used for computation of water quality loads for station 07311669. Gage-height telemeter at station.

COOPERATION.--Flow data furnished by the U.S. Army Corps of Engineers, Tulsa District.

EXTREMES FOR CURRENT YEAR.--Not determined.

FLOW THRU PIPELINE  
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	5.8	5.1	7.1	6.5	6.5	2.3	6.8	.94	6.0	6.7	6.7
2	6.7	5.9	6.7	4.5	3.9	6.4	6.7	6.7	.00	6.1	6.7	1.5
3	6.7	7.2	6.7	5.3	6.8	3.6	7.0	7.0	.00	6.1	6.7	6.4
4	6.6	7.2	5.3	.00	6.7	6.8	7.0	6.9	2.8	6.3	1.5	11
5	6.6	5.3	5.6	.00	6.8	6.2	3.4	7.0	5.7	6.5	6.4	7.5
6	6.7	6.7	6.9	.00	3.6	4.1	4.5	5.5	2.6	6.5	11	6.4
7	6.4	6.7	4.1	3.6	3.6	6.8	.42	5.2	6.4	3.7	7.5	6.6
8	5.6	6.9	7.1	7.2	5.4	.81	.00	6.4	6.6	4.5	6.4	6.6
9	6.6	7.00	5.5	7.1	6.0	3.2	.19	6.4	6.3	6.1	6.6	6.6
10	5.4	7.0	5.6	7.1	3.9	6.7	1.5	3.6	6.6	6.1	6.6	6.6
11	4.0	6.9	6.9	7.1	4.2	6.7	4.5	.00	6.6	2.5	6.6	6.6
12	7.2	5.2	5.7	7.1	6.0	6.7	6.8	.00	6.6	6.4	6.6	6.6
13	7.2	7.1	4.5	7.1	.24	6.7	6.8	3.4	6.6	2.3	6.6	6.8
14	3.3	2.5	7.1	7.1	3.1	6.7	6.8	6.3	6.6	2.3	6.6	6.8
15	3.6	.00	4.9	7.1	6.5	5.6	6.8	6.2	6.5	6.0	6.8	6.8
16	7.3	.00	6.7	7.1	6.5	6.4	6.8	6.3	6.5	.00	6.8	6.5
17	6.8	.00	6.7	7.1	6.5	4.5	6.7	6.3	6.5	3.3	6.8	6.6
18	7.3	.00	6.7	7.0	6.6	4.7	4.0	6.3	6.4	6.5	6.5	3.6
19	5.3	.00	6.7	7.0	6.9	5.9	6.7	6.2	6.5	1.8	6.6	.00
20	6.8	7.1	6.6	7.0	6.8	6.8	3.9	3.4	6.5	.00	3.6	.00
21	5.2	7.2	6.7	7.0	6.8	6.4	6.6	5.6	6.5	2.6	.00	.00
22	5.2	4.3	3.7	7.0	6.8	3.8	2.6	4.2	6.5	6.7	.00	.00
23	7.1	6.7	.00	7.0	5.2	3.5	2.9	5.1	6.5	3.4	.00	.00
24	3.7	6.7	.00	6.9	5.4	6.5	.12	3.5	6.6	4.1	.00	.00
25	5.9	6.7	1.7	5.3	6.9	4.9	3.1	.00	6.8	9.0	.00	4.2
26	2.9	4.1	6.8	5.9	3.1	6.0	4.7	.00	6.8	11	.00	8.3
27	7.3	6.9	3.3	6.1	5.1	6.0	.00	.00	6.8	7.6	4.2	11
28	7.3	6.9	7.2	5.7	6.5	3.9	4.4	2.9	5.1	6.8	8.3	11
29	7.1	4.3	7.1	6.8	---	6.9	6.8	6.8	3.6	6.8	11	11
30	5.1	7.1	7.1	6.6	---	3.4	6.8	6.1	6.3	6.8	11	11
31	6.2	---	6.4	6.5	---	5.2	---	6.7	---	6.8	11	---
TOTAL	185.7	155.40	171.10	183.40	152.34	168.31	130.83	146.80	164.74	160.60	175.10	172.70
MEAN	5.99	5.18	5.52	5.92	5.44	5.43	4.36	4.74	5.49	5.18	5.65	5.76
MAX	7.3	7.2	7.2	7.2	6.9	6.9	7.0	7.0	6.8	11	11	11
MIN	2.9	.00	.00	.00	.24	.81	.00	.00	.00	.00	.00	.00
AC-FT	368	308	339	364	302	334	260	291	327	319	347	343
CAL YR 1990	TOTAL	1677.52	MEAN	4.60	MAX	7.4	MIN	.00	AC-FT	3330		
WTR YR 1991	TOTAL	1967.02	MEAN	5.39	MAX	11	MIN	.00	AC-FT	3900		

RED RIVER BASIN

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07311782 SOUTH WICHITA RIVER AT LOW FLOW DAM NEAR GUTHRIE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1984 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1984 to current year. October 1986 to April 1987 published under station 07311783.  
 WATER TEMPERATURE: October 1984 to current year. October 1986 to April 1987 published under station 07311783.

INSTRUMENTATION.--Since October 1984, specific conductance and water temperature are recorded continuously at this station.

REMARKS.--Interruptions in the record are due to malfunction of the instrument or when the pumps were not running. Where maximum and minimum specific conductance values are not shown, mean values are sometimes estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 41,500 microsiemens Aug. 4, 1989; minimum, 200 microsiemens July 3, 1986.  
 WATER TEMPERATURE: Maximum, 33.0°C Aug. 2, 7, 8, 1985; minimum, 0.0°C Dec. 23, 1989, Dec. 22, 1990.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 39,700 microsiemens July 25; minimum, 542 microsiemens Sept. 18.  
 WATER TEMPERATURE: Maximum, 31.5°C July 17, Aug. 8; minimum 0.0°C Dec. 22.

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA,MG) (MG/L)
OCT. 1990	185.7	36600	24800	12400	12300	6180	3200	1620	*
NOV. 1990	155.40	35100	23700	9940	11700	4920	3100	1320	*
DEC. 1990	171.10	35300	23900	11000	11800	5460	3200	1460	*
JAN. 1991	183.40	34800	23500	11600	11600	5760	3100	1550	*
FEB. 1991	152.34	35700	24100	9920	12000	4920	3200	1310	*
MAR. 1991	168.31	37400	25400	11600	12700	5760	3300	1490	*
APR. 1991	130.83	37900	25800	9110	12800	4540	3300	1160	*
MAY 1991	146.80	36700	24900	9860	12400	4900	3200	1280	*
JUNE 1991	164.74	28400	19000	8440	9300	4140	2700	1190	*
JULY 1991	160.60	34800	23600	10200	11700	5080	3100	1340	*
AUG. 1991	175.10	25700	17100	8090	8400	3970	2400	1140	*
SEPT 1991	172.70	28800	19200	8950	9400	4390	2700	1260	*
TOTAL	1967.02	**	**	121000	**	60000	**	16100	**
WTD.AVG.	5.4	33800	22800	**	11000	**	3000	**	**

## 07311782 SOUTH WICHITA RIVER AT LOW FLOW DAM NEAR GUTHRIE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	37000	36500	36800	36700	36400	36500	35800	35600	35700	35200	35000	35100
2	36900	36100	36500	36700	36500	36600	36100	35800	35900	35200	35000	35100
3	36900	35100	36200	36700	35100	36300	36100	35700	35900	35600	35300	35400
4	36800	36000	36200	35900	35200	35600	36100	35600	35900	---	---	---
5	36800	36100	36600	36200	35900	36100	36200	36000	36100	---	---	---
6	36400	35500	35900	36000	35000	35600	36300	36000	36200	---	---	---
7	35800	35400	35600	35000	33900	34700	36100	35700	35900	36600	35400	35700
8	35700	35100	35400	33900	33300	33700	36000	35700	35900	37200	36300	36700
9	36200	35400	35900	34600	33900	34200	36300	36100	36200	36400	35700	36100
10	36400	36100	36200	34700	33200	34000	36200	35800	36000	35700	35000	35300
11	36700	35900	36300	33300	32700	33000	35900	35600	35800	35100	34200	34700
12	36800	35500	36500	33300	33000	33200	35700	35400	35500	35100	34300	34700
13	36800	36100	36600	33900	33300	33600	35500	35300	35400	34500	34100	34300
14	36900	36400	36600	34300	33900	34100	35400	35100	35200	34300	33800	34100
15	36900	36600	36800	---	---	---	35300	35100	35200	34500	33800	34100
16	37200	36100	36800	---	---	---	35100	34600	34900	34900	34500	34600
17	37500	37100	37300	---	---	---	34900	34600	34700	35100	34500	34900
18	37300	36500	37000	---	---	---	34800	34100	34600	34400	33800	34100
19	37000	36600	36700	---	---	---	34200	33800	34000	34700	33900	34300
20	36800	36300	36700	35500	35100	35300	34000	33500	33700	34800	34400	34700
21	37200	36800	37000	35600	35300	35500	33900	33600	33700	34300	33500	33800
22	37300	35700	37000	35500	35300	35400	34300	33900	34100	34000	33700	33800
23	37300	36900	37100	35500	35200	35300	---	---	---	34500	34000	34300
24	37300	35900	37100	35500	35300	35400	---	---	---	35000	34400	34700
25	37400	37000	37200	35500	35300	35400	35400	35100	35200	35100	34800	34900
26	37300	36900	37200	35500	35300	35400	36000	35300	35800	35100	32900	34400
27	37300	36600	37100	35600	35200	35400	36000	35600	35900	35200	34800	35000
28	37200	36000	37000	35500	35200	35400	35900	35500	35600	35300	35100	35200
29	36800	36400	36600	35400	35200	35300	35500	34400	35100	35200	34800	35000
30	36500	35800	36300	35600	35300	35500	35500	34800	35100	35300	35000	35200
31	36600	36200	36400	---	---	---	35100	34700	34900	35400	35200	35300
MONTH	37500	35100	36600	36700	32700	35100	36300	33500	35300	37200	32900	34800
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	35500	35200	35400	36200	35800	36000	---	---	e38000	37800	37100	37300
2	35400	34600	34900	36100	35700	35900	---	---	e38000	37700	37000	37300
3	35000	34700	34800	36400	35800	36200	---	---	e38000	37200	36400	36900
4	35000	34700	34900	36600	36100	36300	38700	36600	38000	37100	36500	36800
5	34700	34600	34700	36700	36100	36400	37900	36200	36600	37000	35800	36700
6	34900	34600	34700	36700	36000	36200	37800	36400	36900	35700	35100	35300
7	35100	34600	34900	36900	36000	36500	38200	36200	37300	35500	34600	35100
8	35300	34700	35000	36700	36500	36600	---	---	---	35800	34400	35200
9	35600	35100	35300	36700	35700	36300	38300	38000	38100	36700	35700	36200
10	35600	35500	35500	37200	36000	36400	38300	38100	38200	36900	36300	36600
11	35700	35200	35400	37900	36900	37400	38700	38100	38300	---	---	---
12	35900	35200	35600	38200	37200	37900	39000	38500	38700	---	---	---
13	35700	35000	35400	38400	37600	38000	39100	38800	38900	37200	36600	36900
14	36200	35700	35900	37900	37500	37700	39200	38700	39000	37800	37100	37300
15	36000	35500	35700	39200	37600	37800	39100	38300	38700	37900	37200	37600
16	36600	35500	36000	38200	37800	38000	38600	38200	38400	37700	36900	37200
17	36700	36200	36400	38500	38100	38300	38200	37500	37800	37500	36800	37200
18	36600	36300	36400	38500	38300	38400	38700	37100	37800	37100	36400	36800
19	36300	36200	36200	38700	38400	38600	38400	37800	38100	37300	36800	36900
20	36200	35900	36100	38500	37700	38100	38700	37900	38300	36800	36000	36400
21	36100	35900	36000	37600	37300	37500	---	---	e38300	38000	36200	37200
22	36100	35600	35900	37800	37300	37500	---	---	e38200	37900	36400	37100
23	35800	35600	35800	38000	37300	37700	---	---	e38000	38300	37200	37600
24	35900	35500	35800	37800	37500	37700	---	---	e37500	37900	32400	36100
25	36100	35600	35900	38600	37500	37900	---	---	e37000	---	---	---
26	36000	35700	35800	38600	38100	38300	37500	37200	37300	---	---	---
27	36600	36000	36300	39000	38300	38600	---	---	---	---	---	---
28	36500	36200	36400	38700	38000	38500	37900	36400	37100	36800	33500	36000
29	---	---	---	38000	37700	37900	36500	36300	36400	36700	33900	36300
30	---	---	---	38000	37700	37900	37200	36400	36700	36800	36300	36600
31	---	---	---	38400	37300	37800	---	---	---	36800	36300	36600
MONTH	36700	34600	35600	39200	35700	37400	39200	36200	37800	38300	32400	36700

e Estimated



RED RIVER BASIN

07311782 SOUTH WICHITA RIVER AT LOW FLOW DAM NEAR GUTHRIE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	36800	36200	36600	36300	35900	36100	27600	21600	24300	33000	32000	32500
2	---	---	---	36300	35700	36000	30600	26700	29800	33600	33100	33300
3	---	---	---	36800	36000	36300	32700	30200	31500	34900	33500	34000
4	6630	4210	5840	36900	36300	36700	33700	32700	33300	34900	33800	34600
5	12200	6520	9750	38400	36700	37000	34300	33600	34000	34200	32200	32800
6	18100	11000	14500	38600	37500	37900	35200	34300	34700	32500	31800	32100
7	18800	18000	18500	38400	38100	38200	35900	35100	35500	32400	31900	32200
8	18900	18400	18700	38200	37600	37900	36000	35100	35600	31900	31100	31400
9	18800	18100	18500	37800	37200	37500	34800	34200	34700	31900	31000	31300
10	27700	18800	22000	37500	36800	37100	36000	34800	35400	32300	31700	31900
11	26300	24900	25900	37100	36600	36800	35900	34900	35400	32900	32100	32400
12	25900	24500	25300	36900	36300	36600	35200	5140	23400	33300	32700	32900
13	26100	24800	25500	36600	36200	36400	12900	5590	7770	33500	33000	33300
14	28000	25000	26100	37000	36400	36600	11100	9980	10400	34100	33400	33700
15	29700	28200	28800	37600	36800	37000	9870	5160	7770	34300	33900	34100
16	31600	29900	30600	---	---	---	10600	6180	8020	34100	33100	33600
17	32400	31600	32000	38600	38000	38300	11700	9790	10900	33400	33000	33200
18	32700	32200	32400	38000	37300	37600	10900	10700	10800	32900	542	20000
19	33300	32200	32800	38000	37200	37400	12200	10600	11100	---	---	---
20	33700	32900	33100	---	---	---	15100	12300	13200	---	---	---
21	33700	33100	33300	38600	37800	38200	---	---	---	---	---	---
22	34300	33700	33900	39300	38300	38700	---	---	---	---	---	---
23	34900	34200	34400	38600	38300	38400	---	---	---	---	---	---
24	34700	34100	34400	39200	38100	38600	---	---	---	---	---	---
25	34900	34200	34500	39700	38500	39000	---	---	---	18100	17100	17400
26	35100	34300	34600	39300	35900	38300	---	---	---	19600	18100	18600
27	35200	34500	34800	39200	28300	37300	30400	29200	29700	21100	19600	20300
28	35400	34600	34900	33100	27600	29500	31000	30100	30600	22200	21000	21400
29	35800	34900	35300	27600	12000	24100	31900	30900	31400	23000	21900	22400
30	36600	35500	35900	16900	12300	14700	32400	31900	32100	23900	22800	23100
31	---	---	---	22400	16800	19200	32800	32100	32400	---	---	---
MONTH	36800	4210	28000	39700	12000	35300	36000	5140	25000	34900	542	29300

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	e22.0	21.0	16.0	18.0	11.5	7.5	9.5	10.0	5.0	7.5
2	---	---	e21.0	20.0	17.5	18.5	12.0	7.0	10.5	10.5	7.5	9.0
3	25.5	19.5	22.0	18.0	14.0	16.5	10.0	4.0	7.5	7.5	6.0	6.5
4	26.0	20.5	23.0	14.0	11.0	13.0	11.0	7.5	9.0	---	---	---
5	26.0	21.5	23.0	15.0	10.0	12.0	10.5	6.0	8.5	---	---	---
6	25.5	22.5	23.5	14.5	11.0	11.5	10.5	7.5	9.0	---	---	---
7	23.5	22.0	23.0	11.5	10.0	11.0	10.0	7.5	8.5	8.0	5.0	5.5
8	22.0	18.0	20.0	10.0	9.5	9.5	11.5	7.5	9.5	9.0	6.5	7.5
9	18.5	15.5	17.0	12.5	9.0	10.5	12.5	8.0	10.0	10.0	8.5	9.5
10	18.5	13.5	16.0	15.5	10.0	12.0	12.5	8.0	10.5	10.0	8.5	9.5
11	18.5	15.5	17.0	15.5	11.0	13.0	13.0	9.5	11.0	10.5	7.5	9.5
12	20.5	15.0	17.5	16.0	10.0	12.5	14.0	10.0	11.5	11.0	7.0	9.0
13	21.0	15.5	17.5	16.5	10.5	13.5	11.5	10.0	11.0	11.0	8.0	10.0
14	18.0	16.0	17.5	---	---	e14.0	12.5	10.0	11.0	10.5	9.0	10.0
15	---	---	e18.0	---	---	---	11.5	10.5	11.0	11.5	9.0	10.0
16	---	---	e19.0	---	---	---	11.0	10.5	11.0	12.0	9.0	10.5
17	22.0	19.5	20.5	---	---	---	12.5	10.5	11.0	11.5	10.0	11.0
18	20.5	17.0	18.5	---	---	---	12.5	9.5	11.0	11.0	10.5	11.0
19	19.5	16.0	17.5	---	---	---	13.0	9.5	11.0	12.5	10.0	11.5
20	21.0	15.5	17.5	19.0	16.5	18.0	11.0	8.0	10.0	11.5	8.5	9.5
21	17.5	14.5	15.5	18.5	16.5	18.0	8.0	3.5	5.5	10.0	8.0	9.0
22	16.5	12.5	14.0	17.0	15.5	16.5	3.5	.0	2.5	11.0	7.0	9.0
23	18.0	11.5	14.5	16.5	12.5	14.5	---	---	---	11.0	8.0	9.5
24	17.5	12.5	14.5	15.5	12.0	13.5	---	---	---	12.0	8.0	10.0
25	18.5	14.5	16.5	14.5	11.0	12.5	4.0	2.0	2.5	12.0	8.5	10.0
26	18.5	15.5	17.0	15.5	12.0	13.0	6.5	4.0	5.0	9.5	8.5	9.0
27	20.5	15.5	18.0	15.0	11.5	14.0	7.0	5.5	6.5	12.0	8.0	9.5
28	20.5	15.5	17.5	16.0	12.5	13.5	9.5	6.5	8.0	12.5	8.0	10.0
29	19.5	16.0	17.5	12.5	10.5	11.5	10.0	6.5	8.5	10.5	8.0	9.5
30	20.0	15.5	17.5	12.5	7.5	9.5	6.0	3.5	5.0	11.0	6.5	8.5
31	20.5	16.0	18.0	---	---	---	7.5	3.5	5.5	11.5	6.5	8.5
MONTH	26.0	11.5	18.5	21.0	7.5	13.5	14.0	.0	8.5	12.5	5.0	9.0

e Estimated

07311782 SOUTH WICHITA RIVER AT LOW FLOW DAM NEAR GUTHRIE, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	12.5	7.5	10.0	17.5	13.0	15.0	19.0	12.5	15.5	23.0	18.0	20.5
2	10.5	9.0	10.0	18.0	14.0	15.5	18.5	15.5	17.0	21.5	18.5	19.5
3	13.5	9.0	11.0	17.5	12.0	14.5	21.5	15.0	18.0	25.5	19.0	21.5
4	14.5	11.5	12.5	19.0	12.5	15.5	22.5	17.0	19.5	26.5	21.0	23.5
5	13.0	12.0	12.5	18.5	14.0	16.0	22.5	17.0	19.5	24.0	18.0	21.0
6	15.5	12.0	13.5	17.0	15.0	16.0	21.5	17.0	19.0	23.5	18.0	20.5
7	14.5	10.5	12.0	17.5	13.5	15.0	23.5	17.5	20.5	23.0	17.0	20.0
8	14.5	10.5	12.5	13.5	12.5	13.0	---	---	---	26.5	19.0	22.0
9	15.0	11.5	13.0	17.0	12.5	14.0	22.0	19.0	20.5	26.0	20.5	22.5
10	14.0	11.5	13.0	15.5	12.0	14.0	20.5	18.5	19.5	25.0	21.5	23.0
11	14.0	12.0	13.0	17.5	13.0	15.5	22.0	18.5	20.0	---	---	---
12	17.0	13.0	15.0	16.5	13.0	15.0	23.5	21.0	22.0	---	---	---
13	16.0	15.0	15.5	16.5	13.0	15.0	23.0	20.0	21.5	28.5	23.0	25.5
14	16.0	14.0	15.5	17.5	13.0	14.5	22.0	20.0	21.0	27.5	24.5	26.0
15	15.0	12.5	14.0	18.5	12.0	14.5	22.0	17.5	19.5	29.0	24.0	26.0
16	14.0	11.0	13.0	14.0	13.0	13.5	22.5	17.0	19.5	27.5	23.5	25.5
17	15.5	12.0	14.0	17.5	12.0	14.5	21.5	19.0	20.0	29.5	22.5	25.5
18	16.5	12.5	14.5	18.5	12.0	15.5	24.5	17.5	20.5	30.0	23.5	26.5
19	15.5	12.0	14.0	16.0	14.0	15.0	23.5	19.0	21.0	28.5	24.0	26.0
20	15.5	10.5	13.0	16.0	14.0	14.5	23.0	18.0	20.5	29.0	23.5	25.0
21	15.5	10.5	12.5	19.5	13.0	16.0	22.0	17.0	19.0	27.5	24.0	25.5
22	16.5	11.0	13.0	16.5	13.0	15.0	22.0	18.0	19.5	28.0	24.0	25.5
23	16.0	12.0	14.0	19.5	13.0	15.5	21.0	17.5	19.0	28.5	24.0	26.0
24	14.5	11.0	13.0	19.0	13.5	16.0	19.5	18.0	18.5	28.5	25.0	27.0
25	15.5	10.5	12.5	21.5	15.0	17.5	20.0	18.0	19.0	---	---	---
26	14.0	10.0	11.5	21.5	17.5	19.0	24.5	19.5	21.5	---	---	---
27	15.5	10.5	13.0	20.5	15.0	18.0	---	---	---	---	---	---
28	16.0	11.5	13.5	20.5	15.5	17.0	23.0	20.5	21.0	29.0	24.5	26.5
29	---	---	---	17.0	13.0	15.0	23.5	18.0	20.5	29.5	25.0	27.0
30	---	---	---	14.5	12.5	13.5	22.5	18.5	20.5	28.5	25.0	26.5
31	---	---	---	16.5	10.5	13.0	---	---	---	29.0	24.5	26.5
MONTH	17.0	7.5	13.0	21.5	10.5	15.0	24.5	12.5	19.5	30.0	17.0	24.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	26.5	25.0	25.5	29.5	25.5	27.0	30.0	26.0	28.0	26.0	24.0	25.0
2	---	---	---	31.0	25.0	27.5	30.0	26.0	28.0	25.5	24.0	24.5
3	---	---	---	28.0	26.5	27.0	30.5	26.0	28.0	27.5	25.0	26.0
4	26.0	20.0	21.5	27.0	26.5	27.0	30.0	26.0	27.5	27.5	26.5	27.0
5	26.0	25.0	25.5	28.5	26.5	27.5	29.0	25.5	27.5	26.5	24.5	25.5
6	27.0	24.5	26.0	30.5	27.0	28.5	29.5	26.0	28.0	27.0	24.5	25.5
7	27.0	26.0	26.5	31.0	27.5	29.0	30.5	25.5	28.0	26.5	25.5	26.0
8	27.0	24.5	25.5	31.0	27.5	29.5	31.5	26.0	28.5	26.5	25.0	25.5
9	25.0	24.0	24.5	31.0	27.0	29.0	27.0	26.0	26.5	27.0	24.5	26.0
10	25.5	24.0	25.0	31.0	26.5	28.5	27.0	25.0	26.0	28.0	25.0	26.5
11	27.5	25.0	26.0	30.5	26.0	28.0	25.5	25.0	25.0	28.0	25.0	26.5
12	27.5	26.5	27.0	30.0	26.0	27.5	25.0	22.0	24.0	28.0	24.5	26.0
13	28.0	25.5	27.0	30.5	25.5	27.5	24.5	23.5	24.0	26.5	25.0	26.0
14	28.5	25.5	27.0	27.0	26.0	26.5	24.0	23.5	23.5	26.5	24.0	25.0
15	28.5	26.0	27.5	30.0	26.0	27.5	26.0	22.0	24.0	26.5	24.0	25.0
16	29.5	26.5	28.0	---	---	---	26.0	25.0	25.5	25.5	24.0	24.5
17	29.0	27.0	28.0	31.5	27.0	29.0	26.5	25.5	26.0	24.0	23.0	23.5
18	29.0	27.0	28.0	31.0	26.5	28.5	25.5	25.5	25.5	23.5	15.0	20.5
19	29.5	26.5	28.0	30.0	26.5	27.5	30.0	25.5	26.5	---	---	---
20	29.5	27.0	28.5	---	---	---	28.0	26.0	27.5	---	---	---
21	29.5	25.5	27.5	30.0	26.0	28.0	---	---	---	---	---	---
22	30.5	27.0	28.5	31.0	26.0	28.0	---	---	---	---	---	---
23	30.5	27.5	29.0	27.0	26.5	26.5	---	---	---	---	---	---
24	30.5	26.5	28.5	28.5	27.0	27.5	---	---	---	---	---	---
25	31.0	26.5	28.5	27.5	25.0	26.5	---	---	---	19.5	17.5	18.5
26	31.0	26.5	28.5	26.5	24.5	25.5	---	---	---	20.0	18.5	19.5
27	30.5	26.0	28.0	28.0	25.0	26.0	28.0	25.5	27.0	21.0	19.5	20.5
28	30.0	26.0	28.0	26.0	25.0	25.5	28.0	25.0	26.5	21.5	19.5	20.5
29	29.0	25.5	27.0	30.5	25.5	26.5	28.0	25.5	26.5	22.0	20.0	21.0
30	30.0	25.0	27.0	29.5	26.0	28.0	28.5	26.5	27.5	21.5	19.5	21.0
31	---	---	---	30.0	26.0	27.5	28.0	25.0	26.5	---	---	---
MONTH	31.0	20.0	27.0	31.5	24.5	27.5	31.5	22.0	26.5	28.0	15.0	24.0

RED RIVER BASIN

07311783 SOUTH WICHITA RIVER BELOW DAM NEAR GUTHRIE, TX

LOCATION.--Lat 33°37'19", long 100°12'31", King County, Hydrologic Unit 11130205, on right bank 1.1 mi downstream from ranch road crossing, 2.8 mi upstream from Willow Creek, 6.6 mi east of Guthrie, and 91.4 mi upstream from confluence with North Wichita River.

DRAINAGE AREA.--223 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 1,590.0 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Diversions from station 07311782 via pipeline to station 07311669 began in May 1987. Specific conductance and water temperature for October 1986 to April 1987 were collected at station 07311782 but are published at this station and used for computation of water quality loads at this station. Mini-monitor installed at this station in May 1987 and specific conductivity values for this probe used to compute water quality loads since that time. Continuous temperature and specific conductance records were discontinued September 30, 1989. Gage-height telemeter at station via Sutron data collection platform.

AVERAGE DISCHARGE.--6 years (water years 1985-91), 7.39 ft<sup>3</sup>/s (5,350 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,100 ft<sup>3</sup>/s July 3, 1986 (gage height, 19.01 ft); no flow for several periods during 1986 water year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1950, 20.8 ft in May 1954, at station 07311780 located about 1.1 mi upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,570 ft<sup>3</sup>/s Sept. 18 at 1830 hours (gage height 10.26 ft); minimum, 0.01 ft<sup>3</sup>/s for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.03	.01	.03	.03	.01	.02	.13	.63	.06	.01	.05
2	.03	.04	.01	.03	.03	.01	.02	.17	174	.06	.01	.43
3	.03	.03	.01	.03	.03	.01	.04	.13	142	.06	.01	2.5
4	.03	.03	.01	.02	.03	.01	.04	.13	41	.06	.01	.06
5	.03	.02	.01	2.0	.03	.02	.05	.08	14	.21	.01	.05
6	.03	.02	.02	4.3	.03	.01	.04	.12	15	.13	.01	.05
7	.03	.02	.02	2.0	.03	.01	.04	.09	11	.13	.02	.14
8	.02	.03	.02	.03	.03	.01	.04	.15	6.4	.13	.02	.16
9	.02	.03	.02	.03	.04	.01	.55	.17	2.4	.16	.02	.20
10	.02	.03	.02	.03	.04	.01	4.2	.15	3.8	.20	.02	.20
11	.02	.02	.02	.03	.04	.02	3.3	.13	1.4	.20	29	.20
12	.02	.02	.02	.03	.04	.02	1.9	1.3	.40	.19	40	.20
13	.02	.02	.02	.03	4.8	.02	.06	3.4	.08	.13	17	.20
14	.03	1.6	.02	.03	.01	.02	.06	.23	.04	.08	172	.20
15	.03	.04	.02	.03	.01	.02	.10	.25	.05	.06	37	.20
16	.03	e.03	.03	.04	.01	.01	.16	.27	.05	.09	7.0	.18
17	.03	e.03	.03	.04	.01	.01	.20	.34	.05	.06	98	.23
18	.03	e.02	.03	.04	.01	.01	.20	.32	.05	.05	51	857
19	.03	e.02	.03	.04	.01	.01	.14	.32	.06	.05	7.1	452
20	.03	e.01	.03	.04	.01	.02	.13	.34	.06	.05	.01	81
21	.03	.01	.03	.04	.01	.02	.13	.40	.06	.05	1.5	37
22	.03	.01	.12	.03	.01	.02	.13	.40	.06	.05	2.6	22
23	.03	.01	.04	.03	.01	.02	.06	.42	.05	.05	.16	17
24	2.2	.01	3.5	.03	.01	.02	.09	.43	.05	.06	.03	9.8
25	.03	.02	5.2	.03	.01	.02	.89	4.5	.05	.05	.02	1.8
26	.03	.02	.62	.03	.01	.02	3.3	11	.06	.07	.02	3.9
27	.03	.02	.03	.03	.01	.02	.06	11	.06	.12	.02	.71
28	.03	.01	.03	.04	.01	.02	3.7	6.6	.06	203	.03	.38
29	.03	.01	2.0	.04	---	.02	2.3	.70	.06	4.0	.04	.06
30	.03	.01	.45	.03	---	.02	.13	.56	.06	.01	.05	.06
31	.03	---	.12	.03	---	.02	---	.62	---	.01	.05	---
TOTAL	3.04	2.22	12.54	9.21	5.35	0.49	22.08	44.85	413.04	209.63	462.77	1487.96
MEAN	.098	.074	.40	.30	.19	.016	.74	1.45	13.8	6.76	14.9	49.6
MAX	2.2	1.6	5.2	4.3	4.8	.02	4.2	11	174	203	172	857
MIN	.02	.01	.01	.02	.01	.01	.02	.08	.04	.01	.01	.05
AC-FT	6.0	4.4	25	18	11	1.0	44	89	819	416	918	2950
CAL YR 1990	TOTAL	1073.70	MEAN	2.94	MAX	99	MIN	.01	AC-FT	2130		
WTR YR 1991	TOTAL	2673.18	MEAN	7.32	MAX	857	MIN	.01	AC-FT	5300		

e Estimated





RED RIVER BASIN

69

07311790 SOUTH WICHITA RIVER AT ROSS RANCH NEAR BENJAMIN, TX

LOCATION.--Lat 33°39'18", long 100°00'49", King County, Hydrologic Unit 11130205, on left bank 170 ft (52 m) upstream from ranch road, 1.6 mi (2.6 km) downstream from Ox Yoke Creek, 13.7 mi (22.0 km) northwest of Benjamin, and 64.5 mi (103.8 km) upstream from mouth.

PERIOD OF RECORD.--Chemical analyses: August 1970 to September 1979, March 1988 to current year. Sediment analyses: April 1978 to September 1979.

PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: October 1970 to September 1979.

INSTRUMENTATION.--From October 1970 to September 1979, specific conductance was continuously recorded at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: Maximum, 51,000 microsiemens July 28, 1978; minimum, 1,500 microsiemens May 28, 1975.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV 20...	1145	7.7	14500	7.9	16.0	2600	2600	720	200
MAR 13...	1620	0.87	16200	7.9	16.5	3100	3000	810	260
DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 20...	2400	20	17	62	2700	4000	<0.10	2.0	10100
MAR 13...	2500	20	19	85	--	--	0.70	2.0	--

## RED RIVER BASIN

07311800 SOUTH WICHITA RIVER NEAR BENJAMIN, TX

LOCATION.--Lat 33°38'39", long 99°48'02", Knox County, Hydrologic Unit 11130205, on right bank at upstream side of bridge on State Highway 6, 2 mi downstream from Panhandle and Santa Fe Railway Co. bridge, 4 mi north of Benjamin, and 41 mi upstream from confluence with North Wichita River.

DRAINAGE AREA.--584 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1952-57 (occasional low-flow measurements), December 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,334.23 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 2, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. There are low flow diversions upstream at the South Wichita River at Low Flow Dam near Guthrie (station 07311782) to evaporation lake (station 07311669). There were other minor (daily) diversions upstream from station during the year. Gage-height telemeter at station via Sutron data collection platform.

AVERAGE DISCHARGE.--31 years (water years 1961-91), 40.7 ft<sup>3</sup>/s (0.95 in/yr), 29,490 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,900 ft<sup>3</sup>/s June 1, 1990 (gage height, 17.07 ft); maximum gage height, 17.07 ft June 1, 1990; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1903 occurred in September 1919 (stage and discharge unknown), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 2	1800	1,060	10.77	Sept. 18	1800	1,590	12.74
June 3	1200	*3,040	*a15.36	Sept. 20	1400	1,940	13.81

a/ From Highwater mark.

Minimum discharge, no flow July 23-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.3	4.8	6.4	5.7	3.4	1.4	2.6	3.0	4.7	11	19
2	1.8	1.3	4.8	5.2	5.2	3.2	1.3	293	1210	4.3	7.3	9.1
3	2.3	16	4.8	5.3	5.1	3.0	1.3	129	2410	4.2	5.5	6.0
4	1.9	87	4.4	5.1	5.1	3.1	1.2	23	677	4.2	5.9	26
5	2.0	11	4.0	5.0	5.1	3.0	1.0	16	201	3.2	3.3	11
6	2.1	5.0	4.3	4.8	5.1	3.0	1.0	11	125	2.7	2.0	16
7	2.0	4.3	4.4	4.7	4.8	2.7	1.0	8.6	176	2.5	1.1	17
8	45	116	4.5	4.4	4.7	2.7	1.1	73	119	2.3	.46	11
9	40	50	4.5	34	4.6	2.9	1.0	15	78	2.2	3.2	7.2
10	5.1	15	4.0	93	4.8	2.6	.90	8.8	62	1.8	1.6	5.9
11	4.2	11	4.0	18	4.7	2.9	.88	6.7	44	1.2	41	5.2
12	3.8	8.3	4.1	11	4.5	2.6	.92	5.8	35	1.2	57	4.7
13	2.9	6.4	4.5	10	4.5	2.0	.89	5.1	31	1.1	195	77
14	2.7	5.5	4.5	8.8	4.3	2.0	.79	4.8	28	.96	52	58
15	2.3	5.1	4.5	7.6	4.3	2.1	.71	4.5	26	5.6	248	5.3
16	1.8	4.8	4.5	5.4	4.2	3.0	.73	3.8	23	3.0	129	42
17	1.5	4.7	4.9	5.7	5.2	3.3	.73	3.3	21	1.5	341	7.9
18	1.3	4.8	5.7	37	5.1	3.2	.85	3.0	19	.62	212	883
19	1.2	5.4	6.2	62	4.7	3.0	1.0	3.0	18	.46	155	911
20	1.2	7.8	6.2	19	4.2	3.0	.92	2.9	17	.28	72	1550
21	1.3	7.9	e6.0	12	4.0	2.9	.92	2.7	16	.10	46	274
22	1.2	7.9	e5.0	9.9	4.1	2.4	.95	2.1	14	.01	25	181
23	1.2	7.5	e4.5	9.7	3.9	2.1	.84	11	13	.00	18	133
24	1.2	7.0	e4.5	8.4	3.7	2.1	17	35	17	.00	15	99
25	1.2	6.4	e4.8	8.3	3.6	2.1	110	112	10	.00	13	75
26	1.2	5.9	e5.0	7.7	3.5	2.0	10	14	9.2	.00	11	65
27	1.2	5.4	5.8	7.8	3.3	1.9	10	10	8.5	3.0	8.7	51
28	1.2	5.0	6.3	7.6	3.1	1.7	6.2	7.6	7.4	8.7	6.8	43
29	1.2	4.8	8.2	6.7	---	1.5	4.6	5.7	6.0	114	5.6	35
30	1.2	4.8	8.1	6.2	---	1.6	3.3	4.6	5.4	46	4.8	30
31	1.2	---	7.6	6.0	---	1.4	---	3.7	---	19	4.5	---
TOTAL	140.1	433.3	159.4	442.7	125.1	78.4	183.43	831.3	5429.5	238.83	1701.76	4658.3
MEAN	4.52	14.4	5.14	14.3	4.47	2.53	6.11	26.8	181	7.70	54.9	155
MAX	45	116	8.2	93	5.7	3.4	110	293	2410	114	341	1550
MIN	1.2	1.3	4.0	4.4	3.1	1.4	.71	2.1	3.0	.00	.46	4.7
AC-FT	278	859	316	878	248	156	364	1650	10770	474	3380	9240
CAL YR 1990	TOTAL	27368.69	MEAN	75.0	MAX	6920	MIN	.05	AC-FT	54290		
WTR YR 1991	TOTAL	14422.12	MEAN	39.5	MAX	2410	MIN	.00	AC-FT	28610		

e Estimated

RED RIVER BASIN

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07311800 SOUTH WICHITA RIVER NEAR BENJAMIN, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: July 1949 to March 1959, July 1966 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to September 1991 (discontinued).  
WATER TEMPERATURE: October 1967 to September 1991 (discontinued).

INSTRUMENTATION.--From August 1968 to September 1991, specific conductance was recorded continuously at this station. From April 1983 to September 1991, water temperature was recorded continuously at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum and minimum specific conductance values are not shown, mean values are estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 48,900 microsiemens May 13, 1971; minimum, 427 microsiemens Sept. 11, 1989.  
WATER TEMPERATURE: Maximum, 39.0°C July 31, 1989; minimum, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 19,900 microsiemens July 27; minimum, 900 microsiemens, Sept. 18.  
WATER TEMPERATURE: Maximum, 37.0°C Aug. 8; minimum, 0.0°C on several days during December and January.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)
NOV 05...	1145	9.2	3630	7.6	9.5	15.2	144	3.0	1100	1000	290
JAN 14...	1130	11	11800	8.4	5.5	16.4	145	0.6	2500	2300	650
MAR 18...	1045	3.3	16800	8.0	18.5	8.7	103	1.3	3700	3500	870
MAY 03...	1120	75	2720	--	20.0	--	--	--	830	760	240
06...	1215	8.4	10500	8.0	21.5	7.2	88	0.4	2400	2300	650
10...	0940	9.7	5090	--	21.0	--	--	--	1400	1400	410
JUL 15...	1430	30	13400	7.8	32.5	6.9	103	0.3	3400	3200	820
AUG 12...	1315	8.8	2200	7.8	24.5	7.4	93	0.5	800	760	240

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 05...	85	410	5	7.0	48	800	680	<0.10	4.0	2300
JAN 14...	210	1900	17	15	150	2000	3000	<0.10	5.0	7870
MAR 18...	370	2600	19	22	190	3200	4500	0.30	4.5	11700
MAY 03...	55	270	4	9.2	62	760	440	0.40	8.5	1820
06...	180	1800	16	17	79	2200	3000	0.60	4.2	7900
10...	100	580	7	15	61	1300	1000	0.70	5.9	3450
JUL 15...	340	2100	16	17	210	2700	3500	0.70	9.8	9610
AUG 12...	49	170	3	8.0	42	800	250	0.40	6.8	1550

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
NOV 05...	0.230	0.070	0.300	0.090	0.31	0.40	0.190	0.010	3	100
JAN 14...	--	0.040	<0.100	0.070	0.23	0.30	0.080	0.060	--	--
MAR 18...	--	<0.010	<0.050	0.090	0.41	0.50	0.020	<0.010	--	--
MAY 03...	--	--	--	--	--	--	--	--	--	--
06...	--	0.040	<0.050	0.050	0.85	0.90	0.140	0.130	--	--
10...	--	--	--	--	--	--	--	--	--	--
JUL 15...	--	<0.010	<0.050	0.190	--	<0.20	0.110	<0.010	10	<100
AUG 12...	0.120	0.020	0.140	0.040	0.86	0.90	0.530	<0.010	--	--

## RED RIVER BASIN

07311800 SOUTH WICHITA RIVER NEAR BENJAMIN, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 05...	<1.0	2	3	<10	<1	20	0.3	<1	<1.0	10
JAN 14...	--	--	--	--	--	--	--	--	--	--
MAR 18...	--	--	--	--	--	--	--	--	--	--
MAY 03...	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--
10...	--	--	--	--	--	--	--	--	--	--
JUL 15...	<5.0	<2	4	60	<5	50	0.1	<2	<1.0	<10
AUG 12...	--	--	--	--	--	--	--	--	--	--

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	140.1	9040	6050	2290	2400	890	1600	592	1800
NOV. 1990	433.3	7860	5240	6130	2000	2350	1400	1630	1600
DEC. 1990	159.4	15400	10500	4510	4300	1850	2400	1050	*
JAN. 1991	442.7	9410	6280	7510	2400	2900	1600	1970	1900
FEB. 1991	125.1	14700	9980	3370	4100	1370	2400	797	*
MAR. 1991	78.4	16800	11400	2420	4800	1010	2600	543	*
APR. 1991	183.43	8460	5670	2810	2200	1100	1500	719	1700
MAY 1991	831.3	6260	4140	9290	1500	3440	1200	2610	1300
JUNE 1991	5429.5	3030	1980	29000	700	10200	600	8770	660
JULY 1991	238.83	8650	5780	3730	2200	1440	1500	976	1700
AUG. 1991	1701.76	2930	1920	8800	670	3090	580	2680	640
SEPT 1991	4658.3	3010	1980	24900	710	8880	590	7370	650
TOTAL	14422.12	**	**	105000	**	38500	**	29700	**
WTD.AVG.	40	4070	2690	**	990	**	760	**	860



RED RIVER BASIN

07311800 SOUTH WICHITA RIVER NEAR BENJAMIN, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	15800	14900	15200	18200	16000	16400	14900	14700	14800	16400	14700	15700
2	15600	15300	15400	19500	17800	18300	14800	14500	14700	15700	14700	15300
3	14400	11300	13700	18600	6570	16300	15000	14700	14800	15700	15300	15500
4	16000	14100	15000	13200	5630	7300	15200	14100	14800	15600	15400	15500
5	16000	15200	15600	5500	3800	4400	15000	14300	14700	15500	15000	15300
6	15900	15300	15500	5950	4620	5260	15100	14700	14800	15600	15100	15500
7	15500	15100	15300	7170	6050	6640	15100	14600	14800	15800	15100	15600
8	15300	2370	9680	7250	1860	4450	15000	14400	14700	15800	15600	15700
9	4630	2860	3270	4320	2270	3220	14900	14500	14800	15700	4520	12900
10	7450	4860	6140	6460	4520	5340	15000	14600	14800	7850	2160	5470
11	9170	7550	8370	8180	6560	7220	15000	14700	14900	6750	5380	5830
12	9800	9150	9380	9690	8180	8900	15200	14800	15000	9860	6940	8390
13	10400	9800	10100	10800	9790	10200	15400	15100	15200	11500	9760	10600
14	10800	10200	10500	11700	10800	11200	15300	15100	15200	12200	11500	11900
15	11200	10600	10900	12200	11600	11800	15700	15200	15500	12900	12100	12400
16	11700	11200	11400	12500	12100	12300	15000	13000	14100	13200	12900	13000
17	12400	11600	11900	12700	12100	12500	15000	14300	14700	13200	10800	12800
18	13400	12600	13100	13100	12200	12700	15200	14900	15100	11600	5200	8740
19	13800	13300	13500	13500	12400	13000	15600	15200	15400	8200	5500	7060
20	14900	13700	14300	14100	13500	13800	16100	15600	15800	8400	7200	7820
21	16000	14500	14900	14200	14000	14100	16900	15800	16200	9600	8100	8960
22	17000	15800	16300	14600	14100	14300	18200	17000	17400	10400	9500	9970
23	17700	16800	17300	14500	13800	14400	19000	18000	18300	10900	10000	10500
24	17400	16500	17000	14800	14000	14500	19100	17000	18200	11400	10700	11100
25	17000	16300	16700	14800	14300	14600	18100	16300	17200	11900	11200	11500
26	17000	15900	16500	14900	14300	14500	17100	15900	16500	12100	11700	11900
27	18400	15400	16300	14800	14500	14700	16100	14600	15500	12500	11900	12100
28	18700	15500	16800	14800	14500	14700	14700	14200	14500	12800	12300	12500
29	17100	15800	16500	14900	14500	14700	15000	14000	14700	13700	12500	13000
30	16300	15300	15900	14800	14600	14700	15800	15100	15400	13600	12600	13300
31	16500	15600	16200	---	---	---	16400	14500	15600	14100	12300	13500
MONTH	18700	2370	13500	19500	1860	11500	19100	13000	15400	16400	2160	11900
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	13900	13000	13500	16500	15400	16000	18300	17300	17700	---	---	e12000
2	13900	13400	13600	17100	16100	16500	---	---	e17700	12000	1400	8550
3	13800	13300	13600	16600	16200	16400	---	---	e17700	4300	1200	2600
4	13800	13500	13700	16600	15900	16300	---	---	e17800	9500	4600	6840
5	13800	13600	13700	16900	15900	16400	---	---	e17800	11000	9300	10100
6	14100	13700	13900	16900	16200	16500	---	---	e17900	10400	9800	10300
7	14200	13800	14000	17000	16100	16400	---	---	e17900	10300	10100	10200
8	14300	13800	14000	16800	16300	16500	18100	17500	17900	9200	2600	4880
9	14300	14000	14100	17000	16400	16700	18100	17700	17900	4500	3100	3800
10	14400	14200	14300	17300	16600	17000	18200	17800	18100	5600	4600	5030
11	14500	14300	14300	17600	16900	17300	18200	17700	17900	6400	5700	6200
12	14500	14200	14400	17700	17100	17400	18300	17600	17800	---	---	e7500
13	14900	14400	14600	17900	17400	17600	18400	17800	18000	---	---	e8500
14	15000	14700	14800	17400	16900	17200	18500	17900	18100	10000	9100	9500
15	15100	14900	15000	17200	16700	16900	18800	18000	18300	10800	10000	10400
16	15000	14800	14900	---	---	e16000	18800	18000	18300	11500	10500	11000
17	15600	14800	15300	---	---	e16200	18500	17900	18100	12100	11000	11500
18	15600	15400	15500	16800	16200	16500	18500	17800	18100	12300	11200	11700
19	15800	15500	15700	16500	16200	16300	18200	17600	17900	12500	11700	12100
20	16000	15500	15700	16700	16100	16300	19200	17900	18600	12600	12100	12400
21	15800	15500	15600	16700	16100	16400	19600	19100	19300	12700	12100	12400
22	15800	15600	15600	17000	16300	16700	19300	18700	19100	12900	12200	12400
23	15900	15700	15700	17400	16700	17000	19000	17500	18400	12600	1400	8000
24	16000	15700	15900	17700	16900	17200	17800	11900	17100	12700	1500	8850
25	16200	15900	16000	18000	17000	17300	8500	2500	4800	7100	1300	2250
26	16000	15800	15900	17800	17300	17500	10000	6000	8500	---	---	e3500
27	16200	15700	15900	18300	17200	17600	---	---	e9500	---	---	e4500
28	16300	16000	16100	18600	17400	17900	---	---	e10000	---	---	e5500
29	---	---	---	18200	17800	18000	---	---	e11000	7000	4900	6240
30	---	---	---	18100	17700	17900	---	---	e11500	8300	7000	7520
31	---	---	---	17800	17300	17600	---	---	---	9200	7700	8400
MONTH	16300	13000	14800	18600	15400	16900	19600	2500	16300	12900	1200	8210

e Estimated

## RED RIVER BASIN

07311800 SOUTH WICHITA RIVER NEAR BENJAMIN, TX--Continued

## SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	9400	9000	9210	14900	14500	14700	13000	10200	12100	10200	2350	7930
2	6600	1200	2210	14800	13900	14500	14400	9960	11400	8660	2240	4750
3	3800	1500	2080	14300	13800	14000	---	---	e11400	10100	8660	9620
4	5200	2200	2960	14200	13500	13800	---	---	e10500	10100	1220	5080
5	4030	2400	3100	14100	13600	13800	---	---	e11000	7830	3970	5690
6	---	---	e4400	14100	13500	13700	---	---	e11200	10800	2140	8750
7	---	---	e3500	14300	13500	13800	---	---	e11500	7310	2030	4400
8	---	---	e4500	14100	13500	13800	---	---	e12000	7400	5180	6030
9	---	---	e5500	14100	13500	13700	12800	2690	8570	9210	7700	8770
10	---	---	e6500	14000	13400	13600	---	---	e6000	8600	7980	8300
11	---	---	e7100	14000	13400	13600	---	---	e4000	10400	8480	8950
12	---	---	e7800	14000	13400	13600	---	---	e2200	11000	8870	9690
13	8710	7830	8250	13800	13100	13400	---	---	e2000	10900	1610	7040
14	9420	8500	8840	13700	12800	13200	4090	2540	3100	---	---	e4000
15	9930	9110	9440	14800	12600	13300	5070	1810	2800	---	---	e5000
16	10400	9720	9990	16200	14900	15600	2120	1750	1880	---	---	e2000
17	10800	10200	10500	15400	13700	14700	2000	1170	1500	---	---	e3000
18	11300	10500	10900	13600	12100	12600	4800	1630	2870	3100	900	1550
19	11700	9500	11100	16600	11800	13500	---	---	e3000	6520	1060	2090
20	11900	9060	10900	18000	16500	17400	---	---	e3400	2350	964	1430
21	12200	11600	11800	18000	17200	17400	---	---	e3800	4560	2440	3400
22	12600	11900	12100	18300	17200	17600	---	---	e4500	6420	4150	5450
23	12800	7340	12300	---	---	---	5870	5160	5450	7610	5960	6960
24	---	---	e6000	---	---	---	6670	5910	6230	8410	7700	7990
25	---	---	e10100	---	---	---	7430	6670	6990	9870	8400	9140
26	10900	10300	10500	---	---	---	7910	7440	7620	10500	9860	10200
27	13500	10900	12400	19900	2190	17500	8380	7830	8060	10700	10300	10500
28	14300	13400	13900	16000	3980	7820	8710	8290	8480	11200	10700	10800
29	14600	14000	14300	13900	2540	4810	9700	9290	9510	11300	10900	11100
30	15000	14300	14600	16900	2560	9500	10100	9600	9830	11500	11200	11300
31	---	---	---	16800	13300	15000	10100	9800	9950	---	---	---
MONTH	15000	1200	8560	19900	2190	13700	14400	1170	6870	11500	900	6700

e Estimated

## WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	28.0	18.0	22.0	---	---	e17.5	11.0	6.5	8.0	5.5	.0	1.5
2	23.5	21.0	22.0	---	---	e17.0	10.5	5.5	7.5	7.0	1.5	3.0
3	28.5	19.5	23.0	---	---	e15.0	10.0	4.0	6.0	3.0	.0	1.0
4	30.5	20.5	24.0	---	---	e9.0	9.5	2.5	5.0	.0	.0	.0
5	29.5	20.5	24.0	---	---	e10.0	10.0	2.5	5.5	6.0	.0	3.0
6	28.0	22.0	24.5	14.0	7.5	10.0	10.0	5.0	6.5	5.5	2.5	4.5
7	26.0	20.0	23.0	7.5	4.0	5.5	11.0	3.5	6.0	4.5	1.5	3.0
8	20.0	15.5	17.5	6.0	3.0	4.5	11.5	3.5	6.5	8.5	4.0	6.0
9	16.5	15.0	16.0	9.5	4.5	7.0	12.5	4.5	7.5	8.5	6.0	7.5
10	18.0	13.0	15.5	11.0	4.5	8.0	13.0	5.5	8.0	10.5	5.0	6.5
11	20.5	13.0	16.5	13.5	6.5	10.5	13.0	5.5	8.5	9.0	5.0	6.5
12	21.5	15.0	17.5	15.0	8.5	12.0	14.0	6.5	9.0	8.5	2.5	6.0
13	22.5	15.0	18.0	14.5	9.0	11.5	9.0	7.0	8.0	10.0	3.5	7.0
14	21.5	17.0	18.5	17.5	9.0	13.0	12.5	6.5	8.5	8.0	5.0	6.5
15	24.0	16.5	19.5	16.5	12.5	14.5	11.0	8.0	9.0	9.5	6.0	7.5
16	26.0	18.0	21.0	15.0	12.5	14.0	9.0	8.0	8.5	10.5	6.0	8.0
17	23.5	15.5	20.5	14.5	12.0	13.0	11.0	8.5	9.5	10.5	8.0	9.5
18	22.5	13.0	17.0	16.5	13.5	14.5	12.5	7.5	9.5	10.0	8.0	9.0
19	23.0	12.5	16.5	16.5	13.0	15.0	12.5	6.0	9.0	12.5	5.5	9.0
20	24.0	14.0	17.5	19.0	15.5	17.0	8.5	2.5	6.0	9.5	6.0	7.0
21	17.5	12.0	14.0	18.5	16.0	17.5	2.0	.0	.5	8.0	4.0	5.5
22	18.0	10.0	13.0	16.0	14.0	15.0	.0	.0	.0	8.5	1.5	5.5
23	20.0	11.0	14.5	13.5	11.5	12.5	.0	.0	.0	8.0	3.0	6.0
24	20.5	12.0	15.5	13.5	11.0	12.5	.0	.0	.0	10.0	3.5	7.0
25	20.0	12.5	15.5	13.5	11.0	12.5	1.5	.0	.0	10.0	4.0	7.0
26	20.5	14.0	16.5	16.0	13.0	14.5	2.5	.0	.5	5.5	3.0	4.5
27	20.5	14.5	17.0	16.5	13.0	15.0	4.0	.0	1.0	11.5	4.0	7.5
28	20.5	14.5	17.0	12.5	8.5	11.0	5.5	.5	2.5	11.5	3.5	7.5
29	20.0	14.5	17.0	11.0	6.5	8.0	8.0	.0	5.0	9.0	2.5	6.5
30	20.0	14.5	17.0	11.0	5.5	8.0	2.5	.0	.5	7.5	.0	3.5
31	21.0	15.0	17.5	---	---	---	3.0	.0	.5	10.0	1.0	5.0
MONTH	30.5	10.0	18.5	19.0	3.0	12.0	14.0	.0	5.0	12.5	.0	5.5

e Estimated

RED RIVER BASIN

07311800 SOUTH WICHITA RIVER NEAR BENJAMIN, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	12.0	3.5	7.0	18.5	11.0	14.5	24.5	9.0	15.5	22.5	16.5	19.0
2	10.0	5.0	7.0	18.0	9.0	13.5	24.5	12.0	17.0	22.0	18.0	20.0
3	13.5	5.5	9.0	17.0	9.0	12.5	28.0	12.5	18.5	29.5	19.5	23.0
4	14.0	9.5	11.0	19.5	9.5	13.5	29.5	13.5	20.0	29.0	21.5	25.0
5	12.5	10.0	11.0	17.5	11.0	14.5	28.0	14.0	19.5	25.0	15.5	20.0
6	16.5	8.5	11.5	16.5	10.5	14.0	27.5	14.5	19.5	24.0	15.5	20.0
7	15.0	7.0	10.5	18.0	8.5	11.0	28.5	15.5	20.5	24.0	15.5	20.5
8	15.5	7.0	10.5	19.0	7.5	12.0	31.0	16.5	22.0	23.0	18.0	20.5
9	15.5	8.5	11.5	20.5	8.5	12.5	27.0	14.0	19.0	26.0	19.0	22.0
10	14.5	9.0	11.0	17.5	9.0	12.5	26.0	11.0	17.5	29.0	21.5	24.5
11	15.0	8.5	11.5	20.5	11.0	14.5	29.0	16.0	21.0	26.0	23.0	24.5
12	19.5	12.0	15.0	20.0	10.0	14.5	33.0	19.0	23.5	27.5	23.0	25.0
13	18.5	12.5	15.0	21.0	9.5	13.5	31.0	15.0	21.0	28.0	23.5	25.5
14	18.0	10.0	13.0	20.0	9.0	12.5	28.0	14.5	20.0	27.5	22.0	24.0
15	14.5	7.0	9.5	21.0	9.0	13.0	28.0	11.5	18.0	30.0	21.5	24.5
16	13.0	6.0	9.0	12.5	10.5	11.5	29.0	13.0	19.5	26.0	20.5	23.0
17	17.0	9.0	12.5	20.0	8.5	13.0	23.5	17.5	19.5	27.0	19.5	23.5
18	17.5	10.5	13.5	22.5	11.0	15.0	30.0	13.5	20.0	28.0	22.0	24.5
19	14.5	8.0	10.5	18.0	12.5	14.0	28.5	16.0	20.5	27.0	21.0	24.0
20	15.0	5.5	9.5	16.5	12.0	13.5	28.5	13.5	19.5	27.0	21.5	24.0
21	14.0	6.5	10.0	23.5	12.0	16.5	28.0	14.5	18.5	27.0	21.0	24.0
22	18.0	8.0	12.0	19.0	11.0	14.5	26.0	14.5	18.0	26.0	21.5	23.5
23	16.5	9.5	12.5	23.5	9.5	15.0	30.0	12.0	19.5	28.5	21.5	25.0
24	13.5	7.5	10.5	24.5	10.0	16.0	24.0	15.0	18.5	31.5	21.0	26.0
25	15.0	6.0	9.0	26.0	13.0	18.5	23.5	16.0	19.0	28.0	20.0	23.5
26	16.0	6.0	10.0	26.0	17.0	20.5	26.0	20.0	22.5	27.0	25.0	26.0
27	15.0	7.5	10.5	25.5	12.5	17.5	25.5	18.0	21.5	25.0	24.0	24.5
28	16.0	9.5	12.5	25.0	12.5	16.0	22.5	18.5	20.5	32.0	23.0	26.5
29	---	---	---	20.5	11.0	14.5	22.5	16.0	19.0	34.0	22.0	26.5
30	---	---	---	11.0	8.0	9.5	22.0	17.0	19.5	31.0	22.5	26.0
31	---	---	---	22.5	5.5	12.5	---	---	---	30.0	22.5	26.0
MONTH	19.5	3.5	11.0	26.0	5.5	14.0	33.0	9.0	19.5	34.0	15.5	23.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	29.0	23.0	24.5	31.5	25.0	27.5	31.0	27.0	29.0	27.0	24.0	25.0
2	23.0	19.5	20.5	33.5	26.0	29.5	28.5	25.5	27.0	33.5	22.5	27.0
3	21.5	19.5	20.5	31.5	26.0	28.0	27.5	25.0	26.0	32.5	25.0	28.0
4	24.5	21.0	22.5	33.0	24.5	28.5	26.0	25.0	25.5	27.0	22.5	25.0
5	29.5	23.5	26.5	33.0	25.0	28.5	26.0	25.0	25.0	30.5	23.0	26.0
6	30.0	23.0	26.5	33.0	24.0	28.0	35.0	24.0	28.0	29.5	23.5	26.0
7	---	---	e26.5	32.5	25.0	28.0	35.0	22.0	27.5	29.5	24.5	26.0
8	---	---	e27.5	32.5	25.5	28.5	37.0	22.0	27.5	30.5	23.0	26.5
9	---	---	e28.5	30.5	25.0	27.5	28.0	22.5	25.5	28.5	24.5	26.5
10	---	---	e28.5	31.0	24.5	27.5	29.0	24.0	26.0	28.0	25.5	26.5
11	30.5	26.5	28.5	30.5	24.5	27.0	---	---	e25.0	28.0	25.5	26.5
12	33.5	27.0	29.5	30.5	24.5	27.5	---	---	e24.0	27.0	24.0	25.5
13	33.5	25.0	29.0	30.5	24.5	27.5	---	---	e24.0	26.0	23.5	25.0
14	33.5	24.0	28.0	30.5	24.5	27.5	24.0	23.5	23.5	24.5	23.0	24.0
15	33.5	23.5	28.5	33.5	25.0	28.5	26.5	23.5	24.5	25.0	24.5	24.5
16	33.0	26.5	30.0	33.0	25.0	28.5	29.5	24.5	27.0	25.0	21.5	23.5
17	32.5	25.0	29.0	35.0	24.0	28.0	28.0	22.0	25.0	24.5	23.0	23.5
18	33.5	25.0	29.5	34.0	23.0	27.5	29.5	25.0	27.0	24.5	15.0	19.5
19	32.5	25.0	29.0	30.0	23.5	26.5	30.5	26.5	28.5	17.0	14.5	15.5
20	32.5	25.0	28.5	29.0	23.0	26.0	31.5	26.5	29.0	16.0	14.5	15.0
21	30.5	23.5	27.0	30.0	24.0	26.0	32.5	26.0	29.0	19.5	15.5	17.0
22	32.5	25.0	29.0	31.0	23.0	25.5	32.5	26.0	29.0	20.5	19.0	19.5
23	33.0	25.5	29.5	---	---	---	32.0	25.0	28.5	21.0	18.5	19.5
24	32.5	23.0	28.0	---	---	---	32.0	25.5	28.5	20.5	18.5	19.5
25	34.5	25.5	29.5	---	---	---	32.0	24.5	28.0	23.0	15.5	19.0
26	33.5	25.5	29.0	---	---	---	31.5	23.5	28.0	24.5	17.5	21.0
27	34.5	24.5	28.5	25.5	22.0	24.0	30.5	24.0	27.5	24.0	17.0	20.5
28	34.0	25.0	28.5	32.5	22.0	27.0	30.5	24.0	27.5	25.0	18.0	21.5
29	31.0	25.5	28.0	30.5	25.5	28.5	33.0	25.5	29.0	24.5	18.0	21.5
30	31.0	24.5	27.5	32.5	25.0	28.5	32.0	24.5	27.5	24.5	17.5	21.0
31	---	---	---	32.5	22.5	28.0	30.0	24.0	26.0	---	---	---
MONTH	34.5	19.5	27.5	35.0	22.0	27.5	37.0	22.0	27.0	33.5	14.5	23.0

e Estimated

RED RIVER BASIN

07312000 LAKE KEMP NEAR MABELLE, TX

LOCATION.--Lat 33°45'30", long 99°09'03", Baylor County, Hydrologic Unit 11130206, in outlet gate tower near center of dam on Wichita River, 6.2 mi north of Mabelle, 13 mi northeast of Seymour, and 126.7 mi upstream from mouth.

DRAINAGE AREA.--2,086 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 1, 1972, nonrecording gage at different site and at datum 2.40 ft higher.

REMARKS.--The lake is formed by a rolled earthfill dam 8,890 ft long. The original dam was completed Aug. 25, 1923, but deliberate impoundment had begun Oct. 1, 1922. Enlargement of the dam was completed in November 1973. The 3,000-foot-wide uncontrolled spillway is located approximately 600 ft to right and slightly upstream from right end of dam. The controlled outlet works near center of dam consist of two hydraulically operated slide gates 5 ft 8-in by 13 ft with a 13-foot-diameter conduit and spillway basin. The dam and lake are owned by the city of Wichita Falls and the Wichita County Water Improvement District No. 2. Water is used for irrigation in the Wichita River Valley, oil field operation, municipal, and industrial uses. The capacity table is based on a resurvey made in 1973. Data collection platform at station. Figures given herein represents total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	1,183.0	-
Crest of spillway.....	1,160.0	603,000
Top of flood-control pool.....	1,156.0	502,900
Top of conservation pool.....	1,144.0	268,000
Lowest gated outlet (invert).....	1,090.0	1,400

COOPERATION.--Capacity table No. 4-C was provided by the U.S. Army Corps of Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 420,900 acre-ft June 30, 1941 (elevation, 1,152.0 ft), present datum; minimum since first appreciable storage, 26,160 acre-ft June 30, 1953 (elevation, 1,108.0 ft), present datum.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 298,500 acre-ft June 10 at 0900 hours (elevation, 1,145.88 ft); minimum, 230,100 acre-ft May 2 (elevation, 1,141.42 ft).

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

1,141.0	224,200	1,143.0	252,800	1,145.0	284,000
1,142.0	238,200	1,144.0	268,000	1,146.0	300,500

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	256100	243000	249100	247700	256900	255200	245600	231100	243300	268300	256000	247800
2	255500	242600	248400	247500	256300	254200	245700	238500	245800	267100	255400	247800
3	255500	243700	248300	247500	256800	253700	245100	242100	253700	266500	254800	247400
4	255500	244200	248400	247500	256900	253400	244900	243600	264700	266300	254100	249300
5	255200	244800	248400	247700	257100	253000	244500	244200	278100	266000	253300	250500
6	254900	244500	247500	248300	256900	252100	244200	243500	284200	265100	252400	251000
7	254200	244900	248100	248400	256900	252400	243700	243200	291300	265000	251300	251300
8	253900	246800	248000	248600	256800	251600	244000	245200	296400	264400	251300	251200
9	253700	248000	247500	250600	257100	251200	243300	245200	297900	263600	250500	250900
10	253400	248600	247800	252700	256600	250900	242600	246100	297900	263300	249900	251300
11	252700	248700	248100	253400	256900	251000	241300	245900	297400	262700	248700	250600
12	252400	249100	247300	253600	257800	249900	240800	246500	295400	261300	250200	250500
13	251800	249700	247700	253300	257400	249000	240200	246400	294700	260900	250800	251600
14	250900	249100	247700	253300	256900	247800	240000	246400	292700	259900	250900	253900
15	250500	248900	247800	253300	256800	247800	238800	245500	290400	259600	250500	254000
16	250000	248900	248300	253900	256600	249000	238800	245800	288600	259800	251200	256400
17	249300	248400	248400	254500	257200	249200	238600	245500	286500	258900	252400	257500
18	249000	248900	248300	255700	256800	249100	237600	244800	284300	258100	252800	260200
19	248100	249400	248600	256300	256800	249300	237100	244500	282700	256900	253700	264700
20	247800	249700	247800	256600	256600	248400	236500	244200	280600	256300	253400	269400
21	246800	249600	247500	256800	256600	249100	235500	243700	278200	254800	253400	276000
22	246400	249100	248100	256800	256100	249000	235000	243300	276800	254000	253300	280200
23	245900	249600	247800	256600	256300	248900	234300	243000	274700	253400	252800	280400
24	245800	249400	247500	256400	255400	248800	234300	243200	274100	254900	252500	280000
25	245500	250000	247700	256400	255400	249400	233600	244900	273600	254200	252100	278200
26	245200	249700	247300	256600	254900	249400	234000	245100	271800	253600	251400	277400
27	244800	249700	247400	256600	255100	248700	233200	245600	271700	254300	251000	276200
28	244500	249400	248600	256800	255400	247800	233700	245200	270600	255400	250600	275400
29	244200	249100	248100	256900	---	247000	232200	244200	269800	256400	250200	274400
30	243700	249100	247500	256900	---	246700	231800	244600	269000	256600	249300	273600
31	243300	---	247400	257500	---	246200	---	243500	---	256300	248600	---
MAX	256100	250000	249100	257500	257800	255200	245700	246500	297900	268300	256000	280400
MIN	243300	242600	247300	247500	254900	246200	231800	231100	243300	253400	248600	247400
(↑)	1142.35	1142.75	1142.63	1143.31	1143.17	1142.55	1141.54	1142.36	1144.06	1143.23	1142.71	1144.35
(Φ)	-12200	+5800	-1700	+10100	-2100	-9200	-14400	+11700	+25500	-12700	-7700	+25000

CAL YR 1990 MAX 332000 MIN 242600 (Φ) -3600  
WTR YR 1991 MAX 297900 MIN 231100 (Φ) +18100

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



RED RIVER BASIN

07312000 LAKE KEMP NEAR MABELLE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: August 1989 to current year.

334520099092101 - LAKE KEMP SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)
FEB												
12...	1005	258000	1.00	4050	8.1	7.5	1.71	10.2	90	770	670	210
12...	1007	--	10.0	4060	8.0	7.5	--	10.2	90	--	--	--
12...	1009	--	20.0	4050	8.0	7.5	--	10.2	90	--	--	--
12...	1011	--	30.0	4060	7.9	7.5	--	10.1	89	--	--	--
12...	1013	--	40.0	4060	7.9	7.5	--	10.0	88	--	--	--
12...	1015	--	50.0	4290	7.7	7.0	--	8.8	77	--	--	--
12...	1017	--	56.0	4280	7.4	7.0	--	8.9	78	780	680	210
MAY												
14...	0930	246000	1.00	4610	8.3	21.5	2.00	5.9	72	840	740	230
14...	0932	--	10.0	4620	8.2	21.0	--	5.9	71	--	--	--
14...	0934	--	20.0	4620	8.2	20.5	--	5.7	68	--	--	--
14...	0936	--	30.0	4610	8.2	20.0	--	5.6	66	--	--	--
14...	0938	--	40.0	4610	8.2	19.5	--	5.5	64	--	--	--
14...	0940	--	50.0	4610	8.1	19.0	--	5.4	62	--	--	--
14...	0942	--	56.0	4590	7.8	19.0	--	4.7	54	830	730	230
AUG												
01...	0930	256000	1.00	4290	8.4	27.5	1.50	6.8	91	730	630	200
01...	0932	--	10.0	4290	8.3	27.5	--	6.6	89	--	--	--
01...	0934	--	20.0	4290	8.1	26.5	--	5.0	66	--	--	--
01...	0936	--	30.0	4300	7.9	26.5	--	3.9	51	--	--	--
01...	0938	--	40.0	4360	7.4	25.5	--	0.3	4	--	--	--
01...	0940	--	50.0	4510	7.3	23.0	--	0.1	1	--	--	--
01...	0942	--	55.0	4530	7.3	22.5	--	0.2	2	770	640	210

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINIT- WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	ARSENIC DIS- SOLVED (UG/L AS AS)
FEB											
12...	59	610	10	7.3	98	660	1000	0.10	7.3	2610	1
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	61	620	10	7.1	98	760	1000	0.20	7.0	2720	--
MAY											
14...	65	650	10	8.9	100	770	1000	0.30	6.7	2810	2
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	63	640	10	8.6	100	750	1000	0.40	7.4	2780	--
AUG											
01...	55	600	10	8.2	98	710	930	0.40	7.5	2570	2
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	59	630	10	8.4	120	700	980	0.30	9.3	2670	--

## RED RIVER BASIN

07312000 LAKE KEMP NEAR MABELLE, TX--Continued

334520099092101 - LAKE KEMP SITE AC--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	BARIUM, DIS- SOLVED (UG/L AS BA)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)
FEB											
12...	100	<1.0	<1	2	20	<1	<10	0.2	<1	<1.0	<10
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--	--
MAY											
14...	200	<1.0	<1	<1	<10	<1	<10	<0.1	<1	<1.0	<10
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--	--
AUG											
01...	100	<1.0	<1	3	<10	<1	<10	0.1	<1	3.0	<10
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--

334533099112801 - LAKE KEMP SITE BC

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)
FEB											
12...	1145	1.00	4080	8.3	8.0	--	10.2	91	740	640	200
12...	1147	10.0	4070	8.3	8.0	--	10.2	91	--	--	--
12...	1149	20.0	4070	8.3	8.0	--	10.3	92	--	--	--
12...	1151	30.0	4070	8.2	8.0	--	10.2	91	--	--	--
12...	1153	40.0	4370	8.2	7.0	--	9.8	86	--	--	--
12...	1155	45.0	4390	8.2	8.0	--	8.4	75	810	710	220
MAY											
14...	1055	1.00	4590	8.2	22.0	1.30	5.9	72	830	730	230
14...	1057	10.0	4590	8.2	21.5	--	5.9	71	--	--	--
14...	1059	20.0	4610	8.2	21.0	--	5.8	70	--	--	--
14...	1101	30.0	4610	8.2	20.5	--	5.5	65	--	--	--
14...	1103	42.0	4610	8.0	20.0	--	4.4	52	840	740	230
AUG											
01...	1030	1.00	4310	8.4	28.0	1.50	6.8	92	700	610	190
01...	1032	10.0	4310	8.4	27.5	--	6.8	91	--	--	--
01...	1034	20.0	4310	8.2	27.0	--	5.3	70	--	--	--
01...	1036	30.0	4310	8.0	26.5	--	4.4	58	--	--	--
01...	1038	40.0	4750	7.7	26.5	--	1.7	22	--	--	--
01...	1040	45.0	4800	7.5	26.0	--	0.4	5	820	720	230

RED RIVER BASIN

07312000 LAKE KEMP NEAR MABELLE, TX--Continued

334533099112801 - LAKE KEMP SITE BC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS S102)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
FEB										
12...	58	600	10	7.2	98	660	960	0.20	7.3	2550
12...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
12...	--	--	--	--	--	--	--	--	--	--
12...	63	660	10	7.1	100	740	1000	0.20	6.9	2800
MAY										
14...	63	640	10	8.2	99	750	1000	0.40	6.4	2760
14...	--	--	--	--	--	--	--	--	--	--
14...	--	--	--	--	--	--	--	--	--	--
14...	64	660	10	8.2	100	640	1000	0.40	6.6	2690
AUG										
01...	55	600	10	8.1	90	700	940	0.30	7.5	2550
01...	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--
01...	60	660	10	8.7	100	750	1100	0.40	8.2	2840

334702099100201 - LAKE KEMP SITE P1

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
12...	1115	1.00	4050	8.2	8.0	10.2	91
12...	1117	10.0	4050	8.2	8.0	10.2	91
12...	1119	20.0	4050	8.2	8.0	10.1	90
12...	1121	30.0	4060	8.2	7.0	9.8	86
12...	1123	35.0	4070	8.2	7.0	9.7	85
MAY							
14...	1020	1.00	4600	8.3	23.5	5.9	74
14...	1022	10.0	4600	8.3	23.0	5.9	74
14...	1024	20.0	4600	8.2	22.0	5.7	70
14...	1026	30.0	4610	8.0	20.0	4.8	57
14...	1028	34.0	4610	7.9	20.0	4.5	53
AUG							
01...	1005	1.00	4300	8.3	28.0	6.6	89
01...	1007	10.0	4300	8.3	28.0	6.7	91
01...	1009	20.0	4280	8.2	27.0	5.8	77
01...	1011	30.0	4290	7.8	26.5	3.2	42
01...	1013	34.0	4290	7.6	26.5	1.9	25

334655099121701 - LAKE KEMP SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
12...	1300	1.00	4080	7.9	8.5	10.1	92
12...	1302	10.0	4070	7.8	8.5	10.1	92
12...	1304	20.0	4080	7.8	8.5	10.1	92
12...	1306	30.0	4080	7.6	8.0	10.0	90
12...	1308	38.0	4080	7.6	8.0	10.0	90
MAY							
14...	1130	1.00	4600	8.3	23.0	5.8	72
14...	1132	10.0	4600	8.3	23.0	5.8	72
14...	1134	20.0	4600	8.3	23.0	5.8	72
14...	1136	30.0	4610	8.1	21.5	5.1	62
14...	1138	36.0	4610	8.1	21.0	5.1	61
AUG							
01...	1100	1.00	4310	8.3	29.0	6.5	90
01...	1102	10.0	4320	8.3	28.5	6.6	90
01...	1104	20.0	4310	8.1	27.5	5.1	68
01...	1106	30.0	4370	7.8	27.0	3.1	41
01...	1108	36.0	4510	7.6	26.5	1.4	18





RED RIVER BASIN

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07312000 LAKE KEMP NEAR MABELLE, TX--Continued

334244099130901 - LAKE KEMP SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
12...	1420	1.00	4380	8.2	11.0	9.6	93
12...	1422	10.0	4400	8.2	10.5	9.6	92
12...	1424	15.0	4430	8.2	10.5	9.6	92
MAY							
14...	1315	1.00	4480	8.2	22.0	6.3	77
14...	1317	10.0	4490	8.2	22.0	6.2	76
14...	1319	16.0	4490	8.1	21.0	5.8	70
AUG							
01...	1214	1.00	4360	8.3	29.5	6.5	90
01...	1216	10.0	4450	8.0	28.0	4.3	58
01...	1218	15.0	4430	7.6	28.0	1.8	24

## RED RIVER BASIN

07312100 WICHITA RIVER NEAR MABELLE, TX

LOCATION.--Lat 33°45'36", long 99°08'33", Baylor County, Hydrologic Unit 11130206, near left bank at downstream side of bridge on U.S. Highways 183 and 283, 0.3 mi downstream from Lake Kemp Dam, 6.2 mi north of Mabelle, and 13 mi north-east of Seymour.

DRAINAGE AREA.--2,086 mi<sup>2</sup>, all of which is above Lake Kemp Dam.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1952-58 (occasional discharge measurements), October 1959 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,062.72 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow regulated by Lake Kemp (station 07312000) 0.3 mi upstream. Water is released from Lake Kemp to supply Lake Diversion, 12.5 mi downstream. Water from Lake Diversion is released for mining, recreation, and irrigation in the vicinity of Wichita Falls.

AVERAGE DISCHARGE.--32 years, 154 ft<sup>3</sup>/s (111,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,290 ft<sup>3</sup>/s Mar. 24, 1976 (gage height, 10.47 ft); minimum daily, 0.09 ft<sup>3</sup>/s May 8, 1989.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1,190 ft<sup>3</sup>/s Sept. 24, 25 (gage height, 5.45 ft); minimum daily, 0.30 ft<sup>3</sup>/s Dec. 24 (result of ice effect).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	124	.63	.48	117	125	131	130	131	174	123	295
2	1.1	54	.68	.58	278	129	131	141	79	122	215	220
3	1.1	1.5	.80	.59	102	127	131	6.0	1.6	123	273	150
4	66	2.3	.65	e.40	1.2	127	131	2.2	1.4	122	275	68
5	123	1.0	.58	.63	1.0	126	132	1.8	1.2	122	276	1.7
6	123	1.0	.80	.78	.90	128	132	1.5	147	122	276	1.4
7	125	1.2	.66	.61	.83	129	131	1.6	582	122	278	1.3
8	125	4.0	.64	.55	.84	127	131	2.0	585	122	278	1.2
9	126	1.3	.63	6.2	.78	127	221	1.5	576	121	315	1.2
10	125	.87	.59	2.1	.84	126	283	1.5	803	122	397	1.2
11	222	.84	.53	.72	.75	127	283	1.5	1150	122	398	1.1
12	278	.84	.56	.63	.69	126	281	1.5	1160	122	249	1.1
13	279	.80	.65	.55	.77	127	280	1.4	1160	122	151	1.5
14	280	.75	.60	.60	.79	54	183	1.4	1160	123	148	5.1
15	281	.72	.62	.63	.77	1.1	123	1.5	1090	124	104	1.1
16	221	.85	.75	.62	.66	.77	120	1.3	1180	123	1.9	3.3
17	131	.80	.64	.81	.59	.70	119	79	1180	124	1.7	1.4
18	131	.75	.59	2.5	.73	.67	119	129	1180	217	1.5	5.2
19	130	.72	.82	1.1	.92	.64	121	143	1180	275	1.4	1.7
20	130	.69	.71	1.0	.72	.58	120	146	1180	275	1.4	1.2
21	132	.67	.71	.78	.70	.56	120	145	1170	276	1.4	1.1
22	129	.70	e.50	.66	.75	.53	220	147	1170	276	1.4	1.2
23	108	.70	e.40	.73	.65	.55	282	147	1170	276	89	566
24	131	.69	e.30	.76	.83	.58	282	148	611	286	148	1190
25	131	.70	e.50	.78	90	.58	281	87	267	278	150	1190
26	131	.63	.64	.74	142	.63	188	1.5	267	278	150	809
27	131	.65	.58	.69	124	47	130	1.2	267	282	150	581
28	131	.73	.55	.66	124	133	127	1.1	268	180	234	581
29	130	.68	.58	.81	---	134	128	66	268	123	293	585
30	130	.59	.54	.72	---	134	128	131	268	124	293	585
31	128	---	e.40	.66	---	132	---	131	---	123	295	---
TOTAL	4311.4	205.67	18.83	30.07	993.71	2292.89	5189	1800.5	20253.2	5401	5568.7	6853.0
MEAN	139	6.86	.61	.97	35.5	74.0	173	58.1	675	174	180	228
MAX	281	124	.82	6.2	278	134	283	148	1180	286	398	1190
MIN	1.1	.59	.30	.40	.59	.53	119	1.1	1.2	121	1.4	1.1
AC-FT	8550	408	37	60	1970	4550	10290	3570	40170	10710	11050	13590
CAL YR 1990	TOTAL	122036.52	MEAN	334	MAX	3130	MIN	.30	AC-FT	242100		
WTR YR 1991	TOTAL	52917.97	MEAN	145	MAX	1190	MIN	.30	AC-FT	105000		

e Estimated

RED RIVER BASIN

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07312100 WICHITA RIVER NEAR MABELLE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: December 1965 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: July 1968 to current year.

WATER TEMPERATURE: July 1968 to current year.

INSTRUMENTATION.--From 1968 to 1975, specific conductance was continuously recorded at this station.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 7,110 microsiemens May 13, 14, 1980; minimum daily, 561 microsiemens May 28, 1975.

WATER TEMPERATURE: Maximum daily, 32.0°C Sept. 4, 1972, June 26, July 5, 1975; minimum daily, 0.0°C Dec. 20, 1973, Feb. 9, 17, 1980.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 5,800 microsiemens Nov. 25; minimum daily, 2,550 microsiemens Jan. 10.

WATER TEMPERATURE: Maximum daily, 28.0°C Aug. 3; minimum daily, 3.0°C Dec. 22, 23, 30.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV 13...	1045	0.82	5330	8.0	16.5	940	780	260	71
MAR 11...	1050	127	4460	8.2	10.5	800	700	220	61

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 13...	780	11	6.0	160	750	1300	0.80	8.8	3270
MAR 11...	630	10	7.4	98	650	1100	0.70	6.7	2730

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT-ANCE (MICRO-SIEMENS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	4311.4	4020	2410	28100	920	10700	580	6730	720
NOV. 1990	205.67	4100	2460	1370	950	525	590	326	730
DEC. 1990	18.83	5150	3150	160	1200	63	730	37	900
JAN. 1991	30.07	4810	2930	238	1200	94	680	55	850
FEB. 1991	993.71	4440	2680	7200	1000	2790	630	1700	790
MAR. 1991	2292.89	4460	2700	16700	1000	6470	640	3940	790
APR. 1991	5189	4590	2780	38900	1100	15100	650	9140	810
MAY 1991	1800.5	4740	2880	14000	1100	5470	670	3270	840
JUNE 1991	20253.2	4460	2700	147000	1000	57100	640	34800	790
JULY 1991	5401	4190	2520	36800	970	14100	600	8760	750
AUG. 1991	5568.7	4380	2640	39700	1000	15400	630	9400	780
SEPT 1991	6853.0	4350	2620	48600	1000	18800	620	11500	770
TOTAL	52917.97	**	**	379000	**	147000	**	89600	**
WTD.AVG.	145	4390	2650	**	1000	**	630	**	780

## RED RIVER BASIN

07312100 WICHITA RIVER NEAR MABELLE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5270	3990	4980	5280	5120	4390	4500	4720	4820	4130	4330	4370
2	5290	3980	5200	5290	4310	4400	4500	4720	4840	4140	4340	4380
3	4890	5780	5190	5280	4310	4380	4500	3550	5270	4140	4340	4390
4	5150	3180	5200	5280	4660	4480	4500	4500	4850	4140	4350	4290
5	3980	5610	5210	5270	4850	4390	4500	4990	5130	4140	4360	4730
6	3970	5170	5220	4770	4840	4410	4500	5240	3980	4150	4370	4730
7	3980	5220	5210	5180	4750	4400	4500	5320	4670	4150	4370	4740
8	3970	3870	5200	5220	4880	4400	4570	3910	4750	4160	4380	4690
9	3970	3810	5240	5240	4900	4420	4630	5100	4650	4160	4390	4820
10	3980	5050	5210	2550	4980	4420	4560	5200	4630	4150	4370	4770
11	3970	5000	5230	4400	4970	4420	4580	5250	4630	4160	4360	4850
12	3970	5080	5230	5060	5030	4420	4590	5250	4530	4180	4320	4840
13	3970	5140	5180	5150	5040	4430	4560	5260	4520	4130	4360	4820
14	3990	5180	5210	5210	5050	4420	4560	5340	4530	4200	4380	3160
15	3990	5160	5210	5170	5050	5190	4620	5640	4540	4200	4400	4470
16	4000	5170	4790	5220	5050	5280	4660	5310	4400	4200	4700	4790
17	4010	5170	5100	5200	5020	5280	4680	5330	4380	4210	4360	4340
18	4000	5180	5130	3720	5070	5340	4580	4680	4410	4220	4790	4370
19	4010	5170	5080	3740	5110	5350	4580	4680	4410	4210	4740	3630
20	4010	5200	4920	5110	5100	5350	4590	4670	4370	4220	4700	4700
21	4010	5190	5060	5070	5110	5280	4590	4670	4310	4220	4700	4810
22	4020	5180	5150	5000	5090	5280	4610	4680	4350	4230	4730	4840
23	4020	5190	5230	5200	5090	5360	4600	4690	4320	4230	4720	4790
24	4020	5190	5200	5210	5110	5350	4590	4700	4310	4230	4390	4300
25	4040	5800	5210	5210	5110	5350	4600	4670	4330	4190	4390	4290
26	4040	5200	5210	5230	4180	5340	4590	5150	4350	4210	4390	4300
27	4050	5180	5130	5220	4190	5400	4650	5190	4420	4190	4390	4320
28	4060	5210	5170	5220	4190	4500	4670	5280	4390	4150	4400	4300
29	4060	5210	5100	5230	---	4510	4660	5320	4410	4220	4390	4310
30	4050	5240	5130	5260	---	4520	4740	4680	4370	4230	4380	4300
31	4050	---	5170	5240	---	4530	---	4680	---	4230	4390	---
MEAN	4150	4990	5150	4980	4860	4810	4590	4920	4530	4180	4450	4480

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18.0	17.0	11.0	8.0	9.0	10.0	13.0	18.0	24.0	27.0	26.0	26.0
2	19.0	17.0	11.0	9.0	6.0	10.0	14.0	18.0	24.0	27.0	26.0	26.0
3	20.0	18.0	8.0	7.0	6.0	9.0	14.0	18.0	19.0	27.0	28.0	27.0
4	19.0	10.0	8.0	7.0	11.0	10.0	15.0	20.0	18.0	27.0	27.0	25.0
5	23.0	10.0	9.0	10.0	13.0	11.0	14.0	15.0	22.0	26.0	27.0	23.0
6	24.0	13.0	10.0	9.0	12.0	11.0	15.0	15.0	21.0	27.0	27.0	23.0
7	24.0	11.0	8.0	8.0	10.0	10.0	15.0	17.0	24.0	27.0	27.0	24.0
8	23.0	10.0	9.0	9.0	10.0	10.0	15.0	17.0	24.0	27.0	27.0	23.0
9	21.0	9.0	10.0	11.0	11.0	10.0	15.0	18.0	24.0	27.0	27.0	23.0
10	20.0	12.0	10.0	6.0	11.0	11.0	15.0	18.0	23.0	27.0	27.0	23.0
11	20.0	13.0	10.0	9.0	11.0	11.0	16.0	20.0	24.0	27.0	27.0	23.0
12	19.0	14.0	11.0	9.0	13.0	11.0	17.0	20.0	26.0	27.0	27.0	22.0
13	19.0	14.0	11.0	9.0	13.0	11.0	17.0	21.0	25.0	27.0	26.0	23.0
14	19.0	14.0	11.0	11.0	12.0	11.0	17.0	20.0	26.0	27.0	26.0	23.0
15	18.0	15.0	12.0	10.0	10.0	11.0	17.0	20.0	25.0	26.0	27.0	24.0
16	19.0	15.0	12.0	10.0	9.0	12.0	17.0	21.0	26.0	27.0	23.0	23.0
17	19.0	14.0	12.0	12.0	11.0	10.0	18.0	18.0	26.0	27.0	23.0	21.0
18	19.0	14.0	12.0	10.0	11.0	11.0	18.0	22.0	25.0	26.0	23.0	22.0
19	19.0	15.0	10.0	9.0	10.0	13.0	18.0	22.0	26.0	27.0	24.0	16.0
20	18.0	16.0	11.0	9.0	8.0	13.0	17.0	22.0	26.0	27.0	25.0	17.0
21	18.0	18.0	5.0	9.0	10.0	14.0	17.0	23.0	27.0	27.0	23.0	16.0
22	17.0	15.0	3.0	7.0	11.0	13.0	17.0	22.0	26.0	27.0	24.0	19.0
23	17.0	12.0	3.0	9.0	11.0	11.0	17.0	23.0	27.0	27.0	23.0	18.0
24	17.0	12.0	4.0	9.0	12.0	13.0	18.0	23.0	27.0	27.0	26.0	22.0
25	17.0	13.0	6.0	9.0	9.0	14.0	17.0	23.0	26.0	26.0	26.0	21.0
26	17.0	17.0	8.0	8.0	9.0	15.0	18.0	22.0	27.0	26.0	26.0	21.0
27	17.0	16.0	10.0	10.0	9.0	13.0	18.0	22.0	26.0	26.0	26.0	21.0
28	16.0	10.0	10.0	9.0	9.0	14.0	18.0	21.0	27.0	26.0	26.0	21.0
29	17.0	10.0	13.0	11.0	---	13.0	18.0	21.0	26.0	26.0	27.0	21.0
30	17.0	9.0	3.0	6.0	---	13.0	18.0	24.0	27.0	26.0	26.0	21.0
31	17.0	---	5.0	7.0	---	13.0	---	24.0	---	26.0	26.0	---
MEAN	18.9	13.4	8.9	8.9	10.2	11.7	16.4	20.3	24.8	26.7	25.8	21.9



RED RIVER BASIN

07312110 SOUTH SIDE CANAL NEAR DUNDEE, TX

LOCATION.--Lat 33°48'50", Long 98°55'57", Archer County, Hydrologic Unit 11130206, on left bank, 125 ft downstream from Lake Diversion headgates, and 5.3 mi northwest of Dundee.

PERIOD OF RECORD.--October 1971 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,039.70 ft above National Geodetic Vertical Datum of 1929 (Wichita County Water Improvement District bench mark).

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Water diverted from Lake Diversion is used for mining, industrial, recreation, and irrigation uses. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 77.6 ft<sup>3</sup>/s (56,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 374 ft<sup>3</sup>/s July 22, 1974; maximum gage height, 8.66 ft July 23, 1978; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 227 ft<sup>3</sup>/s July 26; maximum gage height, 6.36 ft; minimum daily discharge, 0.03 ft<sup>3</sup>/s Dec. 31 to Jan. 5, 7, 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	95	130	1.5	.03	53	.87	108	23	108	150	e127	181
2	94	e78.0	1.5	.03	41	.85	112	47	109	150	e127	151
3	93	e2.80	1.4	.03	42	.73	108	3.2	69	150	e127	102
4	92	2.5	1.4	.03	41	9.3	111	1.0	5.5	150	e141	87
5	91	2.4	1.4	.03	32	15	113	1.0	5.5	151	e154	54
6	90	2.2	1.4	.04	1.1	17	113	1.0	4.8	151	e154	53
7	90	2.2	1.4	.03	1.0	13	114	1.1	11	151	e154	53
8	92	2.2	1.4	.03	1.0	1.3	114	1.1	16	151	e154	52
9	91	2.1	1.4	.04	1.1	1.1	115	1.1	16	156	e154	52
10	91	2.1	6.8	.04	1.0	1.0	118	1.1	16	e188	e154	52
11	92	1.9	9.4	.04	1.1	1.0	121	1.1	16	e193	e154	52
12	91	1.8	9.2	.04	1.2	.87	121	1.1	16	e198	e154	52
13	92	1.7	8.9	.04	1.4	.78	121	1.2	21	e198	e129	52
14	92	1.6	9.0	.04	1.2	.88	120	1.2	38	e198	e103	52
15	92	1.4	4.0	.04	1.2	.91	123	1.2	e77	e198	e103	52
16	93	1.3	.65	.04	1.2	.91	123	15	e78	e198	e103	53
17	93	1.3	.64	.13	1.2	24	123	46	e81	e193	e102	53
18	93	1.4	.71	.15	1.3	61	124	72	e82	e189	e102	56
19	94	1.3	.64	.15	1.1	79	124	72	e96	e198	e103	55
20	92	1.3	.63	24	1.0	76	122	79	e115	e198	e103	54
21	92	1.4	.63	58	.91	76	124	89	e115	e198	e103	55
22	92	1.4	.63	61	1.0	71	120	89	e116	e208	e105	54
23	92	1.4	.60	62	1.1	74	120	90	e117	e225	129	54
24	92	1.4	.47	62	1.2	76	122	101	e117	222	129	53
25	92	1.4	.22	60	1.1	78	118	85	e118	225	129	53
26	92	1.4	.13	62	.90	77	103	71	137	227	147	54
27	92	1.5	.13	60	.81	84	78	71	149	e176	174	54
28	96	1.5	.10	60	.82	107	76	71	149	e127	173	54
29	114	1.5	.09	58	---	107	75	71	149	e127	174	53
30	131	1.5	.05	58	---	108	49	81	149	e127	176	53
31	131	---	.03	58	---	108	---	106	---	e127	176	---
TOTAL	2959	255.90	66.45	684.00	233.94	1271.50	3333	1295.4	2296.8	5498	4217	1905
MEAN	95.5	8.53	2.14	22.1	8.35	41.0	111	41.8	76.6	177	136	63.5
MAX	131	130	9.4	62	53	108	124	106	149	227	176	181
MIN	90	1.3	.03	.03	.81	.73	49	1.0	4.8	127	102	52
AC-FT	5870	508	132	1360	464	2520	6610	2570	4560	10910	8360	3780

CAL YR 1990 TOTAL 23582.73 MEAN 64.6 MAX 217 MIN .03 AC-FT 46780  
WTR YR 1991 TOTAL 24015.99 MEAN 65.8 MAX 227 MIN .03 AC-FT 47640

e Estimated

## 07312200 BEAVER CREEK NEAR ELECTRA, TX

LOCATION.--Lat 33°54'21", long 98°54'17", Wichita County, Hydrologic Unit 11130207, near right bank at downstream side of bridge on Farm Road 2326, 6.5 mi northwest of Kamay, 8 mi upstream from Wichita River, and 9 mi south of Electra.

DRAINAGE AREA.--652 mi<sup>2</sup>.

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

Water-quality records.--Chemical analyses: October 1968 to June 1970. Water temperatures: October 1968 to June 1970. Sediment records: April 1966 to September 1975.

GAGE.--Water-stage recorder. Datum of gage is 991.3 ft above National Geodetic Vertical Datum of 1929 (State Department of Highways and Public Transportation reference point).

REMARKS.--Records good. Some regulation by Santa Rosa Lake (capacity, 11,570 acre-ft) about 30 mi upstream. There are several diversions above station.

AVERAGE DISCHARGE.--31 years, 70.7 ft<sup>3</sup>/s (1.47 in/yr), 51,220 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,700 ft<sup>3</sup>/s Mar. 17, 1961 (gage height, 33.57 ft); maximum gage height, May 29, 1987, 34.94 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1925, 36.0 ft, probably occurred Oct. 2, 1941 (partly caused by breaching of Santa Rosa Dam to avoid its failure), from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 3	0620	2,170	24.72	June 14	1350	1,430	22.14
June 4	0200	1,460	21.36	July 28	1930	*2,500	*25.61
June 7	2130	1,200	20.23	Sept. 18	2330	1,110	20.86
June 9	1100	1,760	22.26				

Minimum discharge, 0.57 ft<sup>3</sup>/s Apr. 24, 30, and May 18, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	10	13	13	15	11	5.0	3.8	1.4	1.5	6.4	514	9.0		
2	10	13	13	14	9.4	4.9	3.8	171	45	5.4	207	15		
3	14	13	13	13	7.1	4.7	3.9	1880	856	5.4	103	7.5		
4	12	72	13	13	6.7	4.4	4.4	300	1120	5.8	65	269		
5	11	43	13	13	6.6	4.5	4.9	21	254	5.1	40	274		
6	11	19	13	16	6.5	4.5	4.2	6.4	35	3.7	28	85		
7	11	14	13	15	6.1	4.5	4.1	3.6	580	4.3	18	36		
8	24	69	14	13	5.9	4.4	4.2	27	766	3.9	14	26		
9	35	136	14	17	6.1	4.2	3.9	27	1510	3.3	9.9	22		
10	16	31	14	194	6.0	4.2	3.5	7.8	777	3.6	7.2	19		
11	12	16	14	71	5.9	4.5	3.3	3.0	610	4.2	23	16		
12	12	14	14	20	5.8	4.5	3.5	2.0	657	4.0	59	14		
13	12	14	14	14	5.9	4.2	3.6	1.6	739	3.7	47	16		
14	12	13	13	13	5.6	3.7	3.7	.86	1290	3.3	24	270		
15	12	14	13	13	5.3	4.1	3.6	.73	697	4.4	12	97		
16	12	14	17	13	5.4	4.6	3.2	.73	223	4.4	11	52		
17	12	13	18	12	5.5	15	2.8	.64	207	4.0	140	91		
18	12	13	15	47	5.5	6.8	2.7	.73	263	3.5	101	551		
19	12	13	14	87	5.3	4.8	2.6	2.1	245	3.2	15	883		
20	12	14	13	38	5.1	4.3	1.9	2.6	132	2.8	10	497		
21	12	13	e12	16	5.1	4.1	1.7	2.6	78	2.6	9.6	180		
22	12	13	e11	13	5.1	4.0	.93	2.6	51	2.6	7.8	162		
23	12	13	e11	12	5.1	3.8	.78	2.4	31	2.8	6.8	205		
24	13	13	e11	12	5.3	3.9	.96	1.8	23	15	5.2	295		
25	13	13	e13	11	5.0	3.9	28	638	19	75	4.8	341		
26	13	13	e15	11	4.8	3.9	13	492	16	147	4.5	211		
27	12	13	16	11	4.8	4.2	4.6	24	12	1910	5.0	127		
28	12	13	15	11	4.8	3.9	2.4	6.4	9.3	2440	4.8	93		
29	12	13	14	11	---	3.7	2.3	3.9	8.0	1500	4.6	71		
30	12	13	e12	11	---	3.6	.68	2.0	7.1	518	4.7	56		
31	12	---	e11	11	---	3.7	---	1.8	---	632	4.7	---		
TOTAL	409	691	419	781	166.7	144.5	126.95	3637.69	11261.9	7329.4	1510.6	4990.5		
MEAN	13.2	23.0	13.5	25.2	5.95	4.66	4.23	117	375	236	48.7	166		
MAX	35	136	18	194	11	15	28	1880	1510	2440	514	883		
MIN	10	13	11	11	4.8	3.6	.68	.64	1.5	2.6	4.5	7.5		
AC-FT	811	1370	831	1550	331	287	252	7220	22340	14540	3000	9900		
CFSM	.02	.04	.02	.04	.01	.01	.01	.18	.58	.36	.07	.26		
IN.	.02	.04	.02	.04	.01	.01	.01	.21	.64	.42	.09	.28		
CAL YR 1990	TOTAL	54411.7	MEAN	149	MAX	4270	MIN	6.7	AC-FT	107900	CFSM	.23	IN.	3.10
WTR YR 1991	TOTAL	31468.24	MEAN	86.2	MAX	2440	MIN	.64	AC-FT	62420	CFSM	.13	IN.	1.80

e Estimated

RED RIVER BASIN

87

07312500 WICHITA RIVER AT WICHITA FALLS, TX

LOCATION.--Lat 33°54'34", long 98°32'00", Wichita County, Hydrologic Unit 11130206, near center of stream at downstream side of bridge on Beverly Drive in Wichita Falls, 4 mi upstream from Fort Worth and Denver Railway Co. bridge, 8.4 mi upstream from Holliday Creek, and 55.3 mi upstream from mouth.

DRAINAGE AREA.--3,140 mi<sup>2</sup>, of which 2,086 mi<sup>2</sup> is above Lake Kemp Dam.

PERIOD OF RECORD.--February 1900 to January 1902 (monthly discharge only, published in WSP 1311), October 1910 to December 1911 (gauge heights only), March 1938 to current year.  
 Water-quality records.--Chemical analyses: April 1966 to July 1975. Chemical and biochemical analyses: November 1981 to August 1989. Sediment analyses: April 1966 to July 1975. Specific Conductance: October 1981 to September 1989. Water temperature: October 1981 to September 1989.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 924.26 ft above National Geodetic Vertical Datum of 1929. February 1900 to February 1902 and Oct. 1, 1910, to Dec. 31, 1911, nonrecording gages at site 4 mi downstream at different datum. Mar. 30, 1938, to Dec. 1, 1959, nonrecording gage at present site and datum.

REMARKS.--Records good. Flow from 2,086 mi<sup>2</sup> above station is regulated by Lake Kemp (capacity 603,000 acre-ft) 71 mi upstream. Since completion of Lake Kemp in 1923, no outflow has been permitted to pass over spillway. Water is diverted from Lake Diversion (capacity 40,000 acre-ft) 41 mi upstream for the irrigation of 42,000 acres under permit in the vicinity of Wichita Falls. During the water year, Wichita County Water Improvement District No. 2 diverted 47,640 acre-ft from Lake Diversion for mining, industrial use, recreation, and irrigation. Gage-height telemeter at station via Sutron data collection platform.

AVERAGE DISCHARGE.--54 years (water years 1901, 1939-91), 274 ft<sup>3</sup>/s (198,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,800 ft<sup>3</sup>/s Oct. 3, 1941 (gage height, 24.0 ft); no flow Oct. 11, 1960 (construction of cofferdam upstream).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 50,000 ft<sup>3</sup>/s June 8, 1915, computed by Vernon L. Sullivan, engineer for Big Wichita River Irrigation Co.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,030 ft<sup>3</sup>/s July 30 at 0100 hours (gage height, 10.15 ft); minimum, 30 ft<sup>3</sup>/s Feb. 28.

FROM THE DCP  
 DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	85	50	49	48	32	61	40	57	150	714	128
2	71	95	51	46	47	32	67	66	75	147	595	148
3	78	117	50	49	48	32	71	695	295	137	368	137
4	83	120	51	49	47	32	70	1580	1100	127	263	150
5	73	130	51	49	45	33	68	628	1050	118	184	515
6	69	103	50	55	59	33	51	125	321	108	163	502
7	68	81	52	55	57	33	49	86	176	103	146	192
8	79	102	53	54	48	34	50	167	794	100	137	121
9	121	170	51	61	39	35	51	120	1730	99	132	103
10	133	161	52	184	37	35	48	105	1840	98	126	98
11	110	95	53	196	36	38	55	80	1660	100	123	86
12	102	71	54	117	36	38	55	65	1320	105	151	79
13	76	63	54	76	37	37	52	57	1340	106	190	81
14	71	59	54	60	36	36	52	52	1420	107	173	255
15	70	58	54	55	36	38	54	48	1740	102	145	283
16	70	57	61	49	36	42	53	46	1620	100	135	214
17	69	55	63	48	37	44	52	44	1060	101	145	211
18	71	55	63	87	37	44	50	42	996	110	162	488
19	73	53	59	117	35	56	52	44	1040	107	183	1410
20	77	54	58	114	35	90	55	48	1030	104	107	1270
21	78	53	e53	85	35	90	55	54	923	105	94	669
22	77	52	e50	64	36	81	54	53	865	104	86	301
23	77	50	e46	59	35	78	52	56	835	104	75	246
24	79	49	e45	62	33	81	57	68	808	111	74	271
25	76	49	e52	60	32	72	58	118	793	123	87	560
26	76	50	57	58	31	61	50	524	462	187	80	924
27	76	51	53	58	31	61	79	464	209	390	76	908
28	76	49	52	56	31	48	65	113	185	1540	81	746
29	77	49	52	54	---	51	46	76	167	1970	82	600
30	80	49	52	51	---	56	40	62	155	1790	95	565
31	81	---	55	49	---	60	---	57	---	693	96	---
TOTAL	2490	2285	1651	2226	1100	1533	1672	5783	26066	9346	5268	12261
MEAN	80.3	76.2	53.3	71.8	39.3	49.5	55.7	187	869	301	170	409
MAX	133	170	63	196	59	90	79	1580	1840	1970	714	1410
MIN	68	49	45	46	31	32	40	40	57	98	74	79
AC-FT	4940	4530	3270	4420	2180	3040	3320	11470	51700	18540	10450	24320
CAL YR 1990	TOTAL	205973	MEAN	564	MAX	6940	MIN	34	AC-FT	408500		
WTR YR 1991	TOTAL	71681	MEAN	196	MAX	1970	MIN	31	AC-FT	142200		

e Estimated

## RED RIVER BASIN

07312700 WICHITA RIVER NEAR CHARLIE, TX

LOCATION.--Lat 34°03'11", long 98°17'47", Clay County, Hydrologic Unit 11130206, on right bank at upstream side of bridge on Farm Road 810, 3.0 mi southeast of Charlie, and 5.7 mi northwest of Petrolia.

DRAINAGE AREA.--3,439 mi<sup>2</sup>, of which 2,086 mi<sup>2</sup> is above Lake Kemp Dam and 143 mi<sup>2</sup> is above Lake Wichita Dam.

## WATER QUALITY DATA

PERIOD OF RECORD.--October 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 872.71 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. For statement regarding regulation and diversions, see station 07312500. Records furnished by the city of Wichita Falls show that 12,260 acre-ft was returned to river above this station as sewage effluent. Station is special periodic water-quality station.

AVERAGE DISCHARGE.--24 years, 337 ft<sup>3</sup>/s (244,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,760 ft<sup>3</sup>/s May 7, 1990 (gage height, 25.80 ft); minimum, 24 ft<sup>3</sup>/s Feb. 18, 1978, Feb. 4, 1989 result of freeze-up.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,980 ft<sup>3</sup>/s July 30 at 2030 hours (gage height, 10.76 ft); minimum, 32 ft<sup>3</sup>/s Dec. 23, result of freeze-up.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	144	151	80	77	152	62	145	106	114	267	832	186
2	143	180	79	81	154	60	136	101	120	258	824	847
3	157	193	78	74	151	52	141	787	533	248	656	394
4	185	260	79	75	139	51	136	1250	867	222	484	234
5	176	331	80	80	136	51	150	1740	1350	207	367	429
6	165	234	80	93	131	52	209	716	1150	188	268	710
7	149	178	79	164	134	51	170	217	524	178	238	600
8	149	160	78	103	120	52	173	503	459	157	197	320
9	309	451	77	100	102	52	176	467	1340	149	167	189
10	315	379	77	515	85	54	162	211	1850	136	164	162
11	242	303	78	559	78	52	125	172	1930	128	149	151
12	184	183	79	420	78	56	127	122	1740	137	177	131
13	174	130	76	256	78	56	141	116	1500	142	325	121
14	157	110	75	159	76	52	126	83	1530	143	330	568
15	156	100	78	122	69	54	110	68	1630	146	261	628
16	154	97	86	108	67	56	108	63	1870	146	195	721
17	149	94	175	99	65	83	83	60	1730	143	225	1290
18	145	91	124	240	65	84	99	72	1280	135	248	574
19	141	90	103	372	63	69	113	73	1240	140	220	1190
20	139	91	93	304	59	73	109	69	1280	132	229	1620
21	136	91	84	256	61	139	83	68	1220	127	163	1410
22	132	90	67	190	61	163	112	101	1130	128	174	801
23	125	84	47	138	61	142	113	83	1070	124	105	472
24	126	83	78	148	61	134	119	113	1040	133	87	421
25	126	84	88	171	58	134	294	308	1010	205	82	478
26	126	83	89	170	60	145	186	358	944	193	91	831
27	122	84	92	169	62	122	148	807	566	385	90	1160
28	120	82	93	158	61	111	174	575	369	843	94	1120
29	109	79	88	154	---	109	126	201	337	1640	102	938
30	112	80	85	152	---	121	113	116	281	1930	110	812
31	122	---	79	157	---	136	---	118	---	1650	102	---
TOTAL	4889	4646	2644	5864	2487	2628	4207	9844	32004	10760	7756	19508
MEAN	158	155	85.3	189	88.8	84.8	140	318	1067	347	250	650
MAX	315	451	175	559	154	163	294	1740	1930	1930	832	1620
MIN	109	79	47	74	58	51	83	60	114	124	82	121
AC-FT	9700	9220	5240	11630	4930	5210	8340	19530	63480	21340	15380	38690
CAL YR 1990	TOTAL	306249	MEAN	839	MAX	7740	MIN	47	AC-FT	607400		
WTR YR 1991	TOTAL	107237	MEAN	294	MAX	1930	MIN	47	AC-FT	212700		



RED RIVER BASIN

89

07312700 WICHITA RIVER NEAR CHARLIE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1967 to September 1981, October 1989 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to September 1981.  
 WATER TEMPERATURE: October 1967 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD

SPECIFIC CONDUCTANCE: Maximum daily, 10,000 microsiemens Apr. 25, 1972; minimum daily, 384 microsiemens Aug. 16, 1971.

WATER TEMPERATURE: Maximum daily, 34.5°C July 25, 1981; minimum daily, 0.0°C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
NOV 08...	1615	151	3610	8.1	10.5	11.0	106	2.9	660	510
JAN 17...	1520	82	3050	7.8	8.0	12.1	107	4.3	590	410
MAR 22...	1025	157	6400	7.9	17.0	8.8	97	6.3	1300	1100
MAY 10...	0850	244	1540	7.8	21.0	6.0	69	4.0	280	180
JUL 18...	0950	142	4710	8.2	28.5	7.0	94	1.4	770	630
AUG 16...	1030	195	3390	7.7	26.0	6.2	79	0.8	660	540

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
NOV 08...	160	64	490	8	6.5	150	340	1000	0.10	7.2
JAN 17...	140	59	370	7	6.7	180	260	760	0.50	9.2
MAR 22...	310	130	880	11	7.7	230	620	1700	0.50	13
MAY 10...	71	24	170	4	6.4	100	150	320	0.30	7.4
JUL 18...	190	72	630	10	8.6	140	620	980	0.50	6.5
AUG 16...	170	56	490	8	7.4	110	440	800	0.50	9.9

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 08...	2160	0.750	0.150	0.900	0.660	0.64	1.3	0.760	0.590
JAN 17...	1710	1.00	0.100	1.10	0.480	2.8	3.3	1.50	0.270
MAR 22...	3800	0.490	0.170	0.660	1.10	1.3	2.4	0.620	0.540
MAY 10...	809	0.290	0.610	0.900	0.640	1.8	2.4	0.790	0.240
JUL 18...	2590	0.090	0.040	0.130	0.130	1.1	1.2	0.570	0.430
AUG 16...	2040	0.660	0.080	0.740	0.110	0.79	0.90	0.430	0.260

RED RIVER BASIN

07314000 LAKE KICKAPOO NEAR ARCHER CITY, TX

LOCATION.--Lat 33°39'47", long 98°46'43", Archer County, Hydrologic Unit 11130209, on intake tower near left end of dam on North Fork Little Wichita River, 8.2 mi south of Mankins, and 9.2 mi northwest of Archer City.

DRAINAGE AREA.--275 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1946 to current year. Prior to October 1965, monthend contents only. Water-quality records.--Chemical analyses: October 1969 to September 1984.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Nonrecording gage read twice daily prior to Feb. 17, 1974, once daily thereafter. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by city of Wichita Falls). Prior to Oct. 8, 1946, water-stage recorder at same site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 8,200 ft long, including a 483-foot-wide reinforced concrete ogee-type uncontrolled spillway near right end of dam. The dam was completed Dec. 15, 1945, and storage began Feb. 1, 1946. The service outlet consists of two gate-controlled 4- by 5-foot conduits. The dam and lake are owned by the city of Wichita Falls, which uses the water for their municipal supply. The capacity table is based on Geological Survey topographic maps, dated 1929. The capacity curve, dated November 1946, was entitled "Lake Kickapoo Area & Capacity Curve". 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.....	1,062.0	-
Design flood (2-foot freeboard).....	1,060.0	221,000
Crest of spillway.....	1,045.0	106,000
Lowest gated outlet (invert).....	1,000.92	0

COOPERATION.--Capacity curve, record of lake elevations, and diversions for municipal use are provided by the city of Wichita Falls.

EXTREMES (at 0800) FOR PERIOD OF RECORD.--Maximum contents, 134,300 acre-ft Aug. 2, 1950 (elevation, 1,049.2 ft); minimum observed since first filling in July 1950, 35,660 acre-ft June 30, 1953 (elevation, 1,029.8 ft).

EXTREMES (at 0800) FOR CURRENT YEAR.--Maximum contents, 77,600 acre-ft June 13-15 (elevation, 1,040.2 ft); minimum, 66,980 acre-ft May 1, 2 (elevation, 1,038.1 ft).

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

1,038.0	66,500	1,039.0	71,300	1,040.0	76,500
1,038.5	68,900	1,039.5	73,900	1,040.5	79,250

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 08:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	76500	73380	73380	72340	75460	73380	70340	66980	71820	75980	69860	69380
2	76500	72860	73380	72340	74940	73380	70340	66980	72340	75980	69860	69380
3	76500	72860	73380	72340	74940	73380	70340	70340	71820	74940	69860	69860
4	75980	73380	73380	72340	74940	72860	69860	72340	73380	73380	69860	69860
5	76500	73380	73380	72340	74940	73900	69860	72340	73900	73900	69860	69380
6	76500	73380	72860	72340	74940	72860	69860	72340	73380	73380	69380	69380
7	75980	72860	72860	72340	74940	72860	69860	72340	74420	74420	69380	69380
8	75460	73380	72860	72340	74940	72340	70340	72860	75460	73380	69380	69380
9	75460	74420	72860	72340	74940	72340	69380	72860	77050	73900	69380	69380
10	75460	74420	73380	72340	74940	72860	69860	72860	77050	73380	69380	69380
11	75460	74420	72860	73380	74940	72860	69860	72860	77050	73380	69380	69380
12	74940	74420	72340	74420	74420	73380	69860	72860	77050	73380	69380	69380
13	74940	74420	72340	74420	74940	72860	68900	72860	77600	72340	69860	69380
14	74940	74420	72340	74420	74420	72860	69380	72860	77600	72340	70340	69380
15	74940	74420	72340	74420	74420	72860	69380	72860	77600	71820	70340	69380
16	74420	73900	72860	73900	74420	72860	68900	72860	76500	71820	70340	70340
17	75460	73900	72860	73900	74420	72860	68900	72340	77050	71820	70820	71300
18	74940	73900	72860	74420	74420	72860	68900	72340	76500	71820	70820	71300
19	74940	73900	72860	75460	74420	72860	68900	71820	76500	71820	71300	71820
20	74940	73900	72860	75460	73900	72860	68900	71820	77050	71820	70820	72340
21	74940	73900	72860	75460	73900	72860	68900	71820	76500	71300	70820	72340
22	73900	73900	72860	74940	73900	72860	67940	71820	76500	70820	70340	72340
23	73380	73900	72860	75460	73900	72860	68420	71820	76500	70820	70340	72340
24	73380	73380	72860	75460	73900	72340	68420	71820	76500	70340	70340	72340
25	73380	73380	73380	74940	73380	71300	67940	72340	76500	70340	70340	71820
26	73380	73900	72340	74940	73900	71300	68420	72340	76500	70340	70340	71820
27	73380	73380	72340	74940	73380	71300	67940	72340	76500	69860	70340	71820
28	72860	73380	72340	74940	73380	70820	67940	72340	76500	70340	70340	71820
29	73380	73380	72340	74940	---	70340	67460	71820	76500	70340	69860	71820
30	72860	73900	72340	74940	---	70340	67940	72340	76500	69860	69860	71300
31	73380	---	72340	74940	---	70340	---	71820	---	69860	69380	---
MAX	76500	74420	73380	75460	75460	73900	70340	72860	77600	75980	71300	72340
MIN	72860	72860	72340	72340	73380	70340	67460	66980	71820	69860	69380	69380
(+)	1039.4	1039.5	1039.2	1039.7	1039.4	1038.8	1038.3	1039.1	1040.0	1038.7	1038.6	1039.0
(Φ)	-3670	+520	-1560	+2600	-1560	-3040	-2400	+3880	+4680	-6640	-480	+1920
(++)	726	107	259	161	280	1096	86	787	934	295	1052	1105
CAL YR 1990	MAX	119200	MIN	72340	(Φ)	-21260	(++)	10322				
WTR YR 1991	MAX	77600	MIN	66980	(Φ)	-5750	(++)	6888				

(+) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.  
(++) Diversions, in acre-feet, for municipal use.

RED RIVER BASIN

07314500 LITTLE WICHITA RIVER NEAR ARCHER CITY, TX

LOCATION.--Lat 33°39'45", long 98°36'46", Archer County, Hydrologic Unit 11130209, on left bank at downstream side of bridge on State Highway 79, 1.5 mi downstream from confluence of North and Middle Forks, and 4.8 mi north of Archer City.

DRAINAGE AREA.--481 mi<sup>2</sup>, of which 275 mi<sup>2</sup> is above Lake Kickapoo.

PERIOD OF RECORD.--May 1932 to January 1956, August 1966 to current year.  
Water-quality records.--Chemical analyses: January 1953 to January 1956. Water temperatures: January 1953 to January 1956. Sediment records: May 1968 to September 1975.

REVISED RECORDS.--WSP 827: 1932-35. WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 934.72 ft above National Geodetic Vertical Datum of 1929. Aug. 17, 1954, to Jan. 6, 1956, nonrecording gage at present site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Some regulation by Lake Kickapoo (station 07314000) on North Fork Little Wichita River. Records furnished by the city of Wichita Falls show that 6,890 acre-ft was diverted from Lake Kickapoo for municipal use by the city during the current year. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years (water years 1933-45) prior to completion of Lake Kickapoo, 110 ft<sup>3</sup>/s (79,700 acre-ft/yr); 35 years (water years 1946-55, 1967-91) regulated, 53.2 ft<sup>3</sup>/s (38,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,100 ft<sup>3</sup>/s May 16, 1989 (gage height, 27.03 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of June 1930 reached a stage of about 28 ft, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 550 ft<sup>3</sup>/s June 4 at 1030 hours (gage height, 14.26 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	.18	.02	e.00	.24	.14	e.30	.02	.14	.00	.00	.01
2	31	.12	.02	e.00	.17	.14	e.30	.10	.81	.00	.00	.00
3	31	.16	.02	e.00	.17	.09	e.28	64	224	.00	.00	11
4	31	.64	.02	e.00	.20	.10	e.27	92	521	.00	.03	3.6
5	31	11	.02	.09	.19	.14	e.26	17	186	.00	.05	2.3
6	31	2.5	.03	.20	.17	.10	e.24	3.7	101	.00	.00	12
7	31	.86	.04	.15	.13	.13	e.22	1.7	49	.00	.00	4.2
8	32	1.3	.04	.63	.09	.22	e.20	49	193	.00	.00	1.3
9	38	68	.02	1.4	.06	.22	e.19	68	311	.00	.00	.83
10	33	37	.02	163	.02	.17	e.19	19	160	.00	.00	.69
11	18	12	.04	179	.03	.22	e.18	5.2	18	.00	.02	.44
12	3.3	4.5	.04	26	.03	.22	e.15	2.2	5.1	.00	16	.25
13	1.5	1.8	.02	8.1	.02	.22	e.13	1.4	2.0	.00	269	.32
14	.80	1.0	.03	3.4	.00	.24	e.10	.91	.98	.00	61	15
15	.54	.72	.03	1.6	.00	.26	e.07	1.0	.73	.00	35	63
16	.36	.69	.16	.93	.00	.33	e.06	1.0	.64	.00	12	73
17	.30	.62	.10	.92	.01	.35	e.04	.33	.54	.00	65	134
18	.23	.48	.07	40	.00	.35	.02	.42	.41	.00	109	34
19	.18	.50	.71	134	.00	.26	.02	.09	.21	.00	25	50
20	.22	.41	.44	63	.00	.26	.02	.04	.07	.00	11	20
21	.22	.33	e.10	19	.00	.28	.02	.03	.00	.00	2.5	6.4
22	.23	.27	e.00	6.7	.02	.33	.04	.01	.00	.00	1.1	2.8
23	.24	.15	e.00	2.6	.04	.28	.03	.01	.00	.00	.78	2.0
24	.24	.08	e.00	1.2	.05	.26	.22	.06	.00	.03	.63	1.6
25	.25	.07	e.00	.65	.06	.31	.10	.03	.00	.07	.61	1.6
26	.24	.07	e.00	.38	.09	.35	.09	.09	.00	.01	.50	e1.7
27	.14	.06	.13	.36	.10	e.33	.05	1.7	.00	.01	.35	1.3
28	.18	.05	.19	.30	.09	e.33	.02	.62	.00	.01	.22	.91
29	.18	.04	e.00	.29	---	e.32	.02	.11	.00	.00	.11	e.61
30	.20	.02	e.00	.25	---	e.30	.03	.07	.00	.00	.03	e.39
31	.20	---	e.00	.24	---	e.30	---	.14	---	.00	.01	---
TOTAL	347.75	145.62	2.31	654.39	1.98	7.55	3.86	329.98	1774.63	0.13	609.94	445.25
MEAN	11.2	4.85	.075	21.1	.071	.24	.13	10.6	59.2	.004	19.7	14.8
MAX	38	68	.71	179	.24	.35	.30	92	521	.07	269	134
MIN	.14	.02	.00	.00	.00	.09	.02	.01	.00	.00	.00	.00
AC-FT	690	289	4.6	1300	3.9	15	7.7	655	3520	.3	1210	883
CAL YR 1990	TOTAL	88626.68	MEAN	243	MAX	7020	MIN	.00	AC-FT	175800		
WTR YR 1991	TOTAL	4323.39	MEAN	11.8	MAX	521	MIN	.00	AC-FT	8580		

e Estimated

07314800 LAKE ARROWHEAD NEAR HENRIETTA, TX

LOCATION.--Lat 33°45'51", long 98°22'17", Clay County, Hydrologic Unit 11130209, at intake tower near center of dam on Little Wichita River, 2.3 mi upstream from Lake Creek, 11 mi southwest of Henrietta, and 12.3 mi southeast of Wichita Falls.

DRAINAGE AREA.--822 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1967 to current year.

Water-quality records: Chemical analyses: October 1970 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is 0.40 ft below National Geodetic Vertical Datum of 1929.

REMARKS.--The lake is formed by a rolled earthfill dam 15,900 ft long, including an uncontrolled reinforced concrete ogee spillway 1,581 ft wide located near the left end of dam. The dam was completed in December 1966 and storage began in June 1967. The service outlet works, located in a cylindrical service tower at upstream side of dam, consist of two gated 5-foot-diameter inlets that can be used for controlled releases. The dam was built by the city of Wichita Falls to impound water for municipal, industrial, and recreational uses. The area-capacity curves are based on Geological Survey topographic maps. 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.....	944.4	-
Design flood.....	939.95	551,400
Crest of spillway (top of conservation pool).....	926.4	262,100
Lowest gated outlet (invert).....	874.1	-

COOPERATION.--Capacity table provided by Homer Hunter and Associates and Biggs and Mathews, Consulting Engineers, for the city of Wichita Falls. Area-capacity curves provided by Homer Hunter and Associates. Record of diversions provided by the city of Wichita Falls.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 287,500 acre-ft May 4, 1990 (gage height, 927.92 ft); minimum since first appreciable storage, 4,640 acre-ft Aug. 31 to Sept. 4, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 247,500 acre-ft Oct. 3 at 1100 hours (gage height, 925.48 ft); minimum, 209,500 acre-ft Aug. 31 (gage height, 922.91 ft).

Capacity table (gage height, in feet, and total contents, in acre-feet)

922.5	203,900	924.0	225,200	925.0	240,100
923.0	210,800	924.5	232,600	925.5	247,900
923.5	217,900				

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	247100	238400	238300	234100	237200	235400	231700	225300	224800	225200	214700	211900
2	246900	238100	238100	233900	237500	233500	232300	226100	227300	224900	214300	212600
3	246600	237400	237200	233800	238100	234200	231200	227400	228100	224000	212900	212600
4	246500	238900	237500	233300	238100	234200	231400	227700	229500	224200	212800	212200
5	246000	238800	236900	233500	237700	234200	231400	227500	230600	223900	212800	212500
6	246800	237500	236600	233600	238000	233500	231400	227300	229700	223300	212300	212500
7	246000	238400	237500	234100	239400	233000	231100	228300	230600	222800	212100	212500
8	244500	239700	237200	234100	238400	233300	230800	228400	231400	223000	211200	212500
9	245200	239800	237100	234700	239100	233000	230500	228900	232100	222200	211600	212800
10	244900	240000	237100	235700	238200	232900	228600	228700	232900	221500	211400	212600
11	244600	240100	237100	236500	238200	233600	229900	229200	232700	221100	211500	212300
12	244500	240000	236200	236500	238200	232400	230000	228900	232700	220500	212500	212200
13	244600	240100	236200	236600	237800	231500	229900	229000	232400	219400	213300	213200
14	244100	240000	236500	236200	237500	231500	229500	228300	232000	219200	213900	212900
15	243400	239800	236000	236300	237100	231400	229700	228100	231500	218900	213900	213500
16	243100	239200	236600	236200	237700	232400	229300	228100	231400	218400	213900	213600
17	241100	239700	236200	236900	237700	232000	229500	228000	231200	218200	214200	214200
18	240900	239700	236000	237500	236500	232100	228900	227800	230600	218400	214200	213300
19	240300	239400	235900	238900	236500	232400	228100	227500	230500	218000	214300	213600
20	240000	239700	235600	238800	236800	232000	228000	227400	230200	217300	214500	213700
21	239500	239100	235600	239200	236600	234200	227700	227000	229700	216600	214000	213900
22	239800	239100	235300	238900	236600	233200	227500	227000	229300	215900	213700	213000
23	239500	238600	235100	238000	236300	233200	227400	226800	228400	215000	213200	213300
24	239200	238600	234800	238600	234800	233200	227000	227300	228700	214900	213000	213200
25	239500	238600	234800	237700	235200	233500	227000	227300	228100	214900	212900	213200
26	239400	239400	234700	238300	235000	233900	227100	226700	227500	215300	212800	212800
27	238600	238000	234500	237800	235000	233000	226800	226700	227100	216900	213000	212800
28	238900	237700	234500	238300	234800	232900	226700	226700	226500	217000	210500	212500
29	238800	237500	234200	236900	---	231800	226200	225300	226400	216900	210200	212300
30	238800	237200	234200	237100	---	232100	225100	225800	225900	215600	210000	212200
31	238600	---	234100	237400	---	232000	---	225100	---	215500	209700	---
MAX	247100	240100	238300	239200	239400	235400	232300	229200	232900	225200	214700	214200
MIN	238600	237200	234100	233300	234800	231400	225100	225100	224800	209700	209700	211900
(†)	924.90	924.81	924.60	924.82	924.65	924.46	923.99	923.99	924.05	923.33	922.92	923.10
(Φ)	-8200	-1400	-3100	+3300	-2600	-2800	-6900	00	+800	-10400	-5800	+2500
(††)	1040	1787	966	1190	834	225	933	1781	1979	2680	2080	1520
CAL YR 1990	MAX	287500	MIN	234100	(Φ)	-16400	(††)	13945				
WTR YR 1991	MAX	247100	MIN	209700	(Φ)	-34600	(††)	17015				

(†) Gage height, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.  
(††) Diversions, in acre-feet, for municipal use by the city of Wichita Falls.



07314900 LITTLE WICHITA RIVER ABOVE HENRIETTA, TX

LOCATION.--Lat 33°49'36", long 98°14'23", Clay County, Hydrologic Unit 11130209, on right bank at downstream side of bridge on U.S. Highways 822 and 287, 1.0 mi downstream from Duck Creek, 2.8 mi west of Henrietta, 6.6 mi upstream from Turkey Creek, and 7.6 mi upstream from Dry Fork Little Wichita River.

DRAINAGE AREA.--1,037 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1953 to current year. Prior to October 1974, published as "near Henrietta".  
Water-quality records.--Chemical analyses: December 1952 to January 1956, November 1959 to September 1966, January 1968 to September 1985.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 831.57 ft above National Geodetic Vertical Datum of 1929. Prior to June 26, 1953, nonrecording gage. Prior to July 11, 1975, at site 2.6 mi downstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow largely regulated by Lake Arrowhead, 39 mi upstream (capacity, 262,100 acre-ft). The city of Wichita Falls diverted 6,890 acre-ft from Lake Kickapoo, and 17,020 acre-ft from Lake Arrowhead for municipal uses, and returned 12,260 acre-ft as sewage effluent and filter plant wash water to the Wichita River below station 07312500 at Wichita Falls and above station 07312700 near Charlie. The city of Henrietta diverted 456 acre-ft from pool at gage for their municipal use. Records of diversions were furnished by the cities of Wichita Falls and Henrietta respectively.

AVERAGE DISCHARGE.--13 years (water years 1954-66) prior to completion of Lake Arrowhead, 124 ft<sup>3</sup>/s (89,840 acre-ft/yr); 25 years (water years 1967-91) regulated, 66.8 ft<sup>3</sup>/s (48,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,200 ft<sup>3</sup>/s May 3, 1990 (gage height, 24.96); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1908 reached a stage of 21 ft at former site, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 442 ft<sup>3</sup>/s Sept. 18 at 0500 hours (gage height, 12.81 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	16	.00	.00	.00	21	.00	.00	.00	28
2	.00	.00	.00	16	.00	.00	.00	22	.00	.00	.00	67
3	.00	.00	.00	16	.00	.00	.00	29	.00	.00	.00	233
4	.00	.00	.00	16	.00	.00	.00	22	.00	.00	.00	66
5	.00	.00	.00	16	.00	.00	.00	22	4.4	.00	.00	16
6	.00	.00	.00	17	.00	.00	.00	26	45	.00	.00	9.1
7	.00	.00	.00	14	.00	.00	.00	26	49	17	.00	5.5
8	.00	7.4	.00	11	.00	.00	.00	31	69	34	.00	6.9
9	.00	22	.00	9.0	.00	.00	.00	39	78	35	.00	1.1
10	.00	7.1	.00	81	.00	.00	.00	40	69	34	.00	.00
11	.00	.07	.00	51	.00	.00	.00	36	54	27	.00	.00
12	.00	.23	.00	18	.00	.00	.00	37	36	27	.00	.00
13	.00	.13	.00	11	.00	.00	.00	36	27	27	.00	.00
14	.00	.00	.00	6.2	.00	.00	.00	31	20	28	.00	11
15	.00	.00	.00	4.6	.00	.00	.00	23	15	28	.00	8.0
16	.00	.00	.00	6.0	.00	.00	.00	16	14	27	.00	41
17	.00	.00	.00	7.5	.00	.00	.00	12	14	27	.00	351
18	.00	.00	.00	57	.00	.00	.00	8.0	14	27	.00	393
19	.00	.00	.00	78	.00	.00	.00	4.3	14	27	.00	149
20	.00	.00	.00	37	.00	.00	.00	2.6	14	24	.00	74
21	.00	.00	.00	19	.00	e.14	.00	.75	11	10	.00	34
22	.00	.00	.00	14	.00	e9.5	.00	.00	7.1	2.4	.00	20
23	.00	.00	.00	12	.00	1.4	.00	.00	1.3	.00	.00	13
24	.00	.00	.00	8.6	.00	.00	.00	.00	.00	.00	.00	5.7
25	.00	.00	.00	5.2	.00	.00	7.1	.00	.00	.00	.00	1.1
26	.00	.00	.00	2.4	.00	.00	16	.00	.00	.00	.00	.22
27	.00	.00	.00	.64	.00	.00	17	.00	.00	2.6	.00	.00
28	.00	.00	.00	.06	.00	.00	19	.00	.00	9.4	.00	.15
29	.00	.00	10	.00	---	.00	19	.00	.00	1.5	.00	.33
30	.00	.00	15	.00	---	.00	21	.00	.00	.00	.00	.27
31	.00	---	15	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	36.93	40.00	550.20	0.00	11.04	99.10	484.65	555.80	414.90	0.00	1534.37
MEAN	.000	1.23	1.29	17.7	.000	.36	3.30	15.6	18.5	13.4	.000	51.1
MAX	.00	22	15	81	.00	9.5	21	40	78	35	.00	393
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	73	79	1090	.00	22	197	961	1100	823	.00	3040
CAL YR 1990	TOTAL	181631.95	MEAN	498	MAX	10500	MIN	.00	AC-FT	360300		
WTR YR 1991	TOTAL	3726.99	MEAN	10.2	MAX	393	MIN	.00	AC-FT	7390		

e Estimated

07315200 EAST FORK LITTLE WICHITA RIVER NEAR HENRIETTA, TX

LOCATION.--Lat 33°48'46", long 98°05'05", Clay County, Hydrologic Unit 11130209, at downstream side of bridge on U.S. Highway 82, 5.8 mi upstream from Little Wichita River, 6.4 mi east of Henrietta, and 8.9 mi west of Ringgold.

DRAINAGE AREA.--178 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1963 to current year.

Water-quality records.--Chemical analyses: October 1965 to September 1975. Sediment records: October 1965 to September 1975.

REVISED RECORDS.--WRD TX-72-1: 1966(M).

GAGE.--Water-stage recorder. Datum of gage is 825.32 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges which are fair. There are no known diversions upstream from station.

AVERAGE DISCHARGE.--27 years (water years 1965-91), 31.9 ft<sup>3</sup>/s (2.43 in/yr), 23,110 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 32,500 ft<sup>3</sup>/s Oct. 13, 1981 (gage height, 31.70 ft), from rating curve extended above 5,100 ft<sup>3</sup>/s on basis of contracted-opening measurement of 15,500 ft<sup>3</sup>/s; no flow for many days most years.

Maximum stage since at least 1920, that of Oct. 13, 1981.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1941 reached a stage of 28.8 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 9	1600	*204	*11.10				

Minimum discharge, no flow on several days due to freeze-up.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.18	.15	.08	e.00	.65	.14	.91	.16	.42	.26	.26	3.4
2	.18	.17	.10	.10	.49	.12	.69	.28	.50	.26	.21	41
3	.17	.20	.11	.10	.43	.10	.55	81	4.2	.26	.18	4.7
4	.13	.74	.11	.10	.39	.07	.46	124	24	.23	.16	1.3
5	.12	.76	.10	.10	.36	.06	.41	36	34	.23	.14	.45
6	.13	3.0	.11	.14	.29	.00	.38	11	9.0	.23	.12	.21
7	.13	2.2	.12	.12	.23	.00	.35	4.8	4.6	.23	.11	.14
8	.13	5.4	.13	.11	.21	.01	.32	32	16	.23	.10	.13
9	.13	63	.13	1.1	.18	.06	.29	175	29	.21	.08	.11
10	.12	45	.13	114	.15	.12	.26	97	5.8	.21	.08	.09
11	.11	16	.13	122	.12	.12	.25	26	3.3	.20	.08	.06
12	.11	5.8	.13	50	.11	.12	.27	10	2.4	.20	.11	.03
13	.11	2.3	.12	20	.11	.11	.27	6.2	1.6	.20	.12	.01
14	.10	1.0	.12	10	.29	.10	.25	3.2	1.1	.17	.11	.06
15	.10	.42	.12	6.2	.22	.08	.23	2.3	.83	.17	.12	.06
16	.10	.12	.11	4.5	.18	.14	.21	1.6	.70	.17	.14	.06
17	.10	.02	.10	3.9	.25	.25	.20	.96	.62	.17	.11	.09
18	.10	.12	.11	62	.24	.13	.21	.74	.59	.16	.09	.09
19	.10	.03	.11	158	.19	.17	.22	.56	.53	.15	.07	.08
20	.11	.01	.10	140	.20	.19	.20	.40	.47	.15	.06	.09
21	.13	.05	.10	58	.21	.28	.19	.46	.42	.14	1.1	.11
22	.12	.05	e.00	25	.20	1.3	.20	.44	.39	.14	1.2	.10
23	.12	.05	e.00	12	.21	.78	.19	.47	.36	.13	.51	.09
24	.12	.06	e.00	7.0	.18	.38	.19	.71	.34	.13	.27	.07
25	.12	.06	e.00	4.6	.14	.26	.20	.77	.31	.14	.18	.06
26	.12	.09	.10	3.3	.10	.31	.21	.60	.30	.16	.16	.04
27	.13	.12	.10	2.5	.10	19	.19	.50	.30	.75	.11	.03
28	.13	.11	.10	1.7	.12	7.6	.18	.51	.30	1.6	.05	.03
29	.13	.10	.10	1.2	---	2.9	.18	.66	.28	1.2	.03	.02
30	.13	.08	.10	.89	---	1.5	.17	.56	.27	.57	.08	.02
31	.14	---	e.00	.72	---	1.0	---	.45	---	.40	5.1	---
TOTAL	3.85	147.21	2.87	809.38	6.55	37.40	8.83	619.33	142.93	9.45	11.24	52.73
MEAN	.12	4.91	.093	26.1	.23	1.21	.29	20.0	4.76	.30	.36	1.76
MAX	.18	63	.13	158	.65	.19	.91	175	34	1.6	5.1	.41
MIN	.10	.01	.00	.00	.10	.00	.17	.16	.27	.13	.03	.01
AC-FT	7.6	292	5.7	1610	13	74	18	1230	284	19	22	105
CFSM	.00	.03	.00	.15	.00	.01	.00	.11	.03	.00	.00	.01
IN.	.00	.03	.00	.17	.00	.01	.00	.13	.03	.00	.00	.01

CAL YR 1990	TOTAL	46142.45	MEAN	126	MAX	8320	MIN	.00	AC-FT	91520	CFSM	.71	IN.	9.64
WTR YR 1991	TOTAL	1851.77	MEAN	5.07	MAX	175	MIN	.00	AC-FT	3670	CFSM	.03	IN.	.39

e Estimated

RED RIVER BASIN

95

07315500 RED RIVER NEAR TERRAL, OK

LOCATION.--Lat 33°52'43", long 97°56'03". Jefferson County, Hydrologic Unit 1130201, on left bank at downstream side of bridge abutment on U.S. Highway 81, 0.5 mi downstream from Chicago, Rock Island, and Railroad Co. bridge, 1.2 mi south of Terral, 3.6 mi downstream from Little Wichita River, and at mile 872.

DRAINAGE AREA.--28,723 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 770.31 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 12, 1939, nonrecording gage at same site and datum.

REMARKS.--Records good except those for period of estimated daily discharges, which are poor. There are many small diversions upstream from station for irrigation, oil field and municipal uses. Gage-height telemeter at station.

AVERAGE DISCHARGE.--53 years (water years 1939-91), 2,387 ft<sup>3</sup>/s (1,729,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 225,000 ft<sup>3</sup>/s May 30, 1987 (gage height, 32.65 ft); maximum gage height, 33.60 ft, Oct. 22, 1983; minimum, 43 ft<sup>3</sup>/s Mar. 15, 1939. Maximum stage since at least 1891, that of Oct. 22, 1983.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 19, 1935, reached a stage of 27.2 ft, although floods in 1891 and on May 1, 1908, are reported to have reached about the same stage.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 21,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 27	0230	27,200	17.17	July 29	0400	36,000	18.18
June 5	1800	*89,500	21.79	Sept. 20	1030	29,900	17.22
June 9	0400	47,800	19.22				

Minimum discharge, 265 ft<sup>3</sup>/s Mar. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	493	286	395	e350	578	433	357	938	2970	1860	6220	1600
2	456	290	399	e480	578	365	358	893	2650	1730	3740	2930
3	434	315	363	527	575	350	862	2140	9520	1650	2660	4260
4	426	420	346	466	578	366	887	3700	46800	1590	2050	3100
5	838	434	343	505	596	377	626	4120	80300	1530	1720	7610
6	709	547	348	510	705	313	552	3910	42400	1470	1510	11100
7	600	582	327	531	623	315	542	2750	20800	1390	1350	8500
8	578	650	340	553	571	329	543	2230	30600	1250	1260	5670
9	555	781	351	604	549	348	519	2330	43700	1150	1190	4260
10	708	988	357	1010	537	353	479	2620	30600	1080	1140	4300
11	878	1150	357	1430	520	375	447	2010	19600	1020	1130	5020
12	674	1270	355	1700	509	314	428	1860	13800	953	1140	4010
13	609	1380	350	1240	494	280	403	1650	9200	893	1150	3610
14	541	1260	349	1130	477	284	390	1740	14000	889	1310	3630
15	480	961	363	1010	452	297	374	3360	12200	836	1270	10700
16	436	806	419	885	437	332	338	2670	10200	834	1420	11700
17	425	706	454	814	441	356	329	2020	6660	815	1310	8460
18	405	649	451	981	443	355	355	1520	5720	2160	1430	10800
19	382	597	498	1280	407	384	365	1240	4820	2150	1710	17600
20	434	557	482	1340	405	408	329	1060	4320	1680	2280	28000
21	408	535	e420	1110	424	493	310	860	4050	1370	2330	20900
22	349	500	e350	936	420	1250	309	710	3660	1150	1780	14400
23	340	479	e350	846	407	729	309	713	3050	1010	1710	7670
24	330	470	e370	768	411	544	327	731	2810	890	1860	6400
25	315	467	e430	705	387	508	476	5980	2740	966	1540	5940
26	307	475	494	681	384	493	607	23600	2720	918	1460	5710
27	307	441	504	674	382	474	1620	25400	2670	1140	1230	5340
28	305	408	466	653	395	419	1920	14300	2440	12800	1120	4980
29	295	400	502	617	---	382	1750	7610	2230	30000	1070	4490
30	290	390	e420	570	---	372	1220	4250	2040	17600	1180	4070
31	291	---	e350	571	---	369	---	3460	---	10500	1410	---
TOTAL	14598	19194	12303	25477	13685	12967	18331	132375	439270	105274	53680	236760
MEAN	471	640	397	822	489	418	611	4270	14640	3396	1732	7892
MAX	878	1380	504	1700	705	1250	1920	25400	80300	30000	6220	28000
MIN	290	286	327	350	382	280	309	710	2040	815	1070	1600
AC-FT	28960	38070	24400	50530	27140	25720	36360	262600	871300	208800	106500	469600
CAL YR 1990	TOTAL	1900224	MEAN	5206	MAX	107000	MIN	286	AC-FT	3769000		
WTR YR 1991	TOTAL	1083914	MEAN	2970	MAX	80300	MIN	280	AC-FT	2150000		

e Estimated

RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to current year.

WATER TEMPERATURE: October 1967 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,000 microsiemens June 15, 1984; minimum daily, 255 microsiemens Jan. 1, 1985.

WATER TEMPERATURE: Maximum daily, 35.0°C Aug. 13, 16, 17, 1983; minimum daily, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 9,680 microsiemens July 19; minimum daily, 750 microsiemens Sept. 16.

WATER TEMPERATURE: Maximum daily, 30.0°C July 9, 21, Aug. 6; minimum daily, 1.0°C Dec. 24.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV 26...	1030	460	6930	7.9	20.0	1200	1000	300	99
JAN 14...	0940	1150	4670	8.6	6.0	730	660	180	69
MAY 28...	1255	13100	2240	8.5	27.0	280	260	97	8.0
JUN 04...	1820	55400	930	7.2	24.5	150	130	58	0.53
JUL 30...	1355	15300	850	8.2	28.0	170	76	53	10

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS S102)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 26...	1100	14	8.5	130	870	1800	1.0	5.2	4260
JAN 14...	800	13	2.4	72	640	1200	0.50	0.10	2940
MAY 28...	320	8	7.8	20	290	490	0.40	1.8	1230
JUN 04...	110	4	5.5	13	160	190	0.40	4.7	537
JUL 30...	89	3	5.4	98	90	140	0.30	11	457

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT-ANCE (MICRO-SIEMENS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	14598	5870	3610	142000	1500	58000	760	30000	1000
NOV. 1990	19194	5780	3550	184000	1400	74500	750	39000	990
DEC. 1990	12303	3670	2180	72300	840	27900	490	16300	660
JAN. 1991	25477	5460	3340	229000	1300	92500	710	49100	940
FEB. 1991	13685	6510	4030	149000	1700	61300	840	31100	1100
MAR. 1991	12967	6070	3740	131000	1500	53700	790	27500	1000
APR. 1991	18331	4610	2790	138000	1100	54600	610	30100	810
MAY 1991	132375	2640	1540	549000	580	205700	360	127400	490
JUNE 1991	439270	1800	1030	1224E3	380	448400	250	290700	340
JULY 1991	105274	2750	1660	472000	660	186500	360	103200	490
AUG. 1991	53680	3320	1960	284000	750	108500	440	64400	600
SEPT 1991	236760	1600	917	586000	330	213500	220	139900	300
TOTAL	1083914	**	**	4161000	**	1585000	**	949000	**
WTD.AVG.	2970	2410	1420	**	540	**	320	**	440



RED RIVER BASIN

07315500 RED RIVER NEAR TERRAL, OK--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3400	5760	2720	6790	6740	6880	6300	3040	2450	4810	1180	3070
2	3520	5710	e2750	6120	6780	6640	6320	2010	2290	5120	1630	3820
3	e3780	5690	e3800	5920	e6750	6760	6120	e2200	2320	5070	2040	e1500
4	3840	5160	4900	e6300	6720	6730	4210	e2300	1110	4880	2460	1900
5	5330	4780	3690	6000	e6700	6800	3430	2490	1170	4850	3290	1460
6	8790	4810	6180	e5700	5010	e6860	4160	1820	1250	4880	3780	880
7	8340	4810	3120	5580	5440	6940	e4500	2070	1300	4720	e3900	1370
8	8150	4190	2820	6040	6030	6900	4990	1670	1770	4610	4050	1250
9	7020	4320	e3140	5810	6240	6990	4790	1730	1800	4950	e4100	1140
10	6900	4510	3470	4350	6340	7050	4860	1900	1730	5110	e4300	2090
11	5160	4110	3740	3720	6370	7290	5490	1830	1380	5260	e4500	5170
12	5370	5450	4840	3470	6410	7330	5570	e2600	1490	5460	4500	3650
13	5770	5640	2660	4250	6580	7010	5460	3520	2020	5410	4480	3070
14	e5680	6050	2590	4630	6770	7030	5380	4440	2840	5210	4200	3050
15	5590	5710	1930	4980	6720	e7000	5460	3220	e2500	e5200	4120	1070
16	5540	6130	e1800	6000	6600	e6900	5760	2300	e2200	5190	4280	750
17	5560	6610	e3500	6950	6970	6790	5740	2670	2040	5130	4010	1000
18	5740	6700	5450	6320	7080	6520	5240	3870	2360	5650	4370	850
19	5820	7150	2860	4670	6980	6860	5550	4870	3170	9680	4090	770
20	5910	7280	4350	4670	6840	6780	5780	5600	3290	9330	3500	1440
21	6090	7070	e4500	4900	6740	6540	e5900	5930	3430	8160	4650	1590
22	5970	6780	e4300	5450	6810	2710	6000	5860	3600	7570	3960	1360
23	5700	6850	e4100	5890	6800	4660	5850	5730	4260	6990	3840	1840
24	5840	6890	e3900	6400	6840	5240	6020	5140	4500	6380	2680	1900
25	5760	6890	e3700	6630	6640	5910	5830	5390	4600	6430	3270	1880
26	5810	6800	e3500	6890	6550	6380	3790	2290	4720	5700	4400	1710
27	5730	6620	e3300	7360	6550	5680	6260	2340	5020	5730	3660	1740
28	5780	6450	3110	6920	6700	5610	2780	2440	4980	2670	3610	2180
29	5730	6510	e3450	6880	---	6030	2400	2070	5350	900	3680	2540
30	5720	6630	3840	7040	---	6090	2980	2470	5030	800	3880	2630
31	5690	---	6350	6930	---	6030	---	2590	---	990	4260	---
MEAN	5780	5940	3690	5790	6560	6420	5100	3170	2870	5250	3700	1960

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	e20.0	9.0	5.0	9.0	15.0	14.0	15.0	25.0	25.0	28.0	26.0
2	24.0	18.0	e9.0	6.0	8.0	14.0	15.0	22.0	24.0	26.0	29.0	25.0
3	e25.0	18.0	e9.0	8.0	e9.0	13.0	15.0	e22.0	23.0	26.0	27.0	e25.0
4	23.0	14.0	8.0	e7.0	11.0	12.0	16.0	e22.0	e24.0	26.0	27.0	25.0
5	26.0	10.0	8.0	6.0	e11.0	15.0	20.0	22.0	25.0	26.0	27.0	25.0
6	25.0	12.0	e8.0	e6.0	12.0	e13.5	20.0	18.0	25.0	26.0	30.0	25.0
7	25.0	10.0	8.0	6.0	10.0	10.0	e20.0	18.0	26.0	28.0	e29.0	26.0
8	25.0	12.0	8.0	9.0	12.0	12.0	20.0	20.0	e26.0	27.0	29.0	26.0
9	20.0	13.0	e9.0	8.0	13.0	15.0	19.0	20.0	26.0	30.0	e29.0	24.0
10	15.0	14.0	11.0	5.0	14.0	11.0	21.0	21.0	25.0	27.0	e28.0	27.0
11	25.0	15.0	12.0	5.0	12.0	13.0	19.0	22.0	25.0	26.0	e28.0	26.0
12	27.0	16.0	14.0	5.0	12.0	14.0	19.0	e15.0	26.0	26.0	27.0	27.0
13	17.0	15.0	14.0	9.0	14.0	14.0	20.0	19.0	e26.0	28.0	26.0	27.0
14	e18.0	17.0	12.0	8.0	15.0	11.0	20.0	22.0	26.0	29.0	24.0	27.0
15	19.0	16.0	13.0	10.0	8.0	e13.0	19.0	24.0	e26.0	e28.0	25.0	26.0
16	21.0	16.0	e12.0	10.0	7.0	e15.0	17.0	24.0	e27.0	27.0	25.0	24.0
17	21.0	15.0	e12.0	11.0	8.0	17.0	22.0	23.0	27.0	27.0	27.0	25.0
18	18.0	17.0	11.0	11.0	13.0	13.0	20.0	24.0	27.0	27.0	26.0	23.0
19	19.0	16.0	10.0	9.0	12.0	13.0	19.0	24.0	26.0	27.0	27.0	19.0
20	16.0	18.0	11.0	8.0	12.0	15.0	16.0	24.0	27.0	26.0	27.0	21.0
21	15.0	20.0	e10.0	7.0	11.0	19.0	e17.0	24.0	28.0	30.0	27.0	18.0
22	12.0	23.0	e7.0	8.0	12.0	16.0	18.0	24.0	27.0	28.0	28.0	20.0
23	18.0	14.0	e2.0	7.0	11.0	17.0	15.0	24.0	27.0	28.0	27.0	20.0
24	18.0	13.0	e1.0	10.0	15.0	15.0	18.0	24.0	28.0	28.0	27.0	20.0
25	16.0	18.0	e3.0	8.0	7.0	16.0	20.0	23.0	e27.0	21.0	25.0	21.0
26	15.0	20.0	e3.0	9.0	10.0	20.0	22.0	e24.0	27.0	26.0	26.0	21.0
27	14.0	15.0	e4.0	8.0	10.0	15.0	17.0	25.0	27.0	25.0	26.0	21.0
28	16.0	12.0	4.0	9.0	13.0	15.0	20.0	26.0	28.0	28.0	28.0	20.0
29	17.0	e8.0	e6.0	10.0	---	13.0	15.0	26.0	26.0	26.0	26.0	20.0
30	20.0	8.0	10.0	7.0	---	13.0	18.0	25.0	28.0	27.0	25.0	21.0
31	18.0	---	3.0	7.0	---	20.0	---	26.0	---	27.0	25.0	---
MEAN	19.8	15.1	8.4	7.8	11.1	14.4	18.4	22.3	26.2	26.8	26.9	23.4

e Estimated

## 07315950 MOSS LAKE NEAR GAINESVILLE, TX

LOCATION.--Lat 33°46'26", Long 97°12'50", Cooke County, Hydrologic Unit 11130201, on top of upstream side of dam adjacent to guardrail of roadway about 250 ft from right end of Fish Creek dam on Fish Creek, 1.6 mi upstream from Bearhead Creek, 3.7 mi upstream from mouth, and 10 mi northwest of Gainesville.

DRAINAGE AREA.--65.0 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to current year.

Water-quality records.--Chemical analyses: October 1969 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Apr. 20, 1979, recording gage at site about 150 ft upstream at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 1,460 ft long. The dam was completed and storage began Dec. 2, 1966. An uncontrolled morning-glory-type spillway with a 7- by 7-foot opening is designed to discharge 2,500 ft<sup>3</sup>/s at a 10-foot head. A 400-foot-wide spillway has been cut through natural ground, and is located about 100 ft to left of the left end of dam. The dam was built by the city of Gainesville to impound water for municipal use. Area and capacity tables are based on a 1961 survey. There was no diversion from the lake during the current water year. 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.....	740.0	-
Top of design flood pool.....	736.0	55,230
Crest of spillway.....	725.0	36,440
Crest of spillway morning-glory type (top of conservation pool)...	715.0	23,210
Lowest gated outlet (invert).....	666.0	78

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 50,990 acre-ft Oct. 13, 1981 (elevation, 733.72 ft); minimum since lake filled in May 1968, 11,490 acre-ft Jan. 18, 1990 (elevation, 702.08 ft, from graph).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 19,930 acre-ft Oct. 1 at 0100 hours (elevation, 711.92 ft); minimum, 13,220 acre-ft Nov. 21 (elevation, 704.38 ft, from graph).

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

704.0	12,920	708.0	16,210	711.0	19,010
706.0	14,510	710.0	18,040	712.0	20,010

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19680	14520	13620	13740	14260	14700	14910	15080	17490	19140	18620	18430
2	19490	14390	13630	13760	14240	14700	14900	15340	17650	19130	18600	18410
3	19360	14480	13650	13740	14220	14710	14920	16380	17750	19100	18570	18400
4	19130	14510	13650	13720	14250	14710	14930	16460	17780	19070	18560	18390
5	18940	14360	13660	13730	14310	14700	14940	16470	18230	19060	18540	18380
6	18700	14210	13670	13760	14310	14690	14950	16500	18320	19040	18520	18370
7	18530	14090	13670	13740	14330	14700	14960	16500	18620	19020	18510	18400
8	18520	14300	13690	13730	14330	14690	14970	16600	18930	19000	18490	18420
9	18470	14170	13660	13710	14340	14660	14950	16640	19030	18980	18460	18400
10	18250	14000	13660	13810	14380	14660	14950	16660	19070	18930	18430	18390
11	18100	13860	13640	13820	14370	14660	14960	16690	19090	18910	18420	18380
12	17900	13720	13630	13800	14370	14660	14980	16710	19110	18890	18430	18370
13	17740	13580	13630	13800	14370	14650	14980	16710	19120	18860	18430	18370
14	17560	13420	13640	13780	14360	14620	14990	16750	19120	18850	18420	18390
15	17360	13290	13660	13780	14360	14620	14990	16810	19120	18840	18410	18430
16	17200	13240	13710	13770	14360	14670	15000	16840	19120	18810	18410	18510
17	17040	13240	13720	14020	14350	14700	15010	16830	19130	18780	18400	18520
18	16840	13240	13720	14170	14360	14700	15020	16840	19130	18770	18390	18510
19	16660	13230	13710	14190	14340	14710	15000	16840	19110	18730	18370	18490
20	16500	13220	13730	14200	14340	14730	15000	16850	19110	18690	18350	18490
21	16330	13250	13700	14200	14460	14730	15000	16860	19080	18680	18360	18490
22	16160	13290	13710	14210	14620	14810	15000	16860	19170	18650	18350	18490
23	15980	13300	13720	14230	14620	14810	15010	16870	19230	18620	18340	18480
24	15860	13310	13740	14240	14660	14810	15070	17400	19240	18610	18320	18850
25	15670	13350	13730	14250	14660	14820	15100	17480	19230	18610	18300	18880
26	15470	13410	13730	14260	14670	14830	15120	17510	19220	18610	18280	18880
27	15330	13610	13730	14250	14690	14890	15110	17510	19200	18630	18270	18880
28	15160	13610	13740	14250	14690	14890	15120	17520	19190	18670	18260	18870
29	15000	13610	13730	14250	---	14900	15100	17500	19150	18660	18240	18860
30	14840	13630	13740	14250	---	14890	15080	17500	19160	18640	18350	18870
31	14680	---	13740	14260	---	14890	---	17500	---	18630	18360	---
MAX	19680	14520	13740	14260	14690	14900	15120	17520	19240	19140	18620	18880
MIN	14680	13220	13620	13710	14220	14620	14900	15080	17490	18610	18240	18370
(†)	706.20	704.90	705.05	705.69	706.21	706.46	706.69	709.42	711.15	710.61	710.33	710.86
(Φ)	-5260	-1050	+110	+520	+430	+200	+190	+2420	+1660	-530	-270	+510

CAL YR 1990 MAX 32790 MIN 11490 (Φ) -430  
WTR YR 1991 MAX 19680 MIN 13220 (Φ) -1070

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

RED RIVER BASIN

99

07316000 RED RIVER NEAR GAINESVILLE, TX

LOCATION.--Lat 33°43'40", long 97°09'35". in SW 1/4 sec.36, T.9 S., R.1 E., Love County, OK, Hydrologic Unit 11130201, on downstream right bank near end of bridge on Interstate 35, 0.2 mi downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 5.0 mi downstream from Fish Creek, 4.5 mi southwest of Thackerville, OK, 7.0 mi north of Gainesville, and at mile 791.5.

DRAINAGE AREA.--30,782 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.--May 1936 to current year. Monthly discharge only for some periods, published in WSP 1311. Water-quality records.--Chemical analyses: May 1944 to April 1946, October 1952 to September 1964, October 1966 to August 1989. Chemical and biochemical analyses: January 1968 to September 1986. Pesticide analyses: April 1968 to September 1982. Sediment analyses: January 1978 to September 1986.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 627.91 ft above National Geodetic Vertical Datum of 1929. Prior to Jan. 17, 1939, and Feb. 13, 1965, to Nov. 14, 1966, nonrecording gage at same site and datum.

REMARKS.--Records fair. Flow slightly regulated by Lake Kemp (station 07312000), since 1943 by Lake Altus (station 07302500 in Oklahoma), since 1946 by Lake Kickapoo (station 07314000), since 1967 by Lake Arrowhead (station 07314800) and Moss Lake (station 07315950). U.S. Army Corps of Engineers' satellite telemeter at station.

AVERAGE DISCHARGE.--55 years, 3,109 ft<sup>3</sup>/s (2,252,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 265,000 ft<sup>3</sup>/s May 31, 1987 (gage height, 40.08 ft); minimum, 48 ft<sup>3</sup>/s Jan. 27, 1940.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 24,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 28	0300	33,100	18.40	July 30	unknown	25,500	16.80
June 6	1900	*64,500	*23.35	Sept. 21	0900	35,400	18.81
June 9	2300	46,900	20.70				

Minimum daily discharge, 390 ft<sup>3</sup>/s Mar.14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1010	561	942	e800	880	535	767	2340	e8000	e2150	11300	1340
2	910	546	892	e830	844	537	715	1880	e7000	2070	e7000	1880
3	854	541	849	855	820	522	760	3250	e5850	e1900	e4000	2750
4	812	648	834	937	807	516	2380	5120	16900	e1790	e3800	5060
5	766	2060	813	987	802	506	3540	5760	46200	e1650	e3000	4970
6	727	2500	803	966	897	501	2750	6590	60900	e1600	e2500	5570
7	988	1510	768	991	1860	479	1590	6790	36600	e1600	e2000	14300
8	1210	1260	759	1250	2790	465	1130	5430	24400	e1580	e1700	12700
9	1180	1570	763	1420	1630	476	985	4110	39100	e1450	e1400	9070
10	1120	2740	753	1400	1120	451	901	4730	41100	e1250	e1300	6830
11	983	2720	744	2660	954	437	823	4590	25600	1160	e1200	5830
12	1010	2040	743	4270	870	425	801	4070	19200	e1100	e1100	6040
13	1280	e2000	721	4110	825	406	791	3200	13100	e1000	1030	6020
14	1130	e1900	697	3140	771	390	724	2990	9840	e980	e1000	4750
15	1020	e1800	704	2280	723	396	675	2720	12900	e1050	1030	4300
16	933	e1650	734	1990	692	402	634	3510	14900	e1000	1060	9620
17	866	e1500	798	1800	686	469	622	4220	12700	e880	1030	17900
18	788	e1300	906	1980	687	568	640	3580	9120	e850	1140	13700
19	742	e1200	966	e3400	647	569	2550	2960	7680	e800	1040	14600
20	720	e1100	1000	e3900	622	531	1580	2420	6430	e1950	1100	26200
21	752	1020	944	e3300	617	513	907	1980	5550	e2250	1490	33400
22	764	1050	e850	2860	638	1230	697	1740	5140	e1780	2370	23600
23	818	1010	e750	2080	604	5430	612	1510	4970	e1370	2280	16500
24	765	964	e830	1650	590	5770	578	1630	3930	e1150	1590	11100
25	686	933	e780	1430	571	2550	794	1740	3420	e1250	1430	e10000
26	648	965	e800	1280	547	1340	704	3320	3150	e1800	1530	e9100
27	629	1160	814	1150	539	1430	768	28200	2970	e1400	1220	e8600
28	613	1350	850	1080	535	1840	1150	21200	2820	e1380	1130	e8200
29	596	1490	876	1020	---	1870	1790	e15000	2610	e5000	924	e7800
30	586	1120	920	970	---	1160	2450	e12000	2320	25500	987	7600
31	575	---	e850	914	---	889	---	e10000	---	e17000	1060	---
TOTAL	26481	42208	25453	57700	24568	33603	35808	178580	454400	87690	64741	309330
MEAN	854	1407	821	1861	877	1084	1194	5761	15150	2829	2088	10310
MAX	1280	2740	1000	4270	2790	5770	3540	28200	60900	25500	11300	33400
MIN	575	541	697	800	535	390	578	1510	2320	800	924	1340
AC-FT	52530	83720	50490	114400	48730	66650	71030	354200	901300	173900	128400	613600
CAL YR 1990	TOTAL	2919794	MEAN	7999	MAX	131000	MIN	504	AC-FT	5791000		
WTR YR 1991	TOTAL	1340562	MEAN	3673	MAX	60900	MIN	390	AC-FT	2659000		

e Estimated

## RED RIVER BASIN

07331500 LAKE TEXOMA NEAR DENISON, TX

LOCATION.--Lat 33°49'05", long 96°34'20", in NE1/4 sec.33, T.8 S., R.7 E., Bryan County, OK, Hydrologic Unit 11130210, in control tower of Denison Dam on Red River, 1.2 mi upstream from Shawnee Creek, 1.8 mi upstream from Sand Creek, 4.0 mi northwest of Denison, 6.0 mi southwest of Colbert, and at mile 725.9.

DRAINAGE AREA.--39,719 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--July 1942 to current year. Monthend contents only for some periods, published in WSP 1311.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Mar. 30, 1944, non-recording gage at same site and datum. Prior to Oct. 1, 1948, supplementary nonrecording gage in Cumberland pool at the same datum.

REMARKS.--The Lake is formed by a rolled earthfill dam. The controlled outlet consists of eight 20-foot-diameter conduits and the uncontrolled outlet is a concrete, ogee-type weir spillway. Flow was diverted through conduits July 27, 1942; regulated storage began Oct. 31, 1943; power pool was first filled March 15, 1945. Capacity, based on 1969 survey, 5,312,000 acre-ft at elevation 640.0 ft, crest of spillway, 2,643,000 acre-ft at elevation 617.0 ft maximum power pool; 1,031,000 acre-ft at elevation 590.0 ft, minimum power pool, in Denison pool. Dead storage 11,000 acre-ft at elevation 610.0 ft in Cumberland pool. When contents are below 2,105,000 acre-ft, the reservoir is divided into two pools by protective levees around the Cumberland oil field on the Washita River arm with bottom outlet channel for the upper pool (known as Cumberland pool) at elevation 610 ft. At higher elevations the two pools are considered as being at a common level, contents being computed from gage in Denison pool. Figures given herein represent total contents of both pools. Lake is used principally for flood control and power development. Revised capacity table, based on survey in 1969, used since Oct. 1, 1977. U.S. Army Corps of Engineers' satellite telemeter at station.

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

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 6,028,000 acre-ft May 6, 1990 (elevation, 644.76 ft); minimum since power pool was first filled, 1,565,100 acre-ft Sept. 16, 1964; minimum elevation, 599.96 ft Mar. 1, 2, 1957.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 3,404,000 acre-ft June 13 (elevation, 624.76 ft); minimum, 2,584,000 acre-ft Apr. 22 (elevation, 616.32 ft).

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

616.0	2,222,000	621.0	3,333,000	624.0	5,555,000
618.0	2,345,000	622.0	3,456,000	625.0	6,666,000
620.0	2,789,000	623.0	4,444,000		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2620000	2612000	2645000	2624000	2623000	2614000	2642000	2627000	2722000	2799000	2760000	2648000
2	2617000	2608000	2663000	2630000	2625000	2619000	2629000	2630000	2721000	2788000	2757000	2649000
3	2624000	2626000	2654000	2628000	2632000	2607000	2630000	2675000	2721000	2776000	2747000	2652000
4	2620000	2629000	2647000	2616000	2635000	2607000	2627000	2696000	2705000	2772000	2729000	2662000
5	2618000	2627000	2637000	2621000	2636000	2609000	2625000	2721000	2726000	2765000	2712000	2667000
6	2616000	2629000	2637000	2631000	2640000	2610000	2622000	2728000	2799000	2759000	2704000	2665000
7	2619000	2635000	2629000	2631000	2641000	2607000	2615000	2710000	2878000	2753000	2695000	2675000
8	2631000	2647000	2629000	2633000	2643000	2605000	2615000	2696000	3073000	2745000	2681000	2682000
9	2628000	2650000	2632000	2641000	2658000	2607000	2612000	2683000	3194000	2741000	2673000	2670000
10	2625000	2656000	2632000	2651000	2662000	2607000	2602000	2678000	3315000	2735000	2669000	2655000
11	2625000	2665000	2628000	2649000	2665000	2606000	2605000	2671000	3364000	2731000	2669000	2645000
12	2627000	2673000	2632000	2658000	2658000	2611000	2615000	2662000	3394000	2725000	2666000	2640000
13	2627000	2676000	2628000	2668000	2658000	2607000	2615000	2651000	3381000	2727000	2667000	2644000
14	2629000	2674000	2624000	2677000	2655000	2599000	2612000	2640000	3349000	2714000	2664000	2653000
15	2630000	2669000	2628000	2674000	2646000	2596000	2607000	2631000	3320000	2709000	2660000	2664000
16	2632000	2668000	2633000	2668000	2638000	2605000	2602000	2627000	3335000	2707000	2657000	2668000
17	2639000	2660000	2636000	2663000	2631000	2606000	2602000	2627000	3316000	2697000	2653000	2675000
18	2634000	2657000	2638000	2662000	2633000	2603000	2600000	2627000	3269000	2690000	2654000	2663000
19	2629000	2652000	2636000	2666000	2624000	2601000	2595000	2627000	3213000	2685000	2651000	2658000
20	2638000	2644000	2644000	2672000	2619000	2603000	2590000	2628000	3151000	2676000	2645000	2674000
21	2636000	2641000	2642000	2668000	2616000	2615000	2586000	2630000	3089000	2673000	2643000	2702000
22	2632000	2634000	2634000	2664000	2617000	2643000	2590000	2634000	3042000	2669000	2644000	2696000
23	2628000	2635000	2624000	2658000	2619000	2666000	2592000	2635000	3050000	2665000	2642000	2675000
24	2627000	2636000	2624000	2647000	2625000	2682000	2605000	2649000	3025000	2667000	2641000	2672000
25	2620000	2638000	2610000	2647000	2621000	2682000	2614000	2642000	2978000	2664000	2642000	2668000
26	2616000	2644000	2609000	2641000	2617000	2681000	2619000	2653000	2936000	2663000	2639000	2660000
27	2619000	2654000	2611000	2640000	2612000	2685000	2621000	2680000	2899000	2678000	2635000	2658000
28	2619000	2652000	2615000	2637000	2609000	2685000	2632000	2710000	2864000	2689000	2628000	2658000
29	2616000	2647000	2627000	2638000	---	2672000	2628000	2728000	2840000	2700000	2626000	2657000
30	2615000	2641000	2628000	2636000	---	2665000	2630000	2732000	2814000	2735000	2638000	2654000
31	2614000	---	2621000	2627000	---	2654000	---	2731000	---	2755000	2640000	---
MAX	2639000	2676000	2663000	2677000	2665000	2685000	2642000	2732000	3394000	2799000	2760000	2702000
MIN	2614000	2608000	2609000	2616000	2609000	2596000	2627000	2705000	2705000	2663000	2626000	2640000
(↑)	616.66	616.97	616.75	616.81	161.61	617.12	161.85	617.98	618.88	618.24	616.96	617.12
(Φ)	-9000	+27000	-20000	+6000	-18000	+45000	-24000	+101000	+83000	-59000	-115000	+14000
CAL YR 1990	MAX	6011000	MIN	2448000	(Φ)	+176000						
WTR YR 1991	MAX	3394000	MIN	2586000	(Φ)	+31000						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



RED RIVER BASIN

07335390 PAT MAYSE LAKE NEAR CHICOTA, TX

LOCATION.--Lat 33°51'09", long 95°32'40", Lamar County, Hydrologic Unit 11140101, on upstream side of dam on Sanders Creek, 2,800 ft to right of outlet channel, 2.0 mi southeast of Chicota, and 4.6 mi upstream from mouth.

DRAINAGE AREA.--175 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to current year. Prior to October 1970, published as Pat Mayse Reservoir. Water-quality records.--Chemical analyses: October 1969 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 10, 1968, non-recording gage at present site and datum. Digital recorder was put in operation Sept. 12, 1988.

REMARKS.--The lake is formed by a rolled earthfill dam about 7,080 ft long, including a spillway 100 ft wide located near the right abutment of dam. The dam was completed and deliberate impoundment began Sept. 28, 1967. The flood-control outlet works consist of an uncontrolled morning-glory-type drop-inlet spillway that is connected to a 7.25-foot-diameter concrete conduit through the dam. A 24- and 12-inch diameter low-flow pipe is provided for additional outlets. The lake was built for flood control, municipal, and industrial water supply, recreation, fish and wildlife conservation, and for channel improvement on Sanders Creek. Water is diverted from the lake for municipal and industrial uses by the city of Paris. Any resultant effluent is discharged into Pine Creek below Lake Crook (capacity, 11,010 acre-ft), which is located in another drainage basin. The capacity table is based on Geological Survey topographic maps dated 1949. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	488.5	
Crest of spillway.....	477.0	352,700
Top of flood-control pool.....	460.5	189,100
Crest of morning-glory drop-inlet spillway (top of conservation pool).	450.6	122,100
Streambed.....	393.0	0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 208,000 acre-ft Dec. 11, 12, 1971 (elevation, 462.87 ft); minimum since conservation pool was first reached on Apr. 20, 1968, 100,900 acre-ft Nov. 10, 1978 (elevation, 446.80 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 145,900 acre-ft Apr. 15 at 1600 hours (elevation, 454.42 ft); minimum, 118,000 acre-ft Nov. 8 (elevation, 449.91 ft).

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

449.0	112,800	453.0	136,800
451.0	127,500	455.0	149,800

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	119000	118500	118600	120300	129200	129100	126900	137100	130500	131800	126400	124200
2	118900	118300	119200	120200	129000	130000	126600	136400	130400	131300	126200	124400
3	118900	118400	119100	120300	128800	129900	126400	139300	130100	130700	125900	124400
4	118800	118600	119200	120200	129300	129900	126300	141000	129800	130400	125800	124400
5	118700	118500	119200	120500	130000	129700	126200	140400	129600	130000	125600	124200
6	118700	118400	119200	121500	131000	129200	126100	139500	129400	129500	125300	124100
7	119200	118200	119100	122900	131300	129000	126700	138500	129900	129200	125100	124100
8	120200	118700	119100	124700	131100	128900	127100	137900	133300	128800	124900	124100
9	120200	119100	119000	125700	130800	128700	126900	137500	134900	128400	124700	124000
10	120100	119200	118900	125900	130600	128500	126900	136900	134700	128100	124600	123900
11	120000	119300	118900	128000	130400	128300	126800	136300	134300	127800	124400	123800
12	119900	119200	118900	128300	130200	128000	133000	135700	133900	127500	124100	123700
13	119900	119200	118800	129200	129900	128000	140000	135000	133300	127200	125000	123600
14	119800	119100	118700	128100	129300	127900	144500	134500	132800	127000	124900	123500
15	119800	119100	118600	128800	129100	127700	145700	134000	132300	126700	124900	123400
16	119600	119000	118800	130500	128800	127700	144400	133600	133300	126400	124700	123200
17	119500	118800	119000	130500	128900	127900	143300	133100	133500	126200	124800	123200
18	119300	118800	119000	130700	128600	127100	142200	132600	133100	125900	124700	122800
19	119200	118900	119000	131800	128400	127000	141000	132100	132600	125700	124600	122600
20	119100	118800	119200	132600	128300	126900	139900	131700	132300	125500	124400	122500
21	119400	118800	119000	132400	128100	126800	138800	131400	132300	125300	124300	122300
22	119300	118900	119000	132100	128300	127200	138800	131200	132400	125000	124100	122200
23	119200	118800	119000	131800	128200	127200	138900	130900	134400	124900	124100	122100
24	119200	118800	119000	131500	128100	127200	139600	132900	135900	125000	124000	122200
25	119000	118800	118900	131200	128000	127200	139900	133400	135300	125100	123700	122100
26	119000	119000	119000	130700	127800	127200	140000	133300	134700	125000	123700	121900
27	118900	118900	119200	130400	127700	127300	139600	132800	134000	125200	123400	121800
28	118800	118900	119400	130200	127600	127200	139800	132400	133400	126800	123400	121600
29	118700	118800	119800	130000	---	127100	139000	131800	132800	126800	123200	121600
30	118600	118700	120000	129700	---	127000	138100	131300	132300	126700	124100	121500
31	118600	---	120200	129400	---	126900	---	130900	---	126600	124200	---
MAX	120200	119300	120200	132600	131300	130000	145700	141000	135900	131800	126400	124400
MIN	118600	118200	118600	120200	127600	126800	126100	130900	129400	124900	123200	121500
(↑)	450.00	450.02	450.27	451.81	451.51	451.40	453.20	452.05	452.27	451.35	450.95	450.49
(Φ)	-600	+100	+1500	+9200	-1800	-700	+11200	-7200	+1400	-5700	-2400	-2700
CAL YR 1990	MAX	183100	MIN	118200	(Φ)	-300						
WTR YR 1991	MAX	145700	MIN	118200	(Φ)	+2300						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## RED RIVER BASIN

07335500 RED RIVER AT ARTHUR CITY, TX

LOCATION.--Lat 33°52'30", long 95°30'06", in NW 1/4 sec.11.T.8 S., R.17 E., Choctaw County, OK, Hydrologic Unit 11140101, on right downstream bank of bridge on U.S. Highway 271 at Arthur City, 10.6 mi downstream from Muddy Boggy River, 26.0 mi upstream from Kiamichi River, and at mile 633.1.

DRAINAGE AREA.--44,531 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

PERIOD OF RECORD.-- January to September 1905 (gage heights and discharge measurements only), October 1905 to December 1911, July 1936 to current year. Monthly discharge only for some periods, published in WSP 1311. Gage-height records collected at same site since 1891 are contained in reports of the National Weather Service.

REVISED RECORDS.-- WSP 1241: Drainage area. WSP 1311: 1906-11.

GAGE.-- Water-stage recorder. Datum of gage is 380.07 ft above National Geodetic Vertical Datum of 1929. From 1905-11 nonrecording gage at St. Louis-San Francisco Railway Co. bridge 200 ft upstream at same datum. July 1, 1936, to Mar. 24, 1940, nonrecording gage at present site and datum.

REMARKS.--Records good. Flow regulated since October 1943 by Lake Texoma (station 07331500), 92.8 mi upstream from station. U.S. Army Corps of Engineers satellite telemeter at station.

AVERAGE DISCHARGE.--13 years (water years 1906-11, 1937-43) prior to regulation by Lake Texoma, 9,266 ft<sup>3</sup>/s (6,713,000 acre-ft/yr); 47 years (water years 1945-91) since regulation by Lake Texoma, 8,710 ft<sup>3</sup>/s (6,310,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 400,000 ft<sup>3</sup>/s May 28, 1908 (gage height, 43.2 ft), from rating curve extended above 41,000 ft<sup>3</sup>/s, on basis of records for later years; minimum 130 ft<sup>3</sup>/s Dec. 11-12, 1956 (gage height, 4.49 ft).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 51,300 ft<sup>3</sup>/s June 23 at 1400 hours (gage height, 17.26 ft); minimum daily, 1,060 ft<sup>3</sup>/s Jan. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6400	1600	7970	6780	5480	4040	10200	12400	12000	e17000	13600	4170
2	5340	1910	6220	6950	5110	4150	9800	9050	11900	15300	13000	4120
3	4490	2060	4040	4880	4560	3290	9120	15200	12300	12900	12700	3610
4	3570	2590	2670	3800	3180	1700	9240	35600	13000	11900	12400	2590
5	2980	2700	2830	4600	3480	3870	11500	31700	17400	11000	12200	3710
6	2670	2010	4480	e6000	5390	3600	14200	23200	34200	9910	12100	4640
7	3030	3720	6230	e8900	6980	2760	12400	19200	37700	9400	10600	8230
8	3720	5360	4920	e9900	6150	2390	11400	22200	43400	9040	8860	10700
9	9780	4070	4050	9240	5350	2260	10300	26700	48600	8790	8450	11100
10	12200	3380	2650	10600	3210	3170	7520	26900	49500	8510	8390	16700
11	10600	4750	1590	11300	2350	2070	7050	19600	44800	7330	8120	18500
12	6680	3870	1470	11900	2020	1310	17300	16900	42700	6870	5030	14700
13	4580	2470	2370	13900	2480	1170	20600	15300	43500	6730	3530	10600
14	3350	1850	2270	8860	4850	1550	24100	14100	46100	6730	4770	8100
15	2620	2000	2210	6120	5560	3010	18300	15300	48600	6430	4830	7160
16	1990	3670	2520	9290	5530	3290	12000	17200	47600	6490	4440	4050
17	1570	4720	2000	14000	5570	2850	9020	14200	44400	6400	4400	3670
18	1440	4930	2140	15200	5810	2680	15300	11000	39800	6340	4300	9850
19	1320	4950	3710	16900	5300	1550	19700	9520	45200	6280	4240	23300
20	1540	4950	5710	19300	5180	2300	17200	9890	47200	6210	3280	25200
21	1590	4890	5430	17300	5300	3130	13800	10000	46500	6140	3230	21500
22	2160	4920	4750	15400	e4500	4140	11700	9270	44500	6050	4060	22400
23	2130	5690	4550	12700	e4000	9930	13100	7620	48700	6170	3890	31300
24	2390	6060	5390	11100	e3400	13700	13200	7320	38800	6120	3310	30400
25	2960	3060	5680	10800	e2500	14200	10100	8640	29100	6580	3920	23800
26	2940	1550	4660	10200	e1950	12100	11800	7620	34100	6390	3800	20000
27	3220	1280	3640	7890	2230	13700	9480	7410	e32600	6900	2980	19300
28	3010	1300	3760	7340	3460	12700	7420	7520	e27800	8110	2930	16700
29	2030	4940	3090	7170	---	13800	9720	8370	e22900	9200	3730	12500
30	1280	9030	3040	6800	---	13300	13600	12200	e19800	11200	4480	11400
31	1060	---	5300	5310	---	11100	---	12200	---	11900	4370	---
TOTAL	114640	110280	121340	310430	120880	174810	380170	463330	1074700	264320	199940	404000
MEAN	3698	3676	3914	10010	4317	5639	12670	14950	35820	8526	6450	13470
MAX	12200	9030	7970	19300	6980	14200	24100	35600	49500	17000	13600	31300
MIN	1060	1280	1470	3800	1950	1170	7050	7320	11900	6050	2930	2590
AC-FT	227400	218700	240700	615700	239800	346700	754100	919000	2132000	524300	396600	801300
CAL YR 1990	TOTAL	8573211	MEAN	23490	MAX	269000	MIN	517	AC-FT	17000000		
WTR YR 1991	TOTAL	3738840	MEAN	10240	MAX	49500	MIN	1060	AC-FT	7416000		

e Estimated

RED RIVER BASIN

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07336820 RED RIVER NEAR DE KALB, TX

LOCATION (REVISED).--Lat 33°40'59", long 94°41'39", Bowie County, Hydrologic Unit 11140106, on right bank at downstream side of bridge on U.S. Highway 259, 4.8 mi upstream from North Mill Creek, 13 mi north of De Kalb, and at mile 556.9.

DRAINAGE AREA.--47,348 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 302.92 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. At times, flood peaks may be affected by Lake Texoma (station 07331500) located approximately 169 mi upstream, and low flows may be affected by releases for the generation of electric power. Storage and/or releases from Lake Hugo on the Kiamichi River, a tributary to the Red River about 45 miles upstream, may also affect flows. Gage-height telemeter at station.

AVERAGE DISCHARGE.--23 years (water years 1969-91), 13,520 ft<sup>3</sup>/s (9,795,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 279,000 ft<sup>3</sup>/s May 6, 1990 (gage height, 34.42 ft), from rating curve extended above 269,000 ft<sup>3</sup>/s; minimum, 213 ft<sup>3</sup>/s Nov. 30, 1979, from graph based on gage readings.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since 1957, 205,000 ft<sup>3</sup>/s June 1957 (gage height, 32.2 ft), from rating curve extended above 186,500 ft<sup>3</sup>/s. The greatest flood since 1936 occurred in February 1938, stage unknown.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 50,200 ft<sup>3</sup>/s June 10 at 2300 hours (gage height, 22.50 ft); minimum daily, 1,630 ft<sup>3</sup>/s Sept. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5430	1870	7210	7180	8330	4400	15500	25500	13200	19100	11900	5080
2	5940	1710	10200	10400	7860	7900	13800	20700	12800	16900	13700	4040
3	5070	2000	10800	11200	7580	8490	12300	18300	12600	13700	14600	3810
4	4580	2350	9790	11700	7210	7450	10700	28200	12700	10900	14200	2720
5	3860	2560	8040	10400	8060	6030	9430	40000	13700	9220	13300	2190
6	3290	3200	7850	10600	9550	6180	10300	37500	17900	8470	10900	2040
7	2890	2930	8350	15600	9970	8050	13100	32200	31000	7060	9470	2480
8	5070	2790	8550	16300	11600	6220	13200	31400	36400	6410	8780	3930
9	9760	5080	7080	16400	e11400	4170	13100	32100	42300	6050	6660	6500
10	13500	6490	5680	19900	e10200	3220	13900	34200	48900	5810	5860	8220
11	15300	5390	4860	22600	8010	3270	12000	32400	49200	5610	5670	10500
12	15500	4890	3540	22300	6740	3460	15400	26400	43400	5070	5270	15400
13	e15100	5280	2830	21600	5540	2640	28400	23400	41700	4410	4140	13000
14	e14100	4120	3270	21600	3980	2170	38300	19900	42500	4160	3120	10000
15	12400	3030	3690	17300	4760	2090	37700	17500	45100	4030	2720	7110
16	11400	2520	3080	13500	6230	2500	34000	17200	48900	3890	3280	5220
17	10700	2770	3150	14700	6530	3500	29600	18300	47800	3810	3160	3060
18	8890	4590	3800	19000	6990	3630	30400	16900	45500	3780	3500	3020
19	6660	5270	3970	21600	7260	3540	34500	14200	42700	3740	3870	2690
20	5920	5510	4920	23700	7000	2980	35400	13100	46200	3680	3900	1630
21	3240	5800	9050	25300	6860	2370	32500	13000	48500	3630	3550	2040
22	2530	5850	11600	23600	7130	3040	30300	13100	47700	3580	2640	8870
23	2930	5350	11200	21400	7680	4690	30200	13800	47200	3530	3160	21500
24	3160	5430	10100	18800	7160	10600	30400	10800	48600	3540	3830	25300
25	3930	6000	10000	16700	6220	14800	30600	10300	41400	3640	3300	31100
26	4280	5430	10100	14600	5100	17700	28100	10500	33300	3870	2650	25500
27	4270	3490	9760	12400	4240	18600	27700	10900	33300	4290	3820	21500
28	3480	2750	7640	10600	3180	19800	23600	11200	31200	4360	2700	20000
29	3580	2510	7100	9870	---	19800	22100	15000	25700	5310	2390	16800
30	3200	2770	7300	9430	---	19000	22900	13600	22800	6500	2900	14600
31	2340	---	6410	9160	---	17300	---	13600	---	10500	4090	---
TOTAL	212300	119730	220920	499440	202370	239590	699430	635200	1074200	198550	183030	299850
MEAN	6848	3991	7126	16110	7227	7729	23310	20490	35810	6405	5904	9995
MAX	15500	6490	11600	25300	11600	19800	38300	40000	49200	19100	14600	31100
MIN	2340	1710	2830	7180	3180	2090	9430	10300	12600	3530	2390	1630
AC-FT	421100	237500	438200	990600	401400	475200	1387000	1260000	2131000	393800	363000	594800
CAL YR 1990	TOTAL	11202226	MEAN	30690	MAX	278000	MIN	841	AC-FT	22220000		
WTR YR 1991	TOTAL	4584610	MEAN	12560	MAX	49200	MIN	1630	AC-FT	9094000		

e Estimated

## RED RIVER BASIN

07336820 RED RIVER NEAR DE KALB, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: October 1970 to July 1981. Sediment analyses: November 1979 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1968 to September 1991 (discontinued).

WATER TEMPERATURE: January 1968 to September 1991 (discontinued).

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 2,140 microsiemens July 13, 1980; minimum daily, 114 microsiemens Oct. 31, 1984.

WATER TEMPERATURE (1968-89): Maximum daily, 4.0°C on several days during July and August of 1969 and 1970; minimum daily, 0.0°C Jan. 11, 1977.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,510 microsiemens Sep. 12; minimum daily, 192 microsiemens Oct. 17.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)
NOV 06...	1350	3340	990	8.1	15.0	10.3	104	3.0	270	86	72
DEC 18...	1350	3760	900	7.4	11.5	10.6	100	1.9	240	90	64
FEB 13...	0900	5950	400	7.5	12.0	10.0	96	1.5	120	54	35
APR 10...	1834	13700	740	7.9	18.5	9.3	100	0.8	170	89	46
JUN 05...	1518	13900	1280	7.9	26.5	8.3	105	0.8	300	170	79
JUN 12...	0944	45000	588	7.8	23.0	7.2	84	1.1	150	63	41
JUL 24...	1523	3600	1270	8.3	32.0	7.7	107	3.5	300	160	79

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END (MG/L CAC03)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 06...	21	89	2	4.4	180	120	120	0.30	5.8	540
DEC 18...	19	79	2	3.8	150	120	110	0.40	7.5	494
FEB 13...	8.2	29	1	2.7	67	42	39	0.10	7.3	220
APR 10...	14	66	2	3.0	84	110	110	0.10	5.1	405
JUN 05...	25	130	3	3.9	130	200	190	0.20	5.6	710
JUN 12...	11	53	2	3.3	85	69	81	0.40	6.1	316
JUL 24...	24	120	3	4.8	140	170	200	0.20	9.0	690

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	SEDI-MENT, SUS-PENDEED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDEED (T/DAY)
NOV 06...	--	<0.010	<0.100	0.020	0.58	0.60	0.050	0.020	--	--
DEC 18...	--	<0.010	0.200	0.020	0.38	0.40	0.030	0.020	--	--
FEB 13...	0.180	0.020	0.200	0.040	0.46	0.50	0.050	0.030	--	--
APR 10...	0.160	0.040	0.200	0.050	0.65	0.70	0.120	0.050	620	22900
JUN 05...	0.150	0.040	0.190	0.030	0.57	0.60	0.090	0.040	323	12100
JUN 12...	0.100	0.100	0.200	0.110	0.59	0.70	0.090	0.110	824	100000
JUL 24...	--	<0.010	<0.050	0.040	0.66	0.70	0.070	<0.010	60	583



RED RIVER BASIN

07336820 RED RIVER NEAR DE KALB, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 06...	--	--	--	--	--	--	--	--	--	--
DEC 18...	--	1	150	<0.5	2.0	<5	<3	<10	30	<10
FEB 13...	--	--	--	--	--	--	--	--	--	--
APR 10...	30	--	--	--	--	--	--	--	--	--
JUN 05...	55	--	--	--	--	--	--	--	--	--
JUN 12...	74	--	--	--	--	--	--	--	--	--
JUL 24...	63	2	140	0.7	3.0	<5	<3	<10	6	20

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV 06...	--	--	--	--	--	--	--	--	--	--
DEC 18...	<4	44	<0.1	<10	<10	<1	<1.0	610	<6	28
FEB 13...	--	--	--	--	--	--	--	--	--	--
APR 10...	--	--	--	--	--	--	--	--	--	--
JUN 05...	--	--	--	--	--	--	--	--	--	--
JUN 12...	--	--	--	--	--	--	--	--	--	--
JUL 24...	17	11	<0.1	10	<10	<1	5.0	810	7	10

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT-ANCE (MICRO-SIEMENS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	212300	433	240	138000	60	34400	47	26900	120
NOV. 1990	119730	885	497	161000	140	43700	110	35000	220
DEC. 1990	220920	584	324	193000	82	48700	64	38300	160
JAN. 1991	499440	464	256	345000	63	84700	49	66000	130
FEB. 1991	202370	735	412	225000	110	59900	87	47800	190
MAR. 1991	239590	508	281	182000	70	45300	55	35500	140
APR. 1991	699430	419	232	437000	57	107300	44	83700	110
MAY 1991	635200	540	300	514000	76	129900	60	102200	140
JUNE 1991	1074200	1040	590	1712E3	170	484500	140	392500	260
JULY 1991	198550	1140	645	346000	190	99800	150	81300	280
AUG. 1991	183030	1050	595	294000	170	83700	140	67900	260
SEPT 1991	299850	1320	753	610000	230	182800	190	150100	310
TOTAL	4584610	**	**	5156000	**	1405000	**	1127000	**
WTD.AVG.	12560	742	417	**	110	**	91	**	190

## RED RIVER BASIN

07336820 RED RIVER NEAR DE KALB, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	585	969	e689	495	901	487	631	396	e1160	1300	435	e812
2	795	927	e572	340	e928	e539	758	394	1300	1270	705	890
3	906	e882	558	260	e942	e608	836	473	1330	e1210	e1010	911
4	892	e895	555	340	864	636	900	e405	1330	1200	e1020	1130
5	e920	924	490	e382	762	627	1050	e332	1260	1220	1010	1120
6	e948	985	320	e356	526	558	e1030	290	1180	1240	1040	1050
7	e990	1020	280	332	409	545	e830	289	1260	e1200	1290	e1030
8	e330	1030	e274	510	340	697	846	308	e1210	1150	1330	e1150
9	470	e1020	e573	320	e351	e700	850	325	e1140	1160	1290	1350
10	484	805	855	e254	e450	e722	750	e350	933	1180	e1250	1440
11	350	e639	871	280	468	760	770	e445	692	1180	e1270	1450
12	268	670	e855	311	441	795	600	e605	579	700	1280	1510
13	e230	674	784	e323	420	810	e438	743	688	774	1190	1400
14	e215	668	706	334	685	803	e335	830	792	e768	1090	1340
15	200	635	569	e346	e767	835	313	964	e891	740	1100	e1350
16	193	592	e535	e355	e838	e825	311	1010	e1020	689	1060	1360
17	192	e551	e659	372	e1070	e782	298	995	1100	935	959	1300
18	198	e785	892	508	1090	798	311	793	e1090	1230	e1070	1250
19	248	965	837	e533	e1080	826	353	e789	e1070	1250	1120	1190
20	e278	988	e555	e550	1070	839	e336	823	e1110	e1240	e1150	1490
21	e303	e980	445	568	1040	844	e291	828	e1180	e1240	1180	e1480
22	362	935	e480	495	983	833	288	709	e1160	1240	1200	e1210
23	600	950	e506	461	925	e775	310	670	e1100	1250	1170	1300
24	752	e1020	e538	490	e940	e562	318	550	e1070	1250	e1180	1350
25	782	e1100	e575	585	991	350	308	e540	1070	1260	e1250	1350
26	540	1110	e611	e616	856	271	290	e562	e1020	1250	1230	1330
27	e538	1080	658	e775	510	228	e254	645	1000	e1240	1220	1320
28	e745	870	725	920	516	284	241	708	1260	e1210	1310	e1330
29	950	832	e783	850	---	436	278	512	1290	1120	1190	e1330
30	1010	e773	775	882	---	470	295	457	e1290	996	822	1350
31	1000	---	599	888	---	e508	---	846	---	765	e727	---
MEAN	557	876	617	485	756	637	514	600	1090	1110	1100	1260

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	18.0	---	4.0	6.0	15.0	16.0	21.0	---	29.0	28.0	---
2	25.0	19.0	---	4.0	---	---	16.0	21.0	28.0	30.0	29.0	30.0
3	25.0	---	13.0	5.0	---	---	17.0	21.0	26.0	---	---	26.0
4	25.0	---	12.0	5.0	10.0	12.0	17.0	---	27.0	28.0	---	27.0
5	---	15.0	11.0	---	11.0	13.0	18.0	---	28.0	29.0	30.0	28.0
6	---	14.0	10.0	---	12.0	15.0	---	20.0	25.0	30.0	30.0	28.0
7	---	14.0	10.0	7.0	11.0	13.0	---	20.0	25.0	---	30.0	---
8	---	14.0	---	6.0	11.0	12.0	19.0	20.0	---	30.0	30.0	---
9	22.0	---	---	6.0	---	---	20.0	20.0	---	30.0	30.0	26.0
10	18.0	12.0	9.0	---	---	---	19.0	---	23.0	29.0	---	27.0
11	17.0	---	10.0	6.0	12.0	13.0	19.0	---	24.0	29.0	---	29.0
12	18.0	13.0	---	6.0	12.0	16.0	20.0	---	25.0	29.0	29.0	29.0
13	---	14.0	13.0	---	14.0	11.0	---	24.0	26.0	28.0	28.0	28.0
14	---	14.0	13.0	7.0	13.0	11.0	---	25.0	27.0	---	26.0	28.0
15	21.0	15.0	13.0	---	---	10.0	19.0	24.0	---	27.0	26.0	---
16	21.0	16.0	---	---	---	---	20.0	24.0	---	26.0	27.0	29.0
17	21.0	---	---	8.0	---	---	21.0	24.0	26.0	28.0	28.0	28.0
18	19.0	---	12.0	8.0	13.0	13.0	21.0	24.0	---	29.0	---	29.0
19	17.0	16.0	11.0	---	---	14.0	21.0	---	27.0	29.0	28.0	25.0
20	---	18.0	---	---	10.0	15.0	---	25.0	27.0	---	---	21.0
21	---	---	12.0	7.0	11.0	17.0	---	25.0	27.0	---	28.0	---
22	16.0	18.0	---	7.0	12.0	20.0	18.0	25.0	---	29.0	26.0	---
23	15.0	17.0	---	7.0	11.0	---	18.0	25.0	---	30.0	28.0	24.0
24	15.0	---	---	7.0	---	---	19.0	25.0	---	30.0	---	24.0
25	15.0	---	---	7.0	11.0	17.0	19.0	---	27.0	29.0	---	22.0
26	16.0	18.0	---	---	10.0	18.0	20.0	---	---	29.0	28.0	22.0
27	---	19.0	7.0	---	10.0	18.0	---	26.0	28.0	---	28.0	22.0
28	---	15.0	5.0	7.0	12.0	17.0	20.0	28.0	28.0	---	28.0	---
29	17.0	13.0	---	9.0	---	16.0	21.0	28.0	28.0	28.0	29.0	---
30	17.0	12.0	12.0	7.0	---	15.0	21.0	28.0	---	27.0	29.0	22.0
31	17.0	---	3.0	7.0	---	---	---	28.0	---	26.0	---	---
MEAN	19.2	15.4	10.4	6.5	11.2	14.6	19.1	24.0	26.4	28.7	28.3	26.1

07337000 RED RIVER AT INDEX, ARK.  
(National stream-quality accounting network station)

LOCATION.--Lat 33°33'07", long 94°02'28", in NW\SW\ sec.7, T.14 S., R.28 W., Miller County, Hydrologic Unit 11140106, near right bank on downstream side of southbound bridge on U.S. Highway 71 at Index, 2.2 mi south of Ogden, 20.6 mi upstream from Little River, and at mile 485.3.

DRAINAGE AREA.--48,030 mi<sup>2</sup>, of which 5,936 mi<sup>2</sup> is probably noncontributing.

PERIOD OF RECORD.--July 1936 to current year. Gage-height records collected at same site since 1917 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 246.87 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 12, 1939, nonrecording gage, and Dec. 12, 1939, to July 19, 1979, water-stage recorder, at site 500 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Water-discharge records good. Some regulation since Oct. 31, 1943, by Lake Texoma (station 07331500) 241 mi upstream, since Sept. 28, 1967, by Pat Mayse Lake (station 07335390), and since Jan. 18, 1974, by Hugo Lake (Oklahoma) capacity, 966,700 acre-ft. Satellite telemeter at station.

AVERAGE DISCHARGE.--55 years, 12,520 ft<sup>3</sup>/s (9,071,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 297,000 ft<sup>3</sup>/s Feb. 23, 1938 (gage height, 34.25 ft); minimum, 378 ft<sup>3</sup>/s Nov. 28, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 51,400 ft<sup>3</sup>/s June 17 (gage height 13.58 ft); minimum daily, 2,290 ft<sup>3</sup>/s Nov. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8310	3290	3770	e8710	9730	5580	19500	32500	15600	26800	11000	3910
2	6400	2740	4850	e9360	9130	6760	17800	30500	15600	23600	14300	5850
3	6620	2410	9730	e13300	8160	8850	16100	25900	15000	21200	15500	5880
4	6280	2290	12400	e15300	7860	10000	14600	24500	14700	18800	17400	5190
5	5550	2500	12200	e16100	7860	9120	13200	36200	14700	15200	17100	5010
6	4930	2810	9750	e13900	9160	7560	11200	47100	15600	12900	16400	4650
7	4270	2990	8370	e14100	11300	6600	11100	42400	20000	11900	14300	3720
8	4630	3520	8200	17800	12200	7830	13500	36300	32700	10400	12200	3780
9	8430	4420	8680	19800	13000	7740	15000	35200	38200	9480	11700	4290
10	15100	6350	7840	e22600	13000	5780	14700	36200	44600	8970	9990	7810
11	16000	8180	6430	e27500	11400	4410	15500	38100	49700	8580	8620	11000
12	17500	7290	5460	e33100	9640	3840	16900	35700	49400	8310	8070	13800
13	17400	5890	4550	e32500	7810	4060	20900	29800	45100	7870	7920	18900
14	16000	5660	3640	29500	6670	3760	38700	27000	44500	7020	7460	17900
15	14900	5280	3310	27200	5070	3150	47500	24300	45500	6540	5730	14500
16	13400	4180	e4500	22500	4670	2860	45000	21700	48300	6290	4340	11000
17	12300	3400	e3800	18500	5980	2900	39300	20700	51100	6120	4570	8800
18	11500	3030	e3500	17800	6870	3660	34400	21600	50100	5940	4780	7490
19	10200	3690	e3900	19400	8490	4430	35900	20500	47500	5900	4480	5320
20	7840	5010	e4000	24800	10900	4320	39900	18200	45500	5810	4370	5000
21	6880	5450	e4200	27800	10600	4170	39400	16200	48300	5740	4240	17200
22	5150	5840	e10000	28800	9670	3480	37000	15900	50200	5680	4150	25500
23	3580	6210	e14000	26700	12300	3260	36600	16100	49800	5630	3690	24300
24	3200	6040	e13000	23500	14000	4030	35600	16600	49400	5530	3250	24600
25	3350	5680	e12000	20700	12000	7820	34600	14900	50100	5470	3660	31300
26	3650	5940	e11000	18400	8810	14300	33700	13100	43000	5620	3770	31600
27	4140	6260	e12000	16400	6940	19000	33200	14700	36900	5680	3510	26200
28	4480	6200	e11000	14100	5800	21000	38600	13500	36100	6310	3430	22800
29	4020	5230	e9300	12100	---	22100	41200	12400	34200	6490	3710	21700
30	3730	4510	e7800	10900	---	22400	38200	16300	29600	6880	3600	19900
31	3710	---	e7000	10100	---	21400	---	16800	---	8250	3410	---
TOTAL	253450	142290	240180	613270	259020	256170	848800	770900	1131000	294910	240650	408900
MEAN	8176	4743	7748	19780	9251	8264	28290	24870	37700	9513	7763	13630
MAX	17500	8180	14000	33100	14000	22400	47500	47100	51100	26800	17400	31600
MIN	3200	2290	3310	8710	4670	2860	11100	12400	14700	5470	3250	3720
AC-FT	502700	282200	476400	1216000	513800	508100	1684000	1529000	2243000	585000	477300	811100
CAL YR 1990	TOTAL	11356370	MEAN	31110	MAX	268000	MIN	1380	AC-FT	22530000		
WTR YR 1991	TOTAL	5459540	MEAN	14960	MAX	51100	MIN	2290	AC-FT	10830000		

e Estimated

## RED RIVER BASIN

07342470 SOUTH SULPHUR RIVER NEAR COMMERCE, TX

LOCATION.--Lat 33°13'11", Long 95°51'45", Hunt County, Hydrologic Unit 11140301, on left bank at downstream side of bridge on State Highway 11, 0.7 mi upstream from St. Louis Southwestern Railroad bridge, 1.8 mi downstream from Dunbar Creek, and 3.0 mi southeast of Commerce.

DRAINAGE AREA.--189 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to September 1991. Station converted to partial-record station effective Oct. 1, 1991. Stage records collected at this site November 1956 to September 1979 are published in reports by the U.S. Army Corps of Engineers.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 450.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years (water years 1980-91), 166 ft<sup>3</sup>/s (11.93 in/yr), 120,300 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,100 ft<sup>3</sup>/s May 13, 1982 (gage height, 28.66 ft); minimum, 0.09 ft<sup>3</sup>/s Apr. 21, 1985.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 20, 1971, reached a stage of 27.80 ft, from records published by the U.S. Army Corps of Engineers.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 10	1130	3,100	17.38	Apr. 14	1200	*9,140	*24.39
Apr. 12	1115	3,680	19.06	May 5	0345	3,940	19.63

Minimum daily discharge, 1.3 ft<sup>3</sup>/s Oct. 1 & 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.3	1.8	8.9	23	10	1450	9.3	11	5.5	3.6	1.9	1.9		
2	1.3	1.8	222	11	10	438	7.8	8.4	4.7	3.4	1.8	2.1		
3	1.7	2.1	940	9.0	10	95	7.0	1290	21	3.3	1.7	2.8		
4	1.7	5.1	214	9.3	21	26	6.7	1250	10	3.3	1.7	2.5		
5	1.6	5.1	53	11	995	19	6.2	1960	8.4	2.7	1.8	6.3		
6	1.5	2.3	15	1160	1260	15	6.0	168	9.8	2.5	1.9	2.3		
7	1.6	1.8	7.4	1420	401	13	6.3	62	128	2.3	2.6	1.8		
8	11	292	4.8	228	126	10	6.5	34	2560	2.6	2.4	1.7		
9	248	1850	4.0	75	66	8.9	5.4	49	2120	2.8	2.1	2.4		
10	54	321	2.7	2300	42	7.8	5.1	73	218	2.7	1.9	1.9		
11	15	85	2.4	1370	29	7.7	5.2	40	58	3.0	1.9	2.4		
12	6.1	26	2.4	222	19	7.5	2600	23	45	3.0	2.3	2.2		
13	4.0	10	2.2	92	15	7.0	5620	15	25	2.5	2.4	2.0		
14	2.6	6.0	1.9	57	12	6.5	6080	14	13	2.4	2.5	1.8		
15	2.2	4.9	1.9	1810	11	6.1	1140	28	9.4	2.4	2.0	e1.7		
16	2.2	3.5	1.9	1410	10	6.1	115	14	8.5	2.4	2.0	e1.6		
17	1.9	3.1	2.4	207	9.6	7.6	51	9.3	7.5	2.1	1.7	e1.5		
18	5.4	3.1	3.4	237	9.6	6.6	34	7.8	6.4	2.0	1.7	e1.9		
19	3.9	3.1	2.8	1320	10	5.9	21	7.4	6.2	1.9	1.8	e3.4		
20	2.6	3.0	2.9	591	9.1	5.9	15	9.4	5.4	1.9	2.5	e2.3		
21	11	3.0	582	148	8.6	5.9	12	8.8	5.3	1.9	2.8	e2.0		
22	9.4	207	91	73	1070	7.8	12	8.0	5.3	1.9	2.5	e1.9		
23	4.2	257	9.6	43	428	13	10	6.1	80	1.9	2.4	e1.8		
24	2.6	77	4.9	31	103	29	8.8	5.4	20	2.4	2.3	e1.7		
25	2.1	24	3.4	23	50	12	50	520	10	2.8	2.1	e1.6		
26	2.0	9.3	3.5	19	28	8.7	30	156	7.1	2.2	2.3	e1.5		
27	1.7	17	58	16	18	14	17	40	5.7	1.9	3.4	e1.6		
28	1.5	265	75	14	14	39	13	16	4.4	3.3	2.9	e1.5		
29	1.4	105	234	13	---	38	25	11	3.6	2.4	1.8	e1.5		
30	1.6	27	359	11	---	15	17	8.7	3.3	1.9	1.9	e1.6		
31	1.7	---	120	10	---	12	---	7.2	---	2.6	1.8	---		
TOTAL	408.8	3622.0	3036.4	12963.3	4794.9	2344.0	15942.3	5860.5	5414.5	78.0	66.8	63.2		
MEAN	13.2	121	97.9	418	171	75.6	531	189	180	2.52	2.15	2.11		
MAX	248	1850	940	2300	1260	1450	6080	1960	2560	3.6	3.4	6.3		
MIN	1.3	1.8	1.9	9.0	8.6	5.9	5.1	5.4	3.3	1.9	1.7	1.5		
AC-FT	811	7180	6020	25710	9510	4650	31620	11620	10740	155	132	125		
CFSM	.07	.64	.52	2.21	.91	.40	2.81	1.00	.95	.01	.01	.01		
IN.	.08	.71	.60	2.55	.94	.46	3.14	1.15	1.07	.02	.01	.01		
CAL YR 1990	TOTAL	110181.4	MEAN	302	MAX	12100	MIN	1.1	AC-FT	218500	CFSM	1.60	IN.	21.69
WTR YR 1991	TOTAL	54594.7	MEAN	150	MAX	6080	MIN	1.3	AC-FT	108300	CFSM	.79	IN.	10.75

e Estimated







RED RIVER BASIN

07342480 MIDDLE SULPHUR RIVER AT COMMERCE, TX

LOCATION.--Lat 33°15'59", Long 95°54'55", Hunt County, Hydrologic Unit 11140301, at bridge on State Highway 11, 1.5 mi upstream from Willow Creek, and 1.5 mi northwest of Commerce.

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1987 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CaCO3)
JAN 08...	1100	34	198	7.3	4.0	250	50	13.3	102	2.6	68
MAR 06...	1515	1.6	350	8.0	12.0	130	34	9.9	92	1.6	140
APR 15...	1412	46	240	7.8	20.5	80	2.7	7.5	84	2.4	92
MAY 02...	0900	0.89	504	7.9	20.0	50	10	7.8	87	1.8	200
JUN 26...	1014	1.6	255	7.9	24.0	100	34	7.2	86	1.2	100

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
JAN 08...	5	24	2.0	10	0.5	4.0	63	19	4.7	0.20	9.1
MAR 06...	11	50	4.0	16	0.6	3.9	130	36	8.7	0.20	9.2
APR 15...	0	33	2.4	12	0.5	3.7	93	15	4.5	0.20	9.9
MAY 02...	36	70	5.5	30	0.9	4.4	160	83	12	0.20	8.0
JUN 26...	11	36	2.6	12	0.5	4.2	90	22	8.2	0.20	12

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
JAN 08...	111	147	25	122	0.490	0.010	0.500	0.080	0.72	0.80	0.360
MAR 06...	206	64	8	56	0.160	0.040	0.200	0.010	0.59	0.60	0.250
APR 15...	136	245	39	206	0.270	0.190	0.460	0.240	0.76	1.0	0.300
MAY 02...	311	32	8	24	0.045	0.040	0.085	0.040	0.76	0.80	0.140
JUN 26...	153	66	10	56	0.460	0.040	0.500	0.060	1.0	1.1	0.270

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
JAN 08...	0.230	10	5	35	<0.5	1.0	<5	<3	<10	140	<10
MAR 06...	0.180	9.3	--	--	--	--	--	--	--	--	--
APR 15...	0.250	12	--	--	--	--	--	--	--	--	--
MAY 02...	0.080	8.5	5	91	<0.5	<1.0	<5	<3	<10	20	<10
JUN 26...	0.200	13	8	50	<0.5	<1.0	<5	<3	<10	68	<10

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
JAN 08...	<4	5	0.1	<10	<10	<1	<1.0	190	<6	20
MAR 06...	--	--	--	--	--	--	--	--	--	--
APR 15...	--	--	--	--	--	--	--	--	--	--
MAY 02...	8	3	<0.1	<10	<10	<1	<1.0	610	<6	10
JUN 26...	4	3	<0.1	<10	<10	<1	<1.0	280	<6	16

RED RIVER BASIN

07342500 SOUTH SULPHUR RIVER NEAR COOPER, TX

LOCATION.--Lat 33°21'23 , long 95°35'41, Delta County, Hydrologic Unit 11140301, on levee on left bank 110 ft downstream from bridge on State Highways 19 and 154, 1.0 mi downstream from Big Creek, 1.0 mi upstream from Brushy Creek, 4.5 mi downstream from Doctors Creek, and 5.6 mi southeast of Cooper.

DRAINAGE AREA.--527 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1942 to current year. Monthly discharge only for some periods, published in WSP 1311.

GAGE.--Water-stage recorder. Datum of gage is 371.91 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 15, 1985, at site 360 ft to right and 90 ft upstream at same datum. Oct. 1, 1970, at datum 3.00 ft higher. May 9, 1942, to Nov. 8, 1949, nonrecording gage, and Nov. 9, 1949, to May 13, 1955, water-stage recorder at site 1,060 ft to right of present gage. Gage-height telemeter at station.

REMARKS.--Records good including those for estimated daily discharges. There are numerous small diversions upstream from station. Low flow is sustained by sewage effluent released upstream. Construction of Cooper Dam, 13.4 miles upstream from station, was begun during the 1988 water year. Deliberate impoundment began Sept. 28, 1991.

AVERAGE DISCHARGE.--49 years (water years 1943-91), 416 ft<sup>3</sup>/s (10.72 in/yr), 301,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 47,200 ft<sup>3</sup>/s May 13, 1982 (gage height, 27.21 ft, from floodmark), in gage well; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 14	0300	4,310	18.69				

Minimum discharge, no flow Sept. 23-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.8	3.6	220	454	366	657	42	1100	126	38	.02	.03		
2	1.1	4.7	264	388	261	695	37	1040	85	38	.02	.02		
3	.77	3.1	532	320	183	874	32	1280	59	26	.01	.02		
4	.66	3.9	602	258	127	864	27	1090	40	19	.01	.02		
5	.54	5.5	641	201	325	759	24	1230	31	13	.01	.34		
6	.50	2.7	589	541	768	644	22	1170	53	9.4	.89	.06		
7	.55	1.7	522	789	936	527	114	1210	26	6.4	.73	.06		
8	50	19	444	866	1060	404	67	1170	937	4.2	.41	.06		
9	158	555	358	1010	1010	282	44	1130	597	2.0	.26	.03		
10	354	649	278	1520	898	187	43	1070	800	.95	.19	.02		
11	347	705	200	1370	780	124	39	997	1040	.52	.12	.02		
12	211	687	138	1390	660	86	1110	908	1010	.28	.94	.02		
13	117	631	95	1380	545	61	1640	821	898	.07	.41	.01		
14	65	580	65	1300	419	45	3090	769	790	.10	.30	.01		
15	40	503	46	1370	297	38	1510	1010	686	.06	.21	.01		
16	29	405	35	1350	198	31	1430	701	637	.05	.15	.01		
17	21	306	28	1380	134	27	1440	612	553	.04	.11	.01		
18	24	210	24	1400	94	25	1280	550	468	.03	.12	.02		
19	36	139	23	1530	67	22	1410	500	396	.02	.07	.08		
20	30	91	23	1380	50	21	1630	449	336	.02	.11	.02		
21	25	60	26	1310	42	24	1600	413	301	.01	.19	e.01		
22	19	50	206	1270	439	22	1540	378	256	.01	.17	e.01		
23	14	133	344	1270	656	22	1460	343	453	.01	.11	e.00		
24	13	330	281	1180	824	23	1310	326	272	.01	.07	e.00		
25	13	315	204	1080	828	25	1560	716	238	.01	.05	e.00		
26	11	256	146	974	722	29	1460	338	202	.01	.04	e.00		
27	8.7	213	125	859	608	32	1390	333	157	.02	.03	e.00		
28	13	225	138	750	491	30	1630	313	117	.03	.03	e.00		
29	9.8	270	220	649	---	33	1270	279	82	.04	.02	e.00		
30	6.4	271	363	560	---	40	1170	229	55	.05	.02	e.00		
31	4.6	---	473	474	---	45	---	177	---	.03	.03	---		
TOTAL	1625.42	7628.2	7653	30573	13788	6698	29421	22652	11701	158.37	5.85	0.89		
MEAN	52.4	254	247	986	492	216	981	731	390	5.11	.19	.030		
MAX	354	705	641	1530	1060	874	3090	1280	1040	38	.94	.34		
MIN	.50	1.7	23	201	42	21	22	177	26	.01	.01	.00		
AC-FT	3220	15130	15180	60640	27350	13290	58360	44930	23210	314	12	1.8		
CFSM	.10	.48	.47	1.87	.93	.41	1.86	1.39	.74	.01	.00	.00		
IN.	.11	.54	.54	2.16	.97	.47	2.08	1.60	.83	.01	.00	.00		
CAL YR 1990	TOTAL	256993.72	MEAN	704	MAX	25100	MIN	.00	AC-FT	509700	CFSM	1.34	IN.	18.14
WTR YR 1991	TOTAL	131904.73	MEAN	361	MAX	3090	MIN	.00	AC-FT	261600	CFSM	.69	IN.	9.31

e Estimated



07342500 SOUTH SULPHUR RIVER NEAR COOPER, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1958 to September 1966, October 1967 to current year. Chemical and biochemical analyses: December 1979 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1958 to September 1966, October 1967 to September 1989.  
 WATER TEMPERATURE: October 1958 to September 1966, October 1967 to September 1989.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,710 microsiemens Aug. 14, 1973; minimum daily, 82 microsiemens July 2, 1976, July 12, 1988.  
 WATER TEMPERATURE: Maximum daily, 36.0°C Aug. 6, 1960, Aug. 10, 1962; minimum daily, 0.0°C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	COLOR (PLATINUM-COBALT UNITS)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)
NOV 08...	1145	2.6	380	6.9	10.0	32	50	6.4	58	2.5	93
DEC 17...	1310	29	248	7.1	11.5	80	93	9.7	91	2.0	85
FEB 14...	1315	428	260	7.3	13.0	130	72	9.4	91	2.6	96
APR 09...	1234	44	465	7.9	20.5	45	52	9.5	105	2.5	140
JUN 04...	1237	39	269	7.7	26.5	100	74	6.4	80	3.6	94
SEP 10...	1515	0.02	467	7.8	31.0	40	27	9.8	133	2.3	140

DATE	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
NOV 08...	3	31	3.8	31	1	3.3	90	29	29	0.50	6.5
DEC 17...	5	29	3.0	17	0.8	4.3	80	22	15	0.40	10
FEB 14...	0	33	3.2	16	0.7	4.2	97	22	8.9	0.20	9.4
APR 09...	8	50	4.8	40	1	3.9	140	50	27	0.20	4.3
JUN 04...	0	32	3.3	16	0.7	4.6	97	16	8.5	0.30	7.4
SEP 10...	48	47	5.8	40	1	4.0	94	77	34	0.30	5.4

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	RESIDUE VOLATILE, SUSPENDED (MG/L)	RESIDUE FIXED NON FILTERABLE (MG/L)	NITROGEN, NITRATE (MG/L AS N)	NITROGEN, NITRITE (MG/L AS N)	NITROGEN, NO2+NO3 (MG/L AS N)	NITROGEN, AMMONIA (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
NOV 08...	188	152	17	135	0.730	0.070	0.800	0.060	0.54	0.60	0.140
DEC 17...	149	100	17	83	0.750	0.050	0.800	0.120	0.48	0.60	0.210
FEB 14...	155	92	19	73	0.440	0.060	0.500	0.100	0.80	0.90	0.190
APR 09...	262	125	39	86	0.800	0.070	0.870	0.050	0.95	1.0	0.150
JUN 04...	147	173	30	143	0.220	0.150	0.370	0.130	0.77	0.90	0.150
SEP 10...	270	60	25	35	1.54	0.160	1.70	0.040	0.76	0.80	0.110

DATE	PHOSPHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC, DIS-SOLVED (UG/L AS AS)	BARIIUM, DIS-SOLVED (UG/L AS BA)	BERYLLIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 08...	0.100	8.8	--	--	--	--	--	--	--	--	--
DEC 17...	0.210	12	4	47	<0.5	2.0	<5	<3	<10	66	<10
FEB 14...	0.170	11	--	--	--	--	--	--	--	--	--
APR 09...	0.080	11	--	--	--	--	--	--	--	--	--
JUN 04...	0.140	12	5	56	<0.5	<1.0	<5	<3	<10	53	<10
SEP 10...	0.070	9.1	1	82	<0.5	<1.0	<5	<3	<10	5	<10

## RED RIVER BASIN

07342500 SOUTH SULPHUR RIVER NEAR COOPER, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 08...	--	--	--	--	--	--	--	--	--	--
DEC 17...	<4	14	<0.1	<10	<10	<1	<1.0	230	<6	12
FEB 14...	--	--	--	--	--	--	--	--	--	--
APR 09...	--	--	--	--	--	--	--	--	--	--
JUN 04...	<4	4	<0.1	<10	<10	<1	<1.0	280	<6	12
SEP 10...	7	34	<0.1	<10	<10	<1	<1.0	400	<6	<3

RED RIVER BASIN

115

07343000 NORTH SULPHUR RIVER NEAR COOPER, TX

LOCATION.--Lat 33°28'29", Long 95°35'15", Lamar County, Hydrologic Unit 11140301, on left bank at downstream side of highway embankment near left end of downstream bridge on State Highways 19 and 24, 2.3 mi upstream from Auds Creek, 5.5 mi upstream from Hickory Creek, 8.7 mi northeast of Cooper, and 15.6 mi upstream from mouth.

DRAINAGE AREA.--276 mi<sup>2</sup>.

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

Water-quality records.--Chemical analyses: July 1950 to September 1958, January 1967 to September 1988.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 372.42 ft above National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Nov. 8, 1949, nonrecording gage, Nov. 8, 1949, to May 21, 1960, water-stage recorder at site 50 ft upstream at datum 9.00 ft higher, and May 22, 1960, to Sept. 30, 1970, at datum 5.00 ft higher.

REMARKS.--Records fair. In 1928-29, the channel was rectified for a distance of 28 mi upstream and 18 mi downstream from this station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--42 years, 247 ft<sup>3</sup>/s (12.20 in/yr), 179,200 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90,600 ft<sup>3</sup>/s Oct. 19, 1971 (gage height, 36.16 ft, from floodmarks); no flow at times most years. Maximum stage since at least 1915, that of Oct. 19, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 2, 1944, reached a stage of 35.6 ft, present datum, and flood in 1932 reached about same stage, from information by U.S. Army Corps of Engineers and local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 20,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	0645	23,200	20.56	Apr. 13	1730	*34,600	*25.74

Minimum discharge, no flow Sept. 28-30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.4	6.9	50	e64	55	2120	35	37	8.9	3.6	3.4	13		
2	1.4	5.9	628	e55	53	337	e31	32	6.9	2.6	1.7	401		
3	1.5	4.9	963	e50	50	131	28	1830	8.3	3.6	.82	115		
4	1.7	12	172	e48	200	82	27	694	9.8	4.7	.46	19		
5	2.1	29	100	e58	2320	e63	27	780	10	4.5	.29	7.5		
6	2.5	27	79	2550	e1330	e52	27	101	23	3.6	.20	4.0		
7	13	25	65	930	e268	e46	151	49	58	3.1	.17	2.0		
8	2380	182	55	287	e144	41	147	35	5460	3.0	2.7	8.4		
9	2010	1600	48	196	e102	40	44	47	409	2.5	3.4	6.4		
10	180	280	45	7020	e85	52	31	49	83	2.2	.65	1.8		
11	77	99	44	e845	75	73	28	35	57	1.8	.30	.96		
12	54	66	45	254	93	e46	6640	26	60	1.9	1.8	.48		
13	44	51	46	150	71	e34	9570	21	47	1.7	31	.50		
14	41	41	44	125	e52	e28	1750	33	28	1.5	13	.48		
15	30	35	40	3660	e42	e26	285	362	22	1.4	8.8	.50		
16	27	32	53	589	40	26	117	57	140	1.1	2.2	.58		
17	24	29	67	e214	45	42	78	27	54	.88	2.2	.82		
18	22	28	98	757	46	55	71	30	21	.70	7.2	.12		
19	18	28	156	2490	48	37	60	51	15	.59	.42	.10		
20	17	27	72	e673	68	e30	45	24	24	.56	.12	.13		
21	26	27	866	e318	65	e29	39	125	19	.56	.05	.19		
22	36	771	133	e199	724	40	332	26	31	.57	.04	.15		
23	29	334	64	e147	256	114	121	10	1540	.48	.05	.09		
24	26	113	e50	e119	133	e44	61	18	93	.47	.20	.08		
25	21	73	e44	e97	89	36	585	1150	29	.25	.28	.13		
26	16	60	e44	85	73	35	151	83	16	.15	.26	.12		
27	14	112	297	e73	65	70	476	31	10	.17	.43	.07		
28	12	345	e140	e65	59	113	180	19	7.1	6.7	.39	.00		
29	10	96	624	e61	---	66	103	13	7.5	24	.32	.00		
30	8.8	61	e317	e59	---	51	58	11	5.1	15	317	.00		
31	7.8	---	e106	57	---	e41	---	10	---	6.9	29	---		
TOTAL	5154.2	4600.7	5555	22295	6651	4000	21298	5816	8302.6	100.78	428.85	583.60		
MEAN	166	153	179	719	238	129	710	188	277	3.25	13.8	19.5		
MAX	2380	1600	963	7020	2320	2120	9570	1830	5460	24	317	401		
MIN	1.4	4.9	40	48	40	26	27	10	5.1	.15	.04	.00		
AC-FT	10220	9130	11020	44220	13190	7930	42240	11540	16470	200	851	1160		
CFSM	.60	.56	.65	2.61	.86	.47	2.57	.68	1.00	.01	.05	.07		
IN.	.69	.62	.75	3.00	.90	.54	2.87	.78	1.12	.01	.06	.08		
CAL YR 1990	TOTAL	157422.99	MEAN	431	MAX	15800	MIN	.00	AC-FT	312200	CFSM	1.56	IN.	21.22
WTR YR 1991	TOTAL	84785.73	MEAN	232	MAX	9570	MIN	.00	AC-FT	168200	CFSM	.84	IN.	11.43

e Estimated



RED RIVER BASIN

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07343200 SULPHUR RIVER NEAR TALCO, TX

LOCATION.--Lat 33°23'10", Long 95°07'56", Franklin County, Hydrologic Unit 11140302, at downstream side of highway embankment near right end of bridge on U.S. Highway 271, 2.2 mi northwest of Talco, 3.2 mi downstream from Mustang Creek, and 162 mi upstream from mouth.

DRAINAGE AREA.--1,365 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1956 to current year.

REVISED RECORDS.--WDR TX-76-1(P).

GAGE.--Water-stage recorder. Datum of gage is 290.82 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. The River Crest Steam Electric Generating Plant diverts water (amount unknown) upstream from this station. Flow is also affected at times by discharge from the flood-detention pools of 14 floodwater-retarding structures with a combined detention capacity of 8,210 acre-ft. These structures runoff from 23.4 mi<sup>2</sup> in the Auds and Depot Creek drainage basins. Gage-height telemeter at station.

AVERAGE DISCHARGE.--35 years, 1,408 ft<sup>3</sup>/s (14.01 in/yr), 1,020,000 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 77,000 ft<sup>3</sup>/s Dec. 11, 1971 (gage height, 29.40 ft, from floodmark); no flow at times in 1957, 1964-65, 1970, and 1979-80.

EXTREMES OUTSIDE PERIOD OF RECORD.--Floods in 1908 and 1914 each reached a stage of 27.5 ft, and flood in 1945 reached a stage of 26.5 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 15,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 14	2100	22,700	24.86	No other peak greater than base discharge.			
Minimum daily discharge, 0.57 ft <sup>3</sup> /s Aug. 12.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	33	18	350	904	530	984	125	1880	264	132	37	74		
2	30	17	519	707	436	4990	113	1250	232	120	23	36		
3	26	15	3240	620	344	2630	97	2200	186	110	13	283		
4	24	17	4300	592	287	1340	88	7070	151	134	8.1	229		
5	21	18	1880	481	1190	1050	80	6160	138	102	5.6	88		
6	18	17	1180	689	4810	895	72	5340	135	85	3.9	51		
7	18	19	846	6730	4140	741	70	2600	180	70	2.5	32		
8	585	64	647	5110	1930	613	170	1520	1060	60	1.7	28		
9	2590	2140	520	2350	1310	510	293	1280	5810	54	1.1	32		
10	4190	5800	416	3810	1110	410	142	1230	2410	47	.86	37		
11	1800	2850	325	9990	968	317	100	1130	1090	43	.63	31		
12	858	1360	250	5810	845	264	2370	1030	1050	42	.57	26		
13	420	943	211	3320	729	224	11300	922	1080	36	1.0	23		
14	219	735	176	2020	613	194	16100	829	1010	28	8.2	17		
15	135	623	152	2570	492	171	16300	1000	861	21	31	14		
16	90	529	132	5390	361	153	7850	1430	767	15	30	12		
17	69	433	119	3020	263	155	4030	950	959	11	20	10		
18	62	333	187	1910	301	153	2730	754	775	7.0	15	8.8		
19	51	242	269	3280	815	148	2480	654	584	5.1	14	9.1		
20	45	180	326	5760	446	134	1810	606	487	4.4	12	10		
21	50	135	555	3350	276	125	1710	537	433	3.7	7.5	10		
22	50	190	1130	1860	1320	125	1870	555	388	3.2	5.3	9.4		
23	49	999	474	1460	5390	131	3710	464	889	2.8	3.9	8.0		
24	44	754	430	1360	3000	162	2870	406	2070	2.6	3.2	7.7		
25	36	465	379	1240	1490	134	2120	1480	817	2.5	2.3	13		
26	29	390	317	1120	1110	115	3690	4030	471	11	1.7	21		
27	26	428	867	1010	884	109	3060	1360	341	43	1.4	23		
28	23	629	1510	902	720	127	5140	670	262	57	1.4	19		
29	21	728	1530	802	---	164	6150	466	222	94	1.4	17		
30	19	464	1970	706	---	138	3780	377	170	100	22	15		
31	19	---	1510	616	---	126	---	310	---	56	161	---		
TOTAL	11650	21535	26717	79489	36110	17532	100420	50490	25292	1502.3	440.26	1194.0		
MEAN	376	718	862	2564	1290	566	3347	1629	843	48.5	14.2	39.8		
MAX	4190	5800	4300	9990	5390	4990	16300	7070	5810	134	161	283		
MIN	18	15	119	481	263	109	70	310	135	2.5	.57	7.7		
AC-FT	23110	42710	52990	157700	71620	34770	199200	100100	50170	2980	873	2370		
CFSM	.28	.53	.63	1.88	.94	.41	2.45	1.19	.62	.04	.01	.03		
IN.	.32	.59	.73	2.17	.98	.48	2.74	1.38	.69	.04	.01	.03		
CAL YR 1990	TOTAL	774669.1	MEAN	2122	MAX	48600	MIN	4.1	AC-FT	1537000	CFSM	1.55	IN.	21.11
WTR YR 1991	TOTAL	372371.56	MEAN	1020	MAX	16300	MIN	.57	AC-FT	738600	CFSM	.75	IN.	10.15



## RED RIVER BASIN

07343200 SULPHUR RIVER NEAR TALCO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: January 1965 to current year. Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: January 1968 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1966 to September 1991 (discontinued).

WATER TEMPERATURE: October 1966 to September 1991 (discontinued).

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,800 microsiemens Feb. 17, 1976; minimum daily, 65 microsiemens Jan. 15, 1989. WATER TEMPERATURE (1966-89): Maximum daily, 39.0°C Aug. 13, 1987; minimum daily, 0.0°C on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 819 microsiemens Sep. 2; minimum daily, 178 microsiemens May 26.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
NOV 07...	1400	18	530	7.2	13.0	--	--	8.4	80	1.3	170	15
DEC 19...	1425	274	360	7.3	11.0	--	--	8.8	81	2.3	140	25
FEB 13...	1415	681	311	7.7	16.5	--	--	9.0	94	2.3	120	11
APR 11...	1310	100	650	7.9	20.0	--	--	7.8	87	1.3	200	44
JUN 06...	1541	127	343	7.9	27.0	--	--	6.2	78	1.9	130	8
JUL 25...	1408	2.4	477	7.3	27.5	12	10	4.1	52	1.8	170	20

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)
NOV 07...	62	4.8	37	1	3.8	160	48	37	0.40	7.1	296	--
DEC 19...	48	3.8	18	0.7	4.0	110	42	15	0.20	7.9	206	--
FEB 13...	40	3.9	19	0.8	4.1	100	29	10	0.20	9.0	178	--
APR 11...	68	7.0	53	2	3.5	150	110	45	0.30	3.4	383	--
JUN 06...	46	3.8	18	0.7	3.9	120	27	11	0.20	6.3	190	--
JUL 25...	60	4.8	29	1	3.5	150	45	25	0.30	6.3	265	16

DATE	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)
NOV 07...	--	--	0.480	0.020	0.500	0.030	0.47	0.50	0.060	0.050	--	--
DEC 19...	--	--	0.370	0.030	0.400	0.070	0.33	0.40	0.100	0.090	--	2
FEB 13...	--	--	0.350	0.050	0.400	0.060	0.74	0.80	0.180	0.140	--	--
APR 11...	--	--	0.250	0.040	0.290	0.040	0.56	0.60	0.090	0.030	--	--
JUN 06...	--	--	0.260	0.080	0.340	0.070	0.83	0.90	0.070	0.070	--	--
JUL 25...	5	11	0.049	0.020	0.069	0.040	0.96	1.0	0.060	<0.010	8.0	2

RED RIVER BASIN

07343200 SULPHUR RIVER NEAR TALCO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)
NOV 07...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 19...	63	<0.5	4.0	<5	<3	<10	41	<10	<4	53	<0.1	<10
FEB 13...	--	--	--	--	--	--	--	--	--	--	--	--
APR 11...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 25...	87	<0.5	<1.0	<5	<3	<10	13	<10	9	63	<0.1	<10

DATE	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	PCB, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PCN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ALDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- DANE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDD, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DDE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
NOV 07...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 19...	<10	<1	<1.0	410	<6	15	--	--	--	--	--	--
FEB 13...	--	--	--	--	--	--	--	--	--	--	--	--
APR 11...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 25...	<10	<1	<1.0	560	<6	14	<1	<1.0	<0.1	1.0	1.3	6.4

DATE	DDT, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDO- SULFAN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR EPOXIDE TOT. IN BOT- TOM MA- TERIAL (UG/KG)	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METH- OXY- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	MIREX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PER- THANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOXA- PHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
NOV 07...	--	--	--	--	--	--	--	--	--	--	--
DEC 19...	--	--	--	--	--	--	--	--	--	--	--
FEB 13...	--	--	--	--	--	--	--	--	--	--	--
APR 11...	--	--	--	--	--	--	--	--	--	--	--
JUN 06...	--	--	--	--	--	--	--	--	--	--	--
JUL 25...	0.8	0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<1.0	<1.0	<1.00	<10

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	11650	250	147	4620	7.7	241	27	850	95
NOV. 1990	21535	276	162	9440	8.9	515	30	1770	100
DEC. 1990	26717	261	153	11100	8.0	577	28	2040	99
JAN. 1991	79489	261	153	32900	8.0	1710	28	6040	99
FEB. 1991	36110	276	162	15800	8.7	846	30	2940	100
MAR. 1991	17532	305	180	8500	10	494	35	1640	110
APR. 1991	100420	220	129	34900	6.3	1710	23	6250	84
MAY 1991	50490	251	147	20000	7.5	1020	27	3650	95
JUNE 1991	25292	245	144	9830	7.3	495	26	1780	93
JULY 1991	1502.3	382	227	920	15	62	47	191	140
AUG. 1991	440.26	610	367	436	32	38	88	105	210
SEPT 1991	1194.0	528	317	1020	26	85	74	239	190
TOTAL	372371.56	**	**	150000	**	7800	**	27500	**
WTD. AVG.	1020	253	149	**	7.8	**	27	**	96

## RED RIVER BASIN

07343200 SULPHUR RIVER NEAR TALCO, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	425	e480	358	e294	309	296	e510	e222	320	304	624	e817
2	420	490	273	e308	e320	256	e554	251	e328	310	e442	e819
3	e411	499	e211	328	e341	e254	e600	e260	e331	309	e436	788
4	414	e495	e229	356	e386	268	e637	263	339	e308	e441	458
5	420	493	239	402	336	e273	e664	e240	e339	e316	447	389
6	433	510	241	e368	e263	275	e680	243	340	e318	456	385
7	e445	527	248	298	e284	e283	e696	252	e341	e320	465	377
8	418	e539	257	265	292	291	673	263	274	e325	480	370
9	238	379	264	e252	290	303	742	e270	e239	e328	e500	360
10	204	226	267	e240	e290	e320	761	271	226	e333	e520	354
11	226	233	276	231	295	343	685	272	e218	e337	e534	340
12	265	231	e285	233	299	362	e223	266	234	e345	559	336
13	285	247	e293	241	310	376	e208	256	234	e352	579	330
14	303	256	305	261	e325	e386	e190	255	236	e356	e547	347
15	318	e240	e320	267	331	e398	198	e244	233	367	476	e353
16	340	236	329	266	347	408	219	262	e242	375	450	355
17	350	237	e350	e262	364	412	e220	268	e232	381	450	355
18	e367	243	362	254	e372	426	e222	268	e232	e392	e472	365
19	376	248	e350	259	289	439	237	e274	e237	406	497	e369
20	381	259	395	261	332	454	e248	287	e239	413	e524	376
21	381	267	e335	254	325	463	e262	297	e245	e427	e550	387
22	382	255	e282	255	e287	e474	e263	298	e247	434	574	e385
23	387	368	e295	258	e232	502	235	355	e225	436	593	394
24	390	340	e305	e261	229	e597	212	332	e238	449	604	397
25	e400	e323	e318	e265	244	610	226	266	e268	e473	e616	392
26	410	e320	e325	267	e251	613	247	e178	281	440	624	389
27	432	e315	e274	273	261	604	232	e197	e288	405	633	393
28	e440	310	e258	e275	274	e589	e229	249	290	e420	635	398
29	451	388	e260	e280	---	e542	206	289	e299	500	636	e402
30	e463	367	e270	286	---	e474	e212	313	e301	676	642	398
31	475	---	e282	e297	---	484	---	311	---	783	775	---
MEAN	376	344	292	278	303	412	383	267	270	398	541	419

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.5	---	11.5	---	8.5	16.0	---	---	28.0	31.0	28.0	---
2	24.5	18.0	13.0	---	---	15.0	---	22.5	---	30.0	---	---
3	---	18.0	---	5.0	---	---	---	---	---	30.0	---	25.0
4	25.0	---	---	5.0	---	14.5	---	19.5	30.0	---	---	25.5
5	24.0	14.5	10.0	5.0	8.5	---	---	---	---	---	30.0	25.0
6	21.5	14.0	9.5	---	---	16.0	---	21.0	29.0	---	29.0	25.0
7	---	14.0	10.0	5.0	---	---	---	20.5	---	---	29.0	26.0
8	25.0	---	8.0	6.0	8.0	15.0	22.0	20.0	26.5	---	29.0	25.5
9	19.5	12.0	8.0	---	10.0	12.5	22.0	---	---	---	---	26.0
10	16.5	9.5	10.0	---	---	---	22.5	22.0	24.0	---	---	26.5
11	16.0	11.0	10.0	7.0	13.5	15.0	22.0	22.0	---	---	---	27.0
12	27.0	13.0	---	5.0	14.0	16.5	---	22.5	26.0	---	27.0	26.5
13	15.0	14.0	---	5.0	15.0	15.5	---	25.0	28.0	---	26.0	27.0
14	17.0	14.0	11.0	---	---	---	---	26.0	28.0	---	---	27.5
15	20.0	---	---	8.0	12.5	---	20.0	---	27.0	29.5	25.0	---
16	21.0	15.0	11.0	9.0	10.0	14.0	21.0	25.0	---	30.5	26.0	26.5
17	20.5	14.0	---	---	12.0	14.0	---	24.0	---	30.0	27.0	26.5
18	---	14.0	12.5	8.5	---	16.0	---	23.5	---	---	---	26.0
19	18.0	17.0	---	8.5	13.5	15.0	22.0	---	---	28.0	27.0	---
20	16.0	17.5	12.0	8.0	13.0	16.0	---	26.0	---	28.0	---	19.0
21	---	17.5	---	7.0	13.0	17.0	---	26.0	---	---	---	18.0
22	17.0	17.0	---	7.0	---	---	---	25.0	---	31.5	26.5	---
23	15.5	17.5	---	7.0	---	15.0	22.0	27.0	---	28.5	27.0	22.0
24	16.0	15.0	---	---	11.0	---	18.5	27.0	---	28.5	27.0	22.5
25	---	---	---	---	12.5	19.0	19.5	25.0	---	---	---	19.0
26	16.0	---	---	7.0	---	20.0	19.0	---	28.0	27.0	28.0	20.0
27	13.5	---	---	7.5	13.0	20.0	20.0	---	---	26.0	26.0	19.0
28	---	15.0	---	---	13.0	---	---	28.0	28.0	---	26.0	19.0
29	17.0	14.0	---	---	---	---	21.5	29.0	---	27.5	26.5	---
30	---	12.5	---	8.0	---	---	---	29.0	---	27.5	26.0	19.0
31	18.0	---	---	---	---	18.0	---	29.0	---	28.0	27.0	---
MEAN	19.3	14.7	10.5	6.8	11.8	16.0	20.9	24.5	27.5	28.8	27.1	23.7

RED RIVER BASIN

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07343500 WHITE OAK CREEK NEAR TALCO, TX

LOCATION.--Lat 33°19'20", long 95°05'33", Titus County, Hydrologic Unit 11140300, near center of main channel at downstream side of bridge on U.S. Highway 271, 0.8 mi downstream from Lewis Creek, 2.4 mi upstream from Ripley Creek, 2.7 mi south of Talco, and 38.4 mi upstream from mouth.

DRAINAGE AREA.--494 mi<sup>2</sup>.

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

Water-quality records.--Chemical analyses: October 1967 to June 1989. Chemical and biochemical analyses: November 1982 to September 1985. Specific conductance: Recorded continuously from October 1967 to September 1989. Water Temperature: Recorded continuously from October 1967, to September 1989.

REVISED RECORDS.--WSP 1711: Elevation of historical maximum.

GAGE.--Water-stage recorder. Datum of gage is 286.45 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. There are several small diversions upstream from station for municipal supply. The cities of Sulphur Springs and Mount Vernon discharged sewage effluent into tributaries above this station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--41 years (water years 1951-91), 465 ft<sup>3</sup>/s (12.78 in/yr), 336,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 48,000 ft<sup>3</sup>/s Dec. 11, 1971 (gage height, 21.20 ft), from rating curve extended above 23,000 ft<sup>3</sup>/s; no flow at times in 1954, 1956, 1964-65, 1969-73, 1976, 1978-79, and 1988.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, 22.9 ft Mar. 31, 1945, from floodmarks and from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 15	1030	*8,030	*17.72				

Minimum discharge, 3.2 ft<sup>3</sup>/s Aug. 31, Sept. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	7.9	9.5	1200	1320	145	645	92	856	68	39	e12	3.4		
2	7.6	9.0	777	793	127	917	77	767	55	32	e10	3.8		
3	7.5	8.5	851	453	113	1190	61	874	48	28	e8.0	33		
4	7.2	8.9	1360	343	105	1140	52	1490	44	295	e7.0	80		
5	6.3	10	1710	320	298	1060	48	2220	50	384	e6.2	76		
6	5.7	10	1760	345	867	627	45	2870	70	415	e5.6	49		
7	5.4	10	1700	716	1300	326	49	2990	48	310	e5.2	35		
8	5.4	29	977	1030	1430	242	66	2560	36	116	e4.7	21		
9	8.6	370	360	1140	1420	195	196	1920	31	49	e6.0	12		
10	193	938	216	1600	1100	161	205	1170	178	30	e15	9.6		
11	431	1590	166	2410	510	142	148	473	539	21	e20	11		
12	455	2380	134	3130	285	128	1160	270	784	18	e18	21		
13	281	2960	117	3270	224	116	2680	205	683	13	e16	16		
14	94	1880	104	2570	193	107	5940	168	232	12	e13	10		
15	44	618	96	1920	170	101	7410	241	85	11	e10	8.4		
16	29	168	88	1480	148	93	5920	407	58	11	e8.0	9.1		
17	20	76	82	1320	124	106	4480	506	48	9.7	e6.6	6.7		
18	16	54	550	1170	120	159	2990	409	190	8.2	e5.4	5.6		
19	13	45	941	1290	586	171	1820	245	367	7.5	e5.0	7.0		
20	11	38	976	1460	951	147	887	187	255	6.7	e10	10		
21	11	34	815	1490	1060	119	362	146	194	6.0	14	13		
22	10	46	855	1360	1750	98	287	112	87	5.5	17	19		
23	9.7	340	1010	1260	4620	92	322	95	43	5.3	20	51		
24	9.6	531	907	855	6780	87	251	85	41	5.2	e19	36		
25	9.3	642	604	466	5490	83	314	100	97	6.0	e15	23		
26	12	610	312	343	3530	79	457	288	456	15	e10	19		
27	14	515	742	293	2080	72	416	506	593	30	e7.0	19		
28	13	1350	1330	246	1050	67	814	600	372	7.7	e5.0	35		
29	12	1460	1710	212	---	65	1340	543	126	6.7	4.2	38		
30	11	1480	1740	187	---	67	1080	219	55	11	4.0	24		
31	10	---	1650	164	---	87	---	97	---	14	3.5	---		
TOTAL	1770.2	18219.9	25840	34956	36576	8689	39969	23619	5933	1928.5	310.4	704.6		
MEAN	57.1	607	834	1128	1306	280	1332	762	198	62.2	10.0	23.5		
MAX	455	2960	1760	3270	6780	1190	7410	2990	784	415	20	80		
MIN	5.4	8.5	82	164	105	65	45	85	31	5.2	3.5	3.4		
AC-FT	3510	36140	51250	69340	72550	17230	79280	46850	11770	3830	616	1400		
CFSM	.12	1.23	1.69	2.28	2.64	.57	2.70	1.54	.40	.13	.02	.05		
IN.	.13	1.37	1.95	2.63	2.75	.65	3.01	1.78	.45	.15	.02	.05		
CAL YR 1990	TOTAL	380611.9	MEAN	1043	MAX	24900	MIN	1.9	AC-FT	754900	CFSM	2.11	IN.	28.66
WTR YR 1991	TOTAL	198515.6	MEAN	544	MAX	7410	MIN	3.4	AC-FT	393800	CFSM	1.10	IN.	14.95

e Estimated

RED RIVER BASIN

07344200 WRIGHT PATMAN LAKE NEAR TEXARKANA, TX

LOCATION.--Lat 33°18'16", long 94°09'38", Bowie-Cass County line, Hydrologic Unit 11140302, in intake structure of Wright Patman Dam on the Sulphur River, 0.5 mi upstream from U.S. Highway 59, 10 mi southwest of Texarkana, and 44.5 mi upstream from mouth.

DRAINAGE AREA.--3,443 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1953 to current year. Published as Texarkana Reservoir prior to October 1970 and as Lake Texarkana from October 1970 to September 1972.

Water-quality records.--Chemical and biochemical analyses: March 1967 to September 1984.

REVISED RECORDS.--WSP 1561: 1957(M). WSP 1711: 1959(M).

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). July 19 to Dec. 31, 1953, nonrecording gage at site about 125 ft upstream at datum 200 ft higher.

REMARKS.--The lake is formed by a rolled earthfill dam 18,500 ft long, including a 200-foot uncontrolled spillway and a 1-mile long dike. Temporary impoundment of water began July 2, 1953, and deliberate impoundment began June 27, 1956. The dam was completed in December 1957. The flood-control outlet works consist of two 20.0-foot-diameter conduits controlled by four 10.0- by 20.0-foot electrically driven broome-type gates. Flow is affected at times by discharge from the flood-detention pools of 25 floodwater-retarding structures with a combined detention capacity of 13,450 acre-ft. These structures control runoff from 40.0 mi<sup>2</sup> in the Sulphur River and Langford Creek drainage basins. Outflow discharging over the spillway passes into an outlet channel and then to the Sulphur River. The lake was built for flood control and for conservation. An unknown amount of water is diverted for industrial and municipal uses. The capacity table is based on a 1948 survey. 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.....	286.0	-
Crest of spillway.....	259.5	2,654,300
Top of conservation pool.....	220.0	145,300
Lowest gated outlet (invert).....	200.0	2,600

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,912,100 acre-ft May 9, 1966 (elevation, 252.64 ft); minimum since first appreciable storage and after deliberate impoundment began, 137,500 acre-ft Sept. 5, 1958.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 553,200 acre-ft May 10 (elevation, 232.80 ft); minimum daily, 171,300 acre-ft Mar. 27 (elevation, 221.22 ft).

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

221.0	166,400	229.0	399,700	232.0	518,400
224.0	240,200	230.0	437,200	233.0	562,100
227.0	330,300	231.0	476,800		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	271100	199200	220500	260900	238000	236100	179500	465600	386300	346300	314200	311000
2	269300	195300	220500	257500	222900	243800	179700	477700	379900	346000	313500	314200
3	269600	190000	216400	254100	206600	248500	182300	502400	371800	345000	312900	319000
4	268200	188100	212300	251800	201100	247600	183400	519300	366200	349400	311600	320600
5	266400	180200	210300	251000	194100	244900	184100	539100	361700	348300	310700	319900
6	265000	177400	209600	257800	188300	238000	185100	543900	357900	347700	309400	318700
7	263500	174500	210100	252100	188100	230800	185800	545300	356500	347300	308500	317700
8	262800	177900	210300	244300	189500	233700	186200	545300	354800	346300	308200	315800
9	276700	188600	211300	239600	193800	233200	186200	549700	353400	344000	310400	313500
10	275500	195300	212300	243500	199900	229400	185300	553200	354500	341900	309400	311600
11	274300	203100	214400	243500	207300	225200	185300	552800	357200	339300	308200	309400
12	273400	210600	214400	242100	217200	218400	208000	550500	357900	335600	307200	308800
13	272600	217700	213600	242700	227600	211800	228100	544800	359600	332000	307500	308200
14	272000	223400	209300	245700	236900	202800	243500	537800	361700	327700	307800	305300
15	267900	226800	204300	260600	244000	197200	256300	528700	364100	325100	306900	303800
16	262100	228600	198200	273400	249300	193100	266400	516700	367200	323200	306600	300700
17	254900	230200	196700	285700	252100	190500	275800	502400	367600	321600	306000	298200
18	248700	230000	195800	295700	250700	185500	297300	486600	367600	319000	304700	293000
19	242700	229200	197900	302800	247100	181600	333000	473200	367600	317700	304100	294200
20	237200	226800	204300	306000	233700	178600	367900	457600	365500	317100	302800	291700
21	235300	225500	214400	306900	220300	176500	400400	441100	362700	316100	302200	289600
22	230800	227000	222100	305300	227300	176500	414100	434900	360600	315500	302500	286600
23	227300	225700	224900	302200	227600	173600	419700	424200	356800	314500	301600	283300
24	223400	224700	228100	298800	226800	172200	420500	421600	354500	313200	300400	282100
25	219200	223600	232900	294200	226500	171800	420100	416300	352400	312600	299100	278800
26	216400	222600	238600	289900	224700	171800	414500	404100	351400	315500	298500	275200
27	214100	222900	245100	284800	223900	171300	414100	403400	351000	317100	297600	272600
28	211100	223600	249300	277900	225200	174200	413300	402300	351000	317400	297000	269300
29	208800	224200	254100	272800	---	175600	448100	397500	350000	316100	295700	266400
30	206100	222300	257500	261800	---	177700	458000	394200	347700	315500	295300	263800
31	204600	---	259200	251000	---	178800	---	391000	---	315100	310100	---
MAX	276700	230200	259200	306900	252100	248500	458000	553200	386300	349400	314200	320600
MIN	204600	174500	195800	239600	188100	171300	179500	391000	347700	312600	295700	263800
(+)	222.63	223.33	224.68	224.39	223.44	221.55	230.53	228.26	227.52	226.53	226.37	224.84
(Φ)	-68000	+17700	+36900	-8200	-25800	-46400	+279200	-67000	-43300	-32600	-5000	-46300
CAL YR 1990	MAX	1871000	MIN	158800	(Φ)	-8200						
WTR YR 1991	MAX	553200	MIN	171300	(Φ)	-8800						

(+) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



RED RIVER BASIN

123

07344210 SULPHUR RIVER NEAR TEXARKANA, TX

LOCATION.--Lat 33°18'20", Long 94°09'03", Bowie County, Hydrologic Unit 11140302, on downstream side of highway embankment near left end of downstream (northbound) bridge on U.S. Highway 59, 0.4 mi downstream from Texarkana Dam, 1.4 mi upstream from Elliott Creek, 11.7 mi southwest of Texarkana, and at mile 44.1.

DRAINAGE AREA.--3,443 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1985 to current year (midnight elevations). August 1937 to July 1953 and October 1953 to September 1979 (daily gage heights); January to December 1933, January 1937 to December 1942, and January 1945 to September 1979 (discharge measurements); January to December 1939 and January 1945 to September 1979 (daily discharges) published by U.S. Army Corps of Engineers; October 1979 to September 1985 (daily discharges).  
Water-quality records.--Chemical and biochemical analyses: January 1983 to September 1985.

GAGE.--Water-stage recorder. Datum of gage is 180.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Elevation records good, except those for estimated elevations, which are fair. Station was converted from a daily discharge to daily elevation station on Oct. 1, 1985.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,100 ft<sup>3</sup>/s June 16 to July 5, 1981; maximum gage height, 32.57 ft June 15, 1981; no flow June 25, 1980.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge, 94,000 ft<sup>3</sup>/s Apr. 4, 1945; maximum stage, 47.23 ft Apr. 14, 1945; no flow on various occasions.

EXTREMES FOR CURRENT YEAR.--Maximum elevation, 212.12 ft at 1600 hours May 5; minimum, 189.76 ft Apr. 2.

ELEVATION (FEET NGVD), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	193.56	197.60	205.21	208.90	211.53	211.45	189.92	211.80	207.42	195.51	190.00	190.05
2	193.57	200.71	205.40	e209.72	211.49	211.38	189.77	211.83	207.33	194.61	189.98	190.10
3	193.62	201.45	205.43	e210.38	211.43	211.40	189.83	211.92	207.20	194.47	189.96	191.37
4	193.61	201.67	205.41	210.34	210.23	211.41	190.15	212.09	205.75	194.62	189.95	194.31
5	193.57	199.53	205.41	210.52	209.98	211.47	190.28	212.07	203.04	194.65	189.94	196.94
6	193.53	196.94	205.42	210.65	209.83	211.41	190.09	212.06	e199.71	194.52	189.94	197.46
7	193.54	193.99	205.39	e211.58	208.70	211.38	189.98	212.01	e196.02	194.46	189.95	197.45
8	193.52	192.01	205.40	e211.46	207.88	211.15	189.95	211.95	194.67	196.80	189.92	197.38
9	197.17	193.17	205.41	e211.46	206.30	209.95	189.90	212.04	194.37	197.23	190.06	197.26
10	199.54	192.78	205.42	e211.46	204.29	209.77	189.82	212.07	194.37	197.27	189.95	197.24
11	201.41	191.79	205.47	e211.47	201.62	209.72	189.80	212.06	194.40	197.28	189.92	195.25
12	202.30	191.39	205.49	211.48	e198.52	209.67	197.56	212.06	196.64	197.22	189.91	191.08
13	202.51	193.04	205.46	211.50	195.96	209.60	199.34	212.02	197.36	197.20	189.99	191.39
14	202.58	196.00	205.43	211.55	194.56	208.06	200.81	212.00	197.46	197.18	189.94	193.51
15	205.42	198.17	205.38	e211.61	196.51	207.25	201.01	212.03	197.48	194.99	189.96	193.79
16	206.34	201.23	205.34	211.65	e199.14	207.03	201.86	212.02	197.48	194.08	190.00	196.21
17	206.67	201.95	203.23	211.70	e201.43	205.41	203.28	211.95	197.50	193.96	189.92	196.62
18	204.89	202.18	202.54	211.73	e204.73	204.22	205.82	211.89	197.49	192.12	189.89	196.70
19	203.39	202.27	202.26	211.76	e208.84	203.45	208.93	211.85	197.47	190.60	189.88	196.83
20	202.76	202.30	202.09	211.77	210.88	202.81	208.68	211.82	199.61	190.23	189.88	196.83
21	202.53	202.31	204.40	211.72	211.20	200.79	207.67	211.78	200.08	190.18	189.87	196.75
22	202.33	202.51	e205.58	211.72	211.45	199.88	210.66	210.76	200.18	190.14	189.86	196.66
23	200.43	202.56	e205.62	211.75	211.39	197.12	211.49	210.46	200.20	190.10	189.87	196.60
24	199.77	202.51	e205.68	211.76	211.35	196.42	211.58	209.38	200.20	190.07	189.86	196.57
25	199.51	202.48	205.70	211.76	211.25	196.28	211.64	209.06	198.38	190.10	189.85	196.51
26	197.11	202.41	205.95	211.76	211.24	193.85	211.62	209.95	197.71	190.08	189.82	196.47
27	196.40	202.45	208.15	e211.73	211.27	191.78	211.66	207.56	197.56	190.08	189.82	196.42
28	196.24	202.58	208.62	e211.65	211.34	189.97	211.87	206.13	197.48	190.06	189.83	196.40
29	196.19	202.47	208.78	e211.63	---	190.01	211.93	207.06	197.42	190.03	189.81	196.38
30	196.17	204.46	208.82	e211.66	---	190.47	211.85	207.45	197.38	190.03	190.04	194.40
31	196.17	---	208.85	211.60	---	190.19	---	207.48	---	190.02	189.96	---
MAX	206.67	204.46	208.85	211.77	211.53	211.47	211.93	212.09	207.42	197.28	190.06	197.46
MIN	193.52	191.39	202.09	208.90	194.56	189.97	189.77	206.13	194.37	190.02	189.81	190.05
CAL YR 1990	MAX	211.94	MIN	186.30								
WTR YR 1991	MAX	212.09	MIN	189.77								

e Estimated

RED RIVER BASIN

07344482 BIG CYPRESS CREEK NEAR WINNSBORO, TX

LOCATION.--Lat 33°01'24", long 95°16'12", Franklin County, Hydrologic Unit 11140305, on left bank at downstream side of bridge on State Highway 37, 0.3 mi downstream from Glade Branch, 1.8 mi upstream from Little Cypress Creek, 4.7 mi north of Winnsboro, and 146.5 mi upstream from mouth.

DRAINAGE AREA.--27.2 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1974 to September 1991 (discontinued).

REVISED RECORDS.--WRD TX-89-1: 1985-88.

GAGE.--Water-stage recorder. Datum of gage is 375.83 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good. Flow slightly affected by Lake Franklin located 1.4 mi upstream on Glade Branch. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years (water years (1975-91), 23.4 ft<sup>3</sup>/s (11.68 in/yr), 16,950 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,290 ft<sup>3</sup>/s Nov. 26, 1988 (gage height, 12.91 ft); no flow at times in water years 1974, 1978-80, 1982, and 1984-88.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 27	2315	1,370	10.90	Apr. 12	1115	*1,850	*11.22
Dec. 18	0915	1,370	10.90	Apr. 13	2315	1,520	11.00
Dec. 27	0515	1,290	10.84	May 3	1345	1,550	11.02
Jan. 10	1030	1,590	11.05	May 5	0615	1,300	10.85
Feb. 22	1500	1,740	11.15				

Minimum daily discharge, 0.36 ft<sup>3</sup>/s Sept. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.6	2.1	7.4	20	12	122	5.3	13	4.2	2.3	3.4	2.7		
2	1.7	2.0	7.0	25	12	50	5.0	11	4.2	2.2	3.3	2.7		
3	2.0	2.2	7.1	26	12	19	4.9	965	4.1	2.3	3.2	5.3		
4	1.8	4.0	6.0	21	16	13	4.4	711	4.1	5.7	3.1	2.5		
5	1.6	3.6	5.9	18	144	12	4.3	595	3.9	3.2	3.1	2.3		
6	1.7	2.4	5.5	88	148	10	5.8	49	4.4	2.4	3.0	2.2		
7	2.1	2.1	5.4	120	43	8.3	51	23	4.0	2.2	2.5	2.3		
8	4.0	17	5.3	39	25	7.8	29	17	4.8	2.1	3.0	2.5		
9	11	59	5.9	33	19	7.5	10	17	5.2	2.6	3.1	2.2		
10	3.8	9.6	5.7	1290	16	7.1	7.6	20	4.4	2.2	3.2	2.1		
11	2.2	3.8	5.4	931	14	7.3	7.5	14	4.9	1.9	3.1	2.1		
12	1.8	2.9	5.9	84	14	7.6	1040	11	4.3	1.8	3.0	2.0		
13	1.8	2.6	5.0	42	14	6.3	442	9.5	3.9	1.6	3.1	2.0		
14	2.0	2.6	5.0	32	11	5.7	611	18	3.6	1.5	3.5	1.2		
15	1.8	2.6	5.3	95	9.3	6.4	55	104	3.4	1.4	3.2	1.1		
16	1.9	2.6	5.6	67	9.1	8.4	26	22	52	1.6	3.0	1.1		
17	1.9	2.6	13	31	12	10	19	11	14	1.5	3.0	.56		
18	1.7	2.7	717	57	18	8.3	25	33	5.1	1.5	3.2	.39		
19	1.5	2.9	50	154	60	7.0	18	19	3.7	1.6	2.9	.37		
20	1.8	2.8	19	59	24	7.0	14	10	3.1	1.6	2.8	.39		
21	3.1	2.8	85	28	14	6.8	13	7.7	3.0	1.5	2.7	.40		
22	2.9	73	96	22	1050	7.5	14	8.8	2.9	1.4	2.8	.36		
23	2.1	39	23	19	248	6.6	14	8.5	3.2	1.4	2.6	.41		
24	1.8	7.2	15	32	45	5.5	13	7.0	9.6	1.5	2.6	1.3		
25	1.7	5.0	16	30	23	5.3	13	73	11	3.1	2.4	1.5		
26	1.7	5.1	43	21	17	5.6	13	14	3.7	4.0	2.3	1.4		
27	1.8	308	605	19	14	5.8	18	6.7	2.8	3.3	2.3	1.4		
28	1.8	375	68	18	13	8.3	59	5.1	2.7	3.3	2.3	1.3		
29	1.9	16	44	17	---	22	200	4.6	3.0	3.1	2.2	1.0		
30	2.1	9.0	51	15	---	9.3	23	4.4	2.5	2.3	2.5	1.0		
31	2.1	---	25	13	---	6.2	---	4.3	---	2.6	3.2	---		
TOTAL	72.7	972.2	1963.4	3466	2056.4	419.6	2764.8	2816.6	185.7	70.7	89.6	48.08		
MEAN	2.35	32.4	63.3	112	73.4	13.5	92.2	90.9	6.19	2.28	2.89	1.60		
MAX	11	375	717	1290	1050	122	1040	965	52	5.7	3.5	5.3		
MIN	1.5	2.0	5.0	13	9.1	5.3	4.3	4.3	2.5	1.4	2.2	.36		
AC-FT	144	1930	3890	6870	4080	832	5480	5590	368	140	178	95		
CFSM	.09	1.19	2.33	4.11	2.70	.50	3.39	3.34	.23	.08	.11	.06		
IN.	.10	1.33	2.69	4.74	2.81	.57	3.78	3.85	.25	.10	.12	.07		
CAL YR 1990	TOTAL	15242.1	MEAN	41.8	MAX	1320	MIN	1.4	AC-FT	30230	CFSM	1.54	IN.	20.85
WTR YR 1991	TOTAL	14925.78	MEAN	40.9	MAX	1290	MIN	.36	AC-FT	29610	CFSM	1.50	IN.	20.41

RED RIVER BASIN

07344484 LAKE CYPRESS SPRINGS NEAR MOUNT VERNON, TX

LOCATION.--Lat 33°03'22", Long 95°08'22", Franklin County, Hydrologic Unit 11140305, in brick meter house located on upstream side and near center of dam on Big Cypress Creek, 1.5 mi upstream from Andy's Creek, 2.6 mi downstream from Panther Creek, and 10.3 mi southeast of Mount Vernon.

DRAINAGE AREA.--75.0 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1974 to September 1991 (discontinued).  
Water-quality records.--Chemical analyses: October 1974 to September 1984.

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

REMARKS.--The lake is formed by a rolled earthfill dam 5,230 ft long. Deliberate impoundment began July 7, 1970, and the dam was completed Feb. 15, 1971. The spillway is an excavated channel through natural ground 1,000 ft wide located to the left of left end of dam. The service spillway is a rectangular 23- by 23-foot drop inlet located near the right end of dam. The low-flow outlet works consist of an 18-inch-diameter concrete pipe that has duplicate valve controls and discharges into the service spillway conduit. 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.....	397.0	-
Crest of spillway.....	385.0	100,400
Crest of spillway.....	378.0	72,850
Lowest gated outlet (invert).....	317.75	0

COOPERATION.--The capacity table, provided by the Franklin County Water District, was based on data prepared by Wisenbaker, Fix, and Associates, Consulting Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 85,050 acre-ft Dec. 26, 1988 (elevation, 381.33 ft); minimum, 59,440 acre-ft Nov. 12-14, 1978 (elevation, 373.79 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 78,760 acre-ft Jan. 11 at 1600 hours (elevation, 379.67 ft); minimum, 71,460 acre-ft Sept. 30 (elevation, 377.59 ft).

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

377.0	69,490	379.0	76,340
378.0	72,850	380.0	79,980

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	72480	72440	74930	75000	74230	75740	73880	e74230	e73540	73500	72410	71930
2	72410	72440	74750	74930	74160	75670	73740	e74820	e73500	73400	72380	72170
3	72410	72440	74540	73260	74160	75380	73740	e76990	e73500	73430	72340	72170
4	72380	72380	74330	74680	74090	75210	73740	e78360	73470	73500	72240	72170
5	72380	72380	74190	74580	74820	75070	73740	e78390	73400	73430	72240	72170
6	72270	72380	74060	74610	75070	74860	73740	77700	73370	73370	72200	72170
7	72340	72340	73990	74750	75070	74650	73780	e77040	73400	73300	72100	72170
8	72410	73160	73880	74750	75070	74510	73920	76670	73370	73230	72100	72170
9	72720	73640	73810	75030	74930	74400	73920	e76230	73330	73190	72100	72170
10	72720	73640	73710	78180	74790	74300	73850	e75840	73500	73090	72070	72170
11	72680	73640	73670	78760	74650	74190	73740	e75560	73500	73020	72030	72140
12	72680	73640	73640	78180	74540	74060	71730	e75310	73430	72920	72000	72100
13	72680	73640	73570	77490	74510	73950	77880	e75110	73400	72890	72000	72070
14	72680	73610	73540	77010	74190	73880	78210	e74890	73330	72820	72000	72030
15	72680	73500	73500	77000	74090	73780	77590	e74680	73260	72750	72000	72000
16	72680	73500	73470	76670	73990	73780	77030	e74580	73540	72720	72000	72000
17	72580	73400	74400	76130	73990	73880	76620	e74470	73570	72680	72170	71970
18	72580	73370	75240	75980	73990	73880	e76130	e74370	73540	72610	72100	71900
19	72550	73370	75240	75980	74060	73780	e75810	e74300	73470	72510	72100	71830
20	72480	73330	75240	75950	74060	73780	e75520	e74190	73400	72410	72070	71690
21	72480	73190	75170	75630	74060	73780	e75280	e74120	73370	72340	72030	71630
22	72480	73540	75240	75420	76870	73850	75070	e74020	73370	72340	72000	71590
23	72480	74020	75100	75210	77000	73850	e74860	e73950	73330	72270	71970	71560
24	72480	74020	74860	75170	76820	73780	e74680	e73880	74090	72580	71970	71730
25	72440	74020	74680	75030	76230	73740	e74510	e73850	74060	72580	71900	71690
26	72440	74020	75100	74890	75810	73740	e74330	e73780	73950	72580	71860	71630
27	72440	75030	75450	74750	75560	73780	e74260	e73740	73880	72550	71860	71590
28	72440	75450	75450	74610	75310	73990	e74230	e73670	73780	72550	71790	71520
29	72440	75420	75490	74540	---	73990	e74230	e73640	73640	72510	71760	71490
30	72440	75170	75380	74370	---	73950	e74230	e73610	73540	72510	71790	71460
31	72440	---	75140	74330	---	73920	---	e73570	---	72440	71930	---
MAX	72720	75450	75490	78760	77000	75740	78210	78390	74090	73500	72410	72170
MIN	72270	72340	73470	73260	73990	73740	73740	73570	73260	72270	71760	71460
(†)	377.88	378.67	378.66	378.43	378.71	378.31	378.40	378.21	378.20	377.88	377.73	377.59
(Φ)	-70	+2730	-30	-810	+980	-1390	+310	-660	-30	-1100	-510	-470
CAL YR 1990	MAX	82620	MIN	70480	(Φ)	+4660						
WTR YR 1991	MAX	78760	MIN	71460	(Φ)	-1050						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

e Estimated

## RED RIVER BASIN

07344486 BRUSHY CREEK AT SCROGGINS, TX

LOCATION.--Lat 32°58'32", long 95°11'03", Franklin County, Hydrologic Unit 11140305, at downstream side of highway embankment near left end of bridge on Farm Road 115, 0.1 mi north of Scroggins, 0.3 mi downstream from Briary Creek, 2.5 mi upstream from South Brushy Creek, and 9.5 mi upstream from mouth.

DRAINAGE AREA.--23.4 mi<sup>2</sup>.

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

REVISED RECORDS.--WDR TX-89-1 1983-88 (M).

GAGE.--Water-stage recorder. Datum of gage is 343.90 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair, except those below 5.0 ft<sup>3</sup>/s and those for estimated daily discharges, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--13 years (water years 1979-91), 16.5 ft<sup>3</sup>/s (9.58 in/yr), 11,950 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,520 ft<sup>3</sup>/s, Dec. 2, 1982 (gage height, 14.39 ft); no flow in water years 1978, 1980, 1984-88.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 800 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 3	2215	*3,420	*13.79	No other peak greater than base discharge.			
Minimum discharge, 0.44 ft <sup>3</sup> /s July 11.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	4.8	5.0	11	24	11	117	14	7.0	6.5	3.9	1.7	e5.0		
2	4.8	4.7	11	24	11	58	12	5.6	6.1	4.7	1.8	e3.0		
3	4.3	4.8	13	24	10	30	11	659	6.2	5.7	1.9	e8.3		
4	4.7	5.3	12	22	14	23	13	475	7.3	22	1.8	e7.8		
5	4.5	9.6	11	21	141	21	10	279	6.7	2.0	1.8	e3.5		
6	4.9	6.3	11	37	120	19	13	91	8.8	1.4	1.9	e3.2		
7	5.4	5.3	11	48	38	16	23	37	7.9	.95	1.8	e2.8		
8	11	12	10	28	25	14	16	27	8.1	1.1	1.8	e3.1		
9	14	117	10	23	20	13	10	27	9.8	1.1	1.6	e4.7		
10	12	25	9.9	328	17	12	6.5	45	8.5	1.1	1.6	e3.2		
11	7.0	5.2	10	233	14	13	5.8	28	11	.71	1.5	e3.0		
12	5.6	4.0	11	60	15	14	192	19	11	1.2	1.8	e2.8		
13	5.3	4.4	11	35	14	11	150	16	8.6	1.3	1.7	e2.7		
14	5.4	5.3	10	30	12	10	230	13	7.1	1.1	2.0	e2.6		
15	6.1	5.3	10	44	8.3	10	48	53	6.8	.97	2.2	e2.5		
16	6.5	6.7	10	40	7.5	21	24	28	18	.95	1.7	e2.4		
17	6.0	6.9	13	26	10	19	17	17	15	1.1	1.6	2.2		
18	5.3	5.8	238	31	74	16	16	23	4.2	1.5	2.4	2.1		
19	5.1	7.2	64	65	119	13	13	21	2.7	1.9	2.1	2.0		
20	5.2	7.7	22	38	35	13	10	16	2.1	2.1	1.9	2.2		
21	7.4	7.6	34	25	22	12	10	15	2.1	2.2	1.7	2.3		
22	11	82	45	21	279	15	17	15	2.1	2.4	1.7	2.3		
23	7.8	103	20	19	159	17	15	16	2.5	2.6	1.8	2.2		
24	6.4	12	15	26	48	11	12	13	3.7	3.2	e1.9	3.0		
25	5.4	8.6	16	24	34	9.7	14	84	8.1	8.4	e1.7	5.0		
26	5.3	12	23	19	27	9.5	14	35	2.9	13	e1.6	4.0		
27	5.3	36	213	18	23	12	19	15	2.4	2.8	e1.6	2.7		
28	5.4	129	48	16	21	18	18	11	2.5	1.9	e1.5	2.8		
29	5.2	17	33	16	---	82	25	9.2	3.0	1.9	e1.6	2.9		
30	5.1	12	33	14	---	30	11	8.2	3.1	1.8	e1.5	3.6		
31	5.1	---	26	13	---	16	---	7.7	---	1.8	e2.1	---		
TOTAL	197.3	672.7	1014.9	1392	1328.8	695.2	989.3	2115.7	194.8	98.78	55.3	99.9		
MEAN	6.36	22.4	32.7	44.9	47.5	22.4	33.0	68.2	6.49	3.19	1.78	3.33		
MAX	14	129	238	328	279	117	230	659	18	22	2.4	8.3		
MIN	4.3	4.0	9.9	13	7.5	9.5	5.8	5.6	2.1	.71	1.5	2.0		
AC-FT	391	1330	2010	2760	2640	1380	1960	4200	386	196	110	198		
CFSM	.27	.96	1.40	1.92	2.03	.96	1.41	2.92	.28	.14	.08	.14		
IN.	.31	1.07	1.61	2.21	2.11	1.11	1.57	3.36	.31	.16	.09	.16		
CAL YR 1990	TOTAL	9643.1	MEAN	26.4	MAX	466	MIN	1.4	AC-FT	19130	CFSM	1.13	IN.	15.33
WTR YR 1991	TOTAL	8854.68	MEAN	24.3	MAX	659	MIN	.71	AC-FT	17560	CFSM	1.04	IN.	14.08

e Estimated

RED RIVER BASIN

07344489 LAKE BOB SANDLIN NEAR MOUNT PLEASANT, TX

LOCATION.--Lat 33°04'48", long 95°00'07", Titus County, Hydrologic Unit 11140305, in control room in left abutment of service spillway at left end of Fort Sherman Dam on Big Cypress Creek, 1.7 mi upstream from Tankersley Creek, 3.5 mi upstream from bridge on U.S. Highway 271, 5.7 mi southwest of the county courthouse in Mount Pleasant, and 129.2 mi upstream from mouth.

DRAINAGE AREA.--239 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder and data collection platform (DCP). Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Apr. 12, 1978, a nonrecording gage was located at same site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 10,800 ft long, including spillways. Deliberate impoundment began Aug. 8, 1977, and dam was completed by April 1978. The spillway is an excavated channel cut through natural ground. The spillway is 4,500 ft wide, located to the left of the left end of the dam. The service spillway is 289.5 ft wide with 160 ft of net flow width controlled by four 40- by 22.5-foot tainter gates. The dam was built, and is owned, maintained, and operated by the Titus County Fresh Water Supply District No. 1 to provide water for municipal use. Flow from 75.0 mi<sup>2</sup> above this station is controlled by Lake Cypress Springs on Big Cypress Creek and 36.0 mi<sup>2</sup> is controlled by Montecello Reservoir on Blundell Creek, a tributary to Big Cypress Creek. There is a stage telemeter (DCP) at station. Figures given herein represent total contents. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-ft)
Top of dam.....	349.0	-
Crest of uncontrolled spillway.....	341.3	251,000
Crest of gated spillway.....	316.5	64,790
Lowest gated outlet (invert).....	294.5	3,300

COOPERATION.--Area and capacity tables were compiled by Forest and Cotton, Inc., Consulting Engineers.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 222,800 acre-ft Mar. 17, 1987 (elevation, 338.49 ft); minimum, 516 acre-ft Aug. 8-17, 1977 (elevation, 290.00 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 216,200 acre-ft Feb. 22 at 0900 hours (elevation, 337.80 ft); minimum, 197,800 acre-ft Nov. 8 (elevation, 335.82 ft).

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

335.0	190,400	337.0	208,600
336.0	199,400	338.0	218,800

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	202000	198200	209200	210700	213200	213500	213300	213300	213100	213200	209500	204600
2	201800	198100	209600	211200	213300	213800	213100	213500	213300	212900	209200	205500
3	201700	198100	209900	211300	213300	213700	213300	215100	213000	213200	209100	205400
4	201400	198700	210100	211400	214000	213800	213300	214700	213100	214000	208600	205300
5	201100	198300	210100	211700	214300	213900	214100	213900	212900	213900	208200	205100
6	200900	198100	210400	212900	213500	213500	213500	214600	213300	213800	207900	204900
7	200900	198000	210500	212700	213400	213400	213500	213800	213300	213500	207700	204800
8	201100	200500	210700	212100	213500	213500	213300	213500	212800	213500	207700	204900
9	202000	201600	210800	213000	213400	213500	213300	214100	212800	213500	207300	204900
10	201500	201900	210900	214300	213300	213300	213200	214500	213500	213400	207200	204700
11	201200	202000	211100	213300	213300	213400	213400	214600	213400	213100	206800	204600
12	201100	202100	211300	213300	213500	213500	215000	214100	213300	212800	206500	204600
13	200800	202200	211300	213300	213600	213300	214100	213900	213300	212700	206800	204500
14	200500	202300	211300	213000	213500	213100	213600	214300	213300	212600	206700	204200
15	200400	202300	211400	213500	213300	213200	213500	213900	213200	212300	206500	204000
16	200100	202300	211500	213400	213300	213300	213900	213900	213700	211900	206400	204000
17	200000	202300	213200	213300	213700	213400	214200	213700	213500	211500	206400	203800
18	199600	202300	213800	213900	213900	213400	214300	213500	213400	211300	206400	203700
19	199300	202300	213600	213500	213500	213500	213900	213500	213900	210900	206300	203400
20	199000	202300	213700	213200	213300	213300	213500	213400	213900	210500	206000	203100
21	199700	202600	212400	213100	213500	213300	213300	213500	213900	210100	205800	203000
22	199400	204600	211500	213200	213900	213600	213200	213500	214200	209800	205700	202700
23	199200	205200	212200	213300	214300	214300	213000	213500	213700	209500	205500	202700
24	199000	205400	212200	213500	213500	213400	212800	214300	214500	209900	205400	203100
25	198900	205700	212400	213700	213800	214200	213900	213500	214400	210500	204900	202700
26	198800	205900	214300	213600	214100	213400	213700	213400	213900	210500	204700	202600
27	198700	207500	213800	213500	213800	213500	213700	213300	213900	210300	204500	202300
28	198600	208000	213700	213700	213600	213700	213300	213200	213700	210300	204200	202300
29	198500	208400	213000	213900	---	213800	213400	213300	213600	210100	203900	202200
30	198500	208800	210700	213200	---	213700	213300	213200	213300	209900	203800	202000
31	198300	---	210500	213200	---	213300	---	213200	---	209700	204600	---
MAX	202000	208800	214300	214300	214300	214300	215000	215100	214500	214000	209500	205500
MIN	198300	198000	209200	210700	213200	213100	212800	213200	212800	209500	203800	202000
(†)	335.88	337.02	337.20	337.48	337.53	337.50	337.50	337.48	337.50	337.12	336.56	336.28
(Φ)	-4000	+10500	+1700	+2700	+400	-300	0	-100	+100	-3600	-5100	-2600
CAL YR 1990	MAX	217100	MIN	187800	(Φ)	+22700						
WTR YR 1991	MAX	215100	MIN	198000	(Φ)	-300						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



## RED RIVER BASIN

07344500 BIG CYPRESS CREEK NEAR PITTSBURG, TX  
(Flood-hydrograph Partial-record Station)

LOCATION.--Lat 33°01'15", long 94°52'55", Camp-Titus County line, Hydrologic Unit 11140305, near center of stream at downstream side of bridge on State Highway 11, 0.5 mi upstream from Louisiana & Arkansas Railway Co. bridge, 1.4 mi upstream from Williamson Creek, 5.2 mi east of Pittsburg, 19.2 mi downstream from Lake Bob Sandlin, and 110.0 mi upstream from mouth.

DRAINAGE AREA.--366 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1943 to January 1963 (published as Cypress Creek near Pittsburg), October 1967 to September 1989. October 1989 to current year, (peaks above base discharge and annual maximum). Gage-height records collected at this site from September 1963 to December 1967, are published in reports by the U.S. Army Corps of Engineers.

Water-quality records.--Chemical analyses: March 1965 to August 1989. Chemical and biochemical analyses: January 1983 to September 1985.

REVISED RECORDS.--WSP 1211: Drainage area.

GAGE.--Water-stage recorder and data collection platform (DCP). Datum of gage is 247.49 ft above National Geodetic Vertical Datum of 1929. Prior to Nov. 12, 1954, water-stage recorder at site 1,900 ft downstream at present datum.

REMARKS.--Records good. Flow partly regulated by Lake Cypress Springs (station 07344484) since July 1970, and by Monticello Reservoir (on Blundell Creek) since August 1972. Flow largely regulated by Lake Bob Sandlin (station 07344489) since August 1977. Sewage effluent was returned to a tributary above this station by the city of Mount Pleasant, and sewage effluent was returned to a tributary below this station by the city of Pittsburg. Gage-height telemeter (DCP) at station.

AVERAGE DISCHARGE.--24 years (water years 1944-62, 1968-72), prior to combined regulation by Lake Cypress Springs and Monticello Reservoir, 327 ft<sup>3</sup>/s (12.13 in/yr), 236,900 acre-ft/yr; 17 years (water years 1973-89) regulated, 255 ft<sup>3</sup>/s (184,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 58,500 ft<sup>3</sup>/s Mar. 30, 1945 (gage height, 28.3 ft, from floodmark, and adjusted to present site on basis of record for flood of Apr. 27, 1958), from rating curve extended above 20,000 ft<sup>3</sup>/s; no flow Aug. 20 to Oct 3, 1954, July 19 to Nov. 4, 1956.  
Maximum stage since at least 1895, that of Mar. 30, 1945.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in January 1938 reached a stage of about 25 ft, present site, adjusted as explained above, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 10	0200	650	11.13	Mar. 2	1500	1,610	12.77
Nov. 24	1400	545	10.74	Mar. 30	1500	619	11.02
Nov. 29	1500	409	10.11	Apr. 14	0900	3,570	14.05
Dec. 23	0200	3,110	13.77	Apr. 27	0900	415	10.14
Dec. 28	1500	2,520	13.40	Apr. 30	0700	1,640	12.80
Jan. 11	1400	5,480	15.17	May 4	1400	*8,700	*16.84
Jan. 31	1300	704	11.31	May 13	2400	423	10.18
Feb. 7	0200	1,610	12.77	May 16	1800	470	10.41
Feb. 23	0700	7,270	16.14	May 26	2300	656	11.15

Minimum discharge, not determined.

RED RIVER BASIN

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07345600 BIG CYPRESS CREEK NEAR LONE STAR, TX

LOCATION.--Lat 32°54'11" long 94°43'16", Camp-Morris Counties, Hydrologic Unit 1140305, at upstream side of bridge at center of bridge span, 1.1 mi southwest of State Highways 259 and 729 intersection.

DRAINAGE AREA.--Not determined.

PERIOD OF RECORD.--July to September 1991.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARBONIC (MG/L AS CaCO3)
AUG 01...	1000	341	8.2	30.0	3.9	8.7	116	3.1	28	--	73	14
20...	1000	97	8.1	29.0	2.5	9.9	129	3.9	66000	<1000	81	16
SEP 04...	1235	427	7.4	29.0	2.5	8.9	116	3.9	K220	K20	91	23

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY, WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)
AUG 01...	19	6.1	30	2	9.2	59	45	32	209	177	4
20...	23	5.7	47	2	10	65	60	42	268	229	--
SEP 04...	27	5.7	43	2	12	68	63	42	248	236	4

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)
AUG 01...	0.380	0.020	0.400	0.030	0.57	0.60	0.090	0.010	0.020	9.2	<0.010
20...	1.45	0.050	1.50	0.050	0.95	1.0	0.080	0.020	0.030	8.5	--
SEP 04...	1.17	0.030	1.20	0.020	0.58	0.60	0.090	0.020	<0.010	7.8	<0.010

DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)
AUG 01...	--	--	--	--	--	--	--	--	--	2	--
20...	<1	86	<10	<1	<10	140	<100	46	<0.1	<1	11
SEP 04...	<1	80	<10	<1	<10	51	<100	5	<0.1	3	6

## RED RIVER BASIN

07345700 LAKE O' THE PINES AT HIGHWAY 155 BRIDGE NEAR ORE CITY, TX

LOCATION.--Lat 32°51'00", Long 94°42'03", Marion County, Hydrologic Unit 1140305, at downstream side of bridge, 2.25 mi west-southwest of Rock Island, and 3.6 mi north-northeast of Ore City.

DRAINAGE AREA.--850 mi<sup>2</sup>.

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1968 to September 1981, July to September 1991.

REMARKS.--The sampling site for this station is the same location as 32510009442031 Lake O' the Pines Site FC from inventories of October 1977 to September 1981.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)
AUG 01...	0815	106	6.8	30.0	2.0	8.4	112	2.3	K42	--	21	10
20...	1230	97	6.8	31.0	14	7.1	96	2.5	250	<1000	19	8
SEP 04...	1425	108	7.9	31.0	1.5	9.0	122	3.1	120	K1	14	7
DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT FIX END FIELD CaCO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	
AUG 01...	3.1	3.2	10	1	3.7	11	18	11	83	56	3	
20...	2.8	3.0	11	1	3.7	11	16	12	81	55	--	
SEP 04...	1.2	2.7	10	1	3.7	7.0	16	13	84	52	2	
DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	
AUG 01...	--	<0.010	<0.050	0.030	0.77	0.80	0.090	0.030	0.030	8.3	<0.010	
20...	0.120	0.020	0.140	0.090	0.81	0.90	0.120	0.020	0.050	8.8	--	
SEP 04...	--	<0.010	0.064	0.040	0.66	0.70	0.080	0.020	<0.010	9.7	<0.010	
DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)	
AUG 01...	1	36	<10	<1	<10	81	<100	99	<0.1	5	3	
20...	<1	35	<10	<1	<10	100	<100	140	0.1	<1	13	
SEP 04...	<1	26	<10	<1	<10	86	<100	20	<0.1	1	<3	

RED RIVER BASIN

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07345890 LAKE O' THE PINES ABOVE DAM NEAR JEFFERSON, TX

LOCATION.--Lat 32°45'18", long 94°30'01", Marion County, Hydrologic Unit 1140305, on left bank, 1,320 ft north of Ferrell's Bridge Dam gate structure, and 9.2 mi west of Jefferson.

DRAINAGE AREA.--850 mi<sup>2</sup>.

PERIOD OF RECORD.--Chemical and biochemical analyses: July to September 1991.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)	
JUL 31...	1230	88	7.9	31.5	3.3	8.3	112	1.2	K20	--	18	
AUG 20...	1515	102	8.0	32.0	1.0	8.5	117	2.8	220	K17000	22	
SEP 05...	0835	104	6.3	27.0	0.80	4.2	53	0.8	K4	91	21	
DATE	TIME	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)
JUL 31...	8	3.5	2.3	7.8	0.8	3.1	10	15	8.8	62	46	
AUG 20...	10	4.1	2.8	7.9	0.7	3.1	12	14	9.8	68	50	
SEP 05...	8	3.9	2.8	8.1	0.8	3.2	13	15	11	69	52	
DATE	TIME	RESIDUE TOTAL AT 105 DEG. C. SUSPENDED (MG/L)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)
JUL 31...	4	0.010	<0.050	0.030	0.27	0.30	0.030	<0.010	0.020	6.6	<0.010	
AUG 20...	--	0.020	<0.050	0.090	0.51	0.60	0.030	<0.010	0.020	7.6	--	
SEP 05...	14	<0.010	0.052	0.030	0.37	0.40	0.020	<0.010	<0.010	6.1	<0.010	
DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)
JUL 31...	--	--	--	--	--	--	--	--	--	--	2	--
AUG 20...	<1	27	<10	<1	<10	7	<100	4	<0.1	<1	<3	
SEP 05...	<1	34	<10	<1	<10	7	<100	5	<0.1	<1	8	

RED RIVER BASIN

07345900 LAKE O' THE PINES NEAR JEFFERSON, TX

LOCATION.--Lat 32°45'04", long 94°29'59", Marion County, Hydrologic Unit 11140305, on left bank 1,500 ft upstream from left end of Ferrell's Bridge Dam on Big Cypress Creek, on Farm Road 726, 9.0 mi west of Jefferson, and 80.1 mi upstream from mouth.

DRAINAGE AREA.--850 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1957 to current year.  
Water-quality records.--Chemical and biochemical analyses: October 1969 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Nov. 12, 1957, non-recording gage at same site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 10,600 ft long, including a 200-foot-wide concrete spillway. Impoundment of water began Aug. 21, 1957, and the dam was completed June 25, 1958. Official operation began Dec. 11, 1959. The flood-control outlet works consist of two 10.0-foot-diameter conduits that are controlled by two 8.0- by 12.5-foot electrically driven broome-type gates. The low-flow outlet works consist of a controlled 14-inch pipe. Flow over the spillway is discharged into a 2,000-foot-long rectified channel and then into Cypress Creek. The capacity table is based on a survey made in 1950. The lake was built for conservation, flood control, and water supply. During the current year, an unknown amount of water was diverted from the lake for municipal and industrial uses. 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.....	277.0	-
Crest of spillway.....	249.5	842,100
Top of conservation pool.....	228.5	254,900
Crest of intake to wet well (14 in).....	202.5	5,760
Lowest gated outlet (invert).....	200.0	2,860

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 694,360 acre-ft May 5, 1966 (elevation, 245.41 ft); minimum since December 1959, 210,100 acre-ft Oct. 6, 1984 (elevation, 225.98 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 384,300 acre-ft May 15 (elevation, 234.65 ft); minimum daily, 255,200 acre-ft Apr. 11 (elevation, 228.52 ft).

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

228.0	245,600	231.0	303,800	234.0	369,100
229.0	264,300	232.0	324,800	235.0	392,700
230.0	283,700	233.0	346,500		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	266800	258400	278600	294900	324300	304900	267300	275800	315700	286700	278800	273100
2	265800	257800	277400	295500	320300	304000	265400	274900	311300	286700	278800	272700
3	266000	257500	276200	293700	316300	303000	263300	279000	306900	286500	278000	273700
4	265400	258200	273700	290900	315000	301600	263900	295300	297100	285900	277000	273100
5	264500	257800	270400	290000	309800	300200	261600	324300	293500	285500	276800	272500
6	263300	257300	266600	293500	304900	298300	262400	343000	290900	285500	276400	271900
7	262400	256700	263900	290500	301000	295500	261200	353900	290300	285500	275800	271900
8	263300	266600	262400	288500	297900	292100	259200	361800	289600	285700	274900	271900
9	266600	269100	261200	291900	295900	288700	258000	370100	289000	285500	272300	271800
10	264500	267500	260300	295700	294100	284100	256300	374700	311100	285300	272100	271600
11	263500	267500	259400	303400	291900	279200	255200	378900	321600	284900	272900	271400
12	262900	269400	258600	314600	288900	273900	260900	381700	326300	284700	273300	271200
13	262400	274500	258400	326300	285900	269100	267900	382700	325800	284500	273900	271000
14	261800	274900	257800	335100	282500	263700	273500	384100	324300	283700	275200	270400
15	261200	274900	257800	343200	278600	260700	279700	384300	322200	282700	274900	270200
16	260900	273300	259200	348100	272900	257500	288100	381300	319500	282100	273500	270000
17	261400	272700	260300	352300	268100	257100	294900	377500	315300	281500	273500	270000
18	261100	271900	260900	356600	265800	256300	298500	374000	310900	280700	273300	270000
19	260500	271000	260100	359100	264300	256300	301000	371200	305500	280100	272900	269600
20	259700	270000	260500	361100	262000	256300	300600	368000	301400	279900	272500	269200
21	265200	269100	266400	360200	260100	256900	297700	364100	298500	279200	272100	268900
22	264100	279700	269100	357000	262200	258400	295300	360700	295100	278600	273100	268500
23	262900	279500	272100	354800	266800	258600	291300	356600	291700	278400	272100	268300
24	262200	279300	273700	352500	282100	258600	287700	353000	289000	279000	271600	271800
25	261400	279700	276200	350500	291700	258800	283900	350300	287900	280300	271000	271200
26	260900	280500	283700	348300	297500	259000	279500	344300	286900	280900	270400	270200
27	260300	283700	285100	344700	300600	259900	276200	339200	286300	280700	269800	269200
28	259900	283700	285300	340600	301400	266400	277800	334700	286100	280500	269400	268100
29	259400	282700	287300	337100	---	266900	277400	330100	286500	280300	268900	267100
30	259200	281700	292500	332900	---	266900	277000	325600	286700	280100	272100	266000
31	258800	---	293500	328600	---	267700	---	320700	---	279300	274100	---
MAX	266800	283700	293500	361100	324300	304900	301000	384300	326300	286700	278800	273700
MIN	258800	256700	257800	288500	260100	256300	255200	274900	286100	278400	268900	266000
(↑)	228.71	229.90	230.49	232.18	230.88	229.18	229.66	231.81	230.15	229.78	229.51	229.09
(Φ)	-8700	+22900	+11800	+35100	-27200	-33700	+9300	+43700	-34000	-7400	-5200	-8100
CAL YR 1990	MAX	458100	MIN	246100	(Φ)	+47800						
WTR YR 1991	MAX	384300	MIN	255200	(Φ)	-1500						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



RED RIVER BASIN

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07346000 BIG CYPRESS CREEK NEAR JEFFERSON, TX

LOCATION.--Lat 32°44'58", long 94°29'55", Marion County, Hydrologic Unit 11140306, on left bank 950 ft downstream from Ferrell's Bridge Dam, 7.6 mi upstream from French Creek, and 8.5 mi west of Jefferson.

DRAINAGE AREA.--850 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to September 1959 (published as Cypress Creek), October 1979 to current year. Records of stage and discharge for the period October 1959 to September 1979 published by the U.S. Army Corps of Engineers, New Orleans District.

GAGE.--Water-stage recorder. Datum of gage is 180.00 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers benchmark). Prior to Nov. 2, 1933, staff gage, and Nov. 2, 1933, to Dec. 8, 1955, water-stage recorder, at site about 950 ft upstream at datum 3.70 ft higher. After Dec. 9, 1955, at site about 550 ft downstream or at present site at datum 180.00 ft lower.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow completely regulated by Lake O' the Pines (station 07345900), 950 ft upstream, since August 1957. Gage-height telemeter at station.

AVERAGE DISCHARGE.--33 years (water years 1925-57), prior to completion of Ferrells Bridge Dam, 660 ft<sup>3</sup>/s (478,200 acre-ft/yr); 14 years (water years-1959, 1980-91) regulated, 670 ft<sup>3</sup>/s (485,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 57,100 ft<sup>3</sup>/s Apr. 1, 1945 (gage height, 28.78 ft, site and datum then in use), from rating curve extended above 29,000 ft<sup>3</sup>/s; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,820 ft<sup>3</sup>/s Feb. 13 at 1515 hours (gage height, 19.36 ft); minimum daily, 24 ft<sup>3</sup>/s Sept. 8-9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	330	174	1730	2160	2760	2160	1610	2530	2720	33	90	82
2	329	176	1770	2430	2760	2630	1780	2520	2710	32	90	80
3	330	176	1760	2700	2770	2630	1820	2270	2700	32	90	83
4	330	175	1770	2710	2730	2630	1820	1670	2430	33	90	83
5	332	176	1760	2690	2730	2650	1550	1200	1810	32	90	82
6	326	176	1560	2710	2710	2640	1230	734	1140	31	90	71
7	329	177	1150	2700	2700	2620	1450	305	726	31	90	26
8	329	182	741	2690	2700	2650	1550	81	459	30	89	24
9	333	225	670	2740	2700	2700	1220	85	423	47	89	24
10	331	207	654	2570	2710	2690	1050	94	448	95	89	25
11	328	185	648	2130	2750	2680	569	.73	645	96	89	25
12	327	183	515	1590	2790	2670	608	250	1020	95	88	25
13	323	236	361	1140	2790	2650	597	563	1560	95	89	25
14	323	472	350	620	2770	2420	414	945	1930	93	90	25
15	324	630	345	293	2750	1630	125	1610	1990	93	65	26
16	324	672	344	95	2720	1060	35	2300	1980	93	33	26
17	260	678	352	193	2730	606	243	2620	2390	92	77	26
18	179	677	363	493	2710	324	543	2630	2750	92	77	26
19	174	679	362	892	2710	241	918	2620	2770	92	77	26
20	173	680	355	1500	2690	237	1460	2630	2460	93	78	27
21	181	679	460	2310	2310	237	2150	2620	2000	92	78	28
22	181	741	696	2720	1950	236	2520	2630	1950	92	79	28
23	177	791	711	2760	1910	234	2540	2620	1930	92	80	29
24	174	730	705	2760	1890	232	2530	2630	1650	93	80	162
25	174	702	699	2730	1640	232	2540	2680	1160	110	80	300
26	174	691	881	2730	1160	231	2550	2630	714	98	80	304
27	174	804	e1280	2720	1020	230	2550	2600	387	93	80	352
28	172	1200	e1890	2700	1530	240	2560	2580	171	91	81	550
29	173	1260	1850	2700	---	361	2600	2670	37	91	81	570
30	172	1440	1750	2680	---	550	2550	2740	34	91	96	572
31	173	---	1880	2720	---	933	---	2740	---	90	85	---
TOTAL	7959	15974	30362	64576	68090	44234	45682	56870	45094	2363	2560	3732
MEAN	257	532	979	2083	2432	1427	1523	1835	1503	76.2	82.6	124
MAX	333	1440	1890	2760	2790	2700	2600	2740	2770	110	96	572
MIN	172	174	344	95	1020	230	35	73	34	30	33	24
AC-FT	15790	31680	60220	128100	135100	87740	90610	112800	89440	4690	5080	7400
CAL YR 1990	TOTAL	344865	MEAN	945	MAX	3000	MIN	28	AC-FT	684000		
WTR YR 1991	TOTAL	387496	MEAN	1062	MAX	2790	MIN	24	AC-FT	768600		

e Estimated

## RED RIVER BASIN

07346000 BIG CYPRESS CREEK NEAR JEFFERSON, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1983 to September 1985, July to September 1991.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)
JUL 31...	1400	91	105	6.8	27.0	3.6	6.7	84	1.5	K19	--	26
AUG 21...	0755	78	125	6.8	26.5	3.5	6.8	85	1.7	K12000	K24000	27
SEP 05...	1000	81	117	6.2	27.0	2.6	6.7	84	1.2	K33	440	25
DATE	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	
JUL 31...	1	6.0	2.7	7.4	0.6	3.1	25	11	8.8	78	55	
AUG 21...	1	6.1	2.8	7.8	0.7	3.1	26	11	9.6	85	56	
SEP 05...	4	5.2	2.9	8.0	0.7	3.3	21	13	11	74	54	
DATE	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS DIS-SOLVED (MG/L AS P)	PHOSPHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	
JUL 31...	4	<0.010	<0.050	0.220	0.48	0.70	0.040	0.020	0.020	7.4	<0.010	
AUG 21...	--	0.010	<0.050	0.320	0.58	0.90	0.040	0.020	<0.010	7.6	--	
SEP 05...	<1	<0.010	<0.050	0.240	0.36	0.60	0.040	0.010	<0.010	6.3	<0.010	
DATE	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)	
JUL 31...	2	110	<10	4	<10	1300	<100	2300	<0.1	2	4	
AUG 21...	2	110	<10	<1	<10	980	<100	2400	<0.1	2	<3	
SEP 05...	1	82	<10	<1	<10	380	<100	1600	<0.1	1	8	

RED RIVER BASIN

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07346045 BLACK CYPRESS BAYOU AT JEFFERSON, TX

LOCATION.--Lat 32°46'40", long 94°21'26", Marion County, Hydrologic Unit 11140306 near center of channel at downstream side of bridge on U.S. Highway 59, 1.1 mi north of Jefferson, 2.0 mi upstream from Texas and Pacific Railway Co. bridge, and 5.2 mi upstream from mouth.

DRAINAGE AREA.--365 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1968 to current year. May 1938 to September 1955 (daily gage heights) and November 1956 to August 1968 (daily gage heights and discharge measurements) published by U.S. Army Corps of Engineers as "Black Cypress Creek at Jefferson". September 1964 to August 1968 operated as low-flow partial-record station only. Water-quality records.--Chemical analyses: October 1967 to September 1981.

GAGE.--Water-stage recorder. Datum of gage is 171.47 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records good except those below 25 ft<sup>3</sup>/s and those for estimated daily discharges, which are fair. No known regulation or diversion in vicinity of the gage. Gage-height telemeter at station.

AVERAGE DISCHARGE.--23 years (water years 1969-91), 347 ft<sup>3</sup>/s (12.91 in/yr), 251,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,600 ft<sup>3</sup>/s Dec. 28, 1987 (gage height, 19.34 ft); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1938, 22.42 ft Apr. 29, 1958, from records by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft<sup>3</sup>/s (16.19 ft) and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 1	1000	4,700	16.44	May 6	1500	*6,310	*17.26

Minimum discharge, 0.94 ft<sup>3</sup>/s Oct. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3.2	52	663	1470	504	1630	485	4540	414	119	31	e95		
2	2.6	42	620	1400	471	1420	520	3680	350	103	46	e186		
3	2.3	36	584	1200	440	1180	518	2690	292	90	51	e304		
4	1.8	32	592	1010	416	1170	573	2900	259	87	44	e391		
5	1.5	33	605	858	443	1200	564	4540	226	88	33	393		
6	9.5	32	555	855	484	1280	503	6130	208	76	25	387		
7	8.2	29	450	1090	499	1210	594	5470	203	67	19	394		
8	6.4	36	359	1630	543	1010	701	4080	187	65	38	401		
9	12	161	294	2030	616	816	688	3070	169	60	29	399		
10	45	262	252	2400	666	672	690	2520	183	51	23	353		
11	69	315	227	2770	688	551	675	2050	277	46	32	268		
12	109	420	211	3090	683	465	1020	1790	461	42	36	199		
13	156	657	198	3170	639	412	1210	1500	832	38	69	151		
14	168	767	190	3090	554	376	1620	1260	1280	33	93	125		
15	175	809	186	2740	462	351	1860	1260	1190	29	114	108		
16	188	803	181	2190	398	335	1880	1200	1050	27	95	93		
17	173	706	194	1780	368	334	1760	1040	899	25	101	80		
18	116	553	223	1560	389	335	1780	960	759	24	112	69		
19	82	385	264	1450	513	340	1670	907	664	23	96	61		
20	61	258	289	1340	671	347	1370	860	642	21	74	56		
21	85	190	347	1240	813	352	1100	812	506	18	56	54		
22	105	255	474	1180	1300	352	942	780	361	15	46	57		
23	120	402	561	1100	1670	342	856	754	277	13	44	57		
24	135	411	659	1010	2090	325	770	703	227	12	43	59		
25	168	461	802	944	2840	303	720	760	206	28	36	94		
26	177	656	861	876	3120	284	717	776	185	42	29	82		
27	168	775	960	791	2520	273	747	676	166	53	25	75		
28	144	758	977	714	1810	288	829	613	150	47	23	70		
29	112	729	984	642	---	453	1310	600	162	38	21	68		
30	85	704	1170	587	---	519	2990	558	142	35	e21	57		
31	65	---	1350	544	---	485	---	483	---	28	e40	---		
TOTAL	2753.5	11729	16282	46751	26610	19410	31662	59962	12927	1443	1545	5186		
MEAN	88.8	391	525	1508	950	626	1055	1934	431	46.5	49.8	173		
MAX	188	809	1350	3170	3120	1630	2990	6130	1280	119	114	401		
MIN	1.5	29	181	544	368	273	485	483	142	12	19	54		
AC-FT	5460	23260	32300	92730	52780	38500	62800	118900	25640	2860	3060	10290		
CFSM	.24	1.07	1.44	4.13	2.60	1.72	2.89	5.30	1.18	.13	.14	.47		
IN.	.28	1.20	1.66	4.76	2.71	1.98	3.23	6.11	1.32	.15	.16	.53		
CAL YR 1990	TOTAL	170635.33	MEAN	467	MAX	7380	MIN	.00	AC-FT	338500	CFSM	1.28	IN.	17.39
WTR YR 1991	TOTAL	236260.5	MEAN	647	MAX	6130	MIN	1.5	AC-FT	468600	CFSM	1.77	IN.	24.08

e Estimated

## 07346050 LITTLE CYPRESS CREEK NEAR ORE CITY, TX

LOCATION.--Lat 32°40'21", long 94°45'03". Upshur County, Hydrologic Unit 11140307, on right bank at downstream side of bridge on U.S. Highway 259, 4 mi downstream from Clear Creek, 9 mi south of Ore City, and 12 mi north of Longview.

DRAINAGE AREA.--383 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 232.67 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. No known diversions above station. During the year, the city of Gilmer discharged a small amount of sewage effluent into a tributary above this station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--28 years (water years 1964-91), 278 ft<sup>3</sup>/s (9.86 in/yr), 201,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,500 ft<sup>3</sup>/s Apr. 24, 1966 (gage height, 20.20 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1902 occurred in March 1945; maximum stage since 1945, that of Apr. 24, 1966. The flood in April 1958 reached a stage of 19.4 ft, or 1.3 ft lower than the flood of March 1945 at a point 6 mi upstream, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 25	0530	2,710	11.41	Apr. 30	0030	2,530	11.27
Jan. 12	1300	3,400	11.91	May 6	1600	4,640	12.61
Feb. 25	1530	2,030	10.81	June 11	0900	*7,370	*13.74

Minimum discharge, 1.1 ft<sup>3</sup>/s on July 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	33	1120	1430	334	951	653	2130	129	58	11	10
2	12	34	1040	1210	304	1040	743	1570	107	39	7.8	11
3	12	33	844	1020	279	967	691	1680	95	29	5.1	12
4	20	29	637	870	265	1140	766	2420	86	21	4.0	15
5	66	28	441	747	366	1090	757	3490	83	17	4.4	15
6	38	30	302	1090	483	932	692	4370	85	14	5.8	17
7	16	32	231	1380	533	795	714	3520	78	12	7.9	16
8	15	53	198	1230	644	662	861	2210	68	11	11	14
9	69	408	179	1170	888	526	815	1650	66	9.2	13	13
10	227	853	164	2300	1030	410	618	1420	77	9.5	16	12
11	255	799	151	3070	953	320	475	1140	4050	10	19	12
12	211	570	143	3310	797	271	947	897	1990	7.9	23	13
13	167	446	140	2940	648	243	1100	732	834	6.1	24	12
14	78	409	139	2190	504	225	1550	600	323	4.5	25	11
15	46	355	135	1790	382	213	1530	702	126	3.6	31	11
16	35	244	134	1600	303	216	1410	673	84	2.8	25	10
17	30	146	140	1340	270	228	1380	477	83	2.1	21	11
18	30	107	186	1190	327	242	1190	408	76	1.9	17	14
19	28	95	252	1240	916	254	946	401	71	2.6	13	16
20	26	89	289	1210	1070	264	735	389	73	2.5	10	17
21	34	86	426	1020	1300	263	531	376	62	1.7	9.1	17
22	111	349	879	924	1800	248	364	343	49	1.2	8.2	18
23	146	1160	1090	878	1860	231	279	309	48	2.7	5.0	18
24	117	1880	974	804	1780	214	230	265	44	4.9	5.7	21
25	86	2560	1100	714	1950	203	211	454	71	14	5.9	27
26	59	1910	1170	623	1700	192	205	462	96	110	5.8	29
27	47	1460	1380	543	1290	179	206	275	110	248	5.7	27
28	42	1210	1520	481	974	197	304	236	146	133	5.7	24
29	37	1000	1450	437	---	576	1460	235	121	48	6.6	21
30	35	969	1610	401	---	724	2380	228	84	24	7.5	20
31	33	---	1570	368	---	627	---	179	---	15	9.4	---
TOTAL	2141	17377	20034	39520	23950	14643	24743	34241	9415	866.2	368.6	484
MEAN	69.1	579	646	1275	855	472	825	1105	314	27.9	11.9	16.1
MAX	255	2560	1610	3310	1950	1140	2380	4370	4050	248	31	29
MIN	12	28	134	368	265	179	205	179	44	1.2	4.0	10
AC-FT	4250	34470	39740	78390	47500	29040	49080	67920	18670	1720	731	960
CFSM	.18	1.51	1.69	3.33	2.23	1.23	2.15	2.88	.82	.07	.03	.04
IN.	.21	1.69	1.95	3.84	2.33	1.42	2.40	3.33	.91	.08	.04	.05

CAL YR 1990	TOTAL	194090.8	MEAN	532	MAX	5780	MIN	1.0	AC-FT	385000	CFSM	1.39	IN.	18.85
WTR YR 1991	TOTAL	187782.8	MEAN	514	MAX	4370	MIN	1.2	AC-FT	372500	CFSM	1.34	IN.	18.24

RED RIVER BASIN

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07346070 LITTLE CYPRESS CREEK NEAR JEFFERSON, TX

LOCATION (REVISED).--Lat 32°42'46", long 94°20'45", Marion County, Hydrologic Unit 11140307, at downstream side of upstream bridge on U.S. Highway 59, 0.3 mi downstream from Texas and Pacific Railway Co. bridge, 3.3 mi downstream from Grays Creek, 3.5 mi south of Jefferson, and 6.8 mi upstream from mouth.

DRAINAGE AREA.--675 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1946 to current year.

GAGE.--Water-stage recorder and datum collection platform (DCP). Datum of gage is 174.60 ft above National Geodetic Vertical Datum of 1929. Prior to Sept. 19, 1947, nonrecording gage at upstream side of bridge at same datum.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. There is no known diversions above station, but some sewage effluent is discharged into tributaries that enter Little Cypress Creek above this station. Gage-height telemeter (DCP) at station.

AVERAGE DISCHARGE.--45 years (water years 1947-91), 525 ft<sup>3</sup>/s (10.56 in/yr), 380,400 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,500 ft<sup>3</sup>/s Apr. 26, 1966 (gage height, 22.28 ft); no flow at times. Maximum stage since May 1944, that of Apr. 26, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1944 reached a stage of 21.1 ft.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,850 ft<sup>3</sup>/s May 4 at about 1430 hours (gage height, 14.90 ft); minimum, 11.0 ft<sup>3</sup>/s Sept. 23-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	15	70	e2320	e2580	817	2970	1540	1470	537	274	274	173		
2	14	63	e1980	e2580	761	3470	1240	1510	438	281	151	126		
3	14	59	e1630	e2520	713	3110	1060	2920	387	253	97	140		
4	14	55	1350	e2380	677	2640	992	7570	341	213	74	146		
5	15	52	1190	e2220	695	2190	959	7210	305	168	62	127		
6	23	53	1120	e2060	733	1820	964	5500	282	137	51	92		
7	61	55	1080	e2140	748	1560	1040	4530	236	117	44	74		
8	81	65	992	e2590	751	1470	1190	4640	209	104	39	65		
9	84	284	883	e2790	761	1420	1350	5170	193	93	35	59		
10	70	664	759	e3110	771	1310	1420	4940	268	86	35	78		
11	86	924	636	3960	773	1170	1290	e3730	584	79	35	73		
12	131	1390	521	e4080	782	1030	2550	e2880	492	72	31	55		
13	178	1590	e428	e3920	850	900	5480	2310	912	67	28	47		
14	211	1390	360	e4180	953	781	6560	1930	3870	63	30	41		
15	225	1160	e323	5090	1000	676	e7290	1940	3710	59	48	37		
16	212	989	e304	5660	974	594	5380	1760	2490	54	129	34		
17	162	851	e307	4630	912	545	3790	1520	1730	49	179	34		
18	104	729	e348	3670	909	507	2920	1350	1170	44	157	28		
19	73	637	415	3130	1230	477	2420	1210	797	40	119	23		
20	62	552	465	2790	1300	458	2090	1060	580	36	89	20		
21	75	456	542	2450	1080	449	1830	949	529	33	72	17		
22	112	434	770	2190	1380	451	1600	835	390	30	59	13		
23	207	678	940	1950	2160	451	1410	754	371	28	50	12		
24	253	783	1040	1750	2340	450	1190	724	349	26	44	13		
25	258	899	1130	1540	2550	442	1000	792	290	32	39	33		
26	230	1190	1200	1360	2710	429	842	848	257	47	36	39		
27	195	1450	1460	1230	2630	407	741	899	245	146	32	59		
28	155	1850	1900	1140	2550	542	768	816	233	306	31	62		
29	118	2490	2110	1050	---	2360	1530	757	252	418	25	57		
30	92	e2630	e2280	959	---	2580	1770	760	257	456	155	49		
31	78	---	e2490	887	---	1990	---	676	---	404	261	---		
TOTAL	3608	24492	33273	82586	34510	39649	64206	73960	22704	4215	2511	1826		
MEAN	116	816	1073	2664	1232	1279	2140	2386	757	136	81.0	60.9		
MAX	258	2630	2490	5660	2710	3470	7290	7570	3870	456	274	173		
MIN	14	52	304	887	677	407	741	676	193	26	25	12		
AC-FT	7160	48580	66000	163800	68450	78640	127400	146700	45030	8360	4980	3620		
CFSM	.17	1.21	1.59	3.95	1.83	1.89	3.17	3.53	1.12	.20	.12	.09		
IN.	.20	1.35	1.83	4.55	1.90	2.19	3.54	4.08	1.25	.23	.14	.10		
CAL YR 1990	TOTAL	279867.8	MEAN	767	MAX	4470	MIN	1.2	AC-FT	555100	CFSM	1.14	IN.	15.42
WTR YR 1991	TOTAL	387540	MEAN	1062	MAX	7570	MIN	12	AC-FT	768700	CFSM	1.57	IN.	21.36

e Estimated



## RED RIVER BASIN

07346070 LITTLE CYPRESS CREEK NEAR JEFFERSON, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: June 1964 to current year. Pesticide analyses: January 1968 to June 1981.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to September 1990.  
WATER TEMPERATURE: October 1967 to September 1990.

INSTRUMENTATION.--From June 1981 to September 1990, specific conductance and water temperature were recorded continuously at this station.

REMARKS.--Regression equations developed for this station may be obtained from the Geological Survey District office on request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,350 microsiemens Nov. 9, 1969; minimum, 20 microsiemens Mar. 29, 30, 1989.  
WATER TEMPERATURE (1967-87, 1989-90): Maximum, 32.5°C on several days during July and August 1987; minimum, 0.0°C on several days during winter months of 1983, 1985.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	
OCT 17...	0930	170	106	6.2	19.0	7.6	82	1.1	19	13	4.6	1.8	
NOV 14...	1630	1300	81	5.7	16.0	10.2	105	2.0	14	11	3.5	1.2	
JAN 23...	0820	2000	97	6.1	5.0	13.7	107	1.4	22	2	5.7	1.9	
FEB 28...	1345	2540	92	6.4	13.0	9.2	88	1.5	18	10	4.4	1.8	
APR 17...	1717	3540	70	6.6	20.5	6.2	69	1.2	15	8	3.9	1.3	
JUL 30...	1155	442	100	6.4	32.0	5.6	77	1.4	23	17	5.7	2.0	
DATE		SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
OCT 17...	9.9	1	4.7	6.0	16	12	<0.10	16	69	0.280	0.020	0.300	
NOV 14...	7.0	0.8	3.3	3.0	10	10	0.20	9.9	47	--	0.020	<0.100	
JAN 23...	9.0	0.8	3.3	20	14	13	<0.10	14	73	--	<0.010	<0.100	
FEB 28...	7.3	0.7	2.7	8.0	14	10	<0.10	10	55	--	0.020	<0.050	
APR 17...	4.9	0.5	3.1	7.0	5.3	8.3	0.20	8.9	40	0.080	0.040	0.120	
JUL 30...	11	1	3.5	6.0	20	20	0.10	15	82	0.150	0.010	0.160	
DATE		NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
OCT 17...	0.030	0.67	0.70	0.100	0.070	--	--	--	--	--	--	--	--
NOV 14...	0.060	0.64	0.70	0.050	0.050	--	--	--	--	--	--	--	--
JAN 23...	0.030	0.47	0.50	0.100	0.040	<1	42	<0.5	<1.0	<5	<3	<10	
FEB 28...	0.030	0.97	1.0	0.070	<0.010	--	--	--	--	--	--	--	
APR 17...	0.090	0.71	0.80	0.120	0.050	--	--	--	--	--	--	--	
JUL 30...	0.040	0.86	0.90	0.100	0.040	<1	85	<0.5	3.0	<5	<3	10	

RED RIVER BASIN

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07346070 LITTLE CYPRESS CREEK NEAR JEFFERSON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 17...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 14...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	390	<10	6	22	<0.1	<10	<10	<1	<1.0	66	<6	23
FEB 28...	--	--	--	--	--	--	--	--	--	--	--	--
APR 17...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 30...	430	<10	8	340	0.2	<10	10	<1	<1.0	110	<6	40

## RED RIVER BASIN

07346085 BIG CYPRESS CREEK NEAR KARNACK, TX

LOCATION.--Lat 32°41'48", long 94°11'15", Harrison-Marion Counties, Hydrologic Unit 11140306, at downstream side of State Highway 43 bridge at approximate center of bridge span, 1.25 mi north-northwest of State Highways 43 and 143 intersection, and 2.25 mi north-northwest of Karnack, Tx.

DRAINAGE AREA.-- Not determined.

PERIOD OF RECORD.--October 1979 to September 1985, July to September 1991.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARBONIC (MG/L AS CaCO3)
JUL 31...	0845	119	7.0	29.5	4.2	8.0	105	2.2	260	--	26	10
AUG 21...	1100	108	7.0	29.0	3.5	8.5	111	2.0	K53000	K53000	24	8
SEP 05...	1230	77	6.1	27.0	12	6.2	78	2.1	K1	K75	14	7
DATE		CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY, WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)
JUL 31...		5.6	2.8	12	1	2.8	16	10	18	81	61	8
AUG 21...		5.3	2.5	9.6	0.9	3.0	16	11	12	83	55	--
SEP 05...		3.4	1.4	4.7	0.5	2.5	7.0	9.5	7.3	42	35	4
DATE		NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)
JUL 31...		--	<0.010	<0.050	<0.010	--	0.60	0.050	0.020	<0.010	7.9	<0.010
AUG 21...		--	0.020	<0.050	0.070	0.63	0.70	0.060	0.020	0.030	7.9	--
SEP 05...		0.120	0.010	0.130	0.050	0.45	0.50	0.090	0.020	<0.010	7.6	<0.010
DATE		ARSENIC, DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHROMIUM, DIS-SOLVED (UG/L AS CR)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGANESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	NICKEL, DIS-SOLVED (UG/L AS NI)	ZINC, DIS-SOLVED (UG/L AS ZN)
JUL 31...		<1	47	<10	<1	<10	820	<100	5	<0.1	2	9
AUG 21...		1	51	<10	<1	<10	820	<100	45	<0.1	<1	<3
SEP 05...		<1	59	<10	<1	<10	870	<100	270	<0.1	2	10

RED RIVER BASIN

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07346140 FRAZIER CREEK NEAR LINDEN, TX

LOCATION.--Lat 33°03'14", long 94°17'24", Cass County, Hydrologic Unit 11140306, on right bank at downstream side of bridge on U.S. Highway 59, 1.6 mi upstream from Colley Creek, 3.7 mi upstream from Johns Creek, and 5.3 mi north east of Linden.

DRAINAGE AREA.--48.0 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1958 to June 1961 (low-flow partial record only), and November 1964 to September 1991 (discontinued).

GAGE.--Water-stage recorder. Datum of gage is 228.7 ft above National Geodetic Vertical Datum of 1929 (State Department of Highways and Public Transportation bridge plans).

REMARKS.--Records fair except those for estimated daily discharges, which are poor. No known diversions above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years (water years 1966-91), 44.9 ft<sup>3</sup>/s (12.70 in/yr), 32,530 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,750 ft<sup>3</sup>/s Mar. 28, 1989 (gage height, 12.80 ft from graph); no flow at times for most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1945, 15.6 ft Apr. 26, 27, 1958, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 6	1700	1,380	9.91	Apr. 14	1130	722	8.97
Jan. 11	0130	1,220	9.73	Apr. 29	0330	*5,670	*12.43
Feb. 23	0900	953	9.36	May 3	unk	unk	unk

Minimum discharge, 0.19 ft<sup>3</sup>/s July 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	7.1	42	63	44	211	48	272	e14	7.2	e3.0	e20
2	.84	7.1	41	67	43	262	43	e700	e14	6.0	e2.0	e6.0
3	.76	7.1	40	80	43	157	38	e1500	e14	5.4	e1.7	e50
4	2.8	7.1	37	74	51	112	92	e1000	e15	9.1	e1.6	e45
5	2.2	8.0	34	62	128	94	99	e500	e14	13	e1.4	e20
6	2.5	10	33	720	150	85	63	e300	16	9.0	e1.3	e15
7	3.0	10	34	691	89	78	101	e200	15	7.3	e1.3	e12
8	2.8	13	33	281	67	71	87	e150	14	6.1	e1.3	e13
9	7.9	145	32	163	60	67	60	e120	12	5.0	e1.2	e20
10	22	166	31	610	57	63	47	e200	23	5.0	e1.2	e15
11	8.8	38	30	650	53	61	39	e150	65	3.9	e1.2	e12
12	5.6	22	30	224	50	62	195	e120	50	3.5	e1.3	e10
13	4.2	17	31	127	50	60	480	e100	29	3.0	e1.3	e9.0
14	3.9	15	30	100	48	55	589	e90	23	2.4	e1.4	e8.5
15	5.3	13	29	188	42	54	341	e300	20	1.8	e1.4	e7.6
16	5.4	12	31	246	39	71	158	e200	20	1.5	e1.4	e7.4
17	5.7	12	40	150	42	70	93	e100	23	1.5	e1.4	e7.1
18	6.1	12	78	103	98	64	127	e150	19	1.2	e1.6	e6.6
19	6.7	11	92	151	267	55	117	e130	14	1.0	e1.6	e6.2
20	7.1	11	53	155	218	52	73	e100	11	.85	e1.5	e7.0
21	9.9	11	64	95	101	50	59	e70	29	.68	e1.5	e8.0
22	25	75	133	75	357	51	166	e60	25	.60	e1.5	e8.0
23	18	194	101	68	501	51	268	e66	14	.49	e1.6	e7.0
24	11	90	64	66	257	47	154	e56	12	.34	e1.6	e10
25	9.5	55	82	68	168	40	107	e400	11	1.2	e1.5	e20
26	8.7	48	61	59	124	39	97	e200	15	12	e1.5	e15
27	8.4	46	213	56	107	39	267	e100	12	24	e1.5	e8.0
28	7.1	65	245	56	97	46	2330	e50	9.7	20	e1.4	e8.4
29	6.8	58	135	53	---	133	2850	e30	7.8	21	e1.4	e9.0
30	7.3	48	94	51	---	103	425	e20	9.3	12	e1.4	e10
31	7.3	---	86	47	---	56	---	e16	---	7.7	e5.0	---
TOTAL	223.90	1233.4	2079	5599	3351	2459	9613	7450	569.8	193.76	50.0	400.8
MEAN	7.22	41.1	67.1	181	120	79.3	320	240	19.0	6.25	1.61	13.4
MAX	25	194	245	720	501	262	2850	1500	65	24	5.0	50
MIN	.76	7.1	29	47	39	39	38	16	7.8	.34	1.2	6.0
AC-FT	444	2450	4120	11110	6650	4880	19070	14780	1130	384	99	795
CFSM	.15	.86	1.40	3.76	2.49	1.65	6.68	5.01	.40	.13	.03	.28
IN.	.17	.96	1.61	4.34	2.60	1.91	7.45	5.77	.44	.15	.04	.31

CAL YR 1990	TOTAL	20770.76	MEAN	56.9	MAX	3510	MIN	.70	AC-FT	41200	CFSM	1.19	IN.	16.10
WTR YR 1991	TOTAL	33222.66	MEAN	91.0	MAX	2850	MIN	.34	AC-FT	65900	CFSM	1.90	IN.	25.75

e Estimated

## WESTERN GULF OF MEXICO BASINS

## SABINE RIVER MAIN STEM

08017200 COWLEECH FORK SABINE RIVER AT GREENVILLE, TX

LOCATION.--Lat 33°07'58", long 96°04'36", Hunt County, Hydrologic Unit 12010001, on left bank 103 ft downstream from centerline of downstream bridge on Interstate Highway 30 (U.S. Highway 67), 0.3 mi downstream from Horse Creek, 0.9 mi downstream from Louisiana and Arkansas Railroad Co. bridge, 1.8 mi east of Greenville, and at mile 558.3.

DRAINAGE AREA.--77.7 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1959 to current year. Prior to October 1963, published as Sabine River at Greenville.

REVISED RECORDS.--WSP 1732: Drainage area. WSP 2122: 1960, 1963-65.

GAGE.--Water-stage recorder. Datum of gage is 485.07 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. The city of Greenville diverted water from city lakes upstream from the gage and from Lake Tawakoni for municipal use. Sewage effluent is returned to a tributary downstream from gage. Extreme low flow is largely sustained by return water from water treatment plant upstream. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years (water years 1960-91), 62.8 ft<sup>3</sup>/s (10.98 in/yr), 45,500 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,300 ft<sup>3</sup>/s May 13, 1982 (gage height, 18.47 ft); no flow in 1964, 1969-70, 1972-73, and 1977-91.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1895, 22 ft in May 1935, from information by local resident and city engineer of Greenville. Flood of July 3, 1913, reached a stage of 20 ft, from information by local resident.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	1730	4,430	16.74	Apr. 14	0030	*7,650	*17.55

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.02	.06	e.45	36	1.4	437	1.0	1.6	.29	.02	.14	12		
2	.01	.01	108	5.4	1.3	111	.98	.77	.06	.00	.02	11		
3	.00	.00	211	1.5	1.2	23	.94	928	.40	.00	.02	3.3		
4	.00	1.4	e31	1.3	8.4	11	.79	291	.09	.00	.01	.70		
5	.00	.58	e11	1.3	282	6.4	.84	353	1.8	.00	.00	.26		
6	.00	.21	e4.2	142	438	3.7	.99	37	32	.00	.03	.17		
7	.00	.22	e1.7	664	91	2.2	1.1	14	5.3	.00	.15	3.7		
8	.02	.32	e.80	43	31	1.6	.99	34	95	.00	.01	8.7		
9	19	294	e.50	12	16	1.3	1.3	27	125	.00	.00	.56		
10	4.8	.35	e.39	1380	9.5	1.1	1.1	12	5.9	.00	.00	.22		
11	.73	7.4	e.35	202	6.0	1.1	1.2	6.0	1.5	.00	.00	.15		
12	.33	1.9	.35	26	4.0	1.0	2680	3.0	.63	.00	.00	.09		
13	.25	.89	.37	8.6	3.2	.98	2450	1.6	.35	.00	2.3	.07		
14	.19	.54	.34	8.0	2.2	.95	3300	2.7	.25	.00	.50	.06		
15	.15	.52	.27	1500	1.7	.92	131	8.6	.24	.00	.26	.04		
16	.13	.48	.33	324	1.4	.92	46	4.0	.45	.00	.17	.03		
17	.15	.48	.26	34	1.4	1.0	26	1.2	.22	.00	.14	.01		
18	.17	.55	.30	99	1.5	.95	21	.57	.17	.00	.08	.00		
19	.17	.69	.44	504	1.4	.90	12	7.1	.24	.00	.06	.41		
20	.14	.77	1.0	123	1.3	.89	6.4	1.3	.14	.00	.04	.14		
21	.48	.78	205	39	1.2	.89	4.1	.52	.10	.00	.03	.08		
22	.42	116	33	18	259	1.1	3.5	.45	.06	.00	.01	.05		
23	.39	e181	5.5	10	106	1.9	2.5	.34	.24	.00	.00	.04		
24	.32	e28	1.6	6.8	21	1.6	2.0	4.2	.12	.00	.00	.26		
25	.28	e7.8	.67	5.1	9.2	1.2	44	71	.09	.11	.00	.48		
26	.25	e2.3	.55	3.6	4.5	1.1	11	12	.08	.01	.23	.25		
27	.22	e.99	1.5	2.8	3.0	2.0	6.4	1.3	.04	.00	.26	.14		
28	.19	e.61	19	2.3	2.1	1.4	10	.43	.06	.07	.10	.10		
29	.18	e.54	13	2.0	---	1.5	35	.24	.06	.04	.85	.09		
30	.15	e.51	63	1.8	---	1.2	5.0	.16	.04	.00	.77	.08		
31	.12	---	84	1.6	---	1.1	---	.21	---	.45	.22	---		
TOTAL	29.26	716.23	799.87	5208.1	1309.9	622.90	8807.13	1825.29	270.92	0.70	6.40	43.18		
MEAN	.94	23.9	25.8	168	46.8	20.1	294	58.9	9.03	.023	.21	1.44		
MAX	19	294	211	1500	438	437	3300	928	125	.45	2.3	12		
MIN	.00	.00	.26	1.3	1.2	.89	.79	.16	.04	.00	.00	.00		
AC-FT	58	1420	1590	10330	2600	1240	17470	3620	537	1.4	13	86		
CFSM	.01	.31	.33	2.16	.60	.26	3.78	.76	.12	.00	.00	.02		
IN.	.01	.34	.38	2.49	.63	.30	4.22	.87	.13	.00	.00	.02		
CAL YR 1990	TOTAL	36426.85	MEAN	99.8	MAX	4980	MIN	.00	AC-FT	72250	CFSM	1.28	IN.	17.44
WTR YR 1991	TOTAL	19639.88	MEAN	53.8	MAX	3300	MIN	.00	AC-FT	38960	CFSM	.69	IN.	9.40

e Estimated



SABINE RIVER BASIN

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08017300 SOUTH FORK SABINE RIVER NEAR QUINLAN, TX

LOCATION.--Lat 32°53'52", Long 96°15'11", Hunt County, Hydrologic Unit 12010001, on right bank at downstream side of bridge on Farm Road 1565, 2.4 mi upstream from Dry Creek, 6.2 mi upstream from Bearpen Creek, 7 mi southwest of Quinlan, and 25 mi upstream from mouth.

DRAINAGE AREA.--78.7 mi<sup>2</sup>.

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

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 461.0 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. The city of Royse City discharged sewage effluent into the river above this station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--32 years (water years 1960-91), 79.2 ft<sup>3</sup>/s (13.67 in/yr), 57,380 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,000 ft<sup>3</sup>/s June 16, 1981 (gage height, 18.24 ft); maximum gage height, 18.77 ft Apr. 5, 1986; no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1890, 21 ft July 29, 1902, from information by local resident. Flood of Apr. 27, 1957, reached a stage of 17.76 ft, from floodmarks.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	1915	3,260	a16.38	Apr. 14	0445	*6,990	*a17.01

a From estimated stage graph.

Minimum discharge, no flow for many days.

REVISIONS.--Revised figures of discharge for the water year 1990, superseding those published in the WRD report for 1990 are given below:

WATER YEAR 1990							
August	6.....59	August	9.....0.87	August	11.....0.07		
	7.....31		10.....0.21		12.....0.02		
	8.....5.8						
TOTAL	MEAN	MAXIMUM	MINIMUM	AC-FT	CFSM	INCHES	
August.....	96.97	3.13	59.0	.00	192	0.04	0.05
WTR YR 1990...	36273.83	99.4	7050.	.00	71,950	1.26	17.15

## SABINE RIVER BASIN

08017300 SOUTH FORK SABINE RIVER NEAR QUINLAN, TX--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.00	.00	2.0	2.3	1.2	167	1.0	7.8	2.5	.10	.00	7.6		
2	.00	.00	17	1.1	1.1	71	1.2	4.2	2.5	.04	.00	14		
3	.00	.00	234	.91	.98	16	1.3	233	36	.03	.00	21		
4	.00	.00	42	.60	.95	8.9	1.1	152	17	.03	.00	5.0		
5	.00	.00	7.9	.67	570	7.8	.87	180	3.6	.02	.00	1.6		
6	.00	.00	1.8	83	795	6.5	1.1	50	1.5	.01	.00	.63		
7	.00	.00	.69	338	167	5.4	1.7	21	16	.00	.00	.28		
8	.00	.03	.36	48	26	3.0	1.8	21	1060	.00	.00	.65		
9	.02	246	.23	24	9.2	2.0	1.6	40	397	.00	.00	.82		
10	.00	86	.18	896	6.5	1.7	1.0	23	38	.00	.00	.35		
11	.00	11	.26	751	5.1	1.6	1.0	15	15	.00	.00	.17		
12	.00	3.3	.33	109	4.3	1.4	e1690	11	7.1	.00	.00	.10		
13	.00	1.6	.37	31	3.6	1.3	e2480	9.6	3.1	.00	.00	.08		
14	.00	1.6	.29	13	2.9	1.1	e4640	8.9	1.7	.00	.00	.06		
15	.00	1.4	.16	337	2.0	1.1	134	13	.99	.00	.00	.05		
16	.00	1.3	.09	547	1.7	1.2	17	18	.75	.00	.00	13		
17	.00	1.1	.08	56	1.4	1.5	3.8	19	.47	.00	.00	79		
18	.00	.73	.06	42	1.6	2.0	117	17	.33	.00	.00	4.3		
19	.00	1.1	.08	436	1.6	1.7	23	16	.51	.00	.00	43		
20	.00	1.1	.10	297	1.4	1.8	7.1	13	.87	.00	.00	17		
21	.00	1.5	.21	33	1.4	1.6	2.4	12	.51	.00	.00	2.9		
22	.00	6.2	.11	11	98	1.9	1.7	11	.41	.00	.00	1.2		
23	.00	55	.10	6.3	554	1.8	1.6	7.6	109	.00	.00	.91		
24	.00	12	.07	4.4	56	1.4	1.2	4.9	19	.00	.00	1.2		
25	.00	3.1	.10	3.3	13	1.4	1.0	7.7	4.1	.00	.00	8.9		
26	.00	1.3	.18	2.4	7.2	2.0	1.9	12	1.6	.00	.00	1.6		
27	.00	2.1	.46	2.1	4.9	2.7	52	12	.69	.00	.00	.65		
28	.00	4.0	2.6	1.9	7.1	2.8	44	9.4	.36	.00	.00	.49		
29	.00	3.1	2.7	1.7	---	2.6	94	5.6	.20	.00	.00	.36		
30	.00	2.0	25	1.6	---	2.1	19	3.2	.14	.00	.00	.32		
31	.00	---	13	1.3	---	1.6	---	2.5	---	.00	.00	---		
TOTAL	0.02	446.56	352.51	4082.58	2345.13	325.9	9344.37	960.4	1740.93	0.23	0.00	227.22		
MEAN	.001	14.9	11.4	132	83.8	10.5	311	31.0	58.0	.007	.000	7.57		
MAX	.02	246	234	896	795	167	4640	233	1060	.10	.00	79		
MIN	.00	.00	.06	.60	.95	1.1	.87	2.5	.14	.00	.00	.05		
AC-FT	.04	886	699	8100	4650	646	18530	1900	3450	.5	.00	451		
CFSM	.00	.19	.14	1.67	1.06	.13	3.96	.39	.74	.00	.00	.10		
IN.	.00	.21	.17	1.93	1.11	.15	4.42	.45	.82	.00	.00	.11		
CAL YR 1990	TOTAL	37068.86	MEAN	102	MAX	7050	MIN	.00	AC-FT	73530	CFSM	1.29	IN.	17.52
WTR YR 1991	TOTAL	19825.85	MEAN	54.3	MAX	4640	MIN	.00	AC-FT	39320	CFSM	.69	IN.	9.37

e Estimated

SABINE RIVER MAIN STEM

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08017400 LAKE TAWAKONI NEAR WILLS POINT, TX

LOCATION.--Lat 32°48'31", Long 95°55'10", Van-Zandt County, Hydrologic Unit 12010001, in stairwell at left end of spillway of Iron Bridge Dam on Sabine River, 750 ft upstream from bridge on Farm Road 47, 3.8 mi upstream from McBee Creek, 9.0 mi northeast of Wills Point, and at mile 514.5.

DRAINAGE AREA.--756 mi<sup>2</sup>.

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

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

REMARKS.--The lake is formed by a rolled earthfill dam 29,500 ft long, including a 480-foot uncontrolled concrete ogee spillway. Outlet works consist of two 4- by 6-foot sluice gates and two 20-inch steel pipes controlled by service valves. Closure of earthen dam began July 1, 1960, and deliberate impoundment of water began Oct. 7, 1960. Capacity table is based on a 1956 survey. Diversions are made for municipal use by the city of Dallas and various other users in the Sabine River basin. The lake was built for water conservation. 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.....	454.0	-
Design Flood.....	446.2	1,290,000
Crest of spillway.....	437.5	936,200
Lowest intake to wet well (invert).....	416.5	342,700
Lowest gated outlet (invert).....	378.0	0

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,130,000 acre-ft May 1, 1966 (elevation, 442.58 ft); minimum since lake first filled in May 1965, 802,700 acre-ft Oct. 21, 1972 (elevation, 433.65 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 983,500 acre-ft Apr. 15 at 2000 hours (elevation, 438.79 ft); minimum, 821,800 acre-ft Nov. 8 (elevation, 434.21 ft).

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

434.0	814,300	436.0	882,800	438.0	954,300
435.0	848,200	437.0	918,200	439.0	991,200

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	847800	823100	838000	834300	897300	936200	919300	947500	939900	932300	903000	895900
2	846100	822100	840000	834600	896900	942000	916800	950000	940200	930800	901900	898700
3	846500	822500	844100	834300	896600	938100	918200	955800	939100	931900	900800	899400
4	845500	827900	842800	832900	898700	937000	917800	961700	938800	929700	900100	900500
5	844500	822500	841700	833600	904400	937000	917500	961000	938800	928300	898700	899800
6	842800	822100	827200	837000	912200	935500	917100	958800	938400	927200	897600	899100
7	843800	822100	827500	841700	915700	934400	916800	958400	940600	926100	896900	898000
8	844100	830200	826900	842800	916000	933700	916400	957600	942800	924700	895500	897600
9	846100	833300	825800	846500	916000	932600	915700	956500	946700	924000	897600	897600
10	842100	834600	825500	856800	916000	930100	913900	955400	948900	922500	896600	897600
11	840400	835000	824500	866900	915700	933000	913900	954700	947500	921100	895500	897600
12	840000	835000	825200	867900	914600	931900	915300	953600	946000	920300	895200	898000
13	838400	834600	824800	868300	915700	929000	933700	952100	944900	918900	896200	898000
14	837700	834300	827500	870300	917100	927900	975000	950700	944600	918500	896900	898000
15	837000	834000	845800	875900	912900	926800	983500	951400	943100	917800	896200	898000
16	836000	834300	837000	884200	911800	928600	979400	950700	942800	916400	895200	863400
17	837000	832900	838000	886700	912200	926800	975000	949600	942000	915300	898400	862400
18	834600	832900	837000	889200	915000	926500	972000	948900	940900	913900	897600	894100
19	832900	832600	836700	893800	914600	925400	966900	948900	939900	912500	896900	893000
20	832300	832300	836000	898700	913200	925000	962100	947100	938800	911100	895900	890900
21	833300	834300	839400	898000	913900	925400	961000	946400	938100	910000	895200	889200
22	830900	839700	839400	897300	925400	925400	957600	944200	939900	909000	895200	889500
23	830200	839700	837300	898400	933000	925000	956500	944600	939900	907900	894500	888400
24	829600	839700	834300	898000	935900	924300	955100	943800	938800	906800	893800	890200
25	828200	839700	834000	898400	933700	923600	953200	943100	938100	906800	892700	887400
26	826900	839400	834600	897600	932600	925400	953600	947100	937000	906500	892300	886300
27	826900	843100	834600	898400	931900	923600	952100	946400	935500	907200	890900	884200
28	825800	841100	834600	898000	931900	924300	950000	944900	935200	907600	890200	883100
29	824800	839700	836000	899400	---	921800	950000	943800	934400	907200	889500	882400
30	824500	838000	836700	898400	---	921800	947500	942800	933300	905800	890600	881700
31	823800	---	834300	897300	---	920000	---	940900	---	904700	889500	---
MAX	847800	843100	845800	899400	935900	942000	983500	961700	948900	932300	903000	900500
MIN	823800	822100	824500	832900	896600	920000	913900	940900	933300	904700	889500	862400
(↑)	434.28	434.70	434.59	436.41	437.38	437.05	437.81	437.63	437.42	436.62	436.19	435.97
(Φ)	-25400	+14200	-3700	+63000	+34600	-11900	+27500	-6600	-7600	-28600	-15200	-7800
CAL YR 1990	MAX	1037000	MIN	822100	(Φ)	+48800						
WTR YR 1991	MAX	983500	MIN	822100	(Φ)	-400						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## SABINE RIVER MAIN STEM

08017410 SABINE RIVER NEAR WILLS POINT, TX

LOCATION.--Lat 32°48'22", long 95°55'09", Van Zandt County, Hydrologic Unit 12010001, on right bank at downstream side of bridge on Farm Road 47, 750 ft downstream from Iron Bridge Dam that forms Lake Tawakoni, 3.6 mi upstream from McBee Creek, 9.0 mi northeast of Wills Point, and at mile 514.3.

DRAINAGE AREA.--756 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1970 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 370.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those below 1.0 ft<sup>3</sup>/s, which are fair, and those for estimated daily discharges, which are poor. Flow regulated by Lake Tawakoni (see station 08017400) 750 ft upstream. Several observations of water temperature were obtained during the year.

AVERAGE DISCHARGE.--21 years, 399 ft<sup>3</sup>/s (289,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,600 ft<sup>3</sup>/s May 4, 1991 (gage height, 19.11 ft); no flow most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since construction of Iron Bridge Dam in 1960, about 21,000 ft<sup>3</sup>/s May 1, 1966, from theoretical rating curve of flow over dam 750 ft upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,490 ft<sup>3</sup>/s Apr. 15 at 1545 hours (gage height, 13.09 ft), no flow Dec. 8, 10, 12, 13, 18-20, 23-26, 29, 31; Jan. 1-6, 9, 14, 23-28, 31; Feb. 1-4, 11-21, 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.30	.05	.08	.00	.00	8.2	.21	e237	e38	7.3	4.3	23
2	e.30	.10	.08	.00	.00	115	.19	e246	e65	11	4.4	67
3	e.29	.08	.46	.00	.00	453	1.4	e300	244	46	4.4	416
4	e.29	.11	.05	.00	.00	67	.25	e426	112	45	5.0	64
5	e.29	.16	.09	.00	69	30	.22	e862	159	17	5.6	72
6	e.30	.12	.15	.00	1270	80	.24	e862	134	16	5.7	11
7	e.30	.10	.03	1.9	e75	182	.24	e758	88	16	6.0	7.8
8	e.28	.12	.00	.01	e13	65	.24	e671	147	15	5.5	8.3
9	e.30	.17	.03	.00	e1.6	44	51	e604	270	13	7.5	7.8
10	e.29	.12	.00	288	e.03	5.8	3.5	e548	391	9.8	8.5	7.6
11	e.27	.12	.00	249	e.00	.36	.29	e494	405	5.8	8.0	7.3
12	e.27	.10	.00	16	e.00	68	.35	e442	360	5.7	8.0	6.3
13	e.27	.09	.00	.01	e.00	256	15	e388	313	5.9	8.1	7.9
14	e.26	.08	.07	.00	e.00	149	591	e306	269	6.3	7.5	4.9
15	e.18	.10	.01	50	e.00	6.0	2250	e271	246	10	7.1	2.0
16	e.18	.11	.05	83	e.00	.70	e1900	e361	236	5.7	7.1	5.5
17	e.18	.08	.07	1.1	e.00	44	e1680	e390	203	5.3	7.8	4.1
18	e.18	.08	.00	.24	e.00	42	e1580	e337	164	5.0	31	20
19	e.18	.08	.00	65	e.00	.24	e1350	e268	139	5.1	14	14
20	e.18	.08	.00	56	e.00	.19	e1120	e184	106	5.2	12	3.1
21	e.18	.09	.02	22	e.00	.19	e960	e137	72	4.7	12	1.3
22	e.18	389	.01	.01	e366	21	e841	e118	51	4.6	11	1.1
23	e.12	466	.00	.00	e339	.38	e740	e124	102	4.6	11	2.8
24	e.11	2.9	.00	.00	e96	.19	e648	e247	97	4.6	11	17
25	e.11	.11	.00	.00	233	.18	e573	e483	74	4.9	11	12
26	e.11	.12	.00	.00	35	.21	e502	e338	54	5.1	10	1.0
27	e.11	1.1	3.5	.00	1.2	12	e441	e204	35	9.1	10	1.8
28	e.11	.17	.31	.00	.00	1.4	e387	e129	20	5.2	10	.57
29	e.10	.08	.00	27	---	80	e322	e83	14	5.5	10	.46
30	e.10	.08	.01	46	---	30	e272	e53	11	5.9	11	.20
31	.09	---	.00	.00	---	24	---	e40	---	4.2	10	---
TOTAL	6.41	861.70	5.02	905.27	2498.83	1786.04	16230.13	10911	4619	314.5	284.5	797.83
MEAN	.21	28.7	.16	29.2	89.2	57.6	541	352	154	10.1	9.18	26.6
MAX	.30	466	3.5	288	1270	453	2250	862	405	46	31	416
MIN	.09	.05	.00	.00	.00	.18	.19	40	11	4.2	4.3	.20
AC-FT	13	1710	10	1800	4960	3540	32190	21640	9160	624	564	1580
CAL YR 1990	TOTAL	286340.10	MEAN	784	MAX	20000	MIN	.00	AC-FT	568000		
WTR YR 1991	TOTAL	39220.23	MEAN	107	MAX	2250	MIN	.00	AC-FT	77790		

e Estimated

SABINE RIVER MAIN STEM

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08018500 SABINE RIVER NEAR MINEOLA, TX

LOCATION.--Lat 32°36'49", long 95°29'08", Wood County, Hydrologic Unit 12010001, on left bank at downstream side of highway embankment 3 ft downstream from left end of bridge on U.S. Highway 69, 3.5 mi south of Mineola, 4.5 mi upstream from Missouri Pacific Railway Lines bridge, 16.2 mi upstream from Lake Fork Creek, and at mile 461.1.

DRAINAGE AREA.--1,357 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1939 to September 1959, October 1967 to current year. Gage-height records collected at this site since July 1946 are contained in reports published by the National Weather Service.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 304.16 ft above National Geodetic Vertical Datum of 1929. May 12, 1939, to Dec. 11, 1955, at site 55 ft upstream from downstream side of bridge; Dec. 12, 1955, to Dec. 12, 1959, at downstream side of bridge; Oct. 1, 1967, to Sept. 12, 1968, nonrecording gage at downstream side of bridge; Sept. 13, 1968, to Oct. 23, 1974, water-stage recorder at downstream side of bridge; Oct. 24, 1974, to Oct. 16, 1975, at site on right bank 75 ft downstream from bridge. All gages at present datum.

REMARKS.--No estimated daily discharges. Records good. Since October 1960, flow partly regulated by Lake Tawakoni (see station 08017400), capacity 936,200 acre-ft, 53 mi upstream, and since September 1962, by Lake Holbrook (capacity, 7,990 acre-ft), located on Keys Creek, a tributary to the Sabine River 8.0 mi upstream. Flow may also be slightly affected at times by discharge from one floodwater-retarding structure with a detention capacity of 3,570 acre-ft. This structure controls runoff from a 9.70 mi<sup>2</sup> area in the Mill Creek drainage basin.

AVERAGE DISCHARGE.--20 years (water years 1940-59) prior to regulation by Lake Tawakoni, 1,054 ft<sup>3</sup>/s (763,600 acre-ft/yr); 24 years (water years 1968-91) regulated, 862 ft<sup>3</sup>/s (624,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 76,000 ft<sup>3</sup>/s Apr. 1, 1945 (gage height, 24.00 ft); maximum gage height, 24.37 ft June 8, 1943; no flow at times.  
Maximum stage since at least 1890, that of June 8, 1943.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,110 ft<sup>3</sup>/s Jan. 13 at 1230 hours (gage height, 17.09 ft); minimum daily, 1.3 ft<sup>3</sup>/s Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	4.8	281	584	202	850	163	1140	258	44	9.1	63
2	1.6	4.8	156	362	196	1070	133	901	199	36	12	63
3	1.6	5.0	100	287	153	1140	108	962	163	29	11	315
4	1.7	6.2	74	249	142	1090	200	1590	164	25	8.6	693
5	1.7	9.0	57	212	510	988	197	2350	235	22	7.1	973
6	1.6	8.4	47	237	1400	678	153	2820	190	23	6.2	1120
7	1.4	7.9	46	505	2130	367	311	3020	160	46	5.6	885
8	1.3	14	46	779	2550	262	463	2740	344	37	4.9	422
9	14	116	39	885	2500	299	324	2340	382	29	4.9	198
10	23	101	33	1750	1830	251	227	1920	238	22	9.9	222
11	10	67	30	2920	1010	174	151	1510	320	19	21	174
12	6.9	48	28	3630	475	154	140	1240	444	17	21	96
13	5.7	29	27	3940	281	132	403	1090	498	13	17	54
14	6.7	20	26	3570	229	116	1210	961	466	10	18	36
15	11	17	26	2530	191	258	1530	857	394	8.0	20	28
16	10	16	25	1890	159	308	1610	771	357	7.6	20	29
17	8.3	14	27	1790	213	234	1530	701	405	7.1	17	27
18	7.2	11	313	1840	358	176	1530	679	386	5.9	14	22
19	4.6	10	633	1740	682	147	1710	653	303	5.0	12	18
20	3.5	9.2	492	1700	875	158	1940	620	247	4.4	15	15
21	8.0	10	316	1770	810	151	2090	573	199	6.3	66	12
22	18	514	635	1710	1270	124	2150	512	150	7.2	52	11
23	11	1490	838	1280	2400	114	2110	447	126	6.3	32	15
24	7.1	2040	602	782	3250	106	1970	383	130	5.1	21	22
25	6.3	2400	328	454	3740	98	1740	457	214	7.4	22	24
26	6.0	2610	219	361	3530	94	1450	611	164	23	31	17
27	5.9	2280	817	321	2320	86	1220	825	125	14	37	14
28	5.9	1420	1410	285	1290	91	1110	782	96	11	24	11
29	5.6	801	1590	246	---	197	1280	575	75	13	16	13
30	4.9	499	1440	214	---	208	1330	423	58	10	14	20
31	4.7	---	1030	191	---	160	---	330	---	8.8	15	---
TOTAL	206.8	14582.3	11731	39014	34696	10281	30483	34783	7490	522.1	584.3	5612
MEAN	6.67	486	378	1259	1239	332	1016	1122	250	16.8	18.8	187
MAX	23	2610	1590	3940	3740	1140	2150	3020	498	46	66	1120
MIN	1.3	4.8	25	191	142	86	108	330	58	4.4	4.9	11
AC-FT	410	28920	23270	77380	68820	20390	60460	68990	14860	1040	1160	11130
CAL YR 1990	TOTAL	591444.37	MEAN	1620	MAX	28600	MIN	.50	AC-FT	1173000		
WTR YR 1991	TOTAL	189985.5	MEAN	521	MAX	3940	MIN	1.3	AC-FT	376800		



SABINE RIVER MAIN STEM

08018500 SABINE RIVER NEAR MINEOLA, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1967 to current year. Biochemical analyses: October 1973 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to September 1991 (discontinued).  
 WATER TEMPERATURE: October 1967 to September 1991 (discontinued).

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 11,400 microsiemens June 3, 1971; minimum daily, 64 microsiemens May 5, 1990.  
 WATER TEMPERATURE: Maximum daily, 36.0°C Aug. 21, 1984; minimum daily, 0.0°C Jan. 15, Feb. 1, 1979.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 6,180 microsiemens Nov. 13; minimum daily, 96 microsiemens Nov. 26.  
 WATER TEMPERATURE: Maximum daily, 29.0°C July 7, Aug. 8; minimum daily, 4.0°C Dec. 26.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
NOV 13...	1425	28	7250	6.9	12.0	8.4	80	2.4	280	260
JAN 07...	1701	557	1020	6.6	7.0	10.5	86	1.5	110	88
FEB 25...	1845	3850	125	6.6	9.0	7.9	69	1.4	35	17
APR 12...	1200	132	523	7.2	21.0	6.5	74	1.3	130	88
JUN 03...	1538	161	279	7.4	27.5	6.1	78	1.5	86	16
JUL 22...	1520	7.3	496	7.6	31.5	6.1	83	2.2	130	41

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
NOV 13...	85	17	1200	31	14	27	120	2000	0.20	12
JAN 07...	26	10	120	5	5.6	18	88	200	<0.10	13
FEB 25...	9.5	2.7	10	0.7	3.5	18	19	14	<0.10	5.1
APR 12...	31	12	59	2	4.7	39	97	78	0.20	13
JUN 03...	27	4.5	20	0.9	3.6	70	22	22	0.20	4.5
JUL 22...	39	7.7	45	2	3.5	88	54	60	0.20	7.8

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 13...	3460	--	<0.010	<0.100	0.050	0.75	0.80	0.040	0.020
JAN 07...	473	0.180	0.020	0.200	0.100	0.60	0.70	0.100	0.020
FEB 25...	75	0.080	0.040	0.120	0.060	1.4	1.5	0.100	0.030
APR 12...	318	0.160	0.030	0.190	0.080	0.82	0.90	0.110	0.040
JUN 03...	146	0.260	0.070	0.330	0.050	1.5	1.5	0.050	0.060
JUL 22...	270	--	0.020	<0.050	0.030	0.67	0.70	0.080	0.030

SABINE RIVER MAIN STEM

08018500 SABINE RIVER NEAR MINEOLA, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	206.8	1000	546	305	220	126	65	36	130
NOV. 1990	14582.3	219	121	4770	44	1720	17	684	36
DEC. 1990	11731	266	150	4760	46	1470	25	801	52
JAN. 1991	39014	212	120	12600	37	3890	20	2120	42
FEB. 1991	34696	215	122	11400	37	3500	21	1930	43
MAR. 1991	10281	363	204	5660	66	1820	33	916	68
APR. 1991	30483	257	145	11900	45	3700	24	2000	50
MAY 1991	34783	234	132	12400	40	3800	22	2110	47
JUNE 1991	7490	270	153	3090	47	955	26	520	53
JULY 1991	522.1	430	242	341	78	110	39	55	81
AUG. 1991	584.3	463	260	410	85	134	42	66	86
SEPT 1991	5612	225	126	1910	42	639	20	297	40
TOTAL	189985.5	**	**	69700	**	21900	**	11500	**
WTD.AVG.	521	241	136	**	43	**	23	**	47

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	417	576	220	545	543	280	665	283	264	492	448	e500
2	402	525	185	566	535	394	636	263	267	480	562	2650
3	373	460	280	397	500	e276	538	242	279	496	449	e610
4	320	355	315	454	435	229	353	220	278	498	460	265
5	283	290	335	551	380	e153	469	180	247	480	466	105
6	263	532	330	454	322	180	472	192	251	e505	501	119
7	270	660	425	764	228	300	480	173	277	517	508	139
8	269	e770	503	389	200	331	450	190	348	457	506	151
9	275	770	475	283	188	334	730	193	445	330	478	165
10	330	496	355	180	205	318	563	210	370	347	420	188
11	435	615	482	143	238	358	543	231	280	381	441	223
12	480	2030	457	136	295	400	543	235	238	401	512	260
13	502	6180	470	129	355	398	497	231	231	415	453	285
14	e370	5170	e405	127	413	490	339	232	268	406	428	297
15	463	3400	375	145	456	554	282	237	241	392	585	310
16	1150	2100	e445	e172	508	e420	250	260	235	379	611	299
17	1640	1650	400	e190	575	475	225	283	245	383	601	267
18	2370	1380	219	e216	383	735	199	e262	280	e344	593	280
19	2320	1100	200	234	360	593	190	255	245	386	e608	300
20	2300	845	295	e210	416	542	191	292	252	390	574	314
21	2080	640	355	196	320	573	198	319	253	422	460	e330
22	1360	230	e255	178	250	597	199	318	254	469	433	337
23	1850	265	160	203	165	595	199	e345	249	478	e415	373
24	1620	193	273	236	145	627	205	465	220	495	e399	407
25	1470	121	299	333	e125	636	e223	510	164	436	377	460
26	e1400	96	314	430	e130	616	232	337	e201	268	450	365
27	1210	119	e303	388	169	e615	239	264	257	385	580	e350
28	900	205	275	420	201	590	241	274	261	345	337	342
29	722	353	205	458	---	595	256	261	337	281	281	338
30	645	295	240	515	---	814	297	246	499	360	274	390
31	603	---	e390	504	---	790	---	255	---	e379	e273	---
MEAN	938	1080	330	327	323	478	363	266	275	413	467	381

e Estimated

SABINE RIVER MAIN STEM  
08018500 SABINE RIVER NEAR MINEOLA, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22.0	15.0	13.0	---	6.0	14.0	13.0	20.0	26.0	27.0	26.0	---
2	22.0	15.0	15.0	---	7.0	16.0	16.0	20.0	26.0	28.0	26.0	25.0
3	23.0	17.0	13.0	---	10.0	---	17.0	21.0	25.0	28.0	27.0	---
4	23.0	18.0	10.0	---	10.0	14.0	19.0	22.0	26.0	28.0	28.0	25.0
5	22.0	17.0	9.0	---	12.0	---	19.0	20.0	26.0	28.0	27.0	25.0
6	22.0	12.0	10.0	9.0	14.0	12.0	19.0	18.0	25.0	---	28.0	25.0
7	23.0	13.0	9.0	7.0	12.0	14.0	20.0	19.0	26.0	29.0	28.0	26.0
8	24.0	---	7.0	9.0	11.0	11.0	21.0	18.0	25.0	26.0	29.0	27.0
9	23.0	12.0	8.0	8.0	11.0	12.0	21.0	19.0	24.0	28.0	27.0	25.0
10	24.0	11.0	8.0	9.0	12.0	13.0	19.0	20.0	25.0	28.0	27.0	26.0
11	15.0	12.0	10.0	8.0	12.0	12.0	21.0	21.0	26.0	28.0	27.0	25.0
12	16.0	11.0	12.0	7.0	12.0	15.0	21.0	23.0	27.0	28.0	26.0	25.0
13	15.0	12.0	13.0	8.0	18.0	15.0	22.0	23.0	26.0	28.0	26.0	26.0
14	---	12.0	---	10.0	13.0	15.0	20.0	23.0	27.0	28.0	25.0	26.0
15	17.0	12.0	12.0	8.0	11.0	13.0	19.0	22.0	27.0	28.0	28.0	27.0
16	19.0	13.0	---	---	9.0	---	19.0	24.0	27.0	28.0	26.0	27.0
17	17.0	14.0	13.0	---	10.0	17.0	20.0	24.0	25.0	27.0	26.0	26.0
18	16.0	14.0	14.0	---	13.0	17.0	20.0	---	25.0	---	26.0	---
19	16.0	15.0	14.0	10.0	14.0	18.0	20.0	19.0	26.0	28.0	---	---
20	15.0	16.0	15.0	---	12.0	16.0	19.0	20.0	27.0	28.0	26.0	---
21	12.0	17.0	16.0	8.0	12.0	17.0	19.0	24.0	27.0	28.0	25.0	---
22	13.0	18.0	---	7.0	15.0	18.0	19.0	24.0	28.0	28.0	25.0	20.0
23	13.0	17.0	10.0	6.0	12.0	17.0	18.0	---	27.0	28.0	---	21.0
24	12.0	16.0	9.0	8.0	14.0	16.0	20.0	25.0	27.0	28.0	---	17.0
25	13.0	17.0	7.0	6.0	---	15.0	---	24.0	25.0	28.0	26.0	19.0
26	---	17.0	4.0	8.0	---	20.0	20.0	25.0	---	25.0	26.0	18.0
27	17.0	18.0	---	8.0	11.0	---	22.0	25.0	27.0	27.0	25.0	---
28	14.0	16.0	6.0	9.0	11.0	18.0	22.0	25.0	28.0	27.0	26.0	18.0
29	15.0	14.0	8.0	10.0	---	17.0	20.0	26.0	27.0	25.0	25.0	18.0
30	15.0	12.0	6.0	9.0	---	14.0	20.0	26.0	28.0	26.0	25.0	18.0
31	15.0	---	---	6.0	---	14.0	---	27.0	---	---	---	---
MEAN	17.7	14.6	10.4	8.1	11.7	15.2	19.5	22.3	26.2	27.5	26.4	23.3

SABINE RIVER BASIN

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08018720 BIRCH CREEK NEAR YANTIS (FM 2297), TX

LOCATION.--Lat 33°01'31", long 95°38'19", Hopkins County, Hydrologic Unit 12010003, on Farm Road 2297 bridge, over center of channel at downstream side of bridge, 0.96 mi upstream from Gideon Creek, and 7.5 mi northwest of State Highway 154 and Farm Road 17 intersection in Yantis.

DRAINAGE AREA.--17.5 mi<sup>2</sup>.

PERIOD OF RECORD.--Chemical and biochemical analyses: July to September 1991.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)
SEP 04...	0952	1.2	345	7.5	26.5	5.2	65	410	930
19...	1000	10	375	7.4	20.0	6.0	66	K64000	82000

DATE	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE (MG/L AS N)	NITRO-GEN, NO2+NO3 (MG/L AS N)	NITRO-GEN, AMMONIA (MG/L AS N)	NITRO-GEN, ORGANIC (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC (MG/L AS N)	PHOS-PHORUS (MG/L AS P)	PHOS-PHORUS ORTHO (MG/L AS P)
SEP 04...	0.340	0.030	0.370	0.100	1.0	1.1	0.450	0.250
19...	--	0.020	<0.050	0.120	1.1	1.2	0.340	0.230

SABINE RIVER BASIN

08018800 LAKE FORK RESERVOIR NEAR QUITMAN, TX

LOCATION.--Lat 32°48'48", long 95°31'40", Wood County, Hydrologic Unit 12010003, in room at left end of gated concrete spillway structure of Lake Fork Dam on Lake Fork Creek, 2,000 ft upstream from bridge on State Highway 182, 2.3 mi upstream from Alum Branch, and 4.4 mi west-northwest of the county courthouse in Quitman.

DRAINAGE AREA.--490 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1979 to current year.  
Water-quality records.--Chemical analyses: October 1980 to September 1984.

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

REMARKS.--The lake is formed by a rolled earthfill dam 12,660 ft long, including a 260-foot gated concrete spillway. The outlet works consist of two 5- 8-foot low flow sluice gates, five 40- by 20-foot tainter gates, and two 5- by 6-foot sluice gates that open into a wet well where there are two 36-inch and one 10-inch valve-controlled and metered-outlet pipes. Deliberate impoundment began June 29, 1979, and closure of the dam was completed in January 1980. The lake was built for water conservation and is owned by the Sabine River Authority. No known diversions were made from the lake this year. Flow is affected at times by discharge from the flood-detention pools of 21 floodwater-retarding structures with a combined detention capacity of 20,270 acre-ft. These structures control runoff 60 mi<sup>2</sup> above the lake. 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.....	419.5	1,270,000
Top of tainter gates.....	405.0	732,900
Crest of gated spillway.....	385.0	291,900
Invert of upper sluice gate.....	383.0	260,400
Invert of lower sluice gate.....	360.5	43,120
Invert of sluice gate in two center pieces.....	360.0	40,620

COOPERATION.--Area and capacity tables were prepared and provided by URS/Forest and Cotton, Inc., Consulting Engineers for the Sabine River Authority. Observed elevations for the period Oct. 31, 1979, to Jan. 31, 1980, were provided by the Sabine River Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 737,300 acre-ft May 4, 1990 (elevation, 405.15 ft); minimum observed, 46,140 acre-ft Dec. 11-14, 1979 (elevation, 361.10 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 701,100 acre-ft Jan. 11 at 0600 hours (elevation 403.90 ft); minimum, 632,700 acre-ft Nov. 1, 2 (elevation, 401.40).

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

401.0	622,100	403.0	675,800
402.0	648,500	404.0	703,900

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	639800	632700	659500	680000	686500	676400	690700	679500	670900	669800	657000	652600
2	640100	632700	659700	680900	687600	677800	691300	680300	671700	669500	656200	652900
3	638000	636400	661600	681200	688500	676900	690700	669300	670600	669000	655600	653200
4	639000	634200	661400	680600	686200	678300	690700	664900	670400	668700	655100	652900
5	638700	634000	660800	681700	680000	680000	690700	664400	670400	668500	654500	652400
6	639300	634000	661600	684800	676700	680600	690700	668500	669800	667600	654000	651800
7	643800	635800	660500	686800	677800	682000	689000	670900	669800	667400	653500	651500
8	641100	642200	660300	687600	678100	683400	688500	672300	672000	667100	652600	651300
9	639800	643200	660000	691000	677800	684500	688200	673600	672000	666500	653700	651000
10	639800	643500	659700	700600	677200	685700	689000	675300	672300	666000	653200	650700
11	639000	643500	659500	699700	676900	686200	688500	674700	671700	665200	652600	650200
12	638700	643500	659700	693200	676100	685400	679200	673100	671500	664600	652900	649900
13	638500	643200	659700	686500	676100	686500	684000	671700	671200	663800	653500	649400
14	638200	643200	659500	683400	676700	687900	687900	671500	670900	663500	654000	648800
15	638200	643200	659700	684300	678100	687900	684300	669800	670600	663300	653700	648500
16	638000	643800	659500	682600	679200	688500	681700	669000	672000	662500	653200	648500
17	636600	642500	663000	679800	678600	688200	680300	669000	672000	661900	654000	648300
18	636100	642500	664400	680300	676100	688800	678300	669500	671700	661400	653700	647200
19	638000	642200	664600	682300	677500	689900	676400	669300	671200	660800	653200	647000
20	636600	642200	665200	682600	676900	690200	678100	669000	670600	660000	652600	645600
21	636100	645100	669500	680600	680600	690700	680300	668500	670400	659500	652400	644800
22	636100	654500	670600	678600	690400	691000	680900	669300	670400	658900	652600	644600
23	635300	655400	670100	677200	687600	691000	682600	669000	672500	658100	652400	644300
24	634800	655100	668700	676100	684500	691000	683100	670400	672500	658900	653200	645400
25	634500	655100	668700	677800	680000	691300	683700	672800	672300	659700	e653200	644300
26	634200	655400	672300	679800	676400	691800	684500	673100	672000	659500	e653700	643800
27	634000	659500	675800	681200	678900	690400	684000	673100	671500	659200	652600	643200
28	633700	660300	677500	682600	679800	689600	678900	672500	671200	659200	651500	642200
29	633500	660000	680300	681700	---	688800	678100	672000	670600	658900	651000	640900
30	633200	659500	680600	684500	---	689600	678900	671500	670400	658100	651000	640600
31	632900	---	679800	685700	---	690200	---	671200	---	657800	652400	---
MAX	643800	660300	680600	700600	690400	691800	691300	680300	672500	669800	657000	653200
MIN	632900	632700	659500	676100	676100	676400	676400	664400	669800	657800	651000	640600
(†)	401.42	402.40	403.14	403.35	403.14	403.51	403.11	402.83	402.80	402.34	402.14	401.70
(Φ)	-8100	+26600	+20300	+5900	-5900	+10400	-11300	-7700	-800	-12600	-5400	-11800
CAL YR 1990	MAX	736000	MIN	630000	(Φ)	+48800						
WTR YR 1991	MAX	700600	MIN	632700	(Φ)	-400						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



SABINE RIVER BASIN

153

08019000 LAKE FORK CREEK NEAR QUITMAN, TX

LOCATION.--Lat 32°45'47", long 95°27'46", Wood County, Hydrologic Unit 12010003, at downstream side of highway embankment near left end of bridge on State Highway 37, 0.3 mi downstream from Dry Creek, 2.4 mi south of Quitman, and 23.4 mi upstream from mouth.

DRAINAGE AREA.--585 mi<sup>2</sup>.

PERIOD OF RECORD.--June 1924 to April 1926, February 1939 to current year. Discharge from some high-water periods in 1925-26 published in WSP 1342. Monthly discharge only for some periods, published in WSP 1312. Prior to October 1961, published as Lake Fork Sabine River near Quitman.

Water-quality records.--Chemical analyses: December 1961 to August 1989. Specific Conductance: November 1967 to September 1989. Water Temperature: December 1967 to September 1989.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 317.42 ft above National Geodetic Vertical Datum of 1929. From June 27, 1924, to Apr. 30, 1926, a nonrecording gage was located at site 1,000 ft downstream at same datum. Prior to Sept. 5, 1978, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Since May 1962, flow from 31.0 mi<sup>2</sup> above this station has been controlled by Lake Quitman (capacity, 7,440 acre-ft) on Dry Creek, a tributary above this station and below Lake Fork Reservoir. Construction of Lake Fork Dam and Reservoir (capacity, 675,800 acre-ft), located about 5 mi upstream from this station, began in 1975. Deliberate impoundment began June 29, 1979, and the dam was completed in January 1980. Lake Fork Reservoir controls runoff from 490 mi<sup>2</sup> above this station. The city of Quitman discharged a small amount of sewage effluent into a tributary above this station.

AVERAGE DISCHARGE.--41 years (water years 1925, 1940-79), prior to regulation by Lake Fork Reservoir, 432 ft<sup>3</sup>/s (313,000 acre-ft/yr); 12 years (water years 1980-91) regulated, 338 ft<sup>3</sup>/s (244,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 75,600 ft<sup>3</sup>/s Mar. 30, 1945 (gage height, 29.85 ft, from floodmark), from rating curve extended above 49,000 ft<sup>3</sup>/s; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in July 1895 reached a stage of about 25.9 ft, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,040 ft<sup>3</sup>/s Jan. 11 at 1400 hours (gage height, 17.00 ft); minimum daily, 1.1 ft<sup>3</sup>/s Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	8.0	88	118	665	1130	41	386	69	40	27	54
2	12	7.7	51	102	656	1180	36	344	68	33	29	37
3	11	8.1	41	105	642	1060	33	1080	66	35	30	30
4	12	10	32	89	458	915	31	3050	56	35	30	26
5	8.9	11	24	70	576	856	30	3620	55	34	30	25
6	4.2	10	20	95	1010	826	30	3180	54	34	30	24
7	2.1	9.6	18	262	955	806	86	2720	55	34	32	24
8	1.1	12	16	251	718	793	210	2000	54	32	35	28
9	1.9	69	15	177	550	769	135	1490	54	32	33	27
10	4.0	40	14	1470	452	463	70	1160	53	32	66	25
11	4.2	12	14	4700	407	302	52	933	53	32	37	25
12	3.2	7.2	13	4410	383	284	187	856	52	32	32	24
13	2.0	4.9	13	3960	374	280	917	825	52	33	31	24
14	3.0	4.2	13	3690	365	277	2020	806	52	33	28	25
15	4.1	4.1	13	2790	356	273	3320	802	51	33	28	24
16	5.4	4.5	13	2610	345	294	2910	784	53	33	27	23
17	5.1	5.9	24	2490	341	302	2170	464	62	33	26	23
18	4.6	6.7	315	2380	380	298	1670	119	50	32	26	22
19	4.9	7.0	495	1900	627	289	1350	63	48	32	25	22
20	5.4	6.7	326	1600	661	284	1220	43	48	31	25	23
21	6.0	7.6	197	1460	471	281	1020	38	48	31	25	23
22	7.6	607	291	1330	974	283	858	48	47	32	25	23
23	6.3	1140	257	1260	3280	276	814	48	52	30	25	23
24	6.2	605	125	1240	3790	92	785	52	53	31	25	23
25	5.5	234	74	1250	3080	43	504	107	53	32	25	23
26	6.0	69	128	1230	2280	37	345	110	50	32	25	23
27	5.9	81	577	1210	2130	37	348	54	45	30	25	23
28	6.3	328	603	1190	1560	38	471	39	42	29	25	23
29	6.3	421	419	956	---	85	628	30	43	28	24	23
30	6.7	247	277	737	---	76	523	57	42	28	24	23
31	7.3	---	190	686	---	50	---	70	---	28	27	---
TOTAL	181.2	3988.2	4696	45818	28486	12979	22814	25378	1580	996	902	765
MEAN	5.85	133	151	1478	1017	419	760	819	52.7	32.1	29.1	25.5
MAX	12	1140	603	4700	3790	1180	3320	3620	69	40	66	54
MIN	1.1	4.1	13	70	341	37	30	30	42	28	24	22
AC-FT	359	7910	9310	90880	56500	25740	45250	50340	3130	1980	1790	1520
CAL YR 1990	TOTAL	293638.7	MEAN	804	MAX	21300	MIN	1.1	AC-FT	582400		
WTR YR 1991	TOTAL	148583.4	MEAN	407	MAX	4700	MIN	1.1	AC-FT	294700		

## SABINE RIVER BASIN

08019500 BIG SANDY CREEK NEAR BIG SANDY, TX

LOCATION.--Lat 32°36'14", long 95°05'29", Upshur County, Hydrologic Unit 12010002, on downstream side of highway embankment near left end of bridge on State Highway 155, 0.5 mi upstream from St. Louis Southwestern Railway Lines bridge, 1.6 mi northeast of Big Sandy, and 6.5 mi upstream from mouth.

DRAINAGE AREA.--231 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1939 to current year.

Water-quality records.--Chemical analyses: March 1961 to September 1986. Chemical and biochemical analyses: October 1984 to September 1986.

REVISED RECORDS.--WSP 1732: 1941(M), 1945-46, 1956, drainage area. WSP 1922: 1944(M), 1945-46.

GAGE.--Water-stage recorder. Datum of gage is 278.38 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 5, 1940, nonrecording gage, and Oct. 5, 1940, to Nov. 26, 1951, water-stage recorder at site 1.3 mi upstream at datum 3.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Since June 1962, streamflow has been affected somewhat by Lake Winnsboro, about 27 miles upstream (capacity 8,100 acre-ft) and by several other smaller lakes. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--52 years, 182 ft<sup>3</sup>/s (131,900 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,000 ft<sup>3</sup>/s Mar. 31, 1945 (gage height, 24.1 ft, from floodmark, present site and datum), from rating curve extended above 13,000 ft<sup>3</sup>/s; minimum, 3.5 ft<sup>3</sup>/s July 24, Aug. 7-8, 1984. Maximum stage since at least 1875, that of Mar. 31, 1945, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 25	0100	1,540	13.04	May 6	2200	*2,860	*15.10
Jan. 13	1130	1,790	13.52				

Minimum daily discharge, 21 ft<sup>3</sup>/s Oct. 2, 3 and Aug. 8, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23	e38	250	671	210	600	324	357	124	83	41	35
2	21	e37	321	503	204	647	361	326	105	69	40	40
3	21	e36	336	416	193	617	292	522	95	60	34	66
4	27	e32	237	358	189	637	269	1030	81	52	30	102
5	24	e32	169	317	259	667	275	1260	72	48	27	120
6	25	e32	143	345	301	526	260	2400	66	43	24	100
7	24	e32	129	418	330	399	297	2460	63	40	22	75
8	24	e58	120	404	525	315	292	1690	72	38	21	65
9	164	e324	113	414	789	266	246	1180	68	37	21	55
10	188	e561	110	956	677	229	223	884	72	36	52	48
11	185	e484	108	1190	488	211	215	652	95	34	105	41
12	127	e351	107	1390	360	203	235	483	90	31	79	38
13	86	e296	106	1740	298	184	314	380	82	29	55	36
14	66	e237	114	1430	251	184	652	315	72	28	55	35
15	50	e161	116	1130	216	174	555	283	64	28	63	33
16	42	104	108	945	193	187	681	256	76	30	60	33
17	36	83	113	756	181	189	1110	235	107	30	52	30
18	34	75	164	668	235	197	937	261	97	28	44	29
19	32	67	191	719	427	197	683	275	104	35	43	27
20	31	63	227	646	503	196	493	260	130	32	37	26
21	49	66	337	512	453	188	361	216	130	27	33	25
22	98	210	809	475	577	182	281	201	118	26	32	24
23	106	719	831	501	734	176	229	190	96	25	34	23
24	82	1290	580	453	669	172	203	173	85	24	33	23
25	68	1480	428	372	917	169	185	173	87	60	36	29
26	70	1280	404	317	1020	165	173	171	95	128	30	35
27	60	913	520	281	787	160	190	160	91	141	27	32
28	48	764	524	269	589	185	596	167	102	95	27	28
29	44	467	556	262	---	330	1050	215	110	69	27	27
30	41	297	746	247	---	314	651	223	97	59	27	27
31	e39	---	866	225	---	265	---	166	---	47	29	---
TOTAL	1935	10589	9883	19330	12575	9131	12633	17564	2746	1512	1240	1307
MEAN	62.4	353	319	624	449	295	421	567	91.5	48.8	40.0	43.6
MAX	188	1480	866	1740	1020	667	1110	2460	130	141	105	120
MIN	21	32	106	225	181	160	173	160	63	24	21	23
AC-FT	3840	21000	19600	38340	24940	18110	25060	34840	5450	3000	2460	2590
CAL YR 1990	TOTAL	117662.2	MEAN	322	MAX	4020	MIN	8.5	AC-FT	233400		
WTR YR 1991	TOTAL	100445	MEAN	275	MAX	2460	MIN	21	AC-FT	199200		

e Estimated

SABINE RIVER MAIN STEM

08020000 SABINE RIVER NEAR GLADEWATER, TX

LOCATION.--Lat 32°31'37", long 94°57'36", Gregg County, Hydrologic Unit 12010002, on right bank 46 ft downstream from bridge on U.S. Highway 271, 0.4 mi downstream from Glade Creek, 1.2 mi southwest of Gladewater, and at mile 397.5.

DRAINAGE AREA.--2,791 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1932 to current year.

REVISED RECORDS.--WSP 1732: Drainage area. WDR TX-73-1: 1972.

GAGE.--Water-stage recorder. Datum of gage is 243.85 ft above National Geodetic Vertical Datum of 1929 (Texas Reclamation Department bench mark based on Geological Survey datum). Prior to Oct. 13, 1933, nonrecording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow partially regulated by Lake Tawakoni (station 08017400), capacity 936,200 acre-ft, by Lake Fork Creek Reservoir (station 08018800), capacity 675,800 acre-ft, and by five tributary reservoirs with a total combined capacity of 42,370 acre-ft. There are many diversions above station for oil field operations and municipal supply. Several observations of water temperature were obtained during the year. A rain gage and gage-height telemeter are located at station.

AVERAGE DISCHARGE.--28 years (water years 1933-60) prior to regulation by Lake Tawakoni, 2,012 ft<sup>3</sup>/s (1,458,000 acre-ft/yr); 31 years (water years 1961-91) regulated, 1,734 ft<sup>3</sup>/s (1,256,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 138,000 ft<sup>3</sup>/s Apr. 2, 1945 (gage height, 44.16 ft, from floodmark), from rating curve extended above 91,000 ft<sup>3</sup>/s; minimum, 5.6 ft<sup>3</sup>/s Aug. 16, 1939. Maximum stage since at least 1892, that of Apr. 2, 1945.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1914 reached a stage of about 41.7 ft (discharge, 85,900 ft<sup>3</sup>/s), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,160 ft<sup>3</sup>/s Jan. 20 at 1330 hours (gage height, 30.14 ft); minimum daily, 83 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	83	e159	3680	3440	2250	5730	1460	4770	865	415	254	166
2	86	e159	2840	3250	1930	6210	1170	4230	748	364	207	235
3	86	e149	1890	2730	1690	6420	1010	4870	687	318	177	459
4	603	e147	1190	2070	1570	6480	1070	5710	617	279	154	506
5	380	e149	837	1560	1820	6340	1370	6040	559	252	137	601
6	254	e162	665	1790	2180	6000	1520	5980	523	232	125	781
7	238	e157	587	2340	2490	5490	1630	6040	519	212	119	922
8	161	e365	537	2430	2770	4790	1810	6170	502	194	116	1030
9	474	1950	501	2460	3130	3840	1790	6270	496	188	117	985
10	999	2920	477	4050	3500	2830	1710	6370	621	196	187	723
11	1080	2990	461	5350	3770	2130	1420	6440	1020	191	228	477
12	930	2310	446	5710	3890	1730	1310	6460	1140	177	232	381
13	541	1400	444	5840	3770	1420	1800	6410	854	171	210	345
14	315	862	438	5960	3150	1160	3720	6220	765	159	272	290
15	227	626	442	6220	2180	1030	4560	5890	757	146	353	236
16	184	478	432	6530	1450	1020	4620	5390	814	153	416	194
17	163	385	429	6890	1200	1140	4470	4670	1090	157	357	170
18	175	349	529	7360	1390	1220	4460	3920	1140	134	270	157
19	171	329	720	7910	2720	1170	4520	3280	1060	120	221	158
20	156	308	1100	8110	3800	1090	4580	2740	898	122	191	147
21	292	296	1670	7980	4030	1030	4600	2130	748	122	169	132
22	499	774	2710	7710	4230	1010	4570	1600	625	110	156	123
23	598	2390	3280	7320	4440	988	4490	1320	555	99	153	120
24	650	3300	3230	6930	4470	928	4380	1180	499	98	179	117
25	451	3730	2780	6520	4440	892	4240	1100	623	322	185	120
26	296	3960	2290	6090	4570	827	4060	1050	677	1040	175	137
27	229	4040	2750	5550	4860	719	3860	1030	693	1030	158	162
28	198	4180	3210	4830	5180	700	3900	1100	631	759	144	157
29	e187	4270	3420	3990	---	1550	4770	1190	538	529	141	140
30	e178	4120	3400	3210	---	1980	5050	1190	467	378	151	125
31	e170	---	3420	2640	---	1880	---	1050	---	307	162	---
TOTAL	11054	47414	50805	154770	86870	79744	93920	121810	21731	8974	6116	10296
MEAN	357	1580	1639	4993	3102	2572	3131	3929	724	289	197	343
MAX	1080	4270	3680	8110	5180	6480	5050	6460	1140	1040	416	1030
MIN	83	147	429	1560	1200	700	1010	1030	467	98	116	117
AC-FT	21930	94050	100800	307000	172300	158200	186300	241600	43100	17800	12130	20420
CAL YR 1990	TOTAL	1338194	MEAN	3666	MAX	42500	MIN	43	AC-FT	2654000		
WTR YR 1991	TOTAL	693504	MEAN	1900	MAX	8110	MIN	83	AC-FT	1376000		

e Estimated

## SABINE RIVER MAIN STEM

08020450 SABINE RIVER ABOVE LONGVIEW, TX

LOCATION.--Lat 32°28'47", long 94°48'15", Gregg County, Hydrologic Unit 12010002, on left bank at city of Longview pumping station at the end of Swinging Bridge Road, 1.4 mi southwest of the intersection of Swinging Bridge Road and Farm Road 2206 in Longview, 2.5 mi downstream from Hawkins Creek, 2.6 mi upstream from U.S. Highway 259, and at mile 357.4.

DRAINAGE AREA.--2,943 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1983 to current year (operated as a low-flow station only).

GAGE--Water-stage recorder and concrete control. Datum of gage is 230.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair including those for estimated daily discharges. Daily discharges above 500 ft<sup>3</sup>/s are not published. Flow partially regulated by Lake Tawakoni (station 08017400), capacity 936,200 acre-ft, by Lake Fork Reservoir (station 08018800), capacity 675,800 acre-ft, and by five tributary reservoirs with a combined capacity of 42,370 acre-ft. There are many diversions above station for municipal, industrial supply, and for oil field operations.

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, 31.64 ft May 10, 1990; minimum daily discharge, 0.50 ft<sup>3</sup>/s Sept. 4, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 26.95 ft May 4 at 0500 hours; minimum daily discharge, 70 ft<sup>3</sup>/s Oct. 2-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	77	182	---	---	---	---	---	---	---	---	299	199
2	70	179	---	---	---	---	---	---	---	445	237	231
3	70	180	---	---	---	---	---	---	---	391	202	---
4	367	181	---	---	---	---	---	---	---	345	178	---
5	---	181	---	---	---	---	---	---	---	317	166	---
6	478	181	---	---	---	---	---	---	---	e294	149	---
7	313	194	---	---	---	---	---	---	---	e278	139	---
8	244	333	---	---	---	---	---	---	---	e267	136	---
9	---	---	---	---	---	---	---	---	---	e255	138	---
10	---	---	---	---	---	---	---	---	---	e243	149	---
11	---	---	---	---	---	---	---	---	---	e243	199	---
12	---	---	---	---	---	---	---	---	---	e235	213	459
13	---	---	---	---	---	---	---	---	---	e217	215	381
14	---	---	---	---	---	---	---	---	---	e201	405	339
15	343	---	---	---	---	---	---	---	---	e185	---	282
16	247	---	---	---	---	---	---	---	---	e167	469	226
17	205	---	---	---	---	---	---	---	---	e130	437	203
18	195	467	---	---	---	---	---	---	---	e121	351	187
19	208	427	---	---	---	---	---	---	---	e130	262	174
20	196	402	---	---	---	---	---	---	---	e151	216	172
21	316	390	---	---	---	---	---	---	---	e129	196	167
22	---	---	---	---	---	---	---	---	---	e101	183	157
23	---	---	---	---	---	---	---	---	---	94	173	149
24	---	---	---	---	---	---	---	---	---	96	172	150
25	---	---	---	---	---	---	---	---	---	334	190	165
26	456	---	---	---	---	---	---	---	---	---	191	155
27	331	---	---	---	---	---	---	---	---	---	188	160
28	261	---	---	---	---	---	---	---	---	---	175	179
29	217	---	---	---	---	---	---	---	---	---	172	184
30	201	---	---	---	---	---	---	---	---	---	172	167
31	190	---	---	---	---	---	---	---	---	379	180	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---
MEAN	---	---	---	---	---	---	---	---	---	---	---	---
MAX	---	---	---	---	---	---	---	---	---	---	---	---
MIN	---	---	---	---	---	---	---	---	---	---	---	---
AC-FT	---	---	---	---	---	---	---	---	---	---	---	---
CAL YR 1990	TOTAL	---	MEAN	---	MAX	---	MIN	---	AC-FT	---	---	---
WTR YR 1991	TOTAL	---	MEAN	---	MAX	---	MIN	---	AC-FT	---	---	---

e Estimated

SABINE RIVER MAIN STEM

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08022040 SABINE RIVER NEAR BECKVILLE, TX

LOCATION.--Lat 32°19'38", Long 94°21'12", Panola County, Hydrologic Unit 12010002, at downstream side of highway embankment near right end of downstream bridge on U.S. Highway 59, 0.9 mi upstream from Eightmile Creek, 6.0 mi upstream from Farm Road 1794, 8.4 mi northeast of Beckville, 12.4 mi downstream from State Highway 43, and at mile 327.0.

DRAINAGE AREA.--3,589 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1938 to current year. Prior to October 1978, published as "near Tatum".

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 190.00 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1978, at site 12.4 mi upstream at datum 14.18 ft higher. Prior to Sept. 21, 1945, non-recording gage.

REMARKS.--No estimated daily discharges. Records good. Eight major upstream reservoirs, with a combined capacity of 1,701,000 acre-ft, largely regulate the flow. There are several diversions above this station and below Lake Tawakoni for municipal, industrial and for oil field operations. Low flows are sustained by sewage effluents that are returned to the river above the station. For statement regarding regulation by Soil Conservation Service flood-water-retarding structures, see station 08018500.

AVERAGE DISCHARGE.--22 years (water years 1939-60) prior to regulation by Lake Tawakoni, 2,663 ft<sup>3</sup>/s (1,929,000 acre-ft/yr); 31 years (water years 1961-91) regulated, 2,365 ft<sup>3</sup>/s (1,713,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 123,000 ft<sup>3</sup>/s Apr. 4, 1945 (gage height, 33.80 ft), site and datum then in use, from graph based on gage readings, from rating curve extended above 66,000 ft<sup>3</sup>/s on basis of partly estimated discharge measurement of 88,900 ft<sup>3</sup>/s; minimum observed, 2.4 ft<sup>3</sup>/s Aug. 11, 1964. Maximum stage since at least 1884, that of Apr. 4, 1945.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1884 reached a stage of about 2 ft lower than flood of Apr. 4, 1945. These dates and gage heights are based on information for stations near Tatum (08022000) and at Logansport, La. (08022500).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 19,600 ft<sup>3</sup>/s May 4 at 1100 hours (gage height, 29.32 ft); minimum daily, 169 ft<sup>3</sup>/s July 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	175	331	4620	5350	5800	7200	6500	12400	1840	894	568	534
2	179	321	4370	4980	4440	8870	4470	11500	1580	760	457	385
3	173	310	4020	4860	3420	9540	3190	11600	1420	665	384	1480
4	274	306	3230	4730	2890	9380	2400	18700	1710	601	316	2080
5	875	311	2170	4050	2990	9000	2140	16700	1450	528	261	1730
6	1090	340	1500	3290	3660	8640	2280	14600	1290	473	245	1060
7	769	330	1180	3690	3850	8320	3300	13600	1090	430	218	1050
8	503	323	1020	4390	3780	8000	3630	13100	948	395	208	1170
9	464	2080	927	4320	3780	7620	3520	12600	889	368	229	1290
10	1030	7040	845	7300	3860	7120	3120	12100	1020	342	284	1320
11	1570	8390	805	10800	4030	6340	2680	11500	2300	316	289	1190
12	1520	7980	769	11200	4240	5030	5040	10500	5140	307	294	941
13	1280	6590	764	10800	4440	3570	11000	9530	5750	295	317	715
14	1030	4590	738	10200	4550	2690	14000	8800	4110	280	445	571
15	749	2650	728	10500	4400	2140	17800	8810	2420	264	1420	499
16	545	1620	742	11700	3730	1860	15500	9050	1820	242	1460	419
17	429	1190	796	11800	2750	1770	13500	8880	1600	213	978	346
18	382	957	1000	11300	3790	1800	12400	8370	1690	203	755	310
19	381	815	1380	11000	9290	1860	11400	7850	1770	206	623	267
20	368	732	1400	10800	10700	1830	10100	7250	1680	221	501	253
21	477	679	1390	10600	10200	1770	8540	6120	1620	198	411	243
22	1150	672	2640	10300	9480	1690	7320	4720	1400	169	350	225
23	1570	1640	3910	10000	9310	1620	6470	3590	1180	177	341	206
24	1250	3520	4000	9880	9010	1560	5980	2850	1080	179	332	229
25	1070	3970	3840	9730	8240	1480	5710	2900	1090	236	282	440
26	949	3910	3600	9500	7570	1410	5470	3240	1070	1400	254	513
27	749	3970	4350	9200	6960	1380	5950	3110	1090	2000	256	347
28	581	4730	5850	8840	6520	1500	8450	2590	1050	1620	258	281
29	487	5200	6630	8440	---	6050	12000	2380	1140	1370	242	265
30	416	5100	6220	7900	---	9380	13000	2280	1100	1040	227	252
31	365	---	5710	7010	---	8450	---	2100	---	761	496	---
TOTAL	22850	80597	81144	258460	157680	148870	226860	263320	53337	17153	13701	20611
MEAN	737	2687	2618	8337	5631	4802	7562	8494	1778	553	442	687
MAX	1570	8390	6630	11800	10700	9540	17800	18700	5750	2000	1460	2080
MIN	173	306	728	3290	2750	1380	2140	2100	889	169	208	206
AC-FT	45320	159900	160900	512700	312800	295300	450000	522300	105800	34020	27180	40880
CAL YR 1990	TOTAL	1547311	MEAN	4239	MAX	32400	MIN	100	AC-FT	3069000		
WTR YR 1991	TOTAL	1344583	MEAN	3684	MAX	18700	MIN	169	AC-FT	2667000		



## SABINE RIVER MAIN STEM

08022040 SABINE RIVER NEAR BECKVILLE, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: February 1952 to current year. Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: March 1968 to June 1981.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: February 1952 to current year.

WATER TEMPERATURE: February 1952 to current year.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request. Formerly published as 08022000 Sabine River near Tatum.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 3,040 microsiemens Jan. 13, 1966; minimum daily, 53 microsiemens Mar. 31, 1979, Mar. 30, 1989.

WATER TEMPERATURE: Maximum daily, 38.0°C July 8, 1969; minimum daily, 0.0°C on several days during December 1983.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 580 microsiemens Jul. 22; minimum daily, 68 microsiemens Dec. 1.

WATER TEMPERATURE: Maximum daily, 33.5°C Jul. 22, 24; minimum daily, 4.0°C Dec. 27.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV 14...	1205	4860	140	6.6	12.5	8.3	77	2.9	28	14	7.5	2.2
JAN 09...	1505	4200	188	6.5	8.0	10.4	87	1.2	35	20	8.8	3.1
FEB 28...	1440	6510	162	6.6	11.0	9.3	85	0.8	35	21	8.9	3.1
APR 09...	1725	3480	225	6.8	21.0	7.1	79	1.3	43	24	11	3.7
JUN 05...	1530	1400	279	6.8	28.0	5.4	70	2.2	51	21	14	3.8
JUL 24...	1200	169	557	7.6	30.0	6.4	85	1.6	61	0	17	4.4
DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
NOV 14...	15	1	3.4	14	11	25	0.20	10	83	0.090	0.010	0.100
JAN 09...	19	1	2.9	15	23	30	0.20	14	111	0.180	0.020	0.200
FEB 28...	15	1	3.1	14	25	23	<0.10	9.2	96	0.100	0.030	0.130
APR 09...	25	2	2.7	19	21	35	<0.10	12	122	0.220	0.030	0.250
JUN 05...	28	2	3.2	30	21	44	0.20	12	144	0.490	0.070	0.560
JUL 24...	71	4	3.7	71	56	81	0.30	10	287	0.450	0.020	0.470
DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
NOV 14...	0.090	0.51	0.60	0.070	0.050	--	--	--	--	--	--	--
JAN 09...	0.100	0.80	0.90	<0.010	0.040	<1	55	<0.5	1.0	<5	<3	<10
FEB 28...	0.050	0.95	1.0	0.060	<0.010	--	--	--	--	--	--	--
APR 09...	0.090	0.31	0.40	0.140	0.050	--	--	--	--	--	--	--
JUN 05...	0.100	2.6	2.7	0.120	0.080	--	--	--	--	--	--	--
JUL 24...	0.040	0.66	0.70	0.180	0.080	1	67	<0.5	<1.0	<5	3	<10

SABINE RIVER MAIN STEM

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08022040 SABINE RIVER NEAR BECKVILLE, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 14...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 09...	430	<10	7	83	<0.1	<10	<10	<1	<1.0	120	<6	13
FEB 28...	--	--	--	--	--	--	--	--	--	--	--	--
APR 09...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 05...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 24...	27	<10	11	120	0.2	<10	<10	<1	2.0	310	<6	4

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	22850	268	149	9170	39	2390	26	1590	51
NOV. 1990	80597	168	93	20300	23	5070	17	3700	34
DEC. 1990	81144	187	104	22800	26	5700	19	4140	38
JAN. 1991	258460	146	81	56600	20	13800	15	10500	31
FEB. 1991	157680	185	103	43800	26	10900	19	8000	38
MAR. 1991	148870	181	101	40500	25	10100	18	7400	37
APR. 1991	226860	140	78	47800	19	11600	15	8890	30
MAY 1991	263320	132	74	52300	18	12700	14	9770	28
JUNE 1991	53337	221	123	17700	31	4500	22	3160	44
JULY 1991	17153	321	178	8240	48	2230	30	1370	57
AUG. 1991	13701	365	202	7480	55	2040	33	1230	64
SEPT 1991	20611	290	161	8950	42	2360	28	1530	54
TOTAL	1344583	**	**	336000	**	83300	**	61300	**
WTD.AVG.	3684	166	92	**	23	**	17	**	34

## SABINE RIVER MAIN STEM

08022040 SABINE RIVER NEAR BECKVILLE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	498	369	68	192	195	149	162	106	275	261	248	470
2	478	400	112	195	200	146	173	111	263	255	288	448
3	479	433	172	190	211	141	186	122	264	243	312	223
4	461	462	194	188	226	147	217	75	254	255	332	313
5	431	474	211	222	243	150	240	93	248	273	351	281
6	195	506	234	218	233	149	249	87	250	301	368	298
7	314	509	245	234	235	159	233	92	253	308	395	266
8	233	488	259	241	221	175	211	102	260	318	425	260
9	229	270	262	186	220	188	218	112	285	352	442	237
10	293	128	282	155	262	199	209	117	296	374	455	220
11	250	113	284	134	247	212	202	122	212	385	476	204
12	228	109	287	122	220	219	192	133	160	392	498	196
13	175	127	290	124	211	226	108	142	114	391	548	223
14	200	137	294	119	208	242	88	148	151	401	557	250
15	208	162	306	117	210	246	74	153	215	420	412	277
16	221	194	309	111	225	253	99	154	285	460	248	291
17	238	223	314	119	234	246	110	167	264	497	290	298
18	270	240	264	120	204	254	123	167	266	520	269	303
19	358	250	237	122	142	244	146	173	273	542	288	323
20	357	275	175	123	151	246	166	181	213	538	310	345
21	359	288	281	127	153	261	168	185	222	562	337	372
22	339	305	238	128	145	272	168	197	223	580	355	391
23	217	311	e225	132	150	266	168	192	225	564	364	440
24	264	168	211	138	161	256	174	205	260	540	393	459
25	260	190	205	144	165	270	176	208	320	537	428	455
26	228	185	186	153	172	291	182	217	292	538	435	485
27	251	159	178	160	171	289	181	218	269	214	429	423
28	272	168	167	163	167	294	124	212	276	249	436	369
29	285	163	172	164	---	151	118	212	245	247	439	324
30	315	e145	140	168	---	137	106	221	220	205	499	298
31	340	---	148	178	---	167	---	258	---	220	518	---
MEAN	298	265	224	158	199	214	166	157	245	385	392	325

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24.0	15.5	14.0	4.5	8.0	13.0	16.5	22.0	27.0	29.5	28.5	28.5
2	25.0	16.0	15.0	5.0	9.0	14.0	15.5	22.0	28.0	29.5	29.0	30.0
3	25.0	17.0	14.0	5.5	9.5	14.0	16.5	22.0	27.5	29.0	30.0	26.0
4	25.0	18.0	12.0	5.5	9.0	12.5	17.5	21.0	28.0	29.5	32.0	27.5
5	25.5	15.0	11.0	6.0	10.5	14.0	18.0	21.0	28.5	28.0	33.0	27.5
6	23.5	13.0	11.0	8.0	11.0	15.0	19.0	20.5	28.0	29.5	30.0	26.5
7	24.5	14.0	11.5	7.5	11.0	15.0	19.5	20.0	27.0	30.0	29.5	29.0
8	24.5	14.5	11.5	8.0	12.0	15.5	19.5	20.5	27.0	30.0	30.0	29.0
9	24.0	13.0	10.0	8.0	11.0	14.5	21.5	20.5	26.5	30.0	30.0	29.5
10	20.0	11.5	9.5	8.5	13.0	14.0	20.0	20.0	27.0	30.0	29.0	28.0
11	19.0	11.0	9.5	8.5	12.0	15.0	21.0	21.0	25.5	30.0	29.5	29.0
12	17.5	11.5	10.5	7.5	12.0	15.0	20.5	21.5	25.5	30.0	30.5	29.5
13	17.0	12.0	13.0	7.0	12.5	15.5	20.5	22.5	26.0	30.5	29.0	28.0
14	17.5	13.0	12.0	7.5	12.5	15.5	20.0	22.5	27.0	31.0	27.0	27.5
15	18.5	13.0	13.5	7.5	12.0	14.0	19.0	22.5	28.0	31.0	27.0	30.0
16	20.0	13.0	13.0	8.5	11.5	13.0	19.0	23.0	28.0	30.0	26.0	28.0
17	20.0	14.0	12.5	7.5	12.0	14.0	20.0	24.0	27.0	33.0	27.5	28.0
18	18.0	14.0	14.0	8.0	13.0	14.0	20.0	23.0	27.5	29.0	29.5	30.0
19	17.0	14.5	13.5	8.0	14.0	14.0	21.0	23.5	27.0	30.0	30.5	25.5
20	19.5	15.5	13.5	8.5	12.0	14.5	20.5	24.0	28.0	30.0	30.0	24.0
21	19.0	16.5	14.5	8.0	12.0	17.0	20.0	24.0	27.0	30.0	31.0	22.0
22	17.0	17.0	11.0	7.5	12.0	18.0	20.0	24.0	28.0	33.5	30.0	24.0
23	17.0	16.5	---	7.5	11.5	19.0	19.0	24.5	28.0	29.0	28.5	26.0
24	17.0	17.0	6.5	7.5	12.0	17.0	19.0	25.0	28.0	33.5	24.0	24.0
25	15.0	16.0	5.5	7.5	11.5	17.0	19.5	25.0	28.0	29.5	30.5	23.0
26	16.0	17.0	4.5	8.0	11.0	19.0	20.0	25.5	28.5	27.5	30.5	20.5
27	17.0	17.0	4.0	8.5	11.5	20.0	20.5	25.5	29.0	27.0	28.5	21.0
28	15.5	16.0	5.5	8.0	10.5	18.0	21.5	26.5	29.0	28.0	31.0	20.0
29	15.5	14.5	7.0	9.0	---	16.0	21.5	27.5	29.0	30.0	31.5	20.0
30	15.0	14.0	7.0	8.0	---	14.5	20.5	27.0	29.0	28.0	29.0	21.0
31	15.0	---	4.5	9.0	---	15.0	---	27.0	---	28.5	28.0	---
MEAN	19.5	14.7	10.5	7.5	11.4	15.4	19.5	23.2	27.6	29.8	29.4	26.1

SABINE RIVER BASIN

08022060 MARTIN LAKE NEAR TATUM, TX

LOCATION.--Lat 32°15'42", long 94°34'23", Rusk County, Hydrologic Unit 12010002, on retaining wall, 30 ft to right of intake to generating plant No. 1, 1.9 mi upstream from Martin Dam on Martin Creek, 5.8 mi southwest of Tatum, and 21.9 mi upstream from mouth.

DRAINAGE AREA.--130 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1974 to current year.

Water-quality records.--Chemical analyses: October 1974 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 15, 1976, non-recording gage near left end of dam 1.9 mi downstream at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 8,675 ft long, including a 1,000-foot uncontrolled spillway. Deliberate impoundment began in April 1974. The uncontrolled spillway is an excavated channel cut through natural ground and located at the left end of the dam. The controlled spillway is a concrete ogee design cut with four 14.0-by 40.0-foot-wide tainter gates located near the left end of the dam. The low-flow outlet works consist of a 3.0-by 5.0-foot conduit with a sluice gate located in one of the gate piers. There is an 8-inch pipe with sluice gate. The area and capacity tables are based on an aerial survey made in October 1971. There are no known diversions. 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.....	321.5	-
Crest of uncontrolled spillway.....	312.0	111,500
Top of gates.....	308.0	87,960
Top of conservation pool.....	306.0	77,500
Crest of gated spillway.....	294.0	31,040
Lowest gated outlet (invert).....	284.0	10,320

COOPERATION.--Area and capacity tables provided by Forrest and Cotton, Consulting Engineers, for Texas Utilities Services, Inc.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 118,000 acre-ft Mar. 29, 1989 (elevation, 313.00 ft); minimum since first appreciable storage, 54,380 acre-ft Oct. 25, 1988 (elevation, 300.87 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 82,100 acre-ft Apr. 14 at 1200 hours (elevation, 306.90 ft); minimum, 68,520 acre-ft Oct. 3-4 (elevation, 304.40 ft).

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

304.0	67,880	306.0	77,500
305.0	72,580	307.0	82,620

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68800	71910	77000	77400	76900	78100	77500	78000	78200	76700	74040	73360
2	68710	71820	77000	77200	77000	76700	77500	77700	78200	76600	74040	73750
3	68520	71820	77000	78100	77000	77000	77200	77100	78310	76500	73940	74720
4	69640	71720	77100	78510	77600	77200	77200	77200	78310	76700	73550	75210
5	69730	71720	77000	77200	77300	77500	77400	77300	78200	76900	73550	75020
6	69730	71630	77000	77200	76800	77500	78510	77500	78310	76700	73260	75110
7	69640	71530	77000	77800	77000	77700	77500	77700	78200	76800	73260	75020
8	69640	72010	77000	78100	77200	77800	77800	77800	78000	76700	73260	75210
9	70200	78910	77100	77900	77200	77750	77900	77200	77900	76500	73160	75020
10	70390	78200	77100	78510	77400	77900	77900	77500	78000	76500	73070	75110
11	70200	77200	77100	77000	77600	77900	78000	77100	78000	76200	72780	75020
12	70200	77400	77000	77800	77800	78000	77400	77300	77500	76200	72780	74920
13	70200	77500	77100	76900	77800	77900	80550	77400	77700	76100	72970	74720
14	70110	77600	77000	77600	77700	77900	78810	77400	77900	75900	73550	74720
15	70110	77800	77200	78610	77000	78000	77900	77700	77400	75810	73940	74530
16	69920	77800	77300	76700	77100	78200	77500	77900	76700	75510	73840	74430
17	69920	77900	77500	77300	77100	76900	77400	77100	77000	75510	73750	74230
18	69730	77900	77500	77100	77900	77000	78200	76400	77000	75410	73840	74040
19	69640	78000	77500	77400	77200	77100	79120	76700	77000	75210	73750	73650
20	69450	78100	76500	77600	77500	77200	77200	76900	77200	75020	73550	73450
21	71100	78100	76900	77900	76700	77300	77400	77200	77300	74920	73550	73260
22	72010	76700	77000	77600	77500	77200	77600	77400	77200	74530	73750	73160
23	72200	77200	76900	77000	77200	77200	77400	77500	77700	74530	74040	73070
24	72200	77400	76900	77500	77600	77200	77500	77400	78310	74330	73940	73360
25	72100	77500	76900	77800	77750	77400	77700	78810	78510	74720	73750	73360
26	72100	77700	77900	78000	77200	77100	77750	77900	78510	74720	73750	73070
27	72100	77900	77500	77000	77500	77000	77500	78000	76700	74720	73550	73070
28	72010	77200	77800	77200	77500	77400	78910	78200	76800	74720	73550	72970
29	72010	77500	78200	77200	---	77500	77200	78200	76700	74530	73260	72870
30	72010	77000	76900	77600	---	77500	77800	78200	76800	74430	73450	72780
31	71820	---	77200	76800	---	77700	---	78200	---	74230	73450	---
MAX	72200	78910	78200	78610	77900	78200	80550	78810	78510	76900	74040	75210
MIN	68520	71530	76500	76700	76700	76700	77200	76400	76700	74230	72780	72780
(†)	304.84	305.90	305.94	305.86	306.00	306.04	306.06	306.14	305.86	305.34	305.18	305.04
(Φ)	+2830	+5180	-400	+700	+700	+200	+100	+400	-1400	-2570	-780	-670
CAL YR 1990	MAX	78910	MIN	67050	(Φ)	+10110						
WTR YR 1991	MAX	80550	MIN	68520	(Φ)	+3790						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## SABINE RIVER BASIN

08022070 MARTIN CREEK NEAR TATUM, TX

LOCATION.--Lat 32°17'44", long 94°29'29", Panola County, Hydrologic Unit 1201002, on right bank, 35 ft downstream from right abutment, 360 ft to right of bridge on State Highway 149, 50 ft upstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 1.7 mi upstream from Hogan Creek, 2.0 mi southeast of Tatum, 5.0 mi downstream from Martin Lake, and 15.0 mi upstream from mouth.

DRAINAGE AREA.--148 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1974 to current year.

REVISED RECORDS.--WDR TX-76-1: 1975.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 240.26 ft above National Geodetic Vertical Datum of 1929. Prior to Mar. 31, 1978, at site 50 ft upstream at same datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow is largely regulated by Martin Lake, located 5 mi upstream. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--17 years (water years 1975-91), 106 ft<sup>3</sup>/s (76,800 acre-ft/yr).  
 Revisions.--Revised figures for the water years 1989-90 superseding those published in error in the corresponding data reports are given herein:  
 15 years (water years 1975-89), 92.9 ft<sup>3</sup>/s, 67,310 acre-ft/yr.  
 16 years (water years 1975-90), 95.8 ft<sup>3</sup>/s, 69,410 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,900 ft<sup>3</sup>/s Mar. 29, 1989 (gage height, 19.52 ft) from rating extended above 5,500 ft<sup>3</sup>/s; minimum, 0.25 ft<sup>3</sup>/s Oct. 17, 1977.  
 Maximum stage since at least 1948, that of Mar. 29, 1989.

EXTREMES OUTSIDE PERIOD OF RECORD.--Second highest stage, since 1948, 18.15 ft April 1969. The flood in April 1957 reached a stage of 13.95 ft, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 10,100 ft<sup>3</sup>/s Apr. 15 at 0015 hours (gage height, 16.44 ft) from rating extended above 5,500 ft<sup>3</sup>/s; minimum daily, 5.9 ft<sup>3</sup>/s Oct. 1, 3.

REVISIONS.--The maximum discharges for water years 1989 and 1990 have been revised to 16,900 ft<sup>3</sup>/s, March 29, 1989 (gage height, 19.52 ft), from rating extended above 5,500 ft<sup>3</sup>/s; and 11,500 ft<sup>3</sup>/s, May 13, 1990 (gage height, 17.05 ft), from rating extended above 5,500 ft<sup>3</sup>/s, superseding figures published in reports for 1989 and 1990. Revised daily discharges in feet cubed per second, for periods in February, March, May, and June of 1989, and February, May, and June of 1990, are given herein:

WATER YEAR 1989								
Feb.	18.....	2100	May	16.....	1200	June	6.....	3340
Mar.	29.....	11300		17.....	4190		8.....	2970
	30.....	7750		18.....	2080		9.....	1460
	31.....	1710	June	5.....	7270		15.....	2640
		TOTAL	MEAN	MAX	MIN	AC-FT		
February	1989.....	17055	609	2100	21	33830		
March	1989.....	24358	786	11300	11	48310		
May	1989.....	10490.2	338	4190	6.5	20810		
June	1989.....	25609.8	854	7270	9.5	50800		
WTR YR	1989.....	87474.3	240	11300	5.0	173500		
WATER YEAR 1990								
Feb.	2.....	1600	May	12.....	3680	June	1.....	1810
	3.....	1840		13.....	6320			
	10.....	1900		15.....	841			
		TOTAL	MEAN	MAX	MIN	AC-FT		
February	1990.....	10787	385	1900	17	21400		
May	1990.....	17076	551	6320	10	33870		
June	1990.....	4365.5	146	1810	6.7	8660		
CAL YR	1989.....	85857.9	235	11300	1.1	170300		
WTR YR	1990.....	50802.7	139	6320	1.1	100800		



SABINE RIVER BASIN

08022070 MARTIN CREEK NEAR TATUM, TX--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	8.9	411	50	328	999	29	149	e15	13	6.6	8.9
2	6.1	8.5	122	102	36	1460	170	36	e14	12	7.0	22
3	5.9	8.9	23	474	23	792	36	804	e14	12	7.2	18
4	16	9.9	17	57	23	84	159	798	e13	10	7.4	13
5	12	11	15	516	443	33	e39	311	e13	10	7.5	10
6	8.4	11	17	532	259	28	e26	389	13	10	7.5	12
7	7.5	11	15	367	516	26	723	e50	12	9.8	7.2	9.9
8	7.4	13	15	56	66	24	872	e22	12	9.5	6.6	10
9	27	693	14	77	25	22	e118	344	13	9.0	6.6	14
10	24	4090	13	4460	22	21	23	561	145	8.7	6.6	11
11	12	448	13	3130	20	22	19	163	1390	8.4	6.7	9.3
12	9.6	774	15	866	19	24	1520	421	1630	8.3	17	9.0
13	9.1	149	15	115	20	21	1480	e40	474	8.3	17	9.2
14	7.9	20	13	984	19	19	8160	e21	43	7.9	10	8.7
15	7.6	14	13	2630	181	20	4700	460	106	7.9	8.7	8.4
16	8.0	14	13	1700	215	23	847	183	841	7.8	8.3	8.5
17	7.9	12	20	1450	35	487	360	e24	912	7.7	8.3	8.4
18	8.5	10	23	339	656	289	634	785	105	7.5	7.9	8.4
19	8.3	9.3	20	1010	2460	32	223	253	16	7.7	7.5	7.9
20	8.2	11	80	700	1060	22	719	e33	14	7.6	7.4	7.4
21	38	12	684	292	504	21	569	e18	193	7.5	11	7.4
22	34	271	103	45	986	20	60	e15	38	7.6	9.1	7.5
23	15	838	28	658	601	18	165	e14	19	7.4	8.2	7.0
24	12	77	20	186	327	17	132	25	16	7.3	7.8	7.1
25	9.8	19	19	59	e39	17	28	558	19	9.1	7.7	13
26	9.8	17	27	34	e410	103	24	1480	14	15	7.4	11
27	9.5	36	930	234	112	122	48	933	17	9.1	7.4	9.1
28	9.2	1710	1210	485	24	67	2780	105	718	7.2	7.4	8.6
29	8.8	258	245	47	---	446	4640	e23	110	7.1	7.7	8.4
30	9.3	33	600	27	---	159	1290	e18	19	7.2	9.6	8.6
31	9.6	---	504	254	---	32	---	e16	---	6.8	9.2	---
TOTAL	372.3	9597.5	5257	21936	9429	5470	30593	9052	6958	274.4	261.5	301.7
MEAN	12.0	320	170	708	337	176	1020	292	232	8.85	8.44	10.1
MAX	38	4090	1210	4460	2460	1460	8160	1480	1630	15	17	22
MIN	5.9	8.5	13	27	19	17	19	14	12	6.8	6.6	7.0
AC-FT	738	19040	10430	43510	18700	10850	60680	17950	13800	544	519	598
CAL YR 1990	TOTAL	65175.4	MEAN	179	MAX	6320	MIN	5.4	AC-FT	129300		
WTR YR 1991	TOTAL	99502.4	MEAN	273	MAX	8160	MIN	5.9	AC-FT	197400		

e Estimated



SABINE RIVER MAIN STEM

08025350 TOLEDO BEND RESERVOIR NEAR BURKEVILLE, TX

LOCATION.--Lat 31°10'25", long 93°33'57", Newton County, Hydrologic Unit 12010004, in powerhouse at right end of Toledo Bend Dam on Sabine River, 15 mi northeast of Burkeville, and at mile 156.5.

DRAINAGE AREA.--7,178 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Sabine River Authority). Prior to July 20, 1967, nonrecording gage at same site and datum. July 20, 1967, to June 30, 1973, recording gage at right end of spillway 1.6 mi north of present site and at same datum.

REMARKS.--The reservoir is formed by a rolled earthfill dam. Closure of embankment completed and deliberate impoundment was begun Oct. 3, 1966. The reservoir is operated for hydro-electric power generation and water conservation. Releases during high inflow periods are controlled by eleven 40- x 28-foot tainter gates. An 8.33- x 12-foot gated conduit through the dam is used for low-flow releases. Two additional 20-inch-diameter conduits, which bypass the larger conduit, may also be used for low-flow releases. Water for turbines is admitted through four 16.75- x 29-foot penstocks and controlled by vertically operated caterpillar-type gates. The capacity table is based on Geological Survey topographic maps. For statement regarding regulation by upstream reservoirs, see station 08020000. 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.....	185.0	-
Design flood.....	175.3	5,102,000
Top of gates.....	173.0	4,660,000
Top of power drawdown storage.....	172.0	4,476,000
Top of power head storage.....	162.2	2,922,000
Crest of spillway (controlled).....	145.0	1,162,000
Lowest gated outlet (invert).....	100.0	4,090

COOPERATION.--Capacity table furnished by the Sabine River Authority.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 4,840,000 acre-ft May 18, 1989 (elevation, 173.95 ft); minimum since initial filling of reservoir in June 1968, 3,290,000 acre-ft Nov. 14, 15, 1987 (elevation, 164.78 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 4,764,000 acre-ft Apr. 19 at 0900 hours (elevation, 173.55 ft); minimum, 3,571,000 acre-ft Oct. 21 (elevation, 166.63 ft).

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

166.0	3,473,000	169.0	3,953,000	172.0	4,476,000
167.0	3,628,000	170.0	4,123,000	173.0	4,660,000
168.0	3,788,000	171.0	4,297,000	174.0	4,849,000

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3647000	3595000	3803000	3975000	4542000	4596000	4089000	4574000	4476000	4354000	4266000	4077000
2	3623000	3592000	3809000	4021000	4531000	4594000	4103000	4550000	4487000	4354000	4262000	4077000
3	3622000	3585000	3870000	4036000	4515000	4583000	4106000	4614000	4476000	4335000	4252000	4091000
4	3642000	3623000	3837000	4036000	4515000	4548000	4137000	4638000	4460000	4361000	4243000	4091000
5	3641000	3597000	3821000	4040000	4498000	4522000	4140000	4660000	4453000	4363000	4234000	4091000
6	3625000	3589000	3854000	4079000	4478000	4553000	4153000	4616000	4437000	4360000	4231000	4092000
7	3628000	3589000	3837000	4069000	4458000	4557000	4154000	4603000	4421000	4367000	4227000	4089000
8	3626000	3612000	3842000	4069000	4438000	4546000	4158000	4616000	4404000	4376000	4217000	4077000
9	3692000	3623000	3846000	4106000	4417000	4537000	4193000	4623000	4383000	4363000	4222000	4069000
10	3628000	3614000	3837000	4248000	4404000	4505000	4186000	4638000	4383000	4369000	4227000	4057000
11	3617000	3628000	3823000	4390000	4381000	4491000	4193000	4629000	4383000	4365000	4229000	4041000
12	3612000	3642000	3824000	4426000	4342000	4505000	4210000	4627000	4374000	4354000	4229000	4035000
13	3609000	3652000	3839000	4440000	4349000	4494000	4222000	4605000	4367000	4360000	4229000	4018000
14	3605000	3663000	3821000	4483000	4335000	4467000	4288000	4612000	4369000	4358000	4252000	4001000
15	3609000	3678000	3837000	4568000	4297000	4446000	4404000	4601000	4379000	4351000	4266000	3984000
16	3608000	3698000	3834000	4597000	4247000	4408000	4520000	4583000	4388000	4354000	4259000	3970000
17	3611000	3708000	3816000	4614000	4248000	4428000	4642000	4588000	4381000	4344000	4262000	3961000
18	3611000	3708000	3841000	4653000	4255000	4386000	4758000	4586000	4383000	4329000	4266000	3967000
19	3594000	3708000	3837000	4642000	4315000	4358000	4751000	4590000	4369000	4369000	4245000	3967000
20	3577000	3702000	3834000	4660000	4351000	4340000	4675000	4570000	4354000	4302000	4227000	3933000
21	3636000	3705000	3879000	4631000	4458000	4292000	4627000	4550000	4333000	4297000	4193000	3915000
22	3617000	3719000	3875000	4592000	4548000	4292000	4623000	4531000	4351000	4294000	4193000	3899000
23	3616000	3724000	3915000	4608000	4586000	4273000	4588000	4520000	4340000	4281000	4179000	3884000
24	3622000	3719000	3854000	4601000	4612000	4245000	4551000	4505000	4360000	4276000	4172000	3899000
25	3616000	3722000	3859000	4586000	4638000	4253000	4542000	4494000	4360000	4280000	4156000	3854000
26	3609000	3718000	3885000	4564000	4620000	4142000	4504000	4485000	4352000	4280000	4140000	3837000
27	3606000	3772000	3923000	4570000	4596000	4172000	4516000	4472000	4340000	4280000	4132000	3819000
28	3606000	3791000	3922000	4568000	4568000	4175000	4533000	4463000	4351000	4276000	4106000	3803000
29	3608000	3786000	3938000	4572000	---	4137000	4579000	4465000	4354000	4280000	4089000	3785000
30	3599000	3786000	3989000	4575000	---	4120000	4586000	4476000	4361000	4276000	4087000	3772000
31	3599000	---	3973000	4553000	---	4099000	---	4476000	---	4274000	4086000	---
MAX	3692000	3791000	3989000	4660000	4638000	4596000	4758000	4660000	4487000	4376000	4266000	4092000
MIN	3577000	3585000	3803000	3975000	4247000	4099000	4089000	4463000	4333000	4274000	4086000	3772000
(↑)	166.81	167.99	169.12	172.42	172.50	169.86	172.60	172.00	171.36	170.87	169.78	167.90
(Φ)	-55000	+187000	+187000	+58000	+15000	-469000	+487000	-110000	-115000	-87000	-188000	-314000
CAL YR 1990	MAX	4677000	MIN	3577000	(Φ)	+118000						
WTR YR 1991	MAX	4758000	MIN	3577000	(Φ)	+259000						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## SABINE RIVER MAIN STEM

08025360 SABINE RIVER AT TOLEDO BEND RESERVOIR NEAR BURKEVILLE, TX

LOCATION.--Lat 31°10'25", long 93°33'57", Newton County, Hydrologic Unit 12010005, in powerhouse at right end of Toledo Bend Dam, 10 mi upstream from Sabine River near Burkeville gage, and at mile 156.5.

DRAINAGE AREA.--7,178 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1971 to current year.

Water-quality records.--Chemical and biochemical analyses: October 1967 to September 1986.

GAGE.--Water-stage recorders. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Sabine River Authority).

REMARKS.--No estimated daily discharges. Records poor. Daily discharges are a combination of releases from various outlets at the dam. Discharges for releases through the turbines are computed using scroll case differential pressure relationships and operation logs. Taintor gate releases, low-flow sluiceway releases, bypass gate releases, and turbine leakages are based on discharge measurements and operation logs.

AVERAGE DISCHARGE.--20 years, 5,807 ft<sup>3</sup>/s (4,207,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 114,000 ft<sup>3</sup>/s May 19, 1989; minimum daily (estimated), 30 ft<sup>3</sup>/s Oct. 1-4, 1972.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 84,400 ft<sup>3</sup>/s April 19 minimum daily, 174 ft<sup>3</sup>/s on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1270	1150	1720	7420	15400	27500	7350	20800	6960	3260	3270	7130
2	1460	1160	174	7350	14300	26200	2480	18700	7140	3250	3240	7180
3	1450	1730	1090	7390	14200	26200	2710	15500	7390	3350	204	7200
4	1490	174	2540	7350	15200	20000	2790	21800	7220	3170	204	7220
5	1410	1200	2550	7340	15500	14600	2660	34900	7690	3200	3080	7350
6	1990	1160	4230	7290	15400	15500	2550	38600	7550	204	3190	7310
7	174	1050	2530	5980	15300	15500	2510	31200	7370	204	3260	7260
8	1520	1060	174	10200	14600	15200	2670	27600	7410	3280	3130	7220
9	1550	1070	174	9670	14200	14300	2640	27600	7430	3340	3300	7240
10	1440	1710	2590	9280	14200	14300	4340	27300	7450	3120	204	6960
11	1510	174	1690	11700	15100	15100	4540	26900	7390	3180	204	7310
12	1530	1060	2500	14300	15200	15100	5860	26100	7540	3250	3250	7310
13	2080	1130	2740	14600	15600	15500	9480	26900	7280	204	3240	7300
14	174	1210	2410	14200	15400	15600	9140	27100	7250	204	3140	7050
15	1450	373	204	14100	14400	15500	12100	27200	7280	204	3130	7390
16	1530	185	204	20300	14600	14800	15400	27200	7220	3340	2770	7410
17	1120	174	2790	26600	14600	14400	18400	26400	7290	3130	6740	7400
18	1060	174	2690	27000	14500	14300	46000	26300	6860	2760	6730	7390
19	1090	1090	2810	33700	15300	14400	84400	26100	7170	3330	6930	7450
20	1680	1130	2880	37500	15400	14400	74200	27500	7240	204	6660	7510
21	174	1200	2710	31900	14400	14700	51500	27600	7250	204	6950	7470
22	174	1120	204	27100	15800	14500	44500	21300	6930	3200	7310	7380
23	1340	1080	204	26500	15800	14400	32800	15700	7080	3040	7260	7380
24	1080	1700	2940	26500	19800	14400	27900	14900	2970	3350	7270	7380
25	1090	174	2690	26500	25300	14600	23900	14300	3220	3190	7290	7380
26	1060	1150	2340	26300	27200	14400	17500	14200	3320	3380	6140	6770
27	1770	1140	2660	19900	27500	14300	14300	13900	3310	204	7110	7480
28	174	1090	4840	14700	27600	14800	14400	12300	3250	204	7150	7690
29	1210	1040	7450	14500	---	14300	18100	7070	204	3260	7150	7590
30	1030	1060	7470	14800	---	14800	20900	7120	204	3240	7150	7590
31	1070	---	7330	14700	---	14600	---	7140	---	3190	7220	---
TOTAL	37150	28918	79528	536670	471800	498200	578020	687230	183868	72646	143876	219700
MEAN	1198	964	2565	17310	16850	16070	19270	22170	6129	2343	4641	7323
MAX	2080	1730	7470	37500	27600	27500	84400	38600	7690	3380	7310	7690
MIN	174	174	174	5980	14200	14300	2480	7070	204	204	204	6770
AC-FT	73690	57360	157700	1064000	935800	988200	1147000	1363000	364700	144100	285400	435800
CAL YR 1990	TOTAL	2991771	MEAN	8197	MAX	44700	MIN	174	AC-FT	5934000		
WTR YR 1991	TOTAL	3537606	MEAN	9692	MAX	84400	MIN	174	AC-FT	7017000		

SABINE RIVER MAIN STEM

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08026000 SABINE RIVER NEAR BURKEVILLE, TX

LOCATION.--Lat 31°03'50", long 93°31'10", Newton County, Texas-Vernon Parish, Louisiana State line, Hydrologic Unit 12010005, near left edge of low-water channel at downstream side of bridge on State Highway 63, about 200 ft downstream from Pearl Creek, 10 mi northeast of Burkeville, 16 mi downstream from Bayou Toro, and at mile 139.7.

DRAINAGE AREA.--7,482 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1955 to current year. Published as "below Toledo Bend near Burkeville" for period 1955-75. Water-quality records.--Chemical and biochemical analyses: May 1968 to September 1986. Pesticide analyses: October 1972 to September 1981.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 60.59 ft above National Geodetic Vertical Datum of 1929. Prior to Aug. 23, 1958, nonrecording gage at current site. Prior to Jan. 1, 1989, at datum 10.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow regulated by Toledo Bend Reservoir (station 08025350) 16.8 mi upstream, capacity, 4,660,000 acre-ft. National Weather Service rain gage and gage-height telemeters at gage.

AVERAGE DISCHARGE.--11 years (water years 1956-66) prior to completion of Toledo Bend Reservoir, 4,653 ft<sup>3</sup>/s (3,371,000 acre-ft/yr); 25 years (water years 1967-91) regulated, 5,618 ft<sup>3</sup>/s (4,070,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 116,000 ft<sup>3</sup>/s May 20, 1989 (gage height, 47.45 ft); minimum daily, 38 ft<sup>3</sup>/s Sept. 14, 15, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1860, that of May 20, 1989. Flood in May 1884 reached a stage of 45.9 ft, current datum from information by local resident. Flood of Apr. 15, 1945, reached a stage of 45.8 ft, current datum, and flood of May 23, 1953, reached a stage of 45.3 ft, current datum, from floodmarks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 79,800 ft<sup>3</sup>/s Apr. 20 at about 2000 hours (gage height, 44.66 ft); minimum daily, 273 ft<sup>3</sup>/s Nov. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	647	1130	1430	6830	14700	27000	11800	22000	7810	1740	2740	7230
2	919	1120	1350	7300	14100	27200	2290	20700	7760	3430	2890	7080
3	1360	1360	532	8480	14000	26600	2840	17400	8070	3670	1740	6990
4	1550	1130	2030	8010	14600	24600	2850	20500	7750	5160	310	7130
5	1130	649	1840	7340	15200	20000	2760	30100	7670	3250	1410	7160
6	1460	1140	3600	6980	15200	16300	2680	35600	7620	2440	2760	7270
7	1160	1150	2280	5920	14500	15000	3210	35700	7690	653	2770	7200
8	720	1140	1110	7690	14300	e14600	3360	32300	7670	1930	2730	7180
9	1210	1290	344	11000	14000	e14500	3300	31700	7440	3730	2640	7150
10	1170	1300	1480	11800	14200	e14700	3660	31400	9480	3420	2200	7120
11	1450	1450	2310	15300	14700	e14800	5280	29600	10600	3170	566	7270
12	1310	616	1470	17100	14900	14700	9720	27900	8650	3180	1570	7390
13	1700	1160	2920	16500	15200	15000	11100	27200	7500	1970	3050	7440
14	972	1120	2320	14600	14600	15100	10500	27100	e7500	452	3250	7140
15	731	1050	1700	15800	14100	15200	13800	27500	e7500	394	4260	7200
16	1260	360	430	18500	14100	14800	16600	28100	e7600	1760	3210	7310
17	1200	299	1330	24600	14200	14600	17600	29200	e7600	3030	6550	7360
18	1010	273	2300	26100	e14200	14400	25600	28500	e7700	2430	6870	7300
19	1140	409	2680	29100	e14800	14300	44700	27900	e7400	2860	6930	7290
20	1220	1380	2770	33000	e15200	14200	72500	28400	e7500	1870	6760	7300
21	1190	904	3140	33200	16400	14400	69900	28400	e7700	386	6700	7220
22	367	1300	2730	28900	19400	14400	55000	26200	e7600	1420	7010	6930
23	790	1090	816	27500	22100	14200	44300	19200	e7500	2790	7060	6790
24	1250	1660	1050	26900	20100	14200	36300	16600	4000	2830	7120	6820
25	1140	778	2900	26300	21500	14500	31300	15500	2370	2810	7180	6870
26	1460	560	2590	25700	24100	14400	24500	15100	3530	2830	6280	6240
27	791	1220	2770	22900	25200	14300	19200	14700	3490	1800	6800	6770
28	1330	1490	4380	15700	26200	14400	16800	14400	3660	438	6920	6960
29	818	1360	7070	14400	---	14500	17900	8510	2320	1480	6910	6920
30	1180	1210	7050	14600	---	14600	21900	7920	621	3000	6900	6930
31	1100	---	7000	15000	---	14500	---	8230	---	2820	7350	---
TOTAL	34735	31098	77722	543050	465800	506000	603250	733560	201301	73143	141436	212960
MEAN	1120	1037	2507	17520	16640	16320	20110	23660	6710	2359	4562	7099
MAX	1700	1660	7070	33200	26200	27200	72500	35700	10600	5160	7350	7440
MIN	367	273	344	5920	14000	14200	2290	7920	621	386	310	6240
AC-FT	68900	61680	154200	1077000	923900	1004000	1197000	1455000	399300	145100	280500	422400
CAL YR 1990	TOTAL	3135196	MEAN	8590	MAX	38500	MIN	273	AC-FT	6219000		
WTR YR 1991	TOTAL	3624055	MEAN	9929	MAX	72500	MIN	273	AC-FT	7188000		

e Estimated



## SABINE RIVER MAIN STEM

08028500 SABINE RIVER NEAR BON WIER, TX

LOCATION.--Lat 30°44'49", long 93°36'30", Beauregard Parish, Louisiana-Newton County, Texas State line, Hydrologic Unit 12010005, near left bank at downstream side of bridge on U.S. Highway 190, 0.7 mi upstream from Quicksand Creek, 0.8 mi upstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 2.0 mi east of Bon Wier, 2.4 mi upstream from Caney Creek, and at mile 97.7.

DRAINAGE AREA.--8,229 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1923 to current year. Monthly discharge only for some periods, published in WSP 1312. Gage-height records collected in this vicinity since 1913 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1342: 1953. WSP 1442: 1924, 1926-27(M), 1929(M), 1939. WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 33.42 ft above National Geodetic Vertical Datum of 1929. Prior to July 8, 1931, nonrecording gage at site 0.8 mi downstream at datum 13.00 ft higher. July 8, 1931, to Oct. 15, 1958, nonrecording gage at present site at datum 13.00 ft higher. Oct. 16, 1958, to Sept. 30, 1975, water-stage recorder at present site at datum 13.00 ft higher. Oct. 1, 1975, to Dec. 31, 1988, at present site at datum 10.00 ft higher.

REMARKS.--Records poor. Flow regulated by Toledo Bend Reservoir (station 08025350) located 58.8 mi upstream. Gage-height telemeter at station.

AVERAGE DISCHARGE.--43 years (water years 1924-66) prior to completion of Toledo Bend Reservoir, 6,846 ft<sup>3</sup>/s (4,960,000 acre-ft/yr); 25 years (water years 1967-91) regulated, 6,727 ft<sup>3</sup>/s (4,874,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 115,000 ft<sup>3</sup>/s May 19, 1953 (gage height, 38.70 ft, current datum); minimum daily, 134 ft<sup>3</sup>/s Nov. 9, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1833, 43.5 ft Apr. 23 or 24, 1913, from information by Gulf, Colorado, and Santa Fe Railway Co. and local residents. Flood in May 1884 reached a stage of 39 ft. Floods occurring about 1844 and 1860 were higher than flood in May 1884, from information by local residents. All flood data referenced to current datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 68,500 ft<sup>3</sup>/s Apr. 22, time unknown, (gage height, 36.20 ft, from local resident); minimum daily, 786 ft<sup>3</sup>/s Nov. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1450	1470	1940	7940	16600	28800	15000	e25100	12000	e3250	4000	8700
2	1070	1540	2190	8090	16600	29700	9890	e24300	10500	4280	3940	8230
3	1460	1550	1920	10700	16000	e30000	4380	e25100	9850	5390	3950	7910
4	1750	1840	1330	11400	15500	e29400	4020	e27200	9560	5590	2400	7910
5	1930	1590	2730	10700	16200	e26400	4030	e29400	9220	7590	e1210	8210
6	1710	1210	2900	9400	16600	e21200	3920	e31700	9070	7280	2380	8720
7	1960	1660	4050	8750	16600	e18500	e4170	e34600	8960	5620	3650	9200
8	1520	1670	3470	8090	17100	e17500	7940	e37000	9030	4090	3750	9000
9	1120	1790	2110	10200	16600	e16700	8030	e38800	8820	4800	3900	8970
10	1590	2170	1180	13500	15700	e16300	6680	e39200	10300	5790	3920	8990
11	1610	2270	2290	18900	15500	e16400	6840	e38800	17600	5440	2840	8680
12	1730	2020	2990	20300	15700	e16300	11900	e37900	15600	5010	2310	8610
13	1670	1360	2480	21000	15900	16400	14900	e37000	12800	4750	3580	8510
14	2090	1790	3520	18800	16000	16500	16200	e34600	11300	2970	5500	8270
15	1380	1760	3200	18600	15900	16400	20100	e33100	10200	e1710	7010	7940
16	1080	1540	2210	20600	15300	16100	21700	e31700	9670	e1440	6830	8190
17	1580	949	1170	22100	15300	15900	21600	e30900	9400	2970	6240	8350
18	1550	826	2220	25300	15200	15700	22000	e30000	9130	4050	8250	8220
19	1400	786	3340	28000	15800	15500	26400	e29400	8990	3610	8260	8360
20	1470	913	3550	30200	18500	15600	33800	e28900	9010	3890	8140	8460
21	1760	1740	3610	32000	21200	15600	49800	e28100	9210	2500	7790	7910
22	1840	1590	3990	e33200	25700	15600	67800	e27800	9240	e1340	7670	7610
23	1090	1810	3730	e31500	26000	15500	66400	e27200	9330	2640	7850	7470
24	1220	1730	2380	e29700	24000	15800	60400	e26200	9410	3810	7780	7480
25	1610	2420	2790	28800	24200	15500	46300	e24000	6720	3890	7730	8460
26	1580	1470	3870	28400	25400	15200	e40600	e21400	5010	3870	7610	8520
27	1780	1130	3610	28100	26800	14900	e34600	e19000	5940	4020	6740	7560
28	1320	1920	4220	25100	27500	14800	e35200	e16600	5860	2550	7260	7670
29	1570	2410	6180	e20100	---	15200	e31700	e14300	6160	e1320	7410	7700
30	1100	2180	8020	e17900	---	15400	e29400	e11500	4690	3280	7410	7600
31	1490	---	7980	e17100	---	15400	---	e12000	---	4340	7820	---
TOTAL	47480	49104	101170	614470	523400	564200	725700	872800	282580	123080	175130	247410
MEAN	1532	1637	3264	19820	18690	18200	24190	28150	9419	3970	5649	8247
MAX	2090	2420	8020	33200	27500	30000	67800	39200	17600	7590	8260	9200
MIN	1070	786	1170	7940	15200	14800	3920	11500	4690	1320	1210	7470
AC-FT	94180	97400	200700	1219000	1038000	1119000	1439000	1731000	560500	244100	347400	490700

CAL YR 1990 TOTAL 3521803 MEAN 9649 MAX 38100 MIN 786 AC-FT 6985000  
WTR YR 1991 TOTAL 4326524 MEAN 11850 MAX 67800 MIN 786 AC-FT 8582000

e Estimated

SABINE RIVER MAIN STEM

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08028500 SABINE RIVER NEAR BON WIER, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1969 to current year. Chemical and biochemical analyses: October 1969 to May 1973. Sediment analyses: April 1957 to September 1962.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1969 to June 1983.

WATER TEMPERATURE: November 1969 to June 1983.

COLOR: November 1969 to June 1983.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 407 microsiemens Aug. 31, 1978; minimum daily, 34 microsiemens Feb. 3, 1983.

WATER TEMPERATURE: Maximum daily, 33.0°C July 17, 1978, July 14, 26, 1980; minimum daily, 4.0°C Feb. 2, 1980.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
OCT								
05...	1500	2050	155	28.0	60	19	21	<0.10
11...	1815	1650	156	21.0	70	17	19	<0.10
14...	1650	2500	170	25.0	100	19	20	<0.10
24...	1700	1550	174	24.0	140	21	21	<0.10
NOV								
02...	1305	1420	166	20.0	120	21	19	0.10
09...	1245	1610	163	15.0	30	22	21	<0.10
15...	1405	1510	181	18.0	30	20	18	<0.10
23...	1705	1770	168	20.0	20	21	19	<0.10
27...	1258	915	192	21.0	50	25	22	<0.10
DEC								
05...	1400	3180	201	13.0	60	25	25	<0.10
14...	1610	3990	156	17.0	20	15	18	<0.10
20...	1220	3240	182	17.0	30	21	21	<0.10
28...	1235	6320	142	21.0	30	15	16	<0.10
JAN								
03...	1335	11100	137	10.0	70	16	16	<0.10
08...	1248	7250	145	11.0	40	16	17	<0.10
17...	1520	22600	120	11.0	60	13	14	<0.10
23...	1420	31200	130	10.0	40	13	15	<0.10
30...	1650	17700	133	11.0	30	13	15	<0.10
FEB								
06...	1705	16200	120	13.0	40	11	13	<0.10
14...	1755	16000	139	14.0	25	13	14	<0.10
21...	1625	21600	119	13.5	50	11	12	<0.10
MAR								
01...	1415	29000	128	15.0	50	14	17	<0.10
09...	1155	16700	136	14.0	50	15	19	<0.10
16...	1235	16500	137	14.0	40	14	19	<0.10
19...	1416	15600	135	16.0	40	14	18	<0.10
29...	1825	15900	139	16.5	50	16	20	<0.10
APR								
04...	1040	3610	180	17.0	40	11	15	<0.10
09...	1850	7970	85	20.5	120	8.7	10	<0.10
18...	1910	22200	117	20.5	60	12	15	<0.10
23...	1210	66800	124	21.0	60	14	16	<0.10
MAY								
02...	1935	24300	113	23.0	70	15	15	<0.10
10...	1427	39200	95	25.0	70	11	11	<0.10
16...	1310	31700	106	24.0	60	12	12	<0.10
23...	1840	27200	110	25.0	60	11	11	<0.10
29...	1325	14300	122	27.0	40	14	14	<0.10
JUN								
04...	1845	9000	123	27.0	60	15	17	--
12...	1725	14400	93	25.0	70	11	12	--
19...	1500	9600	117	28.0	60	13	15	--
25...	1850	5430	112	27.0	60	13	14	--
JUL								
02...	1450	5190	109	29.0	100	14	13	--
09...	1210	5250	92	28.0	140	12	11	--
15...	1600	1630	139	29.0	70	20	18	--
22...	1330	1310	142	30.0	70	20	18	--
30...	1205	3790	131	30.0	70	18	17	--
AUG								
05...	1625	1140	139	30.0	70	17	18	--
12...	1400	2330	113	28.0	140	13	14	--
19...	1325	8260	115	29.0	70	15	14	--
26...	1155	7640	113	30.0	60	14	14	--
SEP								
02...	1640	8140	107	29.0	60	12	14	--
12...	1600	8600	107	29.0	70	12	14	--
16...	1445	8280	109	30.0	60	12	14	--
24...	1310	7480	113	27.0	70	13	15	--

SABINE RIVER BASIN

08029500 BIG COW CREEK NEAR NEWTON, TX

LOCATION.--Lat 30°49'08", Long 93°47'07", Newton County, Hydrologic Unit 12010005, near center of span at downstream side of bridge on State Highway 87, 2.6 mi southwest of Newton, 5.0 mi downstream from Melhones Creek, and 8.0 mi upstream from White Oak Creek.

DRAINAGE AREA.--128 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1952 to current year.

GAGE.--Water-stage recorder. Datum of gage is 134.69 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 19, 1957, nonrecording gage at same site and datum.

REMARKS.--No estimated daily discharges. Records good. No known diversion above station.

AVERAGE DISCHARGE.--39 years, 122 ft<sup>3</sup>/s (12.94 in/yr), 88,390 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,200 ft<sup>3</sup>/s Apr. 29, 1953 (gage height, 19.45 ft); minimum daily, 10 ft<sup>3</sup>/s July 7, 8, 21-23, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1907, 27.5 ft in April 1922, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 11	0300	*2,830	*15.72	May 5	0500	1,200	14.33
Jan. 16	0600	1,250	14.42	May 9	2100	1,150	14.20
Feb. 22	1600	2,490	15.57	May 17	2300	1,310	14.53
Apr. 15	1800	1,600	14.94	May 31	1600	1,190	14.30
Apr. 27	2100	1,950	15.26				

Minimum discharge, 28 ft<sup>3</sup>/s on Oct. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	35	50	78	109	650	104	257	516	86	65	307
2	28	35	48	205	102	812	95	158	200	78	55	172
3	28	36	52	792	99	470	90	135	152	95	51	108
4	37	38	48	407	101	292	91	640	130	169	49	127
5	88	43	44	145	228	200	99	889	121	122	48	180
6	80	52	44	105	296	172	106	263	121	138	50	187
7	46	44	57	98	167	153	137	162	117	106	49	165
8	40	41	69	111	125	138	251	360	104	89	48	126
9	38	89	57	98	109	124	181	915	96	93	58	122
10	41	182	49	1080	101	116	126	635	484	105	66	217
11	56	99	47	2240	96	112	179	259	966	83	129	156
12	42	57	46	864	92	112	428	186	377	71	136	107
13	38	49	46	257	91	116	259	147	184	67	371	94
14	36	46	46	183	91	112	291	130	143	62	618	90
15	35	44	46	649	86	106	1300	612	127	60	725	86
16	34	44	46	1020	81	112	703	691	126	69	537	83
17	34	44	51	350	89	235	207	972	119	84	207	91
18	34	44	55	258	109	228	204	765	114	63	139	85
19	34	44	80	916	184	147	273	384	111	58	121	81
20	33	44	65	545	352	123	220	306	106	56	112	136
21	42	44	56	237	523	115	147	222	144	53	97	167
22	105	45	130	170	1900	114	118	200	123	55	90	96
23	105	51	247	147	1210	111	128	160	147	68	88	86
24	55	63	117	267	343	103	117	145	120	58	87	88
25	44	53	68	346	221	98	101	149	405	61	81	501
26	40	48	62	203	241	96	94	564	226	93	77	454
27	38	48	123	156	210	96	1190	332	124	65	77	162
28	37	82	267	142	171	95	1000	186	155	64	76	114
29	36	96	140	133	---	240	713	319	167	86	78	101
30	35	60	89	126	---	221	703	476	112	136	77	95
31	35	---	83	117	---	133	---	1050	---	111	187	---
TOTAL	1402	1700	2428	12445	7527	5952	9655	12669	6137	2604	4649	4584
MEAN	45.2	56.7	78.3	401	269	192	322	409	205	84.0	150	153
MAX	105	182	267	2240	1900	812	1300	1050	966	169	725	501
MIN	28	35	44	78	81	95	90	130	96	53	48	81
AC-FT	2780	3370	4820	24680	14930	11810	19150	25130	12170	5170	9220	9090
CFSM	.35	.44	.61	3.14	2.10	1.50	2.51	3.19	1.60	.66	1.17	1.19
IN.	.41	.49	.71	3.62	2.19	1.73	2.81	3.68	1.78	.76	1.35	1.33

CAL YR 1990	TOTAL	54180	MEAN	148	MAX	3180	MIN	26	AC-FT	107500	CFSM	1.16	IN.	15.75
WTR YR 1991	TOTAL	71752	MEAN	197	MAX	2240	MIN	28	AC-FT	142300	CFSM	1.54	IN.	20.85

SABINE RIVER MAIN STEM

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08030500 SABINE RIVER NEAR RULIFF, TX  
(Radiochemical and national stream-quality accounting network)

LOCATION.--Lat 30°18'13", long 93°44'37", Calcasieu Parish, Louisiana-Newton County, Texas State line, Hydrologic Unit 12010005, at downstream side of bridge on State Highway 12, 2.4 mi north of Ruliff, 4.2 mi upstream from the Kansas City Southern Railway Co. bridge, 4.5 mi downstream from Cypress Creek, and at mile 40.2.

DRAINAGE AREA.--9,329 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1924 to current year.

REVISED RECORDS.--WSP 1282: 1941(M), 1942. WSP 1442: 1925-29, 1937-39, 1943. WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 5.92 ft below National Geodetic Vertical Datum of 1929. Prior to Mar. 1, 1941, nonrecording gage at Kansas City Southern Railway Co. bridge, 4.2 mi downstream and at datum 7.98 ft higher than current datum. Mar. 1, 1941, to Dec. 8, 1948, nonrecording gage at present site and at datum 10.00 ft higher than current datum. Dec. 9, 1948, to Dec. 31, 1989, recording gage at present site and at datum 10.00 ft higher than current datum.

REMARKS.--Records good. Flow is partly regulated by Toledo Bend Reservoir (station 08025350) 116.3 mi upstream. Gage-height telemeter at station.

AVERAGE DISCHARGE.--42 years (water years 1925-66) prior to completion of Toledo Bend Reservoir, 8,422 ft<sup>3</sup>/s (6,102,000 acre-ft/yr); 25 years (water years 1967-91 regulated, 8,056 ft<sup>3</sup>/s (5,837,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 121,000 ft<sup>3</sup>/s May 22, 1953 (gage height, 29.98 ft, current datum); minimum, 270 ft<sup>3</sup>/s Sept. 27-30, Oct. 1-3, 17-20, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1835, 32.2 ft in May or June 1884 (adjusted to present site and datum on basis of slope of flood of June 8, 9, 1950); flood of Apr. 26-29, 1913, reached a stage of 29.5 ft, present site and datum, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 59,600 ft<sup>3</sup>/s Apr. 25 at 1100 hours (gage height, 26.51 ft); minimum daily, 1,020 ft<sup>3</sup>/s Nov. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1980	1550	2490	6840	19500	26700	13600	27200	16300	7970	4310	6860
2	2070	1640	2300	7540	17200	27600	13900	24600	16800	7280	4900	7010
3	1490	1660	2160	8550	16100	30400	13900	23600	16800	6260	4850	7380
4	1530	1690	2270	9760	15700	34100	13100	24000	16000	6330	4730	7670
5	1780	1750	1780	11200	16500	35400	11100	23800	14500	7310	4350	7760
6	2010	1930	1990	13000	16300	33700	9110	22200	13300	7520	2900	7800
7	2110	1530	2840	14300	16300	29800	8270	24100	12000	8250	2180	7880
8	2090	1550	3590	13800	16800	25100	7970	29300	11200	8990	3250	8050
9	2180	1810	3760	12600	17500	20700	8240	34600	10900	8670	3930	8340
10	1600	1950	3270	14700	17500	17900	8990	38200	12500	7510	4130	8480
11	1630	2100	1960	15400	16900	16600	9900	40600	15700	6950	4230	8490
12	1790	2370	1680	16100	16200	15900	10200	40100	18700	6920	4170	8530
13	1840	2500	2450	18300	15600	15100	10400	37200	20000	6780	3610	8520
14	1910	1890	2420	23300	14900	14500	12100	34600	20000	6430	4070	8360
15	2010	1700	2770	28300	14500	14400	16400	36600	18000	5780	5230	8280
16	2120	1800	3060	27900	14200	14800	20400	36000	16000	4020	6110	8160
17	1520	1780	2870	26200	14700	14900	24400	36300	14300	2810	6730	7900
18	1590	1470	1970	26100	14800	14900	26300	36700	12800	2710	7110	7720
19	1760	1180	1620	27700	14900	15100	25400	37800	11800	3860	7230	7690
20	1700	1060	2540	29500	14800	15100	23000	37400	11300	4410	7280	7690
21	1670	1020	3140	31800	16500	15100	23000	35400	10500	4470	7350	7770
22	1820	1300	3370	34100	18900	14900	28500	33000	10300	4350	7380	7890
23	2120	1640	3530	35700	23300	14500	39300	30700	10400	3050	7340	7880
24	1810	1690	3690	36700	29700	14200	52700	28900	10600	2370	7180	7740
25	1530	1750	3090	35300	33200	13900	58200	26600	10700	3470	7080	7770
26	1740	1940	2620	33000	31100	13900	56000	24000	10500	4200	7050	7660
27	1790	2060	3250	31400	28100	13700	48900	20800	10400	4470	7060	7750
28	1880	1700	3650	30100	26600	13700	40100	19200	10100	4570	7130	7990
29	1750	1880	3970	28800	---	14000	34500	17800	9230	4430	6900	8040
30	1790	2300	4880	26800	---	13600	31000	16900	8330	3330	6770	7880
31	1530	---	6020	23300	---	13500	---	16600	---	3140	6800	---
TOTAL	56140	52190	91000	698090	528300	587700	698880	914800	399960	168610	173340	236940
MEAN	1811	1740	2935	22520	18870	18960	23300	29510	13330	5439	5592	7898
MAX	2180	2500	6020	36700	33200	35400	58200	40600	20000	8990	7380	8530
MIN	1490	1020	1620	6840	14200	13500	7970	16600	8330	2370	2180	6860
AC-FT	111400	103500	180500	1385000	1048000	1166000	1386000	1815000	793300	334400	343800	470000
CAL YR 1990	TOTAL	3608870	MEAN	9887	MAX	34500	MIN	1020	AC-FT	7158000		
WTR YR 1991	TOTAL	4605950	MEAN	12620	MAX	58200	MIN	1020	AC-FT	9136000		

SABINE RIVER MAIN STEM

08030500 SABINE RIVER NEAR RULIFF, TX--Continued  
(Radiochemical and national stream-quality accounting network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: September 1945 to September 1946, October 1947 to current year. Chemical and biochemical analyses: February 1968 to current year. Pesticide analyses: January 1968 to May 1982. Radiochemical analyses: October 1969 to current year. Sediment analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1945 to September 1946, October 1947 to current year.

WATER TEMPERATURE: October 1947 to current year.

pH: July 1968 to May 1975

COLOR: November 1969 to December 1975.

DISSOLVED OXYGEN: July 1968 to May 1975.

CHLORIDE: July 1968 to September 1968.

INSTRUMENTATION.--From February 1967 to December 1975, a water-quality monitor continuously recorded specific conductance, pH, water temperature, dissolved oxygen, and chloride at this station.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 779 microsiemens Aug. 31, 1966; minimum, 27 microsiemens Feb. 16, 1984.

WATER TEMPERATURE: Maximum, 36.0°C Aug. 14, 1962; minimum, 1.0°C Jan. 28, 1948.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, (more than 30 percent estimated record) 239 microsiemens Dec. 13; minimum daily, 64 microsiemens on several days during June and July.

WATER TEMPERATURE: No extremes for current year due to more than 30 percent missing data.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECCAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECCAL, KF AGAR (COLS. PER 100 ML)
DEC 11...	1025	1980	153	7.4	12.0	10	11.8	107	0.8	120	130
APR 10...	1100	8910	96	6.8	20.5	40	6.7	73	0.9	850	700
JUL 09...	1007	8850	68	6.6	27.0	39	7.5	94	1.6	140	150
AUG 27...	1106	6980	110	6.5	28.0	11	7.4	94	0.5	20	56

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CAR-BONATE WATER DIS IT (MG/L AS CO3)	BICAR-BONATE WATER DIS IT (MG/L AS HCO3)	ALKA-LINITY WAT DIS TOT IT (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS S04)
DEC 11...	30	7	8.1	2.4	17	1	2.9	0	28	23	18
APR 10...	19	5	4.8	1.6	11	1	2.1	0	17	14	9.9
JUL 09...	16	6	4.2	1.4	6.6	0.7	1.8	0	12	10	7.8
AUG 27...	24	10	5.9	2.1	12	1	2.5	0	17	13	14

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
DEC 11...	20	<0.10	9.7	110	93	0.190	0.010	<0.010	0.200	0.200	0.030
APR 10...	12	0.10	7.9	84	59	0.100	0.040	<0.010	0.140	0.130	0.070
JUL 09...	8.9	<0.10	8.1	66	46	0.080	0.040	<0.010	0.120	0.094	0.040
AUG 27...	15	<0.10	6.4	71	67	--	<0.010	<0.010	<0.050	0.053	0.040

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS P04)	SEDI-MENT, SUS-PENDED (MG/L)
DEC 11...	0.030	0.37	--	--	0.40	0.090	0.030	0.020	0.020	0.06	18
APR 10...	0.060	0.63	--	--	0.70	0.080	0.040	0.020	0.030	0.06	75
JUL 09...	0.030	0.66	0.47	0.50	0.70	0.130	0.090	0.100	0.130	0.31	56
AUG 27...	0.040	0.46	--	--	0.50	0.040	0.020	0.020	<0.010	0.06	56



SABINE RIVER MAIN STEM

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08030500 SABINE RIVER NEAR RULIFF, TX--Continued  
(Radiochemical and national stream-quality accounting network)

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SED. SUSP. DIAM. % FINER THAN .062 MM	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM, DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)
DEC 11...	96	62	190	<1	44	<0.5	<1.0	<1	<3	2
APR 10...	1800	80	100	<1	42	<0.5	<1.0	<1	<3	1
JUL 09...	1340	94	60	1	36	<0.5	<1.0	<1	<3	3
AUG 27...	1060	94	30	<1	43	0.6	<1.0	<1	<3	2

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)
DEC 11...	150	<1	5	34	<0.1	<10	2	<1	<1.0	92
APR 10...	300	2	<4	73	<0.1	<10	2	<1	<1.0	64
JUL 09...	230	<1	<4	52	<0.1	<10	1	<1	<1.0	48
AUG 27...	110	<1	<4	29	<0.1	<10	2	<1	<1.0	77

DATE	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	GROSS ALPHA, DIS- SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS- SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS- SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DIS- SOLVED, RADON METHOD (PCI/L)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)
DEC 11...	<6	4	0.7	<0.6	3.9	<0.6	3.3	<0.6	0.13	0.04
APR 10...	<6	9	--	--	--	--	--	--	--	--
JUL 09...	<6	9	--	--	--	--	--	--	--	--
AUG 27...	<6	3	<0.6	<0.6	3.3	<0.6	2.9	<0.6	0.06	0.07

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	56140	149	91	13800	19	2890	18	2760	28
NOV. 1990	52190	174	103	14600	22	3130	21	2920	29
DEC. 1990	91000	161	96	23700	21	5040	19	4750	28
JAN. 1991	698090	109	69	129000	14	26300	14	25900	24
FEB. 1991	528300	117	73	104000	15	21200	15	20800	25
MAR. 1991	587700	119	74	118000	15	24100	15	23600	25
APR. 1991	698880	91	58	109000	12	21800	12	21900	21
MAY 1991	914800	91	58	144000	12	28700	12	28800	21
JUNE 1991	399960	107	67	72600	14	14700	13	14600	23
JULY 1991	168610	95	60	27400	12	5490	12	5480	21
AUG. 1991	173340	105	66	31000	13	6260	13	6220	23
SEPT 1991	236940	102	65	41300	13	8310	13	8280	23
TOTAL	4605950	**	**	828000	**	168000	**	166000	**
WTD. AVG.	12620	106	67	**	14	**	13	**	23

## SABINE RIVER MAIN STEM

08030500 SABINE RIVER NEAR RULIFF, TX--Continued  
(Radiochemical and national stream-quality accounting network)

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	151	147	200	e138	118	107	134	76	e109	e116	110	112
2	150	163	e198	e141	121	106	76	94	e111	e112	101	105
3	150	e165	e196	e140	125	e105	76	97	e108	e117	e98	96
4	e151	e164	200	e136	142	e103	139	99	e109	e114	e94	112
5	151	e167	200	139	125	e104	72	100	e114	e107	e100	96
6	e152	e158	147	97	124	e105	e80	100	e116	100	e96	108
7	e146	159	202	113	121	103	e85	99	e110	64	e101	100
8	139	146	155	139	122	108	e79	92	e112	95	e99	99
9	152	167	e162	159	122	106	e72	89	e114	68	e94	98
10	144	e175	178	100	e123	110	68	89	e114	69	96	98
11	139	e173	159	104	e124	112	e71	87	e112	64	109	100
12	163	e178	160	84	126	133	e70	98	e109	87	102	100
13	150	e172	239	75	122	e135	e69	82	e99	93	109	101
14	e151	165	167	140	122	e135	e74	93	e102	64	106	e100
15	e152	195	e165	77	131	e132	76	87	e101	65	97	100
16	149	154	160	81	e132	e133	66	99	99	64	97	100
17	147	173	e165	87	e130	e134	77	79	107	112	85	99
18	143	170	160	e85	e133	e132	66	99	110	122	97	101
19	148	173	148	86	e131	e134	74	e94	102	137	110	100
20	160	164	e146	93	129	e134	85	e87	64	64	109	107
21	148	172	e150	140	e120	e134	103	79	104	75	105	e104
22	152	173	e150	97	107	e132	112	86	e106	114	108	109
23	149	204	e148	103	123	e133	113	81	e107	e119	112	99
24	148	e200	e146	106	79	132	114	96	e104	e120	e112	109
25	134	e204	e140	112	71	131	114	85	e108	129	e109	109
26	136	e190	e142	e115	123	131	77	85	e109	116	e113	100
27	162	e192	e138	117	81	137	76	94	e112	110	111	100
28	166	e191	e139	130	139	127	97	100	e108	111	e109	101
29	149	e192	e141	118	---	137	83	105	e116	108	e110	105
30	149	160	e143	135	---	e136	102	e107	e114	109	e116	99
31	149	---	e140	117	---	e135	---	e111	---	108	e114	---
MEAN	149	174	164	113	120	124	87	93	107	98	104	102

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27.0	19.0	16.0	---	11.0	13.0	16.0	24.0	---	---	31.0	27.0
2	27.0	20.0	---	---	13.0	15.0	16.0	23.0	---	---	31.0	26.0
3	27.0	---	---	---	12.0	---	17.0	23.0	---	---	---	26.0
4	---	---	16.0	---	13.0	---	19.0	24.0	---	---	---	27.0
5	27.0	---	16.0	12.0	13.0	---	18.0	20.0	---	---	---	27.0
6	---	---	14.0	12.0	12.0	---	---	20.0	---	27.0	---	27.0
7	---	18.0	13.0	12.0	12.0	15.0	---	21.0	---	27.0	---	27.0
8	28.0	16.0	13.0	12.0	12.0	17.0	---	21.0	---	27.0	---	27.0
9	26.0	16.0	---	12.0	12.0	17.0	---	22.0	---	28.0	---	28.0
10	24.0	---	13.0	12.0	---	17.0	20.5	22.0	---	28.0	30.0	28.0
11	21.0	---	13.0	11.0	---	16.0	---	23.0	---	28.0	30.0	28.0
12	21.0	---	14.0	12.0	13.0	14.0	---	23.0	---	30.0	29.0	28.0
13	21.0	---	15.0	12.0	13.0	---	---	23.0	---	31.0	30.0	29.0
14	---	16.0	15.0	12.0	13.0	---	---	23.0	---	30.0	30.0	---
15	---	17.0	---	12.0	13.0	---	21.0	23.0	---	30.0	30.0	28.0
16	23.0	17.0	15.0	12.0	---	---	21.0	23.0	28.0	30.0	29.0	28.0
17	23.0	18.0	14.0	11.0	---	---	22.0	23.0	27.0	29.0	28.0	27.0
18	22.0	20.0	14.0	---	---	---	22.0	23.0	28.0	30.0	28.0	27.0
19	22.0	20.0	13.0	11.0	---	---	22.0	---	28.0	30.0	29.0	26.0
20	22.0	20.0	---	11.0	13.0	---	21.0	---	27.0	30.0	29.0	26.0
21	20.0	20.0	---	10.0	---	---	22.0	23.0	27.0	30.0	29.0	---
22	20.0	20.0	---	10.0	13.0	---	21.0	24.0	---	30.0	29.0	26.0
23	19.0	20.0	---	10.0	13.0	---	19.0	25.0	---	---	29.0	26.0
24	18.0	---	---	10.0	14.0	17.0	20.0	25.0	---	---	---	26.0
25	18.0	---	---	10.0	13.0	18.0	22.0	25.0	---	29.0	---	26.0
26	18.0	---	---	---	13.0	18.0	22.0	26.0	---	29.0	---	26.0
27	17.0	---	---	11.0	13.0	19.0	22.0	26.0	---	29.0	28.0	24.0
28	17.0	---	---	11.0	13.0	19.0	24.0	26.0	---	30.0	---	25.0
29	17.0	---	---	11.0	---	19.0	24.0	27.0	---	30.0	---	24.0
30	17.0	16.0	---	11.0	---	---	24.0	---	---	30.0	---	25.0
31	19.0	---	---	11.0	---	---	---	---	---	30.0	---	---
MEAN	21.5	18.5	14.5	11.0	12.5	16.5	20.5	23.5	27.5	29.0	29.5	26.5

NECHES RIVER MAIN STEM

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08031400 LAKE PALESTINE NEAR FRANKSTON, TX

LOCATION.--Lat 32°03'12", long 95°26'12", Anderson-Cherokee County line, Hydrologic Unit 12020001, in outlet tower near right bank, 140 ft upstream from Blackburn Crossing Dam on Neches River, 5 mi east of Frankston, 21 mi upstream from gage (station 08032000), and at mile 354.0.

DRAINAGE AREA.--839 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1962 to current year.  
Water-quality records.--Chemical analyses: October 1976 to September 1984.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Sept. 20, 1962, non-recording gage read once daily.

REMARKS.--The lake is formed by a rolled earthfill dam with a 500-foot-wide uncontrolled spillway near left end of dam. Deliberate impoundment began May 1, 1962. The enlargement of lake began Sept. 26, 1969, and was completed on Mar. 3, 1971. The outlet works consist of two 5- x 7-foot gates located in concrete tower near center of dam and connected to an 8.5-foot-diameter concrete conduit through the dam. The low-flow outlet consists of two 3-foot iron pipes connected to the tower structure for low-flow releases. Water is used for municipal and industrial purposes in the Palestine area. The diversion point is downstream from gage (station 08032000). There are no large diversions above station. 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.....	364.0	-
Design flood.....	355.3	726,000
Crest of spillway (top of conservation pool).....	345.0	412,000
Lowest gated outlet (invert).....	298.0	550

COOPERATION.--The capacity table, furnished by the Upper Neches River Municipal Water Authority, is based on Geological Survey topographic maps dated 1946 and 1948-49.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 531,100 acre-ft May 19, 1989 (elevation, 349.31 ft); minimum since first appreciable storage, 11,450 acre-ft Nov. 28, 1970 (elevation, 310.00 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 458,400 acre-ft Jan. 12 at 1000 to 1300 hours (elevation, 346.76 ft); minimum, 389,200 acre-ft Oct. 3 (elevation, 344.10 ft).

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

344.0	386,700	346.0	437,900
345.0	411,800	347.0	464,900

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	392200	409300	422000	431400	425900	441700	428500	429800	417000	415200	404000	406500
2	390000	410000	422500	431900	425400	444100	426400	428500	417000	414700	402800	408800
3	391700	409300	422200	430600	424300	443300	425400	430100	413600	413900	402000	410300
4	394200	411800	419600	428200	427200	439800	426900	430900	416500	414100	401300	410800
5	393700	409800	418100	428000	428800	439200	428500	432400	421500	413600	401000	411500
6	393500	410000	420200	430600	430300	438700	429500	433200	415700	412800	400800	411000
7	394500	410300	417300	429000	430900	436300	431400	434200	417000	412100	400300	411000
8	396500	419600	416800	428800	431900	433700	433500	435600	417500	411500	398500	411500
9	403500	423300	416200	435000	432900	431400	434200	435000	417800	411000	399000	410800
10	401500	425900	415700	449000	433500	429000	433700	433500	418100	410500	399500	411500
11	402800	426200	415700	456500	433200	426700	431900	432200	417500	409800	399800	411000
12	402800	426200	415200	456500	430900	426700	431600	429300	416200	409000	400000	410800
13	401000	425400	416800	454100	429800	426400	442800	429300	415200	408500	401500	409800
14	400800	424300	415700	452200	430300	425400	449800	429000	413600	408500	405800	408800
15	400300	423300	416200	451400	428200	424100	454600	426900	416200	408000	406000	408500
16	400000	423000	416200	448700	425600	423300	451900	425900	416500	407500	406000	408000
17	403500	420900	417300	446300	425100	423300	447900	429000	418600	407000	406000	408300
18	402800	419600	417300	446000	429000	422800	443600	429000	419600	405800	406500	409000
19	401800	419400	417500	444600	435800	422000	446000	428800	420200	404300	406300	406500
20	402000	418600	417500	445200	440100	421200	440100	427700	418300	404300	405800	405000
21	410800	418300	428800	442500	442200	420400	436300	426400	417500	403000	405800	404000
22	410500	422000	432200	439800	443800	420400	435000	425900	417000	403500	405500	404000
23	411800	422200	433200	438700	444600	420900	431900	424800	420200	402000	405300	404300
24	412300	422500	430300	436600	445200	420700	429800	427200	418600	403300	405300	404800
25	411300	422800	429300	434500	445200	419600	428800	423500	419400	405000	405000	403500
26	411000	422200	433700	432900	444100	417800	427200	422500	418800	405300	404800	403300
27	411000	425900	434200	431600	441900	418300	427500	421700	417300	404800	403500	402800
28	411000	424600	434500	430300	440600	423500	429000	420200	417000	405300	403300	402300
29	410500	423500	435300	431400	---	428200	428500	419100	417300	405300	403300	401800
30	410300	422000	435800	428000	---	429500	428800	417300	416000	405300	404300	401500
31	410300	---	432700	426900	---	429500	---	417300	---	404500	404500	---
MAX	412300	426200	435800	456500	445200	444100	454600	435600	421500	415200	406500	411500
MIN	390000	409300	415200	426900	424300	417800	425400	417300	413600	402000	398500	401500
(†)	344.94	345.39	345.80	345.58	346.10	345.68	345.65	345.21	345.16	344.71	344.71	344.59
(Φ)	+17800	+11700	+10700	-5800	+13700	-11100	-700	-11500	-1300	-11500	0	-3000
CAL YR 1990	MAX	458100	MIN	361400	(Φ)	+71500						
WTR YR 1991	MAX	456500	MIN	390000	(Φ)	+9000						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## NECHES RIVER MAIN STEM

08032000 NECHES RIVER NEAR NECHES, TX

LOCATION.--Lat 31°53'32", long 95°25'50", Anderson-Cherokee County line, Hydrologic Unit 12020001, on left bank just downstream from bridge on U.S. Highway 79, 1.0 mi downstream from Missouri Pacific Railroad Co. bridge, 1.4 mi downstream from Walnut Creek, 4.4 mi northeast of Neches, and at mile 333.2.

DRAINAGE AREA.--1,145 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1939 to current year.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 264.06 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 27, 1945, nonrecording gage at present site and datum.

REMARKS.--No estimated daily discharges. Records good. Some regulation by Lake Palestine (station 08031400) 11 mi upstream and by Lake Athens (station 08031290) 50 mi upstream, combined capacity 454,600 acre-ft. There are no large diversions above station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--22 years (water years 1940-61) unregulated, 804 ft<sup>3</sup>/s (582,500 acre-ft/yr); 30 years (water years 1962-91) regulated, 667 ft<sup>3</sup>/s (483,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 45,500 ft<sup>3</sup>/s Apr. 2, 1945 (gage height, 22.07 ft); no flow Oct. 3-5, 1939.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1908 (stage 24.3 ft) was the highest since flood in May 1884, which was probably higher.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,270 ft<sup>3</sup>/s Apr. 18 at 0600 hours (gage height, 15.96 ft); minimum daily, 105 ft<sup>3</sup>/s July 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	115	228	1020	2350	1680	3010	1630	1930	540	492	131	252
2	114	212	959	2240	1520	3110	1500	1670	500	438	120	271
3	114	208	912	2160	1380	3060	1370	1590	557	391	113	348
4	125	207	930	2120	1300	2920	1220	2690	636	352	109	429
5	163	314	919	2070	1520	2680	1140	2620	585	341	108	423
6	139	310	789	1970	1740	2370	1150	2260	556	333	113	377
7	126	236	697	1880	1890	2160	1280	2060	504	285	115	339
8	121	251	696	1860	1920	2050	1540	1930	515	244	117	314
9	959	1490	609	1930	1920	1920	1710	1880	542	236	109	314
10	1800	2880	538	2800	1930	1770	1780	1910	532	201	108	304
11	1570	2900	503	4070	1940	1610	1790	1910	555	169	130	280
12	1100	2280	473	4740	1960	1440	1720	1830	533	152	202	263
13	683	1910	449	5070	1920	1280	1760	1710	483	140	657	243
14	391	1660	480	5060	1810	1180	4400	1570	424	134	1280	235
15	284	1480	481	5300	1700	1110	5790	1470	401	128	1830	221
16	232	1320	481	5070	1650	1030	5220	1370	481	123	1400	198
17	198	1170	503	4670	1540	967	4760	1360	605	118	960	186
18	190	1060	533	4200	1480	923	5700	1490	684	115	644	181
19	244	962	593	4020	3440	902	4730	1580	727	110	639	208
20	180	877	577	3810	4320	846	3940	1650	715	108	596	265
21	420	807	586	3650	3370	787	3250	1530	650	105	445	195
22	1060	779	803	3490	3090	758	2690	1400	567	105	310	154
23	1050	936	1060	3200	3370	751	2270	1280	583	109	267	146
24	836	1040	1310	2890	3400	733	2030	1160	794	107	246	173
25	614	1100	1510	2700	3150	702	1810	1050	814	142	223	238
26	464	1110	1590	2500	3050	663	1610	986	716	343	208	237
27	367	1060	1740	2320	2950	617	1470	922	619	336	216	174
28	319	1020	1950	2160	2740	659	1570	838	557	233	210	155
29	293	1050	2170	2030	---	1040	2410	752	540	179	191	147
30	268	1060	2310	1890	---	1480	2190	670	539	160	186	143
31	246	---	2360	1800	---	1680	---	606	---	146	228	---
TOTAL	14785	31917	30531	96020	63680	46208	75430	47674	17454	6575	12211	7413
MEAN	477	1064	985	3097	2274	1491	2514	1538	582	212	394	247
MAX	1800	2900	2360	5300	4320	3110	5790	2690	814	492	1830	429
MIN	114	207	449	1800	1300	617	1140	606	401	105	108	143
AC-FT	29330	63310	60560	190500	126300	91650	149600	94560	34620	13040	24220	14700

CAL YR 1990 TOTAL 397835 MEAN 1090 MAX 6800 MIN 90 AC-FT 789100  
WTR YR 1991 TOTAL 449898 MEAN 1233 MAX 5790 MIN 105 AC-FT 892400

NECHES RIVER MAIN STEM

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08032000 NECHES RIVER NEAR NECHES, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: December 1969 to current year. Biochemical analyses: October 1974 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1969 to September 1991 (discontinued).

WATER TEMPERATURES: December 1983 to September 1991 (discontinued).

INSTRUMENTATION.--Since December 1969 specific conductance is recorded continuously at this station.

Since December 1983 water temperature is recorded continuously at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum and minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (1974-current year): Maximum, 1,190 microsiemens Aug. 29, 1976; minimum 65 microsiemens June 1, 1990.

WATER TEMPERATURE: Maximum, 36.0°C July 16, 1985; minimum, 0.0°C Dec. 24, 25, 1989.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 245 microsiemens July 8; Minimum, 73 microsiemens Feb. 19.

WATER TEMPERATURE: Maximum, 31.0°C Aug. 7, 8; minimum, 6.5°C Dec. 25, Jan. 1.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
DEC 18...	1230	529	165	6.2	15.0	9.2	92	1.0	34	13
FEB 12...	1345	1960	141	6.3	14.0	10.4	102	1.3	34	14
APR 19...	1030	4780	132	6.4	20.0	6.7	75	0.5	33	12
JUN 06...	1350	565	159	7.0	26.5	6.3	79	1.3	40	17
JUL 30...	1255	162	166	6.5	28.5	6.2	80	1.5	40	19
SEP 11...	1128	282	153	6.5	27.5	6.2	79	1.0	39	9

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
DEC 18...	7.9	3.4	14	1	3.2	21	12	23	<0.10	11
FEB 12...	8.4	3.2	12	0.9	3.6	20	15	18	0.20	4.0
APR 19...	8.0	3.1	10	0.8	3.4	21	15	14	<0.10	3.4
JUN 06...	9.5	3.9	13	0.9	3.5	23	21	22	0.10	8.3
JUL 30...	9.5	4.0	14	1	4.0	21	21	24	0.20	12
SEP 11...	9.5	3.8	14	1	3.5	30	13	22	0.10	12

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
DEC 18...	87	--	<0.010	0.200	0.020	0.48	0.50	0.080	0.010
FEB 12...	76	--	<0.010	<0.100	<0.010	--	0.60	0.020	0.020
APR 19...	69	0.130	0.030	0.160	0.070	0.73	0.80	0.090	0.040
JUN 06...	95	0.150	0.020	0.170	0.050	0.55	0.60	0.070	0.030
JUL 30...	101	0.120	0.010	0.130	0.030	0.47	0.50	0.070	<0.010
SEP 11...	96	0.110	0.010	0.120	0.040	0.56	0.60	0.110	0.010



## NECHES RIVER MAIN STEM

08032000 NECHES RIVER NEAR NECHES, TX--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	14785	118	68	2710	15	597	17	681	25
NOV. 1990	31917	135	78	6740	18	1570	19	1640	28
DEC. 1990	30531	143	83	6830	20	1630	20	1640	29
JAN. 1991	96020	125	72	18700	16	4180	18	4670	27
FEB. 1991	63680	142	82	14200	20	3380	20	3400	29
MAR. 1991	46208	140	81	10100	19	2380	20	2450	29
APR. 1991	75430	135	78	15900	18	3690	19	3870	28
MAY 1991	47674	148	86	11100	21	2690	20	2620	30
JUNE 1991	17454	166	97	4580	25	1180	22	1050	32
JULY 1991	6575	176	104	1840	28	490	23	410	34
AUG. 1991	12211	153	89	2930	22	727	21	688	31
SEPT 1991	7413	165	97	1940	25	498	22	443	32
TOTAL	449898	**	**	97400	**	23000	**	23600	**
WTD.AVG.	1233	139	80	**	19	**	19	**	29

## SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	153	149	151	158	154	156	147	144	146	134	133	133
2	154	150	152	158	156	157	149	143	148	134	132	133
3	156	152	154	160	157	159	150	145	148	134	131	133
4	160	153	156	165	158	162	147	142	145	139	130	133
5	174	154	160	189	152	163	149	144	146	136	124	131
6	157	154	155	155	151	153	152	147	151	133	130	132
7	159	154	157	159	155	157	153	149	150	133	131	132
8	163	147	160	176	150	158	149	147	148	131	127	130
9	---	---	e140	230	98	141	151	148	149	130	128	129
10	---	---	e110	99	95	97	152	147	150	129	111	122
11	---	---	e90	111	97	103	152	148	150	113	109	111
12	---	---	e95	124	112	118	157	149	151	118	114	116
13	---	---	e97	132	124	128	153	149	151	122	117	120
14	---	---	e96	153	132	135	151	145	148	126	117	122
15	---	---	e100	138	136	137	157	148	150	128	115	121
16	---	---	e104	151	133	139	157	147	150	121	118	119
17	---	---	e113	234	126	148	163	155	158	121	119	120
18	---	---	e116	209	137	162	172	149	160	121	120	120
19	---	---	e113	203	130	156	168	152	156	134	115	123
20	---	---	e100	207	138	153	154	149	152	144	118	124
21	---	---	e98	148	135	146	161	148	153	121	117	119
22	---	---	e100	159	145	147	167	141	150	121	118	120
23	---	---	e116	174	137	156	142	134	140	144	111	122
24	136	126	130	144	140	142	143	132	141	144	116	133
25	147	137	144	146	141	142	140	139	140	171	123	142
26	149	145	147	149	143	146	142	138	139	160	108	140
27	151	149	150	151	149	150	144	138	140	158	117	139
28	152	151	152	167	146	151	136	132	134	138	105	120
29	154	152	153	146	143	145	136	131	134	143	104	118
30	156	153	155	145	143	144	139	133	134	180	109	149
31	158	154	156	---	---	---	134	132	134	172	126	156
MONTH	174	126	130	234	95	145	172	131	147	180	104	128

e Estimated

NECHES RIVER MAIN STEM

08032000 NECHES RIVER NEAR NECHES, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	172	138	162	141	131	137	139	133	136	140	128	134
2	175	149	166	135	132	133	151	115	137	148	141	145
3	183	120	164	148	130	136	145	134	139	151	139	149
4	194	115	152	140	135	138	145	140	141	142	99	116
5	178	116	149	142	138	139	141	138	140	125	111	117
6	175	131	155	141	140	140	144	138	140	163	125	131
7	175	147	157	142	139	141	147	139	143	141	134	137
8	158	145	150	142	131	141	140	136	137	161	140	145
9	170	140	152	143	141	142	137	135	136	152	148	150
10	204	125	154	143	130	141	141	136	138	153	150	151
11	182	133	153	165	140	142	142	140	141	153	150	152
12	189	133	151	150	113	140	142	138	141	155	151	154
13	203	136	158	143	141	142	142	135	139	157	154	155
14	172	126	150	143	140	142	128	91	104	159	154	157
15	174	138	152	145	131	143	111	95	105	159	157	158
16	163	141	151	151	145	147	153	105	118	160	158	159
17	204	144	159	151	143	148	199	104	153	159	154	156
18	211	126	169	180	131	151	161	104	131	161	140	151
19	158	73	113	162	128	147	151	119	138	149	145	146
20	131	87	108	146	145	145	146	141	144	156	148	152
21	165	103	125	147	144	145	150	146	148	158	154	157
22	153	107	132	147	143	146	151	149	150	159	158	159
23	142	118	133	151	138	144	153	150	151	168	159	160
24	162	117	134	146	143	144	153	150	151	162	160	161
25	139	135	138	146	141	144	170	150	153	163	160	161
26	142	139	140	197	136	150	159	151	153	162	160	161
27	146	135	140	194	134	149	155	150	153	165	161	163
28	146	131	141	154	140	144	151	134	145	166	163	164
29	---	---	---	177	121	139	136	110	118	169	162	165
30	---	---	---	129	122	125	137	116	124	167	163	165
31	---	---	---	134	128	131	---	---	---	172	130	167
MONTH	211	73	147	197	113	142	199	91	138	172	99	152
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	170	163	166	167	163	165	174	168	171	218	167	181
2	167	164	165	170	165	168	178	172	175	182	156	166
3	194	163	171	172	166	170	181	174	177	189	157	170
4	174	159	165	177	171	174	180	175	177	199	134	158
5	167	160	162	175	168	173	184	175	178	152	135	146
6	169	165	167	177	170	173	225	174	193	160	153	156
7	167	163	165	178	173	176	206	173	186	163	159	161
8	205	164	175	245	175	185	196	173	180	167	162	164
9	172	166	170	229	158	176	180	172	175	171	160	165
10	169	164	167	214	161	179	183	171	175	164	157	161
11	184	165	171	190	182	186	172	165	169	166	162	163
12	172	165	169	204	179	189	165	136	153	167	164	165
13	171	166	169	202	183	193	---	---	e145	168	165	167
14	171	165	169	191	173	187	---	---	e140	198	170	177
15	177	167	172	201	177	189	---	---	e138	171	166	169
16	210	162	180	203	189	195	---	---	e135	172	169	170
17	191	159	168	215	184	189	---	---	e140	173	171	172
18	164	158	160	---	---	e190	---	---	e146	175	172	173
19	168	159	163	---	---	e193	---	---	e150	173	162	169
20	169	166	168	---	---	e191	---	---	e161	165	161	163
21	171	167	168	---	---	e194	---	---	e164	173	165	169
22	172	165	168	---	---	e194	---	---	e169	177	171	173
23	194	164	171	---	---	e193	176	169	172	177	174	176
24	166	143	149	---	---	e194	173	167	169	217	173	183
25	165	145	153	---	---	e185	172	168	170	199	156	174
26	168	160	163	---	---	e163	173	170	171	159	145	152
27	166	163	165	---	---	e165	232	169	185	166	159	163
28	177	159	165	---	---	e167	178	169	173	167	164	165
29	173	157	167	---	---	e166	174	170	172	169	166	167
30	164	157	161	---	---	e168	174	170	172	170	166	168
31	---	---	---	173	168	169	238	169	192	---	---	---
MONTH	210	143	166	245	158	181	238	136	167	218	134	167

e Estimated

## NECHES RIVER MAIN STEM

08032000 NECHES RIVER NEAR NECHES, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	25.5	24.0	24.5	18.0	17.0	17.5	14.5	13.5	14.0	7.0	6.5	6.5
2	25.0	24.0	24.5	18.5	17.5	18.0	16.0	14.5	15.0	7.5	7.0	7.0
3	25.5	24.5	25.0	19.5	18.5	19.0	16.0	15.0	15.5	8.0	7.5	7.5
4	26.5	25.0	25.5	19.5	18.0	19.5	15.0	13.5	14.0	8.0	7.5	8.0
5	25.5	24.5	25.0	18.0	16.5	17.0	13.5	12.0	12.5	9.5	8.0	8.5
6	25.0	24.0	24.5	16.0	15.0	15.5	12.5	11.5	12.0	10.0	9.5	9.5
7	26.0	24.5	25.0	15.0	14.5	15.0	13.0	12.0	12.5	9.5	9.0	9.5
8	26.5	25.5	26.0	15.0	14.0	15.0	12.5	11.5	12.0	9.0	8.0	8.5
9	---	---	---	13.5	11.5	12.0	11.5	10.5	11.0	8.0	8.0	8.0
10	---	---	---	12.5	11.5	12.0	12.0	11.0	11.5	8.5	8.0	8.5
11	---	---	---	13.5	12.0	12.5	12.5	11.0	11.5	8.5	8.5	8.5
12	---	---	---	14.5	13.5	13.5	14.0	12.0	13.0	8.5	7.5	8.0
13	---	---	---	15.0	14.0	14.5	15.0	14.0	14.0	8.0	7.5	8.0
14	---	---	---	15.0	14.5	15.0	14.5	14.0	14.5	9.0	8.0	8.5
15	---	---	---	15.5	15.0	15.0	15.0	14.5	15.0	9.0	9.0	9.0
16	---	---	---	16.0	15.5	15.5	15.0	14.5	14.5	9.0	8.5	9.0
17	---	---	---	16.5	15.5	16.0	15.5	14.5	15.0	9.5	8.5	9.0
18	---	---	---	16.5	16.0	16.0	15.5	15.0	15.5	9.5	9.0	9.5
19	---	---	---	17.0	16.5	16.5	15.0	13.5	14.0	9.5	9.0	9.0
20	---	---	---	18.0	17.0	17.5	13.5	13.0	13.5	9.0	8.5	9.0
21	---	---	---	18.0	17.5	18.0	14.0	13.0	14.0	8.5	8.0	8.5
22	---	---	---	18.5	18.0	18.0	13.0	9.5	11.0	8.0	7.0	7.5
23	---	---	15.5	18.0	15.5	17.5	9.0	7.5	8.0	8.0	7.0	7.5
24	15.5	14.5	15.0	17.5	16.5	16.5	7.0	7.0	7.0	8.0	7.5	8.0
25	16.0	15.5	15.5	16.5	16.0	16.5	7.5	6.5	7.0	8.5	7.5	8.0
26	16.5	15.5	16.0	18.0	16.5	17.5	8.0	7.5	7.5	8.5	8.0	8.5
27	16.5	15.5	16.0	18.5	16.0	18.5	8.0	7.5	7.5	9.0	8.5	8.5
28	17.5	16.0	16.5	18.5	17.0	17.5	8.5	8.0	8.0	9.5	9.0	9.0
29	18.0	17.0	17.5	16.5	15.0	15.5	10.5	9.0	9.5	10.0	9.5	9.5
30	18.0	17.5	18.0	15.0	14.0	14.5	11.0	9.0	10.0	10.0	8.0	9.0
31	18.0	17.5	18.0	---	---	---	8.5	7.0	7.5	8.0	7.5	8.0
MONTH	26.5	14.5	20.5	19.5	11.5	16.0	16.0	6.5	12.0	10.0	6.5	8.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	8.0	7.0	7.5	15.0	13.0	14.0	16.5	15.0	16.0	21.5	20.5	21.0
2	8.5	7.5	8.0	15.5	14.5	15.0	17.0	16.5	16.5	22.0	21.0	21.5
3	9.5	8.0	8.5	14.5	13.0	14.0	17.5	15.0	17.0	22.5	22.0	22.5
4	10.0	9.0	9.5	13.5	12.0	13.0	18.0	17.0	17.5	21.5	20.5	21.0
5	11.0	10.0	10.5	14.5	13.0	13.5	19.0	18.0	18.5	20.5	20.5	20.5
6	11.5	11.0	11.0	15.5	14.5	15.0	19.0	19.0	19.0	20.0	19.5	20.0
7	11.5	10.5	11.0	15.5	14.5	15.0	19.0	18.5	19.0	19.5	19.0	19.5
8	11.5	10.5	11.0	14.5	14.0	14.5	19.5	18.5	19.0	20.0	19.5	20.0
9	11.5	10.5	11.0	14.5	13.5	14.0	20.5	19.5	20.0	20.5	20.0	20.5
10	11.5	10.5	11.0	14.5	13.5	14.5	20.0	19.0	19.5	20.5	20.0	20.5
11	12.0	11.0	11.5	14.5	14.0	14.5	20.0	19.5	20.0	22.0	20.5	21.0
12	13.0	12.0	12.5	15.5	14.5	15.0	20.0	20.0	20.0	22.5	20.0	22.0
13	13.5	13.0	13.0	15.5	15.0	15.5	20.0	20.0	20.0	23.0	22.0	22.5
14	13.0	12.0	12.5	15.0	14.5	14.5	19.5	19.0	19.5	23.0	22.5	22.5
15	12.5	11.0	11.5	14.5	13.5	14.0	20.0	19.0	19.5	22.5	22.0	22.5
16	11.0	10.0	10.5	13.0	13.0	13.0	20.5	19.5	20.0	23.0	22.0	22.5
17	11.5	10.0	10.5	15.0	13.0	14.0	21.0	20.0	20.5	23.0	21.5	22.5
18	13.5	10.0	11.5	16.0	14.5	15.0	21.0	20.0	20.5	21.5	21.0	21.5
19	14.0	13.5	14.0	15.5	15.0	15.5	21.0	20.0	20.5	23.0	21.5	22.0
20	13.5	11.0	12.5	16.5	15.5	16.0	20.0	19.5	20.0	23.5	23.0	23.5
21	12.0	11.5	12.0	17.0	16.0	16.5	19.5	19.0	19.5	24.0	23.5	24.0
22	11.5	11.0	11.5	18.0	17.0	17.5	19.5	19.0	19.5	24.5	24.0	24.5
23	12.0	10.5	11.5	17.5	16.5	17.0	19.5	18.5	19.0	24.5	24.0	24.5
24	12.5	11.5	12.0	17.5	16.0	17.0	20.0	19.0	19.5	25.0	24.5	24.5
25	12.0	11.5	12.0	17.5	16.5	17.0	20.0	19.5	20.0	26.0	25.0	25.5
26	11.5	10.5	11.0	18.5	17.0	18.0	21.0	20.0	20.5	26.5	25.0	25.5
27	12.0	11.0	11.5	19.0	18.0	18.5	21.5	21.0	21.0	27.0	25.5	26.5
28	13.0	12.0	12.5	18.5	16.5	17.5	21.5	21.0	21.0	27.0	26.0	26.5
29	---	---	---	16.5	15.5	16.0	21.0	20.5	21.0	26.5	26.0	26.0
30	---	---	---	15.5	15.0	15.5	21.0	20.0	20.5	26.0	25.0	25.5
31	---	---	---	16.0	15.0	15.5	---	---	---	25.5	24.5	25.0
MONTH	14.0	7.0	11.0	19.0	12.0	15.5	21.5	15.0	19.5	27.0	19.0	23.0

NECHES RIVER MAIN STEM

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WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	26.0	24.5	25.5	28.5	27.0	28.0	29.5	28.0	28.5	26.5	25.5	26.0
2	26.0	25.0	25.5	29.0	27.5	28.5	30.0	28.0	29.0	26.5	25.5	26.0
3	26.0	24.5	25.5	29.0	28.0	28.5	30.0	28.0	29.0	26.0	25.5	26.0
4	26.0	25.0	25.5	29.0	28.5	29.0	30.5	28.5	29.5	26.0	25.5	26.0
5	26.5	25.5	26.0	28.5	27.5	28.0	30.5	29.0	29.5	26.5	26.0	26.0
6	27.0	25.5	26.0	29.0	28.0	28.5	30.5	28.5	29.5	27.0	26.0	26.5
7	27.0	26.0	26.5	30.0	29.0	29.0	31.0	29.0	29.5	27.0	26.5	27.0
8	26.0	25.0	25.5	29.5	28.5	29.0	31.0	29.0	30.0	27.0	26.5	26.5
9	25.5	24.5	25.0	29.0	27.5	28.5	30.0	29.0	29.5	27.5	26.5	27.0
10	25.5	25.0	25.0	29.0	27.5	28.5	29.0	27.5	28.5	27.5	26.5	27.0
11	26.0	24.5	25.5	29.5	28.0	28.5	28.0	27.0	27.5	27.5	27.0	27.5
12	27.0	25.5	26.0	29.5	28.0	28.5	27.5	25.0	26.5	27.5	26.5	27.0
13	28.0	27.0	27.5	30.0	28.0	29.0	---	---	---	27.5	26.5	27.0
14	27.5	26.5	27.5	30.0	28.0	29.0	---	---	---	27.5	26.5	27.0
15	27.5	26.0	27.0	30.0	28.5	29.0	---	---	---	28.0	26.5	27.5
16	26.5	25.5	26.0	30.0	28.5	29.0	---	---	---	28.0	27.0	27.5
17	25.5	24.5	25.0	29.5	28.0	29.0	---	---	---	28.0	27.0	27.5
18	27.0	25.0	26.0	29.5	27.5	28.5	---	---	---	28.0	27.0	27.5
19	28.5	27.0	27.5	29.5	27.5	28.5	---	---	---	27.0	24.0	25.0
20	28.5	26.5	28.0	30.0	28.0	28.5	---	---	---	23.5	22.5	23.0
21	28.5	27.5	28.0	29.5	28.0	29.0	---	---	---	22.5	21.5	22.0
22	28.5	27.5	28.0	30.0	27.5	28.5	---	---	---	22.5	21.0	22.0
23	27.5	26.0	26.5	29.5	27.5	28.5	27.0	25.5	26.5	23.0	22.0	22.5
24	27.0	25.5	26.0	29.5	27.5	28.5	27.0	26.0	26.5	24.0	23.0	23.0
25	28.0	26.5	27.0	28.5	26.5	27.5	27.0	26.0	26.5	23.0	22.0	22.5
26	28.5	27.0	27.5	26.0	25.0	25.5	27.0	26.0	26.5	22.0	21.0	21.5
27	28.0	27.5	28.0	27.0	25.5	26.0	27.0	26.0	26.5	21.5	20.5	21.0
28	28.5	27.5	28.0	28.0	26.5	27.0	27.5	26.0	26.5	21.0	20.0	20.5
29	28.5	27.0	27.5	28.5	26.5	27.5	27.5	26.5	27.0	21.0	19.5	20.5
30	28.0	26.5	27.5	29.5	27.5	28.5	27.5	27.0	27.0	21.5	20.5	21.0
31	---	---	---	30.0	28.0	29.0	27.0	26.5	26.5	---	---	---
MONTH	28.5	24.5	26.5	30.0	25.0	28.5	31.0	25.0	28.0	28.0	19.5	25.0

## NECHES RIVER MAIN STEM

08033000 NECHES RIVER NEAR DIBOLL, TX  
(Flood-hydrograph Partial-record Station)

LOCATION.--Lat 31°07'58", long 94°48'35", Angelina-Polk County line, Hydrologic Unit 12020002, near center of main span of downstream bridge on U.S. Highway 59, 700 ft downstream from Texas and New Orleans Railroad Co. bridge, 2.9 mi downstream from Alabama Creek, 3.8 mi south of Diboll, and at mile 203.5

DRAINAGE AREA.--2,724 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1923 to September 1925, March 1939 to September 1985. Monthly discharge only for some periods, published in WSP 1312. October 1985 to September 1989 (annual maximum), October 1989 to September 1991 (peaks above base discharge and annual maximum).

Water-quality records: Chemical and biochemical analyses: October 1969 to September 1981.

REVISED RECORDS.--WSP 1242: 1950. WSP 1732: Drainage area.

GAGE.--Water-stage recorder and Data collection platform (DCP). Datum of gage is 136.46 ft above National Geodetic Vertical Datum of 1929. Prior to July 10, 1925, nonrecording gage at site 630 ft upstream; July 10 to Aug. 31, 1925, and Mar. 30, 1939, to Sept. 24, 1943, nonrecording gage at site 500 ft upstream; Sept. 25, 1943, to Aug. 16, 1973, nonrecording gage at site 70 ft upsgream; all at present datum.

REMARKS.--Satellite telemeter (DCP) at station.

AVERAGE DISCHARGE.--24 years (water years 1923-25, 1939-61) unregulated, 1,807 ft<sup>3</sup>/s (1,309,000 acre-ft/yr); 24 years (water years 1962-85) regulated, 1,353 ft<sup>3</sup>/s (980,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,900 ft<sup>3</sup>/s May 4, 1944 (gage height, 18.70 ft); no flow Aug. 15-22, 1925.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1874, 21 ft in May 1884 (discharge, about 110,000 ft<sup>3</sup>/s from rating curve extended above 40,000 ft<sup>3</sup>/s; flood in 1900 reached a stage of 19.9 ft (discharge, about 80,000 ft<sup>3</sup>/s); from information by local residents. ~  
ft<sup>3</sup>/s); from information by local residents. ~

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 6,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 11	2200	*17,400	*15.84	Apr. 16	1900	10,400	14.72
Jan. 16	1100	16,300	15.68	Apr. 21	1600	11,000	14.83
Feb. 6	1100	6,850	13.84	May 9	0100	13,100	15.21
Feb. 22	2300	11,800	14.98	May 23	1900	8,730	14.36
Mar. 3	2200	7,790	14.13	Aug. 21	1500	6,720	13.79

Minimum discharge, not determined.



NECHES RIVER MAIN STEM

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08033500 NECHES RIVER NEAR ROCKLAND, TX

LOCATION.--Lat 31°01'29", long 94°23'55", Tyler County, Hydrologic Unit 12020003, at downstream side of bridge at U.S. Highway 69, 2,200 ft upstream from abandoned ferry crossing, 0.8 mi upstream from Texas and New Orleans Railway Co. bridge, 1.2 mi north of Rockland, 3.2 mi downstream from Williams Creek, and 32.4 mi upstream from Angelina River.

DRAINAGE AREA.--3,636 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1903 to current year.

REVISED RECORDS.--WSP 878: 1926-27. WSP 1342: 1922(M), 1935. WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 88.41 ft above National Geodetic Vertical Datum of 1929. Prior to May 23, 1973, nonrecording gage located 2,200 ft downstream at datum 3.00 ft higher. May 23, 1973, to Sept. 30, 1975, recording gage at present site at datum 3.00 ft higher.

REMARKS.-- Records good. At times, low flow may be affected by regulations by Lake Athens (station 08031290), Lake Palestine (station 08031400), and Lake Jacksonville, combined capacity 130,700 acre-ft/yr. During the current year, the Upper Neches River Municipal Water Authority diverted 2,170 acre-ft from the Neches River at diversion point located about 10 mi downstream from station 08032000. This water is used for municipal and industrial purposes in the Palestine area. Gage-height telemeter at station.

AVERAGE DISCHARGE.--58 years (water years 1904-61) unregulated, 2,362 ft<sup>3</sup>/s (1,711,000 acre-ft/yr); 30 years (water years 1962-91) regulated, 2,144 ft<sup>3</sup>/s (1,553,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 49,800 ft<sup>3</sup>/s May 6, 1944 (gage height, 35.04 ft), present site; minimum observed during period of daily records, 1.6 ft<sup>3</sup>/s Sept. 28-30, Oct. 1, 2, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Historical flood information begins with flood in May 1884, which reached a stage of 38.0 ft, present site, from information by local resident (discharge, about 62,000 ft<sup>3</sup>/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 23,000 ft<sup>3</sup>/s Jan. 20 at 2300 hours (gage height, 27.73 ft); minimum daily, 156 ft<sup>3</sup>/s Oct. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	256	1550	2060	2330	9080	11700	1870	9180	4920	2380	469	1890
2	266	1600	1950	2440	8080	10900	1760	8540	4290	2170	497	1270
3	252	1600	1830	3820	7150	10200	1670	8030	3770	1910	502	1310
4	228	1450	1720	3800	6490	9670	1580	7910	3450	1570	478	1920
5	211	1150	1660	3610	6810	9250	1580	7770	3110	1590	425	2490
6	189	870	1590	3570	6970	8990	1700	7760	2740	2000	360	2010
7	181	713	1590	3760	7670	8810	2370	8010	2430	1960	313	2090
8	168	635	1550	3840	8150	8560	3700	9080	2210	1830	284	2110
9	173	741	1520	4120	8150	8210	3530	11000	1970	1700	261	2160
10	184	793	1480	7310	7870	7790	2980	13900	2090	1550	310	2300
11	162	952	1450	8320	7400	7380	3070	15800	2020	1370	341	1990
12	156	1010	1410	9240	6860	7000	3660	16000	1950	1300	347	1670
13	209	1070	1360	11300	6310	6580	3640	15000	1730	1140	863	1400
14	481	1150	1320	14200	5710	6090	4890	13400	1630	958	1670	1160
15	695	1260	1270	17600	5050	5610	8200	12000	1920	794	2670	1020
16	823	1380	1210	19300	4420	5230	8750	10700	2090	671	3470	987
17	921	1500	1130	20500	4040	5210	9270	10200	2280	565	3710	908
18	1030	1610	1050	21500	3830	5140	9860	9310	1950	491	3770	852
19	1130	1690	1030	22500	4670	4950	11200	8180	1850	439	3910	762
20	1240	1740	962	22700	6070	4690	12500	7260	1710	390	4250	714
21	1380	1800	967	22800	7700	4370	12800	6810	2790	354	4560	671
22	1520	1860	1010	21700	10500	4050	12200	6490	2450	327	4860	621
23	1570	1950	1020	20200	12500	3760	11800	6160	2120	306	5210	578
24	1450	2040	1070	19100	14800	3490	11600	5950	1850	296	5440	524
25	1180	2120	1090	18100	15600	3220	11600	6270	1790	294	5630	636
26	1020	2210	1110	17100	15300	2960	11500	6970	2090	296	5700	605
27	1020	2280	2820	15900	14200	2700	11500	7440	2070	301	5560	562
28	1110	2360	2900	14500	12700	2440	11100	7370	2320	366	5200	546
29	1250	2340	2620	13000	---	2300	10500	6920	2620	380	4740	543
30	1360	2200	2420	11400	---	2190	9920	6350	2530	427	4040	545
31	1460	---	2430	10100	---	2030	---	5770	---	447	3030	---
TOTAL	23275	45624	48599	389660	234080	185470	212300	281530	72740	30572	82870	36844
MEAN	751	1521	1568	12570	8360	5983	7077	9082	2425	986	2673	1228
MAX	1570	2360	2900	22800	15600	11700	12800	16000	4920	2380	5700	2490
MIN	156	635	962	2330	3830	2030	1580	5770	1630	294	261	524
AC-FT	46170	90500	96400	772900	464300	367900	421100	558400	144300	60640	164400	73080
CAL YR 1990	TOTAL	1183601	MEAN	3243	MAX	25800	MIN	130	AC-FT	2348000		
WTR YR 1991	TOTAL	1643564	MEAN	4503	MAX	22800	MIN	156	AC-FT	3260000		

NECHES RIVER MAIN STEM

08033500 NECHES RIVER NEAR ROCKLAND, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1941 to September 1942, September 1945 to September 1947. Chemical and biochemical analyses: December 1967 to current year. Sediment analyses: 1961 to 1963.

PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: April 1941 to September 1942, September 1945 to September 1947.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	
DEC 13...	1430	1360	162	7.4	12.5	10.4	97	0.8	32	10	7.2	3.3	
FEB 22...	1000	10500	100	6.7	12.0	12.8	118	1.7	25	14	6.9	2.0	
APR 16...	1116	8730	89	6.5	21.0	6.2	69	2.5	23	11	6.4	1.8	
MAY 16...	1145	10600	110	6.8	23.0	6.3	73	1.8	28	9	7.0	2.6	
JUL 11...	1420	1340	158	7.0	29.0	6.2	80	1.1	36	10	8.7	3.5	
AUG 29...	1425	4680	110	6.5	26.0	7.7	94	0.3	28	10	6.9	2.7	
DATE		SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
DEC 13...	15	1	3.5	22	19	24	<0.10	13	99	0.080	0.020	0.100	
FEB 22...	10	0.9	2.1	11	18	13	<0.10	7.7	66	--	0.020	<0.100	
APR 16...	8.8	0.8	2.6	12	12	9.8	0.20	7.6	56	0.016	0.060	0.076	
MAY 16...	8.9	0.7	2.8	19	12	11	0.10	11	67	0.150	0.030	0.180	
JUL 11...	16	1	3.5	26	22	19	0.20	12	100	0.360	0.040	0.400	
AUG 29...	8.8	0.7	3.3	18	15	12	<0.10	13	73	0.067	0.020	0.087	
DATE		NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
DEC 13...	0.020	0.38	0.40	0.080	0.030	<1	39	<0.5	1.0	<5	<3	<10	
FEB 22...	0.050	0.65	0.70	0.070	0.030	--	--	--	--	--	--	--	
APR 16...	0.070	0.93	1.0	0.120	0.080	--	--	--	--	--	--	--	
MAY 16...	0.050	0.75	0.80	0.100	0.040	--	--	--	--	--	--	--	
JUL 11...	0.100	0.60	0.70	0.090	0.070	--	--	--	--	--	--	--	
AUG 29...	0.160	0.54	0.70	0.120	0.050	1	52	<0.5	<1.0	<5	<3	<10	
DATE		IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC 13...	560	<10	7	35	<0.1	<10	<10	<1	<1.0	80	<6	5	
FEB 22...	--	--	--	--	--	--	--	--	--	--	--	--	
APR 16...	--	--	--	--	--	--	--	--	--	--	--	--	
MAY 16...	--	--	--	--	--	--	--	--	--	--	--	--	
JUL 11...	--	--	--	--	--	--	--	--	--	--	--	--	
AUG 29...	410	<10	6	86	<0.1	<10	<10	<1	<1.0	81	<6	13	

NECHES RIVER BASIN

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08036500 ANGELINA RIVER NEAR ALTO, TX

LOCATION.--Lat 31°40'10", long 94°57'24", Nacogdoches-Cherokee County line, Hydrologic Unit 12020004, near center of rectified channel at downstream side of bridge on State Highway 21, 0.4 mi upstream from Allen Creek, 1.5 mi upstream from Bingham Creek, 7.5 mi east of Alto, and 149.3 mi upstream from mouth.

DRAINAGE AREA.--1,276 mi<sup>2</sup>.

PERIOD OF RECORD.--May to August 1940 (discharge measurements only), September 1940 to March 1949 (fragmentary for 1941-42, 1944-49), February 1959 to current year.  
Water-quality records.--Chemical analyses: November 1961 to September 1963.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 204.30 ft above National Geodetic Vertical Datum of 1929. May 9, 1940, to Mar. 31, 1949, nonrecording gage on bridge at natural channel 1,400 ft to right at same datum. Feb. 18 to Sept. 15, 1959, nonrecording gage at present site and datum.

REMARKS.--Records good, including those for estimated daily discharges. No large diversions above station. Flow partly regulated since May 1957 by Lake Striker, 35.5 mi upstream and by Lake Tyler, 69.9 mi upstream since January 1949 (combined capacity, 110,700 acre-ft). Several observations of water temperature were made during the year. A U.S. Army Corps of Engineers telemeter for rainfall and stage at station.

AVERAGE DISCHARGE.--33 years (water years 1943, 1960-91), 838 ft<sup>3</sup>/s (607,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 42,500 ft<sup>3</sup>/s Mar. 31, 1989 (gage height, 23.20 ft); minimum, 2.0 ft<sup>3</sup>/s Aug. 14, 15, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1905, that of Mar. 31, 1989. A flood in May 1908 reached a stage of about 22 ft, from information by local residents. Flood in 1932 reached a stage of 21.5 ft, from floodmarks and from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,800 ft<sup>3</sup>/s Apr. 17 at 0400 hours (gage height, 19.10 ft); minimum daily, 66 ft<sup>3</sup>/s Oct. 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80	613	1270	2560	1990	4030	1050	4640	2110	1500	252	181
2	73	513	1300	2890	1840	3800	1480	7570	1750	1220	240	287
3	69	448	1260	3050	1700	3570	1880	7650	1520	882	210	343
4	68	407	1120	3020	1540	3650	2110	8240	1310	675	192	386
5	66	315	988	2890	1630	4030	2110	7640	1150	635	181	700
6	67	243	948	2730	1590	4220	1960	7460	1110	610	172	883
7	112	227	875	2620	1670	4040	1770	6950	1010	624	165	924
8	175	234	709	2490	1840	3660	1590	6220	857	621	156	888
9	220	623	581	2520	1970	3210	1460	5450	782	587	152	763
10	426	1020	525	3590	2020	2790	1390	4780	727	475	161	698
11	838	1300	489	4230	1990	2360	1330	4170	1690	398	188	660
12	1460	1890	460	7090	1910	1920	1190	3780	1590	335	271	477
13	1800	2800	460	9690	1860	1530	1060	3400	1520	277	695	314
14	1960	3490	522	8930	1810	1300	1670	3040	1550	244	1300	245
15	1880	3820	558	9000	1710	1200	2930	2700	1630	221	1370	211
16	1580	3800	563	8240	1570	1170	7780	2330	1700	202	1170	192
17	1250	3470	566	8250	1420	1160	11500	2310	1650	189	1070	177
18	957	3010	581	8510	1320	1130	11000	2590	1540	180	1100	166
19	654	2510	598	7890	1770	1110	10000	2550	1430	187	1200	160
20	465	1950	624	7020	1800	1040	8910	2810	1330	171	1140	201
21	424	1460	606	6300	1980	938	7730	3050	1210	160	966	216
22	533	1090	585	5720	3560	851	6570	3110	1060	156	729	162
23	675	870	595	5200	5670	808	5570	3060	875	147	419	139
24	977	840	635	4660	6370	826	4560	2920	757	153	351	135
25	1320	894	695	4120	5980	790	3730	2750	871	217	431	132
26	1600	964	777	3760	5390	720	3160	2550	1030	221	343	142
27	1710	1050	1320	3420	4810	669	2740	2280	1250	269	245	261
28	1600	1220	1450	3120	4140	640	2300	2080	1500	317	203	344
29	1270	1190	1580	2840	---	683	2460	2190	1650	347	182	327
30	911	1210	1790	2520	---	795	2600	2370	1650	305	171	303
31	721	---	2140	2220	---	914	---	2370	---	251	170	---
TOTAL	25941	43471	27170	151090	72850	59554	115590	125010	39809	12776	15595	11017
MEAN	837	1449	876	4874	2602	1921	3853	4033	1327	412	503	367
MAX	1960	3820	2140	9690	6370	4220	11500	8240	2110	1500	1370	924
MIN	66	227	460	2220	1320	640	1050	2080	727	147	152	132
AC-FT	51450	86220	53890	299700	144500	118100	229300	248000	78960	25340	30930	21850
CAL YR 1990	TOTAL	446765	MEAN	1224	MAX	12400	MIN	27	AC-FT	886200		
WTR YR 1991	TOTAL	699873	MEAN	1917	MAX	11500	MIN	66	AC-FT	1388000		

e Estimated

NECHES RIVER BASIN

08036700 LAKE NACOGDOCHES NEAR NACOGDOCHES, TX

LOCATION.--Lat 31°35'19", long 94°49'31", Nacogdoches County, Hydrologic Unit 12020004, at upstream side of dam on Bayou Loco near service outlet tower and 10 mi west of Nacogdoches.

DRAINAGE AREA.--87.9 mi<sup>2</sup>.

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

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

REMARKS.--The lake is formed by a rolled earthfill dam. Deliberate impoundment began July 14, 1976. Water is used for both industrial and municipal supply by the city of Nacogdoches. The spillway is an uncontrolled 500-foot-wide cut through natural ground located near the right end of dam. There is an uncontrolled drop inlet with a 20.5-foot-diameter top opening that is connected to an 8- x 7-foot conduit that extends through the dam. A separate multi-gated inlet tower is connected to a valve by a 30-inch conduit through the dam. The valve box directs water to a purification plant. 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.....	303.0	-
Top of design flood.....	298.5	102,900
Crest of spillway.....	286.0	59,570
Crest of drop inlet (top of conservation pool).....	279.0	42,320
Lowest gated outlet (invert of 30 in. conduit).....	238.25	254

COOPERATION.--The capacity table, furnished by the city of Nacogdoches, is based on Geological Survey topographic maps dated 1952.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 53,550 acre-ft June 3, 1979 (elevation, 283.76 ft); minimum since first appreciable storage, 20,540 acre-ft Nov. 26, 1977 (elevation, 266.62 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 51,010 acre-ft Apr. 18 at 1800 to 2100 hours (elevation, 282.76 ft); minimum, 37,400 acre-ft Nov. 7-8 (elevation, 276.63 ft).

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

276.0	36,140	280.0	44,500	282.0	49,140
278.0	40,200	281.0	47,770	283.0	51,600

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	38080	37540	38220	e38600	42540	43560	41870	42930	41640	41150	39520	41790
2	38020	37520	38220	e39200	42490	43520	41790	42730	41600	41200	39380	41750
3	38020	37500	38100	e39200	42430	43390	41790	45250	41560	41130	39270	41710
4	38020	37460	38120	e39200	42580	43210	41830	49110	41450	41070	39170	41660
5	37980	37500	38080	e39400	43130	42950	41830	47990	41430	41010	39090	41600
6	37960	37440	38060	e40200	43210	42870	41980	46270	41320	40920	38960	41620
7	37940	37420	38060	e41700	43080	42670	42210	45150	41240	40920	38940	41600
8	37940	37720	38020	40980	43000	42600	42260	44410	41150	40880	38860	41600
9	37940	38140	38000	42520	42820	42430	42280	44170	41090	40770	38840	41580
10	37920	38240	38000	48180	42760	42390	42150	43890	41260	40670	38900	41540
11	37880	38240	38000	47850	42650	42280	42210	43560	41470	40600	38940	41470
12	37820	38240	38020	46130	42490	42280	42490	43370	41470	40520	42070	41410
13	37780	38220	38000	44830	42540	42210	42930	43100	41410	40370	44090	41390
14	37760	38200	38000	44660	42430	42110	50220	43040	41390	40310	46490	41340
15	37740	38180	38040	48210	42340	42110	49060	42970	41620	40260	45550	41300
16	37700	38200	38060	47120	42260	42170	47870	42870	41710	40260	44570	41320
17	37660	38160	38100	45580	42280	42210	47440	43240	41660	40220	44060	41260
18	37600	38160	38080	45150	43960	42190	50840	43170	41600	40120	44220	41200
19	37540	38140	38080	45150	46590	42150	48930	43130	41490	39970	43800	41090
20	37500	38120	38100	44410	45870	42090	47740	43020	41390	39870	43340	41030
21	37840	38100	38120	44040	45280	42090	45840	42870	41320	39770	43000	40940
22	37880	38240	38100	43690	45680	42110	44630	42730	41260	39690	42760	40860
23	37860	38200	38040	43410	44960	42020	44020	42600	41220	39600	42580	40790
24	37800	38180	38040	43390	44390	42000	43610	42520	41300	39540	42360	40750
25	37740	38200	e38100	43300	44020	41940	43300	42390	41390	39890	42210	40690
26	37700	38220	e38100	43100	43740	41900	43080	42240	41320	39950	42130	40600
27	37660	38350	e38200	43020	43450	41940	42910	42150	41320	39930	42000	40500
28	37660	38260	e38200	42910	43210	41960	43020	42020	41390	39870	41900	40410
29	37620	38240	e38100	42690	---	41980	43370	41900	41280	39770	41810	40310
30	37580	38240	e38100	42650	---	41960	43150	41790	41220	39690	41770	40240
31	37580	---	e38100	42650	---	41940	---	41770	---	39600	41730	---
MAX	38080	38350	38220	48210	46590	43560	50840	49110	41710	41200	46490	41790
MIN	37500	37420	38000	38600	42260	41900	41790	41770	41090	39540	38840	40240
(↑)	276.72	277.05	---	279.15	279.41	278.82	279.38	278.74	278.48	277.71	278.72	278.02
(Φ)	-540	+660	-140	+4550	+560	-1270	+1210	-1380	-550	-1620	+2130	-1410
(↑↑)	353	338	202	281	158	301	226	239	245	308	314	227
CAL YR 1990	MAX	49060	MIN	37420	(Φ)	-1800	(↑↑)	3496				
WTR YR 1991	MAX	50840	MIN	37420	(Φ)	+2120	(↑↑)	3192				

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.  
(↑↑) Diversions, in acre-feet, by the city of Nacogdoches.

e Estimated

NECHES RIVER BASIN

187

08037050 BAYOU LANANA AT NACOGDOCHES, TX

LOCATION.--Lat 31°36'58", long 94°38'28", Nacogdoches County, Hydrologic Unit 12020005, on right bank at downstream side of bridge on Farm Road 1878 in Nacogdoches and 14.5 mi upstream from mouth.

DRAINAGE AREA.--31.3 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1964 to September 1986, May 1988 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Prior to July 1974, concrete control. Datum of gage is 264.23 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. No diversion above station.

AVERAGE DISCHARGE.--25 years (water years 1964-86, 1989-91), 32.6 ft<sup>3</sup>/s (14.14 in/yr), 23,620 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,500 ft<sup>3</sup>/s June 2, 1979 (gage height, 22.18 ft), from rating curve extended above 2,800 ft<sup>3</sup>/s on basis of indirect measurement of peak flow; no flow at times.  
Maximum stage since at least 1956, that of June 2, 1979.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 10	1600	1,150	12.02	Apr. 18	0315	2,720	16.24
Feb. 19	1400	1,160	12.10	May 3	2145	*4,010	*17.52
Apr. 14	1800	2,220	15.49	May 4	0400	3,740	a17.31

a/ From outside staff gage (CSG).

Minimum discharge, 0.09 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.21	.30	.68	6.3	31	183	9.5	25	e14	3.1	.91	8.6		
2	.16	.29	.68	100	29	86	9.0	19	e13	2.9	.83	3.4		
3	14	.29	.78	90	27	56	8.5	482	e12	3.7	.83	23		
4	1.6	1.2	.68	17	71	40	50	1150	e12	4.1	.91	5.2		
5	.42	.67	.74	10	248	35	22	e243	e11	3.4	.91	5.2		
6	.28	.47	.72	17	83	29	67	e151	e11	3.3	.61	9.6		
7	.35	.36	.75	34	48	25	52	e58	e11	3.2	.38	5.7		
8	.38	46	.75	17	36	22	40	e46	e10	4.9	.43	4.7		
9	.60	78	.69	355	30	20	22	e40	e25	4.1	1.8	4.2		
10	.31	5.6	.68	765	27	18	15	e36	e16	2.8	8.0	3.1		
11	.24	1.8	.74	255	24	18	87	e32	e11	2.6	5.0	2.0		
12	.20	1.2	.83	89	22	18	266	e30	8.4	2.4	6.6	1.9		
13	.18	.94	.83	56	25	16	174	e27	7.0	2.1	.75	1.7		
14	.23	.87	.88	84	22	15	1030	e25	8.2	1.9	156	1.7		
15	.15	.75	.83	606	17	19	258	e23	20	2.2	27	2.1		
16	.15	.79	.83	127	19	27	91	e21	10	2.2	9.1	1.6		
17	.16	.76	.85	59	29	27	279	e50	7.5	1.5	5.6	1.4		
18	.17	.68	1.0	166	429	19	1260	e30	6.2	1.4	24	1.4		
19	.15	.68	.82	200	659	16	169	e27	5.6	1.3	6.9	1.1		
20	.15	.68	4.2	93	189	15	80	e70	5.7	1.4	4.5	.88		
21	53	.68	17	55	209	14	57	e40	6.4	1.3	3.2	1.1		
22	2.3	2.9	3.0	43	340	14	45	e30	3.8	1.2	3.0	1.3		
23	.93	1.3	1.5	40	127	12	39	e24	3.5	1.1	2.7	1.6		
24	.66	.81	1.0	138	78	11	32	e20	57	1.1	2.2	1.9		
25	.47	.63	1.0	83	86	11	26	e18	29	e5.6	2.0	1.6		
26	.46	.68	.71	53	58	11	22	e16	7.3	e5.9	1.8	1.2		
27	.43	3.3	116	45	44	9.7	21	e15	5.6	3.2	1.8	1.0		
28	.43	1.7	16	40	39	27	74	e25	5.3	1.7	1.8	.91		
29	.42	.84	7.6	37	---	20	159	e20	4.0	1.3	1.7	1.2		
30	.34	.68	18	38	---	12	35	e17	3.5	1.3	11	1.3		
31	.40	---	6.9	37	---	10	---	e15	---	1.1	9.3	---		
TOTAL	79.93	155.85	277.96	3755.3	3046	855.7	4499.0	2825	350.0	79.3	375.81	101.59		
MEAN	2.58	5.19	8.97	121	109	27.6	150	91.1	11.7	2.56	12.1	3.39		
MAX	53	78	116	765	659	183	1260	1150	57	5.9	156	23		
MIN	.15	.29	.68	6.3	17	9.7	8.5	15	3.5	1.1	.38	.88		
AC-FT	159	309	551	7450	6040	1700	8920	5600	694	157	745	202		
CFSM	.08	.17	.29	3.87	3.48	.88	4.79	2.91	.37	.08	.39	.11		
IN.	.09	.19	.33	4.46	3.62	1.02	5.35	3.36	.42	.09	.45	.12		
CAL YR 1990	TOTAL	12442.24	MEAN	34.1	MAX	1160	MIN	.00	AC-FT	24680	CFSM	1.09	IN.	14.79
WTR YR 1991	TOTAL	16401.44	MEAN	44.9	MAX	1260	MIN	.15	AC-FT	32530	CFSM	1.44	IN.	19.49

e Estimated



## NECHES RIVER BASIN

08038000 ATTOYAC BAYOU NEAR CHIRENO, TX  
(Flood-hydrograph Partial-record Station)

LOCATION.--lat 31°30'15", long 94°18'15", Nacogdoches-San Augustine County Line, Hydrologic Unit 12020005, near right bank at downstream side of bridge on State Highway 21, 2.2 mi upstream from Amaladeros Creek, 2.8 mi east of Chireno, 5.4 mi downstream from Arenoso Creek, and 41 mi upstream from mouth.

DRAINAGE AREA.--503 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1924 to September 1925, July 1939 to November 1954, and October 1955 to Sept. 30, 1985. Monthly discharge only for some periods, published in WSP 1312 and 1732. October 1985 to September 1989 (annual maximum). October 1989 to current year (peaks above base discharge and annual maximum).

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder and Data collection platform (DCP). Datum of gage is 169.58 ft above National Geodetic Vertical Datum of 1929. Jan. 24, 1924, to Aug. 29, 1925, and Sept. 6, 1957, to Oct. 27, 1958, nonrecording gage at same site and datum.

REMARKS.--Flow is affected at times by discharge from the flood-detention pools of twelve floodwater-retarding structures with a combined detention capacity of 15,870 acre-ft. These structures control runoff from 46.7 mi<sup>2</sup> above this station. Satellite telemeter (DCP) at station.

AVERAGE DISCHARGE.--46 years (water years 1939-85) 457 ft<sup>3</sup>/s (12.34 in/yr), 331,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft<sup>3</sup>/s Nov. 24, 1940 (gage height, 25.97 ft); minimum, 0.8 ft<sup>3</sup>/s Aug. 26, 27, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1865, 29.9 ft June 29, 1902, from information by local residents. Flood in July 1933 reached a stage of 25.2 ft from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum(\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 11	1400	*14,400	*21.53	Apr. 16	0200	9,720	19.95
Jan. 14	0100	3,250	17.39	Apr. 19	0200	11,700	20.66
Jan. 17	0500	3,600	17.61	May 6	0800	3,490	17.54
Feb. 22	0200	4,880	18.22				

Minimum discharge, not determined.

## NECHES RIVER BASIN

189

08039100 AYISH BAYOU NEAR SAN AUGUSTINE, TX  
(Flood-hydrograph Partial-record Station)

LOCATION.--Lat 31°23'46", Long 94°09'03", San Augustine County, Hydrologic Unit 12020005, near center of span at downstream side of bridge on State Highway 103, 3.0 mi upstream from Turkey Creek, and 9.5 mi south of San Augustine.

DRAINAGE AREA.--89.0 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1959 to September 1985. October 1985 to September 1989 (annual maximum), October 1989 to current year (peaks above base discharge and annual maximum).

REVISED RECORDS.--WSP 1922: 1959(M).

GAGE.--Water-stage recorder and Data collection platform (DCP). Datum of gage is 190.22 ft above National Geodetic Vertical Datum of 1929. Prior to June 2, 1959, nonrecording gage at same site and datum.

REMARKS.--Satellite gage-height and rainfall telemeter (DCP) at station.

AVERAGE DISCHARGE.--26 years (water years 1960-85), 83.7 ft<sup>3</sup>/s, 12.77 in/yr, 60,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,200 ft<sup>3</sup>/s Sept. 14, 1978 (gage height, 18.02 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Between October 1957 and February 1959, the maximum discharge was 15.900 ft<sup>3</sup>/s Sept. 21 or 22, 1958 (gage height, 17.5 ft), from floodmarks.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 10	2400	4,710	13.92	Feb. 22	0300	3,750	13.45
Jan. 15	2100	1,950	12.37	Apr. 15	0500	2,860	12.99
Feb. 19	2300	1,850	12.28	Apr. 18	1200	*7,460	*15.15

Minimum discharge, not determined.

NECHES RIVER BASIN

08039300 SAM RAYBURN RESERVOIR NEAR JASPER, TX

LOCATION.--Lat 31°03'38", long 94°06'21", Jasper County, Hydrologic Unit 12020005, in the powerhouse-intake structure of Sam Rayburn Dam on the Angelina River, 10 mi northwest of Jasper, and 25.2 mi upstream from mouth.

DRAINAGE AREA.--3,449 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1965 to current year.

Water-quality records.--Chemical analyses: October 1964 to September 1984. Biochemical analyses: November 1967 to September 1984.

GAGE.--Stevens-type AP recording transmitter. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Apr. 20, 1965, nonrecording gage at same site and datum.

REMARKS.--The reservoir is formed by a rolled earthfill dam 19,430 ft long, including spillway and dikes. The dam was completed and deliberate impoundment began Mar. 29, 1965. The spillway is an uncontrolled broad-crested weir 2,200 ft wide, on right bank 7,000 ft to right of outlet works, and is designed to discharge 125,300 ft<sup>3</sup>/s at maximum flood design. The flood-control outlet works consists of two 10.0- by 20.0-foot rectangular concrete-lined conduits controlled by two 10.0- by 20.0-foot tractor-type service gates and one 10.0- by 20.0-foot tractor-type emergency gate. Water for turbines is admitted through four 18.0- by 26.0-foot penstocks and controlled by two wheeled-leaf-type headgates. The reservoir is operated for flood control and power generation. The area-capacity tables are based on topographic maps prepared by the U.S. Army Corps of Engineers and detailed sedimentation ranges established in 1961 and dated February 1965. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 08038000. Gage-height telemeter at station. 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.....	190.0	-
Design flood.....	183.0	5,610,000
Crest of spillway.....	176.0	4,442,400
Top of flood-control pool.....	173.0	3,997,600
Top of conservation pool (power pool).....	164.0	2,852,600
Top of power head and sediment pool.....	149.0	1,452,000
Lowest gated outlet (invert).....	105.0	21,940

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 3,881,000 acre-ft Feb. 7, 1974 (elevation, 172.17 ft); minimum since conservation storage was reached in 1968, 1,797,000 acre-ft Nov. 15, 1977 (elevation, 153.35 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 3,873,000 acre-ft May 19 (elevation, 172.12 ft); minimum daily, 2,273,000 acre-ft Nov. 7 (elevation, 158.53 ft).

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

158.0	2,221,000	168.0	3,329,000	172.0	3,857,000
162.0	2,631,000	170.0	3,586,000	173.0	3,998,000
166.0	3,085,000	171.0	3,720,000		

RESERVOIR STORAGE (ACRE-Feet), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2375000	2277000	2341000	2437000	3339000	3438000	3032000	3572000	3713000	3097000	2831000	2908000
2	2361000	2277000	2341000	2464000	3328000	3463000	3015000	3552000	3694000	3079000	2824000	2908000
3	2354000	2277000	2354000	2479000	3314000	3474000	2997000	3572000	3691000	3062000	2813000	2914000
4	2354000	2297000	2348000	2486000	3306000	3474000	2992000	3598000	3664000	3052000	2810000	2927000
5	2347000	2283000	2344000	2495000	3306000	3468000	2988000	3638000	3644000	3035000	2802000	2927000
6	2340000	2278000	2354000	2517000	3298000	3465000	2985000	3642000	3614000	3024000	2795000	2930000
7	2337000	2273000	2354000	2522000	3291000	3463000	2997000	3663000	3597000	3012000	2791000	2930000
8	2331000	2286000	2354000	2530000	3278000	3450000	3000000	3705000	3570000	2997000	2783000	2935000
9	2348000	2291000	2354000	2565000	3270000	3443000	3012000	3736000	3547000	2980000	2779000	2933000
10	2321000	2286000	2354000	2672000	3257000	3438000	3012000	3758000	3549000	2973000	2783000	2930000
11	2316000	2287000	2348000	2743000	3245000	3418000	3013000	3778000	3546000	2969000	2783000	2927000
12	2307000	2287000	2348000	2791000	3228000	3411000	3020000	3792000	3519000	2958000	2784000	2926000
13	2297000	2286000	2351000	2821000	3217000	3395000	3020000	3797000	3492000	2951000	2794000	2920000
14	2293000	2283000	2347000	2861000	3198000	3370000	3079000	3811000	3474000	2937000	2818000	2912000
15	2291000	2283000	2351000	2914000	3174000	3361000	3115000	3824000	3463000	2930000	2836000	2905000
16	2287000	2283000	2354000	2960000	3150000	3336000	3147000	3840000	3439000	2927000	2850000	2905000
17	2288000	2286000	2354000	3005000	3126000	3323000	3174000	3853000	3415000	2914000	2864000	2905000
18	2286000	2286000	2357000	3071000	3126000	3303000	3289000	3868000	3394000	2905000	2861000	2905000
19	2278000	2286000	2354000	3116000	3150000	3282000	3361000	3873000	3370000	2891000	2862000	2905000
20	2278000	2286000	2351000	3163000	3164000	3265000	3397000	3872000	3346000	2891000	2887000	2891000
21	2301000	2291000	2369000	3187000	3231000	3240000	3423000	3860000	3323000	2887000	2891000	2882000
22	2292000	2302000	2369000	3207000	3294000	3220000	3468000	3840000	3307000	2881000	2891000	2881000
23	2291000	2307000	2369000	3234000	3323000	3200000	3488000	3825000	3282000	2868000	2905000	2868000
24	2291000	2307000	2354000	3265000	3338000	3174000	3500000	3811000	3256000	2867000	2905000	2887000
25	2291000	2312000	2354000	3289000	3347000	3150000	3516000	3785000	3236000	2862000	2905000	2868000
26	2291000	2316000	2372000	3307000	3365000	3125000	3516000	3771000	3207000	2862000	2905000	2862000
27	2287000	2330000	2394000	3323000	3387000	3119000	3526000	3756000	3190000	2859000	2905000	2851000
28	2286000	2341000	2405000	3339000	3397000	3105000	3540000	3736000	3169000	2858000	2905000	2850000
29	2283000	2341000	2415000	3347000	---	3091000	3570000	3729000	3145000	2847000	2905000	2842000
30	2282000	2337000	2434000	3361000	---	3076000	3587000	3729000	3121000	2844000	2891000	2839000
31	2282000	---	2431000	3347000	---	3052000	---	3722000	---	2839000	2905000	---
MAX	2375000	2341000	2434000	3361000	3397000	3474000	3587000	3873000	3713000	3097000	2905000	2935000
MIN	2278000	2273000	2341000	2437000	3126000	3052000	2985000	3552000	3121000	2839000	2779000	2839000
(†)	158.62	229.90	160.10	168.14	168.54	165.72	170.01	171.02	166.30	163.88	164.46	163.88
(Φ)	1000000	+55000	+94000	+916000	+50000	-345000	+535000	+135000	-601000	-282000	+66000	-66000
CAL YR 1990	MAX	3375000	MIN	2273000	(Φ)	+76000						
WTR YR 1991	MAX	3873000	MIN	2273000	(Φ)	+457000						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

NECHES RIVER MAIN STEM

08040000 B.A. STEINHAGEN LAKE AT TOWN BLUFF, TX

LOCATION.--Lat 30°47'43", Long 94°10'48", Tyler County, Hydrologic Unit 12020003, near right bank 70 ft upstream from outlet structure of Town Bluff Dam on Neches River, 0.4 mi north of Town Bluff, and at mile 113.7.

DRAINAGE AREA.--7,573 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1951 to current year. Prior to October 1967, published as Dam B Reservoir at Town Bluff.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 25, 1954, at site 490 ft upstream at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam with concrete spillway sections. The total length of dam is 6,698 ft, including a concrete spillway and non-overflow section. Deliberate impoundment of water began Apr. 16, 1951, and the dam was completed in June 1951. The uncontrolled spillway is 6,100 ft long. A 326-foot-long gated service spillway with six 40.0- by 35.0-foot tainter gates is located near right end of dam. The capacity of the spillways at maximum flood design is 218,300 ft<sup>3</sup>/s. The capacity table is based on a survey made in 1945. Water is used for industrial, municipal and irrigation supplies. Gage-height telemeter at station. 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 (nonoverflow).....	95.0	-
Design flood.....	93.0	306,400
Crest of uncontrolled spillway (top of tainter gates).....	85.0	124,700
Top of conservation pool.....	83.0	94,200
Bottom of tainter gates (sill).....	50.0	0

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 128,400 acre-ft May 22, 1953 (elevation, 85.21 ft); no storage Sept. 18 to Oct. 13, 1954.

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 97,160 acre-ft Feb. 21 (elevation, 83.21 ft); minimum daily, 71,560 acre-ft May 21 (elevation, 81.17 ft).

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

81.0	69,680	83.0	94,250
82.0	81,280	84.0	108,700

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80540	86680	88100	82010	76710	85020	77420	73250	80060	82510	83000	79210
2	81030	88230	87450	86290	81030	86550	78610	75780	77420	82260	83380	76360
3	81770	86800	87580	88360	83500	82880	80540	80420	76710	80790	84000	77660
4	83380	86800	84890	87580	83750	76130	84000	81520	78610	76600	84640	83500
5	83250	86800	83630	86550	85910	73700	83380	83380	82010	77540	85400	86930
6	82880	87450	82510	86290	86800	78250	79690	80790	86290	79810	85780	87710
7	82140	87450	80180	85400	86040	81030	80660	80660	86290	81520	85020	87580
8	81770	88890	78610	84260	85270	81770	87970	83500	83500	82140	85650	88360
9	84380	89680	77420	87060	85270	80540	88100	90200	81030	85270	84510	90470
10	82760	86550	77900	95210	85140	78130	82760	90600	89940	85910	84890	90340
11	82760	83380	79570	90870	84260	75660	79810	86290	88620	83000	83000	88230
12	84130	83380	81400	83500	82760	74850	82380	83380	79210	85780	84510	85910
13	84130	84000	83000	78490	82880	75310	83000	84000	76130	85520	89940	82380
14	84640	84890	84510	80790	83250	77540	89150	84000	77540	85020	90470	80180
15	85780	85020	84260	86800	82510	79570	89410	84130	82010	84000	87840	79570
16	86290	86420	82010	91270	81770	82010	84510	82010	86800	84510	85780	78490
17	87710	85400	81030	93570	80300	84510	83000	84890	87970	84640	81890	77420
18	87450	83630	83750	95490	79330	85270	83250	85020	88360	85140	80180	79090
19	87710	84380	84890	94800	82010	83880	81150	80300	88230	84380	80420	79570
20	85780	86420	84510	96460	86160	81400	80660	73470	85780	81520	81400	80060
21	85780	88620	88490	95770	97160	79090	80910	71560	86290	78970	82880	80300
22	86930	89540	87580	95770	94520	78490	83630	74040	88890	78370	84760	80910
23	88620	88490	84890	96180	86040	76710	82760	77660	89280	78370	84760	81030
24	87320	87450	82510	96460	83750	76830	81030	79210	87060	78490	84510	86160
25	85020	86930	83500	93980	86680	76710	78370	80540	85520	78850	84260	86930
26	82140	86420	84510	93020	90470	77660	77180	82260	85020	79090	84260	87710
27	81280	87970	85650	91540	87970	79810	83500	85020	84760	79810	82140	87840
28	81400	88890	84260	87320	80420	79210	89680	87450	83630	80300	80540	88100
29	82260	88620	83000	82140	---	77660	90200	91540	82140	81280	78130	87970
30	84260	88360	83250	78370	---	76240	77900	94390	81640	81890	79090	87450
31	85520	---	80790	74040	---	76480	---	83250	---	82510	80790	---
MAX	88620	89680	88490	96460	97160	86550	90200	94390	89940	85910	90470	90470
MIN	80540	83380	77420	74040	76710	73700	77180	71560	76130	76600	78130	76360
(↑)	82.34	82.56	81.96	81.39	81.93	81.60	81.72	82.16	82.03	82.10	81.96	82.49
(Φ)	+5710	+2840	-7570	+6380	-3940	+6380	+1420	+5350	-1610	+870	-1720	+6660
CAL YR 1990	MAX	109300	MIN	70890	(Φ)	-16370						
WTR YR 1991	MAX	97160	MIN	71560	(Φ)	+7640						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## NECHES RIVER MAIN STEM

08040600 NECHES RIVER NEAR TOWN BLUFF, TX

LOCATION.--Lat 30°47'27", long 94°09'03", Jasper-Tyler County line, Hydrologic Unit 12020003, on left bank 1.8 mi downstream from Town Bluff Dam, 2.0 mi northeast of Town Bluff, 1.0 mi upstream from Walnut Run, 6.5 mi downstream from Wolf Creek, and at mile 114.9.

DRAINAGE AREA.--7,574 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1951 to current year. Prior to Oct. 27, 1989, published as Neches River at Town Bluff.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Dec. 4, 1954 to Oct. 27, 1989, water-stage recorder at site 1.5 mi upstream at same datum. Prior to May 21, 1953, water-stage recorder, and May 21, 1953, to Dec. 3, 1954, nonrecording gage at former site at same datum.

REMARKS--Records good. Flow is regulated by B.A. Steinhagen Lake (station 08040000) 1.8 mi upstream and by Sam Rayburn Reservoir (station 08039300) 37.9 mi upstream. Some diversions upstream from station. Prior to October 1989, published as 08040500 Neches River at Town Bluff, TX. Gage-height telemeter at station.

AVERAGE DISCHARGE.--13 years (water years 1952-64) prior to regulation by Sam Rayburn Reservoir, 4,406 ft<sup>3</sup>/s (3,192,000 acre-ft/yr); 27 years (water years 1965-91) regulated, 5,154 ft<sup>3</sup>/s (3,734,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 90,900 ft<sup>3</sup>/s May 21, 22, 1953 (elevation, 82.85 ft) at former site; no flow at times due to regulation of B.A. Steinhagen Lake.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 1884 reached a stage about 86.8 ft (discharge, about 120,000 ft<sup>3</sup>/s) and is the highest since that date, from information by the U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,800 ft<sup>3</sup>/s Jan. 25 at 1700 hours (elevation, 69.33 ft), minimum daily, 2,100 ft<sup>3</sup>/s Dec. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2680	2420	2350	2170	16900	17100	11800	17300	16400	15900	3270	6150
2	2680	2410	2300	3070	17000	17500	11000	17100	15900	15500	3330	5430
3	2680	2390	2270	6030	17100	17200	10400	17200	15800	15000	3300	4270
4	2650	2320	2390	5570	17500	16900	9880	17900	15700	14400	3280	3500
5	2650	2400	2210	5180	18100	16700	9630	18100	15800	13200	3290	4200
6	2680	2380	2460	4860	17100	16700	8720	17600	16200	11500	3270	4840
7	2710	2350	2470	4720	16800	17100	7670	17300	16900	11500	3350	5090
8	2700	2350	2300	4770	16900	17400	7290	17400	17200	11500	3150	4920
9	2670	2470	2120	5240	16800	17600	8590	18000	17200	11500	3470	4970
10	2490	2560	2110	9550	16800	17500	9820	17900	18100	10100	3730	6180
11	2490	2550	2120	14100	16800	17400	9680	17800	18600	7680	4710	6750
12	2480	2450	2120	13700	16800	17400	9070	17600	17600	5650	4140	6620
13	2480	2400	2120	12700	16800	17400	8960	17500	16400	5530	3600	6710
14	2480	2390	2120	12000	16700	17400	9410	17400	15500	6440	4550	6040
15	2430	2290	2120	13100	16600	17400	12500	17600	15100	6050	6550	5100
16	2420	2330	2110	14100	16500	17500	13300	17700	15200	5400	6500	4380
17	2400	2460	2110	14700	16500	17700	13800	17600	15700	5510	6380	3610
18	2390	2350	2110	16700	16600	17700	15000	17300	16300	4950	5630	3100
19	2410	2300	2100	19700	16700	17700	16000	17200	16300	4470	4610	2840
20	2410	2290	2270	20700	16900	17600	16100	16900	16600	3840	4170	2810
21	2430	2320	2130	20700	17300	17600	16000	16800	16900	3920	4170	2820
22	2460	2340	2220	19900	19000	17500	16100	16900	16900	3860	4480	2810
23	2460	2370	2340	20700	18300	17400	16300	17000	17200	3650	5560	2810
24	2410	2450	2380	20800	17100	16900	16400	17600	17600	3460	5690	2540
25	2420	2430	2340	20800	16900	16400	16600	18200	17400	3400	5960	3230
26	2420	2170	2280	19700	16900	16100	16600	18300	16900	3390	6020	3200
27	2450	2330	3810	18200	17000	15100	17900	18300	16800	3380	6560	2980
28	2450	2320	5390	17800	16900	14900	18000	18500	16800	3350	6830	2960
29	2420	2340	4200	17400	---	14300	18100	19000	16800	3330	7400	2970
30	2580	2350	3970	17200	---	13500	17800	19300	16500	3310	6410	2890
31	2450	---	3260	17000	---	12500	---	17900	---	3280	6100	---
TOTAL	77930	71280	78600	412860	477300	519100	388420	548200	498300	223950	149460	126720
MEAN	2514	2376	2535	13320	17050	16750	12950	17680	16610	7224	4821	4224
MAX	2710	2560	5390	20800	19000	17700	18100	19300	18600	15900	7400	6750
MIN	2390	2170	2100	2170	16500	12500	7290	16800	15100	3280	3150	2540
AC-FT	154600	141400	155900	818900	946700	1030000	770400	1087000	988400	444200	296500	251300
CAL YR 1990	TOTAL	2512240	MEAN	6883	MAX	23300	MIN	2100	AC-FT	4983000		
WTR YR 1991	TOTAL	3572120	MEAN	9787	MAX	20800	MIN	2100	AC-FT	7085000		



NECHES RIVER MAIN STEM

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08040600 NECHES RIVER NEAR TOWN BLUFF, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1981 to September 1991 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CaCO3)	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)
DEC 13...	1045	2380	142	7.4	13.5	10.6	100	0.9	29	13	6.9	2.9
FEB 20...	1350	17000	136	7.5	12.5	12.5	115	0.7	31	11	7.2	3.1
APR 12...	0940	9130	136	7.0	20.0	8.8	96	1.0	32	13	8.1	2.8
MAY 14...	1205	17400	95	6.7	23.5	7.5	88	1.7	24	9	6.1	2.1
JUL 11...	1025	8070	120	6.8	27.5	6.4	81	1.3	29	8	6.7	2.9
AUG 29...	1010	7380	92	6.3	27.5	8.2	103	0.7	23	7	5.8	2.0

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
DEC 13...	14	1	3.4	16	18	22	<0.10	14	91	--	0.010	<0.100
FEB 20...	14	1	2.7	20	19	17	<0.10	8.7	84	--	0.010	<0.100
APR 12...	14	1	2.5	19	18	16	0.10	8.7	82	0.070	0.040	0.110
MAY 14...	8.7	0.8	2.5	15	12	9.9	<0.10	8.4	59	0.100	0.030	0.130
JUL 11...	11	0.9	2.7	21	16	14	0.20	8.5	75	--	0.020	<0.050
AUG 29...	8.1	0.7	2.8	16	14	9.3	<0.10	11	63	--	0.040	<0.050

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
DEC 13...	0.020	0.48	0.50	0.100	0.050	<1	42	<0.5	2.0	<5	<3	<10
FEB 20...	0.040	0.26	0.30	0.030	<0.010	--	--	--	--	--	--	--
APR 12...	0.030	0.37	0.40	0.040	<0.010	--	--	--	--	--	--	--
MAY 14...	0.030	1.1	1.1	0.090	0.030	--	--	--	--	--	--	--
JUL 11...	0.070	0.43	0.50	0.040	0.020	--	--	--	--	--	--	--
AUG 29...	0.180	0.42	0.60	0.110	0.060	1	43	0.7	<1.0	<5	<3	<10

DATE	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC 13...	270	10	7	12	<0.1	<10	<10	<2	2.0	76	<6	7
FEB 20...	--	--	--	--	--	--	--	--	--	--	--	--
APR 12...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 14...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 11...	--	--	--	--	--	--	--	--	--	--	--	--
AUG 29...	390	<10	6	95	<0.1	<10	10	<1	<1.0	64	<6	6

## NECHES RIVER MAIN STEM

08041000 NECHES RIVER AT EVADALE, TX  
(National stream-quality accounting network)

LOCATION.--Lat 30°21'20", long 94°05'35", Jasper-Hardin County line, Hydrologic Unit 12020003, near right bank on downstream side of bridge on U.S. Highway 96 at Evadale, 0.8 mi upstream from Mill Creek, 16 mi upstream from Village Creek, and at mile 55.6.

DRAINAGE AREA.--7,951 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1904 to December 1906, April 1921 to current year. Monthly discharge only for some periods, published in WSP 1312.

REVISED RECORDS.--WSP 718: 1929. WSP 1342: 1905-07, 1924. WSP 1732: Drainage area at former site.

GAGE.--Water-stage recorder. Datum of gage is 8.25 ft above National Geodetic Vertical Datum of 1929. July 1, 1904, to Dec. 31, 1906, nonrecording gage on Gulf, Colorado, and Santa Fe Railway Co. bridge at site 1.2 mi downstream at datum 5.50 ft lower; Apr. 1, 1921, to Dec. 7, 1948, nonrecording gages at site 1.2 mi downstream at present datum; Dec. 8, 1948, to Nov. 8, 1963, water-stage recorder at site 1.2 mi downstream at present datum.

REMARKS.--Records good. Flow regulated by B. A. Steinhagen Lake (station 08040000) 58.1 mi upstream, and by Sam Rayburn Reservoir (station 08039300) 95.7 mi upstream. There are some diversions upstream for municipal use. Gage-height telemeter at station.

AVERAGE DISCHARGE.--45 years (water years 1905-06, 1922-64) unregulated, 6,308 ft<sup>3</sup>/s (4,570,000 acre-ft/yr); 27 years (water years 1965-91) regulated, 5,765 ft<sup>3</sup>/s (4,177,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 92,100 ft<sup>3</sup>/s May 11, 1944 (gage height, 23.58 ft, from floodmark), at site then in use; minimum daily, 63 ft<sup>3</sup>/s Nov. 26-28, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1884 reached a stage of 26.2 ft, at former site (discharge, about 125,000 ft<sup>3</sup>/s), and flood in August 1915 reached a stage of 24.5 ft, at former site (discharge, about 102,000 ft<sup>3</sup>/s). These are the highest floods since at least 1884. Stages furnished by Gulf, Colorado, and Santa Fe Railway Co.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 24,500 ft<sup>3</sup>/s May 31 at 1900 hours (gage height, 17.40 ft); maximum gage height, 17.62 ft Jan. 24 at 1400 hours; minimum daily, 2,330 ft<sup>3</sup>/s Dec. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2680	2550	2540	3800	18300	18300	14100	20800	24300	18900	3670	6610
2	2660	2470	2540	3020	18000	18800	13200	20500	23000	19500	3610	6460
3	2640	2440	2550	3830	17900	19200	12400	20000	20900	19100	3590	6200
4	2640	2430	2490	5720	18100	19100	11900	20500	19300	18700	3560	5650
5	2670	2410	2540	6470	19200	18800	12800	20500	18400	18800	3520	4900
6	2680	2410	2510	6210	19100	18300	11800	20200	17900	18300	3500	4840
7	2670	2420	2560	5760	19100	17700	10900	20500	17700	16900	3490	5180
8	2680	2420	2670	5330	18800	17400	9880	21300	18100	15100	3510	5430
9	2690	2510	2610	5120	18200	17400	8870	21600	18500	14200	3440	5440
10	2680	2570	2410	6240	17800	17500	8340	21100	21100	13600	3430	5360
11	2560	2680	2340	8120	17600	17800	8920	21100	22700	12700	3860	5620
12	2480	2740	2330	10500	17400	18000	9730	20900	23400	11300	4310	6160
13	2470	2680	2340	13300	17400	18000	10000	20600	23200	9080	4670	6480
14	2470	2550	2350	15000	17400	17900	10200	20300	22000	7310	4860	6560
15	2470	2500	2360	15700	17200	17800	11300	21600	20400	6990	5140	6460
16	2450	2440	2370	15000	17100	18100	12300	21600	19400	7000	6170	5920
17	2420	2400	2380	14800	17200	18600	13600	22200	19400	6580	6850	5180
18	2420	2490	2380	15700	17300	18500	14500	22000	18600	6250	6980	4360
19	2390	2500	2390	17100	17300	18400	15100	21600	18600	5960	6650	3670
20	2390	2450	2380	18000	17400	18300	16000	21100	18700	5550	5790	3200
21	2460	2400	2450	19600	19000	18400	17000	20500	18600	4940	4930	3000
22	2580	2420	2550	21400	21600	18300	17800	20000	18700	4650	4590	2920
23	2540	2480	2490	22400	22100	18100	18400	19500	19200	4530	4590	2890
24	2530	2500	2600	23100	22100	18000	18400	19200	19100	4350	4980	2860
25	2500	2560	2630	22900	21300	17900	18400	19400	19200	4160	5420	2830
26	2460	2590	2640	22700	20100	17700	18500	20300	19700	4010	5680	2970
27	2460	2430	2650	22600	18900	17100	18600	20500	19900	3930	5800	3390
28	2460	2500	3090	22200	18300	16600	18900	20500	19500	3880	6100	3200
29	2490	2540	4520	21100	---	16000	19900	21100	19100	3860	6430	3030
30	2480	2540	4610	19900	---	15400	20700	22900	18900	3810	6740	2970
31	2520	---	4250	18900	---	14800	---	24300	---	3740	6870	---
TOTAL	78690	75020	83520	431520	521200	552200	422440	648200	597500	297680	152730	139740
MEAN	2538	2501	2694	13920	18610	17810	14080	20910	19920	9603	4927	4658
MAX	2690	2740	4610	23100	22100	19200	20700	24300	24300	19500	6980	6610
MIN	2390	2400	2330	3020	17100	14800	8340	19200	17700	3740	3430	2830
AC-FT	156100	148800	165700	855900	1034000	1095000	837900	1286000	1185000	590400	302900	277200
CAL YR 1990	TOTAL	2614960	MEAN	7164	MAX	21400	MIN	2330	AC-FT	5187000		
WTR YR 1991	TOTAL	4000440	MEAN	10960	MAX	24300	MIN	2330	AC-FT	7935000		

NECHES RIVER MAIN STEM

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WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: September 1939 to current year. Pesticide analyses: February 1968 to July 1981. Sediment analyses: October 1960 to current year.

PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: October 1947 to current year.  
WATER TEMPERATURE: October 1947 to current year.

INSTRUMENTATION.--From October 1954 to September 1963, water temperature was continuously recorded at this station.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
SPECIFIC CONDUCTANCE: Maximum daily, 422 microsiemens Jan. 25, 1957; minimum daily, 23 microsiemens Sept. 19, 1963.  
WATER TEMPERATURE (1947-85, 1987 to current year): Maximum daily, 34.0°C June 29, 1953; minimum daily, 3.0°C Jan. 30, 31, 1948, Jan. 31, 1949, Jan 24, 1963.

EXTREMES FOR CURRENT YEAR.--  
SPECIFIC CONDUCTANCE: Maximum daily, 177 microsiemens Nov. 13; minimum daily, 72 microsiemens Jan. 24, 25.  
WATER TEMPERATURE: Maximum daily, 31.0°C Aug. 14; minimum daily, 10.0°C on many days during winter months.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CaCO3)
DEC 10...	1420	2390	132	7.2	12.5	30	11.0	101	1.3	48	52	27
FEB 19...	1407	17200	136	7.5	14.0	17	8.6	83	0.9	120	150	31
APR 09...	1440	8750	138	7.1	24.0	21	8.0	94	1.0	44	56	30
MAY 13...	1325	20600	106	6.7	24.0	32	7.6	89	1.8	92	210	26
JUL 08...	1607	14900	114	6.7	27.5	23	6.8	86	1.3	60	210	27
AUG 26...	1554	5740	108	6.5	30.0	37	7.1	93	0.6	44	96	24

DATE	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	CARBONATE WATER DIS IT FIELD (MG/L AS CO3)	BICARBONATE WATER DIS IT FIELD (MG/L AS HCO3)	ALKALINITY WAT DIS TOT IT (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)
DEC 10...	12	6.5	2.5	13	1	3.2	0	18	15	19	19
FEB 19...	17	7.8	2.9	15	1	2.6	0	18	14	20	21
APR 09...	11	7.0	2.9	15	1	2.4	0	22	18	17	17
MAY 13...	11	6.5	2.3	10	0.9	2.4	0	18	15	14	13
JUL 08...	9	6.5	2.5	11	0.9	2.5	0	21	17	14	15
AUG 26...	10	6.1	2.1	12	1	2.7	0	17	14	19	12

DATE	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)
DEC 10...	<0.10	13	94	86	--	--	0.020	<0.010	<0.100	<0.100	0.020
FEB 19...	<0.10	8.2	81	86	--	--	<0.010	<0.010	<0.100	<0.100	0.020
APR 09...	0.20	9.5	91	83	0.059	--	0.030	<0.010	0.089	0.099	0.040
MAY 13...	<0.10	8.6	80	66	0.110	0.130	0.030	0.010	0.140	0.140	0.040
JUL 08...	<0.10	8.5	82	71	0.054	0.055	0.030	0.010	0.084	0.065	0.040
AUG 26...	<0.10	11	77	74	0.039	0.059	0.030	0.010	0.069	0.069	0.060

## NECHES RIVER MAIN STEM

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## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS P04)	SEDI- MENT, SUS- PENDEd (MG/L)
DEC 10...	0.020	0.38	--	--	0.40	0.090	0.090	0.090	0.020	0.28	44
FEB 19...	0.020	0.38	--	--	0.40	0.050	0.030	0.030	<0.010	0.09	18
APR 09...	0.040	0.46	--	--	0.50	0.070	0.040	<0.010	<0.010	--	37
MAY 13...	0.030	0.86	--	--	0.90	0.080	0.030	<0.010	0.030	--	27
JUL 08...	0.040	0.56	0.46	0.50	0.60	0.050	0.050	0.020	0.030	0.06	32
AUG 26...	0.020	0.64	--	--	0.70	0.090	0.030	0.020	0.040	0.06	18
DATE	SEDI- MENT, DIS- CHARGE, SUS- PENDEd (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)
DEC 10...	284	51	540	<1	37	<0.5	<1.0	<1	<3	5	310
FEB 19...	836	65	--	--	--	--	--	--	--	--	--
APR 09...	874	76	130	<1	47	<0.5	<1.0	<1	<3	1	250
MAY 13...	1500	94	--	--	--	--	--	--	--	--	--
JUL 08...	1290	77	40	1	41	<0.5	<1.0	1	<3	2	260
AUG 26...	279	12	40	<1	41	0.6	<1.0	<1	<3	3	91
DATE	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 10...	2	7	20	<0.1	<10	2	<2	<1.0	69	<6	4
FEB 19...	--	--	--	--	--	--	--	--	--	--	--
APR 09...	3	5	58	<0.1	<10	5	<1	<1.0	82	<6	7
MAY 13...	--	--	--	--	--	--	--	--	--	--	--
JUL 08...	<1	5	80	<0.1	<10	2	<1	<1.0	72	<6	11
AUG 26...	<1	6	22	<0.1	<10	2	<1	<1.0	66	<6	6

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	78690	139	87	18500	18	3740	21	4420	29
NOV. 1990	75020	140	87	17700	18	3600	21	4240	29
DEC. 1990	83520	140	87	19700	18	4000	21	4720	29
JAN. 1991	431520	96	63	73900	12	13500	15	17900	22
FEB. 1991	521200	125	79	112000	16	21900	19	26900	27
MAR. 1991	552200	133	84	125000	17	25000	20	30000	28
APR. 1991	422440	124	79	90200	15	17600	19	21700	27
MAY 1991	648200	111	72	126000	14	23700	17	30500	25
JUNE 1991	597500	114	74	119000	14	22600	18	28800	25
JULY 1991	297680	121	78	62500	15	12100	19	15000	26
AUG. 1991	152730	124	79	32600	15	6360	19	7850	27
SEPT 1991	139740	121	78	29300	15	5660	19	7050	26
TOTAL	4000440	**	**	827000	**	160000	**	199000	**
WTD.AVG.	10960	119	77	**	15	**	18	**	26

NECHES RIVER MAIN STEM

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SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	147	137	130	153	93	101	144	105	101	119	128	99
2	151	135	135	167	116	105	142	107	114	116	130	104
3	142	135	139	127	113	105	145	106	103	116	128	122
4	141	138	108	122	117	99	136	106	116	113	133	116
5	142	134	129	133	120	112	141	112	115	113	135	142
6	137	136	134	131	128	110	145	115	116	114	137	137
7	139	138	134	134	129	112	144	118	118	119	133	105
8	140	139	125	130	129	146	139	120	117	120	143	120
9	137	136	127	129	130	127	142	121	117	119	128	124
10	147	133	136	128	137	139	142	122	112	121	128	120
11	135	134	139	114	131	135	146	119	112	125	134	116
12	140	128	139	109	137	138	137	126	102	118	146	114
13	137	177	142	106	133	135	131	106	104	125	119	118
14	135	131	148	125	135	135	130	108	107	120	125	126
15	134	132	139	145	139	138	134	95	113	126	126	123
16	140	160	155	87	145	138	118	100	112	125	123	120
17	139	130	141	88	141	146	120	94	112	124	123	122
18	145	131	146	116	146	135	118	97	115	124	124	124
19	136	146	144	127	150	139	105	99	115	125	125	127
20	137	156	142	75	153	140	140	99	115	125	126	124
21	136	135	141	74	124	139	109	109	116	123	126	129
22	135	137	140	76	135	139	109	109	118	128	118	126
23	130	149	155	77	115	141	110	110	117	131	123	129
24	135	145	147	72	103	155	108	117	119	134	131	131
25	138	151	153	72	116	146	108	119	118	149	140	136
26	138	e146	144	79	97	145	113	119	115	127	114	127
27	138	140	142	85	95	146	113	121	115	124	124	122
28	138	135	153	84	100	150	109	122	115	127	111	119
29	136	131	140	84	---	148	106	114	130	138	108	118
30	138	137	142	89	---	146	122	115	131	154	99	123
31	134	---	140	88	---	149	---	103	---	124	101	---
MEAN	139	140	140	107	125	134	127	111	114	125	125	122

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.0	18.0	13.0	10.0	10.0	12.0	16.0	21.0	27.0	30.0	30.0	30.0
2	26.0	18.0	13.0	10.0	10.0	12.0	16.0	21.0	27.0	30.0	30.0	30.0
3	26.0	18.0	13.0	10.0	10.0	12.0	16.0	21.0	27.0	30.0	30.0	30.0
4	26.0	17.0	13.0	10.0	10.0	12.0	16.0	23.0	27.0	30.0	30.0	30.0
5	26.0	17.0	13.0	10.0	10.0	12.0	16.0	23.0	28.0	30.0	30.0	30.0
6	26.0	17.0	13.0	10.0	10.0	12.0	16.0	23.0	28.0	30.0	30.0	30.0
7	25.0	16.0	13.0	10.0	10.0	12.0	16.0	23.0	28.0	30.0	30.0	30.0
8	25.0	16.0	13.0	10.0	10.0	12.0	18.0	23.0	28.0	30.0	30.0	30.0
9	25.0	16.0	13.0	10.0	10.0	12.0	18.0	23.0	28.0	30.0	30.0	30.0
10	25.0	16.0	13.0	10.0	10.0	13.0	18.0	23.0	28.0	30.0	30.0	30.0
11	25.0	15.0	13.0	10.0	10.0	13.0	18.0	23.0	28.0	30.0	30.0	30.0
12	25.0	15.0	13.0	10.0	10.0	13.0	18.0	24.0	28.0	30.0	30.0	30.0
13	25.0	15.0	13.0	10.0	10.0	13.0	19.0	24.0	28.0	30.0	30.0	30.0
14	25.0	15.0	13.0	10.0	10.0	13.0	18.0	24.0	28.0	30.0	31.0	30.0
15	23.0	15.0	13.0	10.0	10.0	13.0	19.0	24.0	28.0	30.0	30.0	30.0
16	22.0	15.0	13.0	10.0	10.0	13.0	19.0	24.0	29.0	30.0	30.0	30.0
17	22.0	15.0	13.0	10.0	10.0	14.0	19.0	24.0	29.0	30.0	30.0	30.0
18	22.0	15.0	13.0	10.0	10.0	14.0	19.0	24.0	29.0	30.0	30.0	29.0
19	22.0	15.0	13.0	10.0	10.0	14.0	19.0	25.0	29.0	30.0	30.0	28.0
20	22.0	15.0	13.0	10.0	10.0	14.0	19.0	25.0	29.0	30.0	30.0	27.0
21	22.0	15.0	13.0	10.0	10.0	14.0	20.0	25.0	29.0	30.0	30.0	27.0
22	22.0	15.0	13.0	10.0	10.0	14.0	20.0	25.0	29.0	30.0	30.0	26.0
23	22.0	15.0	11.0	10.0	10.0	14.0	20.0	25.0	29.0	30.0	30.0	26.0
24	22.0	15.0	11.0	10.0	10.0	15.0	20.0	25.0	29.0	30.0	30.0	25.0
25	21.0	15.0	11.0	10.0	10.0	15.0	20.0	25.0	29.0	30.0	30.0	25.0
26	21.0	---	11.0	10.0	10.0	15.0	20.0	25.0	29.0	30.0	30.0	25.0
27	21.0	15.0	11.0	10.0	10.0	15.0	20.0	25.0	29.0	30.0	30.0	23.0
28	21.0	15.0	11.0	10.0	10.0	15.0	21.0	26.0	29.0	30.0	30.0	23.0
29	19.0	15.0	11.0	10.0	---	15.0	21.0	26.0	29.0	30.0	30.0	23.0
30	19.0	15.0	10.0	10.0	---	15.0	21.0	26.0	29.0	30.0	30.0	23.0
31	19.0	---	10.0	10.0	---	15.0	---	26.0	---	30.0	30.0	---
MEAN	23.0	15.5	12.5	10.0	10.0	13.5	18.5	24.0	28.5	30.0	30.0	28.0



## NECHES RIVER BASIN

08041500 VILLAGE CREEK NEAR KOUNTZE, TX

LOCATION.--Lat 30°23'52", long 94°15'48", Hardin County, Hydrologic Unit 12020006, at downstream side of bridge on Farm Road 418, 1.6 mi upstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 3.1 mi upstream from Cypress Creek, 3.4 mi northeast of Kountze, and 4.3 mi downstream from Beech Creek.

DRAINAGE AREA.--860 mi<sup>2</sup>.

PERIOD OF RECORD.--May 1924 to September 1927, October 1927 to November 1929 (discharge measurements only), April 1939 to current year.

Water-quality records: November 1967 to September 1985.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 25.12 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 30, 1939, nonrecording gage at site 1.6 mi downstream at different datum. Apr. 30, 1939, to Sept. 30, 1966, water-stage recorder at site 2,000 ft downstream at present datum.

REMARKS.--No estimated daily discharges. Records good. There are small diversions above station. Several measurements of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--55 years, 867 ft<sup>3</sup>/s (13.70 in/yr), 628,100 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 67,200 ft<sup>3</sup>/s Nov. 26, 1940 (gage height, 27.6 ft), former site, from floodmark and from rating curve extended above 32,000 ft<sup>3</sup>/s; minimum not determined, probably occurred during period of no gage-height record Sept. 16 to Oct. 3, 1956; minimum daily, 16 ft<sup>3</sup>/s Oct. 1, 2, 1956.

Flood of May 27, 1929, reached a stage of about 32 ft at site 2,000 ft downstream at present datum; stage was determined on basis of information furnished by engineers of Gulf, Colorado, and Santa Fe Railway Co. for site 1.6 mi downstream.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1884, about 34 ft in August 1915 at site 2,000 ft downstream at present datum; stage was determined on basis of information by engineers of Gulf, Colorado, and Santa Fe Railway Co. for site 1.6 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,940 ft<sup>3</sup>/s Feb. 23 at 1700 to 2000 hours (gage height, 18.34 ft); minimum, 82 ft<sup>3</sup>/s Oct. 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	92	103	230	826	928	2570	813	2830	2410	1080	499	1170		
2	87	101	209	695	825	3840	703	2910	2170	985	375	1550		
3	85	97	174	1420	744	4840	538	2260	1800	732	275	1430		
4	84	95	156	2160	707	4970	669	1590	1270	785	226	1520		
5	89	95	147	2840	1200	4650	2330	1410	772	1080	199	2300		
6	89	95	141	3220	2090	3940	3480	1340	588	1520	183	2800		
7	95	98	139	3150	2650	2820	3150	1140	514	2120	173	2790		
8	97	121	140	2480	2910	1920	2650	1090	544	2600	176	2570		
9	95	155	142	1690	2880	1340	2190	1460	607	2500	202	2160		
10	94	174	142	1660	2410	1040	1880	2070	1100	2280	191	1740		
11	91	202	143	2690	1860	882	1830	2470	2160	1760	174	1300		
12	95	275	148	3980	1260	788	2100	2780	2700	1110	222	1080		
13	107	264	183	4760	917	735	2300	2570	2690	689	719	941		
14	108	200	209	4930	797	702	2260	1840	2440	544	2390	803		
15	102	172	199	4800	729	670	4070	1480	1750	470	4940	758		
16	94	152	184	4350	666	674	6020	2210	1300	468	5060	660		
17	90	139	183	3940	613	908	6310	3050	1290	519	4490	669		
18	89	130	171	3800	593	1140	6460	3790	1270	432	3070	622		
19	88	125	170	4460	671	1270	5640	3840	1350	360	1740	534		
20	87	121	190	5050	1020	1250	4590	3600	1430	304	896	467		
21	98	120	247	4540	1580	1090	3790	3230	1130	273	572	403		
22	148	119	257	4000	4680	885	3010	2540	779	256	450	369		
23	186	118	252	3550	9200	741	2270	1950	719	258	464	331		
24	244	121	299	2890	9470	670	1750	1550	796	251	530	320		
25	255	135	291	2270	7830	615	1520	1370	1000	258	503	464		
26	196	159	247	1880	5960	568	1270	1190	1050	265	434	588		
27	156	169	238	1760	4300	531	1100	1150	1280	241	369	534		
28	133	163	361	1660	3110	508	1330	1080	1250	252	373	471		
29	122	155	674	1460	---	546	1570	1030	995	263	306	405		
30	112	159	957	1230	---	654	2070	1390	968	354	276	319		
31	106	---	1030	1050	---	780	---	2230	---	449	389	---		
TOTAL	3614	4332	8253	89191	72600	48537	79663	64440	40122	25458	30866	32068		
MEAN	117	144	266	2877	2593	1566	2655	2079	1337	821	996	1069		
MAX	255	275	1030	5050	9470	4970	6460	3840	2700	2600	5060	2800		
MIN	84	95	139	695	593	508	538	1030	514	241	173	319		
AC-FT	7170	8590	16370	176900	144000	96270	158000	127800	79580	50500	61220	63610		
CFSM	.14	.17	.31	3.35	3.01	1.82	3.09	2.42	1.56	.95	1.16	1.24		
IN.	.16	.19	.36	3.86	3.14	2.10	3.45	2.79	1.74	1.10	1.34	1.39		
CAL YR 1990	TOTAL	298020	MEAN	816	MAX	9460	MIN	70	AC-FT	591100	CFSM	.95	IN.	12.89
WTR YR 1991	TOTAL	499144	MEAN	1368	MAX	9470	MIN	84	AC-FT	990100	CFSM	1.59	IN.	21.59

NECHES RIVER BASIN

199

08041700 PINE ISLAND BAYOU NEAR SOUR LAKE, TX

LOCATION.--Lat 30°06'21", long 94°20'04", Jefferson-Hardin County line, Hydrologic Unit 12020007, on right bank at downstream side of bridge on county road and 5.1 mi southeast of Sour Lake.

DRAINAGE AREA.--336 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to current year.

Water-quality records.--Chemical analyses: February 1968 to June 1989. Specific conductance: February 1968 to September 1989. Water temperature: February 1968 to September 1989.

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

REMARKS.--No estimated daily discharges. Records good. Low flow for period March through September is affected by small diversions and return flow from irrigated fields. Gage height telemeter at station.

AVERAGE DISCHARGE.--24 years, 486 ft<sup>3</sup>/s (352,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,000 ft<sup>3</sup>/s Apr. 22, 1979 (elevation, 34.29 ft); minimum daily, 0.25 ft<sup>3</sup>/s Oct. 28, 1982.

Maximum stage since at least 1917, that of Apr. 22, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,240 ft<sup>3</sup>/s Apr. 9 at 1500 hours (elevation, 27.84 ft); minimum daily, 2.7 ft<sup>3</sup>/s Oct. 2-3, 6.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.1	8.1	18	125	525	2260	45	147	327	169	48	59
2	2.7	6.6	15	104	335	2010	55	101	249	562	39	93
3	2.7	5.7	13	385	224	1820	54	72	156	708	30	111
4	2.9	5.6	10	393	255	1590	259	55	92	637	27	66
5	2.8	6.2	7.8	375	1460	1300	1460	43	70	512	29	109
6	2.7	7.0	7.3	347	1850	1040	2540	58	58	641	32	206
7	3.1	5.9	33	437	2030	857	3460	103	47	861	30	153
8	3.2	6.7	39	490	2090	735	3720	198	43	1210	31	122
9	3.2	143	29	516	1990	610	4170	910	52	1720	40	e100
10	6.3	144	22	1790	1880	460	4050	1260	671	1880	45	e80
11	6.6	79	16	2480	1790	290	3780	1310	1220	1550	50	63
12	4.0	43	12	2470	1650	172	3510	1170	1280	976	60	45
13	3.8	27	11	2600	1440	111	3010	953	1230	483	78	36
14	3.6	23	8.9	2490	1180	77	2700	819	958	201	74	44
15	3.4	26	8.2	3060	850	58	2990	1180	609	103	73	51
16	2.9	23	6.5	3260	478	53	3010	1540	415	71	68	45
17	3.0	17	7.3	3220	231	125	3140	2080	813	66	69	83
18	11	13	8.9	3320	139	221	3080	2350	1100	61	58	84
19	30	9.6	10	3820	111	296	3000	2330	1140	54	42	70
20	23	8.4	8.6	3750	115	329	3130	2230	1020	51	36	55
21	27	6.9	8.3	3610	639	316	2800	2060	769	60	30	37
22	88	6.8	9.0	3240	1710	271	2580	1900	691	88	30	31
23	78	28	8.0	2880	2100	206	2260	1730	1420	75	34	25
24	49	27	6.9	2580	2570	146	1940	1510	1410	66	28	26
25	34	21	6.0	2300	3650	103	1570	1250	1230	73	34	38
26	26	18	5.3	2040	3890	75	1150	919	964	84	34	40
27	20	15	188	1830	3270	56	812	578	759	103	33	40
28	16	21	340	1570	2660	42	494	334	612	101	29	39
29	13	23	306	1290	---	36	273	286	422	75	26	31
30	12	19	246	1030	---	34	191	338	234	63	23	24
31	10	---	176	774	---	38	---	344	---	65	44	---
TOTAL	497.0	793.5	1591.0	58576	41112	15737	65233	30158	20061	13369	1304	2006
MEAN	16.0	26.4	51.3	1890	1468	508	2174	973	669	431	42.1	66.9
MAX	88	144	340	3820	3890	2260	4170	2350	1420	1880	78	206
MIN	2.7	5.6	5.3	104	111	34	45	43	43	51	23	24
AC-FT	986	1570	3160	116200	81550	31210	129400	59820	39790	26520	2590	3980

CAL YR 1990 TOTAL 91277.1 MEAN 250 MAX 2160 MIN 2.7 AC-FT 181000  
WTR YR 1991 TOTAL 250437.5 MEAN 686 MAX 4170 MIN 2.7 AC-FT 496700

e Estimated

## TAYLOR BAYOU MAIN STEM

08042000 TAYLOR BAYOU NEAR LABELLE, TX

LOCATION.--Lat 29°52'30", long 94°09'34", Jefferson County, Hydrologic Unit 12040201, near center of stream at downstream side of bridge on county road, 0.7 mi south of LaBelle, 6.0 mi upstream from Hillebrandt Bayou, 7.2 mi upstream from State Highway 73, and 11.2 mi upstream from saltwater gates and barge locks. Distances are measured along rectified channel.

DRAINAGE AREA.--262 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1954 to September 1984 (complete records for storms of 1.0 inch or more runoff, except for the period Sept. 10-22, 1961). October 1984 to current year (gauge heights only).

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 4.63 ft below National Geodetic Vertical Datum of 1929, originally determined by several comparisons of water surface with auxiliary water-stage recorder 7.2 mi downstream during times of no flow and ideal weather conditions. Prior to October 1984, auxiliary water-stage recorder 7.2 mi downstream.

REMARKS.--Records fair. Prior to October 1984, records were computed using fall as a factor. Low flow is regulated by drainage from ricefields and operation of saltwater gates and barge locks. An unknown amount of water is diverted above and below gage for irrigation of ricefields.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,590 ft<sup>3</sup>/s Sept. 22, 1963, and Apr. 23, 1979; maximum gage height, 11.78 ft Sept. 20, 1963 (backwater from Hillebrandt Bayou); minimum discharge not determined (affected by tides and pumping); minimum gage height, 2.31 ft July 17, 1954.  
Maximum stage since at least 1941, that of Sept. 20, 1963, and Apr. 23, 1979. Flood of Sept. 13, 1961 (Hurricane Carla), reached a stage of 11.51 ft.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1941 reached a stage of 11.3 ft, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 8.6 ft Jan. 11 at 1200 to 1400 hours and June 12 at 2000 to 2200 hours; minimum (recorded) gage height, 4.3 ft Feb. 5, 6.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	5.9	6.1	6.2	---	---	5.7	6.5	7.5	6.1	6.0	6.3
2	6.0	6.0	6.1	6.4	6.0	---	5.7	6.4	7.0	6.3	6.0	6.3
3	6.1	6.0	6.2	7.0	6.0	---	5.8	6.4	6.6	6.1	6.1	6.2
4	6.1	6.1	6.1	6.5	6.1	---	6.1	6.4	6.4	6.3	6.1	6.3
5	6.1	6.1	6.0	6.2	5.0	---	7.2	6.4	6.1	6.4	6.1	6.5
6	6.1	5.8	6.1	6.2	4.8	---	7.6	6.4	5.9	6.3	6.1	6.8
7	6.2	5.9	6.2	6.6	---	---	7.6	6.5	6.1	6.5	6.1	6.7
8	6.2	6.1	5.7	6.7	---	---	7.4	7.2	6.4	6.5	6.1	6.6
9	6.1	6.7	5.7	6.3	---	5.7	6.8	7.6	6.7	6.3	6.1	6.4
10	6.0	6.3	5.7	8.4	6.5	5.7	6.1	7.6	8.3	6.1	6.0	6.4
11	5.9	5.9	5.7	8.6	6.4	5.7	6.6	7.3	8.6	6.2	5.9	6.5
12	5.9	6.0	5.8	8.6	6.3	5.8	6.7	6.7	8.6	5.8	5.9	6.4
13	5.8	6.0	5.8	8.2	6.2	5.8	6.8	6.6	8.6	5.9	5.9	6.3
14	5.8	5.9	5.8	7.9	6.2	5.7	7.2	6.4	8.2	6.0	6.1	6.3
15	5.8	6.0	5.8	8.0	6.6	5.8	7.6	8.1	7.6	6.0	6.3	6.3
16	5.9	6.0	5.8	7.9	6.6	6.0	7.5	8.3	7.2	6.0	6.0	6.1
17	6.0	6.0	5.9	7.6	6.4	6.1	7.2	8.2	6.9	6.0	6.1	6.2
18	6.1	6.1	5.9	---	6.1	6.1	6.9	8.2	6.6	6.0	6.1	6.1
19	6.1	6.1	5.9	---	6.0	6.1	6.7	7.8	6.6	6.0	6.0	6.2
20	6.1	6.1	5.9	---	6.1	6.2	6.6	7.8	6.5	6.0	5.9	6.0
21	6.3	6.1	6.0	---	6.1	6.2	6.5	7.6	6.4	6.1	5.9	6.1
22	6.4	6.2	6.0	---	5.0	6.2	6.4	7.1	6.2	6.1	5.9	6.1
23	5.9	6.3	5.9	---	---	6.2	6.4	7.2	6.4	6.2	6.1	6.1
24	6.0	6.0	5.7	---	---	6.0	6.2	7.3	6.3	5.9	5.9	6.2
25	5.9	6.1	5.7	---	---	6.0	6.4	7.2	6.2	6.1	5.8	6.2
26	5.9	6.2	5.7	---	---	6.1	6.5	7.2	6.2	6.1	5.7	5.9
27	5.9	6.2	6.4	---	---	6.1	6.6	7.1	6.2	6.1	5.8	5.9
28	5.9	6.4	6.4	---	---	6.1	6.7	6.8	6.0	6.1	5.8	5.9
29	5.8	6.3	6.4	---	---	6.1	6.7	7.2	6.2	5.8	5.8	5.9
30	5.9	6.0	6.3	---	---	5.8	6.6	7.7	6.4	5.9	5.9	5.9
31	5.9	---	6.2	---	---	5.7	---	7.7	---	5.9	6.1	---
MAX	---	6.7	6.4	---	---	---	7.6	8.3	8.6	6.5	6.3	6.8

TAYLOR BAYOU BASIN

201

08042500 HILLEBRANDT BAYOU NEAR LOVELL LAKE, TX

LOCATION.--Lat 29°55'44", long 94°06'35", Jefferson County, Hydrologic Unit 12040201, near center of stream at downstream side of bridge on county road, 1.3 mi southeast of Lovell Lake, and 4.4 mi upstream (along rectified channel) from Taylor Bayou.

DRAINAGE AREA.--128 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1954 to September 1984 (complete records for storms of 1.0 inch or more runoff, except for the period Sept. 11-18, 1961). October 1984 to current year (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 4.63 ft below National Geodetic Vertical Datum of 1929, originally determined by comparisons of water surface with Taylor Bayou near LaBelle, an auxiliary gage 5.6 mi downstream, during times of no flow and ideal weather conditions. Prior to Aug. 28, 1963, auxiliary water-stage recorder on Taylor Bayou, 1.2 mi downstream from Hillebrandt Bayou, nonrecording gages on Taylor Bayou 2.3 and 5.2 mi downstream from Hillebrandt Bayou; Aug. 28, 1963, to Sept. 30, 1984, auxiliary water-stage recorder 3.0 mi downstream. Gage was destroyed on Aug. 24, 1991.

REMARKS.--Records fair. Prior to October 1984, records were computed using fall as a factor. Low flow regulated by drainage from ricefields and operation of saltwater gates and barge locks. An unknown amount of water is diverted above and below gage for rice irrigation.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 15,000 ft<sup>3</sup>/s Sept. 18, 1963; maximum gage height, 12.34 ft Sept. 19, 1963; minimum discharge not determined (affected by tides and pumping); minimum gage height, 2.33 ft July 17, 1954. Maximum stage since 1941, 12.34 ft Sept. 19, 1963.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 8.8 ft Jan. 10, at 2300 hours to Jan. 11 at 0100 hours; minimum (recorded) gage height, 4.8 ft Feb. 23.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	6.1	6.3	6.4	6.2	6.6	5.9	6.7	7.3	6.3	6.2	---
2	---	6.2	6.3	6.7	6.3	6.6	6.0	6.7	7.0	6.5	6.2	---
3	---	6.3	6.4	7.1	6.3	6.6	6.0	6.7	6.8	6.3	6.3	---
4	---	6.3	6.3	6.2	7.2	5.8	6.3	6.7	6.5	6.5	6.2	---
5	---	6.3	6.2	6.4	7.5	6.1	7.1	6.7	6.3	6.6	6.3	---
6	---	6.0	6.3	6.4	6.9	6.1	7.1	6.6	6.1	6.5	6.3	---
7	---	6.0	6.4	6.7	6.4	6.1	7.0	6.6	6.4	6.6	6.3	---
8	---	6.3	5.9	6.7	6.4	6.0	7.0	7.3	6.6	6.6	6.3	---
9	---	6.8	6.0	6.6	6.4	---	6.8	7.4	7.0	6.5	6.3	---
10	---	6.4	6.0	8.8	6.1	---	6.4	7.4	7.8	6.3	6.2	---
11	---	6.2	6.0	8.8	5.9	---	6.8	7.2	7.8	6.5	6.2	---
12	---	6.2	6.0	7.7	6.0	---	7.0	7.0	7.7	6.0	6.1	---
13	---	6.2	6.0	6.8	6.1	---	7.1	6.8	7.6	6.1	6.1	---
14	---	6.2	6.0	7.4	6.1	---	7.5	6.7	7.5	6.2	6.3	---
15	---	6.2	6.0	8.1	6.0	---	7.5	8.1	7.2	6.3	6.5	---
16	---	6.2	6.0	7.0	5.8	---	7.4	8.0	7.2	6.3	6.2	---
17	---	6.2	6.1	6.7	6.1	---	7.1	8.0	7.2	6.3	6.4	---
18	---	6.2	6.2	7.8	6.2	---	6.9	7.7	6.6	6.2	6.3	---
19	---	6.3	6.1	7.8	6.3	---	6.9	7.8	6.6	6.2	6.2	---
20	---	6.3	6.2	7.0	6.2	6.4	6.9	7.8	6.6	6.3	6.1	---
21	---	6.4	6.3	6.1	7.1	6.5	6.6	7.5	6.7	6.4	6.1	---
22	6.1	6.4	6.2	6.2	7.1	6.5	6.6	7.3	6.4	6.4	6.2	---
23	6.1	6.4	6.1	6.3	6.5	6.5	6.6	7.4	6.6	6.4	6.1	---
24	6.2	6.2	5.9	6.7	6.4	6.2	6.0	7.5	6.6	6.2	6.0	---
25	6.2	6.3	5.8	6.7	6.2	6.3	6.6	7.4	6.4	6.3	---	---
26	6.2	6.5	6.0	6.7	6.2	6.3	6.9	7.4	6.2	6.3	---	---
27	6.1	6.5	6.4	6.6	6.2	6.4	6.9	7.2	6.4	6.3	---	---
28	6.0	6.6	6.5	6.5	6.1	6.4	6.9	6.9	6.2	6.3	---	---
29	6.0	6.4	6.6	6.4	---	6.4	6.9	7.5	6.5	6.0	---	---
30	6.1	6.2	6.5	6.5	---	6.0	6.9	7.7	6.6	6.1	---	---
31	6.1	---	6.4	6.3	---	5.9	---	7.6	---	6.2	---	---
MAX	---	6.8	6.6	8.8	7.5	---	7.5	8.1	7.8	6.6	---	---

## TRINITY RIVER MAIN STEM

08042800 WEST FORK TRINITY RIVER NEAR JACKSBORO, TX

LOCATION.--Lat 33°17'36", long 98°04'43", Jack County, Hydrologic Unit 12030101, on left abutment at downstream side of bridge on State Highway 59, 4 mi downstream from Big Cleveland Creek, 7 mi upstream from Carroll Creek, 7 mi north-east of Jacksboro, and at mile 660.

DRAINAGE AREA.--683 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1956 to current year.

Water-quality records.--Sediment records: October 1976 to September 1978.

GAGE.--Water-stage recorder. Datum of gage is 869.28 ft above National Geodetic Vertical Datum of 1929, from State Department of Highways and Public Transportation. Sept. 20, 1960, to May 30, 1961, nonrecording gage at same site and datum.

REMARKS.--Records good. At end of year, flow from 70.9 mi upstream from this station was partly controlled by 21 flood-water retarding structures with a combined detention capacity of 19,780 acre-ft. Gage-height telemeter at station via data-collection platform installed April 1987.

AVERAGE DISCHARGE.--35 years (water years 1957-91), 115 ft<sup>3</sup>/s (2.29 in/yr), 83,320 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 35,100 ft<sup>3</sup>/s Apr. 27, 1957 (gage height, 32.10 ft, from floodmark); no flow at times each year.

Maximum stage since at least 1900, that of Apr. 27, 1957.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in June 1941 reached a stage of 30 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft<sup>3</sup>/s and maximum (\*).

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 5	1500	*606	*10.92				

Minimum discharge, no flow for July 17-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	.27	2.3	.86	4.8	6.8	4.2	2.8	.78	1.2	9.0	11
2	1.2	.28	1.9	.94	4.3	6.4	2.9	2.7	2.7	.94	5.8	11
3	1.2	.36	1.7	1.0	4.0	5.6	2.5	77	98	.64	4.3	6.7
4	1.0	41	1.2	1.2	3.9	4.8	2.2	504	456	.64	2.6	36
5	.71	36	1.1	1.3	4.0	2.7	1.8	597	572	.61	1.8	9.2
6	.52	39	.91	1.6	3.8	1.4	1.6	389	560	.56	1.5	29
7	.34	37	.72	1.8	3.3	1.3	1.3	62	198	.51	.79	21
8	.41	118	.67	1.9	3.0	1.2	1.3	80	222	.63	.46	7.4
9	60	463	.81	6.5	2.9	1.0	1.3	268	331	.54	.25	4.0
10	20	307	.60	222	2.8	1.0	1.1	449	294	.34	.15	2.7
11	5.5	148	.41	363	2.8	1.1	.92	362	275	.22	.11	1.8
12	2.5	27	.35	278	2.7	1.7	1.1	70	97	.14	12	1.2
13	1.6	6.4	.50	124	2.6	3.5	1.0	29	40	.10	158	1.1
14	1.7	2.1	.54	54	2.6	3.0	1.5	16	22	.07	221	2.1
15	1.8	.96	.61	33	2.5	2.5	2.5	9.8	17	.03	147	11
16	1.6	.69	.83	22	2.1	1.8	2.6	6.6	15	.01	41	49
17	1.5	.40	.72	16	1.9	1.6	2.4	4.5	23	.00	19	76
18	1.5	.32	1.0	31	1.9	1.4	2.8	2.9	26	.00	12	27
19	1.6	.50	1.6	165	1.9	1.3	2.9	2.4	15	.00	7.9	13
20	1.3	.51	.91	263	1.9	1.4	2.9	2.1	11	.00	5.2	8.9
21	1.1	.74	.75	209	1.7	1.2	2.7	1.9	8.0	.00	3.6	7.1
22	.95	.97	.68	106	2.2	35	2.7	1.7	6.8	.00	2.9	6.3
23	.76	.95	.48	54	9.1	1.6	2.7	1.4	5.2	.00	2.1	4.9
24	.62	.89	.40	32	8.9	2.5	2.7	1.4	4.4	.00	1.5	3.8
25	.52	.83	.36	21	8.5	1.9	3.0	1.3	3.8	.00	1.0	3.0
26	.44	2.1	.40	15	7.5	1.6	3.4	1.4	3.8	.00	.62	1.9
27	.41	3.2	.49	12	7.0	16	3.5	1.4	2.8	112	.42	1.5
28	.39	3.6	.57	9.4	6.9	106	3.4	1.1	2.0	179	.32	1.5
29	.34	4.1	.62	8.0	---	26	3.2	.97	1.6	62	.25	1.3
30	.31	3.0	.58	6.5	---	12	3.1	.97	1.5	30	.37	1.4
31	.27	---	.42	5.6	---	5.6	---	.93	---	16	.38	---
TOTAL	113.59	1249.17	25.13	2066.60	111.5	260.9	71.22	2951.27	3315.38	406.18	663.32	361.8
MEAN	3.66	41.6	.81	66.7	3.98	8.42	2.37	95.2	111	13.1	21.4	12.1
MAX	60	463	2.3	363	9.1	106	4.2	597	572	179	221	76
MIN	.27	.27	.35	.86	1.7	1.0	.92	.93	.78	.00	.11	1.1
AC-FT	225	2480	50	4100	221	517	141	5850	6580	806	1320	718
CAL YR 1990	TOTAL	171805.51	MEAN	471	MAX	19000	MIN	.00	AC-FT	340800		
WTR YR 1991	TOTAL	11596.06	MEAN	31.8	MAX	597	MIN	.00	AC-FT	23000		



08043000 BRIDGEPORT RESERVOIR ABOVE BRIDGEPORT, TX

LOCATION.--Lat 33°13'22", long 97°49'54", Wise County, Hydrologic Unit 12030101, in brick valve house on upstream side and near left end of Bridgeport Dam on West Fork Trinity River, 4.6 mi west of Bridgeport, 13 mi upstream from Big Sandy Creek, and at mile 626.

DRAINAGE AREA.--1,111 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1932 to current year. Prior to October 1950, monthend figures only. Water-quality records.--Chemical analyses: October 1969 to September 1984.

REVISED RECORDS.--WSP 1922: Drainage Area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Jan. 12, 1988, non-recording gages at various sites in vicinity of present gage at present datum.

REMARKS.--The reservoir is formed by a rolled earthfill dam 2,040 ft long. The dam was completed in December 1931 and storage began Apr. 1, 1932. The original dam was 1,900 ft long, but was lengthened to the present length (2,040 ft) in 1971-72. The original service spillway was eliminated during construction (1971-72), and a new spillway with approach and discharge channels was built through natural ground 2,800 ft from the left end of dam. The new spillway is 90 ft wide and has eight vertical lift gates that are 11.25 by 22 ft. The controlled outlet works consist of a 48-inch-diameter and an 18-inch-diameter pipe encased in a concrete conduit extending through the dam. In addition, a controlled 60-inch-diameter steel pipe extends through the service spillway wall to the spillway discharge basin. For elevations of outlet works, see table below. Capacity tables are based on surveys made in 1956 and 1968. 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.....	874.0	-
Crest of spillway.....	866.0	889,700
Top of gates.....	842.0	456,900
Top of conservation pool.....	836.0	374,800
Crest of spillway.....	820.0	202,200
Lowest gated outlet (invert, at spillway).....	810.0	124,300
Lowest gated outlet (invert).....	751.4	0

COOPERATION.--Capacity table No. 5-C was provided by Tarrant County Water Control and Improvement District No. 1. The table was put into use Oct. 1, 1988.

EXTREMES FOR PERIOD OF RECORD.--Prior to Jan. 12, 1988, once-daily reading of nonrecording gage at 0700 hours; maximum contents observed, 491,700 acre-ft May 5, 1990 (elevation, 844.36 ft); minimum contents observed since first appreciable storage in 1935, 7,170 acre-ft Oct. 12-16, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 365,600 acre-ft June 12 at 1600 hours (elevation, 835.28 ft); minimum 328,400 acre-ft Jan. 1, 4 (elevation, 832.26 ft).

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

832.0	325,300	835.0	362,100
833.0	337,300	836.0	374,800
834.0	349,500		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	355700	341100	343800	328700	336700	337700	338400	336600	350400	361200	348200	350600
2	355000	340500	343800	328800	336800	337400	338500	337700	351600	361200	347400	350600
3	354900	339900	343300	328500	336800	337200	338800	340000	352100	360600	346800	351000
4	354400	340100	343200	328500	336900	337700	338900	341900	353300	360600	346400	351000
5	353900	340000	343200	328800	337400	337900	338900	342700	354000	360300	345800	350900
6	353400	339900	342800	328900	337500	337500	338600	343600	355400	360100	345400	350800
7	352500	339600	342200	328900	337500	337100	338800	343900	356200	359600	344900	350500
8	352300	341000	341800	328900	337500	337200	339000	349400	359700	359100	344500	350800
9	351600	341800	341300	329700	337500	337200	338500	350000	363700	358800	343500	350800
10	351400	342500	340700	330500	337500	337200	337900	350900	364500	358200	342500	350600
11	351100	343200	340300	331200	337400	337400	338200	351900	365200	357800	341700	350400
12	351000	343400	339700	331900	337800	337400	338500	352000	365400	357700	344100	350100
13	350600	343400	338800	332400	337900	337100	338600	352000	365200	357400	347400	349900
14	350800	343300	338300	332600	337700	336700	338400	351800	365200	357300	348900	349500
15	350400	343200	337800	332700	337100	336200	338300	351900	365200	356900	349500	350300
16	350100	343000	337400	332900	336600	336500	338300	351900	364700	356600	349900	350500
17	349600	342900	336700	333100	337400	336900	338200	351900	365100	355700	349800	350800
18	349100	342900	336600	333800	337400	337100	338400	352000	365100	354900	350000	349900
19	348400	343000	336100	335100	336800	336800	338000	351800	365100	354000	349900	349400
20	348000	343000	335600	335400	336800	337300	337700	351800	365000	353000	349600	349300
21	347500	343200	334500	335900	336600	338300	337200	351600	364500	352000	349100	349300
22	347100	343200	333200	336200	337500	338000	337100	351500	364000	351300	349000	349300
23	346400	343300	332600	336500	337300	338300	337200	351500	363900	350500	348900	349000
24	346000	343300	332000	336700	337300	338400	337300	351400	363700	349400	348800	348800
25	345100	343300	331500	336700	337200	338500	337100	351600	363400	348600	348500	348800
26	344500	343600	330900	336300	337200	338800	337200	351500	363000	347900	348000	348800
27	344300	344500	330600	336800	336900	338800	337700	351500	362700	348300	347800	348400
28	343600	344300	330200	336800	337100	338600	337500	351300	362100	349100	347500	348200
29	342900	344100	329900	336500	---	338400	336900	350600	361500	349100	349900	347900
30	342300	343600	328800	336600	---	338400	336900	350500	361300	348800	350100	347800
31	341700	---	328500	336600	---	338400	---	350400	---	348500	350100	---
MAX	355700	344500	343800	336800	337900	338800	339000	352000	365400	361200	350100	351000
MIN	341700	339600	328500	328500	336600	336200	336900	336600	350400	347900	341700	347800
(†)	833.36	833.52	832.27	832.94	832.98	833.09	832.97	834.07	834.94	833.92	834.05	833.86
(Φ)	-14600	+1900	-15100	+8100	+500	+1300	-1500	+13500	+10900	-12800	+1600	-2300
CAL YR 1990	MAX	491300	MIN	324700	(Φ)	+3200						
WTR YR 1991	MAX	365400	MIN	328500	(Φ)	-8500						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## TRINITY RIVER BASIN

08044000 BIG SANDY CREEK NEAR BRIDGEPORT, TX

LOCATION.--Lat 33°13'54", long 97°41'40", Wise County, Hydrologic Unit 12030101, at downstream side of bridge on U.S. Highway 380, 1.9 mi upstream from Greathouse Branch, 4.0 mi east of Bridgeport, and 4.4 mi upstream from mouth.

DRAINAGE AREA.--333 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1936 to current year.

REVISED RECORDS.--WSP 1148: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 724.44 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1984, at datum 3.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Since May 1, 1956, runoff from 100 mi<sup>2</sup> above this station is affected at times by storage in Lake Amon G. Carter, 30 mi upstream, with a capacity of 15,240 acre-ft at elevation 920.0 ft (spillway crest). During the year, the city of Bowie diverted water from Lake Amon G. Carter for municipal use and discharged sewage effluent into tributaries to Big Sandy Creek upstream from this station. Flow was also affected at times by discharge from the flood-detention pools of 19 floodwater-retarding structures with a combined capacity of 11,430 acre-ft. These structures control runoff from an 46.0 mi<sup>2</sup> area upstream from this station and below Lake Amon G. Carter. Gage-height telemeter at station.

AVERAGE DISCHARGE.--55 years, 76.8 ft<sup>3</sup>/s (55,640 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,000 ft<sup>3</sup>/s June 10, 1941 (gage height, 15.69 ft, datum then in use, from floodmark), from rating curve extended above 22,000 ft<sup>3</sup>/s; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1887 occurred in 1908 and 1915 and reached about the same stage as that of June 10, 1941.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,400 ft<sup>3</sup>/s June 9 at 2345 hours (gage height, 10.32 ft); no flow Aug. 4-22-28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	.22	9.3	14	14	21	17	4.6	11	7.3	.05	48
2	.13	.27	8.6	15	13	21	16	3.3	14	6.4	.02	50
3	.33	.45	8.2	14	12	21	17	121	90	5.2	.01	51
4	.57	3.5	8.2	14	12	21	16	175	73	4.4	.00	19
5	.39	23	8.3	14	11	20	16	80	75	3.3	.00	18
6	.25	12	8.7	17	10	18	16	36	351	2.5	.00	13
7	.52	5.5	8.4	19	9.9	17	16	23	191	1.8	.00	7.5
8	32	11	8.1	19	9.2	16	16	222	263	1.4	.00	9.3
9	42	63	7.9	17	8.5	15	14	374	1290	1.1	.00	11
10	17	32	8.1	46	7.9	14	13	95	997	.77	.00	7.0
11	6.1	16	8.1	60	7.3	13	13	50	143	.60	.00	3.0
12	1.2	10	8.2	37	6.8	12	24	38	84	.50	14	1.5
13	.48	8.2	8.1	28	6.3	12	18	34	65	.40	4.1	.95
14	.26	7.2	7.8	30	5.7	12	15	70	54	.30	.48	.60
15	.17	6.3	7.8	30	5.3	13	13	139	47	.23	.19	.64
16	.12	5.7	8.6	26	5.1	14	12	47	42	.19	.12	86
17	.12	4.9	11	25	4.9	15	11	30	38	.19	.10	31
18	.09	4.1	15	42	4.8	16	11	22	35	.14	.08	15
19	.07	3.6	12	120	5.3	16	11	20	32	.10	.07	11
20	.07	5.0	11	92	7.9	17	9.1	20	28	.05	.04	10
21	.08	16	9.5	57	14	20	8.1	19	25	.03	.02	9.2
22	.08	42	8.6	41	28	45	8.3	17	22	.02	.00	7.6
23	.17	29	8.8	37	39	41	8.9	16	20	.02	.00	6.2
24	.22	18	9.0	35	35	29	8.8	105	17	.01	.00	5.0
25	.19	21	9.8	33	28	25	11	83	14	.02	.00	4.7
26	.17	81	11	31	24	24	11	31	12	.04	.00	4.4
27	.18	48	11	26	23	37	10	22	11	.13	.00	3.9
28	.21	19	13	22	23	55	7.7	18	11	4.4	.00	2.8
29	.21	13	15	18	---	34	6.6	16	9.6	3.7	.13	2.0
30	.20	11	16	17	---	23	5.7	14	8.4	.59	27	1.4
31	.22	---	13	16	---	18	---	12	---	.17	82	---
TOTAL	103.91	519.94	306.1	1012	380.9	675	380.2	1956.9	4073.0	46.00	128.41	440.69
MEAN	3.35	17.3	9.87	32.6	13.6	21.8	12.7	63.1	136	1.48	4.14	14.7
MAX	42	81	16	120	39	55	24	374	1290	7.3	82	86
MIN	.07	.22	7.8	14	4.8	12	5.7	3.3	8.4	.01	.00	.60
AC-FT	206	1030	607	2010	756	1340	754	3880	8080	91	255	874
CAL YR 1990	TOTAL	87132.33	MEAN	239	MAX	12600	MIN	.07	AC-FT	172800		
WTR YR 1991	TOTAL	10023.05	MEAN	27.5	MAX	1290	MIN	.00	AC-FT	19880		

TRINITY RIVER MAIN STEM

205

08044500 WEST FORK TRINITY RIVER NEAR BOYD, TX

LOCATION.--Lat 33°05'07", long 97°33'30", Wise County, Hydrologic Unit 12030101, on right bank at downstream side of highway embankment, 10 ft right of right abutment of bridge on Farm Road 730, 0.6 mi northeast of Boyd, 3.5 mi downstream from Boggy Creek, and at mile 602.

DRAINAGE AREA.--1,725 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1947 to current year.

GAGE.--Water-stage recorder. Datum of gage is 660.57 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 14, 1954, water-stage recorder at site 2.2 mi downstream at datum 5.48 ft lower.

REMARKS.--No estimated daily discharges. Records good. During the current year, sustained flows at this station were the result of water released for downstream supply from Bridgeport Reservoir (drainage area, 1,111 mi<sup>2</sup>), 25 mi upstream from station. In addition, flow from an 100 mi<sup>2</sup> area above station is affected by storage in Lake Amon G. Carter (capacity, 15,240 acre-ft) on Big Sandy Creek. Flow is also affected at times by discharge from the flood-detention pools of 36 floodwater-retarding structures with a total combined detention capacity of 24,450 acre-ft. These structures control runoff from 91.2 mi<sup>2</sup> in the Big Sandy and Salt Creeks drainage basins above this station. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--44 years, 259 ft<sup>3</sup>/s (187,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 60,400 ft<sup>3</sup>/s Oct. 14, 1981 (gage height, 25.87 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1880, about 25 ft in May 1908, present site and datum, from information by local residents, who also reported a flood of about the same gage height between 1870-80. A flood in April 1942 reached a stage of 20.6 ft, present site and datum, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,250 ft<sup>3</sup>/s Apr. 12 at 0100 hours (gage height, 14.81 ft); minimum daily, 3.7 ft<sup>3</sup>/s Aug. 28 & 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	244	249	34	251	41	46	39	25	30	15	119	67
2	246	251	32	64	39	49	37	25	29	14	115	42
3	249	253	32	43	40	48	36	251	182	13	112	456
4	255	278	32	40	41	44	36	721	210	13	109	173
5	252	250	32	39	52	42	35	411	226	14	108	37
6	250	150	31	40	59	40	34	175	752	14	107	27
7	250	132	30	42	58	41	34	81	737	13	106	17
8	250	139	141	43	52	40	36	599	537	12	103	11
9	268	189	280	43	47	40	35	924	630	11	101	9.5
10	196	109	282	71	47	38	32	511	844	10	205	9.9
11	108	53	285	110	48	38	76	210	936	10	292	8.2
12	97	40	287	93	48	37	936	117	688	9.7	387	6.9
13	92	34	288	62	45	37	274	85	324	9.5	358	6.6
14	90	32	288	52	43	37	95	67	169	8.9	499	17
15	89	29	288	48	40	35	57	200	95	8.7	200	12
16	89	28	290	45	37	35	45	133	75	8.0	42	7.3
17	90	28	294	43	37	44	41	71	63	16	16	80
18	92	28	300	47	38	43	40	56	57	182	9.1	19
19	91	30	300	112	39	43	39	49	54	284	6.9	14
20	90	31	299	201	38	41	36	46	50	288	5.8	12
21	89	31	295	124	35	41	33	44	46	289	5.0	9.8
22	89	31	294	77	46	42	32	41	38	290	4.9	8.5
23	174	37	293	59	88	75	32	39	34	289	4.4	8.9
24	237	42	293	54	70	59	32	36	32	315	4.3	11
25	239	34	293	50	56	49	33	811	26	344	4.0	11
26	240	31	295	47	51	44	36	295	23	344	3.9	12
27	241	35	296	45	47	49	36	101	21	344	3.8	9.1
28	243	152	300	44	46	68	33	59	21	385	3.7	8.6
29	243	79	303	46	---	80	30	45	20	373	3.7	7.7
30	244	41	305	45	---	56	28	37	16	236	11	6.3
31	247	---	306	43	---	45	---	32	---	128	37	---
TOTAL	5674	2846	7118	2123	1328	1426	2318	6297	6965	4290.8	3086.5	1125.3
MEAN	183	94.9	230	68.5	47.4	46.0	77.3	203	232	138	99.6	37.5
MAX	268	278	306	251	88	80	936	924	936	385	499	456
MIN	89	28	30	39	35	35	28	25	16	8.0	3.7	6.3
AC-FT	11250	5650	14120	4210	2630	2830	4600	12490	13820	8510	6120	2230
CAL YR 1990	TOTAL	392957	MEAN	1077	MAX	30900	MIN	10	AC-FT	779400		
WTR YR 1991	TOTAL	44597.6	MEAN	122	MAX	936	MIN	3.7	AC-FT	88460		

08045000 EAGLE MOUNTAIN RESERVOIR ABOVE FORT WORTH, TX

LOCATION.--Lat 32°52'39", long 97°28'29", Tarrant County, Hydrologic Unit 12030101, at right end of main section (left) of Eagle Mountain Dam on West Fork Trinity River, 11.8 mi northwest of Fort Worth, and at mile 583.3.

DRAINAGE AREA.--1,970 mi<sup>2</sup>.

PERIOD OF RECORD.--February 1934 to current year. Prior to October 1950, month-end figures only.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 16, 1988, nonrecording gages at several sites within 1.0 mi of present site at present datum.

REMARKS.--The reservoir is formed by two sections of rolled earthfill and a concrete spillway separated by high natural ground. Total length of the dam including spillway, is 4,800 ft. The dam was completed Oct. 24, 1932, and storage began Feb. 24, 1934. The spillway is a 1,300-foot-wide cut through natural ground located between the two sections of earthfill that make up the dam. The original service spillway, located in the section to the right of the main dam, contains a concrete spillway with four 25-foot bays, three are equipped with vertical lift gates and the fourth is left open. In 1971, a side-channel spillway was constructed. The newest spillway is located 300 ft to the left of the original service spillway and has six 11.25- by 22-foot-wide roller lift gates. The main section of the dam contains the outlet works that consist of two concrete conduits with two 48-inch diameter valves in each conduit. The reservoir is used for flood control and for part of the municipal water supply for the city of Fort Worth. Capacities are based on a survey made in 1968. For statement regarding regulation by Soil Conservation Service floodwater-retarding structures, see station 08044500. For storage above the reservoir, see REMARKS for West Fork Trinity River near Boyd (station 08044500). 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.....	682.0	-
Crest of spillway.....	676.0	545,900
Top of gates (new side-channel spillway).....	659.0	283,200
Crest of (old service) spillway (top of conservation pool).....	649.1	178,400
Crest of spillway (new side-channel spillway).....	637.0	89,450
Lowest gated outlet (invert).....	599.9	36

COOPERATION.--New capacity table, No. 4-C, furnished by Tarrant County Water Control and Improvement District No. 1, was put into use Oct. 1, 1988.

EXTREMES FOR PERIOD OF RECORD.--Prior to Oct. 16, 1987, once-daily reading of nonrecording gage at 0700 hours, maximum contents observed, 333,500 acre-ft Apr. 26, 1942 (elevation, 659.9 ft); minimum observed since first appreciable storage in 1935, 57,690 acre-ft Nov. 19, 20, 1956.

EXTREMES FOR CURRENT YEAR.--Maximum contents, 178,500 acre-ft June 7 at 0600 hours (elevation, 649.11 ft); minimum, 163,500 acre-ft Oct. 2 (elevation, 647.39 ft).

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

647.0	160,200	649.0	177,500
648.0	168,700	650.0	186,700

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	163700	165600	169700	174300	177900	176700	172800	172500	176600	173900	167300	168000
2	163500	165600	170000	174800	177800	176600	172600	172100	177000	173700	166900	167800
3	163900	166500	169700	175000	177500	176100	172600	173300	177200	173500	166700	168200
4	164100	167200	169900	175000	177700	176200	172100	174400	177600	173000	166500	169000
5	164000	167300	169500	175000	178000	176200	171800	175900	178000	172700	166300	169000
6	164000	167600	169500	175500	177900	176100	171700	176100	177900	172200	166300	168600
7	164400	167800	169000	175400	177700	175700	171400	176100	178000	171700	166100	168400
8	165600	169500	168600	175400	177500	175400	171100	177400	177800	171400	165900	168000
9	165300	169500	168600	176100	177300	174900	171600	177500	177600	170700	165600	167800
10	165300	169500	168600	176900	177200	174400	171000	177500	177900	170100	165300	167800
11	165400	169600	169000	177000	177200	174200	170900	177000	178000	169900	165200	167700
12	165600	169600	169100	176900	177300	174300	172700	177200	178000	169400	167500	167500
13	165100	169600	169400	176500	177400	174200	174000	177400	177800	168800	169500	167300
14	165100	169500	169500	176900	177600	174000	174200	178000	178000	168300	170600	167000
15	165100	169600	169700	176900	177100	173900	174000	177500	178000	167500	171200	166900
16	165100	169800	170200	176600	177000	174200	173800	177500	178100	166900	170900	166900
17	165600	169700	170800	176500	176900	174200	174100	177600	178000	166200	170800	167000
18	165400	169600	171100	176500	177000	174000	174300	177700	177800	165600	170900	167100
19	165000	169500	171400	176900	177000	173900	174200	177700	177600	165300	170600	166900
20	165300	169500	171900	177400	177000	174100	173600	177500	177300	165100	170500	166500
21	165100	169900	172200	177600	177400	173900	173200	177200	177000	165000	170400	165800
22	165000	170300	171900	177500	177600	174800	172700	177300	176600	164900	170200	165500
23	165000	170200	171700	177700	177000	173900	172500	177300	177200	164700	170000	165300
24	165000	170100	171600	177800	177000	174300	172500	177900	176700	164800	169500	165200
25	165000	170000	171700	178000	176800	173700	172500	177000	176300	164800	169100	165100
26	164900	170100	172100	177700	176400	174000	172600	177200	175900	165500	168900	165000
27	165100	170900	172200	177600	176100	174000	172600	177200	175500	165800	168700	164600
28	165100	170600	172600	177700	176200	174200	172400	177300	174900	166700	168500	164300
29	165400	170200	173700	177800	---	174600	172400	177000	174700	167300	168500	163900
30	165500	169700	173900	177900	---	174400	172500	176800	174300	167300	186600	163900
31	165600	---	173900	177900	---	173600	---	176600	---	167300	168400	---
MAX	165600	170900	173900	178000	178000	176700	174300	178000	178100	173900	186600	169000
MIN	163500	165600	168600	174300	176100	173600	170900	172100	174300	164700	165200	163900
(†)	647.63	648.12	648.59	649.04	648.86	648.56	648.43	648.90	648.64	647.83	647.96	647.43
(Φ)	+1900	+4100	+4200	+4000	-1700	-2600	-1100	+4100	-2300	-7000	+1100	-4500
CAL YR 1990	MAX	259000	MIN	161000	(Φ)	+5500						
WTR YR 1991	MAX	186600	MIN	163500	(Φ)	+200						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



TRINITY RIVER MAIN STEM

08045400 LAKE WORTH ABOVE FORT WORTH, TX

LOCATION.--Lat 32°47'21", long 97°24'58", Tarrant County, Hydrologic Unit 12030102, on top of Lake Worth Dam on West Fork Trinity River, 240 ft to right of right end of uncontrolled concrete spillway, 2.9 mi upstream from Farmer's Branch, 3.3 mi upstream from bridge on State Highway 183 crossing West Fork Trinity River, 5.3 mi northwest of Tarrant County Courthouse in Fort Worth, and at river mile 572.0.

DRAINAGE AREA.--2,064 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1981 to current year.

Water-quality records.--Chemical analyses: January 1970 to September 1984.

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

REMARKS.--The lake is formed by a rolled earthfill dam 3,200 ft long, with an uncontrolled concrete spillway 700 ft long near the center of the dam. Deliberate impoundment began in June 1914 and the dam was completed in October 1914. There is a 48-inch diameter pipe controlled by a 36-inch valve, which may be used to make small releases through the dam. The dam is owned by the city of Fort Worth. Area-capacity curves are based on a 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.....	606.3	-
Crest of concrete spillway.....	594.0	37,070
Lowest gated outlet (invert).....	584.25	12,290

COOPERATION.--Copies of the capacity table (prepared by the U.S. Army Corps of Engineers) and area-capacity curves (prepared by Freese, Nichols, and Endress, Consulting Engineers) were provided by Tarrant County Water Control and Improvement District No. 1.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents observed, 56,040 acre-ft May 3, 1990 (elevation, 598.70 ft); minimum, 24,730 acre-ft Sept. 9-10, 1985 (elevation, 589.95 ft).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum contents observed, 52,080 acre-ft May 25, 1957 (elevation, 598.47 ft); minimum observed, 20,540 acre-ft June 30, 1955 (elevation, 589.45 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 38,080 acre-ft May 25 at 1900 hours (elevation, 594.28 ft); minimum, 32,390 acre-ft May 7 (elevation, 592.59 ft).

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

592.0	30,540	594.0	37,070
593.0	33,690	595.0	40,670

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34230	33890	33530	36060	36190	36600	35180	33310	35990	35510	34500	33150
2	34200	33930	33890	35990	36260	36630	35140	33310	36190	35450	34430	33410
3	34470	34500	33530	35890	36360	36290	35180	33150	36800	35280	34330	33370
4	34530	34770	33410	35820	36430	36190	35310	33150	36700	35140	34230	33440
5	34570	34670	33370	35820	36390	36090	35450	32930	36460	35080	34060	33340
6	34700	34570	33500	35850	36330	35920	35680	32680	36800	35010	33790	33340
7	34840	34470	33560	35720	36460	35890	35650	32490	37750	34870	33600	33560
8	35510	35040	33790	35650	36700	36060	35510	32990	37900	34770	33720	33530
9	35550	34870	33960	35920	36830	36220	35350	33470	37720	34570	33660	33500
10	35350	34770	34030	35950	36830	36290	35140	34740	37680	34300	33960	33310
11	35180	34640	34100	35920	36730	36390	35280	35950	37750	34060	34300	33180
12	35080	34570	34260	35920	36600	36460	35310	36160	37930	34100	34570	33150
13	35080	34430	34430	36090	36500	36290	35280	35950	37720	34130	34670	33150
14	35040	34300	34570	36220	36390	36060	35080	36160	37180	34200	34670	33090
15	34840	34230	34770	36260	36220	35890	34840	36930	36870	34100	34570	33120
16	34600	34160	34910	36390	36260	36060	34640	37070	36660	34160	34300	33090
17	34470	34030	34970	36700	36500	36090	34570	36800	36500	34300	34230	32990
18	34230	33960	34870	37040	36560	35950	34430	36730	36390	34370	34300	32990
19	34030	33820	34740	37040	36220	35950	34370	36870	36220	34400	34230	32960
20	34330	33630	35040	36930	36090	35790	34570	36970	36220	34330	33990	32800
21	33990	33530	35040	36800	36120	35750	34940	36930	36120	34200	33760	32870
22	33760	33630	35210	36770	36190	35580	34910	36700	35950	34030	33590	33280
23	33560	33560	35350	36770	36360	35680	34670	36530	36160	33930	33440	33250
24	33530	33470	35450	36600	36600	35750	34670	36660	36090	33820	33340	33280
25	33530	33440	35580	36630	36660	35720	34370	38080	36090	33930	33440	33150
26	33600	33370	35850	36630	36700	35280	34230	37830	35990	34300	33310	32990
27	33820	33340	36090	36930	36660	35380	34030	37360	35920	34530	33120	32770
28	33860	33220	36330	36530	36630	35210	33890	36930	35790	34770	32960	32680
29	33690	33220	36600	36500	---	35040	33690	36630	35820	34840	32800	32770
30	33720	33340	36390	36390	---	35080	33560	36500	35680	34670	32870	32710
31	33790	---	36190	36260	---	35180	---	36220	---	34600	32990	---
MAX	35550	35040	36600	37040	36830	36630	35680	38080	37930	35510	34670	33560
MIN	33530	33220	33370	35650	36090	35040	33560	32490	35680	33820	32800	32680
(↑)	593.03	592.89	593.74	593.76	593.87	593.44	592.96	593.75	593.59	593.27	592.78	592.69
(Φ)	-440	-450	+2850	+70	+370	-1450	-1620	+2660	-540	-1080	-1610	-280
CAL YR 1990	MAX	55820	MIN	32220	(Φ)	-70						
WTR YR 1991	MAX	38080	MIN	32490	(Φ)	-1520						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



## TRINITY RIVER BASIN

08045850 CLEAR FORK TRINITY RIVER NEAR WEATHERFORD, TX  
(Flood-hydrograph Partial-record Station)

LOCATION.--Lat 32°44'25", long 97°39'06", Parker County, Hydrologic Unit 12030102, near left end of bridge on weigh station exit road associated with Interstate Highway 20, 150 ft downstream from Squaw Creek, 2.8 mi downstream from Lake Weatherford Dam on the Clear Fork Trinity River, 3.8 mi upstream from South Fork Trinity River, and 8.5 mi east of county courthouse in Weatherford.

DRAINAGE AREA.--121 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1924 to September 1925 and November 1947 to September 1985. October 1985 to current year, (peaks above base discharge and annual maximum).

REVISED RECORDS.--WSP 1312. 1925(M). WDR TX-76-2: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 810.00 ft above National Geodetic Vertical Datum of 1929 (State Department of Highways and Public Transportation bench mark).

AVERAGE DISCHARGE.--5 years (water years 1981-85) 23.0 ft<sup>3</sup>/s (16,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,080 ft<sup>3</sup>/s Nov. 1, 1981 (gage height, 21.58 ft); minimum, no flow Sept. 12-15, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 190 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 25	1015	*140	*10.69	No peaks greater than base discharge.			

Minimum discharge, not determined.

TRINITY RIVER BASIN

209

08046020 CLEAR FORK TRINITY RIVER ABOVE BENBROOK NEAR ALEDO, TX

LOCATION.--Lat 32°37'14", long 97°31'46", Tarrant County, Hydrologic Unit 12030102, on U.S. Highway 377, over center of channel at upstream side of upstream bridge, 1/4 mi southwest of FM 2376, 1/4 mi northeast of FM 1187, and 6.5 mi southwest of Benbrook.

DRAINAGE AREA.--258 mi<sup>2</sup>.

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1989 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)
DEC 04...	0955	15	714	7.9	9.0	2	3.4	12.1	105	1.8	290
JAN 14...	1210	21	650	8.3	7.0	5	1.6	13.2	111	1.8	270
FEB 26...	1418	19	684	8.3	15.0	7	4.5	15.5	155	1.3	300
APR 23...	1240	15	660	7.8	18.0	7	22	8.2	89	1.9	280
JUN 07...	1240	70	510	7.9	25.0	13	21	7.5	92	1.4	210
AUG 21...	1135	14	382	7.4	26.0	21	31	7.2	90	1.7	150

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
DEC 04...	38	98	12	42	1	4.2	260	57	53	0.40	14
JAN 14...	23	91	10	30	0.8	3.2	250	42	42	0.40	10
FEB 26...	39	100	13	39	1	2.8	260	60	52	0.30	3.9
APR 23...	12	93	12	40	1	4.2	270	50	52	0.70	16
JUN 07...	34	70	9.5	25	0.7	3.2	180	33	34	0.30	9.3
AUG 21...	14	50	6.7	22	0.8	4.7	140	19	26	0.50	10

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 04...	434	<1	<1	--	1.18	0.020	1.20	0.040	--	--	0.960
JAN 14...	377	37	9	28	0.980	0.020	1.00	0.220	0.28	0.50	0.410
FEB 26...	429	5	3	2	0.920	0.020	0.940	0.040	0.56	0.60	0.620
APR 23...	431	53	15	38	1.58	0.120	1.70	0.170	0.83	1.0	0.880
JUN 07...	292	71	15	56	0.300	0.040	0.340	0.040	0.56	0.60	0.220
AUG 21...	223	21	21	0	0.530	0.030	0.560	0.070	0.53	0.60	0.470

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
DEC 04...	--	3.7	--	--	--	--	--	--	--	--	--
JAN 14...	0.390	3.8	1	80	<0.5	<1.0	<5	<3	<10	6	<10
FEB 26...	0.510	4.5	--	--	--	--	--	--	--	--	--
APR 23...	0.800	5.6	3	84	<0.5	1.0	<5	<3	<10	4	<10
JUN 07...	0.210	6.2	--	--	--	--	--	--	--	--	--
AUG 21...	0.410	7.1	3	60	0.6	2.0	<5	<3	<10	19	<10

## TRINITY RIVER BASIN

08046020 CLEAR FORK TRINITY RIVER ABOVE BENBROOK NEAR ALEDO, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 04...	--	--	--	--	--	--	--	--	--	--
JAN 14...	11	34	<0.1	<10	<10	<1	<1.0	540	<6	28
FEB 26...	--	--	--	--	--	--	--	--	--	--
APR 23...	11	77	0.2	<10	<10	<1	1.0	650	<6	5
JUN 07...	--	--	--	--	--	--	--	--	--	--
AUG 21...	5	7	0.2	<10	<10	<1	<1.0	290	<6	8

TRINITY RIVER BASIN

211

08046150 BEAR CREEK AT FM 1187 NEAR BENBROOK, TX

LOCATION.--Lat 32°35'38", long 97°30'47", Tarrant County, Hydrologic Unit 12030102, on FM 1187 bridge over center of channel at upstream side of bridge, 0.3 mi downstream from an unnamed tributary on left bank, 0.3 mi upstream from Benbrook Lake, and 6.4 mi south of Benbrook.

DRAINAGE AREA.--62.8 mi<sup>2</sup>.

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1989 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)
DEC 04...	1300	1.7	435	7.8	13.0	<1	0.30	12.5	119	1.3	210
JAN 14...	1455	7.0	430	8.0	9.5	1	3.5	12.7	115	1.5	210
FEB 26...	1125	12	399	7.5	11.5	2	1.3	11.5	106	0.6	200
APR 23...	0920	8.3	427	7.6	16.0	2	0.40	8.4	88	1.4	210
JUN 07...	0940	28	405	7.6	24.0	12	3.5	7.2	87	1.0	210
AUG 21...	1415	1.8	350	7.8	31.0	1	1.2	9.3	128	0.8	170

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
DEC 04...	36	77	4.7	11	0.3	1.4	180	50	12	0.30	9.3
JAN 14...	27	75	4.3	11	0.3	1.6	180	33	12	0.20	7.1
FEB 26...	22	74	3.7	10	0.3	1.0	180	32	10	0.30	6.0
APR 23...	14	79	3.9	10	0.3	1.4	200	27	8.2	0.30	8.7
JUN 07...	26	77	3.7	8.7	0.3	2.0	180	19	11	0.30	12
AUG 21...	22	62	3.7	10	0.3	1.3	150	27	10	0.40	12

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 04...	271	<1	<1	--	--	<0.010	<0.100	0.010	--	--	<0.010
JAN 14...	252	10	8	2	--	<0.010	<0.100	0.020	--	<0.20	0.010
FEB 26...	244	12	2	10	--	0.010	<0.050	0.010	--	<0.20	0.030
APR 23...	259	<1	<1	--	0.150	0.010	0.160	0.010	0.19	0.20	0.010
JUN 07...	243	14	8	6	0.100	0.030	0.130	0.030	0.97	1.0	0.020
AUG 21...	216	1	1	0	--	<0.010	<0.050	0.020	--	<0.20	0.020

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
DEC 04...	--	1.4	--	--	--	--	--	--	--	--	--
JAN 14...	<0.010	1.8	<1	54	<0.5	<1.0	<5	<3	<10	4	<10
FEB 26...	<0.010	1.5	--	--	--	--	--	--	--	--	--
APR 23...	<0.010	1.8	<1	66	<0.5	<1.0	<5	<3	<10	<3	<10
JUN 07...	<0.010	2.7	--	--	--	--	--	--	--	--	--
AUG 21...	0.030	1.4	<1	56	<0.5	<1.0	<5	<3	<10	5	<10

## TRINITY RIVER BASIN

08046150 BEAR CREEK AT FM 1187 NEAR BENBROOK, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 04...	--	--	--	--	--	--	--	--	--	--
JAN 14...	11	4	<0.1	<10	10	<1	<1.0	430	<6	12
FEB 26...	--	--	--	--	--	--	--	--	--	--
APR 23...	9	9	<0.1	<10	<10	<1	<1.0	430	<6	<3
JUN 07...	--	--	--	--	--	--	--	--	--	--
AUG 21...	10	3	<0.1	<10	<10	<1	<1.0	380	<6	3



TRINITY RIVER BASIN

213

08046500 BENBROOK LAKE NEAR BENBROOK, TX

LOCATION.--Lat 32°39'02", long 97°26'54", Tarrant County, Hydrologic Unit 12030102, in intake structure of Benbrook Dam on Clear Fork Trinity River, 2.5 mi south of Benbrook, 3.5 mi upstream from Marys Creek, and 14.6 mi upstream from mouth.

DRAINAGE AREA.--429 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1952 to current year. Prior to October 1970, published as Benbrook Reservoir.

REVISED RECORDS.--WSP 1922: Drainage area.

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

REMARKS.--The lake is formed by a rolled earthfill dam 9,130 ft long, including a 500-foot uncontrolled off-channel concrete-gravity spillway with a 100-foot notch in center of ogee weir section. The outlet works consist of a 13.0-foot-diameter concrete conduit controlled by two 6.5- by 13.0-foot broome-type gates and two 30-inch steel pipes controlled by slide gates. Deliberate impoundment began Sept. 29, 1952. From August 1950 to Sept. 28, 1952, the lake was operated as a detention basin only. The capacity table is based on a survey made in 1945. The lake was built for flood control, navigation, and low-flow regulation. Inflow is affected at times by the discharge from flood-detention pools of 12 floodwater-retarding structures with a combined detention capacity of 11,170 acre-ft. These structures control runoff from 37.6 mi<sup>2</sup>. Gage-height telemeter at station. 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.....	747.0	-
Crest of spillway.....	724.0	258,600
Crest of notch in spillway.....	710.0	164,800
Top of conservation storage.....	694.0	88,250
Crest of intake to wet wells (inverts).....	656.0	6,550
Lowest gated outlet (invert).....	622.0	12

COOPERATION.--Records of elevations and contents furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily contents, 212,200 acre-ft May 3, 1990 (elevation, 717.54 ft); minimum since lake first filled in 1957, 61,450 acre-ft Oct. 10, 1984 (elevation, 686.16 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 91,990 acre-ft May 26 (elevation, 694.98 ft); minimum daily, 78,340 acre-ft Nov. 2 (elevation, 691.28 ft).

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

691.0	77,350	694.0	88,250
692.0	80,890	695.0	92,060
693.0	84,520		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	80320	78410	79620	79510	82890	85720	86830	88940	89390	87840	86760	87280
2	80180	78340	79680	79540	82960	85720	86910	88970	89700	87730	86650	88550
3	80110	78410	79620	79540	83030	85750	86830	88940	91450	88140	86540	88480
4	79900	78550	79620	79580	83430	85790	86830	88780	91680	88020	86420	88360
5	79440	78550	79580	79620	83650	85830	86830	88710	91680	87950	86270	88290
6	79300	78520	79510	79680	83800	85830	86830	88710	91450	87880	86120	88250
7	79150	78480	79510	79720	83910	85860	86870	88630	91340	87690	86010	88550
8	79680	79080	79470	79720	84020	85860	86870	89510	91070	87580	85900	88520
9	79790	79220	79470	79970	84120	85900	86830	89540	90760	87390	85750	88480
10	79720	79220	79440	79970	84200	85940	86830	89240	90460	87240	85640	88400
11	79650	79260	79470	79970	84310	85980	87760	88940	90160	87090	85570	88320
12	79580	79220	79440	80000	84420	85940	88100	88630	89770	86940	87540	88250
13	79510	79220	79400	80320	84450	85940	88630	88520	89510	86830	88140	88170
14	79400	79220	79400	80320	84560	85940	88740	88590	89390	86680	88480	88140
15	79370	79190	79400	80320	84600	85940	88780	88670	89540	86540	88590	87990
16	79300	79190	79440	80360	84670	86050	88780	88670	89580	86420	88630	87990
17	79220	79150	79470	80390	84750	86120	90380	88630	89580	86310	88630	88020
18	79120	79190	79510	80390	84780	86160	91030	88630	89430	86160	88630	88290
19	79050	79190	79510	81690	84820	86200	90880	88630	89200	85980	88630	88630
20	78980	79190	79510	81800	84900	86240	90580	88780	89050	85860	88590	88630
21	78870	79190	79470	81870	85010	86350	90270	88940	88940	85830	88480	88630
22	78840	79540	79400	81980	85190	86420	89960	88900	88860	85720	88400	88630
23	78800	79650	79330	82090	85230	86390	89660	88820	88780	85530	88320	88630
24	78760	79650	79330	82160	85310	86390	89390	89160	88670	85310	88250	88590
25	78690	79680	79300	82240	85340	86460	89160	91600	88550	85160	88170	88550
26	78620	79720	79330	82310	85420	86650	88900	91990	88480	85940	88020	88440
27	78550	79720	79370	82420	85490	86760	88550	91800	88360	86090	87880	88400
28	78550	79680	79400	82490	85570	86870	89010	91380	88250	86680	87650	88320
29	78520	79680	79510	82560	---	86870	89090	90920	88100	86870	87500	88250
30	78480	79680	79510	82710	---	86830	89010	90460	87990	86870	87500	88170
31	78410	---	79510	82820	---	86870	---	89930	---	86830	87350	---
MAX	80320	79720	79680	82820	85570	86870	91030	91990	91680	88140	88630	88630
MIN	78410	78340	79300	79510	82890	85720	86830	88520	87990	85160	85570	87280
(↑)	691.30	691.66	691.61	692.53	693.28	693.63	694.20	694.44	693.93	693.62	693.76	693.98
(Φ)	-1400	+1200	-170	+3310	+2750	+1300	+2140	+920	-1940	-1160	+520	+820

CAL YR 1990 MAX 211700 MIN 78340 (Φ) +1710  
WTR YR 1991 MAX 91990 MIN 78340 (Φ) +7710

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1969 to September 1982. February 1990 to current year.

323858097265601 - BENBROOK LAKE SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)
MAR												
18...	1043	86100	1.00	353	8.2	13.5	0.90	8.9	86	K4	K3	150
18...	1048	--	10.0	352	8.2	13.0	--	8.8	84	--	--	--
18...	1053	--	20.0	352	8.2	13.0	--	8.6	82	--	--	--
18...	1058	--	30.0	352	8.2	13.0	--	8.6	82	--	--	--
18...	1104	--	40.0	353	8.2	13.0	--	8.7	83	--	--	--
18...	1109	--	50.0	353	8.1	13.0	--	8.6	82	--	--	--
18...	1116	--	56.0	355	8.0	13.0	--	8.2	79	--	--	150
MAY												
24...	1125	89200	1.00	336	8.2	27.5	1.30	8.9	115	<1	<1	140
24...	1132	--	10.0	358	8.1	24.5	--	6.9	84	--	--	--
24...	1135	--	20.0	362	7.9	23.5	--	5.4	65	--	--	--
24...	1139	--	30.0	368	7.5	22.5	--	2.2	26	--	--	--
24...	1143	--	40.0	371	7.3	21.0	--	0.1	1	--	--	--
24...	1149	--	50.0	372	7.3	20.5	--	0.1	1	--	--	--
24...	1155	--	56.0	374	7.3	20.5	--	0.1	1	--	--	160
AUG												
20...	1042	88600	1.00	272	8.5	29.5	1.20	10.0	134	<1	<1	95
20...	1049	--	10.0	272	8.5	29.0	--	9.9	131	--	--	--
20...	1055	--	20.0	293	7.5	27.5	--	2.6	34	--	--	--
20...	1101	--	30.0	297	7.3	27.0	--	0	0	--	--	--
20...	1108	--	40.0	331	7.2	26.0	--	0	0	--	--	--
20...	1115	--	50.0	368	7.0	24.0	--	0	0	--	--	--
20...	1121	--	56.0	372	6.9	23.5	--	0	0	--	--	170
DATE	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	
MAR												
18...	15	50	5.7	15	0.5	4.0	130	24	20	0.20	5.2	
18...	--	--	--	--	--	--	--	--	--	--	--	
18...	--	--	--	--	--	--	--	--	--	--	--	
18...	--	--	--	--	--	--	--	--	--	--	--	
18...	--	--	--	--	--	--	--	--	--	--	--	
18...	12	49	5.5	14	0.5	3.8	130	25	20	0.20	5.2	
MAY												
24...	24	46	6.2	18	0.7	4.0	120	20	19	0.30	1.2	
24...	--	--	--	--	--	--	--	--	--	--	--	
24...	--	--	--	--	--	--	--	--	--	--	--	
24...	--	--	--	--	--	--	--	--	--	--	--	
24...	--	--	--	--	--	--	--	--	--	--	--	
24...	--	--	--	--	--	--	--	--	--	--	--	
24...	18	53	5.9	15	0.5	4.0	140	25	19	0.30	6.2	
AUG												
20...	15	29	5.6	16	0.7	3.8	80	21	19	0.20	5.5	
20...	--	--	--	--	--	--	--	--	--	--	--	
20...	--	--	--	--	--	--	--	--	--	--	--	
20...	--	--	--	--	--	--	--	--	--	--	--	
20...	--	--	--	--	--	--	--	--	--	--	--	
20...	0	56	6.3	16	0.5	4.3	180	9.9	19	0.20	10	

TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX--Continued

323858097265601 - BENBROOK LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
18...	204	0.210	0.010	0.220	0.100	0.50	0.60	0.030	0.020	<3	<1
18...	--	0.210	0.010	0.220	0.100	0.40	0.50	0.030	0.010	10	<10
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	202	0.190	0.020	0.210	0.130	0.47	0.60	0.080	0.020	5	47
MAY											
24...	184	0.030	0.020	0.050	0.010	0.49	0.50	<0.010	<0.010	4	2
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	0.340	0.040	0.380	0.040	0.46	0.50	<0.010	<0.010	20	30
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	212	0.100	0.040	0.140	0.500	0.50	1.0	0.210	0.140	110	350
AUG											
20...	148	--	<0.010	<0.050	<0.010	--	0.60	0.030	<0.010	6	1
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	0.066	0.010	0.076	0.040	0.46	0.50	0.030	<0.010	--	--
20...	--	--	<0.010	<0.050	0.220	0.48	0.70	0.050	<0.010	<10	120
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	228	--	<0.010	<0.050	2.70	0.40	3.1	0.490	0.380	460	690

323908097273401 - BENBROOK LAKE SITE AL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
18...	1123	1.00	355	8.2	14.0	8.8	86
18...	1126	10.0	355	8.2	13.0	8.7	83
18...	1128	20.0	354	8.2	13.0	8.6	82
18...	1130	30.0	352	8.2	13.0	8.7	83
18...	1133	36.0	354	8.2	13.0	8.7	83
MAY							
24...	1210	1.00	336	8.2	28.0	9.1	118
24...	1213	10.0	357	8.0	24.5	6.5	79
24...	1216	20.0	360	7.9	23.5	5.1	61
24...	1219	30.0	366	7.4	22.0	1.5	17
24...	1221	45.0	371	7.3	21.0	0.2	2
AUG							
20...	1135	1.00	272	8.5	29.5	9.5	127
20...	1137	10.0	275	8.5	29.5	9.3	124
20...	1141	20.0	294	7.7	28.0	4.1	53
20...	1144	35.0	304	7.4	27.0	0	0

323735097274701 - BENBROOK LAKE SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)
MAR											
18...	1157	1.00	356	8.2	14.5	0.90	8.9	88	K3	<1	150
18...	1200	10.0	355	8.2	13.5	--	8.8	85	--	--	--
18...	1204	20.0	354	8.2	13.0	--	8.8	84	--	--	--
18...	1208	30.0	355	8.2	13.0	--	8.6	82	--	--	--
18...	1213	40.0	356	8.1	13.5	--	7.9	77	--	--	150
MAY											
24...	1232	1.00	338	8.2	29.0	1.20	8.8	117	<1	K1	140
24...	1235	10.0	349	8.1	25.0	--	7.0	86	--	--	--
24...	1240	20.0	360	7.8	24.0	--	4.8	58	--	--	--
24...	1245	30.0	367	7.3	22.5	--	0.3	4	--	--	--
24...	1440	40.0	376	7.3	21.0	--	0.2	2	--	--	160
AUG											
20...	1219	1.00	272	8.6	30.0	1.00	9.5	128	K2	K2	93
20...	1224	10.0	271	8.5	28.5	--	9.4	123	--	--	--
20...	1230	20.0	303	7.4	27.5	--	0	0	--	--	--
20...	1235	30.0	307	7.4	27.5	--	0	0	--	--	--
20...	1240	40.0	328	7.2	26.5	--	0	0	--	--	120

TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX--Continued

323735097274701 - BENBROOK LAKE SITE BC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
MAR											
18...	12	50	5.7	14	0.5	4.0	140	25	20	0.30	5.0
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	17	50	5.8	15	0.5	3.9	130	24	19	0.20	5.2
MAY											
24...	10	45	5.8	15	0.6	3.8	130	24	20	0.10	1.2
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	26	54	6.4	18	0.6	4.0	130	28	19	0.20	5.5
AUG											
20...	14	28	5.6	16	0.7	3.8	79	20	18	0.20	5.5
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	2	40	5.7	15	0.6	3.9	120	16	16	0.20	8.4

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
18...	206	0.200	0.010	0.210	0.080	0.62	0.70	0.020	<0.010	6	<1
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	--	--	--	--	--	--	--	--	--	--	--
18...	202	0.190	0.020	0.210	0.160	0.64	0.80	0.100	0.020	12	21
MAY											
24...	190	--	0.020	<0.050	<0.010	--	0.40	0.030	<0.010	6	2
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	0.150	0.020	0.170	0.060	0.44	0.50	0.030	<0.010	<10	10
24...	--	--	--	--	--	--	--	--	--	--	--
24...	217	0.120	0.050	0.170	0.370	0.53	0.90	0.040	0.070	99	540
AUG											
20...	144	--	<0.010	<0.050	0.010	0.49	0.50	0.050	<0.010	6	6
20...	--	--	<0.010	<0.050	0.020	0.58	0.60	0.030	<0.010	<10	530
20...	--	0.580	0.020	0.600	0.080	0.62	0.70	0.040	<0.010	<10	100
20...	--	--	--	--	--	--	--	--	--	--	--
20...	179	--	0.020	<0.050	1.20	0.60	1.8	0.380	0.120	760	770

323628097275101 - BENBROOK LAKE SITE CR

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
18...	1126	1.00	353	8.3	14.5	9.4	93
18...	1229	10.0	356	8.3	13.5	9.1	88
18...	1232	21.0	355	8.1	13.5	8.0	78
MAY							
24...	1453	1.00	334	8.3	28.5	9.3	122
24...	1456	10.0	355	8.2	25.5	7.5	93
24...	1459	20.0	362	7.7	24.5	4.6	56
AUG							
20...	1308	1.00	272	8.5	30.0	9.2	124
20...	1312	10.0	290	7.8	28.0	4.7	61
20...	1315	19.0	304	7.4	27.5	0	0

TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX--Continued

323629097280901 - BENBROOK LAKE SITE CL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
MAR							
18...	1243	1.00	354	8.4	13.5	9.6	93
18...	1246	10.0	356	8.3	13.5	8.7	84
18...	1249	22.0	361	8.1	13.0	7.9	76
MAY							
24...	1507	1.00	338	8.3	27.0	9.5	121
24...	1510	10.0	348	8.1	25.5	7.9	98
24...	1513	19.0	365	7.6	25.0	3.7	46
AUG							
20...	1321	1.00	273	8.5	30.0	9.5	128
20...	1324	10.0	287	8.1	28.5	5.9	77
20...	1327	18.0	303	7.5	28.0	0.8	10

323652097291901 - BENBROOK LAKE SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CaCO3)
MAR											
18...	1303	1.00	370	8.5	14.5	0.70	10.4	103	K2	K2	160
18...	1309	10.0	361	8.3	13.0	--	9.0	86	--	--	--
18...	1313	25.0	368	8.1	13.0	--	8.2	79	--	--	160
MAY											
24...	1527	1.00	335	8.4	28.5	0.90	10.4	137	<1	<1	130
24...	1534	10.0	349	8.1	25.5	--	7.9	98	--	--	--
24...	1539	24.0	381	7.5	25.0	--	2.8	35	--	--	150
AUG											
20...	1341	1.00	294	8.5	31.0	0.50	8.2	112	K8	<4	110
20...	1347	5.00	295	7.8	28.0	--	4.4	57	--	--	--
20...	1353	10.0	300	7.6	28.0	--	2.9	38	--	--	--
20...	1400	15.0	301	7.5	28.0	--	1.9	25	--	--	--
20...	1407	24.0	313	7.4	27.5	--	0	0	--	--	110

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
MAR											
18...	16	53	6.2	17	0.6	3.9	140	26	21	0.20	4.7
18...	--	--	--	--	--	--	--	--	--	--	--
18...	15	52	6.2	17	0.6	3.9	140	25	21	0.30	5.2
MAY											
24...	17	43	5.9	16	0.6	3.9	120	25	21	<0.10	0.90
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	20	52	6.0	16	0.6	3.8	130	27	20	0.30	4.7
AUG											
20...	13	33	5.6	16	0.7	3.8	92	21	22	0.10	6.3
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	8	36	5.6	15	0.6	3.7	100	19	19	0.20	7.0



## TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX--Continued

323652097291901 - BENBROOK LAKE SITE DC--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITRO- GEN, NITRATE (MG/L AS N)	NITRO- GEN, NITRITE (MG/L AS N)	NITRO- GEN, NO2+NO3 (MG/L AS N)	NITRO- GEN, AMMONIA (MG/L AS N)	NITRO- GEN, ORGANIC (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
18...	217	0.200	0.010	0.210	<0.010	--	0.60	0.050	<0.010	<3	<1
18...	--	0.200	0.010	0.210	0.050	0.45	0.50	0.030	<0.010	10	<10
18...	215	0.190	0.020	0.210	0.110	0.49	0.60	0.050	0.010	19	21
MAY											
24...	185	--	0.020	<0.050	0.020	0.48	0.50	0.010	<0.010	4	2
24...	--	--	--	--	--	--	--	--	--	--	--
24...	--	--	--	--	--	--	--	--	--	--	--
24...	211	0.070	0.030	0.100	0.180	0.22	0.40	0.060	0.020	11	74
AUG											
20...	163	--	<0.010	<0.050	0.010	0.49	0.50	0.090	0.010	3	1
20...	--	0.00	0.010	0.010	0.030	0.47	0.50	0.050	<0.010	<10	10
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	<0.010	<0.050	<0.010	--	0.50	0.040	<0.010	10	<10
20...	169	--	0.010	<0.050	0.150	0.75	0.90	0.120	0.020	12	180

08046500 BENBROOK LAKE NEAR BENBROOK, TX—Continued

## Benbrook Lake AC (32385097265601)

## Phytoplankton Analyses October 1990 to September 1991

Date	3-18-91
Time	1044
<hr/>	
<b>TOTAL CELLS/mL</b>	295,693
<b>NUMBER OF SPECIES</b>	26
<b>DEPTH COLLECTED (ft.)</b>	1.5
<hr/>	

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella bodanica</i> var. <i>michiganensis</i>	758
<i>Cyclotella meneghiniana</i>	2,167
<i>Cyclotella ocellata</i>	433
<i>Melosira granulata</i>	6,935
<i>Melosira italica</i>	108
<i>Stephanodiscus astraea</i> var. <i>minutula</i>	217
Order Pennales	
<i>Cocconeis placentula</i> var. <i>euglypta</i>	58
<i>Fragilaria vaucheriae</i>	58
<i>Navicula lanceolata</i>	58
<i>Navicula sanctaerucis</i>	175
<i>Navicula</i> sp.	175
<i>Nitzschia acicularis</i>	58
<i>Nitzschia dissipata</i>	117
<i>Nitzschia</i> sp.	58
<i>Synedra filiformis</i> var. <i>exilis</i>	58
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chamydomonas</i> sp.	4,901
<i>Chlorella ellipsoidea</i>	5,718
<i>Chlorococcum humicola</i>	5,718
<i>Chodatella quadriseta</i>	817
<i>Crucigena tetrapedia</i>	13,069
<i>Tetrastrum staurogeniaeforme</i>	3,267
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown flagellate</i>	3,267
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	142,947
<i>Aphanocapsa elachista</i>	17,154
<i>Aphanothece nidulans</i>	75,966
<i>Aphanothece saxicola</i>	11,436

## Benbrook Lake DC (323652097291901)

## Phytoplankton Analyses October 1990 to September 1991

Date	3-18-91
Time	1304

<b>TOTAL CELLS/mL</b>	651,842
<b>NUMBER OF SPECIES</b>	23
<b>DEPTH COLLECTED (ft.)</b>	1.1

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella bodanica</i> var. <i>michiganensis</i>	3,869
<i>Cyclotella meneghiniana</i>	7,738
<i>Cyclotella ocellata</i>	3,439
<i>Melosira granulata</i>	15,692
<i>Stephanodiscus astraea</i> var. <i>minutula</i>	1,935
Order Pennales	
<i>Cocconeis placentula</i> var. <i>euglypta</i>	4,524
<i>Navicula lanceolata</i>	503
<i>Navicula sanctaecrucis</i>	1,508
<b>CHLOROPHYTA (Green algae)</b>	
<i>Ankistrodesmus falcatus</i>	3,267
<i>Chlamydomonas</i> sp.	4,901
<i>Chlorococcum humicola</i>	1,634
<i>Chodatella quadriseta</i>	3,267
<i>Scenedesmus quadricauda</i> var. <i>longispina</i>	11,436
<i>Selenastrum minutum</i>	1,634
<i>Sphaerocystis Schroeteri</i>	9,802
<i>Tetraëdron caudatum</i>	1,634
<i>Tetraëdron minimum</i>	1,634
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	297,331
<i>Aphanocapsa elachista</i>	26,139
<i>Aphanothece nidulans</i>	204,211
<i>Chroococcus</i> sp.	37,575
<b>EUGLENOPHYTA (Euglenoids)</b>	
<i>Euglena</i> sp.	1,634
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Chroomonas</i> sp.	6,535

08046500 BENBROOK LAKE NEAR BENBROOK, TX—Continued

## Benbrook Lake AC (323858097265601)

## Phytoplankton Analyses October 1990 to September 1991

Date	5-24-91
Time	1128

TOTAL CELLS/mL	338,174
NUMBER OF SPECIES	17
DEPTH COLLECTED (ft.)	2.2

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Aulacoseira distans</i>	2,042
<i>Cyclotella meneghiniana</i>	1,100
<i>Cyclotella ocellata</i>	2,985
<i>Cyclotella operculata</i>	2,042
<b>CHLOROPHYTA (Green algae)</b>	
<i>Ankistrodesmus falcatus</i> var. <i>mirabilis</i>	1,634
<i>Chlamydomonas</i> sp.	3,267
<i>Chlorella ellipsoidea</i>	4,901
<i>Chlorococcum humicola</i>	8,168
<i>Micratinium pusillum</i>	6,535
<i>Oocystis pusilla</i>	1,634
<i>Pediastrum duplex</i> var. <i>gracilimum</i>	6,535
<i>Selenastrum minutum</i>	4,901
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	259,756
<i>Chroococcus dispersus</i>	21,238
<i>Oscillatoria</i> sp.	3,267
<i>Synechococcus</i> sp.	6,535
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	1,634

## TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX—Continued

Benbrook Lake DC (323652097291901)

Phytoplankton Analyses October 1990 to September 1991

Date	5-24-91
Time	1530

TOTAL CELLS/mL	338,170
NUMBER OF SPECIES	18
DEPTH COLLECTED (ft.)	1.4

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Aulacoseira distans</i>	942
<i>Aulacoseira italica</i>	90
<i>Cyclotella meneghiniana</i>	628
<i>Cyclotella ocellata</i>	808
<i>Cyclotella operculata</i>	5,430
<i>Stephanodiscus astraea</i>	269
Order Pennals	
<i>Cocconeis pediculus</i>	1,634
<b>CHLOROPHYTA (Green algae)</b>	
<i>Ankistrodesmus falcatus</i> var. <i>mirabilis</i>	1,634
<i>Chlamydomonas</i> sp.	3,267
<i>Chlorella ellipsoidea</i>	1,634
<i>Chlorococcum humicola</i>	14,703
<i>Oocystis pusilla</i>	3,267
<i>Pediastrum obtusum</i>	8,168
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown flagellate</i>	1,634
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	267,924
<i>Chroococcus</i> sp.	3,267
<i>Oscillatoria angustissima</i>	3,267
<i>Synechococcus</i> sp.	19,604



08046500 BENBROOK LAKE NEAR BENBROOK, TX—Continued

## Benbrook Lake AC (323858097265601)

## Phytoplankton Analyses October 1990 to September 1991

Date	8-20-91
Time	1044

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<b>TOTAL CELLS/mL</b>	119,307
<b>NUMBER OF SPECIES</b>	14
<b>DEPTH COLLECTED (ft.)</b>	1.9

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<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Stephanodiscus hantzschia</i>	451
<b>CHLOROPHYTA (Green algae)</b>	
<i>Golenkinia</i> sp. 1	225
<i>Scenedesmus bijuga</i>	451
<i>Staurastrum</i> sp. 1	225
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Anabaena helicoidea</i>	4,958
<i>Anabaena</i> sp. 1	22,312
<i>Anabaena</i> sp. 2	15,776
<i>Aphanocapsa elachista</i> var. <i>planctonica</i>	33,131
<i>Cylindrospermum stagnale</i>	15,100
<i>Dactylococcopsis raphidoides</i>	8,339
<i>Lyngbya limnetica</i>	3,155
<i>Oscillatoria subbrevis</i>	7,296
<i>Raphidiopsis curvata</i>	2,479
<i>Synechococcus aeruginosus</i>	5,409

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## TRINITY RIVER BASIN

08046500 BENBROOK LAKE NEAR BENBROOK, TX—Continued

Benbrook Lake DC (323652097291901)

Phytoplankton Analyses October 1990 to September 1991

Date	8-20-91
Time	1343

<b>TOTAL CELLS/mL</b>	132,221
<b>NUMBER OF SPECIES</b>	19
<b>DEPTH COLLECTED (ft.)</b>	1.0

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella ocellata</i>	264
<i>Aulacoseira granulata</i>	1,058
<i>Stephanodiscus hantzschia</i>	529
Order Pennales	
<i>Synedra ulna</i>	529
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella vulgaris</i>	10,578
<i>Dictyosphaerium pulchellum</i>	1,587
<i>Haematococcus lacustris</i>	793
<i>Scenedesmus bijuga</i>	2,116
<i>Unknown chlorophyta sp. 1</i>	1,322
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Anabaena helicoidea</i>	11,371
<i>Anabaena sp. 1</i>	26,973
<i>Anabaena sp. 2</i>	2,644
<i>Aphanocapsa elachista</i> var. <i>planctonica</i>	35,171
<i>Cylindrospermum stagnale</i>	13,751
<i>Dactylococcopsis raphiodes</i>	4,231
<i>Lyngbya limnetica</i>	5,553
<i>Merismopedia elegans</i>	12,164
<i>Raphidiopsis curvata</i>	1,058
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas ovata</i>	529

TRINITY RIVER BASIN

225

08047000 CLEAR FORK TRINITY RIVER NEAR BENBROOK, TX

LOCATION.--Lat 32°39'54", long 97°26'30", Tarrant County, Hydrologic Unit 12030102, on left bank 1.5 mi downstream from Benbrook Dam, 1.7 mi southeast of Benbrook, 2.9 mi upstream from Marys Creek, and 13.1 mi upstream from mouth.

DRAINAGE AREA.--431 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1947 to current year.

REVISED RECORDS.--WDR TX-89-1: 1988.

GAGE.--Water-stage recorder. Datum of gage is 604.22 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--No estimated daily discharges. Records good. Flow regulated by Benbrook Lake (station 08046500), 1.5 mi upstream, since September 1952. There is a diversion 1.0 mi upstream for Pecan Valley Golf Course. Gage-height telemeter at station.

AVERAGE DISCHARGE.--5 years (water years 1948-52) prior to regulation by Benbrook Lake, 105 ft<sup>3</sup>/s (76,070 acre-ft/yr); 39 years (water years 1953-91) regulated, unadjusted, 77.6 ft<sup>3</sup>/s (56,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 82,900 ft<sup>3</sup>/s May 17, 1949 (gage height, 28.72 ft), from rating curve extended above 11,000 ft<sup>3</sup>/s on basis of velocity-area studies and slope-area measurement of 82,900 ft<sup>3</sup>/s; no flow at times most years. Maximum discharge since construction of Benbrook Dam in 1952, 6,740 ft<sup>3</sup>/s May 3, 1990 (gage height, 14.71 ft).  
Maximum stage since at least 1922, that of May 17, 1949.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 805 ft<sup>3</sup>/s Apr. 11 at 2245 hours (gage height, 5.49 ft); minimum daily, 1.3 ft<sup>3</sup>/s Feb. 19-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	9.6	9.0	4.6	3.3	1.9	4.4	29	358	26	25	79
2	41	9.8	9.6	4.3	3.4	2.1	4.2	30	172	20	25	87
3	42	9.6	9.2	4.1	3.7	2.1	12	68	49	23	25	75
4	41	12	9.3	4.1	7.0	1.7	27	163	185	23	25	75
5	42	9.7	9.3	4.1	2.9	2.3	16	116	293	23	25	55
6	43	10	9.5	4.6	2.4	2.3	4.9	32	292	21	25	41
7	43	9.9	9.4	3.7	2.2	1.7	5.1	32	292	21	25	47
8	53	21	9.4	3.7	2.1	2.0	4.8	40	292	21	25	44
9	33	9.2	9.1	6.8	2.0	5.3	5.0	195	291	20	26	43
10	16	8.7	8.7	5.7	2.0	10	5.2	288	289	22	26	43
11	13	8.4	8.0	3.7	2.0	7.6	39	281	289	27	29	43
12	11	8.9	7.5	3.5	2.0	4.1	17	282	287	27	85	41
13	11	8.6	7.6	3.5	2.0	3.7	12	140	200	27	22	42
14	11	8.8	7.7	3.2	1.9	3.7	11	40	96	27	39	42
15	11	9.1	7.7	3.0	1.9	4.4	11	40	73	26	22	41
16	11	9.3	7.9	2.8	1.9	4.5	13	39	72	26	21	53
17	12	10	8.3	2.9	1.8	4.2	20	39	115	26	23	34
18	11	10	8.2	6.0	1.6	3.7	11	40	153	26	26	48
19	9.8	10	7.9	5.8	1.3	3.5	136	42	152	26	27	35
20	9.4	9.4	7.8	3.3	1.3	3.9	222	41	98	27	26	32
21	9.9	10	7.0	3.3	1.9	4.1	221	42	44	27	27	23
22	9.3	13	7.5	3.2	3.1	4.7	229	65	45	27	28	22
23	6.4	8.7	7.4	3.0	2.0	4.9	225	82	45	27	28	25
24	6.3	7.0	7.5	2.2	1.8	4.3	227	101	44	27	28	28
25	6.7	8.8	7.3	3.1	1.8	4.3	228	60	39	28	29	29
26	6.8	9.2	6.9	3.4	1.6	3.8	229	234	29	34	44	29
27	6.5	9.6	6.5	3.3	1.8	5.9	226	359	29	29	87	29
28	7.3	9.1	5.5	3.3	2.0	4.2	108	356	29	35	83	28
29	8.0	10	6.3	3.1	---	4.3	31	356	28	27	77	29
30	8.6	9.2	5.1	3.7	---	4.3	30	357	28	26	78	30
31	8.9	---	4.9	3.5	---	4.7	---	359	---	26	79	---
TOTAL	588.9	296.6	243.0	118.5	64.7	124.2	2334.6	4348	4408	798	1160	1272
MEAN	19.0	9.89	7.84	3.82	2.31	4.01	77.8	140	147	25.7	37.4	42.4
MAX	53	21	9.6	6.8	7.0	10	229	359	358	35	87	87
MIN	6.3	7.0	4.9	2.2	1.3	1.7	4.2	29	28	20	21	22
AC-FT	1170	588	482	235	128	246	4630	8620	8740	1580	2300	2520
CAL YR 1990	TOTAL	118846.9	MEAN	326	MAX	6320	MIN	4.9	AC-FT	235700		
WTR YR 1991	TOTAL	15756.5	MEAN	43.2	MAX	359	MIN	1.3	AC-FT	31250		

## TRINITY RIVER BASIN

08047000 CLEAR FORK TRINITY RIVER NEAR BENBROOK, TX--Continued

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CaCO3)	
MAR 18...	1405	3.0	350	8.2	15.5	13	14	11.3	114	0.7	150	
MAY 24...	1625	101	365	7.5	21.0	14	5.4	4.8	55	1.3	150	
AUG 20...	1125	26	377	7.7	25.0	7	2.0	5.0	62	2.3	150	
DATE		HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CaCO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
MAR 18...	18	49	5.7	15	0.5	3.7	130	24	20	0.20	5.1	
MAY 24...	16	51	5.7	14	0.5	3.5	130	20	26	0.30	4.9	
AUG 20...	3	50	5.9	15	0.5	3.8	150	10	20	0.30	9.4	
DATE		SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
MAR 18...	200	18	8	10	0.210	0.010	0.220	0.110	0.49	0.60	0.040	
MAY 24...	207	26	7	19	0.310	0.040	0.350	0.180	0.72	0.90	0.060	
AUG 20...	204	<1	<1	--	--	0.010	<0.050	1.40	0.90	2.3	0.330	
DATE		PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
MAR 18...	0.020	4.8	<1	51	<0.5	<1.0	<5	<3	<10	9	<10	
MAY 24...	0.060	4.2	3	49	<0.5	<1.0	<5	<3	<10	11	<10	
AUG 20...	0.230	5.2	6	63	0.6	2.0	<5	<3	<10	5	<10	
DATE		LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)	
MAR 18...	6	3	<0.1	<10	<10	<1	<1.0	290	<6	9		
MAY 24...	5	130	<0.1	<10	<10	<1	<1.0	300	<6	10		
AUG 20...	6	560	0.2	<10	<10	<1	<1.0	320	<6	<3		

TRINITY RIVER BASIN

227

08047500 CLEAR FORK TRINITY RIVER AT FORT WORTH, TX

LOCATION.--Lat 32°43'56", long 97°21'31", Tarrant County, Hydrologic Unit 12030102, at Fort Worth pumping station on left bank, 240 ft upstream from the Texas and Pacific Railway Co. bridge in Fort Worth, 830 ft upstream from East West Expressway bridge, 2.5 mi upstream from mouth, 5 mi downstream from Marys Creek, and 10 mi downstream from Benbrook Dam.

DRAINAGE AREA.--518 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1924 to current year.

REVISED RECORDS.--WSP 1392: 1924-25, 1927. WSP 1922: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 532.91 ft above National Geodetic Vertical Datum of 1929. Prior to Apr. 3, 1970, various nonrecording and recording gages were located within 650 ft of present site at different datums.

REMARKS.--No estimated daily discharges. Records good. Since September 1952, flow largely regulated by Benbrook Lake (station 08046500). The city of Fort Worth diverted water from pool at gage during the current year. The Benbrook Water and Sewage Authority diverted water from the river upstream from station during current year for municipal use. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--28 years (water years 1925-52) prior to regulation by Benbrook Lake, 112 ft<sup>3</sup>/s (81,140 acre-ft/yr); 39 years (water years 1953-91) regulated, unadjusted, 114 ft<sup>3</sup>/s (82,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 107,000 ft<sup>3</sup>/s May 17, 1949 (gage height, 28.20 ft, present datum), from rating curve extended above 16,000 ft<sup>3</sup>/s on basis of contracted-opening measurement of 107,000 ft<sup>3</sup>/s; no flow at times most years.  
Maximum stage since at least 1900, 28.20 ft May 17, 1949, present datum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 25, 1922, reached a stage of 27.5 ft, present datum (discharge, 74,300 ft<sup>3</sup>/s, by slope-area measurement of peak flow); data furnished by Fort Worth city engineer.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,460 ft<sup>3</sup>/s Apr. 11 at 2330 hours (gage height, 13.48 ft, from rating curve extended above 7,000 ft<sup>3</sup>/s by calculations using equation for flow over ogee-shaped broad-crested concrete weir); minimum daily, 3.6 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	11	13	25	20	23	13	37	297	26	32	32
2	5.6	12	19	23	18	18	11	39	282	20	31	86
3	14	22	21	22	16	15	12	51	401	198	24	45
4	14	188	13	23	214	14	32	180	159	44	22	25
5	9.9	40	12	27	63	12	45	143	249	33	22	34
6	6.5	18	12	53	35	11	25	40	255	29	20	37
7	5.7	14	11	32	26	9.6	19	37	376	21	21	193
8	280	431	11	23	23	10	18	331	254	18	20	61
9	362	90	11	118	20	9.8	16	137	237	18	21	38
10	64	40	11	107	18	9.4	15	237	237	16	32	36
11	48	22	14	40	18	14	486	237	237	18	33	35
12	29	18	15	31	16	12	473	237	237	23	822	34
13	24	23	14	27	16	9.2	120	160	185	23	95	34
14	21	21	14	27	15	7.4	48	172	91	21	613	35
15	20	16	13	28	14	13	33	63	86	21	66	33
16	20	15	15	15	16	18	27	41	112	20	44	152
17	19	14	16	20	12	35	306	38	81	19	38	69
18	20	13	31	112	12	19	84	38	111	19	36	234
19	19	13	28	95	11	15	99	86	111	19	35	77
20	17	12	20	36	10	14	200	85	90	18	29	42
21	17	12	13	31	12	15	196	62	37	20	30	37
22	19	104	10	27	76	17	188	52	36	19	33	34
23	18	41	11	24	23	16	187	60	173	19	32	33
24	14	17	12	24	16	16	233	482	41	18	30	34
25	12	13	13	25	12	15	223	471	39	19	28	34
26	12	13	20	25	11	13	200	202	31	145	28	32
27	11	20	34	18	11	85	200	331	29	48	34	31
28	9.1	19	24	20	10	24	241	313	27	285	25	31
29	10	15	52	13	---	17	50	303	25	44	20	30
30	11	13	32	33	---	14	41	297	27	37	51	29
31	11	---	28	30	---	13	---	297	---	33	24	---
TOTAL	1146.4	1300	563	1154	764	533.4	3841	5259	4553	1311	2391	1657
MEAN	37.0	43.3	18.2	37.2	27.3	17.2	128	170	152	42.3	77.1	55.2
MAX	362	431	52	118	214	85	486	482	401	285	822	234
MIN	3.6	11	10	13	10	7.4	11	37	25	16	20	25
AC-FT	2270	2580	1120	2290	1520	1060	7620	10430	9030	2600	4740	3290
CAL YR 1990	TOTAL	178341.8	MEAN	489	MAX	11000	MIN	2.7	AC-FT	353700		
WTR YR 1991	TOTAL	24472.8	MEAN	67.0	MAX	822	MIN	3.6	AC-FT	48540		



## TRINITY RIVER MAIN STEM

08048000 WEST FORK TRINITY RIVER AT FORT WORTH, TX

LOCATION.--Lat 32°45'39", long 97°19'56", Tarrant County, Hydrologic Unit 12030102, on left bank 125 ft upstream from Texas Electric Service Co.'s concrete dam, 980 ft downstream from centerline of Paddock Viaduct (North Main Street) at Fort Worth, 2,600 ft downstream from Clear Fork Trinity River, and at mile 556.8.

DRAINAGE AREA.--2,615 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1920 to current year. Gage-height records collected in this vicinity since 1910 are contained in reports of the National Weather Service.

Water-quality records.--Chemical and biochemical analyses: October 1967 to September 1976.

REVISED RECORDS.--WSP 1392: 1925. WSP 1922: Drainage area.

GAGE.--Water-stage recorder and concrete dam control with angle-iron-crested notch for flow below 50 ft<sup>3</sup>/s. Datum of gage is 519.24 ft above Texas Reclamation Department datum. Prior to Aug. 22, 1954, at site 1,200 ft upstream at same datum. Aug. 22, 1954, to Oct. 15, 1955, at site 2,000 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow is largely regulated by Lake Worth (station 08045400) on the West Fork Trinity River and by Benbrook Lake (station 08046500) on the Clear Fork Trinity River. At times, flow is sustained by releases from the flood-detention pool of Benbrook Lake. The city of Fort Worth diverts water from river upstream from station and from Cedar Creek Reservoir (station 08063010) for municipal and industrial uses and returns sewage effluent to river downstream from station 08048543. There are many small diversions upstream from station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--71 years, 395 ft<sup>3</sup>/s (286,200 acre-ft/yr, unadjusted).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 85,000 ft<sup>3</sup>/s Apr. 25, 1922 (gage height, 23.95 ft), site then in use, by slope-area measurement of peak flow by city engineer of Fort Worth; maximum gage height, 25.91 ft May 17, 1949, site then in use (discharge, 64,300 ft<sup>3</sup>/s); no flow at times. Maximum stage since at least 1866, that of May 17, 1949.

Maximum stages have been affected by levee construction, levee breaks, and channel rectification.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,630 ft<sup>3</sup>/s Apr. 11 at 2400 hours (gage height, 4.84 ft); minimum daily, 9.9 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	21	21	23	29	44	18	41	326	35	32	186
2	11	20	34	22	26	44	17	44	386	32	29	168
3	29	27	37	21	25	35	18	66	662	335	27	101
4	37	362	24	23	344	31	24	235	222	63	23	37
5	25	45	21	29	108	26	42	184	313	36	23	42
6	19	26	19	90	48	23	33	50	300	33	21	46
7	17	20	19	40	39	21	24	38	714	27	18	273
8	289	770	19	30	38	20	21	589	728	23	18	153
9	750	188	19	196	37	20	18	162	710	19	18	50
10	58	51	19	218	39	19	17	287	647	18	32	45
11	41	34	20	42	49	21	310	274	636	18	38	43
12	33	27	20	33	41	24	1150	269	679	21	1590	40
13	28	31	19	30	33	26	188	207	665	22	280	38
14	26	31	19	28	29	22	69	331	413	23	930	37
15	25	28	20	33	26	23	43	117	263	23	121	36
16	26	27	26	23	26	28	42	120	180	22	65	188
17	26	25	27	24	25	69	359	124	132	21	51	165
18	27	24	38	195	23	32	157	85	173	20	46	375
19	28	24	30	175	22	27	117	120	166	20	46	195
20	31	24	24	71	21	25	244	173	143	18	40	59
21	32	24	22	44	26	24	236	159	51	20	48	44
22	35	183	18	35	169	24	232	124	47	20	55	37
23	33	54	17	29	39	21	226	121	399	20	42	36
24	29	28	17	28	31	23	284	674	58	18	37	36
25	23	23	20	28	25	24	293	989	50	19	34	37
26	21	22	26	31	25	25	238	814	41	217	36	34
27	22	32	41	28	25	126	231	726	35	76	45	33
28	21	33	30	26	25	37	352	527	35	483	35	32
29	21	25	78	26	---	26	76	392	34	63	33	32
30	20	22	35	53	---	21	47	346	36	44	177	32
31	21	---	26	43	---	20	---	331	---	36	42	---
TOTAL	1813.9	2251	805	1717	1393	951	5126	8719	9244	1845	4032	2630
MEAN	58.5	75.0	26.0	55.4	49.7	30.7	171	281	308	59.5	130	87.7
MAX	750	770	78	218	344	126	1150	989	728	483	1590	375
MIN	9.9	20	17	21	21	19	17	38	34	18	18	32
AC-FT	3600	4460	1600	3410	2760	1890	10170	17290	18340	3660	8000	5220
CAL YR 1990	TOTAL	667331.9	MEAN	1828	MAX	31900	MIN	9.9	AC-FT	1324000		
WTR YR 1991	TOTAL	40526.9	MEAN	111	MAX	1590	MIN	9.9	AC-FT	80390		

TRINITY RIVER MAIN STEM

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08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX

LOCATION.--Lat 32°45'06", long 97°17'21", Tarrant County, Hydrologic Unit 12030102, at downstream side of bridge on Beach Street, 1,700 ft downstream from Sycamore Creek, 0.9 mi downstream from Riverside Drive bridge, 2.6 mi east of the Tarrant County Courthouse, and at mile 549.6.

DRAINAGE AREA.--2,685 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 478.70 ft above National Geodetic Vertical Datum of 1929, State Department of Highways and Public Transportation datum.

REMARKS.--No estimated daily discharges. Records good. Flow is largely regulated by Lake Worth (station 08045400) on the West Fork Trinity River and by Benbrook Lake (station 08046500) on the Clear Fork Trinity River. At times, flow is sustained by releases from the flood-detention pool of Benbrook Lake. There are many diversions upstream from this station for municipal, industrial, and other uses. Gage-height telemeter at station.

AVERAGE DISCHARGE.--15 years, 532 ft<sup>3</sup>/s (385,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 46,600 ft<sup>3</sup>/s May 2, 1990 (gage height, 38.02 ft); minimum, 0.84 ft<sup>3</sup>/s July 25, 1977.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1866 probably occurred in May 1949 (stage and discharge unknown). Maximum stages have been affected by levee construction, levee breaks, and channel rectification.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,210 ft<sup>3</sup>/s Apr. 12 at 0200 hours (gage height, 20.16 ft); minimum daily, 9.1 ft<sup>3</sup>/s Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	15	31	49	59	55	24	80	369	33	44	514
2	9.1	15	69	42	45	64	22	71	405	33	36	506
3	24	23	74	40	35	59	21	113	1200	590	31	302
4	33	684	52	42	796	50	21	231	259	181	28	110
5	31	131	37	52	323	41	36	311	349	63	25	121
6	21	68	33	205	118	34	48	112	328	50	24	79
7	15	48	32	120	89	32	39	68	992	40	21	406
8	356	1560	30	75	74	29	30	1220	921	33	20	375
9	1910	608	29	327	58	27	26	197	875	26	19	100
10	147	125	28	678	54	25	24	323	780	22	27	83
11	96	84	28	138	54	24	293	314	758	21	39	75
12	72	64	29	86	56	26	2590	299	809	20	3240	68
13	55	51	29	68	55	30	572	277	818	23	1160	62
14	43	47	28	57	50	32	201	1260	514	25	1860	61
15	36	44	28	63	45	42	90	407	332	26	254	57
16	32	39	37	61	42	44	67	155	306	25	110	220
17	31	36	42	46	41	99	719	170	163	24	79	305
18	30	32	67	438	39	66	459	128	191	22	67	763
19	29	30	55	502	35	47	177	159	184	26	59	507
20	30	28	42	140	33	36	280	269	169	19	60	152
21	33	29	35	108	54	30	278	224	92	19	63	93
22	37	443	29	78	416	30	273	176	67	19	68	76
23	37	152	31	66	93	28	268	143	827	21	56	74
24	34	74	31	56	64	25	306	916	104	22	46	59
25	27	48	33	50	49	24	431	2200	74	21	41	61
26	20	35	62	47	42	22	273	1070	64	328	36	56
27	18	51	78	45	37	333	261	955	50	170	40	51
28	17	55	60	45	35	87	1430	684	41	964	43	49
29	16	44	152	40	---	54	240	490	36	161	34	46
30	16	35	96	68	---	37	107	412	34	77	248	49
31	15	---	62	82	---	29	---	383	---	56	101	---
TOTAL	3279.4	4698	1469	3914	2891	1561	9606	13817	12111	3160	7979	5480
MEAN	106	157	47.4	126	103	50.4	320	446	404	102	257	183
MAX	1910	1560	152	678	796	333	2590	2200	1200	964	3240	763
MIN	9.1	15	28	40	33	22	21	68	34	19	19	46
AC-FT	6500	9320	2910	7760	5730	3100	19050	27410	24020	6270	15830	10870
CAL YR 1990	TOTAL	710744.7	MEAN	1947	MAX	35200	MIN	8.8	AC-FT	1410000		
WTR YR 1991	TOTAL	69965.4	MEAN	192	MAX	3240	MIN	9.1	AC-FT	138800		

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1976 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1976 to current year.  
 pH: October 1976 to current year.  
 WATER TEMPERATURE: October 1976 to current year.  
 DISSOLVED OXYGEN: October 1976 to current year.

INSTRUMENTATION.--Since October 1976, a four-parameter water-quality monitor records temperature, DO, pH, and specific conductance continuously at this station. Since the 1990 water year, the satellite downlink was extended to include water-quality parameters such that unit-values can be accessed on a timely basis.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument, pump, or power failure. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request. Dissolved oxygen values bypassing saturation can be attributed to algae blooms in close proximity to the well intake.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 2,000 microsiemens Nov. 6, 1978; minimum, 98 microsiemens Aug. 12, 1991.  
 pH: Maximum, 9.8 units Aug. 8, Sept. 2, 1980; minimum, 6.6 units Aug. 15, 1987.  
 WATER TEMPERATURE: Maximum, 38.0°C July 14, 16, 1978, Aug. 20, 1991; minimum, 0.0°C Jan. 31, Feb. 1, 2, 1985.  
 DISSOLVED OXYGEN: Maximum, 22.1 mg/L Oct. 4, 1983; minimum, 0.0 mg/L on many days during winter months.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 838 microsiemens Dec. 18; minimum, 98 microsiemens Aug. 12.  
 pH: Maximum, 9.2 units Aug. 18; minimum, 7.4 units Oct. 9, 10, Feb. 4, 6, Sep. 17.  
 WATER TEMPERATURE: Maximum, 38.0°C Aug. 20; minimum, 0.5°C Dec. 22-24.  
 DISSOLVED OXYGEN: Maximum, 16.2 mg/L July 30; minimum, 2.8 mg/L Aug. 22.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCTANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL AS CaCO3 (MG/L)	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)
NOV 09...	1320	215	286	7.8	13.0	9.8	94	3.2	110	20
JAN 11...	1310	130	511	8.0	7.0	12.7	105	2.6	200	34
MAR 28...	1435	75	532	8.2	20.0	9.9	112	4.4	210	35
JUN 06...	1415	374	376	8.2	29.0	8.5	113	1.7	160	24
JUL 15...	1505	26	437	8.3	34.0	9.2	133	3.4	160	24
SEP 10...	1055	83	394	7.8	28.0	6.9	89	2.6	150	12

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CaCO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
NOV 09...	39	3.1	13	0.5	3.9	90	26	15	0.30	4.3
JAN 11...	69	5.8	26	0.8	5.4	160	53	30	0.30	6.2
MAR 28...	72	6.3	30	0.9	3.8	170	56	38	0.40	4.6
JUN 06...	56	5.4	16	0.5	3.6	140	29	18	0.10	5.4
JUL 15...	52	6.2	30	1	4.6	130	39	35	0.30	5.8
SEP 10...	52	4.6	21	0.7	4.5	140	33	21	0.30	7.0

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 09...	159	0.670	0.030	0.700	0.070	0.83	0.90	0.090	0.060
JAN 11...	293	0.960	0.040	1.00	0.300	0.80	1.1	0.180	0.060
MAR 28...	314	0.370	0.050	0.420	0.060	0.84	0.90	0.140	0.030
JUN 06...	216	0.380	0.050	0.430	0.050	0.85	0.90	0.040	0.040
JUL 15...	251	--	<0.010	<0.050	0.020	0.88	0.90	0.060	<0.010
SEP 10...	226	0.300	0.070	0.370	0.050	0.35	0.40	0.090	<0.010

TRINITY RIVER MAIN STEM

08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	3279.4	310	176	1550	20	181	25	218	120
NOV. 1990	4698	383	217	2750	26	331	32	408	140
DEC. 1990	1469	577	329	1300	45	177	60	238	200
JAN. 1991	3914	499	284	3000	37	390	48	508	170
FEB. 1991	2891	511	290	2270	38	297	50	388	180
MAR. 1991	1561	571	325	1370	44	187	59	250	190
APR. 1991	9606	337	191	4950	23	585	27	712	120
MAY 1991	13817	371	210	7840	25	938	31	1150	140
JUNE 1991	12111	375	212	6950	25	832	31	1020	140
JULY 1991	3160	350	198	1690	23	199	28	242	130
AUG. 1991	7979	267	151	3250	17	364	20	422	100
SEPT 1991	5480	345	195	2890	23	340	28	411	130
TOTAL	69965.4	**	**	39800	**	4820	**	5970	**
WTD.AVG.	192	372	211	**	26	**	32	**	140

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	538	495	518	528	504	518	481	467	474	598	578	588
2	553	517	534	530	514	522	481	419	461	636	598	614
3	557	509	535	550	520	535	697	434	514	641	621	632
4	627	479	547	540	292	391	482	463	474	684	627	642
5	477	468	472	404	364	382	497	479	486	757	661	715
6	492	470	481	438	406	428	524	494	504	643	460	528
7	510	492	499	452	440	446	574	521	543	577	541	564
8	532	126	461	---	---	e368	654	579	624	584	566	576
9	---	---	e240	---	---	e335	642	588	605	583	293	513
10	---	---	e260	322	294	308	606	582	591	470	403	435
11	---	---	e300	349	324	342	605	571	586	526	472	503
12	---	---	e330	375	349	365	580	553	565	538	528	534
13	---	---	e360	413	375	395	599	552	566	536	526	529
14	---	---	e380	412	398	406	614	586	600	580	534	559
15	---	---	e410	428	412	418	624	599	609	580	560	573
16	---	---	e390	452	424	437	620	605	612	562	432	532
17	---	---	e400	465	446	457	817	606	712	590	560	570
18	---	---	e410	475	453	460	838	567	637	606	334	452
19	---	---	e420	471	444	460	764	563	614	474	338	415
20	---	---	e440	467	438	452	574	558	565	506	474	491
21	---	---	e380	482	436	456	614	570	587	508	484	495
22	---	---	e400	496	255	391	638	612	622	514	502	507
23	---	---	e425	401	346	375	663	642	654	538	504	520
24	437	414	422	430	401	419	704	653	674	556	522	539
25	442	422	430	457	427	444	676	628	643	580	534	561
26	466	436	446	475	451	460	647	566	619	592	554	577
27	478	458	467	502	446	476	718	523	614	582	558	568
28	482	462	472	669	448	531	626	595	606	594	560	575
29	494	472	481	462	448	454	826	434	568	600	582	591
30	502	488	496	474	460	465	563	527	544	652	530	585
31	524	502	513	---	---	---	581	563	574	718	518	575
MONTH	627	126	430	669	255	430	838	419	582	757	293	550

e Estimated

## TRINITY RIVER MAIN STEM

08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	562	540	555	630	588	605	631	610	622	440	409	426
2	621	559	590	612	572	594	641	629	635	472	426	445
3	718	579	636	603	577	591	641	600	623	565	448	478
4	---	---	e460	599	581	592	614	604	610	472	396	445
5	---	---	e430	611	585	599	615	597	611	454	440	448
6	---	---	e508	627	601	615	603	577	593	464	442	454
7	604	480	512	648	623	630	600	584	593	467	459	463
8	640	549	583	652	638	647	598	574	590	461	151	324
9	569	549	561	662	636	647	596	570	587	415	379	402
10	604	561	583	668	646	658	616	578	597	371	343	355
11	580	564	573	672	640	660	622	556	608	409	379	399
12	572	562	568	664	644	656	---	---	e250	416	408	411
13	580	564	574	669	641	656	---	---	e270	414	408	412
14	608	576	589	651	639	646	---	---	e360	482	113	359
15	602	584	592	681	641	656	---	---	e470	415	255	341
16	616	598	610	667	629	650	---	---	e550	447	391	420
17	622	594	608	631	492	583	---	---	e280	421	387	404
18	604	592	598	616	596	607	---	---	e306	494	415	441
19	628	596	611	620	604	611	---	---	e336	459	319	421
20	622	610	616	634	614	626	---	---	e360	442	390	414
21	628	344	589	638	618	631	---	---	e390	473	424	440
22	540	320	466	658	626	637	---	---	e400	477	442	456
23	554	534	546	647	617	635	426	404	413	450	429	442
24	568	552	561	---	---	e645	428	326	415	443	152	371
25	602	570	590	---	---	e650	416	359	387	324	257	291
26	612	600	608	---	---	e652	403	383	390	401	249	341
27	614	606	611	---	---	e435	411	401	407	406	385	395
28	618	606	613	---	---	e502	411	112	325	412	406	408
29	---	---	---	566	531	550	375	317	343	416	408	411
30	---	---	---	604	568	588	431	379	412	422	408	413
31	---	---	---	620	601	606	---	---	---	414	403	410
MONTH	718	320	569	681	492	615	641	112	458	565	113	408

e Estimated

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	411	403	407	427	407	414	350	323	339	423	127	278
2	445	359	405	433	417	425	356	330	346	387	138	313
3	367	281	336	445	130	361	368	350	357	323	241	287
4	363	325	346	348	271	315	372	354	360	383	317	361
5	388	326	346	376	342	359	392	363	376	395	277	371
6	390	376	381	362	330	347	412	384	395	425	384	404
7	388	160	322	362	340	348	423	394	409	430	220	375
8	387	275	316	378	348	366	441	413	421	382	300	343
9	407	395	403	406	376	389	428	407	418	406	384	394
10	411	404	408	---	---	e390	489	424	443	405	355	384
11	410	406	408	---	---	e394	439	403	424	390	350	372
12	410	406	408	---	---	e398	411	98	243	410	373	392
13	410	399	405	413	389	402	304	168	239	410	381	399
14	417	401	406	428	392	407	297	142	227	441	408	421
15	452	407	419	447	413	425	325	256	292	434	417	425
16	430	238	392	425	413	418	343	320	334	456	169	391
17	430	400	417	446	421	428	361	343	350	377	312	358
18	418	360	397	464	432	446	442	359	378	391	149	324
19	399	367	380	458	438	445	467	320	389	361	258	309
20	405	369	387	478	452	462	359	320	342	389	345	368
21	411	375	398	472	452	460	430	351	387	398	383	391
22	420	404	412	477	458	465	700	359	458	407	384	393
23	429	207	332	485	457	470	424	375	400	412	379	391
24	392	361	378	548	459	467	417	377	396	403	390	396
25	393	344	372	504	467	491	427	381	406	433	396	417
26	369	352	362	512	251	413	436	403	421	425	389	406
27	378	360	369	409	298	381	438	416	426	424	389	411
28	391	370	380	368	192	288	436	411	425	450	406	435
29	409	391	397	360	208	334	460	432	447	458	435	444
30	415	401	408	352	316	334	472	189	385	460	428	441
31	---	---	---	359	318	345	433	395	419	---	---	---
MONTH	452	160	383	548	130	400	700	98	376	460	127	380

e Estimated



TRINITY RIVER MAIN STEM

08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.3	7.7	8.0	8.5	8.1	8.3	8.2	8.0	8.1	8.0	7.9	8.0
2	8.3	7.7	8.0	8.4	8.1	8.2	8.0	8.0	8.0	8.0	7.9	7.9
3	8.0	7.8	7.9	8.4	8.0	8.1	8.3	7.8	8.1	7.9	7.9	7.9
4	8.4	7.7	8.0	8.0	7.8	8.0	8.3	8.2	8.3	8.0	7.9	8.0
5	8.4	7.7	8.0	8.0	7.9	8.0	8.3	8.2	8.3	8.0	7.9	7.9
6	8.3	7.7	8.0	8.0	7.9	7.9	8.4	8.2	8.3	8.0	7.8	7.9
7	8.3	7.7	8.0	---	---	---	8.3	8.1	8.2	8.1	8.0	8.0
8	8.4	7.6	8.0	---	---	---	8.3	8.1	8.2	8.1	7.9	8.0
9	7.6	7.4	7.5	---	---	---	8.3	8.1	8.1	7.9	7.7	7.8
10	8.0	7.4	7.7	7.8	7.7	7.8	8.3	8.1	8.2	7.8	7.8	7.8
11	---	---	---	---	---	---	8.4	8.1	8.2	8.0	7.8	7.9
12	---	---	---	7.8	7.7	7.7	8.4	8.1	8.2	8.0	8.0	8.0
13	---	---	---	---	---	---	8.4	8.1	8.2	8.0	8.0	8.0
14	---	---	---	7.8	7.7	7.7	8.4	8.1	8.2	8.0	8.0	8.0
15	---	---	---	7.9	7.7	7.8	8.3	8.0	8.1	8.0	7.9	8.0
16	---	---	---	7.9	7.7	7.8	8.1	7.9	8.0	8.0	7.8	7.9
17	---	---	---	8.1	7.7	7.9	8.0	7.9	7.9	7.9	7.8	7.9
18	---	---	---	8.3	7.9	8.1	8.1	7.9	8.0	8.0	7.8	7.9
19	---	---	---	8.6	8.0	8.3	8.2	8.0	8.1	8.0	7.9	7.9
20	---	---	---	8.5	8.0	8.2	8.2	8.0	8.1	8.0	7.9	7.9
21	---	---	---	8.3	7.9	8.1	8.2	8.0	8.1	8.0	7.9	8.0
22	---	---	---	8.1	7.7	8.0	8.3	8.1	8.2	8.0	7.9	7.9
23	---	---	---	8.2	7.8	8.0	8.2	8.1	8.1	8.0	7.9	7.9
24	8.7	8.1	8.4	8.4	7.9	8.2	8.1	8.1	8.1	8.0	7.9	7.9
25	8.8	8.3	8.5	8.3	8.0	8.2	8.2	8.1	8.1	7.9	7.8	7.8
26	8.8	8.3	8.5	8.1	7.9	8.0	8.1	7.9	8.0	7.9	7.8	7.9
27	8.8	8.3	8.5	8.2	7.9	8.0	8.0	7.9	7.9	7.9	7.9	7.9
28	8.6	8.2	8.4	8.2	7.9	8.0	8.0	7.9	8.0	7.9	7.8	7.9
29	8.6	8.1	8.3	8.2	8.1	8.1	8.0	7.8	7.9	8.0	7.7	7.8
30	8.6	8.1	8.3	8.2	8.0	8.1	8.1	7.9	8.0	8.0	7.8	7.9
31	8.5	8.1	8.3	---	---	---	8.1	8.0	8.1	8.1	7.8	8.0
MONTH	8.8	7.4	8.1	8.6	7.7	8.0	8.4	7.8	8.1	8.1	7.7	7.9
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.0	7.8	7.9	8.6	8.2	8.4	8.5	8.0	8.2	8.6	8.3	8.4
2	8.0	7.7	7.9	8.7	8.1	8.4	8.3	7.9	8.1	8.6	8.2	8.4
3	8.0	7.7	7.9	8.6	8.3	8.4	8.5	7.9	8.2	8.3	7.9	8.1
4	8.0	7.4	7.7	8.6	8.2	8.4	8.5	7.8	8.1	8.5	8.0	8.2
5	8.0	7.5	7.6	8.6	8.1	8.3	8.4	7.7	8.0	8.5	8.1	8.3
6	7.9	7.4	7.7	---	---	---	8.3	7.8	8.0	8.5	8.1	8.3
7	8.0	7.9	8.0	8.5	8.0	8.2	8.3	7.7	8.0	8.6	8.2	8.4
8	8.2	8.0	8.1	8.5	8.1	8.3	8.3	7.7	8.0	8.4	7.7	8.1
9	8.2	8.0	8.1	8.5	8.0	8.3	8.4	7.7	8.0	---	---	---
10	8.3	8.1	8.2	8.5	8.0	8.3	8.5	7.8	8.2	8.2	7.8	8.0
11	8.3	8.1	8.2	8.6	8.1	8.3	8.5	7.9	8.2	8.3	8.0	8.1
12	8.3	8.1	8.2	8.6	8.0	8.2	8.8	7.5	7.7	8.3	8.1	8.2
13	8.5	8.0	8.2	8.6	7.9	8.2	---	---	---	8.2	8.0	8.1
14	8.5	8.1	8.3	8.6	8.0	8.3	---	---	---	8.3	7.8	8.0
15	8.4	8.2	8.3	8.3	8.0	8.1	---	---	---	7.9	7.7	7.8
16	8.4	8.1	8.3	8.3	8.0	8.1	---	---	---	8.2	7.7	7.9
17	8.5	8.1	8.3	8.4	7.9	8.1	---	---	---	8.4	7.8	8.1
18	8.5	8.0	8.3	8.5	8.0	8.2	---	---	---	8.3	7.9	8.1
19	8.5	8.1	8.3	8.5	8.0	8.2	---	---	---	8.4	7.9	8.1
20	8.6	8.2	8.4	8.4	8.0	8.2	---	---	---	8.3	7.7	7.9
21	8.4	8.0	8.2	8.5	7.9	8.2	---	---	---	8.2	7.7	8.0
22	8.4	7.9	8.1	8.6	7.8	8.2	---	---	---	8.2	7.7	8.0
23	8.4	8.0	8.2	---	---	---	8.3	8.2	8.3	8.3	7.8	8.0
24	8.4	7.9	8.2	---	---	---	8.4	8.1	8.2	8.3	7.6	7.9
25	8.5	8.0	8.2	---	---	---	8.2	8.1	8.1	7.6	7.5	7.6
26	8.4	8.1	8.3	8.4	7.8	8.1	8.3	8.1	8.2	8.0	7.6	7.8
27	8.3	8.1	8.2	---	---	---	8.5	8.1	8.3	7.9	7.7	7.8
28	8.6	8.0	8.2	---	---	---	8.6	8.0	8.3	7.9	7.7	7.8
29	---	---	---	8.6	8.1	8.4	8.1	8.0	8.0	8.1	7.7	7.9
30	---	---	---	8.7	8.3	8.5	8.7	8.0	8.3	8.2	7.9	8.0
31	---	---	---	8.6	8.2	8.3	---	---	---	8.2	7.9	8.1
MONTH	8.6	7.4	8.1	8.7	7.8	8.3	8.8	7.5	8.1	8.6	7.5	8.0

TRINITY RIVER MAIN STEM

08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.3	7.9	8.1	8.4	7.8	8.0	8.6	7.6	8.1	8.0	7.6	7.7
2	8.3	7.9	8.1	8.3	7.7	8.0	8.6	7.6	8.1	8.1	7.6	7.7
3	7.9	7.8	7.9	8.7	7.6	7.8	8.5	7.7	8.1	8.3	7.6	7.8
4	8.2	7.7	7.9	8.0	7.5	7.7	8.5	7.7	8.1	8.6	7.8	8.1
5	8.2	7.7	7.9	8.4	7.7	7.9	8.5	7.7	8.0	8.3	7.8	8.0
6	8.4	7.8	8.1	8.3	7.6	7.9	8.5	7.7	8.1	8.6	7.7	8.1
7	8.2	7.7	8.0	8.2	7.6	7.9	8.4	7.7	8.0	8.4	7.7	7.9
8	8.0	7.7	7.9	8.2	7.6	7.9	8.5	7.6	8.0	8.3	7.7	8.0
9	8.3	8.0	8.1	8.4	7.7	8.0	8.4	7.6	8.0	8.4	7.7	8.0
10	8.3	8.0	8.2	8.4	7.8	8.1	8.2	7.7	7.8	8.4	7.7	8.0
11	8.3	8.0	8.2	8.3	7.7	8.0	8.5	7.7	8.1	8.4	7.6	8.0
12	8.3	8.0	8.1	8.3	7.8	8.0	8.5	7.8	8.0	8.3	7.5	7.8
13	8.4	8.0	8.2	8.3	7.7	8.0	8.4	8.0	8.1	8.2	7.5	7.8
14	8.5	8.0	8.2	8.3	7.6	7.9	8.3	8.0	8.1	8.1	7.5	7.8
15	8.5	8.0	8.2	8.4	7.7	8.0	8.1	8.0	8.1	8.2	7.5	7.8
16	8.2	7.9	8.0	8.5	7.8	8.1	8.1	8.0	8.0	8.1	7.5	7.7
17	8.4	7.8	8.1	8.5	7.9	8.2	8.5	8.0	8.2	8.0	7.4	7.6
18	8.5	7.9	8.2	8.6	8.0	8.2	9.2	8.1	8.6	7.9	7.5	7.7
19	8.4	7.9	8.1	8.6	7.9	8.2	9.0	8.4	8.7	7.7	7.6	7.7
20	8.4	7.8	8.1	8.6	7.9	8.2	8.8	7.9	8.3	7.9	7.6	7.8
21	8.2	7.6	7.9	8.5	7.9	8.2	8.4	7.7	8.0	8.1	7.7	7.9
22	8.2	7.6	7.9	8.5	7.8	8.2	8.7	7.7	8.1	8.2	7.7	7.9
23	8.1	7.6	7.8	8.5	7.8	8.1	8.7	7.8	8.2	8.4	7.7	8.0
24	8.3	7.6	7.9	8.5	7.8	8.1	8.6	7.8	8.1	8.5	7.8	8.1
25	8.2	7.6	7.9	8.5	7.8	8.1	8.6	7.7	8.1	8.5	8.0	8.2
26	8.1	7.5	7.8	8.1	7.8	8.0	8.6	7.7	8.1	8.6	7.8	8.2
27	8.0	7.5	7.7	8.4	7.9	8.1	8.6	7.8	8.1	8.5	7.7	8.1
28	8.4	7.5	7.9	8.2	7.7	8.0	8.5	7.8	8.1	8.4	7.7	8.0
29	8.5	7.9	8.2	8.7	7.8	8.1	8.5	7.8	8.1	8.4	7.7	8.0
30	8.5	7.8	8.1	8.8	7.8	8.2	8.1	7.5	7.8	8.3	7.7	7.9
31	---	---	---	8.6	7.7	8.1	8.4	7.6	8.0	---	---	---
MONTH	8.5	7.5	8.0	8.8	7.5	8.0	9.2	7.5	8.1	8.6	7.4	7.9

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	29.0	23.0	25.5	23.5	18.5	20.5	14.5	11.0	12.5	5.0	3.0	4.0
2	27.5	24.0	25.5	23.0	19.0	20.5	14.0	13.0	13.5	6.0	5.0	5.5
3	25.5	24.0	24.5	22.5	19.5	20.5	13.0	10.5	11.5	5.5	3.5	4.5
4	27.5	24.0	26.0	20.0	14.0	16.5	11.0	9.0	10.0	4.0	3.0	3.5
5	28.0	24.5	26.5	16.0	13.0	14.5	11.5	9.5	10.0	5.5	4.0	4.5
6	29.0	25.5	27.0	17.0	13.5	15.5	10.5	9.0	10.0	6.5	5.0	6.0
7	30.0	26.5	27.5	---	---	---	10.0	7.5	9.0	5.0	4.0	4.5
8	28.5	20.0	25.5	---	---	---	11.0	7.5	9.0	6.5	4.5	5.5
9	---	---	---	---	---	---	12.0	9.0	10.0	8.0	6.0	6.5
10	---	---	---	15.5	11.0	13.0	13.0	10.0	11.0	7.5	6.5	7.0
11	---	---	---	16.5	12.5	14.5	14.5	11.0	12.5	7.5	6.5	7.0
12	---	---	---	16.5	13.5	15.5	16.5	13.5	14.5	8.5	5.0	7.0
13	---	---	---	17.0	14.5	16.0	14.5	12.0	13.5	9.5	6.0	8.0
14	---	---	---	17.0	15.0	16.5	13.0	12.0	12.5	10.5	8.0	9.0
15	---	---	---	18.5	16.0	17.5	14.0	12.5	13.0	11.5	10.0	10.5
16	---	---	---	18.5	17.0	18.0	13.0	11.5	12.5	10.5	8.5	9.5
17	---	---	---	18.5	16.5	17.0	13.5	12.0	12.5	11.0	9.5	10.5
18	---	---	---	18.0	16.5	17.5	14.5	12.5	13.5	11.0	9.5	10.0
19	---	---	---	20.5	17.5	18.5	13.0	11.5	12.5	12.0	9.5	10.5
20	---	---	---	21.0	19.0	20.0	14.5	12.5	13.5	10.5	8.5	9.5
21	---	---	---	21.0	19.5	20.0	14.0	4.0	9.5	8.0	7.0	8.0
22	---	---	---	19.5	17.5	18.5	3.5	.5	1.5	9.0	6.0	7.5
23	---	---	---	18.5	16.0	17.5	2.0	.5	1.0	9.0	7.5	8.5
24	19.0	15.5	17.0	18.5	15.5	17.0	3.0	.5	1.5	10.5	8.5	9.5
25	20.0	16.5	17.5	20.0	16.5	18.5	4.0	1.0	2.0	10.0	8.5	9.0
26	20.5	16.0	18.0	20.5	20.0	20.0	5.5	2.5	4.0	8.5	7.5	8.0
27	21.5	16.5	18.5	21.0	18.0	20.0	5.0	4.5	5.0	11.5	8.0	9.5
28	23.0	18.0	20.0	18.0	14.0	15.5	7.0	5.0	5.5	11.5	9.5	10.5
29	23.5	19.0	21.0	14.0	12.0	13.0	11.5	7.0	9.5	13.5	9.0	12.0
30	23.0	19.0	20.5	13.5	11.5	12.0	8.0	2.5	4.5	8.5	5.0	7.0
31	23.0	18.5	20.5	---	---	---	3.5	1.0	2.5	11.0	5.5	8.0
MONTH	30.0	15.5	22.5	23.5	11.0	17.0	16.5	.5	9.0	13.5	3.0	7.5

TRINITY RIVER MAIN STEM

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08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	11.5	6.5	9.0	24.0	15.5	19.5	27.0	14.0	21.0	27.5	20.5	24.0
2	12.0	7.5	9.5	23.0	15.5	19.0	22.0	15.5	17.5	27.0	24.0	25.5
3	13.5	9.5	11.5	16.0	6.5	12.0	24.5	14.5	19.0	27.0	22.0	24.5
4	---	---	---	21.0	9.0	15.5	28.0	19.0	23.5	26.5	22.5	24.5
5	---	---	---	23.5	13.5	19.0	25.0	20.0	22.5	24.5	19.5	22.0
6	---	---	---	23.5	17.5	20.5	22.5	17.5	20.5	25.0	17.5	21.5
7	16.5	9.5	13.0	18.0	11.0	13.5	23.0	17.0	20.0	24.0	19.5	21.5
8	16.5	8.0	12.5	17.0	7.5	13.0	27.5	17.5	23.0	---	---	---
9	15.5	8.5	12.5	18.5	10.0	15.0	25.0	17.5	21.0	---	---	---
10	16.5	9.5	13.5	18.0	10.0	14.5	20.0	11.5	16.0	24.0	19.5	22.0
11	14.5	10.0	13.0	22.0	11.0	16.5	22.0	15.5	18.5	28.0	22.0	24.0
12	17.5	12.0	14.5	22.0	17.0	19.5	---	---	---	29.5	22.0	25.5
13	19.5	13.5	16.0	19.0	12.0	16.0	---	---	---	29.5	23.5	26.0
14	16.5	10.5	14.0	16.5	10.0	13.5	---	---	---	25.5	20.0	23.0
15	---	---	---	14.5	7.5	9.5	---	---	---	25.0	20.0	22.0
16	---	---	---	10.5	7.5	9.0	---	---	---	28.0	22.5	25.0
17	---	---	---	20.0	10.0	14.0	---	---	---	25.5	21.5	23.5
18	---	---	---	19.0	10.5	15.0	---	---	---	26.5	22.0	24.5
19	---	---	---	17.5	13.0	15.5	---	---	---	25.5	22.5	24.0
20	---	---	---	17.5	13.5	15.5	---	---	---	28.0	23.0	25.5
21	---	---	---	---	---	---	---	---	---	28.0	23.0	25.5
22	---	---	---	---	---	---	---	---	---	27.0	23.0	25.0
23	---	---	---	---	---	---	27.0	16.5	21.0	30.5	23.5	27.0
24	---	---	---	---	---	---	22.5	18.5	20.5	30.5	21.0	25.5
25	---	---	---	---	---	---	27.0	19.5	22.5	26.0	20.0	23.0
26	---	---	---	---	---	---	30.5	20.5	25.0	30.5	22.5	26.5
27	---	---	---	---	---	---	31.5	22.5	26.5	32.5	26.0	29.0
28	---	---	---	---	---	---	26.5	18.0	23.0	30.0	26.5	28.5
29	---	---	---	---	---	---	26.5	18.0	22.0	30.0	24.0	27.0
30	---	---	---	17.5	9.0	14.0	27.0	19.0	23.5	28.5	22.0	24.5
31	---	---	---	22.0	9.0	16.5	---	---	---	28.0	21.5	24.5
MONTH	19.5	6.5	12.5	24.0	6.5	15.0	31.5	11.5	21.5	32.5	17.5	24.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	26.5	22.0	24.0	34.0	27.0	30.5	36.0	25.0	31.0	28.5	22.5	26.0
2	28.0	21.0	24.0	34.0	28.5	31.5	35.5	26.5	31.5	27.5	23.5	25.5
3	22.5	20.0	21.0	32.5	24.5	29.0	35.0	25.5	30.5	31.5	24.0	27.0
4	31.0	19.5	24.5	33.5	24.5	29.0	36.0	26.5	31.5	32.0	25.0	28.0
5	31.0	22.5	26.0	34.0	28.0	31.5	35.0	26.5	31.5	30.0	23.5	26.5
6	31.0	21.5	26.0	35.5	29.5	33.0	35.0	26.0	31.0	32.0	24.0	28.0
7	26.5	22.0	24.5	35.0	30.0	32.5	36.0	27.5	32.0	28.5	24.5	26.0
8	26.0	21.5	23.5	34.5	30.0	32.0	36.5	28.5	32.5	30.5	24.5	26.5
9	26.0	22.5	24.0	35.0	28.5	31.0	33.5	28.0	31.0	32.5	23.0	27.5
10	25.5	22.0	23.5	37.0	27.0	31.0	29.5	25.0	28.0	33.5	23.0	28.0
11	27.5	21.5	24.5	---	---	---	31.0	25.0	28.0	33.5	23.5	28.5
12	29.5	23.0	26.0	---	---	---	30.5	22.5	26.5	32.5	24.0	28.0
13	31.5	25.0	27.5	36.5	24.5	29.5	26.5	23.0	25.5	33.0	23.5	28.0
14	31.0	26.0	28.0	35.0	26.0	30.5	25.5	22.5	24.0	31.0	24.0	27.5
15	31.5	23.0	27.0	34.5	26.5	30.5	28.5	23.0	25.5	32.5	23.5	27.5
16	27.5	21.0	24.5	34.0	28.5	30.5	33.5	25.5	29.5	31.0	24.0	26.5
17	32.5	21.5	26.5	34.0	28.0	30.5	34.0	28.0	31.0	32.5	25.0	27.5
18	34.0	24.5	29.0	35.5	26.5	30.0	36.0	30.0	33.0	---	---	---
19	34.5	24.5	29.0	32.0	26.5	29.0	36.5	30.5	34.0	---	---	---
20	34.0	25.5	29.5	31.5	24.5	28.0	38.0	31.0	35.0	---	---	---
21	32.0	26.0	29.5	32.5	24.5	28.0	35.5	29.0	32.0	---	---	---
22	32.0	27.0	29.5	32.0	24.5	28.5	33.5	28.0	31.0	---	---	---
23	34.5	20.5	29.0	31.0	25.5	29.0	36.0	28.0	32.0	---	---	---
24	35.0	28.5	32.0	30.5	25.0	27.5	36.5	28.5	33.0	---	---	---
25	34.5	28.0	32.0	27.0	24.0	25.5	35.0	28.0	32.0	---	---	---
26	34.5	29.0	32.0	25.5	19.5	22.5	34.5	28.5	31.5	28.5	20.5	25.0
27	34.0	29.5	32.0	29.0	22.0	25.0	34.0	27.5	31.0	28.5	20.5	25.5
28	32.0	28.5	30.5	26.5	20.5	23.5	34.0	26.5	31.0	28.0	21.5	25.5
29	30.0	26.0	27.5	34.0	22.5	27.0	32.0	27.0	29.5	29.0	20.5	25.5
30	31.5	25.0	28.0	34.0	22.5	28.5	30.5	22.0	27.0	32.0	23.5	27.5
31	---	---	---	35.5	24.0	30.0	30.0	24.0	27.0	---	---	---
MONTH	35.0	19.5	27.0	37.0	19.5	29.0	38.0	22.0	30.5	33.5	20.5	27.0

## TRINITY RIVER MAIN STEM

08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

## OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	13.6	8.1	10.2	13.9	9.0	11.0	13.2	12.1	12.6	14.2	13.1	13.7
2	13.5	7.9	9.9	13.3	8.8	10.4	12.8	11.2	12.2	14.1	12.4	13.1
3	8.4	7.0	7.7	12.7	8.0	9.5	11.9	10.2	11.0	13.6	12.6	13.0
4	12.1	4.8	8.5	9.3	6.1	8.2	12.2	10.4	11.4	13.9	13.5	13.7
5	12.9	6.4	9.9	12.9	8.4	9.9	12.6	11.3	11.9	14.0	12.8	13.4
6	12.3	6.6	9.5	10.0	8.3	9.1	13.0	10.8	11.8	13.5	11.5	12.3
7	11.2	6.6	8.9	---	---	---	13.4	11.3	12.2	14.8	12.8	13.7
8	12.9	6.7	8.9	---	---	---	14.0	11.4	12.6	14.7	12.8	13.9
9	---	---	---	---	---	---	14.1	11.1	12.4	14.7	10.6	12.8
10	---	---	---	8.8	8.2	8.6	14.1	10.8	12.2	12.9	11.3	12.2
11	---	---	---	8.3	7.9	8.2	14.4	10.5	12.0	12.8	11.7	12.2
12	---	---	---	8.5	7.9	8.2	15.0	10.3	11.6	12.3	11.8	12.1
13	---	---	---	8.6	7.7	8.2	14.4	10.7	12.0	12.0	11.4	11.7
14	---	---	---	9.0	7.5	8.3	14.3	10.6	12.1	11.9	11.1	11.4
15	---	---	---	9.5	7.7	8.6	15.3	10.2	11.9	11.7	10.7	11.1
16	---	---	---	9.8	7.7	8.9	11.9	9.2	10.6	11.9	10.9	11.5
17	---	---	---	11.5	8.0	9.8	10.5	8.6	9.7	11.9	11.1	11.5
18	---	---	---	12.9	9.5	11.0	10.9	8.7	9.7	11.6	10.6	11.1
19	---	---	---	14.2	9.3	11.2	12.1	9.5	10.9	11.7	10.9	11.3
20	---	---	---	12.1	8.6	10.1	13.0	10.2	11.4	11.8	10.4	11.0
21	---	---	---	10.2	7.2	8.8	11.9	10.4	11.3	12.6	11.2	11.8
22	---	---	---	9.0	6.8	7.8	13.9	12.2	13.3	12.5	11.8	12.2
23	---	---	---	11.9	7.0	9.4	15.0	13.3	14.1	12.5	11.5	12.0
24	14.1	10.1	11.9	13.0	8.5	10.5	14.5	13.3	13.9	12.5	11.6	12.0
25	14.5	10.8	12.1	13.2	8.6	11.2	14.1	12.6	13.4	12.5	11.8	12.2
26	13.8	10.8	12.1	11.5	9.0	9.9	12.8	11.5	12.3	13.5	12.0	12.8
27	14.8	10.5	11.8	10.6	8.5	9.6	12.2	11.4	11.7	13.8	12.4	13.2
28	14.6	10.3	11.8	13.0	8.7	10.9	12.9	11.7	12.3	13.4	11.8	12.6
29	14.6	9.9	11.5	13.3	12.5	12.9	13.0	9.3	10.5	13.1	10.5	12.0
30	13.4	9.5	11.0	13.3	12.5	12.8	13.8	10.5	12.3	13.9	11.6	12.6
31	13.6	8.9	10.7	---	---	---	14.2	12.8	13.6	15.2	11.8	13.3
MONTH	14.8	4.8	10.4	14.2	6.1	9.7	15.3	8.6	12.0	15.2	10.4	12.4
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	16.0	11.4	13.8	11.6	7.7	9.5	14.6	6.0	11.7	10.7	7.3	9.0
2	15.8	11.5	13.6	14.1	7.0	9.9	---	---	---	9.8	7.5	8.8
3	16.0	11.9	14.1	12.4	8.6	10.4	---	---	---	8.2	5.4	6.7
4	---	---	---	12.9	8.5	10.6	---	---	---	9.4	5.6	7.0
5	---	---	---	13.5	8.0	9.9	---	---	---	9.5	6.5	7.8
6	9.7	8.6	9.4	14.2	7.0	9.7	---	---	---	9.4	6.6	7.9
7	9.9	7.9	9.0	11.8	7.7	9.8	---	---	---	9.8	6.7	8.1
8	11.4	8.1	9.8	13.2	8.8	10.9	---	---	---	---	---	---
9	10.9	8.8	10.0	14.8	8.8	11.1	---	---	---	---	---	---
10	12.2	8.9	10.5	13.6	8.2	10.8	---	---	---	8.2	6.6	7.3
11	12.7	8.9	11.0	15.7	8.0	10.7	---	---	---	8.3	6.7	7.3
12	12.4	8.6	10.4	14.1	6.5	9.5	---	---	---	8.3	6.9	7.5
13	12.7	7.9	10.2	13.0	6.3	9.5	---	---	---	8.4	6.6	7.4
14	13.3	8.1	10.6	13.4	6.8	9.9	---	---	---	8.4	6.4	7.1
15	13.2	8.8	11.1	10.0	8.2	9.0	---	---	---	7.2	6.5	6.8
16	12.7	9.9	11.4	10.9	7.9	9.2	---	---	---	9.0	5.8	7.3
17	15.9	9.2	11.8	10.9	7.1	8.8	---	---	---	10.0	6.1	8.1
18	14.8	7.9	11.1	13.7	7.6	10.0	---	---	---	10.1	5.9	7.8
19	13.9	8.4	11.0	12.8	7.7	10.1	---	---	---	10.7	6.4	8.1
20	13.9	9.6	11.7	11.5	7.3	9.3	---	---	---	11.2	5.7	7.7
21	13.4	9.0	11.2	14.5	6.5	9.6	---	---	---	10.3	6.2	8.3
22	11.2	8.6	9.6	11.8	5.5	8.7	---	---	---	10.8	6.3	8.3
23	12.9	8.0	10.1	---	---	---	9.3	8.0	8.6	12.0	6.4	9.0
24	13.1	7.9	10.4	---	---	---	9.6	8.1	8.7	11.7	6.5	8.1
25	13.9	8.5	11.0	---	---	---	8.6	7.9	8.2	7.6	6.5	7.1
26	14.3	9.8	11.9	13.0	5.6	8.7	8.8	7.6	8.1	8.3	6.6	7.4
27	13.9	9.9	11.8	---	---	---	9.8	7.2	8.4	8.1	6.3	7.3
28	12.9	9.1	10.7	---	---	---	8.9	7.1	7.7	9.4	5.7	7.7
29	---	---	---	11.6	7.0	9.3	7.5	6.9	7.2	8.4	6.7	7.6
30	---	---	---	11.5	8.5	9.8	11.0	7.0	8.5	8.1	6.4	7.1
31	---	---	---	14.5	4.2	10.3	---	---	---	8.5	6.3	7.3
MONTH	16.0	7.9	11.0	15.7	4.2	9.8	14.6	6.0	8.6	12.0	5.4	7.7

TRINITY RIVER MAIN STEM

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08048543 WEST FORK TRINITY RIVER AT BEACH STREET, FORT WORTH, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	JUNE			JULY			AUGUST			SEPTEMBER		
		MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	
1	8.7	6.4	7.2	7.8	6.5	7.3	14.8	5.6	9.8	6.4	3.1	5.3	
2	9.0	6.1	7.2	7.6	6.3	7.1	13.4	4.8	9.0	6.2	4.4	5.2	
3	8.0	6.1	7.1	7.0	5.8	6.5	12.0	4.9	8.3	8.4	4.8	6.2	
4	8.9	7.1	7.8	7.7	4.0	6.5	12.4	4.5	8.1	10.9	4.6	7.3	
5	8.8	6.4	7.4	8.4	5.7	7.3	12.7	4.6	8.4	9.0	4.7	6.5	
6	8.9	6.2	7.6	7.9	6.6	7.4	12.9	4.5	8.6	11.4	4.9	7.6	
7	8.0	4.4	6.5	7.6	6.2	7.0	12.8	4.2	8.3	10.4	3.6	5.8	
8	8.0	6.6	7.2	7.6	6.1	7.0	13.4	3.6	8.2	9.6	4.5	6.6	
9	8.7	6.7	7.8	9.2	6.4	7.5	12.0	4.0	8.2	12.1	5.0	7.7	
10	8.7	5.3	7.8	10.9	6.0	8.7	10.0	4.0	6.1	12.8	5.8	8.7	
11	8.9	5.9	7.8	10.6	8.7	9.6	12.6	4.7	8.3	13.1	5.7	9.0	
12	8.9	5.8	7.5	10.7	8.5	9.4	8.2	5.5	6.4	11.9	5.1	8.0	
13	8.9	6.0	7.5	11.2	8.6	9.7	6.6	5.5	5.8	10.6	4.8	7.2	
14	8.9	6.2	7.6	10.3	8.1	9.1	7.1	5.8	6.2	10.9	3.9	6.9	
15	9.2	5.9	7.7	10.3	7.3	8.6	6.2	5.4	6.0	11.9	4.5	7.6	
16	7.7	5.8	6.8	9.3	7.2	8.3	6.0	5.2	5.6	11.0	4.6	6.6	
17	9.6	6.2	7.9	10.3	7.3	8.5	8.3	5.5	6.6	8.7	4.4	5.9	
18	9.7	5.8	8.3	11.2	6.9	8.8	13.2	5.6	8.8	8.1	4.8	6.5	
19	9.5	6.7	8.3	10.9	8.2	9.3	15.7	6.8	11.1	8.1	7.3	7.8	
20	9.3	5.3	7.8	12.1	5.7	8.9	12.1	5.4	9.0	9.4	5.5	8.3	
21	8.9	4.5	7.3	12.1	6.0	9.0	8.5	4.4	6.2	10.0	7.7	8.6	
22	8.8	4.1	7.2	12.2	6.0	9.1	10.5	2.8	6.3	10.9	7.3	9.0	
23	8.1	5.1	6.7	12.2	5.8	9.1	12.1	4.5	8.1	12.2	7.6	9.8	
24	9.1	4.1	7.1	10.3	5.8	8.4	12.8	4.6	8.4	13.0	7.6	10.2	
25	8.6	4.6	7.2	11.8	5.8	8.6	12.4	4.5	8.2	14.0	8.5	11.0	
26	7.9	4.6	6.5	9.6	4.7	7.2	11.6	4.2	7.8	14.6	7.9	11.2	
27	7.6	4.2	6.0	9.9	5.7	7.3	11.9	4.6	7.7	14.4	8.1	11.3	
28	8.6	4.7	6.6	9.2	5.9	7.6	11.3	4.5	7.4	13.6	7.6	10.6	
29	8.5	5.3	7.5	12.9	6.3	8.3	10.5	4.2	6.9	13.3	7.5	10.3	
30	8.1	6.9	7.7	16.2	5.6	10.4	7.7	3.1	5.9	12.9	7.1	9.7	
31	---	---	---	14.4	5.8	9.9	9.8	3.4	6.4	---	---	---	
MONTH	9.7	4.1	7.4	16.2	4.0	8.3	15.7	2.8	7.6	14.6	3.1	8.1	



## TRINITY RIVER BASIN

08048970 VILLAGE CREEK AT EVERMAN, TX

LOCATION.--Lat 32°36'12", long 97°15'53", Tarrant County, Hydrologic Unit 12030102, at center of channel at downstream side of bridge on Rendon Road (Tarrant County Road 1015), 1.4 mi downstream from Deer Creek, and 1.8 mi southeast of Everman High School.

DRAINAGE AREA.--84.5 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1989 to September 1991.

GAGE.--Water-stage recorder. Datum of gage is 589.93 ft above National Geodetic Vertical Datum of 1929 (Tarrant County Public Works Department reference mark).

REMARKS.--Records good including those for estimated daily discharge. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,500 ft<sup>3</sup>/s May 3, 1990 (gage height, 21.38 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since about 1930, 27.37 ft date uncertain, but may be same date, Mar. 27, 1977, as date of maximum stage at discontinued downstream station, Village Creek at Kennedale (08048980). Flood of May 18, 1989, may have equalled, or slightly exceeded, the indicated known maximum stage.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,260 ft<sup>3</sup>/s May 24 at 2345 hours (gage height, 15.54 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.09	.05	.21	4.1	2.9	2.1	9.8	6.6	.11	.95	29
2	.00	.06	.10	.15	3.9	2.9	2.4	8.0	6.4	.12	.12	27
3	.47	.06	3.7	.12	3.9	2.5	3.0	8.2	87	.07	.02	15
4	2.9	4.4	.93	.10	44	2.1	1.7	7.0	19	.07	.01	4.0
5	.15	3.2	.11	.08	41	2.2	.15	8.0	8.4	.08	.01	2.6
6	.03	.63	.04	5.0	8.5	1.9	.20	5.8	6.8	.04	.01	1.6
7	.01	.03	.05	4.6	6.1	2.2	.24	4.9	32	.02	.00	4.8
8	.08	151	.05	2.4	5.2	2.6	.35	76	8.7	.01	.00	12
9	70	99	.06	14	4.8	e2.2	.26	37	6.5	.01	.00	4.3
10	4.1	6.3	.06	133	4.5	e2.1	.14	e9.2	5.6	.00	.00	2.7
11	1.6	3.7	.11	29	4.3	e2.0	.10	e6.8	5.1	.00	.00	1.1
12	.18	2.6	.13	8.0	4.1	e1.9	3.0	e5.4	4.7	.00	475	.56
13	.10	1.4	.15	6.4	3.9	e1.8	315	4.7	4.3	.00	53	2.0
14	.30	1.1	.20	5.6	3.7	1.7	110	134	3.9	.00	106	1.5
15	.37	1.4	.28	34	3.4	1.6	35	150	3.8	.00	9.4	.37
16	.18	2.5	.33	9.0	3.1	2.1	11	15	5.6	.00	5.5	.14
17	.10	2.8	.64	6.6	3.1	2.5	211	7.3	6.3	.00	3.8	.22
18	.07	2.6	1.3	115	3.3	2.3	389	57	4.5	.00	3.0	83
19	.04	2.4	1.4	210	3.3	1.5	60	56	3.9	.00	2.1	184
20	.02	1.9	.66	28	3.0	1.5	13	16	3.4	.00	1.2	24
21	.01	1.5	.24	8.1	2.9	1.6	8.5	28	3.0	.00	.26	6.0
22	.01	12	.24	6.3	14	1.5	7.5	9.5	2.7	.00	.62	4.3
23	.01	5.2	.23	5.8	5.2	1.4	6.8	8.7	2.4	.00	.74	3.2
24	.03	2.5	.15	5.4	3.8	.88	6.0	560	2.3	.00	.34	2.6
25	.10	1.2	.15	4.9	3.3	.57	6.8	1300	2.1	.00	.34	2.2
26	.21	.82	.74	4.7	3.1	.60	6.9	141	1.7	95	.41	1.9
27	.20	.87	3.6	4.6	2.9	48	6.2	51	.90	18	.26	1.3
28	.09	3.5	1.1	4.2	2.7	4.4	334	16	.19	54	.17	.50
29	.11	1.1	1.7	4.3	---	2.9	169	9.7	.12	31	.25	.50
30	.10	.14	3.0	4.3	---	2.4	43	8.3	.14	4.9	5.6	.32
31	.09	---	.92	4.7	---	2.4	---	7.3	---	2.7	4.4	---
TOTAL	81.66	316.00	22.42	668.56	199.1	109.15	1752.34	2765.6	248.05	206.13	673.51	422.71
MEAN	2.63	10.5	.72	21.6	7.11	3.52	58.4	89.2	8.27	6.65	21.7	14.1
MAX	70	151	3.7	210	44	48	389	1300	87	95	475	184
MIN	.00	.03	.04	.08	2.7	.57	.10	4.7	.12	.00	.00	.14
AC-FT	162	627	44	1330	395	216	3480	5490	492	409	1340	838
CAL YR 1990	TOTAL	22096.51	MEAN	60.5	MAX	5290	MIN	.00	AC-FT	43830		
WTR YR 1991	TOTAL	7465.23	MEAN	20.5	MAX	1300	MIN	.00	AC-FT	14810		

e Estimated

08048970 VILLAGE CREEK AT EVERMAN, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1989 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1989 to September 1990.

pH: October 1989 to September 1990.

WATER TEMPERATURE: October 1989 to September 1990.

DISSOLVED OXYGEN: October 1989 to September 1990.

INSTRUMENTATION.--From October 1989 to September 1990, a four-parameter water-quality monitor continuously recorded specific conductance, pH, water temperature, and dissolved oxygen at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,000 microsiemens on several days during January and May, 1990; minimum, 129 microsiemens May 3, 1990.

pH: Maximum, 9.1 units Jan. 13, 1990; minimum, 7.0 units Nov. 22, 1989.

WATER TEMPERATURE: Maximum, 34.5°C July 11, 1990; minimum, 0.5°C Dec. 22, 1989.

DISSOLVED OXYGEN: Maximum, 20.8 mg/L Feb. 25, 1990; minimum, 2.4 mg/L Nov. 8, 1989.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV 29...	1005	1.6	495	8.0	11.0	9.6	86	1.0	180	12	60	8.1
JAN 11...	1020	27	410	7.6	8.0	11.6	99	2.5	140	28	46	5.5
MAR 07...	1430	2.1	800	8.4	14.0	12.5	124	1.1	240	90	75	14
MAY 02...	1304	8.1	525	8.1	22.0	11.9	139	1.8	190	25	63	7.8
JUN 27...	1403	1.2	700	8.2	31.0	10.2	140	0.4	220	45	67	13
AUG 22...	1647	0.66	560	8.2	31.0	10.1	138	1.0	160	29	51	7.7

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
NOV 29...	32	1	6.0	170	49	31	0.30	11	300	--	<0.010	<0.100
JAN 11...	36	1	6.1	110	43	36	0.30	8.6	248	1.36	0.040	1.40
MAR 07...	76	2	4.9	150	110	76	0.30	1.2	450	--	<0.010	<0.050
MAY 02...	33	1	5.4	160	47	27	0.30	7.5	289	0.250	0.030	0.280
JUN 27...	61	2	3.4	180	110	58	0.30	6.8	426	--	<0.010	<0.050
AUG 22...	E46	2	5.3	130	64	48	0.20	4.2	304	--	<0.010	9.80

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
NOV 29...	0.060	0.34	0.40	0.060	0.060	--	--	--	--	--	--	--
JAN 11...	0.080	0.92	1.0	0.480	0.430	2	39	<0.5	<1.0	<5	<3	<10
MAR 07...	<0.010	--	0.50	0.050	0.040	--	--	--	--	--	--	--
MAY 02...	0.020	0.48	0.50	0.090	0.090	--	--	--	--	--	--	--
JUN 27...	0.020	0.38	0.40	0.060	0.040	1	68	<0.5	<1.0	<5	<3	<10
AUG 22...	0.070	1.3	1.4	0.060	0.030	--	--	--	--	--	--	--



08049200 LAKE ARLINGTON AT ARLINGTON, TX

LOCATION.--Lat 32°42'58", long 97°11'32", Tarrant County, Hydrologic Unit 12030102, in new pumphouse at right end of Arlington Dam on Village Creek near western boundary of Arlington, 1.5 mi upstream from the Texas and Pacific Railway Co. bridge, and 7 mi upstream from mouth.

DRAINAGE AREA.--143 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1957 to current year.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Sept. 9, 1957, non-recording gage at same site and datum.

REMARKS.--The lake is formed by a rolled earthfill dam 6,482 ft long. The service spillway is a 10-foot-diameter uncontrolled circular drop inlet. The spillway is an 882-foot-wide cut through natural ground near the right end of dam. The dam was completed and storage began Mar. 31, 1957. Capacities are based on a 1980 survey. The dam was built by the city of Arlington to impound water for municipal and industrial uses. Water is diverted from Cedar Creek Reservoir (station 08063010) into Lake Arlington. Water is pumped from the lake to a generating plant of Texas Electric Service Co. Gage-height telemeter located at station. 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.....	572.0	-
Crest of spillway.....	559.7	64,360
Crest of drop inlet (top of conservation pool).....	550.0	39,930
Lowest gated outlet (invert).....	505.0	40

COOPERATION.--Capacity table provided by Freese and Nichols, Inc., Consulting Engineers, for the city of Arlington.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 72,500 acre-ft May 17, 1989 (elevation, 562.42 ft); minimum since lake first filled in April 1957, 18,110 acre-ft Oct. 17, 1971 (elevation, 534.27 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 43,350 acre-ft May 25 at 1900 hours (elevation, 551.51 ft); minimum, 21,840 acre-ft Oct. 8 (elevation, 540.15 ft.)

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

540.0	21,620	546.0	31,750	550.0	39,930
542.0	24,650	548.0	35,720	552.0	44,460
544.0	28,030				

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22160	22160	25460	25870	29460	28320	30770	35480	39760	36930	30690	29880
2	22050	22180	25570	25840	29330	28470	30820	35420	39740	36680	30580	30410
3	22080	22190	25590	25860	29240	28520	30810	35320	39800	36510	30390	30410
4	22090	22440	25660	25920	29700	28600	30770	35300	39800	36430	30180	30330
5	22090	22440	25740	26020	29880	28710	30690	35170	39740	36340	29990	30220
6	21990	22430	25770	26300	29900	28670	30710	35050	39590	36160	29730	30070
7	21870	22440	25810	26390	29840	28690	30730	34890	39630	35870	29490	30050
8	21990	23650	25840	26460	29770	28730	30650	35440	39530	35580	29330	29990
9	22910	24070	25760	26890	29680	28780	30600	35500	39380	35300	29130	29840
10	22940	24140	25770	27460	29590	28800	30580	35420	39210	34950	29110	29700
11	22970	24200	25870	27620	29510	28850	30940	35340	39060	34610	29090	29570
12	22940	24230	25820	27720	29460	28780	31240	35210	38860	34290	31980	29420
13	22930	24290	25810	27810	29350	28740	32610	35070	38610	33940	32470	29220
14	22900	24290	25890	27870	29220	28710	32960	35910	38370	33560	32900	29070
15	22810	24310	25940	28080	29130	28760	33080	36360	38310	33210	32820	28940
16	22710	24310	25990	28180	29040	28910	33190	36340	38740	32920	32690	28870
17	22680	24310	26100	28270	28930	29090	33760	36300	38740	32590	32570	28820
18	22660	24320	26150	28840	28800	29220	35030	36640	38760	32220	32370	29460
19	22690	24370	26170	29510	28650	29350	35030	36930	38800	31810	32140	30120
20	22650	24420	26200	29620	28580	29510	34950	36880	38720	31410	31930	30090
21	22660	24460	26120	29790	28580	29620	34830	36970	38460	31050	31670	29970
22	22680	24980	26020	29920	28820	29660	34730	36990	38230	30640	31470	29860
23	22680	25100	26000	29970	28780	29640	34570	36990	38330	30330	31220	29750
24	22650	25210	25970	30030	28650	29620	34490	39270	38370	30010	30990	29600
25	22600	25280	25820	30090	28560	29600	34390	43280	38290	29790	30730	29510
26	22550	25330	25770	30030	28470	29640	34330	42270	38080	30010	30480	29290
27	22530	25340	25710	29920	28340	30310	34160	41560	37840	30240	30280	29110
28	22460	25360	25670	29810	28250	30450	35540	41040	37550	30640	30030	28940
29	22350	25410	25820	29680	---	30560	35680	40630	37340	30770	29790	28800
30	22220	25440	25840	29620	---	30640	35580	40220	37160	30840	29880	28630
31	22180	---	25870	29550	---	30710	---	39980	---	30790	29820	---
MAX	22970	25440	26200	30090	29900	30710	35680	43280	39800	36930	32900	30410
MIN	21870	22160	25460	25840	28250	28320	30580	34890	37160	29790	29090	28630
(↑)	540.38	542.48	542.74	544.83	544.12	545.45	547.93	550.02	548.69	545.49	544.98	544.33
(Φ)	-130	+3260	+430	+3680	-1300	+2460	+4870	+4400	-2820	-6370	-970	-1190
CAL YR 1990	MAX	64930	MIN	19210	(Φ)	+5990						
WTR YR 1991	MAX	43280	MIN	21870	(Φ)	+6320						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## TRINITY RIVER BASIN

08049200 LAKE ARLINGTON AT ARLINGTON, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1964 to current year.

324304097113601 - LAKE ARLINGTON SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CAC03)	HARD- NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
FEB											
20...	1352	28600	1.00	293	8.6	13.0	0.70	9.2	88	120	4
20...	1354	--	10.0	293	8.5	12.0	--	9.1	85	--	--
20...	1356	--	20.0	289	8.4	12.0	--	8.3	77	--	--
20...	1358	--	30.0	291	8.5	12.0	--	8.3	77	--	--
20...	1400	--	39.0	290	8.3	12.0	--	7.8	73	120	11
MAY											
13...	1435	35100	1.00	311	8.6	27.5	1.10	8.2	106	120	8
13...	1445	--	10.0	310	8.6	27.0	--	7.6	97	--	--
13...	1452	--	20.0	317	7.7	24.0	--	4.6	56	--	--
13...	1500	--	30.0	321	7.4	22.5	--	1.6	19	--	--
13...	1508	--	41.0	333	7.4	22.0	--	0	0	120	6
JUL											
29...	1440	30800	1.00	319	8.6	31.5	1.00	8.3	114	110	9
29...	1445	--	10.0	318	8.4	30.5	--	7.1	96	--	--
29...	1450	--	20.0	330	7.3	29.0	--	0	0	--	--
29...	1456	--	30.0	361	7.1	24.0	--	0	0	--	--
29...	1505	--	40.0	372	7.0	23.5	--	0	0	130	0
DATE	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
FEB											
20...	40	3.9	15	0.6	4.6	110	26	13	0.20	1.6	171
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--	--
20...	40	3.9	15	0.6	4.6	100	26	13	0.20	1.6	167
MAY											
13...	40	4.1	16	0.6	4.5	110	20	17	0.30	2.9	170
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	--	--	--	--	--	--	--	--	--	--	--
13...	42	4.2	17	0.7	4.8	120	19	19	0.30	5.3	182
JUL											
29...	35	4.5	17	0.7	5.0	97	27	16	0.20	5.1	168
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	44	4.4	16	0.6	4.8	150	6.7	15	0.20	9.3	193
DATE	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	
FEB											
20...	0.090	0.020	0.110	0.020	0.58	0.60	0.090	<0.010	3	2	
20...	0.090	0.020	0.110	0.020	0.68	0.70	0.070	<0.010	<10	10	
20...	0.080	0.020	0.100	0.030	0.47	0.50	0.060	<0.010	<10	10	
20...	--	--	--	--	--	--	--	--	--	--	
20...	0.090	0.020	0.110	0.050	0.65	0.70	0.060	<0.010	9	34	
MAY											
13...	0.076	0.020	0.096	<0.010	--	0.60	0.030	<0.010	<3	3	
13...	--	--	--	--	--	--	--	--	--	--	
13...	0.260	0.070	0.330	0.110	0.59	0.70	0.040	<0.010	20	160	
13...	0.200	0.020	0.220	0.030	0.57	0.60	0.030	<0.010	10	20	
13...	0.040	0.060	0.100	0.490	0.91	1.4	0.130	0.050	210	1100	
JUL											
29...	--	<0.010	<0.050	0.020	0.48	0.50	0.040	<0.010	7	3	
29...	--	<0.010	<0.050	<0.010	--	0.50	0.030	<0.010	<10	10	
29...	--	<0.010	<0.050	0.060	0.64	0.70	0.050	0.010	30	130	
29...	--	--	--	--	--	--	--	--	--	--	
29...	--	<0.010	<0.050	1.90	0.70	2.6	0.330	0.270	470	1900	



TRINITY RIVER BASIN

243

08049200 LAKE ARLINGTON AT ARLINGTON, TX--Continued

324320097121101 - LAKE ARLINGTON SITE AL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)
FEB							
20...	1615	1.00	292	8.6	13.0	9.2	88
20...	1618	10.0	291	8.4	12.5	8.4	79
20...	1621	20.0	291	8.4	12.5	8.3	78
20...	1624	28.0	292	8.4	12.5	8.6	81
MAY							
13...	1523	1.00	313	8.6	27.5	7.9	102
13...	1528	10.0	315	8.6	27.5	7.7	99
13...	1531	20.0	319	7.6	23.0	3.2	38
13...	1535	31.0	322	7.4	22.5	1.8	21
JUL							
29...	1512	1.00	318	8.5	31.0	7.9	108
29...	1518	10.0	321	8.4	30.5	6.7	90
29...	1521	20.0	331	7.3	29.5	0	0
29...	1524	30.0	356	7.2	24.5	0	0

324253097121801 - LAKE ARLINGTON SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)
FEB							
20...	1648	1.00	293	8.8	14.0	9.9	96
20...	1651	10.0	294	8.5	12.5	8.8	83
20...	1654	20.0	291	8.5	12.0	8.6	80
20...	1658	30.0	292	8.4	12.0	8.1	75
20...	1702	35.0	294	8.2	12.0	7.9	74
MAY							
13...	1545	1.00	314	8.6	27.5	7.7	99
13...	1548	10.0	314	8.6	27.0	7.5	96
13...	1551	20.0	321	7.8	24.0	4.6	56
13...	1555	30.0	323	7.4	22.5	1.2	14
13...	1600	37.0	330	7.4	22.0	0.3	3
JUL							
29...	1533	1.00	321	8.6	31.5	8.0	110
29...	1535	10.0	325	8.6	30.0	5.8	78
29...	1538	20.0	327	7.8	29.5	4.3	57
29...	1541	34.0	366	7.1	24.5	0	0

324301097123301 - LAKE ARLINGTON SITE BL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)
FEB							
20...	1708	1.00	291	8.8	14.0	9.6	93
20...	1711	10.0	293	8.5	12.5	8.6	81
20...	1714	20.0	295	8.5	12.0	8.2	76
20...	1717	23.0	295	8.4	12.5	8.2	77
MAY							
13...	1607	1.00	312	8.5	27.5	7.6	98
13...	1610	10.0	314	8.5	27.0	7.5	96
13...	1612	20.0	318	8.0	25.0	5.5	68
13...	1615	31.0	322	7.4	22.5	1.1	13
JUL							
29...	1547	1.00	320	8.5	31.5	7.8	107
29...	1549	10.0	322	8.4	30.5	6.9	93
29...	1551	20.0	326	7.7	30.0	3.6	48
29...	1555	27.0	353	7.2	27.0	0	0

TRINITY RIVER BASIN

08049200 LAKE ARLINGTON AT ARLINGTON, TX--Continued

324257097130301 - LAKE ARLINGTON SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)
FEB							
20...	1740	1.00	298	8.7	13.5	9.4	90
20...	1805	9.00	298	8.7	13.5	9.4	90
MAY							
13...	1627	1.00	313	8.3	36.0	6.1	91
13...	1630	10.0	314	8.3	34.5	6.3	92
13...	1633	18.0	319	7.9	29.5	4.7	63
JUL							
29...	1613	1.00	322	8.2	38.0	5.8	89
29...	1617	11.0	323	8.2	38.0	5.8	89

324228097130301 - LAKE ARLINGTON SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)
FEB							
20...	1813	1.00	303	8.6	12.5	9.0	85
20...	1816	10.0	300	8.7	12.5	9.1	86
20...	1819	15.0	296	8.5	12.5	8.8	83
MAY							
13...	1643	1.00	314	8.3	29.5	6.5	87
13...	1646	10.0	316	8.3	26.0	6.7	84
13...	1650	17.0	319	7.7	24.5	4.1	50
JUL							
29...	1618	1.00	323	8.2	35.5	5.1	75
29...	1625	10.0	321	8.2	30.5	6.3	85
29...	1640	15.0	325	7.8	30.5	3.6	49

324143097132201 - LAKE ARLINGTON SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK (M))	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)
FEB											
20...	1832	1.00	300	8.8	14.5	0.60	10.2	100	--	--	--
20...	1837	10.0	312	8.8	12.5	--	9.7	91	--	--	--
20...	1842	19.0	365	8.6	11.0	--	9.2	84	--	--	--
MAY											
13...	1703	1.00	324	8.3	25.5	0.50	6.1	76	120	9	40
13...	1710	10.0	318	7.9	24.0	--	4.5	54	--	--	--
13...	1719	21.0	322	7.5	23.0	--	2.2	26	120	6	40
JUL											
29...	1651	1.00	321	8.5	32.5	0.60	7.5	105	110	11	36
29...	1655	10.0	319	8.4	29.5	--	7.0	93	--	--	--
29...	1700	19.0	313	8.1	29.0	--	5.8	76	100	7	34

DATE	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)
FEB										
20...	--	--	--	--	110	--	--	--	--	--
20...	--	--	--	--	--	--	--	--	--	--
20...	--	--	--	--	110	--	--	--	--	--
MAY										
13...	4.0	16	0.6	4.5	110	20	21	0.30	3.1	173
13...	--	--	--	--	--	--	--	--	--	--
13...	4.0	16	0.6	4.3	110	20	17	0.30	4.0	172
JUL										
29...	4.6	17	0.7	5.0	98	26	17	0.20	4.8	169
29...	--	--	--	--	--	--	--	--	--	--
29...	4.2	17	0.7	4.9	95	27	16	0.20	6.8	167

TRINITY RIVER BASIN

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08049200 LAKE ARLINGTON AT ARLINGTON, TX--Continued

324143097132201 - LAKE ARLINGTON SITE EC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
FEB										
20...	0.068	0.010	0.078	0.020	0.58	0.60	0.060	<0.010	<10	10
20...	--	0.010	<0.050	0.020	0.68	0.70	0.070	<0.010	20	40
20...	--	0.020	<0.050	0.040	1.1	1.1	0.100	<0.010	10	90
MAY										
13...	0.140	0.030	0.170	0.030	0.57	0.60	0.030	<0.010	12	10
13...	--	--	--	--	--	--	--	--	--	--
13...	0.200	0.060	0.260	0.160	0.54	0.70	0.070	0.010	47	210
JUL										
29...	--	<0.010	<0.050	<0.010	--	0.50	0.030	<0.010	<3	4
29...	--	<0.010	<0.050	0.020	0.48	0.50	0.050	0.010	<10	20
29...	0.044	0.020	0.064	0.040	0.76	0.80	0.100	0.030	<3	55

324133097130601 - LAKE ARLINGTON SITE EL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
20...	1849	1.00	297	8.9	14.0	10.0	97
20...	1852	10.0	319	8.7	12.0	8.7	81
20...	1855	14.0	315	8.6	12.0	8.7	81
MAY							
13...	1726	1.00	326	8.3	25.5	7.1	88
13...	1730	10.0	325	8.2	24.5	6.5	79
13...	1734	16.0	318	7.6	23.0	3.1	37
JUL							
29...	1709	1.00	320	8.5	32.0	7.7	107
29...	1712	14.0	314	7.9	28.5	5.1	66

324041097134601 - LAKE ARLINGTON SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)
FEB											
20...	1916	1.00	315	8.8	14.5	0.50	10.1	99	120	14	42
20...	1922	9.00	356	8.6	11.0	--	9.7	88	130	13	45
MAY											
13...	1752	1.00	331	8.3	25.5	--	7.1	88	120	13	41
13...	1802	13.0	329	8.0	24.5	--	5.6	68	120	13	41
JUL											
29...	1728	1.00	318	8.6	31.5	0.50	8.5	117	100	9	34
29...	1735	12.0	288	7.6	27.5	--	5.0	64	93	9	31

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITTY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
FEB										
20...	4.2	16	0.6	4.7	110	30	15	0.20	1.5	178
20...	4.6	20	0.8	4.6	120	34	18	0.20	1.9	199
MAY										
13...	4.3	17	0.7	4.5	110	23	19	0.30	3.3	177
13...	4.2	16	0.6	4.7	110	28	17	0.30	3.4	179
JUL										
29...	4.4	18	0.8	5.1	94	29	17	0.20	5.0	169
29...	3.9	17	0.8	4.7	84	26	14	0.20	5.7	153

## TRINITY RIVER BASIN

08049200 LAKE ARLINGTON AT ARLINGTON, TX--Continued

324041097134601 - LAKE ARLINGTON SITE FC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
FEB										
20...	--	0.010	<0.050	0.020	0.58	0.60	0.060	<0.010	13	2
20...	0.090	0.020	0.110	0.020	0.88	0.90	0.060	<0.010	14	17
MAY										
13...	0.120	0.030	0.150	0.010	0.59	0.60	0.040	<0.010	4	8
13...	0.120	0.040	0.160	0.080	0.62	0.70	0.070	<0.010	7	92
JUL										
29...	--	<0.010	<0.050	0.010	0.49	0.50	0.050	<0.010	3	4
29...	0.240	0.050	0.290	0.090	0.51	0.60	0.170	0.100	13	36

TRINITY RIVER MAIN STEM

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08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX

LOCATION.--Lat 32°45'46", long 96°59'42", Dallas County, Hydrologic Unit 12030102, on left bank at upstream side of bridge on Belt Line Road, 1.3 mi northeast of Grand Prairie, 3.7 mi upstream from Mountain Creek, and at mile 514.6.

DRAINAGE AREA.--3,065 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1925 to current year.

REVISED RECORDS.--WSP 628: 1925. WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 405.42 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 6, 1933, nonrecording gage at bridge on old channel 2,500 ft southeast of present site at datum 7.56 ft higher. Dec. 6, 1933, to May 24, 1956, water-stage recorder at site 440 ft downstream from site of nonrecording gage at datum 7.56 ft higher than present datum. May 25, 1956, to Apr. 18, 1957, nonrecording gage at site 1.5 mi downstream at different datum. Apr. 19 to Aug 13, 1957, nonrecording gage on bridge at present site and at datum 5.00 ft higher than present datum. Aug. 14, 1957, to Sept. 30, 1982, water-stage recorder at present site and at datum 5.00-ft higher than present datum.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Flow is affected at times by three upstream reservoirs with a combined capacity of 248,600 acre-ft, of which 76,550 acre-ft is for flood control. During the current year, the city of Fort Worth discharged sewage effluent into the river upstream from this station. There are many diversions upstream from this station for municipal, industrial, and other uses. The river channel at this station was relocated and rectified in 1956. Gage-height telemeter at station.

AVERAGE DISCHARGE.--66 years (water years 1926-91), 606 ft<sup>3</sup>/s (439,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 64,400 ft<sup>3</sup>/s May 3, 1990 (gage-height, 33.88 ft, from graph based on several wire-weight gage readings), from rating curve extended above 54,000 ft<sup>3</sup>/s; minimum observed, 3.2 ft<sup>3</sup>/s June 6, 1925.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1900, 30.6 ft in May 1908 (former site and datum), from information by local resident. Flood in April 1922 reached a stage of 29.0 ft (former site and datum), from flood-marks.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 6,760 ft<sup>3</sup>/s Apr. 12 at 1400 hours (gage height, 18.62 ft), from rating curve extended above 54,000 ft<sup>3</sup>/s; minimum daily, 127 ft<sup>3</sup>/s Oct. 31 to Nov. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	166	127	177	233	296	305	231	e554	e680	237	247	2650
2	171	128	199	209	265	312	240	e424	658	e239	223	1130
3	270	128	334	176	207	292	234	e377	1700	424	217	1160
4	207	576	262	168	533	280	233	e371	1080	1210	211	625
5	200	848	206	192	1590	282	225	e437	e657	312	205	1020
6	184	279	179	540	e558	275	215	e359	e673	e227	209	501
7	181	187	164	687	384	264	230	336	939	e199	205	719
8	203	1360	158	360	359	239	225	946	e1730	189	202	1500
9	3520	3320	161	423	320	227	214	1650	e970	191	203	656
10	947	672	155	1850	286	228	211	445	e938	189	201	443
11	358	344	158	939	271	230	214	471	e904	184	216	371
12	264	249	164	452	282	233	4290	438	e919	189	1750	349
13	220	233	158	342	e274	230	2190	414	e947	201	5150	327
14	202	194	156	295	e288	217	1370	763	891	201	3260	517
15	189	184	160	386	232	214	386	3310	e640	203	1380	413
16	169	177	172	327	221	250	207	784	948	205	581	493
17	171	171	185	267	225	304	276	491	e798	206	410	815
18	166	173	212	566	237	354	1720	577	e414	190	347	622
19	160	174	232	1370	218	272	605	655	e410	176	313	2500
20	157	191	202	763	198	231	320	567	e349	169	304	873
21	155	178	170	440	202	233	e349	608	e303	167	307	479
22	154	450	155	345	1510	225	e358	e451	e271	169	305	375
23	150	850	154	289	908	228	346	e361	1880	172	295	339
24	142	304	152	259	472	228	e347	550	854	173	277	328
25	138	217	178	232	357	240	e442	e3850	e366	180	275	306
26	132	199	193	205	317	237	e353	e2220	e267	258	273	284
27	131	315	334	197	306	974	e351	e1640	e247	815	263	269
28	130	290	295	210	295	704	e891	e1290	e248	e1450	257	257
29	130	229	356	212	---	377	e3110	e988	e239	804	272	254
30	135	198	487	211	---	280	e916	e775	e239	403	1380	252
31	127	---	287	290	---	237	---	698	---	279	865	---
TOTAL	9629	12945	6555	13435	11611	9202	21299	27800	22159	10211	20603	20827
MEAN	311	431	211	433	415	297	710	897	739	329	665	694
MAX	3520	3320	487	1850	1590	974	4290	3850	1880	1450	5150	2650
MIN	127	127	152	168	198	214	207	336	239	167	201	252
AC-FT	19100	25680	13000	26650	23030	18250	42250	55140	43950	20250	40870	41310
CAL YR 1990	TOTAL	825145	MEAN	2261	MAX	48900	MIN	127	AC-FT	1637000		
WTR YR 1991	TOTAL	186276	MEAN	510	MAX	5150	MIN	127	AC-FT	369500		

e Estimated



## 08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: January 1964 to current year. Chemical and biochemical analyses: January 1968 to current year.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1966 to current year.  
pH: October 1976 to current year.  
WATER TEMPERATURE: October 1966 to current year.  
DISSOLVED OXYGEN: October 1976 to current year.

INSTRUMENTATION.--Since November 1976, a four-parameter water-quality monitor records temperature, DO, pH, and specific conductance continuously at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument, pump, or intake. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,320 microsiemens Dec. 12, 1978; minimum, 108 microsiemens May 1, 1986.  
pH: Maximum, 8.6 units July 2, 1981, June 27, 1982, Mar. 26, 1983, Feb. 5, 1986; minimum, 6.6 units Jan. 6, 1979.  
WATER TEMPERATURE: Maximum, 35.0°C Aug. 8, 1982; minimum, 3.0°C Jan. 9, 1973.  
DISSOLVED OXYGEN: Maximum, 14.8 mg/L Dec. 14, 16, 1983; minimum, 0.0 mg/L on several days during period of record.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 959 microsiemens Nov. 3; minimum, 125 microsiemens Sep. 1.  
pH: Maximum, 8.3 units Nov. 6; minimum, 7.0 units on several days during October, January, and February.  
WATER TEMPERATURE: Maximum, 31.5°C July 15, Aug. 8; minimum, 7.5°C Dec. 31.  
DISSOLVED OXYGEN: Maximum, 12.3 mg/L Aug. 20; minimum, 2.1 mg/L July 4.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	
NOV	06...	1505	261	472	7.9	16.0	8.5	87	3.0	150	38
FEB	01...	1540	256	737	7.7	11.5	11.4	104	11	210	43
MAR	26...	1450	229	808	7.7	20.5	8.1	92	3.3	200	45
JUN	14...	0825	946	547	7.8	28.0	6.3	81	0.1	170	18
JUL	18...	1035	206	777	7.9	29.5	6.0	80	1.5	160	9
SEP	10...	1355	443	565	7.8	28.5	7.1	92	2.6	160	25

DATE	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	
NOV	06...	50	5.5	37	1	6.0	110	43	38	0.40	5.9
FEB	01...	70	8.0	65	2	8.2	170	71	73	0.50	6.3
MAR	26...	67	8.5	84	3	9.6	160	93	86	0.90	9.2
JUN	14...	57	7.2	39	1	6.2	150	38	46	0.40	5.4
JUL	18...	52	7.8	94	3	12	150	68	94	1.0	10
SEP	10...	54	5.8	45	2	7.2	130	52	46	0.50	9.4

DATE	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	
NOV	06...	252	2.87	0.030	2.90	0.060	1.0	1.1	1.00	1.00
FEB	01...	401	2.44	0.360	2.80	0.530	0.87	1.4	1.30	1.30
MAR	26...	452	6.75	0.050	6.80	0.050	1.7	1.8	1.90	1.80
JUN	14...	292	1.78	0.020	1.80	0.010	0.79	0.80	0.630	0.660
JUL	18...	431	8.45	0.050	8.50	0.080	1.4	1.5	2.50	2.40
SEP	10...	300	5.07	0.030	5.10	0.030	1.1	1.1	1.50	1.50

TRINITY RIVER MAIN STEM

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08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	9629	524	291	7560	48	1240	52	1340	140
NOV. 1990	12945	542	302	10500	47	1640	53	1840	160
DEC. 1990	6555	731	403	7140	73	1290	75	1320	180
JAN. 1991	13435	628	348	12600	58	2110	62	2260	170
FEB. 1991	11611	660	365	11400	63	1980	66	2080	170
MAR. 1991	9202	787	433	10800	83	2060	82	2040	180
APR. 1991	21299	505	281	16200	43	2450	48	2790	150
MAY 1991	27800	489	273	20500	40	2990	46	3480	150
JUNE 1991	22159	503	281	16800	41	2460	48	2860	160
JULY 1991	10211	605	336	9250	56	1550	60	1660	160
AUG. 1991	20603	431	240	13400	36	2000	41	2290	130
SEPT 1991	20827	442	247	13900	36	2000	42	2350	140
TOTAL	186276	**	**	150000	**	23800	**	26300	**
WTD.AVG.	510	537	298	**	47	**	52	**	150

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	809	785	795	891	847	871	743	689	721	673	640	658
2	788	745	772	940	893	905	749	645	724	716	647	692
3	739	487	636	959	933	945	741	681	709	707	686	690
4	812	627	757	943	536	771	684	620	655	748	686	715
5	815	789	806	704	395	463	699	657	684	761	747	753
6	784	757	764	547	434	481	733	690	710	742	597	667
7	798	767	781	617	553	591	767	732	748	685	639	654
8	802	497	776	640	283	458	769	750	757	657	629	644
9	418	190	285	---	---	e420	783	766	775	721	417	654
10	388	255	315	---	---	e410	765	742	751	615	403	495
11	545	395	455	---	---	e490	759	737	743	540	458	494
12	613	550	584	---	---	e570	773	727	741	642	542	584
13	659	620	645	---	---	e600	777	766	773	714	648	672
14	712	653	696	667	616	645	791	772	776	751	722	738
15	734	685	716	708	667	692	793	786	789	753	635	710
16	714	691	707	741	693	719	804	795	798	753	712	735
17	738	704	717	753	730	743	805	791	795	779	739	763
18	777	718	746	766	740	757	791	740	765	776	618	704
19	778	744	754	760	728	748	779	750	768	674	475	530
20	750	734	740	725	690	708	775	761	770	560	465	508
21	768	731	739	730	688	700	795	760	779	651	563	593
22	794	765	784	742	395	633	818	780	795	688	635	654
23	762	712	732	743	434	542	818	763	798	738	696	717
24	726	700	709	549	425	470	760	721	737	756	739	745
25	755	731	737	596	555	583	720	695	706	785	747	766
26	795	756	769	656	596	634	718	661	694	795	776	787
27	924	795	845	654	574	626	707	657	686	804	780	795
28	924	872	896	696	634	660	747	718	738	794	766	782
29	923	868	898	695	654	680	744	613	695	776	751	765
30	868	838	857	695	660	683	708	657	684	804	757	779
31	865	819	837	---	---	---	681	648	666	823	796	811
MONTH	924	190	718	959	283	640	818	613	740	823	403	686

e Estimated

## TRINITY RIVER MAIN STEM

08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	794	726	755	834	796	809	819	789	807	636	579	613
2	757	737	747	817	802	809	795	781	787	711	630	690
3	778	733	758	819	794	807	817	782	801	709	426	622
4	776	509	692	809	757	791	868	814	838	608	511	541
5	683	401	498	787	758	777	909	868	875	646	522	583
6	623	512	560	856	786	831	873	853	859	603	482	537
7	700	628	654	857	846	852	873	840	858	673	608	625
8	751	705	726	865	845	854	838	813	831	693	332	521
9	775	742	756	851	837	844	809	790	798	461	344	395
10	782	763	770	854	839	848	817	789	802	645	464	539
11	787	746	772	846	826	841	821	800	818	651	592	619
12	781	753	770	824	797	812	765	260	439	636	564	603
13	800	773	786	854	794	817	465	239	379	637	592	622
14	814	789	799	904	856	870	436	416	424	634	367	571
15	814	793	803	945	897	926	622	442	513	582	258	360
16	815	789	801	883	844	858	695	567	631	564	414	472
17	799	780	794	877	817	849	736	459	680	677	570	610
18	794	775	787	825	777	806	666	344	472	681	411	619
19	787	770	779	776	754	763	540	379	476	680	494	575
20	821	772	801	821	767	801	636	524	568	672	563	613
21	900	768	866	837	818	829	680	607	626	610	566	580
22	760	335	547	857	832	847	611	535	577	628	571	604
23	536	474	501	870	843	853	641	569	604	703	637	661
24	682	544	604	869	857	862	658	609	640	700	229	629
25	723	685	701	852	816	835	668	546	639	---	---	e360
26	748	720	734	814	805	810	623	516	561	---	---	e420
27	807	738	781	804	522	682	639	606	624	---	---	e470
28	835	803	821	670	593	646	649	513	626	---	---	e495
29	---	---	---	682	608	633	404	245	340	---	---	e540
30	---	---	---	750	691	730	569	407	485	---	---	e560
31	---	---	---	804	749	787	---	---	---	---	---	e571
MONTH	900	335	727	945	522	809	909	239	646	711	229	555

e Estimated

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	599	538	577	---	---	e698	724	640	697	403	125	243
2	613	533	578	708	684	699	746	702	730	292	242	270
3	---	---	e460	749	346	644	746	711	734	367	284	315
4	---	---	e575	723	332	479	781	727	765	406	293	364
5	---	---	e550	579	389	450	782	750	768	509	284	371
6	---	---	e500	672	510	583	746	722	732	565	308	424
7	---	---	e415	661	569	628	789	707	746	618	299	515
8	---	---	e399	701	650	682	796	779	788	530	306	360
9	---	---	e420	716	673	701	839	788	810	480	321	406
10	---	---	e490	755	690	718	834	811	824	599	440	511
11	---	---	e540	790	752	769	827	818	824	636	574	603
12	---	---	e510	810	779	793	821	195	504	685	597	645
13	---	---	e550	810	778	788	261	127	209	712	652	689
14	---	---	e570	790	777	784	308	190	240	716	521	654
15	---	---	e620	790	756	772	366	236	290	626	544	574
16	---	---	e510	773	738	751	535	369	441	709	262	606
17	---	---	e570	767	717	735	621	547	579	687	486	582
18	---	---	e538	786	762	771	649	618	635	594	423	490
19	---	---	e540	799	779	788	682	639	661	534	256	343
20	---	---	e542	821	794	807	691	652	671	458	260	376
21	---	---	e550	826	790	812	713	683	701	609	461	516
22	---	---	e595	817	785	803	706	676	692	679	613	632
23	---	---	e395	810	783	795	723	693	709	691	657	678
24	---	---	e460	792	756	773	726	704	713	709	676	696
25	---	---	e475	821	795	808	746	700	734	726	697	708
26	---	---	e480	826	713	793	743	704	727	749	723	736
27	---	---	e560	840	512	713	731	691	718	795	751	767
28	---	---	e615	506	287	406	754	690	716	781	751	765
29	---	---	e670	404	284	363	779	734	756	773	749	764
30	---	---	e690	588	410	473	755	220	486	775	719	756
31	---	---	---	626	566	594	426	370	393	---	---	---
MONTH	613	533	531	840	284	689	839	127	645	795	125	545

e Estimated

TRINITY RIVER MAIN STEM

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08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	7.7	7.6	7.6	7.7	7.5	7.6	7.6	7.4	7.5	7.7	7.4	7.6
2	7.7	7.6	7.6	7.7	7.5	7.6	7.5	7.4	7.5	7.6	7.4	7.5
3	7.6	7.4	7.5	7.8	7.5	7.7	7.5	7.4	7.5	7.6	7.3	7.5
4	7.6	7.4	7.6	7.8	7.5	7.6	7.8	7.4	7.6	7.6	7.3	7.5
5	7.7	7.5	7.6	7.8	7.5	7.7	7.7	7.5	7.6	7.5	7.4	7.5
6	7.5	7.4	7.5	8.3	7.6	7.9	7.7	7.5	7.5	7.7	7.4	7.6
7	7.4	7.2	7.3	8.2	7.8	8.0	7.7	7.5	7.6	7.8	7.4	7.7
8	7.4	7.0	7.2	8.2	7.8	8.0	7.8	7.7	7.7	7.8	7.5	7.7
9	8.0	7.6	7.8	8.2	8.0	8.1	7.7	7.7	7.7	7.7	7.2	7.5
10	7.9	7.7	7.8	8.2	7.7	7.9	7.8	7.7	7.7	7.8	7.2	7.6
11	7.9	7.7	7.8	8.1	7.6	7.9	7.9	7.7	7.8	7.8	7.4	7.6
12	7.8	7.7	7.8	8.1	7.4	7.8	7.8	7.7	7.8	7.8	7.2	7.6
13	7.8	7.5	7.7	7.9	7.6	7.7	7.8	7.5	7.7	7.7	7.3	7.5
14	7.8	7.5	7.6	7.6	7.6	7.6	7.8	7.5	7.6	7.6	7.2	7.5
15	7.8	7.6	7.7	7.7	7.6	7.6	7.8	7.5	7.6	7.6	7.1	7.5
16	7.7	7.6	7.7	7.7	7.6	7.6	7.9	7.5	7.7	7.6	7.2	7.5
17	7.8	7.7	7.7	7.6	7.5	7.6	7.8	7.4	7.5	7.6	7.0	7.4
18	7.8	7.7	7.7	7.6	7.5	7.6	7.8	7.2	7.5	7.6	7.1	7.4
19	7.9	7.7	7.8	7.7	7.6	7.6	7.6	7.2	7.5	7.6	7.0	7.4
20	8.0	7.8	7.9	7.6	7.6	7.6	7.7	7.5	7.6	7.7	7.1	7.5
21	7.9	7.7	7.8	7.7	7.6	7.6	7.7	7.4	7.6	7.7	7.1	7.5
22	8.0	7.7	7.8	7.8	7.5	7.6	7.7	7.4	7.6	7.7	7.2	7.5
23	7.8	7.6	7.7	7.8	7.4	7.6	7.8	7.6	7.7	7.6	7.1	7.4
24	7.8	7.4	7.6	7.8	7.6	7.7	7.8	7.5	7.7	7.6	7.0	7.4
25	7.9	7.6	7.8	7.7	7.4	7.6	7.7	7.5	7.6	7.6	7.1	7.4
26	7.9	7.7	7.8	7.5	7.3	7.4	7.7	7.3	7.5	7.5	7.0	7.3
27	8.0	7.7	7.9	7.6	7.4	7.5	7.7	7.3	7.5	7.5	7.0	7.3
28	7.9	7.7	7.8	7.5	7.4	7.5	7.8	7.3	7.5	7.6	7.0	7.3
29	7.9	7.6	7.8	7.6	7.4	7.5	7.7	7.4	7.5	7.5	7.0	7.3
30	7.8	7.5	7.7	7.7	7.4	7.6	7.7	7.3	7.5	7.5	7.0	7.3
31	7.7	7.5	7.6	---	---	---	7.8	7.5	7.6	7.5	7.0	7.3
MONTH	8.0	7.0	7.7	8.3	7.3	7.7	7.9	7.2	7.6	7.8	7.0	7.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	7.9	7.0	7.4	7.5	7.4	7.5	7.7	7.5	7.6	7.7	7.4	7.6
2	7.8	7.3	7.6	7.6	7.4	7.5	7.7	7.5	7.6	7.7	7.5	7.6
3	7.6	7.2	7.5	7.7	7.5	7.6	7.7	7.5	7.6	7.6	7.4	7.6
4	7.8	7.1	7.4	7.7	7.6	7.7	7.7	7.5	7.6	7.6	7.5	7.5
5	7.7	7.2	7.4	7.7	7.5	7.6	7.6	7.5	7.5	7.6	7.4	7.5
6	7.5	7.3	7.4	7.6	7.4	7.5	7.6	7.5	7.5	7.7	7.5	7.6
7	7.6	7.3	7.4	7.6	7.5	7.6	7.6	7.5	7.6	7.9	7.5	7.7
8	7.6	7.2	7.4	7.9	7.5	7.7	7.7	7.5	7.6	7.7	7.4	7.6
9	7.6	7.2	7.4	7.8	7.7	7.8	7.9	7.6	7.7	7.5	7.3	7.4
10	7.5	7.2	7.4	7.8	7.7	7.7	7.8	7.6	7.7	7.5	7.3	7.5
11	7.5	7.2	7.3	7.8	7.6	7.7	7.6	7.6	7.6	7.7	7.4	7.5
12	7.8	7.2	7.5	7.8	7.6	7.7	7.8	7.4	7.6	7.8	7.4	7.6
13	7.7	7.5	7.6	7.8	7.6	7.7	7.7	7.4	7.5	8.0	7.5	7.7
14	7.7	7.5	7.6	7.8	7.6	7.7	7.5	7.3	7.4	7.8	7.5	7.7
15	7.7	7.5	7.6	8.0	7.5	7.8	7.5	7.4	7.5	7.5	7.2	7.4
16	7.6	7.5	7.5	7.9	7.7	7.8	7.6	7.4	7.5	7.6	7.3	7.4
17	7.6	7.4	7.5	8.0	7.8	7.9	7.5	7.4	7.5	7.9	7.4	7.7
18	7.6	7.5	7.6	8.0	7.7	7.9	7.5	7.3	7.4	8.2	7.8	8.0
19	7.6	7.5	7.6	8.0	7.7	7.9	7.4	7.2	7.3	7.9	7.8	7.9
20	7.6	7.5	7.5	7.9	7.7	7.8	7.4	7.3	7.3	8.2	7.9	8.1
21	7.6	7.4	7.5	7.8	7.7	7.8	7.4	7.2	7.3	8.2	7.7	8.0
22	7.7	7.4	7.6	7.8	7.7	7.7	7.5	7.3	7.4	7.9	7.4	7.8
23	7.6	7.4	7.5	7.8	7.6	7.7	7.9	7.4	7.6	7.7	7.3	7.5
24	7.7	7.4	7.5	7.7	7.5	7.6	7.8	7.6	7.7	---	---	---
25	7.7	7.5	7.6	7.7	7.5	7.6	7.8	7.5	7.6	---	---	---
26	7.7	7.5	7.6	7.7	7.5	7.6	7.7	7.5	7.6	---	---	---
27	7.6	7.5	7.6	7.7	7.4	7.5	7.6	7.3	7.5	---	---	---
28	7.6	7.5	7.5	7.6	7.4	7.6	7.4	7.2	7.3	---	---	---
29	---	---	---	7.6	7.4	7.5	7.7	7.4	7.5	---	---	---
30	---	---	---	7.7	7.5	7.6	7.6	7.4	7.5	---	---	---
31	---	---	---	7.7	7.5	7.6	---	---	---	---	---	---
MONTH	7.9	7.0	7.5	8.0	7.4	7.7	7.9	7.2	7.5	8.2	7.2	7.6

TRINITY RIVER MAIN STEM  
08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN												
													JUNE			JULY			AUGUST			SEPTEMBER		
1	8.2	8.0	8.1	7.9	7.6	7.7	---	---	---	8.1	7.6	7.7												
2	8.2	7.8	8.1	7.8	7.6	7.7	---	---	---	7.7	7.6	7.6												
3	8.1	7.8	8.0	---	---	---	---	---	---	7.7	7.5	7.6												
4	7.9	7.8	7.9	---	---	---	---	---	---	7.7	7.6	7.7												
5	8.0	7.8	7.9	---	---	---	7.5	7.2	7.3	7.7	7.6	7.6												
6	8.2	7.8	8.0	---	---	---	7.6	7.4	7.5	7.9	7.6	7.7												
7	8.0	7.8	7.9	---	---	---	7.8	7.4	7.6	7.9	7.7	7.9												
8	7.9	7.7	7.7	---	---	---	7.7	7.5	7.7	7.8	7.6	7.7												
9	7.9	7.7	7.8	---	---	---	7.6	7.4	7.6	8.0	7.6	7.8												
10	8.1	7.8	8.0	---	---	---	7.5	7.2	7.4	8.0	7.7	7.9												
11	8.1	7.9	8.0	---	---	---	7.4	7.1	7.3	8.0	7.7	7.8												
12	8.1	7.9	8.0	---	---	---	7.8	7.1	7.5	8.0	7.7	7.8												
13	8.2	7.9	8.0	---	---	---	7.9	7.4	7.7	7.7	7.5	7.6												
14	8.2	7.9	8.0	---	---	---	7.8	7.6	7.8	7.7	7.5	7.6												
15	8.2	7.9	8.0	---	---	---	7.7	7.5	7.6	7.7	7.5	7.6												
16	7.9	7.6	7.8	---	---	---	7.5	7.4	7.5	8.0	7.5	7.7												
17	7.7	7.5	7.6	---	---	---	7.7	7.4	7.5	7.9	7.6	7.7												
18	7.6	7.4	7.5	8.1	7.9	8.0	7.8	7.6	7.7	7.8	7.6	7.7												
19	7.5	7.3	7.4	8.0	7.9	8.0	8.1	7.6	7.8	7.8	7.6	7.7												
20	7.5	7.2	7.3	8.0	7.8	7.9	8.0	7.7	7.8	7.8	7.7	7.7												
21	7.8	7.2	7.5	8.1	7.8	8.0	7.6	7.3	7.4	7.9	7.7	7.8												
22	8.1	7.6	7.8	8.0	7.8	8.0	7.5	7.3	7.4	7.9	7.7	7.8												
23	7.8	7.4	7.6	7.9	7.7	7.8	7.5	7.4	7.5	8.0	7.7	7.8												
24	7.6	7.4	7.5	7.9	7.7	7.8	7.7	7.5	7.6	8.0	7.8	7.9												
25	7.4	7.3	7.4	7.9	7.6	7.8	7.8	7.6	7.7	8.0	7.7	7.8												
26	7.6	7.2	7.3	8.0	7.8	7.9	8.0	7.7	7.9	7.9	7.8	7.8												
27	7.8	7.3	7.5	8.0	7.7	7.9	8.0	7.7	7.9	7.9	7.7	7.8												
28	7.8	7.5	7.7	8.2	7.7	7.8	7.9	7.7	7.8	8.0	7.7	7.8												
29	7.8	7.7	7.7	---	---	---	7.9	7.8	7.8	8.2	7.8	8.0												
30	7.8	7.6	7.7	---	---	---	7.9	7.5	7.7	8.1	7.5	7.8												
31	---	---	---	---	---	---	7.6	7.5	7.6	---	---	---												
MONTH	8.2	7.2	7.8	8.2	7.6	7.9	8.1	7.1	7.6	8.2	7.5	7.7												

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN												
													OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	27.5	26.0	26.5	23.0	21.5	22.5	16.5	15.5	16.0	10.5	8.5	9.5												
2	27.0	26.0	26.5	22.5	21.5	22.0	17.0	15.5	16.5	11.5	10.5	11.5												
3	26.5	24.5	25.5	23.0	22.0	22.5	16.5	15.5	16.0	11.5	10.5	11.0												
4	27.5	25.5	26.5	22.5	16.0	19.0	15.5	13.5	14.0	11.0	10.5	10.5												
5	27.5	26.0	26.5	18.0	15.0	16.0	14.0	13.5	13.5	12.0	10.5	11.0												
6	27.5	26.0	27.0	17.5	15.0	16.0	14.5	13.5	14.0	11.5	10.0	11.0												
7	28.5	27.0	27.5	18.0	17.5	17.5	14.5	13.5	14.0	11.5	8.5	9.5												
8	28.0	23.5	27.5	17.5	13.0	15.5	14.0	13.5	14.0	11.0	8.5	9.5												
9	23.0	19.0	20.5	13.5	12.5	13.0	15.0	13.5	14.5	11.5	8.5	11.0												
10	19.5	18.5	19.0	15.5	13.5	14.5	15.5	14.0	15.0	11.5	8.0	9.5												
11	20.0	18.0	19.0	17.0	15.0	16.0	16.5	15.0	15.5	9.5	8.0	9.0												
12	21.0	19.5	20.0	18.0	17.0	17.5	17.0	16.0	16.5	10.5	8.5	9.5												
13	21.5	20.5	21.0	18.5	18.0	18.0	17.0	16.5	16.5	11.5	10.0	11.0												
14	23.0	21.5	22.0	18.5	18.0	18.5	16.5	16.0	16.0	12.5	11.5	12.0												
15	24.0	22.5	23.5	19.5	18.5	19.0	17.0	16.0	16.5	13.5	12.0	13.0												
16	25.0	23.5	24.5	20.5	19.5	20.0	16.5	16.0	16.0	13.5	12.5	13.0												
17	24.5	24.0	24.0	20.0	19.5	20.0	16.5	16.0	16.5	14.0	13.0	13.5												
18	23.5	22.0	22.5	20.0	19.0	19.5	17.0	15.5	16.5	14.0	12.0	13.0												
19	21.5	20.5	21.0	21.0	19.5	20.5	16.5	16.0	16.0	13.0	11.0	11.5												
20	21.5	20.5	21.0	21.5	20.5	21.0	16.5	15.5	16.0	11.5	11.0	11.5												
21	21.5	19.5	20.5	21.5	21.0	21.0	16.0	12.5	15.0	11.5	10.5	11.0												
22	20.0	18.5	19.5	21.5	19.0	20.5	12.0	9.0	10.5	11.5	10.5	11.0												
23	20.0	18.0	19.0	21.0	18.0	19.0	9.0	8.0	8.5	12.5	11.5	12.0												
24	20.0	19.0	19.5	18.5	16.5	17.5	9.5	8.0	9.0	13.0	12.5	12.5												
25	20.5	19.0	19.5	20.0	18.5	19.0	11.0	9.0	10.5	13.0	12.5	13.0												
26	20.5	19.0	20.0	20.5	20.0	20.5	11.5	8.5	10.5	13.0	12.0	12.5												
27	21.5	19.5	20.5	21.5	20.5	21.0	11.5	8.5	11.0	14.0	12.5	13.0												
28	22.0	20.5	21.5	20.0	18.0	19.0	11.0	10.0	10.5	14.0	13.5	13.5												
29	23.0	21.0	22.0	18.0	16.0	17.0	12.5	10.5	12.0	15.5	13.5	14.5												
30	23.0	21.5	22.0	16.0	15.5	16.0	13.0	9.0	11.0	13.5	11.5	12.5												
31	23.0	21.5	22.5	---	---	---	9.0	7.5	8.0	13.0	11.5	12.0												
MONTH	28.5	18.0	22.5	23.0	12.5	18.5	17.0	7.5	13.5	15.5	8.0	11.5												



TRINITY RIVER MAIN STEM

08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	12.5	11.0	12.0	18.0	15.5	16.5	---	---	---	26.0	23.0	24.5
2	13.0	11.5	12.5	18.5	17.5	18.0	---	---	---	25.5	24.5	25.0
3	14.0	12.5	13.0	17.5	15.5	16.5	---	---	---	25.0	23.0	24.0
4	15.0	13.0	14.5	17.0	15.5	16.5	---	---	---	24.0	23.5	23.5
5	15.5	13.0	14.0	18.0	16.5	17.5	---	---	---	24.0	22.5	23.0
6	15.5	13.5	14.5	19.0	18.0	18.5	---	---	---	---	---	---
7	15.5	14.0	15.0	18.5	16.5	17.5	---	---	---	---	---	---
8	16.0	14.0	15.0	17.0	15.5	16.5	---	---	---	---	---	---
9	15.5	14.5	15.0	17.0	15.5	16.5	25.0	23.0	23.5	23.0	18.0	21.0
10	16.0	15.0	15.5	17.0	16.0	16.5	24.0	22.5	23.5	24.0	21.0	22.5
11	16.0	15.5	16.0	17.5	16.0	17.0	24.5	22.5	23.5	25.5	23.5	24.5
12	16.5	16.0	16.5	19.0	17.5	18.0	23.0	21.0	22.5	26.5	24.0	25.0
13	17.5	16.5	17.0	18.5	15.5	18.0	23.0	21.0	22.5	---	---	---
14	17.0	16.5	17.0	18.0	17.0	17.5	23.5	21.0	22.0	---	---	---
15	16.5	14.5	15.5	17.0	15.0	16.0	24.0	21.0	22.5	24.5	21.5	23.0
16	14.5	12.5	13.5	15.5	15.0	15.0	24.5	23.0	24.0	---	---	---
17	15.5	12.5	14.0	17.5	15.0	16.0	24.5	21.0	23.5	25.0	23.5	24.0
18	17.5	15.5	16.5	17.5	16.5	17.0	---	---	---	25.5	23.0	24.5
19	17.5	16.0	16.5	17.0	16.5	17.0	---	---	---	25.5	24.0	25.0
20	16.0	15.0	15.5	17.5	17.0	17.5	---	---	---	26.5	19.5	24.5
21	15.0	14.0	15.0	20.0	17.5	18.5	---	---	---	27.0	25.5	26.5
22	14.0	11.0	13.0	20.0	19.0	19.5	---	---	---	27.0	25.5	26.0
23	14.0	12.5	13.5	19.5	18.5	19.0	24.5	19.5	21.5	27.5	25.5	26.5
24	16.0	13.5	14.5	20.0	18.5	19.0	23.5	22.5	23.0	28.0	22.5	26.5
25	15.5	14.5	15.0	19.5	19.0	19.5	25.5	23.0	24.0	---	---	---
26	15.0	14.0	14.5	21.0	19.5	20.5	26.5	24.0	25.0	27.0	24.5	26.0
27	15.5	14.5	15.0	21.0	20.0	20.5	28.0	25.5	26.5	29.0	26.5	27.5
28	15.5	15.0	15.0	20.0	19.5	19.5	27.0	24.5	26.0	29.0	27.5	28.5
29	---	---	---	19.5	18.5	19.0	24.5	20.0	22.5	29.0	27.0	28.0
30	---	---	---	---	---	---	25.0	22.0	24.0	28.5	27.5	28.0
31	---	---	---	---	---	---	---	---	---	28.5	27.0	27.5
MONTH	17.5	11.0	15.0	21.0	15.0	17.5	28.0	19.5	23.5	29.0	18.0	25.0
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	28.0	26.5	27.5	30.5	29.0	30.0	30.5	29.0	30.0	26.5	23.5	25.0
2	28.0	26.5	27.0	31.0	29.5	30.5	31.0	29.5	30.0	26.5	25.5	26.0
3	26.0	24.0	25.5	30.5	27.5	30.0	31.0	29.5	30.5	27.0	25.5	26.5
4	26.5	23.5	25.0	29.5	28.0	29.0	31.0	29.5	30.5	27.5	26.0	26.5
5	28.0	26.0	27.0	30.5	28.0	29.0	31.0	30.0	30.5	27.5	27.0	27.0
6	29.0	26.5	27.5	31.0	29.5	30.0	31.0	30.0	30.5	28.5	26.5	27.5
7	28.0	26.5	27.0	31.0	29.5	30.5	31.0	30.0	30.5	28.0	26.0	27.5
8	27.0	25.0	26.0	31.0	29.5	30.5	31.5	30.0	31.0	27.0	26.0	26.5
9	27.0	25.0	26.0	30.5	29.5	30.0	31.0	30.0	30.5	28.0	26.5	27.0
10	27.0	25.5	26.0	30.0	29.0	29.5	30.0	29.5	30.0	28.5	27.0	28.0
11	27.5	25.5	26.5	30.0	28.5	29.5	29.5	29.0	29.0	29.5	27.5	28.5
12	28.5	26.5	27.5	30.5	28.5	29.5	29.0	24.5	27.0	29.5	28.0	29.0
13	29.5	27.5	28.5	31.0	29.0	30.0	25.5	24.0	24.5	29.5	28.0	29.0
14	29.5	28.0	28.5	31.0	29.5	30.5	25.0	24.0	24.5	29.0	28.0	28.5
15	29.5	27.5	28.5	31.5	30.0	30.5	26.0	24.5	25.0	29.0	27.5	28.0
16	29.0	25.0	27.0	31.0	30.0	30.5	28.0	25.5	26.5	28.5	27.5	28.5
17	28.0	23.0	26.0	31.0	30.0	30.5	29.0	27.0	28.0	28.5	27.5	28.0
18	29.0	26.5	27.5	30.5	29.5	30.0	30.0	28.0	29.0	28.0	25.5	27.0
19	30.0	27.5	29.0	30.5	29.5	30.0	30.5	28.5	29.5	25.5	19.0	21.0
20	30.5	28.5	29.5	30.5	29.5	30.0	30.0	28.5	29.5	21.0	19.0	20.0
21	28.5	25.0	27.5	30.5	29.0	30.0	30.0	28.5	29.0	22.5	20.5	21.5
22	29.5	27.5	28.0	31.0	29.0	30.0	28.5	27.5	28.0	24.5	22.5	23.0
23	29.0	25.5	27.5	31.0	29.5	30.0	29.5	28.0	28.5	25.0	24.0	24.5
24	30.0	25.5	28.0	30.5	29.5	30.0	29.5	28.5	29.0	25.5	24.0	25.0
25	30.5	28.0	29.5	30.0	29.0	29.5	29.5	28.5	29.0	24.0	23.0	24.0
26	31.0	28.5	30.0	29.5	27.5	28.5	29.5	28.0	29.0	24.5	23.0	23.5
27	31.0	29.5	30.5	29.0	28.0	28.5	29.0	28.0	28.5	24.0	23.0	23.5
28	31.0	29.5	30.5	28.0	26.5	27.0	29.5	28.5	29.0	24.0	23.0	23.5
29	30.0	29.0	29.5	29.0	26.0	27.5	29.0	28.5	29.0	24.0	23.0	23.5
30	30.5	28.5	29.5	30.0	27.5	28.5	29.0	23.5	26.5	25.0	23.5	24.0
31	---	---	---	30.5	28.5	29.5	27.0	26.0	26.5	---	---	---
MONTH	31.0	23.0	28.0	31.5	26.0	29.5	31.5	23.5	28.5	29.5	19.0	25.5

## TRINITY RIVER MAIN STEM

08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

## OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.3	5.5	6.1	7.2	5.8	6.5	8.8	8.2	8.5	9.9	9.3	9.5
2	7.1	5.5	6.3	6.7	5.5	6.1	8.2	7.6	7.9	9.5	8.0	8.5
3	6.6	6.0	6.4	7.0	6.0	6.5	8.6	7.8	8.1	8.9	8.5	8.7
4	7.5	6.1	6.6	8.8	6.5	7.3	10.7	8.5	9.6	9.0	8.1	8.6
5	7.1	6.2	6.7	8.2	7.1	7.7	10.1	9.1	9.7	8.3	8.0	8.1
6	7.2	6.1	6.5	8.4	7.9	8.2	9.1	8.7	8.9	9.5	8.4	9.1
7	7.0	5.7	6.3	7.8	7.6	7.7	8.8	8.1	8.5	10.3	8.9	9.9
8	8.9	5.8	7.0	9.6	7.4	8.5	8.5	7.7	8.1	9.9	9.5	9.8
9	9.3	5.9	7.4	8.9	8.4	8.6	8.2	7.6	7.9	10.8	8.8	9.3
10	8.8	7.9	8.5	8.8	8.5	8.6	8.9	7.5	8.0	10.9	9.6	10.2
11	9.0	8.7	8.9	8.8	8.3	8.6	8.9	7.4	8.0	10.6	10.0	10.3
12	8.8	8.2	8.5	8.3	8.0	8.2	9.4	7.4	8.4	10.0	9.3	9.8
13	8.2	7.7	8.0	8.1	7.2	7.8	8.4	6.8	7.5	10.1	8.8	9.1
14	8.1	7.3	7.6	---	---	---	8.0	6.9	7.3	8.7	8.2	8.4
15	8.3	6.7	7.3	---	---	---	7.9	6.6	7.2	8.7	8.0	8.3
16	8.8	6.9	7.9	7.0	6.5	6.7	8.1	7.2	7.7	8.3	7.7	8.0
17	7.0	6.5	6.7	6.9	6.3	6.6	7.4	6.4	7.0	8.1	7.7	7.9
18	7.1	6.3	6.6	6.5	6.1	6.3	7.6	6.3	7.0	9.0	7.6	8.2
19	8.5	7.2	8.0	6.8	6.1	6.4	7.5	6.3	6.9	9.8	8.6	9.4
20	8.8	7.9	8.4	7.1	6.1	6.6	7.8	7.0	7.3	9.7	9.0	9.3
21	7.8	7.2	7.5	7.9	6.4	7.1	7.2	6.4	6.6	9.6	9.0	9.4
22	7.5	7.2	7.4	8.3	5.5	6.5	7.4	6.7	7.1	10.0	9.2	9.6
23	8.4	7.2	7.8	7.4	5.2	6.6	8.3	7.5	8.0	10.0	8.9	9.5
24	8.2	7.0	7.6	7.5	6.4	7.1	9.3	8.3	8.9	9.6	8.4	8.9
25	7.4	6.5	6.9	8.0	7.2	7.6	9.3	8.9	9.1	8.7	8.4	8.5
26	7.4	6.5	6.9	7.9	7.2	7.4	9.9	8.6	9.1	8.8	8.4	8.6
27	7.3	6.3	6.7	7.7	7.4	7.5	9.9	8.6	9.2	9.3	8.6	8.9
28	6.8	5.9	6.3	7.5	6.8	7.2	9.5	8.6	9.1	9.3	8.4	8.8
29	6.8	5.7	6.2	8.1	7.0	7.5	8.6	7.9	8.3	9.7	8.8	9.2
30	6.8	5.5	6.1	8.9	8.0	8.5	9.0	7.7	8.5	10.1	9.0	9.6
31	6.6	5.4	6.0	---	---	---	10.1	9.0	9.6	10.7	9.6	10.1
MONTH	9.3	5.4	7.1	9.6	5.2	7.4	10.7	6.3	8.2	10.9	7.6	9.1
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	11.8	9.5	10.6	8.6	7.5	8.1	9.3	7.9	8.6	6.9	6.1	6.5
2	10.6	9.2	10.0	9.5	7.6	8.5	8.8	7.9	8.2	6.9	6.3	6.6
3	10.0	9.0	9.4	9.1	8.1	8.6	8.7	7.6	8.1	6.8	6.3	6.6
4	9.5	7.7	8.6	10.1	7.8	8.9	8.8	7.6	8.2	7.1	6.1	6.3
5	9.1	6.7	8.0	9.7	7.7	8.7	8.2	7.2	7.8	11.3	6.1	7.0
6	---	---	---	8.9	7.3	8.1	7.8	6.7	7.3	7.8	6.4	6.8
7	8.5	7.5	8.0	8.4	6.9	7.6	8.1	6.7	7.4	9.3	6.9	7.9
8	8.6	7.5	8.0	7.9	6.9	7.5	9.3	7.0	8.1	9.2	5.5	7.6
9	9.0	7.3	8.2	7.9	6.8	7.3	8.9	7.3	8.2	6.6	5.6	6.3
10	9.0	7.7	8.4	8.1	6.7	7.4	8.3	6.7	7.6	7.1	6.3	6.6
11	8.7	7.4	8.1	8.1	7.4	7.8	7.5	6.5	7.0	8.5	6.5	7.3
12	11.8	8.1	9.7	8.1	7.3	7.6	---	---	---	---	---	---
13	10.3	7.5	8.9	7.5	6.8	7.2	---	---	---	---	---	---
14	9.2	6.5	8.2	7.9	6.2	7.1	---	---	---	---	---	---
15	9.6	7.3	8.6	7.2	6.6	6.9	---	---	---	---	---	---
16	9.3	7.9	8.3	7.2	6.8	7.1	---	---	---	6.3	5.5	5.8
17	10.4	7.8	9.0	9.3	7.2	8.3	---	---	---	7.0	5.8	6.4
18	10.8	8.4	9.7	10.6	7.6	8.9	---	---	---	8.2	6.6	7.2
19	10.4	8.5	9.5	10.1	8.1	9.1	---	---	---	7.1	5.8	6.4
20	10.4	8.7	9.6	8.9	7.8	8.2	---	---	---	8.8	6.2	7.3
21	9.6	8.5	9.2	8.1	7.4	7.7	---	---	---	7.4	6.2	6.7
22	10.1	8.4	9.0	8.3	7.1	7.7	---	---	---	7.7	5.8	6.6
23	8.7	7.8	8.2	8.6	6.9	7.8	---	---	---	8.7	6.3	7.3
24	8.5	7.8	8.1	9.6	6.9	8.2	7.9	7.1	7.5	9.9	6.4	8.0
25	9.2	7.4	8.3	8.5	7.8	8.1	7.1	6.8	6.9	7.7	4.1	5.5
26	9.8	8.3	9.0	8.5	7.4	7.9	6.9	5.9	6.5	6.5	5.6	5.9
27	9.5	8.4	8.8	8.0	4.6	6.4	7.0	6.2	6.6	6.9	6.3	6.6
28	8.6	8.2	8.4	6.5	4.8	6.0	6.9	5.7	6.4	7.2	6.7	6.9
29	---	---	---	6.7	5.2	5.9	5.6	4.1	5.0	7.6	6.9	7.2
30	---	---	---	7.8	6.7	7.2	6.3	5.6	6.0	7.8	7.0	7.4
31	---	---	---	9.0	7.7	8.3	---	---	---	8.1	7.0	7.4
MONTH	11.8	6.5	8.8	10.6	4.6	7.7	9.3	4.1	7.3	11.3	4.1	6.8

TRINITY RIVER MAIN STEM

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08049500 WEST FORK TRINITY RIVER AT GRAND PRAIRIE, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.8	6.5	7.4	8.4	6.0	7.1	10.4	6.8	8.4	8.4	5.7	6.7
2	8.9	6.7	7.4	8.4	6.0	7.2	9.8	6.4	8.0	7.0	5.9	6.4
3	6.4	3.9	5.5	7.3	5.8	6.3	8.7	6.0	7.2	6.7	5.0	6.1
4	5.9	4.9	5.4	5.9	2.1	3.9	7.5	5.5	6.5	7.3	5.7	6.3
5	7.0	5.6	6.1	6.3	3.5	5.0	7.2	5.4	6.3	6.9	5.1	6.1
6	8.3	5.6	6.6	8.0	5.6	6.4	7.5	5.6	6.5	7.0	6.1	6.5
7	6.7	5.4	6.0	8.9	6.1	7.3	6.9	5.7	6.3	8.0	6.7	7.1
8	5.7	4.4	5.1	9.6	6.7	8.0	7.4	5.4	6.3	6.9	4.6	6.1
9	6.5	5.5	5.9	8.8	6.1	7.4	6.9	5.7	6.3	7.9	4.5	6.6
10	7.3	6.0	6.5	7.7	6.0	6.9	6.8	5.6	6.1	9.7	6.7	8.0
11	7.5	6.2	6.7	7.8	6.0	6.9	6.5	5.4	6.0	10.2	6.2	8.3
12	7.7	6.0	6.7	7.8	6.3	7.0	6.8	3.2	5.4	10.4	6.5	8.2
13	7.6	5.9	6.6	7.9	6.3	7.0	6.7	4.1	5.1	8.1	5.9	7.0
14	7.6	5.8	6.5	7.8	6.3	7.0	5.9	5.1	5.6	6.8	5.4	6.1
15	7.6	5.7	6.6	8.0	6.3	7.1	6.2	5.8	6.0	6.4	4.6	5.6
16	6.6	5.2	6.0	7.5	6.3	6.9	6.4	6.2	6.3	7.2	5.1	6.1
17	5.9	4.8	5.4	7.1	5.6	6.3	6.6	6.0	6.3	6.4	5.7	6.0
18	6.6	5.2	5.8	7.2	5.6	6.4	7.7	6.0	6.7	6.1	4.1	5.2
19	9.0	5.9	7.3	7.4	5.6	6.5	10.6	6.0	7.9	8.3	5.8	6.9
20	9.8	6.6	8.0	7.4	5.8	6.6	12.3	7.2	9.3	7.6	7.1	7.3
21	8.9	6.0	7.4	7.3	5.8	6.6	9.8	7.3	8.2	7.4	7.0	7.1
22	9.0	6.0	7.3	7.2	5.9	6.6	8.4	6.5	7.3	7.5	6.7	7.0
23	6.6	2.8	5.0	6.7	5.7	6.3	8.8	6.4	7.5	7.3	6.2	6.7
24	5.2	3.1	4.5	6.6	5.6	6.1	9.3	6.4	7.7	7.5	6.2	6.7
25	6.5	5.0	5.7	6.4	5.4	5.9	9.7	6.7	8.1	7.9	6.3	7.0
26	8.3	5.5	6.7	6.0	5.5	5.7	11.4	7.0	8.9	8.0	6.3	7.1
27	8.5	6.0	7.1	6.0	4.9	5.6	10.4	7.0	8.7	8.3	6.4	7.2
28	7.7	5.6	6.6	5.5	4.0	4.7	9.5	7.0	8.2	8.7	6.3	7.4
29	6.8	5.5	6.3	5.4	4.0	4.8	8.6	6.7	7.6	9.4	6.3	7.7
30	7.6	5.6	6.5	7.3	5.3	6.0	8.3	4.5	6.5	9.1	6.0	7.5
31	---	---	---	10.3	6.3	7.9	5.8	4.6	5.2	---	---	---
MONTH	9.8	2.8	6.4	10.3	2.1	6.4	12.3	3.2	7.0	10.4	4.1	6.8

## TRINITY RIVER BASIN

08049580 MOUNTAIN CREEK NEAR VENUS, TX  
(Flood-hydrograph Partial-record Station)

LOCATION.--Lat 32°29'27", long 97°07'22", Johnson County, Hydrologic Unit 12030102, on right bank on downstream side of highway embankment near right end of bridge on Farm Road 157, 3.0 mi upstream from Grassy Creek, 3.2 mi upstream from Reece Branch, and 3.9 mi north of Venus.

DRAINAGE AREA.--25.5 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1985 to September 1987. October 1987 to current year, (peaks above base discharge and annual maximum).

GAGE.--Water-stage recorder. Datum of gage is 580.49 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,100 ft<sup>3</sup>/s May 17, 1988 (gage height, 15.04 ft); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 13	1530	*3,200	*11.33	May 25	1000	776	7.53
Apr. 17	2145	648	7.18	Aug. 12	1600	823	7.67
Apr. 28	1615	900	7.89	Aug. 14	0100	597	7.03
May 24	2230	766	7.50	Sept. 16	2200	1,970	9.90

Minimum discharge, not determined.







TRINITY RIVER BASIN

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08049700 WALNUT CREEK NEAR MANSFIELD, TX

LOCATION.--Lat 32°34'51", long 97°06'06", Tarrant County, Hydrologic Unit 12030102, on right bank at downstream side of bridge on county road, 2.6 mi northeast of Mansfield, 3.3 mi downstream from Texas and New Orleans Railroad Co. bridge, and 10.2 mi upstream from mouth.

DRAINAGE AREA.--62.8 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is 531.08 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair, except those for periods of estimated daily discharges, which are poor. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--31 years, 16.4 ft<sup>3</sup>/s (3.55 in/yr), 11,880 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,800 ft<sup>3</sup>/s May 17, 1989 from rating curve extended above 14,000 ft<sup>3</sup>/s (gage height, 33.77 ft, from floodmark); no flow at times in 1960-74, 1976-91.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 13	1200	*2,580	*20.19	Sept. 16	1930	1,100	14.69
Apr. 17	2145	1,990	18.51	Sept. 19	0230	1,360	15.93
May 24	2145	2,570	20.18				

Minimum discharge, no flow many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.00	.00	.05	.11	.54	.90	.18	2.6	1.3	.20	.09	2.9		
2	.00	.00	7.7	.11	.51	.57	.18	2.5	10	.23	.07	1.2		
3	.00	.00	1.2	.11	.57	.42	.18	2.6	16	.20	.06	.90		
4	.00	.99	.24	.11	10	.39	.18	3.6	2.0	.22	.04	.43		
5	.00	.15	.08	.11	4.8	.40	.18	3.9	1.2	.24	.03	.68		
6	.00	.02	.06	5.1	1.9	.40	.21	2.5	.89	.45	.01	.43		
7	.00	.00	.05	1.5	1.1	.35	.25	2.2	1.7	.52	.01	5.5		
8	.00	70	.05	.49	.87	.35	.28	39	.83	.45	.02	4.4		
9	3.9	6.7	.05	31	.84	.35	.21	14	.69	.26	.00	.85		
10	.08	.46	.05	53	.64	.35	.14	4.4	.61	.13	.00	.56		
11	.01	.15	.28	15	.54	.44	.17	3.0	.54	.26	.00	.32		
12	.00	.09	.25	1.9	.45	.37	2.0	2.6	.53	.38	270	1.0		
13	.00	.09	.11	.86	.38	.28	930	2.2	.47	.14	71	1.7		
14	.00	.09	.07	.57	.31	.28	247	10	.46	.11	80	3.3		
15	.00	.09	.07	3.6	.71	.33	17	145	.43	.06	6.7	.72		
16	.00	.09	.05	1.1	.44	.49	8.9	13	.77	.06	1.2	229		
17	.00	.09	.05	.60	.35	.44	361	5.5	.56	.04	.65	166		
18	.00	.07	.40	44	.35	.38	331	19	.39	.03	.39	289		
19	.00	.07	.29	96	.30	.30	44	39	.40	.02	.50	613		
20	.00	.07	.12	8.1	.22	.34	12	8.8	.39	.01	.60	44		
21	.00	4.0	.07	1.5	.31	.38	7.8	5.0	.38	.00	.42	6.1		
22	.00	16	.05	.71	42	.79	6.6	5.8	.38	.00	.15	2.3		
23	.00	1.1	.05	.56	2.2	.42	5.6	5.3	3.4	.00	.07	1.3		
24	.00	.43	.04	.49	1.0	.43	5.1	388	.46	.00	.07	.95		
25	.00	.07	.06	.49	.69	.35	10	865	.35	.00	.04	.67		
26	.00	.06	.24	.46	.57	.33	7.0	56	.31	46	.03	.51		
27	.00	.14	.71	.41	.47	1.1	4.5	9.9	.27	7.9	.04	.41		
28	.00	.16	.25	.45	.43	.55	8.5	4.1	.27	26	.08	.33		
29	.00	.07	.55	.51	---	.32	4.7	2.8	.20	21	.09	.20		
30	.00	.05	.46	.53	---	.22	3.2	2.0	.21	.90	4.2	.12		
31	.00	---	.16	.52	---	.19	---	1.7	---	.20	.48	---		
TOTAL	3.99	101.30	13.86	270.00	73.49	13.21	2018.06	1671.0	46.39	106.01	437.04	1378.78		
MEAN	.13	3.38	.45	8.71	2.62	.43	67.3	53.9	1.55	3.42	14.1	46.0		
MAX	3.9	70	7.7	96	42	1.1	930	865	16	46	270	613		
MIN	.00	.00	.04	.11	.22	.19	.14	1.7	.20	.00	.00	.12		
AC-FT	7.9	201	27	536	146	26	4000	3310	92	210	867	2730		
CFSM	.00	.05	.01	.14	.04	.01	1.07	.86	.02	.05	.22	.73		
IN.	.00	.06	.01	.16	.04	.01	1.20	.99	.03	.06	.26	.82		
CAL YR 1990	TOTAL	15242.19	MEAN	41.8	MAX	3630	MIN	.00	AC-FT	30230	CFSM	.66	IN.	9.03
WTR YR 1991	TOTAL	6133.13	MEAN	16.8	MAX	930	MIN	.00	AC-FT	12170	CFSM	.27	IN.	3.63





TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX

LOCATION.--Lat 32°38'36", long 97°00'03", Dallas County, Hydrologic Unit 12030102, in control room of outlet works tower located 285 ft upstream from centerline of Joe Pool Dam on Mountain Creek, 0.7 mi downstream from Walnut Creek, 0.7 mi upstream from bridge over Mountain Creek on Camp Wisdom Road, 1.0 mi downstream from John Penn Branch, 5.5 mi west of water towers in downtown Duncanville, 7.1 mi upstream from Mountain Creek Dam on Mountain Creek, and 11.2 mi upstream from mouth.

DRAINAGE AREA.--232 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--The lake is formed by a rolled earthfill dam 22,360 ft long, including a 50-foot uncontrolled broad-crested concrete spillway. Impoundment of water began Jan. 7, 1986, after closure of the dam was completed in December 1985. The flood-control outlet works consist of a 10.5-foot-diameter conduit that is controlled by two 4.75- by 10.5-foot slide gates. Above an elevation of 541 ft, water will flow over a 50-foot-long uncontrolled broad-crested concrete spillway located 0.5 mi to left of the outlet works tower. The low-flow outlet works consist of four 3- by 5-foot slide gates having invert elevations at 486.0, 495.0, 504.0, and 513.0 ft that open to a wet-well. Discharge from the wet-well to the 10.5-foot-diameter conduit is controlled by a 2- by 4-foot gate with invert at elevation 483.0 ft. A low-flow bypass system consisting of a turbine pump and 10-inch-diameter piping is also available for use if needed. The capacity table was provided by the U.S. Army Corps of Engineers. The lake was built for water supply, conservation, and flood-control. During the current year, no water has been diverted for municipal or industrial supply since the initial filling of the lake is in progress. 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.....	564.5	-
Crest of spillway.....	541.0	362,700
Top of conservation pool.....	522.0	176,900
Lowest gated outlet.....	466.0	1,095

COOPERATION.--Records provided by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 274,600 acre-ft May 20, 1990 (elevation, 533.21 ft); minimum since initial filling began, 1,595 acre-ft Jan. 24, 1986 (elevation, 467.65 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 192,500 acre-ft Apr. 18 (elevation, 524.03 ft); minimum daily, 166,300 acre-ft Nov. 3 (elevation, 520.56 ft).

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

520.0	162,300	522.0	176,900	524.0	192,200
521.0	169,500	523.0	184,500	525.0	200,200

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	169700	166600	168400	167200	176000	179300	176300	180900	180200	175700	171900	174400
2	169500	166400	168900	167200	176000	179000	176100	180500	179700	175600	171700	174400
3	169500	166300	168700	167200	176000	179000	176000	180200	179400	175300	171600	174400
4	169500	166800	168600	167200	177000	178900	175900	180200	178600	175300	171400	174200
5	169300	166600	168500	167300	177600	178800	175800	180000	178100	175000	171200	174200
6	168900	166500	168400	167500	177900	178600	175700	179800	177700	174900	171000	174100
7	169100	166400	168200	167600	177900	178500	175700	179400	177900	174700	170800	174800
8	169100	168100	168100	167600	177900	178400	175700	180100	177800	174600	170600	174800
9	169300	168100	168100	168600	178000	178400	175600	180000	177600	174300	170500	174700
10	169200	168100	168100	170400	177900	178200	175400	179700	177500	174000	170500	174600
11	168900	168000	168100	170800	178000	178100	176500	179600	177300	173800	170200	174400
12	168900	167900	168000	170800	178100	177900	176500	179400	177200	173500	173500	174400
13	168700	167800	167800	170900	177900	177600	186900	179100	177000	173300	174300	174400
14	168600	167800	167800	171100	177900	177500	188200	179600	176900	173200	175300	174100
15	168500	167800	167800	171900	177700	177500	188200	180100	176800	173000	175300	174100
16	168400	167800	167700	171900	177600	177500	187700	179700	177000	172900	175300	174700
17	168100	167600	167900	171900	177600	177400	190400	179100	177000	172700	175300	176200
18	168000	167600	167900	173900	177500	177200	192500	179300	176900	172400	175300	177000
19	167800	167600	167800	175800	177300	177200	191000	179200	176800	172200	175200	179100
20	167600	167600	167800	176000	177300	177200	188800	179000	176700	171900	174900	179100
21	167600	168000	167600	176100	177600	177200	186600	178800	176400	171800	174700	178900
22	167500	168600	167400	176100	179300	177200	184200	178500	176100	171600	174700	178800
23	167300	168700	167300	176100	179400	177000	182100	178300	177000	171300	174500	178700
24	167200	168700	167200	176100	179400	176900	180700	181300	176900	171200	174400	178600
25	167200	168700	167100	176100	179400	176900	179600	190100	176700	171000	174300	178400
26	167000	168800	167200	176100	179400	176900	179300	189700	176600	171400	174100	178200
27	166900	168900	167200	176100	179300	177000	178900	188100	176400	171700	174000	177900
28	166900	168700	167300	176100	179300	176900	181700	186300	176300	172300	173800	177800
29	166800	168600	167400	176000	---	176600	181900	184500	176100	172400	173800	177600
30	166600	168500	167300	176100	---	176400	181500	182700	175900	172200	174400	177500
31	166600	---	167200	176100	---	176400	---	181200	---	172100	174400	---
MAX	169700	168900	168900	176100	179400	179300	192500	190100	180200	175700	175300	179100
MIN	166600	166300	167100	167200	176000	176400	175400	178300	175900	171000	170200	174100
(↑)	520.60	520.86	520.68	521.89	522.32	521.93	522.61	522.57	521.87	521.35	521.67	522.08
(Φ)	-3100	+1900	-1300	+8900	+3200	-2900	+5100	-300	-5300	-3800	+2300	+3100
CAL YR 1990	MAX	274100	MIN	163700	(Φ)	+3100						
WTR YR 1991	MAX	192500	MIN	166300	(Φ)	+7800						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



TRINITY RIVER BASIN

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08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1986 to current year.

323812096591701 - JOE POOL LAKE SITE AR

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
FEB							
26...	1405	1.00	442	8.3	11.5	7.4	68
26...	1408	10.0	442	8.2	11.0	7.5	68
26...	1412	20.0	440	8.2	11.5	7.4	68
26...	1414	30.0	441	8.2	11.0	7.8	71
26...	1416	41.0	444	8.2	11.0	7.8	71
MAY							
16...	1306	1.00	445	8.4	24.5	8.1	99
16...	1309	10.0	445	8.4	24.5	8.1	99
16...	1312	20.0	442	8.4	24.5	8.0	98
16...	1315	30.0	443	8.3	24.0	7.8	94
16...	1318	40.0	458	8.0	22.5	5.8	68
AUG							
27...	1459	1.00	439	8.1	29.0	6.9	91
27...	1502	10.0	440	7.9	28.0	5.8	75
27...	1505	20.0	438	7.9	28.0	5.8	75
27...	1508	30.0	438	7.9	28.0	5.8	75
27...	1511	40.0	439	7.7	28.0	4.8	62

323819096584801 - JOE POOL LAKE SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER-VOIR STORAGE (AC-FT)	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CaCO3)
FEB												
26...	1325	179000	1.00	445	8.3	11.5	1.40	7.6	70	K1	K2	160
26...	1329	--	10.0	442	8.2	11.0	--	7.6	69	--	--	--
26...	1333	--	20.0	442	8.2	11.0	--	7.6	69	--	--	--
26...	1338	--	30.0	442	8.2	11.0	--	7.6	69	--	--	--
26...	1343	--	40.0	441	8.2	11.0	--	7.5	68	--	--	--
26...	1348	--	52.0	440	8.2	11.0	--	7.8	71	--	--	160
MAY												
16...	1234	180000	1.00	445	8.4	24.5	0.79	8.1	99	K1	K3	160
16...	1237	--	10.0	442	8.4	24.5	--	8.0	98	--	--	--
16...	1240	--	20.0	446	8.4	24.0	--	7.8	94	--	--	--
16...	1243	--	30.0	448	8.3	23.5	--	7.7	92	--	--	--
16...	1247	--	40.0	453	8.0	22.0	--	6.6	77	--	--	--
16...	1250	--	51.0	460	7.7	21.0	--	4.7	54	--	--	170
AUG												
27...	1413	174000	1.00	436	8.1	29.0	1.10	6.8	89	K8	<1	150
27...	1417	--	10.0	438	7.7	28.0	--	5.0	65	--	--	--
27...	1421	--	20.0	440	7.6	28.0	--	4.3	56	--	--	--
27...	1426	--	30.0	440	7.4	27.5	--	3.2	41	--	--	--
27...	1430	--	40.0	472	7.1	24.5	--	0	0	--	--	--
27...	1434	--	52.0	480	7.0	24.0	--	0	0	--	--	170

TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX--Continued

323819096584801 - JOE POOL LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	HARD- NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
FEB											
26...	37	56	4.9	25	0.9	7.9	120	89	14	0.30	3.9
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	41	57	4.9	26	0.9	7.5	120	88	14	0.30	4.0
MAY											
16...	47	57	5.0	27	0.9	7.8	120	89	17	0.40	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	44	60	4.7	27	0.9	7.7	120	85	19	0.40	3.8
AUG											
27...	40	50	4.9	27	1	7.7	100	96	18	0.20	3.6
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
27...	15	59	5.1	28	0.9	7.5	150	71	18	0.20	7.3

DATE	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
FEB											
26...	275	0.200	0.020	0.220	0.040	0.56	0.60	0.060	<0.010	4	1
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	275	0.210	0.030	0.240	0.060	0.74	0.80	0.080	<0.010	6	18
MAY											
16...	273	0.250	0.020	0.270	0.010	0.39	0.40	0.020	<0.010	92	9
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	283	0.370	0.020	0.390	0.020	0.18	0.20	0.040	<0.010	210	31
AUG											
27...	270	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	5	25
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	0.010	<0.050	0.030	0.37	0.40	0.020	<0.010	20	150
27...	--	--	<0.010	<0.050	0.470	0.53	1.0	0.010	<0.010	500	1700
27...	290	--	<0.010	<0.050	0.690	0.51	1.2	0.020	<0.010	1100	1500

323731097013901 - JOE POOL LAKE SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)
FEB											
26...	1648	1.00	443	8.3	11.5	1.40	8.1	75	K1	K1	160
26...	1650	10.0	442	8.2	11.5	--	8.2	75	--	--	--
26...	1653	20.0	441	8.2	11.5	--	8.1	75	--	--	--
26...	1658	30.0	442	8.2	11.5	--	8.1	75	--	--	--
26...	1702	40.0	442	8.2	11.0	--	8.0	73	--	--	--
26...	1705	50.0	438	8.1	11.5	--	7.8	72	--	--	150
MAY											
16...	1628	1.00	440	8.4	24.5	--	8.5	104	K3	K1	160
16...	1631	10.0	438	8.4	24.0	--	8.3	100	--	--	--
16...	1634	20.0	446	8.4	23.5	--	7.8	93	--	--	--
16...	1637	30.0	459	7.8	21.5	--	4.9	57	--	--	--
16...	1640	40.0	462	7.7	20.5	--	3.6	41	--	--	--
16...	1645	51.0	467	7.6	20.5	--	2.9	33	--	--	170
AUG											
27...	1755	1.00	434	8.3	29.5	1.50	7.3	97	<1	K1	140
27...	1800	10.0	436	8.2	28.5	--	6.7	87	--	--	--
27...	1805	20.0	438	7.7	28.0	--	4.3	56	--	--	--
27...	1810	30.0	445	7.2	27.0	--	0	0	--	--	--
27...	1816	40.0	467	7.2	24.5	--	0	0	--	--	--
27...	1822	51.0	481	7.2	23.5	--	0	0	--	--	170

TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX--Continued

323731097013901 - JOE POOL LAKE SITE BC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	HARD- NESS DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITI WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
FEB											
26...	33	57	4.9	26	0.9	7.6	130	83	14	0.30	3.9
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	22	52	4.8	27	1	6.8	130	73	16	0.30	4.2
MAY											
16...	42	55	4.7	27	0.9	7.6	120	93	18	0.50	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	47	60	4.8	27	0.9	7.7	120	94	19	0.40	4.3
AUG											
27...	37	48	5.0	28	1	7.6	100	74	15	0.30	3.5
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--	--
27...	18	59	5.5	28	0.9	7.4	150	57	17	0.40	8.0

DATE	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
FEB											
26...	275	0.210	0.010	0.220	0.040	0.46	0.50	0.070	<0.010	4	2
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--	--
26...	261	0.210	0.010	0.220	0.050	0.75	0.80	0.020	<0.010	20	30
MAY											
16...	275	0.210	0.020	0.230	0.020	0.78	0.80	0.020	<0.010	6	2
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--	--
16...	291	0.390	0.020	0.410	0.020	0.68	0.70	0.030	<0.010	14	14
AUG											
27...	243	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	4	38
27...	--	--	--	--	--	--	--	--	--	--	--
27...	--	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	30	200
27...	--	--	0.010	<0.050	0.040	0.46	0.50	0.010	<0.010	40	200
27...	--	--	--	--	--	--	--	--	--	--	--
27...	275	--	<0.010	<0.050	1.00	0.70	1.7	0.040	<0.010	610	1200

323645097002001 - JOE POOL LAKE SITE CR

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
26...	1451	1.00	446	8.3	44.5	7.4	124
26...	1454	10.0	445	8.2	11.5	7.3	67
26...	1457	20.0	442	8.2	11.5	7.4	68
26...	1500	30.0	444	8.2	11.5	7.4	68
26...	1502	38.0	444	8.2	11.0	7.6	69
MAY							
16...	1448	1.00	450	8.4	23.5	7.7	92
16...	1451	10.0	451	8.4	23.5	7.6	91
16...	1453	20.0	451	8.3	23.5	7.3	87
16...	1457	30.0	455	8.1	22.0	5.8	68
16...	1501	40.0	460	7.7	21.0	3.8	43
AUG							
27...	1625	1.00	437	8.2	29.5	7.1	94
27...	1627	10.0	437	8.2	28.5	6.8	89
27...	1630	20.0	439	7.9	28.0	5.5	71
27...	1633	30.0	447	7.2	27.5	0	0
27...	1636	36.0	454	7.2	27.0	0	0

TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX--Continued

323646097005101 - JOE POOL LAKE SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)
FEB											
26...	1432	1.00	445	8.3	11.5	1.40	7.5	69	--	--	--
26...	1434	10.0	442	8.2	11.5	--	7.4	68	--	--	--
26...	1437	20.0	441	8.2	11.5	--	7.3	67	--	--	--
26...	1439	30.0	441	8.2	11.0	--	7.4	67	--	--	--
26...	1442	40.0	441	8.2	11.5	--	7.4	68	--	--	--
26...	1445	51.0	440	8.2	11.5	--	7.4	68	--	--	--
MAY											
16...	1410	1.00	451	8.4	23.5	1.20	7.6	91	--	--	--
16...	1416	10.0	452	8.3	23.5	--	7.4	89	--	--	--
16...	1421	20.0	453	8.3	23.0	--	6.9	82	--	--	--
16...	1427	30.0	460	7.8	22.0	--	4.8	56	--	--	--
16...	1434	40.0	460	7.7	21.0	--	4.0	46	--	--	--
16...	1439	51.0	462	7.6	21.0	--	2.9	33	--	--	--
AUG											
27...	1542	1.00	437	8.2	29.5	1.20	6.8	90	140	42	50
27...	1548	10.0	438	8.0	28.0	--	6.1	79	--	--	--
27...	1555	20.0	440	7.8	28.0	--	4.9	63	--	--	--
27...	1602	30.0	477	7.2	24.0	--	2.5	30	--	--	--
27...	1608	40.0	475	7.2	24.0	--	0	0	--	--	--
27...	1616	53.0	480	7.1	23.5	--	0	0	170	18	59

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
FEB										
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
MAY										
16...	--	--	--	--	120	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	120	--	--	--	--	--
AUG										
27...	4.8	28	1	7.7	100	95	17	0.20	3.7	268
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	5.2	28	0.9	7.5	150	68	17	0.20	8.1	287

DATE	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE (MG/L AS N)	NITRO-GEN, NO2+NO3 (MG/L AS N)	NITRO-GEN, AMMONIA (MG/L AS N)	NITRO-GEN, ORGANIC (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB										
26...	0.229	0.021	0.250	0.050	0.75	0.80	0.070	<0.010	20	<10
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	0.220	0.010	0.230	0.050	0.65	0.70	0.070	<0.010	20	20
MAY										
16...	0.310	0.020	0.330	0.020	0.38	0.40	0.010	<0.010	<10	<10
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	0.380	0.060	0.440	0.030	0.57	0.60	0.110	0.010	<10	20
AUG										
27...	--	<0.010	<0.050	<0.010	--	0.40	0.010	<0.010	<3	98
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	--	<0.010	<0.050	0.760	0.44	1.2	0.020	<0.010	980	1500
27...	--	<0.010	<0.050	0.820	0.58	1.4	0.030	<0.010	1800	1400

TRINITY RIVER BASIN

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08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX--Continued

323503097012201 - JOE POOL LAKE SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARANCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	HARDNESS TOTAL (MG/L AS CAC03)	HARDNESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)
FEB											
26...	1514	1.00	451	8.3	11.5	1.20	7.4	68	--	--	--
26...	1517	10.0	453	8.3	11.5	--	7.3	67	--	--	--
26...	1519	20.0	452	8.2	11.0	--	7.4	67	--	--	--
26...	1521	28.0	454	8.2	11.0	--	7.3	66	--	--	--
MAY											
16...	1512	1.00	457	8.3	23.5	--	7.1	85	--	--	--
16...	1515	10.0	455	8.2	22.5	--	6.5	76	--	--	--
16...	1518	20.0	456	7.8	21.5	--	4.7	54	--	--	--
16...	1521	28.0	458	7.6	21.0	--	3.5	40	--	--	--
AUG											
27...	1648	1.00	437	8.2	30.0	--	7.2	96	140	37	48
27...	1652	10.0	441	7.6	28.0	--	3.5	45	--	--	--
27...	1656	20.0	447	7.3	27.5	--	0.6	8	--	--	--
27...	1700	28.0	472	7.2	26.5	--	0	0	150	3	52

DATE	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)
FEB										
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
MAY										
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
AUG										
27...	4.9	28	1	7.7	100	94	18	0.40	3.5	266
27...	--	--	--	--	--	--	--	--	--	--
27...	--	--	--	--	--	--	--	--	--	--
27...	4.6	31	1	8.1	120	82	19	0.50	8.4	295

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)
FEB										
26...	0.270	0.020	0.290	0.050	0.35	0.40	0.060	<0.010	20	10
26...	--	--	--	--	--	--	--	--	--	--
26...	--	--	--	--	--	--	--	--	--	--
26...	0.250	0.020	0.270	0.060	1.1	1.2	0.030	<0.010	20	20
MAY										
16...	0.420	0.030	0.450	0.010	0.59	0.60	0.020	<0.010	<10	<10
16...	--	--	--	--	--	--	--	--	--	--
16...	--	--	--	--	--	--	--	--	--	--
16...	0.450	0.060	0.510	0.040	0.46	0.50	0.060	0.020	20	10
AUG										
27...	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	<3	26
27...	--	--	--	--	--	--	--	--	--	--
27...	--	0.010	<0.050	0.080	0.42	0.50	0.020	<0.010	30	200
27...	--	0.010	<0.050	0.550	0.65	1.2	0.030	<0.010	1200	780

323329097024101 - JOE POOL LAKE SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARANCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	COLIFORMS, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CAC03)
FEB											
26...	1545	1.00	669	8.8	12.5	0.30	9.0	85	K1400	350	180
26...	1555	10.0	706	8.5	12.0	--	8.3	77	--	--	--
26...	1612	15.0	740	8.3	11.5	--	7.3	67	--	--	180
MAY											
16...	1542	1.00	600	7.7	24.0	0.12	5.0	61	K1500	900	200
16...	1543	--	--	--	--	--	--	--	--	--	--
16...	1552	14.0	481	7.5	22.0	--	2.7	31	--	--	170
AUG											
27...	1717	1.00	484	8.4	31.5	0.20	7.1	98	K19	170	140
27...	1722	5.00	497	7.4	29.0	--	2.7	36	--	--	--
27...	1727	13.0	500	7.5	28.5	--	2.7	35	--	--	140



## TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX--Continued

323329097024101 - JOE POOL LAKE SITE EC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
FEB											
26...	62	62	5.6	64	2	18	120	170	33	0.50	4.1
26...	--	--	--	--	--	--	--	--	--	--	--
26...	60	64	5.7	72	2	22	120	180	38	0.50	4.7
MAY											
16...	75	72	4.8	41	1	7.8	120	140	28	0.50	9.3
16...	--	--	--	--	--	--	--	--	--	--	--
16...	51	61	4.4	29	1	7.8	120	93	17	0.40	5.2
AUG											
27...	31	49	4.4	37	1	11	110	110	22	0.30	6.1
27...	--	--	--	--	--	--	--	--	--	--	--
27...	33	49	4.7	40	1	12	110	110	24	0.50	6.7
DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
FEB											
26...	427	0.470	0.040	0.510	0.030	1.6	1.6	0.150	<0.010	9	5
26...	--	0.460	0.030	0.490	0.020	1.3	1.3	0.120	<0.010	30	10
26...	461	0.570	0.050	0.620	0.050	1.5	1.6	0.170	<0.010	11	25
MAY											
16...	378	1.18	0.120	1.30	0.060	0.74	0.80	0.140	0.060	25	58
16...	--	--	--	--	--	--	--	--	--	--	--
16...	289	0.530	0.130	0.660	0.070	1.0	1.1	0.170	0.050	55	170
AUG											
27...	305	--	<0.010	<0.050	<0.010	--	0.70	0.040	<0.010	<3	15
27...	--	--	0.030	<0.050	0.030	0.67	0.70	0.060	<0.010	50	50
27...	312	--	0.040	<0.050	0.040	0.66	0.70	0.060	<0.010	3	94

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX—Continued

## Joe Pool Lake AC (323819096584801)

## Phytoplankton Analyses October 1990 to September 1991

Date	2-26-91
Time	1326

<b>TOTAL CELLS/mL</b>	<b>321,835</b>
<b>NUMBER OF SPECIES</b>	<b>24</b>
<b>DEPTH COLLECTED (ft.)</b>	<b>2.5</b>

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella meneghiniana</i>	1,068
<i>Cyclotella ocellata</i>	31
<i>Melosira italica</i>	314
<i>Stephanodiscus astraea</i>	220
Order Pennales	
<i>Achnanthes minutissima</i>	430
<i>Cocconeis pediculus</i> 172	
<i>Cymbella pusilla</i>	172
<i>Navicula sanctaecrucis</i>	258
<i>Navicula</i> sp.	172
<i>Nitzschia amphibia</i> 258	
<i>Nitzschia palea</i>	172
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella ellipsoidea</i> 8,168	
<i>Chlorococcum humicola</i>	3,267
<i>Franceia ovalis</i>	1,634
<i>Micractinum pusillum</i>	6,535
<i>Scenedesmus bijuga</i>	3,267
<i>Selenastrum minutum</i>	1,634
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown flagellate</i>	6,535
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa elachista</i>	176,438
<i>Aphanocapsa rivularis</i>	40,842
<i>Aphanothece clathrata</i>	52,278
<i>Chroococcus multicoloratus</i>	3,267
<i>Chroococcus</i> sp.	8,168
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	6,535

## TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX—Continued

Joe Pool Lake EC (323329097024101)

Phytoplankton Analyses October 1990 to September 1991

Date	2-26-91
Time	1546

TOTAL CELLS/mL	16,908,635
NUMBER OF SPECIES	25
DEPTH COLLECTED (ft.)	0.6

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella kuetzingiana</i>	442
<i>Cyclotella meneghiniana</i>	7,065
<i>Cyclotella ocellata</i>	62,257
<i>Melosira italica</i>	7,506
<i>Stephanodiscus astraee</i>	2,208
<i>Stephanodiscus astraee</i> var. <i>minutula</i>	2,208
Order Pennales	
<i>Caloneis ventricosa</i> var. <i>minuta</i>	2,723
<i>Cymbella pusilla</i>	5,446
<i>Navicula lanceolata</i>	5,446
<i>Navicula pupula</i> var. <i>mutata</i>	5,446
<i>Navicula sanctaerucis</i>	16,337
<i>Nitzschia acicularis</i>	8,168
<i>Nitzschia amphibia</i>	2,723
<i>Nitzschia palea</i>	19,060
<i>Synedra delicatissima</i>	5,446
<i>Synedra rumpens</i>	10,891
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella ellipsoidea</i> 653,474	
<i>Chlorococcum humicola</i>	163,368
<i>Selenastrum minutum</i>	245,053
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa elachista</i>	12,089,263
<i>Aphanocapsa rivularis</i>	1,388,632
<i>Aphanothece clathrata</i>	8,98,526
<i>Chroococcus multicoloratus</i>	81,684
<i>Chroococcus</i> sp.	898,526
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Rhodomonas minuta</i>	326,737

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX—Continued

## Joe Pool Lake AC (323819096584801)

## Phytoplankton Analyses October 1990 to September 1991

Date	5-16-91
Time	1235

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TOTAL CELLS/mL	519,513
NUMBER OF SPECIES	17
DEPTH COLLECTED (ft.)	1.3

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<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella meneghiniana</i>	24,884
<i>Cyclotella ocellata</i>	155,161
<i>Stephanodiscus astraea</i> var. <i>minutula</i>	2,928
<b>CHLOROPHYTA (Green algae)</b>	
<i>Ankistrodesmus falcatus</i> var. <i>mirabilis</i>	1,634
<i>Chlamydomonas</i> sp.	6,535
<i>Chlorella ellipsoidea</i>	16,337
<i>Chlorococcum humicola</i>	4,901
<i>Dictyosphaerium pulchellum</i>	22,872
<i>Selenastrum minutum</i>	1,634
<i>Stichococcus</i> sp.	3,267
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown flagellate</i>	4,901
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	212,379
<i>Aphanocapsa elachista</i>	31,040
<i>Chroococcus</i> sp.	16,337
<i>Synechococcus</i> sp.	8,168
<b>PYRRHOPHYTA (Dinoflagellates)</b>	
<i>Ceratium hirundinella</i>	4,901
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	1,634

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## TRINITY RIVER BASIN

08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX—Continued

Joe Pool Lake EC (323329097024101)

Phytoplankton Analyses October 1990 to September 1991

Date	5-16-91
Time	1543
<hr/>	
TOTAL CELLS/mL	3,839,156
NUMBER OF SPECIES	22
DEPTH COLLECTED (ft.)	1.0
<hr/>	

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Aulacoseira granulata</i>	305
<i>Cyclotella kuetzingiana</i>	1,219
<i>Cyclotella meneghiniana</i>	3,353
<i>Cyclotella ocellata</i>	30,479
<i>Cyclotella operculata</i>	305
<i>Melosira varians</i>	5,181
Order Pennales	
<i>Achnanthes minutissima</i>	933
<i>Amphora veneta</i>	700
<i>Caloneis ventricosa</i> var. <i>minuta</i>	467
<i>Cocconeis pediculus</i>	467
<i>Navicula lanceolata</i>	1,634
<i>Navicula</i> sp.	700
<i>Nitzschia acicularis</i>	933
<i>Nitzschia dissipata</i>	2,100
<i>Nitzschia palea</i>	233
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella ellipsoidea</i>	16,337
<i>Chlorococcum humicola</i>	32,674
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	1,217,095
<i>Aphanocapsa elachista</i>	73,516
<i>Aphanothece clathrata</i>	2,434,189
<b>EUGLENOPHYTA (Euglenoids)</b>	
<i>Euglena</i> sp.	8,168
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	8,168



08049800 JOE POOL LAKE NEAR DUNCANVILLE, TX—Continued

## Joe Pool Lake AC (323819096584801)

## Phytoplankton Analyses October 1990 to September 1991

Date	8-27-91
Time	1413

TOTAL CELLS/mL	120,935
NUMBER OF SPECIES	11
DEPTH COLLECTED (ft.)	1.8

<u>Organisms</u>	<u>Cells/mL</u>
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
<i>Stephanodiscus hantzschia</i>	242
CHLOROPHYTA (Green algae)	
<i>Ankistrodesmus falcatus</i> var. <i>acicularis</i>	968
<i>Dictyosphaerium pulchellum</i>	1,209
CHRYSOPHYTA (Golden-brown algae)	
<i>Unknown statospore</i> sp. 3	242
<i>Unknown statospore</i> sp. 4	242
CYANOPHYTA (Blue-green algae)	
<i>Anabaena</i> sp. 1	5,321
<i>Aphanocapsa elachista</i> var. <i>planctonica</i>	95,538
<i>Chroococcus varius</i>	1,935
<i>Dactylococcopsis raphidiodes</i>	3,386
<i>Lyngbya limnetica</i>	7,982
<i>Raphidiopsis curvata</i>	3,870

TRINITY RIVER BASIN

08050050 MOUNTAIN CREEK LAKE NEAR GRAND PRAIRIE, TX

LOCATION.--Lat 32°43'55", long 96°56'35", Dallas County, Hydrologic Unit 12030102, at right end of spillway in Mountain Creek Dam on Mountain Creek, 2.5 mi upstream from Texas and Pacific Railway Co. bridge, and 3.7 mi southeast of Grand Prairie.

DRAINAGE AREA.--295 mi<sup>2</sup>.

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

Water-quality records.--Chemical analyses: October 1969 to September 1985.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 21, 1960, non-recording gage at powerplant at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 5,800 ft long, including a controlled spillway six 34- by 27 foot tainter gates. The dam was completed in December 1936 and deliberate impoundment began on Mar. 24, 1937. The lake was built and is operated by Dallas Power and Light Co. to supply cooling water for their generating plant. The capacity curve is based on a survey made in 1963. For statement regarding regulation by Joe Pool Dam, see station 08049900. Figures given herein represent total contents. Gage-height telemeter at station. Data regarding the dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	467.0	-
Top of gates.....	458.0	25,720
Top of dry weather conservation pool.....	457.0	22,840
Top of wet weather conservation pool.....	456.0	20,260
Crest of spillway (sill of tainter gates).....	431.0	0

COOPERATION.--The capacity curve was provided by the Dallas Power and Light Co.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 28,360 acre-ft May 17, 1989 (elevation, 458.80 ft); minimum, 14,120 acre-ft Oct. 18, 1972 (elevation, 453.25 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 24,110 acre-ft May 24 at 2400 hours (elevation, 457.44 ft); minimum, 19,530 acre-ft Nov. 2 and 4 (elevation, 455.69 ft).

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

455.0	17,890	457.0	22,840
456.0	20,260	458.0	25,720

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19620	19570	22870	23160	23100	22170	21830	22250	23730	22710	21420	21630
2	19600	19530	23070	23160	23100	22120	21910	22710	22690	22630	21370	21830
3	19740	19550	23040	23160	23100	22190	21860	20750	22090	22870	21290	21890
4	19690	19860	23070	23190	23210	22250	21890	20490	22960	22810	21240	22560
5	19670	19830	23100	23240	23070	22300	21940	20490	22710	22760	21160	22710
6	19640	19810	22980	23590	23210	22270	22010	20570	22090	22690	21210	22740
7	19570	19760	22980	23700	23240	22270	22090	20750	22320	22610	21270	22090
8	19690	21140	22980	23760	23270	22300	22170	21550	22320	22560	21010	21760
9	20190	21650	22980	23790	23300	22350	22010	21760	22320	22430	20900	21780
10	20170	21700	22960	21960	23300	22400	22010	22010	22320	22320	20900	21760
11	20140	21680	22980	22170	23330	22560	22530	22250	22300	22220	20880	21730
12	20090	21680	22960	22250	23530	22400	23040	22500	22300	22170	21940	21700
13	20120	21680	22900	22300	23330	22380	22630	22760	22270	22090	23210	21680
14	20070	21650	22900	22320	23190	22400	21910	23330	22300	22010	22120	21700
15	20050	21630	22870	22560	23270	22450	22010	21600	22300	21940	22140	21680
16	20020	21600	22870	22610	23390	22560	22380	21290	22690	21890	22170	21780
17	19950	21580	22930	22690	23420	22580	23300	21630	22760	21810	22140	22010
18	19880	21580	23010	23300	23360	22610	22660	22010	22760	21730	22120	21990
19	19880	21550	22980	23850	23390	22660	22350	22270	22740	21630	22190	23190
20	19810	21550	22980	22810	23420	22710	22170	22480	22710	21520	22140	23240
21	19790	21680	22810	22870	23760	22760	21990	22690	22660	21450	21940	23270
22	19760	22660	22790	22960	21600	22900	21760	22930	22690	21370	21890	23270
23	19760	22840	22760	22960	21780	22900	22140	23130	23160	21320	21860	23270
24	19740	22870	22760	22980	21760	22960	23070	24110	23160	21240	21830	23390
25	19710	22900	22760	23010	21830	23100	22190	21730	23100	21160	21810	23420
26	19690	22980	22870	23010	21890	23240	21780	22040	23010	21270	21730	23420
27	19670	22930	22960	23010	21940	21730	21990	23590	22960	21450	21730	23420
28	19640	22930	22980	23100	22040	21780	21760	23440	22900	21580	21680	23440
29	19640	22930	23130	23010	---	21760	21780	22760	22810	21520	21650	23470
30	19620	22900	23130	23040	---	21760	21910	22120	22760	21470	22220	23470
31	19600	---	23160	23070	---	21810	---	22870	---	21420	22760	---
MAX	20190	22980	23160	23850	23760	23240	23300	24110	23730	22870	23210	23470
MIN	19570	19530	22760	21960	21600	21730	21760	20490	22090	21160	20880	21630
(↑)	455.72	457.02	457.11	457.08	456.69	456.60	456.64	457.01	456.97	456.45	456.97	457.22
(Φ)	-20	+3300	+260	-90	-1030	-230	+100	+960	-110	-1340	+1340	+710
CAL YR 1990	MAX	23790	MIN	19530	(Φ)	+2310						
WTR YR 1991	MAX	24110	MIN	19530	(Φ)	+3850						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

TRINITY RIVER BASIN

275

08050100 MOUNTAIN CREEK AT GRAND PRAIRIE, TX

LOCATION (revised).--Lat 32°44'51", long 96°55'32", Dallas County, Hydrologic Unit 12030102, on roadway embankment at upstream right end of downstream bridge on Jefferson Street, 1,000 ft upstream from bridge on U.S. Highway 80, 1.2 mi upstream from Texas and Pacific Railroad Co. bridge, 1.5 mi downstream from Mountain Creek Lake Dam, and 4.4 mi east of Grand Prairie.

DRAINAGE AREA.--298 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 404.31 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 19, 1984, at datum 3.0 ft higher.

REMARKS.--Records fair including those for days of estimated daily discharges. Since March 1937, flow regulated by Mountain Creek Lake (station 08050050), 1.5 mi upstream. Reconstruction of the upstream road embankment and bridge was completed during the 1991 water year. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--31 years, 99.9 ft<sup>3</sup>/s (72,380 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 38,100 ft<sup>3</sup>/s Apr. 19, 1976 (gage height, 24.21 ft); maximum gage height, 24.62 ft May 7, 1969; no flow in 1964, 1972-74, 1984, 1988.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,750 ft<sup>3</sup>/s May 25 at 1515 hours (gage height, 12.79 ft); minimum daily, 0.20 ft<sup>3</sup>/s Dec. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	e.62	1.1	.48	.59	3.5	1.6	4.3	3.4	1.4	1.1	1600
2	.80	.58	1.9	.43	.34	2.2	1.8	4.3	984	1.3	.95	12
3	1.1	.59	2.6	.38	.32	1.4	2.5	1110	1160	1.8	.83	3.9
4	1.1	5.3	1.3	.33	283	1.4	2.2	484	9.6	2.5	.87	14
5	.82	2.5	1.2	.54	592	1.2	2.1	7.0	393	1.6	.90	7.0
6	.56	1.3	1.2	5.6	9.5	1.0	e2.2	5.7	410	1.3	.92	1.7
7	.44	.91	.73	4.2	6.4	.80	e2.5	5.6	3.4	1.3	.86	645
8	.72	17	.58	1.7	6.3	.93	2.6	27	2.1	1.2	.86	546
9	7.3	9.9	.46	314	6.4	1.0	2.5	e7.4	2.0	1.3	.72	4.2
10	2.4	1.7	.33	2170	6.3	.93	2.5	e4.4	2.0	1.2	.87	3.8
11	3.8	.97	.32	894	6.3	1.5	5.2	e2.9	1.8	1.3	1.3	3.4
12	3.8	.80	1.2	2.7	6.6	2.7	.38	e2.2	1.6	1.1	3.1	2.7
13	3.6	.73	.63	1.8	8.6	1.3	1660	e1.8	1.3	.92	53	2.2
14	4.3	.71	.27	1.9	3.9	1.3	1380	3.7	1.3	.80	761	2.4
15	4.5	.64	.22	7.8	3.5	1.3	13	1080	1.6	.79	3.9	2.5
16	4.4	.59	.20	2.6	3.6	1.3	11	440	7.1	.82	3.1	2.8
17	e4.0	.56	.27	1.7	5.7	1.3	36	2.8	3.9	1.0	2.9	3.2
18	e3.6	.49	.50	12	4.6	1.3	1160	3.1	2.3	1.0	2.9	3.9
19	e3.4	.47	.39	29	2.3	1.3	1140	3.2	1.6	.85	2.7	7.9
20	e3.1	.50	.37	2260	1.5	1.5	1130	2.0	1.5	.89	2.3	4.6
21	e2.9	.81	.23	1640	1.7	1.9	1130	1.8	1.4	.88	.84	3.9
22	e2.5	18	.44	2.0	1930	4.8	1140	1.8	1.5	.79	.70	3.1
23	e2.2	3.5	.35	1.6	276	4.0	816	2.0	7.5	1.1	.83	2.5
24	e2.1	1.7	.34	1.3	3.9	3.9	292	238	2.0	.79	.82	4.6
25	e1.9	1.2	.27	1.2	2.8	4.0	944	2410	1.7	.83	.66	5.3
26	e1.8	1.8	.55	.94	2.3	5.1	615	32	1.6	1.2	.78	3.3
27	e1.3	3.6	1.1	.72	2.0	864	4.4	5.5	1.6	2.2	.83	2.8
28	e1.2	2.4	.51	.59	2.0	3.9	409	772	1.5	3.3	.80	2.6
29	e1.1	1.6	1.4	.45	---	1.3	132	1050	1.5	2.2	.94	2.3
30	e.95	1.4	1.4	.45	---	1.3	4.4	1030	1.5	1.8	252	2.1
31	e.72	---	.54	.51	---	1.4	---	471	---	1.4	7.2	---
TOTAL	73.23	82.87	22.90	7360.92	3178.45	924.76	12082.5	9215.5	3015.3	40.86	1111.48	2905.7
MEAN	2.36	2.76	.74	237	114	29.8	403	297	101	1.32	35.9	96.9
MAX	7.3	18	2.6	2260	1930	864	1660	2410	1160	3.3	761	1600
MIN	.44	.47	.20	.33	.32	.80	1.6	1.8	1.3	.79	.66	1.7
AC-FT	145	164	45	14600	6300	1830	23970	18280	5980	81	2200	5760
CAL YR 1990	TOTAL	95654.27	MEAN	262	MAX	7860	MIN	.20	AC-FT	189700		
WTR YR 1991	TOTAL	40014.47	MEAN	110	MAX	2410	MIN	.20	AC-FT	79370		

e Estimated

## TRINITY RIVER BASIN

08050400 ELM FORK TRINITY RIVER AT GAINESVILLE, TX

LOCATION.--Lat 33°37'27", long 97°09'22", Cooke County, Hydrologic Unit 12030103, on right bank 16 ft to the right of the right end of the bridge on Farm Road 51, 31 ft downstream from the centerline of the road, 0.6 mi west of Cooke County courthouse in Gainesville, 1.0 mi upstream from Interstate Highway 35, and 1.2 mi downstream from Dozier Creek (corrected).

DRAINAGE AREA.--174 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 700.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--6 years (water years 1986-91), 125 ft<sup>3</sup>/s (90,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,000 ft<sup>3</sup>/s May 16, 1989 (gage height, 25.33 ft) from rating curve extended above 20,000 ft<sup>3</sup>/s on basis of velocity-area study; no flow for several days in August 1988, because of construction in channel.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1981, reached a peak stage of 28.1 ft, from information furnished by an employee of the Gainesville Department of Public Works.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,920 ft<sup>3</sup>/s May 3 at 0500 hours (gage height, 14.96 ft); minimum discharge, 0.46 ft<sup>3</sup>/s July 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.5	e1.3	3.3	2.9	19	14	9.2	5.9	4.0	2.6	1.4	160
2	e1.4	e1.3	3.3	2.9	17	14	8.0	19	25	2.3	1.2	161
3	e1.4	12	2.8	2.7	17	12	7.6	2020	172	2.0	1.0	189
4	e1.4	3.6	2.6	2.7	17	12	7.3	448	27	2.0	.90	125
5	e1.3	2.5	2.5	2.9	18	12	6.6	224	119	1.8	.80	154
6	e1.3	2.3	2.4	5.8	24	9.4	6.4	156	129	1.6	.76	116
7	e1.3	2.2	2.3	6.4	34	8.0	7.2	99	47	1.5	.69	84
8	2.1	43	2.2	4.7	27	7.4	7.8	337	465	1.4	.69	96
9	7.5	32	2.2	5.6	23	7.1	6.3	257	137	1.2	.77	59
10	2.6	11	2.2	128	20	6.7	4.8	171	73	.90	.86	30
11	2.3	6.0	2.2	62	20	7.7	11	121	48	.78	.74	16
12	2.3	4.5	2.3	35	18	7.1	15	88	35	.69	3.9	10
13	2.3	3.5	2.2	23	18	6.0	8.6	73	25	.69	2.5	7.3
14	2.2	3.1	2.1	20	16	5.4	6.6	75	18	.64	2.2	6.0
15	2.2	3.0	2.2	26	14	5.9	5.6	210	14	.71	1.6	28
16	2.2	3.0	2.9	25	12	6.7	5.0	98	11	.66	1.2	48
17	2.1	2.9	3.0	19	13	8.5	4.9	55	10	.62	1.0	133
18	e2.0	2.7	4.2	219	12	10	5.4	36	7.8	.62	.79	82
19	e1.9	2.6	3.2	540	12	8.9	5.0	27	6.3	.60	.74	82
20	e1.8	2.5	2.7	191	11	9.0	4.6	24	5.1	.57	.69	66
21	e1.8	2.4	2.4	114	10	9.0	4.5	20	12	.59	1.3	41
22	e1.7	2.7	2.3	82	27	52	4.2	18	6.1	.52	.80	30
23	e1.7	2.4	2.2	65	26	37	4.1	18	50	.46	.78	26
24	e1.6	2.3	2.1	54	21	17	5.1	430	12	.74	.69	125
25	e1.5	2.3	2.0	45	17	12	6.3	149	6.0	.86	.67	196
26	e1.5	8.1	2.2	38	15	11	5.2	27	4.7	.77	.60	117
27	e1.4	157	2.3	35	14	21	4.3	14	3.9	6.9	.64	75
28	e1.4	46	2.5	31	13	22	3.8	9.1	3.5	72	.64	48
29	e1.4	9.9	3.9	30	---	21	3.4	6.6	3.1	4.1	2.3	31
30	e1.3	4.2	3.2	27	---	15	3.8	5.2	2.8	2.2	.99	22
31	e1.3	---	3.0	23	---	11	---	4.5	---	1.8	17	---
TOTAL	59.7	382.3	80.9	1868.6	505	405.8	187.6	5245.3	1482.3	114.82	148.85	2363.3
MEAN	1.93	12.7	2.61	60.3	18.0	13.1	6.25	169	49.4	3.70	4.80	78.8
MAX	7.5	157	4.2	540	34	52	15	2020	465	72	99	196
MIN	1.3	1.3	2.0	2.7	10	5.4	3.4	4.5	2.8	.46	.60	6.0
AC-FT	118	758	160	3710	1000	805	372	10400	2940	228	295	4690
CAL YR 1990	TOTAL	101262.14	MEAN	277	MAX	12500	MIN	.74	AC-FT	200900		
WTR YR 1991	TOTAL	12844.47	MEAN	35.2	MAX	2020	MIN	.46	AC-FT	25480		

e Estimated

TRINITY RIVER BASIN

277

08050410 ELM FORK TRINITY RIVER NEAR GAINESVILLE, TX

LOCATION.--Lat 33°34'56", long 97°07'49", Cooke County, Hydrologic Unit 12030103, on Farm Road 2071 bridge, over center of channel at downstream side of bridge, 1.0 mi downstream from Atchison, Topeka, and Santa Fe Railroad Co. bridge, and 3.0 mi south of Cooke County Courthouse in Gainesville.

DRAINAGE AREA.--1.65 mi.<sup>2</sup>

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1988 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)
NOV 20...	1300	4.8	930	7.8	19.0	13	8.0	7.6	84	1.4	160
JAN 15...	1300	29	740	8.1	9.0	5	20	10.3	92	1.5	220
MAR 06...	1345	13	851	8.1	16.0	14	8.2	10.8	114	2.0	230
APR 30...	1530	7.4	906	8.0	21.0	13	25	7.6	88	1.8	210
JUN 11...	1345	50	573	8.0	25.5	22	25	7.8	98	0.7	190
AUG 06...	1435	3.5	1020	8.2	29.0	25	20	7.3	98	1.7	100

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY AD-WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
NOV 20...	0	55	4.8	150	5	6.7	290	57	73	0.50	10
JAN 15...	0	79	5.5	72	2	4.2	220	56	72	0.30	6.4
MAR 06...	0	82	6.5	89	3	4.2	250	64	84	0.30	5.0
APR 30...	0	72	6.1	110	3	4.6	260	54	92	0.30	11
JUN 11...	12	67	4.3	40	1	4.6	170	30	49	0.30	9.5
AUG 06...	0	36	3.3	160	7	7.1	300	54	69	0.70	11

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON-FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 20...	531	8	3	5	5.13	0.070	5.20	0.060	1.2	1.3	2.50
JAN 15...	430	40	12	28	2.77	0.030	2.80	0.080	0.52	0.60	0.750
MAR 06...	482	10	7	3	2.07	0.030	2.10	<0.010	--	0.70	1.10
APR 30...	505	59	16	43	2.34	0.060	2.40	0.110	0.79	0.90	1.30
JUN 11...	308	104	15	89	1.28	0.020	1.30	0.010	0.99	1.0	0.380
AUG 06...	523	25	8	17	5.23	0.070	5.30	0.060	1.1	1.2	3.40

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 20...	2.70	6.5	--	--	--	--	--	--	--	--	--
JAN 15...	0.780	5.9	1	71	<0.5	<1.0	<5	<3	<10	9	<10
MAR 06...	1.00	5.8	--	--	--	--	--	--	--	--	--
APR 30...	1.10	6.1	2	82	<0.5	<1.0	<5	<3	<10	8	<10
JUN 11...	0.370	6.9	--	--	--	--	--	--	--	--	--
AUG 06...	1.00	10	3	50	<0.5	<1.0	<5	<3	<10	5	<10



## TRINITY RIVER BASIN

08050410 ELM FORK TRINITY RIVER NEAR GAINESVILLE, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 20...	--	--	--	--	--	--	--	--	--	--
JAN 15...	11	16	0.1	<10	10	<1	<1.0	420	<6	4
MAR 06...	--	--	--	--	--	--	--	--	--	--
APR 30...	14	14	0.2	<10	<10	<1	<1.0	460	<6	4
JUN 11...	--	--	--	--	--	--	--	--	--	--
AUG 06...	10	2	0.2	20	10	<1	<1.0	230	<6	6

TRINITY RIVER BASIN

279

08050800 TIMBER CREEK NEAR COLLINSVILLE, TX

LOCATION.--Lat 33°33'16", Long 96°56'49", Cooke County, Hydrologic Unit 12030103, on left bank 13 ft to the left of bridge on Farm Road 902 and 19 ft downstream from the centerline of the road, 2.1 mi west of Collinsville, and 3.0 mi upstream from mouth.

DRAINAGE AREA.--38.8 mi<sup>2</sup>.

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

GAGE.--Water-stage recorder. Datum of gage is 640.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--6 years, 27.8 ft<sup>3</sup>/s (20,140 acre-ft/yr), 9.73 in/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft<sup>3</sup>/s May 16, 1989 (gage height, 14.23 ft); maximum gage height, 14.79 ft Apr. 26, 1990 (debris in channel); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in October 1981 reached a peak stage of 15.0 ft, from information by local resident.

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

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 3	1130	*944	*12.68				

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.00	.00	e.18	3.6	1.1	2.0	1.3	3.9	1.0	1.4	.27	14		
2	.00	.00	e.02	1.7	1.0	2.2	2.3	3.8	11	1.3	.11	7.2		
3	.00	.00	e.00	.93	1.2	2.0	2.4	703	278	1.2	.00	3.8		
4	.00	.16	e.00	.50	1.3	1.5	3.5	220	22	1.0	.00	2.3		
5	.00	4.4	e.00	.09	1.7	1.5	3.1	172	10	1.0	.00	1.2		
6	.00	e1.6	e.00	11	2.2	1.7	3.3	23	19	.95	.00	3.0		
7	.00	e.84	e.00	19	1.8	1.6	4.1	10	e5.1	.87	.00	3.0		
8	.00	e1.2	e.00	10	1.4	1.1	4.3	40	3.2	.68	.00	27		
9	.00	28	e.00	7.6	1.2	1.0	3.3	26	7.4	.33	.00	4.6		
10	.00	e3.0	e.00	16	1.3	.89	2.5	11	6.0	.05	.00	2.4		
11	.00	e.95	e.00	10	1.2	.93	37	6.9	4.4	.00	.00	1.2		
12	.00	e.63	e.00	3.8	1.4	1.1	760	5.1	3.7	.00	.00	.79		
13	.00	.44	e.00	2.2	1.9	1.1	41	4.2	3.2	.00	.00	.34		
14	.00	.08	e.00	2.2	1.9	.86	20	22	2.8	.00	.00	.01		
15	.00	.00	e.00	15	1.6	.69	11	9.7	2.5	.00	.00	.00		
16	.00	.00	e.00	11	1.2	.77	7.5	4.9	1.8	.00	.00	.00		
17	.00	.00	1.5	3.7	1.5	2.2	7.1	3.2	1.8	.00	.00	.00		
18	.00	.00	4.3	43	2.0	2.7	11	2.6	1.8	.00	.00	2.2		
19	.00	.00	4.4	75	2.0	1.7	7.3	2.2	1.7	.00	.00	2.3		
20	.00	.00	1.7	21	1.6	1.5	5.6	2.0	1.6	.00	.00	1.1		
21	.00	.00	.85	5.5	1.3	1.6	5.0	1.7	1.5	.00	.00	.53		
22	.00	.00	e.49	3.0	7.6	18	5.4	1.7	1.8	.00	.00	.17		
23	.00	.00	e.13	2.3	5.8	7.0	5.4	1.8	46	.00	.00	.00		
24	.00	.00	e.00	1.9	2.9	2.4	5.0	1.5	11	.00	.00	43		
25	.00	.00	e.00	1.6	2.3	1.7	67	7.3	5.6	.00	.00	77		
26	.00	.08	e.00	1.4	2.0	1.8	16	4.0	3.1	.00	.00	4.1		
27	.00	4.6	e.25	1.4	1.8	40	8.1	1.8	2.2	.00	.00	2.2		
28	.00	4.8	1.3	1.4	1.8	9.3	39	1.2	1.9	19	.00	1.3		
29	.00	2.0	2.8	1.4	---	3.5	20	1.0	1.7	7.1	.00	.87		
30	.00	.41	5.4	1.3	---	2.0	5.5	.99	1.6	.87	30	.55		
31	.00	---	e3.5	1.2	---	1.5	---	1.0	---	.51	8.1	---		
TOTAL	0.00	53.19	26.82	279.72	56.0	117.84	1114.0	1299.49	464.4	36.26	38.48	206.16		
MEAN	.000	1.77	.87	9.02	2.00	3.80	37.1	41.9	15.5	1.17	1.24	6.87		
MAX	.00	28	5.4	75	7.6	40	760	703	278	19	30	77		
MIN	.00	.00	.00	.09	1.0	.69	1.3	.99	1.0	.00	.00	.00		
AC-FT	.00	106	53	555	111	234	2210	2580	921	72	76	409		
CFSM	.00	.05	.02	.23	.05	.10	.96	1.08	.40	.03	.03	.18		
IN.	.00	.05	.03	.27	.05	.11	1.07	1.25	.45	.03	.04	.20		
CAL YR 1990	TOTAL	16139.18	MEAN	44.2	MAX	3280	MIN	.00	AC-FT	32010	CFSM	1.14	IN.	15.47
WTR YR 1991	TOTAL	3692.36	MEAN	10.1	MAX	760	MIN	.00	AC-FT	7320	CFSM	.26	IN.	3.54

e Estimated

## TRINITY RIVER BASIN

08050815 JORDAN CREEK TRIBUTARY NEAR COLLINSVILLE, TX.

LOCATION.--Lat 33°32'15", long 96°55'22", Grayson County, Hydrologic Unit 12030103, at culvert on gravel road, 0.4 mi upstream from mouth (Jordan Creek), and 1.5 mi southwest of Collinsville.

DRAINAGE AREA.--179 mi.<sup>2</sup>

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1988 to current year.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CaCO3)
NOV 21...	1105	0.07	1080	7.9	19.0	55	5.0	4.9	54	2.3	89
JAN 16...	1500	0.35	1060	8.2	9.0	25	6.0	13.9	123	6.7	120
MAR 07...	1025	0.26	1010	8.5	10.0	47	10	8.0	73	9.9	120
MAY 01...	1155	0.45	713	7.9	17.0	40	10	6.9	73	4.5	130
JUN 12...	0952	0.20	866	7.9	22.5	25	15	6.1	72	1.4	110
SEP 03...	1425	0.07	944	7.9	24.5	1	12	4.3	53	7.8	63
DATE	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CaCO3 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
NOV 21...	0	27	5.2	200	9	8.4	350	58	76	0.50	8.8
JAN 16...	0	37	6.6	180	7	7.4	340	70	110	0.50	9.3
MAR 07...	0	38	7.0	190	7	7.0	330	65	95	0.70	1.0
MAY 01...	0	39	7.1	94	4	7.5	200	43	67	0.80	8.9
JUN 12...	0	33	6.4	140	6	7.2	270	57	72	0.40	3.3
SEP 03...	0	19	3.7	180	10	9.6	320	34	73	0.40	8.2
DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON-FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE (MG/L AS N)	NITRO-GEN, NO2+NO3 (MG/L AS N)	NITRO-GEN, AMMONIA (MG/L AS N)	NITRO-GEN, ORGANIC (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 21...	593	5	1	4	--	0.030	<0.100	0.050	0.95	1.0	1.70
JAN 16...	625	8	7	1	2.03	0.270	2.30	3.20	0.40	3.6	1.70
MAR 07...	602	34	10	24	0.610	0.050	0.660	<0.010	--	1.7	1.40
MAY 01...	386	19	8	11	1.38	0.220	1.60	0.270	1.1	1.4	0.680
JUN 12...	481	36	8	28	0.910	0.020	0.930	0.040	0.96	1.0	1.10
SEP 03...	520	21	7	14	0.049	0.020	0.069	0.050	2.0	2.1	3.30
DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 21...	1.20	10	--	--	--	--	--	--	--	--	--
JAN 16...	1.60	7.3	2	30	<0.5	<1.0	<5	<3	<10	14	<10
MAR 07...	1.10	14	--	--	--	--	--	--	--	--	--
MAY 01...	0.520	9.5	1	55	<0.5	<1.0	<5	<3	<10	61	<10
JUN 12...	0.990	7.4	--	--	--	--	--	--	--	--	--
SEP 03...	3.10	12	3	35	<0.5	<1.0	<5	<3	<10	130	<10

TRINITY RIVER BASIN

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08050815 JORDAN CREEK TRIBUTARY NEAR COLLINSVILLE, TX.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 21...	--	--	--	--	--	--	--	--	--	--
JAN 16...	12	180	0.3	<10	<10	<1	<1.0	260	<6	71
MAR 07...	--	--	--	--	--	--	--	--	--	--
MAY 01...	8	54	<0.1	<10	<10	<1	<1.0	290	<6	9
JUN 12...	--	--	--	--	--	--	--	--	--	--
SEP 03...	12	37	0.4	<10	<10	<1	1.0	140	<6	4

TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX

LOCATION.--Lat 32°21'19", long 97°02'59", Denton County, Hydrologic Unit 12030103, in control room of outlet works tower located 336 ft upstream from centerline of Ray Roberts Dam (and Farm Road 455 which is located on top of dam) on Elm Fork Trinity River, 3.7 mi upstream from Bray Branch, 5.7 mi southwest of Pilot Point, and at river mile 60.0.

DRAINAGE AREA.--692 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1987 to current year.

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

REMARKS.--Lake is formed by a rolled earthfill dam 15,250 ft long. There is an uncontrolled, broad-crested spillway excavated in natural ground about 5,000 ft right of right end of dam. A reinforced concrete tower houses the flood-control and low-flow gates and operating equipment. Construction started Sept. 16, 1980 and closure was made in May 1986. The dam was built and is owned by the U.S. Army Corps of Engineers. Deliberate impoundment started June 30, 1987. The lake was built for water supply, flood control, and recreation purposes. 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.....	665.0	-
Spillway crest (uncontrolled).....	645.5	1,262,000
Top of flood-control pool.....	640.5	1,065,000
Top of conservation pool.....	632.5	799,600
Invert, lowest gated outlet.....	551.0	990

COOPERATION.--Area and capacity tables provided by the U.S. Army Corps of Engineers. Records of elevations and contents provided by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,219,000 acre-ft May 3, 1990 (elevation, 644.48 ft); minimum since initial filling began, 990 acre-ft July 1, 1987 (elevation, 551.00 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 820,800 acre-ft May 12 (elevation, 633.21 ft); minimum daily, 747,500 acre-ft Dec. 25 (elevation, 630.67 ft).

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

630.0	729,000	633.0	814,500
631.0	756,700	634.0	844,800
632.0	785,200		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	757800	748000	752500	748000	763500	765200	763200	786600	807100	805300	792400	790400
2	757000	748000	752800	748600	763500	765200	762300	788700	809800	804800	792100	790700
3	757200	750500	752500	748000	763700	764600	763200	807700	811300	804500	791300	790400
4	756700	751400	751600	748000	763700	764300	762900	812700	811000	804200	790700	791000
5	756400	750500	751100	748800	764000	764000	762600	814500	811300	803900	790100	791000
6	755800	750200	750800	749700	764300	764300	762900	814800	810700	803300	789500	790700
7	757000	750000	750200	749700	764300	764000	762900	814800	809800	802700	788700	792100
8	758400	753300	750200	749700	764300	763700	762900	819000	810700	801800	788100	791900
9	757800	753300	750000	751600	764300	763500	762900	819600	810400	800900	787500	791300
10	757000	753000	749700	753600	764300	763200	762300	820500	809800	800000	786600	791300
11	756400	752800	749100	753900	764300	762900	772300	820500	808900	798900	786300	790700
12	755800	752800	749100	753900	763700	762900	782600	820800	808600	798000	788400	790400
13	755000	752500	749400	753600	764300	762600	784600	820500	808000	798000	789800	789800
14	755000	752500	749100	754400	764600	762300	785200	820500	807400	797100	789000	789800
15	754400	752500	749100	754700	763700	762000	784900	819900	807100	796500	788700	789000
16	753600	752500	749700	755000	763200	762600	784900	818400	806800	795900	788100	789000
17	754400	751600	750200	755800	763700	762600	785200	816900	806500	795400	787800	788700
18	753600	751400	750500	758100	763700	762600	785200	816000	805900	794800	787500	789000
19	753000	751400	750500	761800	763700	762000	784900	814800	805900	793600	786900	787800
20	752800	751400	750800	763200	763700	762000	784600	813600	805300	792700	786300	786600
21	752500	751900	750500	763200	763700	762600	784300	813300	805300	792100	787800	785800
22	751600	752800	749700	763200	765400	762900	784000	812500	810100	791600	787800	785500
23	751400	752500	748600	763500	765400	763200	783700	812500	810100	790700	787200	785500
24	751400	752500	747700	763500	765700	762300	783700	814200	809500	790100	786600	786900
25	750500	751900	747700	763500	765200	762900	783500	813600	809200	789800	786300	786600
26	749700	752500	748000	763500	764900	762300	784000	812700	808900	789200	785800	786600
27	750000	753600	747700	763700	764300	762300	784000	812200	808300	793900	785200	785800
28	749700	753600	748000	763500	764600	764000	786600	811300	807400	793900	784600	785500
29	749100	753000	749400	764000	---	764600	787200	810100	806800	793900	784300	785200
30	749100	752500	748800	763700	---	763700	787200	809200	806200	793300	787500	784900
31	748600	---	748300	763700	---	763500	---	808000	---	793000	787800	---
MAX	758400	753600	752800	764000	765700	765200	787200	820800	811300	805300	792400	792100
MIN	748600	748000	747700	748000	763200	762000	762300	786600	805300	789200	784300	784900
(†)	630.70	630.85	630.70	631.25	631.28	631.24	632.07	632.78	632.72	632.27	632.09	631.99
(Φ)	-9500	+3900	-4200	+15400	+900	-1100	+23700	+20800	-1800	-13200	-5200	-2900

CAL YR 1990 MAX 1218000 MIN 645600 (Φ) +101500  
WTR YR 1991 MAX 820800 MIN 747700 (Φ) +26800

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



TRINITY RIVER BASIN

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08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: February 1989 to current year.

332138097024101 - LAKE RAY ROBERTS SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)
MAR												
06...	1105	765000	1.00	282	8.3	11.5	0.90	9.5	90	K3	<1	120
06...	1109	--	10.0	283	8.2	11.0	--	9.3	87	--	--	--
06...	1113	--	20.0	281	8.2	11.0	--	9.3	87	--	--	--
06...	1118	--	30.0	280	8.2	11.0	--	9.2	86	--	--	--
06...	1122	--	40.0	281	8.2	11.0	--	9.2	86	--	--	--
06...	1126	--	50.0	281	8.2	11.0	--	9.2	86	--	--	--
06...	1130	--	60.0	281	8.2	11.0	--	9.2	86	--	--	--
06...	1135	--	70.0	281	8.2	11.0	--	9.1	85	--	--	--
06...	1139	--	77.0	279	8.1	11.0	--	9.1	85	--	--	120
JUN												
05...	0848	811000	1.00	286	8.3	24.5	1.50	7.6	93	<1	K8	110
05...	0851	--	10.0	288	7.9	24.5	--	6.0	73	--	--	--
05...	0855	--	20.0	289	7.8	24.0	--	5.5	67	--	--	--
05...	0858	--	30.0	302	7.3	21.0	--	0	0	--	--	--
05...	0902	--	40.0	308	7.2	19.0	--	0	0	--	--	--
05...	0906	--	50.0	309	7.2	18.0	--	0	0	--	--	--
05...	0910	--	60.0	314	7.2	17.5	--	0	0	--	--	--
05...	0914	--	75.0	314	7.2	17.5	--	0	0	--	--	130
AUG												
30...	1117	788000	1.00	289	7.7	27.5	1.50	5.0	64	K5	K5	100
30...	1122	--	10.0	285	7.6	27.5	--	4.9	63	--	--	--
30...	1127	--	20.0	286	7.6	27.0	--	5.0	64	--	--	--
30...	1132	--	30.0	286	7.6	27.0	--	4.7	60	--	--	--
30...	1137	--	40.0	320	7.1	21.5	--	0	0	--	--	--
30...	1141	--	50.0	326	7.1	19.5	--	0	0	--	--	--
30...	1146	--	60.0	331	7.1	18.5	--	0	0	--	--	--
30...	1151	--	75.0	331	7.0	18.5	--	0	0	--	--	130

DATE	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)
MAR											
06...	8	42	3.8	13	0.5	4.3	110	15	14	0.10	2.2
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	4	42	3.7	12	0.5	4.4	120	15	15	0.20	2.3
JUN											
05...	0	39	4.0	13	0.5	4.7	120	11	16	0.20	1.2
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	4	44	4.2	13	0.5	3.9	120	11	16	0.20	3.2
AUG											
30...	0	35	3.9	14	0.6	4.7	100	10	15	0.20	2.3
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	0	45	4.1	14	0.5	4.7	140	5.9	18	<0.10	5.4

## TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

332138097024101 - LAKE RAY ROBERTS SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
06...	162	0.340	0.010	0.350	0.020	0.68	0.70	0.030	<0.010	7	2
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	164	0.350	0.010	0.360	0.040	0.86	0.90	0.020	<0.010	16	26
JUN											
05...	158	0.100	0.030	0.130	0.020	0.58	0.60	<0.010	<0.010	7	2
05...	--	0.170	0.010	0.180	0.050	0.45	0.50	0.010	<0.010	10	20
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	170	--	--	--	--	--	--	--	--	230	900
AUG											
30...	148	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	<3	4
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	0.010	<0.050	0.020	0.58	0.60	0.020	<0.010	10	40
30...	--	--	<0.010	<0.050	0.340	0.46	0.80	0.020	<0.010	620	1600
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	184	--	<0.010	<0.050	0.860	0.44	1.3	0.150	0.060	1100	1500

332200097010001 - LAKE RAY ROBERTS SITE AL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
06...	1147	1.00	285	8.2	11.5	9.4	89
06...	1150	10.0	283	8.2	11.0	9.3	87
06...	1153	20.0	282	8.2	11.0	9.2	86
06...	1156	30.0	282	8.2	10.5	9.2	85
06...	1159	40.0	282	8.2	11.0	9.2	86
06...	1202	50.0	280	8.2	10.5	9.3	86
06...	1205	63.0	280	8.2	11.0	9.2	86
JUN							
05...	0925	1.00	285	8.3	25.0	7.9	97
05...	0928	10.0	285	8.3	24.5	7.9	96
05...	0930	20.0	286	8.0	24.5	6.2	76
05...	0932	30.0	293	7.7	23.5	4.6	55
05...	0933	40.0	305	7.3	21.0	0	0
05...	0936	50.0	309	7.3	19.0	0	0
05...	0939	60.0	309	7.3	18.0	0	0
05...	0942	66.0	310	7.3	18.0	0	0
AUG							
30...	1425	1.00	286	7.9	28.0	5.7	74
30...	1427	10.0	287	7.7	27.5	4.9	63
30...	1430	20.0	288	7.7	27.0	4.9	63
30...	1432	30.0	288	7.6	27.0	4.9	63
30...	1435	40.0	321	7.2	21.5	0	0
30...	1438	50.0	326	7.2	19.0	0	0
30...	1441	60.0	330	7.1	18.5	0	0
30...	1445	66.0	333	7.1	19.0	0	0

TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

332301097050601 - LAKE RAY ROBERTS SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR								
06...	1605	1.00	282	8.3	12.0	0.70	9.7	93
06...	1609	10.0	282	8.3	11.5	--	9.5	90
06...	1612	20.0	281	8.2	11.0	--	9.3	87
06...	1616	30.0	283	8.2	11.0	--	9.3	87
06...	1619	40.0	280	8.2	11.0	--	9.2	86
06...	1623	50.0	280	8.1	10.5	--	9.1	84
06...	1627	60.0	283	8.1	10.5	--	9.0	83
06...	1630	70.0	282	8.0	10.5	--	8.6	79
06...	1634	76.0	281	8.0	10.5	--	8.3	77
JUN								
05...	1218	1.00	272	8.6	27.5	--	9.5	122
05...	1221	10.0	278	8.3	25.5	--	6.8	85
05...	1223	20.0	288	7.8	24.5	--	5.1	62
05...	1225	30.0	300	7.4	22.5	--	2.1	25
05...	1228	40.0	310	7.3	19.5	--	0	0
05...	1230	50.0	311	7.3	19.0	--	0	0
05...	1232	60.0	314	7.3	18.5	--	0	0
05...	1234	76.0	314	7.3	18.0	--	0	0
AUG								
30...	1657	1.00	283	8.2	28.0	--	6.9	90
30...	1700	10.0	286	8.1	28.0	--	6.3	82
30...	1703	20.0	288	7.7	27.5	--	4.5	58
30...	1706	30.0	292	7.3	26.5	--	1.4	18
30...	1709	40.0	327	7.2	21.5	--	0	0
30...	1712	50.0	334	7.1	19.5	--	0	0
30...	1714	60.0	334	7.1	19.0	--	0	0
30...	1716	75.0	334	7.1	19.0	--	0	0

332353097020101 - LAKE RAY ROBERTS SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
06...	1225	1.00	282	8.2	12.5	9.4	91
06...	1227	10.0	278	8.2	11.5	9.3	88
06...	1229	20.0	282	8.2	11.0	9.3	87
06...	1232	30.0	279	8.2	11.0	9.2	86
06...	1235	40.0	280	8.2	11.0	9.2	86
06...	1237	50.0	281	8.1	11.0	9.1	85
06...	1239	60.0	281	8.0	10.5	8.7	80
06...	1241	73.0	280	8.0	10.5	8.3	77
JUN							
05...	1003	1.00	277	8.6	26.0	8.8	110
05...	1006	10.0	278	7.9	24.5	5.4	66
05...	1008	20.0	301	7.3	22.0	0.5	6
05...	1011	30.0	307	7.3	19.5	0	0
05...	1013	40.0	309	7.3	18.5	0	0
05...	1016	50.0	313	7.3	17.5	0	0
05...	1019	60.0	315	7.3	17.5	0	0
05...	1022	70.0	313	7.3	17.5	0	0
05...	1025	85.0	317	7.3	17.0	0	0
AUG							
30...	1503	1.00	285	8.2	28.5	6.5	85
30...	1506	10.0	286	8.1	28.0	6.2	81
30...	1509	20.0	286	7.9	27.5	5.6	72
30...	1512	30.0	294	7.2	26.0	0	0
30...	1515	40.0	321	7.2	20.5	0	0
30...	1518	50.0	326	7.2	19.5	0	0
30...	1521	60.0	331	7.1	18.5	0	0
30...	1524	70.0	331	7.1	18.5	0	0
30...	1529	77.0	333	7.1	18.5	0	0

TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

332459097063001 - LAKE RAY ROBERTS SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CaCO3)
MAR											
06...	1701	1.00	291	8.3	12.5	0.60	9.3	90	K4	K4	130
06...	1710	10.0	291	8.2	12.0	--	9.1	87	--	--	--
06...	1720	20.0	291	8.2	11.5	--	8.9	84	--	--	--
06...	1738	30.0	296	8.1	11.5	--	8.5	80	--	--	--
06...	1745	40.0	298	7.9	11.0	--	7.3	68	--	--	--
06...	1750	50.0	298	7.8	11.0	--	7.2	67	--	--	--
06...	1755	57.0	292	7.8	11.0	--	7.3	68	--	--	130
JUN											
05...	1248	1.00	267	8.6	28.0	1.00	8.6	112	<1	K8	100
05...	1251	10.0	266	8.2	27.0	--	6.1	78	--	--	--
05...	1255	20.0	268	8.0	26.5	--	5.4	68	--	--	--
05...	1258	30.0	297	7.5	24.0	--	2.9	35	--	--	--
05...	1302	40.0	318	7.3	21.0	--	0	0	--	--	--
05...	1306	50.0	325	7.3	20.0	--	0	0	--	--	--
05...	1310	56.0	324	7.3	20.5	--	0	0	--	--	140
AUG											
30...	1320	1.00	287	8.0	29.0	1.20	6.0	79	K1	<1	100
30...	1324	10.0	288	7.9	28.5	--	5.2	68	--	--	--
30...	1328	20.0	292	7.4	27.5	--	2.7	35	--	--	--
30...	1332	30.0	319	7.1	25.0	--	0	0	--	--	--
30...	1336	40.0	349	7.0	21.0	--	0	0	--	--	--
30...	1340	50.0	346	7.0	19.5	--	0	0	--	--	--
30...	1346	57.0	343	7.0	20.0	--	0	0	--	--	130

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
MAR											
06...	9	44	3.9	14	0.5	4.2	120	16	15	0.10	2.0
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	10	45	3.9	13	0.5	4.5	120	16	14	0.20	2.5
JUN											
05...	8	34	3.7	14	0.6	5.1	92	12	17	0.20	2.2
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	5	47	4.3	14	0.5	4.6	130	9.0	14	0.20	3.4
AUG											
30...	0	35	3.8	16	0.7	4.7	100	15	19	<0.10	2.6
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	0	45	4.2	14	0.5	4.7	150	4.0	18	<0.10	5.5

TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

332459097063001 - LAKE RAY ROBERTS SITE DC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITRO- GEN, NITRATE (MG/L AS N)	NITRO- GEN, NITRITE (MG/L AS N)	NITRO- GEN, NO2+NO3 (MG/L AS N)	NITRO- GEN, AMMONIA (MG/L AS N)	NITRO- GEN, ORGANIC (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
06...	170	0.350	0.010	0.360	0.020	0.68	0.70	0.020	<0.010	130	35
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	0.380	0.020	0.400	0.040	0.66	0.70	0.030	<0.010	200	60
06...	--	0.350	0.010	0.360	0.050	0.65	0.70	0.020	<0.010	290	100
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	171	0.340	0.020	0.360	0.130	0.87	1.0	0.040	<0.010	1000	310
JUN											
05...	143	--	<0.010	<0.050	0.010	0.79	0.80	0.030	<0.010	7	9
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	0.190	0.020	0.210	0.020	0.38	0.40	0.020	<0.010	10	110
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	176	--	0.010	<0.050	0.260	0.34	0.60	0.050	0.050	750	1200
AUG											
30...	159	--	<0.010	<0.050	<0.010	--	0.40	0.030	<0.010	10	150
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	<0.010	<0.050	<0.010	--	0.50	0.030	<0.010	120	390
30...	--	--	<0.010	<0.050	0.340	0.56	0.90	0.030	<0.010	620	1500
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	187	--	<0.010	<0.050	0.950	0.85	1.8	0.290	<0.010	2300	1700

332509096595301 - LAKE RAY ROBERTS SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)
MAR											
06...	1258	1.00	279	8.3	13.0	1.30	9.3	91	K2	<2	120
06...	1303	10.0	278	8.2	12.0	--	9.2	88	--	--	--
06...	1307	20.0	278	8.2	12.0	--	7.5	72	--	--	--
06...	1312	30.0	278	8.0	11.5	--	7.2	68	--	--	--
06...	1317	40.0	276	7.9	11.0	--	6.9	64	--	--	--
06...	1322	50.0	276	7.7	11.0	--	6.4	60	--	--	--
06...	1327	60.0	278	7.6	10.5	--	5.8	54	--	--	--
06...	1332	69.0	278	7.6	10.5	--	6.4	59	--	--	110
JUN											
05...	1043	1.00	264	8.6	27.5	1.20	8.7	112	K1	<1	110
05...	1046	10.0	264	8.6	26.5	--	8.7	110	--	--	--
05...	1050	20.0	272	8.0	25.0	--	5.4	67	--	--	--
05...	1053	30.0	267	7.6	23.5	--	3.2	38	--	--	--
05...	1057	40.0	302	7.2	21.0	--	0	0	--	--	--
05...	1100	50.0	314	7.2	19.0	--	0	0	--	--	--
05...	1103	60.0	318	7.2	19.0	--	0	0	--	--	--
05...	1106	71.0	320	7.2	18.5	--	0	0	--	--	130
AUG											
30...	1214	1.00	283	8.0	28.5	1.50	5.9	77	K9	K5	110
30...	1219	10.0	283	8.0	28.0	--	5.7	74	--	--	--
30...	1223	20.0	291	7.1	26.5	--	0	0	--	--	--
30...	1227	30.0	311	7.0	25.0	--	0	0	--	--	--
30...	1232	40.0	338	6.8	21.5	--	0	0	--	--	--
30...	1237	50.0	348	6.9	20.0	--	0	0	--	--	--
30...	1242	60.0	344	7.0	19.0	--	0	0	--	--	--
30...	1246	67.0	342	7.0	19.0	--	0	0	--	--	130



TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

332509096595301 - LAKE RAY ROBERTS SITE EC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
MAR											
06...	6	40	3.9	12	0.5	4.3	110	15	14	0.10	2.1
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	6	40	3.6	12	0.5	4.2	110	16	14	0.30	2.4
JUN											
05...	9	36	4.0	13	0.5	4.2	97	11	16	0.20	1.3
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	0	43	4.5	13	0.5	5.1	130	7.4	15	0.20	3.4
AUG											
30...	3	36	4.0	15	0.6	4.7	100	15	19	<0.10	2.1
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	0	45	4.2	13	0.5	4.7	150	4.1	19	<0.10	5.4

DATE	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
06...	157	--	<0.010	0.330	0.010	0.59	0.60	0.010	<0.010	12	3
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	<0.010	0.320	0.020	0.58	0.60	0.010	<0.010	20	10
06...	--	--	<0.010	0.320	0.040	0.56	0.60	0.020	<0.010	20	20
06...	--	--	--	--	--	--	--	--	--	--	--
06...	158	0.290	0.010	0.300	0.100	0.60	0.70	0.030	<0.010	12	130
JUN											
05...	144	--	0.020	<0.050	0.020	0.48	0.50	0.010	<0.010	12	3
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	0.120	0.010	0.130	0.030	0.57	0.60	0.020	<0.010	30	30
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	173	--	<0.010	<0.050	0.720	0.28	1.0	0.180	0.080	2500	1300
AUG											
30...	158	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	5	2
30...	--	--	<0.010	<0.050	<0.010	--	0.50	0.020	<0.010	<10	20
30...	--	--	<0.010	<0.050	0.070	0.43	0.50	0.020	<0.010	50	20
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	--	--	--	--	--	--	--	--	--	--	--
30...	185	--	<0.010	<0.050	1.10	0.50	1.6	0.220	0.130	1500	1500

332758097063301 - LAKE RAY ROBERTS SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JUN							
05...	1407	1.00	259	8.4	29.5	7.1	95
05...	1408	10.0	352	7.3	25.5	1.5	19
05...	1409	20.0	375	7.2	24.0	0.7	8
05...	1413	34.0	375	7.2	24.0	0.7	8
AUG							
30...	1739	1.00	282	8.1	29.5	6.6	88
30...	1742	10.0	285	7.7	29.0	4.6	61
30...	1745	20.0	287	7.6	28.5	4.5	59
30...	1748	35.0	415	6.9	27.0	0	0

## TRINITY RIVER BASIN

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX--Continued

332642096561201 - LAKE RAY ROBERTS SITE GC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
06...	1425	1.00	270	8.2	15.0	9.5	97
06...	1428	10.0	272	8.1	12.5	9.1	88
06...	1431	20.0	270	7.5	11.5	6.1	58
06...	1435	30.0	276	7.2	10.0	1.5	14
06...	1439	35.0	278	7.2	10.0	0.7	6
JUN							
05...	1124	1.00	233	8.7	29.5	7.8	104
05...	1127	10.0	231	8.6	27.0	6.6	84
05...	1131	20.0	267	7.2	25.5	0	0
05...	1135	30.0	318	7.0	22.0	0	0
05...	1139	39.0	338	7.0	20.5	0	0
AUG							
30...	1614	1.00	271	7.7	29.0	5.2	69
30...	1616	10.0	275	7.1	28.0	0	0
30...	1619	20.0	296	6.8	27.0	0	0
30...	1621	30.0	334	6.7	25.5	0	0
30...	1624	36.0	505	6.4	22.5	0	0

## Ray Roberts Lake AC (332138097024101)

## Phytoplankton Analyses October 1990 to September 1991

Date	3-06-91
Time	1106
<hr/>	
TOTAL CELLS/mL	1,256,305
NUMBER OF SPECIES	26
DEPTH COLLECTED (ft.)	1.4
<hr/>	

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella kuetzingiana</i>	1,571
<i>Cyclotella meneghiniana</i>	5,498
<i>Cyclotella ocellata</i>	11,781
<i>Melosira granulata</i>	14,138
<i>Melosira italica</i>	6,283
<i>Stephanodiscus astraeta</i> var. <i>minutula</i>	1,571
Order Pennales	
<i>Fragilaria vaucheriae</i>	61
<i>Nitzschia acicularis</i>	424
<i>Nitzschia palea</i>	121
<i>Synedra delicatissima</i>	484
<i>Synedra delicatissima</i> var. <i>angustissima</i>	121
<i>Synedra rumpens</i>	363
<i>Synedra ulna</i> var. <i>ramesi</i>	61
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella ellipsoidea</i>	50,644
<i>Chlorococcum humicola</i>	45,743
<i>Cosmarium</i> sp.	1,634
<i>Selenastrum minutum</i>	4,901
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	802,139
<i>Aphanothece nidulans</i>	115,992
<i>Chroococcus multicoloratus</i>	3,267
<i>Chroococcus</i> sp.	24,505
<i>Dactylococcopsis acicularis</i>	1,634
<i>Microcystis aeruginosa</i>	151,933
<b>EUGLENOPHYTA (Euglenoids)</b>	
<i>Euglena acus</i>	1,634
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	4,901
<i>Rhodomonas minuta</i>	4,901

08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX—Continued

## Ray Roberts Lake DC (332459097063001)

## Phytoplankton Analyses October 1990 to September 1991

Date	3-06-91
Time	1702

<b>TOTAL CELLS/mL</b>	<b>934,466</b>
<b>NUMBER OF SPECIES</b>	<b>27</b>
<b>DEPTH COLLECTED (ft.)</b>	<b>1.0</b>

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella meneghiniana</i>	4,668
<i>Cyclotella ocellata</i>	2,801
<i>Melosira granulata</i>	5,134
<i>Melosira italica</i>	6,068
<i>Stephanodiscus astraea</i>	934
Order Pennales	
<i>Achnanthes linearis</i>	192
<i>Achnanthes microcephala</i>	96
<i>Fragilaria vaucheriae</i>	96
<i>Gomphonema</i> sp.	96
<i>Navicula arvensis</i>	384
<i>Navicula sanctaecrucis</i>	96
<i>Navicula</i> sp.	96
<i>Nitzschia palea</i>	480
<i>Synedra rumpens</i>	96
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlamydomonas</i> sp. 3,267	
<i>Chlorella ellipsoidea</i>	39,208
<i>Chlorococcum humicola</i>	26,139
<i>Scenedesmus bijuga</i>	3,267
<i>Scenedesmus quadricauda</i>	6,535
<i>Selenastrum minutum</i>	1,634
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	147,032
<i>Aphanocapsa rivularis</i>	39,208
<i>Aphanothece nidulans</i>	635,503
<i>Chroococcus</i> sp.	4,901
<i>Dactylococcopsis acicularis</i>	1,634
<i>Lyngbya</i> sp.	3,267
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	1,634

## Ray Roberts Lake AC (332138097024101)

Phytoplankton Analyses October 1990 to September 1991

Date	6-5-91
Time	0850

TOTAL CELLS/mL	463,966
NUMBER OF SPECIES	13
DEPTH COLLECTED (ft.)	2.5

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Stephanodiscus astrea</i> var. <i>minutula</i>	1,634
Order Pennales	
<i>Fragilaria vaucheriae</i>	1,089
<i>Nitzschia palea</i>	1,089
<i>Synedra</i> sp.	1,089
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlamydomonas</i> sp.	3,267
<i>Chlorella ellipsoidea</i>	8,168
<i>Chlorococcum humicola</i>	3,267
<i>Pediastrum biradiatum</i>	6,535
<i>Scenedesmus quadricauda</i> var. <i>longispina</i>	3,267
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Mallomonas</i> sp.	1,634
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	207,478
<i>Aphanothece nidulans</i>	17,971
<i>Chroococcus</i> sp.	207,478



08051100 RAY ROBERTS LAKE NEAR PILOT POINT, TX—Continued

## Ray Roberts Lake EC (332509096595301)

Phytoplankton Analyses October 1990 to September 1991

Date	6-5-91
Time	1044

TOTAL CELLS/mL	437,837
NUMBER OF SPECIES	17
DEPTH COLLECTED (ft.)	2

<u>Organisms</u>	<u>Cells/mL</u>
BACILLARIOPHYTA (Diatoms)	
Order Centrales	
<i>Cyclotella meneghiniana</i>	467
<i>Cyclotella ocellata</i>	467
<i>Stephanodiscus astrea</i> var. <i>minutula</i>	2,334
Order Pennales	
<i>Achnanthes microcephala</i>	1,508
<i>Gomphonema parvulum</i>	377
<i>Navicula</i> sp.	377
<i>Nitzschia acicularis</i>	2,639
CHLOROPHYTA (Green algae)	
<i>Chlorococcum humicola</i>	3,267
<i>Scenedesmus bijuga</i>	3,267
<i>Tetraedron muticum</i>	1,634
CHRYSOPHYTA (Golden-brown algae)	
<i>Unknown chrysophyte flagellate</i>	3,267
CYANOPHYTA (Blue-green algae)	
<i>Aphanocapsa delicatissima</i>	174,804
<i>Aphanothece nidulans</i>	11,436
<i>Chroococcus</i> sp.	218,914
<i>Lyngbya</i> sp.	9,802
PYRRROPHYTA (Dinoflagellates)	
<i>Glenodinium</i> sp.	1,634
CRYPTOPHYTA (Cryptomonads)	
<i>Cryptomonas erosa</i>	1,634

## TRINITY RIVER BASIN

08051130 ELM FORK TRINITY RIVER NEAR PILOT POINT, TX

LOCATION.--Lat 33°21'01", Long 97°02'49", Denton County, Hydrologic Unit 12030103, on right bank of excavated outlet channel, 1,600 ft downstream from center line of Ray Roberts Dam on Elm Fork Trinity River, 3.3 mi upstream from Bray Branch, 4.9 mi upstream from Farm Road 428 bridge, and 5.7 mi southwest of town square in Pilot Point.

DRAINAGE AREA.--692 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Occasional low-flow measurements and annual maximum, water years 1981-84, July 1985 to current year.

GAGE.--Water-stage recorder. Datum of gage is 526.26 ft above National Geodetic Vertical Datum of 1929. Prior to July 1985, nonrecording staff and crest-stage gages at site 0.8 mi downstream at 526.26 ft lower datum.

REMARKS.--No estimated daily discharges. Records fair, except those below 15 ft<sup>3</sup>/s, which are poor. Flow regulated by Ray Roberts Lake (station 08051100) 1,600 ft upstream.

AVERAGE DISCHARGE.--6 years (water years 1986-91) regulated, 275 ft<sup>3</sup>/s (199,200 acre-ft per year).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,190 ft<sup>3</sup>/s May 3, 1990 (gage height, 27.33 ft); no flow in 1987-89 water years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge since at least 1900, 183,000 ft<sup>3</sup>/s in October 1981 from discontinued gages 5.0 mi upstream on Elm Fork Trinity River and 6.3 mi upstream on Isle du Bois Creek. The crest-stage gage then in use recorded an elevation of 566.32 ft (gage height to current datum 40.06 ft) for that flood.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 651 ft<sup>3</sup>/s May 14 at 1730 hours (gage height, 8.30 ft); minimum daily, 0.03 ft<sup>3</sup>/s, Apr. 27 and May 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.55	1.0	.55	1.9	.55	.55	.96	.03	328	.82	.18	.90
2	.55	1.1	.55	1.9	.55	.55	.56	.04	329	.82	.17	.76
3	.55	1.2	.55	1.9	.55	.55	2.2	.18	332	.82	.27	.94
4	.55	2.2	.58	1.9	.55	.61	1.2	.07	330	.82	.45	.64
5	.55	2.2	1.1	1.9	.55	.67	1.0	.05	331	.82	.55	.74
6	.55	2.2	1.4	3.8	.55	.67	1.1	.05	331	.82	.55	.56
7	.59	2.2	1.6	3.0	.55	.67	1.6	.05	330	.82	.55	.69
8	.69	3.4	1.8	1.9	.55	.67	1.8	.15	332	.82	.55	.72
9	.81	3.5	1.9	2.3	.55	.67	1.1	.08	331	.82	.55	.56
10	.67	3.2	1.8	6.2	.55	.98	2.6	.05	332	.82	.55	.55
11	.67	2.9	1.1	.74	.55	1.1	6.4	.05	331	.82	.55	.55
12	.67	2.9	1.0	.55	.55	.60	6.6	.05	164	.82	.70	.55
13	.67	3.2	.56	.55	.55	.55	.06	238	1.0	.82	.74	.55
14	.67	3.3	.55	.55	.55	.62	.04	582	.90	1.0	.82	.55
15	.67	3.6	.55	.55	.55	.85	.04	631	.82	1.0	.83	.55
16	.67	3.7	.90	.55	.55	1.4	.04	625	.82	1.0	1.2	.55
17	.67	3.9	1.2	.55	.55	1.5	.04	617	.82	1.3	.55	.55
18	.67	4.2	2.6	.60	.55	1.2	.04	614	.82	.79	.42	.56
19	.67	4.2	2.7	1.6	.55	1.2	.05	610	.82	.83	.34	.67
20	.67	4.2	2.1	.56	.55	1.0	.04	610	.82	1.1	2.5	.67
21	.67	4.2	.81	.55	.55	1.0	.04	494	.82	1.5	1.8	.67
22	.67	4.7	.55	.55	2.1	.78	.05	330	.92	.98	2.2	.67
23	.67	4.3	.66	.55	.72	.55	.05	331	1.7	.84	.62	.67
24	.67	4.2	.67	.55	.55	.61	.05	341	.91	12	.45	.99
25	.67	4.2	.67	.55	.55	.67	.05	338	.82	1.1	.35	.83
26	.67	3.1	.87	.55	.55	.66	.05	331	.82	1.1	.38	.67
27	.67	1.8	1.9	.55	.55	.66	.03	331	.82	1.1	.50	.67
28	.67	.78	2.2	.55	.55	1.0	.09	331	.82	1.2	.55	.67
29	.77	.55	2.6	.55	---	.87	.06	329	.88	1.0	.50	.67
30	.82	.55	2.5	.55	---	.89	.05	329	1.0	.42	.88	.67
31	.96	---	1.9	.55	---	1.0	---	328	---	.25	.60	---
TOTAL	20.67	86.68	40.42	39.55	17.12	25.30	27.99	8340.85	3817.33	39.17	21.85	19.99
MEAN	.67	2.89	1.30	1.28	.61	.82	.93	269	127	1.26	.70	.67
MAX	.96	4.7	2.7	6.2	2.1	1.5	6.6	631	332	12	2.5	.99
MIN	.55	.55	.55	.55	.55	.55	.03	.03	.82	.25	.17	.55
AC-FT	41	172	80	78	34	50	56	16540	7570	78	43	40
CAL YR 1990	TOTAL	295713.38	MEAN	810	MAX	7960	MIN	.17	AC-FT	586500		
WTR YR 1991	TOTAL	12496.92	MEAN	34.2	MAX	631	MIN	.03	AC-FT	24790		

TRINITY RIVER BASIN

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08051130 ELM FORK TRINITY RIVER NEAR PILOT POINT, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: December 1985 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)
NOV 26...	1130	3.1	281	7.6	17.5	10	4.8	9.4	101	0.6	110
MAR 06...	1245	0.68	502	8.2	15.0	15	7.6	11.0	113	2.8	160
MAY 01...	1638	0.03	315	8.0	15.0	25	12	8.6	87	1.4	120
JUN 05...	1615	331	308	7.8	19.5	7	4.5	8.7	96	3.3	120
AUG 07...	1350	0.54	338	7.8	18.0	15	3.6	8.5	91	1.7	130
AUG 30...	1225	1.0	411	7.7	22.5	18	30	6.1	71	1.0	150
DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)
NOV 26...	3	39	3.6	13	0.5	4.7	110	16	16	0.10	2.8
MAR 06...	19	55	6.1	41	1	3.7	140	62	37	0.20	4.1
MAY 01...	6	42	3.8	13	0.5	4.5	120	13	14	<0.10	2.8
JUN 05...	3	42	3.8	16	0.6	4.9	120	11	17	0.20	1.8
AUG 07...	1	45	3.9	12	0.5	4.3	130	8.3	16	0.20	3.9
AUG 30...	37	53	5.3	23	0.8	4.4	120	51	23	0.30	5.2
DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+N03 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 26...	161	5	4	1	--	<0.010	0.300	0.060	0.24	0.30	0.020
MAR 06...	296	<1	<1	--	--	<0.010	0.220	0.020	0.88	0.90	0.030
MAY 01...	162	21	11	10	0.450	0.030	0.480	0.030	0.47	0.50	0.050
JUN 05...	168	39	9	30	0.290	0.010	0.300	0.060	0.94	1.0	0.030
AUG 07...	170	5	5	0	0.067	0.030	0.097	0.390	0.51	0.90	0.090
AUG 30...	237	64	19	45	0.380	0.050	0.430	0.360	1.5	1.9	0.180
DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 26...	0.020	4.8	--	--	--	--	--	--	--	--	--
MAR 06...	<0.010	4.4	<1	51	0.6	<1.0	<5	<3	<10	<3	<10
MAY 01...	0.020	5.0	--	--	--	--	--	--	--	--	--
JUN 05...	<0.010	6.1	1	57	<0.5	<1.0	<5	<3	<10	4	<10
AUG 07...	0.060	4.9	--	--	--	--	--	--	--	--	--
AUG 30...	0.050	6.7	2	50	<0.5	<1.0	<5	<3	<10	10	<10

## TRINITY RIVER BASIN

08051130 ELM FORK TRINITY RIVER NEAR PILOT POINT, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 26...	--	--	--	--	--	--	--	--	--	--
MAR 06...	8	19	<0.1	<10	<10	<1	<1.0	320	<6	<3
MAY 01...	--	--	--	--	--	--	--	--	--	--
JUN 05...	<4	<1	<0.1	<10	<10	<1	<1.0	200	<6	4
AUG 07...	--	--	--	--	--	--	--	--	--	--
30...	7	640	<0.1	<10	<10	1	<1.0	280	<6	11

TRINITY RIVER BASIN

297

08051500 CLEAR CREEK NEAR SANGER, TX

LOCATION.--Lat 33°20'10", long 97°10'45", Denton County, Hydrologic Unit 12030103, at the downstream side near right end of bridge on county road, 1,350 ft downstream from Duck Creek, 1.1 mi upstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, and 1.8 mi south of Sanger.

DRAINAGE AREA.--295 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1512: 1950, 1955. WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 582.23 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Apr. 18, 1975, water-stage recorder at datum 5.00 ft higher. Apr. 18, 1975 to June 9, 1988, at site 950 ft upstream at same datum.

REMARKS.--Estimated daily discharges: Apr. 26 to May 23. Records good. There are no appreciable diversions above station. Flow affected at times by discharge from the flood-detention pools of 51 floodwater-retarding structures with a combined detention capacity of 38,850 acre-ft. These structures control runoff from 149 mi<sup>2</sup> in the Clear Creek watershed. Gage-height telemeter at station.

AVERAGE DISCHARGE.--31 years (water years 1950-80) prior to regulation, 74.3 ft<sup>3</sup>/s (53,830 acre-ft/yr); 11 years (water years 1981-91) after completion of floodwater-retarding structures, 162 ft<sup>3</sup>/s (117,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104,000 ft<sup>3</sup>/s Oct. 13, 1981 (gage height, 35.70 ft, site and datum then in use); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1880, 36.5 ft in May 1908, from information by Gulf, Colorado, and Santa Fe Railway Co. Flood in May 1935 reached a stage of 34.0 ft, from information by State Department of Highways and Public Transportation. Both peaks now referenced to present site and datum.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,880 ft<sup>3</sup>/s Apr. 12 at 0300 hrs (gage height, 22.75 ft); minimum discharge, 1.1 ft<sup>3</sup>/s Aug. 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	11	22	14	30	25	24	19	20	11	8.4	26
2	11	11	21	23	30	25	24	19	49	10	5.0	25
3	11	11	21	19	29	25	23	730	279	9.7	4.3	127
4	11	18	20	18	31	23	23	502	102	8.9	3.4	37
5	11	24	18	17	34	23	23	226	71	8.6	2.6	20
6	11	23	18	22	33	23	22	99	65	8.4	1.9	18
7	18	19	18	21	34	22	23	73	70	8.1	1.7	13
8	59	23	17	20	32	22	27	290	221	7.9	1.6	12
9	45	33	17	20	31	21	21	407	1140	7.6	1.3	18
10	39	30	17	51	30	22	19	159	353	6.8	1.3	15
11	21	20	18	52	29	23	198	99	166	5.8	1.3	11
12	17	17	18	40	28	23	2130	73	96	4.9	3.3	9.1
13	15	16	17	33	28	23	690	59	73	4.7	8.9	7.6
14	14	15	17	31	27	22	409	52	59	5.2	9.0	7.6
15	13	15	17	31	25	22	202	343	49	5.9	7.2	6.8
16	13	15	17	31	23	22	105	178	41	6.1	5.1	6.3
17	12	15	19	29	23	27	56	83	37	6.2	3.9	24
18	12	15	23	46	24	29	40	50	32	6.1	3.3	21
19	12	15	20	320	24	26	36	41	27	5.6	2.9	16
20	11	15	19	257	23	25	30	37	23	5.1	2.1	14
21	11	16	18	109	22	25	27	33	20	5.6	2.5	11
22	11	17	17	75	30	29	26	33	19	5.6	4.6	9.5
23	11	22	15	62	42	52	26	32	46	4.7	6.0	8.7
24	11	20	13	54	37	36	25	33	23	3.4	3.7	18
25	11	18	14	48	32	37	25	38	18	3.3	2.8	17
26	11	18	16	43	28	32	28	37	15	10	2.3	19
27	11	28	18	40	26	33	28	30	14	17	1.9	13
28	11	121	19	39	25	56	31	26	13	53	1.5	11
29	11	37	21	38	---	41	25	24	12	25	1.6	8.1
30	11	26	21	36	---	32	21	23	12	12	4.4	8.4
31	11	---	14	33	---	26	---	21	---	9.3	9.1	---
TOTAL	488	684	560	1672	810	872	4387	3869	3165	291.5	118.9	558.1
MEAN	15.7	22.8	18.1	53.9	28.9	28.1	146	125	105	9.40	3.84	18.6
MAX	59	121	23	320	42	56	2130	730	1140	53	9.1	127
MIN	11	11	13	14	22	21	19	19	12	3.3	1.3	6.3
AC-FT	968	1360	1110	3320	1610	1730	8700	7670	6280	578	236	1110
CAL YR 1990	TOTAL	144498.0	MEAN	396	MAX	17600	MIN	7.0	AC-FT	286600		
WTR YR 1991	TOTAL	17475.5	MEAN	47.9	MAX	2130	MIN	1.3	AC-FT	34660		



WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: April 1959, January 1966, October 1984 to current year. Sediment analyses: February 1966 to May 1977.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1969 to August 1977.

WATER TEMPERATURE: May 1968 to August 1977.

SUSPENDED SEDIMENT DISCHARGE: May 1968 to August 1977.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (1972-77): Maximum daily, 1,920 microsiemens Oct. 12, 1976; minimum daily, 182 microsiemens July 29, 1973.

WATER TEMPERATURE (1968-70, 1972-77): Maximum daily, 39.0°C June 8, 1969; minimum daily, 0.0°C Jan. 9, 1970.

SEDIMENT CONCENTRATION: Maximum daily mean, 7,370 mg/L May 12, 1972; minimum, no flow on many days.

SEDIMENT LOADS: Maximum daily, 79,000 tons May 7, 1969; minimum daily, 0 tons on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)
NOV 23...	1030	22	673	7.9	13.0	7	16	9.1	88	1.2	240
JAN 14...	1738	30	570	8.1	8.5	4	8.0	12.0	106	2.9	250
MAR 05...	1305	24	626	8.1	14.0	5	10	10.3	104	0.7	230
APR 29...	1245	25	608	8.1	19.5	8	6.4	8.5	96	1.5	230
JUN 10...	1500	269	308	7.9	24.5	35	56	7.6	93	0.8	130
AUG 05...	1535	2.5	542	8.1	32.5	7	2.5	9.4	133	1.3	180

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
NOV 23...	32	66	19	42	1	2.1	210	58	47	0.40	13
JAN 14...	26	80	12	29	0.8	1.9	220	52	35	0.30	9.3
MAR 05...	35	71	14	37	1	1.8	200	59	50	0.30	6.1
APR 29...	42	74	12	36	1	2.1	190	50	45	0.30	10
JUN 10...	21	42	5.1	10	0.4	3.3	100	19	15	0.20	7.0
AUG 05...	39	51	12	37	1	3.4	140	48	52	0.30	11

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, DIS-SOLVED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE (MG/L AS N)	NITRO-GEN, NITRITE (MG/L AS N)	NITRO-GEN, NO2+NO3 (MG/L AS N)	NITRO-GEN, AMMONIA (MG/L AS N)	NITRO-GEN, ORGANIC (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 23...	374	39	18	21	--	0.020	<0.100	0.040	0.16	0.20	0.030
JAN 14...	355	26	10	16	0.290	0.010	0.300	0.020	--	<0.20	0.020
MAR 05...	359	19	5	14	--	<0.010	0.072	<0.010	--	<0.20	<0.010
APR 29...	346	15	8	7	0.090	0.020	0.110	0.010	--	<0.20	0.020
JUN 10...	165	688	112	576	0.550	0.080	0.630	0.080	0.42	0.50	0.030
AUG 05...	298	<1	<1	--	--	<0.010	--	0.020	0.48	0.50	0.020

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC, DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 23...	0.040	3.3	--	--	--	--	--	--	--	--	--
JAN 14...	0.010	2.6	<1	100	<0.5	<1.0	<5	<3	<10	<3	<10
MAR 05...	<0.010	2.3	--	--	--	--	--	--	--	--	--
APR 29...	0.010	2.8	<1	97	<0.5	<1.0	<5	<3	<10	6	<10
JUN 10...	0.050	11	--	--	--	--	--	--	--	--	--
AUG 05...	<0.010	3.3	<1	95	<0.5	<1.0	<5	<3	<10	4	<10

TRINITY RIVER BASIN

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08051500 CLEAR CREEK NEAR SANGER, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 23...	--	--	--	--	--	--	--	--	--	--
JAN 14...	12	21	0.2	<10	<10	<1	<1.0	570	<6	<3
MAR 05...	--	--	--	--	--	--	--	--	--	--
APR 29...	10	16	<0.1	<10	<10	<1	<1.0	590	<6	<3
JUN 10...	--	--	--	--	--	--	--	--	--	--
AUG 05...	<4	19	0.1	<10	<10	<1	<1.0	510	<6	3

## TRINITY RIVER BASIN

08052700 LITTLE ELM CREEK NEAR AUBREY, TX

LOCATION.--Lat 33°17'00", long 96°53'33", Denton County, Hydrologic Unit 12030103, on left bank at downstream side of bridge on Farm Road 1385, 1.5 mi upstream from Mustang Creek, 5.5 mi east of Aubrey, and 18 mi upstream from Lewisville Dam on the Elm Fork Trinity River.

DRAINAGE AREA.--75.5 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1956 to September 1976, October 1979 to current year.

REVISED RECORDS.--WDR TX-70-1: 1969.

GAGE.--Water-stage recorder. Datum of gage is 534.76 ft above National Geodetic Vertical Datum of 1929 (State Department of Highways and Public Transportation bench mark).

REMARKS.--Records good except those for estimated daily discharges, which are poor. There are several small diversions for irrigation above station. Flow affected at times by discharge from the flood-detention pools of 17 floodwater-retarding structures with a combined detention capacity of 10,460 acre-ft. These structures control runoff from 36.4 mi<sup>2</sup> above this station. Several observations of water temperature were obtained during the year.

AVERAGE DISCHARGE.--32 years (water year 1957-76, 1980-1991), 46.4 ft<sup>3</sup>/s (33,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,300 ft<sup>3</sup>/s May 13, 1982 (gage height, 17.80 ft); no flow at times each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1900, 18.2 ft in May 1941, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 3	2145	*782	*13.89				

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.12	2.4	5.9	3.4	5.3	.24	5.4	7.6	1.3	.00	5.6
2	.00	.11	1.5	3.9	3.0	5.0	.23	6.5	3.9	1.7	.00	4.8
3	.00	.09	2.3	2.8	2.3	4.2	.20	612	4.7	.47	.00	.78
4	.00	.53	4.5	2.2	2.3	3.4	.18	363	4.5	.00	.00	30
5	.00	3.4	2.8	e1.5	4.3	2.2	.19	166	3.8	.00	.00	47
6	.00	3.1	1.6	e43	7.9	1.6	.27	93	4.7	.00	.00	8.5
7	.00	2.3	.77	e45	7.2	1.2	.29	46	1.9	.00	.00	15
8	.00	8.3	.39	e17	5.9	1.1	.33	171	117	.00	.00	44
9	70	184	.31	e11	5.0	.79	.31	109	9.7	.00	.00	12
10	27	63	.26	e90	4.4	.37	.35	45	3.4	.00	.00	8.5
11	15	20	.18	e56	3.7	.29	.36	22	2.7	.00	.00	6.9
12	7.6	9.1	.14	e26	3.4	.21	.47	12	2.4	.00	.00	5.4
13	4.2	6.1	.11	e16	2.8	.23	.89	8.5	1.5	.00	.00	4.3
14	2.1	4.0	.13	e11	2.1	.21	1.3	6.9	.52	.00	.00	3.4
15	.75	2.8	.12	e69	2.2	.20	1.1	6.7	.30	.00	.00	2.2
16	.44	2.1	.21	e70	1.5	.22	.66	6.1	.24	.00	.00	1.8
17	.88	1.4	.32	26	.93	.53	.37	4.1	4.9	.00	.00	1.4
18	.79	.91	26	60	.89	2.5	1.3	3.7	2.3	.00	.00	1.4
19	1.8	.79	16	240	.52	1.8	1.4	3.4	2.8	.00	.00	2.3
20	.71	.55	7.0	120	.38	1.1	.57	3.8	3.6	.00	.00	1.7
21	.27	.60	3.7	65	.61	.60	.29	4.5	3.2	.00	.00	1.9
22	.14	.71	1.7	37	57	.65	.30	5.3	2.4	.00	.00	1.9
23	.10	4.4	.73	20	58	.40	.26	5.4	8.3	.00	.00	1.6
24	.09	4.3	.33	12	29	.36	.25	22	4.6	.00	.00	2.0
25	.12	2.7	.22	9.4	16	.26	.35	142	4.5	.00	.00	4.7
26	.08	1.6	.19	7.8	10	.29	.35	56	3.5	.00	.00	2.5
27	.09	1.6	.28	6.6	7.6	.34	.35	24	3.5	.00	.00	1.1
28	.10	17	.38	5.9	5.9	.39	1.4	14	3.7	.00	.00	.47
29	.12	7.7	7.7	5.1	---	.35	42	9.7	3.6	.00	.00	.76
30	.10	4.4	29	5.2	---	.32	10	8.6	1.9	.00	.00	.41
31	.11	---	8.8	4.5	---	.24	---	8.3	---	.00	.40	---
TOTAL	132.59	357.71	120.07	1094.8	248.23	36.65	66.56	1993.9	221.66	3.47	0.40	224.32
MEAN	4.28	11.9	3.87	35.3	8.87	1.18	2.22	64.3	7.39	.11	.013	7.48
MAX	70	184	29	240	58	5.3	42	612	117	1.7	.40	47
MIN	.00	.09	.11	1.5	.38	.20	.18	3.4	.24	.00	.00	.41
AC-FT	263	710	238	2170	492	73	132	3950	440	6.9	.8	445
CAL YR 1990	TOTAL	29532.58	MEAN	80.9	MAX	4790	MIN	.00	AC-FT	58580		
WTR YR 1991	TOTAL	4500.36	MEAN	12.3	MAX	612	MIN	.00	AC-FT	8930		

e Estimated

08052700 LITTLE ELM CREEK NEAR AUBREY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: June 1962 to June 1963, June 1965 to January 1968. Chemical and biochemical analyses: October 1984 to current year. Sediment analyses: April 1966 to October 1974.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1966 to June 1975.

WATER TEMPERATURES: February 1966 to June 1975.

SUSPENDED SEDIMENT DISCHARGE: February 1966 to September 1975.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: (1966-68, 1971-74): Maximum daily, 1,380 microsiemens Jan. 24, Feb. 25, 1967; minimum daily, 195 microsiemens June 4, 1968.

WATER TEMPERATURE (1966-68, 1971-74): Maximum daily, 33.0°C June 16, 1968; minimum daily, 0.0°C Feb. 22, 1968.

SEDIMENT CONCENTRATIONS: Maximum daily mean, 4,750 mg/L Aug. 13, 1966; minimum daily mean, no flow on many days.

SEDIMENT LOADS: Maximum daily, 17,900 tons May 31, 1967; minimum daily, 0 tons on many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	
NOV 23...	1500	8.0	624	8.0	15.0	65	80	9.1	92	4.2	140
JAN 17...	1240	25	420	7.9	7.5	180	130	11.4	96	3.7	150
MAR 08...	1030	0.83	552	8.2	7.5	32	20	10.2	87	3.6	170
MAY 02...	1450	3.0	516	8.0	20.5	130	79	7.8	89	2.4	180
JUN 13...	1040	1.3	476	8.2	26.0	30	66	5.9	75	1.1	170
SEP 04...	1418	0.41	832	8.2	28.0	140	50	7.3	95	6.4	120

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
NOV 23...	0	50	4.6	76	3	6.9	170	95	20	0.50	2.8
JAN 17...	46	53	4.5	24	0.9	4.8	100	74	13	0.30	6.8
MAR 08...	29	60	5.5	51	2	5.2	140	130	16	0.40	3.0
MAY 02...	47	64	4.9	35	1	6.1	130	97	12	0.40	7.4
JUN 13...	42	61	4.5	29	1	5.4	130	85	11	0.40	7.2
SEP 04...	0	40	4.1	190	8	7.5	270	130	56	0.90	12

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 23...	357	141	14	127	1.95	0.150	2.10	0.110	0.89	1.0	0.300
JAN 17...	244	262	44	218	4.14	0.060	4.20	0.160	0.54	0.70	0.220
MAR 08...	357	99	14	85	--	0.010	<0.050	<0.010	--	0.80	0.140
MAY 02...	308	149	20	129	0.400	0.130	0.530	0.080	0.72	0.80	0.200
JUN 13...	281	120	17	103	--	0.040	<0.050	0.020	0.98	1.0	0.060
SEP 04...	605	127	29	98	2.82	0.180	3.00	0.040	1.2	1.2	1.60

DATE	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
NOV 23...	0.240	12	--	--	--	--	--	--	--	--	--
JAN 17...	0.130	12	2	39	<0.5	<1.0	<5	<3	<10	97	10
MAR 08...	0.030	9.9	--	--	--	--	--	--	--	--	--
MAY 02...	0.170	10	2	47	<0.5	<1.0	<5	<3	<10	56	<10
JUN 13...	0.060	8.5	--	--	--	--	--	--	--	--	--
SEP 04...	1.10	14	7	49	<0.5	<1.0	<5	<3	<10	64	<10

## TRINITY RIVER BASIN

08052700 LITTLE ELM CREEK NEAR AUBREY, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 23...	--	--	--	--	--	--	--	--	--	--
JAN 17...	11	3	0.2	<10	<10	<1	<1.0	410	<6	4
MAR 08...	--	--	--	--	--	--	--	--	--	--
MAY 02...	14	6	0.1	<10	<10	<1	<1.0	550	<6	<3
JUN 13...	--	--	--	--	--	--	--	--	--	--
SEP 04...	26	11	0.3	<10	<10	<1	1.0	410	10	<3







TRINITY RIVER BASIN

305

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX

LOCATION.--Lat 33°04'09", long 96°57'51", Denton County, Hydrologic Unit 12030103, in intake structure of Lewisville Dam on Elm Fork Trinity River, 2 mi upstream from bridge on State Highway 121, 2.4 mi northeast of Lewisville, 12 mi upstream from Denton Creek, and 30.0 mi upstream from mouth.

DRAINAGE AREA.--1,660 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1954 to current year. Prior to October 1970, published as Garza-Little Elm Reservoir near Lewisville.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 17, 1955, non-recording gage at site 4,000 ft upstream at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 32,888 ft long, including a 560-foot uncontrolled off-channel concrete-gravity spillway with ogee weir section. Deliberate impoundment began Nov. 1, 1954, and the dam was completed in August 1955. The controlled low-flow outlet works consist of a 16.0-foot-diameter conduit that is controlled by three 6.5- by 13.0-foot broome-type gates and two 60-inch steel pipes with service valves. The lake was built for flood control and water conservation. The city of Dallas obtains most of its municipal water supply from this lake. The capacity table is based on a survey made in 1965. Inflow is affected at times by discharge from the flood-detention pools of 118 floodwater-retarding structures with a combined detention capacity of 81,670 acre-ft. These structures control runoff from 298 mi<sup>2</sup> in the Elm Fork Trinity River, Clear, Little Elm, and Hickory Creeks watersheds. An unknown amount of water was diverted for municipal and industrial uses. Gage-height telemeter at station. 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.....	560.0	-
Crest of spillway.....	532.0	981,800
Top of conservation pool.....	515.0	457,600
Lowest intakes to wet wells (invert).....	481.0	42,560
Invert of three broome-type gates.....	448.0	0

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 1,181,000 acre-ft May 4, 1990 (elevation, 536.73 ft); minimum since initial filling in 1957, 184,700 acre-ft Sept. 28, 1980 (elevation, 498.65 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 651,700 acre-ft Jun. 3 (elevation, 522.36 ft); minimum daily, 568,400 acre-ft Sept. 30 (elevation, 519.45 ft).

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

519.0	556,500	522.0	641,000
520.0	583,500	523.0	670,900
521.0	611,800		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	612700	595000	597300	588200	600100	601200	591900	607200	646300	635700	598400	579600
2	611500	594400	598700	588500	599800	602400	590800	608900	649300	634200	597000	579900
3	611800	596100	597800	588200	599500	600700	591300	620800	651700	633300	595800	579900
4	611200	597000	596400	587700	600700	600400	590800	627800	651400	632100	594100	579900
5	610400	595300	595600	588200	601800	599800	590500	628000	651400	631000	593000	579900
6	609500	595000	595600	589100	602100	600100	590200	627800	651100	629200	591300	579000
7	609800	595000	595000	589100	601800	599200	589600	627500	650800	628000	589900	581000
8	613200	600400	594100	589100	601800	598700	589600	630700	650200	626600	588800	580700
9	613500	600400	593900	590500	601800	598400	589400	632100	650800	624500	587700	580100
10	611800	600400	593300	593300	601800	597000	588000	632400	649900	622500	586500	579900
11	610900	600400	592400	593900	601500	596100	589100	632100	649300	620800	585400	579300
12	610400	599800	592700	593900	600900	597300	599500	631900	648400	619900	586800	578500
13	608900	599800	592400	593600	601200	596700	604100	632100	646900	618700	587700	577700
14	608400	599500	591600	594100	601500	595800	605200	635700	646300	617000	586800	577100
15	608100	599200	591300	595300	600400	595000	605200	637700	646000	615300	585700	576300
16	606600	599500	591300	595600	598400	595600	605200	638900	646000	614100	584600	576000
17	607800	598400	591900	596100	599200	596100	608100	640700	645400	612400	584300	575200
18	607200	598100	591600	597800	600100	595800	608400	641300	645100	610700	583200	575500
19	605500	598100	590800	600900	599200	594700	608100	642200	644500	608900	582400	574100
20	605200	597300	591900	602900	598700	594400	606900	643100	643700	607200	580700	573000
21	604600	597800	592200	602900	599500	595000	606100	643400	642500	605800	580700	571900
22	603500	599200	591600	602900	601500	595000	605800	643900	642800	604400	580700	571600
23	602900	598700	589400	603200	601800	595000	605200	644200	644500	602900	579600	571100
24	602400	598100	588200	603200	602400	594400	604600	646600	643400	601800	578500	572500
25	601500	597500	587700	603200	602100	593300	603800	649600	642800	600400	577700	571600
26	600100	597300	588200	602400	601500	591900	603500	649900	641600	599200	576300	570800
27	599800	598400	588000	602100	600700	595000	603500	650200	640400	600900	575200	570000
28	599200	599000	587700	601500	600700	594400	608400	649900	638000	602100	573800	569200
29	598400	598100	590200	601800	---	594400	608100	648700	637700	601500	573000	568700
30	597300	596700	589400	600900	---	593600	607800	647200	636900	600700	576300	568400
31	596100	---	588200	600400	---	593000	---	646600	---	599800	576300	---
MAX	613500	600400	598700	603200	602400	602400	608400	650200	651700	635700	598400	581000
MIN	596100	594400	587700	587700	598400	591900	588000	607200	636900	599200	573000	568400
(↑)	520.45	520.47	520.17	520.60	520.61	520.34	520.86	522.19	521.86	520.58	519.74	519.45
(Φ)	-17700	+600	-8500	+12200	+300	-7700	+14800	+38800	-9700	-37100	-23500	-7900
CAL YR 1990	MAX	1177000	MIN	570800	(Φ)	+13300						
WTR YR 1991	MAX	651700	MIN	568400	(Φ)	-45400						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

TRINITY RIVER BASIN

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: March 1962 to July 1964, December 1969 to current year.

330419096575401 - LEWISVILLE LAKE SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, SATUR- ATION (PER- CENT)	COLI- FORM, FECAL, UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)
MAR												
05...	1154	600000	1.00	301	8.2	11.5	0.70	9.2	87	K21	K6	120
05...	1158	--	10.0	299	8.2	11.5	--	9.1	86	--	--	--
05...	1202	--	20.0	300	8.2	11.5	--	9.0	85	--	--	--
05...	1206	--	30.0	300	8.2	11.5	--	9.1	86	--	--	--
05...	1210	--	40.0	300	8.2	11.5	--	9.1	86	--	--	--
05...	1214	--	50.0	299	8.2	11.5	--	9.0	85	--	--	--
05...	1218	--	63.0	301	8.0	11.5	--	8.5	80	--	--	120
JUN												
04...	1141	651000	1.00	340	7.8	25.5	1.80	7.1	88	K1	<1	120
04...	1146	--	10.0	340	7.8	25.0	--	6.8	84	--	--	--
04...	1151	--	20.0	340	7.7	25.0	--	6.4	79	--	--	--
04...	1156	--	30.0	345	7.3	23.5	--	3.8	46	--	--	--
04...	1201	--	40.0	353	7.1	21.0	--	1.4	16	--	--	--
04...	1206	--	50.0	357	7.1	19.5	--	0	0	--	--	--
04...	1212	--	65.0	359	7.0	19.0	--	0	0	--	--	130
AUG												
29...	1146	576000	1.00	309	7.6	28.5	1.70	4.0	52	K1	K3	110
29...	1151	--	10.0	311	7.4	27.5	--	2.9	37	--	--	--
29...	1156	--	20.0	311	7.4	27.5	--	2.6	33	--	--	--
29...	1201	--	30.0	315	7.2	27.0	--	0	0	--	--	--
29...	1212	--	40.0	348	7.0	24.0	--	0	0	--	--	--
29...	1217	--	50.0	367	7.0	21.0	--	0	0	--	--	--
29...	1223	--	60.0	373	6.9	21.0	--	0	0	--	--	140

DATE	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
MAR											
05...	7	42	3.7	15	0.6	4.2	110	25	13	0.20	3.2
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	5	42	3.8	15	0.6	3.9	120	25	14	0.20	3.5
JUN											
04...	11	41	4.2	18	0.7	4.4	110	28	15	0.20	1.5
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	6	45	4.0	17	0.7	4.7	120	22	15	0.20	3.7
AUG											
29...	5	36	4.0	18	0.8	3.1	100	27	18	0.20	3.2
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	0	50	3.8	17	0.6	4.1	160	11	15	0.30	8.7

TRINITY RIVER BASIN

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08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX--Continued

330419096575401 - LEWISVILLE LAKE SITE AC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
05...	174	0.260	0.010	0.270	0.060	0.54	0.60	0.020	<0.010	9	<1
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--	--
05...	177	0.250	0.020	0.270	0.080	0.72	0.80	0.030	<0.010	23	19
JUN											
04...	178	0.200	0.010	0.210	0.020	0.58	0.60	0.010	<0.010	14	1
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	<0.010	0.400	0.010	0.59	0.60	0.020	<0.010	<10	<10
04...	--	--	<0.010	0.290	0.030	0.67	0.70	<0.010	<0.010	<10	30
04...	--	--	--	--	--	--	--	--	--	--	--
04...	186	0.400	0.020	0.420	0.050	0.55	0.60	0.050	0.020	26	300
AUG											
29...	170	--	<0.010	<0.050	0.010	0.49	0.50	0.020	<0.010	4	2
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	<0.010	<0.050	0.030	0.47	0.50	0.020	<0.010	<10	<10
29...	--	--	<0.010	<0.050	0.040	0.26	0.30	0.020	<0.010	30	60
29...	--	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--	--
29...	206	--	0.010	<0.050	1.20	0.90	2.1	0.410	0.250	950	1300

330410096584501 - LEWISVILLE LAKE SITE AL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
05...	1228	1.00	301	8.3	11.5	9.2	87
05...	1231	10.0	299	8.3	11.5	9.2	87
05...	1234	20.0	300	8.2	11.5	9.2	87
05...	1236	30.0	300	8.3	11.5	9.2	87
05...	1238	40.0	298	8.2	11.5	9.2	87
05...	1241	51.0	300	8.2	11.5	9.2	87
JUN							
04...	1227	1.00	340	7.9	25.5	7.1	88
04...	1230	10.0	338	7.8	25.0	6.7	83
04...	1233	20.0	341	7.8	25.0	6.4	79
04...	1236	30.0	347	7.3	23.0	3.2	38
04...	1239	40.0	352	7.1	21.0	1.8	21
04...	1242	53.0	359	7.1	19.5	0.6	7
AUG							
29...	1418	1.00	305	7.9	28.0	5.4	70
29...	1420	10.0	307	7.8	27.5	4.8	61
29...	1423	20.0	307	7.5	27.5	3.4	44
29...	1426	30.0	312	7.3	27.0	1.9	24
29...	1430	40.0	347	7.1	23.5	0	0
29...	1433	50.0	365	7.0	21.5	0	0

330450096560501 - LEWISVILLE LAKE SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR							
05...	1250	1.00	354	8.4	13.0	9.3	91
05...	1253	10.0	359	8.4	13.0	9.3	91
05...	1255	20.0	332	8.3	12.0	9.1	87
05...	1258	30.0	302	8.2	11.5	8.9	84
05...	1301	36.0	302	8.2	11.5	8.8	83
JUN							
04...	1252	1.00	339	7.9	26.0	7.1	89
04...	1254	10.0	339	7.9	25.5	7.1	88
04...	1257	20.0	339	7.9	25.0	7.0	86
04...	1300	30.0	350	7.5	24.0	4.8	58
04...	1303	38.0	364	7.1	21.5	0	0
AUG							
29...	1442	1.00	312	8.2	28.5	8.3	108
29...	1444	10.0	316	8.0	28.0	5.7	74
29...	1447	20.0	311	7.4	27.5	2.0	26
29...	1450	33.0	346	7.1	26.5	0	0



## TRINITY RIVER BASIN

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX--Continued

330606097025601 - LEWISVILLE LAKE SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
MAR								
05...	1720	1.00	305	8.3	13.0	--	8.8	86
05...	1723	10.0	308	8.2	13.0	--	8.7	85
05...	1726	20.0	309	8.1	12.5	--	8.2	79
05...	1729	29.0	306	8.1	12.5	--	8.1	78
JUN								
04...	1543	1.00	320	8.0	28.0	--	7.1	92
04...	1546	10.0	325	7.7	26.5	--	5.5	70
04...	1549	20.0	349	7.2	25.0	--	1.2	15
04...	1552	32.0	359	7.1	24.0	--	0	0
AUG								
29...	1640	1.00	302	8.2	29.5	0.67	6.7	89
29...	1644	10.0	304	7.9	29.0	--	5.0	66
29...	1648	20.0	314	7.2	28.5	--	0	0
29...	1652	27.0	321	7.2	28.0	--	0	0

330755096572001 - LEWISVILLE LAKE SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)
MAR											
05...	1345	1.00	305	8.4	12.5	0.70	8.5	82	--	--	--
05...	1349	10.0	301	8.3	12.5	--	8.6	83	--	--	--
05...	1352	20.0	305	8.3	12.0	--	8.4	80	--	--	--
05...	1356	30.0	307	8.3	12.0	--	8.3	79	--	--	--
05...	1400	41.0	306	8.3	12.0	--	8.0	77	--	--	--
JUN											
04...	1324	1.00	327	8.1	27.0	1.00	7.8	100	--	--	--
04...	1328	10.0	331	8.0	26.0	--	7.0	88	--	--	--
04...	1332	20.0	332	7.8	26.0	--	6.2	78	--	--	--
04...	1336	30.0	357	7.1	23.0	--	0	0	--	--	--
04...	1341	42.0	357	7.1	22.5	--	0	0	--	--	--
AUG											
29...	1523	1.00	288	8.4	29.0	--	7.1	93	95	8	32
29...	1529	10.0	291	8.1	29.0	--	6.1	80	--	--	--
29...	1535	20.0	292	8.0	28.5	--	5.5	72	--	--	--
29...	1540	30.0	305	7.2	28.0	--	0	0	--	--	--
29...	1544	39.0	328	7.1	27.5	--	0	0	110	0	39

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
MAR										
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--	--
JUN										
04...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--
AUG										
29...	3.6	19	0.8	4.1	87	27	17	0.30	3.9	159
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	--	--	--	--	--	--	--	--	--	--
29...	3.8	19	0.8	4.1	110	22	16	0.30	5.7	179

TRINITY RIVER BASIN

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08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX--Continued

330755096572001 - LEWISVILLE LAKE SITE DC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
MAR 05...	0.280	0.020	0.300	0.040	0.36	0.40	0.020	<0.010	20	<10
MAR 05...	--	--	--	--	--	--	--	--	--	--
MAR 05...	--	--	--	--	--	--	--	--	--	--
MAR 05...	0.290	0.020	0.310	0.040	0.76	0.80	0.030	<0.010	20	10
JUN 04...	0.120	0.020	0.140	<0.010	--	0.60	0.030	<0.010	<10	<10
JUN 04...	--	--	--	--	--	--	--	--	--	--
JUN 04...	0.150	0.020	0.170	0.020	0.88	0.90	0.010	<0.010	<10	20
JUN 04...	--	--	--	--	--	--	--	--	--	--
JUN 04...	0.260	0.040	0.300	0.090	0.71	0.80	0.060	0.020	<10	130
AUG 29...	--	<0.010	<0.050	0.020	0.68	0.70	0.050	<0.010	<3	26
AUG 29...	--	--	--	--	--	--	--	--	--	--
AUG 29...	--	<0.010	<0.050	0.030	0.57	0.60	0.030	<0.010	<10	140
AUG 29...	--	<0.010	<0.050	0.050	0.65	0.70	0.080	0.020	20	490
AUG 29...	--	<0.010	<0.050	0.450	1.2	1.7	0.080	<0.010	42	560

330959096565301 - LEWISVILLE LAKE SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CAC03)
MAR 05...	1443	1.00	330	8.2	13.5	0.40	8.5	84	K1	K3	130
MAR 05...	1448	10.0	333	8.2	13.5	--	8.4	83	--	--	--
MAR 05...	1454	23.0	338	8.0	13.0	--	7.6	74	--	--	140
JUN 04...	1356	1.00	333	8.0	27.5	0.50	7.1	92	K12	K5	120
JUN 04...	1358	10.0	335	7.6	26.5	--	5.5	70	--	--	--
JUN 04...	1403	20.0	336	7.6	26.5	--	5.2	66	--	--	--
JUN 04...	1409	22.0	336	7.6	26.5	--	5.3	67	--	--	120
AUG 29...	1250	1.00	290	8.2	29.5	0.73	6.7	89	K6	K11	96
AUG 29...	1254	10.0	290	7.8	28.5	--	5.1	66	--	--	--
AUG 29...	1257	24.0	297	7.3	28.5	--	1.9	25	--	--	98
DATE	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
MAR 05...	17	47	4.2	16	0.6	4.0	120	34	13	0.30	2.5
MAR 05...	--	--	--	--	--	--	--	--	--	--	--
MAR 05...	22	48	4.3	16	0.6	4.2	120	39	13	0.30	2.6
JUN 04...	16	41	4.2	17	0.7	4.6	100	31	13	0.30	2.6
JUN 04...	--	--	--	--	--	--	--	--	--	--	--
JUN 04...	--	--	--	--	--	--	--	--	--	--	--
JUN 04...	13	41	4.2	17	0.7	4.6	110	31	13	0.40	2.8
AUG 29...	5	32	3.9	19	0.8	4.2	91	28	19	0.30	3.8
AUG 29...	--	--	--	--	--	--	--	--	--	--	--
AUG 29...	1	33	3.8	18	0.8	4.3	97	26	19	0.30	4.5

TRINITY RIVER BASIN

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX--Continued

330959096565301 - LEWISVILLE LAKE SITE EC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
05...	192	0.540	0.020	0.560	0.060	0.64	0.70	0.040	<0.010	<3	3
05...	--	0.540	0.020	0.560	0.060	0.74	0.80	0.050	<0.010	20	10
05...	197	0.580	0.030	0.610	0.110	2.2	2.3	0.060	<0.010	20	28
JUN											
04...	176	0.200	0.040	0.240	0.050	1.2	1.2	0.030	<0.010	3	1
04...	--	--	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--	--	--
04...	178	0.210	0.050	0.260	0.120	0.88	1.0	0.030	<0.010	7	13
AUG											
29...	165	--	<0.010	<0.050	0.030	0.67	0.70	0.030	0.020	33	6
29...	--	--	<0.010	<0.050	0.080	0.52	0.60	0.040	<0.010	40	50
29...	167	--	0.020	<0.050	0.160	0.74	0.90	0.080	0.030	8	190

330722096592201 - LEWISVILLE LAKE SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)
MAR									
05...	1533	1.00	322	8.4	13.0	0.40	8.9	87	0.220
05...	1541	10.0	316	8.4	12.5	--	9.0	87	--
05...	1549	20.0	308	8.3	12.0	--	9.0	86	--
05...	1557	30.0	303	8.3	11.5	--	9.0	85	--
05...	1607	41.0	302	8.3	12.0	--	9.0	86	0.260
JUN									
04...	1431	1.00	343	8.0	27.0	0.80	7.7	98	0.033
04...	1435	10.0	338	7.8	26.0	--	6.5	82	--
04...	1438	20.0	335	7.8	26.0	--	6.3	79	--
04...	1442	30.0	337	7.7	25.5	--	5.5	68	0.160
04...	1445	40.0	355	7.2	22.5	--	1.1	13	--
04...	1448	46.0	353	7.2	22.5	--	1.4	16	0.300
AUG									
29...	1607	1.00	293	8.3	29.0	--	6.7	88	--
29...	1610	10.0	300	7.8	28.5	--	4.8	63	--
29...	1613	20.0	307	7.6	28.5	--	3.9	51	--
29...	1616	30.0	310	7.4	28.0	--	2.9	37	--
29...	1620	43.0	314	7.5	28.0	--	3.1	40	--

DATE	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR									
05...	0.020	0.240	0.040	0.66	0.70	0.050	<0.010	20	<10
05...	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--
05...	--	--	--	--	--	--	--	--	--
05...	0.010	0.270	0.040	0.66	0.70	0.020	<0.010	30	<10
JUN									
04...	0.020	0.053	0.020	0.48	0.50	0.050	0.010	20	<10
04...	--	--	--	--	--	--	--	--	--
04...	--	--	--	--	--	--	--	--	--
04...	0.020	0.180	0.030	0.87	0.90	0.030	<0.010	10	20
04...	--	--	--	--	--	--	--	--	--
04...	0.030	0.330	0.060	0.84	0.90	0.080	0.020	<10	70
AUG									
29...	<0.010	<0.050	0.020	0.68	0.70	0.040	<0.010	<10	<10
29...	--	--	--	--	--	--	--	--	--
29...	<0.010	<0.050	0.020	0.58	0.60	0.040	0.010	<10	<10
29...	--	--	--	--	--	--	--	--	--
29...	<0.010	<0.050	0.100	0.80	0.90	0.080	0.030	<10	30

TRINITY RIVER BASIN

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08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX--Continued

330944097003601 - LEWISVILLE LAKE SITE GC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CAC03)
MAR											
05...	1628	1.00	328	8.5	13.5	0.40	8.9	88	K1	K1	130
05...	1633	10.0	328	8.5	13.5	--	9.0	89	--	--	--
05...	1639	18.0	328	8.4	13.5	--	9.0	89	--	--	130
JUN											
04...	1500	1.00	344	7.9	28.0	0.50	6.7	87	K3	K2	120
04...	1504	10.0	345	7.8	27.0	--	6.0	77	--	--	--
04...	1507	20.0	348	7.6	26.5	--	5.0	63	--	--	120
AUG											
29...	1318	1.00	297	8.2	28.5	--	5.9	77	K1	K1	96
29...	1324	10.0	298	8.1	28.5	--	5.6	73	--	--	--
29...	1330	17.0	300	7.8	28.5	--	4.3	56	--	--	96
DATE	HARD- NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS- SOLVED (MG/L AS S04)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SI02)
MAR											
05...	6	45	4.3	17	0.6	3.9	120	27	17	0.20	1.0
05...	--	--	--	--	--	--	--	--	--	--	--
05...	7	45	4.2	18	0.7	4.0	120	28	16	0.20	1.1
JUN											
04...	1	42	4.6	19	0.7	4.7	120	23	21	0.20	3.3
04...	--	--	--	--	--	--	--	--	--	--	--
04...	8	42	4.6	18	0.7	4.7	120	21	22	0.20	3.9
AUG											
29...	1	32	4.0	20	0.9	4.5	95	25	23	0.30	4.9
29...	--	--	--	--	--	--	--	--	--	--	--
29...	0	32	4.0	21	0.9	4.5	96	24	23	0.30	5.2
DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
MAR											
05...	190	0.190	0.010	0.200	0.030	1.4	1.4	0.070	<0.010	7	<1
05...	--	--	--	--	--	--	--	--	--	--	--
05...	190	0.180	0.020	0.200	0.030	0.37	0.40	0.050	<0.010	17	2
JUN											
04...	192	0.036	0.020	0.056	0.070	0.93	1.0	0.080	0.040	3	13
04...	--	--	--	--	--	--	--	--	--	--	--
04...	186	0.025	0.040	0.065	0.100	0.80	0.90	0.140	0.060	8	56
AUG											
29...	171	--	<0.010	<0.050	0.050	0.95	1.0	0.110	0.040	<3	5
29...	--	--	<0.010	<0.050	0.050	1.0	1.1	0.100	0.040	<10	30
29...	172	0.044	0.020	0.064	0.120	0.98	1.1	0.170	0.060	7	21

## TRINITY RIVER BASIN

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX—Continued

Lewisville Lake AC (330419096575401)

Phytoplankton Analyses October 1990 to September 1991

Date	3-05-91
Time	1155

TOTAL CELLS/mL	1,246,501
NUMBER OF SPECIES	18
DEPTH COLLECTED (ft.)	1.2

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella meneghiniana</i>	261
<i>Cyclotella ocellata</i>	523
<i>Melosira granulata</i>	65
<i>Melosira italica</i>	392
<i>Stephanodiscus astraea</i>	261
<i>Stephanodiscus astraea</i> var. <i>minutula</i>	131
Order Pennales	
<i>Fragilaria vaucheriae</i>	102
<i>Tabellaria fenestrata</i>	1,532
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella ellipsoidea</i> 13,069	
<i>Chlorococcum humicola</i>	1,634
<i>Selenastrum minutum</i>	6,535
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	60,446
<i>Aphanothece nidulans</i>	1,135,411
<i>Chroococcus</i> sp.	11,436
<i>Dactylococcopsis acicularis</i>	3,267
<i>Lyngbya</i> sp.	1,634
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	6,535
<i>Rhodomonas minuta</i>	3,267



08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX—Continued

## Lewisville Lake GC (330944097003601)

## Phytoplankton Analyses October 1990 to September 1991

Date	3-05-91
Time	1629

<b>TOTAL CELLS/mL</b>	1,685,962
<b>NUMBER OF SPECIES</b>	20
<b>DEPTH COLLECTED (ft.)</b>	0.6

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella meneghiniana</i>	840
<i>Cyclotella ocellata</i>	1,972
<i>Melosira granulata</i>	469
<i>Melosira italica</i>	1,504
<i>Stephanodiscus astraea</i>	117
Order Pennales	
<i>Achnanthes minutissima</i>	258
<i>Fragilaria vaucheriae</i>	172
<i>Gomphonema parvulum</i>	430
<i>Gyrosigma</i> sp.	86
<i>Nitzschia acicularis</i>	86
<i>Nitzschia palea</i>	430
<i>Tabellaria fenestrata</i>	172
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlorella ellipsoidea</i> 11,436	
<i>Chlorococcum humicola</i>	13,069
<i>Scenedesmus bijuga</i>	3,267
<i>Selenastrum minutum</i>	4,901
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown flagellate</i>	3,267
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanothece nidulans</i>	1,638,585
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	3,267
<i>Rhodomonas minuta</i>	1,634

## TRINITY RIVER BASIN

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX—Continued

## Lewisville Lake AC (330419096575401)

Phytoplankton Analyses October 1990 to September 1991

Date	6-4-91
Time	1144

<b>TOTAL CELLS/mL</b>	<b>258,939</b>
<b>NUMBER OF SPECIES</b>	<b>16</b>
<b>DEPTH COLLECTED (ft.)</b>	<b>3</b>

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Cyclotella ocellata</i>	182
<i>Melosira varians</i>	726
<i>Stephanodiscus astrea</i> var. <i>minutula</i>	726
Order Pennales	
<i>Cocconeis pediculus</i> 817	
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlamydomonas</i> sp. 817	
<i>Chlorella ellipsoidea</i> 817	
<i>Chlorococcum humicola</i>	817
<i>Pediastrum duplex</i> var. <i>clathratum</i>	5,718
<i>Selenastrum minutum</i>	817
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown chrysophyte flagellate</i>	817
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	200,126
<i>Chroococcus</i> sp.	4,901
<i>Merismopedia tenuissima</i>	32,674
<i>Synechococcus</i> sp.	6,535
<b>PYRROPHYTA (Dinoflagellates)</b>	
<i>Ceratium hirundinella</i>	817
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Rhodomonas minuta</i>	1,634

08052800 LEWISVILLE LAKE NEAR LEWISVILLE, TX—Continued

## Lewisville Lake GC (330944097003601)

Phytoplankton Analyses October 1990 to September 1991

Date	6-4-91
Time	1502

<b>TOTAL CELLS/mL</b>	<b>645,305</b>
<b>NUMBER OF SPECIES</b>	<b>21</b>
<b>DEPTH COLLECTED (ft.)</b>	<b>0.8</b>

<u>Organisms</u>	<u>Cells/mL</u>
<b>BACILLARIOPHYTA (Diatoms)</b>	
Order Centrales	
<i>Aulacoseira distans</i>	935
<i>Aulacoseira italica</i>	4,365
<i>Cyclotella ocellata</i>	1,309
<i>Stephanodiscus astrea</i> var. <i>minutula</i>	1,559
Order Pennales	
<i>Navicula</i> sp.	1,634
<b>CHLOROPHYTA (Green algae)</b>	
<i>Chlamydomonas</i> sp. 1,634	
<i>Chlorella ellipsoidea</i> 1,634	
<i>Chlorococcum humicola</i>	11,436
<i>Oocystis lacustris</i>	4,901
<i>Pediastrum simplex</i> var. <i>duodenarium</i>	9,802
<i>Pediastrum tetras</i>	8,168
<i>Scenedesmus quadricauda</i> var. <i>longispina</i>	8,168
<i>Tetraedron muticum</i> 3,267	
<b>CHRYSOPHYTA (Golden-brown algae)</b>	
<i>Unknown chrysophyte flagellate</i>	8,168
<b>CYANOPHYTA (Blue-green algae)</b>	
<i>Aphanocapsa delicatissima</i>	365,945
<i>Aphanothece nidulans</i>	27,773
<i>Chroococcus</i> sp.	22,872
<i>Merismopedia tenuissima</i>	155,200
<b>EUGLENOPHYTA (Euglenoids)</b>	
<i>Phacus</i> sp.	3,267
<b>CRYPTOPHYTA (Cryptomonads)</b>	
<i>Cryptomonas erosa</i>	1,634
<i>Rhodomonas minuta</i>	1,634

## TRINITY RIVER BASIN

08053000 ELM FORK TRINITY RIVER NEAR LEWISVILLE, TX

LOCATION.--Lat 33°02'44", long 96°57'39", Denton County, Hydrologic Unit 12030103, on left bank at downstream edge of highway right-of-way, 90 ft to left of left end of bridge on State Highway 121, 1.8 mi east of Lewisville 1.9 mi downstream from Lewisville Lake, 8.3 mi upstream from Denton Creek, and 28.2 mi upstream from mouth.

DRAINAGE AREA.--1,673 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 432.39 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Jan. 6, 1950, nonrecording gage 0.6 mi upstream at datum 3.26 ft lower.

REMARKS.--Records good including those for periods of estimated daily discharges. Flow regulated by Lewisville Lake (station 08052800) 1.9 mi upstream since November 1954. Most of low flow is used by the city of Dallas for municipal supply (see station 08055500). Gage height telemeter at station.

AVERAGE DISCHARGE.--5 years (water years 1950-54) prior to regulation, 402 ft<sup>3</sup>/s (291,200 acre-ft/yr); 37 years (water years 1955-91) regulated, 659 ft<sup>3</sup>/s (477,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 21,700 ft<sup>3</sup>/s Sept. 15, 1950 (gage height, 30.75 ft); minimum daily, 0.8 ft<sup>3</sup>/s Jan. 19, 1955. Maximum discharge since construction of Lewisville Dam in 1954, 19,600 ft<sup>3</sup>/s (gage height, 30.15 ft) May 4, 1990.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1907, 33.8 ft in 1908, present site and datum, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,130 ft<sup>3</sup>/s June 2 at 2400 hours (gage height, 10.88 ft); minimum daily, 16 ft<sup>3</sup>/s Jan. 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	290	340	113	126	119	74	128	202	492	277	323	319
2	188	208	89	132	148	93	158	233	497	331	370	143
3	151	154	93	107	148	116	188	433	626	359	333	136
4	144	136	91	107	134	98	168	76	457	332	336	134
5	184	104	107	130	97	80	166	87	630	298	378	135
6	184	128	117	124	65	117	166	96	635	291	400	135
7	188	109	117	76	58	179	165	158	633	284	358	160
8	171	134	118	73	55	144	136	143	633	364	361	157
9	174	98	145	76	115	104	138	90	617	426	407	140
10	124	68	176	79	140	102	182	192	619	408	337	139
11	156	64	177	28	93	128	102	182	628	340	261	134
12	154	64	181	61	92	150	167	177	628	340	182	137
13	155	59	172	55	93	101	41	198	423	406	127	118
14	155	47	158	58	119	103	44	272	134	411	183	133
15	137	38	161	97	172	141	95	207	103	400	250	191
16	137	46	162	87	175	143	94	46	103	399	294	136
17	171	66	163	93	119	127	209	126	102	384	226	184
18	201	85	158	82	85	86	244	227	101	357	250	186
19	151	97	138	75	107	75	173	227	134	378	349	134
20	152	116	136	16	142	91	160	161	221	411	382	129
21	152	143	129	38	125	113	184	183	280	394	306	e132
22	151	153	109	84	143	132	211	210	309	394	288	e138
23	145	143	127	92	52	130	214	210	518	391	289	e144
24	147	113	148	84	74	152	326	217	343	369	365	e175
25	195	114	149	122	74	151	367	309	310	323	380	191
26	192	191	149	377	72	130	238	218	299	324	324	130
27	172	192	130	445	71	114	181	213	317	343	296	107
28	212	145	101	382	71	52	256	318	315	275	292	138
29	236	115	113	426	---	72	175	546	331	150	270	129
30	258	113	109	295	---	127	160	666	310	189	170	130
31	378	---	102	136	---	128	---	574	---	209	132	---
TOTAL	5605	3583	4138	4163	2958	3553	5236	7197	11748	10557	9219	4494
MEAN	181	119	133	134	106	115	175	232	392	341	297	150
MAX	378	340	181	445	175	179	367	666	635	426	407	319
MIN	124	38	89	16	52	52	41	46	101	150	127	107
AC-FT	11120	7110	8210	8260	5870	7050	10390	14280	23300	20940	18290	8910
CAL YR 1990	TOTAL	698686.2	MEAN	1914	MAX	19000	MIN	9.2	AC-FT	1386000		
WTR YR 1991	TOTAL	72451	MEAN	198	MAX	666	MIN	16	AC-FT	143700		

e Estimated

TRINITY RIVER BASIN

317

08053000 ELM FORK TRINITY RIVER NEAR LEWISVILLE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1981 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1981 to September 1990.

WATER TEMPERATURE: November 1976 to September 1990.

INSTRUMENTATION.--From November 1976 to October 1981, water temperature was continuously recorded at this station.

REMARKS.--Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,050 microsiemens Feb. 5, 8, 1989; minimum daily, 200 microsiemens May 13, 1982.

WATER TEMPERATURES (1976-89): Maximum, 33.5°C July 16, Aug. 18, 1988, Sept. 14, 15, 1989; minimum, 0.0°C Jan. 31, Feb. 9, 1979.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CaCO3)
NOV 13...	1500	60	430	7.9	18.0	7	10	9.2	98	0.6	140
MAR 05...	1905	88	388	8.5	15.0	22	19	11.9	122	0.9	130
APR 26...	1205	251	355	7.7	16.5	25	20	9.0	95	1.5	130
JUN 04...	1835	620	363	7.8	24.5	4	5.5	8.2	100	2.4	130
AUG 29...	1325	270	347	7.8	28.0	7	3.1	7.5	95	1.0	120
SEP 11...	1040	134	381	7.9	27.5	5	2.0	7.8	99	0.3	120

DATE	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNE-SIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
NOV 13...	27	48	4.7	33	1	5.0	110	44	26	0.30	5.9
MAR 05...	17	46	4.2	27	1	5.2	120	42	24	0.30	4.0
APR 26...	15	46	4.1	21	0.8	4.8	120	30	17	0.30	3.1
JUN 04...	9	44	4.0	22	0.9	4.8	120	31	15	0.20	2.0
AUG 29...	17	41	4.3	24	1	4.7	100	30	18	0.30	4.0
SEP 11...	20	41	4.4	27	1	4.9	100	39	22	0.40	4.4

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE FIXED NON FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
NOV 13...	234	14	6	8	2.57	0.030	2.60	0.080	0.82	0.90	0.990
MAR 05...	223	24	7	17	1.58	0.020	1.60	0.060	0.94	1.0	0.550
APR 26...	196	50	11	39	1.06	0.040	1.10	0.050	0.65	0.70	0.290
JUN 04...	194	11	7	4	--	<0.010	0.460	0.040	0.56	0.60	0.090
AUG 29...	189	9	9	0	--	<0.010	0.740	0.060	0.64	0.70	0.330
SEP 11...	204	17	17	0	1.19	0.010	1.20	0.050	0.65	0.70	0.440





TRINITY RIVER BASIN

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08053500 DENTON CREEK NEAR JUSTIN, TX

LOCATION.--Lat 33°07'08", long 97°17'25", Denton County, Hydrologic Unit 12030104, on right bank at downstream side of bridge on Farm Road 156, 100 ft upstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 2.2 mi north of Justin, 3.0 mi upstream from Olivers Creek, 12.9 mi upstream from Harriet Creek, and 32.9 mi upstream from Grapevine Dam.

DRAINAGE AREA.--400 mi<sup>2</sup>.

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

Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982.

REVISED RECORDS.--WSP 1732: 1950(M). WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 606.66 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. There are several small diversions above station. Flow is affected at times by discharge from the flood-detention pools of 84 floodwater-retarding structures with a combined detention capacity of 52,750 acre-ft. These structures control runoff from 197 mi<sup>2</sup> in the Denton Creek watershed. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--31 years (water years 1950-80) prior to completion of floodwater-retarding structures, 77.4 ft<sup>3</sup>/s (56,080 acre-ft/yr); 11 years (water years 1981-91) after completion of floodwater-retarding structures, 172 ft<sup>3</sup>/s (124,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 34,700 ft<sup>3</sup>/s Oct. 13, 1981 (gage height, 18.68 ft), from high-water mark; no flow at times in 1949-65, 1967-74, 1976-85, 1988-89.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1935 was the highest since 1908 and reached a stage of 20.6 ft at site about 1,500 ft upstream, from information by local resident. Flood in May 1908 reached a stage about 1.0 ft higher than flood in May 1935, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,670 ft<sup>3</sup>/s Apr. 12 at 1445 hours (gage height, 12.85 ft); minimum daily discharge, 1.8 ft<sup>3</sup>/s Aug. 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	15	40	27	42	41	37	36	32	18	11	64
2	11	16	34	35	41	41	35	35	31	17	11	91
3	11	17	33	35	41	41	35	145	33	16	10	243
4	12	24	31	32	42	39	34	356	58	15	9.4	163
5	15	37	28	e30	44	38	33	267	49	15	8.5	77
6	15	37	26	e30	47	38	32	133	72	14	7.2	44
7	15	30	25	e29	46	38	32	82	145	13	6.0	26
8	31	27	e24	e29	46	37	32	197	195	13	4.7	21
9	58	50	e24	32	46	37	32	488	2060	12	3.6	22
10	48	88	e23	49	46	35	29	218	1500	12	2.7	16
11	28	49	e23	72	45	34	28	133	480	12	1.8	12
12	23	34	e23	69	44	34	2080	96	241	11	1.9	11
13	20	28	e22	51	43	35	601	74	159	11	57	9.5
14	18	26	e22	45	43	35	338	66	112	10	24	8.8
15	15	25	25	43	41	35	242	283	85	9.7	21	8.9
16	14	24	26	43	39	35	181	216	66	9.2	17	44
17	13	23	29	40	39	34	146	119	51	8.9	16	76
18	14	23	34	39	39	34	133	81	39	8.7	14	28
19	14	23	34	99	39	34	107	62	34	8.4	12	21
20	12	23	31	163	38	34	86	55	0	8.0	11	18
21	12	24	29	93	38	34	73	52	27	7.3	10	13
22	13	26	28	66	40	34	60	49	25	6.7	9.9	11
23	14	38	e27	56	57	56	53	47	33	6.0	11	10
24	14	36	e26	51	55	50	48	49	35	4.9	14	10
25	15	29	e26	48	47	41	46	179	25	4.0	12	10
26	14	28	e25	45	42	39	46	84	21	3.2	11	11
27	14	33	e25	43	41	38	46	52	20	5.5	10	11
28	14	196	27	43	40	53	45	41	19	33	9.5	9.3
29	14	84	29	42	---	73	42	37	19	51	8.6	8.1
30	15	50	31	42	---	51	39	35	18	21	15	7.8
31	15	---	27	42	---	41	---	33	---	14	49	---
TOTAL	552	1163	857	1563	1211	1239	4771	3800	5714	398.5	409.8	1105.4
MEAN	17.8	38.8	27.6	50.4	43.2	40.0	159	123	190	12.9	13.2	36.8
MAX	58	196	40	163	57	73	2080	488	2060	51	57	243
MIN	11	15	22	27	38	34	28	33	18	3.2	1.8	7.8
AC-FT	1090	2310	1700	3100	2400	2460	9460	7540	11330	790	813	2190
CAL YR 1990	TOTAL	150697.0	MEAN	413	MAX	14700	MIN	4.2	AC-FT	298900		
WTR YR 1991	TOTAL	22783.7	MEAN	62.4	MAX	2080	MIN	1.8	AC-FT	45190		

e Estimated

TRINITY RIVER BASIN

08054500 GRAPEVINE LAKE NEAR GRAPEVINE, TX

LOCATION.--Lat 32°58'21", long 97°03'22", Tarrant County, Hydrologic Unit 12030104, in intake structure of Grapevine Dam on Denton Creek, 2.7 mi northeast of Grapevine, 4.3 mi upstream from bridge on State Highway 121, and 11.7 mi upstream from mouth.

DRAINAGE AREA.--695 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1952 to current year. Prior to October 1970, published as Grapevine Reservoir. Water-quality records.--Chemical and biochemical analyses: October 1969 to August 1986.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 16, 1953, non-recording gage at site 1,000 ft upstream at present datum.

REMARKS.--The lake is formed by a rolled earthfill dam 12,850 ft long, including a 500-foot uncontrolled off-channel concrete-gravity spillway with an ogee weir section. The dam was completed in June 1952, and deliberate impoundment began July 3, 1952. The controlled outlet works consist of a 13.0-foot-diameter concrete conduit that is controlled by two 6.5- by 13.0-foot broome-type gates and two 30-inch steel pipes with service valves. The capacity table, used since April 1972, is based on a survey made in October 1966. The lake was built for flood control, navigation, and water conservation. The city of Dallas uses part of this water for their municipal supply. An unknown amount of water is diverted for industrial and municipal uses. Inflow is affected at times by discharge from the flood-detention pools of 87 floodwater-retarding structures with a combined detention capacity of 57,850 acre-ft. These structures control runoff from 217 mi<sup>2</sup> in the Denton Creek watershed. Gage-height telemeter at station. 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.....	588.0	-
Crest of spillway.....	560.0	425,500
Top of conservation pool.....	535.0	181,100
Lowest intake to wet wells (invert).....	500.5	22,140
Invert of two broome-type gates.....	475.0	100

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 471,200 acre-ft Nov. 1, 1981 (elevation, 563.29 ft); minimum since lake first filled in 1957, 94,480 acre-ft Feb. 26, 1979 (elevation, 520.67 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 187,600 acre-ft Jun. 11-12 (elevation, 535.88 ft); minimum daily, 160,300 acre-ft Apr. 10 (elevation, 532.05 ft).

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

532.0	160,000	534.0	173,900	536.0	188,500
533.0	166,800	535.0	181,100		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170600	164400	164800	161400	163600	163400	161100	172200	182000	179300	170700	166400
2	170100	164200	164900	161500	163500	163500	161100	172400	182800	179000	170600	166500
3	170100	164300	164800	161300	163500	163100	160900	173700	183000	178700	170600	166600
4	169800	164600	164500	161200	163700	163000	160900	175000	182800	178400	170500	167100
5	169400	164300	164200	161300	163900	162900	160900	175300	182600	178100	170300	167100
6	169100	164300	164100	161500	163900	162800	160800	175300	182200	177800	169800	167000
7	169600	164100	164000	161400	163900	162700	160600	175300	182200	177500	169200	167800
8	170800	165700	163800	161300	163900	162600	160600	176300	182100	177100	168600	167600
9	170600	165700	163700	161700	163800	162400	160500	177200	183900	176800	168000	167400
10	170300	165700	163500	162400	163800	162200	160300	177700	187100	176300	168000	167300
11	170100	165700	163500	162400	163700	162100	161300	177900	187600	175900	167700	167000
12	169900	165700	163400	162500	163700	162000	165900	178100	187600	175500	168400	166700
13	169500	165600	163200	162500	163700	161900	168600	178100	187000	175200	168900	166600
14	169400	165400	163100	162600	163600	161700	169400	179200	186200	174900	169000	166400
15	169100	165300	163000	162600	163400	161500	169700	180500	185500	174500	168900	166100
16	168800	165200	162900	162600	163200	161700	170100	180900	184800	174200	168600	166000
17	168700	165000	163000	162700	163200	161700	170900	181000	183900	173800	168400	165900
18	168400	164900	163000	163100	163200	161700	171000	181300	183000	173400	168200	165900
19	168000	164800	162900	163400	163100	161600	171200	181700	182300	172900	167900	165700
20	168000	164600	163000	163700	163000	161500	171000	181900	181800	172500	167500	165400
21	167500	164600	163000	163800	163200	161600	171000	181800	181500	172200	167300	165000
22	167000	164900	162800	163800	163700	161500	171000	181800	181100	171800	167100	164900
23	166800	164800	162500	163900	163700	161500	170900	181800	181600	171400	166800	164700
24	166500	164700	162000	163900	163800	161400	170900	182300	181300	171000	166600	164800
25	166100	164600	161600	163900	163700	161400	170900	183700	181000	170700	166300	164300
26	165800	164600	161600	163800	163500	161400	170900	183900	180600	170600	165900	164100
27	165700	164800	161600	163800	163400	161500	170800	183800	180400	171300	165700	163800
28	165400	164900	161500	163700	163300	161500	172600	183700	180100	171500	165300	163500
29	165100	164900	161900	163900	---	161500	172500	183300	179900	171400	165100	163300
30	164900	164800	161700	163700	---	161400	172300	182700	179600	171200	166200	163100
31	164700	---	161500	163700	---	161300	---	182300	---	170900	166100	---
MAX	170800	165700	164900	163900	163900	163500	172600	183900	187600	179300	170700	167800
MIN	164700	164100	161500	161200	163000	161300	160300	172200	179600	170600	165100	163100
(↑)	532.69	532.70	532.22	532.54	532.49	532.19	533.78	535.16	534.79	533.58	532.90	532.46
(Φ)	-6300	+100	-3300	+2200	-400	-2000	-11000	+10000	-2700	-8700	-4800	-3000
CAL YR 1990	MAX	464300	MIN	159000	(Φ)	+1100						
WTR YR 1991	MAX	187600	MIN	160300	(Φ)	-7900						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

TRINITY RIVER BASIN

321

08055000 DENTON CREEK NEAR GRAPEVINE, TX

LOCATION.--Lat 32°59'13", long 97°00'45", Denton County, Hydrologic Unit 12030104, on left bank at downstream side of left pier of bridge on State Highway 121, 1.3 mi downstream from Bakers Branch, 4.1 mi downstream from Grapevine Dam, 5.0 mi northeast of Grapevine, and 6.1 mi upstream from mouth.

DRAINAGE AREA.--705 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1947 to June 1991 (discontinued).  
Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 439.11 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Since July 1952, flow regulated by Grapevine Lake (see preceding page), 4.1 mi upstream. Much of flow of Denton Creek is used by the city of Dallas for municipal supply (see station 0805500). The city of Grapevine diverts water from Denton Creek just downstream from Grapevine Dam, upstream from this station. There were several observations of water temperature made during the year. Station discontinued June 25, 1991.

AVERAGE DISCHARGE.--5 years (water years 1948-52) prior to regulation, 140 ft<sup>3</sup>/s (101,400 acre-ft/yr); 38 years (water years 1953-90) regulated, unadjusted, 183 ft<sup>3</sup>/s (132,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,900 ft<sup>3</sup>/s Feb. 26, 1948 (gage height, 30.38 ft), from rating curve extended above 6,000 ft<sup>3</sup>/s on basis of conveyance-slope study; no flow at times. Maximum discharge since construction of Grapevine Dam in 1952, 9,700 ft<sup>3</sup>/s Nov. 1, 1981 (gage height, 27.93 ft).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1908 was slightly higher than the flood in April 1942, which reached a stage of 35.9 ft, from floodmarks, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October 1990 to June 1991, 1,300 ft<sup>3</sup>/s June 2 at 2200 hours gage height, 13.11 ft); minimum daily, 52 ft<sup>3</sup>/s Mar. 30, Apr. 1, Apr. 5-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	96	56	68	70	69	71	52	58	130	---	---	---
2	96	56	71	70	70	71	53	75	287	---	---	---
3	98	56	67	71	70	71	54	207	290	---	---	---
4	99	62	67	72	75	72	53	89	138	---	---	---
5	97	60	67	72	77	72	52	80	168	---	---	---
6	96	60	67	79	73	72	52	69	166	---	---	---
7	123	61	67	72	69	72	52	68	169	---	---	---
8	117	103	68	72	69	71	52	98	165	---	---	---
9	149	72	67	79	69	71	54	70	164	---	---	---
10	82	60	69	89	68	71	53	69	199	---	---	---
11	67	58	69	70	69	72	58	68	243	---	---	---
12	65	59	69	69	69	72	116	68	325	---	---	---
13	66	59	69	69	69	67	76	69	424	---	---	---
14	65	60	69	69	70	57	61	99	423	---	---	---
15	64	63	70	72	70	57	56	85	424	---	---	---
16	74	63	71	69	71	58	55	73	422	---	---	---
17	87	63	70	70	72	59	93	72	423	---	---	---
18	87	64	71	80	72	58	80	79	422	---	---	---
19	87	65	70	90	71	56	68	81	344	---	---	---
20	88	65	70	69	71	56	68	85	202	---	---	---
21	89	67	70	68	72	56	66	73	135	---	---	---
22	89	74	70	68	108	56	66	70	145	---	---	---
23	89	65	70	68	73	56	65	70	236	---	---	---
24	88	64	70	68	71	56	66	76	142	---	---	---
25	88	65	69	69	71	56	66	103	---	---	---	---
26	84	67	70	69	70	56	65	74	---	---	---	---
27	74	69	70	69	71	58	65	71	---	---	---	---
28	73	66	70	69	71	55	79	105	---	---	---	---
29	66	67	75	69	---	53	63	173	---	---	---	---
30	55	67	71	70	---	52	59	205	---	---	---	---
31	56	---	71	69	---	53	---	187	---	---	---	---
TOTAL	2654	1936	2152	2229	2020	1933	1918	2869	---	---	---	---
MEAN	85.6	64.5	69.4	71.9	72.1	62.4	63.9	92.5	---	---	---	---
MAX	149	103	75	90	108	72	116	207	---	---	---	---
MIN	55	56	67	68	68	52	52	58	---	---	---	---
AC-FT	5260	3840	4270	4420	4010	3830	3800	5690	---	---	---	---
CAL YR 1990	TOTAL	233292	MEAN	639	MAX	6750	MIN	35	AC-FT	462700		
WTR YR 1991	TOTAL	---	MEAN	---	MAX	---	MIN	---	AC-FT	---		

## TRINITY RIVER BASIN

08055500 ELM FORK TRINITY RIVER NEAR CARROLLTON, TX

LOCATION.--Lat 32°57'57", long 96°56'39", Dallas County, Hydrologic Unit 12030103, near left bank at downstream side of bridge on Sandy Lake Road, 40 ft upstream from Carrollton Dam, 0.3 mi downstream from Denton Creek, 1.0 mi upstream from St. Louis Southwestern Railway Lines bridge, 2.3 mi northwest of Carrollton, and 18.2 mi upstream from mouth.

DRAINAGE AREA.--2,459 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1907 to current year. Monthly discharge only for some periods, published in WSP 1312. Prior to November 1923, published as "near Dallas".

REVISED RECORDS.--WSP 788: 1924. WSP 1148: Drainage area at former site. WSP 1632: 1908(M). WSP 1922: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 431.40 ft above National Geodetic Vertical Datum of 1929. Prior to November 1923, nonrecording gage at site 15.5 mi downstream at different datum. Nov. 1, 1923, to Nov. 13, 1934, nonrecording gage, and Nov. 14, 1934, to July 6, 1938, water-stage recorder at present site and datum. July 7, 1938, to Apr. 14, 1939, nonrecording gage at site 9.3 mi downstream at datum 22.94 ft lower. Apr. 15, 1939, to Sept. 30, 1955, water-stage recorder at site 8.5 mi downstream at datum 22.94 ft lower. Oct. 1, 1955, to Sept. 30, 1987, water-stage recorder at present site and at datum 2.00 ft higher.

REMARKS.--No estimated daily discharges. Records fair. Flow largely regulated by Lewisville Lake (station 08052800) since November 1954, and by Grapevine Lake (station 08054500) since July 1952. The city of Dallas diverts water from the pool at gage and from the river 14 mi downstream for municipal use. A water treatment plant returns water to the river below the station. In addition, Dallas Power and Light Co. diverts water from the pool at gage into North Lake for cooling water at their electric generating plant. Several observations of water temperature were made during the year. Gage-height telemeters at station

AVERAGE DISCHARGE.--47 years (water years 1908-54) prior to regulation by Lewisville and Grapevine Lakes, 818 ft<sup>3</sup>/s (592,600 acre-ft/yr); 37 years (water years 1955-91) regulated, unadjusted, 780 ft<sup>3</sup>/s (565,100 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height, about 19 ft May 25, 1908, present site and datum, from information by local resident; estimated discharge, 145,000 ft<sup>3</sup>/s, at site 8.5 mi downstream (from information by U.S. Army Corps of Engineers); maximum gage height subsequent to 1908, 16.5 ft Apr. 26, 1942, present site and datum, from observation by National Weather Service; discharge at site 8.5 mi downstream, 90,700 ft<sup>3</sup>/s; no flow at times. Flood in 1866, reached about the same stage as flood of May 25, 1908.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,620 ft<sup>3</sup>/s June 3 at 0200 hours (gage height, 6.39 ft); minimum daily discharge, 8.3 ft<sup>3</sup>/s Dec. 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	183	145	66	82	48	71	95	141	458	99	144	600
2	148	73	82	97	92	74	111	167	583	165	187	281
3	123	96	39	116	110	115	192	1460	1820	168	176	146
4	104	161	26	69	177	91	169	255	469	158	148	169
5	137	113	20	62	185	60	148	365	664	128	136	118
6	119	202	27	231	94	33	169	46	641	108	216	97
7	189	191	31	72	64	124	185	70	667	113	169	249
8	138	604	30	41	44	142	117	415	637	139	149	313
9	655	514	29	74	71	83	55	93	607	202	194	157
10	89	192	72	431	156	70	175	163	611	201	197	199
11	129	159	29	64	64	73	104	164	692	148	164	161
12	105	157	35	110	85	136	835	110	703	136	206	146
13	92	155	29	102	85	105	240	124	681	176	114	142
14	124	141	8.4	153	90	35	98	390	409	192	157	150
15	69	126	20	295	155	58	121	563	392	183	93	188
16	65	95	37	51	175	77	47	39	393	166	243	48
17	101	65	45	42	126	144	253	35	387	181	153	57
18	139	68	61	152	68	98	554	163	389	158	125	175
19	33	84	65	418	58	51	137	199	410	178	151	128
20	32	70	133	87	71	44	119	172	341	211	184	71
21	94	81	105	15	90	61	130	108	234	190	150	51
22	53	218	23	31	573	98	143	141	264	185	127	91
23	108	145	33	53	84	102	183	131	1540	180	87	37
24	62	75	66	58	110	93	169	354	379	162	125	132
25	146	34	60	51	81	108	288	854	260	133	234	234
26	80	132	100	272	58	97	211	281	254	147	190	98
27	77	235	151	402	64	348	140	171	200	198	191	52
28	137	108	74	203	54	95	287	203	128	531	150	124
29	74	53	78	237	---	30	342	489	132	49	243	45
30	58	66	46	228	---	105	89	693	167	78	440	34
31	137	---	8.3	139	---	97	---	610	---	98	146	---
TOTAL	3800	4558	1628.7	4438	3132	2918	5906	9169	15512	5161	5389	4493
MEAN	123	152	52.5	143	112	94.1	197	296	517	166	174	150
MAX	655	604	151	431	573	348	835	1460	1820	531	440	600
MIN	32	34	8.3	15	44	30	47	35	128	49	87	34
AC-FT	7540	9040	3230	8800	6210	5790	11710	18190	30770	10240	10690	8910
CAL YR 1990	TOTAL	965052.7	MEAN	2644	MAX	25300	MIN	8.3	AC-FT	1914000		
WTR YR 1991	TOTAL	66104.7	MEAN	181	MAX	1820	MIN	8.3	AC-FT	131100		



TRINITY RIVER BASIN

323

08056500 TURTLE CREEK AT DALLAS, TX

LOCATION.--Lat 32°48'26", long 96°48'08", Dallas County, Hydrologic Unit 12030105, on left bank 68 ft upstream from Hall Street Dam, 210 ft upstream from Hall Street in Dallas, and 2.0 mi north of Dallas County Courthouse.

DRAINAGE AREA.--7.98 mi<sup>2</sup>.

PERIOD OF RECORD.--Water years 1948-51 (annual maximum only), October 1951 to September 1980, April 1984 to September 1991 (discontinued). Daily discharge records for April 1948 to September 1951, published in WSP 1392, are unreliable and should not be used.

REVISED RECORDS.--See PERIOD OF RECORD.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 428.13 ft above National Geodetic Vertical Datum of 1929. Prior to Dec. 17, 1951, at site 52 ft upstream at same datum.

REMARKS.--No estimated daily discharges. Records good. Flow is slightly affected by eight small on-channel dams above the station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--36 years (water years 1952-80, 1986-91) 9.10 ft<sup>3</sup>/s (6,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,200 ft<sup>3</sup>/s Apr. 28, 1966 (gage height 10.54 ft), from rating curve extended above 2,460 ft<sup>3</sup>/s on basis of contracted-opening measurement of 12,200 ft<sup>3</sup>/s; no flow at times during most years.  
Maximum stage since at least 1903, that of Apr. 28, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	0015	*4,930	*8.26	Apr. 17	1900	1,920	5.31
Apr. 13	1030	4,500	7.95	May 24	2030	2,370	5.84

Minimum discharge, 0.56 ft<sup>3</sup>/s, July 16-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	1.1	2.5	3.6	3.1	19	3.1	3.1	3.1	1.3	1.5	19
2	1.5	1.2	30	4.5	3.1	4.7	3.4	5.2	40	.98	1.1	43
3	30	1.8	3.9	4.8	3.1	4.0	3.5	48	18	13	.92	4.8
4	2.8	55	2.5	3.1	57	4.0	3.0	18	3.6	2.8	1.0	3.6
5	1.5	2.7	2.5	7.8	24	4.0	2.9	5.9	10	1.4	1.1	3.0
6	1.6	1.8	2.8	38	7.0	4.0	6.2	3.7	3.9	1.3	.97	3.1
7	1.3	1.6	2.5	5.8	5.6	3.6	3.4	3.4	25	1.0	.92	37
8	39	182	2.6	4.8	5.3	3.6	3.2	91	3.2	1.1	.89	7.4
9	118	20	2.6	102	5.0	3.2	2.6	6.1	2.6	.93	.75	3.1
10	3.0	4.1	2.4	29	4.8	3.3	2.4	5.1	2.7	.87	1.6	2.6
11	2.1	3.1	2.4	7.5	4.9	3.5	151	4.4	2.4	.84	.96	2.4
12	2.0	3.0	2.1	5.3	4.8	3.1	218	4.0	2.3	.87	65	1.9
13	1.7	2.3	2.0	4.6	4.0	2.9	413	3.8	1.9	.80	37	1.7
14	1.5	2.3	1.9	31	3.3	2.7	18	71	2.0	.73	16	1.9
15	1.7	2.3	2.1	18	3.3	6.8	9.3	13	2.1	.83	3.7	5.1
16	1.3	2.2	2.9	5.4	3.6	3.5	6.6	4.9	86	.71	2.7	3.5
17	1.5	1.4	3.7	8.8	4.2	6.3	117	4.1	3.9	.73	2.0	3.3
18	.92	2.5	9.8	45	4.1	2.7	65	17	2.5	.81	1.9	80
19	1.1	2.1	2.4	29	3.1	3.0	14	12	2.2	.82	1.6	41
20	1.3	2.1	1.9	7.4	3.0	3.2	7.5	5.5	2.2	.83	1.1	4.1
21	5.2	48	3.8	5.7	16	3.3	5.8	4.5	1.7	.81	1.9	2.9
22	2.3	71	2.1	5.5	140	58	5.7	6.8	1.6	.81	20	2.6
23	1.4	4.7	1.9	5.0	8.8	4.3	5.0	4.2	37	.81	2.8	2.1
24	1.4	3.4	2.3	5.0	6.4	3.8	5.4	168	2.3	.82	2.1	19
25	.89	2.9	3.4	4.0	6.1	3.5	5.8	39	1.5	.72	1.7	3.3
26	1.3	8.4	20	3.5	5.6	3.6	4.4	6.3	1.7	6.5	8.8	2.2
27	1.6	16	4.8	3.7	5.4	40	4.4	4.7	1.6	61	2.7	1.9
28	1.1	3.1	3.6	4.0	5.2	4.1	24	4.2	1.5	32	1.3	1.8
29	1.4	2.3	17	3.9	---	4.5	4.7	4.2	1.4	7.7	38	1.7
30	1.5	2.4	3.5	5.5	---	3.5	3.5	4.1	1.3	2.3	105	1.6
31	1.1	---	3.3	3.3	---	3.0	---	3.4	---	1.6	13	---
TOTAL	234.31	456.8	151.2	414.5	349.8	222.7	1121.8	578.6	271.2	147.72	340.01	310.6
MEAN	7.56	15.2	4.88	13.4	12.5	7.18	37.4	18.7	9.04	4.77	11.0	10.4
MAX	118	182	30	102	140	58	413	168	86	61	105	80
MIN	.89	1.1	1.9	3.1	3.0	2.7	2.4	3.1	1.3	.71	.75	1.6
AC-FT	465	906	300	822	694	442	2230	1150	538	293	674	616

CAL YR 1990	TOTAL	5976.33	MEAN	16.4	MAX	528	MIN	.89	AC-FT	11850
WTR YR 1991	TOTAL	4599.24	MEAN	12.6	MAX	413	MIN	.71	AC-FT	9120

## TRINITY RIVER MAIN STEM

08057000 TRINITY RIVER AT DALLAS, TX

LOCATION.--Lat 32°46'29", long 96°49'18", Dallas County, Hydrologic Unit 12030105, on right bank (levee) 90 ft downstream from Commerce Street viaduct in Dallas, 5.2 mi downstream from confluence of West and Elm Forks, and at mile 500.3.

DRAINAGE AREA.--6,106 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1898 to December 1899 (gage heights only published in WSP 28 and 37), July 1903 to current year.

REVISED RECORDS.--WSP 850: 1903-6 (monthly and annual means). WSP 1732: 1937(M). WSP 1922: Drainage area. WDR TX-73-1: 1972.

GAGE.--Water-stage recorder. Datum of gage is 368.02 ft above National Geodetic Vertical Datum of 1929. Oct. 1, 1898, to Dec. 31, 1899, nonrecording gage at site 2 mi upstream at different datum. July 1, 1903, to July 20, 1930, non-recording gage at present site and datum. July 21, 1930, to Sept. 30, 1932, nonrecording gage at site 6 mi downstream at datum 3.08 ft lower.

REMARKS.--Records good, except those for estimated daily discharges, which are fair. At times, flow is affected by storage in seven upstream reservoirs, combined capacity 1,703,000 acre-ft, of which 846,200 acre-ft is for flood control. The city of Dallas diverts water for municipal use from Elm Fork, Lake Ray Hubbard (on the East Fork), and Lake Tawakoni (on the Sabine River), and purchases water from North Texas Municipal Water District (from the East Fork). Sewage effluent is returned to the river downstream from this station. The Trinity River Authority discharges sewage effluent into the river upstream from this station. For additional information on diversions and effluent returns for this station, see stations 08048000, 08049200, and 08049500. Several observations of water temperature were made during the year. Gage-height telemeters at station.

AVERAGE DISCHARGE.--88 years, 1,590 ft<sup>3</sup>/s (1,152,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 184,000 ft<sup>3</sup>/s May 25, 1908 (gage height, 52.6 ft), from rating curve extended above 109,000 ft<sup>3</sup>/s; minimum observed for periods 1903-6, 1920-75, 1.2 ft<sup>3</sup>/s July 4, 1953, result of storage behind temporary dam 4 mi upstream.  
Maximum stage since at least 1840, that of May 25, 1908.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in 1866 reached about the same stage as that of May 25, 1908.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 11,700 ft<sup>3</sup>/s May 25 at 1945 hours (gage height, 32.82 ft); minimum daily, 313 ft<sup>3</sup>/s Oct. 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	338	330	387	469	553	540	386	668	1210	384	404	4610
2	333	346	527	446	471	494	392	546	1590	376	378	3780
3	663	332	728	434	446	460	387	2920	5330	507	359	1730
4	520	1250	557	420	1000	447	383	3400	3080	1040	351	894
5	363	1450	465	451	3410	446	409	1740	1550	549	343	1260
6	334	576	422	1050	1530	431	385	1050	1970	385	343	720
7	325	453	417	1300	743	411	401	653	1560	369	339	925
8	398	2410	391	654	561	397	421	2330	1720	354	336	3430
9	4650	6180	389	770	529	381	396	2940	1690	360	333	1180
10	2990	2390	401	4570	495	383	375	978	1510	369	340	661
11	627	737	410	2550	507	394	439	877	1470	369	369	579
12	463	522	399	754	469	395	7290	795	1470	327	1630	523
13	411	475	391	562	458	379	8790	745	1550	328	6270	486
14	397	444	374	628	461	374	7580	1020	1370	325	6410	528
15	385	422	366	961	429	390	2920	5550	1000	325	3210	734
16	363	401	381	793	420	419	1250	3220	1530	361	899	707
17	356	374	429	564	452	473	1140	866	1550	354	642	1130
18	354	373	538	1040	443	522	4270	787	838	345	521	1020
19	357	376	484	2670	415	443	3420	1370	759	335	479	3270
20	336	386	414	2250	395	415	2180	907	729	337	461	1980
21	352	498	394	805	402	403	2010	882	654	347	453	752
22	361	1450	405	619	4420	598	1980	738	513	337	563	571
23	347	1440	402	567	3390	421	1880	692	3310	334	518	522
24	339	693	394	542	881	381	899	1070	2590	334	433	556
25	331	477	408	513	609	395	1910	9200	913	332	421	687
26	313	463	455	494	501	397	1900	7620	584	405	443	573
27	323	645	704	629	475	1880	776	3260	511	809	432	461
28	318	752	558	558	463	1250	1050	e2770	426	2520	405	425
29	322	472	681	491	---	531	4090	2560	398	2190	601	424
30	324	414	803	523	---	433	1290	2580	384	640	3150	399
31	324	---	545	627	---	382	---	2140	---	452	2580	---
TOTAL	18617	27531	14619	29704	25328	15665	60999	66874	43759	16799	34416	35517
MEAN	601	918	472	958	905	505	2033	2157	1459	542	1110	1184
MAX	4650	6180	803	4570	4420	1880	8790	9200	5330	2520	6410	4610
MIN	313	330	366	420	395	374	375	546	384	325	333	399
AC-FT	36930	54610	29000	58920	50240	31070	121000	132600	86800	33320	68260	70450

CAL YR 1990 TOTAL 1970163 MEAN 5398 MAX 72100 MIN 311 AC-FT 3908000  
WTR YR 1991 TOTAL 389828 MEAN 1068 MAX 9200 MIN 313 AC-FT 773200

e Estimated

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX

LOCATION.--Lat 32°45'04", Long 96°47'07", Dallas County, Hydrologic Unit 12030105, on right bank at abandoned bridge abutment, 0.2 mi upstream from Cedar Crest Blvd. bridge, 1.8 mi southeast of Dallas City Hall, 2.1 mi downstream from Coombs Creek, and 2.7 mi downstream from Commerce Street Bridge (station 08057000).

PERIOD OF RECORD.--Chemical and biochemical analyses: February 1984 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: February 1984 to current year.

pH: February 1984 to current year.

WATER TEMPERATURES: February 1984 to current year.

DISSOLVED OXYGEN: February 1984 to current year.

INSTRUMENTATION.--Since February 1984, a four-parameter water-quality monitor records temperature, DO, pH, and specific conductance continuously at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request. Records of discharge are given for gaging station 08057000. No appreciable inflow between the two stations.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,030 microsiemens Feb. 12, 1988; minimum, 93 microsiemens Oct. 20, 1984.

pH: Maximum, 8.6 units Oct. 20, 1984; minimum, 6.8 units Sept. 6, 1988.

WATER TEMPERATURE: Maximum, 33.5°C Aug. 12, 1987; minimum, 5.0°C Feb. 7, 8, 1989.

DISSOLVED OXYGEN: Maximum, 13.7 mg/L Feb. 8, 1989; minimum, 0.0 mg/L July 21, 1985.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 922 microsiemens Mar. 16; minimum, 188 microsiemens Aug. 13.

pH: Maximum, 8.3 units Nov. 8, Sept. 1; minimum, 6.9 units July 28.

WATER TEMPERATURE: Maximum, 32.0°C Aug. 4-8; minimum, 6.5°C Jan. 9-11.

DISSOLVED OXYGEN: Maximum, 12.1 mg/L Jan. 9; minimum, 3.0 mg/L Apr. 7.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
NOV 07...	1210	437	571	7.6	17.5	8.5	89	2.2	150	40
JAN 28...	1400	558	761	7.8	12.5	9.9	95	1.9	210	69
MAR 27...	1330	1880	608	8.0	19.0	7.8	86	4.2	190	68
JUN 03...	1515	5330	402	7.7	24.5	6.7	82	3.3	150	43
JUL 17...	1425	354	790	8.0	33.5	7.2	103	1.8	170	43
SEP 11...	1230	579	629	7.8	28.5	7.2	93	1.2	160	31

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
NOV 07...	51	5.6	55	2	7.9	110	60	50	0.50	7.0
JAN 28...	72	7.1	67	2	9.1	140	90	61	0.60	7.6
MAR 27...	65	6.2	48	2	7.1	120	110	34	0.60	4.3
JUN 03...	52	4.9	25	0.9	4.8	110	65	20	0.30	5.2
JUL 17...	56	7.0	95	3	11	130	86	92	1.2	9.2
SEP 11...	55	5.9	66	2	7.2	130	78	51	0.80	9.2

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 07...	303	6.07	0.030	6.10	0.070	1.1	1.2	1.80	1.70
JAN 28...	398	6.68	0.120	6.80	0.100	0.90	1.0	1.90	1.80
MAR 27...	347	2.56	0.040	2.60	0.100	1.1	1.2	0.780	0.620
JUN 03...	241	0.850	0.110	0.960	0.100	0.90	1.0	0.310	0.250
JUL 17...	433	11.0	0.050	11.0	0.080	0.92	1.0	3.60	3.10
SEP 11...	352	6.46	0.040	6.50	0.050	1.2	1.2	1.90	1.80

## TRINITY RIVER MAIN STEM

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG (MG/L)
OCT. 1990	18617	564	320	16100	49	2440	68	3400	150
NOV. 1990	27531	486	279	20700	38	2800	58	4320	140
DEC. 1990	14619	702	394	15600	64	2530	84	3320	170
JAN. 1991	29704	600	341	27300	51	4060	72	5770	160
FEB. 1991	25328	621	351	24000	54	3700	74	5090	160
MAR. 1991	15665	785	436	18400	77	3280	94	3990	170
APR. 1991	60999	512	292	48100	42	6840	61	10100	150
MAY 1991	66874	457	265	47800	33	6030	55	9880	140
JUNE 1991	43759	496	286	33800	37	4420	59	7010	150
JULY 1991	16799	634	358	16200	57	2560	76	3450	160
AUG. 1991	34416	442	254	23600	34	3160	53	4920	130
SEPT 1991	35517	462	267	25600	35	3320	55	5300	140
TOTAL	389828	**	**	317000	**	45200	**	66500	**
WTD.AVG.	1068	528	301	**	43	**	63	**	150

## SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	822	776	800	793	780	789	741	703	726	677	670	674
2	787	752	775	778	740	762	745	498	654	683	673	679
3	814	464	737	784	766	777	661	590	622	724	671	690
4	622	483	552	781	417	586	670	612	649	726	715	721
5	815	630	714	597	415	508	674	638	664	743	711	722
6	806	774	798	524	468	498	712	638	679	742	556	643
7	814	792	803	579	514	557	717	687	704	601	542	571
8	809	324	756	595	231	423	740	716	729	681	604	645
9	443	266	342	336	239	293	754	733	744	687	325	623
10	377	282	322	389	288	335	756	727	747	517	402	467
11	518	386	463	497	397	463	728	710	719	540	443	484
12	631	521	580	584	498	552	742	731	737	626	542	592
13	706	634	678	649	582	619	751	732	739	708	628	676
14	743	689	718	659	614	642	764	751	757	739	336	666
15	751	708	730	685	640	667	791	763	777	689	551	616
16	767	720	737	733	682	708	796	771	788	703	586	641
17	781	745	761	741	716	730	771	748	757	742	705	729
18	773	737	750	759	738	749	753	699	719	716	550	635
19	---	---	e752	766	747	756	737	699	720	555	495	520
20	---	---	e755	771	743	758	782	727	762	573	494	512
21	---	---	e749	766	465	700	777	764	772	---	---	e603
22	---	---	e744	524	212	409	773	751	763	---	---	e660
23	778	741	759	625	432	524	766	742	751	---	---	e725
24	779	767	772	544	501	522	772	727	749	---	---	e760
25	777	762	767	610	505	569	743	705	719	---	---	e784
26	776	760	768	681	611	647	754	597	693	812	774	792
27	787	753	775	670	525	619	666	605	632	788	673	745
28	812	772	788	581	542	557	673	610	645	770	678	732
29	828	790	813	683	588	641	687	634	664	799	743	779
30	807	789	798	721	692	712	645	585	623	781	738	761
31	809	792	801	---	---	---	669	643	658	759	714	739
MONTH	828	266	712	793	212	602	796	498	712	812	325	664

e Estimated

TRINITY RIVER MAIN STEM

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	780	743	764	826	712	791	802	765	786	---	---	e633
2	778	760	771	810	793	803	822	797	809	713	656	693
3	803	754	780	833	811	822	821	805	815	715	398	533
4	753	523	667	840	818	830	836	817	826	476	417	445
5	580	438	505	827	795	817	837	807	822	518	445	468
6	579	457	522	835	801	821	871	827	855	550	527	536
7	683	584	633	881	822	852	865	852	859	641	533	600
8	745	686	718	881	864	871	863	832	851	658	348	484
9	786	747	772	875	859	866	849	818	834	492	356	397
10	819	775	801	875	852	862	---	---	e825	544	428	500
11	792	762	778	864	846	857	---	---	e820	649	553	610
12	822	750	804	856	837	849	---	---	e820	662	610	642
13	828	797	817	852	825	839	---	---	e270	669	609	646
14	859	814	834	847	823	832	---	---	e330	663	409	597
15	848	830	840	870	850	858	---	---	e400	527	322	397
16	848	828	838	922	872	904	---	---	e510	488	370	426
17	832	794	810	913	855	882	---	---	e600	600	494	559
18	818	793	807	848	815	836	---	---	e440	703	603	667
19	831	798	816	840	815	828	---	---	e420	695	470	558
20	835	813	824	823	809	817	---	---	e485	632	580	605
21	838	679	819	856	817	839	---	---	e540	659	577	627
22	638	335	464	854	525	725	---	---	e560	653	626	642
23	522	482	497	857	762	812	---	---	e570	692	640	673
24	610	525	577	865	838	853	---	---	e660	744	228	656
25	707	613	668	864	855	860	---	---	e625	398	285	335
26	780	709	747	858	844	852	---	---	e600	380	313	341
27	797	757	782	849	527	668	---	---	e620	450	383	409
28	825	774	802	630	564	597	---	---	e635	504	460	478
29	---	---	---	701	636	677	---	---	e450	496	480	486
30	---	---	---	709	693	700	---	---	e540	499	489	494
31	---	---	---	787	713	758	---	---	---	549	495	508
MONTH	859	335	731	922	525	812	871	765	639	744	228	537
e Estimated												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	589	551	571	811	791	803	711	665	687	407	255	320
2	625	427	569	801	779	788	783	694	743	360	261	312
3	577	390	432	784	402	704	785	748	767	458	368	400
4	446	379	400	734	534	660	794	745	770	546	431	461
5	518	384	475	526	475	489	786	743	765	601	457	505
6	525	481	504	630	503	576	791	753	771	---	---	e530
7	580	474	511	713	621	672	787	758	771	---	---	e550
8	543	437	484	751	681	716	780	749	763	---	---	e460
9	495	451	474	776	725	751	787	776	781	---	---	e415
10	516	468	485	793	743	769	788	771	778	---	---	e480
11	523	501	514	782	727	750	788	715	752	---	---	e560
12	537	512	525	833	785	807	774	341	586	---	---	e630
13	533	506	519	847	771	823	297	188	250	---	---	e720
14	548	512	533	847	770	831	329	217	274	---	---	e740
15	563	539	554	836	763	818	384	268	324	---	---	e640
16	601	223	508	805	733	789	516	392	472	---	---	e570
17	528	418	485	797	765	786	625	522	576	---	---	e530
18	569	487	539	801	747	771	691	627	666	---	---	e590
19	626	562	588	823	797	809	711	685	701	---	---	e350
20	665	606	636	819	746	801	721	700	708	---	---	e325
21	678	643	656	814	774	793	737	711	722	---	---	e450
22	717	643	679	815	795	802	740	398	651	---	---	e580
23	541	331	418	805	768	792	716	615	664	---	---	e680
24	437	359	380	811	791	802	755	719	735	---	---	e700
25	521	410	470	799	761	783	752	721	735	---	---	e600
26	606	524	570	802	629	755	735	703	721	---	---	e680
27	675	611	651	817	365	734	736	705	721	---	---	e730
28	777	681	732	612	357	447	766	706	736	807	761	e783
29	796	764	780	412	337	368	754	489	663	---	---	e735
30	804	776	790	526	417	483	551	226	376	---	---	e738
31	---	---	---	664	522	583	433	282	375	---	---	---
MONTH	804	223	548	847	337	718	794	188	645	807	255	559
e Estimated												



## TRINITY RIVER MAIN STEM

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	7.9	7.9	7.9	---	---	---	8.0	7.9	8.0
2	---	---	---	7.9	7.9	7.9	---	---	---	7.9	7.8	7.9
3	---	---	---	8.0	7.9	7.9	---	---	---	7.8	7.8	7.8
4	---	---	---	8.0	7.9	7.9	---	---	---	7.8	7.6	7.7
5	---	---	---	7.9	7.8	7.9	---	---	---	7.7	7.6	7.6
6	7.5	7.2	7.3	7.9	7.8	7.9	---	---	---	7.9	7.7	7.8
7	7.5	7.3	7.5	8.2	7.6	8.0	---	---	---	7.9	7.7	7.8
8	7.5	7.3	7.4	8.3	8.1	8.2	8.0	7.9	8.0	7.7	7.6	7.7
9	7.7	7.4	7.6	8.2	8.0	8.1	8.0	7.9	7.9	8.0	7.6	7.8
10	7.6	7.4	7.5	8.0	7.9	8.0	7.9	7.9	7.9	8.0	7.8	7.9
11	7.5	7.4	7.4	8.0	7.9	7.9	8.0	7.9	7.9	8.0	7.8	7.8
12	7.5	7.4	7.5	8.0	7.9	8.0	7.9	7.9	7.9	7.8	7.6	7.7
13	7.5	7.5	7.5	7.9	7.9	7.9	7.9	7.9	7.9	7.7	7.6	7.6
14	7.5	7.4	7.5	8.0	7.9	7.9	7.9	7.9	7.9	7.8	7.6	7.6
15	7.6	7.5	7.6	8.0	7.9	7.9	7.9	7.8	7.8	7.7	7.6	7.6
16	7.8	7.6	7.7	8.0	7.8	7.9	7.8	7.7	7.8	7.7	7.6	7.6
17	7.7	7.7	7.7	7.9	7.8	7.9	7.8	7.7	7.8	7.7	7.6	7.6
18	7.7	7.6	7.7	7.9	7.8	7.8	8.1	7.7	7.9	7.7	7.6	7.7
19	---	---	---	7.8	7.8	7.8	8.1	8.1	8.1	7.7	7.6	7.7
20	---	---	---	7.8	7.5	7.7	8.1	8.0	8.1	7.9	7.6	7.7
21	---	---	---	7.6	7.4	7.5	8.2	8.1	8.1	7.7	7.6	7.6
22	---	---	---	7.6	7.4	7.4	8.1	8.1	8.1	---	---	---
23	7.9	7.9	7.9	8.0	7.3	7.5	8.2	8.1	8.1	---	---	---
24	7.9	7.9	7.9	8.0	7.6	7.8	8.1	8.0	8.1	---	---	---
25	7.9	7.8	7.9	---	---	---	8.1	8.0	8.0	---	---	---
26	7.9	7.8	7.9	---	---	---	8.2	8.0	8.1	8.0	7.9	8.0
27	7.9	7.9	7.9	---	---	---	8.2	8.1	8.2	7.9	7.8	7.9
28	7.9	7.9	7.9	---	---	---	8.2	8.0	8.1	7.9	7.8	7.9
29	8.0	7.9	7.9	---	---	---	8.1	8.0	8.0	7.9	7.8	7.9
30	8.0	7.9	7.9	---	---	---	8.1	8.0	8.0	8.0	7.9	8.0
31	8.0	7.9	7.9	---	---	---	8.0	7.9	8.0	8.0	7.9	8.0
MONTH	8.0	7.2	7.7	8.3	7.3	7.9	8.2	7.7	8.0	8.0	7.6	7.8
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	8.0	7.9	7.9	8.1	7.6	7.8	7.9	7.8	7.8	---	---	---
2	7.9	7.9	7.9	8.0	7.8	7.9	7.9	7.8	7.9	7.8	7.7	7.7
3	7.9	7.8	7.8	8.0	7.9	8.0	8.0	7.9	7.9	8.1	7.7	7.9
4	7.8	7.7	7.8	8.0	7.8	7.9	7.9	7.8	7.9	8.1	7.7	7.9
5	7.9	7.8	7.9	7.9	7.8	7.9	7.9	7.8	7.8	7.9	7.7	7.8
6	7.9	7.8	7.9	7.9	7.7	7.8	7.9	7.6	7.8	7.9	7.8	7.9
7	7.8	7.7	7.8	7.8	7.7	7.7	7.9	7.5	7.8	8.0	7.9	7.9
8	7.8	7.7	7.7	7.8	7.6	7.7	8.0	7.9	8.0	8.0	7.8	7.9
9	7.7	7.6	7.7	7.9	7.7	7.8	8.0	7.9	8.0	7.8	7.8	7.8
10	7.7	7.6	7.7	7.9	7.8	7.9	---	---	---	7.8	7.8	7.8
11	7.9	7.7	7.8	7.8	7.7	7.8	---	---	---	7.8	7.8	7.8
12	7.9	7.8	7.9	7.8	7.7	7.8	---	---	---	7.8	7.8	7.8
13	7.9	7.8	7.9	7.8	7.7	7.8	---	---	---	7.9	7.7	7.8
14	7.9	7.7	7.8	7.8	7.7	7.7	---	---	---	8.0	7.7	7.9
15	7.8	7.7	7.7	7.8	7.7	7.7	---	---	---	7.9	7.6	7.7
16	7.8	7.6	7.7	7.7	7.6	7.7	---	---	---	7.8	7.6	7.7
17	7.7	7.5	7.6	7.8	7.6	7.7	---	---	---	7.8	7.7	7.7
18	7.5	7.4	7.5	7.8	7.8	7.8	---	---	---	7.9	7.7	7.8
19	7.4	7.3	7.4	7.8	7.8	7.8	---	---	---	7.9	7.7	7.8
20	7.4	7.2	7.3	8.0	7.8	7.8	---	---	---	7.8	7.6	7.7
21	7.3	7.1	7.2	8.0	7.9	7.9	---	---	---	7.8	7.7	7.8
22	8.1	7.1	7.6	7.9	7.7	7.8	---	---	---	7.7	7.7	7.7
23	8.1	7.7	7.9	7.8	7.6	7.7	---	---	---	7.7	7.7	7.7
24	7.7	7.6	7.6	7.7	7.5	7.6	---	---	---	7.7	7.4	7.7
25	7.7	7.6	7.7	7.7	7.5	7.6	---	---	---	7.8	7.6	7.7
26	7.6	7.6	7.6	7.7	7.6	7.7	---	---	---	7.6	7.5	7.6
27	7.6	7.5	7.6	8.0	7.5	7.8	---	---	---	7.7	7.4	7.6
28	7.6	7.6	7.6	7.7	7.5	7.6	---	---	---	7.8	7.7	7.8
29	---	---	---	7.8	7.7	7.8	---	---	---	8.0	7.8	7.9
30	---	---	---	7.8	7.7	7.7	---	---	---	8.0	7.8	7.9
31	---	---	---	7.8	7.7	7.7	---	---	---	8.0	7.8	8.0
MONTH	8.1	7.1	7.7	8.1	7.5	7.8	8.0	7.5	7.9	8.1	7.4	7.8

TRINITY RIVER MAIN STEM

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08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	7.7	7.0	7.5	7.7	7.6	7.7	8.3	7.4	7.8
2	---	---	---	7.7	7.7	7.7	7.8	7.7	7.8	8.2	7.7	7.9
3	---	---	---	7.9	7.0	7.7	7.8	7.7	7.8	7.8	7.6	7.7
4	7.7	7.6	7.7	7.7	7.6	7.7	7.8	7.7	7.8	7.7	7.5	7.6
5	---	---	---	---	---	---	7.8	7.7	7.8	7.7	7.6	7.6
6	---	---	---	---	---	---	7.9	7.8	7.8	8.0	7.6	7.9
7	---	---	---	---	---	---	7.9	7.8	7.9	7.9	7.7	7.8
8	---	---	---	---	---	---	7.9	7.8	7.8	---	---	---
9	---	---	---	---	---	---	7.8	7.7	7.8	---	---	---
10	8.0	7.8	7.9	---	---	---	7.7	7.3	7.6	---	---	---
11	8.1	8.0	8.0	---	---	---	7.3	7.1	7.2	---	---	---
12	8.2	8.0	8.1	---	---	---	7.4	7.0	7.2	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	8.0	8.0	8.0
15	---	---	---	---	---	---	7.4	7.2	7.4	8.0	7.9	7.9
16	---	---	---	---	---	---	7.3	7.2	7.3	7.9	7.7	7.8
17	7.3	7.2	7.3	---	---	---	7.3	7.2	7.3	7.8	7.6	7.8
18	7.9	7.3	7.4	7.9	7.6	7.8	7.5	7.3	7.4	---	---	---
19	7.5	7.3	7.4	7.6	7.1	7.4	7.5	7.4	7.5	---	---	---
20	7.7	7.3	7.4	---	---	---	7.5	7.4	7.5	---	---	---
21	7.6	7.3	7.4	---	---	---	7.5	7.5	7.5	---	---	---
22	7.4	7.3	7.4	---	---	---	7.5	7.2	7.4	---	---	---
23	---	---	---	---	---	---	7.5	7.4	7.4	---	---	---
24	---	---	---	---	---	---	7.5	7.4	7.5	---	---	---
25	---	---	---	---	---	---	7.5	7.5	7.5	---	---	---
26	---	---	---	7.8	7.6	7.7	7.6	7.5	7.5	---	---	---
27	7.3	7.1	7.2	7.7	7.4	7.6	7.7	7.5	7.6	---	---	---
28	7.4	7.1	7.2	7.5	6.9	7.2	7.6	7.6	7.6	7.8	7.7	7.8
29	7.4	7.2	7.3	7.5	7.3	7.4	7.6	7.3	7.5	---	---	---
30	7.4	7.1	7.3	7.6	7.4	7.5	7.9	7.3	7.6	---	---	---
31	---	---	---	7.6	7.6	7.6	7.7	7.4	7.6	---	---	---
MONTH	8.2	7.1	7.5	7.9	6.9	7.6	7.9	7.0	7.6	8.3	7.4	7.8

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	28.0	25.5	27.0	---	---	---	17.5	14.5	16.0	11.0	9.5	10.0
2	27.5	25.5	26.5	---	---	---	16.5	14.5	16.0	12.5	10.5	11.5
3	27.0	25.0	26.0	---	---	---	15.0	13.0	14.5	11.5	10.5	11.0
4	27.0	25.0	26.0	---	---	---	14.5	13.0	14.0	12.0	10.5	11.0
5	28.0	25.0	26.5	---	---	---	14.5	13.0	13.5	12.5	11.0	12.0
6	28.5	25.5	27.0	---	---	---	14.5	12.5	13.5	12.0	8.5	10.5
7	28.5	26.5	27.5	---	---	---	14.5	12.5	13.5	9.5	8.0	8.5
8	28.0	22.0	27.0	17.5	12.5	15.0	15.0	12.5	13.5	11.0	8.5	9.5
9	23.0	19.0	21.0	13.5	12.5	13.0	15.5	13.0	14.0	11.5	6.5	10.5
10	19.5	18.5	19.0	14.0	13.0	13.5	16.0	13.0	14.5	9.5	6.5	7.5
11	21.0	18.5	19.5	16.5	14.5	15.5	16.5	14.0	15.0	8.5	6.5	7.5
12	21.5	19.5	20.5	18.5	16.0	17.0	18.0	15.5	16.5	10.5	8.5	9.5
13	23.0	20.5	21.5	19.5	17.5	18.5	17.0	15.0	16.5	12.0	9.5	11.0
14	24.5	21.0	22.5	20.0	18.0	19.0	16.5	15.5	16.0	13.0	11.0	12.0
15	25.0	22.5	23.5	20.5	18.5	19.5	17.0	16.0	16.5	12.5	11.0	12.0
16	25.5	23.0	24.0	21.0	19.0	20.0	16.5	15.0	16.0	12.5	10.5	11.5
17	24.5	23.0	24.0	21.0	19.5	20.0	17.0	15.0	16.0	14.0	12.5	13.0
18	23.0	21.0	22.0	21.0	19.0	20.0	17.0	16.0	16.5	13.0	11.5	12.5
19	---	---	---	22.0	19.5	21.0	16.5	15.5	16.0	11.5	11.0	11.0
20	---	---	---	22.0	20.5	21.5	18.0	15.5	17.0	11.0	9.5	10.0
21	---	---	---	22.0	20.5	21.5	17.5	12.0	15.0	---	---	---
22	---	---	---	21.0	18.0	19.5	12.0	9.5	10.5	---	---	---
23	---	---	---	19.5	18.0	18.5	10.0	8.0	9.0	---	---	---
24	---	---	---	19.0	17.5	18.0	11.5	8.0	10.0	---	---	---
25	---	---	---	20.0	17.5	19.0	12.0	9.5	10.5	---	---	---
26	---	---	---	21.0	20.0	20.5	11.5	9.5	10.5	---	---	---
27	---	---	---	21.5	19.5	21.0	10.5	9.0	10.0	13.0	11.5	12.0
28	---	---	---	19.5	17.0	18.0	11.5	9.5	10.5	13.0	11.5	12.0
29	---	---	---	17.5	16.0	16.5	14.0	11.5	13.0	15.5	12.5	14.0
30	---	---	---	16.5	15.5	16.0	12.0	9.5	10.0	12.5	11.0	11.5
31	---	---	---	---	---	---	10.0	8.5	9.5	12.0	10.0	11.0
MONTH	28.5	18.5	24.0	22.0	12.5	18.5	18.0	8.0	13.5	15.5	6.5	11.0

## TRINITY RIVER MAIN STEM

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	13.0	11.0	12.0	18.5	15.0	16.5	20.5	17.5	19.0	---	---	---
2	13.5	12.0	12.5	18.5	16.5	17.5	19.0	18.0	18.5	23.5	22.0	22.5
3	14.5	12.5	13.5	17.0	15.0	16.0	21.0	18.0	19.5	22.5	21.0	21.5
4	14.5	13.0	14.0	18.5	15.0	16.5	22.0	19.5	20.5	21.5	21.0	21.5
5	13.0	12.5	12.5	19.5	16.5	18.0	22.0	20.5	21.0	21.5	20.5	21.0
6	14.0	13.0	13.5	19.5	17.5	18.5	22.0	21.0	21.5	22.5	20.0	21.0
7	15.0	13.5	14.5	17.5	16.0	17.0	22.5	21.0	21.5	22.5	21.0	21.5
8	16.0	14.0	15.0	18.0	15.0	16.0	24.5	21.0	22.5	22.0	19.5	21.0
9	16.0	14.5	15.5	18.5	15.5	17.0	24.0	22.5	23.0	22.0	20.0	21.0
10	17.0	15.0	15.5	18.0	15.5	16.5	---	---	---	23.5	21.5	22.5
11	16.5	15.0	15.5	19.0	15.0	17.0	---	---	---	25.5	23.0	24.0
12	17.5	16.0	16.5	19.5	17.0	18.0	---	---	---	26.5	24.5	25.5
13	18.0	16.5	17.0	---	---	---	---	---	---	27.5	25.5	26.5
14	17.5	16.0	17.0	---	---	---	---	---	---	26.5	25.0	26.0
15	16.0	14.0	15.0	16.5	13.5	15.0	---	---	---	25.0	24.0	24.5
16	14.0	13.0	13.5	16.0	14.5	15.0	---	---	---	26.0	24.5	25.0
17	16.0	12.5	14.0	---	---	---	---	---	---	25.5	24.5	25.0
18	18.0	15.0	16.5	---	---	---	---	---	---	26.5	24.5	25.5
19	17.0	15.0	16.0	---	---	---	---	---	---	26.5	24.5	25.5
20	17.0	14.5	15.5	---	---	---	---	---	---	28.0	25.5	26.5
21	16.0	14.0	15.0	23.5	16.5	20.0	---	---	---	27.0	25.0	26.0
22	13.0	11.0	12.0	23.0	19.0	21.0	---	---	---	26.0	25.5	26.0
23	13.5	12.0	12.5	---	---	---	---	---	---	27.0	25.0	26.0
24	15.0	13.0	14.0	23.0	17.5	21.0	---	---	---	28.5	25.5	26.5
25	14.5	13.0	14.0	22.0	20.0	21.0	---	---	---	---	---	---
26	15.5	13.5	14.0	22.5	21.0	21.5	---	---	---	---	---	---
27	16.0	14.0	14.5	21.5	19.5	20.5	---	---	---	---	---	---
28	15.5	14.0	14.5	19.5	18.5	19.0	---	---	---	---	---	---
29	---	---	---	19.0	18.0	18.5	---	---	---	---	---	---
30	---	---	---	19.0	16.5	18.0	---	---	---	---	---	---
31	---	---	---	20.0	17.0	18.5	---	---	---	---	---	---
MONTH	18.0	11.0	14.5	23.5	13.5	18.0	24.5	17.5	21.0	28.5	19.5	24.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	---	---	---	31.0	26.5	29.0	31.0	29.0	30.0	27.0	25.5	26.5
2	---	---	---	31.5	29.0	30.0	31.5	29.5	30.5	26.5	26.5	26.5
3	---	---	---	---	---	---	31.5	29.0	30.5	28.0	26.0	27.0
4	26.0	23.5	24.5	---	---	---	32.0	29.5	30.5	28.0	27.0	27.5
5	27.5	25.0	26.0	---	---	---	32.0	29.5	30.5	28.0	27.5	28.0
6	28.0	26.0	27.0	---	---	---	32.0	29.5	30.5	28.5	27.0	27.5
7	27.5	25.5	26.5	---	---	---	32.0	29.5	31.0	28.5	27.0	27.5
8	26.0	25.5	26.0	---	---	---	32.0	29.5	31.0	---	---	---
9	26.0	24.5	25.5	---	---	---	31.0	30.0	30.5	---	---	---
10	26.0	25.0	25.5	---	---	---	30.5	29.0	29.5	---	---	---
11	27.0	25.5	26.0	---	---	---	29.5	28.5	29.0	---	---	---
12	28.0	26.0	27.0	---	---	---	29.0	26.5	27.5	---	---	---
13	28.5	26.5	27.5	---	---	---	26.0	24.5	25.5	---	---	---
14	28.5	27.0	28.0	---	---	---	26.0	24.5	25.5	29.5	28.5	29.0
15	29.0	27.0	28.0	---	---	---	26.5	24.5	25.5	29.0	28.0	28.5
16	28.5	23.5	26.5	---	---	---	28.0	26.0	27.0	29.0	27.5	28.5
17	27.5	25.0	26.0	---	---	---	29.0	27.5	28.5	29.0	25.5	28.0
18	28.5	26.5	27.5	31.5	29.0	30.0	30.5	28.5	29.5	---	---	---
19	29.0	27.0	28.0	31.5	29.0	30.0	31.0	29.0	30.0	---	---	---
20	29.5	27.5	28.5	31.0	28.5	30.0	31.0	29.0	30.0	---	---	---
21	30.0	27.5	29.0	31.0	28.5	30.0	30.0	28.5	29.5	---	---	---
22	29.5	28.0	29.0	31.5	28.5	30.0	28.5	26.0	28.0	---	---	---
23	27.5	25.5	26.5	31.5	29.0	30.5	30.0	28.0	29.0	---	---	---
24	28.5	26.5	27.5	31.5	29.0	30.0	30.5	28.5	29.5	---	---	---
25	30.0	27.0	28.5	30.0	29.0	29.5	30.0	28.5	29.5	---	---	---
26	30.0	28.0	29.0	29.5	27.5	28.5	29.5	28.5	29.0	---	---	---
27	30.5	28.5	29.5	29.5	27.0	28.5	30.0	28.5	29.0	---	---	---
28	30.5	29.0	29.5	28.0	27.5	27.5	30.5	28.5	29.5	23.5	22.5	23.0
29	29.5	26.5	28.5	29.0	26.5	27.5	29.5	28.0	29.0	---	---	---
30	30.0	28.0	29.0	30.0	28.0	29.0	29.0	25.5	27.0	---	---	---
31	---	---	---	31.0	28.5	29.5	27.5	26.5	27.0	---	---	---
MONTH	30.5	23.5	27.5	31.5	26.5	29.5	32.0	24.5	29.0	29.5	22.5	27.5

TRINITY RIVER MAIN STEM

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.5	6.2	6.7	7.5	7.0	7.2	8.4	7.9	8.2	10.0	9.6	9.8
2	7.5	6.4	6.9	7.5	7.0	7.3	8.5	7.8	8.1	10.0	9.5	9.7
3	7.0	4.8	6.2	7.5	7.0	7.2	8.8	7.7	8.4	9.6	9.3	9.5
4	6.0	5.4	5.7	8.3	6.3	7.5	8.8	8.5	8.7	9.7	9.3	9.5
5	6.5	5.8	6.2	8.3	7.2	7.6	9.3	8.7	9.0	9.7	9.0	9.5
6	6.7	6.2	6.4	8.2	7.4	7.9	9.5	8.4	9.1	10.5	8.9	9.5
7	6.8	6.2	6.5	8.4	8.2	8.3	8.8	8.3	8.6	10.7	10.1	10.4
8	7.7	5.7	6.7	9.5	7.9	8.7	8.6	8.2	8.4	10.4	9.8	10.2
9	7.7	5.2	6.5	9.5	8.5	8.8	8.4	8.1	8.3	12.1	9.6	9.9
10	7.0	5.8	6.7	8.9	8.1	8.6	8.3	8.0	8.2	11.3	10.5	11.0
11	7.5	6.9	7.3	8.4	8.1	8.3	8.5	8.0	8.3	11.1	10.2	10.4
12	7.6	7.4	7.5	8.4	8.2	8.3	8.2	7.9	8.1	10.2	9.9	10.0
13	7.5	7.1	7.3	8.2	7.8	8.0	8.5	7.9	8.2	9.9	9.5	9.7
14	7.2	7.0	7.2	8.0	7.9	7.9	8.2	7.8	8.1	9.5	8.9	9.3
15	7.1	6.9	6.9	7.9	7.7	7.9	8.2	7.7	8.0	9.7	8.9	9.3
16	7.1	6.6	6.9	7.7	7.5	7.6	8.0	7.7	7.9	9.8	9.2	9.5
17	7.1	6.5	6.7	7.7	7.4	7.5	8.4	7.8	8.1	9.2	8.8	9.0
18	7.3	6.7	7.1	7.7	7.3	7.5	8.1	7.7	8.0	9.5	8.8	9.2
19	---	---	---	7.6	7.2	7.4	8.2	7.8	8.0	9.8	9.2	9.6
20	---	---	---	8.0	7.0	7.4	7.9	7.5	7.8	10.4	9.3	9.9
21	---	---	---	7.6	6.3	7.1	8.1	7.3	7.8	9.7	9.6	9.6
22	---	---	---	7.6	6.3	6.7	8.8	8.0	8.5	---	---	---
23	7.3	6.9	7.0	7.3	6.1	6.6	9.2	8.7	9.1	---	---	---
24	7.3	6.8	7.0	7.2	6.8	7.0	9.3	9.0	9.1	---	---	---
25	7.5	7.0	7.2	7.7	7.1	7.5	9.5	9.0	9.3	---	---	---
26	7.5	7.1	7.2	7.5	6.9	7.3	9.8	9.3	9.5	9.4	9.0	9.2
27	7.5	7.0	7.2	7.2	6.0	6.9	10.0	9.5	9.7	10.0	9.4	9.7
28	7.5	7.0	7.2	8.2	7.3	7.9	9.9	9.4	9.6	10.1	9.6	9.9
29	7.6	7.0	7.2	8.1	7.8	8.0	9.4	8.6	9.0	9.7	9.4	9.5
30	7.7	7.1	7.3	8.0	7.8	7.9	9.5	9.0	9.2	10.1	9.7	10.0
31	7.7	7.0	7.3	---	---	---	9.6	9.2	9.5	10.7	10.2	10.4
MONTH	7.7	4.8	6.9	9.5	6.0	7.7	10.0	7.3	8.6	12.1	8.8	9.7
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.6	10.1	10.3	8.7	7.9	8.4	8.6	7.8	8.4	---	---	---
2	10.3	10.1	10.2	8.2	7.8	7.9	8.8	8.1	8.5	7.0	6.8	6.9
3	10.3	9.6	10.0	8.8	7.8	8.5	8.4	8.1	8.3	7.2	5.8	6.8
4	9.8	8.8	9.4	9.0	8.1	8.6	8.7	7.8	8.2	7.2	6.2	6.8
5	9.5	7.9	8.9	8.7	8.0	8.4	8.2	6.8	7.7	7.0	6.3	6.8
6	8.6	8.0	8.4	8.6	7.8	8.3	6.9	4.4	6.2	7.0	6.7	6.8
7	8.4	8.2	8.3	8.7	7.7	8.2	7.0	3.0	5.6	7.4	7.0	7.2
8	8.4	8.2	8.3	8.5	7.7	8.2	7.3	6.4	6.9	7.5	5.8	7.1
9	8.3	8.0	8.2	8.7	7.8	8.3	7.9	6.8	7.4	6.6	5.8	6.2
10	8.7	8.2	8.3	8.8	7.7	8.3	---	---	---	6.8	6.6	6.7
11	8.9	8.5	8.7	8.7	7.7	8.3	---	---	---	6.9	6.8	6.9
12	8.5	8.1	8.3	9.0	7.9	8.4	---	---	---	7.4	6.9	7.2
13	8.9	8.1	8.6	9.0	7.8	8.4	---	---	---	8.6	7.1	7.7
14	9.5	8.1	8.9	8.8	7.8	8.3	---	---	---	7.9	6.3	7.5
15	9.1	8.2	8.7	8.4	7.7	8.0	---	---	---	7.1	5.0	5.8
16	9.8	8.5	9.2	8.1	7.6	7.9	---	---	---	6.2	5.9	6.1
17	9.5	8.5	9.1	7.9	7.6	7.7	---	---	---	6.5	6.1	6.3
18	10.1	8.5	9.3	8.6	7.8	8.3	---	---	---	7.1	6.5	6.7
19	10.7	9.4	9.9	8.6	8.1	8.4	---	---	---	7.3	6.2	6.7
20	10.3	9.2	9.9	8.4	7.7	8.2	---	---	---	7.0	6.5	6.8
21	10.3	8.7	9.7	8.0	7.1	7.7	---	---	---	7.2	6.7	7.0
22	10.4	9.0	9.9	7.4	6.4	6.7	---	---	---	7.0	6.6	6.8
23	9.6	8.5	9.2	7.5	6.6	7.1	---	---	---	6.8	6.5	6.7
24	8.6	8.4	8.5	7.6	6.5	7.2	---	---	---	7.2	6.6	7.0
25	9.1	8.6	8.9	7.9	6.6	7.2	---	---	---	---	---	---
26	9.4	9.0	9.1	7.8	7.0	7.3	---	---	---	---	---	---
27	9.3	9.1	9.3	7.7	5.5	6.9	---	---	---	---	---	---
28	9.4	8.6	9.1	6.3	5.5	5.8	---	---	---	---	---	---
29	---	---	---	7.0	6.4	6.8	---	---	---	---	---	---
30	---	---	---	7.5	6.9	7.2	---	---	---	---	---	---
31	---	---	---	8.0	7.4	7.8	---	---	---	---	---	---
MONTH	10.7	7.9	9.1	9.0	5.5	7.8	8.8	3.0	7.5	8.6	5.0	6.8

## TRINITY RIVER MAIN STEM

08057055 TRINITY RIVER AT CEDAR CREST BOULEVARD, DALLAS, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	7.3	6.1	6.8	7.5	6.3	7.0	---	---	---
2	---	---	---	7.4	6.3	6.8	7.6	6.5	7.0	---	---	---
3	---	---	---	7.5	5.4	6.6	7.5	6.2	6.9	---	---	---
4	6.6	5.8	6.3	6.4	4.9	5.6	8.0	6.5	7.1	---	---	---
5	7.1	6.5	6.8	5.5	4.7	5.1	7.7	6.4	7.0	---	---	---
6	7.5	6.9	7.2	6.5	5.5	6.0	7.8	6.4	7.0	---	---	---
7	7.4	6.4	7.1	7.5	5.9	6.6	7.5	6.3	6.9	---	---	---
8	7.2	6.6	6.8	8.0	6.7	7.2	7.4	6.3	6.8	---	---	---
9	7.4	6.8	7.1	7.6	6.5	7.1	7.2	6.0	6.6	---	---	---
10	7.9	7.2	7.5	7.4	6.6	7.0	6.9	5.9	6.4	---	---	---
11	8.5	7.5	7.9	7.2	6.3	6.7	6.9	6.0	6.4	---	---	---
12	8.5	7.5	8.0	7.2	6.2	6.7	---	---	---	---	---	---
13	8.7	7.5	8.0	7.4	6.2	6.7	---	---	---	---	---	---
14	8.3	7.4	7.9	7.3	6.1	6.6	---	---	---	7.1	5.8	6.7
15	7.9	7.2	7.6	7.5	6.1	6.7	---	---	---	6.8	6.0	6.3
16	7.8	5.6	6.9	7.3	6.2	6.8	---	---	---	6.3	5.3	5.8
17	6.3	5.7	6.1	7.0	6.1	6.6	---	---	---	6.2	5.8	6.0
18	7.0	6.3	6.6	7.2	6.3	6.7	---	---	---	---	---	---
19	7.7	6.5	6.9	7.2	6.2	6.6	---	---	---	---	---	---
20	7.7	6.8	7.2	7.2	6.0	6.6	---	---	---	---	---	---
21	7.8	7.0	7.4	7.2	6.3	6.7	---	---	---	---	---	---
22	7.7	6.8	7.3	7.3	6.3	6.7	---	---	---	---	---	---
23	7.2	5.7	6.4	7.2	6.2	6.6	---	---	---	---	---	---
24	5.8	4.7	5.2	7.0	6.1	6.4	---	---	---	---	---	---
25	6.5	5.7	6.1	6.8	5.8	6.3	---	---	---	---	---	---
26	6.5	6.1	6.2	6.4	5.1	6.0	---	---	---	---	---	---
27	6.9	6.6	6.7	6.2	5.4	6.0	---	---	---	---	---	---
28	7.1	6.8	7.0	5.8	5.1	5.6	---	---	---	---	---	---
29	7.1	6.6	6.9	5.6	4.9	5.2	---	---	---	---	---	---
30	7.2	6.6	6.9	6.3	5.6	6.0	---	---	---	---	---	---
31	---	---	---	6.7	6.3	6.5	---	---	---	---	---	---
MONTH	8.7	4.7	7.0	8.0	4.7	6.4	8.0	5.9	6.8	7.1	5.3	6.2



TRINITY RIVER BASIN

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08057200 WHITE ROCK CREEK AT GREENVILLE AVENUE, DALLAS, TX

LOCATION.--Lat 32°53'21", long 96°45'23", Dallas County, Hydrologic Unit 12030105, on left bank 20 ft upstream from bridge on Greenville Avenue in Dallas, 1.1 mi downstream from Texas and New Orleans Railroad Co. bridge, 1.2 mi downstream from Cottonwood Creek, 2.9 mi upstream from White Rock Lake, and 8.2 mi northeast of Dallas County Courthouse.

DRAINAGE AREA.--66.4 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1961 to September 1980, April 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Oct. 24, 1961, non-recording gage at same site and datum.

REMARKS.--Records good except those for estimated daily discharges, which are poor. There is some regulation of low flow by diversions from small on channel dams upstream from station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--26 years (water years 1962-80, 85-91), 70.3 ft<sup>3</sup>/s (14.38 in/yr), 50,930 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,200 ft<sup>3</sup>/s May 2, 1990 (elevation, 490.59 ft); minimum daily, 0.01 ft<sup>3</sup>/s July 8, 1970, June 27, July 14, 1971.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum elevation since at least 1886, that of May 2, 1990.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base discharge of 2,900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Elevation (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Elevation (ft)
Oct. 9	0215	4,770	483.36	May 14	1500	7,050	485.02
Apr. 12	0115	*36,800	*490.32	May 24	2130	17,900	487.94
Apr. 13	1200	13,900	487.10	June 23	0200	5,000	484.00
May 3	0430	3,530	482.97	Aug. 30	0700	6,300	484.68

Minimum daily discharge, 4.9 ft<sup>3</sup>/s July 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.1	11	30	32	38	119	26	32	39	12	11	345
2	8.8	9.0	129	31	38	45	26	42	142	9.2	8.8	311
3	260	16	62	32	37	38	25	630	200	17	7.0	126
4	29	398	37	29	225	37	20	222	68	15	7.5	135
5	16	57	33	51	145	35	20	142	109	10	7.3	93
6	12	33	30	190	85	32	27	64	53	8.5	6.3	72
7	9.7	25	28	77	66	31	30	53	68	7.7	5.9	176
8	82	908	30	53	59	30	24	422	79	8.9	5.8	145
9	773	195	25	217	55	29	18	91	36	12	5.5	85
10	44	68	27	279	53	27	15	71	32	7.8	4.2	74
11	28	49	23	86	48	27	98	64	29	6.0	11	66
12	22	40	24	67	46	24	5850	54	28	6.5	134	68
13	17	35	23	57	40	23	2040	47	21	6.0	152	64
14	16	30	22	118	38	22	233	846	20	5.5	91	88
15	15	29	22	208	34	42	158	203	21	5.3	37	157
16	15	27	37	86	32	35	134	80	106	5.0	27	111
17	13	23	36	78	38	70	296	60	31	5.3	23	93
18	12	23	92	186	41	31	272	76	22	5.3	18	208
19	9.3	25	34	230	35	26	137	93	16	4.9	14	434
20	11	24	25	100	30	29	100	53	14	5.2	9.9	50
21	33	128	36	80	47	27	87	44	16	5.7	8.8	31
22	20	224	25	72	698	100	89	77	40	5.9	126	24
23	14	60	22	66	89	27	77	56	863	5.6	43	19
24	11	42	22	66	69	22	64	2030	57	5.9	24	212
25	11	36	24	59	58	25	92	409	34	6.8	17	64
26	11	67	67	53	50	27	60	122	25	12	101	25
27	10	141	62	51	44	202	75	90	19	152	61	16
28	11	57	33	48	41	46	168	67	16	304	31	12
29	13	38	113	45	---	34	91	54	12	42	52	9.5
30	17	35	47	63	---	29	45	48	13	20	860	8.6
31	9.7	---	35	47	---	25	---	43	---	15	111	---
TOTAL	1560.6	2853.0	1255	2857	2279	1316	10397	6385	2229	738.0	2058.8	3322.1
MEAN	50.3	95.1	40.5	92.2	81.4	42.5	347	206	74.3	23.8	66.4	111
MAX	773	908	129	279	698	202	5850	2030	863	304	860	434
MIN	7.1	9.0	22	29	30	22	15	32	12	4.9	5.5	8.6
AC-FT	3100	5660	2490	5670	4520	2610	20620	12660	4420	1460	4080	6590
CAL YR 1990	TOTAL	68008.8	MEAN	186	MAX	7940	MIN	3.0	AC-FT	134900		
WTR YR 1991	TOTAL	37250.5	MEAN	102	MAX	5850	MIN	4.9	AC-FT	73890		

## TRINITY RIVER MAIN STEM

08057410 TRINITY RIVER BELOW DALLAS, TX

LOCATION.--Lat 32°42'26", Long 96°44'08", Dallas County, Hydrologic Unit 12030105, on right bank at downstream side of bridge on South Loop Highway 12, 1.0 mi downstream from White Rock Creek, 1.5 mi upstream from Fivemile Creek, 6.4 mi southeast of Dallas County Courthouse in Dallas, and at mile 491.8.

DRAINAGE AREA.--6,278 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1956 to September 1961 (monthly records only), October 1961 to current year.

GAGE.--Water-stage recorder. Datum of gage is 365.89 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good, except those for estimated daily discharges, which are fair. Flow affected at times by eight upstream reservoirs with a combined capacity of 1,714,400 acre-ft, of which 846,200 acre-ft is for flood control. Several cities within the Dallas-Fort Worth metroplex divert water for municipal use and return it to the river as sewage effluents above this station. Low flows are sustained by sewage effluents.

AVERAGE DISCHARGE.--34 years (water years 1958-91), 2,000 ft<sup>3</sup>/s (1,449,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,000 ft<sup>3</sup>/s May 4, 1990 (gage height, 34.79 ft); minimum daily, 131 ft<sup>3</sup>/s Dec. 9, 1956.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 25, 1908, reached a stage of 41.1 ft, from information by U.S. Army Corps of Engineers, and is the highest since that date. Floods in 1866 and 1908 reached about the same stage at Dallas.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,400 ft<sup>3</sup>/s May 26 at 1000 hours (gage height, 26.97 ft from estimated stage record); minimum daily, 542 ft<sup>3</sup>/s Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	546	570	700	802	934	952	665	1030	1490	643	653	3870
2	542	601	873	752	815	954	669	870	1560	630	620	4550
3	762	578	1240	768	768	857	668	2470	4640	790	589	2340
4	972	1380	1020	744	1240	779	664	4190	3850	1260	573	1370
5	668	2090	802	753	3870	752	691	2340	1840	909	570	1410
6	584	1040	746	1400	2620	745	662	1710	2320	649	568	1070
7	553	768	753	2110	1350	745	673	1040	1950	612	561	963
8	584	2280	695	1250	1010	719	685	2220	2240	605	558	3300
9	4050	7110	681	1080	925	683	670	3580	1920	611	552	1740
10	4260	4240	691	5040	866	681	654	1580	1740	613	564	893
11	1150	1360	708	4210	878	688	661	1190	1660	612	591	798
12	750	896	698	1550	827	699	9300	1080	1660	573	1340	722
13	661	806	695	1050	805	697	14200	999	1700	566	5210	682
14	626	761	683	1080	805	696	13900	1180	1620	558	6290	691
15	610	731	652	1860	778	689	6310	5130	1280	564	3840	923
16	601	707	665	1600	723	723	1980	4620	1660	601	1310	866
17	608	674	718	1100	746	769	1280	1440	2010	597	880	1280
18	621	653	864	1590	754	872	3910	1050	1210	589	729	1140
19	612	662	854	3290	766	776	4010	1610	1030	576	682	2920
20	577	674	749	3140	719	727	2600	1260	998	568	655	2740
21	583	744	732	1510	693	707	2240	1230	916	575	647	1180
22	616	2370	749	1110	4290	989	2190	1040	784	576	818	936
23	595	2400	723	1000	5060	899	2140	1000	3250	580	920	866
24	588	1290	691	955	1720	731	1250	937	3690	577	693	901
25	589	856	692	910	1120	694	1960	e5220	1440	655	626	1210
26	572	795	748	860	903	673	2240	e17000	927	683	636	1020
27	578	1020	1100	957	839	1860	1160	e5780	805	947	688	795
28	564	1310	969	963	816	2020	1170	e2820	720	2480	653	711
29	574	899	1030	838	---	969	3770	e2630	659	2890	756	706
30	578	752	1310	900	---	771	2040	2610	641	1120	2750	670
31	577	---	985	987	---	691	---	2390	---	739	3390	---
TOTAL	26751	41017	25216	46159	37640	26207	85012	83246	52210	24948	39912	43263
MEAN	863	1367	813	1489	1344	845	2834	2685	1740	805	1287	1442
MAX	4260	7110	1310	5040	5060	2020	14200	17000	4640	2890	6290	4550
MIN	542	570	652	744	693	673	654	870	641	558	552	670
AC-FT	53060	81360	50020	91560	74660	51980	168600	165100	103600	49480	79170	85810
CAL YR 1990	TOTAL	2182193	MEAN	5979	MAX	79200	MIN	542	AC-FT	4328000		
WTR YR 1991	TOTAL	531581	MEAN	1456	MAX	17000	MIN	542	AC-FT	1054000		

e Estimated

08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1967 to current year. Pesticide analyses: October 1970 to July 1981. Sediment analyses: April 1972 to April 1975.

PERIOD OF DAILY RECORD.--  
 SPECIFIC CONDUCTANCE: October 1967 to current year.  
 pH: January 1977 to current year.  
 WATER TEMPERATURE: October 1967 to current year.  
 DISSOLVED OXYGEN: January 1977 to current year.

INSTRUMENTATION.--Since October 1976, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument and pump, plugged intake, and pump failures. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
 SPECIFIC CONDUCTANCE: Maximum, 1,130 microsiemens Dec. 17, 1977; minimum, 112 microsiemens Oct. 20, 1984.  
 pH: Maximum, 8.8 units Jan. 23, 1980; minimum, 6.7 units Mar. 25, 1991.  
 WATER TEMPERATURES: Maximum, 35.0°C Aug. 20, 25, 28, 31, 1972; minimum, 1.0°C Jan. 29, 1968.  
 DISSOLVED OXYGEN (1977-90): Maximum, 12.8 mg/L Mar. 19, 1990; minimum, 0.0 mg/L on many days during spring and summer of 1977-81.

EXTREMES FOR CURRENT YEAR.--  
 SPECIFIC CONDUCTANCE: Maximum, 824 microsiemens Mar. 17; minimum, 195 microsiemens Apr. 12.  
 pH: Maximum, 8.2 units Jan. 8-10; minimum, 6.7 units Mar. 25.  
 WATER TEMPERATURE: Maximum, 32.5°C Aug. 4-7, 9; minimum, 8.0°C Jan. 11.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV (MG/L AS CAC03)
NOV 07...	1440	834	556	7.7	17.5	8.4	88	2.5	140	30
JAN 29...	1405	883	735	7.6	14.5	9.3	93	1.9	200	72
MAR 27...	1330	2250	699	7.7	20.5	5.6	63	5.1	180	56
MAY 24...	1100	973	650	7.4	26.5	6.1	77	4.3	180	54
JUL 11...	1145	586	715	7.4	29.5	6.2	82	1.4	160	47
AUG 28...	1300	655	648	7.4	28.5	6.1	79	1.9	150	34

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS S102)
NOV 07...	48	4.9	50	2	8.4	110	63	48	0.80	6.8
JAN 29...	69	6.1	66	2	8.8	120	91	63	0.80	7.6
MAR 27...	63	5.8	66	2	8.9	120	97	64	0.80	6.8
MAY 24...	63	6.4	58	2	7.7	130	75	57	0.90	6.6
JUL 11...	52	6.3	80	3	11	110	81	68	1.1	8.8
AUG 28...	51	4.6	64	2	9.4	110	70	61	1.0	7.2

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 07...	296	5.36	0.040	5.40	0.760	1.1	1.9	1.80	1.90
JAN 29...	387	6.87	0.030	6.90	0.080	1.5	1.6	2.50	2.00
MAR 27...	387	5.73	0.070	5.80	0.200	2.0	2.2	1.80	1.70
MAY 24...	353	5.56	0.140	5.70	0.250	1.5	1.7	2.00	1.80
JUL 11...	374	9.96	0.040	10.0	0.180	1.2	1.4	2.30	2.80
AUG 28...	335	9.22	0.080	9.30	0.060	1.1	1.2	2.60	2.40

TRINITY RIVER MAIN STEM  
08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	26751	575	326	23500	48	3440	70	5080	150
NOV. 1990	41017	485	277	30600	36	3980	58	6390	150
DEC. 1990	25216	656	370	25200	57	3870	81	5530	160
JAN. 1991	46159	583	330	41200	47	5890	71	8830	160
FEB. 1991	37640	611	345	35100	51	5230	75	7620	160
MAR. 1991	26207	719	404	28600	66	4700	91	6410	160
APR. 1991	85012	430	246	56500	30	6910	50	11600	140
MAY 1991	83246	444	255	57200	31	6900	52	11700	140
JUNE 1991	52210	498	284	40100	36	5130	59	8320	150
JULY 1991	24948	617	349	23500	53	3550	76	5130	160
AUG. 1991	39912	469	268	28800	35	3770	56	6020	140
SEPT 1991	43263	478	273	31900	35	4060	57	6610	150
TOTAL	531581	**	**	422000	**	57400	**	89200	**
WTD.AVG.	1456	517	294	**	40	**	62	**	150

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	761	706	734	734	711	721	688	677	682	643	621	634
2	740	698	716	724	686	707	692	501	651	641	630	635
3	771	534	726	726	688	705	596	539	569	644	626	635
4	524	477	503	708	414	589	638	553	595	681	647	668
5	673	527	595	556	400	476	658	638	647	682	675	679
6	729	678	709	522	457	483	661	630	644	694	559	640
7	740	704	721	572	523	543	676	657	664	572	524	541
8	729	670	705	587	285	462	701	679	692	632	571	597
9	666	283	414	329	261	306	706	687	697	656	470	642
10	365	316	336	396	315	349	708	686	691	512	357	451
11	508	370	440	503	401	461	695	671	684	504	439	462
12	597	510	550	564	502	531	700	680	690	578	510	537
13	673	600	635	620	561	589	703	684	694	655	596	621
14	689	666	675	632	601	617	712	687	702	685	500	664
15	692	660	677	645	621	634	725	707	715	601	392	527
16	687	665	676	673	613	654	730	707	714	621	546	575
17	710	677	697	680	661	673	718	686	704	684	624	659
18	716	702	710	708	680	690	704	662	685	684	576	633
19	716	698	706	702	613	682	673	648	657	589	492	525
20	738	702	718	709	606	677	700	671	682	535	494	506
21	728	676	712	717	420	666	710	681	699	612	519	565
22	691	663	676	441	311	381	705	682	693	668	614	635
23	697	670	686	545	414	486	703	677	693	705	669	685
24	731	698	713	514	468	480	708	664	688	727	708	718
25	728	702	712	546	511	522	681	644	665	736	726	730
26	715	694	703	607	551	581	651	620	641	753	726	735
27	732	699	710	643	557	614	638	575	608	753	686	736
28	719	692	704	582	522	541	625	585	605	717	655	680
29	740	704	717	623	523	568	654	604	630	750	716	734
30	729	701	711	686	623	655	608	559	586	743	698	722
31	749	719	727	---	---	---	622	597	610	745	702	724
MONTH	771	283	659	734	261	568	730	501	664	753	357	629

TRINITY RIVER MAIN STEM

08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	740	723	729	752	672	725	751	707	726	650	542	592
2	740	724	735	719	688	702	743	714	730	694	647	670
3	734	715	724	734	704	713	764	741	749	682	408	498
4	727	511	659	762	735	746	809	744	759	464	417	439
5	578	442	511	762	745	756	772	742	756	474	448	460
6	544	440	495	757	736	747	769	743	756	530	480	513
7	624	547	591	755	738	746	770	744	760	616	519	572
8	687	627	662	793	761	777	762	738	749	627	383	501
9	721	689	709	797	776	786	755	724	742	479	375	413
10	737	719	727	790	763	776	753	725	741	542	419	488
11	729	704	714	779	753	766	769	493	742	635	538	593
12	754	716	734	777	752	763	606	195	325	640	606	624
13	757	744	751	770	745	758	330	221	279	644	596	624
14	768	745	756	765	746	755	369	274	335	658	395	570
15	770	750	760	792	754	774	404	335	357	469	345	418
16	796	739	778	820	780	803	568	408	489	418	335	366
17	797	747	773	824	780	807	642	449	585	545	424	468
18	757	742	748	786	744	762	515	368	458	640	549	585
19	748	722	736	754	737	746	466	399	427	674	482	602
20	771	743	759	759	738	746	519	465	497	594	530	560
21	778	763	769	756	733	744	544	514	528	635	575	603
22	764	361	502	780	526	670	542	531	536	628	604	617
23	488	445	471	694	619	644	549	523	536	643	616	631
24	572	477	524	733	700	721	681	540	610	683	302	647
25	636	576	598	755	734	742	684	553	582	393	299	343
26	709	640	675	774	748	761	569	534	556	399	329	356
27	737	713	726	771	537	685	656	536	614	372	328	347
28	742	715	730	591	524	561	663	528	629	470	374	408
29	---	---	---	710	570	630	574	318	409	502	426	478
30	---	---	---	709	660	672	538	417	480	501	428	485
31	---	---	---	744	661	701	---	---	---	512	497	502
MONTH	797	361	680	824	524	732	809	195	581	694	299	515
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	592	508	549	727	710	718	662	602	633	451	298	374
2	613	527	590	741	717	727	687	631	658	366	288	332
3	563	392	461	728	429	673	718	656	694	431	328	372
4	421	386	401	710	525	640	715	653	685	489	390	430
5	504	409	465	620	517	539	694	630	671	523	452	479
6	502	460	482	604	527	561	690	647	669	542	463	500
7	545	462	496	656	608	625	713	667	690	586	484	521
8	533	452	490	679	640	659	709	662	679	603	366	468
9	497	464	484	713	685	697	704	677	689	496	384	422
10	498	464	484	734	713	723	691	672	681	551	447	499
11	526	479	513	745	700	720	710	641	683	592	505	556
12	561	519	536	763	700	732	688	359	588	647	595	627
13	533	508	524	781	734	759	458	267	321	705	646	674
14	542	511	528	777	751	764	303	214	268	711	635	686
15	561	540	552	753	719	740	344	294	322	680	581	656
16	569	327	508	751	717	732	500	347	415	598	542	560
17	505	423	475	747	717	731	570	501	529	614	417	515
18	558	451	510	738	702	724	625	573	599	602	456	565
19	597	555	569	754	711	736	650	628	640	479	302	392
20	630	598	612	766	700	740	670	645	656	393	329	361
21	643	631	637	760	705	737	689	666	675	513	401	464
22	656	624	637	732	696	717	694	476	662	646	486	576
23	657	338	417	737	699	718	583	492	554	656	592	635
24	445	371	396	745	703	724	669	589	634	690	510	648
25	556	380	470	709	634	661	684	670	677	620	520	561
26	574	502	539	732	598	684	692	669	678	636	497	577
27	643	575	606	772	574	729	682	638	653	686	549	639
28	693	632	655	573	357	451	693	641	657	733	632	706
29	719	695	712	399	347	370	741	537	691	737	634	706
30	724	712	718	510	378	446	611	283	460	708	664	692
31	---	---	---	608	514	544	401	347	373	---	---	---
MONTH	724	327	534	781	347	668	741	214	596	737	288	540



TRINITY RIVER MAIN STEM  
08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	7.6	7.4	7.5	7.5	7.4	7.4	---	---	---	---	---	---
2	7.6	7.3	7.5	7.5	7.3	7.4	---	---	---	---	---	---
3	7.5	7.3	7.4	7.5	7.3	7.4	---	---	---	7.6	7.4	7.5
4	7.5	7.3	7.4	7.6	7.0	7.4	---	---	---	7.7	7.4	7.5
5	7.4	7.3	7.3	7.8	7.6	7.7	---	---	---	7.6	7.1	7.4
6	7.4	7.2	7.3	7.8	7.6	7.7	---	---	---	8.1	7.1	7.6
7	7.4	7.3	7.3	7.7	7.6	7.6	---	---	---	8.1	7.7	7.8
8	7.8	7.3	7.4	8.0	7.6	7.9	7.6	7.4	7.5	8.2	7.7	7.8
9	7.9	7.4	7.7	8.1	7.9	8.0	7.6	7.4	7.5	8.2	7.2	7.7
10	7.9	7.6	7.7	8.0	7.8	7.9	7.6	7.4	7.5	8.2	7.8	7.9
11	7.7	7.4	7.5	7.8	7.7	7.8	7.6	7.5	7.5	8.0	7.6	7.8
12	7.7	7.5	7.6	7.8	7.6	7.7	7.6	7.4	7.5	8.0	7.5	7.6
13	7.6	7.3	7.5	7.7	7.6	7.7	7.5	7.3	7.4	8.0	7.4	7.6
14	7.4	7.3	7.3	7.7	7.6	7.7	---	---	---	---	---	---
15	7.7	7.3	7.5	7.7	7.5	7.6	---	---	---	---	---	---
16	7.6	7.4	7.6	7.6	7.5	7.6	---	---	---	8.0	7.5	7.7
17	8.0	7.5	7.8	7.6	7.4	7.5	---	---	---	7.6	7.3	7.4
18	---	---	---	7.6	7.2	7.4	7.5	7.4	7.5	---	---	---
19	8.0	7.5	7.7	7.6	7.3	7.5	7.6	7.4	7.5	---	---	---
20	7.6	7.4	7.5	7.6	7.3	7.4	7.6	7.4	7.4	---	---	---
21	7.7	7.5	7.6	7.5	7.4	7.4	7.5	7.4	7.4	---	---	---
22	7.7	7.6	7.6	7.6	7.5	7.5	7.5	7.4	7.5	---	---	---
23	7.7	7.6	7.6	7.7	7.5	7.6	7.6	7.4	7.5	---	---	---
24	7.7	7.5	7.6	---	---	---	7.6	7.4	7.5	---	---	---
25	7.6	7.4	7.5	7.3	7.0	7.2	7.5	7.4	7.5	---	---	---
26	7.6	7.4	7.5	---	---	---	---	---	---	---	---	---
27	7.6	7.4	7.5	---	---	---	---	---	---	---	---	---
28	7.6	7.4	7.5	7.6	7.5	7.5	---	---	---	---	---	---
29	7.6	7.4	7.5	7.6	7.4	7.5	---	---	---	---	---	---
30	7.6	7.4	7.5	7.6	7.4	7.4	---	---	---	7.6	7.5	7.6
31	7.6	7.4	7.5	---	---	---	---	---	---	7.7	7.3	7.5
MONTH	8.0	7.2	7.5	8.1	7.0	7.6	7.6	7.3	7.5	8.2	7.1	7.6
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	7.5	7.3	7.4	---	---	---	7.5	7.4	7.5	7.6	7.5	7.5
2	7.4	7.2	7.3	---	---	---	7.5	7.4	7.4	7.6	7.4	7.5
3	7.4	7.2	7.3	7.5	7.3	7.4	---	---	---	7.9	7.5	7.7
4	---	---	---	7.4	7.2	7.3	---	---	---	7.9	7.6	7.8
5	---	---	---	7.3	7.2	7.2	---	---	---	7.6	7.6	7.6
6	7.4	7.4	7.4	7.3	7.0	7.2	---	---	---	7.8	7.5	7.6
7	7.4	7.2	7.3	7.3	7.1	7.2	---	---	---	7.6	7.4	7.5
8	7.3	7.2	7.2	7.2	7.1	7.2	---	---	---	7.7	7.4	7.6
9	7.3	7.2	7.2	---	---	---	---	---	---	7.7	7.4	7.6
10	7.3	7.2	7.2	---	---	---	---	---	---	7.5	7.4	7.5
11	7.3	7.2	7.2	---	---	---	---	---	---	7.5	7.4	7.5
12	7.5	7.2	7.3	---	---	---	---	---	---	7.5	7.4	7.5
13	7.5	7.4	7.4	---	---	---	---	---	---	7.5	7.4	7.5
14	7.6	7.4	7.5	---	---	---	---	---	---	7.6	7.4	7.5
15	7.6	7.4	7.5	---	---	---	---	---	---	7.7	7.5	7.6
16	7.6	7.4	7.5	7.5	7.4	7.4	7.8	7.5	7.6	8.0	7.4	7.6
17	7.6	7.4	7.5	7.6	7.5	7.5	8.0	7.6	7.8	7.4	7.3	7.4
18	7.5	7.3	7.4	7.7	7.5	7.6	8.0	7.5	7.7	7.5	7.3	7.4
19	7.6	7.3	7.4	7.6	7.5	7.5	7.9	6.9	7.7	7.6	7.4	7.5
20	7.6	7.3	7.4	7.6	7.5	7.5	7.4	7.3	7.4	7.5	7.3	7.4
21	7.5	7.3	7.4	7.5	7.4	7.5	7.5	7.4	7.5	7.5	7.4	7.4
22	---	---	---	7.6	7.5	7.5	7.5	7.5	7.5	7.4	7.3	7.4
23	---	---	---	7.6	7.5	7.5	7.6	7.5	7.6	7.4	7.3	7.3
24	7.6	7.4	7.5	7.5	6.9	7.3	7.7	7.5	7.6	7.5	7.3	7.3
25	7.5	7.4	7.4	7.5	6.7	7.0	7.8	7.6	7.7	7.6	7.1	7.4
26	7.4	7.3	7.4	7.5	7.1	7.4	7.7	7.6	7.7	7.5	7.4	7.5
27	7.4	7.3	7.3	7.9	7.4	7.6	7.7	7.4	7.5	7.5	7.4	7.4
28	---	---	---	7.7	7.5	7.6	7.6	7.5	7.6	7.6	7.5	7.5
29	---	---	---	7.6	7.5	7.5	7.9	7.6	7.8	7.6	7.5	7.6
30	---	---	---	7.6	7.4	7.5	7.9	7.5	7.7	7.7	7.6	7.6
31	---	---	---	---	---	---	---	---	---	7.7	7.5	7.6
MONTH	7.6	7.2	7.4	7.9	6.7	7.4	8.0	6.9	7.6	8.0	7.1	7.5

TRINITY RIVER MAIN STEM

08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.6	7.5	7.5	7.3	7.2	7.3	7.4	7.3	7.4	---	---	---
2	7.8	7.6	7.6	7.4	7.2	7.3	7.5	7.3	7.4	---	---	---
3	8.0	7.5	7.7	7.3	7.1	7.2	7.4	7.4	7.4	---	---	---
4	7.5	7.4	7.4	7.4	7.1	7.2	7.6	7.4	7.5	---	---	---
5	7.5	7.4	7.4	7.3	7.1	7.2	7.6	7.3	7.5	---	---	---
6	8.0	7.5	7.6	7.3	7.1	7.2	7.5	7.3	7.4	---	---	---
7	---	---	---	7.5	7.3	7.4	7.4	7.3	7.3	---	---	---
8	---	---	---	7.6	7.4	7.5	7.4	7.3	7.3	---	---	---
9	7.6	7.5	7.5	7.8	7.5	7.6	7.4	7.2	7.3	---	---	---
10	7.7	7.6	7.6	7.7	7.5	7.6	7.4	7.3	7.4	---	---	---
11	7.7	7.6	7.7	7.6	7.1	7.5	7.5	7.4	7.4	---	---	---
12	7.7	7.6	7.6	7.4	7.3	7.4	7.6	7.4	7.5	---	---	---
13	7.7	7.6	7.6	7.5	7.3	7.4	7.8	7.5	7.7	---	---	---
14	7.7	7.5	7.6	7.5	7.3	7.4	7.9	7.6	7.8	---	---	---
15	7.6	7.4	7.5	7.5	7.4	7.4	7.7	7.0	7.3	---	---	---
16	7.8	7.3	7.5	7.6	7.4	7.5	7.1	7.0	7.1	---	---	---
17	7.5	7.3	7.3	7.5	7.4	7.4	7.2	7.1	7.1	---	---	---
18	7.5	7.2	7.3	7.4	7.3	7.4	7.3	7.2	7.2	---	---	---
19	7.4	7.2	7.3	7.4	7.3	7.4	7.3	7.2	7.3	---	---	---
20	7.4	7.2	7.3	7.5	7.3	7.4	7.4	7.2	7.3	---	---	---
21	7.7	7.3	7.4	7.5	7.4	7.4	7.3	7.2	7.2	7.5	7.4	7.5
22	7.4	7.2	7.3	7.4	7.3	7.4	7.3	7.1	7.2	7.6	7.5	7.6
23	7.6	7.2	7.4	7.4	7.3	7.3	7.3	7.1	7.2	7.7	7.5	7.5
24	7.4	7.4	7.4	7.4	7.2	7.3	7.4	7.2	7.3	7.6	7.4	7.5
25	7.4	7.3	7.4	7.3	7.1	7.3	7.4	7.0	7.3	7.7	7.4	7.6
26	7.3	7.1	7.2	7.4	7.2	7.3	7.4	7.0	7.3	7.6	7.5	7.5
27	7.2	7.1	7.1	7.5	7.3	7.4	7.4	7.3	7.3	7.6	7.5	7.5
28	7.4	7.1	7.2	7.5	7.4	7.4	7.6	7.2	7.4	7.5	7.3	7.4
29	7.3	7.1	7.2	7.4	7.3	7.4	7.5	7.3	7.4	7.5	7.3	7.4
30	7.3	7.1	7.2	7.4	7.3	7.3	7.5	7.0	7.3	7.5	7.3	7.4
31	---	---	---	7.5	7.2	7.4	---	---	---	---	---	---
MONTH	8.0	7.1	7.4	7.8	7.1	7.4	7.9	7.0	7.3	7.7	7.3	7.5

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	27.5	26.5	27.0	23.0	22.5	23.0	18.0	16.0	17.0	11.5	10.0	10.5
2	27.0	26.5	27.0	23.0	22.5	23.0	18.0	16.0	17.0	12.5	11.5	12.0
3	27.0	25.5	26.5	23.5	22.5	23.0	16.0	14.5	15.5	12.5	11.0	11.5
4	26.5	25.0	26.0	23.5	16.5	20.0	15.5	13.5	14.5	12.0	10.5	11.0
5	27.0	25.5	26.5	17.5	16.0	16.5	15.5	14.0	15.0	13.0	12.0	12.0
6	27.5	26.0	27.0	18.0	16.0	17.0	15.5	14.0	15.0	13.0	10.0	12.0
7	28.0	27.0	27.5	18.5	17.0	18.0	15.5	13.5	14.5	10.0	8.5	9.5
8	28.0	27.0	27.5	18.5	13.5	16.0	15.5	13.5	14.5	12.0	9.5	10.5
9	27.0	20.0	22.5	14.0	13.0	13.5	16.0	14.0	15.0	13.0	11.0	12.0
10	20.0	19.0	19.5	14.5	13.0	13.5	16.5	14.5	16.0	11.0	8.5	9.5
11	21.0	19.0	19.5	17.0	14.5	16.0	17.0	15.0	16.0	9.0	8.0	8.5
12	22.0	20.0	21.0	18.5	16.0	17.5	18.5	16.5	17.5	11.0	9.0	10.0
13	23.0	21.0	22.0	19.5	17.5	18.5	18.5	16.5	17.5	12.5	10.5	11.5
14	24.0	21.5	22.5	19.5	18.0	19.0	17.5	16.5	17.0	14.0	12.0	13.0
15	24.5	23.0	24.0	20.5	18.5	19.5	18.0	17.0	17.5	13.5	11.5	13.0
16	25.0	24.0	24.5	21.0	19.5	20.5	17.5	16.0	17.0	12.5	10.5	11.5
17	25.0	21.0	23.5	21.0	19.5	20.0	17.5	16.5	17.0	14.5	12.5	13.5
18	22.0	20.0	21.0	21.0	19.5	20.0	17.5	16.5	17.0	14.5	12.5	13.5
19	22.0	20.0	21.5	21.5	20.0	21.0	16.5	15.0	16.0	12.5	11.5	12.0
20	22.5	21.0	22.0	22.0	21.0	21.5	17.5	15.5	16.5	11.5	10.5	11.0
21	23.0	20.5	22.0	22.0	21.0	21.5	17.5	13.5	16.0	11.5	10.5	11.0
22	20.5	19.5	20.0	20.5	18.0	19.5	13.5	10.5	11.5	12.5	11.0	11.5
23	21.0	19.5	20.5	19.0	17.5	18.5	10.5	9.0	10.0	13.0	11.5	12.5
24	21.5	20.0	20.5	18.5	18.0	18.0	11.5	9.5	10.5	14.5	12.5	13.5
25	21.5	20.5	21.0	19.5	18.0	18.5	12.0	10.5	11.5	14.5	13.0	13.5
26	21.5	20.5	21.0	21.0	20.0	20.5	12.5	11.5	12.0	14.0	13.0	13.5
27	22.0	20.5	21.5	21.5	20.5	21.0	11.0	10.0	10.5	14.5	12.5	13.5
28	23.0	21.5	22.0	21.0	18.0	19.0	12.5	10.0	11.0	14.5	12.5	13.5
29	23.0	22.0	23.0	18.0	16.5	17.0	14.0	12.5	13.0	15.5	14.5	15.0
30	23.0	22.0	23.0	17.5	16.0	17.0	13.0	9.5	10.5	14.5	11.5	12.5
31	23.0	22.5	23.0	---	---	---	10.5	9.0	9.5	13.0	11.0	12.0
MONTH	28.0	19.0	23.0	23.5	13.0	19.0	18.5	9.0	14.5	15.5	8.0	12.0

## TRINITY RIVER MAIN STEM

08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

## WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	14.0	12.0	13.0	16.0	13.0	14.0	20.0	18.0	19.0	24.5	22.5	24.0
2	14.5	12.5	13.5	16.5	13.5	15.0	20.0	18.5	19.0	24.5	23.5	24.0
3	15.5	13.5	14.5	15.0	12.0	14.0	20.5	18.5	19.5	23.5	22.5	23.0
4	15.5	14.5	15.0	16.5	14.0	15.0	21.5	20.0	20.5	22.5	22.5	22.5
5	14.5	12.0	13.0	18.5	15.5	17.0	22.0	21.0	21.5	22.5	22.0	22.0
6	15.0	13.0	14.0	18.5	17.5	18.0	22.0	21.0	21.5	23.0	21.0	22.0
7	15.5	14.0	15.0	18.5	16.0	17.0	22.5	21.5	22.0	23.5	22.0	22.5
8	16.0	14.5	15.5	16.5	14.5	16.0	24.0	21.5	22.5	23.0	21.0	22.0
9	16.5	14.5	15.5	17.5	15.5	16.5	24.0	23.0	23.5	22.5	20.5	22.0
10	17.0	15.0	16.0	17.5	15.0	16.5	23.5	21.5	22.5	24.0	22.5	23.0
11	16.5	15.0	16.0	18.0	15.0	16.5	22.5	21.5	22.0	25.5	24.0	24.5
12	18.0	16.0	17.0	19.0	17.5	18.5	22.0	20.0	21.0	27.0	25.0	26.0
13	19.0	17.5	18.0	18.5	17.0	18.0	21.0	20.0	20.5	27.5	25.5	26.5
14	18.5	17.0	18.0	17.5	16.0	17.0	22.0	20.5	21.5	26.5	24.5	26.0
15	17.5	15.0	16.0	17.5	16.0	16.5	22.5	21.0	21.5	24.5	24.0	24.5
16	15.5	14.0	14.5	16.5	15.0	15.5	24.0	22.0	23.0	25.0	24.0	24.5
17	17.0	14.0	15.0	18.0	16.0	16.5	24.0	22.5	23.5	26.0	25.0	25.5
18	18.5	16.5	17.5	18.0	16.5	17.5	23.5	22.0	22.5	26.0	24.5	25.0
19	18.5	16.5	17.5	18.0	17.0	17.5	23.5	22.5	23.0	26.5	25.0	25.5
20	17.0	15.0	16.0	---	---	---	23.5	22.5	23.0	27.0	25.5	26.0
21	17.0	15.5	16.5	---	---	---	23.5	21.5	22.0	27.5	26.5	27.0
22	16.5	10.0	12.5	---	---	---	21.5	20.5	21.0	27.0	26.5	26.5
23	11.0	9.5	10.5	---	---	---	21.5	19.5	20.5	28.0	26.0	27.0
24	12.5	10.5	11.5	---	---	---	22.0	21.0	21.5	29.0	24.0	27.5
25	12.5	11.0	12.0	---	---	---	22.0	20.5	21.5	25.0	24.0	24.5
26	13.0	10.5	11.5	---	---	---	23.5	21.0	22.5	26.0	25.0	25.5
27	13.0	11.5	12.0	---	---	---	25.0	23.5	24.5	27.0	25.0	26.5
28	13.5	11.5	12.5	19.5	19.0	19.0	24.5	23.5	24.0	28.0	26.5	27.5
29	---	---	---	19.0	18.5	18.5	23.0	21.5	22.5	29.0	28.0	28.5
30	---	---	---	18.5	17.0	18.0	23.5	22.0	23.0	29.0	28.0	28.5
31	---	---	---	19.0	17.0	18.0	---	---	---	28.5	27.5	28.0
MONTH	19.0	9.5	14.5	19.5	12.0	17.0	25.0	18.0	22.0	29.0	20.5	25.0
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	28.0	26.5	27.5	---	---	---	32.0	30.0	31.0	28.5	26.0	27.0
2	28.0	27.0	27.5	---	---	---	32.0	30.5	31.5	28.0	26.5	27.0
3	28.0	25.0	26.5	---	---	---	32.0	30.5	31.5	28.0	26.5	27.0
4	26.0	24.5	25.0	---	---	---	32.5	30.5	31.5	28.0	27.5	28.0
5	27.5	26.0	26.5	---	---	---	32.5	31.0	31.5	28.0	27.0	27.5
6	28.0	26.5	27.5	---	---	---	32.5	31.0	32.0	28.5	27.5	28.0
7	28.0	26.5	27.0	---	---	---	32.5	31.0	31.5	28.5	27.5	28.0
8	26.5	26.0	26.5	---	---	---	32.0	31.0	31.5	27.5	26.5	27.0
9	26.5	25.0	26.0	---	---	---	32.5	31.0	32.0	28.0	26.5	27.0
10	26.5	24.5	25.5	---	---	---	31.5	30.5	31.0	28.5	27.0	27.5
11	24.5	23.5	24.0	---	---	---	31.0	30.0	30.5	28.5	27.5	28.0
12	28.0	24.0	26.5	30.5	29.0	30.0	30.5	27.5	29.0	29.0	28.0	28.5
13	29.0	27.0	28.0	31.0	29.5	30.5	27.5	26.0	26.5	29.0	27.5	28.5
14	29.0	27.5	28.5	31.5	30.0	30.5	27.0	25.5	26.5	28.5	27.5	28.0
15	29.0	27.5	28.0	31.5	30.0	31.0	27.0	26.0	26.5	28.0	27.0	27.5
16	28.5	24.5	27.0	31.5	30.0	31.0	29.0	26.5	27.5	28.0	27.5	27.5
17	27.5	25.5	26.5	31.5	30.0	30.5	29.5	29.0	29.0	27.5	27.0	27.0
18	29.0	27.0	28.0	31.0	29.5	30.5	31.0	29.5	30.0	27.5	24.5	27.0
19	29.5	28.0	29.0	31.0	29.5	30.5	31.0	29.5	30.5	24.0	18.5	22.0
20	30.0	28.5	29.5	31.0	29.5	30.0	31.5	30.0	30.5	22.0	20.0	21.0
21	30.0	29.0	29.5	31.0	29.5	30.0	31.0	29.5	30.5	23.5	22.0	22.5
22	30.5	29.0	30.0	31.0	29.5	30.0	29.5	27.5	29.0	25.0	23.0	24.0
23	29.0	25.5	27.0	31.0	29.5	30.5	30.0	27.5	28.5	26.5	25.0	25.5
24	29.0	27.0	28.0	31.0	29.5	30.5	30.5	29.0	29.5	26.5	25.5	26.0
25	---	---	---	30.5	29.0	30.0	30.0	29.0	29.5	25.0	23.5	24.0
26	---	---	---	30.0	28.5	29.0	30.0	29.0	29.5	25.0	23.5	24.0
27	---	---	---	30.0	28.5	29.0	30.0	28.0	29.0	25.5	23.5	24.5
28	---	---	---	30.0	28.0	29.0	32.0	28.5	30.0	25.5	23.5	24.5
29	---	---	---	31.0	28.5	29.5	32.0	30.5	31.0	25.5	23.5	24.5
30	---	---	---	31.5	29.5	30.5	30.5	27.5	29.5	26.0	24.0	25.0
31	---	---	---	31.5	29.5	30.5	29.0	28.0	28.5	---	---	---
MONTH	30.5	23.5	27.5	31.5	28.0	30.0	32.5	25.5	30.0	29.0	18.5	26.0

TRINITY RIVER MAIN STEM  
08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

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OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	9.8	9.2	9.5
4	---	---	---	---	---	---	---	---	---	9.8	9.5	9.6
5	---	---	---	---	---	---	---	---	---	9.6	9.3	9.4
6	---	---	---	---	---	---	---	---	---	9.9	8.9	9.2
7	---	---	---	---	---	---	---	---	---	10.6	10.0	10.4
8	---	---	---	---	---	---	---	---	---	10.1	9.6	10.0
9	---	---	---	---	---	---	---	---	---	9.7	9.3	9.4
10	---	---	---	---	---	---	---	---	---	11.1	10.0	10.6
11	---	---	---	---	---	---	---	---	---	11.0	10.0	10.4
12	---	---	---	---	---	---	---	---	---	10.0	9.6	9.9
13	---	---	---	---	---	---	---	---	---	9.7	9.3	9.6
14	---	---	---	---	---	---	---	---	---	9.3	8.4	9.2
15	---	---	---	8.0	7.4	7.7	---	---	---	11.1	8.2	9.9
16	---	---	---	---	---	---	---	---	---	11.7	9.0	10.8
17	---	---	---	---	---	---	---	---	---	12.1	9.0	10.7
18	---	---	---	---	---	---	9.0	8.4	8.7	12.1	10.1	11.6
19	---	---	---	---	---	---	8.8	8.4	8.6	10.2	9.6	9.9
20	---	---	---	---	---	---	8.5	8.1	8.3	10.8	9.8	10.3
21	---	---	---	---	---	---	8.7	7.7	8.1	10.2	9.9	10.0
22	---	---	---	---	---	---	9.0	8.5	8.8	10.2	9.7	10.0
23	---	---	---	---	---	---	9.2	6.1	8.7	9.9	9.6	9.7
24	---	---	---	---	---	---	---	---	---	9.6	8.9	9.3
25	---	---	---	---	---	---	---	---	---	8.8	8.3	8.7
26	---	---	---	---	---	---	---	---	---	---	---	---
27	---	---	---	---	---	---	---	---	---	---	---	---
28	---	---	---	---	---	---	---	---	---	---	---	---
29	---	---	---	---	---	---	---	---	---	---	---	---
30	---	---	---	---	---	---	---	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	8.0	7.4	7.7	9.2	6.1	8.5	12.1	8.2	9.9
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	---	---	---
10	---	---	---	---	---	---	---	---	---	---	---	---
11	---	---	---	---	---	---	---	---	---	---	---	---
12	---	---	---	---	---	---	---	---	---	---	---	---
13	---	---	---	---	---	---	---	---	---	---	---	---
14	---	---	---	---	---	---	---	---	---	---	---	---
15	---	---	---	---	---	---	---	---	---	---	---	---
16	---	---	---	---	---	---	---	---	---	---	---	---
17	---	---	---	---	---	---	---	---	---	---	---	---
18	---	---	---	---	---	---	---	---	---	---	---	---
19	---	---	---	---	---	---	---	---	---	---	---	---
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	---	---	---	---	---	---	---	---	---
24	---	---	---	---	---	---	---	---	---	---	---	---
25	---	---	---	---	---	---	---	---	---	6.7	5.7	6.1
26	---	---	---	---	---	---	---	---	---	5.7	4.5	5.0
27	---	---	---	---	---	---	---	---	---	5.0	4.3	4.7
28	---	---	---	---	---	---	---	---	---	5.8	4.9	5.4
29	---	---	---	---	---	---	---	---	---	6.2	5.7	6.0
30	---	---	---	---	---	---	---	---	---	6.7	6.2	6.5
31	---	---	---	---	---	---	---	---	---	6.6	4.2	6.0
MONTH	---	---	---	---	---	---	---	---	---	6.7	4.2	5.7

TRINITY RIVER MAIN STEM  
08057410 TRINITY RIVER BELOW DALLAS, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	7.6	6.6	6.8
5	---	---	---	---	---	---	---	---	---	6.9	6.6	6.8
6	---	---	---	---	---	---	---	---	---	7.0	6.6	6.8
7	---	---	---	---	---	---	---	---	---	7.0	6.7	6.9
8	---	---	---	---	---	---	---	---	---	6.9	6.1	6.7
9	---	---	---	---	---	---	---	---	---	7.1	6.4	6.8
10	---	---	---	---	---	---	---	---	---	7.2	6.4	6.8
11	---	---	---	---	---	---	---	---	---	7.2	6.6	6.9
12	---	---	---	---	---	---	---	---	---	6.8	6.5	6.7
13	---	---	---	---	---	---	---	---	---	6.6	6.4	6.5
14	---	---	---	---	---	---	---	---	---	6.4	5.7	6.0
15	---	---	---	---	---	---	---	---	---	6.7	6.1	6.4
16	---	---	---	---	---	---	---	---	---	6.7	6.2	6.4
17	---	---	---	---	---	---	---	---	---	6.7	6.2	6.4
18	---	---	---	---	---	---	---	---	---	6.7	6.1	6.4
19	---	---	---	---	---	---	---	---	---	6.8	6.2	6.5
20	---	---	---	---	---	---	---	---	---	6.8	6.3	6.6
21	---	---	---	---	---	---	---	---	---	6.9	6.3	6.6
22	---	---	---	---	---	---	---	---	---	7.2	6.3	6.9
23	---	---	---	---	---	---	---	---	---	7.0	6.6	6.8
24	---	---	---	---	---	---	---	---	---	6.8	6.4	6.6
25	---	---	---	---	---	---	---	---	---	7.0	6.4	6.7
26	---	---	---	---	---	---	---	---	---	7.0	6.5	6.7
27	---	---	---	---	---	---	---	---	---	7.1	6.6	6.8
28	---	---	---	---	---	---	---	---	---	7.1	6.6	6.8
29	---	---	---	---	---	---	---	---	---	7.1	6.6	6.9
30	---	---	---	---	---	---	---	---	---	7.3	6.6	6.9
31	---	---	---	---	---	---	---	---	---	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	7.6	5.7	6.7



TRINITY RIVER BASIN

343

08057445 PRAIRIE CREEK AT U.S. HIGHWAY 175, DALLAS, TX

LOCATION.--Lat 32°42'17", long 96°40'11", Dallas County, Hydrologic Unit 12030105, on left bank at downstream side of the downstream access road bridge on U.S. Highway 175, 3.4 mi upstream from mouth, and 9.0 mi southeast of Dallas City Hall.

DRAINAGE AREA.--9.03 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1975 to September 1980, April 1984 to current year.

GAGE.--Water-stage recorder. Datum of gage is 390.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--12 years (water years 1976-80, 1985-91), 7.76 ft<sup>3</sup>/s (5,620 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,660 ft<sup>3</sup>/s May 17, 1989 (gage height, 29.21 ft); from rating curve extended above 1,900 ft<sup>3</sup>/s on basis of velocity-area study; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 900 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	0330	1,070	19.19	Apr. 13	1300	*3,420	*25.79
Minimum discharge, no flow Aug. 5-11.							

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.60	.45	1.0	1.4	1.1	15	.62	e1.0	e1.1	.26	.06	6.3
2	.59	.49	20	1.4	.93	3.4	.94	e1.5	e6.0	.46	.06	4.1
3	.69	.58	7.0	1.8	.90	1.5	1.5	e26	e8.2	.67	.05	5.6
4	.76	21	1.9	1.7	21	1.3	1.5	e8.0	e2.3	1.0	.03	1.4
5	.54	3.1	1.7	1.5	46	1.2	1.3	e4.5	e4.3	.79	.00	.52
6	.63	.69	1.1	41	8.8	1.2	1.7	e1.9	e1.8	.80	.00	.51
7	.61	.66	.97	8.0	3.0	1.1	1.6	e1.8	e2.2	.54	.00	1.6
8	.69	147	.89	2.7	1.9	.97	1.7	e18	e.70	.05	.00	7.1
9	26	33	1.0	17	1.7	1.1	1.4	e3.5	e.60	.05	.00	1.5
10	1.5	2.5	1.1	145	1.4	.99	1.4	e2.4	e.60	.06	.00	.69
11	.48	.78	1.4	11	1.2	.94	28	e2.1	.24	.05	.00	.22
12	.25	.47	2.0	3.8	1.5	1.2	252	e1.7	.12	.04	23	.19
13	.17	.39	2.3	2.2	1.7	1.6	511	e1.5	.12	.05	37	.08
14	.12	.48	2.3	18	1.4	1.1	17	e37	.11	.08	9.0	.17
15	.10	.51	2.8	36	1.1	1.2	6.9	e8.0	5.7	.06	3.8	.17
16	.13	.53	2.6	5.7	.97	2.0	4.1	e2.3	5.5	.05	1.5	16
17	.15	.62	2.8	3.5	1.1	2.3	5.6	e1.9	3.7	.05	.74	7.8
18	.14	.65	7.8	50	1.6	2.0	17	e3.0	.92	.05	.35	4.4
19	.16	.69	3.6	54	1.4	1.2	5.0	e3.7	.38	.05	.17	16
20	.19	.75	1.9	5.6	1.2	1.0	2.7	e2.0	.20	.05	.27	6.6
21	1.3	2.8	2.5	2.9	1.5	1.1	2.9	e1.5	.11	.05	.09	2.8
22	2.1	247	2.5	2.3	116	1.2	2.6	e3.1	.14	.04	5.9	2.0
23	.85	6.7	1.7	1.8	6.2	1.3	e2.2	e2.0	119	.02	3.8	2.0
24	.57	2.0	1.6	1.5	2.8	1.2	e2.2	e4.8	1.6	.26	1.0	33
25	.48	1.6	1.7	1.5	2.1	1.2	e3.0	e15	.32	6.8	.42	15
26	.41	1.5	7.4	1.3	1.8	1.6	e2.0	e3.1	.33	4.6	9.2	5.2
27	.37	3.1	9.6	1.2	1.7	3.4	e2.5	e2.4	.39	1.7	5.0	2.7
28	.40	2.5	2.5	1.2	1.6	2.4	e7.4	e1.8	.36	36	.90	3.2
29	.44	1.1	11	1.1	---	1.3	e3.5	e1.6	.38	3.1	.30	2.3
30	.47	.67	4.9	1.2	---	1.0	e1.5	e1.4	.38	.35	58	1.5
31	.38	---	2.0	1.4	---	1.0	---	e1.2	---	.05	6.2	---
TOTAL	42.27	484.31	113.56	428.7	233.60	59.00	892.76	169.7	167.80	58.18	166.84	150.65
MEAN	1.36	16.1	3.66	13.8	8.34	1.90	29.8	5.47	5.59	1.88	5.38	5.02
MAX	26	247	20	145	116	15	511	37	119	36	58	33
MIN	.10	.39	.89	1.1	.90	.94	.62	1.0	.11	.02	.00	.08
AC-FT	84	961	225	850	463	117	1770	337	333	115	331	299
CAL YR 1990	TOTAL	4854.82	MEAN	13.3	MAX	474	MIN	.00	AC-FT	9630		
WTR YR 1991	TOTAL	2967.37	MEAN	8.13	MAX	511	MIN	.00	AC-FT	5890		

e Estimated

## TRINITY RIVER BASIN

08058900 EAST FORK TRINITY RIVER AT MCKINNEY, TX

LOCATION.--Lat 33°14'38", long 96°36'31", Collin County, Hydrologic Unit 12030106, at downstream side of highway embankment near left end of main channel bridge on State Highways 5 and 121, 750 ft downstream from Honey Creek, 1.2 mi upstream from Southern Pacific Railway Co. bridge, 1.7 mi upstream from Clemons Creek, 3.3 mi north of McKinney, 26.1 mi upstream from Lavon Dam, and 86.5 mi upstream from mouth.

DRAINAGE AREA.--164 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1975 to current year.

Water-quality records.--Chemical and biochemical analyses: October 1980 to August 1982, November 1985 to June 1987.

GAGE.--Water-stage recorder. Datum of gage is 528.74 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Flow from an 89.1 mi<sup>2</sup> area above this station is affected at times by discharge from the flood-detention pools of 49 floodwater-retarding structures with a combined detention capacity of 26,080 acre-ft. Several observations of water temperature were made during the year. A nonrecording rain gage and gage-height telemeter at station.

AVERAGE DISCHARGE.--16 years regulated, 100 ft<sup>3</sup>/s (72,450 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 61,800 ft<sup>3</sup>/s May 13, 1982 (gage height, 22.17 ft, from graph); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1913, about 28 ft in April 1942 (discharge not determined), from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 638 ft<sup>3</sup>/s May 3 at 1400 hours (gage height, 11.76 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	6.8	15	28	29	12	20	8.7	1.6	.49	.10
2	.00	.00	6.5	17	26	31	12	16	8.4	.76	.19	9.8
3	.00	.00	6.5	16	25	27	12	398	57	.17	.04	3.9
4	.00	.00	7.3	16	40	25	11	273	31	.10	.01	.68
5	.00	.00	8.8	16	59	23	11	291	64	.06	.01	6.4
6	.00	.00	7.9	21	53	22	11	134	111	.02	.00	.76
7	.00	.00	6.7	30	46	20	11	83	122	.12	.00	2.8
8	.00	1.3	5.6	30	40	19	11	78	134	.06	.00	7.6
9	.00	6.9	5.5	27	36	17	11	106	82	.02	.00	2.1
10	.00	13	5.4	59	34	17	9.2	100	42	.00	.00	.23
11	.00	7.8	4.9	91	34	17	8.4	71	29	.00	.00	.01
12	.00	3.4	5.0	67	32	17	21	52	23	.00	.00	.00
13	.00	1.4	5.0	58	32	16	119	39	19	.00	.05	.00
14	.00	.73	5.0	52	29	15	44	37	16	.00	.75	.00
15	.00	.70	4.8	99	26	14	28	81	14	.00	.64	.00
16	.00	1.7	5.0	99	24	14	22	47	12	.00	.22	.00
17	.00	.58	6.5	74	23	20	19	29	11	.03	.11	.00
18	.00	.64	11	77	25	25	20	23	11	.00	.05	.00
19	.00	.71	21	156	25	20	20	20	9.5	.00	.02	.00
20	.00	.79	16	123	22	18	16	21	8.3	.00	.01	.00
21	.00	1.4	12	76	21	17	14	22	7.5	.00	.00	.00
22	.00	5.6	11	59	68	19	13	24	7.1	.00	.00	.00
23	.00	6.9	9.3	51	85	18	13	24	8.4	.00	.00	.00
24	.00	12	7.8	45	55	17	12	55	10	.00	.00	.00
25	.00	6.9	7.3	41	44	16	13	222	7.6	.00	.00	.00
26	.00	5.3	7.2	37	37	16	12	98	5.3	.00	.00	4.5
27	.00	5.2	8.0	35	33	26	13	43	4.1	.00	.00	3.3
28	.00	5.1	8.6	34	29	19	22	25	3.4	1.9	.00	.69
29	.00	10	12	33	---	17	78	17	2.8	2.4	.00	.10
30	.00	8.1	20	31	---	15	33	13	2.4	.94	3.6	.01
31	.00	---	19	29	---	13	---	10	---	.62	1.0	---
TOTAL	0.00	106.15	273.4	1614	1031	599	651.6	2472	871.5	8.80	7.19	42.98
MEAN	.000	3.54	8.82	52.1	36.8	19.3	21.7	79.7	29.0	.28	.23	1.43
MAX	.00	13	21	156	85	31	119	398	134	2.4	3.6	9.8
MIN	.00	.00	4.8	15	21	13	8.4	10	2.4	.00	.00	.00
AC-FT	.00	211	542	3200	2040	1190	1290	4900	1730	17	14	85
CAL YR 1990	TOTAL	91836.77	MEAN	252	MAX	15100	MIN	.00	AC-FT	182200		
WTR YR 1991	TOTAL	7677.62	MEAN	21.0	MAX	398	MIN	.00	AC-FT	15230		

08059400 SISTER GROVE CREEK NEAR BLUE RIDGE, TX

LOCATION.--Lat 33°17'40", long 96°28'58", Collin County, Hydrologic Unit 12030106, on left bank at upstream side of highway embankment of bridge on Farm Road 545, 3.5 mi upstream from Hatler Branch, 4.8 mi west of Blue Ridge, 7.4 mi upstream from Stiff Creek, 14.7 mi upstream from mouth, and 24.7 mi upstream from Lavon Dam.

DRAINAGE AREA.--83.1 mi<sup>2</sup>.

PERIOD OF RECORD.--July 1975 to current year.

Water-quality records.--Chemical and bilchemical analyses: November 1985 to June 1987.

GAGE.--Water-stage recorder. Datum of gage is 526.29 ft above National Geodetic Vertical Datum of 1929. Prior to June 29, 1988, at datum 10.00 ft higher at same site.

REMARKS.--No estimated daily discharges. Records good. Flow is affected at times by discharge from the flood-detention pools of 34 floodwater-retarding structures with a combined detention capacity of 12,710 acre-ft. These structures control runoff from 47.4 mi<sup>2</sup>. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--16 years regulated, 54.4 ft<sup>3</sup>/s (39,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,300 ft<sup>3</sup>/s May 13, 1982 (gage height, 32.5 ft, present datum, from floodmarks); no flow at times most years.

Maximum stage since about 1900, that of May 13, 1982.

EXTREMES OUTSIDE PERIOD OF RECORD.--A stage of 30.7 ft, present datum, probably occurred in July 1913, from information by State Department of Highways and Public Transportation. The probable date is from published records for discontinued station 08059500, located 9.7 mi downstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 415 ft<sup>3</sup>/s Apr. 13 at 1700 hours (gage height, 16.62 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	25	1.6	3.0	18	26	8.4	13	14	2.5	35	.32
2	.00	4.0	1.6	3.1	18	28	8.1	11	12	2.3	35	.14
3	.00	1.5	1.7	3.7	17	23	7.5	143	51	2.0	53	.07
4	.00	1.4	1.5	3.8	20	18	7.1	126	42	2.1	109	.08
5	.00	1.6	1.4	3.8	46	17	6.1	196	48	2.1	108	.65
6	.00	2.8	1.0	5.3	60	16	5.9	97	166	2.1	31	.88
7	.00	1.8	.79	10	52	14	6.3	60	104	1.9	1.7	1.1
8	.00	1.6	.89	7.5	43	12	6.4	72	83	1.8	.70	.68
9	.00	3.4	1.1	5.5	36	11	5.8	73	59	1.7	.87	.59
10	.01	5.7	1.2	18	33	10	4.2	64	39	1.5	.26	.48
11	.65	2.9	1.3	29	29	10	4.0	50	31	1.4	.16	.68
12	.19	1.5	1.4	20	27	11	231	38	24	1.3	.18	.55
13	.10	1.0	1.3	18	27	10	201	30	19	1.1	.20	.37
14	.11	.79	1.3	17	24	9.2	136	78	15	1.1	.14	.34
15	.02	.92	1.1	81	20	8.1	93	86	13	1.0	.21	.34
16	.00	.81	1.2	88	17	7.9	64	52	11	1.0	.26	.26
17	.00	.69	1.5	52	18	12	48	37	11	.92	.22	.09
18	52	.88	2.8	46	20	19	39	37	9.5	.94	.12	.05
19	108	1.1	29	132	19	15	33	32	8.3	.95	.07	.05
20	108	1.2	7.2	121	16	13	25	35	7.2	.85	.03	.05
21	109	1.2	2.3	77	14	12	19	38	6.3	.83	.01	.04
22	112	1.2	1.4	59	46	14	16	38	5.8	.91	.00	.02
23	114	2.2	1.1	49	66	12	15	35	7.2	.86	.00	.02
24	111	3.6	1.0	38	48	10	14	72	8.7	.82	.00	.05
25	62	2.0	1.2	33	37	8.8	15	156	6.7	.88	.00	1.9
26	50	1.3	1.4	28	28	9.3	14	96	5.1	.72	.00	3.0
27	49	1.5	1.9	26	24	24	14	78	4.4	7.3	.00	.77
28	52	1.9	2.4	24	22	21	16	59	3.6	104	.00	.28
29	54	2.0	3.3	24	---	16	24	36	3.0	105	.00	.20
30	45	1.9	4.7	22	---	12	18	25	2.8	47	.07	.18
31	33	---	5.1	21	---	9.6	---	18	---	35	.03	---
TOTAL	1060.08	79.39	86.68	1068.7	845	438.9	1104.8	1981	820.6	333.88	376.23	14.23
MEAN	34.2	2.65	2.80	34.5	30.2	14.2	36.8	63.9	27.4	10.8	12.1	.47
MAX	114	25	29	132	66	28	231	196	166	105	109	3.0
MIN	.00	.69	.79	3.0	14	7.9	4.0	11	2.8	.72	.00	.02
AC-FT	2100	157	172	2120	1680	871	2190	3930	1630	662	746	28
CAL YR 1990	TOTAL	47802.27	MEAN	131	MAX	2220	MIN	.00	AC-FT	94820		
WTR YR 1991	TOTAL	8209.49	MEAN	22.5	MAX	231	MIN	.00	AC-FT	16280		

TRINITY RIVER BASIN

08060500 LAVON LAKE NEAR LAVON, TX

LOCATION.--Lat 33°01'54", long 96°28'56", Collin County, Hydrologic Unit 12030106, in right abutment of spillway in dam on East Fork Trinity River, 3,850 ft upstream from St. Louis Southwestern Railway Lines bridge, 4,000 ft upstream from bridge on State Highway 78, 2.9 mi west of Lavon, and 55.9 mi upstream from mouth.

DRAINAGE AREA.--770 mi<sup>2</sup>.

PERIOD OF RECORD.--September 1953 to current year. Prior to October 1970, published as Lavon Reservoir. Water-quality records.--Chemical analyses: October 1969 to September 1974, October 1975 to September 1982.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to Jan. 20, 1954, non-recording gage in the approach channel at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 18,860 ft long, including a 568-foot gated spillway with twelve 40.0- by 28.0-foot tainter gates. The original dam was 9,499 ft long, but conservation capacity was increased to present size in December 1975. Deliberate impoundment began Sept. 14, 1953, and the dam was completed in October 1953. Low-flow outlets consist of five 36-inch-diameter controlled sluice gates. Capacity Table No. 9, now in use, is based on Design Memo, 1970 Conditions. Lake was designed for flood control and water conservation. Water for municipal supply can be released down to elevation 453.0 ft. Flow is affected at times by discharge from the flood-detention pools of 149 floodwater-retarding structures with a combined detention capacity of 69,170 acre-ft. These structures control runoff from 242 mi<sup>2</sup> in the East Fork Trinity River, Pilot Grove, and Sister Grove Creek drainage basins. Gage-height telemeter at station. Figures given herein represent total contents. Data regarding dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	514.0	-
Design flood.....	509.0	921,200
Top of tainter gates.....	503.5	748,200
Top of conservation pool.....	492.0	456,500
Crest of spillway (sill of tainter gates).....	475.5	178,300
Lowest gated outlet (invert).....	453.0	12,700

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 791,000 acre-ft May 3, 1990 (elevation, 504.93 ft); minimum since lake first filled in 1957, 80,150 acre-ft Apr. 17, 1976 (elevation, 465.96 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 503,600 acre-ft Apr. 18 (elevation, 494.13 ft); minimum daily, 385,200 acre-ft Jan. 4 (elevation, 488.47 ft).

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

488.0	376,200	491.0	435,500	494.0	500,600
489.0	395,500	492.0	456,500	495.0	523,700
490.0	415,200	493.0	478,200		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	409600	394900	394500	385600	412200	429000	425100	467400	458500	450900	422100	407500
2	408500	394500	395500	386000	412200	430200	424100	464400	459400	450000	421100	407100
3	410000	393900	395100	385600	412200	429200	424700	469100	460900	449600	420000	407500
4	409400	395700	394100	385200	415000	429000	424300	472400	460700	449000	418600	408500
5	408700	394700	393500	385400	419200	428800	424100	473000	460900	448100	417800	408300
6	407700	394100	393300	387000	422500	429000	423700	473000	460900	446800	417200	407900
7	408100	393900	393000	387300	423900	428600	423500	466700	464100	445800	416000	407500
8	409400	398000	392400	387300	424500	428200	423300	467600	467400	444700	415000	406900
9	409100	397600	392000	389700	424700	427800	423100	467600	467200	443700	414200	406700
10	407900	397000	391600	393300	425100	426900	421900	465000	465400	442200	413400	406100
11	406900	396800	390800	394300	425100	425700	426700	462200	463100	441200	412600	405500
12	406300	396700	390800	394300	424700	426900	464100	459800	460500	440100	412800	404700
13	405100	396300	390800	394100	425100	426300	489400	459200	459000	439500	416400	403900
14	404900	395700	390200	395300	425900	425700	499300	460500	458300	438300	416000	403100
15	404300	395300	390000	399800	424900	425300	501600	462200	457900	437200	415200	402500
16	403300	395300	389800	401600	424100	425100	502500	460900	457900	436000	414400	402300
17	403500	394500	389700	402500	423900	425500	503200	459400	457500	435000	413800	401700
18	402500	393900	389800	404700	425100	425100	503600	459200	457000	433700	413400	401600
19	401600	393700	389300	408900	424700	424700	502500	458500	456600	432500	412600	401000
20	401000	393100	389500	410800	424300	424500	498600	458100	455800	430800	411400	399400
21	401000	394900	389700	411400	425100	424700	493900	458100	454700	429800	411000	398400
22	400200	396500	389100	411400	427100	425500	489800	458300	456400	428600	410400	398000
23	399800	396500	387500	412000	427800	425700	485600	458300	457000	427600	410200	397400
24	399400	395900	386600	412200	428600	425500	482900	463300	456400	426500	409400	398400
25	398800	395300	386400	412400	428400	424900	481200	469600	456000	425900	408700	397600
26	398000	395100	386800	412400	428400	423900	478100	471100	455300	424900	408100	397000
27	397800	396300	386400	412600	428000	426700	477900	469100	454500	424700	407300	396100
28	397200	396300	386200	412400	428200	426900	477000	466100	453000	424900	406500	395300
29	396700	395500	387300	412600	---	426900	475000	463100	452300	424500	406100	394700
30	396100	394500	386800	412600	---	426300	471300	460900	451500	423900	407500	394300
31	395500	---	386000	412400	---	425700	---	459800	---	423100	407300	---
MAX	410000	398000	395500	412600	428600	430200	503600	473000	467400	450900	422100	408500
MIN	395500	393100	386000	385200	412200	423900	421900	458100	451500	423100	406100	394300
(↑)	488.99	488.94	488.50	489.85	490.63	490.51	492.67	492.14	491.75	490.38	489.59	488.93
(Φ)	-15100	-1000	-8500	+26400	+15800	-2500	+45600	-11500	-8300	-28400	-15800	-13000
CAL YR 1990	MAX	780900	MIN	386000	(Φ)	-22700						
WTR YR 1991	MAX	503600	MIN	385200	(Φ)	-16300						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

TRINITY RIVER BASIN

347

08061540 ROWLETT CREEK NEAR SACHSE, TX

LOCATION.--Lat 32°57'35", long 96°36'51", Dallas County, Hydrologic Unit 12030106, on left bank at downstream side of bridge on State Highway 78, 150 ft downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 250 ft downstream from Spring Creek, and 1.5 mi southwest of Sachse.

DRAINAGE AREA.--120 mi<sup>2</sup>.

PERIOD OF RECORD.--March 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is 450.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are fair. There are no known diversions above station. The North Texas Municipal Water District returns sewage effluent into a tributary above this station. Several observations of water temperature were made during the year. Rain gage and gage-height telemeter at station.

AVERAGE DISCHARGE.--23 years (water years 1969-91), 106 ft<sup>3</sup>/s (76,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 31,900 ft<sup>3</sup>/s May 17, 1989 (gage height, 29.62 ft); no flow Aug. 24 to Sept. 2, 1969.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1942, 35.4 ft in 1942, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	0600	*16,300	*27.09	May 24	2200	4,540	21.86
Apr. 13	1500	6,990	24.57				

Minimum daily discharge, 13 ft<sup>3</sup>/s Oct. 7 and Aug. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	17	36	42	78	177	67	83	e77	54	22	219
2	20	19	146	40	75	98	65	81	e287	52	21	627
3	222	19	79	38	75	84	65	e1030	e726	137	20	136
4	34	376	44	37	270	82	63	e347	e103	67	18	61
5	17	48	40	50	259	81	62	e245	e370	55	18	53
6	15	28	39	224	161	77	63	142	e146	51	18	46
7	13	23	35	86	127	e72	64	120	738	49	17	112
8	20	824	33	64	114	71	64	505	274	46	16	110
9	771	334	33	183	107	68	61	186	121	43	64	52
10	45	83	33	543	103	68	57	152	102	41	35	45
11	30	57	32	123	97	69	114	136	98	40	23	41
12	26	49	31	94	92	70	3810	123	90	41	73	38
13	24	44	31	86	92	75	2470	114	80	37	83	37
14	22	40	30	130	85	80	469	838	76	38	51	38
15	20	37	29	593	79	92	221	518	69	38	33	69
16	21	37	43	151	80	87	175	144	82	46	28	52
17	19	35	45	114	81	110	297	110	77	37	23	42
18	23	35	86	241	85	84	290	98	68	35	25	44
19	19	37	42	440	75	77	156	124	65	34	23	284
20	18	35	35	164	71	78	136	86	63	32	19	58
21	25	133	117	128	72	78	130	83	62	32	18	44
22	26	303	e45	114	697	160	131	90	64	32	203	42
23	21	73	33	105	152	81	115	77	1540	32	44	44
24	19	46	32	104	121	74	107	703	111	31	22	305
25	18	40	31	101	106	74	135	1420	77	31	16	82
26	18	50	35	94	96	72	103	e171	71	30	19	50
27	18	188	50	90	92	242	157	e128	67	77	21	42
28	19	67	41	86	89	92	181	e109	62	264	14	38
29	20	43	108	84	---	76	167	e97	60	39	13	37
30	20	32	52	92	---	72	94	e87	66	26	418	37
31	19	---	44	87	---	68	---	e75	---	23	49	---
TOTAL	1624	3152	1510	4528	3631	2789	10089	8222	5892	1590	1467	2885
MEAN	52.4	105	48.7	146	130	90.0	336	265	196	51.3	47.3	96.2
MAX	771	824	146	593	697	242	3810	1420	1540	264	418	627
MIN	13	17	29	37	71	68	57	75	60	23	13	37
AC-FT	3220	6250	3000	8980	7200	5530	20010	16310	11690	3150	2910	5720
CAL YR 1990	TOTAL	72341	MEAN	198	MAX	5870	MIN	13	AC-FT	143500		
WTR YR 1991	TOTAL	47379	MEAN	130	MAX	3810	MIN	13	AC-FT	93980		

e Estimated



TRINITY RIVER BASIN

08061550 LAKE RAY HUBBARD NEAR FORNEY, TX

LOCATION.--Lat 32°48'00", long 96°29'45", Kaufman County, Hydrologic Unit 12030106, near right end of spillway in Forney Dam on East Fork Trinity River, 0.5 mi upstream from Duck Creek, 1.8 mi upstream from bridge on Interstate Highway 20, 3.8 mi northwest of Forney, 24 mi downstream from Lavon Dam, and 31.8 mi upstream from mouth.

DRAINAGE AREA.--1,071 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1968 to current year.  
Water-quality records.--Chemical analyses: October 1969 to September 1979.

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

REMARKS.--The lake is formed by a rolled earthfill dam 12,500 ft long, including a 664-foot gated spillway with fourteen 40- by 28-foot tainter gates. Closure was made in September 1967, but the gates were not closed until Mar. 22, 1978. Low-flow releases are made through three 4.5- by 6.75-foot sluiceways. The lake was built by the city of Dallas for municipal water supply. Flow is affected at times by discharge from the flood-detention pools of 14 floodwater-retarding structures with a combined detention capacity of 12,530 acre-ft. These structures control runoff from 44.5 mi<sup>2</sup> above this station and below Lavon Lake station (08060500). Gage-height telemeter at station. Area and capacity tables are based on surveys made in 1953 and 1959. 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.....	450.0	-
Design flood.....	440.5	611,500
Top of tainter gates.....	437.5	536,700
Top of conservation pool.....	435.5	489,900
Crest of spillway (sill of tainter gates).....	409.5	83,130
Lowest gated outlet (invert).....	388.0	80

COOPERATION.--The area and capacity tables were provided by Forrest and Cotton, Consulting Engineers, for the city of Dallas.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 544,100 acre-ft May 4, 1990 (elevation, 437.81 ft); minimum since first appreciable filling following closure of gates on Mar. 22, 1970, 326,600 acre-ft Sept. 29, 30, 1978 (elevation, 427.48 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 509,900 acre-ft Apr. 12 at 1000 hours (elevation, 436.37 ft); minimum, 458,900 acre-ft Dec. 25 (elevation, 434.11 ft).

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

434.0	456,500	436.0	501,400
435.0	478,600	437.0	524,700

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	467500	460400	464000	461800	483400	490400	487700	487900	489700	486300	467500	465500
2	466200	460200	466800	463300	483600	493100	487000	488800	492700	485400	466600	466400
3	467500	460000	466200	462900	483600	489700	487900	491100	489700	486500	465700	467000
4	467000	462600	464400	461800	487200	489900	487900	488800	489200	485400	465100	467500
5	466400	461300	463700	462900	490800	489200	487700	490400	491100	484700	463700	466800
6	465900	460700	465900	465900	490600	491100	487200	489700	489900	484000	463100	466400
7	466400	460400	463500	465500	490200	490800	487000	489500	490800	483100	462600	466400
8	467700	468600	463100	465100	489900	489900	487200	490400	490800	482500	461300	466200
9	470400	467900	462900	467900	489900	489500	487900	488600	489900	481800	462900	465900
10	468400	467300	462600	472600	490400	488100	486100	488600	490800	480200	462600	465500
11	467900	466800	462000	473300	490400	485600	495400	488800	490600	480000	462000	464800
12	467700	466400	462600	471900	489200	489500	499100	489200	490800	478900	462400	464000
13	466800	465700	463100	471500	490600	489900	496100	488800	490400	478200	463500	463100
14	466800	465100	462400	475000	493600	489000	486700	492400	490200	478200	464000	462900
15	466400	464400	463100	476600	490400	488600	488300	491500	489900	477100	464000	462600
16	465500	465100	462200	477100	489000	488800	489200	489900	490400	476400	463300	463300
17	466800	462900	462200	478000	489700	489200	492200	490600	489700	475500	463500	462400
18	465100	463100	462400	480000	491500	489000	490200	491500	489700	473900	463500	464600
19	464200	462200	462600	482000	491500	488100	489000	490600	489200	472800	462900	463100
20	464200	461300	463100	483400	490400	488800	487900	489900	488300	471900	462200	461800
21	464800	462400	463700	482900	491100	488800	488300	489500	487700	470800	462000	461300
22	463700	465700	462600	482200	491100	489200	489900	489700	491700	469000	464800	461800
23	463500	465300	460900	483100	487900	489500	490200	489200	492000	469300	464600	461800
24	463300	464600	459800	483400	489900	489000	491500	493300	489500	469000	464200	464000
25	462400	464000	460000	483600	491300	488600	489900	491500	489500	468800	463700	462900
26	462200	464200	461100	483100	490600	486700	488300	489900	489200	467900	463100	462900
27	463300	466200	460400	484000	489700	490600	488800	490400	488300	468600	462400	461800
28	461800	465300	460700	483100	490200	489700	487200	490200	487700	469500	462000	461500
29	461300	465100	464000	485600	---	489500	485200	489700	487000	469900	461500	461500
30	461500	463700	463100	484500	---	489000	485800	488800	486500	469300	465100	461500
31	461300	---	462200	483600	---	488100	---	489700	---	468200	464800	---
MAX	470400	468600	466800	485600	493600	493100	499100	493300	492700	486500	467500	467500
MIN	461300	460000	459800	461800	483400	485600	485200	487900	486500	467900	461300	461300
(†)	434.22	434.33	434.26	435.22	435.51	435.42	435.32	435.49	435.35	434.53	434.38	434.23
(Φ)	-7100	+2400	-1500	+21400	+6600	-2100	-2300	+3900	-3200	-18300	-3400	-3300
CAL YR 1990	MAX	535900	MIN	454300	(Φ)	+7000						
WTR YR 1991	MAX	499100	MIN	459800	(Φ)	-6900						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

TRINITY RIVER BASIN

349

08061700 DUCK CREEK NEAR GARLAND, TX

LOCATION.--Lat 32°49'58", long 96°35'43", Dallas County, Hydrologic Unit 12030106, on right bank in the median area between the dual bridges on Belt Line Road, 6.0 mi southeast of Garland, and 7.7 mi upstream from mouth.

DRAINAGE AREA.--31.6 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1958 to current year.

Water-quality records.--Chemical analyses: January 1969 to September 1982. Chemical and biochemical analyses: July 1988 to September 1989. Sediment analyses: January 1979.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 430.02 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1962, at datum 4.00 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are poor. Flow is slightly regulated by several small on-channel dams. There are several small diversions above station including the irrigation of a golf course. Low flows are sustained by effluents from the city of Garland. Record rain gage located at station.

AVERAGE DISCHARGE.--33 years, 33.1 ft<sup>3</sup>/s (14.22 in/yr), 23,980 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,900 ft<sup>3</sup>/s Apr. 16, 1990 (gage height, 21.06 ft, present datum); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1895, 21.5 ft (present datum) June 13, 1949, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 12	0145	*15,700	*20.77	May 24	2400	3,610	17.34
Apr. 13	1245	14,200	20.39	June 23	0345	6,220	18.21

Minimum daily discharge, 1.0 ft<sup>3</sup>/s Oct. 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	1.0	1.4	5.1	5.6	5.8	56	6.6	10	7.5	5.3	3.4	132		
2	1.2	1.4	91	5.4	5.3	13	6.7	9.5	63	4.1	3.1	59		
3	65	1.4	19	6.0	5.0	10	7.6	195	184	18	3.2	14		
4	8.1	e147	7.7	5.0	195	9.2	7.2	81	13	13	3.1	7.2		
5	2.6	e16	6.2	8.0	167	8.8	7.4	43	92	5.6	3.0	5.5		
6	1.9	e4.7	5.8	170	24	8.3	7.3	11	33	4.9	2.4	4.2		
7	1.4	e2.3	5.2	25	12	7.6	9.4	9.6	93	3.5	2.3	31		
8	3.0	e291	4.3	10	10	7.3	7.3	141	35	3.1	2.2	24		
9	351	e126	4.2	166	8.4	7.3	7.4	22	11	2.4	21	5.4		
10	6.5	e29	4.2	422	7.5	6.7	6.5	12	9.4	2.4	12	3.6		
11	3.9	e13	3.6	25	6.9	7.1	71	10	9.2	3.2	5.8	3.1		
12	2.9	e6.7	3.9	11	6.4	7.1	2770	9.2	7.9	2.6	76	2.7		
13	2.5	e4.0	4.0	8.7	6.2	7.6	2300	8.1	6.8	2.3	102	2.7		
14	2.4	2.9	4.1	84	6.1	8.5	99	121	6.0	2.2	58	4.7		
15	2.1	2.8	3.8	81	5.4	12	39	107	7.8	2.0	13	15		
16	2.0	2.9	4.6	13	5.3	12	21	14	29	2.2	7.9	4.5		
17	1.9	2.7	8.9	10	5.4	21	224	10	12	2.7	5.6	3.9		
18	1.9	2.4	34	155	9.4	9.1	190	9.6	7.2	2.7	4.4	10		
19	1.9	2.3	6.5	134	5.9	7.2	78	30	6.0	2.3	3.6	169		
20	1.6	2.5	4.1	16	4.9	7.4	21	16	5.3	2.1	2.5	8.3		
21	5.9	75	10	11	5.1	7.6	16	8.3	5.3	1.9	4.1	4.3		
22	6.1	231	4.5	9.2	275	102	15	8.0	5.6	1.8	228	3.6		
23	2.9	18	3.0	8.7	19	14	14	10	897	1.6	15	3.1		
24	3.7	8.9	2.8	9.7	14	10	13	337	13	42	6.3	91		
25	2.3	7.0	4.0	7.7	11	10	25	408	8.8	20	4.6	12		
26	1.8	15	43	6.7	9.9	9.8	12	19	7.8	10	36	4.1		
27	1.6	91	34	6.2	9.3	70	30	12	7.1	77	13	3.3		
28	1.6	14	7.0	5.6	9.3	13	47	9.3	5.7	206	4.8	2.5		
29	1.6	7.0	67	5.7	---	9.3	27	7.7	4.5	11	4.3	2.2		
30	1.7	5.7	11	7.8	---	8.4	11	7.5	9.2	6.1	378	2.2		
31	1.5	---	5.3	8.7	---	7.1	---	6.3	---	4.1	18	---		
TOTAL	495.5	1135.0	421.8	1447.7	854.5	494.4	6096.4	1702.1	1602.1	468.1	1046.6	638.1		
MEAN	16.0	37.8	13.6	46.7	30.5	15.9	203	54.9	53.4	15.1	33.8	21.3		
MAX	351	291	91	422	275	102	2770	408	897	206	378	169		
MIN	1.0	1.4	2.8	5.0	4.9	6.7	6.5	6.3	4.5	1.6	2.2	2.2		
AC-FT	983	2250	837	2870	1690	981	12090	3380	3180	928	2080	1270		
CFSM	.51	1.20	.43	1.48	.97	.50	6.43	1.74	1.69	.48	1.07	.67		
IN.	.58	1.34	.50	1.70	1.01	.58	7.18	2.00	1.89	.55	1.23	.75		
CAL YR 1990	TOTAL	23121.4	MEAN	63.3	MAX	2680	MIN	1.0	AC-FT	45860	CFSM	2.00	IN.	27.22
WTR YR 1991	TOTAL	16402.3	MEAN	44.9	MAX	2770	MIN	1.0	AC-FT	32530	CFSM	1.42	IN.	19.31

e Estimated

## TRINITY RIVER BASIN

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX

LOCATION.--Lat 32°46'27", long 96°30'12", Kaufman County, Hydrologic Unit 12030106, on right bank 25 ft downstream from bridge on Interstate Highway 20, 0.2 mi downstream from Duck Creek, 1.9 mi downstream from Lake Ray Hubbard Dam, 2.5 mi upstream from Texas and Pacific Railroad Co. bridge, 2.6 mi northwest of Forney, and 30.8 mi upstream from mouth.

DRAINAGE AREA.--1,118 mi<sup>2</sup>, of which 1,071 mi<sup>2</sup> is above Lake Ray Hubbard.

## WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 374.86 ft above National Geodetic Vertical Datum of 1929 (from State Department of Highways and Public Transportation bridge plans). Prior to Aug. 26, 1975, recording gage at 3-foot higher datum located at site 126 ft upstream and 868 ft to left. From Aug. 26, 1975, to May 12, 1977, recording gage at 3-foot higher datum located at site 105 ft downstream. From May 13, 1977, to Sept. 30, 1984, recording gage at 3-foot higher datum at current site.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Flow is regulated by Lake Ray Hubbard (station 08061550) 1.9 mi upstream. Low flow is sustained by sewage effluent discharge from the city of Garland into Duck Creek, which enters the East Fork Trinity River 0.2 mi upstream from this station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--18 years (water years 1974-91), 600 ft<sup>3</sup>/s (434,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,000 ft<sup>3</sup>/s May 3, 1990 (gage height, 22.01 ft), from rating extended above 52,300 ft<sup>3</sup>/s; minimum daily, 13 ft<sup>3</sup>/s Oct. 18, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 38,200 ft<sup>3</sup>/s (calculated from Lake Ray Hubbard release data and incremental discharge values for Duck Creek near Garland, station 08061700) Apr. 13 at about 1300 hours (gage height, about 20.3 ft, from rating table value nearest the calculated peak discharge); minimum daily, 23 ft<sup>3</sup>/s July 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	36	28	45	54	60	288	33	976	248	31	34	122
2	35	25	69	52	56	522	31	971	83	32	32	249
3	51	25	175	48	53	290	34	2250	1580	32	33	119
4	90	126	65	49	127	49	33	2150	478	65	33	58
5	39	149	52	46	414	43	33	2430	357	40	31	43
6	35	38	50	171	637	41	32	2190	1220	33	30	37
7	33	36	46	205	586	46	33	2210	1250	25	30	40
8	33	213	43	90	342	56	33	2390	1770	26	29	104
9	298	688	43	80	82	39	34	2290	1290	33	31	52
10	79	110	43	605	68	35	30	2220	896	34	65	47
11	39	64	43	204	63	37	32	2200	891	33	45	36
12	32	51	41	102	56	31	e12900	1570	892	29	57	34
13	31	42	41	88	46	38	e23400	382	536	27	177	35
14	31	39	39	84	47	35	e8910	178	45	25	184	33
15	37	36	40	315	56	30	e28	1820	37	26	88	55
16	37	33	40	153	56	40	e435	1840	39	26	53	48
17	36	32	45	97	54	43	e1870	1090	70	26	45	43
18	32	31	67	167	50	45	e2150	543	39	27	41	42
19	28	31	67	411	59	32	e2210	692	35	27	34	250
20	27	33	45	156	176	29	e2200	837	35	26	34	121
21	30	32	46	104	541	29	e2210	90	35	25	263	55
22	36	369	65	92	2220	84	e2240	50	35	25	180	45
23	32	178	53	81	881	81	2200	54	2280	25	55	41
24	30	70	50	75	97	39	2010	102	1530	23	45	71
25	38	52	47	73	69	31	2040	5760	63	99	37	179
26	35	46	50	64	262	31	2020	1870	48	43	38	56
27	25	95	124	62	495	53	2030	918	42	42	90	46
28	25	133	60	69	260	323	2030	1590	35	332	46	41
29	39	57	85	74	---	55	2440	1360	31	109	36	41
30	40	46	118	78	---	36	1660	928	34	46	394	39
31	38	---	60	67	---	34	---	665	---	42	140	---
TOTAL	1427	2908	1857	4016	7913	2565	75341	44616	15924	1434	2430	2182
MEAN	46.0	96.9	59.9	130	283	82.7	2511	1439	531	46.3	78.4	72.7
MAX	298	688	175	605	2220	522	23400	5760	2280	332	394	250
MIN	25	25	39	46	46	29	28	50	31	23	29	33
AC-FT	2830	5770	3680	7970	15700	5090	149400	88500	31590	2840	4820	4330
CAL YR 1990	TOTAL	509569	MEAN	1396	MAX	50700	MIN	25	AC-FT	1011000		
WTR YR 1991	TOTAL	162613	MEAN	446	MAX	23400	MIN	23	AC-FT	322500		

e Estimated

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: November 1981 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1981 to current year.

pH: August 1986 to current year.

WATER TEMPERATURE: October 1981 to current year.

DISSOLVED OXYGEN: August 1986 to current year.

INSTRUMENTATION.--Since August 1986, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,100 microsiemens Aug. 29, 1985; minimum, 135 microsiemens Nov. 9, 1990.

pH: Maximum, 8.9 units Aug. 13, 1989; minimum, 6.6 units May 27, 28, 1987.

WATER TEMPERATURE: Maximum, 33.5°C Aug. 31, 1990; minimum, 2.5°C Feb. 4, 1989.

DISSOLVED OXYGEN: Maximum, 14.1 mg/L July 14, 1991; minimum, 3.2 mg/L Aug. 10, 1991.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 782 microsiemens Apr. 5; minimum, 135 microsiemens Nov. 9.

pH: Maximum, 8.6 units Mar. 27, July 25; minimum, 6.9 units Sept. 14.

WATER TEMPERATURE: Maximum, 33.0°C July 14; minimum, 4.5°C Dec. 27.

DISSOLVED OXYGEN: Maximum, 14.1 mg/l July 14; minimum, 3.2 mg/l Aug. 10.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
NOV 20...	0945	33	605	7.4	21.0	6.3	71	4.2	140	45	52	3.3
FEB 13...	1510	46	640	7.7	18.5	8.4	92	3.6	170	39	63	3.5
APR 03...	1130	34	671	7.7	18.5	7.5	81	3.5	170	60	64	3.3
MAY 31...	1040	665	330	7.6	23.5	8.3	98	3.0	130	20	49	2.6
JUL 25...	0920	99	314	7.5	27.0	4.3	54	5.1	92	20	34	1.7
SEP 10...	0840	47	621	7.6	27.5	6.1	77	3.5	150	37	56	3.3
DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
NOV 20...	59	2	10	98	44	62	0.90	8.9	299	5.15	0.050	5.20
FEB 13...	46	2	6.2	130	51	37	0.60	8.6	297	7.97	0.030	8.00
APR 03...	61	2	10	110	57	64	0.90	8.5	336	8.15	0.050	8.20
MAY 31...	16	0.6	4.2	110	23	13	0.40	2.6	179	1.37	0.030	1.40
JUL 25...	20	0.9	4.4	72	33	17	0.60	5.5	160	1.77	0.030	1.80
SEP 10...	56	2	11	120	49	60	1.0	11	317	9.42	0.180	9.60
DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
NOV 20...	0.100	1.7	1.8	5.60	5.50	--	--	--	--	--	--	--
FEB 13...	0.120	1.7	1.8	4.00	4.00	5	51	<0.5	1.0	<5	<3	<10
APR 03...	0.120	2.3	2.4	5.30	5.20	--	--	--	--	--	--	--
MAY 31...	0.040	1.1	1.1	0.470	0.470	--	--	--	--	--	--	--
JUL 25...	0.030	0.97	1.0	1.40	1.00	2	39	0.7	2.0	<5	<3	<10
SEP 10...	1.80	1.8	3.6	4.60	4.60	--	--	--	--	--	--	--

## TRINITY RIVER BASIN

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV 20...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 13...	11	<10	9	12	--	<10	<10	<1	<1.0	660	<6	10
APR 03...	--	--	--	--	--	--	--	--	--	--	--	--
MAY 31...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 25...	88	<10	8	13	<0.1	<10	<10	<1	<1.0	380	8	48
SEP 10...	--	--	--	--	--	--	--	--	--	--	--	--

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	1427	495	273	1050	34	130	49	188	150
NOV. 1990	2908	403	224	1760	24	188	42	330	130
DEC. 1990	1857	524	288	1440	37	186	51	255	160
JAN. 1991	4016	466	258	2800	31	334	47	507	140
FEB. 1991	7913	354	199	4240	19	402	38	820	120
MAR. 1991	2565	464	256	1780	31	214	46	321	140
APR. 1991	75341	287	163	33200	12	2410	33	6780	98
MAY 1991	44616	289	164	19800	12	1450	34	4040	99
JUNE 1991	15924	321	181	7800	15	655	36	1550	110
JULY 1991	1434	526	288	1120	39	150	50	194	160
AUG. 1991	2430	491	271	1780	33	218	49	319	150
SEPT 1991	2182	479	265	1560	32	187	48	282	150
TOTAL	162613	**	**	78300	**	6520	**	15600	**
WTD.AVG.	446	316	178	**	15	**	36	**	110



TRINITY RIVER BASIN

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	542	499	516	595	575	587	590	568	580	567	527	546
2	598	506	563	631	575	602	569	351	541	560	502	526
3	636	377	598	669	579	642	466	305	375	624	538	581
4	495	274	388	---	---	e504	542	471	507	661	580	620
5	563	509	543	---	---	e335	583	548	569	618	570	592
6	609	551	578	---	---	e458	614	584	601	627	294	480
7	605	548	586	---	---	e545	631	602	622	472	307	388
8	549	512	525	606	137	418	608	575	599	580	476	524
9	606	139	319	326	135	237	611	574	594	604	573	590
10	---	---	e425	501	333	421	623	564	592	609	170	287
11	---	---	e535	530	500	509	632	586	614	---	---	e415
12	630	518	585	552	504	537	657	614	636	---	---	e534
13	630	561	602	585	537	569	664	617	646	---	---	e584
14	572	531	559	595	550	571	679	618	653	---	---	e614
15	531	505	518	605	584	598	637	621	630	483	296	384
16	590	522	566	610	590	601	617	569	592	541	425	475
17	619	525	579	659	598	630	584	544	563	583	518	538
18	601	532	567	628	598	615	595	512	562	627	388	514
19	593	540	579	612	547	573	565	519	542	406	274	335
20	615	577	601	613	553	597	602	569	585	516	413	466
21	598	553	582	662	602	633	641	571	609	633	523	561
22	549	466	493	605	206	313	577	542	551	649	597	619
23	569	486	539	477	291	370	552	505	526	664	621	638
24	621	547	595	554	484	500	505	474	491	678	637	655
25	624	573	604	571	535	556	484	475	479	663	615	630
26	610	533	582	549	532	542	477	474	475	672	636	653
27	586	536	570	576	338	508	499	342	398	640	603	626
28	587	564	577	512	302	411	525	449	491	646	512	589
29	577	490	535	554	520	543	563	361	510	633	596	614
30	597	513	565	569	547	560	491	364	438	621	579	596
31	627	561	594	---	---	---	528	495	515	676	591	625
MONTH	636	139	547	669	135	516	679	305	551	678	170	542
e Estimated												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	603	585	592	624	305	464	596	557	570	297	286	292
2	653	610	630	305	297	302	670	619	654	297	290	293
3	687	607	643	480	298	356	695	650	674	358	262	284
4	608	273	515	583	490	537	731	698	713	328	281	287
5	379	270	305	642	596	616	782	680	735	287	276	282
6	390	291	307	662	610	631	741	673	710	288	283	285
7	317	301	306	715	573	659	674	619	653	289	285	287
8	593	311	407	697	499	617	642	609	614	313	272	285
9	625	569	594	638	541	619	694	576	660	290	280	285
10	665	605	625	645	605	627	628	589	609	290	228	284
11	665	583	617	603	574	591	675	610	636	289	285	287
12	681	593	626	664	558	623	670	161	303	326	286	300
13	711	552	651	704	518	633	284	249	272	438	313	339
14	692	524	625	694	637	664	314	209	268	573	376	502
15	721	645	688	690	631	662	371	306	349	325	255	282
16	700	611	657	718	629	658	455	309	369	300	291	295
17	632	590	608	628	545	600	346	289	310	324	294	307
18	625	566	580	593	545	566	370	270	291	324	314	319
19	684	589	643	659	609	630	321	276	290	365	292	312
20	694	291	560	674	622	650	294	289	291	382	287	308
21	297	283	292	691	648	669	295	289	292	562	392	491
22	360	248	280	716	291	554	295	287	292	624	573	606
23	374	274	295	556	440	517	297	285	290	619	559	594
24	545	382	469	617	558	585	293	286	289	612	253	552
25	618	532	559	599	563	574	294	285	291	270	243	258
26	632	299	447	660	609	630	290	287	288	320	272	287
27	310	296	303	693	303	558	299	285	291	319	284	302
28	547	305	388	462	301	340	304	280	288	293	279	285
29	---	---	---	635	479	556	287	279	283	302	278	292
30	---	---	---	691	610	653	299	282	293	308	302	305
31	---	---	---	609	566	587	---	---	---	336	308	317
MONTH	721	248	508	718	291	578	782	161	429	624	228	336

## TRINITY RIVER BASIN

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

## SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	579	332	410	---	---	e586	724	640	680	561	361	434
2	617	268	553	---	---	e602	716	682	700	429	248	336
3	339	249	269	703	606	661	703	669	689	495	341	411
4	470	280	349	710	532	587	666	645	656	551	501	523
5	534	255	383	615	573	595	647	619	632	586	532	562
6	262	254	258	642	581	609	623	601	615	592	551	573
7	280	258	268	604	533	571	647	605	634	628	581	602
8	264	253	260	566	517	547	667	635	649	612	392	470
9	276	261	267	641	556	600	678	634	657	552	477	505
10	274	264	268	670	610	634	652	409	513	617	560	583
11	272	260	266	679	610	647	593	509	544	597	569	582
12	267	259	264	692	607	652	553	465	547	607	573	589
13	446	265	327	724	604	665	461	284	368	620	583	608
14	564	461	539	711	594	669	---	---	e367	631	601	614
15	621	570	603	615	551	591	---	---	e471	665	451	550
16	608	494	586	623	576	604	---	---	e557	520	466	494
17	517	453	480	641	600	619	---	---	e590	673	527	622
18	594	526	565	659	631	647	---	---	e601	716	642	687
19	636	579	618	687	643	671	---	---	e598	648	223	406
20	644	619	630	692	663	679	---	---	e582	502	329	424
21	662	632	643	754	637	691	---	---	e595	547	504	526
22	640	619	632	694	597	613	---	---	e382	582	531	562
23	---	---	e406	667	604	647	---	---	e344	548	528	535
24	---	---	e407	669	646	658	---	---	e476	612	213	565
25	---	---	e428	651	284	475	---	---	e537	492	208	354
26	---	---	e520	622	522	589	---	---	e537	617	501	561
27	---	---	e568	601	541	564	583	368	448	668	591	626
28	---	---	e585	609	191	304	567	510	555	621	591	611
29	---	---	e595	548	383	492	606	573	590	661	593	624
30	---	---	e601	608	551	594	625	234	431	599	569	584
31	---	---	---	676	613	647	535	355	430	---	---	---
MONTH	662	249	452	754	191	604	724	234	548	716	208	537

e Estimated

## PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	7.5	7.3	7.4	7.4	7.3	7.4	7.5	7.4	7.5
2	---	---	---	7.5	7.4	7.4	7.6	7.3	7.4	7.5	7.3	7.4
3	---	---	---	7.4	7.3	7.4	7.6	7.5	7.6	7.4	7.3	7.4
4	---	---	---	8.3	7.3	7.7	7.5	7.4	7.5	---	---	---
5	---	---	---	7.9	7.6	7.8	7.5	7.4	7.4	---	---	---
6	---	---	---	7.6	7.4	7.5	7.4	7.4	7.4	---	---	---
7	---	---	---	7.4	7.3	7.3	7.5	7.3	7.4	---	---	---
8	---	---	---	8.4	7.4	7.7	7.5	7.3	7.4	---	---	---
9	---	---	---	8.3	7.7	8.0	7.4	7.3	7.4	---	---	---
10	---	---	---	7.8	7.6	7.7	7.4	7.3	7.3	---	---	---
11	---	---	---	7.7	7.6	7.7	7.3	7.2	7.3	---	---	---
12	7.6	7.3	7.4	7.6	7.5	7.6	---	---	---	---	---	---
13	7.4	7.3	7.3	7.6	7.5	7.5	---	---	---	---	---	---
14	7.3	7.3	7.3	7.5	7.4	7.4	---	---	---	---	---	---
15	7.3	7.2	7.3	7.4	7.3	7.4	---	---	---	---	---	---
16	7.4	7.3	7.3	7.4	7.4	7.4	---	---	---	---	---	---
17	7.4	7.3	7.3	7.4	7.3	7.4	---	---	---	7.6	7.5	7.6
18	7.4	7.3	7.4	7.4	7.3	7.4	---	---	---	7.8	7.3	7.6
19	7.5	7.4	7.4	7.3	7.3	7.3	7.4	7.3	7.3	7.8	7.7	7.7
20	7.5	7.3	7.4	7.3	7.2	7.3	7.4	7.2	7.3	7.8	7.6	7.7
21	7.4	7.3	7.3	7.3	7.2	7.2	7.6	7.2	7.3	7.7	7.6	7.7
22	7.4	7.3	7.4	7.8	7.2	7.6	7.8	7.6	7.7	7.6	7.5	7.6
23	7.6	7.4	7.5	7.6	7.4	7.5	7.8	7.7	7.8	7.7	7.6	7.6
24	7.5	7.3	7.4	7.5	7.4	7.5	7.7	7.5	7.6	7.7	7.5	7.6
25	7.4	7.2	7.4	7.5	7.3	7.4	7.6	7.5	7.5	7.7	7.6	7.6
26	7.6	7.3	7.4	7.3	7.3	7.3	7.5	7.4	7.4	7.7	7.5	7.6
27	7.5	7.3	7.4	7.6	7.3	7.4	8.1	7.4	7.8	7.6	7.6	7.6
28	7.3	7.2	7.2	7.6	7.4	7.5	7.8	7.6	7.7	7.6	7.5	7.6
29	7.4	7.1	7.2	7.5	7.4	7.4	7.8	7.4	7.6	7.7	7.5	7.6
30	7.5	7.2	7.4	7.4	7.3	7.4	7.7	7.5	7.6	7.8	7.7	7.7
31	7.5	7.3	7.4	---	---	---	7.6	7.5	7.6	7.8	7.6	7.7
MONTH	7.6	7.1	7.4	8.4	7.2	7.5	8.1	7.2	7.5	7.8	7.3	7.6

TRINITY RIVER BASIN

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08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.8	7.6	7.7	8.1	7.7	7.9	7.3	7.2	7.3	8.1	7.8	8.0
2	7.7	7.6	7.6	8.2	8.1	8.1	7.3	7.3	7.3	8.0	7.9	7.9
3	7.7	7.6	7.6	8.2	7.8	8.0	7.4	7.3	7.3	8.0	7.8	8.0
4	---	---	---	7.8	7.6	7.7	7.3	7.2	7.3	8.0	7.8	7.9
5	---	---	---	7.8	7.7	7.8	7.3	7.2	7.3	8.1	7.9	8.0
6	---	---	---	7.9	7.7	7.8	7.3	7.2	7.3	8.1	8.0	8.1
7	---	---	---	7.8	7.7	7.8	7.2	7.2	7.2	8.0	8.0	8.0
8	---	---	---	7.8	7.6	7.7	7.3	7.1	7.2	8.1	7.9	8.0
9	---	---	---	7.7	7.6	7.6	7.4	7.1	7.3	8.0	8.0	8.0
10	---	---	---	8.1	7.6	7.7	7.4	7.3	7.3	8.1	7.9	8.0
11	---	---	---	8.3	7.7	7.9	7.3	7.2	7.3	7.9	7.9	7.9
12	---	---	---	7.7	7.6	7.7	8.0	7.2	7.8	8.0	7.9	7.9
13	---	---	---	7.6	7.3	7.5	8.0	7.9	8.0	7.9	7.6	7.8
14	---	---	---	7.4	7.3	7.4	8.0	7.5	7.8	7.9	7.4	7.5
15	---	---	---	7.3	7.2	7.3	7.7	7.6	7.7	7.9	7.8	7.8
16	---	---	---	7.4	7.3	7.4	8.0	7.6	7.7	7.9	7.7	7.8
17	---	---	---	7.5	7.3	7.4	7.8	7.7	7.8	7.9	7.7	7.8
18	---	---	---	7.5	7.3	7.4	7.9	7.6	7.8	8.0	7.7	7.9
19	---	---	---	7.4	7.2	7.3	8.1	7.8	8.0	8.4	7.9	8.1
20	---	---	---	7.4	7.3	7.4	8.0	7.9	8.0	8.3	7.8	8.1
21	---	---	---	7.4	7.3	7.3	8.0	7.9	7.9	7.8	7.3	7.5
22	---	---	---	7.8	7.3	7.5	7.9	7.8	7.8	7.3	7.1	7.2
23	---	---	---	7.6	7.4	7.5	7.8	7.7	7.7	7.3	7.1	7.2
24	---	---	---	7.5	7.4	7.5	7.9	7.6	7.7	8.4	7.2	7.4
25	---	---	---	7.4	7.3	7.3	8.0	7.9	7.9	8.1	7.9	8.0
26	8.2	7.8	8.0	7.4	7.3	7.3	7.9	7.8	7.9	7.9	7.7	7.8
27	8.2	8.1	8.2	8.6	7.2	7.6	7.9	7.8	7.9	7.8	7.6	7.7
28	8.2	7.7	8.0	8.1	7.7	8.0	8.1	7.9	8.0	7.8	7.6	7.7
29	---	---	---	7.6	7.4	7.5	8.3	7.9	8.1	7.7	7.5	7.6
30	---	---	---	7.5	7.4	7.4	8.0	7.8	7.9	7.7	7.5	7.5
31	---	---	---	7.4	7.3	7.3	---	---	---	7.6	7.5	7.5
MONTH	8.2	7.6	7.8	8.6	7.2	7.6	8.3	7.1	7.6	8.4	7.1	7.8
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	7.5	7.2	7.4	---	---	---	---	---	---	7.6	7.5	7.6
2	7.9	7.1	7.3	---	---	---	---	---	---	7.9	7.5	7.7
3	7.9	7.7	7.8	8.1	7.5	7.8	---	---	---	7.8	7.5	7.6
4	7.9	7.6	7.7	8.4	7.5	7.9	---	---	---	7.7	7.3	7.5
5	8.1	7.6	7.9	8.3	7.7	8.0	---	---	---	7.5	7.2	7.3
6	7.9	7.6	7.7	8.0	7.7	7.9	---	---	---	---	---	---
7	8.0	7.4	7.6	7.7	7.5	7.6	7.4	7.3	7.4	---	---	---
8	7.4	7.2	7.3	7.8	7.6	7.7	7.5	7.4	7.4	7.4	7.2	7.3
9	7.5	7.3	7.4	7.6	7.5	7.6	7.5	7.4	7.4	7.3	7.2	7.3
10	7.6	7.4	7.5	7.5	7.4	7.5	7.6	7.5	7.6	7.3	7.2	7.2
11	8.1	7.5	7.8	7.5	7.4	7.4	7.6	7.5	7.5	7.4	7.2	7.3
12	8.0	7.7	7.9	7.5	7.4	7.4	7.6	7.2	7.4	7.3	7.3	7.3
13	---	---	---	---	---	---	7.8	7.5	7.6	7.3	7.0	7.1
14	---	---	---	---	---	---	7.8	7.6	7.7	7.3	6.9	7.0
15	---	---	---	---	---	---	---	---	---	7.4	7.2	7.3
16	---	---	---	---	---	---	---	---	---	7.3	7.1	7.2
17	---	---	---	8.4	7.7	8.0	---	---	---	7.3	7.2	7.2
18	---	---	---	8.0	7.5	7.6	---	---	---	7.3	7.2	7.2
19	---	---	---	7.5	7.4	7.4	---	---	---	7.8	7.3	7.5
20	---	---	---	7.4	7.4	7.4	---	---	---	7.6	7.4	7.5
21	---	---	---	7.5	7.4	7.4	---	---	---	7.5	7.4	7.5
22	---	---	---	7.5	7.4	7.4	---	---	---	7.4	7.3	7.4
23	8.3	7.3	7.9	7.5	7.4	7.5	---	---	---	7.3	7.1	7.2
24	8.0	7.8	7.9	7.5	7.3	7.4	---	---	---	7.7	7.1	7.2
25	---	---	---	8.6	7.3	8.0	---	---	---	7.7	7.4	7.5
26	---	---	---	7.9	7.5	7.6	---	---	---	7.6	7.4	7.5
27	---	---	---	7.6	7.5	7.5	7.5	7.4	7.4	7.5	7.5	7.5
28	---	---	---	7.9	7.5	7.8	7.4	7.3	7.3	7.5	7.4	7.4
29	---	---	---	8.2	7.6	7.9	7.3	7.2	7.3	---	---	---
30	---	---	---	---	---	---	8.1	7.2	7.7	---	---	---
31	---	---	---	---	---	---	7.8	7.5	7.6	---	---	---
MONTH	8.3	7.1	7.6	8.6	7.3	7.6	8.1	7.2	7.5	7.9	6.9	7.4

## TRINITY RIVER BASIN

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	27.5	25.0	26.5	22.5	20.5	21.5	17.5	15.0	16.0	12.0	9.5	11.0
2	27.0	25.5	26.0	22.0	21.0	21.5	18.0	13.5	17.0	13.0	11.5	12.0
3	26.0	24.5	26.0	23.0	21.5	22.5	14.0	13.0	13.5	13.0	10.5	12.0
4	27.0	24.0	25.0	22.5	13.0	18.5	15.0	12.5	14.0	12.0	10.0	11.0
5	26.5	25.0	25.5	16.0	13.0	14.5	15.5	14.0	14.5	13.5	12.0	12.5
6	27.0	25.0	26.0	18.0	15.5	17.0	15.5	14.0	14.5	14.0	7.0	11.0
7	28.0	26.0	27.0	19.5	17.5	18.5	15.0	13.5	14.0	9.5	7.5	8.5
8	28.0	26.0	26.5	19.0	11.0	15.5	15.0	12.5	13.5	12.0	9.0	11.0
9	25.5	17.5	20.5	13.5	11.0	12.5	16.0	13.5	14.5	13.5	12.0	13.0
10	19.5	18.0	18.5	16.5	13.5	15.0	16.5	14.5	15.5	13.0	7.0	8.0
11	21.5	19.0	20.0	19.0	16.5	17.5	17.5	15.0	16.5	---	---	---
12	22.5	19.5	20.5	19.5	18.0	18.5	19.0	16.5	17.5	---	---	---
13	22.5	20.0	21.5	20.0	18.5	19.0	18.0	17.0	17.5	---	---	---
14	24.0	21.0	22.0	20.0	18.5	19.5	17.5	16.5	17.0	---	---	---
15	25.0	22.5	23.5	21.0	19.0	20.0	18.0	16.5	17.5	12.0	11.0	11.5
16	25.5	24.0	24.5	21.0	19.5	20.5	17.5	16.5	16.5	12.5	11.5	12.0
17	24.5	23.5	24.0	20.5	19.0	20.0	17.5	16.5	17.0	14.0	13.0	13.5
18	23.0	20.0	21.5	20.5	18.5	19.5	18.0	14.5	16.5	14.0	10.5	12.5
19	21.0	18.5	19.5	21.5	19.5	20.5	16.0	14.5	15.0	11.5	10.0	11.0
20	22.0	19.5	20.5	22.0	21.0	21.5	17.5	15.5	16.0	12.0	11.0	11.5
21	21.5	19.0	20.5	21.5	21.0	21.5	17.5	9.5	14.5	11.5	11.0	11.5
22	19.0	17.0	18.0	21.5	18.0	19.5	9.5	6.0	7.0	12.5	11.0	12.0
23	20.0	16.5	18.0	19.5	18.0	19.0	7.5	5.5	6.5	12.5	11.5	12.0
24	20.5	18.0	19.0	19.5	18.0	19.0	11.0	7.0	9.0	14.5	12.5	13.5
25	21.5	19.0	20.0	21.0	19.0	20.0	12.5	10.0	11.5	13.5	12.5	13.0
26	20.5	18.5	19.5	22.0	21.0	21.5	12.5	11.0	12.0	13.5	12.5	13.0
27	21.0	18.5	19.5	22.0	19.5	21.5	13.0	4.5	7.0	14.5	12.5	13.5
28	23.5	19.5	21.5	19.5	16.5	18.0	12.0	8.5	10.5	14.0	13.0	14.0
29	23.0	21.0	22.0	17.5	16.0	16.5	16.0	12.0	13.5	16.0	13.0	15.0
30	22.5	21.0	21.5	16.0	15.0	15.5	12.5	8.0	10.0	13.0	10.5	11.0
31	22.5	20.5	21.5	---	---	---	10.0	7.5	9.0	12.0	10.0	11.0
MONTH	28.0	16.5	22.0	23.0	11.0	19.0	19.0	4.5	14.0	16.0	7.0	12.0
DAY	FEBRUARY			MARCH			APRIL			MAY		
1	13.5	11.0	12.5	16.0	12.0	14.5	20.0	17.0	18.5	21.0	19.0	20.0
2	14.5	12.5	13.0	12.5	11.5	12.0	18.5	17.5	18.0	20.5	19.5	20.0
3	15.5	13.5	14.5	13.0	10.5	12.0	20.5	17.5	19.0	20.0	19.5	20.0
4	16.0	12.5	15.0	17.0	13.0	15.0	22.0	19.0	20.5	20.5	20.0	20.0
5	14.0	13.0	13.5	18.5	16.0	17.0	21.5	20.0	21.0	20.5	19.5	20.0
6	13.0	9.0	10.0	19.0	17.0	18.0	22.5	20.0	21.0	20.5	19.5	20.0
7	10.5	8.5	9.5	18.0	15.0	16.5	22.5	20.5	21.5	20.0	19.5	19.5
8	14.5	9.0	11.5	16.0	14.0	15.0	24.0	20.5	22.0	20.5	19.5	20.0
9	15.5	14.5	15.0	17.5	14.5	16.0	23.5	21.5	22.5	20.5	20.0	20.5
10	17.0	15.0	16.0	17.5	15.0	16.5	22.0	19.5	20.5	20.5	20.0	20.5
11	17.0	15.5	16.0	18.0	15.5	16.5	21.5	19.5	20.5	20.5	20.0	20.5
12	17.5	16.0	16.5	19.5	17.0	18.0	21.0	16.5	18.5	22.0	20.0	21.0
13	18.5	16.0	17.0	18.5	16.0	17.5	18.0	17.0	17.5	23.5	21.0	22.0
14	17.5	15.0	16.5	17.5	15.0	16.5	20.5	18.0	19.0	25.0	22.0	24.0
15	15.5	13.0	14.0	15.5	14.0	15.0	21.0	19.0	20.0	22.5	21.0	21.5
16	13.0	12.5	13.0	15.0	14.0	14.5	22.0	18.5	20.5	22.0	21.0	21.5
17	16.5	12.5	14.5	19.0	15.0	17.0	19.0	18.5	18.5	21.5	21.0	21.5
18	19.0	16.0	17.0	18.5	15.5	17.0	19.5	18.5	19.0	23.0	21.5	22.5
19	17.5	15.0	16.5	18.0	16.5	17.5	20.5	19.0	20.0	24.5	22.5	23.0
20	16.5	10.5	13.5	18.0	17.0	17.5	20.5	19.5	20.0	24.5	23.0	23.5
21	11.0	10.0	10.5	20.5	18.0	19.5	20.0	19.0	19.5	26.5	24.0	25.0
22	12.0	10.5	11.0	20.5	17.0	19.0	19.0	19.0	19.0	26.0	25.0	25.5
23	12.5	10.0	11.0	20.0	16.5	18.0	20.0	19.0	19.5	27.0	24.5	25.5
24	16.0	12.5	14.5	20.5	18.0	19.0	19.0	19.0	19.0	27.5	25.0	26.0
25	16.0	13.5	14.5	20.0	18.0	19.0	19.5	18.5	19.0	25.0	24.5	24.5
26	14.0	10.5	12.0	21.5	20.0	20.5	19.5	19.0	19.0	24.5	24.0	24.5
27	11.5	10.5	11.0	21.0	15.5	20.0	20.0	19.0	19.5	24.5	23.5	24.0
28	14.5	10.5	12.0	16.0	15.0	15.5	20.5	20.0	20.0	24.5	23.5	24.0
29	---	---	---	18.5	16.0	17.0	21.0	19.5	20.5	25.0	23.0	24.0
30	---	---	---	18.0	16.0	17.0	20.5	19.0	20.0	24.5	22.5	23.5
31	---	---	---	19.5	16.0	17.5	---	---	---	25.0	22.5	23.5
MONTH	19.0	8.5	13.5	21.5	10.5	17.0	24.0	16.5	20.0	27.5	19.0	22.5

TRINITY RIVER BASIN

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08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	26.0	23.0	24.5	30.0	28.0	29.0	31.5	28.0	29.5	26.5	25.5	26.0
2	27.5	25.0	26.5	32.5	28.0	30.0	30.5	28.5	29.5	26.5	26.0	26.0
3	26.0	24.5	25.0	30.5	28.5	29.5	30.5	28.0	29.0	28.5	25.5	26.5
4	26.5	25.0	25.5	30.5	27.5	29.0	31.0	28.0	29.5	27.5	27.0	27.5
5	27.5	25.5	26.5	30.5	28.0	29.0	30.5	28.5	29.5	28.5	26.5	27.5
6	26.5	25.5	26.0	30.5	28.5	29.5	30.0	28.5	29.5	29.0	27.0	28.0
7	26.5	25.0	25.5	30.5	28.0	29.5	31.0	28.0	29.0	27.5	27.0	27.5
8	25.5	25.0	25.0	30.0	28.0	29.0	30.5	28.0	29.0	27.0	25.5	26.5
9	26.0	25.0	25.0	30.0	28.0	29.0	30.5	28.0	29.0	28.5	26.5	27.5
10	25.5	25.0	25.5	29.5	27.5	28.5	28.5	27.0	28.0	29.0	27.0	28.0
11	27.0	25.0	26.0	29.5	27.5	28.5	28.5	27.0	27.5	30.0	27.0	28.5
12	27.0	25.5	26.5	30.0	27.5	28.5	28.0	26.5	27.5	30.0	27.5	28.5
13	27.5	25.5	26.5	30.5	28.0	29.0	26.0	24.5	25.5	29.5	27.5	28.5
14	28.5	26.5	27.5	33.0	28.0	30.0	25.0	24.5	25.0	29.0	27.5	28.5
15	28.0	26.0	27.0	31.5	29.0	30.0	---	---	---	28.5	27.5	28.0
16	26.5	25.5	26.5	31.5	28.5	29.5	---	---	---	30.0	27.5	28.5
17	28.5	25.0	26.5	32.0	28.5	29.5	---	---	---	29.5	27.5	28.5
18	30.5	26.5	28.5	30.0	28.0	29.0	---	---	---	28.5	25.0	27.5
19	30.0	27.5	28.5	30.0	28.0	28.5	---	---	---	24.5	17.5	20.5
20	29.5	27.5	28.5	30.0	27.5	28.5	---	---	---	21.5	18.5	20.5
21	29.5	27.5	28.5	30.0	27.5	29.0	---	---	---	23.5	21.5	22.5
22	29.5	27.5	28.5	30.0	28.0	29.0	---	---	---	25.0	22.5	23.5
23	28.5	24.5	26.5	30.0	28.0	29.0	---	---	---	26.5	24.0	25.0
24	28.5	26.5	27.5	30.0	28.0	29.0	---	---	---	26.5	22.0	25.0
25	29.0	27.0	28.0	29.0	26.5	28.0	---	---	---	22.5	21.0	22.0
26	29.5	27.5	28.5	29.0	27.5	28.0	---	---	---	24.0	22.0	23.0
27	30.0	28.0	29.0	29.5	27.5	28.5	28.0	26.5	27.5	24.5	22.5	23.0
28	30.0	28.0	29.0	28.0	26.0	26.5	29.0	27.0	28.0	24.5	22.0	23.0
29	29.0	27.5	28.0	31.0	26.5	28.0	29.0	27.5	28.0	25.0	22.0	23.0
30	29.5	27.5	28.5	30.5	28.0	29.0	28.0	24.5	26.0	26.5	22.5	24.0
31	---	---	---	31.5	27.5	29.0	27.0	25.5	26.0	---	---	---
MONTH	30.5	23.0	27.0	33.0	26.0	29.0	31.5	24.5	28.0	30.0	17.5	25.5

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	9.8	5.3	6.8	8.7	6.9	7.7	8.3	7.9	8.1	9.6	9.3	9.5
2	7.4	5.8	6.5	7.7	6.2	6.8	8.8	7.5	7.7	9.3	8.7	9.1
3	6.3	4.6	5.7	7.2	6.2	6.6	8.9	8.4	8.7	9.4	8.5	8.9
4	6.9	4.8	5.8	9.1	6.2	7.2	9.0	8.6	8.8	9.4	9.1	9.4
5	7.1	5.6	6.3	8.5	7.2	7.7	8.8	8.4	8.6	9.0	8.4	8.8
6	6.1	5.2	5.6	7.4	6.9	7.2	8.5	8.2	8.3	10.7	8.2	9.5
7	6.2	5.1	5.5	7.5	6.9	7.1	8.7	8.1	8.4	10.5	10.0	10.2
8	5.9	4.9	5.3	10.0	6.7	8.1	9.0	8.6	8.8	9.9	9.3	9.6
9	7.9	5.3	6.8	---	---	---	8.7	8.2	8.5	9.3	8.8	9.0
10	7.7	7.1	7.4	---	---	---	8.5	7.9	8.2	10.8	9.8	10.3
11	7.6	6.9	7.2	---	---	---	8.4	7.7	8.0	---	---	---
12	7.0	6.4	6.7	---	---	---	7.9	7.4	7.7	---	---	---
13	6.9	6.1	6.5	---	---	---	7.8	7.4	7.6	---	---	---
14	6.7	6.2	6.4	---	---	---	7.9	7.5	7.7	---	---	---
15	6.4	6.0	6.2	7.4	6.8	7.1	7.9	7.5	7.7	---	---	---
16	6.8	5.7	6.2	7.9	6.9	7.2	8.0	7.5	7.7	---	---	---
17	7.1	6.0	6.4	7.5	6.6	7.0	7.9	7.5	7.7	9.4	8.8	9.1
18	7.6	5.8	6.5	7.3	6.8	7.1	8.9	7.4	8.0	9.6	8.6	9.1
19	7.9	6.8	7.3	7.2	6.5	6.8	8.2	7.5	7.7	9.8	9.1	9.5
20	7.5	6.5	7.0	6.8	6.2	6.5	7.5	7.2	7.4	9.4	9.0	9.2
21	7.2	6.5	6.7	6.6	6.0	6.3	8.8	6.8	7.4	9.7	9.3	9.4
22	7.7	7.0	7.4	7.5	5.7	6.5	10.0	8.8	9.5	9.6	9.3	9.4
23	8.8	7.3	8.0	7.0	5.9	6.4	10.4	9.8	10.0	9.6	9.2	9.4
24	8.0	6.9	7.5	7.3	6.7	7.0	10.1	9.5	9.8	9.4	9.1	9.2
25	9.8	6.8	8.1	7.0	6.6	6.8	9.5	8.8	9.0	9.7	9.2	9.4
26	10.5	8.4	9.3	6.8	6.6	6.7	8.9	8.3	8.6	9.6	9.0	9.3
27	10.1	7.8	8.8	6.9	6.4	6.7	11.4	8.3	10.4	9.6	9.2	9.5
28	8.0	6.7	7.4	7.9	6.7	7.4	9.9	9.0	9.5	9.5	8.7	9.0
29	8.8	6.5	7.5	8.4	7.8	8.1	9.2	8.2	8.6	9.2	8.4	8.7
30	9.4	7.2	8.2	8.5	8.2	8.3	9.7	8.5	9.1	10.6	9.2	9.8
31	9.2	7.5	8.3	---	---	---	10.0	9.6	9.8	10.3	9.4	9.9
MONTH	10.5	4.6	6.9	10.0	5.7	7.1	11.4	6.8	8.5	10.8	8.2	9.4



## TRINITY RIVER BASIN

08061750 EAST FORK TRINITY RIVER NEAR FORNEY, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	10.0	9.3	9.7	10.5	8.1	9.4	7.1	6.5	6.8	9.6	8.8	9.2
2	10.5	8.8	9.5	10.4	10.1	10.3	6.9	6.2	6.5	9.1	8.8	8.9
3	10.3	8.9	9.6	10.3	9.3	10.0	7.5	6.5	6.9	9.3	8.4	9.0
4	9.9	9.0	9.3	9.1	8.2	8.6	7.1	6.3	6.7	9.3	8.7	9.1
5	10.0	8.7	9.0	8.3	7.6	7.9	6.9	6.1	6.5	9.6	8.7	9.3
6	12.0	10.8	11.5	8.1	7.2	7.6	6.6	5.5	6.2	9.8	9.4	9.5
7	11.9	11.4	11.6	8.8	7.3	7.9	6.6	6.0	6.2	9.7	9.4	9.5
8	11.6	9.2	10.9	9.8	7.9	8.6	6.8	5.9	6.4	9.4	8.9	9.2
9	9.7	8.8	9.3	9.2	7.9	8.5	6.8	5.7	6.2	9.3	9.0	9.1
10	9.1	8.6	8.8	9.5	7.9	8.5	6.9	6.1	6.5	9.6	9.1	9.3
11	9.5	8.3	8.8	9.4	7.7	8.4	6.7	6.2	6.4	9.4	9.1	9.2
12	9.3	8.4	8.8	8.9	7.2	8.0	9.2	5.2	7.8	9.4	8.8	9.2
13	9.3	8.0	8.5	8.8	7.2	7.9	10.0	9.2	9.5	9.0	8.0	8.6
14	9.2	8.0	8.4	9.0	7.4	8.1	9.9	5.3	7.3	8.4	6.8	7.3
15	9.4	8.0	8.6	8.1	7.1	7.6	7.2	6.2	6.5	9.5	7.7	8.8
16	8.9	8.5	8.7	8.5	7.5	7.9	---	---	---	9.5	9.1	9.3
17	9.1	8.5	8.7	8.6	7.3	7.8	---	---	---	9.3	8.8	9.1
18	9.6	7.8	8.5	8.6	7.1	7.7	---	---	---	9.9	8.7	9.2
19	10.0	7.6	8.5	8.5	7.0	7.6	---	---	---	10.1	8.7	9.2
20	12.7	8.2	9.6	8.0	7.1	7.5	---	---	---	10.0	8.5	9.3
21	11.3	10.9	11.1	7.6	6.8	7.2	---	---	---	8.3	7.6	7.8
22	11.9	10.3	11.3	7.1	5.9	6.5	---	---	---	7.5	6.9	7.2
23	11.7	10.3	11.4	8.1	6.3	7.2	---	---	---	8.6	7.1	7.7
24	10.2	8.8	9.5	8.0	6.8	7.4	---	---	---	9.8	7.8	8.6
25	9.4	8.5	8.9	7.3	6.7	7.0	---	---	---	---	---	---
26	11.0	8.4	9.6	7.1	6.3	6.7	9.4	9.0	9.2	---	---	---
27	11.1	10.6	10.7	9.0	5.6	7.0	9.3	9.0	9.1	---	---	---
28	10.6	9.0	10.1	9.8	7.7	8.9	9.3	8.9	9.1	---	---	---
29	---	---	---	7.6	6.9	7.2	9.8	8.9	9.3	---	---	---
30	---	---	---	7.3	6.7	7.1	9.3	8.7	9.1	---	---	---
31	---	---	---	7.4	6.8	7.0	---	---	---	---	---	---
MONTH	12.7	7.6	9.6	10.5	5.6	7.9	10.0	5.2	7.4	10.1	6.8	8.9
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.9	7.1	7.6	---	---	---	9.0	5.3	6.8	7.4	6.8	7.1
2	7.9	6.6	7.0	---	---	---	8.3	5.6	6.7	7.1	6.4	6.6
3	---	---	---	9.8	6.3	8.1	5.9	4.9	5.4	8.5	6.8	7.5
4	---	---	---	10.4	5.7	7.7	6.0	5.0	5.5	9.4	6.1	7.5
5	---	---	---	11.4	6.4	8.6	6.1	4.8	5.4	10.7	6.6	8.0
6	---	---	---	9.8	7.3	8.5	5.8	4.8	5.3	9.2	6.4	7.5
7	---	---	---	8.1	5.8	7.0	6.0	4.6	5.2	6.1	5.7	5.9
8	---	---	---	8.5	5.5	7.0	6.3	4.5	5.3	6.5	5.5	5.9
9	---	---	---	7.4	5.7	6.5	6.1	4.7	5.3	6.1	5.5	5.8
10	---	---	---	7.3	5.6	6.3	5.5	3.2	4.7	5.9	5.2	5.7
11	---	---	---	7.4	5.2	6.1	6.5	4.7	5.3	6.2	5.0	5.6
12	---	---	---	7.3	4.8	6.0	6.2	5.1	5.5	6.2	5.1	5.7
13	---	---	---	8.0	4.9	6.4	6.1	5.3	5.6	6.2	5.4	5.7
14	---	---	---	14.1	4.9	8.6	6.2	5.7	5.9	6.0	5.2	5.6
15	---	---	---	10.7	7.3	8.8	---	---	---	6.2	5.2	5.7
16	---	---	---	10.3	6.0	8.2	---	---	---	6.2	5.0	5.5
17	---	---	---	12.7	6.4	9.0	---	---	---	7.2	5.3	6.1
18	---	---	---	8.8	5.5	6.7	---	---	---	6.9	5.3	5.9
19	---	---	---	6.3	4.4	5.3	---	---	---	9.1	6.6	7.9
20	---	---	---	6.8	4.5	5.5	---	---	---	8.3	7.5	8.0
21	---	---	---	7.6	4.8	5.9	---	---	---	7.4	6.7	7.2
22	---	---	---	7.2	4.5	5.8	---	---	---	7.0	6.1	6.6
23	---	---	---	6.9	4.5	5.6	---	---	---	6.6	5.7	6.2
24	---	---	---	7.5	4.5	5.8	---	---	---	6.9	5.2	5.7
25	---	---	---	8.1	3.8	5.7	---	---	---	7.1	6.3	6.7
26	---	---	---	6.2	5.0	5.5	---	---	---	7.2	6.3	6.8
27	---	---	---	6.0	4.6	5.2	7.5	5.0	6.4	7.3	6.3	6.8
28	---	---	---	6.0	3.9	5.3	7.2	5.9	6.5	7.2	6.3	6.7
29	---	---	---	8.2	5.0	6.0	6.5	5.9	6.2	7.1	6.4	6.7
30	---	---	---	8.7	5.4	6.7	7.4	5.6	6.5	7.3	6.1	6.7
31	---	---	---	9.6	5.5	7.0	7.2	6.5	6.8	---	---	---
MONTH	7.9	6.6	7.3	14.1	3.8	6.7	9.0	3.2	5.8	10.7	5.0	6.5

TRINITY RIVER BASIN

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08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX

LOCATION.--Lat 32°42'01", long 96°31'52", Dallas County, Hydrologic Unit 12030106, at downstream side of downstream bridge on IH 20 (under construction) about 20 ft right of channel; 100 ft downstream from South Mesquite Creek and 3.7 mi north of intersection of U. S. Highway 175 and Malloy Bridge Road in Seagoville.

PERIOD OF RECORD.--Chemical and biochemical analyses: April 1987 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1987 to current year.

pH: March 1987 to current year.

WATER TEMPERATURE: March 1987 to current year.

DISSOLVED OXYGEN: March 1987 to current year.

INSTRUMENTATION.--Since March 1987, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunction of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD --

SPECIFIC CONDUCTANCE: Maximum, 818 microsiemens Aug. 15, 1987; minimum, 110 microsiemens May 17, 1989.

pH: Maximum, 9.5 units Oct. 30, 1989; minimum 6.6 units Mar. 29, 1988.

WATER TEMPERATURE: Maximum, 32.0°C Aug. 8, 9, 1988, July 14, 1991 minimum, 3.0°C Jan. 8, 1988, Feb. 4-6, 1989.

DISSOLVED OXYGEN: Maximum, 13.2 mg/L Mar. 5, 1989; minimum, 1.0 mg/L May 22, 1989.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 753 microsiemens July 25; minimum, 138 microsiemens June 23.

pH: Maximum, 8.6 units Sept. 24; minimum, 6.9 units May 23, 24.

WATER TEMPERATURE: Maximum, 32.0°C July 14; minimum, 3.5°C Dec. 24.

DISSOLVED OXYGEN: Maximum, 11.3 mg/L Dec. 26; minimum, 3.2 mg/L July 26, Sept. 18.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CaCO3)	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)
NOV 19...	1600	31	559	7.6	20.5	6.9	78	2.0	130	14
JAN 28...	1145	69	617	7.7	12.0	8.8	83	4.4	180	22
APR 03...	0920	34	621	7.6	17.5	6.1	65	7.0	160	27
JUN 10...	1550	896	302	7.7	25.0	7.7	93	1.5	110	11
JUL 25...	1115	99	550	7.7	27.5	4.1	52	7.2	120	20
AUG 29...	1120	36	588	7.6	28.0	5.2	66	9.3	150	35

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS-FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
NOV 19...	45	3.3	58	2	9.4	110	43	53	0.90	8.9
JAN 28...	65	3.9	53	2	7.8	160	55	45	0.70	8.5
APR 03...	57	3.9	55	2	8.7	130	60	53	0.70	8.2
JUN 10...	39	2.8	14	0.6	4.0	98	22	11	0.70	2.6
JUL 25...	41	3.6	54	2	9.3	97	49	64	1.2	7.6
AUG 29...	53	3.1	50	2	9.4	110	51	63	0.80	9.4

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 19...	289	5.09	0.110	5.20	0.450	1.2	1.7	4.90	5.00
JAN 28...	332	4.82	0.080	4.90	2.00	1.2	3.2	3.70	3.80
APR 03...	325	5.84	0.160	6.00	0.910	1.6	2.5	4.50	4.50
JUN 10...	155	0.790	0.050	0.840	0.060	0.64	0.70	0.400	0.370
JUL 25...	288	3.99	0.110	4.10	1.00	1.5	2.5	4.40	3.40
AUG 29...	306	5.73	0.370	6.10	2.60	1.2	3.8	3.40	3.00

TRINITY RIVER BASIN

08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	615	567	590	592	523	557	578	539	560	535	512	524
2	617	564	590	598	534	564	583	250	458	558	535	549
3	634	552	588	612	578	595	451	322	374	563	529	544
4	643	369	517	610	210	474	504	397	441	586	534	562
5	513	412	466	491	254	318	561	506	525	620	582	604
6	574	512	546	441	371	399	576	550	564	583	294	449
7	586	551	573	505	432	462	593	575	564	423	322	369
8	610	563	583	516	147	353	618	585	600	518	422	460
9	607	172	344	272	160	206	614	587	597	558	418	524
10	408	223	321	398	279	334	609	575	590	317	185	243
11	506	411	452	494	407	446	609	595	604	424	290	362
12	567	510	539	498	484	493	630	579	604	510	424	469
13	588	541	564	515	496	506	656	609	632	563	500	529
14	617	598	607	559	506	536	666	611	636	581	288	542
15	602	569	585	584	538	565	666	636	652	383	279	330
16	589	532	556	610	559	585	645	607	616	496	362	422
17	619	539	586	629	580	602	608	588	596	561	448	507
18	626	576	598	598	555	577	597	547	570	571	324	444
19	613	547	583	591	559	571	575	525	549	377	264	311
20	614	553	588	579	555	567	574	531	554	489	368	426
21	608	536	580	624	544	567	597	563	581	557	475	507
22	572	517	552	487	172	252	603	566	583	616	537	570
23	575	518	542	417	263	322	570	540	550	639	580	609
24	555	489	523	498	396	432	548	518	532	698	602	623
25	596	532	562	532	481	504	517	497	504	664	615	640
26	597	577	588	557	537	544	499	405	486	662	612	638
27	598	563	582	568	529	543	487	376	429	663	621	640
28	591	539	561	582	350	458	478	372	423	645	617	632
29	588	558	570	545	432	482	494	422	464	637	579	611
30	592	527	564	562	536	549	511	388	446	652	623	633
31	570	515	543	---	---	---	523	455	484	650	603	626
MONTH	643	172	547	629	147	479	666	250	542	698	185	513
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	668	612	641	605	389	479	634	590	607	323	310	317
2	644	590	622	385	343	364	619	564	593	318	289	301
3	670	616	640	458	322	375	693	570	630	386	276	309
4	683	314	572	546	436	471	680	631	659	309	287	294
5	414	293	324	610	543	563	722	650	681	317	277	294
6	377	328	343	637	609	623	722	673	701	302	288	295
7	372	343	355	653	620	634	702	664	681	325	289	301
8	478	352	386	680	610	659	675	642	653	368	248	300
9	609	468	532	694	582	645	654	610	631	320	291	303
10	615	570	599	666	608	639	657	571	627	329	297	310
11	655	569	612	668	638	652	637	580	612	308	297	303
12	630	589	604	667	630	645	623	194	276	355	293	305
13	638	598	624	690	630	670	298	236	272	413	338	359
14	689	643	664	730	602	681	299	236	280	548	239	426
15	664	554	625	721	697	714	337	259	294	497	266	328
16	699	659	681	719	692	708	378	319	338	345	293	312
17	678	638	662	708	672	694	329	303	318	391	308	342
18	662	618	643	687	615	642	312	268	293	415	364	389
19	657	605	631	653	608	626	318	289	304	393	343	369
20	675	608	646	690	641	669	312	299	305	351	317	334
21	673	328	425	723	650	683	314	294	305	530	350	431
22	552	220	322	721	674	700	309	295	304	---	---	e600
23	344	271	298	741	428	519	312	289	303	---	---	e610
24	518	349	419	611	564	588	316	295	306	---	---	e560
25	596	479	531	669	606	628	327	304	314	394	227	272
26	618	393	548	665	621	641	314	298	303	330	267	290
27	396	340	370	709	623	658	309	295	302	352	299	329
28	487	331	395	553	350	403	324	303	315	318	293	307
29	---	---	---	538	409	463	319	291	303	336	291	308
30	---	---	---	616	547	574	327	288	304	334	313	324
31	---	---	---	653	608	631	---	---	---	382	312	341
MONTH	699	220	525	741	322	601	722	194	427	548	227	350

e Estimated

TRINITY RIVER BASIN

08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	e400	656	617	638	---	---	e660	526	369	436
2	---	---	e550	663	614	637	---	---	e690	437	264	342
3	---	---	e280	670	590	635	---	---	e700	448	297	380
4	438	299	333	681	614	650	---	---	e670	554	377	456
5	503	259	446	677	578	611	---	---	e640	621	525	572
6	323	270	286	629	592	608	---	---	e620	639	579	619
7	319	283	298	628	581	602	---	---	e630	625	492	594
8	303	274	291	631	598	609	---	---	e640	578	477	524
9	323	283	303	627	579	600	---	---	e650	615	430	510
10	325	288	305	656	570	617	---	---	e530	663	530	595
11	309	279	298	685	612	645	---	---	e540	643	582	624
12	306	282	294	683	642	659	---	---	e540	659	566	620
13	386	279	310	683	636	659	---	---	e350	686	612	648
14	515	400	447	677	622	651	403	313	365	676	623	658
15	596	481	529	685	660	672	501	364	431	653	549	612
16	612	550	581	681	611	631	592	465	521	641	546	599
17	606	562	587	642	602	623	607	562	584	640	508	570
18	592	479	546	666	595	634	604	566	586	712	569	639
19	623	523	579	675	628	651	615	586	603	706	307	528
20	661	561	609	695	639	662	614	566	587	475	283	365
21	680	611	646	677	645	660	630	552	590	598	459	518
22	690	630	659	698	649	673	633	222	440	622	549	582
23	652	138	324	694	653	673	422	243	322	667	578	619
24	345	255	283	653	582	618	506	388	443	667	254	533
25	518	361	432	753	293	550	537	493	518	529	310	396
26	597	492	538	634	489	544	554	217	509	593	399	486
27	629	569	596	634	532	574	528	246	435	643	541	592
28	632	599	617	678	517	620	585	392	489	688	594	640
29	654	585	626	---	---	e450	652	538	595	660	599	629
30	677	600	628	---	---	e570	640	171	347	694	600	640
31	---	---	---	---	---	e630	424	240	337	---	---	---
MONTH	690	138	454	753	293	621	652	171	534	712	254	551

e Estimated

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.5	7.4	7.5	7.7	7.5	7.6	7.7	7.5	7.6	---	---	---
2	7.5	7.3	7.4	7.6	7.5	7.5	8.0	7.5	7.7	---	---	---
3	7.5	7.4	7.4	7.5	7.4	7.5	7.6	7.5	7.6	---	---	---
4	7.7	7.4	7.5	8.3	7.4	7.6	7.6	7.5	7.6	7.7	7.6	7.6
5	7.6	7.5	7.6	7.9	7.6	7.8	7.6	7.5	7.6	7.6	7.5	7.6
6	7.6	7.5	7.5	7.6	7.5	7.6	7.6	7.6	7.6	8.0	7.6	7.8
7	7.5	7.4	7.5	7.6	7.5	7.6	7.6	7.6	7.6	---	---	---
8	7.5	7.4	7.4	8.3	7.5	7.8	7.6	7.5	7.6	---	---	---
9	8.4	7.4	7.9	8.3	7.8	8.1	7.6	7.5	7.6	---	---	---
10	8.0	7.7	7.8	7.8	7.6	7.7	7.5	7.5	7.5	---	---	---
11	7.6	7.5	7.6	7.7	7.6	7.6	7.6	7.5	7.5	---	---	---
12	7.6	7.5	7.5	7.7	7.5	7.6	7.5	7.3	7.4	---	---	---
13	7.6	7.5	7.5	7.6	7.5	7.6	---	---	---	---	---	---
14	7.6	7.4	7.5	7.7	7.5	7.6	---	---	---	---	---	---
15	7.6	7.5	7.5	7.7	7.6	7.6	---	---	---	---	---	---
16	7.5	7.5	7.5	7.6	7.5	7.6	---	---	---	---	---	---
17	7.6	7.4	7.5	7.6	7.6	7.6	---	---	---	7.9	7.8	7.8
18	7.5	7.5	7.5	7.6	7.6	7.6	---	---	---	8.1	7.8	8.0
19	7.6	7.5	7.5	7.6	7.5	7.6	---	---	---	8.0	7.9	8.0
20	7.6	7.5	7.5	7.6	7.5	7.5	7.5	7.4	7.5	7.9	7.9	7.9
21	7.7	7.5	7.6	7.7	7.6	7.6	7.5	7.4	7.5	7.9	7.9	7.9
22	7.7	7.5	7.6	8.2	7.8	8.0	7.5	7.3	7.4	8.0	7.9	7.9
23	7.6	7.5	7.5	7.9	7.7	7.8	7.5	7.3	7.4	7.9	7.8	7.9
24	7.7	7.5	7.6	7.8	7.7	7.7	7.4	7.3	7.4	7.9	7.8	7.9
25	7.6	7.5	7.6	7.7	7.7	7.7	---	---	---	7.9	7.8	7.9
26	7.6	7.5	7.6	7.7	7.6	7.7	---	---	---	7.8	7.8	7.8
27	7.7	7.5	7.6	7.8	7.6	7.7	---	---	---	7.8	7.7	7.8
28	7.7	7.4	7.5	7.7	7.6	7.7	---	---	---	7.7	7.6	7.7
29	7.6	7.5	7.5	7.7	7.6	7.6	---	---	---	7.7	7.6	7.6
30	7.6	7.4	7.5	7.7	7.6	7.6	---	---	---	7.7	7.6	7.7
31	7.6	7.5	7.6	---	---	---	---	---	---	7.8	7.7	7.7
MONTH	8.4	7.3	7.5	8.3	7.4	7.7	8.0	7.3	7.5	8.1	7.5	7.8

## TRINITY RIVER BASIN

08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.7	7.6	7.7	---	---	---	7.5	7.3	7.4	7.8	7.5	7.7
2	7.7	7.6	7.6	---	---	---	7.5	7.3	7.4	7.8	7.7	7.7
3	7.6	7.5	7.5	---	---	---	7.5	7.3	7.4	7.8	7.6	7.7
4	7.8	7.4	7.6	---	---	---	7.5	7.3	7.4	7.8	7.6	7.7
5	7.8	7.6	7.7	---	---	---	7.5	7.3	7.4	7.8	7.7	7.8
6	---	---	---	---	---	---	7.4	7.3	7.3	7.9	7.8	7.8
7	---	---	---	---	---	---	7.3	7.2	7.3	7.9	7.7	7.8
8	---	---	---	7.8	7.7	7.8	7.2	7.1	7.2	8.0	7.7	7.8
9	---	---	---	7.9	7.7	7.8	7.2	7.1	7.2	8.0	7.9	8.0
10	---	---	---	7.8	7.7	7.8	7.2	7.2	7.2	8.1	8.0	8.1
11	---	---	---	7.8	7.7	7.7	7.3	7.1	7.2	8.1	8.0	8.0
12	---	---	---	7.8	7.6	7.7	8.0	7.3	7.7	8.1	7.9	8.0
13	---	---	---	7.6	7.6	7.6	7.9	7.5	7.6	8.0	7.8	7.9
14	---	---	---	7.6	7.5	7.6	7.8	7.5	7.7	7.9	7.6	7.7
15	---	---	---	7.5	7.4	7.5	7.5	7.3	7.4	8.1	7.8	8.0
16	---	---	---	7.5	7.4	7.5	7.8	7.4	7.5	8.1	8.0	8.1
17	---	---	---	7.5	7.4	7.5	7.8	7.7	7.8	8.1	7.9	8.0
18	---	---	---	7.5	7.3	7.4	7.8	7.7	7.7	8.0	7.9	8.0
19	---	---	---	7.5	7.3	7.4	7.8	7.7	7.7	8.3	8.0	8.1
20	---	---	---	---	---	---	7.9	7.8	7.8	8.3	8.0	8.2
21	---	---	---	---	---	---	7.9	7.7	7.8	8.0	7.6	7.8
22	---	---	---	---	---	---	7.8	7.7	7.7	8.2	7.2	7.4
23	---	---	---	---	---	---	7.6	7.5	7.6	7.4	6.9	7.2
24	---	---	---	---	---	---	7.6	7.6	7.6	7.8	6.9	7.3
25	---	---	---	---	---	---	7.7	7.6	7.7	8.1	7.8	7.9
26	7.9	7.7	7.8	---	---	---	7.7	7.6	7.6	7.9	7.8	7.9
27	---	---	---	---	---	---	7.6	7.5	7.6	8.0	7.8	7.9
28	---	---	---	---	---	---	7.6	7.5	7.6	8.0	7.8	7.9
29	---	---	---	7.7	7.5	7.6	7.6	7.5	7.6	7.9	7.8	7.9
30	---	---	---	7.5	7.4	7.5	7.7	7.5	7.6	7.8	7.8	7.8
31	---	---	---	7.5	7.4	7.4	---	---	---	7.8	7.7	7.8
MONTH	7.9	7.4	7.6	7.9	7.3	7.6	8.0	7.1	7.5	8.3	6.9	7.8
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.5	7.5	7.7	7.8	7.7	7.7	---	---	---	7.8	7.7	7.8
2	7.8	7.1	7.6	7.8	7.6	7.7	---	---	---	7.9	7.7	7.8
3	8.1	7.6	7.9	7.7	7.6	7.6	---	---	---	7.8	7.7	7.7
4	7.9	7.6	7.8	7.7	7.6	7.7	---	---	---	7.8	7.6	7.7
5	8.1	7.5	7.8	7.8	7.6	7.7	---	---	---	7.7	7.5	7.6
6	8.0	7.7	7.8	7.8	7.7	7.7	---	---	---	7.5	7.4	7.5
7	7.9	7.8	7.8	7.8	7.6	7.7	---	---	---	7.4	7.2	7.3
8	7.8	7.7	7.8	7.8	7.5	7.6	---	---	---	7.4	7.2	7.3
9	7.8	7.7	7.7	7.8	7.5	7.6	---	---	---	7.2	7.1	7.2
10	7.9	7.6	7.7	7.7	7.5	7.6	---	---	---	7.4	7.2	7.3
11	8.0	7.8	7.9	7.7	7.4	7.6	---	---	---	7.5	7.3	7.4
12	8.1	7.9	8.0	7.7	7.5	7.6	---	---	---	7.4	7.3	7.3
13	---	---	---	7.8	7.5	7.6	---	---	---	7.5	7.3	7.4
14	---	---	---	7.8	7.6	7.7	7.7	7.6	7.6	7.4	7.3	7.4
15	---	---	---	7.9	7.6	7.7	7.6	7.5	7.5	7.4	7.3	7.4
16	---	---	---	7.9	7.6	7.7	7.5	7.3	7.4	7.5	7.3	7.4
17	---	---	---	7.6	7.1	7.4	7.7	7.4	7.5	7.4	7.3	7.4
18	---	---	---	7.5	7.1	7.4	8.0	7.3	7.5	---	---	---
19	7.5	7.3	7.4	7.4	7.2	7.3	8.2	7.3	7.7	---	---	---
20	7.5	7.3	7.4	7.3	7.1	7.2	8.2	7.4	7.7	---	---	---
21	7.7	7.5	7.6	7.4	7.1	7.2	7.7	7.4	7.5	---	---	---
22	7.6	7.5	7.5	7.1	7.0	7.1	7.8	7.3	7.5	---	---	---
23	8.3	7.5	7.8	7.1	7.1	7.1	7.6	7.4	7.5	7.4	7.2	7.3
24	7.7	7.6	7.7	7.2	7.1	7.1	7.6	7.5	7.6	8.6	7.0	7.4
25	7.8	7.5	7.6	7.5	7.1	7.2	7.6	7.5	7.6	7.7	7.5	7.6
26	7.6	7.5	7.6	7.2	7.1	7.2	7.9	7.5	7.6	7.5	7.4	7.5
27	7.6	7.5	7.6	7.4	7.1	7.3	7.8	7.5	7.6	7.5	7.4	7.4
28	7.7	7.6	7.7	7.6	7.3	7.4	7.6	7.3	7.5	7.4	7.3	7.3
29	7.8	7.7	7.7	---	---	---	7.7	7.5	7.6	7.3	7.2	7.3
30	7.8	7.7	7.7	---	---	---	8.4	7.7	8.0	7.3	7.1	7.2
31	---	---	---	---	---	---	8.0	7.7	7.8	---	---	---
MONTH	8.5	7.1	7.7	7.9	7.0	7.5	8.4	7.3	7.6	8.6	7.0	7.4



TRINITY RIVER BASIN

08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	26.5	24.5	25.5	22.0	20.0	21.0	16.5	13.5	15.0	9.5	6.5	8.0
2	25.5	24.5	25.0	22.0	20.5	21.0	16.5	12.5	14.5	11.5	9.0	10.0
3	25.5	24.5	25.0	23.0	21.0	22.0	14.5	13.0	13.5	11.0	9.0	10.0
4	25.0	24.0	25.0	22.5	13.5	18.5	13.0	11.5	12.5	11.0	9.0	10.0
5	26.0	23.5	24.5	16.5	13.0	14.0	13.0	10.5	12.0	12.0	9.5	11.0
6	26.0	24.0	25.0	17.0	14.0	15.5	14.0	11.5	13.0	11.5	7.5	9.0
7	27.0	25.5	26.0	17.5	16.0	17.0	13.5	12.0	13.0	8.5	7.0	8.0
8	27.0	25.0	26.0	17.5	11.5	14.5	13.5	10.5	12.5	10.0	7.5	9.0
9	25.0	17.0	20.0	12.5	11.0	11.5	14.0	11.0	13.0	11.5	7.5	10.5
10	18.5	17.0	17.5	14.5	12.5	13.0	15.0	12.0	13.5	8.0	7.0	7.5
11	19.5	17.0	18.0	16.5	14.0	15.5	15.5	13.0	14.5	9.0	7.5	8.5
12	20.0	17.5	19.0	18.0	15.5	17.0	17.5	15.0	16.0	9.5	7.5	8.5
13	21.0	18.0	19.5	18.5	16.0	17.5	17.0	15.5	16.5	11.0	7.5	9.5
14	22.5	19.0	21.0	18.5	16.5	17.5	16.5	15.0	16.0	12.5	10.0	11.0
15	23.5	21.0	22.5	19.0	17.0	18.0	17.0	15.5	16.5	11.5	10.5	11.0
16	24.5	22.5	23.5	20.0	18.0	19.0	16.0	14.5	15.5	11.5	9.0	10.5
17	25.0	23.0	24.0	19.5	18.0	19.0	17.0	14.5	16.0	13.0	10.0	11.5
18	23.5	21.0	22.0	19.5	17.5	19.0	17.0	14.5	16.0	13.0	9.5	11.0
19	21.0	18.5	20.0	20.5	18.5	19.5	15.0	14.0	15.0	11.0	9.0	10.0
20	21.5	18.0	20.0	21.0	19.5	20.5	16.0	13.5	15.0	11.0	10.0	11.0
21	21.5	18.0	19.5	21.5	20.0	21.0	16.5	11.5	13.5	11.0	9.5	10.0
22	19.0	16.5	18.0	20.5	18.0	19.0	11.0	8.0	9.0	10.0	9.0	9.5
23	19.0	16.0	17.5	18.5	17.0	18.0	8.0	4.0	6.5	11.0	10.0	10.5
24	19.0	15.5	17.5	18.5	16.5	17.5	8.5	3.5	6.5	12.0	10.5	11.5
25	19.0	16.5	18.0	20.0	17.5	19.0	10.0	5.5	8.0	12.5	10.5	11.5
26	19.5	17.0	18.5	21.0	20.0	20.5	11.0	4.0	8.5	12.0	11.0	11.5
27	21.0	17.0	19.0	21.5	20.0	21.0	10.5	5.5	7.5	13.5	11.0	12.0
28	21.5	17.5	20.0	19.5	16.5	18.0	10.0	7.0	8.5	13.0	11.5	12.5
29	21.5	18.5	20.5	17.0	14.5	15.5	13.0	10.0	11.5	14.5	13.0	13.5
30	22.0	19.5	21.0	15.0	13.0	14.0	12.0	9.5	10.5	13.0	11.0	12.0
31	22.0	19.5	21.0	---	---	---	9.5	7.0	8.5	11.5	9.0	10.5
MONTH	27.0	15.5	21.5	23.0	11.0	18.0	17.5	3.5	12.5	14.5	6.5	10.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	12.0	9.5	11.0	---	---	---	19.0	15.0	17.5	20.5	19.0	20.0
2	13.5	10.0	12.0	---	---	---	18.0	17.0	18.0	20.5	19.5	20.0
3	15.0	11.5	13.5	---	---	---	20.0	17.5	19.0	20.5	19.5	20.0
4	15.5	12.5	14.5	---	---	---	21.0	19.0	19.5	20.5	19.5	20.0
5	14.5	13.0	14.0	---	---	---	20.5	19.0	20.0	20.5	19.5	19.5
6	14.0	11.5	13.0	---	---	---	21.5	20.0	21.0	20.5	18.5	19.5
7	11.5	10.0	11.0	---	---	---	22.5	20.5	21.5	20.0	19.0	19.5
8	13.0	10.0	11.0	17.0	14.0	15.5	23.5	21.0	22.5	20.0	19.0	19.5
9	15.5	12.0	13.5	17.0	13.5	15.5	24.0	22.0	23.0	20.5	20.0	20.5
10	16.5	14.0	15.5	17.0	13.5	15.5	22.0	20.0	21.0	21.0	20.0	20.5
11	17.0	14.5	16.0	18.0	15.0	16.5	21.5	20.5	21.0	21.5	20.5	21.0
12	18.0	16.0	17.0	19.5	17.5	18.0	22.5	19.5	21.0	23.0	20.5	21.5
13	18.0	17.0	17.5	18.5	16.5	17.5	19.5	18.0	18.5	23.0	22.0	22.5
14	17.5	15.0	16.5	17.5	15.0	16.5	20.0	17.5	19.0	25.5	21.5	23.5
15	16.5	12.5	14.5	16.0	14.5	15.0	21.5	18.5	20.0	24.0	22.0	22.5
16	14.5	10.5	12.0	15.5	13.5	14.5	22.0	20.5	21.0	22.5	21.0	22.0
17	14.5	10.5	12.0	18.0	15.0	16.0	22.0	19.0	20.0	22.5	21.0	21.5
18	18.0	14.5	15.5	18.5	15.5	17.0	20.0	18.5	19.5	23.5	21.5	22.5
19	18.0	15.5	17.0	18.0	15.5	17.0	20.5	19.0	19.5	24.5	22.5	23.5
20	16.0	13.5	15.0	18.0	16.5	17.5	20.0	19.0	19.5	24.5	23.0	24.0
21	15.0	10.5	12.0	20.5	18.0	19.0	19.5	18.5	19.0	26.0	24.0	24.5
22	12.5	9.5	11.5	20.0	19.5	20.0	18.5	18.5	18.5	---	---	---
23	12.0	9.5	11.0	19.5	17.0	18.0	19.5	18.0	18.5	---	---	---
24	15.0	12.0	13.5	20.5	17.0	18.5	19.5	18.5	19.0	---	---	---
25	---	---	---	20.0	18.0	19.0	19.5	18.5	19.0	---	---	---
26	---	---	---	21.0	19.5	20.5	20.0	18.5	19.0	25.5	24.0	25.0
27	---	---	---	21.0	20.5	21.0	20.0	19.0	19.5	25.5	25.0	25.0
28	---	---	---	20.0	16.0	17.0	20.5	19.5	20.0	25.5	23.5	24.5
29	---	---	---	17.5	15.5	16.5	21.0	19.5	20.0	26.0	24.0	25.0
30	---	---	---	18.0	15.0	16.5	21.0	19.0	20.0	25.0	23.0	24.0
31	---	---	---	18.5	15.0	16.5	---	---	---	25.5	23.0	24.0
MONTH	18.0	9.5	13.5	21.0	13.5	17.5	24.0	15.0	20.0	26.0	18.5	22.0

## TRINITY RIVER BASIN

08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX--Continued

## WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	26.5	24.0	25.0	31.0	28.5	29.5	---	---	---	27.5	26.0	27.0
2	---	---	---	31.5	28.0	29.5	---	---	---	27.0	26.5	27.0
3	---	---	---	31.0	27.5	29.0	---	---	---	28.0	26.0	27.0
4	26.5	25.0	25.5	30.5	28.5	29.5	---	---	---	28.5	26.5	27.5
5	27.5	26.0	26.5	30.0	27.5	29.0	---	---	---	28.5	26.5	27.5
6	26.5	25.0	26.0	30.5	27.5	29.0	---	---	---	29.0	27.0	28.0
7	26.5	25.5	26.0	30.5	28.0	29.0	---	---	---	28.5	26.5	28.0
8	26.0	25.0	25.5	29.5	27.5	29.0	---	---	---	28.0	26.0	27.0
9	26.0	24.5	25.5	30.0	27.5	28.5	---	---	---	28.5	26.5	27.5
10	26.0	25.0	25.0	30.0	27.5	29.0	---	---	---	29.0	27.0	28.0
11	26.0	24.5	25.0	30.0	27.0	28.5	---	---	---	29.5	27.5	28.5
12	27.0	25.5	26.0	31.0	27.5	29.5	---	---	---	29.5	27.5	28.5
13	26.5	25.0	26.0	31.5	28.0	30.0	---	---	---	29.5	27.5	28.5
14	27.5	26.0	27.0	32.0	27.5	30.0	26.0	25.0	25.5	29.5	27.5	28.5
15	27.5	25.0	26.5	31.0	28.0	29.5	27.5	25.0	26.5	29.0	27.5	28.0
16	27.0	25.5	26.0	30.5	28.5	29.5	29.0	26.5	27.5	29.0	27.0	28.0
17	27.0	24.5	25.5	30.0	27.5	29.0	29.5	27.5	28.5	29.0	27.0	28.0
18	28.0	25.0	26.5	30.0	27.5	28.5	30.0	27.5	29.0	28.0	25.5	27.5
19	28.5	26.0	27.5	30.5	28.0	29.0	30.0	27.5	28.5	25.5	18.5	22.0
20	29.0	27.0	28.0	30.0	28.0	29.0	30.0	27.5	29.0	20.0	17.5	19.0
21	29.0	27.0	28.0	30.5	28.0	29.0	29.0	28.0	28.5	23.0	19.0	21.0
22	29.0	27.0	28.0	30.5	28.5	29.5	28.0	25.5	26.5	24.0	20.5	22.5
23	27.5	22.5	25.0	30.0	28.5	29.5	27.5	25.0	26.5	24.5	22.0	23.5
24	27.5	26.0	26.5	30.0	28.5	29.0	28.5	26.5	27.5	25.5	21.0	23.5
25	29.0	26.5	27.5	30.0	26.0	28.0	29.0	27.0	28.0	21.0	20.0	21.0
26	30.5	27.0	28.5	28.5	26.5	27.5	29.0	26.0	28.0	24.0	21.0	22.5
27	31.0	28.0	29.5	28.5	26.5	27.5	29.0	26.5	27.5	24.0	21.5	23.0
28	31.0	28.0	29.5	29.0	26.5	28.0	29.0	27.0	28.0	24.5	21.5	23.0
29	30.5	27.5	28.5	---	---	---	29.0	27.5	28.5	24.5	21.0	23.0
30	31.0	28.5	29.5	---	---	---	28.5	24.5	26.5	25.0	21.5	23.5
31	---	---	---	---	---	---	27.0	25.5	26.5	---	---	---
MONTH	31.0	22.5	26.5	32.0	26.0	29.0	30.0	24.5	27.5	29.5	17.5	25.5

## OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	6.5	---	---	8.2	5.7	6.8	8.2	7.6	8.0	10.0	9.4	9.8
2	5.8	---	---	7.4	5.5	6.2	9.6	7.3	8.3	9.5	9.0	9.3
3	5.8	---	---	6.4	4.9	5.6	8.6	8.2	8.5	9.3	9.0	9.2
4	4.9	---	---	8.8	5.0	6.3	9.2	8.5	8.9	9.2	9.0	9.1
5	5.9	---	---	7.8	6.6	7.4	9.1	8.3	8.8	9.1	8.6	8.9
6	6.0	---	---	7.5	7.0	7.2	8.5	8.1	8.3	10.6	9.0	9.9
7	6.0	---	---	7.5	6.9	7.2	8.4	8.0	8.2	10.8	10.2	10.5
8	5.5	---	---	9.7	6.7	8.2	8.6	8.1	8.2	10.3	9.7	10.1
9	7.8	---	---	9.6	8.8	9.2	8.8	8.0	8.3	10.9	9.4	9.7
10	7.2	6.7	6.9	8.8	8.0	8.3	8.5	7.6	8.1	11.0	10.2	10.7
11	7.1	6.8	6.9	7.9	7.4	7.7	8.2	7.4	7.8	10.4	10.1	10.2
12	6.9	6.3	6.7	7.4	7.2	7.3	8.0	7.1	7.5	10.3	9.9	10.1
13	6.8	6.1	6.4	7.3	6.9	7.1	7.7	6.7	7.2	10.2	9.6	9.9
14	6.4	5.7	6.0	7.2	6.5	6.8	7.4	6.6	6.9	9.8	9.1	9.4
15	6.2	5.3	5.7	6.8	6.2	6.5	7.4	6.5	6.9	10.0	9.5	9.7
16	5.8	5.1	5.3	6.6	5.9	6.2	7.3	6.8	7.0	9.9	9.3	9.6
17	5.9	3.7	5.0	6.9	5.9	6.3	7.1	6.5	6.8	9.5	9.0	9.3
18	5.8	3.9	5.1	6.7	6.0	6.3	8.0	6.5	7.1	10.3	9.0	9.8
19	6.7	5.6	6.1	6.9	5.9	6.3	7.9	6.8	7.3	10.3	9.4	9.9
20	7.3	6.0	6.5	6.3	5.4	5.8	7.3	7.0	7.2	9.4	9.2	9.3
21	7.3	5.7	6.5	7.0	5.2	5.7	7.8	6.9	7.3	9.7	9.3	9.5
22	7.4	6.2	6.8	7.8	6.0	6.9	8.7	7.6	8.0	10.0	9.4	9.6
23	7.5	6.6	7.0	6.6	6.0	6.3	10.0	8.8	9.6	9.4	9.1	9.3
24	7.8	6.7	7.1	7.2	6.5	6.8	10.4	9.7	10.0	9.2	8.9	9.1
25	7.7	6.6	7.1	7.0	6.5	6.8	9.9	9.2	9.6	9.1	8.8	8.9
26	7.7	6.3	6.8	6.4	5.9	6.1	11.3	8.9	9.4	9.0	8.7	8.9
27	8.6	6.8	7.5	6.7	5.9	6.2	10.7	9.0	10.0	8.9	8.7	8.8
28	8.5	6.6	7.5	7.0	6.2	6.6	10.0	9.0	9.7	8.8	8.4	8.6
29	8.2	6.1	7.0	7.8	7.0	7.5	9.2	8.5	8.9	8.6	8.1	8.4
30	7.0	5.6	6.2	8.2	7.8	8.0	8.9	8.1	8.6	9.4	8.3	8.8
31	7.7	6.2	6.7	---	---	---	9.7	8.9	9.4	10.5	9.4	9.9
MONTH	8.6	3.7	6.5	9.7	4.9	6.9	11.3	6.5	8.3	11.0	8.1	9.5

TRINITY RIVER BASIN

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08061970 EAST FORK TRINITY RIVER ABOVE SEAGOVILLE, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	9.9	9.4	9.6	8.9	7.6	8.3	7.4	6.8	7.1	8.1	7.3	7.7
2	9.9	9.1	9.5	9.2	8.4	8.9	6.8	6.3	6.6	8.0	7.7	7.8
3	9.6	8.8	9.1	9.5	8.7	9.2	7.2	6.1	6.5	7.8	7.1	7.6
4	9.9	8.3	8.8	8.8	8.0	8.5	6.8	6.0	6.4	7.7	7.0	7.5
5	9.5	9.0	9.2	8.4	7.3	7.7	7.4	6.0	6.6	7.8	6.9	7.4
6	10.4	8.8	9.7	7.3	6.7	7.1	7.3	6.3	6.8	8.4	7.8	8.1
7	10.8	10.3	10.5	7.9	6.5	7.3	6.7	5.6	6.2	8.5	8.0	8.2
8	10.7	9.7	10.5	8.5	7.5	8.0	6.6	5.3	5.9	8.0	7.3	7.7
9	9.6	8.4	9.2	9.3	7.6	8.5	5.8	4.7	5.3	8.0	7.4	7.7
10	8.7	8.1	8.4	9.3	7.9	8.5	6.2	5.1	5.7	8.3	7.6	8.0
11	8.5	8.0	8.3	9.2	7.7	8.2	6.2	5.4	5.8	8.3	7.9	8.0
12	8.3	7.7	8.0	---	---	---	6.9	4.8	5.7	8.9	7.0	8.1
13	7.9	7.4	7.6	---	---	---	8.8	6.6	7.7	7.6	6.8	7.2
14	7.8	7.0	7.4	---	---	---	9.3	5.6	8.2	---	---	---
15	8.0	7.4	7.6	---	---	---	5.4	4.0	4.6	7.8	5.7	6.9
16	8.2	7.4	7.8	---	---	---	6.4	5.1	5.8	8.2	7.6	7.8
17	8.2	7.7	8.0	---	---	---	8.0	6.7	7.3	9.0	7.4	8.3
18	7.7	6.7	7.2	---	---	---	7.5	6.7	7.0	8.5	7.5	8.1
19	7.7	6.2	6.8	---	---	---	7.1	6.8	7.0	8.1	7.4	7.8
20	8.2	6.5	7.2	---	---	---	7.8	7.2	7.5	8.3	7.8	8.0
21	9.6	7.4	9.0	7.7	6.5	7.3	7.7	7.5	7.7	7.9	6.5	7.2
22	9.7	8.7	9.4	7.5	5.8	6.6	7.8	7.6	7.7	8.1	6.9	7.7
23	9.8	9.3	9.5	6.8	5.9	6.5	8.0	7.7	7.9	8.4	7.2	7.8
24	9.3	8.1	8.8	8.0	6.3	7.0	8.1	7.7	7.9	8.5	4.1	7.2
25	8.1	7.8	7.9	6.9	6.1	6.5	8.1	7.8	7.9	7.4	4.1	6.2
26	9.8	7.9	8.4	6.5	5.7	6.1	8.0	7.6	7.9	7.0	6.0	6.4
27	10.0	9.7	9.9	6.7	5.6	6.2	8.0	7.7	7.8	8.1	6.8	7.3
28	9.9	8.9	9.6	8.9	5.9	8.2	7.8	7.3	7.6	8.4	7.7	8.0
29	---	---	---	8.4	7.5	7.9	8.4	7.4	7.8	8.3	7.6	7.9
30	---	---	---	7.5	6.9	7.3	8.1	7.4	7.8	8.0	7.4	7.7
31	---	---	---	7.4	6.8	7.1	---	---	---	7.8	7.1	7.6
MONTH	10.8	6.2	8.7	9.5	5.6	7.6	9.3	4.0	6.9	9.0	4.1	7.6
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	---	---	---	---	---	---	---	6.1	5.5	5.9
2	---	---	---	---	---	---	---	---	---	6.6	5.6	6.0
3	---	---	---	---	---	---	---	---	---	6.3	5.4	6.0
4	7.8	7.3	7.5	---	---	---	---	---	---	6.3	5.4	5.9
5	8.2	6.7	7.2	---	---	---	---	---	---	6.4	5.0	5.7
6	8.1	6.9	7.5	6.8	4.7	5.5	---	---	---	5.8	4.7	5.2
7	8.0	7.3	7.6	7.3	4.3	5.5	---	---	---	6.5	4.1	4.8
8	7.9	7.3	7.6	7.6	4.1	5.3	---	---	---	6.1	4.8	5.3
9	7.8	7.5	7.7	7.3	4.0	5.4	---	---	---	5.4	4.2	4.8
10	7.9	7.3	7.7	8.0	3.6	5.8	---	---	---	4.8	3.6	4.2
11	8.0	7.1	7.6	7.9	4.6	5.8	---	---	---	5.2	3.4	4.4
12	8.3	7.1	7.6	7.7	4.4	5.8	---	---	---	6.0	3.5	4.7
13	7.7	6.8	7.3	8.8	4.4	6.0	---	---	---	6.1	3.9	5.0
14	6.7	5.2	5.8	---	---	---	6.8	4.5	6.3	6.1	3.8	4.9
15	---	---	---	---	---	---	6.6	6.0	6.4	6.2	4.5	5.2
16	---	---	---	---	---	---	6.5	5.5	6.0	5.7	3.7	4.9
17	---	---	---	9.3	5.3	7.1	6.5	5.1	5.8	5.4	4.3	4.9
18	---	---	---	8.0	4.3	6.0	6.5	4.9	5.6	4.7	3.2	4.2
19	---	---	---	7.8	3.7	5.7	6.8	4.7	5.6	7.6	4.0	5.8
20	---	---	---	5.8	3.4	4.4	8.0	5.1	6.2	7.3	6.0	6.7
21	---	---	---	---	---	---	6.5	5.1	5.8	6.1	5.1	5.6
22	---	---	---	---	---	---	6.6	5.1	5.7	5.8	5.2	5.4
23	---	---	---	---	---	---	6.0	5.3	5.7	5.5	4.2	5.1
24	---	---	---	---	---	---	6.3	5.1	5.6	7.0	4.1	5.4
25	---	---	---	---	---	---	7.0	5.3	6.1	6.3	5.2	5.6
26	---	---	---	4.7	3.2	3.8	7.6	5.2	6.4	5.9	5.2	5.5
27	---	---	---	5.8	4.4	5.0	7.5	5.2	6.2	5.5	4.8	5.2
28	---	---	---	5.5	4.0	4.7	6.4	4.5	5.4	6.4	4.9	5.4
29	---	---	---	---	---	---	6.2	4.5	5.4	6.4	4.8	5.5
30	---	---	---	---	---	---	7.0	5.2	5.7	6.3	4.9	5.6
31	---	---	---	---	---	---	6.7	5.8	5.9	---	---	---
MONTH	8.3	5.2	7.4	9.3	3.2	5.5	8.0	4.5	5.9	7.6	3.2	5.3

TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX

LOCATION.--Lat 32°39'53", long 96°31'26", Dallas County, Hydrologic Unit 12030106, on right bank at downstream side of bridge on Malloy Bridge Road, 1.3 mi north of intersection of U. S. Highway 175 and Malloy Bridge Road in Seagoville and 3.5 mi downstream from South Mesquite Creek.

PERIOD OF RECORD.-- Chemical and biochemical analyses: April 1987 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1987 to current year.  
 pH: March 1987 to current year.  
 WATER TEMPERATURE: March 1987 to current year.  
 DISSOLVED OXYGEN: March 1987 to current year.

INSTRUMENTATION.--Since March 1987, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunction of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 820 microsiemens Aug. 15, 1987; minimum, 129 microsiemens May 17, 1989.  
 pH: Maximum, 9.4 units Oct. 30, 1989; minimum, 6.7 units Mar. 7, 1988.  
 WATER TEMPERATURE: Maximum, 31.5°C on several days during summer months of 1988 and 1989; minimum, 3.5°C Jan. 8, 1988, Feb. 5, 1989.  
 DISSOLVED OXYGEN: Maximum, 13.2 mg/L Mar. 18, 22, 1989; minimum, 0.0 mg/L Nov. 23, 1988, Aug. 10, 12, 1991.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 735 microsiemens Apr. 7; minimum, 138 microsiemens Apr. 13.  
 pH: Maximum, 8.6 units Sept. 24; minimum, 6.9 units Apr. 11.  
 WATER TEMPERATURE: Maximum, 31.0°C on several days during July and August; minimum, 4.0°C Dec. 23.  
 DISSOLVED OXYGEN: Maximum, 11.0 mg/L June 20, July 16; minimum 0.0 mg/L Aug. 10, 12.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
NOV 20...	1515	78	575	7.5	21.0	6.0	69	4.0	130	13
JAN 31...	1615	133	630	7.8	10.0	10.4	92	4.8	190	43
APR 03...	1425	66	624	7.7	19.5	6.8	75	7.1	160	25
MAY 31...	1405	990	317	7.6	24.0	7.5	89	1.9	130	14
JUL 25...	1240	189	485	7.8	26.5	3.0	37	7.3	110	0
SEP 10...	1140	81	540	7.6	27.5	3.8	48	7.7	130	0

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)
NOV 20...	45	3.2	62	2	9.9	110	50	53	1.0	9.7
JAN 31...	68	4.0	48	2	7.2	140	55	47	0.60	6.9
APR 03...	57	3.8	57	2	9.2	130	56	53	0.70	8.5
MAY 31...	48	2.5	15	0.6	3.9	120	24	13	0.40	2.7
JUL 25...	39	3.4	42	2	6.1	120	56	45	0.80	6.2
SEP 10...	46	4.0	49	2	9.2	130	40	45	0.80	10

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
NOV 20...	302	4.99	0.210	5.20	0.470	1.4	1.9	5.20	5.50
JAN 31...	322	5.18	0.120	5.30	0.400	1.1	1.5	2.40	2.20
APR 03...	325	5.22	0.280	5.50	1.10	1.9	3.0	4.60	4.50
MAY 31...	179	0.920	0.040	0.960	0.140	0.66	0.80	0.330	0.320
JUL 25...	270	2.21	0.190	2.40	1.00	1.6	2.6	2.20	1.60
SEP 10...	284	3.05	0.250	3.30	4.00	1.1	5.1	7.00	1.40

TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	597	573	588	574	538	555	560	537	543	534	502	522
2	614	574	597	599	548	580	570	272	495	559	537	546
3	595	561	577	611	554	590	458	292	365	569	544	560
4	631	409	569	607	220	511	469	352	407	582	537	552
5	467	400	436	526	258	339	540	473	514	627	584	606
6	535	475	504	412	346	382	581	548	562	612	308	494
7	563	540	555	466	420	450	596	571	585	445	315	365
8	572	549	563	504	155	392	612	593	598	484	392	429
9	577	177	395	230	171	191	624	596	611	526	486	510
10	358	182	272	381	232	299	611	584	598	522	204	292
11	454	363	411	474	386	425	615	589	607	379	271	326
12	544	449	505	507	477	495	615	590	605	471	382	418
13	580	548	564	520	500	510	636	614	628	527	473	494
14	626	566	603	559	522	532	661	619	643	556	530	541
15	620	584	604	586	558	568	671	635	656	444	325	380
16	601	550	580	600	578	591	672	612	644	430	365	392
17	609	553	572	621	601	611	618	596	611	511	435	463
18	619	580	598	607	571	589	599	572	590	533	339	458
19	625	559	594	601	571	589	579	535	559	361	285	308
20	617	566	599	592	569	582	576	543	554	420	313	363
21	618	533	594	576	532	560	594	574	583	485	424	450
22	563	527	548	578	172	302	607	572	590	558	490	514
23	580	540	562	342	240	280	604	552	572	590	554	568
24	541	503	525	430	347	381	557	534	549	604	581	592
25	566	536	551	489	437	468	532	508	521	---	---	e600
26	601	572	592	535	494	519	510	486	498	---	---	e600
27	591	575	585	545	514	527	501	412	455	---	---	e610
28	606	557	591	551	360	471	458	386	416	---	---	e610
29	587	560	576	487	384	434	500	431	473	---	---	e610
30	603	563	587	548	491	525	505	410	453	626	573	608
31	575	532	547	---	---	---	498	421	460	639	607	622
MONTH	631	177	547	621	155	475	672	272	547	639	204	497
e Estimated												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	663	606	636	542	356	431	660	600	630	306	293	299
2	641	599	626	375	306	322	611	573	597	299	290	295
3	663	630	645	339	297	312	659	585	615	340	279	295
4	694	327	629	444	341	398	676	640	663	300	283	287
5	419	273	320	520	448	487	703	663	682	295	283	286
6	323	280	299	571	513	550	725	687	705	288	282	286
7	315	292	307	587	550	570	735	675	705	289	285	287
8	359	314	334	615	561	594	697	653	677	316	264	283
9	549	376	452	626	557	601	665	624	646	298	286	291
10	574	552	565	598	537	571	657	618	637	302	300	301
11	598	557	579	615	599	606	628	570	599	305	300	302
12	617	571	591	624	594	607	629	168	314	320	300	303
13	626	584	600	636	592	616	271	138	228	351	327	343
14	681	627	658	698	595	638	250	168	215	463	362	406
15	648	549	608	705	689	699	279	221	254	550	280	348
16	691	651	673	706	681	697	346	280	299	314	298	305
17	678	645	665	704	665	686	340	294	310	331	311	314
18	658	627	647	695	615	652	384	283	305	352	334	343
19	655	609	632	619	601	610	307	295	298	360	328	338
20	675	605	644	668	617	638	298	295	296	320	305	312
21	648	305	406	678	643	666	296	292	294	---	---	e400
22	477	249	310	710	669	691	296	293	295	---	---	e580
23	307	277	289	701	387	516	298	291	294	---	---	e590
24	444	312	366	609	504	562	298	291	294	---	---	e540
25	524	442	483	627	584	609	299	293	297	---	---	e290
26	611	530	552	655	602	623	298	292	294	297	269	282
27	400	320	346	697	612	652	296	291	293	340	298	320
28	359	314	332	659	323	401	---	---	e290	310	294	305
29	---	---	---	482	339	399	---	---	e290	318	293	300
30	---	---	---	611	486	536	306	284	291	322	313	318
31	---	---	---	658	602	622	---	---	---	349	316	325
MONTH	694	249	507	710	297	567	735	138	420	550	264	338
e Estimated												



## TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX--Continued

## SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	387	334	356	670	643	656	616	550	570	---	---	e410
2	508	382	438	688	630	659	---	---	e620	---	---	e360
3	568	276	357	681	632	660	---	---	e650	---	---	e350
4	333	286	303	696	641	672	---	---	e630	458	375	406
5	475	344	404	697	608	659	---	---	e645	578	466	534
6	352	276	292	635	606	622	---	---	e630	619	561	590
7	298	259	277	650	611	630	---	---	e620	634	541	608
8	302	280	287	651	629	642	---	---	e620	628	521	579
9	303	266	290	636	621	629	662	608	631	595	446	490
10	302	288	296	---	---	e630	656	341	513	601	519	554
11	298	286	292	---	---	e670	625	475	569	652	583	615
12	292	282	287	---	---	e690	558	387	536	---	---	e628
13	308	285	293	---	---	e685	500	261	393	---	---	e658
14	457	316	390	696	656	683	415	263	333	---	---	e667
15	587	460	506	707	656	683	439	335	377	689	595	657
16	612	530	563	694	614	665	525	442	472	---	---	e630
17	613	583	602	647	612	631	602	536	559	---	---	e590
18	610	515	562	667	608	638	618	597	607	---	---	e647
19	602	550	573	668	624	644	654	619	632	---	---	e551
20	623	583	607	---	---	e660	656	629	648	---	---	e338
21	666	627	646	---	---	e670	663	624	642	---	---	e494
22	687	650	666	---	---	e680	---	---	e540	---	---	e599
23	667	160	366	---	---	e660	---	---	e360	---	---	e628
24	309	255	274	---	---	e650	---	---	e400	---	---	e620
25	448	313	378	---	---	e410	---	---	e480	---	---	e321
26	546	435	496	---	---	e325	---	---	e520	---	---	e444
27	599	547	575	---	---	e276	---	---	e460	---	---	e584
28	628	602	614	---	---	e343	---	---	e470	---	---	e653
29	651	595	622	385	257	303	---	---	e570	---	---	e656
30	654	617	639	484	373	437	---	---	e380	---	---	e656
31	---	---	---	540	488	522	---	---	e340	---	---	---
MONTH	687	160	442	707	257	593	663	261	530	689	375	551

e Estimated

## PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	---	---	---	---	---	---	7.7	7.6	7.6
2	---	---	---	---	---	---	---	---	---	7.7	7.6	7.6
3	---	---	---	7.6	7.6	7.6	---	---	---	7.8	7.7	7.7
4	7.5	7.4	7.4	8.0	7.6	7.7	---	---	---	7.7	7.7	7.7
5	7.5	7.5	7.5	7.7	7.4	7.6	7.8	7.7	7.8	7.7	7.6	7.6
6	7.5	7.5	7.5	7.7	7.4	7.6	7.8	7.7	7.8	7.8	7.6	7.7
7	---	---	---	7.6	7.4	7.5	7.8	7.8	7.8	7.8	7.7	7.8
8	---	---	---	8.1	7.6	7.7	7.8	7.8	7.8	7.8	7.7	7.8
9	---	---	---	8.0	7.8	7.9	7.8	7.7	7.8	7.7	7.7	7.7
10	---	---	---	7.8	7.6	7.7	7.8	7.7	7.8	8.0	7.7	7.8
11	---	---	---	7.6	7.6	7.6	7.8	7.7	7.8	7.8	7.7	7.7
12	---	---	---	7.6	7.5	7.6	7.8	7.7	7.8	7.9	7.7	7.8
13	7.7	7.5	7.6	7.6	7.5	7.5	7.8	7.7	7.7	7.8	7.8	7.8
14	7.6	7.4	7.5	7.6	7.5	7.5	7.7	7.7	7.7	7.8	7.7	7.8
15	7.4	7.4	7.4	7.6	7.5	7.5	7.7	7.7	7.7	7.9	7.8	7.8
16	7.5	7.4	7.4	7.5	7.4	7.5	7.7	7.6	7.7	7.8	7.7	7.8
17	7.5	7.2	7.4	7.5	7.4	7.5	7.7	7.6	7.7	7.8	7.6	7.7
18	7.5	7.2	7.4	---	---	---	7.6	7.4	7.6	7.7	7.6	7.7
19	7.6	7.4	7.5	---	---	---	7.5	7.4	7.5	7.7	7.6	7.7
20	7.5	7.5	7.5	---	---	---	7.5	7.5	7.5	7.6	7.6	7.6
21	7.6	7.4	7.5	---	---	---	7.5	7.4	7.5	7.6	7.6	7.6
22	7.6	7.5	7.6	8.0	7.5	7.7	7.6	7.5	7.5	7.6	7.6	7.6
23	7.6	7.5	7.6	7.6	7.5	7.6	7.7	7.4	7.5	7.6	7.5	7.6
24	7.6	7.5	7.6	7.6	7.5	7.6	7.7	7.6	7.7	7.6	7.5	7.6
25	7.7	7.5	7.6	7.7	7.5	7.6	7.7	7.6	7.6	---	---	---
26	7.6	7.4	7.5	---	---	---	7.6	7.6	7.6	---	---	---
27	---	---	---	---	---	---	7.8	7.5	7.7	---	---	---
28	---	---	---	---	---	---	7.7	7.6	7.7	---	---	---
29	---	---	---	---	---	---	7.7	7.6	7.6	---	---	---
30	---	---	---	---	---	---	7.7	7.6	7.7	7.8	7.7	7.7
31	---	---	---	---	---	---	7.7	7.6	7.6	7.8	7.6	7.7
MONTH	7.7	7.2	7.5	8.1	7.4	7.6	7.8	7.4	7.7	8.0	7.5	7.7

TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.8	7.8	7.8	8.0	7.8	7.9	---	---	---	8.0	7.8	7.9
2	7.8	7.6	7.7	8.0	7.9	8.0	7.6	7.4	7.5	8.0	7.9	7.9
3	7.7	7.5	7.6	8.1	8.0	8.0	7.6	7.3	7.5	7.9	7.7	7.8
4	7.8	7.5	7.6	8.0	7.8	7.9	7.6	7.3	7.5	7.8	7.8	7.8
5	7.8	7.6	7.7	7.8	7.7	7.8	7.5	7.2	7.3	7.8	7.7	7.8
6	7.9	7.7	7.8	7.8	7.7	7.7	7.4	7.1	7.3	7.9	7.8	7.9
7	8.0	7.9	7.9	7.8	7.7	7.7	7.4	7.2	7.3	7.9	7.8	7.9
8	8.1	7.9	8.0	7.8	7.7	7.8	7.4	7.1	7.3	7.9	7.7	7.8
9	7.9	7.8	7.9	7.8	7.7	7.8	7.4	7.0	7.2	7.8	7.8	7.8
10	7.8	7.7	7.7	7.8	7.6	7.7	7.5	7.0	7.3	7.8	7.8	7.8
11	7.8	7.7	7.7	7.7	7.6	7.6	7.5	6.9	7.1	7.8	7.7	7.8
12	---	---	---	7.7	7.5	7.6	8.0	7.5	7.7	7.8	7.7	7.8
13	---	---	---	7.7	7.5	7.6	7.9	7.7	7.8	7.7	7.6	7.7
14	---	---	---	7.7	7.5	7.6	7.8	7.7	7.8	7.7	7.5	7.6
15	---	---	---	7.6	7.5	7.6	7.8	7.7	7.8	7.7	7.5	7.6
16	8.3	8.1	8.2	7.7	7.6	7.7	7.8	7.7	7.7	7.7	7.6	7.7
17	8.2	8.0	8.1	7.7	7.5	7.6	7.8	7.7	7.8	7.7	7.6	7.7
18	8.0	7.9	8.0	7.7	7.6	7.6	7.7	7.5	7.6	7.6	7.5	7.6
19	8.1	7.9	8.0	7.7	7.5	7.6	7.5	7.4	7.5	7.8	7.6	7.7
20	8.0	7.9	7.9	7.6	7.5	7.6	7.8	7.6	7.7	7.9	7.7	7.8
21	8.3	7.9	8.2	7.6	7.5	7.5	7.8	7.7	7.7	---	---	---
22	8.3	8.2	8.2	7.6	7.4	7.5	7.9	7.7	7.8	---	---	---
23	8.2	8.1	8.1	7.6	7.5	7.5	7.8	7.7	7.8	---	---	---
24	8.1	7.9	8.0	7.6	7.4	7.5	7.8	7.7	7.8	---	---	---
25	7.9	7.7	7.8	7.5	7.3	7.4	7.9	7.8	7.8	8.0	7.5	7.7
26	7.7	7.6	7.7	7.4	7.3	7.4	7.9	7.8	7.8	7.7	7.5	7.6
27	8.1	7.7	7.9	7.4	7.3	7.3	7.9	7.8	7.9	7.8	7.5	7.6
28	8.1	8.0	8.0	---	---	---	---	---	---	7.9	7.7	7.8
29	---	---	---	---	---	---	---	---	---	7.8	7.7	7.8
30	---	---	---	---	---	---	8.0	7.9	8.0	7.7	7.7	7.7
31	---	---	---	---	---	---	---	---	---	7.7	7.5	7.6
MONTH	8.3	7.5	7.9	8.1	7.3	7.6	8.0	6.9	7.6	8.0	7.5	7.7
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.5	7.4	7.5	7.9	7.6	7.8	7.4	7.3	7.4	7.6	7.5	7.5
2	7.4	7.3	7.4	7.8	7.5	7.6	7.5	7.3	7.4	7.7	7.5	7.6
3	7.7	7.4	7.6	7.9	7.5	7.7	7.4	7.4	7.4	7.9	7.5	7.7
4	7.7	7.6	7.6	8.0	7.5	7.8	7.4	7.3	7.4	7.9	7.8	7.9
5	7.5	7.4	7.5	7.9	7.5	7.7	7.4	7.3	7.4	7.9	7.6	7.8
6	7.8	7.5	7.7	7.7	7.6	7.7	7.4	7.3	7.4	7.8	7.6	7.7
7	7.8	7.7	7.7	---	---	---	7.4	7.4	7.4	7.8	7.6	7.7
8	7.8	7.6	7.6	---	---	---	7.5	7.3	7.4	7.9	7.7	7.8
9	7.6	7.5	7.6	---	---	---	7.5	7.4	7.4	7.8	7.6	7.7
10	7.7	7.5	7.6	7.7	7.3	7.6	7.7	7.4	7.5	7.7	7.6	7.6
11	7.7	7.6	7.7	7.8	7.6	7.7	7.5	7.4	7.5	---	---	---
12	7.8	7.7	7.7	7.7	7.6	7.7	7.6	7.4	7.5	---	---	---
13	7.7	7.6	7.6	7.9	7.6	7.7	7.8	7.5	7.6	---	---	---
14	7.6	7.4	7.5	7.7	7.5	7.6	7.6	7.5	7.5	---	---	---
15	7.7	7.5	7.6	8.1	7.5	7.7	7.5	7.4	7.5	---	---	---
16	7.5	7.5	7.5	8.2	7.5	7.7	---	---	---	---	---	---
17	7.5	7.4	7.5	7.9	7.4	7.5	---	---	---	---	---	---
18	7.6	7.4	7.5	7.7	7.2	7.4	---	---	---	---	---	---
19	7.9	7.5	7.7	7.6	7.2	7.3	---	---	---	---	---	---
20	8.0	7.3	7.6	---	---	---	---	---	---	---	---	---
21	7.6	7.2	7.3	---	---	---	7.4	7.3	7.3	7.6	7.5	7.6
22	7.5	7.2	7.4	---	---	---	7.8	7.3	7.4	7.6	7.5	7.5
23	8.3	7.2	7.8	---	---	---	7.7	7.3	7.5	8.0	7.4	7.6
24	8.1	8.0	8.0	---	---	---	7.4	7.3	7.4	8.6	7.3	7.5
25	8.0	7.8	7.8	---	---	---	7.5	7.3	7.4	8.1	7.4	7.6
26	7.9	7.8	7.9	7.6	7.5	7.5	7.6	7.3	7.4	7.5	7.4	7.5
27	8.1	7.8	7.8	7.7	7.5	7.6	7.8	7.4	7.5	7.5	7.4	7.4
28	8.0	7.8	7.9	7.8	7.5	7.6	7.4	7.3	7.4	7.5	7.2	7.3
29	8.0	7.8	7.9	7.8	7.5	7.7	7.4	7.2	7.3	7.6	7.2	7.3
30	7.9	7.7	7.8	7.5	7.3	7.5	7.9	7.2	7.5	7.5	7.2	7.3
31	---	---	---	7.5	7.3	7.4	7.8	7.5	7.6	---	---	---
MONTH	8.3	7.2	7.6	8.2	7.2	7.6	7.9	7.2	7.4	8.6	7.2	7.6

## TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	26.5	25.0	25.5	21.0	20.0	20.5	15.5	13.5	14.5	8.5	6.5	7.5
2	25.5	24.5	25.5	21.5	20.5	21.0	16.0	12.5	15.0	10.5	9.0	9.5
3	25.5	25.0	25.5	22.5	21.0	21.5	13.5	12.5	13.0	10.5	8.5	9.5
4	26.5	25.0	25.5	22.0	13.5	19.0	12.0	11.5	12.0	10.0	9.0	9.0
5	26.0	23.5	25.0	16.0	13.0	14.0	12.0	10.5	11.5	11.5	9.5	10.0
6	27.0	24.5	25.5	16.0	13.5	14.5	12.5	11.5	12.0	11.5	7.5	9.5
7	27.5	26.0	27.0	16.5	16.0	16.5	12.5	12.0	12.0	8.5	6.5	7.5
8	27.5	26.0	27.0	16.5	11.5	15.0	12.0	10.5	11.5	9.0	7.0	8.0
9	26.0	18.0	22.0	12.0	11.0	11.5	13.0	11.5	12.0	10.0	9.0	9.5
10	19.0	17.5	18.0	14.0	12.0	12.5	13.5	12.0	13.0	10.0	6.5	7.5
11	19.5	17.5	18.5	16.0	13.5	14.5	14.5	13.5	14.0	8.0	7.0	7.5
12	19.5	18.0	19.0	17.0	15.5	16.0	16.5	14.5	15.5	8.5	7.0	7.5
13	20.5	18.5	19.5	17.5	16.0	17.0	16.5	15.5	16.0	10.0	8.0	8.5
14	22.0	19.5	21.0	17.5	16.5	17.0	16.0	15.5	15.5	12.0	9.5	10.5
15	24.0	21.5	22.5	18.5	17.0	17.5	16.0	15.5	16.0	11.0	10.0	10.5
16	24.5	23.0	23.5	19.5	18.0	18.5	16.0	14.0	15.0	10.5	9.0	10.0
17	24.5	23.0	24.0	19.0	18.0	18.5	16.5	15.5	16.0	11.5	10.0	11.0
18	24.0	20.0	22.0	19.0	18.0	18.5	17.0	14.5	16.0	12.0	9.5	11.0
19	20.0	19.0	19.5	20.5	19.0	19.5	15.0	14.0	14.5	10.5	9.5	10.0
20	20.5	18.5	19.5	20.5	20.0	20.5	16.0	14.0	14.5	10.5	10.0	10.0
21	21.0	18.0	19.5	21.0	20.5	21.0	16.0	10.5	13.5	10.0	9.0	9.5
22	18.0	17.0	17.5	21.0	18.5	19.5	10.5	6.5	8.5	9.5	8.5	9.0
23	17.5	16.0	17.0	18.5	17.0	17.5	7.5	4.0	6.0	10.5	9.0	9.5
24	17.5	16.5	17.0	17.5	16.5	17.0	7.0	4.5	5.5	11.5	10.0	10.5
25	18.5	17.0	17.5	19.5	17.0	18.5	8.0	6.5	7.0	---	---	---
26	18.5	17.0	18.0	20.5	20.0	20.5	9.5	7.5	8.5	---	---	---
27	19.0	17.5	18.5	21.0	20.0	21.0	10.0	4.5	7.0	---	---	---
28	20.5	19.0	20.0	20.0	16.5	18.0	9.5	6.5	7.5	---	---	---
29	21.0	19.5	20.0	16.5	14.5	15.0	13.0	10.0	11.0	---	---	---
30	21.5	19.5	20.5	14.5	13.0	13.5	12.0	8.5	10.0	---	---	---
31	21.0	20.0	20.5	---	---	---	8.5	7.0	7.5	---	---	---
MONTH	27.5	16.0	21.5	22.5	11.0	17.5	17.0	4.0	12.0	12.0	6.5	9.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	11.0	8.5	10.0	16.5	12.0	14.5	19.0	16.0	17.5	21.5	19.5	20.5
2	12.5	9.5	10.5	15.0	12.5	13.5	18.0	17.0	17.5	21.0	20.5	21.0
3	14.0	11.5	12.5	12.5	11.0	12.0	20.5	17.5	19.0	21.0	20.0	20.5
4	14.5	12.5	14.0	15.0	11.5	13.0	21.0	19.0	20.0	21.0	20.0	20.5
5	13.5	13.0	13.5	17.5	13.5	15.5	21.0	19.5	20.5	20.5	19.5	20.5
6	13.5	11.0	13.0	18.5	16.5	17.5	21.5	20.0	21.0	21.0	19.0	20.0
7	10.5	9.5	10.0	17.5	15.5	16.5	23.0	21.0	22.0	20.5	19.0	20.0
8	10.5	9.5	10.0	16.0	14.0	15.5	24.5	21.5	23.0	20.5	19.5	20.0
9	14.0	10.5	12.0	16.0	13.5	15.0	24.5	22.5	23.5	20.5	20.0	20.0
10	15.0	13.0	14.0	16.0	14.0	15.0	22.5	20.5	21.5	21.0	19.5	20.5
11	15.5	13.5	14.5	17.5	15.0	16.5	22.0	21.0	21.5	21.5	20.5	21.0
12	16.5	15.0	15.5	19.0	17.0	18.0	22.0	20.0	21.0	22.5	20.5	21.5
13	17.5	15.5	16.5	18.0	16.5	17.5	20.5	18.5	19.0	23.0	22.0	22.5
14	16.5	15.5	16.0	17.0	15.0	16.0	20.0	18.5	19.0	24.0	22.5	23.0
15	15.5	13.0	13.5	16.0	14.0	15.0	21.5	19.0	20.0	23.5	21.5	22.5
16	13.0	10.5	11.5	14.5	13.5	14.0	22.5	20.5	21.0	22.5	21.0	22.0
17	14.5	11.5	12.5	17.5	14.5	16.0	22.5	19.5	21.0	22.5	21.0	21.5
18	17.0	14.5	15.5	17.5	15.5	16.5	21.0	19.0	20.0	23.0	21.5	22.0
19	17.0	15.5	16.0	17.5	16.0	16.5	21.0	19.5	20.5	24.0	22.5	23.0
20	15.0	13.5	14.5	18.0	16.5	17.0	20.5	19.0	20.0	24.5	23.0	23.5
21	14.5	10.5	11.5	20.5	18.0	19.0	20.0	19.0	19.5	---	---	---
22	12.0	10.5	11.0	20.5	19.5	20.0	19.0	18.5	19.0	---	---	---
23	12.5	10.0	11.0	19.0	17.0	18.5	20.5	18.0	19.0	---	---	---
24	14.0	11.5	12.5	20.0	17.0	18.5	20.0	19.0	19.5	---	---	---
25	14.0	13.0	13.5	20.0	18.0	19.0	20.5	19.0	19.5	---	---	---
26	13.5	12.0	12.5	21.0	20.0	20.5	21.0	19.5	20.5	26.0	24.0	25.0
27	12.0	10.0	11.0	21.5	20.5	21.0	21.0	20.0	20.5	26.0	25.0	25.5
28	12.0	10.5	11.5	20.5	15.5	17.5	---	---	---	25.5	23.5	24.5
29	---	---	---	17.0	15.5	16.5	---	---	---	26.0	24.0	25.0
30	---	---	---	17.0	15.0	16.5	21.5	19.5	21.0	25.5	23.5	24.5
31	---	---	---	18.0	15.5	17.0	---	---	---	25.0	23.0	24.0
MONTH	17.5	8.5	13.0	21.5	11.0	16.5	24.5	16.0	20.0	26.0	19.0	22.0

TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	25.0	24.5	25.0	30.0	28.0	29.0	30.0	27.5	28.5	27.5	26.0	26.5
2	27.5	25.0	26.0	30.5	28.0	29.5	30.0	28.0	29.0	27.0	26.5	26.5
3	26.5	25.0	25.5	30.5	28.5	29.5	30.0	28.0	29.0	27.5	26.0	27.0
4	26.5	25.0	25.5	30.5	27.5	29.0	30.5	28.0	29.5	27.5	26.5	27.0
5	28.0	26.0	27.0	30.5	27.5	29.0	30.5	28.5	29.5	28.0	26.5	27.0
6	27.0	25.5	26.0	31.0	28.0	29.5	31.0	28.5	30.0	28.5	26.5	27.5
7	26.5	25.5	26.0	31.0	28.5	30.0	30.5	28.5	30.0	28.0	27.0	27.5
8	26.0	25.0	25.5	30.5	28.5	29.5	31.0	28.5	30.0	27.5	26.0	26.5
9	26.0	24.0	25.0	30.5	28.5	29.5	30.5	29.0	30.0	28.5	26.0	27.0
10	26.0	25.0	25.5	30.5	28.0	29.5	30.0	28.0	28.5	28.5	26.5	27.5
11	26.5	25.0	26.0	30.0	28.0	29.5	28.5	27.0	28.0	29.0	27.0	28.0
12	27.5	26.0	27.0	30.0	28.0	29.5	28.0	26.0	27.0	29.0	27.5	28.0
13	27.5	25.5	26.5	31.0	28.5	29.5	26.0	25.0	25.5	29.0	27.5	28.0
14	28.5	27.0	27.5	31.0	28.5	29.5	25.5	25.0	25.0	28.5	27.0	28.0
15	28.0	26.5	27.5	30.5	28.5	30.0	27.0	25.0	25.5	28.5	27.5	28.0
16	27.5	26.0	27.0	30.0	28.5	29.5	28.0	26.0	27.0	---	---	---
17	28.0	25.5	26.5	30.0	28.0	29.0	29.0	27.0	28.0	---	---	---
18	29.0	26.0	27.5	29.5	27.5	28.5	30.0	27.5	29.0	---	---	---
19	30.0	27.0	28.5	30.0	28.0	29.0	29.5	27.5	28.5	---	---	---
20	30.0	28.0	29.0	30.0	28.0	29.0	29.5	27.5	28.5	---	---	---
21	30.0	28.0	29.0	30.5	28.0	29.5	29.5	27.5	28.0	22.5	19.5	20.5
22	30.0	28.0	29.0	30.5	28.0	29.5	28.0	25.0	26.5	24.5	21.5	22.5
23	29.0	23.5	26.5	30.0	28.0	29.5	27.5	25.0	26.0	25.5	23.0	24.5
24	28.0	26.0	27.0	30.0	28.0	29.0	28.5	26.5	27.5	26.5	22.5	25.0
25	29.5	27.0	28.5	29.0	26.0	28.0	28.5	26.5	27.5	23.0	22.0	22.5
26	30.0	27.5	29.0	28.0	26.5	27.5	28.5	27.0	28.0	23.5	21.5	22.0
27	30.5	28.0	29.0	28.5	27.0	27.5	28.5	26.0	27.5	23.5	21.5	22.5
28	30.5	28.0	29.5	28.5	26.5	27.5	29.0	27.0	28.0	23.5	21.5	22.5
29	29.5	27.5	29.0	28.5	25.5	27.0	29.0	27.5	28.0	25.0	21.5	23.0
30	30.0	27.5	29.0	29.5	27.0	28.0	28.5	24.5	26.5	25.5	22.0	23.5
31	---	---	---	29.5	27.0	28.5	26.5	25.0	26.0	---	---	---
MONTH	30.5	23.5	27.0	31.0	25.5	29.0	31.0	24.5	28.0	29.0	19.5	25.5

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	5.1	4.4	4.8	6.9	6.1	6.4	---	---	---	10.1	9.4	9.7
2	4.6	4.1	4.4	6.7	5.3	5.8	---	---	---	9.4	8.8	9.1
3	4.4	3.9	4.1	6.0	5.2	5.5	---	---	---	9.3	8.7	9.0
4	5.0	4.2	4.6	8.3	5.2	6.0	---	---	---	9.3	9.0	9.1
5	4.7	4.4	4.6	7.6	6.1	7.1	9.9	9.2	9.4	9.0	8.3	8.7
6	4.5	4.0	4.3	7.5	7.3	7.4	9.5	8.5	9.0	10.3	8.0	9.2
7	4.1	3.7	3.9	7.5	7.1	7.3	8.9	8.5	8.7	10.7	9.8	10.3
8	4.0	3.6	3.8	8.9	7.0	7.7	9.0	8.7	8.8	10.2	9.7	10.0
9	7.2	4.0	5.5	8.8	8.2	8.5	9.1	8.4	8.7	9.7	9.3	9.5
10	7.2	6.7	6.9	8.2	7.8	8.0	9.0	8.4	8.7	10.6	9.4	10.2
11	6.8	6.3	6.6	8.0	7.6	7.8	8.8	8.0	8.4	10.1	9.9	10.0
12	6.4	6.1	6.3	7.6	7.3	7.4	8.3	7.6	8.0	10.2	9.8	10.0
13	6.2	5.7	6.0	7.3	6.9	7.1	8.1	7.2	7.6	9.9	9.5	9.8
14	5.9	5.1	5.5	6.9	6.8	6.9	7.8	7.1	7.5	9.4	8.9	9.2
15	5.2	4.8	5.0	7.0	6.4	6.6	7.8	7.0	7.4	9.5	9.1	9.3
16	4.9	4.5	4.7	6.6	6.2	6.3	7.6	7.1	7.4	9.5	9.3	9.4
17	4.5	3.3	4.3	6.6	6.1	6.3	7.4	7.0	7.2	9.5	8.7	9.2
18	4.6	2.7	4.0	6.8	6.2	6.5	7.9	6.9	7.3	9.4	8.4	8.9
19	6.0	4.5	5.1	6.5	5.9	6.2	7.6	7.1	7.4	9.3	8.8	9.1
20	5.6	5.0	5.3	6.4	5.5	5.8	7.5	7.1	7.3	8.8	8.6	8.7
21	6.5	5.2	5.4	6.3	5.4	5.7	7.9	6.8	7.2	8.9	8.6	8.8
22	6.8	6.1	6.4	6.8	5.4	6.1	8.7	7.8	8.2	9.0	8.7	8.8
23	7.1	6.3	6.7	6.2	5.3	5.7	10.2	7.4	9.1	---	---	---
24	7.1	6.7	6.9	6.9	6.3	6.6	10.5	9.6	10.0	---	---	---
25	7.8	6.8	7.1	6.8	6.5	6.6	10.1	9.2	9.7	---	---	---
26	7.3	6.7	7.0	6.4	5.8	6.0	9.5	8.8	9.1	---	---	---
27	8.0	6.7	7.2	---	---	---	10.9	8.7	9.8	---	---	---
28	7.4	6.2	6.7	---	---	---	10.1	8.9	9.7	---	---	---
29	7.1	6.3	6.6	---	---	---	8.9	8.4	8.7	---	---	---
30	6.8	5.7	6.1	---	---	---	8.9	8.3	8.6	10.0	8.5	9.3
31	6.8	5.7	6.2	---	---	---	9.7	8.7	9.2	10.5	9.3	9.9
MONTH	8.0	2.7	5.5	8.9	5.2	6.7	10.9	6.8	8.4	10.7	8.0	9.4

## TRINITY RIVER BASIN

08061980 EAST FORK TRINITY RIVER AT SEAGOVILLE, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	9.5	8.8	9.3	9.5	7.9	8.6	6.9	6.1	6.3	9.3	7.8	8.4
2	9.6	8.5	8.9	9.6	8.6	9.3	6.5	5.8	6.1	8.5	7.6	8.2
3	9.5	8.1	8.7	10.0	9.5	9.8	6.7	5.6	6.0	8.1	6.7	7.6
4	8.9	7.5	8.0	9.5	8.4	8.9	6.3	5.4	5.7	7.4	7.0	7.3
5	8.9	8.4	8.6	8.4	7.4	7.9	6.6	5.2	5.7	7.6	6.7	7.2
6	10.0	8.4	9.1	7.3	6.8	7.1	6.3	5.0	5.5	8.2	7.5	7.8
7	10.6	10.0	10.4	7.6	6.5	7.1	5.5	4.6	5.1	8.3	7.7	7.9
8	10.6	10.1	10.4	8.2	7.3	7.8	5.6	4.3	4.8	8.0	7.1	7.5
9	10.0	8.6	9.3	8.7	7.8	8.2	5.3	4.2	4.6	7.4	6.6	7.0
10	8.5	8.0	8.3	9.4	7.8	8.5	5.5	4.5	5.0	7.0	6.4	6.7
11	8.5	8.0	8.2	8.8	7.2	8.0	5.4	4.8	5.1	6.9	6.6	6.7
12	8.0	7.5	7.7	8.3	6.7	7.4	5.7	3.4	4.8	7.1	6.4	6.8
13	7.4	7.0	7.2	8.3	6.5	7.2	6.8	5.1	6.0	6.7	6.1	6.4
14	7.3	6.6	6.9	8.7	6.7	7.5	7.1	5.8	6.5	6.3	5.1	5.7
15	8.7	7.0	7.6	7.3	6.3	6.8	6.0	4.4	5.0	6.9	4.5	6.0
16	8.3	6.7	7.7	8.4	6.8	7.5	6.2	4.4	5.2	7.1	6.7	6.9
17	8.4	7.2	7.7	8.3	6.7	7.4	7.8	6.2	7.1	7.2	6.7	6.9
18	7.1	6.3	6.7	8.1	6.7	7.3	7.8	6.1	6.8	7.1	6.8	7.0
19	7.5	5.8	6.6	7.7	6.3	7.0	6.6	6.1	6.4	7.2	6.8	7.0
20	7.7	6.6	7.2	7.8	6.5	7.1	7.5	6.5	7.0	7.5	7.0	7.2
21	10.0	7.7	9.4	7.6	6.2	6.8	7.5	7.1	7.3	7.6	6.6	7.1
22	9.9	8.5	9.5	7.1	5.6	6.4	7.6	7.4	7.5	7.9	6.9	7.4
23	9.5	9.1	9.3	6.7	5.8	6.3	7.9	7.5	7.7	7.8	6.5	7.1
24	9.3	8.5	9.0	7.6	6.1	6.7	8.2	7.4	7.7	---	---	---
25	8.5	8.0	8.3	6.9	5.8	6.4	8.0	7.7	7.9	---	---	---
26	8.9	8.2	8.5	6.3	5.5	5.8	7.7	7.4	7.6	6.4	5.5	5.9
27	10.1	9.2	10.0	6.3	5.1	5.7	7.7	7.2	7.5	7.6	5.7	6.5
28	10.1	9.5	9.9	8.4	5.6	7.6	---	---	---	8.1	7.2	7.6
29	---	---	---	8.1	7.1	7.7	---	---	---	8.0	7.0	7.5
30	---	---	---	7.3	6.5	6.9	9.0	7.7	8.1	7.7	7.1	7.4
31	---	---	---	6.8	6.1	6.4	---	---	---	7.6	6.8	7.3
MONTH	10.6	5.8	8.5	10.0	5.1	7.4	9.0	3.4	6.3	9.3	4.5	7.1
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	6.8	6.0	6.5	5.8	3.9	4.5	6.1	3.7	4.5	5.7	5.2	5.4
2	5.8	4.7	5.2	5.5	3.5	4.2	7.1	3.7	4.9	5.8	5.5	5.6
3	6.9	4.6	6.0	4.6	2.8	3.5	7.2	3.9	5.1	5.7	5.3	5.5
4	7.1	6.4	6.7	6.8	2.7	4.0	6.3	3.7	4.9	5.8	5.2	5.5
5	6.6	5.6	5.9	5.0	2.8	3.7	5.8	3.8	4.6	5.4	4.4	4.8
6	7.5	5.7	6.8	6.3	2.0	3.5	5.6	3.6	4.3	6.4	4.2	5.2
7	7.3	6.8	7.1	6.4	2.1	3.8	5.8	3.5	4.4	5.7	4.1	5.1
8	7.4	6.8	7.0	7.2	3.2	4.7	5.3	3.6	4.3	4.8	4.1	4.5
9	7.3	6.8	7.0	7.1	3.4	4.8	5.0	3.4	4.1	4.8	4.0	4.4
10	7.7	7.0	7.2	7.1	3.3	4.6	4.5	.0	3.1	4.7	3.4	4.0
11	7.7	7.1	7.4	6.1	3.1	4.2	4.7	4.0	4.3	---	---	---
12	8.1	7.1	7.6	6.3	3.2	4.3	4.7	.0	3.6	---	---	---
13	7.7	7.2	7.4	7.6	3.1	4.7	5.4	3.3	4.9	---	---	---
14	7.1	5.4	6.2	8.0	3.0	5.0	5.6	4.4	5.3	---	---	---
15	5.5	4.6	5.0	9.4	3.3	5.5	5.6	5.0	5.5	---	---	---
16	5.2	4.7	4.9	11.0	3.2	5.8	5.0	4.5	4.7	---	---	---
17	5.6	4.7	5.1	10.2	3.1	5.7	5.8	4.2	4.7	---	---	---
18	5.6	4.5	4.8	9.5	3.4	5.6	5.4	3.8	4.4	---	---	---
19	9.0	4.3	6.0	10.2	3.3	5.7	5.5	3.5	4.3	---	---	---
20	11.0	4.3	6.7	7.0	3.2	4.7	6.4	3.6	4.5	---	---	---
21	9.5	4.0	5.9	5.6	2.9	3.9	5.1	3.6	4.1	6.2	4.3	5.8
22	7.9	3.8	5.4	7.7	2.8	4.5	5.0	3.3	3.9	---	---	---
23	6.1	3.6	5.3	7.7	2.8	4.4	5.2	4.4	5.0	---	---	---
24	7.3	6.1	6.6	6.0	2.5	3.7	5.3	4.7	5.0	---	---	---
25	6.6	5.7	6.1	4.4	.5	3.1	6.8	3.9	5.2	5.7	5.2	5.5
26	6.1	4.5	5.3	4.7	3.1	3.7	8.4	4.5	5.9	5.6	5.0	5.2
27	6.3	4.2	4.9	5.8	4.0	4.7	7.2	3.8	5.5	---	---	---
28	6.3	4.0	4.9	4.9	3.6	4.5	6.3	4.5	5.3	---	---	---
29	6.7	4.2	5.0	5.7	4.7	5.2	5.6	4.1	4.7	---	---	---
30	5.7	3.8	4.6	4.9	4.2	4.5	5.4	3.1	4.6	---	---	---
31	---	---	---	5.8	4.0	4.6	5.4	5.0	5.3	---	---	---
MONTH	11.0	3.6	6.0	11.0	.5	4.5	8.4	.0	4.7	6.4	3.4	5.1



TRINITY RIVER BASIN

373

08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX

LOCATION.--Lat 32°38'19", Long 96°29'17", Kaufman County, Hydrologic Unit 12030106, on right bank 15 ft downstream from downstream eastbound bridge on U.S. Highway 175, 0.7 mi downstream from Mustang Creek, 1.8 mi northwest of Crandall, 4.0 mi upstream from Buffalo Creek, and 11.0 mi upstream from mouth.

DRAINAGE AREA.--1,256 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1922: Drainage area. WDR TX-75-1: 1974.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 338.69 ft above National Geodetic Vertical Datum of 1929. Prior to Feb. 21, 1983, at datum 5.00 ft higher.

REMARKS.--No estimated daily discharges. Records good. Flow largely regulated by Lavon Lake (station 08060500) since September 1953, and by Lake Ray Hubbard (station 08061550) since Mar. 22, 1970. The city of Forney discharges sewage effluent into a tributary below Lake Ray Hubbard and above this station. The North Texas Municipal Water District discharges sewage effluent into tributaries above this station from their Mesquite and Changler's Landing sewage treatment plants. Flow is also affected at times by discharge from the flood-detention pools of 20 floodwater-retarding structures with a combined detention capacity of 11,760 acre-ft. These structures control runoff from an 39.2<sup>2</sup> area above this station. Gage-height telemeter at station.

AVERAGE DISCHARGE.--4 years (water years 1950-53) prior to regulation by Lavon Lake, 652 ft<sup>3</sup>/s (472,400 acre-ft/yr); 38 years (water years 1954-91) regulated, 633 ft<sup>3</sup>/s (458,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 59,900 ft<sup>3</sup>/s May 5, 1990 (gage height, 27.17 ft); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 35,300 ft<sup>3</sup>/s Apr. 14 at 1800 hours (gage height, 21.97 ft); minimum daily, 41 ft<sup>3</sup>/s Aug. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	54	74	87	111	126	347	69	1340	525	85	77	154
2	62	64	190	107	116	774	66	1120	150	81	68	256
3	57	63	470	100	112	658	66	1340	1090	76	66	203
4	129	140	191	97	186	191	67	2000	1160	90	62	120
5	101	460	111	98	1360	122	63	2200	253	103	62	92
6	65	125	93	375	1500	109	64	2100	1140	77	60	78
7	58	80	81	650	1160	101	69	1960	1430	67	61	68
8	57	362	77	206	936	105	71	2090	1600	71	52	122
9	404	1610	85	133	315	106	59	2350	1830	68	41	116
10	409	410	86	1690	193	89	62	2090	1230	71	118	81
11	99	142	82	1200	176	86	60	1970	1060	67	67	72
12	71	112	75	334	162	82	1260	1930	1060	66	93	61
13	62	92	76	212	150	74	7220	995	991	64	280	63
14	60	80	72	180	120	88	28200	237	240	64	312	63
15	62	77	71	1010	125	80	18200	1060	116	66	182	78
16	74	75	76	587	123	79	3100	1760	112	62	82	103
17	71	72	82	288	122	97	1530	1650	120	66	62	93
18	69	73	108	470	120	110	1970	779	112	64	56	78
19	63	73	141	1520	115	91	2510	625	92	68	55	149
20	56	78	103	676	118	79	2440	1010	87	71	48	347
21	61	84	86	317	672	78	2260	464	83	68	48	121
22	90	1240	100	218	1690	75	2220	98	81	65	201	88
23	75	932	101	191	2410	212	2200	82	906	68	459	78
24	64	204	93	170	820	103	2080	80	1830	72	116	78
25	64	134	89	162	199	78	1950	1540	440	189	69	256
26	75	107	93	143	195	75	1920	3900	119	128	56	126
27	69	120	258	132	646	91	1900	1970	104	130	150	79
28	57	237	172	131	602	625	1900	1370	93	357	85	67
29	59	134	165	134	---	259	1960	1670	90	399	58	64
30	78	97	271	140	---	84	1940	1190	77	117	374	66
31	80	---	152	133	---	71	---	988	---	91	467	---
TOTAL	2855	7551	3937	11915	14569	5219	87476	43958	18221	3131	3987	3420
MEAN	92.1	252	127	384	520	168	2916	1418	607	101	129	114
MAX	409	1610	470	1690	2410	774	28200	3900	1830	399	467	347
MIN	54	63	71	97	112	71	59	80	77	62	41	61
AC-FT	5660	14980	7810	23630	28900	10350	173500	87190	36140	6210	7910	6780
CAL YR 1990	TOTAL	606928	MEAN	1663	MAX	48800	MIN	49	AC-FT	1204000		
WTR YR 1991	TOTAL	206239	MEAN	565	MAX	28200	MIN	41	AC-FT	409100		

## TRINITY RIVER BASIN

08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January to April 1964, May 1966 to September 1981, June 1986 to current year. Pesticide analyses: March 1977 to July 1981. Sediment analyses: April to September 1964.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1967 to September 1981, May 1986 to current year.

pH: March to September 1977, May 1986 to current year.

WATER TEMPERATURE: October 1967 to September 1981, May 1986 to current year.

DISSOLVED OXYGEN: March to September 1977, May 1986 to current year.

INSTRUMENTATION.--From March to November 1977, a four-parameter water-quality monitor continuously recorded specific conductance, pH, water temperature, and dissolved oxygen at this station. Since May 1986, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,010 microsiemens Nov. 23, 1968; minimum, 100 microsiemens May 17, 1989.

pH: Maximum, 9.5 units Oct. 30, 1989; minimum, 6.7 units on several days during 1988 and 1991.

WATER TEMPERATURE: Maximum, 34.0°C June 26, July 1, Aug. 16, 17, 1980; minimum, 1.0°C Jan. 3, 1979.

DISSOLVED OXYGEN: Maximum, 14.5 mg/L July 8, 1977; minimum, 0.0 mg/L on many days during 1977 and 1991.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 716 microsiemens Mar. 24; minimum, 163 microsiemens Nov. 8.

pH: Maximum, 8.4 units July 15, Sept. 25; minimum, 6.7 units Feb. 26.

WATER TEMPERATURE: Maximum, 32.5°C July 15; minimum, 3.0°C Dec. 24.

DISSOLVED OXYGEN: Maximum, 13.7 mg/L June 21; minimum, 0.0 mg/L Aug. 13.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGFN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)
NOV	20...	83	565	7.6	20.0	6.0	67	4.6	130	16
FEB	12...	150	556	7.9	16.0	8.9	91	3.4	190	39
APR	02...	62	626	7.6	17.5	7.5	79	7.8	160	30
JUN	11...	1060	290	7.7	25.5	7.6	93	2.0	110	9
JUL	25...	200	301	7.9	26.5	1.7	21	7.3	79	0
SEP	06...	69	518	7.5	28.0	4.8	61	7.9	140	25

DATE	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WAT DIS FIX END CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)
NOV	46	3.2	59	2	9.2	110	49	55	0.90	9.0
FEB	70	3.3	56	2	8.5	150	60	58	1.0	8.7
APR	56	3.7	59	2	8.9	120	56	56	0.70	8.2
JUN	38	2.6	13	0.6	3.8	97	20	28	0.60	2.3
JUL	28	2.2	24	1	3.9	82	37	15	0.60	4.5
SEP	51	3.8	44	2	8.9	120	51	44	0.80	11

DATE	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)
NOV	298	4.95	0.250	5.20	0.560	1.2	1.8	4.60	4.80
FEB	355	3.97	0.130	4.10	0.250	1.2	1.5	2.00	1.70
APR	323	5.83	0.270	6.10	0.620	2.0	2.6	4.60	4.60
JUN	166	0.680	0.040	0.720	0.040	0.76	0.80	0.320	0.260
JUL	164	0.590	0.140	0.730	0.330	0.97	1.3	0.550	0.390
SEP	285	4.14	0.360	4.50	1.30	1.1	2.4	7.00	1.30

TRINITY RIVER BASIN

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08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	2855	502	281	2160	39	302	53	410	150
NOV. 1990	7551	350	197	4010	19	395	33	676	120
DEC. 1990	3937	497	278	2950	37	393	52	550	150
JAN. 1991	11915	379	213	6840	22	699	36	1170	130
FEB. 1991	14569	369	207	8150	21	808	35	1380	120
MAR. 1991	5219	515	288	4060	42	590	55	781	150
APR. 1991	87476	292	164	38800	11	2710	25	5990	110
MAY 1991	43958	315	177	21000	13	1590	28	3300	110
JUNE 1991	18221	330	185	9120	16	773	30	1480	120
JULY 1991	3131	560	312	2640	49	415	62	524	150
AUG. 1991	3987	478	268	2880	35	380	50	534	140
SEPT 1991	3420	460	257	2380	32	299	47	434	140
TOTAL	206239	**	**	105000	**	9350	**	17200	**
WTD.AVG.	565	336	189	**	17	**	31	**	120

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	1	---	---	e635	569	531	549	552	528	546	520	463
2	---	---	e603	580	541	553	571	397	549	534	515	525
3	---	---	e619	595	556	578	466	287	374	558	535	548
4	636	584	600	597	547	585	415	333	374	558	531	541
5	636	424	507	530	240	347	508	417	455	589	538	564
6	498	431	467	394	287	345	545	511	522	607	299	498
7	566	500	531	450	398	414	561	545	553	416	303	344
8	576	568	572	474	163	391	580	555	572	408	357	388
9	586	203	467	241	177	200	570	552	558	480	358	451
10	321	199	255	---	---	e280	574	555	564	369	190	252
11	427	327	374	---	---	e410	566	548	556	333	239	289
12	492	430	459	---	---	e480	572	557	568	398	338	368
13	557	496	529	---	---	e500	588	556	567	454	404	440
14	579	559	567	---	---	e520	601	586	591	494	454	480
15	621	582	607	---	---	e550	616	588	601	511	309	366
16	610	584	596	---	---	e580	629	609	618	396	345	360
17	596	551	568	599	573	582	628	584	599	449	397	427
18	614	557	580	609	596	602	588	563	578	492	331	442
19	619	581	599	599	573	584	568	536	551	372	293	316
20	619	569	591	595	569	580	555	524	538	393	310	347
21	614	571	596	585	550	574	562	530	544	443	399	428
22	603	542	568	546	183	309	583	563	573	494	444	475
23	576	548	559	332	246	284	594	568	583	543	493	526
24	583	541	562	406	336	377	566	541	551	566	529	551
25	554	517	532	492	409	452	547	522	535	584	550	561
26	599	552	567	520	482	496	521	493	506	593	560	569
27	604	594	600	538	523	530	493	420	456	590	564	580
28	602	582	591	565	504	528	492	399	442	599	582	588
29	605	562	585	487	385	417	488	393	440	596	575	583
30	588	565	576	523	445	480	498	419	457	584	545	566
31	599	551	579	---	---	---	462	414	435	587	574	580
MONTH	636	199	550	609	163	469	629	287	528	607	190	466

e Estimated

## 08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	591	563	576	559	358	423	620	545	583	332	323	326
2	611	578	591	541	336	388	660	617	633	323	315	320
3	593	570	584	345	317	331	627	603	615	359	303	323
4	587	549	579	440	331	388	667	610	640	315	303	310
5	631	297	374	530	433	468	695	653	672	319	307	311
6	358	294	323	570	531	546	693	666	681	315	307	310
7	331	318	325	616	579	599	712	678	695	315	307	311
8	347	326	334	626	605	616	707	662	677	335	290	306
9	444	348	395	667	613	645	672	632	645	306	298	302
10	541	448	510	678	605	648	638	598	613	310	299	306
11	549	525	539	643	592	617	622	557	605	310	306	309
12	559	531	548	660	636	650	566	188	333	319	264	316
13	542	527	534	673	629	652	272	239	257	363	319	352
14	575	540	559	668	622	648	291	233	270	477	376	426
15	620	579	600	677	613	653	295	281	289	529	294	396
16	613	532	575	705	680	689	325	286	309	323	307	318
17	642	617	629	713	682	701	357	314	326	322	314	318
18	629	604	615	713	667	685	396	302	319	357	322	345
19	617	600	608	697	619	658	322	310	315	357	333	345
20	620	588	597	637	613	620	314	310	312	361	310	322
21	646	309	485	661	622	642	310	306	309	384	314	341
22	411	238	299	687	647	673	310	306	310	498	388	438
23	289	266	276	714	650	688	310	306	308	588	482	528
24	369	290	324	716	405	517	310	306	308	618	573	597
25	454	373	421	579	457	534	314	306	311	584	247	338
26	522	455	493	616	574	593	319	306	314	286	247	272
27	567	335	386	642	616	631	310	306	308	329	286	310
28	353	326	339	694	625	637	332	315	318	306	290	301
29	---	---	---	662	328	407	343	311	319	310	290	295
30	---	---	---	409	337	372	327	307	313	318	310	314
31	---	---	---	547	414	480	---	---	---	333	310	320
MONTH	646	238	479	716	317	574	712	188	430	618	247	343
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	373	333	349	655	620	639	566	519	543	412	341	388
2	427	376	395	667	643	656	625	566	586	522	259	423
3	510	282	357	667	643	651	643	609	628	365	259	311
4	329	282	304	675	631	650	660	615	636	431	380	401
5	424	325	371	678	635	664	642	620	633	478	384	428
6	467	290	320	678	608	632	646	618	633	467	439	452
7	298	290	295	647	616	627	629	610	617	506	475	490
8	306	287	296	643	608	627	620	600	609	549	471	503
9	306	290	297	647	635	643	635	608	622	584	467	539
10	314	302	308	639	616	631	663	380	522	545	443	485
11	307	290	301	647	616	632	647	537	610	592	522	553
12	298	286	290	678	651	668	627	518	562	624	584	605
13	310	290	294	702	678	687	576	357	461	624	580	603
14	396	314	354	686	667	678	475	337	397	651	616	630
15	506	392	438	694	659	680	471	412	442	659	627	648
16	569	502	534	696	654	682	553	459	512	655	588	615
17	616	557	582	687	620	655	612	533	569	631	553	587
18	608	584	598	639	614	627	667	612	639	---	---	e550
19	580	529	553	661	620	636	671	639	654	---	---	e560
20	608	557	577	666	635	649	686	663	675	584	224	330
21	631	588	605	684	653	668	690	663	675	376	275	329
22	655	631	643	679	655	670	686	404	634	---	---	e400
23	647	165	434	697	668	679	561	349	400	---	---	e480
24	290	239	269	691	628	667	494	404	455	---	---	e580
25	376	294	343	677	279	508	565	471	514	584	286	419
26	498	380	438	653	472	569	596	561	578	400	275	332
27	580	502	535	540	465	505	584	275	432	533	392	453
28	620	576	592	622	300	513	565	475	521	584	529	555
29	631	612	621	341	284	303	537	447	486	647	584	603
30	651	604	628	459	340	402	561	200	450	651	600	620
31	---	---	---	519	453	479	482	216	287	---	---	---
MONTH	655	165	431	702	279	612	690	200	548	659	224	496

e Estimated

TRINITY RIVER BASIN

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08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	7.9	7.6	7.7	7.5	7.3	7.4	8.0	7.9	8.0
2	---	---	---	7.8	7.6	7.7	7.8	7.4	7.6	7.9	7.9	7.9
3	---	---	---	7.7	7.6	7.7	7.7	7.5	7.6	7.9	7.6	7.8
4	---	---	---	7.7	7.4	7.6	7.8	7.5	7.6	8.0	7.9	7.9
5	---	---	---	8.0	7.6	7.9	8.0	7.8	7.9	7.9	7.8	7.8
6	---	---	---	7.8	7.5	7.6	8.0	8.0	8.0	8.0	7.6	7.8
7	---	---	---	7.8	7.3	7.5	8.1	7.9	8.0	8.0	7.9	8.0
8	---	---	---	8.2	7.7	7.8	8.1	8.0	8.0	8.0	7.9	7.9
9	---	---	---	8.1	7.9	8.0	8.1	8.0	8.1	7.9	7.8	7.9
10	---	---	---	---	---	---	8.2	8.0	8.1	8.1	7.2	7.9
11	---	---	---	---	---	---	8.1	7.5	7.9	8.1	8.0	8.0
12	---	---	---	---	---	---	8.0	7.5	7.7	8.1	8.0	8.1
13	---	---	---	---	---	---	7.6	7.6	7.6	8.1	7.6	8.0
14	---	---	---	---	---	---	7.6	7.5	7.6	8.1	7.9	8.0
15	---	---	---	---	---	---	7.6	7.6	7.6	8.0	7.2	7.9
16	---	---	---	---	---	---	7.6	7.5	7.6	8.0	7.9	8.0
17	---	---	---	7.7	7.6	7.6	7.7	7.7	7.7	8.0	7.8	7.9
18	7.6	7.4	7.5	7.7	7.6	7.7	7.7	7.6	7.6	8.0	7.9	8.0
19	7.5	7.3	7.4	7.7	7.5	7.6	7.7	7.6	7.7	8.0	7.9	8.0
20	7.6	7.3	7.4	7.5	7.4	7.4	7.9	7.7	7.8	8.0	7.9	7.9
21	7.5	7.3	7.4	7.6	7.3	7.4	7.9	7.8	7.9	8.0	7.9	8.0
22	7.5	7.3	7.4	8.1	7.6	7.8	8.0	7.8	7.9	8.0	7.9	8.0
23	7.3	7.1	7.2	7.8	7.7	7.8	7.9	7.8	7.9	8.0	7.8	7.9
24	7.2	7.0	7.1	7.7	7.7	7.7	8.0	7.9	8.0	7.9	7.8	7.8
25	7.1	6.9	7.0	7.7	7.4	7.6	8.0	7.9	7.9	7.9	7.8	7.8
26	7.1	6.9	7.0	7.4	7.2	7.4	7.9	7.9	7.9	7.9	7.8	7.9
27	7.1	6.9	7.0	7.6	7.2	7.4	8.1	7.9	8.0	7.8	7.7	7.8
28	7.1	6.9	7.0	7.8	7.5	7.6	8.0	7.9	8.0	7.7	7.7	7.7
29	7.6	7.0	7.4	7.6	7.4	7.5	8.0	7.9	7.9	7.8	7.7	7.7
30	7.6	7.4	7.5	7.5	7.3	7.4	8.0	7.9	8.0	7.8	7.7	7.8
31	---	---	---	---	---	---	8.0	8.0	8.0	8.0	7.8	7.9
MONTH	7.6	6.9	7.3	8.2	7.2	7.6	8.2	7.3	7.8	8.1	7.2	7.9
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	8.1	7.9	8.0	8.0	7.8	7.9	---	---	---	8.1	8.0	8.0
2	8.0	7.9	7.9	8.1	7.8	8.0	---	---	---	8.1	8.0	8.1
3	8.0	7.8	7.9	8.2	8.1	8.2	7.8	7.7	7.7	8.0	7.8	7.9
4	7.9	7.8	7.9	8.2	8.1	8.2	7.7	7.7	7.7	7.9	7.8	7.9
5	8.0	7.9	8.0	8.2	8.1	8.1	7.8	7.6	7.7	8.0	7.8	7.9
6	8.2	8.0	8.1	8.1	8.0	8.1	7.9	7.7	7.8	8.1	7.9	8.0
7	8.3	8.2	8.3	8.1	8.0	8.0	7.9	7.8	7.9	8.1	8.0	8.0
8	8.3	8.3	8.3	8.2	8.0	8.1	7.9	7.8	7.8	8.1	7.9	8.0
9	8.2	8.1	8.2	8.2	8.1	8.1	7.9	7.7	7.8	8.0	7.9	7.9
10	8.1	8.0	8.1	8.2	8.0	8.1	7.8	7.8	7.8	8.1	7.9	8.0
11	8.1	7.8	8.0	8.2	8.0	8.1	7.9	7.8	7.8	8.0	7.9	8.0
12	7.9	7.8	7.8	8.1	7.9	8.0	---	---	---	7.9	7.8	7.9
13	8.0	7.9	7.9	8.0	7.9	7.9	---	---	---	7.8	7.7	7.8
14	8.0	7.9	7.9	8.1	8.0	8.0	---	---	---	7.8	7.6	7.7
15	8.0	7.8	7.9	8.1	8.0	8.1	---	---	---	7.7	7.5	7.7
16	8.1	7.9	8.0	8.0	7.9	8.0	---	---	---	7.8	7.7	7.7
17	8.0	7.9	8.0	8.0	8.0	8.0	8.0	7.9	8.0	7.8	7.7	7.7
18	7.9	7.8	7.9	8.0	7.9	7.9	8.0	8.0	8.0	7.8	7.6	7.7
19	7.9	7.8	7.8	8.0	7.8	7.9	8.0	8.0	8.0	7.8	7.7	7.8
20	7.8	7.7	7.7	8.2	7.9	8.1	8.2	8.0	8.1	7.9	7.8	7.9
21	8.0	7.6	7.8	8.2	8.1	8.2	8.2	8.0	8.1	7.9	7.8	7.8
22	8.1	7.8	7.9	8.3	8.0	8.1	8.2	8.1	8.1	7.8	7.6	7.7
23	---	---	---	8.1	8.0	8.0	8.2	8.1	8.1	7.7	7.5	7.6
24	---	---	---	8.1	8.0	8.1	8.2	8.1	8.1	7.7	7.5	7.6
25	7.9	7.0	7.5	8.1	8.0	8.1	8.1	8.0	8.1	7.8	7.4	7.6
26	7.7	6.7	7.2	8.2	8.0	8.1	8.1	8.0	8.1	7.8	7.5	7.6
27	8.0	7.7	7.9	8.1	7.9	8.1	8.1	8.0	8.0	7.7	7.6	7.6
28	8.0	8.0	8.0	8.2	8.0	8.1	8.1	8.0	8.0	7.8	7.7	7.7
29	---	---	---	---	---	---	8.3	8.0	8.1	7.8	7.7	7.8
30	---	---	---	---	---	---	8.2	8.0	8.1	7.8	7.7	7.7
31	---	---	---	---	---	---	---	---	---	7.7	7.6	7.6
MONTH	8.3	6.7	7.9	8.3	7.8	8.1	8.3	7.6	8.0	8.1	7.4	7.8



## TRINITY RIVER BASIN

08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

## PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.6	7.3	7.4	7.6	7.4	7.5	7.6	7.5	7.5	7.6	7.5	7.6
2	7.3	7.1	7.2	7.5	7.3	7.4	7.6	7.5	7.5	7.6	7.5	7.6
3	7.8	7.2	7.6	7.4	7.3	7.3	7.5	7.4	7.5	7.6	7.4	7.5
4	7.8	7.6	7.7	7.3	7.2	7.3	7.8	7.4	7.6	7.6	7.4	7.5
5	7.7	7.5	7.6	7.3	7.2	7.3	7.7	7.5	7.6	7.7	7.4	7.6
6	7.8	7.6	7.7	7.4	7.3	7.3	7.7	7.6	7.6	7.7	7.3	7.5
7	7.8	7.7	7.8	7.5	7.3	7.4	7.6	7.6	7.6	7.6	7.5	7.6
8	7.7	7.7	7.7	7.5	7.4	7.5	7.6	7.4	7.6	7.7	7.6	7.6
9	7.7	7.6	7.7	7.5	7.4	7.5	7.5	7.3	7.4	7.6	7.5	7.6
10	7.7	7.6	7.7	7.5	7.4	7.5	7.4	7.2	7.4	7.5	7.3	7.4
11	7.8	7.7	7.7	7.5	7.3	7.4	7.2	7.1	7.1	7.6	7.3	7.5
12	7.8	7.7	7.7	7.4	7.3	7.4	7.2	7.1	7.2	7.6	7.5	7.5
13	7.7	7.6	7.6	7.6	7.2	7.4	7.4	7.2	7.3	7.6	7.4	7.5
14	7.7	7.5	7.6	8.0	7.6	7.7	7.5	7.3	7.4	7.6	7.4	7.4
15	7.6	7.4	7.5	8.4	7.6	7.9	7.3	7.2	7.3	7.4	7.3	7.3
16	7.5	7.4	7.4	8.2	7.6	7.8	7.3	7.2	7.3	7.4	7.3	7.3
17	7.5	7.4	7.4	8.1	7.6	7.8	7.3	7.2	7.3	7.3	7.2	7.3
18	7.5	7.3	7.4	7.6	7.4	7.5	7.4	7.3	7.3	---	---	---
19	7.5	7.3	7.4	7.4	7.4	7.4	7.4	7.3	7.3	---	---	---
20	8.2	7.4	7.7	7.4	7.3	7.4	7.4	7.3	7.3	---	---	---
21	8.3	7.5	7.8	7.4	7.3	7.4	7.3	7.3	7.3	---	---	---
22	8.2	7.4	7.7	7.5	7.4	7.4	7.6	7.3	7.3	---	---	---
23	7.9	7.4	7.6	7.5	7.4	7.4	7.7	7.4	7.6	---	---	---
24	7.7	7.6	7.7	7.5	7.4	7.5	7.5	7.4	7.5	---	---	---
25	7.7	7.5	7.6	8.0	7.5	7.7	7.4	7.4	7.4	8.4	7.5	7.8
26	7.9	7.5	7.7	7.6	7.5	7.5	7.5	7.4	7.4	7.8	7.6	7.7
27	7.8	7.5	7.6	7.6	7.5	7.6	7.7	7.4	7.5	7.6	7.4	7.5
28	7.9	7.5	7.6	7.8	7.5	7.6	7.7	7.5	7.6	---	---	---
29	7.8	7.5	7.6	7.8	7.6	7.7	7.6	7.4	7.5	---	---	---
30	7.8	7.4	7.6	7.6	7.5	7.5	7.9	7.4	7.5	---	---	---
31	---	---	---	7.6	7.5	7.5	7.8	7.6	7.6	---	---	---
MONTH	8.3	7.1	7.6	8.4	7.2	7.5	7.9	7.1	7.4	8.4	7.2	7.5

## WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	26.0	24.5	25.5	21.0	19.5	20.5	14.5	12.5	13.5	7.5	5.5	6.5
2	25.5	24.5	25.0	20.5	20.0	20.5	15.5	14.0	14.5	9.0	7.0	8.0
3	25.0	24.5	25.0	21.5	20.5	21.0	13.5	12.0	13.0	8.5	8.0	8.5
4	26.0	24.5	25.0	21.5	17.5	20.0	12.0	11.0	11.5	9.0	7.5	8.5
5	25.5	23.5	24.5	16.0	13.0	14.5	11.5	10.0	11.0	10.0	8.5	9.5
6	26.0	23.5	25.0	15.0	13.0	14.0	11.5	10.0	11.0	11.0	7.5	9.0
7	27.0	25.0	26.0	16.0	14.5	15.5	11.5	10.5	11.5	8.0	7.0	7.5
8	27.0	25.5	26.5	16.0	11.5	14.5	11.5	10.0	11.0	8.0	6.5	7.5
9	25.0	18.0	22.0	12.0	11.0	11.5	11.5	10.0	11.0	9.0	8.0	8.5
10	18.0	16.5	17.0	---	---	---	12.0	10.5	11.5	8.5	7.0	7.5
11	18.0	16.0	17.0	---	---	---	13.5	11.5	12.5	7.5	7.0	7.5
12	18.5	16.5	17.5	---	---	---	15.5	13.5	14.5	8.0	6.5	7.5
13	19.5	17.5	18.5	---	---	---	15.5	14.5	15.0	9.0	7.5	8.0
14	21.0	18.5	19.5	---	---	---	15.0	14.5	14.5	10.5	8.0	9.5
15	23.0	20.5	22.0	---	---	---	15.0	15.0	15.0	11.5	10.0	10.5
16	24.0	22.5	23.0	---	---	---	15.0	14.0	14.5	10.0	9.0	10.0
17	23.5	22.5	23.0	18.5	18.0	18.0	16.0	14.0	15.0	11.0	9.5	10.5
18	23.0	21.0	22.0	18.5	17.5	18.0	16.0	15.0	15.5	11.5	10.0	10.5
19	21.0	19.0	20.0	20.0	18.5	19.0	15.0	13.5	14.0	10.5	9.5	10.0
20	20.0	18.5	19.0	20.0	19.5	20.0	14.5	13.5	14.0	10.0	9.5	10.0
21	20.0	18.0	19.0	21.0	20.0	20.5	15.0	10.5	13.0	9.5	8.5	9.0
22	18.0	16.5	17.5	21.0	18.5	19.5	10.5	6.5	8.0	9.5	7.5	8.5
23	17.5	15.5	16.5	18.5	17.0	18.0	6.5	4.5	5.5	9.5	8.0	8.5
24	17.5	16.0	16.5	17.5	16.0	17.0	5.5	3.0	4.5	10.5	9.0	10.0
25	17.5	16.5	17.0	19.0	16.5	18.0	6.5	4.0	5.5	10.5	9.0	10.0
26	18.0	16.5	17.0	20.0	19.0	20.0	7.5	6.0	7.0	10.0	10.0	10.0
27	19.0	17.0	18.0	21.0	19.5	20.5	9.0	5.0	7.0	12.0	9.5	10.5
28	19.5	18.0	19.0	19.5	16.5	18.0	8.5	7.0	7.5	11.5	10.5	11.0
29	20.5	19.5	20.0	16.5	14.5	15.5	12.0	8.0	10.0	13.5	11.5	12.0
30	21.0	19.5	20.0	14.5	12.5	13.5	11.0	7.5	9.5	12.5	10.0	11.0
31	21.0	19.5	20.5	---	---	---	7.5	6.5	7.5	10.5	8.5	9.5
MONTH	27.0	15.5	21.0	21.5	11.0	17.5	16.0	3.0	11.0	13.5	5.5	9.0

TRINITY RIVER BASIN

08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.5	8.0	9.0	16.0	12.0	13.5	18.0	15.0	16.5	21.5	19.5	20.5
2	11.0	8.5	9.5	16.0	13.0	14.5	18.0	17.0	17.5	21.0	20.5	21.0
3	12.5	9.5	11.0	13.0	11.5	12.5	20.0	17.0	18.5	21.0	20.0	20.5
4	13.5	12.0	12.5	14.5	11.0	12.5	21.5	19.5	20.0	---	---	---
5	14.0	12.5	13.5	16.5	13.5	14.5	21.0	20.0	20.5	---	---	---
6	14.0	11.5	13.5	18.0	15.5	16.5	21.5	20.0	21.0	---	---	---
7	11.5	10.0	10.5	17.5	16.0	16.5	23.0	21.0	22.0	---	---	---
8	11.0	10.0	10.5	16.5	14.0	15.0	24.5	22.0	23.0	---	---	---
9	13.0	10.0	11.5	16.0	14.0	15.0	25.0	23.5	24.0	---	---	---
10	15.0	12.5	13.5	16.0	13.5	15.0	23.5	21.5	22.5	---	---	---
11	15.0	13.5	14.0	17.0	14.0	15.5	22.0	21.0	21.5	20.5	19.0	20.0
12	16.0	14.0	15.0	19.0	16.5	17.0	22.0	20.5	21.5	21.0	19.5	20.5
13	17.0	15.0	15.5	19.0	16.5	17.5	---	---	---	22.5	21.0	21.5
14	16.5	15.0	16.0	18.0	15.0	17.0	---	---	---	23.0	21.5	22.0
15	16.0	13.0	14.0	17.0	14.0	15.5	---	---	---	22.5	21.0	21.5
16	13.0	10.5	11.5	14.0	13.0	13.5	---	---	---	22.0	20.0	21.0
17	13.5	10.5	11.5	15.0	13.5	14.0	23.5	20.5	22.0	21.5	19.5	20.0
18	16.0	13.0	14.5	17.0	15.5	16.5	22.0	20.0	21.0	21.5	20.5	21.0
19	16.0	14.5	15.5	17.5	15.5	16.5	23.0	20.5	21.5	22.0	21.5	22.0
20	15.5	13.0	14.5	17.5	16.0	16.5	21.5	19.5	20.5	22.5	22.0	22.5
21	14.5	11.0	12.5	18.0	16.5	17.5	20.5	19.0	19.5	25.0	22.5	23.5
22	12.0	11.0	11.5	20.0	18.0	19.5	---	---	---	25.0	23.5	24.5
23	12.5	10.0	11.5	20.5	18.0	19.5	---	---	---	26.0	24.0	25.0
24	13.5	11.5	12.5	19.5	17.0	18.5	---	---	---	29.0	25.0	26.5
25	13.5	12.5	13.0	19.5	17.0	18.5	---	---	---	26.0	21.5	24.0
26	13.5	11.5	12.5	19.5	18.0	19.0	---	---	---	27.5	24.0	25.5
27	12.5	10.5	11.5	21.0	19.5	20.5	---	---	---	26.0	24.5	25.0
28	12.0	11.0	11.5	21.5	20.0	21.0	---	---	---	24.5	23.5	24.0
29	---	---	---	19.5	15.5	17.0	---	---	---	25.0	23.0	24.0
30	---	---	---	16.5	15.5	16.0	---	---	---	25.0	22.5	23.0
31	---	---	---	17.5	15.0	16.0	---	---	---	23.0	22.0	22.5
MONTH	17.0	8.0	12.5	21.5	11.0	16.5	25.0	15.0	21.0	29.0	19.0	22.5
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	23.5	23.0	23.5	---	---	---	30.0	27.0	28.5	28.5	27.0	27.5
2	25.5	23.0	24.0	---	---	---	30.5	27.5	29.0	28.0	26.5	27.0
3	26.5	23.5	25.0	---	---	---	30.5	28.0	29.0	28.0	26.0	27.0
4	26.5	24.5	25.5	---	---	---	31.0	28.5	29.5	28.0	26.5	27.0
5	29.5	25.0	27.0	30.0	27.0	28.5	31.0	28.5	30.0	28.5	26.5	27.5
6	26.5	24.5	25.5	---	---	---	31.0	29.0	30.0	29.0	26.0	27.5
7	---	---	---	---	---	---	31.0	29.0	30.0	27.5	26.5	27.0
8	---	---	---	---	---	---	---	---	---	27.5	26.0	26.5
9	---	---	---	---	---	---	---	---	---	28.5	26.0	27.0
10	---	---	---	---	---	---	---	---	---	29.0	26.5	27.5
11	---	---	---	---	---	---	---	---	---	29.5	27.0	28.0
12	---	---	---	---	---	---	---	---	---	29.5	27.5	28.5
13	---	---	---	---	---	---	---	---	---	29.5	27.5	28.5
14	---	---	---	31.0	29.0	30.0	---	---	---	29.5	27.5	28.5
15	---	---	---	32.5	29.0	30.5	28.0	26.0	27.0	29.5	27.5	28.5
16	---	---	---	31.5	30.0	30.5	29.5	27.0	28.0	29.0	27.5	28.5
17	29.0	24.5	26.5	31.0	29.0	30.0	30.0	28.0	29.0	29.5	27.0	28.5
18	31.5	26.0	28.5	30.5	28.5	29.5	31.5	28.5	30.0	---	---	---
19	---	---	---	30.5	28.5	29.5	31.5	29.0	30.0	---	---	---
20	---	---	---	31.0	29.0	30.0	31.5	29.0	30.0	22.5	20.5	21.0
21	---	---	---	31.0	29.0	30.0	30.5	29.0	29.5	23.0	21.0	22.0
22	---	---	---	32.0	29.5	30.5	28.5	26.5	28.0	25.0	22.0	23.5
23	28.0	24.0	26.0	31.5	29.5	30.5	27.5	26.0	27.0	26.5	24.5	25.5
24	28.0	26.0	27.0	31.5	29.0	30.0	29.0	27.0	28.0	26.5	24.0	25.0
25	29.5	27.5	28.5	30.0	27.5	28.5	29.5	27.0	28.5	24.0	21.5	23.0
26	30.5	27.5	28.5	28.5	27.5	28.0	30.5	27.5	28.5	23.5	21.0	22.5
27	---	---	---	29.5	27.0	28.0	30.5	28.0	29.5	24.0	21.5	22.5
28	---	---	---	28.5	27.0	28.0	31.0	28.5	29.5	24.0	21.5	23.0
29	---	---	---	28.0	26.5	27.5	30.5	28.5	29.5	24.0	21.5	23.0
30	---	---	---	29.5	26.5	28.0	30.0	26.5	28.0	25.0	22.5	24.0
31	---	---	---	30.0	27.0	28.5	28.0	26.0	27.0	---	---	---
MONTH	31.5	23.0	26.0	32.5	26.5	29.5	31.5	26.0	29.0	29.5	20.5	26.0

## TRINITY RIVER BASIN

08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

## OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	8.1	5.5	6.6	8.5	8.1	8.4	10.4	10.0	10.3
2	---	---	---	7.1	5.5	6.2	8.4	7.6	7.9	10.3	9.5	10.0
3	---	---	---	7.0	5.3	6.2	8.9	8.4	8.6	9.6	9.4	9.5
4	4.9	3.7	4.3	6.6	5.2	5.8	9.3	8.6	9.0	10.2	9.5	9.9
5	5.2	4.7	4.9	8.2	6.8	7.5	9.7	9.3	9.5	9.6	9.0	9.5
6	4.8	4.3	4.6	8.1	7.8	7.9	9.4	9.2	9.3	10.7	8.7	9.6
7	4.7	3.9	4.2	7.9	7.4	7.7	9.4	9.0	9.2	11.1	10.3	10.8
8	4.1	3.3	3.7	8.8	7.3	7.7	9.5	8.9	9.2	10.9	10.7	10.9
9	7.1	4.0	5.1	8.9	8.5	8.7	9.8	9.3	9.5	10.7	10.1	10.4
10	7.6	6.9	7.3	---	---	---	9.9	8.9	9.3	11.0	10.4	10.8
11	7.1	6.7	7.0	---	---	---	9.7	8.9	9.2	10.8	10.7	10.8
12	6.7	6.0	6.4	---	---	---	9.3	8.5	8.9	11.0	10.8	10.9
13	6.0	5.5	5.8	---	---	---	9.1	8.0	8.5	11.0	10.7	10.9
14	5.4	4.8	5.0	---	---	---	8.7	7.9	8.3	10.8	10.0	10.4
15	4.7	4.1	4.5	---	---	---	8.6	7.8	8.2	10.1	9.6	9.9
16	5.0	4.1	4.6	---	---	---	8.4	7.9	8.2	10.3	10.1	10.2
17	4.5	3.9	4.2	7.3	6.6	7.0	8.6	7.8	8.2	10.2	9.4	9.9
18	5.3	4.2	4.6	7.4	6.6	7.0	8.6	7.6	8.0	10.0	9.2	9.5
19	6.2	4.2	5.1	7.0	6.2	6.6	9.0	8.1	8.6	10.0	9.6	9.8
20	7.1	4.9	5.8	6.4	5.7	6.1	8.7	7.8	8.4	9.8	9.5	9.7
21	5.9	4.9	5.4	6.1	5.5	5.8	7.9	7.6	7.7	9.9	9.8	9.8
22	6.6	5.1	5.9	6.5	5.4	6.1	9.3	7.9	8.7	10.2	9.9	10.0
23	6.9	5.7	6.3	6.7	5.7	6.2	9.8	8.9	9.4	10.0	9.6	9.9
24	7.2	5.9	6.5	7.3	6.8	7.1	10.7	9.8	10.5	9.7	9.4	9.5
25	7.3	6.1	6.6	7.4	6.7	7.2	10.9	9.9	10.5	9.6	9.3	9.4
26	7.8	6.2	6.9	6.7	6.2	6.6	10.1	9.2	9.8	9.5	9.1	9.3
27	7.3	6.2	6.7	6.3	6.0	6.2	10.9	9.3	10.1	9.3	8.9	9.2
28	7.2	5.8	6.5	7.1	6.2	6.8	10.4	9.7	10.0	9.0	8.7	8.9
29	6.9	5.1	6.1	8.1	7.1	7.7	9.8	8.6	9.2	9.0	8.6	8.7
30	6.6	5.0	5.8	8.5	8.0	8.4	9.5	8.7	9.1	9.8	8.5	9.0
31	6.6	4.9	5.7	---	---	---	10.0	9.5	9.7	10.7	9.4	9.8
MONTH	7.8	3.3	5.6	8.9	5.2	6.9	10.9	7.6	9.0	11.1	8.5	9.9
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	11.4	10.2	10.6	9.2	7.7	8.5	---	---	---	9.6	8.8	9.2
2	10.7	9.8	10.2	8.8	7.6	8.3	---	---	---	9.6	9.4	9.5
3	10.3	9.5	9.8	9.3	8.8	9.1	7.2	6.2	6.7	9.5	8.4	9.1
4	9.4	8.3	9.0	9.1	8.4	8.9	6.7	5.6	6.2	8.9	8.3	8.5
5	9.2	8.4	8.9	8.4	7.8	8.1	6.4	5.3	5.9	9.4	7.8	8.6
6	10.2	8.9	9.3	7.9	7.0	7.4	6.9	5.3	6.1	10.4	8.8	9.5
7	10.5	10.2	10.4	7.6	6.6	7.0	6.6	4.9	5.8	10.4	9.3	9.8
8	10.6	10.4	10.5	8.5	6.8	7.4	6.3	4.6	5.4	9.8	8.2	9.1
9	10.4	9.3	9.9	9.0	7.3	7.8	6.2	4.3	5.2	---	---	---
10	9.3	8.4	9.0	9.6	7.5	8.2	5.8	4.3	5.0	---	---	---
11	9.2	8.4	8.7	9.5	7.6	8.4	5.9	5.0	5.3	---	---	---
12	9.0	8.3	8.6	9.0	6.9	7.7	5.4	4.3	4.8	---	---	---
13	8.9	7.9	8.3	8.7	6.4	7.3	---	---	---	---	---	---
14	8.9	7.6	8.1	8.1	6.5	7.3	---	---	---	---	---	---
15	9.1	7.5	8.2	8.5	6.8	7.6	---	---	---	---	---	---
16	8.8	8.4	8.6	7.5	6.7	7.0	---	---	---	---	---	---
17	9.2	8.4	8.7	8.1	7.2	7.7	8.4	6.8	7.5	---	---	---
18	8.4	7.3	8.0	8.5	7.0	7.6	8.4	6.9	7.6	---	---	---
19	8.2	6.5	7.3	8.3	6.8	7.4	7.4	6.7	7.0	---	---	---
20	9.6	7.1	8.1	8.0	6.5	7.2	8.4	7.3	7.8	---	---	---
21	10.1	7.4	9.0	7.7	6.6	7.1	8.7	7.9	8.2	---	---	---
22	10.1	9.4	9.8	8.1	5.9	7.1	8.7	8.1	8.4	---	---	---
23	9.5	9.3	9.4	7.7	5.9	6.7	9.3	8.4	8.8	---	---	---
24	9.5	9.0	9.4	6.9	5.9	6.3	9.1	8.2	8.7	---	---	---
25	9.0	8.8	8.9	7.4	5.9	6.6	9.0	8.6	8.8	5.7	3.1	5.2
26	9.3	8.8	9.0	7.6	5.5	6.6	9.0	8.5	8.7	6.2	4.9	5.5
27	9.9	8.8	9.5	6.2	5.2	5.8	9.1	8.4	8.8	6.8	5.4	5.9
28	9.4	9.2	9.3	6.3	4.9	5.6	9.0	8.4	8.7	7.1	6.6	6.8
29	---	---	---	8.0	5.4	7.2	10.0	8.4	9.0	7.2	6.4	6.8
30	---	---	---	7.8	7.2	7.7	10.1	8.6	9.3	7.0	6.6	6.8
31	---	---	---	7.5	6.7	7.1	---	---	---	7.0	6.8	6.9
MONTH	11.4	6.5	9.1	9.6	4.9	7.4	10.1	4.3	7.2	10.4	3.1	7.8

TRINITY RIVER BASIN

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08062000 EAST FORK TRINITY RIVER NEAR CRANDALL, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	6.8	6.4	6.6	8.4	3.7	5.8	4.9	2.7	3.6	5.1	4.8	5.0
2	6.4	5.4	5.9	8.0	3.7	5.6	6.4	2.6	4.1	5.4	4.9	5.2
3	6.9	4.7	6.0	6.1	3.5	4.8	7.6	2.8	4.8	5.3	4.9	5.1
4	7.1	6.4	6.8	6.9	2.9	4.6	7.5	2.9	4.9	6.5	4.5	5.3
5	7.1	5.9	6.6	7.7	3.5	5.1	6.6	2.9	4.5	5.4	2.4	4.4
6	8.1	5.5	6.7	6.5	2.6	4.4	5.8	3.0	4.2	5.6	2.0	3.6
7	8.6	6.9	7.5	8.6	2.3	4.9	5.6	2.8	4.1	4.7	3.6	4.1
8	8.3	7.1	7.5	8.3	2.8	5.1	6.1	3.0	4.3	5.6	3.8	4.6
9	7.5	7.0	7.3	8.9	4.0	6.1	5.3	2.9	3.9	5.9	4.4	5.1
10	7.6	7.1	7.4	8.5	3.8	6.1	3.8	.5	2.3	5.3	3.8	4.4
11	7.6	7.2	7.4	8.4	3.5	5.6	3.9	3.1	3.5	4.8	3.2	3.8
12	7.5	7.0	7.2	7.6	3.3	5.2	4.2	3.4	3.7	5.4	2.9	3.9
13	7.4	6.9	7.1	8.0	3.2	5.4	4.8	.0	3.2	6.4	3.2	4.5
14	7.3	6.3	6.9	11.0	3.2	6.4	5.1	4.0	4.7	6.5	3.1	4.5
15	7.3	5.5	6.2	11.6	3.5	6.9	4.9	4.5	4.7	5.4	3.1	4.1
16	5.8	5.0	5.3	10.9	4.0	6.9	4.5	3.3	4.0	5.3	3.3	4.0
17	6.6	5.2	5.7	12.4	3.8	7.4	4.2	3.1	3.5	5.3	3.4	4.0
18	7.5	5.1	5.9	9.6	3.6	6.4	4.5	2.7	3.5	---	---	---
19	9.3	4.6	6.4	8.6	3.3	5.7	4.5	2.4	3.3	---	---	---
20	13.4	5.1	8.6	8.7	3.1	5.6	4.4	2.2	3.1	7.3	5.9	6.8
21	13.7	5.3	9.0	5.6	2.6	4.1	3.5	1.8	2.6	6.6	5.6	6.2
22	12.3	4.6	8.0	5.6	2.1	3.6	3.4	2.0	2.7	5.5	4.5	5.0
23	7.0	2.7	5.2	7.8	2.3	4.5	4.5	2.7	4.1	4.7	4.0	4.4
24	7.0	5.8	6.4	5.8	2.0	3.8	4.6	4.1	4.4	5.1	3.5	4.3
25	6.9	6.2	6.5	3.5	.7	2.2	5.3	4.0	4.5	6.7	5.1	6.1
26	8.2	5.4	6.6	3.8	3.1	3.4	6.0	4.1	5.0	6.5	5.6	6.1
27	8.4	4.9	6.3	3.8	3.1	3.4	5.2	3.1	4.1	6.0	5.3	5.6
28	8.6	4.6	6.3	3.8	2.9	3.3	6.7	4.9	5.6	6.0	4.9	5.4
29	8.5	4.6	6.3	4.5	3.8	4.2	6.0	4.1	4.9	6.0	4.7	5.3
30	9.0	4.2	6.3	3.8	2.8	3.5	4.5	2.9	4.2	6.1	4.5	5.2
31	---	---	---	4.4	2.7	3.3	5.2	4.4	5.0	---	---	---
MONTH	13.7	2.7	6.7	12.4	.7	4.9	7.6	.0	4.0	7.3	2.0	4.9

## TRINITY RIVER MAIN STEM

08062500 TRINITY RIVER NEAR ROSSER, TX

LOCATION.--Lat 32°25'35", Long 96°27'46", Ellis County, Hydrologic Unit 12030105, on right bank at downstream side of right pier of bridge on State Highway 34, 2.5 mi south of Rosser, 8.5 mi downstream from East Fork Trinity River, and at mile 451.4.

DRAINAGE AREA.--8,147 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1924 to September 1925, October 1938 to current year. Monthly discharge only for some periods, published in WSP 1312.

REVISED RECORDS.--WSP 1922: Drainage area. WDR TX-77-1: 1942(M), drainage area. WDR TX-89-1

GAGE.--Water-stage recorder. Datum of gage is 302.65 ft above National Geodetic Vertical Datum of 1929. July 25, 1924, to Sept. 30, 1925, nonrecording gage at abandoned lock and dam No. 7, 1.7 mi upstream from present site at datum 6.94 ft higher.

REMARKS.--Records good except those for estimated daily discharges, which are fair. At times, flow is affected by storage in 15 upstream reservoirs having a combined capacity of 3,572,000 acre-ft, of which 1,138,000 acre-ft is for flood control. A levee system constructed in 1916, extends several miles upstream and downstream from station. The cities of Fort Worth, Dallas, and several smaller cities divert considerable water for their municipal use, of which about 60 percent is returned as sewage effluent that sustains low flows at this site. Flow may also be affected at times by discharge from the flood-detention pools of 38 floodwater-retarding structures with a combined detention capacity of 22,600 acre-ft. These structures control runoff from 76.7 mi<sup>2</sup> above this station. Two separate gage-height telemeters at station.

AVERAGE DISCHARGE.--54 years (water years 1925, 1939-91), 2,787 ft<sup>3</sup>/s (2,019,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 150,000 ft<sup>3</sup>/s Apr. 23, 1942, following numerous breaks in levee systems along both banks; maximum gage height, 41.55 ft Apr. 22, 1942, just prior to levee breaks; minimum discharge, 32 ft<sup>3</sup>/s for several days in 1924-25.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1908 reached a stage of about 33 ft (present site and datum), from information by U.S. Army Corps of Engineers (discharge believed to have been about the same as that of Apr. 22, 1942).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 31,700 ft<sup>3</sup>/s Apr. 15 at 1300 hours (gage height, 30.00 ft); minimum daily, 409 ft<sup>3</sup>/s Sept. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	745	747	975	1110	1300	1500	892	3520	3080	871	877	3380
2	756	743	931	e1020	1200	1890	881	2490	2030	883	780	5230
3	747	758	1600	1000	1110	1710	889	2550	2570	844	739	4550
4	1150	778	1550	1000	1130	1370	887	5870	5950	1230	704	2000
5	1090	2430	1180	989	3990	1160	884	6150	3830	1440	682	1050
6	867	2020	1030	1110	6460	1120	906	4950	3750	1010	681	1220
7	797	1110	964	2590	3650	1080	885	3920	4140	844	674	749
8	766	1070	955	2170	2340	1060	896	3810	e4190	806	664	1770
9	1560	5950	907	1410	1690	1030	903	6390	4270	762	653	2990
10	5550	7200	893	4470	1410	991	867	5660	3610	e805	698	1080
11	3460	3660	917	8030	1320	982	850	3890	3040	e782	723	689
12	1190	1430	905	4310	1290	995	3760	3580	2970	e756	845	583
13	950	1110	896	1890	1240	975	10600	2890	2930	e721	3450	520
14	868	1010	889	1510	1190	960	15200	1880	2500	e709	6110	484
15	836	971	858	3130	1150	956	26100	2950	1940	e699	5910	653
16	827	925	858	3420	1110	981	19600	7420	1690	e713	2760	726
17	810	890	879	2130	1080	1010	5680	5550	2780	e736	878	961
18	807	866	950	2200	1140	1080	4850	2710	2180	e721	622	1020
19	803	846	1130	5880	1130	1110	7370	2210	1480	e702	508	1450
20	790	862	1040	5530	1100	1020	6620	2770	1380	e676	465	3600
21	765	874	927	3570	1180	982	5360	2420	1300	e670	442	1850
22	811	2790	952	1940	3690	973	5000	1750	1210	e671	527	762
23	816	4880	959	1590	8960	1270	4910	1570	2210	e656	1070	582
24	787	2780	922	1480	6020	1110	4560	1490	5930	e653	722	543
25	764	1520	898	1400	e2930	960	3930	4880	4000	e696	489	1020
26	768	1190	891	1320	e2070	939	4580	10700	1620	e754	418	921
27	748	1170	1160	1270	e1730	957	4260	10800	1240	e991	587	620
28	740	1510	1340	1370	1610	2760	3420	6330	1080	e2060	525	457
29	731	1460	1110	1260	---	1950	3710	4640	971	e4360	436	421
30	752	1070	1470	1220	---	1120	5000	4380	913	e2560	1030	409
31	753	---	1430	1280	---	961	---	4050	---	e1120	4360	---
TOTAL	33804	54620	32366	72599	64220	36962	154250	134170	80784	31901	40029	42290
MEAN	1090	1821	1044	2342	2294	1192	5142	4328	2693	1029	1291	1410
MAX	5550	7200	1600	8030	8960	2760	26100	10800	5950	4360	6110	5230
MIN	731	743	858	989	1080	939	850	1490	913	653	418	409
AC-FT	67050	108300	64200	144000	127400	73310	306000	266100	160200	63280	79400	83880

CAL YR 1990 TOTAL 3156162 MEAN 8647 MAX 107000 MIN 712 AC-FT 6260000  
WTR YR 1991 TOTAL 777995 MEAN 2131 MAX 26100 MIN 409 AC-FT 1543000

e Estimated



08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1954 to current year. Chemical and biochemical analyses: January 1968 to current year. Pesticide analyses: January 1968 to July 1981. Sediment analyses: 1962, April to September 1964, April 1972 to April 1975.

PERIOD OF DAILY RECORD.--  
 SPECIFIC CONDUCTANCE: October 1954 to current year.  
 pH: March 1977 to current year.  
 WATER TEMPERATURE: October 1954 to current year.  
 DISSOLVED OXYGEN: March 1977 to current year.

INSTRUMENTATION.--Since March 1977, a four-parameter water-quality monitor records temperature, DO, pH, and specific conductance continuously at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--  
 SPECIFIC CONDUCTANCE: Maximum, 2,990 microsiemens Oct. 13, 1956; minimum, 122 microsiemens Sept. 30, 1981.  
 pH: Maximum, 9.9 units July 12, 1982; minimum, 6.8 units Oct. 3, 19, 20, Nov. 19, 1980.  
 WATER TEMPERATURE: Maximum, 36.0°C July 1, 1955; minimum, 1.0°C on many days during winter months.  
 DISSOLVED OXYGEN: Maximum, 11.4 mg/L Feb. 12, 1986; minimum, 0.0 mg/L on several days during 1979-81.

EXTREMES FOR CURRENT YEAR.--  
 SPECIFIC CONDUCTANCE: Maximum, 796 microsiemens Dec. 22; minimum, 243 microsiemens Nov. 23.  
 pH: Maximum, 8.1 units on several days during July, August, and September; minimum, 7.4 units on several days during the year.  
 WATER TEMPERATURE: Maximum, 31.5°C Aug. 7, 8; minimum, 8.0°C Dec. 23, Jan. 11, 12.  
 DISSOLVED OXYGEN: Maximum, 10.7 mg/L Jan. 4, 5, 8; minimum, 3.2 mg/L Apr. 12, Aug. 14, 31.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)
OCT 31...	1015	762	685	7.7	21.0	8.0	90	2.1	140	38
JAN 30...	1430	1260	641	7.8	11.5	9.7	89	1.9	200	61
MAR 27...	0900	916	706	7.6	20.5	7.2	81	6.0	180	54
MAY 23...	1530	1580	620	7.7	27.0	7.1	90	1.4	190	59
JUL 09...	1400	764	587	7.9	30.5	6.7	91	1.3	150	49
AUG 28...	0900	559	620	7.7	28.5	6.8	88	1.6	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS S102)
OCT 31...	49	5.2	76	3	12	110	70	69	1.0	9.4
JAN 30...	72	5.1	50	2	7.4	140	89	49	0.70	6.7
MAR 27...	65	5.5	67	2	9.7	130	95	63	1.0	6.7
MAY 23...	66	5.5	52	2	6.6	130	69	50	0.70	6.1
JUL 09...	51	5.0	57	2	9.1	99	65	52	1.1	8.0
AUG 28...	--	--	--	--	--	100	--	--	--	--

DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)
OCT 31...	355	9.91	0.090	10.0	0.080	1.5	1.6	4.20	4.00
JAN 30...	364	5.33	0.070	5.40	0.190	1.2	1.4	1.70	1.70
MAR 27...	391	6.03	0.270	6.30	0.240	1.4	1.6	2.50	2.50
MAY 23...	333	6.28	0.120	6.40	0.070	1.5	1.6	2.10	1.60
JUL 09...	308	8.20	0.100	8.30	0.070	0.73	0.80	2.60	2.50
AUG 28...	--	8.06	0.040	8.10	0.080	1.3	1.4	2.70	2.40

TRINITY RIVER MAIN STEM

08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	33804	567	314	28600	47	4260	66	6010	150
NOV. 1990	54620	464	259	38200	32	4770	52	7630	140
DEC. 1990	32366	634	349	30500	55	4820	75	6520	160
JAN. 1991	72599	509	283	55400	37	7350	57	11300	150
FEB. 1991	64220	531	294	51000	41	7100	61	10500	150
MAR. 1991	36962	669	368	36700	61	6090	80	7960	160
APR. 1991	154250	397	222	92600	25	10300	43	18000	130
MAY 1991	134170	416	233	84500	26	9360	45	16400	140
JUNE 1991	80784	439	245	53500	28	6180	48	10500	140
JULY 1991	31901	596	329	28300	50	4320	69	5980	150
AUG. 1991	40029	467	260	28100	33	3600	52	5650	140
SEPT 1991	42290	441	246	28100	29	3330	49	5540	140
TOTAL	777995	**	**	556000	**	71500	**	112000	**
WTD.AVG.	2131	475	265	**	34	**	53	**	140

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	e680	704	686	697	513	461	479	---	---	e630
2	---	---	e680	702	698	699	553	515	533	---	---	e630
3	---	---	e680	710	700	707	568	509	545	---	---	e620
4	---	---	e680	706	694	702	551	471	504	610	604	e620
5	---	---	e690	698	466	627	578	518	554	618	606	613
6	632	528	550	546	424	470	621	578	600	638	606	622
7	568	536	544	522	482	501	658	619	643	640	542	596
8	656	570	611	516	478	486	677	657	666	546	502	515
9	692	658	674	528	286	384	683	663	676	556	522	545
10	644	310	396	370	326	350	698	679	690	552	324	475
11	372	322	342	416	352	384	712	687	699	414	346	388
12	416	374	393	444	404	423	---	---	e646	430	392	405
13	506	420	455	512	448	484	---	---	e645	488	432	460
14	556	510	533	560	514	531	---	---	e650	550	490	524
15	618	560	592	590	562	575	671	653	660	---	---	e510
16	656	620	644	607	592	601	672	662	667	---	---	e490
17	664	652	658	618	606	614	673	662	669	494	480	487
18	664	652	657	634	618	625	687	673	680	526	480	504
19	668	658	663	645	633	639	692	666	682	486	402	435
20	690	670	679	645	634	638	666	650	661	460	416	442
21	690	674	681	649	638	644	734	636	675	482	460	466
22	692	680	687	639	445	542	796	650	721	530	476	497
23	702	688	694	442	243	322	758	668	679	588	534	566
24	688	662	677	448	364	395	---	---	e670	632	590	610
25	664	656	661	464	417	443	---	---	e660	656	632	643
26	684	664	674	462	419	439	---	---	e650	678	658	667
27	692	686	690	486	457	464	---	---	e650	690	678	683
28	696	690	695	543	490	520	---	---	e650	710	688	694
29	696	692	695	531	484	509	---	---	e640	708	666	696
30	702	690	697	482	461	470	---	---	e640	666	638	650
31	690	684	687	---	---	---	---	---	e630	694	666	681
MONTH	702	310	624	710	243	529	796	461	639	710	324	560

e Estimated

TRINITY RIVER MAIN STEM

08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	692	664	680	626	568	588	652	628	641	404	360	384
2	690	666	677	632	590	612	662	656	659	434	406	424
3	690	676	681	580	548	563	696	662	682	518	436	459
4	698	670	686	620	558	580	708	692	697	578	394	480
5	664	464	588	658	622	641	722	704	711	402	382	395
6	452	400	428	690	660	674	730	722	726	406	388	398
7	442	398	419	704	690	699	738	730	733	398	390	394
8	486	444	463	708	698	702	740	730	734	446	390	401
9	576	488	531	714	700	707	758	736	750	460	370	419
10	634	578	609	730	698	713	754	742	747	426	366	380
11	672	636	654	732	730	730	748	732	740	398	370	378
12	678	668	673	736	718	727	732	256	611	424	400	414
13	678	658	666	730	722	725	364	280	318	520	424	463
14	688	670	679	732	724	727	306	262	274	584	524	560
15	700	686	695	732	722	724	314	276	296	624	480	568
16	702	698	700	724	716	718	372	316	329	476	348	384
17	710	696	703	736	716	721	440	376	415	400	378	392
18	708	696	701	762	738	742	514	442	475	476	400	427
19	718	706	712	768	756	763	452	398	429	562	478	517
20	704	698	700	756	722	740	420	394	404	594	438	536
21	702	674	693	722	704	713	438	420	432	564	444	486
22	668	370	545	724	710	719	450	438	444	582	568	576
23	424	326	390	738	718	724	452	444	448	628	586	608
24	438	412	420	742	594	663	448	430	440	612	502	601
25	514	442	478	636	602	619	466	416	432	518	312	367
26	570	518	549	704	640	676	528	470	490	328	320	323
27	608	546	582	718	704	708	472	428	460	378	330	356
28	570	540	557	760	564	694	424	410	415	414	376	387
29	---	---	---	548	500	526	530	414	477	428	414	420
30	---	---	---	572	544	566	522	336	408	458	430	447
31	---	---	---	626	572	598	---	---	---	470	456	459
MONTH	718	326	602	768	500	677	758	256	527	628	312	445
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	486	470	478	666	634	653	498	422	456	390	354	375
2	572	488	532	674	666	671	550	502	527	392	278	338
3	580	410	498	676	672	674	624	552	587	342	314	325
4	418	372	388	688	676	681	638	628	634	422	342	381
5	424	382	394	682	494	604	676	638	658	452	416	434
6	438	368	410	660	588	633	678	674	675	522	452	486
7	414	396	408	642	528	569	676	662	668	564	502	537
8	424	376	401	544	528	533	672	650	659	562	498	519
9	420	384	403	596	546	575	678	658	667	570	400	451
10	426	380	407	626	594	611	684	658	674	446	418	429
11	428	408	419	650	620	630	668	650	660	490	446	465
12	448	420	437	672	648	656	660	634	649	574	494	537
13	456	440	446	680	666	672	660	406	528	594	572	578
14	516	452	485	678	664	670	348	264	302	640	596	620
15	526	506	511	698	680	691	346	280	314	658	642	648
16	538	522	531	716	700	708	376	328	349	660	642	650
17	560	398	492	712	696	705	440	380	407	650	544	608
18	508	446	480	696	680	688	524	444	490	586	516	541
19	504	478	491	698	676	686	572	526	542	582	446	524
20	558	498	534	692	686	690	610	574	591	536	332	411
21	590	560	570	692	680	684	634	612	623	376	350	356
22	612	578	598	704	694	699	634	526	603	438	378	404
23	596	332	431	710	692	702	604	538	578	524	444	487
24	388	336	352	712	680	697	566	472	530	574	526	544
25	374	340	352	694	678	687	544	512	528	586	548	566
26	432	376	400	690	616	653	608	548	576	588	460	534
27	506	434	472	660	592	626	642	536	616	548	510	519
28	564	508	535	694	594	640	616	534	589	574	514	541
29	606	566	583	634	380	467	622	588	607	612	576	594
30	632	608	619	398	360	371	606	590	598	660	614	639
31	---	---	---	418	376	399	644	328	444	---	---	---
MONTH	632	332	469	716	360	633	684	264	559	660	278	501

TRINITY RIVER MAIN STEM  
08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	7.7	7.6	7.7	7.7	7.7	7.7	---	---	---
2	---	---	---	7.7	7.6	7.7	7.7	7.6	7.6	---	---	---
3	---	---	---	7.7	7.6	7.7	7.6	7.6	7.6	---	---	---
4	---	---	---	7.7	7.6	7.7	7.6	7.5	7.6	7.7	7.6	7.6
5	---	---	---	7.6	7.4	7.5	7.7	7.6	7.7	7.7	7.6	7.6
6	7.5	7.5	7.5	7.6	7.5	7.6	7.7	7.7	7.7	7.6	7.6	7.6
7	7.5	7.4	7.5	7.7	7.6	7.6	7.7	7.6	7.7	7.6	7.5	7.6
8	7.6	7.5	7.5	7.7	7.5	7.6	7.7	7.6	7.7	7.7	7.6	7.7
9	7.6	7.4	7.5	7.8	7.5	7.7	7.7	7.7	7.7	7.7	7.7	7.7
10	7.7	7.4	7.6	7.7	7.7	7.7	7.7	7.6	7.7	7.8	7.6	7.7
11	7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.7	7.8	7.7	7.7
12	7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.6	7.8	7.7	7.7
13	7.6	7.6	7.6	7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.7	7.7
14	7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.6	7.7	7.7	7.7
15	7.6	7.6	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7
16	7.7	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.7
17	7.6	7.6	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.6	7.7
18	7.6	7.6	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.7	7.7
19	7.7	7.6	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.7	7.6	7.7
20	7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.6	7.6	7.6	7.6
21	7.6	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.6	7.8	7.6	7.7
22	7.7	7.6	7.6	7.7	7.5	7.6	7.7	7.6	7.7	7.8	7.8	7.8
23	7.7	7.6	7.6	7.7	7.5	7.6	7.7	7.6	7.7	7.8	7.7	7.8
24	7.8	7.6	7.7	7.6	7.5	7.5	---	---	---	7.8	7.7	7.8
25	7.7	7.6	7.7	7.6	7.5	7.6	---	---	---	7.8	7.7	7.8
26	7.7	7.6	7.7	7.7	7.6	7.6	---	---	---	7.8	7.7	7.7
27	7.7	7.6	7.7	7.6	7.6	7.6	---	---	---	7.8	7.7	7.7
28	7.7	7.6	7.6	7.6	7.6	7.6	---	---	---	7.7	7.7	7.7
29	7.6	7.6	7.6	7.7	7.5	7.6	---	---	---	7.7	7.7	7.7
30	7.7	7.6	7.6	7.7	7.6	7.7	---	---	---	7.8	7.7	7.8
31	7.7	7.6	7.6	---	---	---	---	---	---	7.8	7.7	7.8
MONTH	7.8	7.4	7.6	7.8	7.4	7.6	7.7	7.5	7.6	7.8	7.5	7.7
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	7.8	7.7	7.8	7.8	7.7	7.8	7.8	7.7	7.7	7.7	7.7	7.7
2	7.8	7.7	7.8	7.7	7.7	7.7	7.8	7.7	7.7	7.7	7.7	7.7
3	7.8	7.7	7.8	7.8	7.7	7.7	7.8	7.7	7.8	7.7	7.7	7.7
4	7.7	7.7	7.7	7.8	7.8	7.8	7.8	7.7	7.7	7.7	7.5	7.6
5	7.7	7.6	7.6	7.8	7.7	7.8	7.8	7.7	7.8	7.7	7.7	7.7
6	7.6	7.6	7.6	7.9	7.8	7.8	7.8	7.7	7.7	7.7	7.7	7.7
7	7.7	7.6	7.7	7.9	7.7	7.8	7.7	7.7	7.7	7.8	7.7	7.8
8	7.7	7.7	7.7	7.9	7.8	7.8	7.8	7.6	7.7	7.8	7.7	7.8
9	7.7	7.7	7.7	7.9	7.8	7.8	7.8	7.7	7.8	7.7	7.6	7.6
10	7.7	7.7	7.7	7.9	7.7	7.8	7.9	7.7	7.8	7.7	7.6	7.7
11	7.7	7.7	7.7	7.8	7.7	7.8	7.8	7.7	7.8	7.7	7.7	7.7
12	7.8	7.7	7.7	7.8	7.8	7.8	7.8	7.4	7.6	7.8	7.7	7.7
13	7.8	7.7	7.8	7.8	7.8	7.8	7.7	7.6	7.6	7.8	7.7	7.8
14	7.8	7.7	7.7	7.9	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.8
15	7.8	7.7	7.7	7.9	7.8	7.8	7.7	7.6	7.6	7.8	7.5	7.7
16	7.9	7.7	7.8	7.8	7.7	7.8	7.6	7.5	7.6	7.6	7.5	7.6
17	7.8	7.8	7.8	7.8	7.7	7.7	7.6	7.5	7.6	7.7	7.6	7.7
18	7.8	7.7	7.8	7.8	7.7	7.7	7.7	7.5	7.6	7.7	7.7	7.7
19	7.8	7.7	7.8	7.7	7.6	7.7	7.6	7.5	7.5	7.7	7.7	7.7
20	7.9	7.8	7.8	7.8	7.7	7.7	7.7	7.6	7.6	7.7	7.6	7.7
21	7.9	7.8	7.8	7.8	7.7	7.8	7.7	7.7	7.7	7.7	7.7	7.7
22	7.8	7.6	7.8	7.8	7.7	7.8	7.8	7.7	7.8	7.7	7.6	7.7
23	7.8	7.7	7.7	7.7	7.6	7.7	7.8	7.8	7.8	7.7	7.7	7.7
24	7.8	7.7	7.7	7.7	7.6	7.6	7.8	7.8	7.8	7.7	7.5	7.7
25	7.8	7.7	7.8	7.7	7.6	7.7	7.8	7.7	7.8	7.7	7.5	7.6
26	7.8	7.8	7.8	7.7	7.6	7.6	7.7	7.7	7.7	7.6	7.5	7.6
27	7.8	7.8	7.8	7.7	7.7	7.7	7.8	7.7	7.8	7.6	7.5	7.6
28	7.8	7.7	7.8	7.7	7.4	7.6	7.8	7.8	7.8	7.7	7.6	7.6
29	---	---	---	7.7	7.6	7.6	7.8	7.5	7.7	7.7	7.7	7.7
30	---	---	---	7.7	7.6	7.7	7.7	7.6	7.7	7.7	7.7	7.7
31	---	---	---	7.8	7.7	7.7	---	---	---	7.8	7.7	7.8
MONTH	7.9	7.6	7.7	7.9	7.4	7.7	7.9	7.4	7.7	7.8	7.5	7.7

TRINITY RIVER MAIN STEM

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08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.8	7.7	7.8	7.8	7.7	7.8	7.7	7.7	7.7	7.6	7.5	7.6
2	7.8	7.7	7.7	7.9	7.7	7.8	7.8	7.7	7.7	7.7	7.6	7.6
3	7.7	7.6	7.7	7.9	7.7	7.8	7.9	7.8	7.8	7.7	7.6	7.6
4	7.7	7.6	7.7	7.8	7.6	7.7	8.0	7.8	7.9	7.7	7.6	7.6
5	7.6	7.6	7.6	7.6	7.5	7.6	8.1	7.9	8.0	7.7	7.6	7.6
6	7.6	7.6	7.6	7.7	7.6	7.7	8.1	7.9	8.0	7.7	7.6	7.6
7	7.7	7.6	7.7	7.8	7.7	7.8	8.1	7.9	8.1	7.8	7.6	7.7
8	7.7	7.6	7.7	7.8	7.7	7.7	8.1	7.9	8.0	7.8	7.5	7.6
9	7.7	7.6	7.7	7.8	7.7	7.8	8.1	7.9	8.0	7.6	7.5	7.6
10	7.7	7.7	7.7	8.0	7.7	7.8	7.9	7.8	7.9	7.7	7.6	7.7
11	7.8	7.7	7.7	8.0	7.9	7.9	7.9	7.7	7.8	7.8	7.7	7.7
12	7.8	7.8	7.8	8.0	7.8	7.9	7.8	7.6	7.7	7.9	7.7	7.8
13	7.9	7.8	7.8	8.1	7.8	7.9	7.6	7.4	7.5	8.0	7.8	7.9
14	7.8	7.8	7.8	7.9	7.8	7.9	7.7	7.6	7.6	8.1	7.8	8.0
15	7.8	7.8	7.8	7.9	7.8	7.9	7.7	7.6	7.6	8.0	7.8	7.9
16	7.8	7.7	7.8	7.9	7.8	7.9	7.6	7.6	7.6	7.9	7.8	7.8
17	7.7	7.5	7.6	8.0	7.8	7.9	7.7	7.6	7.6	7.8	7.6	7.7
18	7.6	7.5	7.6	8.0	7.8	7.9	7.7	7.6	7.7	7.7	7.6	7.6
19	7.6	7.6	7.6	8.0	7.9	7.9	7.9	7.7	7.8	7.7	7.6	7.6
20	7.7	7.6	7.7	8.0	7.8	7.9	7.9	7.8	7.8	7.7	7.5	7.6
21	7.7	7.6	7.7	8.0	7.8	7.9	7.9	7.8	7.9	7.7	7.6	7.7
22	7.8	7.7	7.8	7.9	7.8	7.9	7.8	7.7	7.8	7.8	7.7	7.7
23	7.7	7.5	7.6	7.9	7.8	7.8	7.8	7.6	7.6	7.8	7.7	7.7
24	7.6	7.5	7.6	7.9	7.8	7.9	7.7	7.6	7.6	7.9	7.7	7.8
25	7.6	7.6	7.6	7.8	7.7	7.8	7.9	7.7	7.8	7.8	7.6	7.7
26	7.6	7.6	7.6	7.8	7.6	7.7	8.0	7.8	7.9	7.7	7.6	7.7
27	7.7	7.6	7.6	7.7	7.6	7.7	7.9	7.7	7.8	7.9	7.7	7.8
28	7.7	7.7	7.7	7.7	7.4	7.6	7.9	7.7	7.8	8.0	7.8	7.9
29	7.8	7.7	7.7	7.5	7.4	7.5	8.0	7.8	7.9	8.0	7.9	7.9
30	7.8	7.7	7.7	7.6	7.5	7.6	8.0	7.7	7.9	8.0	7.9	7.9
31	---	---	---	7.7	7.6	7.6	7.6	7.4	7.5	---	---	---
MONTH	7.9	7.5	7.7	8.1	7.4	7.8	8.1	7.4	7.8	8.1	7.5	7.7

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	22.0	21.0	21.5	15.5	14.5	15.0	---	---	---
2	---	---	---	22.0	21.0	21.5	16.5	15.5	16.0	---	---	---
3	---	---	---	22.0	21.5	22.0	16.0	15.0	15.5	---	---	---
4	---	---	---	22.0	19.0	20.5	15.0	14.0	14.0	10.5	9.5	10.0
5	---	---	---	19.0	16.5	18.5	14.0	13.0	13.5	11.0	10.5	11.0
6	26.5	25.5	26.0	17.0	15.5	16.0	13.0	13.0	13.0	11.0	11.0	11.0
7	27.5	26.0	27.0	17.0	16.5	17.0	13.0	12.5	13.0	11.0	10.5	10.5
8	27.5	26.5	27.0	16.5	15.5	16.0	13.0	12.5	12.5	10.5	9.0	9.5
9	26.5	24.0	25.0	16.5	13.5	14.5	13.5	12.5	13.0	10.0	9.5	9.5
10	24.0	19.5	21.0	14.0	13.5	14.0	13.5	12.5	13.0	10.0	9.0	9.5
11	19.5	18.5	19.0	15.0	13.5	14.0	14.5	13.5	14.0	9.5	8.0	8.5
12	19.5	18.5	19.0	16.0	15.0	15.5	16.0	14.5	15.5	8.5	8.0	8.0
13	20.0	19.0	19.5	17.0	16.0	16.5	16.0	15.5	16.0	9.5	8.5	9.0
14	21.5	20.0	21.0	17.5	16.5	17.0	16.0	15.5	15.5	11.0	10.0	10.5
15	23.5	21.5	22.5	18.5	17.5	18.0	16.5	16.0	16.0	12.0	11.0	11.5
16	24.0	23.0	23.5	19.0	18.0	18.5	16.0	15.5	15.5	12.0	11.0	11.5
17	24.0	23.5	23.5	19.0	18.5	19.0	16.5	15.5	16.0	12.0	11.0	11.5
18	23.5	21.5	22.5	19.5	18.5	19.0	16.5	16.0	16.5	11.5	11.0	11.5
19	21.5	20.5	21.0	20.5	19.0	20.0	16.0	15.5	15.5	12.0	11.0	11.5
20	21.5	20.5	21.0	21.0	20.0	20.5	16.0	15.5	16.0	11.5	11.0	11.5
21	21.5	19.0	20.0	21.0	20.5	20.5	16.0	12.0	14.5	11.0	10.0	10.5
22	19.0	18.0	18.5	21.0	20.5	21.0	12.0	9.5	10.5	10.0	9.0	9.5
23	19.0	18.0	18.5	20.5	18.5	19.5	9.0	8.0	9.0	10.5	9.5	10.0
24	19.0	18.0	18.5	18.5	18.0	18.0	---	---	---	11.5	10.5	11.0
25	19.0	18.0	18.5	19.5	18.5	18.5	---	---	---	12.0	11.0	11.5
26	19.0	18.0	18.5	20.5	19.5	20.0	---	---	---	12.0	11.5	12.0
27	20.0	18.5	19.0	20.5	20.0	20.5	---	---	---	13.0	11.5	12.0
28	20.5	19.5	20.0	20.0	18.5	19.0	---	---	---	13.0	12.5	12.5
29	21.5	20.0	21.0	18.5	17.0	18.0	---	---	---	13.5	13.0	13.0
30	21.5	20.5	21.0	17.0	15.0	15.5	---	---	---	13.0	11.0	11.5
31	22.0	21.0	21.5	---	---	---	---	---	---	12.0	11.0	11.5
MONTH	27.5	18.0	21.5	22.0	13.5	18.5	16.5	8.0	14.5	13.5	8.0	10.5



## TRINITY RIVER MAIN STEM

08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	11.5	11.0	11.5	16.5	14.0	15.0	19.0	17.5	18.5	23.0	21.5	22.0
2	11.5	11.0	11.5	17.0	16.0	16.5	19.0	18.0	18.5	23.0	21.5	22.5
3	13.0	11.5	12.5	16.5	14.5	15.5	20.0	18.0	19.0	23.0	22.0	22.5
4	14.0	13.0	13.5	16.0	14.5	15.0	21.0	19.5	20.5	22.5	21.5	22.0
5	15.0	14.0	14.5	17.0	16.0	16.5	21.0	20.0	20.5	21.5	21.5	21.5
6	14.0	13.5	14.0	18.0	17.0	17.5	21.5	20.5	21.0	21.5	20.5	21.0
7	14.0	13.0	13.5	18.0	16.5	17.5	22.5	21.0	21.5	21.0	20.5	21.0
8	14.0	13.0	13.5	17.0	16.0	16.5	23.5	22.0	23.0	21.5	20.5	21.0
9	14.5	13.0	13.5	17.0	16.5	16.5	24.0	23.5	23.5	21.5	21.0	21.0
10	15.5	14.0	14.5	16.5	16.0	16.0	23.0	22.0	22.5	22.0	21.0	21.5
11	16.0	15.0	15.5	17.0	16.0	16.5	23.0	22.0	22.5	23.5	22.0	22.5
12	16.5	15.5	16.0	18.5	17.0	18.0	22.5	21.5	22.5	24.5	23.0	23.5
13	17.0	16.5	16.5	18.0	17.5	17.5	21.5	20.0	21.0	26.0	23.5	24.5
14	16.5	16.5	16.5	17.5	16.5	17.0	20.0	19.5	20.0	26.0	25.5	25.5
15	16.0	14.5	15.5	17.0	15.0	16.0	21.0	19.5	20.0	25.5	24.5	25.0
16	14.5	13.0	13.5	15.5	14.5	15.0	22.0	20.5	21.0	24.5	24.0	24.0
17	14.5	13.0	13.5	17.0	15.5	16.0	23.0	22.0	22.0	24.0	23.5	24.0
18	16.0	14.5	15.5	17.0	16.5	16.5	22.5	21.5	22.0	25.5	23.0	24.0
19	15.5	15.0	15.5	17.5	17.0	17.0	22.5	21.5	22.0	25.5	24.5	25.0
20	15.5	15.0	15.5	17.5	17.5	17.5	22.5	21.5	22.0	26.0	25.0	25.5
21	15.5	14.5	15.5	19.5	18.0	18.5	22.0	20.0	21.0	26.5	25.0	26.0
22	14.5	13.0	13.5	20.0	19.0	19.5	20.0	19.5	20.0	26.5	26.0	26.5
23	13.5	12.5	13.0	20.0	18.5	19.5	20.0	18.5	19.5	27.0	26.5	26.5
24	14.5	13.0	13.5	20.0	19.5	19.5	20.0	20.0	20.0	27.5	26.0	26.5
25	14.5	14.0	14.0	19.5	19.0	19.5	21.0	20.0	20.5	25.5	24.0	24.5
26	14.0	13.5	14.0	21.0	19.5	20.5	22.0	21.0	21.5	25.5	25.0	25.5
27	14.0	13.5	14.0	21.5	20.5	21.0	22.5	22.0	22.0	26.5	26.0	26.5
28	14.0	13.0	13.5	20.5	19.0	20.0	22.0	21.5	22.0	27.5	26.5	27.0
29	---	---	---	19.0	18.0	18.5	23.0	21.0	22.0	27.5	27.0	27.0
30	---	---	---	18.0	17.0	17.5	22.5	21.5	22.0	28.0	27.0	27.5
31	---	---	---	18.0	17.0	17.5	---	---	---	28.0	27.0	27.5
MONTH	17.0	11.0	14.0	21.5	14.0	17.5	24.0	17.5	21.0	28.0	20.5	24.5
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	27.5	27.0	27.5	30.5	29.5	30.0	30.0	29.0	29.5	28.0	27.0	27.5
2	28.0	27.0	27.5	31.0	30.0	30.5	30.5	29.5	30.0	27.5	26.0	27.0
3	27.0	26.0	26.5	31.0	29.5	30.5	30.5	29.5	30.0	27.5	26.5	27.0
4	26.0	25.5	26.0	31.0	29.5	30.0	31.0	29.5	30.5	28.0	27.0	27.5
5	27.0	25.5	26.5	30.5	29.5	30.0	31.0	30.0	30.5	28.0	27.5	28.0
6	27.5	26.0	27.0	31.0	29.5	30.5	31.0	30.0	30.5	28.5	27.5	28.0
7	27.0	26.5	27.0	31.0	29.5	30.5	31.5	30.0	30.5	28.5	27.5	28.0
8	27.0	26.0	26.5	30.5	29.5	30.0	31.5	30.0	30.5	28.0	27.5	27.5
9	27.0	26.0	26.5	30.5	29.5	30.0	31.0	29.5	30.5	28.5	27.5	28.0
10	26.5	26.0	26.5	30.5	29.5	30.0	30.0	29.0	29.5	29.0	28.0	28.5
11	27.5	26.0	26.5	30.0	29.0	29.5	29.5	29.0	29.0	29.0	28.0	28.5
12	28.5	26.5	27.5	30.5	29.0	29.5	28.5	28.0	28.5	29.0	28.5	29.0
13	29.0	27.5	28.5	31.0	29.0	30.0	28.0	26.5	27.0	29.5	29.0	29.0
14	29.0	28.0	28.5	31.0	29.0	30.0	26.0	25.5	25.5	29.0	28.5	29.0
15	29.0	28.0	28.5	31.0	29.5	30.5	27.0	25.5	26.0	29.5	28.5	29.0
16	28.5	27.5	28.0	30.5	30.0	30.5	27.5	26.0	26.5	29.0	28.5	29.0
17	27.5	27.0	27.5	30.5	29.0	30.0	28.5	27.5	28.0	29.5	28.5	29.0
18	28.5	27.0	28.0	30.5	29.0	30.0	29.5	28.0	28.5	29.0	26.5	28.0
19	30.0	28.0	29.0	30.5	29.0	30.0	30.0	28.5	29.5	26.5	24.5	25.0
20	30.5	29.0	30.0	30.0	29.0	29.5	30.5	29.0	30.0	24.5	21.0	22.5
21	30.5	29.5	30.0	30.0	29.0	29.5	30.0	29.0	29.5	22.0	21.0	21.5
22	30.5	29.5	30.5	30.5	29.0	30.0	29.0	27.5	28.0	23.0	21.5	22.0
23	30.0	27.0	28.0	30.5	29.0	30.0	29.0	27.5	28.0	24.5	23.0	23.5
24	28.5	27.5	28.0	30.0	29.0	29.5	29.0	28.0	28.5	25.5	24.0	24.5
25	29.5	28.0	28.5	29.5	29.0	29.5	29.0	28.0	28.5	24.0	23.0	23.5
26	30.0	29.0	29.5	29.5	28.0	28.5	29.5	28.5	29.0	24.0	22.5	23.5
27	30.5	29.0	29.5	29.5	28.0	29.0	29.5	28.5	29.0	23.5	22.0	22.5
28	30.5	30.0	30.0	29.5	28.5	29.0	29.0	28.5	29.0	23.0	22.0	22.5
29	30.0	29.5	29.5	29.0	27.5	28.5	30.0	29.0	29.5	23.0	22.0	22.5
30	30.0	29.0	29.5	29.0	28.0	28.5	29.5	28.5	29.0	24.0	22.5	23.0
31	---	---	---	29.5	28.5	29.0	29.5	26.5	27.5	---	---	---
MONTH	30.5	25.5	28.0	31.0	27.5	29.5	31.5	25.5	29.0	29.5	21.0	26.0

TRINITY RIVER MAIN STEM  
08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	---	8.1	7.8	7.9	8.8	8.6	8.7	---	---	---
2	---	---	---	7.9	7.5	7.8	8.6	8.0	8.3	---	---	---
3	---	---	---	7.8	7.5	7.7	8.1	7.8	8.0	---	---	---
4	---	---	---	7.8	7.4	7.6	8.3	7.7	8.0	10.7	10.4	10.5
5	---	---	---	7.5	6.0	6.9	9.5	8.3	9.0	10.7	10.3	10.5
6	6.7	6.4	6.5	7.8	6.9	7.6	9.6	9.3	9.4	10.5	10.0	10.2
7	6.7	6.1	6.5	8.2	7.5	7.9	9.5	9.1	9.3	10.2	9.7	9.9
8	6.7	6.3	6.5	8.4	8.0	8.1	9.5	9.0	9.2	10.7	10.1	10.5
9	6.8	5.9	6.6	8.1	7.2	7.7	9.4	9.2	9.3	10.6	10.3	10.4
10	6.1	3.5	5.5	7.9	7.8	7.9	9.4	9.1	9.3	10.5	9.7	10.1
11	7.1	6.0	6.6	8.3	7.9	8.1	9.1	8.7	8.9	10.5	10.1	10.4
12	7.7	7.1	7.4	8.5	8.3	8.3	8.7	8.4	8.6	10.6	10.2	10.3
13	7.9	7.5	7.7	8.4	8.1	8.3	8.5	8.3	8.4	10.4	10.0	10.3
14	7.8	7.4	7.6	8.3	8.1	8.2	8.5	8.3	8.4	10.0	9.7	9.8
15	7.5	7.3	7.4	8.2	8.0	8.1	8.3	8.1	8.2	9.7	8.6	9.3
16	7.5	7.1	7.3	8.1	7.8	7.9	8.4	8.1	8.3	9.1	8.5	8.9
17	7.4	7.3	7.4	8.1	7.8	7.9	8.3	8.0	8.1	9.5	9.1	9.4
18	7.7	7.2	7.5	8.0	7.8	7.9	---	---	---	9.5	9.2	9.4
19	8.0	7.7	7.8	7.9	7.7	7.8	---	---	---	9.2	9.0	9.1
20	7.9	7.7	7.9	7.8	7.6	7.7	---	---	---	8.9	8.6	8.8
21	8.0	7.7	7.9	7.7	7.5	7.6	---	---	---	9.8	8.8	9.3
22	8.4	7.9	8.2	7.6	5.6	6.6	---	---	---	9.9	9.7	9.8
23	8.4	8.1	8.3	5.9	4.3	5.1	---	---	---	9.9	9.7	9.8
24	8.6	8.2	8.4	7.0	5.9	6.5	---	---	---	9.7	9.5	9.6
25	8.8	8.3	8.6	7.1	6.8	6.9	---	---	---	9.5	9.4	9.5
26	8.6	8.2	8.5	7.3	7.0	7.2	---	---	---	9.3	9.1	9.2
27	8.4	8.1	8.3	7.3	7.1	7.2	---	---	---	9.2	8.9	9.1
28	8.4	8.0	8.2	7.5	7.2	7.4	---	---	---	9.1	8.8	8.9
29	8.3	7.9	8.1	8.1	7.2	7.5	---	---	---	8.9	8.8	8.8
30	8.1	7.9	8.0	8.8	7.9	8.4	---	---	---	9.7	8.8	9.3
31	8.1	7.8	8.0	---	---	---	---	---	---	9.7	9.4	9.6
MONTH	8.8	3.5	7.6	8.8	4.3	7.6	9.6	7.7	8.7	10.7	8.5	9.7
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	10.1	9.6	9.9	8.9	8.4	8.7	8.6	8.2	8.4	7.1	6.6	6.9
2	10.0	9.7	9.9	8.4	7.8	8.1	8.5	8.2	8.3	7.3	7.1	7.2
3	9.6	9.4	9.5	8.6	7.8	8.2	8.6	8.2	8.4	7.3	7.0	7.3
4	9.4	8.9	9.2	8.6	8.5	8.6	8.7	8.2	8.4	7.0	5.9	6.6
5	8.9	7.9	8.3	8.8	8.2	8.5	8.9	8.2	8.5	6.9	6.7	6.8
6	8.2	7.6	7.9	8.9	8.3	8.6	8.4	8.1	8.3	7.5	6.7	7.1
7	8.5	7.7	8.2	8.8	8.0	8.4	8.4	7.7	8.0	7.8	7.5	7.6
8	8.8	8.5	8.6	9.1	8.3	8.7	8.7	7.4	8.0	7.8	7.1	7.7
9	8.8	8.6	8.7	9.1	8.4	8.8	8.6	7.6	8.1	7.0	6.1	6.7
10	8.6	8.5	8.5	9.0	8.6	8.8	8.1	7.7	7.9	7.1	6.5	6.7
11	8.5	8.2	8.4	9.0	8.4	8.7	8.2	7.5	7.9	7.2	7.1	7.1
12	8.7	8.3	8.5	8.8	8.3	8.6	7.6	3.2	5.9	7.2	7.1	7.2
13	8.9	8.5	8.6	8.9	8.2	8.6	5.2	3.9	4.7	7.2	7.0	7.1
14	8.7	8.2	8.5	9.2	8.4	8.9	5.6	5.0	5.3	7.1	6.7	6.9
15	9.2	8.1	8.6	9.2	8.7	8.9	5.9	5.3	5.7	7.0	5.1	6.3
16	9.7	8.8	9.2	9.1	8.7	8.9	5.2	4.5	4.8	5.8	5.0	5.3
17	9.3	9.0	9.2	8.9	8.4	8.7	6.1	5.0	5.6	6.7	5.9	6.3
18	9.0	8.5	8.6	8.6	8.1	8.4	6.5	5.3	6.3	6.8	6.7	6.7
19	9.1	8.4	8.7	8.1	7.5	7.9	5.8	4.5	5.5	6.8	6.6	6.7
20	9.6	8.8	9.1	8.4	7.5	8.0	6.9	5.4	6.1	6.8	6.5	6.6
21	10.0	9.1	9.4	8.4	7.9	8.2	7.3	6.3	6.9	7.0	6.5	6.7
22	9.4	8.3	9.1	8.3	7.7	8.0	7.8	7.1	7.5	6.8	6.3	6.6
23	8.8	8.0	8.5	7.9	7.4	7.6	8.0	7.5	7.8	6.9	6.5	6.7
24	8.5	8.3	8.4	7.6	6.9	7.3	7.9	7.7	7.8	7.7	4.7	6.6
25	8.6	8.2	8.4	7.7	7.3	7.5	7.7	7.2	7.5	5.1	3.6	4.7
26	8.9	8.6	8.8	7.5	7.1	7.3	7.5	7.3	7.4	4.7	4.5	4.6
27	9.2	8.9	9.0	7.9	7.2	7.5	7.4	7.3	7.3	5.4	4.7	5.0
28	9.2	8.7	9.1	7.2	5.3	6.3	7.4	7.3	7.3	5.9	5.5	5.7
29	---	---	---	7.0	6.4	6.6	7.4	5.8	7.1	6.1	5.9	6.1
30	---	---	---	7.8	6.8	7.3	6.8	5.5	6.1	6.3	6.0	6.1
31	---	---	---	8.4	7.7	8.0	---	---	---	6.4	6.2	6.3
MONTH	10.1	7.6	8.8	9.2	5.3	8.1	8.9	3.2	7.1	7.8	3.6	6.5

## TRINITY RIVER MAIN STEM

08062500 TRINITY RIVER NEAR ROSSER, TX--Continued

## OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	6.6	6.1	6.4	6.5	6.2	6.4	6.6	6.0	6.3	5.2	4.7	5.0
2	6.5	6.1	6.4	6.6	6.2	6.4	6.8	6.3	6.6	5.5	5.1	5.3
3	6.4	5.0	5.9	6.6	6.3	6.5	6.9	6.6	6.8	5.5	5.0	5.3
4	6.0	5.8	5.9	6.4	6.0	6.2	7.5	6.9	7.2	6.1	5.2	5.7
5	6.0	5.6	5.8	6.0	4.1	5.4	7.6	7.2	7.4	6.2	5.9	6.0
6	5.9	5.3	5.7	6.0	5.4	5.9	7.6	6.8	7.2	6.4	6.0	6.2
7	6.4	5.7	6.2	6.3	5.9	6.0	7.8	7.1	7.4	6.6	6.1	6.3
8	6.3	6.0	6.2	6.4	6.0	6.2	7.6	7.0	7.3	6.6	5.2	6.1
9	6.6	6.0	6.4	6.6	6.3	6.5	7.5	6.9	7.1	5.9	5.0	5.5
10	6.7	6.4	6.5	7.0	6.4	6.7	7.1	6.6	6.9	6.4	5.8	6.0
11	6.9	6.5	6.7	7.1	6.8	7.0	7.0	6.5	6.8	6.7	6.1	6.4
12	7.1	6.6	6.8	7.1	6.8	6.9	6.9	6.4	6.7	7.1	6.7	6.9
13	7.0	6.5	6.8	7.1	6.8	6.9	6.4	3.5	5.2	7.8	6.9	7.2
14	6.9	6.4	6.7	6.9	6.5	6.8	4.7	3.2	4.2	8.1	7.0	7.5
15	6.7	6.3	6.5	6.9	6.6	6.7	5.3	4.6	4.9	7.8	7.1	7.3
16	6.6	6.1	6.3	6.8	6.5	6.7	5.8	5.3	5.5	7.0	6.7	6.8
17	6.3	4.4	5.5	7.1	6.7	6.9	6.2	5.8	6.0	6.8	6.2	6.5
18	5.7	5.2	5.4	7.1	6.8	7.0	6.4	5.9	6.3	6.6	6.0	6.3
19	5.8	5.6	5.6	7.2	6.9	7.0	6.7	6.4	6.6	6.8	6.4	6.6
20	6.1	5.6	5.8	7.1	6.7	7.0	6.9	6.6	6.8	7.1	5.7	6.5
21	6.4	5.9	6.1	7.1	6.7	6.9	7.1	6.8	6.9	7.5	6.7	7.2
22	6.6	5.8	6.4	7.0	6.7	6.9	7.0	6.4	6.8	7.6	7.5	7.5
23	6.1	3.6	4.7	7.1	6.6	6.8	6.7	5.2	5.9	7.6	7.5	7.5
24	5.3	5.0	5.1	6.9	6.6	6.8	6.4	5.8	6.1	7.6	7.4	7.5
25	5.4	5.0	5.1	6.9	6.1	6.6	7.1	6.3	6.8	7.5	7.0	7.2
26	5.6	5.4	5.5	6.6	5.8	6.3	7.7	6.9	7.3	7.4	6.5	6.9
27	6.0	5.6	5.8	6.5	6.1	6.2	7.6	6.3	7.1	8.1	7.4	7.9
28	6.1	5.8	6.0	6.3	4.7	5.7	7.1	6.4	6.9	8.4	8.0	8.2
29	6.4	6.0	6.2	5.0	3.8	4.4	7.8	7.0	7.3	8.4	8.2	8.3
30	6.4	6.2	6.3	5.5	4.8	5.1	7.7	6.7	7.2	8.3	8.1	8.2
31	---	---	---	6.1	5.5	5.8	6.5	3.2	4.4	---	---	---
MONTH	7.1	3.6	6.0	7.2	3.8	6.4	7.8	3.2	6.5	8.4	4.7	6.7

TRINITY RIVER MAIN STEM

08062700 TRINITY RIVER AT TRINIDAD, TX  
(National stream-quality accounting network)

LOCATION.--Lat 32°08'05", long 96°06'20", Henderson County, Hydrologic Unit 12030105, on left bank at pumping station of Texas Power and Light Co., near southwest boundary of Trinidad, 0.5 mi downstream from St. Louis Southwestern Railway Lines bridge, 0.9 mi downstream from bridge on State Highway 31, 8 mi upstream from Cedar Creek, and at mile 391.2.

DRAINAGE AREA.--8,538 mi<sup>2</sup>, not including 1,007 mi<sup>2</sup> upstream from Cedar Creek Reservoir.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1964 to current year. Records of gage height collected in this vicinity for period October 1913 to September 1915 are contained in reports of U.S. Army Corps of Engineers, and records collected since October 1915 are contained in reports of the National Weather Service.

REVISED RECORDS.-- WDR TX-89-1: 1988. WDR TX-90-1: 1989.

GAGE.--Water-stage recorder. Datum of gage is 239.21 ft above National Geodetic Vertical Datum of 1929. Prior to May 3, 1967, at site 0.9 mi upstream at datum 1.28 ft higher.

REMARKS.--Records good. The spillway outflow from Cedar Creek Reservoir (station 08062650) enters the Trinity River 13 mi upstream from this station. There are many diversions above station for municipal supply for the cities of Fort Worth, Dallas, and by several smaller towns. Low flows are maintained by sewage effluent from the Dallas-Fort Worth metropolplex. There are 62 floodwater-retarding structures with a combined detention capacity of 38,690 acre-ft in the drainage basin above this station. These structures control runoff from 126 mi<sup>2</sup> area above this station. For regulation by upstream reservoirs, see Trinity River near Rosser (station 08062500). Gage-height telemeter at station.

AVERAGE DISCHARGE.--27 years, 3,899 ft<sup>3</sup>/s (2,825,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 94,500 ft<sup>3</sup>/s May 7, 1990 (gage height, 48.11 ft); minimum daily, 312 ft<sup>3</sup>/s Aug. 9, 1972.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1908, 49.8 ft Apr. 25, 1942 (present site and datum), from records of the National Weather Service. A flood in 1908 reached a stage of 48.3 ft, present site and datum, from records of the National Weather Service.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 20,700 ft<sup>3</sup>/s Apr. 18 at 0300 hours (gage height, 32.70 ft); minimum daily, 674 ft<sup>3</sup>/s Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	683	702	1100	1540	1310	3950	979	5730	4070	1020	1320	4820
2	674	696	969	1180	1340	5500	904	3570	3030	982	1040	4840
3	681	691	929	1020	1230	4690	891	2320	2100	988	965	5800
4	681	719	1590	983	1530	2540	1030	2650	4280	965	931	5110
5	1080	795	1610	987	7910	1630	968	5990	6300	1270	901	2840
6	1090	2350	1220	989	12100	1300	914	6430	4080	1530	889	1800
7	808	2050	1020	1240	12600	1210	925	5230	3880	1120	887	1850
8	724	1160	955	2710	10200	1150	905	3980	4130	963	883	1430
9	742	1500	939	2560	6170	1120	912	4240	4220	931	882	2610
10	1860	6080	893	4700	2500	1080	908	6440	4250	916	878	3390
11	5300	7320	879	7360	1630	1030	880	5920	3610	922	906	1820
12	3650	4210	897	8820	1470	1010	865	4120	3060	925	991	1300
13	1320	1600	891	5760	1400	1010	4930	3540	2970	916	1290	1160
14	924	1100	872	2420	1300	997	11500	2870	2910	884	4350	1100
15	837	981	869	2230	1230	983	13000	4310	2470	880	6630	1050
16	797	932	839	5740	1160	987	15000	4060	1970	872	6530	1230
17	787	888	840	5960	1120	997	18500	7370	1830	874	3840	1560
18	784	848	882	5260	1750	1030	20100	6010	2680	891	1740	1640
19	758	821	920	7650	3590	1100	16700	2900	2180	892	1320	1690
20	752	804	1090	10300	3550	1140	13300	2160	1550	876	1100	2390
21	764	814	1160	9830	1620	1040	10400	2610	1430	864	1040	4030
22	734	879	1010	5000	3560	1000	8300	2250	1350	862	1030	2570
23	755	3220	955	2350	10400	1000	6070	1630	1300	860	1160	1470
24	765	4870	947	1800	13400	1330	5290	1450	2710	863	1730	1380
25	738	3050	911	1630	13300	1170	4670	1390	5670	884	1370	1470
26	721	1670	936	1530	6880	983	4100	5320	4010	963	1080	1920
27	721	1240	1170	1420	2410	947	4610	8970	1770	1040	999	1630
28	707	1190	1250	1340	1830	1060	4210	9960	1290	1100	1150	1260
29	702	1540	1440	1430	---	2900	3390	8470	1170	1980	1100	1060
30	690	1520	1210	1330	---	2200	4660	5400	1070	3620	1070	1010
31	700	---	1530	1260	---	1210	---	4480	---	2570	2040	---
TOTAL	32929	56240	32723	108329	128490	49294	179811	141770	87340	35223	52042	67230
MEAN	1062	1875	1056	3494	4589	1590	5994	4573	2911	1136	1679	2241
MAX	5300	7320	1610	10300	13400	5500	20100	9960	6300	3620	6630	5800
MIN	674	691	839	983	1120	947	865	1390	1070	860	878	1010
AC-FT	65310	111600	64910	214900	254900	97770	356700	281200	173200	69860	103200	133400
CAL YR 1990	TOTAL	3649885	MEAN	10000	MAX	94100	MIN	674	AC-FT	7240000		
WTR YR 1991	TOTAL	971421	MEAN	2661	MAX	20100	MIN	674	AC-FT	1927000		

## TRINITY RIVER MAIN STEM

08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: May 1966 to current year. Pesticide analyses: November 1977 to June 1982. Sediment analyses: November 1977 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: September 1967 to September 1981, May 1986 to current year.

PH: September 1967 to October 1969, May 1986 to current year.

WATER TEMPERATURE: September 1967 to September 1981, May 1986 to current year.

DISSOLVED OXYGEN: September 1967 to October 1969, May 1986 to current year.

INSTRUMENTATION.--From April 1967 to October 1969, a four-parameter water-quality monitor continuously recorded specific conductance, pH, water temperature, and dissolved oxygen. Since May 1986, a four-parameter water quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,000 micromhos Dec. 28, 1977; minimum daily, 170 micromhos May 4, 1990.

PH (1967-69, 1986-90): Maximum, 8.8 units July 28, 1988; minimum, 5.7 units Aug. 13, 1988.

WATER TEMPERATURE: Maximum daily, 34.0°C July 17, 1979, July 9, 13, 1980; minimum daily, 2.5°C Dec. 24, 1989.

DISSOLVED OXYGEN: Maximum, 15.6 mg/L Sept. 15, 1988; minimum, 0.0 mg/L May 3, 1987.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 773 microsiemens Mar. 21; minimum, 175 microsiemens May 15.

WATER TEMPERATURE: Minimum, 6.5°C Dec. 25-28.

DISSOLVED OXYGEN: Maximum, 12.7 mg/L Mar. 14; minimum, 3.2 mg/L May 27.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
OCT 30...	1045	688	690	7.9	18.5	0.50	8.5	91	3.5	K12	130
JAN 29...	1115	1440	670	8.0	11.5	74	9.6	90	2.0	K70	270
MAR 26...	1010	994	728	7.9	20.0	20	8.6	96	3.8	140	530
MAY 23...	0945	1700	483	7.8	25.5	100	6.5	80	1.6	3600	810
JUL 10...	1045	911	642	7.9	30.0	67	6.5	86	0.9	52	200
AUG 27...	1100	1000	547	7.8	28.5	2.2	6.4	83	1.2	270	110

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT 30...	150	38	52	5.3	72	3	11	0	139	110	71
JAN 29...	210	57	75	5.2	52	2	8.0	0	186	152	86
MAR 26...	190	57	67	5.8	70	2	9.9	0	164	140	99
MAY 23...	160	40	56	4.0	34	1	5.6	0	142	116	56
JUL 10...	170	47	58	5.7	61	2	8.7	0	148	121	65
AUG 27...	150	45	51	5.0	29	1	7.6	0	126	104	85

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
OCT 30...	69	0.90	9.0	419	411	9.00	9.11	0.100	0.090	9.10	9.20
JAN 29...	50	0.70	7.5	424	408	6.10	6.00	0.100	0.100	6.20	6.10
MAR 26...	69	1.0	6.4	435	447	6.98	6.90	0.120	0.100	7.10	7.00
MAY 23...	29	0.50	5.0	260	278	3.24	3.26	0.060	0.040	3.30	3.30
JUL 10...	60	0.90	8.5	387	369	5.08	5.26	0.120	0.040	5.20	5.30
AUG 27...	14	0.30	5.0	278	292	6.46	6.38	0.040	0.020	6.50	6.40



TRINITY RIVER MAIN STEM

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08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS P04)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
OCT 30...	0.410	0.400	1.5	1.9	3.60	3.80	3.60	3.80	11	92	171
JAN 29...	0.140	0.140	0.86	1.0	1.50	1.50	1.50	1.50	4.6	142	552
MAR 26...	0.060	0.040	1.6	1.7	2.80	2.50	2.50	2.60	7.7	65	174
MAY 23...	0.070	0.070	0.63	0.70	0.820	0.790	0.790	0.790	2.4	293	1340
JUL 10...	0.060	0.050	0.74	0.80	1.70	1.50	1.50	1.60	4.6	107	263
AUG 27...	0.050	0.060	0.75	0.80	1.80	1.70	1.40	1.60	4.3	163	440

DATE	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT 30...	89	30	3	45	<0.5	<1.0	<1	<3	7	14	<1
JAN 29...	83	<10	2	54	<0.5	2.0	<1	<3	4	11	1
MAR 26...	96	--	--	--	--	--	--	--	--	--	--
MAY 23...	88	10	3	45	<0.5	<1.0	<1	<3	4	11	<1
JUL 10...	95	--	--	--	--	--	--	--	--	--	--
AUG 27...	8	<10	2	38	<0.5	1.0	<1	<3	2	<3	<1

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 30...	13	3	<0.1	<10	8	<1	<1.0	400	<6	15
JAN 29...	11	3	<0.1	<10	5	<1	<1.0	580	<6	15
MAR 26...	--	--	--	--	--	--	--	--	--	--
MAY 23...	8	2	<0.1	<10	2	<1	<1.0	500	<6	5
JUL 10...	--	--	--	--	--	--	--	--	--	--
AUG 27...	11	2	0.4	<10	<1	<1	<1.0	500	<6	<3

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT-ANCE (MICRO-SIEMENS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA, MG/L)
OCT. 1990	32929	569	319	28400	45	4000	65	5820	150
NOV. 1990	56240	494	279	42300	35	5370	56	8450	150
DEC. 1990	32723	621	348	30700	51	4490	72	6360	160
JAN. 1991	108329	433	245	71600	29	8350	48	14000	140
FEB. 1991	128490	414	234	81300	27	9490	46	15900	130
MAR. 1991	49294	582	326	43400	48	6330	67	8970	150
APR. 1991	179811	388	220	107000	24	11700	43	20700	130
MAY 1991	141770	423	240	91900	27	10300	47	17900	140
JUNE 1991	87340	464	263	61900	31	7350	52	12200	150
JULY 1991	35223	616	345	32800	51	4860	72	6810	160
AUG. 1991	52042	490	276	38800	36	5000	55	7790	140
SEPT 1991	67230	449	254	46100	30	5450	50	9070	140
TOTAL	971421	**	**	676000	**	82700	**	134000	**
WTD.AVG.	2661	456	258	**	32	**	51	**	140

## TRINITY RIVER MAIN STEM

08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	664	647	653	714	702	709	600	576	591	596	569	580
2	673	659	665	718	702	710	585	548	567	600	592	595
3	672	652	661	718	702	712	549	531	538	600	567	587
4	676	664	668	710	663	694	619	529	567	589	563	574
5	698	679	688	722	698	709	647	592	630	613	589	599
6	701	688	696	698	648	672	592	529	567	628	613	621
7	702	685	691	646	600	624	565	522	542	635	628	631
8	726	640	702	598	552	576	565	549	554	662	629	645
9	712	540	607	550	462	510	596	549	568	631	471	565
10	676	540	568	458	402	424	624	600	616	456	376	409
11	693	371	515	414	398	405	635	624	629	504	380	451
12	381	335	349	412	392	402	643	624	634	429	379	403
13	379	350	364	412	394	403	659	643	650	469	422	436
14	415	371	398	416	398	406	678	663	672	542	469	508
15	431	398	414	472	417	438	675	671	673	---	---	e450
16	485	433	453	527	475	506	675	671	675	---	---	e390
17	548	489	524	569	530	543	675	647	665	406	300	340
18	606	545	571	597	571	585	675	663	672	329	267	305
19	660	609	631	620	600	614	675	667	674	335	282	312
20	668	658	661	639	619	631	694	675	681	357	329	341
21	670	639	654	655	638	643	694	631	669	377	332	339
22	666	652	662	658	636	651	675	596	646	456	392	429
23	682	665	672	666	502	581	663	639	652	462	443	450
24	690	682	687	510	390	493	643	635	640	499	462	478
25	702	683	691	384	290	332	667	643	656	554	502	531
26	712	696	701	415	351	393	671	616	659	595	554	573
27	710	693	699	493	411	448	627	580	614	631	599	613
28	692	672	678	499	460	482	639	584	620	660	632	645
29	687	670	676	510	462	485	639	620	631	678	627	670
30	702	686	692	573	508	538	620	584	606	682	678	679
31	710	698	704	---	---	---	592	573	584	698	686	693
MONTH	726	335	613	722	290	544	694	522	624	698	267	511
e Estimated												
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	694	643	663	553	243	416	592	553	571	522	347	458
2	690	651	672	353	267	323	600	592	595	381	347	364
3	698	675	688	380	294	352	647	600	622	418	384	401
4	690	196	657	576	376	530	651	624	636	450	421	434
5	306	200	263	557	537	545	675	604	635	571	414	491
6	396	275	342	580	549	557	710	671	690	407	389	397
7	369	329	349	631	584	610	722	706	711	408	402	405
8	380	298	314	659	631	644	737	722	727	401	394	396
9	502	318	383	686	659	672	753	737	745	418	388	396
10	545	486	514	690	686	689	753	741	747	449	379	418
11	612	522	553	698	686	692	749	741	746	419	370	387
12	627	580	602	702	690	695	765	749	760	385	374	377
13	659	616	636	718	691	706	765	342	662	421	386	405
14	671	659	665	737	718	730	329	265	303	436	183	393
15	682	667	675	737	729	733	290	271	277	522	175	377
16	682	667	674	733	725	728	290	275	281	615	501	562
17	702	682	693	733	725	729	310	290	299	489	339	395
18	702	694	698	729	725	727	338	310	322	400	355	378
19	711	698	706	725	718	723	451	337	370	408	401	404
20	703	698	699	745	722	735	443	404	423	494	409	442
21	698	661	684	773	745	756	404	384	392	593	498	548
22	682	208	481	765	749	758	427	349	382	594	450	523
23	443	282	339	745	718	733	443	432	435	508	457	479
24	349	290	314	722	706	713	451	444	448	596	512	563
25	345	314	334	722	718	720	447	442	446	644	596	609
26	455	333	404	749	722	737	442	418	432	644	438	607
27	510	455	482	745	620	660	520	422	474	400	340	359
28	545	514	533	663	624	634	473	470	471	466	338	389
29	---	---	---	757	671	721	468	418	441	402	363	381
30	---	---	---	749	558	644	511	414	443	442	403	415
31	---	---	---	558	553	555	---	---	---	467	438	446
MONTH	711	196	536	773	243	651	765	265	516	644	175	439

TRINITY RIVER MAIN STEM

08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	487	462	476	586	541	562	---	---	e400	657	365	522
2	498	481	487	622	586	601	---	---	e460	423	347	371
3	510	490	500	641	623	632	---	---	e530	387	319	352
4	604	505	546	673	642	659	---	---	e590	343	308	318
5	497	396	435	677	672	674	---	---	e660	348	314	327
6	411	391	404	682	669	675	---	---	e670	407	352	380
7	455	410	430	674	573	645	---	---	e670	431	403	416
8	443	397	421	635	528	576	---	---	e650	496	432	460
9	434	402	423	659	610	632	698	576	661	524	483	498
10	443	418	428	658	575	616	694	672	687	517	386	453
11	441	403	416	570	547	555	695	677	683	441	386	418
12	449	433	443	605	554	573	689	635	669	445	422	429
13	458	436	447	640	607	619	659	581	629	484	447	466
14	472	459	468	654	642	646	633	495	571	530	485	504
15	482	465	475	682	656	669	464	290	338	578	532	560
16	540	483	516	697	683	691	337	293	312	616	576	589
17	547	532	537	702	694	699	359	339	350	645	507	609
18	586	550	564	719	691	702	371	339	354	657	594	642
19	556	443	492	736	717	724	417	353	388	662	565	629
20	532	491	511	734	727	730	489	420	449	568	475	546
21	541	515	527	726	713	717	545	493	524	576	397	491
22	575	521	541	724	712	717	584	544	559	377	350	363
23	597	573	587	719	698	711	631	585	601	375	364	367
24	638	599	615	723	700	712	631	549	607	401	376	389
25	620	361	431	720	620	694	596	555	577	473	390	423
26	466	365	398	721	707	712	595	565	580	523	426	462
27	395	368	379	713	692	702	579	500	538	567	527	544
28	426	397	412	699	678	689	564	518	539	579	485	539
29	490	428	456	---	---	e630	648	566	604	---	---	e560
30	541	493	516	---	---	e450	665	597	640	---	---	e580
31	---	---	---	---	---	e370	654	601	634	---	---	---
MONTH	638	361	476	736	528	645	698	290	552	662	308	474

e Estimated

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	---	---	---	8.2	8.1	8.2	7.9	7.9	7.9	---	---	---
2	---	---	---	8.2	8.0	8.1	7.9	7.8	7.8	---	---	---
3	---	---	---	8.0	7.6	7.8	8.0	7.7	7.9	---	---	---
4	---	---	---	7.9	7.5	7.7	8.0	7.9	8.0	8.0	7.9	8.0
5	---	---	---	8.1	7.5	7.7	7.9	7.8	7.9	8.0	8.0	8.0
6	---	---	---	8.1	7.8	8.0	7.9	7.8	7.9	8.0	7.9	8.0
7	---	---	---	7.9	7.7	7.8	7.9	7.8	7.8	8.0	7.9	7.9
8	---	---	---	7.9	7.5	7.8	---	---	---	7.9	7.8	7.8
9	---	---	---	8.0	7.5	7.8	---	---	---	7.8	7.8	7.8
10	---	---	---	8.0	7.5	7.8	---	---	---	7.8	7.8	7.8
11	---	---	---	8.0	7.7	7.9	---	---	---	7.9	7.8	7.8
12	---	---	---	7.9	7.6	7.9	---	---	---	8.3	7.8	8.0
13	---	---	---	7.9	7.7	7.9	---	---	---	8.0	7.9	8.0
14	---	---	---	8.0	7.6	7.8	---	---	---	8.0	7.9	7.9
15	---	---	---	---	---	---	---	---	---	8.0	7.9	8.0
16	---	---	---	---	---	---	---	---	---	8.0	7.8	7.9
17	---	---	---	---	---	---	---	---	---	8.0	7.7	7.9
18	---	---	---	---	---	---	---	---	---	8.0	7.6	7.9
19	---	---	---	---	---	---	---	---	---	8.0	7.6	7.7
20	---	---	---	---	---	---	---	---	---	---	---	---
21	---	---	---	---	---	---	---	---	---	---	---	---
22	---	---	---	---	---	---	---	---	---	---	---	---
23	---	---	---	7.9	7.6	7.7	---	---	---	---	---	---
24	---	---	---	7.6	7.5	7.6	---	---	---	---	---	---
25	---	---	---	7.6	7.6	7.6	---	---	---	---	---	---
26	---	---	---	7.7	7.6	7.7	---	---	---	---	---	---
27	---	---	---	7.8	7.7	7.8	---	---	---	---	---	---
28	---	---	---	7.9	7.8	7.8	---	---	---	---	---	---
29	---	---	---	7.9	7.9	7.9	---	---	---	---	---	---
30	---	---	---	7.9	7.8	7.9	---	---	---	8.2	8.1	8.1
31	8.2	7.9	8.1	---	---	---	---	---	---	8.2	8.1	8.2
MONTH	8.2	7.9	8.1	8.2	7.5	7.8	8.0	7.7	7.9	8.3	7.6	7.9

TRINITY RIVER MAIN STEM  
08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	---	---	---	---	---	---	---	---	---	---	---	---
2	---	---	---	---	---	---	---	---	---	---	---	---
3	---	---	---	---	---	---	---	---	---	---	---	---
4	---	---	---	---	---	---	---	---	---	---	---	---
5	---	---	---	---	---	---	---	---	---	---	---	---
6	---	---	---	---	---	---	---	---	---	---	---	---
7	---	---	---	---	---	---	---	---	---	---	---	---
8	---	---	---	---	---	---	---	---	---	---	---	---
9	---	---	---	---	---	---	---	---	---	8.0	7.9	7.9
10	---	---	---	---	---	---	---	---	---	7.9	7.8	7.8
11	---	---	---	---	---	---	---	---	---	7.8	7.8	7.8
12	---	---	---	---	---	---	---	---	---	7.9	7.8	7.9
13	---	---	---	---	---	---	---	---	---	7.9	7.9	7.9
14	---	---	---	---	---	---	---	---	---	8.0	7.9	8.0
15	---	---	---	---	---	---	---	---	---	8.0	7.9	8.0
16	---	---	---	---	---	---	---	---	---	8.0	7.7	7.9
17	---	---	---	---	---	---	---	---	---	7.7	7.7	7.7
18	---	---	---	---	---	---	---	---	---	7.9	7.7	7.8
19	---	---	---	---	---	---	---	---	---	7.9	7.9	7.9
20	---	---	---	---	---	---	---	---	---	7.9	7.9	7.9
21	---	---	---	---	---	---	---	---	---	7.9	7.9	7.9
22	---	---	---	---	---	---	---	---	---	7.9	7.9	7.9
23	---	---	---	---	---	---	---	---	---	7.9	7.8	7.9
24	---	---	---	---	---	---	---	---	---	7.9	7.9	7.9
25	---	---	---	---	---	---	---	---	---	8.0	7.9	7.9
26	---	---	---	---	---	---	---	---	---	8.0	7.6	7.8
27	---	---	---	---	---	---	---	---	---	7.7	7.7	7.7
28	---	---	---	---	---	---	---	---	---	7.7	7.7	7.7
29	---	---	---	---	---	---	---	---	---	7.8	7.7	7.7
30	---	---	---	---	---	---	---	---	---	7.8	7.7	7.8
31	---	---	---	---	---	---	---	---	---	7.8	7.7	7.8
MONTH	---	---	---	---	---	---	---	---	---	8.0	7.6	7.8
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.9	7.7	7.8	---	---	---	7.9	7.9	7.9	7.9	7.6	7.7
2	7.8	7.7	7.8	---	---	---	8.1	7.9	8.0	7.8	7.7	7.7
3	7.8	7.8	7.8	---	---	---	8.1	7.8	8.0	7.8	7.8	7.8
4	7.8	7.7	7.8	---	---	---	8.1	7.8	8.0	7.8	7.8	7.8
5	7.7	7.6	7.7	---	---	---	8.2	7.8	8.0	7.8	7.8	7.8
6	7.7	7.6	7.7	---	---	---	8.2	7.9	8.1	7.8	7.8	7.8
7	7.7	7.6	7.7	---	---	---	8.1	7.9	8.1	7.9	7.7	7.8
8	7.7	7.6	7.7	---	---	---	8.0	7.7	7.8	7.9	7.7	7.9
9	7.7	7.6	7.7	---	---	---	7.8	7.7	7.8	7.9	7.6	7.8
10	7.7	7.6	7.7	---	---	---	7.8	7.7	7.8	7.8	7.7	7.7
11	7.7	7.7	7.7	---	---	---	7.8	7.7	7.8	7.8	7.7	7.8
12	7.7	7.7	7.7	---	---	---	7.8	7.4	7.5	7.9	7.8	7.9
13	7.7	7.7	7.7	---	---	---	7.7	7.2	7.5	7.9	7.8	7.9
14	7.7	7.7	7.7	---	---	---	8.2	7.7	8.0	7.9	7.7	7.8
15	7.7	7.6	7.7	---	---	---	8.0	7.9	8.0	7.7	7.5	7.6
16	7.6	7.4	7.5	---	---	---	8.0	7.9	8.0	8.2	7.3	7.7
17	7.7	7.2	7.5	---	---	---	7.9	7.9	7.9	8.1	7.8	8.0
18	7.8	7.7	7.7	---	---	---	7.9	7.9	7.9	8.0	7.7	7.9
19	7.7	7.5	7.6	---	---	---	8.0	7.9	7.9	7.9	7.3	7.8
20	7.6	7.5	7.6	---	---	---	7.9	7.7	7.9	7.9	7.8	7.8
21	7.7	7.6	7.6	---	---	---	7.8	7.5	7.7	7.8	7.6	7.7
22	7.7	7.6	7.6	---	---	---	7.9	7.6	7.8	7.7	7.5	7.6
23	7.7	7.6	7.7	---	---	---	7.8	7.6	7.7	7.8	7.6	7.7
24	7.7	7.5	7.6	7.9	7.6	7.7	8.0	7.6	7.9	7.7	7.6	7.6
25	7.5	7.3	7.4	8.0	7.6	7.8	7.9	7.5	7.7	7.7	7.6	7.6
26	7.6	7.4	7.5	8.0	7.7	7.9	7.9	7.5	7.8	7.7	7.6	7.6
27	---	---	---	8.1	7.9	8.0	7.9	7.5	7.7	7.6	7.5	7.6
28	---	---	---	8.0	7.9	8.0	---	---	---	7.6	7.6	7.6
29	---	---	---	7.9	7.9	7.9	---	---	---	7.7	7.6	7.6
30	---	---	---	7.8	7.8	7.8	---	---	---	7.7	7.5	7.6
31	---	---	---	7.9	7.8	7.9	8.0	7.8	7.9	---	---	---
MONTH	7.9	7.2	7.7	8.1	7.6	7.9	8.2	7.2	7.9	8.2	7.3	7.7

TRINITY RIVER MAIN STEM

08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	26.5	25.5	26.0	20.5	19.0	20.0	16.0	15.0	15.5	8.0	7.5	7.5
2	26.0	25.5	26.0	21.0	20.0	20.5	16.0	15.5	16.0	8.5	8.0	8.0
3	25.5	25.0	25.5	21.5	20.5	21.0	16.0	14.0	15.0	8.5	8.0	8.0
4	26.0	25.0	25.5	21.5	18.5	20.0	14.0	13.0	13.5	8.0	7.5	7.5
5	25.5	24.5	25.0	18.5	17.5	18.0	13.5	13.0	13.0	9.0	8.0	8.0
6	26.0	24.5	25.5	18.0	17.5	17.5	13.0	12.5	12.5	9.0	9.0	9.0
7	26.5	25.5	26.0	18.0	16.5	17.0	12.5	12.0	12.5	9.0	8.5	8.5
8	27.0	24.5	26.0	16.5	14.5	15.5	12.0	11.0	11.5	10.0	9.0	9.5
9	26.0	22.0	23.5	15.0	14.5	14.5	11.5	10.5	11.0	10.0	9.0	9.5
10	22.0	20.5	21.5	15.5	13.5	14.5	12.0	11.0	11.5	9.0	8.0	8.5
11	22.0	19.5	20.5	14.0	13.5	13.5	13.0	11.5	12.0	9.0	8.0	8.5
12	19.5	18.5	19.0	14.5	13.5	14.0	14.0	12.5	13.5	8.5	8.0	8.0
13	19.0	18.0	19.0	15.0	13.5	14.0	14.5	13.5	14.0	8.0	7.5	8.0
14	20.5	18.5	19.5	16.0	14.5	15.0	14.5	14.0	14.5	9.0	8.0	8.5
15	21.5	20.0	20.5	16.5	15.0	15.5	14.5	14.5	14.5	9.5	8.0	9.0
16	22.5	20.5	21.5	17.5	16.0	16.5	15.0	14.5	14.5	10.0	8.0	9.0
17	23.0	22.0	22.5	17.5	17.0	17.0	15.5	14.5	15.0	10.0	9.5	10.0
18	23.0	21.0	21.5	18.0	17.0	17.5	16.0	15.0	15.5	10.0	9.0	9.5
19	21.0	20.0	20.5	19.0	18.0	18.5	15.5	14.5	15.0	10.0	9.0	9.0
20	21.0	19.5	20.5	19.5	18.5	19.0	15.0	14.0	14.5	10.0	9.5	9.5
21	21.0	19.0	20.0	20.0	19.0	19.5	15.0	12.5	13.5	10.0	9.5	9.5
22	19.0	18.0	18.5	20.0	19.0	19.5	12.5	8.5	10.5	10.0	9.5	10.0
23	18.5	17.0	18.0	20.0	19.0	19.5	8.5	7.5	8.0	9.5	9.0	9.0
24	18.5	17.0	18.0	19.5	19.0	19.5	7.5	7.0	7.0	9.5	9.0	9.0
25	18.0	17.0	17.5	19.0	18.0	18.5	7.0	6.5	6.5	10.0	9.0	9.5
26	18.0	17.0	17.5	18.5	18.0	18.5	7.0	6.5	7.0	10.5	10.0	10.5
27	19.0	17.5	18.0	19.5	18.0	19.0	7.0	6.5	6.5	11.0	10.5	11.0
28	19.5	18.0	18.5	19.5	18.0	19.0	7.5	6.5	7.0	11.5	11.0	11.0
29	20.0	18.5	19.0	18.0	16.5	17.5	10.0	8.0	9.0	12.0	11.0	11.5
30	20.0	19.0	19.5	17.0	16.0	16.5	10.0	8.0	9.0	11.0	10.0	10.5
31	20.0	19.0	19.5	---	---	---	8.0	7.5	7.5	10.5	9.5	10.0
MONTH	27.0	17.0	21.5	21.5	13.5	17.5	16.0	6.5	12.0	12.0	7.5	9.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	10.5	9.5	10.0	14.0	12.5	13.5	19.0	16.5	17.5	22.5	22.0	22.0
2	11.0	9.0	10.0	14.0	12.5	13.5	18.0	17.5	18.0	23.0	21.5	22.0
3	11.5	10.5	11.0	13.5	13.0	13.5	19.5	17.5	18.5	23.0	22.5	23.0
4	---	---	---	15.5	13.0	14.5	21.0	19.0	19.5	23.0	22.0	22.5
5	---	---	---	16.0	14.5	15.5	20.5	19.0	20.0	22.0	21.5	22.0
6	---	---	---	17.0	15.5	16.5	21.0	19.0	20.0	21.5	21.0	21.0
7	12.5	12.0	12.0	16.5	16.0	16.5	22.0	20.5	21.0	21.5	20.5	21.0
8	12.0	11.5	11.5	16.5	15.0	16.0	23.0	21.0	22.0	21.5	20.5	21.0
9	12.5	11.0	11.5	17.0	15.0	16.0	23.5	22.5	23.0	21.5	21.0	21.0
10	13.5	12.0	12.5	16.5	15.0	16.0	23.0	22.0	22.5	21.5	21.0	21.0
11	13.5	12.5	13.0	17.0	15.5	16.0	23.0	22.0	22.5	22.5	21.5	22.0
12	14.5	13.5	14.0	17.5	16.5	17.0	23.5	22.0	23.0	24.0	22.5	23.5
13	15.5	14.5	15.0	17.5	16.0	17.0	23.0	21.5	22.5	25.0	23.5	24.5
14	15.5	14.5	15.0	16.5	15.5	16.0	21.0	20.0	20.0	25.0	22.5	24.5
15	14.5	13.5	14.0	16.0	15.0	15.5	20.0	19.0	19.5	25.5	22.5	24.5
16	13.0	12.5	12.5	15.0	14.5	14.5	20.5	19.5	20.0	26.0	25.0	25.5
17	14.0	12.0	13.0	16.5	14.5	15.5	21.5	20.5	21.0	25.0	24.0	24.5
18	14.5	12.0	13.5	16.5	15.5	16.0	22.5	21.0	21.5	24.5	24.0	24.0
19	12.0	11.5	12.0	17.0	15.5	16.0	---	---	---	25.0	24.0	24.5
20	12.0	11.0	11.5	17.5	16.0	17.0	---	---	---	26.0	24.5	25.5
21	13.5	11.5	13.0	18.0	17.0	17.5	---	---	---	26.5	25.0	26.0
22	13.0	11.0	12.0	19.0	18.0	18.5	---	---	---	26.5	25.5	26.0
23	12.0	11.0	11.5	19.0	17.5	18.5	---	---	---	27.0	25.5	26.0
24	12.0	11.0	11.5	20.0	18.0	19.0	19.5	18.5	19.0	28.5	26.5	27.0
25	12.0	11.5	11.5	20.0	19.0	19.5	21.0	18.5	20.0	29.0	26.5	27.5
26	12.5	11.0	12.0	22.0	20.0	20.5	21.5	20.0	21.0	28.5	26.0	27.5
27	13.0	12.0	12.5	21.5	20.5	21.0	22.0	21.5	22.0	26.0	25.0	25.5
28	14.0	12.5	13.0	20.5	19.0	19.5	22.5	22.0	22.0	27.0	26.0	26.5
29	---	---	---	19.5	19.0	19.0	22.5	21.5	22.0	27.5	27.0	27.5
30	---	---	---	19.0	17.5	18.0	22.5	21.0	22.0	28.0	27.0	27.5
31	---	---	---	20.0	16.0	18.0	---	---	---	28.5	27.0	27.5
MONTH	15.5	9.0	12.5	22.0	12.5	17.0	23.5	16.5	21.0	29.0	20.5	24.5



TRINITY RIVER MAIN STEM  
08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	28.5	27.5	28.0	30.0	29.0	29.5	---	---	---	30.5	28.5	29.5
2	29.0	27.5	28.0	30.0	29.5	29.5	---	---	---	29.5	28.5	29.0
3	28.0	27.0	28.0	30.0	29.0	29.5	---	---	---	29.0	28.0	28.5
4	28.0	26.5	27.5	30.5	29.0	29.5	---	---	---	29.0	28.5	28.5
5	27.0	26.5	26.5	30.0	29.0	29.5	---	---	---	30.0	29.0	29.0
6	27.5	26.0	26.5	31.0	29.5	30.5	---	---	---	30.0	29.0	29.5
7	27.0	26.5	27.0	30.5	30.0	30.0	---	---	---	30.0	29.5	30.0
8	27.0	26.5	26.5	30.5	29.5	30.0	---	---	---	29.5	29.0	29.5
9	27.0	26.0	26.5	30.5	29.0	30.0	---	---	---	30.5	26.5	29.5
10	26.5	26.0	26.5	32.0	29.5	30.5	---	---	---	30.5	27.0	29.0
11	27.0	25.5	26.0	31.5	30.5	31.0	---	---	---	31.0	26.5	29.5
12	28.0	24.0	26.0	31.5	30.5	31.0	---	---	---	31.5	27.5	30.0
13	28.5	27.0	28.0	32.0	30.5	31.0	---	---	---	31.5	30.0	31.0
14	29.0	28.0	28.5	31.5	30.5	31.0	---	---	---	---	---	---
15	29.0	27.0	28.5	31.5	30.5	31.0	---	---	---	---	---	---
16	28.5	28.0	28.5	31.5	30.5	31.0	---	---	---	---	---	---
17	29.0	24.0	28.0	32.0	30.5	31.0	---	---	---	---	---	---
18	29.0	28.0	28.5	31.5	30.5	31.0	---	---	---	31.5	29.5	30.5
19	29.0	26.5	28.0	31.5	30.5	31.0	---	---	---	30.0	26.5	28.0
20	30.0	28.0	29.0	31.0	30.5	31.0	---	---	---	26.0	24.0	25.0
21	30.5	29.0	29.5	31.0	29.5	30.5	---	---	---	24.0	22.5	23.5
22	31.0	29.5	30.0	31.5	30.0	31.0	---	---	---	23.0	21.5	22.0
23	31.0	29.0	30.0	31.0	30.0	30.5	---	---	---	24.5	23.0	23.5
24	31.0	29.0	30.0	31.0	29.5	30.0	---	---	---	25.0	23.5	24.5
25	29.5	27.0	28.0	30.0	28.5	29.5	---	---	---	25.5	23.5	24.5
26	29.5	25.5	28.0	---	---	---	---	---	---	25.0	23.5	24.5
27	30.5	28.5	29.0	---	---	---	---	---	---	24.5	23.5	24.0
28	30.5	27.5	29.0	---	---	---	32.5	30.5	31.5	25.0	23.5	24.0
29	29.0	27.5	29.0	---	---	---	32.5	31.0	31.5	25.0	23.0	24.0
30	29.5	28.5	29.0	---	---	---	32.5	30.0	31.0	25.0	23.0	24.0
31	---	---	---	---	---	---	31.5	29.5	30.5	---	---	---
MONTH	31.0	24.0	28.0	32.0	28.5	30.5	32.5	29.5	31.0	31.5	21.5	27.0

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.5	7.1	7.2	9.1	8.1	8.6	9.3	8.9	9.1	10.6	10.2	10.4
2	7.4	7.0	7.1	8.7	8.1	8.3	9.5	9.1	9.3	10.6	10.3	10.4
3	7.0	6.5	6.8	8.9	7.8	8.3	10.1	9.4	9.7	10.7	10.4	10.5
4	7.1	6.5	6.7	8.1	7.8	7.8	10.0	9.6	9.9	11.1	10.6	10.8
5	6.9	6.7	6.8	8.4	7.8	8.1	9.6	9.3	9.5	11.1	10.9	11.0
6	6.8	6.6	6.7	8.0	7.1	7.6	9.6	9.4	9.5	10.8	10.7	10.7
7	6.8	6.5	6.7	7.2	6.0	6.7	10.2	9.4	9.8	10.7	10.4	10.6
8	7.0	6.4	6.6	8.1	7.2	7.7	10.9	10.3	10.5	10.4	9.6	10.0
9	7.0	6.4	6.7	8.2	7.9	8.2	10.9	10.5	10.7	10.0	9.4	9.6
10	7.2	6.1	6.9	8.2	6.4	7.1	10.9	10.3	10.6	10.0	9.6	9.9
11	6.0	4.0	5.3	7.5	7.1	7.3	10.6	10.2	10.4	10.0	9.2	9.6
12	6.5	5.4	6.0	7.9	7.5	7.7	10.5	10.1	10.3	10.0	9.3	9.8
13	7.2	6.5	6.9	8.2	7.9	8.1	10.4	9.9	10.1	10.3	10.0	10.2
14	7.4	7.2	7.3	8.7	8.2	8.5	9.9	9.6	9.7	10.3	10.2	10.2
15	7.4	7.3	7.3	8.8	8.6	8.7	9.8	9.3	9.6	11.0	10.3	10.4
16	7.4	7.2	7.3	8.6	8.4	8.5	9.6	9.2	9.4	---	---	---
17	7.4	7.1	7.2	8.6	8.5	8.5	10.0	9.2	9.6	---	---	---
18	7.4	7.0	7.2	8.5	8.4	8.5	9.9	9.1	9.4	---	---	---
19	7.7	7.3	7.5	8.6	8.3	8.5	9.9	8.9	9.4	---	---	---
20	7.8	7.5	7.6	8.6	8.3	8.4	9.7	9.4	9.6	---	---	---
21	7.8	7.6	7.7	8.9	8.2	8.5	9.5	9.2	9.4	---	---	---
22	8.2	7.7	7.9	8.5	8.1	8.4	9.8	9.3	9.5	---	---	---
23	8.4	8.0	8.1	8.2	6.0	7.6	10.6	9.9	10.2	---	---	---
24	8.7	8.2	8.4	6.0	4.5	5.1	11.1	10.6	10.9	---	---	---
25	8.9	8.2	8.5	7.1	5.8	6.5	11.5	11.1	11.2	---	---	---
26	9.0	8.4	8.7	7.8	7.1	7.6	11.3	11.1	11.2	---	---	---
27	9.0	8.3	8.6	7.8	7.4	7.6	11.1	10.9	11.0	---	---	---
28	9.6	8.4	8.9	8.4	7.5	7.9	11.0	10.8	10.9	---	---	---
29	9.7	8.6	9.1	8.9	8.2	8.6	10.9	10.2	10.6	---	---	---
30	9.1	8.2	8.6	9.6	8.5	9.0	10.3	10.1	10.2	10.0	9.6	9.8
31	9.0	8.1	8.5	---	---	---	10.4	9.7	10.1	10.3	9.9	10.1
MONTH	9.7	4.0	7.4	9.6	4.5	7.9	11.5	8.9	10.0	11.1	9.2	10.2

TRINITY RIVER MAIN STEM

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08062700 TRINITY RIVER AT TRINIDAD, TX--Continued  
(National stream-quality accounting network)

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	10.7	10.1	10.3	9.8	8.5	9.1	---	---	---	---	---	---
2	10.8	10.5	10.6	9.5	8.8	9.1	---	---	---	---	---	---
3	11.1	10.4	10.7	9.3	8.8	9.1	---	---	---	---	---	---
4	11.2	10.1	10.4	9.3	8.3	8.5	---	---	---	---	---	---
5	11.5	10.4	11.0	8.7	8.4	8.5	---	---	---	---	---	---
6	10.4	9.2	9.9	8.9	8.4	8.6	---	---	---	---	---	---
7	9.3	8.9	9.1	9.2	8.6	8.9	---	---	---	---	---	---
8	9.6	9.3	9.4	10.0	9.0	9.5	---	---	---	---	---	---
9	9.8	8.9	9.5	10.7	9.4	9.9	---	---	---	7.4	6.8	7.2
10	9.2	8.9	9.1	11.5	9.6	10.4	---	---	---	6.7	5.9	6.2
11	9.3	9.1	9.2	11.4	9.7	10.4	---	---	---	6.5	6.2	6.3
12	9.3	8.7	9.0	11.7	9.8	10.7	---	---	---	6.8	6.5	6.7
13	8.6	8.5	8.5	11.9	9.9	10.8	---	---	---	6.9	6.8	6.8
14	9.0	8.5	8.7	12.7	10.1	11.4	---	---	---	8.0	6.4	6.9
15	9.5	8.6	9.0	11.7	10.1	10.7	---	---	---	8.1	6.5	7.1
16	9.4	9.1	9.3	10.6	9.6	10.1	---	---	---	6.6	4.9	6.2
17	9.5	9.1	9.2	11.8	9.6	10.7	---	---	---	5.5	4.8	5.0
18	9.8	9.1	9.3	11.9	10.0	10.9	---	---	---	6.2	5.5	5.9
19	9.9	9.8	9.8	11.5	10.3	10.8	---	---	---	6.5	6.2	6.4
20	10.2	9.8	10.0	10.3	9.4	9.9	---	---	---	6.5	6.4	6.4
21	9.9	9.2	9.5	10.3	9.1	9.5	---	---	---	6.6	6.4	6.5
22	10.4	9.2	9.7	10.4	8.7	9.5	---	---	---	6.5	6.3	6.4
23	10.1	9.2	9.8	11.6	8.9	10.1	---	---	---	6.7	6.2	6.5
24	9.3	9.1	9.2	11.0	9.3	9.9	---	---	---	6.8	6.5	6.6
25	9.1	8.8	8.9	10.1	8.7	9.3	---	---	---	7.2	6.5	6.7
26	9.0	8.3	8.6	---	---	---	---	---	---	7.1	3.3	5.7
27	8.8	8.5	8.7	---	---	---	---	---	---	4.5	3.2	4.2
28	8.9	8.8	8.9	7.2	5.9	6.5	---	---	---	4.8	4.6	4.7
29	---	---	---	6.6	5.3	5.9	---	---	---	5.3	4.8	5.0
30	---	---	---	---	---	---	---	---	---	5.8	5.4	5.6
31	---	---	---	---	---	---	---	---	---	5.8	5.8	5.8
MONTH	11.5	8.3	9.5	12.7	5.3	9.6	---	---	---	8.1	3.2	6.1
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	6.0	5.9	5.9	6.2	6.0	6.1	5.6	5.0	5.3	6.1	3.4	4.5
2	6.1	6.0	6.0	6.2	5.9	6.0	6.0	5.7	5.9	5.0	4.4	4.8
3	6.1	6.0	6.0	6.3	5.9	6.1	6.3	5.7	6.1	5.1	4.8	5.0
4	6.0	5.2	5.9	6.3	6.0	6.1	6.8	6.1	6.4	5.1	4.8	5.0
5	5.7	4.7	5.4	6.2	6.0	6.1	7.1	6.2	6.6	5.6	5.1	5.3
6	5.7	5.5	5.6	6.1	5.8	5.9	7.3	6.3	6.8	6.0	5.6	5.8
7	5.6	5.2	5.5	6.0	5.8	5.9	7.5	6.4	6.9	6.2	6.0	6.1
8	5.9	5.0	5.5	6.3	5.6	5.9	7.8	6.5	7.0	6.2	6.1	6.1
9	6.0	5.7	5.9	6.7	6.0	6.3	7.3	6.4	6.8	6.2	5.7	6.1
10	6.1	5.7	5.9	6.9	6.2	6.5	6.7	6.1	6.4	5.7	4.7	5.0
11	6.3	6.1	6.2	7.0	6.3	6.6	7.1	6.2	6.6	5.6	5.0	5.4
12	6.3	6.2	6.2	7.3	6.3	6.7	6.5	6.1	6.3	6.1	5.6	5.9
13	6.2	6.2	6.2	7.3	6.4	6.8	6.3	5.9	6.1	6.3	6.1	6.2
14	6.2	6.1	6.2	7.1	6.4	6.8	6.2	4.1	5.4	6.9	6.2	6.5
15	6.1	6.1	6.1	7.2	5.5	6.6	4.5	3.7	4.1	7.3	6.5	6.8
16	6.1	6.0	6.1	7.2	6.1	6.7	5.0	4.4	4.7	7.9	6.5	7.1
17	6.2	6.0	6.1	7.4	6.2	6.8	5.2	5.0	5.2	6.9	5.5	6.4
18	6.2	5.8	6.0	7.7	6.3	6.8	5.7	5.2	5.5	6.8	6.2	6.4
19	5.8	5.0	5.3	7.2	6.2	6.6	5.8	5.2	5.6	6.4	6.0	6.2
20	5.6	5.4	5.5	7.1	6.0	6.5	6.1	5.8	6.0	6.6	6.4	6.5
21	5.7	5.6	5.7	6.8	5.7	6.2	6.4	6.0	6.2	6.4	5.5	6.0
22	5.8	5.7	5.7	7.0	5.8	6.3	6.5	6.2	6.4	6.4	6.0	6.3
23	5.9	5.8	5.9	8.0	6.2	6.8	6.7	6.2	6.4	6.8	6.4	6.6
24	5.9	4.8	5.6	7.9	6.3	6.9	6.5	5.9	6.2	6.7	6.2	6.5
25	5.0	3.4	4.2	6.6	6.2	6.3	6.0	5.6	5.8	6.9	6.0	6.5
26	5.2	5.0	5.2	6.4	6.2	6.3	6.5	5.9	6.2	6.9	6.2	6.6
27	5.7	5.2	5.5	6.5	6.2	6.3	6.8	6.0	6.4	7.0	6.7	6.8
28	6.0	5.6	5.8	6.4	6.2	6.3	7.4	6.6	6.8	7.0	6.6	6.8
29	6.1	5.9	6.0	6.1	5.3	5.9	7.9	6.6	7.1	8.0	6.9	7.3
30	6.1	6.0	6.1	5.2	3.3	4.1	7.6	6.4	6.8	8.7	7.5	8.0
31	---	---	---	4.9	4.1	4.5	6.5	6.0	6.3	---	---	---
MONTH	6.3	3.4	5.8	8.0	3.3	6.2	7.9	3.7	6.1	8.7	3.4	6.1

08063010 CEDAR CREEK RESERVOIR NEAR TRINIDAD, TX

LOCATION.--Lat 32°14'35", long 96°08'26", Henderson County, Hydrologic Unit 12030107, inside pumphouse on lower level, 1,000 ft north of spillway, 5.5 mi upstream from Joe B. Hogsett Dam on Cedar Creek, and 8.0 mi northwest of Trinidad.

DRAINAGE AREA.--1,007 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1965 to current year.

Water-quality records.--Chemical and biochemical analyses: October 1969 to September 1985.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929. Prior to May 15, 1972, at unfinished pumphouse at same site and datum. May 16, 1972, to Sept. 8, 1975, at site 0.25 mi north and upstream from pumphouse at same datum.

REMARKS.--The reservoir is formed by a rolled earthfill dam 17,539 ft long. The spillway is located on the right bank 5.5 mi upstream from the dam and discharges into the Trinity River through a cut channel 2 mi long. Deliberate impoundment began July 2, 1965, and the dam was completed in February 1966. The spillway is 474 ft long and has eight 40- by 24-foot radial gates and two automatically operated 40- by 8.5-foot hinged gates. Low-flow releases may be made downstream through a 5.0-foot-diameter conduit through the dam. The dam is the property of Tarrant County Water Control and Improvement District No. 1 and was built for municipal and industrial supply and for recreational purposes. The area and capacity tables were based on a survey during the period 1940-58. Water is diverted from the reservoir for municipal and industrial uses by lakeside developments and by the cities of Arlington, Fort Worth, Mansfield, Kemp, Trinidad, and Mabank. 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.....	340.0	-
Top of radial gates.....	325.0	785,100
Top of automatic gates.....	322.5	696,400
Top of conservation pool.....	322.0	679,200
Crest of spillway (automatic gates).....	314.0	441,000
Crest of spillway (radial gates).....	302.0	197,800
Lowest gated outlet (invert).....	263.5	430

COOPERATION.--Records of diversions provided by the Tarrant County Water Control and Improvement District No. 1. The area and capacity tables were provided by Freese and Nichols, Consulting Engineers, for Tarrant County Water Control and Improvement District No. 1.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 722,000 acre-ft June 4, 1973 (elevation, 323.24 ft); minimum since first appreciable storage in 1966, 332,900 acre-ft Mar. 19, 1967 (elevation, 309.42 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 686,800 acre-ft Feb. 23 at 0100 hours (elevation, 322.22 ft); minimum, 589,500 acre-ft Nov. 7 (elevation, 319.22 ft).

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

319.0	582,600	322.0	679,200
320.0	613,800	323.0	713,500
321.0	646,000		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	604500	592000	616700	626100	679600	680600	670600	677200	673900	665900	643500	653000
2	603200	590700	617400	626700	679600	682700	669300	675900	675600	665300	641500	653700
3	602900	591700	617000	626700	679200	677600	670300	677200	675900	665300	640600	654000
4	602900	594500	616100	625700	682300	677600	675600	679900	674200	662600	640600	655000
5	602000	590700	615400	626100	682700	676900	676200	679200	674600	662000	638600	655300
6	600400	591400	616700	629000	682300	678900	676600	678600	673300	661300	638300	655000
7	600400	590100	613800	629600	682300	678200	676600	679200	673300	659600	638000	656000
8	599800	597000	613500	630600	679600	677200	677200	680600	673300	660000	635700	656300
9	603800	595100	613200	637300	678200	676200	677900	680600	673900	658300	636400	656000
10	602000	594800	612900	653700	678600	674600	676600	680300	674900	657300	636700	656000
11	601000	594500	611600	663300	678600	673300	675900	680600	674600	657000	635700	655300
12	601000	594500	612000	671900	677200	675600	676900	680900	673600	655300	638600	654700
13	599200	594500	612600	674200	679200	675900	684000	680900	672300	654300	641800	654300
14	598200	593900	612000	674600	680300	674200	684400	680900	671600	653700	643800	653300
15	597900	593900	611300	680600	676900	674900	683000	677200	672300	653300	643500	653000
16	597600	594500	611000	682700	676200	674600	679900	677200	672300	651300	642500	654000
17	602900	592900	614200	683300	676600	674900	679200	676900	671900	650700	642500	654700
18	598200	592000	614200	681600	680300	674200	680300	678200	671600	649000	647000	655000
19	596700	592000	613800	680900	680600	672900	681300	679200	670600	647400	646400	652700
20	596400	591700	614200	679600	677600	672600	679900	679200	669900	646000	645700	651300
21	598900	592900	619600	677900	680600	673900	679200	678900	668900	645700	645100	650300
22	597300	597600	618700	676900	686100	673600	676900	678200	668300	644100	647400	650000
23	597000	602600	617000	679600	684400	673300	677200	677900	670900	643800	647400	651300
24	597300	609500	616100	678600	682000	672900	676600	679600	670600	645100	647400	653700
25	596000	613200	616100	679600	678900	672600	676600	677900	670300	644400	647000	650700
26	594800	613800	619600	679200	678600	672300	676900	677600	669600	645400	646400	650300
27	594800	618300	623200	679200	678200	672900	676200	677200	668900	645100	646000	649300
28	594800	618000	624100	679900	678600	673600	677600	676600	667900	646000	645100	648700
29	593900	617700	628300	681600	---	673900	676900	675600	666900	646000	645100	648000
30	593500	616700	627000	679900	---	672600	676200	674900	666600	644700	651300	648400
31	592000	---	625700	679900	---	671600	---	674200	---	644100	652000	---
MAX	604500	618300	628300	683300	686100	682700	684400	680900	675900	665900	652000	656300
MIN	592000	590100	611000	625700	676200	671600	669300	674200	666600	643800	635700	648000
(†)	319.30	320.09	320.37	322.02	321.98	321.77	321.91	321.85	321.62	320.94	321.18	321.07
(Φ)	+14000	+24700	+9000	+54200	-1300	-7000	+4600	-2000	-7600	-22500	+7900	-3600
CAL YR 1990	MAX	704600	MIN	562000	(Φ)	+59700						
WTR YR 1991	MAX	686100	MIN	590100	(Φ)	+42400						

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

08063050 NAVARRO MILLS LAKE NEAR DAWSON, TX

LOCATION.--Lat 31°57'27", long 96°41'21", Navarro County, Hydrologic Unit 12030108, in left abutment of spillway of Navarro Mills Dam on Richland Creek, 1.7 mi upstream from bridge on State Highway 31, 3.0 mi upstream from St. Louis Southwestern Railway Lines bridge, 4.2 mi upstream from Post Oak Creek, 4.6 mi north of Dawson, and 63.9 mi upstream from mouth.

DRAINAGE AREA.--320 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1962 to current year. Prior to October 1970, published as Navarro Mills Reservoir.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by U.S. Army Corps of Engineers). Prior to Oct. 8, 1962, nonrecording gage in low-water channel at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 7,570 ft long, including a 240-foot off-channel gated spillway with six 40.0- by 29.0-foot tainter gates. From Aug. 27, 1962, to Mar. 14, 1963, lake was operated as a detention basin only. Deliberate impoundment began Mar. 15, 1963, and dam was completed in September 1963. Low-flow outlet works consist of two 36-inch-diameter gate-controlled conduits. Lake was built for flood control and water conservation. Capacity table prior to September 1976 is based on survey made in February 1956 by U.S. Army Corps of Engineers. Capacity table after Aug. 31, 1976, is based on a sedimentation survey made in September 1972. Flow is affected at times by discharge from the flood-detention pools of 51 floodwater-retarding structures with a combined detention capacity of 26,160 acre-ft. These structures control runoff from 86.9 mi<sup>2</sup> in the Richland Creek drainage basin. An unknown amount of water is diverted for municipal and industrial uses. Gage-height telemeter at station. Figures given herein represent total contents. Data regarding dam and lake are given in the following table:

	Elevation (feet)	Capacity (acre-feet)
Top of dam.....	457.0	-
Design flood.....	451.9	329,500
Top of gates (top of flood-control storage pool).....	443.0	206,200
Top of conservation pool.....	424.5	56,960
Crest of spillway.....	414.0	18,840
Lowest gated outlet (invert).....	400.0	1,150

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 183,300 acre-ft May 18, 1968 (elevation, 440.36 ft); minimum since since initial filling in May 1965, 32,490 acre-ft Dec. 28, 1978 (elevation, 418.89 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 72,750 acre-ft Aug. 15 (elevation, 427.41 ft); minimum daily, 48,413 acre-ft Dec. 15 (elevation, 422.75 ft).

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

422.0	45,020	426.0	64,810
424.0	54,460	428.0	76,310

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	50180	48820	49230	48820	57700	58760	57550	57390	56940	56530	53530	58360
2	50030	48770	49270	48860	57700	59060	57500	57390	58300	56430	53390	58510
3	50030	48680	49140	48910	57700	58860	57440	57240	58860	56480	53240	58860
4	49980	49230	49040	48950	60530	58910	57440	58200	58410	56330	53100	58710
5	49840	48860	48950	49000	63760	58760	57440	60050	57900	56230	53000	58610
6	49790	48720	48860	49320	63860	58250	57440	59890	57700	56130	52850	58300
7	49640	48630	48860	49410	63010	57750	57500	59420	57650	55980	52710	58510
8	49740	49410	48770	49360	62010	57600	57500	61640	57500	55820	52610	58410
9	50180	49460	48720	50420	61000	57600	57340	61430	57500	55670	52610	58000
10	50030	49360	48680	53530	60000	57600	57240	60210	57700	55470	52510	57550
11	49890	49360	48680	53920	59010	57600	57240	58960	57750	55320	52660	57240
12	49790	49320	48680	53920	58660	57650	57290	57700	57700	55220	52710	57190
13	49690	49270	48630	53970	58100	57550	58910	57240	57550	55020	54260	57090
14	49590	49230	48590	54120	57800	57500	59520	57800	57500	54860	70440	57040
15	49550	49180	48410	55320	57600	57340	59570	59520	57550	54710	72750	57040
16	49460	49180	48540	55520	57650	57600	59570	59570	58050	54660	70860	56890
17	49500	49090	48630	55520	57850	57600	59680	59220	58250	54460	69160	57190
18	49410	49090	48590	56180	58050	57550	61000	58910	58050	54310	67320	57140
19	49320	49040	48540	57140	57950	57550	62010	58560	57950	54120	65430	56790
20	49230	49040	48540	57290	57500	57600	60000	58200	57950	53970	63650	56740
21	49590	49040	48680	57290	57900	57650	58510	57700	57850	53870	61850	56640
22	49460	49640	48770	57440	58710	57750	57650	57550	57650	53680	60680	56640
23	49410	49640	48680	57500	58660	57600	57600	57500	57600	53530	60000	64340
24	49320	49590	48540	57500	58460	57550	57650	57500	57440	53970	59520	65320
25	49230	49590	48450	57500	58050	57550	57650	57500	57340	54070	58960	65260
26	49140	49550	48770	57500	57700	57550	57650	57390	57190	54120	58460	64810
27	49090	49500	48820	57550	57340	57650	57700	57340	57090	54020	58150	64280
28	49040	49460	48820	57600	57140	57700	57800	57290	56890	53970	58100	63700
29	49000	49410	48910	57650	---	57700	57600	57240	56790	53920	58000	63230
30	48950	49270	48950	57650	---	57650	57500	57190	56680	53780	58360	62700
31	48910	---	48860	57700	---	57600	---	57090	---	53630	58360	---
MAX	50180	49640	49270	57700	63860	59060	62010	61640	58860	56530	72750	65320
MIN	48910	48630	48410	48820	57140	57340	57240	57090	56680	53530	52510	56640
(†)	422.85	422.93	422.84	424.64	242.53	424.62	424.60	424.52	424.44	423.83	424.77	425.60
(Φ)	-1410	+360	-410	+8840	-560	+460	-100	-410	-410	-3050	+4730	+4340

CAL YR 1990 MAX 160100 MIN 47080 (Φ) +1370  
WTR YR 1991 MAX 72750 MIN 48410 (Φ) +12380

(†) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.



## TRINITY RIVER BASIN

08063100 RICHLAND CREEK NEAR DAWSON, TX

LOCATION.--Lat 31°56'18", long 96°40'52". Navarro County, Hydrologic Unit 12030108, at downstream side of bridge on State Highway 31, 1.3 mi upstream from St. Louis Southwestern Railway Lines bridge, 1.7 mi downstream from Navarro Mills Dam, 2.5 mi upstream from Post Oak Creek, and 3.6 mi northeast of Dawson.

DRAINAGE AREA.--333 mi<sup>2</sup>.

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

Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 367.52 ft above National Geodetic Vertical Datum of 1929. Nov. 21, 1960, to Sept. 30, 1982, water-stage recorder at same site and at 3.00-foot higher datum. Prior to Nov. 21, 1960, nonrecording gage at same site and datum.

REMARKS.--Records good, except those below 2.0 ft<sup>3</sup>/s and those of estimated daily discharges, which are poor. Since Mar. 15, 1963, flow has been regulated by Navarro Mills Lake (station 08063050), 1.7 mi upstream. Flow may be slightly affected at times by discharge from the flood-detention pool of one floodwater-retarding structure with a conservation capacity of 297 acre-ft. This structure controls runoff from a 1.28 mi<sup>2</sup> area below Navarro Mills Lake and above this station. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--31 years, 144 ft<sup>3</sup>/s (104,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,500 ft<sup>3</sup>/s July 3, 1961 (gage height, 25.50 ft), from rating curve extended above 14,000 ft<sup>3</sup>/s; no flow at times. Maximum discharge since completion of Navarro Mills Dam in 1963, 3,850 ft<sup>3</sup>/s Nov. 24, 1974 (gage height, 22.85 ft).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since about 1895, about 31 ft June 19, 1929, from information by local residents. Floods in 1946 and 1957 reached a stage of about 26 ft, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,470 ft<sup>3</sup>/s Aug. 14 at 0930 hours (gage height, 17.52 ft); minimum daily, no flow Nov. 2 and Sept. 19-24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.12	.47	1.9	2.5	25	.73	1.5	.16	.36	.77	.26
2	.11	.00	.43	1.9	2.5	8.5	.68	1.6	.64	.36	.55	.45
3	.07	.01	.49	2.1	2.5	3.6	.69	2.0	84	2.7	.68	.31
4	.07	.14	.44	2.1	152	1.9	1.1	3.3	255	1.6	.67	126
5	.07	.36	.46	2.0	270	137	.78	4.6	241	.56	.46	296
6	.06	.40	.64	3.3	371	248	.81	202	119	.71	.48	291
7	.05	.31	.66	5.5	644	247	.68	465	3.0	.81	.44	291
8	.04	.95	.64	3.4	633	125	.54	478	1.6	.51	.32	304
9	3.9	1.0	.63	21	622	2.4	.49	610	.96	.31	.35	291
10	.99	.31	.47	213	616	1.6	.45	727	6.1	.14	.41	287
11	.02	.20	.39	16	610	1.5	.58	720	9.0	.05	.59	203
12	.03	.21	.37	5.0	432	.91	.63	714	2.4	.05	.86	.56
13	.02	.58	.37	1.9	263	.75	13	344	.72	.03	7.2	.06
14	.02	.43	.33	1.6	228	.86	10	8.3	.45	.04	795	.03
15	.01	.43	.34	31	71	1.1	2.6	17	.91	.08	355	.02
16	.01	.46	.31	10	3.0	1.3	1.1	108	24	.21	1260	.06
17	.10	.49	.35	3.8	2.4	1.7	1.0	248	22	.18	1130	.75
18	.36	.54	2.5	3.0	3.2	1.3	17	247	5.0	.26	1100	.04
19	.06	.67	.70	9.3	115	.63	573	244	1.9	.33	1080	e.00
20	.02	.70	.49	5.3	254	.69	1080	244	.69	.33	982	e.00
21	.23	.70	.99	2.3	142	1.1	885	242	.39	.29	856	e.00
22	.17	2.5	1.6	1.7	67	.88	512	173	.41	.30	658	e.00
23	.19	1.4	.96	1.3	129	.98	10	3.6	.88	.37	381	e.00
24	.13	.62	.79	1.8	221	.86	5.6	1.2	.84	.72	283	e.00
25	.03	.60	.83	1.8	217	.73	3.9	.86	.71	1.2	281	e193
26	.03	.86	2.0	2.4	214	.53	2.9	.43	.63	.73	279	e463
27	.03	.80	2.6	1.8	211	.63	2.4	.28	.63	.78	141	e462
28	.03	.77	1.5	1.9	117	.50	2.7	.18	.48	.87	1.7	e461
29	.03	.44	2.1	2.3	---	.49	2.3	.12	.32	1.5	.98	e460
30	.05	.49	2.7	2.7	---	.50	2.3	.10	.31	1.8	1.1	e459
31	.65	---	2.1	2.8	---	.63	---	.18	---	1.3	.38	---
TOTAL	7.72	17.49	29.65	365.9	6615.1	818.57	3134.96	5811.25	784.13	19.48	9598.94	4589.54
MEAN	.25	.58	.96	11.8	236	26.4	104	187	26.1	.63	310	153
MAX	3.9	2.5	2.7	213	644	248	1080	727	255	2.7	1260	463
MIN	.01	.00	.31	1.3	2.4	.49	.45	.10	.16	.03	.32	.00
AC-FT	15	35	59	726	13120	1620	6220	11530	1560	39	19040	9100
CAL YR 1990	TOTAL	94322.04	MEAN	258	MAX	2180	MIN	.00	AC-FT	187100		
WTR YR 1991	TOTAL	31792.73	MEAN	87.1	MAX	1260	MIN	.00	AC-FT	63060		

e Estimated



TRINITY RIVER BASIN

08063700 BARDWELL LAKE NEAR ENNIS, TX

LOCATION.--Lat 32°15'00", Long 96°38'49", Ellis County, Hydrologic Unit 12030109, in intake structure of Bardwell Dam on Waxahachie Creek, 5 mi south of Ennis, and 5.6 mi upstream from mouth.

DRAINAGE AREA.--178 mi<sup>2</sup>.

PERIOD OF RECORD.--November 1965 to current year. Prior to October 1970, published as Bardwell Reservoir.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark). Prior to Apr. 25, 1966, nonrecording gage on intake structure at same datum.

REMARKS.--The lake is formed by a rolled earthfill dam 15,400 ft long, including a 350-foot uncontrolled off-channel concrete-gravity spillway with ogee weir section. Deliberate impoundment began Nov. 20, 1965, and dam was completed Mar. 27, 1966. Controlled low-flow outlet works consists of a 10.0-foot-diameter concrete conduit with two 5.0- by 10.0-foot sluice gates. Lake was built for flood control and water conservation. Capacity table beginning October 1976 is based on a survey completed in 1972. Runoff from 81.4 mi<sup>2</sup> above Bardwell Lake is modified by Lake Waxahachie, with a capacity of 13,500 acre-ft at spillway elevation. The city of Waxahachie diverts water from Lake Waxahachie and returns an unknown amount of effluent to Waxahachie Creek. Inflow is affected at times by discharge from flood-detention pools of 23 floodwater-retarding structures with a combined detention capacity of 15,370 acre-ft. These structures control runoff from 52.4 mi<sup>2</sup> in the Chambers Creek watershed. Gage-height telemeter at station. 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.....	460.0	-
Design flood.....	455.9	-
Crest of spillway (top of flood-control pool).....	439.0	137,600
Top of conservation pool.....	421.0	52,300
Lowest gated outlet (invert).....	391.0	690

COOPERATION.--Records furnished by the U.S. Army Corps of Engineers and reviewed by the Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 112,100 acre-ft May 22, 1990 (elevation, 434.54 ft); minimum since initial filling, 39,720 acre-ft Nov. 10, 1978 (elevation, 417.21 ft).

EXTREMES FOR CURRENT YEAR.--Maximum daily contents, 56,520 acre-ft Apr. 15 (elevation, 422.16 ft); minimum daily, 47,270 acre-ft Dec. 25 (elevation, 419.56 ft).

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

419.0	45,390	422.0	55,920
420.0	48,780	423.0	59,680
421.0	52,290		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	49230	47470	48090	47510	52790	53150	52790	52790	52580	52220	51400	52860
2	49130	47470	48160	47580	52900	53580	52720	52650	52760	52180	51330	52900
3	49130	47470	48090	47610	52970	53440	52790	52540	53040	52180	51230	52860
4	49130	47580	47950	47580	53620	53510	52900	53440	53080	52080	51160	52860
5	48990	47470	47880	47610	54600	53330	52930	53470	52930	52040	51090	52860
6	48920	47440	47880	47750	54600	53110	52970	53150	52790	51970	51050	52790
7	48920	47440	47810	47750	54090	52790	52970	52930	52650	51900	50980	52970
8	48880	48020	47750	47780	53730	52790	53010	53290	52540	51830	50880	53010
9	48850	48090	47710	48160	53440	52830	53040	53260	52430	51720	50880	53010
10	48710	48050	47710	48670	53150	52790	52930	53080	52360	51580	50880	53010
11	48600	48020	47610	48880	52970	52720	53010	52930	52360	51480	50880	52970
12	48540	48020	47680	48920	52860	53010	53080	52790	52360	51400	51300	52930
13	48430	48020	47680	48920	52860	53010	55040	52680	52330	51330	51760	52860
14	48360	47950	47680	48950	52760	53010	56220	52720	52290	51260	52720	52860
15	48300	47950	47640	49370	52650	53110	56520	52900	52330	51190	52830	52930
16	48300	47950	47610	49440	52680	53220	56440	52930	52610	51090	52830	53080
17	48260	47880	47680	49580	52760	53290	55960	52790	52720	51090	52860	53150
18	48160	47850	47640	50800	53180	53290	55520	52720	52760	51050	52930	53580
19	47980	47850	47610	51970	52930	53330	55300	52580	52720	51020	52930	53290
20	47950	47850	47680	52290	52720	53360	54710	52580	52720	50950	52860	53110
21	48120	47950	47750	52470	52720	53360	54160	52610	52650	50910	52790	52930
22	47980	48230	47640	52610	54490	53180	53650	52720	52610	50800	52860	52930
23	47950	48300	47400	52790	54520	52930	53360	52760	52680	50800	52790	53110
24	47920	48260	47300	53010	54340	52760	53290	52860	52650	50800	52760	53080
25	47810	48230	47270	53110	53690	52610	53290	52900	52610	50800	52720	52970
26	47750	48260	47510	53220	53180	52650	53220	53080	52580	50880	52650	52860
27	47710	48360	47510	53330	52860	52790	53290	53150	52500	50910	52610	52720
28	47710	48300	47470	53290	52790	52900	53180	53040	52430	51370	52500	52650
29	47680	48190	47680	53290	---	52930	53080	52930	52360	51550	52500	52650
30	47610	48120	47640	53080	---	52900	52900	52760	52290	51510	52790	52650
31	47580	---	47510	52860	---	52860	---	52580	---	51480	52900	---
MAX	49230	48360	48160	53330	54600	53580	56520	53470	53080	52220	52930	53580
MIN	47580	47440	47270	47510	52650	52610	52720	52540	52290	50800	50880	52650
(↑)	419.65	419.81	419.63	421.16	421.14	421.16	421.17	421.08	421.00	420.77	421.17	421.10
(Φ)	-1720	+540	-610	+5350	-70	+80	+40	-320	-290	-810	+1420	-250

CAL YR 1990 MAX 112100 MIN 47270 (Φ) +40  
WTR YR 1991 MAX 56520 MIN 47270 (Φ) +3350

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

## TRINITY RIVER BASIN

08063800 WAXAHACHIE CREEK NEAR BARDWELL, TX

LOCATION.--Lat 32°14'36", long 96°38'24", Ellis County, Hydrologic Unit 12030109, on left bank at downstream side of highway embankment near left end of bridge on county road, 0.8 mi downstream from Bardwell Dam, 3.6 mi southeast of Bardwell, 3.8 mi downstream from bridge on State Highway 34, and 4.1 mi upstream from mouth.

DRAINAGE AREA.--178 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1963 to current year.

Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982.

GAGE.--Water-stage recorder. Datum of gage is 370.18 ft above National Geodetic Vertical Datum of 1929 (U.S. Army Corps of Engineers bench mark).

REMARKS.--Records fair, except for discharges below 1.0 ft<sup>3</sup>/s, which are poor. Since November 1965, flow regulated by Bardwell Lake (station 08063700) 0.8 mi upstream. Several observations of water temperature were made during the year. Gage-height telemeter at station.

AVERAGE DISCHARGE.--28 years, 75.0 ft<sup>3</sup>/s (54,340 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,960 ft<sup>3</sup>/s Feb. 9, 1965 (gage height, 17.55 ft); no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1944, about 23 ft in 1944 and 1945, from information by U.S. Army Corps of Engineers.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 374 ft<sup>3</sup>/s Apr. 18 at 0130 hours (gage height, 7.04 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.00	.03	e.05	e36	37	.05	111	28	.04	.11	.02
2	.00	e.00	.05	e.05	e.87	2.2	.05	111	.37	.04	.07	.01
3	.00	e.00	.06	e.06	e.52	1.4	.05	44	.39	.04	.06	.01
4	.00	e.02	.03	e.05	1.2	1.3	.05	4.5	62	.04	.05	.00
5	.00	.05	.03	e.04	1.2	e102	.04	3.8	120	.04	.05	.00
6	.00	.04	.03	e.43	e197	e160	.03	112	120	.04	.05	.00
7	.00	.02	.03	e.25	e320	e108	.03	191	95	.06	.03	.04
8	.00	1.2	.02	e.13	e267	e30	.04	141	70	.08	.00	.03
9	.03	1.3	.03	e.54	e190	e2.3	.05	140	70	.06	.00	.00
10	.02	.50	.08	e.87	e174	e2.0	.06	136	31	.05	.00	.00
11	.00	.32	.06	e.25	e116	e1.7	.06	136	.08	.05	.00	.00
12	.00	.19	.04	e.13	e80	e1.3	.09	137	.09	.05	.06	.00
13	.00	.13	.03	e.10	e80	e1.0	.20	139	.08	.05	.11	.00
14	.00	.10	.02	e.08	e80	e.80	1.1	69	.09	.05	.87	.00
15	.00	.10	.02	e.52	e35	e.60	4.2	.42	.08	.05	.09	.02
16	.00	.09	.02	e.18	e1.5	e.50	152	56	.15	.06	.06	.04
17	.00	.09	.18	e.08	e1.2	e.35	368	115	.10	.06	.04	.09
18	.00	.09	.26	e.68	e.90	e.25	369	114	.07	.06	.04	.06
19	.00	.08	.09	e1.6	e92	e.19	367	115	.06	.07	.03	27
20	.00	.06	.05	e.82	e110	e.15	363	55	.06	.07	.03	64
21	.01	.05	.06	e.48	e80	e52	359	.39	.06	.06	.02	62
22	.01	1.0	.05	e.29	e80	e80	360	.42	.06	.07	.04	62
23	.01	.46	e.03	e.18	e80	e80	228	.51	.13	.06	.05	65
24	e.00	.22	e.03	e.38	e230	e80	110	.44	.07	.17	.04	63
25	e.00	.23	e.03	e.32	e320	e30	111	.47	.05	.19	.03	63
26	e.00	.30	e.67	e.20	e320	.29	111	.43	.05	.10	.03	61
27	e.00	.34	e.29	e.13	e320	.22	111	74	.05	.09	.03	34
28	e.00	.15	e.15	e47	e183	.18	113	119	.05	.31	.02	.00
29	e.00	.05	e.12	e80	---	.07	112	120	.05	.11	.02	.00
30	e.00	.03	e.08	e80	---	.05	111	118	.05	.07	.08	.00
31	e.00	---	e.06	e80	---	.05	---	89	---	.08	.04	---
TOTAL	0.08	7.21	2.73	295.89	3397.39	775.90	3351.10	2453.38	598.24	2.37	2.15	501.32
MEAN	.003	.24	.088	9.54	121	25.0	112	79.1	19.9	.076	.069	16.7
MAX	.03	1.3	.67	80	320	160	369	191	120	.31	.87	65
MIN	.00	.00	.02	.04	.52	.05	.03	.39	.05	.04	.00	.00
AC-FT	.2	14	5.4	587	6740	1540	6650	4870	1190	4.7	4.3	994
CAL YR 1990	TOTAL	57639.68	MEAN	158	MAX	1680	MIN	.00	AC-FT	114300		
WTR YR 1991	TOTAL	11387.76	MEAN	31.2	MAX	369	MIN	.00	AC-FT	22590		

e Estimated

TRINITY RIVER BASIN

405

08064100 Chambers Creek near Rice, Tex.

LOCATION.--Lat 32°11'54, long 96°31'12", Navarro County, Hydrologic Unit 12030109, on downstream side of highway embankment 20 ft to left of left end of bridge on Farm Road 1126, 3.6 mi downstream from Oak Branch, 3.9 mi upstream from Cummins Creek, 4.2 mi upstream from bridge on Interstate Highway 45, 5.0 miles downstream from Waxahachie Creek, and 3.4 mi southwest of Rice.

DRAINAGE AREA.--807 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 340.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Flow from 178 mi<sup>2</sup> above this station is affected by storage in Bardwell Lake on Waxahachie Creek. Flood releases from Bardwell Lake will sustain flows at this site from time to time. In addition, flow is affected at times by discharge from the flood-detention pools of numerous floodwater-retarding structures in the drainage basin above this station.

AVERAGE DISCHARGE.--8 years (water years 1984-1991) regulated, unadjusted, 382 ft<sup>3</sup>/s (276,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 43,400 ft<sup>3</sup>/s June 6, 1986 (gage height, 31.12 ft), from rating curve extended above 15,000 ft<sup>3</sup>/s on basis of velocity-area study; no flow at times most years.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood information for the next downstream station, Chambers Creek near Corsicana, (08064500) indicates that the maximum stage since at least 1870 occurred in August 1887, and that other significant floods occurred in December 1913, May 1944, and May 1958. Stages for these floods are unknown, but over the years a levee system has been developed along the main channel to limit crop land flooding.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 5,300 ft<sup>3</sup>/s Apr. 15 at 0700 hours (gage height, 27.26 ft); minimum, no flow July 20-26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.08	1.0	3.0	197	341	21	266	171	1.2	99	22
2	.01	.08	.90	2.9	46	259	20	226	69	.95	56	29
3	.01	.08	.84	2.8	35	184	19	180	251	.87	28	200
4	.02	.10	.80	2.8	80	153	24	134	208	1.1	13	138
5	.02	.11	.78	2.6	730	195	22	1490	246	5.5	6.1	104
6	.03	.11	1.6	3.1	891	326	20	434	208	2.1	3.5	102
7	.03	.11	2.2	4.9	720	292	18	406	184	1.1	2.3	27
8	.03	.15	2.3	4.7	566	194	19	596	202	.95	1.6	44
9	.09	.21	2.3	5.6	412	92	18	736	201	.57	1.1	46
10	.09	.21	2.2	264	384	75	16	467	132	.39	1.0	16
11	.07	.22	2.2	247	342	69	14	353	25	.29	.79	8.3
12	.06	.57	2.2	98	253	72	13	308	14	.21	1.1	5.9
13	.05	1.3	2.1	51	247	68	247	276	9.4	.17	1.8	4.3
14	.04	1.5	1.9	30	245	57	3280	241	6.9	.14	955	3.5
15	.05	1.4	1.8	46	223	50	4430	593	5.5	.12	2010	3.1
16	.05	1.3	1.8	152	122	52	1220	535	5.7	.11	448	7.1
17	.05	1.1	1.9	79	92	58	1130	382	19	.09	232	85
18	.05	1.1	1.9	157	90	55	1020	302	23	.07	175	439
19	.04	1.0	2.0	1230	166	53	1430	269	24	.03	114	333
20	.04	.97	2.0	790	296	47	1190	280	10	.00	45	258
21	.08	.91	1.8	351	209	81	775	161	6.2	.00	21	212
22	.08	1.1	1.7	219	524	198	658	137	4.6	.00	50	170
23	.07	16	1.5	163	893	199	526	123	4.3	.00	59	527
24	.06	11	1.4	130	659	198	306	89	3.3	.00	32	765
25	.06	3.1	1.3	118	554	167	318	370	2.9	.00	9.5	386
26	.08	2.1	1.3	97	508	37	475	1920	2.5	.00	5.7	240
27	.07	2.1	1.5	77	448	31	321	1160	2.2	1.9	4.5	173
28	.07	2.0	3.0	96	304	31	271	520	1.8	107	3.8	63
29	.08	1.5	4.1	233	---	30	262	387	1.6	975	3.1	34
30	.08	1.2	3.8	228	---	27	443	312	1.3	474	3.9	24
31	.08	---	3.2	224	---	24	---	251	---	193	4.6	---
TOTAL	1.65	52.71	59.32	5112.4	10236	3715	18526	13904	2045.2	1766.86	4391.39	4469.2
MEAN	.053	1.76	1.91	165	366	120	618	449	68.2	57.0	142	149
MAX	.09	16	4.1	1230	893	341	4430	1920	251	975	2010	765
MIN	.01	.08	.78	2.6	35	24	13	89	1.3	.00	.79	3.1
AC-FT	3.3	105	118	10140	20300	7370	36750	27580	4060	3500	8710	8860
CAL YR 1990	TOTAL	233924.00	MEAN	641	MAX	17500	MIN	.00	AC-FT	464000		
WTR YR 1991	TOTAL	64279.73	MEAN	176	MAX	4430	MIN	.00	AC-FT	127500		



TRINITY RIVER BASIN

407

08064100 Chambers Creek near Rice, Tex.--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 31...	48	150	<0.1	<10	<10	<1	<1.0	1800	<6	7
FEB 07...	6	4	<0.1	<10	<10	<1	<1.0	500	<6	11
APR 04...	--	--	--	--	--	--	--	--	--	--
MAY 24...	11	1	0.5	<10	<10	<1	<1.0	620	<6	5
JUL 18...	21	50	0.2	<10	<10	<1	<1.0	860	<6	24
SEP 05...	--	--	--	--	--	--	--	--	--	--

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1440	1720	e1900	e1190	---	510	602	---	---	---	e350	e475
2	1460	e1720	e1910	1190	---	505	601	---	---	---	e370	e475
3	e1470	1730	e1920	1190	---	505	602	---	---	---	e380	e350
4	1480	1700	e1930	1190	---	505	e565	---	---	---	e390	268
5	1510	1760	e1940	1190	---	532	e560	---	---	---	397	297
6	1530	e1770	e1950	1190	---	e480	e560	---	---	---	412	324
7	1530	1780	e1950	1190	---	e400	e560	---	---	---	425	e360
8	1530	e1790	e1960	e1150	---	e450	e570	---	---	---	446	e390
9	1480	e1800	e1960	e1100	---	e480	e560	---	---	---	458	420
10	e1490	e1800	1970	589	---	504	e560	---	---	---	479	481
11	1500	e1800	e1950	e500	---	505	e550	---	---	---	e490	467
12	1510	1740	e1940	e600	---	e520	e550	---	---	---	510	483
13	e1520	1490	e1920	601	---	532	365	---	---	---	514	465
14	e1530	e1600	e1910	466	---	e520	e300	---	---	---	430	462
15	e1540	1710	e1900	464	---	506	e330	---	---	---	285	e480
16	e1560	e1750	1890	e400	---	506	367	---	---	---	e300	512
17	e1570	e1770	e1800	e420	---	e500	363	---	---	---	e340	429
18	e1590	e1790	e1700	465	---	499	e364	---	---	---	383	339
19	1600	e1830	e1550	e350	---	533	365	---	---	---	e390	303
20	1610	e1860	e1400	e400	---	506	364	---	---	---	414	332
21	1580	1890	e1300	465	---	e480	361	---	---	---	429	357
22	1600	1890	e1250	e500	---	e430	366	---	---	---	e390	e340
23	1610	1910	e1200	540	---	392	e365	---	---	---	e320	336
24	1630	1820	1180	533	---	e460	364	---	---	---	e340	302
25	e1650	e1800	e1190	410	---	506	365	---	---	---	e360	326
26	e1670	e1770	1200	408	---	590	366	---	---	---	378	345
27	e1680	e1750	e1200	e350	---	595	365	---	---	---	420	354
28	e1700	1810	e1200	e375	---	597	364	---	---	---	463	e380
29	1710	1830	e1200	409	---	597	e430	---	---	---	497	e410
30	1690	1890	e1200	e440	---	e595	e500	---	---	---	487	443
31	e1700	---	1190	531	---	596	---	---	---	---	e480	---
MEAN	1570	1780	1630	671	---	511	450	---	---	---	411	390

e Estimated



## TRINITY RIVER BASIN

08064100 Chambers Creek near Rice, Tex.--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	19.0	---	---	---	14.0	19.0	---	---	---	---	---
2	26.0	---	---	---	---	15.0	20.0	---	---	---	---	---
3	---	22.0	---	---	---	15.0	20.0	---	---	---	---	29.0
4	27.0	13.0	---	---	---	16.0	---	---	---	---	---	26.0
5	26.0	14.0	---	---	---	17.0	21.0	---	---	---	30.0	27.0
6	27.0	---	---	---	---	15.0	---	---	---	---	31.0	27.0
7	28.0	15.0	---	---	---	15.0	---	---	---	---	32.0	---
8	29.0	12.0	---	---	---	18.0	---	---	---	---	31.0	---
9	17.0	---	---	---	---	19.0	18.0	---	---	---	30.0	28.0
10	---	14.0	---	---	---	17.0	---	---	---	---	28.0	28.0
11	20.0	16.0	---	---	---	19.0	---	---	---	---	---	29.0
12	19.0	20.5	---	---	---	---	---	---	---	---	28.0	28.0
13	---	16.0	---	---	---	21.0	20.0	---	---	---	27.0	28.0
14	---	14.0	---	---	---	---	---	---	---	---	24.0	28.0
15	---	16.0	---	---	---	16.0	20.0	---	---	---	26.0	---
16	---	---	---	---	---	17.0	20.0	---	---	---	---	29.0
17	---	17.0	---	---	---	15.0	19.0	---	---	---	---	28.0
18	---	---	---	---	---	17.0	---	---	---	---	29.0	27.0
19	11.0	---	---	---	---	17.0	20.0	---	---	---	---	22.0
20	20.0	---	---	---	---	15.0	21.0	---	---	---	30.0	22.0
21	16.5	20.0	---	---	---	16.0	20.0	---	---	---	30.0	20.0
22	16.0	20.0	---	---	---	---	20.0	---	---	---	28.0	---
23	17.0	19.0	---	---	---	15.0	---	---	---	---	27.0	25.0
24	17.5	19.0	17.0	---	---	17.0	21.0	---	---	---	---	21.0
25	---	17.0	---	---	---	18.0	20.0	---	---	---	---	22.0
26	---	17.0	---	---	---	19.0	20.0	---	---	---	29.0	22.0
27	---	16.0	---	---	---	20.0	19.0	---	---	---	29.0	22.0
28	---	15.0	---	---	---	19.0	20.0	---	---	---	29.0	---
29	18.5	18.0	---	---	---	19.0	---	---	---	---	26.0	---
30	19.0	19.0	---	---	---	---	---	---	---	---	27.0	23.0
31	---	---	---	---	---	21.0	---	---	---	---	---	---
MEAN	20.9	16.9	17.0	---	---	17.1	19.9	---	---	---	28.6	25.6

TRINITY RIVER BASIN

08064550 RICHLAND-CHAMBERS RESERVOIR NEAR KERENS, TX

LOCATION.--Lat 32°02'25", long 96°12'23", Navarro County, Hydrologic Units 12030108 and 12030109, on upper floor of pumphouse, on left bank of Chambers Creek arm of Richland-Chambers Reservoir, 7.0 mi south of intersection of State Highway 31 and Farm Road 309 in Kerens, and 14.4 mi upstream from dam on Richland Creek.

DRAINAGE AREA.--1,957 mi².

PERIOD OF RECORD.--November 1988 to current year.

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

REMARKS.--The reservoir is formed by a rolled earthfill dam 31,000 ft long. Deliberate impoundment of water began July 14, 1987, and the dam was completed in December 1988. A gated concrete spillway is located near the left end of dam. The spillway 1,155 ft long and contains twenty-four 40- x 29.4-foot radial gates. The low flow outlet works consist of two 3- X 5-foot outlets at elevation 266.0 ft, one 1.5- X 2.5-foot outlet, and one 1- X 1-foot outlet at elevation 285.0 ft. Each of the low flow outlets are controlled by sluice gates. The dam is owned by Tarrant County Water Control and Improvement District No. 1, and was built for municipal and industrial water supply and for recreation. The area and capacity tables were prepared by Freese and Nichols, Consulting Engineers for Tarrant County Water Control and Improvement District No. 1, who provided copies of the tables. Flow from 464 mi² above the dam is controlled by Bardwell and Navarro Mills Lakes. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

Table with 3 columns: Description, Elevation (feet), Capacity (acre-feet). Rows include Top of dam, Top of gates, Top of conservation pool, Crest of spillway, and Lowest gated outlet.

COOPERATION.--Capacity table was prepared by Freese and Nichols, Consulting Engineer for Tarrant County Water Control and Improvement District No. 1.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents 1,262,000 acre-ft May 4, 1990 (elevation, 316.74 ft); minimum contents, 233,600 acre-ft Dec. 8, 1988 (elevation, 283.02 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 1,214,000 acre-ft Feb. 6 at 1500 hrs (elevation, 315.70 ft); minimum, 1,090,000 acre-ft Dec. 17 (elevation, 312.88 ft).

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

Table with 4 columns: Elevation (feet), Capacity (acre-feet). Rows show elevations 312.0, 313.0, 314.0 and corresponding capacities.

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991 DAILY OBSERVATION AT 24:00 VALUES

Large table with 13 columns (DAY, OCT, NOV, DEC, JAN, FEB, MAR, APR, MAY, JUN, JUL, AUG, SEP) showing daily reservoir storage in acre-feet from October 1990 to September 1991.

(†) Elevation, in feet, at end of month. (Φ) Change in contents, in acre-feet.

TRINITY RIVER BASIN

08064700 TEHUACANA CREEK NEAR STREETMAN, TX

LOCATION.--Lat 31°50'54", long 96°17'23", Freestone County, Hydrologic Unit 12030201, at downstream side of bridge on U.S. Highway 75, 2.8 mi southeast of Streetman, 3.1 mi downstream from Chicago, Rock Island, and Pacific Railroad Co. bridge, 3.8 mi upstream from Caney Creek, and 25 mi upstream from mouth.

DRAINAGE AREA.--142 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum gage is 287.58 ft above National Geodetic Vertical Datum of 1929.

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

AVERAGE DISCHARGE.--23 years, 83.7 ft<sup>3</sup>/s (8.00 in/yr), 60,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 85,700 ft<sup>3</sup>/s May 17, 1989 (gage height, 30.20 ft) from rating curve extended above 21,000 ft<sup>3</sup>/s (gage height, 24.9 ft) and confirmed by indirect computation of peak discharge of 48,100 ft<sup>3</sup>/s (gage height, 27.48 ft); no flow at times most years.  
Maximum stage since at least 1932, that of May 17, 1989.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in September 1932 reached a stage of about 24 ft, from information by State Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 21	1845	3,300	22.30	Apr. 14	0315	4,150	22.78
Jan. 10	1045	*6,710	*23.64	Apr. 19	0600	3,210	22.12
Feb. 5	1100	6,240	23.56	Aug. 14	1845	6,280	23.55

Minimum discharge, 0.01 ft<sup>3</sup>/s Dec. 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	e.02	.34	.93	7.4	5.2	700	11	2.7	6.7	.81	.60	9.1		
2	e.02	.34	.73	6.6	4.6	562	8.1	2.3	6.2	.87	.60	7.9		
3	e.02	.90	.51	496	4.2	77	7.1	5.3	6.5	.78	.77	29		
4	e.04	1.1	.33	111	703	34	6.9	e780	17	.73	.91	15		
5	e.05	1.2	.21	28	4760	21	6.5	e1120	9.8	.68	.93	16		
6	e.03	1.8	.20	17	1050	16	6.4	e135	7.3	.78	.88	23		
7	e2.5	1.6	.17	73	118	13	6.8	e22	6.2	.85	.82	21		
8	e15	3.5	.13	27	53	11	7.1	e65	5.7	.94	.72	51		
9	e100	351	.08	555	34	10	6.5	e636	5.7	1.0	.65	22		
10	e30	44	.06	5020	25	9.5	5.9	e100	6.4	1.0	.57	11		
11	e7.0	8.2	.05	1230	21	9.1	5.5	e15	5.9	e.98	.70	8.5		
12	e3.0	4.3	.05	108	18	8.7	5.2	e8.5	5.3	e.82	.71	7.3		
13	e1.8	3.1	.03	34	16	8.2	855	e7.4	4.7	e.82	.86	6.7		
14	e1.1	2.3	.02	19	14	7.6	2550	12	4.2	e.82	3730	6.3		
15	e.90	2.1	.01	211	13	7.5	233	456	3.7	e.82	2070	5.9		
16	e.70	1.8	.04	190	11	9.4	27	73	4.1	.82	125	5.7		
17	e1.5	1.7	.11	40	11	15	13	24	11	.82	24	5.5		
18	e.80	1.9	3.2	35	91	12	118	14	7.4	1.0	15	5.3		
19	e.50	1.8	11	345	2370	9.7	2410	12	4.9	.80	12	5.0		
20	e25	1.5	3.4	107	470	8.5	281	11	3.7	.70	8.9	4.7		
21	e110	1.5	1240	30	70	8.1	33	50	3.0	.67	7.5	5.1		
22	e50	2.6	1130	15	1500	7.9	16	26	2.7	.70	7.3	5.4		
23	e15	40	47	10	252	7.6	11	13	3.1	.82	7.1	208		
24	e7.0	9.6	11	9.0	65	7.1	8.4	11	2.6	1.0	6.2	156		
25	e4.0	4.2	7.0	8.5	36	6.7	7.1	10	2.4	1.8	5.8	328		
26	e2.5	2.4	12	7.8	24	6.7	6.0	9.6	2.2	1.5	5.6	44		
27	e1.5	1.5	437	7.5	19	6.6	6.4	8.8	1.6	1.0	6.6	15		
28	e1.3	1.0	85	6.8	16	36	6.8	8.1	1.2	.82	7.2	9.3		
29	e1.1	1.2	22	6.4	---	237	4.9	7.7	.91	.82	7.3	7.5		
30	.90	1.1	13	6.0	---	56	3.8	7.4	.76	.80	12	6.6		
31	.70	---	10	5.6	---	19	---	7.2	---	.61	17	---		
TOTAL	383.98	499.58	3035.26	8772.6	11774.0	1947.9	6673.4	3660.0	152.87	27.38	6084.22	1050.8		
MEAN	12.4	16.7	97.9	283	420	62.8	222	118	5.10	.88	196	35.0		
MAX	110	351	1240	5020	4760	700	2550	1120	17	1.8	3730	328		
MIN	.02	.34	.01	5.6	4.2	6.6	3.8	2.3	.76	.61	.57	4.7		
AC-FT	762	991	6020	17400	23350	3860	13240	7260	303	54	12070	2080		
CFSM	.09	.12	.69	1.99	2.96	.44	1.57	.83	.04	.01	1.38	.25		
IN.	.10	.13	.80	2.30	3.08	.51	1.75	.96	.04	.01	1.59	.28		
CAL YR 1990	TOTAL	57762.60	MEAN	158	MAX	13500	MIN	.00	AC-FT	114600	CFSM	1.11	IN.	15.13
WTR YR 1991	TOTAL	44061.99	MEAN	121	MAX	5020	MIN	.01	AC-FT	87400	CFSM	.85	IN.	11.54

e Estimated







TRINITY RIVER MAIN STEM

413

08065000 TRINITY RIVER NEAR OAKWOOD, TX

LOCATION.--Lat 31°38'54", long 95°47'21", Anderson County, Hydrologic Unit 12030201, on left bank at downstream side of bridge on U.S. Highways 79 and 84, 1.5 mi upstream from Missouri Pacific Railroad Co. bridge, 6 mi northeast of Oakwood, and at mile 313.4.

DRAINAGE AREA.--12,833 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1923 to September 1924 (monthly discharge only), October 1924 to current year. Records of January 1905 to September 1923, published in WSP 850 and 878, have been found unreliable and should not be used. Gage-height records collected in this vicinity since 1904 are contained in reports of the National Weather Service.

REVISED RECORDS.--WSP 1442: 1934. See also PERIOD OF RECORD. WSP 1922: Drainage area. WRD TX-81-1: 1980 (M,m).

GAGE.--Water-stage recorder. Datum of gage is 175.06 ft above National Geodetic Vertical Datum of 1929. Prior to July 1932, nonrecording gage at site 1.5 mi downstream at datum 1.06 ft lower. July 15, 1932, to Oct. 7, 1934, non-recording gage at present site and datum.

REMARKS.--Records good. Twenty-one major reservoirs with a capacity of 4,200,000 acre-ft, of which 1,362,000 acre-ft is for flood control, partly regulate the flow. Streamflow is affected at times by discharge from the flood-detention pools of 252 floodwater-retarding structures with a combined detention capacity of 183,300 acre-ft. These structures control runoff from 614 mi<sup>2</sup> in the Richland, Chambers and Tehuacana Creeks drainage basins. The Industrial Generating Co., Fairfield, makes a minor diversion from the river at a site about 34 mi upstream. The diversion to Big Brown Lake is used to maintain the normal pool elevation for that lake. Gage-height telemeter at station.

AVERAGE DISCHARGE.--30 years (water 1924-53) unregulated, 5,045 ft<sup>3</sup>/s (3,655,000 acre-ft/yr); 38 years (water years 1954-91) regulated, 4,752 ft<sup>3</sup>/s (3,443,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 153,000 ft<sup>3</sup>/s Apr. 29, 1942 (gage height, 51.64 ft); minimum observed, 28 ft<sup>3</sup>/s Aug. 24, 1925.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1890 reached a stage of 53 ft (discharge about 180,000 ft<sup>3</sup>/s) and was the highest since that date, from information in local newspapers. Flood of June 4, 1908, reached a stage of 52.2 ft, present site and datum, from information by the National Weather Service (discharge, about 164,000 ft<sup>3</sup>/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 21,400 ft<sup>3</sup>/s Apr. 23 at 1300 hours (gage height, 37.95 ft); minimum daily, 722 ft<sup>3</sup>/s Aug. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	891	995	2280	2560	2240	8050	3850	4990	6100	1280	3230	2180
2	875	993	2040	2670	2100	7880	2590	5740	5010	1160	2230	4390
3	854	992	1680	2780	2080	9340	1970	5460	4280	1090	1310	5980
4	834	988	1480	2920	2450	9060	1690	7320	3420	1070	958	6260
5	852	1020	1600	2960	5300	7370	1600	9450	3620	1060	849	6460
6	884	1020	2080	2480	9750	5210	1840	10100	5760	1120	790	5030
7	1230	1620	1960	2510	13300	3360	1970	10500	5740	1500	749	3400
8	1200	2790	1610	2690	15700	2320	2060	9730	4710	1520	730	2680
9	2930	6540	1410	3900	17200	1990	2180	8000	4600	1160	722	2520
10	4540	6690	1330	11200	17200	1830	2090	7160	4670	984	741	2880
11	3930	7100	1290	13700	13500	1730	1860	7370	4730	920	741	4040
12	4720	7840	1250	15100	8280	1650	1670	7860	4470	872	760	3340
13	4990	6830	1240	16200	6400	1580	1980	7230	3900	846	966	2040
14	3470	4330	1240	15300	5760	1530	8190	6350	3570	845	3790	1460
15	2040	2660	1230	12500	4210	1500	13000	5950	3650	821	8540	1260
16	1460	1920	1210	8610	2630	1510	15100	6250	3490	778	11900	1140
17	1280	1660	1210	7600	1970	1530	16300	8590	3270	774	13200	1160
18	1170	1530	1210	7750	2720	1530	17800	12000	2650	756	12900	1870
19	1130	1430	1350	7900	6980	1520	19100	10500	2730	760	9580	2050
20	1100	1350	1560	8730	9120	1530	19600	8010	2930	771	5890	1960
21	2460	1280	1620	9900	9630	1570	20300	4880	2360	766	4160	2110
22	3540	1350	3690	10300	10000	1560	21100	3770	1870	742	3550	3370
23	2870	2130	5190	8810	9590	1470	21300	3540	1700	723	3410	3930
24	2230	3100	4750	5640	11200	1400	19900	2990	1610	724	3170	3440
25	1760	4850	3790	3710	13000	1470	15200	2580	1900	820	2710	3840
26	1500	4530	2670	3010	14000	1660	10200	2310	4380	1030	2320	4270
27	1310	3370	2930	2690	14100	1520	7530	3520	5060	1100	1620	4340
28	1190	2480	3990	2490	10700	1430	6450	7090	3460	1190	1230	3900
29	1120	2200	4050	2340	---	3550	6460	8920	2030	1120	1160	3360
30	1060	2150	3370	2340	---	5550	5460	9340	1460	1340	1280	2420
31	1020	---	2890	2460	---	5240	---	7960	---	2720	1520	---
TOTAL	60440	87738	69200	203750	241110	98440	270340	215460	109130	32362	106706	97080
MEAN	1950	2925	2232	6573	8611	3175	9011	6950	3638	1044	3442	3236
MAX	4990	7840	5190	16200	17200	9340	21300	12000	6100	2720	13200	6460
MIN	834	988	1210	2340	1970	1400	1600	2310	1460	723	722	1140
AC-FT	119900	174000	137300	404100	478200	195300	536200	427400	216500	64190	211700	192600

CAL YR 1990	TOTAL	4485750	MEAN	12290	MAX	106000	MIN	795	AC-FT	8897000
WTR YR 1991	TOTAL	1591756	MEAN	4361	MAX	21300	MIN	722	AC-FT	3157000

## TRINITY RIVER BASIN

08065200 UPPER KEECHI CREEK NEAR OAKWOOD, TX

LOCATION.--Lat 31°34'11", long 95°53'17", Leon County, Hydrologic Unit 12030201, at right bank at downstream side of bridge on U.S. Highway 79, 1.9 mi upstream from Missouri Pacific Railroad Co. bridge, 2 mi southwest of Oakwood, 11 mi upstream from Buffalo Creek, and 21 mi upstream from mouth.

DRAINAGE AREA.--150 mi<sup>2</sup>.

PERIOD OF RECORD.--April 1962 to current year.

Water-quality records: Chemical analyses: June 1962 to April 1964, November 1967 to September 1975.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 240.11 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair, including those days of estimated daily discharges. No known diversions or regulation above station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--29 years (water years 1963-91), 73.0 ft<sup>3</sup>/s (6.61 in/yr), 52,890 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,000 ft<sup>3</sup>/s May 16, 1965 (gage height, 14.91 ft), and Apr. 25, 1966, from rating curve extended above 5,800 ft<sup>3</sup>/s; maximum gage height, 15.46 ft Oct. 31, 1974; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1900, about 21 ft in 1932, from information by local residents.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 9	2200	2,800	13.36	Feb. 5	2300	2,300	13.15
Jan. 10	2000	*5,140	*14.06				

Minimum discharge, 3.1 ft<sup>3</sup>/s Aug. 9, 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	3.7	14	28	45	66	321	89	47	29	11	5.1	24		
2	3.5	13	26	61	58	536	53	36	24	10	4.6	18		
3	3.5	13	26	182	54	522	46	94	26	9.0	4.0	16		
4	3.5	16	25	232	128	193	40	378	33	8.2	3.6	21		
5	3.5	24	22	208	872	99	37	583	29	14	3.3	27		
6	3.4	21	21	98	1540	81	40	626	23	14	3.8	29		
7	3.4	18	21	128	825	69	60	674	20	11	3.8	35		
8	3.4	68	20	180	345	59	110	269	20	9.8	3.6	34		
9	105	889	20	286	131	52	70	120	24	11	3.3	33		
10	196	1770	19	2720	91	47	47	95	21	11	3.2	25		
11	279	979	19	1860	71	45	37	73	20	11	3.4	18		
12	145	397	19	871	63	46	35	61	20	7.7	5.4	15		
13	25	85	19	500	60	44	144	59	19	7.0	11	13		
14	15	56	19	198	57	41	955	54	26	6.3	104	12		
15	12	44	18	533	48	40	1440	122	55	5.6	181	11		
16	10	39	18	868	43	54	1090	116	83	5.4	131	10		
17	9.7	37	19	788	52	63	562	61	181	4.9	39	9.4		
18	8.8	34	23	454	159	57	243	54	77	4.8	26	13		
19	8.4	33	25	365	781	48	330	85	38	4.6	20	14		
20	8.2	31	24	497	723	43	280	75	26	4.5	15	9.1		
21	396	29	23	481	496	42	128	64	20	4.2	12	8.0		
22	495	42	48	166	417	43	72	57	17	4.0	11	7.4		
23	343	126	87	99	366	40	56	48	17	3.8	10	115		
24	194	199	40	100	401	35	49	39	22	3.7	9.4	460		
25	42	102	30	118	191	34	46	36	22	5.4	8.3	647		
26	27	49	39	96	109	34	45	32	16	7.1	7.5	237		
27	21	41	160	79	88	34	44	29	14	17	7.1	33		
28	17	36	181	74	81	34	58	31	13	15	7.1	18		
29	15	41	155	71	---	126	103	27	13	8.9	7.3	13		
30	14	33	73	69	---	465	94	50	12	7.0	9.8	11		
31	14	---	55	75	---	474	---	39	---	5.6	22	---		
TOTAL	2428.0	5279	1322	12502	8316	3821	6403	4134	960	252.5	685.6	1935.9		
MEAN	78.3	176	42.6	403	297	123	213	133	32.0	8.15	22.1	64.5		
MAX	495	1770	181	2720	1540	536	1440	674	181	17	181	647		
MIN	3.4	13	18	45	43	34	35	27	12	3.7	3.2	7.4		
AC-FT	4820	10470	2620	24800	16490	7580	12700	8200	1900	501	1360	3840		
CFSM	.52	1.17	.28	2.69	1.98	.82	1.42	.89	.21	.05	.15	.43		
IN.	.60	1.31	.33	3.10	2.06	.95	1.59	1.03	.24	.06	.17	.48		
CAL YR 1990	TOTAL	32880.94	MEAN	90.1	MAX	2770	MIN	.02	AC-FT	65220	CFSM	.60	IN.	8.15
WTR YR 1991	TOTAL	48039.0	MEAN	132	MAX	2720	MIN	3.2	AC-FT	95290	CFSM	.88	IN.	11.91

TRINITY RIVER MAIN STEM

415

08065350 TRINITY RIVER NEAR CROCKETT, TX  
(National stream-quality accounting network)

LOCATION.--Lat 31°20'18", long 95°39'22", Houston-Leon County line, Hydrologic Unit 12030201, on left bank at an abandoned bridge abutment near left end of an abandoned lock and dam, 1,000 ft upstream from State Highway 7, 6.9 mi downstream from Upper Keechi Creek, 11.9 mi west of Crockett, and at mile 265.4.

DRAINAGE AREA.--13,911 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Water-stage recorder. Datum of gage is 141.15 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 13, 1983, water-stage recorder at site 1,000 ft downstream at datum 4.56 ft lower.

REMARKS.-- Records good. For statement regarding regulation by upstream reservoirs, see station 08065000. Flow from 44 mi<sup>2</sup> of Elkhart Creek basin is affected by storage in Houston County Lake near Crockett (capacity 19,500 acre-ft). There are many diversions above station for irrigation, municipal, and industrial uses. Gage-height telemeter at station.

AVERAGE DISCHARGE.--27 years (water years 1965-91), 6,038 ft<sup>3</sup>/s (4,375,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 109,000 ft<sup>3</sup>/s May 10, 1990 (gage height, 48.54 ft); minimum, 275 ft<sup>3</sup>/s Aug. 13, 1964.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1900, 56.1 ft Apr. 30 or May 1, 1942, at former site and datum from information by Texas Department of Highways and Public Transportation.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 26,600 ft<sup>3</sup>/s Jan. 12, at 1400 hours (gage height, 31.64 ft); minimum daily, 1,050 ft<sup>3</sup>/s Aug. 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1260	1450	2470	3720	3170	14500	5790	6920	8900	1870	3370	3260
2	1210	1390	2520	3500	2900	12400	4380	6660	6890	1710	3350	6010
3	1180	1340	2300	4320	2760	12100	3330	7290	5680	1590	2340	6490
4	1170	1360	2040	4240	3420	13300	2620	13300	4910	1530	1650	6970
5	1140	1360	1860	4030	7520	12500	2280	15300	4470	1540	1350	7390
6	1140	1400	2000	3970	11100	9710	2300	16200	5300	1550	1220	6950
7	1240	1460	2280	3890	16000	6460	3380	16000	7090	1620	1130	5210
8	1620	2260	2170	3860	19600	4200	4140	15200	6220	1960	1080	3930
9	2250	6010	1930	5700	20600	3130	3230	13200	5450	1890	1050	3550
10	5160	9410	1780	21200	21100	2730	3020	10800	5340	1600	1060	3420
11	5330	8840	1710	25700	20500	2510	2800	9630	5400	1440	1080	3980
12	4910	10700	1660	26400	16200	2410	2560	9740	5410	1340	1090	4450
13	5910	11500	1640	25200	10400	2330	2560	9820	4990	1280	1270	3630
14	5410	8930	1630	23200	7960	2220	8130	8650	4420	1260	2490	2800
15	3670	5400	1640	24800	6730	2170	16300	7700	4500	1240	7670	2310
16	2430	3320	1630	23200	4770	2180	19100	7350	4680	1210	12200	2130
17	1910	2490	1620	16500	3360	2260	21300	8100	4530	1150	15000	2030
18	1730	2180	1640	14100	3790	2290	24100	15100	4060	1150	16100	2210
19	1590	2020	1650	15300	7780	2260	24700	15300	3640	1130	14900	2960
20	1530	1900	1790	14100	10700	2210	24500	12800	3840	1130	10300	2970
21	2870	1830	1940	13700	12900	2190	23700	8730	3650	1150	6070	2930
22	5370	1790	2260	14300	15300	2230	23400	5540	2990	1140	4530	3270
23	4500	2030	4690	14100	15400	2170	23300	4640	2510	1120	4080	4240
24	3730	2660	5700	11400	14400	2070	23200	4200	2400	1100	3980	4640
25	3300	4130	5160	7470	15800	1990	22000	3710	2600	1170	3690	4380
26	2920	5660	4120	4980	17200	2070	18000	3320	3350	1480	3430	5220
27	2480	4940	4780	4080	17900	2200	12400	3090	5460	1670	3030	5850
28	1980	3530	4990	3640	17100	2070	9160	5450	5330	1660	2400	5690
29	1740	2760	5500	3310	---	2360	10100	8990	3650	1680	2020	4950
30	1600	2510	5030	3120	---	4810	9420	10800	2360	1610	1980	3950
31	1520	---	4320	3200	---	6380	---	10800	---	1990	2120	---
TOTAL	83800	116560	86450	350230	326360	144410	355200	294330	140020	44960	137030	127770
MEAN	2703	3885	2789	11300	11660	4658	11840	9495	4667	1450	4420	4259
MAX	5910	11500	5700	26400	21100	14500	24700	16200	8900	1990	16100	7390
MIN	1140	1340	1620	3120	2760	1990	2280	3090	2360	1100	1050	2030
AC-FT	166200	231200	171500	694700	647300	286400	704500	583800	277700	89180	271800	253400
CAL YR 1990	TOTAL	5077620	MEAN	13910	MAX	109000	MIN	1050	AC-FT	10070000		
WTR YR 1991	TOTAL	2207120	MEAN	6047	MAX	26400	MIN	1050	AC-FT	4378000		

## TRINITY RIVER MAIN STEM

08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
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## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: February 1964 to current year. Chemical and biochemical analyses: February 1968 to current year. Pesticide analyses: November 1971 to July 1981. Sediment analyses: November 1972 to September 1977.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: February 1964 to current year.

pH: March 1975 to current year.

WATER TEMPERATURE: February 1964 to September 1971, March 1975 to current year.

DISSOLVED OXYGEN: March 1975 to current year.

SUSPENDED-SEDIMENT DISCHARGE: July 1972 to September 1977.

INSTRUMENTATION.--Since March 1975, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen at this station.

REMARKS.--Interruptions in the record were due to malfunctions of the instrument. Where maximum or minimum specific conductance values are not shown, mean value is estimated. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 2,370 microsiemens Sept. 22, 1964; minimum, 96 microsiemens Mar. 29, 1989.

pH: Maximum, 9.6 units Aug. 11, 12, 1981; minimum, 5.9 units Aug. 12, 1977.

WATER TEMPERATURE (1975-current year): Maximum, 37.0°C July 4, 1970, Sept. 4, 1978; minimum, 1.0°C Jan. 17, 1978, Nov. 24, 1984.

DISSOLVED OXYGEN: Maximum, 19.3 mg/L Feb. 10, 1981; minimum, 0.0 mg/L Apr. 20, 1976.

## EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 767 microsiemens July 27; minimum, 143 microsiemens Jan. 13, May 18.

pH: Maximum, 8.4 units Mar. 19, 23-25; minimum, 6.7 units Feb. 19.

WATER TEMPERATURE: Maximum, 33.0°C July 14-18; minimum, 3.5°C Dec. 26.

DISSOLVED OXYGEN: Maximum, 12.1 mg/L Dec. 26; minimum, 4.2 mg/L Oct. 9, May 29, Sept. 20.

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	
DEC 18...	0900	1620	570	7.5	15.0	9.9	99	2.3	130	29	45	4.9
FEB 12...	0945	17000	290	7.2	13.0	9.4	89	2.2	110	18	37	3.8
APR 19...	1400	24800	246	7.8	22.0	5.9	68	0.7	94	14	33	2.8
JUN 05...	1230	4500	422	7.2	27.5	6.1	78	1.7	140	31	49	4.9
JUL 31...	1116	1870	604	7.7	30.5	6.5	87	1.5	150	28	51	6.4
SEP 11...	1405	4060	386	7.6	29.0	6.7	88	1.0	120	9	41	4.6
DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)
DEC 18...	42	2	6.0	100	56	55	0.70	8.6	281	4.86	0.040	4.90
FEB 12...	15	0.6	4.8	90	27	17	0.20	6.3	165	0.560	0.040	0.600
APR 19...	12	0.5	4.1	80	21	12	0.20	6.0	139	0.490	0.110	0.600
JUN 05...	28	1	5.4	110	54	27	0.30	7.5	243	1.61	0.090	1.70
JUL 31...	62	2	7.6	130	74	56	0.80	12	346	5.91	0.090	6.00
SEP 11...	32	1	5.2	110	37	27	0.30	9.0	223	2.58	0.020	2.60
DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)
DEC 18...	0.030	0.87	0.90	1.60	1.30	2	50	<0.5	<1.0	<5	<3	<10
FEB 12...	0.050	0.75	0.80	0.210	0.130	--	--	--	--	--	--	--
APR 19...	0.100	0.60	0.70	0.210	0.160	--	--	--	--	--	--	--
JUN 05...	0.070	0.73	0.80	0.380	0.350	--	--	--	--	--	--	--
JUL 31...	0.040	1.2	1.2	1.80	1.20	4	63	<0.5	2.0	<5	<3	<10
SEP 11...	0.010	0.69	0.70	0.600	0.450	--	--	--	--	--	--	--

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WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
DEC 18...	39	<10	10	12	<0.1	<10	<10	<1	<1.0	350	<6	23
FEB 12...	--	--	--	--	--	--	--	--	--	--	--	--
APR 19...	--	--	--	--	--	--	--	--	--	--	--	--
JUN 05...	--	--	--	--	--	--	--	--	--	--	--	--
JUL 31...	7	<10	16	5	<0.1	<10	<10	<1	<1.0	410	7	19
SEP 11...	--	--	--	--	--	--	--	--	--	--	--	--

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT- ANCE (MICRO- SIEMENS)	DIS- SOLVED SOLIDS (MG/L)	DIS- SOLVED SOLIDS (TONS)	DIS- SOLVED CHLORIDE (MG/L)	DIS- SOLVED CHLORIDE (TONS)	DIS- SOLVED SULFATE (MG/L)	DIS- SOLVED SULFATE (TONS)	HARDNESS (CA, MG) (MG/L)
OCT. 1990	83800	400	231	52200	30	6890	46	10300	130
NOV. 1990	116560	358	207	65300	25	8010	41	12800	120
DEC. 1990	86450	412	237	55300	32	7430	47	11000	130
JAN. 1991	350230	264	155	147000	15	14400	29	27900	99
FEB. 1991	326360	277	163	143000	16	14000	31	27200	100
MAR. 1991	144410	403	232	90400	31	12200	46	18000	130
APR. 1991	355200	318	186	178000	20	19300	36	34300	110
MAY 1991	294330	333	194	154000	22	17300	38	29800	120
JUNE 1991	140020	437	252	95100	34	12700	50	18900	140
JULY 1991	44960	612	344	41800	61	7440	72	8760	160
AUG. 1991	137030	349	202	74800	25	9130	40	14600	120
SEPT 1991	127770	390	226	77900	29	9870	44	15300	130
TOTAL	2207120	**	**	1175000	**	139000	**	229000	**
WTD.AVG.	6047	339	197	**	23	**	38	**	120



## TRINITY RIVER MAIN STEM

08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
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## SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	622	577	598	565	533	544	392	369	379	448	351	386
2	616	575	590	584	553	566	431	396	416	474	427	448
3	644	620	633	600	573	586	427	404	415	438	405	417
4	649	635	640	600	576	587	447	416	435	459	391	413
5	646	620	637	592	573	578	471	443	457	497	450	470
6	638	612	621	588	576	580	506	471	485	482	416	456
7	661	640	653	600	588	595	510	502	505	455	416	426
8	678	651	661	600	529	585	514	482	497	480	433	450
9	650	622	634	537	396	484	529	482	501	473	256	409
10	619	322	455	373	231	290	565	533	550	246	156	190
11	331	264	294	247	212	226	565	537	553	237	163	205
12	302	262	280	306	231	253	533	510	521	244	146	206
13	458	307	387	345	247	294	518	490	503	225	143	183
14	559	357	477	271	251	264	518	506	513	316	230	285
15	352	337	344	271	259	263	522	506	512	297	158	255
16	338	316	323	290	271	280	545	514	530	239	153	199
17	335	321	328	325	290	302	569	545	554	248	186	212
18	343	332	337	337	318	324	573	553	558	272	214	258
19	361	340	350	361	333	347	573	553	561	260	214	244
20	380	361	369	392	361	370	592	565	576	250	235	241
21	389	364	378	408	380	391	600	580	586	261	239	248
22	362	201	293	447	412	428	608	584	592	308	253	277
23	345	298	288	471	447	458	584	345	507	309	298	303
24	337	306	316	510	439	475	345	247	308	310	298	302
25	329	314	322	467	380	427	255	231	242	329	310	321
26	345	314	321	545	412	500	267	243	249	337	329	334
27	404	341	385	506	373	443	285	238	250	349	341	342
28	443	396	413	369	306	326	351	293	317	357	345	350
29	482	435	453	365	325	339	382	351	366	373	357	363
30	522	475	491	384	361	372	374	315	342	388	373	380
31	545	514	525	---	---	---	359	315	330	400	384	391
MONTH	678	201	445	600	212	416	608	231	455	497	143	321
DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	420	404	407	302	282	291	478	390	431	402	388	395
2	431	420	424	298	267	280	487	474	477	414	394	402
3	435	424	428	361	294	326	483	448	467	449	388	398
4	427	337	405	361	263	306	467	446	454	456	208	292
5	329	307	321	306	263	290	458	437	445	237	211	227
6	340	294	312	318	282	299	475	441	453	244	218	233
7	330	209	290	333	318	324	501	309	447	295	237	267
8	255	201	237	412	337	380	387	297	347	357	297	324
9	287	215	238	420	412	416	446	395	422	303	297	299
10	300	234	245	455	408	432	438	398	417	334	303	321
11	244	238	241	475	459	468	460	434	443	332	315	326
12	249	242	244	510	475	491	489	464	478	364	317	347
13	282	249	265	533	510	521	488	441	480	394	360	379
14	288	275	279	553	533	541	431	252	334	369	345	359
15	298	281	290	573	553	562	358	210	268	346	340	344
16	313	298	302	582	575	579	373	271	317	354	339	343
17	337	314	330	584	578	580	284	240	273	405	355	367
18	384	190	295	587	573	580	237	221	228	321	143	208
19	329	213	267	590	546	576	251	232	242	405	239	339
20	302	262	269	603	579	589	274	249	259	388	321	347
21	329	259	299	617	594	602	300	276	287	337	325	332
22	260	243	252	622	603	610	321	303	313	366	337	347
23	243	239	240	633	607	616	330	323	326	393	368	381
24	308	241	260	638	613	619	445	328	337	452	392	412
25	324	261	281	632	611	620	340	323	329	507	452	478
26	306	284	297	650	618	630	357	330	341	511	473	500
27	322	271	306	664	638	648	381	356	370	465	423	435
28	322	306	312	676	643	657	381	366	377	606	426	490
29	---	---	---	656	631	642	365	299	344	617	356	479
30	---	---	---	652	391	559	392	292	330	373	342	352
31	---	---	---	402	367	381	---	---	---	368	346	357
MONTH	435	190	298	676	263	497	501	210	368	617	143	357

TRINITY RIVER MAIN STEM

08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
(National stream-quality accounting network)

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	390	360	375	411	407	409	698	668	686	562	185	440
2	421	389	400	431	412	419	687	644	656	301	168	204
3	433	422	428	454	432	441	669	533	600	541	294	404
4	452	419	438	474	455	464	530	452	484	548	314	426
5	437	350	388	502	470	483	457	447	450	369	326	348
6	457	441	449	545	502	522	471	458	466	367	325	345
7	551	459	503	573	527	545	470	465	468	352	332	339
8	487	405	431	610	574	595	470	464	466	336	331	334
9	411	397	403	639	613	630	487	470	477	349	332	339
10	418	405	409	670	639	655	506	487	497	391	350	368
11	437	406	423	673	670	671	536	508	522	412	392	401
12	427	411	420	678	672	674	585	536	557	477	399	432
13	432	408	417	699	679	687	594	561	584	487	464	473
14	439	422	430	700	668	689	551	274	410	499	401	454
15	436	408	419	665	608	630	457	183	334	446	419	426
16	422	403	412	671	633	659	345	260	301	472	423	447
17	430	400	414	688	663	678	266	248	256	489	474	483
18	424	398	407	670	622	640	250	234	242	481	469	473
19	437	404	418	637	617	632	264	246	254	523	483	502
20	477	434	454	664	621	643	303	266	284	550	501	529
21	506	480	498	694	665	679	315	305	311	537	472	511
22	529	507	522	707	693	697	310	297	302	598	492	529
23	542	504	532	722	708	715	321	300	309	620	541	589
24	499	461	476	729	724	727	340	322	330	539	412	503
25	505	457	487	735	723	731	368	345	355	401	314	357
26	510	455	474	733	716	728	375	364	370	333	286	309
27	606	509	562	767	614	703	462	374	429	296	280	286
28	602	379	468	660	543	611	542	463	498	299	278	284
29	393	364	373	691	651	668	546	533	543	356	304	330
30	416	396	410	658	580	600	545	507	521	393	350	364
31	---	---	---	665	607	626	566	548	559	---	---	---
MONTH	606	350	441	767	407	621	698	183	436	620	168	408

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.6	7.5	7.6	7.6	7.5	7.6	7.6	7.5	7.5	7.7	7.4	7.5
2	7.6	7.5	7.6	7.7	7.5	7.6	7.5	7.5	7.5	7.6	7.4	7.5
3	7.6	7.5	7.6	7.7	7.6	7.6	7.6	7.5	7.6	7.5	7.4	7.4
4	7.7	7.5	7.6	7.7	7.6	7.6	7.6	7.6	7.6	7.6	7.4	7.4
5	7.7	7.6	7.6	7.8	7.6	7.7	7.6	7.6	7.6	7.7	7.4	7.5
6	7.7	7.6	7.6	7.8	7.6	7.7	7.6	7.6	7.6	7.6	7.4	7.5
7	7.7	7.6	7.6	7.7	7.6	7.6	7.7	7.6	7.6	7.6	7.3	7.4
8	7.7	7.6	7.6	7.6	7.6	7.6	7.8	7.7	7.7	7.5	7.3	7.3
9	7.6	7.6	7.6	7.5	7.3	7.5	7.7	7.7	7.7	7.4	7.2	7.3
10	7.6	7.3	7.4	7.6	7.4	7.5	7.7	7.6	7.7	7.4	7.1	7.2
11	7.5	7.4	7.5	7.6	7.5	7.6	7.6	7.6	7.6	7.4	7.2	7.3
12	7.5	7.5	7.5	7.5	7.5	7.5	7.7	7.6	7.6	7.6	7.4	7.5
13	7.5	7.4	7.4	7.6	7.5	7.6	7.7	7.6	7.7	7.6	7.5	7.5
14	7.4	7.4	7.4	7.6	7.5	7.6	7.8	7.7	7.8	7.5	7.5	7.5
15	7.5	7.4	7.5	7.6	7.6	7.6	7.9	7.8	7.8	7.5	7.3	7.4
16	7.5	7.4	7.5	7.6	7.6	7.6	7.9	7.7	7.8	7.3	7.2	7.3
17	7.5	7.4	7.5	7.6	7.5	7.6	7.8	7.7	7.8	7.4	7.3	7.4
18	7.5	7.4	7.5	7.6	7.5	7.5	7.9	7.7	7.8	7.5	7.3	7.4
19	7.5	7.4	7.5	7.5	7.5	7.5	7.9	7.7	7.8	7.4	7.2	7.3
20	7.5	7.5	7.5	7.6	7.5	7.5	7.8	7.7	7.8	7.4	7.3	7.4
21	7.5	7.4	7.5	7.6	7.5	7.5	7.9	7.6	7.7	7.4	7.3	7.4
22	7.7	7.5	7.6	7.5	7.5	7.5	7.9	7.7	7.8	7.4	7.3	7.3
23	7.5	7.4	7.5	7.5	7.5	7.5	7.9	7.6	7.7	7.5	7.3	7.4
24	7.5	7.4	7.5	7.5	7.4	7.4	8.1	7.8	7.8	7.5	7.4	7.5
25	7.5	7.3	7.4	7.5	7.4	7.4	8.1	7.8	7.9	7.4	7.3	7.3
26	7.4	7.3	7.3	7.5	7.4	7.5	8.1	7.6	7.8	7.3	7.3	7.3
27	7.4	7.3	7.3	7.5	7.4	7.5	7.6	7.5	7.5	7.5	7.3	7.3
28	7.5	7.3	7.3	7.6	7.5	7.5	7.5	7.4	7.4	7.4	7.3	7.3
29	7.5	7.4	7.4	7.5	7.5	7.5	7.8	7.5	7.6	7.5	7.3	7.4
30	7.6	7.4	7.5	7.5	7.5	7.5	7.7	7.5	7.6	7.5	7.4	7.4
31	7.6	7.5	7.5	---	---	---	7.7	7.5	7.5	7.4	7.3	7.4
MONTH	7.7	7.3	7.5	7.8	7.3	7.5	8.1	7.4	7.7	7.7	7.1	7.4

TRINITY RIVER MAIN STEM  
08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
(National stream-quality accounting network)

PH (STANDARD UNITS), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	7.5	7.4	7.4	7.6	7.6	7.6	7.8	7.6	7.7	7.6	7.6	7.6
2	7.5	7.4	7.4	7.6	7.5	7.6	7.7	7.6	7.6	7.7	7.6	7.7
3	7.6	7.4	7.5	7.6	7.5	7.6	7.7	7.6	7.6	7.7	7.7	7.7
4	7.5	7.2	7.4	7.7	7.6	7.6	7.8	7.6	7.7	7.8	7.6	7.7
5	7.3	7.1	7.2	7.6	7.6	7.6	7.8	7.6	7.7	7.8	7.6	7.7
6	7.4	7.1	7.2	7.6	7.6	7.6	7.8	7.6	7.7	7.6	7.6	7.6
7	7.5	7.3	7.4	7.6	7.6	7.6	7.8	7.6	7.7	7.6	7.5	7.6
8	7.5	7.3	7.4	7.6	7.5	7.6	7.6	7.5	7.5	7.6	7.5	7.5
9	7.3	7.3	7.3	7.5	7.5	7.5	7.6	7.5	7.6	7.6	7.5	7.6
10	7.3	7.3	7.3	7.5	7.5	7.5	7.6	7.6	7.6	7.5	7.5	7.5
11	7.3	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6	7.5	7.5	7.5
12	7.3	7.3	7.3	7.6	7.6	7.6	7.7	7.6	7.7	7.6	7.5	7.6
13	7.4	7.3	7.3	7.7	7.6	7.6	7.7	7.6	7.7	7.6	7.5	7.5
14	7.5	7.4	7.4	7.8	7.6	7.7	7.6	7.4	7.5	7.5	7.5	7.5
15	7.5	7.5	7.5	7.8	7.7	7.7	7.8	7.5	7.6	7.5	7.5	7.5
16	7.5	7.5	7.5	7.8	7.7	7.8	7.9	7.7	7.9	7.5	7.5	7.5
17	7.5	7.3	7.4	8.0	7.7	7.8	7.9	7.9	7.9	7.6	7.5	7.6
18	7.4	6.8	7.2	8.2	7.9	8.0	7.9	7.8	7.9	7.8	7.5	7.7
19	7.2	6.7	7.0	8.4	7.9	8.1	7.8	7.8	7.8	7.5	7.4	7.5
20	7.3	7.2	7.2	8.3	8.0	8.2	7.8	7.7	7.7	7.5	7.4	7.4
21	7.4	7.2	7.2	8.3	7.9	8.1	7.7	7.7	7.7	7.5	7.4	7.4
22	7.3	7.2	7.3	8.3	7.9	8.1	7.7	7.6	7.7	7.4	7.4	7.4
23	7.3	7.2	7.2	8.4	7.9	8.1	7.7	7.6	7.6	7.5	7.4	7.4
24	7.3	7.2	7.3	8.4	7.9	8.2	7.7	7.7	7.7	7.5	7.4	7.5
25	7.5	7.3	7.4	8.4	8.0	8.2	7.7	7.6	7.7	7.5	7.4	7.4
26	7.4	7.3	7.3	8.2	7.9	8.1	7.7	7.6	7.6	7.5	7.4	7.4
27	7.7	7.3	7.5	8.2	7.9	8.0	7.8	7.7	7.7	7.4	7.3	7.4
28	7.7	7.6	7.6	8.0	7.8	7.9	7.8	7.6	7.8	7.5	7.4	7.4
29	---	---	---	8.0	7.8	7.9	7.6	7.5	7.6	7.4	7.3	7.4
30	---	---	---	7.8	7.6	7.7	7.6	7.5	7.6	7.4	7.4	7.4
31	---	---	---	7.8	7.7	7.8	---	---	---	7.5	7.4	7.4
MONTH	7.7	6.7	7.3	8.4	7.5	7.8	7.9	7.4	7.7	7.8	7.3	7.5
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.5	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5	7.6	7.0	7.4
2	7.5	7.5	7.5	7.5	7.4	7.5	7.5	7.4	7.4	7.2	6.9	7.0
3	7.5	7.5	7.5	7.5	7.5	7.5	7.4	7.4	7.4	7.4	7.2	7.3
4	7.5	7.4	7.5	7.6	7.5	7.5	7.4	7.4	7.4	7.4	7.4	7.4
5	7.5	7.3	7.4	7.6	7.5	7.6	7.4	7.4	7.4	7.4	7.4	7.4
6	7.5	7.5	7.5	7.7	7.6	7.7	7.5	7.4	7.5	7.5	7.4	7.4
7	7.5	7.5	7.5	7.8	7.6	7.7	7.5	7.5	7.5	7.4	7.4	7.4
8	7.5	7.5	7.5	7.8	7.7	7.8	7.6	7.5	7.5	7.4	7.4	7.4
9	7.5	7.5	7.5	7.8	7.7	7.8	7.7	7.5	7.6	7.4	7.4	7.4
10	7.6	7.5	7.6	7.8	7.7	7.8	7.7	7.6	7.7	7.5	7.4	7.4
11	7.6	7.5	7.5	7.8	7.7	7.8	7.8	7.7	7.8	7.5	7.5	7.5
12	7.6	7.5	7.6	7.8	7.7	7.8	7.8	7.7	7.7	7.5	7.5	7.5
13	7.6	7.5	7.6	7.9	7.7	7.8	7.7	7.6	7.7	7.5	7.5	7.5
14	7.6	7.5	7.6	8.0	7.8	7.9	7.6	7.1	7.3	7.5	7.4	7.5
15	7.6	7.5	7.6	8.1	7.8	7.9	7.6	7.2	7.4	7.4	7.4	7.4
16	7.5	7.4	7.5	8.1	7.9	8.0	7.5	7.4	7.5	7.5	7.4	7.4
17	7.5	7.4	7.5	8.1	7.8	7.9	7.6	7.5	7.5	7.5	7.5	7.5
18	7.5	7.4	7.4	8.1	7.9	8.0	7.5	7.4	7.5	7.5	7.5	7.5
19	7.4	7.4	7.4	8.0	7.8	7.9	7.4	7.4	7.4	7.6	7.5	7.6
20	7.5	7.4	7.4	7.9	7.8	7.8	7.4	7.3	7.3	7.6	7.6	7.6
21	7.5	7.5	7.5	7.8	7.7	7.7	7.4	7.3	7.3	7.6	7.5	7.5
22	7.5	7.5	7.5	7.7	7.6	7.7	7.4	7.4	7.4	7.6	7.5	7.6
23	7.5	7.5	7.5	7.8	7.6	7.7	7.4	7.4	7.4	7.6	7.6	7.6
24	7.5	7.4	7.4	7.8	7.7	7.7	7.4	7.4	7.4	7.6	7.4	7.5
25	7.5	7.3	7.4	7.8	7.7	7.7	7.5	7.4	7.5	7.5	7.4	7.5
26	7.5	7.3	7.4	7.7	7.6	7.7	7.5	7.5	7.5	7.5	7.5	7.5
27	7.5	7.4	7.5	7.6	7.4	7.5	7.5	7.5	7.5	7.5	7.5	7.5
28	7.4	7.4	7.4	7.5	7.3	7.4	7.5	7.5	7.5	7.5	7.5	7.5
29	7.4	7.4	7.4	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5	7.5
30	7.4	7.4	7.4	7.4	7.4	7.4	7.5	7.5	7.5	7.6	7.5	7.5
31	---	---	---	7.5	7.4	7.5	7.5	7.5	7.5	---	---	---
MONTH	7.6	7.3	7.5	8.1	7.3	7.7	7.8	7.1	7.5	7.6	6.9	7.5

TRINITY RIVER MAIN STEM

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08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
(National stream-quality accounting network)

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	27.5	26.0	27.0	19.0	18.0	18.5	15.5	15.0	15.0	6.5	6.5	6.5
2	27.0	26.0	26.5	19.5	18.5	19.0	15.5	15.5	15.5	6.5	6.5	6.5
3	27.0	26.0	26.5	20.5	19.0	20.0	15.5	14.0	15.0	7.0	6.5	7.0
4	27.5	26.5	27.0	20.5	18.5	19.5	14.0	13.5	14.0	8.0	7.0	7.5
5	28.0	26.5	27.0	18.5	17.5	18.0	13.5	12.5	13.0	8.5	7.5	8.0
6	27.5	26.5	27.0	17.5	16.5	17.0	13.0	12.0	12.5	9.0	8.5	8.5
7	28.0	27.0	27.5	17.5	16.5	17.0	13.0	12.0	12.5	9.0	8.5	8.5
8	28.0	27.0	27.5	17.0	15.5	16.5	12.0	11.5	11.5	9.0	8.5	9.0
9	28.0	24.0	25.5	15.0	13.5	14.5	12.0	10.5	11.5	8.5	8.0	8.5
10	23.5	20.5	22.0	13.5	12.5	13.0	12.0	10.5	11.0	8.5	8.0	8.5
11	20.0	19.0	19.5	13.0	12.0	12.5	12.0	11.0	11.5	8.5	8.5	8.5
12	19.0	18.0	18.5	13.5	12.5	13.0	13.5	11.5	12.5	8.5	8.0	8.0
13	20.0	18.0	19.0	14.0	13.5	14.0	13.5	12.5	13.0	8.0	8.0	8.0
14	21.0	20.0	20.5	15.0	13.5	14.0	14.0	13.5	13.5	8.5	8.0	8.0
15	21.0	20.0	20.5	15.0	14.0	14.5	15.0	14.0	14.5	9.5	8.5	9.0
16	22.0	20.5	21.0	15.5	14.5	15.0	15.5	14.5	14.5	9.5	9.0	9.0
17	22.0	21.0	21.5	16.5	15.0	15.5	16.0	15.5	15.5	10.0	9.0	9.5
18	22.0	21.0	21.5	16.5	15.5	16.0	16.0	15.5	16.0	10.0	9.5	10.0
19	21.5	20.0	20.5	17.5	16.5	17.0	15.5	14.5	15.0	10.0	9.5	10.0
20	21.5	19.5	20.5	18.5	17.5	18.0	15.5	14.5	14.5	10.0	10.0	10.0
21	21.0	19.0	20.0	19.0	18.0	18.5	15.5	13.5	14.5	9.5	8.5	9.5
22	19.0	16.5	17.5	19.0	19.0	19.0	13.5	10.0	11.5	9.0	8.5	9.0
23	17.5	16.5	17.0	19.5	18.5	19.0	10.0	7.0	9.0	9.0	8.5	9.0
24	17.0	16.0	16.5	19.0	18.0	18.5	7.0	4.5	6.0	9.0	8.5	9.0
25	17.0	15.5	16.0	18.5	18.0	18.0	4.5	4.0	4.0	9.5	8.0	8.5
26	16.5	15.5	16.0	19.0	18.5	18.5	4.0	3.5	3.5	9.5	9.0	9.0
27	17.0	15.5	16.0	19.5	19.0	19.5	5.0	4.0	4.5	10.0	9.0	9.5
28	17.5	16.0	17.0	19.5	18.0	19.0	7.0	5.0	6.0	10.5	9.5	10.0
29	18.5	17.0	17.5	18.0	16.5	17.5	8.0	7.0	7.5	11.5	10.0	11.0
30	19.0	17.5	18.0	16.5	15.5	16.0	8.5	6.5	7.5	11.0	10.0	10.5
31	19.0	17.5	18.5	---	---	---	6.5	6.5	6.5	10.0	9.5	9.5
MONTH	28.0	15.5	21.0	20.5	12.0	17.0	16.0	3.5	11.5	11.5	6.5	9.0
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	10.0	9.5	9.5	14.5	12.5	13.5	17.5	16.0	17.0	23.5	22.0	22.5
2	10.0	9.0	9.5	15.5	14.5	15.0	18.0	17.0	17.5	24.0	23.0	23.5
3	11.0	9.5	10.5	15.5	15.0	15.0	18.5	17.5	18.0	23.5	23.5	23.5
4	12.0	10.5	11.0	15.0	14.5	14.5	19.5	18.0	19.0	23.5	22.0	22.5
5	13.0	12.0	12.5	15.0	14.0	14.5	19.5	19.0	19.0	22.5	21.5	22.0
6	13.0	12.5	13.0	16.0	14.5	15.5	20.0	19.0	19.5	22.0	21.5	21.5
7	13.0	12.0	12.5	16.0	15.5	16.0	20.5	20.0	20.5	22.0	21.5	21.5
8	12.0	11.5	11.5	16.5	15.5	16.0	21.5	20.0	21.0	21.5	21.0	21.5
9	12.0	12.0	12.0	17.0	15.5	16.5	23.0	21.5	22.0	21.5	21.0	21.0
10	12.5	12.0	12.5	16.5	15.5	16.0	23.0	21.5	22.0	22.0	21.0	21.5
11	13.0	12.5	12.5	16.5	15.5	16.0	23.0	22.0	22.5	23.0	22.0	22.0
12	13.5	13.0	13.0	17.5	16.0	16.5	23.5	22.5	23.0	23.5	22.5	23.0
13	14.0	13.5	13.5	17.5	16.5	17.0	23.0	22.5	23.0	24.0	23.0	23.5
14	13.5	12.5	13.0	16.5	15.5	16.0	22.5	20.5	21.0	24.5	23.5	24.0
15	13.5	12.5	13.0	15.5	15.0	15.5	21.5	20.0	20.5	25.0	24.0	24.5
16	12.5	12.0	12.0	15.0	14.5	15.0	21.5	21.5	21.5	25.0	24.5	25.0
17	13.0	12.0	12.5	16.5	14.5	15.5	21.5	21.5	21.5	25.0	24.5	24.5
18	16.5	13.0	14.5	16.5	15.5	16.0	21.5	21.0	21.5	24.5	21.5	22.5
19	16.0	14.5	15.0	16.5	15.5	16.0	22.0	21.5	22.0	24.5	23.0	24.0
20	14.5	13.5	14.0	17.5	16.5	16.5	22.5	22.0	22.0	25.0	24.5	24.5
21	13.5	12.5	13.0	18.5	17.5	18.0	22.0	21.5	21.5	25.5	25.0	25.0
22	12.5	12.0	12.0	19.5	18.5	19.0	21.5	21.0	21.0	26.0	25.0	25.5
23	12.0	11.5	11.5	19.5	18.5	19.0	21.0	20.5	21.0	26.5	25.5	26.0
24	12.0	11.5	11.5	20.0	18.5	19.0	21.0	20.5	20.5	27.0	26.0	26.5
25	12.0	12.0	12.0	20.0	19.0	19.5	21.0	20.5	20.5	28.0	26.5	27.0
26	12.0	12.0	12.0	21.0	19.5	20.5	21.5	21.0	21.0	28.5	27.0	28.0
27	12.0	11.5	12.0	21.0	20.5	21.0	22.0	21.0	21.5	29.0	27.5	28.5
28	12.5	12.0	12.0	20.5	19.5	20.0	22.5	22.0	22.0	29.5	28.5	29.0
29	---	---	---	20.0	19.0	19.5	22.5	22.0	22.0	29.5	27.0	28.0
30	---	---	---	19.0	16.5	18.0	23.0	21.5	22.0	27.5	27.0	27.5
31	---	---	---	17.0	16.0	16.5	---	---	---	28.0	27.5	28.0
MONTH	16.5	9.0	12.5	21.0	12.5	17.0	23.5	16.0	21.0	29.5	21.0	24.5

## TRINITY RIVER MAIN STEM

08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
(National stream-quality accounting network)

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	29.0	27.0	28.5	31.5	30.0	31.0	31.5	30.5	31.0	29.5	26.0	28.0
2	29.5	28.5	29.0	32.0	30.5	31.0	31.5	30.5	31.0	28.0	25.5	26.5
3	29.5	28.5	29.0	32.0	30.5	31.5	31.5	30.5	31.0	28.5	27.0	28.0
4	29.5	28.0	28.5	32.0	30.5	31.5	31.5	30.0	31.0	28.0	27.5	28.0
5	29.5	27.5	28.5	32.0	30.5	31.0	32.0	30.0	31.0	28.0	27.5	27.5
6	29.0	28.5	28.5	32.0	30.5	31.5	32.5	30.5	31.5	28.0	27.5	27.5
7	28.5	28.0	28.5	32.0	30.5	31.5	32.5	31.0	32.0	28.0	27.5	27.5
8	28.0	27.5	28.0	31.5	30.5	31.0	32.5	31.5	32.0	28.0	27.5	28.0
9	28.0	27.0	27.5	31.5	30.0	31.0	32.5	31.5	32.0	29.0	27.5	28.0
10	27.5	27.0	27.5	32.0	30.0	31.0	32.0	31.0	31.5	29.0	28.0	28.5
11	28.0	27.0	27.5	32.0	30.5	31.5	31.5	30.5	31.0	29.0	28.5	28.5
12	28.5	27.5	28.0	32.0	30.5	31.5	30.5	30.0	30.0	29.0	28.5	29.0
13	29.0	28.0	28.5	32.5	31.0	31.5	30.0	29.0	29.5	29.0	28.5	29.0
14	29.5	28.5	29.0	33.0	31.0	32.0	28.5	27.0	27.5	29.5	28.5	29.0
15	29.0	28.5	28.5	33.0	31.5	32.5	27.0	25.0	26.0	30.0	28.5	29.0
16	28.5	28.0	28.5	33.0	31.5	32.5	26.5	25.5	26.0	30.0	28.5	29.5
17	29.0	27.5	28.0	33.0	31.5	32.0	27.0	26.0	26.5	30.5	28.5	29.5
18	29.0	27.5	28.5	32.5	31.0	32.0	28.0	27.0	27.0	30.0	29.0	29.5
19	29.5	28.0	29.0	32.5	31.0	32.0	28.5	27.5	28.0	29.0	26.5	28.0
20	30.0	29.0	29.5	32.5	31.0	32.0	29.5	28.0	28.5	26.5	25.5	26.0
21	31.0	29.5	30.0	32.0	31.0	31.5	30.0	28.5	29.5	25.5	24.5	25.0
22	30.0	29.5	30.0	32.0	30.5	31.5	30.0	29.0	29.5	25.0	24.0	24.5
23	30.5	29.0	29.5	32.0	30.5	31.0	30.0	29.0	29.5	24.5	24.0	24.5
24	31.0	29.0	30.0	32.0	30.5	31.0	30.0	29.0	29.5	24.5	23.5	24.0
25	30.5	29.0	29.5	31.5	30.5	31.0	29.5	28.5	29.0	23.5	22.5	23.0
26	31.0	29.0	30.0	31.5	30.0	30.5	29.5	28.5	29.0	23.0	22.0	22.5
27	31.5	30.5	31.0	31.0	29.5	30.5	30.0	29.0	29.5	23.0	22.0	22.5
28	31.0	30.0	30.5	31.0	29.0	30.0	30.0	29.0	29.5	22.5	22.0	22.0
29	30.5	29.5	30.0	31.5	30.0	31.0	30.5	29.0	29.5	23.0	22.0	22.5
30	31.0	29.5	30.5	32.0	30.0	31.0	30.0	29.0	29.5	23.5	22.0	23.0
31	---	---	---	32.5	30.5	31.5	30.0	29.0	29.5	---	---	---
MONTH	31.5	27.0	29.0	33.0	29.0	31.5	32.5	25.0	29.5	30.5	22.0	26.5

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	7.8	7.1	7.4	8.4	7.9	8.1	8.3	8.1	8.3	11.2	10.6	10.8
2	7.7	7.1	7.4	8.5	7.9	8.2	8.4	8.3	8.3	11.5	11.2	11.3
3	7.4	6.7	7.1	8.5	7.9	8.2	8.6	8.3	8.4	11.4	11.1	11.3
4	6.8	5.5	6.2	8.2	7.7	7.9	8.8	8.5	8.6	11.3	11.0	11.2
5	5.5	4.6	5.1	8.5	7.7	8.1	9.0	8.4	8.7	11.4	11.2	11.3
6	4.7	4.4	4.5	8.8	8.1	8.4	9.3	8.9	9.1	11.4	10.9	11.2
7	4.7	4.3	4.5	8.7	8.2	8.4	9.5	9.2	9.3	10.8	10.6	10.8
8	4.7	4.4	4.5	8.3	8.2	8.3	10.0	9.2	9.6	10.8	10.6	10.7
9	4.5	4.2	4.3	8.3	7.9	8.1	10.2	9.5	9.8	10.8	10.6	10.8
10	4.7	4.4	4.6	8.0	7.8	7.9	10.2	9.6	9.9	10.7	10.3	10.5
11	5.3	4.8	5.0	8.4	8.0	8.2	10.1	9.9	10.0	10.2	10.0	10.1
12	5.6	5.0	5.3	8.3	8.0	8.1	10.1	9.7	9.9	10.0	9.9	10.0
13	6.0	5.2	5.5	7.9	7.3	7.6	10.2	9.8	10.0	10.0	9.7	9.8
14	5.9	5.3	5.6	7.9	7.4	7.8	10.6	10.0	10.3	9.8	9.6	9.8
15	6.1	5.6	5.8	8.1	7.8	8.0	10.7	10.0	10.3	9.8	9.6	9.7
16	6.2	5.7	5.9	8.2	8.0	8.1	10.2	9.5	9.9	10.0	9.6	9.8
17	6.1	5.8	5.9	8.3	8.1	8.2	10.5	9.6	10.0	9.9	9.8	9.8
18	6.1	5.7	5.9	8.3	8.1	8.2	10.7	9.4	10.0	10.1	9.8	9.9
19	6.4	5.8	6.0	8.2	8.1	8.1	10.7	9.6	10.1	10.1	9.8	10.0
20	6.9	6.0	6.3	8.1	8.0	8.0	10.4	9.8	10.1	9.8	9.7	9.8
21	6.5	6.2	6.4	8.0	7.9	8.0	9.9	9.5	9.8	10.1	9.8	10.0
22	6.9	6.3	6.6	7.9	7.7	7.8	9.7	9.4	9.5	10.1	9.8	10.0
23	7.0	6.8	6.8	7.9	7.7	7.8	10.0	9.5	9.6	10.0	9.9	10.0
24	7.2	6.7	6.9	7.8	7.4	7.7	11.0	10.2	10.6	10.0	9.7	9.9
25	7.3	7.2	7.2	7.7	7.4	7.6	11.9	11.0	11.4	9.8	9.6	9.7
26	7.6	7.3	7.4	7.5	7.1	7.4	12.1	11.0	11.9	9.7	9.6	9.6
27	7.7	7.6	7.7	7.0	6.6	6.8	12.0	11.6	11.8	10.0	9.7	9.9
28	7.7	7.7	7.7	7.1	6.6	6.8	11.7	11.4	11.5	10.0	9.8	9.9
29	7.8	7.7	7.8	7.5	7.1	7.3	11.7	11.5	11.6	9.9	9.6	9.8
30	7.9	7.8	7.8	8.1	7.4	7.8	11.4	10.6	11.0	9.6	9.5	9.6
31	8.1	7.8	7.9	---	---	---	10.6	10.4	10.6	10.1	9.6	9.8
MONTH	8.1	4.2	6.2	8.8	6.6	7.9	12.1	8.1	10.0	11.5	9.5	10.2



TRINITY RIVER MAIN STEM

423

08065350 TRINITY RIVER NEAR CROCKETT, TX--Continued  
(National stream-quality accounting network)

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DAY	FEBRUARY			MARCH			APRIL			MAY		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	10.4	9.7	10.0	10.5	10.0	10.3	8.3	7.5	7.9	7.3	6.4	6.8
2	10.4	9.9	10.2	10.0	9.6	9.7	8.1	7.7	7.9	7.3	6.6	6.9
3	10.4	10.0	10.2	9.7	9.3	9.5	8.1	7.7	7.9	7.1	6.7	6.9
4	10.1	9.5	10.0	10.3	9.2	9.7	8.2	7.8	7.9	7.0	6.4	6.7
5	9.4	8.8	9.1	10.6	9.7	10.1	7.8	7.6	7.7	6.7	6.5	6.6
6	9.0	8.7	8.9	10.7	10.0	10.3	7.7	7.5	7.6	6.8	6.3	6.6
7	9.1	8.6	8.8	10.3	9.8	10.1	7.5	7.1	7.4	6.9	6.5	6.7
8	9.3	9.1	9.2	10.0	9.4	9.7	7.5	7.0	7.2	8.1	6.6	7.3
9	9.3	9.0	9.2	10.0	9.2	9.6	7.4	7.0	7.2	8.2	8.0	8.1
10	9.4	8.9	9.1	10.1	9.2	9.7	7.4	7.0	7.2	7.9	7.2	7.7
11	9.4	9.0	9.1	10.0	9.5	9.8	7.5	7.1	7.3	7.3	7.1	7.3
12	9.5	9.1	9.3	10.4	9.8	10.0	7.3	7.0	7.1	7.5	7.1	7.3
13	9.8	9.5	9.6	10.4	9.4	9.9	7.1	6.7	7.0	7.4	7.0	7.1
14	10.2	9.7	10.0	10.1	9.3	9.7	6.7	6.2	6.5	7.2	7.0	7.1
15	10.1	9.9	10.0	9.7	9.2	9.4	6.4	6.0	6.2	7.7	7.2	7.5
16	10.2	10.0	10.1	9.5	9.2	9.3	5.9	5.5	5.7	7.7	7.6	7.7
17	10.5	10.2	10.4	10.8	9.5	10.0	6.1	5.8	5.9	7.7	7.2	7.6
18	10.4	7.5	9.3	10.9	9.6	10.2	6.1	5.8	6.0	7.4	6.9	7.2
19	9.5	8.3	9.0	11.5	9.5	10.4	5.9	5.7	5.8	6.9	6.1	6.4
20	9.6	9.1	9.4	11.0	9.8	10.4	5.8	5.6	5.7	6.2	5.8	6.0
21	10.0	9.5	9.9	11.0	9.8	10.3	5.9	5.6	5.7	6.3	6.0	6.2
22	10.6	10.0	10.2	10.8	9.6	10.2	6.1	5.7	5.9	6.2	5.5	5.9
23	10.8	10.0	10.3	10.9	9.0	9.9	6.2	5.7	5.9	5.9	5.5	5.6
24	11.1	10.2	10.5	11.0	9.1	9.9	6.3	5.8	6.1	6.2	6.0	6.1
25	10.4	10.3	10.3	10.2	9.2	9.8	6.4	6.0	6.2	6.1	5.8	6.0
26	10.8	10.3	10.4	10.4	9.2	9.7	6.6	6.1	6.4	5.8	5.6	5.7
27	10.7	10.1	10.3	9.8	9.0	9.3	6.9	6.4	6.7	5.6	5.5	5.6
28	10.4	10.0	10.2	8.7	8.3	8.5	7.0	6.4	6.7	5.5	4.7	5.3
29	---	---	---	8.7	7.9	8.3	6.6	6.3	6.4	4.7	4.2	4.5
30	---	---	---	8.0	7.4	7.7	7.1	6.2	6.6	5.2	4.7	5.0
31	---	---	---	7.9	7.3	7.6	---	---	---	5.5	5.2	5.3
MONTH	11.1	7.5	9.7	11.5	7.3	9.6	8.3	5.5	6.7	8.2	4.2	6.5
DAY	JUNE			JULY			AUGUST			SEPTEMBER		
	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
1	5.6	5.3	5.4	6.6	5.2	6.1	6.8	6.5	6.7	6.4	6.1	6.3
2	5.7	5.4	5.5	5.9	5.2	5.6	6.5	6.3	6.4	6.2	5.9	6.1
3	6.0	5.4	5.7	6.2	5.7	6.0	6.6	6.3	6.4	6.0	5.8	5.9
4	5.9	5.4	5.6	6.3	5.9	6.1	6.9	6.5	6.7	5.8	5.6	5.7
5	5.9	5.7	5.8	6.3	6.0	6.1	7.2	6.7	7.0	6.0	5.8	5.9
6	6.1	5.7	5.8	6.4	6.0	6.2	7.6	7.0	7.2	6.0	5.9	6.0
7	6.3	5.9	6.1	6.5	5.9	6.2	7.7	7.1	7.3	6.1	5.9	6.0
8	6.6	6.2	6.4	6.2	5.8	6.0	7.8	7.0	7.4	6.3	6.1	6.2
9	6.8	6.6	6.7	6.0	5.6	5.8	8.1	7.2	7.5	6.5	6.1	6.3
10	6.9	6.7	6.8	5.8	5.4	5.6	8.1	7.2	7.5	6.6	6.2	6.4
11	6.9	6.7	6.8	5.7	5.3	5.5	8.2	7.3	7.6	6.7	6.4	6.5
12	7.1	6.9	7.0	6.0	5.2	5.5	7.8	7.3	7.5	6.8	6.4	6.6
13	7.1	6.9	7.0	6.7	5.7	6.1	7.6	7.3	7.5	6.7	6.5	6.6
14	7.1	7.0	7.0	7.0	5.6	6.1	7.8	7.3	7.6	6.9	6.4	6.6
15	7.2	7.1	7.1	6.2	5.4	5.8	7.9	7.3	7.7	7.0	6.6	6.8
16	7.2	6.9	7.0	6.0	5.3	5.6	7.5	4.7	6.5	7.1	6.6	6.8
17	7.1	6.9	7.0	6.1	5.1	5.5	4.6	4.4	4.5	7.3	6.7	6.9
18	7.0	6.6	6.8	6.4	5.8	6.0	4.9	4.4	4.6	7.4	6.7	7.0
19	6.9	6.5	6.6	5.9	5.3	5.6	4.8	4.5	4.7	7.0	5.0	6.5
20	7.0	6.9	7.0	6.0	5.2	5.6	4.9	4.5	4.7	4.9	4.2	4.4
21	7.0	6.9	7.0	6.2	5.5	5.7	5.5	4.9	5.3	6.0	4.4	5.0
22	7.1	6.9	6.9	7.3	6.2	6.6	5.6	5.5	5.5	6.0	4.7	5.2
23	6.9	6.6	6.8	7.7	5.7	6.8	5.8	5.5	5.6	4.9	4.5	4.6
24	7.4	6.8	6.9	6.6	5.5	6.0	6.1	5.8	5.9	5.3	4.3	4.6
25	7.1	6.5	6.8	7.1	6.1	6.5	6.3	6.1	6.2	6.5	4.7	5.7
26	6.8	6.6	6.7	7.2	6.3	6.7	6.4	6.1	6.2	6.8	6.2	6.4
27	6.7	5.8	6.3	6.8	6.1	6.5	6.3	6.2	6.3	6.9	6.5	6.7
28	6.5	5.8	5.9	7.1	6.4	6.7	6.5	6.1	6.2	7.2	6.8	7.0
29	6.7	6.5	6.6	7.2	6.7	6.9	6.6	6.2	6.3	6.0	5.5	5.8
30	6.7	6.5	6.6	7.1	6.6	6.8	6.5	6.2	6.3	6.3	5.5	5.8
31	---	---	---	7.2	6.7	6.9	6.5	6.3	6.4	---	---	---
MONTH	7.4	5.3	6.5	7.7	5.1	6.1	8.2	4.4	6.4	7.4	4.2	6.1

## TRINITY RIVER BASIN

08065800 BEDIAS CREEK NEAR MADISONVILLE, TX

LOCATION.--Lat 30°53'03", long 95°46'39", Madison-Walker County line, Hydrologic Unit 12030202, on right bank at downstream side of bridge on U.S. Highways 75 and 190, 0.5 mi upstream from Interstate Highway 45, 1.5 mi downstream from Caney Creek, and 9.5 mi southeast of Madisonville.

DRAINAGE AREA.--321 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1967 to current year.

Water-quality records.--Chemical analyses: July 1962 to April 1965; January 1968 to September 1974. Chemical and biochemical analyses: September 1970 to September 1974; April 1985 to June 1988. Pesticide analyses: April 1985 to April 1988. Specific conductance: October 1984 to September 1987. Water temperature: October 1984 to September 1987. Suspended sediment discharge: October 1984 to September 1986.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 150.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records fair. There are no diversions above station. Flow may be slightly affected at times by discharge from the flood-detention pools of three floodwater-retarding structures with a combined detention capacity of 1,290 acre-ft. These structures control runoff from 2.71 mi<sup>2</sup> in the upper Caney Creek and Town Branch drainage basins. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--24 years, 200 ft<sup>3</sup>/s (8.46 in/yr), 144,900 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 33,800 ft<sup>3</sup>/s Sept. 14, 1974 (gage height, 25.07 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1910, 34 ft in May 1922 (discharge unknown), from information by local resident.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 10	1400	*32,000	*24.79	Feb. 6	1000	4,290	17.48
Jan. 16	0300	7,340	19.52	Apr. 15	1800	5,020	18.56
Jan. 19	2400	3,810	17.90				

Minimum daily discharge, 0.24 ft<sup>3</sup>/s, on Aug. 2-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.59	.49	.59	17	176	78	15	472	137	2.2	.28	1.3		
2	.62	.52	.59	111	121	299	13	94	40	1.8	.24	1.7		
3	.65	.54	.56	997	74	571	12	51	21	12	.24	8.1		
4	.77	.57	.49	2040	310	223	11	281	19	49	.24	33		
5	.75	.59	.42	1350	1210	109	17	597	95	41	.27	12		
6	.71	.59	.40	310	3430	75	44	778	41	22	11	17		
7	.71	.56	.40	105	1710	57	144	397	21	11	8.9	24		
8	.78	1.3	.40	220	437	43	94	86	11	9.0	2.8	15		
9	1.4	.43	.40	1340	153	36	90	131	7.1	25	1.3	41		
10	2.4	229	.40	23000	99	31	58	193	5.6	39	.70	69		
11	38	180	.40	8200	76	27	33	100	54	16	.57	24		
12	22	50	.40	2720	63	25	21	61	28	7.3	.44	12		
13	8.0	21	.40	1220	54	23	16	164	11	4.4	.57	9.9		
14	3.9	9.4	.40	296	49	22	444	157	6.7	3.1	1.3	7.2		
15	2.2	4.9	.40	1910	43	21	2790	603	5.1	2.1	5.2	4.2		
16	1.3	2.9	.40	5130	39	22	3090	205	4.4	1.3	12	2.9		
17	.93	1.9	.40	2280	36	31	1330	70	36	.91	40	2.4		
18	.62	1.4	.48	1190	35	80	1280	45	67	.74	26	1.9		
19	.41	1.1	.49	2230	385	85	1630	38	44	.62	8.9	12		
20	.32	.81	.49	2900	851	52	2190	73	17	.54	4.5	23		
21	.39	.72	.59	1350	680	37	1090	87	8.6	.54	2.7	11		
22	.42	.65	.59	329	360	30	342	42	5.2	.54	1.6	20		
23	4.6	.65	.52	142	580	26	95	30	3.8	.54	1.1	13		
24	4.6	.61	.43	345	825	23	64	20	2.9	.91	.76	7.6		
25	3.9	.59	.40	755	376	21	49	16	2.6	1.8	.68	7.9		
26	2.4	.59	2.1	1050	141	18	39	13	10	1.7	.61	46		
27	1.5	.59	175	499	213	17	34	10	22	3.3	.63	110		
28	1.0	.59	436	151	111	15	109	8.7	9.1	1.7	.58	26		
29	.81	.59	327	103	---	15	844	7.3	5.2	.93	.43	6.2		
30	.62	.59	77	82	---	16	871	51	2.9	.60	.33	1.6		
31	.50	---	33	98	---	16	---	319	---	.43	.75	---		
TOTAL	107.80	556.74	1061.54	62470	12637	2144	16859	5200.0	743.2	262.00	135.62	570.9		
MEAN	3.48	18.6	34.2	2015	451	69.2	562	168	24.8	8.45	4.37	19.0		
MAX	38	229	436	23000	3430	571	3090	778	137	49	40	110		
MIN	.32	.49	.40	17	35	15	11	7.3	2.6	.43	.24	1.3		
AC-FT	214	1100	2110	123900	25070	4250	33440	10310	1470	520	269	1130		
CFSM	.01	.06	.11	6.28	1.41	.22	1.75	.52	.08	.03	.01	.06		
IN.	.01	.06	.12	7.24	1.46	.25	1.95	.60	.09	.03	.02	.07		
CAL YR 1990	TOTAL	36165.22	MEAN	99.1	MAX	3460	MIN	.02	AC-FT	71730	CFSM	.31	IN.	4.19
WTR YR 1991	TOTAL	102747.80	MEAN	282	MAX	23000	MIN	.24	AC-FT	203800	CFSM	.88	IN.	11.91

TRINITY RIVER BASIN

425

08066170 KICKAPOO CREEK NEAR ONALASKA, TX

LOCATION.--Lat 30°54'25", long 95°05'18", Polk County, Hydrologic Unit 12030202, on right bank 114 ft downstream from old bridge site, 1.2 mi downstream from Magnolia Creek, 6.2 mi upstream from Rocky Creek, 7.3 mi northeast of Onalaska, and 15.9 mi upstream from mouth.

DRAINAGE AREA.--57.0 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1965 to current year.

Water-quality records.--Chemical analyses: December 1963 to September 1969. Chemical and biochemical analyses: October 1969 to September 1974.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 139.85 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records poor. Low flow is sustained by sewage effluent that enters the creek upstream from this station.

AVERAGE DISCHARGE.--25 years (water years 1967-91), 42.0 ft<sup>3</sup>/s (10.00 in/yr), 30,430 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,500 ft<sup>3</sup>/s June 7, 1981, from rating curve extended above 6,800 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow (gage height, 30.37 ft); minimum, 0.01 ft<sup>3</sup>/s July 19, 20, 1971.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 15	0300	3,670	14.13	Feb. 19	0700	3,030	13.08
Jan. 18	1500	2,520	12.18	Apr. 14	1300	*4,610	*15.54
Feb. 4	1900	3,040	13.10				

Minimum discharge, 0.15 ft<sup>3</sup>/s Apr. 2-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	e.60	e.70	1.3	3.8	7.6	e50	.32	10	1.9	1.7	.93	e.90		
2	e.60	e.70	1.1	254	5.3	e60	.24	4.2	1.7	17	.86	e1.0		
3	e.60	e.70	1.1	210	4.3	e46	.15	89	1.5	12	.72	e3.0		
4	e.60	e.70	1.0	35	915	e39	.15	324	38	5.2	.62	e7.0		
5	e.60	e.70	.90	13	627	29	.24	73	7.7	70	.50	e2.0		
6	e.55	e.82	.85	17	84	16	1.0	34	3.0	24	.50	e1.5		
7	e.50	e.82	.85	42	45	8.5	7.4	21	2.1	22	.50	e4.5		
8	e.50	e.82	.85	24	28	5.1	51	22	23	13	.50	e2.5		
9	e.50	e.82	.85	330	15	3.1	8.2	44	8.3	8.0	.84	e7.0		
10	e.50	e.82	.85	1130	9.4	2.1	1.6	27	13	5.2	9.8	32		
11	e.50	e.82	.85	180	6.2	1.6	.70	20	18	3.5	18	10		
12	e.50	e.82	.85	49	4.5	1.5	.66	16	12	2.6	3.8	5.3		
13	e.50	e.82	.85	30	3.9	1.1	.62	11	4.0	2.0	2.5	3.8		
14	e.50	e.82	.85	103	3.0	.73	1390	8.8	2.3	1.6	311	2.9		
15	e.50	e.82	.85	1490	1.9	.96	e60	10	2.3	1.3	e4.5	2.3		
16	e.50	e.82	.85	118	1.4	14	e30	9.1	12	1.0	e1.8	1.9		
17	e.50	e.82	.87	48	2.6	39	e20	15	171	.85	e10	2.4		
18	e.80	e.82	1.6	965	11	9.6	e15	11	19	.79	e8.0	2.3		
19	e.80	e.82	1.6	279	1400	3.2	e100	12	8.0	.73	e4.0	1.5		
20	e.65	e.82	1.6	70	153	1.8	e30	25	6.3	.77	e2.0	1.2		
21	e.65	e.80	1.9	41	412	1.5	e20	26	3.2	.71	e1.4	1.1		
22	e.65	e.82	3.3	27	434	1.4	e10	16	2.3	.62	e1.2	1.1		
23	e.75	e.82	2.3	17	e85	.97	e8.0	10	2.1	1.9	e1.1	1.1		
24	e.75	e.82	1.9	477	e51	.63	e6.0	6.3	2.4	3.0	e1.1	7.3		
25	e.70	e.82	1.9	97	e43	.48	e5.0	5.5	1.8	2.0	e1.1	12		
26	e.70	e.82	35	43	e39	.43	e4.0	4.2	1.7	1.8	e1.0	2.7		
27	e.70	e.82	153	35	e37	.39	e3.0	3.1	1.5	1.3	e.90	1.8		
28	e.70	e.82	25	26	e35	.51	e10	4.6	6.5	1.1	e.90	1.5		
29	e.70	1.0	8.5	19	---	2.9	e300	2.8	8.8	.86	e.90	1.2		
30	e.70	1.3	4.9	14	---	1.5	e34	2.6	2.7	.89	e.90	1.1		
31	e.70	---	5.4	11	---	.53	---	2.2	---	.93	e.90	---		
TOTAL	19.00	24.64	263.52	6197.8	4464.1	343.53	2117.28	869.4	388.1	208.35	392.77	125.90		
MEAN	.61	.82	8.50	200	159	11.1	70.6	28.0	12.9	6.72	12.7	4.20		
MAX	.80	1.3	153	1490	1400	60	1390	324	171	70	311	32		
MIN	.50	.70	.85	3.8	1.4	.39	.15	2.2	1.5	.62	.50	.90		
AC-FT	38	49	523	12290	8850	681	4200	1720	770	413	779	250		
CFSM	.01	.01	.15	3.51	2.80	.19	1.24	.49	.23	.12	.22	.07		
IN.	.01	.02	.17	4.04	2.91	.22	1.38	.57	.25	.14	.26	.08		
CAL YR 1990	TOTAL	19540.81	MEAN	53.5	MAX	3900	MIN	.35	AC-FT	38760	CFSM	.94	IN.	12.75
WTR YR 1991	TOTAL	15414.39	MEAN	42.2	MAX	1490	MIN	.15	AC-FT	30570	CFSM	.74	IN.	10.06

e Estimated

TRINITY RIVER MAIN STEM

08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX

LOCATION.--Lat 30°38'00", long 95°00'36", Polk-San Jacinto County line, Hydrologic Unit 12030202, at left end of gated spillway at Livingston Dam on Trinity River, 4.4 mi northwest of Goodrich, 7 mi southwest of Livingston, 11.7 mi upstream from Long King Creek, and at mile 129.2.

DRAINAGE AREA.--16,583 mi<sup>2</sup>.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1968 to current year.

GAGE.--Water-stage recorder. Datum of gage is National Geodetic Vertical Datum of 1929 (levels by Trinity River Authority). Prior to Feb. 26, 1969, temporary nonrecording gages at site about 200 ft upstream and at same datum.

REMARKS.--The reservoir is formed by an earthfill dam 14,400 ft long. The dam was completed Sept. 29, 1968, and deliberate impoundment began June 26, 1969. The reservoir is operated for industrial water supply in the Houston metropolitan area. The spillway has twelve 40 x 35 ft tainter gates located near the left end of dam. Low-flow releases may be made through multi-gated inlet tower. There are five gated openings at various elevations located in the tower, and all discharge into a 10-foot-diameter concrete conduit through the dam. Flow is affected at times by discharge from the flood-detention pools of 255 floodwater-retarding structures with a combined detention capacity of 184,600 acre-ft. These structures control runoff from an 617 mi<sup>2</sup> area in the Richland, Chambers, Tehuacana, and Bedias Creeks drainage basins above this station. 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.....	145.0	-
Design flood.....	135.0	2,136,000
Top of tainter gates.....	134.0	2,046,000
Top of conservation pool.....	131.0	1,788,000
Crest of spillway (sill of tainter gates).....	99.0	157,900
Lowest gated outlet (invert).....	58.0	335

COOPERATION.--The capacity table, furnished by the Trinity River Authority, is based on Geological Survey topographic maps.

EXTREMES FOR PERIOD OF RECORD.--Maximum contents, 2,032,000 acre-ft Jan. 14, 1991 (elevation, 133.85 ft); minimum since conservation pool capacity was reached on Nov. 2, 1971, 1,345,000 acre-ft Oct. 25, 1988 (elevation, 125.22 ft).

EXTREMES FOR CURRENT YEAR.--Maximum contents, 2,032,000 acre-ft Jan. 14 at 2400 hours (elevation, 133.85 ft); minimum, 1,743,000 acre-ft Aug. 14 (elevation, 130.44 ft).

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

130.0	1,707,000	131.5	1,830,000	133.0	1,958,000
130.5	1,748,000	132.0	1,872,000	133.5	2,002,000
131.0	1,788,000	132.5	1,915,000	134.0	2,046,000

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY OBSERVATION AT 24:00 VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1768000	1788000	1798000	1808000	1797000	1859000	1809000	1798000	1826000	1808000	1766000	1807000
2	1754000	1788000	1798000	1834000	1800000	1868000	1812000	1778000	1831000	1803000	1766000	1831000
3	1761000	1786000	1801000	1831000	1805000	1849000	1818000	1798000	1828000	1803000	1767000	1841000
4	1764000	1804000	1793000	1818000	1835000	1834000	1823000	1813000	1833000	1803000	1764000	1842000
5	1762000	1788000	1788000	1812000	1847000	1820000	1813000	1836000	1825000	1800000	1756000	1837000
6	1756000	1786000	1796000	1811000	1851000	1813000	1808000	1839000	1818000	1799000	1753000	1827000
7	1758000	1787000	1793000	1795000	1854000	1800000	1807000	1847000	1818000	1797000	1753000	1821000
8	1757000	1801000	1789000	1789000	1860000	1794000	1804000	1856000	1817000	1797000	1748000	1812000
9	1768000	1801000	1788000	1822000	1863000	1788000	1807000	1852000	1815000	1795000	1746000	1798000
10	1762000	1806000	1788000	1911000	1869000	1779000	1795000	1843000	1813000	1791000	1752000	1793000
11	1764000	1815000	1788000	1976000	1866000	1779000	1794000	1832000	1815000	1790000	1752000	1794000
12	1773000	1821000	1788000	2012000	1864000	1784000	1793000	1814000	1811000	1788000	1750000	1798000
13	1774000	1828000	1791000	2022000	1858000	1785000	1794000	1811000	1808000	1786000	1747000	1800000
14	1781000	1830000	1787000	2032000	1836000	1782000	1843000	1813000	1803000	1784000	1763000	1800000
15	1788000	1829000	1788000	2006000	1818000	1786000	1868000	1805000	1808000	1778000	1786000	1802000
16	1792000	1824000	1788000	1970000	1809000	1789000	1872000	1799000	1819000	1778000	1802000	1802000
17	1801000	1809000	1789000	1923000	1805000	1798000	1884000	1802000	1825000	1775000	1818000	1798000
18	1797000	1798000	1787000	1908000	1805000	1795000	1886000	1809000	1821000	1767000	1832000	1802000
19	1788000	1791000	1785000	1864000	1856000	1796000	1915000	1813000	1817000	1764000	1840000	1796000
20	1788000	1786000	1783000	1844000	1861000	1795000	1901000	1825000	1814000	1761000	1844000	1792000
21	1804000	1787000	1795000	1818000	1871000	1792000	1881000	1831000	1804000	1762000	1838000	1789000
22	1803000	1792000	1793000	1793000	1875000	1799000	1877000	1829000	1801000	1760000	1828000	1789000
23	1810000	1791000	1791000	1797000	1869000	1799000	1855000	1820000	1799000	1759000	1818000	1793000
24	1811000	1786000	1784000	1798000	1865000	1799000	1834000	1812000	1792000	1756000	1808000	1809000
25	1809000	1788000	1792000	1793000	1864000	1797000	1820000	1802000	1791000	1756000	1801000	1801000
26	1805000	1790000	1818000	1788000	1854000	1787000	1819000	1795000	1790000	1754000	1795000	1804000
27	1806000	1805000	1821000	1785000	1847000	1800000	1806000	1791000	1790000	1757000	1793000	1808000
28	1805000	1808000	1818000	1779000	1848000	1810000	1811000	1788000	1798000	1764000	1791000	1815000
29	1800000	1800000	1818000	1798000	---	1803000	1815000	1795000	1802000	1769000	1788000	1818000
30	1795000	1793000	1826000	1791000	---	1805000	1808000	1805000	1804000	1770000	1786000	1821000
31	1793000	---	1814000	1792000	---	1807000	---	1816000	---	1768000	1795000	---
MAX	1811000	1830000	1826000	2032000	1875000	1868000	1915000	1856000	1833000	1808000	1844000	1842000
MIN	1754000	1786000	1783000	1797000	1797000	1779000	1793000	1778000	1790000	1754000	1746000	1789000
(↑)	131.05	131.05	131.31	131.04	131.71	131.22	131.23	131.33	131.19	130.75	131.08	131.39
(Φ)	+24000	0	+21000	-22000	+56000	-41000	-1000	+8000	-12000	-36000	+27000	+26000
CAL YR 1990	MAX	1966000	MIN	1754000	(Φ)	+48000						
WTR YR 1991	MAX	2032000	MIN	1746000	(Φ)	+52000						

(↑) Elevation, in feet, at end of month.  
(Φ) Change in contents, in acre-feet.

TRINITY RIVER MAIN STEM

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08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1969 to current year.

303807095011101 - LIVINGSTON RES SITE AC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)
FEB											
06...	1252	1850000	1.00	260	8.1	11.0	0.32	10.4	93	84	14
06...	1254	--	10.0	260	8.0	11.0	--	10.2	91	--	--
06...	1256	--	20.0	260	8.0	10.0	--	10.0	87	--	--
06...	1258	--	30.0	260	8.0	9.5	--	9.8	85	--	--
06...	1300	--	40.0	265	8.0	9.5	--	9.2	79	--	--
06...	1302	--	50.0	270	8.0	9.5	--	9.0	78	--	--
06...	1304	--	60.0	270	8.0	9.5	--	8.9	77	--	--
06...	1306	--	70.0	270	8.0	9.5	--	9.0	78	--	--
06...	1308	--	78.0	275	8.0	9.5	--	8.8	76	90	12
AUG											
01...	1215	1770000	1.00	310	8.8	30.5	1.02	7.7	102	110	27
01...	1217	--	10.0	315	8.7	29.0	--	5.8	75	--	--
01...	1219	--	20.0	315	8.5	29.0	--	4.8	62	--	--
01...	1221	--	30.0	320	7.7	28.5	--	0.6	8	--	--
01...	1223	--	40.0	325	7.5	27.5	--	0	0	--	--
01...	1225	--	50.0	325	7.4	25.5	--	0	0	--	--
01...	1227	--	60.0	325	7.4	23.5	--	0	0	--	--
01...	1229	--	70.0	335	7.4	22.0	--	0	0	120	7
DATE	CALCIUM DIS- SOLVED (MG/L AS CA)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
FEB											
06...	29	2.8	16	0.8	4.3	70	24	19	0.10	5.8	143
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--
06...	31	3.0	17	0.8	4.5	78	25	20	0.20	6.1	154
AUG											
01...	39	3.3	19	0.8	4.0	84	35	21	0.30	7.8	180
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--	--	--
01...	43	3.9	19	0.7	3.8	120	22	18	0.30	15	200
DATE	NITRO- GEN, NITRATE TOTAL (MG/L AS N)	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	
FEB											
06...	0.670	0.030	0.700	0.110	0.89	1.0	0.180	0.130	21	<1	
06...	--	--	--	--	--	--	--	--	--	--	
06...	--	--	--	--	--	--	--	--	--	--	
06...	0.670	0.030	0.700	0.140	0.46	0.60	0.180	0.130	40	<10	
06...	--	--	--	--	--	--	--	--	--	--	
06...	--	--	--	--	--	--	--	--	--	--	
06...	0.670	0.030	0.700	0.170	0.53	0.70	0.200	0.130	36	4	
AUG											
01...	--	<0.010	<0.050	<0.010	--	0.70	0.100	0.040	<3	17	
01...	--	<0.010	<0.050	<0.010	--	0.40	0.090	0.050	<10	200	
01...	--	0.020	<0.050	0.240	0.46	0.70	0.300	0.220	100	700	
01...	--	--	--	--	--	--	--	--	--	--	
01...	--	<0.010	<0.050	1.30	1.2	2.5	2.40	0.440	3800	1600	



## TRINITY RIVER MAIN STEM

08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX--Continued

303821095005001 - LIVINGSTON RES SITE AL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB								
06...	1350	1.00	260	8.1	11.5	0.35	10.3	93
06...	1352	10.0	260	8.0	11.5	--	10.2	92
06...	1354	20.0	260	8.0	10.5	--	10.1	89
06...	1356	30.0	260	8.0	10.0	--	9.9	87
06...	1358	40.0	265	8.0	9.5	--	9.4	81
06...	1400	44.0	270	8.0	9.5	--	9.2	80
AUG								
01...	1315	1.00	310	8.8	30.5	1.01	7.4	98
01...	1317	10.0	315	8.6	29.0	--	5.2	67
01...	1319	20.0	315	8.5	29.0	--	4.5	58
01...	1321	30.0	315	8.0	29.0	--	2.3	30
01...	1323	40.0	325	7.6	27.5	--	0.1	1
01...	1325	50.0	325	7.7	26.0	--	0.2	2

303935095055401 - LIVINGSTON RES SITE BC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB								
06...	1115	1.00	265	8.0	12.0	0.42	10.7	98
06...	1117	10.0	265	7.9	11.5	--	10.5	95
06...	1119	20.0	250	7.9	10.0	--	9.6	84
06...	1121	30.0	250	7.8	9.5	--	9.4	81
06...	1123	40.0	255	7.8	9.5	--	9.2	79
06...	1125	50.0	260	7.7	9.5	--	9.0	78
06...	1127	60.0	270	7.6	9.5	--	8.9	77
06...	1129	65.0	270	7.9	9.5	--	8.4	73
AUG								
01...	1140	1.00	315	8.8	31.0	0.96	7.7	103
01...	1142	10.0	315	8.7	30.0	--	6.0	79
01...	1144	20.0	320	8.5	29.5	--	4.9	64
01...	1146	30.0	325	7.7	29.0	--	0.5	6
01...	1148	40.0	325	7.1	28.5	--	0	0
01...	1150	50.0	335	7.5	25.5	--	0	0
01...	1152	58.0	345	7.6	25.0	--	0	0

304144095073001 - LIVINGSTON RES SITE CC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB								
06...	1040	1.00	250	8.3	12.5	0.36	10.8	100
06...	1042	10.0	225	8.1	10.5	--	10.0	88
06...	1044	20.0	215	8.1	9.5	--	9.3	80
06...	1046	30.0	220	7.9	9.5	--	8.9	77
06...	1048	40.0	235	8.1	9.5	--	8.9	77
06...	1050	50.0	265	8.0	9.5	--	7.9	68
06...	1052	56.0	265	8.0	9.5	--	7.8	67
AUG								
01...	1055	1.00	320	8.8	30.5	0.88	7.1	94
01...	1057	10.0	325	8.7	30.0	--	5.9	77
01...	1059	20.0	325	8.5	30.0	--	5.2	68
01...	1101	30.0	325	7.9	29.0	--	1.8	23
01...	1103	40.0	325	7.6	28.5	--	0.3	4
01...	1105	55.0	345	7.5	25.5	--	0.1	1

TRINITY RIVER MAIN STEM

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08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX--Continued

304521095075501 - LIVINGSTON RES SITE DC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)
FEB									
06...	0950	1.00	235	8.0	12.0	0.25	10.4	95	0.660
06...	0952	5.00	235	8.0	11.5	--	10.2	92	--
06...	0954	10.0	235	8.0	11.5	--	10.1	91	--
06...	0956	15.0	235	8.0	11.0	--	9.9	88	--
06...	0958	25.0	240	8.0	10.0	--	9.3	81	--
06...	1000	35.0	245	8.0	10.0	--	9.2	80	--
06...	1002	45.0	250	8.1	10.0	--	9.1	79	--
06...	1004	55.0	265	8.3	9.5	--	7.8	67	0.850
AUG									
01...	1005	1.00	325	8.7	30.0	0.82	6.3	83	--
01...	1007	10.0	325	8.5	30.0	--	5.0	66	--
01...	1009	20.0	330	8.2	29.5	--	3.7	48	--
01...	1011	30.0	335	7.8	29.5	--	1.8	23	--
01...	1013	40.0	335	7.4	27.5	--	0.1	1	--
01...	1015	50.0	340	7.4	26.0	--	0.1	1	--
01...	1017	57.0	345	7.4	26.0	--	0.1	1	--

DATE	NITRO- GEN, NITRITE TOTAL (MG/L AS N)	NITRO- GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO- GEN, AMMONIA TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
FEB									
06...	0.040	0.700	0.100	0.60	0.70	0.180	0.130	90	<10
06...	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--
06...	0.050	0.900	0.200	0.70	0.90	0.270	0.180	140	10
AUG									
01...	<0.010	<0.050	<0.010	--	0.60	0.130	0.070	10	160
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	0.020	<0.050	0.930	0.0	0.90	0.810	0.630	560	1500

304453095064901 - LIVINGSTON RES SITE DL

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB								
06...	0925	1.00	245	8.6	12.0	0.27	10.5	96
06...	0927	5.00	245	8.3	11.5	--	10.3	93
06...	0929	10.0	245	8.4	11.0	--	10.0	89
06...	0931	15.0	245	8.3	10.5	--	9.7	86
06...	0933	21.0	240	8.9	10.0	--	8.4	73
AUG								
01...	0945	1.00	325	8.5	29.5	0.70	5.2	68
01...	0947	10.0	325	8.4	29.5	--	4.3	56
01...	0949	20.0	325	8.0	29.0	--	2.2	29

TRINITY RIVER MAIN STEM

08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX--Continued

304659095052001 - LIVINGSTON RES SITE EC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)
FEB									
06...	0845	1.00	225	8.0	11.5	0.22	9.9	90	0.470
06...	0847	5.00	230	8.6	11.5	--	9.9	90	--
06...	0849	10.0	250	8.6	11.0	--	9.8	88	--
06...	0851	20.0	260	8.4	10.0	--	8.5	74	--
06...	0853	30.0	270	8.1	10.0	--	7.7	67	0.660
AUG									
01...	0910	1.00	320	8.8	30.0	0.76	7.6	100	--
01...	0912	10.0	325	8.6	29.5	--	6.2	81	--
01...	0914	20.0	330	8.4	29.5	--	4.5	59	--
01...	0916	33.0	340	8.0	29.5	--	1.8	24	--

DATE	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB									
06...	0.030	0.500	0.090	0.61	0.70	0.150	0.090	80	<10
06...	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--
06...	0.040	0.700	0.210	0.69	0.90	0.220	0.110	90	10
AUG									
01...	<0.010	<0.050	<0.010	--	0.80	0.150	0.080	<10	<10
01...	--	--	--	--	--	--	--	--	--
01...	--	--	--	--	--	--	--	--	--
01...	0.040	<0.050	0.060	0.84	0.90	0.280	0.150	10	60

304843095104001 - LIVINGSTON RES SITE FC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)
FEB								
06...	1600	1.00	265	8.0	12.5	0.20	8.5	79
06...	1602	10.0	265	8.0	12.0	--	8.4	77
06...	1604	20.0	255	8.0	11.0	--	8.4	75
06...	1606	30.0	265	8.0	10.0	--	8.4	74
06...	1608	40.0	270	8.0	9.5	--	8.3	72
06...	1610	50.0	270	8.0	9.5	--	8.2	71
06...	1612	58.0	285	8.0	9.5	--	8.2	71
AUG								
01...	1415	1.00	360	9.0	31.5	0.64	9.2	124
01...	1417	10.0	370	8.4	30.5	--	4.1	54
01...	1419	20.0	385	7.8	29.5	--	0.3	4
01...	1421	30.0	395	7.7	29.5	--	0	0
01...	1423	40.0	350	7.6	27.5	--	0	0
01...	1425	52.0	350	7.6	27.0	--	0.1	1

305411095144901 - LIVINGSTON RES SITE GC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATURATION)	HARD-NESS TOTAL (MG/L AS CaCO3)	HARD-NESS NONCARB DISSOLV FLD, AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)
FEB											
07...	0845	1.00	335	7.8	12.5	0.12	8.5	79	100	38	33
07...	0847	10.0	335	7.8	12.0	--	8.6	79	--	--	--
07...	0849	20.0	335	7.8	12.0	--	8.7	80	--	--	--
07...	0851	30.0	330	7.8	12.0	--	8.7	80	--	--	--
07...	0853	40.0	325	7.8	12.0	--	8.9	81	--	--	--
07...	0855	50.0	325	7.7	12.0	--	9.3	85	98	38	32
AUG											
02...	0810	1.00	470	8.5	30.0	0.29	4.6	60	150	35	52
02...	0812	10.0	470	8.4	29.5	--	4.0	52	--	--	--
02...	0814	20.0	470	8.0	29.5	--	1.5	19	--	--	--
02...	0816	30.0	445	8.0	29.0	--	2.0	26	--	--	--
02...	0818	40.0	440	7.8	29.0	--	0.8	10	--	--	--
02...	0820	46.0	440	7.8	29.0	--	0.3	4	140	23	47

TRINITY RIVER MAIN STEM

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08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX--Continued

305411095144901 - LIVINGSTON RES SITE GC--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)
FEB										
07...	4.5	25	1	4.7	63	41	35	0.20	9.8	191
07...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
07...	4.5	25	1	4.6	60	44	31	0.10	10	187
AUG										
02...	5.0	37	1	4.9	120	55	43	0.50	8.8	275
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	5.0	33	1	5.0	120	47	35	0.40	8.2	250

DATE	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)
FEB										
07...	1.25	0.050	1.30	0.080	0.72	0.80	0.330	0.230	43	24
07...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
07...	1.15	0.050	1.20	0.090	0.61	0.70	0.310	0.210	90	40
07...	--	--	--	--	--	--	--	--	--	--
07...	1.15	0.050	1.20	0.110	0.79	0.90	0.320	0.220	120	44
AUG										
02...	0.510	0.110	0.620	0.060	0.94	1.0	0.300	0.190	<3	3
02...	--	--	--	--	--	--	--	--	--	--
02...	0.470	0.200	0.670	0.080	0.62	0.70	0.270	0.190	<10	20
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	0.120	0.150	0.270	0.080	0.82	0.90	0.340	0.210	3	89

305447095161401 - LIVINGSTON RES SITE HC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, SATURATION (%)	NITROGEN, NITRATE TOTAL (MG/L AS N)
FEB									
07...	0945	1.00	165	7.5	12.0	0.27	8.5	78	0.070
07...	0947	10.0	165	7.5	11.5	--	8.3	75	--
07...	0949	20.0	310	7.7	11.0	--	8.1	72	--
07...	0951	30.0	195	7.7	10.0	--	8.0	70	--
07...	0953	40.0	195	7.7	9.5	--	7.7	66	0.260
AUG									
02...	0850	1.00	435	8.6	30.0	0.34	5.3	69	0.180
02...	0852	10.0	435	8.4	30.0	--	4.2	55	--
02...	0854	20.0	435	7.6	29.5	--	0	0	--
02...	0856	30.0	420	7.5	29.5	--	0	0	--
02...	0858	38.0	410	7.5	29.5	--	0	0	0.060

DATE	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)
FEB									
07...	0.030	0.100	0.070	0.83	0.90	0.130	0.050	150	130
07...	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--
07...	0.040	0.300	0.260	0.54	0.80	0.170	0.100	170	150
AUG									
02...	0.060	0.240	0.030	0.97	1.0	0.240	0.160	10	180
02...	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--
02...	0.040	0.100	0.430	0.97	1.4	0.440	0.280	40	640

TRINITY RIVER MAIN STEM

08066190 LIVINGSTON RESERVOIR NEAR GOODRICH, TX--Continued

305135095193601 - LIVINGSTON RES SITE IC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
FEB								
07...	1115	1.00	265	7.8	13.0	0.16	9.2	86
07...	1117	10.0	265	7.8	13.0	--	9.2	86
07...	1119	20.0	265	7.8	13.0	--	9.3	87
07...	1121	30.0	265	8.0	13.0	--	9.4	88
07...	1123	41.0	265	8.1	13.0	--	9.6	90
AUG								
02...	1020	1.00	620	8.2	31.0	0.55	5.4	72
02...	1022	10.0	620	8.1	31.0	--	4.7	62
02...	1024	20.0	620	8.1	31.0	--	4.6	61
02...	1026	30.0	620	7.9	30.5	--	3.3	43
02...	1028	37.0	620	7.9	30.5	--	3.3	43

305135095235401 - LIVINGSTON RES SITE JC

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	SAM-PLING DEPTH (FEET)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TRANS-PAR-ENCY (SECCHI DISK) (M)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV (MG/L AS CAC03)	CALCIUM DIS-SOLVED (MG/L AS CA)
FEB											
07...	1155	1.00	250	7.8	13.0	0.15	9.0	84	74	25	24
07...	1157	10.0	250	7.8	13.0	--	9.0	84	--	--	--
07...	1159	20.0	250	7.8	13.0	--	9.2	86	--	--	--
07...	1200	34.0	250	7.9	13.0	--	9.0	84	79	29	26
AUG											
02...	1050	1.00	615	8.4	31.5	0.46	8.0	107	180	47	63
02...	1052	10.0	615	8.2	30.5	--	5.6	74	--	--	--
02...	1054	20.0	615	8.2	30.5	--	5.6	74	--	--	--
02...	1056	30.0	615	8.2	30.5	--	5.6	74	--	--	--
02...	1058	36.0	615	8.2	30.5	--	5.4	71	180	41	62

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
FEB										
07...	3.3	17	0.9	4.4	49	29	24	0.10	8.5	140
07...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
07...	3.5	17	0.8	4.6	50	32	23	0.10	8.2	144
AUG										
02...	6.3	55	2	6.7	140	67	64	0.70	8.7	353
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	--	--	--	--	--	--	--	--	--	--
02...	5.4	55	2	6.4	140	66	64	0.70	8.9	350

DATE	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS ORTHO TOTAL (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB										
07...	1.06	0.040	1.10	0.050	0.85	0.90	0.360	0.220	180	11
07...	--	--	--	--	--	--	--	--	--	--
07...	--	--	--	--	--	--	--	--	--	--
07...	1.05	0.050	1.10	0.060	1.2	1.3	0.400	0.230	78	21
AUG										
02...	2.97	0.230	3.20	0.010	0.99	1.0	0.740	0.670	<3	5
02...	--	--	--	--	--	--	--	--	--	--
02...	3.06	0.240	3.30	0.020	0.88	0.90	0.740	0.680	30	20
02...	--	--	--	--	--	--	--	--	--	--
02...	2.95	0.250	3.20	0.040	0.76	0.80	0.720	0.660	4	25



TRINITY RIVER MAIN STEM

433

08066191 LIVINGSTON RESERVOIR AT OUTFLOW WEIR NEAR GOODRICH, TX

LOCATION.--Lat 30°37'55", long 95°01'11", San Jacinto County, Hydrologic Unit 12030202, at end of conduit into stilling basin, 1,700 ft to right of right spillway abutment, 4.8 mi northwest of Goodrich, 11.7 mi upstream from Long King Creek, and at mile 129.2.

DRAINAGE AREA.--16,583 mi<sup>2</sup>.

PERIOD OF RECORD.--August 1969 to current year.

Water-quality records.--Chemical and biochemical analyses: October 1969 to September 1972.

GAGE.--Water-stage recorder, concrete control, and crest-stage gage. Datum of gage is at National Geodetic Vertical Datum of 1929 (levels by Trinity River Authority). Oct. 1, 1974, to Jan. 30, 1976, staff gage and control only.

REMARKS.--Records fair. For details concerning outlet works, see Livingston Reservoir (station 08066190). The purpose of this station is to record selective withdrawal releases at outflow weir, crest 61.90 ft. These releases do not constitute the total flow from Livingston Reservoir since flow through taintor gates is not included in these totals.

AVERAGE DISCHARGE.--22 years, 201 ft<sup>3</sup>/s (145,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 3,990 ft<sup>3</sup>/s Jan 7, 1982; maximum elevation not determined, but probably occurred between May 16 and May 23, 1990; no flow for many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 918 ft<sup>3</sup>/s Nov. 2; maximum elevation, not determined; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	400	330	.00	423	379	.00	391	.00	269	269	314	.00
2	400	918	.00	.00	379	.00	394	.00	276	276	306	.00
3	.00	413	.00	.00	382	.00	394	e420	276	284	306	.00
4	.00	410	.00	.00	391	.00	400	e210	284	291	306	.00
5	.00	403	.00	.00	.00	.00	397	e105	299	291	291	.00
6	.00	400	.00	.00	.00	.00	397	.00	284	291	291	.00
7	.00	405	.00	.00	.00	.00	397	.00	276	284	291	.00
8	.00	408	.00	.00	.00	.00	397	.00	276	284	314	.00
9	.00	415	.00	.00	.00	.00	400	.00	269	284	314	.00
10	.00	413	.00	.00	.00	.00	558	.00	269	291	291	306
11	.00	415	.00	.00	.00	220	385	.00	269	291	322	306
12	.00	420	.00	.00	.00	379	388	.00	284	299	322	299
13	.00	300	.00	.00	.00	382	394	.00	276	291	345	291
14	.00	.00	.00	.00	.00	382	385	.00	269	291	255	314
15	.00	.00	.00	.00	.00	379	.00	.00	269	284	.00	314
16	.00	.00	.00	.00	.00	379	.00	.00	269	276	.00	314
17	.00	.00	.00	.00	.00	382	.00	.00	276	276	.00	314
18	.00	.00	.00	.00	.00	385	.00	.00	269	276	.00	314
19	.00	.00	.00	.00	.00	382	.00	.00	269	276	.00	306
20	.00	.00	.00	.00	.00	385	.00	.00	269	291	.00	306
21	.00	.00	.00	.00	.00	391	.00	.00	262	299	.00	314
22	.00	.00	.00	.00	.00	382	.00	.00	262	291	.00	314
23	.00	.00	.00	.00	.00	388	.00	.00	255	291	.00	330
24	400	.00	.00	.00	.00	382	.00	97	248	284	.00	330
25	397	.00	.00	.00	.00	388	.00	242	242	291	.00	330
26	403	.00	.00	.00	.00	391	.00	242	242	306	.00	361
27	400	.00	.00	.00	.00	391	.00	235	242	306	.00	370
28	403	.00	.00	.00	.00	385	.00	235	142	314	.00	370
29	408	.00	.00	208	---	376	.00	235	248	335	.00	355
30	154	.00	.00	379	---	376	.00	242	269	335	.00	355
31	.00	---	.00	379	---	376	---	269	---	314	.00	---
TOTAL	3365.00	5650.00	0.00	1389.00	1531.00	7881.00	5677.00	2532.00	7909	9062	4268.00	6813.00
MEAN	109	188	.000	44.8	54.7	254	189	81.7	264	292	138	227
MAX	408	918	.00	423	391	391	558	420	299	335	345	370
MIN	.00	.00	.00	.00	.00	.00	.00	.00	142	269	.00	.00
AC-FT	6670	11210	.00	2760	3040	15630	11260	5020	15690	17970	8470	13510
CAL YR 1990	TOTAL	14897.00	MEAN	40.8	MAX	1460	MIN	.00	AC-FT	29550		
WTR YR 1991	TOTAL	56077.00	MEAN	154	MAX	918	MIN	.00	AC-FT	111200		

e Estimated

## TRINITY RIVER BASIN

08066200 LONG KING CREEK AT LIVINGSTON, TX

LOCATION.--Lat 30°42'58", long 94°57'31", Polk County, Hydrologic Unit 12030202, on right bank at downstream side of bridge on U.S. Highway 190, 2 mi west of Livingston, 2 mi upstream from Choates Creek, and 14.8 mi upstream from mouth.

DRAINAGE AREA.--141 mi<sup>2</sup>.

PERIOD OF RECORD.--January 1963 to current year.

Water-quality records.--Chemical analyses: January 1963 to September 1974.

GAGE.--Water-stage recorder. Datum of gage is 100.12 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records good except those for estimated daily discharges, which are fair. No diversions above station.

AVERAGE DISCHARGE.--28 years, 99.6 ft<sup>3</sup>/s (9.59 in/yr), 72,160 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,600 ft<sup>3</sup>/s May 18, 1989 (gage height, 27.27 ft); no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1870, about 41 ft in May 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,600 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 10	1600	2,720	10.57	Feb. 19	2030	2,780	10.69
Jan. 15	0630	3,490	11.91	Feb. 22	0130	4,200	13.05
Jan. 18	1830	2,730	10.59	Apr. 14	1730	*7,490	*17.46
Feb. 4	2300	2,680	10.50	May 8	2100	2,950	10.99

Minimum daily discharge, 0.81 ft<sup>3</sup>/s Oct. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP		
1	.83	1.3	3.6	17	23	770	15	56	33	13	2.6	26		
2	.81	1.3	3.4	251	21	359	13	35	19	13	2.2	22		
3	.95	1.3	3.0	968	20	252	12	33	17	19	1.9	375		
4	1.3	1.8	2.7	135	623	102	12	256	33	152	2.4	757		
5	1.5	2.6	2.7	41	1890	58	18	211	19	215	2.1	207		
6	1.2	2.1	2.7	26	425	43	63	74	15	102	2.5	50		
7	.99	1.8	3.4	23	150	34	408	39	13	336	2.0	25		
8	.88	2.5	3.2	22	74	28	389	779	12	84	2.1	17		
9	5.1	13	2.8	157	48	24	80	1500	11	25	2.4	43		
10	4.3	11	2.8	2420	37	21	36	293	12	16	5.5	163		
11	1.9	6.0	3.0	901	31	20	28	131	17	11	6.0	31		
12	1.7	3.9	3.0	151	27	20	41	71	16	9.8	5.0	16		
13	1.5	3.1	3.0	60	26	19	55	46	12	8.4	6.2	12		
14	1.2	2.6	3.0	50	23	18	3580	34	9.6	7.3	21	9.2		
15	1.1	2.5	3.0	2560	19	20	2810	65	10	6.1	205	7.6		
16	1.1	2.4	3.0	586	17	81	299	112	29	5.7	73	8.2		
17	.95	2.4	3.6	128	18	420	128	420	379	5.0	20	8.8		
18	7.7	2.4	5.3	1040	21	112	156	146	59	4.8	11	6.4		
19	3.7	2.4	4.5	1530	1500	46	329	100	23	4.4	7.8	5.2		
20	2.0	2.4	4.2	249	862	31	177	161	15	4.2	5.5	4.8		
21	7.4	2.4	11	102	1640	26	69	270	243	3.9	4.3	4.6		
22	12	3.0	15	56	2640	24	44	196	101	3.6	4.5	4.2		
23	6.7	5.2	10	40	398	22	35	87	44	3.3	6.2	4.0		
24	3.6	3.8	5.6	591	148	19	28	66	25	3.9	3.8	4.6		
25	2.5	3.4	4.6	497	103	17	24	79	38	4.9	3.1	16		
26	2.0	3.2	29	136	231	17	46	37	16	4.4	3.0	10		
27	1.5	3.1	737	74	103	17	579	25	12	3.6	2.7	6.4		
28	1.5	4.9	125	56	62	16	105	52	179	3.5	2.8	4.9		
29	1.5	4.2	27	44	---	72	456	24	49	5.3	3.2	4.1		
30	1.5	4.1	19	35	---	31	143	48	20	5.1	2.7	3.7		
31	1.5	---	24	28	---	18	---	131	---	4.3	19	---		
TOTAL	82.41	106.1	1073.1	12974	11180	2757	10178	5577	1480.6	1087.5	441.5	1856.7		
MEAN	2.66	3.54	34.6	419	399	88.9	339	180	49.4	35.1	14.2	61.9		
MAX	12	13	737	2560	2640	770	3580	1500	379	336	205	757		
MIN	.81	1.3	2.7	17	17	16	12	24	9.6	3.3	1.9	3.7		
AC-FT	163	210	2130	25730	22180	5470	20190	11060	2940	2160	876	3680		
CFSM	.02	.03	.25	2.97	2.83	.63	2.41	1.28	.35	.25	.10	.44		
IN.	.02	.03	.28	3.42	2.95	.73	2.69	1.47	.39	.29	.12	.49		
CAL YR 1990	TOTAL	52195.80	MEAN	143	MAX	8380	MIN	.30	AC-FT	103500	CFSM	1.01	IN.	13.77
WTR YR 1991	TOTAL	48793.91	MEAN	134	MAX	3580	MIN	.81	AC-FT	96780	CFSM	.95	IN.	12.87

TRINITY RIVER MAIN STEM

435

08066250 TRINITY RIVER NEAR GOODRICH, TX

LOCATION.--Lat 30°34'19", long 94°56'55", Polk-San Jacinto County line, Hydrologic Unit 12030202, on left bank at downstream bridge on U.S. Highway 59, 0.2 mi downstream from Long King Creek, 3.0 mi southeast of Goodrich, 11.9 mile downstream from Livingston Dam, and at mile 117.3.

DRAINAGE AREA.--16,844 mi<sup>2</sup>.

PERIOD OF RECORD.--December 1965 to current year.  
Water-quality records.--March 1966 to September 1973.

GAGE.--Water-stage recorder. Datum of gage is 40.00 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair except those for estimated daily discharges, which are poor. Regulation by Livingston Reservoir (station 08066190) 11.9 mi upstream, with capacity of 2,046,000 acre-ft, began Sept. 29, 1968. No diversions between Livingston Reservoir and station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--25 years (water years 1967-91), 7,272 ft<sup>3</sup>/s (5,269,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 107,000 ft<sup>3</sup>/s May 21, 1990 (gage height, 46.80 ft); minimum daily, 191 ft<sup>3</sup>/s Aug. 6, 1971 (regulation by Livingston Reservoir).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1929, 52.0 ft in May 1942, from information by State Department of Highways and Public Transportation and by local residents.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 58,700 ft<sup>3</sup>/s Jan. 16 at 1600 hours (gage height, 38.63 ft); minimum daily, 870 ft<sup>3</sup>/s Oct. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1150	2460	2230	6260	1660	19100	2240	e19000	5830	2200	1630	2310
2	1130	1850	2090	6530	1620	19000	2750	e13000	6500	2660	1630	3260
3	1100	1300	2090	10800	1590	18600	2790	e6500	6530	2930	1630	7960
4	1030	1190	2090	11100	2950	18400	3560	e5500	7140	2700	1640	10600
5	1010	1170	2090	10800	14000	18200	5650	e7500	7960	3490	1630	10800
6	1010	1100	2020	10500	15500	17800	6390	e11500	7740	3330	1630	10500
7	1010	1090	1740	9710	15000	15500	6710	e13000	6640	2840	1620	10500
8	1000	1110	1720	8320	14800	10800	7060	e16000	6520	2460	1620	10400
9	1010	1390	1720	6850	15300	6990	6430	e18000	6510	2250	1620	9330
10	1030	3210	1720	15100	17000	5000	5890	e18500	6270	2200	1610	5940
11	1020	3700	1710	21300	17600	3650	5110	e18000	5810	2180	1640	3100
12	993	5020	1690	26700	18300	2700	4540	e17500	5770	2160	1650	2280
13	984	6160	1680	31500	19000	2100	4500	e15500	5760	2150	1640	2230
14	979	7410	1660	33700	19000	2060	7840	e13500	5670	2150	1640	2210
15	988	7970	1650	51200	16300	2050	17100	e13000	4950	2150	1800	2200
16	994	8010	1650	58400	10600	2060	19500	e12500	4850	2150	2190	2190
17	1050	8010	1650	58000	6860	2410	20600	e12200	5020	2040	3730	2190
18	1510	7530	1660	57700	6540	2370	22400	e11000	5340	1690	6400	2190
19	1510	5610	1660	55000	8400	2180	26400	e11000	5720	1680	8590	2190
20	922	4370	1660	44400	14600	2100	30000	e11000	5730	1660	9440	2180
21	873	2800	1650	34300	16900	2060	30100	e11000	5720	1640	9500	2170
22	870	1890	1660	26300	21600	2050	30000	e11000	5880	1660	9500	2050
23	1310	1810	1650	19600	19600	2020	30000	e11000	5500	1660	9350	1720
24	2580	1800	1650	16800	18700	2010	29300	e10500	4750	1660	8150	1700
25	2850	1780	1650	17100	18400	2000	28100	e10000	3470	1660	7110	1710
26	2870	1770	1830	14700	18400	2000	25800	e9000	2300	1640	5480	1710
27	2870	1930	5910	10500	18300	1990	23200	e6000	2180	1670	4050	1700
28	2880	3380	6640	7230	18100	1990	21400	e4000	2170	1660	2560	1950
29	2880	4510	6340	4520	---	2030	e20000	e3500	2290	1690	2190	2780
30	2790	3510	6290	2650	---	2050	e20000	3350	2220	1650	2170	3360
31	2580	---	6280	1800	---	2000	---	3870	---	1620	2730	---
TOTAL	46783	104840	77730	689370	386620	195270	465360	346920	158740	65280	117770	125410
MEAN	1509	3495	2507	22240	13810	6299	15510	11190	5291	2106	3799	4180
MAX	2880	8010	6640	58400	21600	19100	30100	19000	7960	3490	9500	10800
MIN	870	1090	1650	1800	1590	1990	2240	3350	2170	1620	1610	1700
AC-FT	92790	208000	154200	1367000	766900	387300	923000	688100	314900	129500	233600	248800
CAL YR 1990	TOTAL	5114863	MEAN	14010	MAX	106000	MIN	870	AC-FT	10150000		
WTR YR 1991	TOTAL	2780093	MEAN	7617	MAX	58400	MIN	870	AC-FT	5514000		

e Estimated

## TRINITY RIVER BASIN

## 08066300 MENARD CREEK NEAR RYE, TX

LOCATION.--Lat 30°28'52", long 94°46'46", Liberty County, Hydrologic Unit 12030202, on left bank 20 ft downstream from bridge on State Highway 146, 2.3 mi northwest of Rye, and about 6 mi upstream from mouth.

DRAINAGE AREA.--152 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--December 1965 to current year.

GAGE.--Water-stage recorder and crest-stage gage. Datum of of gage is 62.32 ft above National Geodetic Vertical Datum of 1929. September 1974 to August 1976, wire-weight gage read twice daily.

REMARKS.--Records good. No known diversions above station. Regulation by Bear Foot Lake on Mill Creek, located 0.5 mi upstream from station. A section of the dam on this lake washed out on June 26-27, 1986, and was repaired in 1987.

AVERAGE DISCHARGE.--25 years (water years 1967-91), 127 ft<sup>3</sup>/s (92,010 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,200 ft<sup>3</sup>/s June 27, 1986 (gage height, 30.78 ft); minimum daily, 2.6 ft<sup>3</sup>/s Nov. 1, 1967.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood in May 1929 reached a stage of about 39.4 ft, from information by the Texas Department of Transportation. Flood in September 1961 reached a stage of about 34.0 ft, from information by local resident. Flood of May 1929 may have been equaled or exceeded by other floods during the period 1929-65.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,230 ft<sup>3</sup>/s Feb. 22 at 0800 hours (gage height, 21.06 ft); minimum daily, 18 ft<sup>3</sup>/s Oct. 1-3.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	21	30	79	135	941	107	410	86	54	69	511
2	18	20	29	202	122	1220	81	272	95	67	46	254
3	18	20	29	578	112	1190	72	165	79	69	37	165
4	20	22	28	482	141	966	798	146	67	60	32	195
5	21	26	27	503	427	553	1120	198	62	87	30	e238
6	22	25	27	559	477	337	888	180	59	114	29	425
7	21	28	27	277	953	245	527	146	57	93	28	394
8	21	29	27	185	882	194	468	134	57	103	27	208
9	22	38	27	184	445	161	595	156	56	85	28	129
10	22	38	27	718	237	139	976	151	70	69	27	121
11	22	45	28	946	181	123	606	167	110	55	26	100
12	22	44	27	915	155	114	314	138	111	49	30	90
13	25	37	27	1120	139	109	251	114	105	49	34	81
14	23	31	27	660	128	105	510	121	74	43	52	72
15	22	29	27	731	117	100	1510	246	64	40	62	67
16	21	27	28	803	108	106	1770	224	66	37	62	64
17	20	26	28	954	104	179	1540	265	71	36	62	62
18	26	25	32	1180	103	196	905	249	70	34	78	65
19	22	25	34	1100	124	207	490	258	85	33	58	63
20	21	24	47	739	172	157	357	212	74	32	44	56
21	31	24	45	960	693	122	343	181	60	32	38	53
22	40	26	48	725	2030	108	299	176	60	31	35	50
23	44	31	53	365	1780	100	234	159	60	32	37	49
24	39	28	48	263	1730	93	200	149	63	33	35	48
25	32	26	40	265	1050	87	186	142	70	32	32	51
26	28	28	40	280	595	83	154	108	59	33	30	57
27	25	32	98	295	426	80	150	94	52	33	29	59
28	23	35	160	224	425	78	200	85	53	33	28	57
29	22	35	187	185	---	94	497	81	60	33	28	50
30	21	34	186	166	---	109	740	88	57	58	28	47
31	21	---	105	149	---	126	---	91	---	104	355	---
TOTAL	753	879	1593	16792	13991	8422	16888	5306	2112	1663	1536	3881
MEAN	24.3	29.3	51.4	542	500	272	563	171	70.4	53.6	49.5	129
MAX	44	45	187	1180	2030	1220	1770	410	111	114	355	511
MIN	18	20	27	79	103	78	72	81	52	31	26	47
AC-FT	1490	1740	3160	33310	27750	16710	33500	10520	4190	3300	3050	7700
CAL YR 1990	TOTAL	42431	MEAN	116	MAX	2020	MIN	16	AC-FT	84160		
WTR YR 1991	TOTAL	73816	MEAN	202	MAX	2030	MIN	18	AC-FT	146400		

e Estimated

TRINITY RIVER BASIN

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08066300 MENARD CREEK NEAR RYE, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: August 1950 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
MAR 13...	1615	108	86	16.5	19	9	5.1	1.4	9.0
MAY 09...	1345	159	84	19.0	17	5	5.4	0.87	9.0
JUL 02...	1414	71	116	28.5	19	8	5.6	1.3	14
JUL 26...	1429	33	111	27.5	20	5	5.5	1.5	14
AUG 05...	1712	30	106	27.5	20	9	5.7	1.4	12
SEP 09...	1610	120	91	25.0	19	9	5.4	1.4	11

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (MG/L AS S04)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS S102)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
MAR 13...	0.9	0.80	10	2.8	18	<0.10	13	56
MAY 09...	0.9	0.80	12	1.7	16	<0.10	12	53
JUL 02...	1	0.90	11	1.9	29	0.10	12	71
JUL 26...	1	1.0	15	1.7	26	0.10	14	73
AUG 05...	1	1.0	11	3.0	23	<0.10	13	66
SEP 09...	1	0.90	10	2.9	20	<0.10	13	61



## TRINITY RIVER MAIN STEM

08066500 TRINITY RIVER AT ROMAYOR, TX  
(National stream-quality accounting network)

LOCATION.--Lat 30°25'30", Long 94°51'02", Liberty County, Hydrologic Unit 12030202, near right bank at downstream side of bridge on State Highway 787, 1.9 mi south of Romayor, 1.9 mi downstream from Gulf, Colorado, and Santa Fe Railway Co. bridge, 3.7 mi downstream from Big Creek, and at mile 94.3.

DRAINAGE AREA.--17,186 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1924 to current year. Monthly discharge only for some periods, published in WSP 1312.

REVISED RECORDS.--WSP 1392: 1932, 1935. WSP 1922: Drainage area. WRD TX-81-1: 1980(M, m).

GAGE.--Water-stage recorder. Datum of gage is 25.92 ft above National Geodetic Vertical Datum of 1929. Prior to Oct. 1, 1943, nonrecording gage at datum 63.57 ft higher at railroad bridge 1.9 mi upstream. Oct. 1, 1943 to Dec. 31, 1988, water-stage recorder and nonrecording gage (Sept. 15, 1975 to June 16, 1977) at present site and at datum 10.00 ft higher than current datum.

REMARK.--Records fair. Since Sept. 28, 1968, flow is regulated by Livingston Reservoir (station 08066190), capacity 1,788,000 acre-ft, 35 mi upstream. There are no large diversions between Livingston Reservoir and this station.

AVERAGE DISCHARGE.--44 years (water years 1925-68) unregulated, 7,155 ft<sup>3</sup>/s (5,184,000 acre-ft/yr); 23 years (water years 1969-1991) flow regulated by Livingston Reservoir, 7,755 ft<sup>3</sup>/s (5,618,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 111,000 ft<sup>3</sup>/s May 9, 1942 (gage height, 45.8 ft, from floodmarks), present site and datum; minimum, 102 ft<sup>3</sup>/s Aug. 24, 25, 1956.  
Maximum stage since at least 1908, that of May 9, 1942.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 63,400 ft<sup>3</sup>/s Jan. 19 at 0100 hours (gage height, 37.74 ft); minimum daily, 977 ft<sup>3</sup>/s Oct. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1060	2540	2750	6480	2310	21500	2270	20600	5680	2440	1640	2700
2	e1140	2150	2400	6850	2220	22300	2760	16400	7080	2580	1630	2350
3	e1170	1700	2370	11200	2180	21400	2450	10300	7280	3130	1620	6580
4	e1350	1440	2340	13300	2480	20900	3700	6330	7580	2820	1610	11900
5	e1290	1420	2310	12800	12300	20200	7250	6990	8970	3430	1610	13100
6	e1120	1350	2310	12600	17400	19600	8340	10500	9140	3700	1600	12900
7	e1150	1300	2110	11700	17000	17700	8370	11900	8110	3500	1590	12700
8	e1110	1330	2000	10000	16900	13200	8930	13800	7500	2920	1580	12500
9	e1150	1430	2000	7990	16700	8730	8090	18800	7420	2610	1570	12000
10	e1190	2530	2000	14400	17900	5670	e7550	19500	7370	2470	1560	8080
11	e1190	3500	2000	24400	18900	4380	e6540	18700	6800	2410	1560	4750
12	e1220	4540	2000	29500	19600	3270	e5280	18300	6600	2360	1550	2580
13	e1200	5810	2000	35200	20400	e2400	e5080	16800	6570	2330	1540	2350
14	e1190	7380	1990	37600	20500	e2210	e6650	15100	6490	2320	1530	2280
15	e1220	8640	1970	47100	18900	e2260	e17600	13700	5800	2290	1540	2260
16	e1220	8780	1970	54900	13500	e2330	e23000	13100	5440	2290	1730	2260
17	e1220	8810	1970	60900	8220	e2470	25400	13100	5430	2240	2920	2250
18	e1290	8690	2030	62200	6950	e2690	26300	12300	5580	1890	5860	2240
19	e1650	6480	2010	62500	7400	e2450	30100	11400	6190	1780	8800	2200
20	e1510	5040	2010	57100	13800	e2380	e37000	11300	6310	1770	10500	2190
21	e1230	3470	2010	45900	17300	e2280	e36000	11300	6310	1750	10700	2180
22	e977	2410	2020	37600	24800	2280	e35200	11300	6410	1730	10700	2160
23	e1040	2110	2010	28300	24000	2250	35100	11200	6420	1730	10700	1810
24	2190	2060	2010	21900	22100	2210	34800	11100	5560	1730	9720	1710
25	2770	2040	1990	21100	20900	2190	33400	10500	4400	1730	8160	1700
26	2840	2040	2010	19500	20400	2180	31800	9430	2900	1710	6150	1700
27	2860	2090	4520	14500	20100	2180	28300	6890	2480	1680	4190	1700
28	2860	2880	7090	9960	19800	2160	26100	4540	2410	1620	2890	1710
29	2860	4280	6810	6460	---	2240	23200	4080	2400	1590	1920	2330
30	2840	4060	6670	3910	---	2270	22300	4010	2420	1600	1820	3240
31	2610	---	6570	2700	---	2260	---	4050	---	1620	2500	---
TOTAL	49717	112300	86250	790550	424960	222540	548860	367320	179050	69770	122990	140410
MEAN	1604	3743	2782	25500	15180	7179	18300	11850	5968	2251	3967	4680
MAX	2860	8810	7090	62500	24800	22300	37000	20600	9140	3700	10700	13100
MIN	977	1300	1970	2700	2180	2160	2270	4010	2400	1590	1530	1700
AC-FT	98610	222700	171100	1568000	842900	441400	1089000	728600	355100	138400	244000	278500
CAL YR 1990	TOTAL	5502917	MEAN	15080	MAX	104000	MIN	977	AC-FT	10920000		
WTR YR 1991	TOTAL	3114717	MEAN	8533	MAX	62500	MIN	977	AC-FT	6178000		

e Estimated

TRINITY RIVER MAIN STEM

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08066500 TRINITY RIVER AT ROMAYOR, TX--Continued  
(National stream-quality accounting network)

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical analyses: October 1941 to November 1949, February 1950 to September 1951, October 1953 to current year. Chemical and biochemical analyses: February 1968 to current year. Pesticide analyses: February 1968 to July 1981, August 1983 to current year. Sediment analyses: March 1959 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1941 to September 1942, January 1944 to September 1951, October 1953 to current year.  
WATER TEMPERATURE: October 1941 to September 1950, October 1953 to current year.  
SUSPENDED-SEDIMENT DISCHARGE: October 1954 to September 1955, October 1968 to September 1971.

REMARKS.--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the Geological Survey District office upon request.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE (1945-50, 1953-to current year): Maximum daily, 3,800 microsiemens Oct. 30, 1956; minimum daily, 103 microsiemens Nov. 9, 1946.  
WATER TEMPERATURES (1953-58, 1961-to current year): Maximum daily, 37.0°C July 18, 27, 1953; minimum daily, 3.0°C Jan. 18, 1956, Jan. 15, 16, 1968, Jan. 2, 3, 1979.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily 360 microsiemens Dec. 4, 6, 26; minimum daily, 213 microsiemens Feb. 22, Apr. 5.  
WATER TEMPERATURE: Maximum daily, 32.0°C July 20; minimum daily, 7.0°C Dec. 25, Jan. 21, 22.

WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)
DEC 04...	1245	2340	352	8.3	15.0	6.5	10.4	100	1.9	20	K16
APR 24...	1117	34900	304	8.0	21.5	30	9.3	104	0.5	44	40
JUL 02...	1116	2450	311	8.4	28.0	13	8.8	111	2.8	92	330
AUG 14...	1100	1520	320	7.5	28.0	6.1	7.6	97	1.6	44	120
SEP 04...	0950	11800	302	7.5	26.5	23	7.4	91	1.4	820	1300
SEP 23...	1055	1820	338	8.5	27.0	1.4	8.7	108	2.7	52	24

DATE	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	CAR-BONATE WATER DIS IT FIELD (MG/L AS CO3)	BICAR-BONATE WATER DIS IT FIELD (MG/L AS HCO3)	ALKA-LINITY WAT DIS TOT IT FIELD (MG/L AS CAC03)	SULFATE DIS-SOLVED (MG/L AS SO4)
DEC 04...	120	13	42	3.9	21	0.8	4.6	0	132	108	26
APR 24...	100	28	35	3.4	19	0.8	4.4	0	89	73	31
JUL 02...	110	24	38	3.4	18	0.8	4.2	1	102	85	30
AUG 14...	110	33	38	3.2	19	0.8	4.5	0	92	75	34
SEP 04...	100	22	36	3.5	20	0.9	4.3	0	101	83	29
SEP 23...	110	24	39	3.7	22	0.9	4.6	1	106	90	33

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SI02)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE TOTAL (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)
DEC 04...	20	0.70	5.8	207	191	0.280	0.020	<0.010	0.300	0.300	0.050
APR 24...	22	0.20	8.1	168	172	1.14	0.060	<0.010	1.20	1.00	0.070
JUL 02...	22	0.30	9.1	196	179	0.440	0.010	<0.010	0.450	0.420	0.020
AUG 14...	26	0.30	8.8	205	179	--	0.020	<0.010	<0.050	<0.050	0.010
SEP 04...	22	0.30	7.4	179	173	0.055	0.020	<0.010	0.075	0.058	0.030
SEP 23...	27	0.30	7.3	200	191	--	<0.010	<0.010	0.065	0.079	<0.010

## TRINITY RIVER MAIN STEM

08066500 TRINITY RIVER AT ROMAYOR, TX--Continued  
(National stream-quality accounting network)

## WATER QUALITY DATA, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, TOTAL (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS P04)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)
DEC 04...	0.040	0.55	--	0.60	0.110	0.070	0.060	0.070	0.18	11	69
APR 24...	0.020	0.53	--	0.60	0.170	0.120	0.100	0.150	0.31	33	3110
JUL 02...	<0.010	0.68	--	0.70	0.160	0.080	0.060	0.070	0.18	29	192
AUG 14...	<0.010	0.59	0.40	0.60	0.160	0.110	0.100	0.110	0.31	--	--
SEP 04...	0.010	0.77	--	0.80	0.190	0.120	0.090	0.100	0.28	18	573
SEP 23...	<0.010	--	--	0.60	0.130	0.100	0.090	0.090	0.28	--	--

DATE	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
DEC 04...	94	<10	2	60	<0.5	<1.0	<1	<3	4	8	<1
APR 24...	97	--	--	--	--	--	--	--	--	--	--
JUL 02...	91	20	2	49	<0.5	<1.0	<1	<3	3	12	<1
AUG 14...	--	--	--	--	--	--	--	--	--	--	--
SEP 04...	96	40	3	53	<0.5	<1.0	<1	<3	2	34	<1
SEP 23...	--	--	--	--	--	--	--	--	--	--	--

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC 04...	6	2	<0.1	<10	2	<1	<1.0	310	<6	<3
APR 24...	--	--	--	--	--	--	--	--	--	--
JUL 02...	4	3	<0.1	<10	2	<1	<1.0	250	<6	<3
AUG 14...	--	--	--	--	--	--	--	--	--	--
SEP 04...	9	4	0.4	<10	3	<1	<1.0	260	<6	6
SEP 23...	--	--	--	--	--	--	--	--	--	--

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1990 TO SEPTEMBER 1991

MONTH YEAR	DISCHARGE (CFS-DAYS)	SPECIFIC CONDUCT-ANCE (MICRO-SIEMENS)	DIS-SOLVED SOLIDS (MG/L)	DIS-SOLVED SOLIDS (TONS)	DIS-SOLVED CHLORIDE (MG/L)	DIS-SOLVED CHLORIDE (TONS)	DIS-SOLVED SULFATE (MG/L)	DIS-SOLVED SULFATE (TONS)	HARDNESS (CA, MG)
OCT. 1990	49717	331	191	25600	23	3150	32	4360	110
NOV. 1990	112300	343	197	59800	25	7600	34	10300	120
DEC. 1990	86250	352	202	47000	26	6100	35	8180	120
JAN. 1991	790550	322	186	397000	23	48300	32	67300	110
FEB. 1991	424960	250	147	168000	14	16500	23	26400	94
MAR. 1991	222540	259	152	91200	15	9150	24	14400	96
APR. 1991	548860	280	163	242000	18	26000	26	39100	100
MAY 1991	367320	297	172	171000	19	19200	28	28100	110
JUNE 1991	179050	307	178	86100	21	9940	30	14300	110
JULY 1991	69770	311	180	34000	21	3970	30	5670	110
AUG. 1991	122990	320	185	61400	22	7340	31	10300	110
SEPT 1991	140410	324	187	70900	23	8570	32	12000	110
TOTAL	3114717	**	**	1454000	**	166000	**	240000	**
WTD.AVG.	8533	298	173	**	20	**	29	**	110

TRINITY RIVER MAIN STEM

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08066500 TRINITY RIVER AT ROMAYOR, TX--Continued  
(National stream-quality accounting network)

SPECIFIC CONDUCTANCE, US/CM AT 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	328	336	351	351	254	244	270	297	307	310	309	290
2	329	336	357	347	258	241	277	304	306	310	318	297
3	328	339	358	320	264	248	277	301	307	311	320	323
4	323	337	360	330	273	254	231	293	306	315	323	309
5	328	334	358	341	230	260	213	287	307	304	325	309
6	330	341	360	341	240	263	224	297	306	282	323	317
7	330	344	358	344	250	265	236	300	306	297	e323	320
8	330	344	359	349	246	266	227	276	307	287	324	327
9	329	339	359	348	251	269	239	276	e308	315	322	329
10	326	344	359	314	258	e271	239	290	307	311	325	327
11	327	339	e358	309	261	272	244	300	307	314	316	320
12	326	340	359	348	254	272	254	301	309	318	315	e322
13	331	342	359	347	260	274	262	303	308	318	320	326
14	336	342	358	353	255	278	251	303	308	318	323	330
15	337	342	358	348	258	277	230	301	e309	317	318	330
16	334	342	357	347	259	276	243	300	308	e316	e310	329
17	333	342	356	353	260	270	256	298	308	317	298	332
18	333	342	354	352	261	258	269	292	293	320	316	334
19	330	344	356	333	259	251	275	296	305	321	319	340
20	330	345	e355	325	239	255	287	297	307	319	319	339
21	327	346	354	319	243	265	295	297	310	319	317	342
22	326	346	353	321	213	270	298	296	e307	e320	320	341
23	324	347	e355	241	239	271	299	298	305	319	319	341
24	335	348	e354	215	248	274	306	300	306	319	323	345
25	331	349	357	235	255	275	303	301	309	319	324	344
26	332	347	360	218	259	276	305	301	319	320	326	e343
27	331	348	337	244	259	276	292	e301	319	319	326	342
28	332	350	331	258	259	277	296	302	318	318	328	346
29	331	350	346	251	---	272	292	304	313	314	327	344
30	332	349	347	253	---	274	296	303	303	315	328	345
31	332	---	350	254	---	270	---	305	---	305	308	---
MEAN	330	343	355	310	252	267	266	297	308	313	320	329

e Estimated

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26.5	20.0	18.0	10.0	9.0	16.0	18.0	23.0	28.5	29.0	29.0	28.0
2	28.0	22.0	19.5	10.0	10.0	17.0	19.0	23.0	27.5	29.0	30.0	28.0
3	28.0	24.0	17.0	11.0	13.0	15.0	18.0	24.0	29.0	29.0	30.0	29.0
4	28.0	20.0	15.0	11.0	14.0	15.0	19.0	23.0	29.5	29.0	30.0	28.0
5	29.0	17.0	15.0	12.0	14.0	17.0	19.0	23.0	29.5	28.0	31.0	28.0
6	29.5	19.0	15.5	12.0	14.0	17.0	20.0	24.0	28.0	29.0	31.0	28.0
7	29.5	19.0	15.0	10.0	11.0	15.0	19.0	23.0	28.0	28.0	---	28.0
8	29.0	16.5	15.0	10.0	11.0	14.0	20.0	22.0	28.0	28.0	30.0	28.0
9	26.0	15.0	15.0	10.0	8.0	15.0	20.0	22.0	---	30.0	30.0	28.0
10	20.0	15.0	15.0	11.0	16.0	---	19.0	23.0	27.5	31.0	30.0	28.0
11	20.0	17.0	---	10.0	10.0	15.0	20.0	24.0	28.5	30.0	30.0	28.0
12	23.0	17.0	16.0	10.0	15.0	16.0	20.0	24.0	29.0	31.0	30.0	---
13	23.0	18.5	16.0	10.0	16.0	15.0	21.0	25.0	29.0	31.0	29.0	28.0
14	25.5	12.5	17.5	10.0	15.0	15.0	20.0	25.0	29.0	31.5	28.0	28.5
15	25.5	17.5	17.5	10.0	14.0	14.0	20.0	23.0	---	30.0	27.0	28.0
16	25.0	19.0	17.5	10.0	8.0	14.0	20.0	23.0	27.0	---	---	28.5
17	25.0	21.0	19.0	9.0	10.0	16.0	21.5	24.0	29.0	29.5	29.0	30.0
18	21.0	19.5	18.0	10.0	18.0	15.0	21.5	24.0	28.0	31.0	29.0	30.0
19	19.0	19.0	15.5	10.0	16.0	17.0	22.0	24.0	29.0	30.0	30.0	26.0
20	21.0	19.0	---	10.0	10.0	17.0	20.5	25.0	29.5	32.0	28.0	24.0
21	25.5	20.0	18.5	7.0	9.0	19.0	22.0	25.0	30.0	31.0	29.5	24.5
22	20.0	19.0	16.0	7.0	9.0	19.0	23.0	25.0	---	---	29.0	26.0
23	18.5	20.0	---	9.0	9.0	18.0	21.0	24.0	28.0	29.0	30.0	27.0
24	21.0	19.0	---	9.0	9.0	17.0	22.0	25.0	28.0	28.0	30.0	27.0
25	19.5	20.0	7.0	9.0	12.0	17.0	22.0	25.0	27.0	28.0	29.0	28.0
26	16.5	20.5	9.0	9.0	8.0	21.0	23.0	26.0	28.0	29.0	30.0	---
27	18.0	21.0	9.0	11.0	14.0	20.0	23.0	---	29.0	30.0	30.0	25.0
28	28.0	20.0	11.0	12.0	15.0	20.0	23.0	28.0	29.0	29.0	30.0	24.5
29	22.0	17.0	15.0	12.0	---	19.5	21.0	28.0	28.0	29.0	30.0	24.0
30	19.5	16.5	10.5	9.0	---	18.0	24.0	28.0	29.0	28.0	29.5	24.0
31	19.0	---	8.0	9.0	---	17.0	---	28.0	---	30.0	28.0	---
MEAN	23.5	18.5	15.0	10.0	12.0	16.5	20.5	24.5	28.5	29.5	29.5	27.0

## TRINITY RIVER MAIN STEM

08067000 TRINITY RIVER AT LIBERTY, TX

LOCATION.--Lat 30°03'27", long 94°49'05", Liberty County, Hydrologic Unit 12030203, at upstream side of upstream bridge on U.S. Highway 90 in Liberty, 345 ft downstream from Texas and New Orleans Railroad Co. bridge, and at mile 40.3.

DRAINAGE AREA.--17,468 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1938 to September 1940 (gage heights, discharge measurements, and some records of daily discharge), October 1940 to current year (high-water records only). Gage-height records collected in this vicinity since 1903 are contained in reports of the National Weather Service.

Water-quality records.--Chemical and biochemical analyses: October 1970 to September 1972. Pesticide analyses: May 1971 to September 1972.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 2.22 ft below National Geodetic Vertical Datum of 1929; unadjusted land-surface subsidence. Prior to Mar. 13, 1973, nonrecording gage at site 105 ft downstream at same datum.

REMARKS.--Records fair. Discharges for current year were computed using stage discharge relationship. During years with predominantly low releases from Livingston Reservoir, discharges are estimated using records for Trinity River near Romayor (station 08066500), intervening area computation, and discharge measurements. Estimated discharges below 10,000 ft<sup>3</sup>/s are not published. Considerable regulation of flow by Livingston Reservoir (station 08066190) 88.9 mi upstream. Many diversions above station for municipal supplies, industrial uses, and irrigation. Gage-height telemeter at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 114,000 ft<sup>3</sup>/s May 12, 1942 (gage height, 29.38 ft); minimum not determined (affected by tides); minimum gage height observed, 2.32 ft Nov. 24, 1970.

Maximum stage since at least 1903, May 23, 1990 at 1700 hours (gage height, 30.03 ft).

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 8-11, 1922, reached a stage of 28.6 ft, present datum, from observations by the National Weather Service at nonrecording gage on railroad bridge upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 72,300 ft<sup>3</sup>/s Jan. 21 at 0200 hours (gage height, 29.05 ft); minimum discharge not determined (affected by tides); minimum gage height, not recorded.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	21800	---	25000	---	---	---	---
2	---	---	---	---	---	22400	---	22800	---	---	---	---
3	---	---	---	---	---	22600	---	18900	---	---	---	---
4	---	---	---	---	---	22300	---	14200	---	---	---	---
5	---	---	---	11200	---	21900	---	10900	---	---	---	---
6	---	---	---	11200	---	21200	---	10200	---	---	---	10500
7	---	---	---	11000	16900	20600	11900	10900	---	---	---	10500
8	---	---	---	---	17100	18700	11800	11800	---	---	---	10400
9	---	---	---	---	16800	15100	11500	14600	---	---	---	10200
10	---	---	---	---	16800	---	10600	17100	---	---	---	---
11	---	---	---	16100	17400	---	---	17200	---	---	---	---
12	---	---	---	21400	18000	---	---	16700	---	---	---	---
13	---	---	---	25200	18700	---	---	16400	---	---	---	---
14	---	---	---	28700	19400	---	---	15200	---	---	---	---
15	---	---	---	32700	19500	---	---	14100	---	---	---	---
16	---	---	---	37700	18000	---	19600	13500	---	---	---	---
17	---	---	---	42400	14300	---	22400	13300	---	---	---	---
18	---	---	---	51000	---	---	24000	13100	---	---	---	---
19	---	---	---	64300	---	---	25400	12000	---	---	---	---
20	---	---	---	65100	---	---	28100	11300	---	---	---	---
21	---	---	---	65500	14900	---	31300	10900	---	---	---	---
22	---	---	---	57900	21600	---	33700	10700	---	---	---	---
23	---	---	---	47000	24700	---	35100	10500	---	---	---	---
24	---	---	---	37100	24700	---	35800	10300	---	---	---	---
25	---	---	---	29800	24100	---	36100	---	---	---	---	---
26	---	---	---	25700	23300	---	35000	---	---	---	---	---
27	---	---	---	21900	22600	---	33900	---	---	---	---	---
28	---	---	---	17600	22000	---	31900	---	---	---	---	---
29	---	---	---	13700	---	---	29500	---	---	---	---	---
30	---	---	---	---	---	---	26900	---	---	---	---	---
31	---	---	---	---	---	---	---	---	---	---	---	---
CAL YR 1990	TOTAL	---	MEAN	---	MAX	---	MIN	---	AC-FT	---	---	---
WTR YR 1991	TOTAL	---	MEAN	---	MAX	---	MIN	---	AC-FT	---	---	---



TRINITY RIVER BASIN

443

08067070 CWA CANAL NEAR DAYTON, TX

LOCATION.--Lat 29°57'40", long 94°48'36", Liberty County, Hydrologic Unit 12030203, at flume on left bank of Coastal Water Authority canal, 1,000 ft west of the Trinity River, 2 mi east of Farm Road 1409, and 7.4 mi south-east of Dayton.

PERIOD OF RECORD.--April 1981 to current year. Prior to October 1990, published as CIWA Canal near Dayton, TX.

GAGE.--Water-stage recorder. National Geodetic Vertical Datum of gage not determined.

REMARKS.--No estimated daily discharges. Records good. There are no known diversions between pumping plant and the gage. Water is pumped from the Trinity River for industrial and municipal use in the area.

AVERAGE DISCHARGE.--10 years, 343 ft<sup>3</sup>/s (248,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 639 ft<sup>3</sup>/s Sept. 26, 1991; minimum daily, 52 ft<sup>3</sup>/s Aug. 18, 1983, and Nov. 10, 1985.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 639 ft<sup>3</sup>/s Sept. 26 (gage height, not applicable); minimum daily, 233 ft<sup>3</sup>/s Feb. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	515	401	500	447	512	428	490	547	499	520	527	528
2	512	445	492	415	478	428	490	525	503	518	563	567
3	468	446	484	456	436	428	495	490	508	556	564	567
4	474	444	456	462	372	448	469	453	529	548	568	435
5	483	453	450	465	342	479	408	412	570	491	583	527
6	499	479	459	449	371	453	362	432	583	509	598	518
7	503	470	420	404	320	455	396	457	597	511	603	538
8	499	497	415	401	347	426	432	486	593	510	605	551
9	451	457	398	401	479	422	444	490	593	509	606	618
10	414	448	381	399	478	415	478	469	588	550	605	617
11	449	438	388	393	478	416	516	448	593	574	610	524
12	450	428	374	418	438	434	490	453	570	575	614	598
13	449	432	421	419	424	412	448	473	529	574	617	611
14	449	420	442	373	453	424	432	495	521	563	614	606
15	449	480	487	267	450	445	404	482	495	540	574	616
16	452	442	488	326	424	469	412	453	482	512	534	606
17	452	444	488	363	422	446	404	448	482	549	542	578
18	473	444	454	362	413	448	416	448	482	625	544	561
19	475	444	431	369	380	460	420	453	486	635	596	581
20	482	443	455	402	327	451	392	457	521	634	572	577
21	482	431	457	418	233	453	377	453	529	627	578	589
22	473	450	455	417	265	457	377	457	538	592	546	610
23	477	444	464	418	339	436	377	482	538	557	563	618
24	453	442	472	415	369	436	420	499	574	549	563	622
25	469	442	504	429	369	432	503	508	588	551	561	599
26	458	444	517	461	405	436	490	512	570	550	560	639
27	423	451	502	428	412	448	400	543	419	552	555	628
28	388	441	480	350	428	448	420	583	552	552	551	612
29	389	471	451	382	---	448	453	570	537	554	514	604
30	392	493	451	378	---	444	516	561	525	554	525	592
31	363	---	448	467	---	448	---	508	---	509	524	---
TOTAL	14165	13464	14084	12554	11164	13673	13131	15047	16094	17150	17679	17437
MEAN	457	449	454	405	399	441	438	485	536	553	570	581
MAX	515	497	517	467	512	479	516	583	597	635	617	639
MIN	363	401	374	267	233	412	362	412	419	491	514	435
AC-FT	28100	26710	27940	24900	22140	27120	26050	29850	31920	34020	35070	34590
CAL YR 1990	TOTAL	160462	MEAN	440	MAX	561	MIN	321	AC-FT	318300		
WTR YR 1991	TOTAL	175642	MEAN	481	MAX	639	MIN	233	AC-FT	348400		

## CEDAR BAYOU MAIN STEM

08067500 CEDAR BAYOU NEAR CROSBY, TX

LOCATION.--Lat 29°58'21", long 94°59'08", Liberty County, Hydrologic Unit 12040203, on left bank at downstream side of bridge on U.S. Highway 90 and 6.6 mi northeast of Crosby.

DRAINAGE AREA.--64.9 mi<sup>2</sup>.

PERIOD OF RECORD.--March to August 1946, March 1963 to February 1964, May to August 1971 (discharge measurements only), October 1971 to current year.

Water-quality records.--Chemical, biochemical, and pesticide analyses: May 1971 to September 1979.

GAGE.--Water-stage recorder. Datum of gage is 31.31 ft above National Geodetic Vertical Datum of 1929.

REMARKS.--No estimated daily discharges. Records good. Stage discharge relationship is affected by seasonal vegetal growth during most years. Low flow is sustained by drainage from irrigated lands. There are diversions upstream from station for irrigation. Gage-height telemetry at station.

AVERAGE DISCHARGE.--20 years (water years 1972-91), 78.7 ft<sup>3</sup>/s (57,020 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,760 ft<sup>3</sup>/s June 5, 1981 (gage height, 23.92 ft); maximum gage height, 24.95 ft May 19, 1989; no flow occasionally during pumping season of some years.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,400 ft<sup>3</sup>/s and maximum (\*):

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 10	1900	*2,590	*21.54	Feb. 21	2100	2,000	19.83
Jan. 15	1000	2,220	20.49	Apr. 5	2400	2,410	21.05
Jan. 18	2100	2,220	20.50	Apr. 14	2200	1,930	19.58
Feb. 5	0300	2,170	20.34				

Minimum daily discharge, 0.79 ft<sup>3</sup>/s Dec. 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.97	.97	1.4	5.7	10	54	2.1	6.1	135	6.7	7.3	20
2	1.1	.89	1.2	188	11	49	1.7	2.8	73	223	6.5	10
3	1.4	.97	1.1	967	9.3	30	1.8	2.6	34	69	6.5	52
4	1.7	1.3	.99	251	513	16	35	2.6	16	49	6.4	23
5	1.6	1.2	.90	91	1580	5.8	994	5.0	10	145	8.8	37
6	1.7	1.1	.86	62	425	4.8	1890	5.0	5.8	85	12	104
7	2.1	1.0	.92	167	140	7.7	648	3.5	5.4	280	4.5	73
8	5.2	2.2	.89	96	63	7.2	302	216	2.3	239	2.0	64
9	3.0	27	.86	109	38	6.1	157	447	3.5	84	2.1	101
10	1.9	38	.82	2050	22	5.4	88	145	11	43	2.0	43
11	2.8	18	.80	1890	16	4.7	360	67	32	25	1.8	28
12	2.8	3.3	.79	490	13	3.9	270	26	21	30	1.6	15
13	2.2	2.0	.84	177	14	1.7	112	5.6	8.4	21	1.5	9.5
14	1.8	1.6	.87	113	12	1.6	757	3.0	32	24	1.5	10
15	1.8	1.4	.87	1780	10	1.6	1170	30	269	13	23	6.6
16	2.8	1.2	.87	563	8.9	3.0	302	179	552	13	23	5.2
17	7.7	1.1	.87	208	8.7	24	151	1010	831	20	20	7.6
18	41	1.1	.92	1040	8.9	15	305	274	212	13	11	9.2
19	49	1.1	.89	1370	15	9.9	247	188	65	10	6.6	8.8
20	21	1.0	.90	362	30	7.1	153	186	15	5.8	9.4	5.8
21	17	1.0	12	159	931	5.5	48	164	7.5	10	12	6.5
22	79	1.1	34	76	1090	4.4	20	103	287	6.7	13	4.7
23	48	5.2	13	43	302	2.8	16	53	447	2.1	13	4.3
24	42	6.2	3.4	67	146	2.2	9.8	29	428	9.2	13	6.0
25	17	2.3	2.1	84	82	2.1	4.6	16	167	38	8.5	12
26	4.6	1.6	3.3	45	60	2.1	5.1	8.4	65	18	6.6	8.9
27	2.1	1.4	339	29	41	2.1	3.2	1.6	28	23	3.7	6.4
28	1.6	2.7	171	21	25	2.1	3.6	1.5	13	32	3.2	5.7
29	1.3	3.7	63	16	---	3.4	10	116	9.1	21	12	4.3
30	1.1	1.8	30	23	---	2.8	3.5	406	5.8	12	12	3.3
31	1.1	---	18	11	---	2.2	---	388	---	8.8	13	---
TOTAL	368.37	133.43	707.36	12553.7	5624.8	290.2	8070.4	4090.7	3790.8	1579.3	267.5	694.8
MEAN	11.9	4.45	22.8	405	201	9.36	269	132	126	50.9	8.63	23.2
MAX	79	38	339	2050	1580	5.4	1890	1010	831	280	23	104
MIN	.97	.89	.79	5.7	8.7	1.6	1.7	1.5	2.3	2.1	1.5	3.3
AC-FT	731	265	1400	24900	11160	576	16010	8110	7520	3130	531	1380
CAL YR 1990	TOTAL	6624.49	MEAN	18.1	MAX	726	MIN	.10	AC-FT	13140		
WTR YR 1991	TOTAL	38171.36	MEAN	105	MAX	2050	MIN	.79	AC-FT	75710		

Because the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than continuous stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage of those events. The data collected for special reasons are called measurements at miscellaneous sites.

Streamflow data collected at partial-record stations where water-quality data other than observations of water temperature are not obtained are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations; the second is a table of annual maximum stage and (or) discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low and high flows are given in a third table. Discharge measurements and water-quality data collected at partial-record stations are presented in downstream order in the section of this report entitled "Gaging-station records."

#### Low-flow partial-record stations

Measurements of streamflow at low-flow partial-record stations that are not published in the gaging-station section are given in the following table. Most of the measurements of low flow were made during periods when streamflow was sustained primarily by ground-water discharge. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will indicate the low-flow potential of the stream. The years listed in the column headed "Period of record" identifies the water years in which measurements were made at the same or at practically the same site.

Discharge measurements made at low-flow partial-record station during water year 1991

Station no.	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Measurements	
					Date	Discharge (ft <sup>3</sup> /s)
Red River basin						
07299890	Lelia Lake Creek below Bell Creek near Hedley, Tex.	Lat 34°56'08", long 100°41'46", Donley County, 150 ft downstream from county road crossing, 1.0 mile downstream from mouth of Bell Creek, and about 5 mi north of Hedley.	74	1964-91	02-04-91	4.23
07307700	Roaring Springs near Roaring Springs, Tex.	Lat 33°51'12", long 100°51'53", Motley County, 3.5 mi south of Roaring Springs.	(a)	1937, 1943-91	1-29-91	1.05

a Not applicable.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

## Crest-stage partial-record stations

The following table contains annual maximum stage and (or) discharge at partial-record stations operated primarily for the purpose of defining the flooding characteristics of the streams. At stations where discharge is given, or is footnoted "to be determined", a stage-discharge relation has been, or will be, defined by discharge measurements obtained by current meter or by indirect procedures. Water-stage recorders are located at these flood-hydrograph stations to facilitate complete hydrograph definition. At stations where only the maximum stage is given (discharge column is dashed), data are generally collected for use in stage-frequency studies of flood-profile definition. Gages at these stations usually consist of a device that will register the peak stage occurring between inspections of the gage. The years used in the column "Period of record" identify the years in which the annual maximum has been determined.

## Annual maximum stage and (or) discharge during water year 1991

Station no.	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Annual maximum		
					Date	Gage height	Discharge (ft <sup>3</sup> /s)
Red River basin							
07301200	McClellan Creek near McLean, Tex.	Lat 35°19'45", long 100°36'32", Gray County, on left bank at downstream side of bridge on State Highway 273, 5 mi upstream from mouth.	759	1967-80† 1987-91	05-31-91	5.20	440
Sabine River basin							
08017210	Long Branch at Greenville, Tex.	Lat 33°07'20", long 96°05'54", Hunt County, on left edge of low-water channel 80 ft upstream from culvert under Moulton St. (Business Route U.S. Highway 69), 0.5 mi upstream from Interstate Highway 30, 0.6 mi downstream from Wesley St. (Business Route U.S. Highway 67), and 1.3 mi southeast of Hunt County Courthouse in Greenville.	5.37	1986-91	04-13-91	11.91	--
Trinity River Basin							
08048800	Big Fossil Creek at Haltom City, Tex.	Lat 33°48'32", long 97°15'02", Tarrant County, at center of channel at downstream side of downstream bridge on State Highway 183, 2.0 mi upstream from Little Fossil Creek, 3.5 mi upstream from mouth, and 6.0 mi northeast of downtown section of Fort Worth.	52.8	1960-73† 1974-84♠ 1985-91	05-24-91	9.05	--
Cedar Bayou basin							
08067510	Cedar Bayou near Baytown, Tex.	Lat 29°46'12", long 94°54'59", Chambers-Harris County line, at bridge on State Highway 146, 0.2 mi downstream from Cary Bayou, 0.2 mi upstream from Saw Pit Gully, and 4.3 mi north-east of Baytown.	169	1984-91	04-05-91	*3.94	--

- u Unknown
- \* Elevation, in feet.
- † Operated as a continuous-record station.
- ♠ Operated as an unpublished stage-only station.

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## FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
<i>Length</i>		
inches (in)	$2.54 \times 10^1$	millimeters (mm)
feet (ft)	$2.54 \times 10^{-2}$	meters (m)
miles (mi)	$3.048 \times 10^{-1}$	meters (m)
	$1.609 \times 10^0$	kilometers (km)
<i>Area</i>		
acres	$4.047 \times 10^3$	square meters (m <sup>2</sup> )
	$4.047 \times 10^{-1}$	square hectometers (hm <sup>2</sup> )
	$4.047 \times 10^{-3}$	square kilometers (km <sup>2</sup> )
square miles (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometers (km <sup>2</sup> )
<i>Volume</i>		
gallons (gal)	$3.785 \times 10^0$	liters (L)
	$3.785 \times 10^0$	cubic decimeters (dm <sup>3</sup> )
million gallons	$3.785 \times 10^{-3}$	cubic meters (m <sup>3</sup> )
	$3.785 \times 10^{-3}$	cubic meters (m <sup>3</sup> )
cubic feet (ft <sup>3</sup> )	$3.785 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
	$2.832 \times 10^1$	cubic decimeters (dm <sup>3</sup> )
	$2.832 \times 10^{-2}$	cubic meters (m <sup>3</sup> )
cfs-days	$2.447 \times 10^3$	cubic meters (m <sup>3</sup> )
	$2.447 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
acre-feet (acre-ft)	$1.233 \times 10^3$	cubic meters (m <sup>3</sup> )
	$1.233 \times 10^{-3}$	cubic hectometers (hm <sup>3</sup> )
	$1.233 \times 10^{-6}$	cubic kilometers (km <sup>3</sup> )
<i>Flow</i>		
cubic feet per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liters per second (L/s)
	$2.832 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$2.832 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
gallons per minute (gal/min)	$6.309 \times 10^{-2}$	liters per second (L/s)
	$6.309 \times 10^{-2}$	cubic decimeters per second (dm <sup>3</sup> /s)
	$6.309 \times 10^{-5}$	cubic meters per second (m <sup>3</sup> /s)
million gallons per day	$4.381 \times 10^1$	cubic decimeters per second (dm <sup>3</sup> /s)
	$4.381 \times 10^{-2}$	cubic meters per second (m <sup>3</sup> /s)
<i>Mass</i>		
tons (short)	$9.072 \times 10^{-1}$	megagrams (Mg) or metric tons



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