

# Water Resources Data Texas Water Year 1997

U.S. GEOLOGICAL SURVEY  
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Volume 3. Colorado River Basin, Lavaca River Basin,  
Guadalupe River Basin, Nueces River Basin, Rio  
Grande Basin, and Intervening Coastal Basins



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-97-3

Prepared in cooperation with the State of Texas  
and with other agencies





## CALENDAR FOR WATER YEAR 1997

1996

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						1	2	1	2	3	4	5	6	7
6	7	8	9	10	11	12	3	4	5	6	7	8	9	8	9	10	11	12	13	14
13	14	15	16	17	18	19	10	11	12	13	14	15	16	15	16	17	18	19	20	21
20	21	22	23	24	25	26	17	18	19	20	21	22	23	22	23	24	25	26	27	28
27	28	29	30	31			24	25	26	27	28	29	30	29	30	31				

1997

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							1							1
5	6	7	8	9	10	11	2	3	4	5	6	7	8	2	3	4	5	6	7	8
12	13	14	15	16	17	18	9	10	11	12	13	14	15	9	10	11	12	13	14	15
19	20	21	22	23	24	25	16	17	18	19	20	21	22	16	17	18	19	20	21	22
26	27	28	29	30	31		23	24	25	26	27	28		23	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					1	2	3	1	2	3	4	5	6	7
6	7	8	9	10	11	12	4	5	6	7	8	9	10	8	9	10	11	12	13	14
13	14	15	16	17	18	19	11	12	13	14	15	16	17	15	16	17	18	19	20	21
20	21	22	23	24	25	26	18	19	20	21	22	23	24	22	23	24	25	26	27	28
27	28	29	30				25	26	27	28	29	30	31	29	30					

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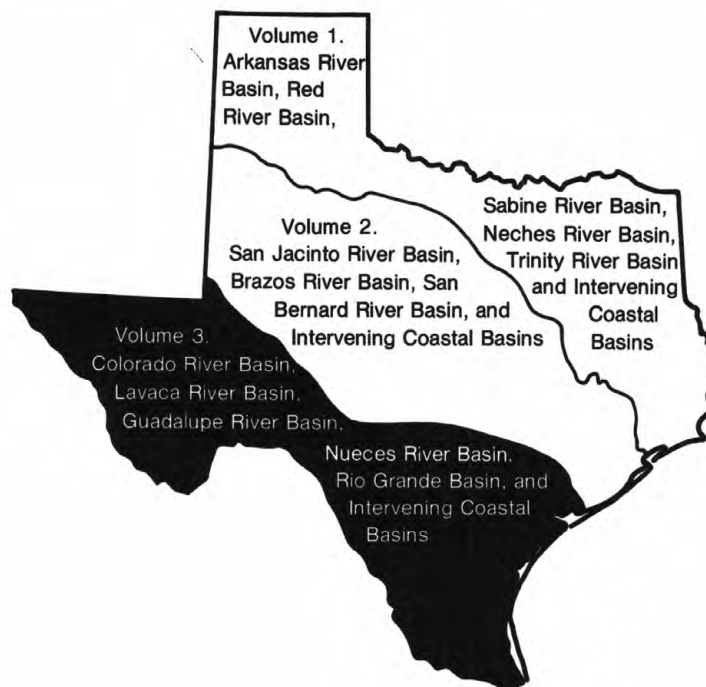




# Water Resources Data Texas Water Year 1997

Volume 3. Colorado River Basin, Lavaca River Basin,  
Guadalupe River Basin, Nueces River Basin, Rio  
Grande Basin, and Intervening Coastal Basins

by S.C. Gandara, W.J. Gibbons, F.L. Andrews, R.E. Jones, and D.L. Barbie



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT TX-97-3

Prepared in cooperation with the State of Texas  
and with other agencies



UNITED STATES DEPARTMENT OF THE INTERIOR

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GEOLOGICAL SURVEY

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## PREFACE

This edition of the annual hydrologic data report of Texas is one of a series of annual reports that document hydrologic data collected from the U.S. Geological Survey's collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by Federal, State, local agencies, and the private sector for developing and managing land and water resources in Texas which 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 U.S. Geological Survey policy and established guidelines, most of the data were collected, computed, and processed from Subdistrict and Field Offices. The following supervised the collection, processing, and tabulation of the data:

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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 v	Page
<b>WESTERN GULF OF MEXICO BASINS</b>		
<b>COLORADO RIVER BASIN</b>		
Colorado River near Gail (d) -----	08117995	25
Colorado River near Cuthbert (d) (c) (t) -----	08120700	26
Colorado River at Colorado City (d) (c) (t) -----	08121000	32
Morgan Creek:		
Lake Colorado City near Colorado City (e) -----	08123000	36
Champion Creek Reservoir near Colorado City (e) -----	08123600	37
Beals Creek near Westbrook (d) (c) (t) -----	08123800	38
Colorado River above Silver (d) (c) (t) -----	08123850	44
E.V. Spence Reservoir near Robert Lee (e) -----	08123950	50
Colorado River at Robert Lee (d) -----	08124000	51
Colorado River near Ballinger (d) (c) (t) -----	08126380	53
Elm Creek at Ballinger (d) -----	08127000	58
South Concho River (head of Concho River):		
South Concho River at Christoval (d) -----	08128000	60
Middle Concho River above Tankersley (d) -----	08128400	61
Spring Creek above Tankersley (d) -----	08129300	62
Dove Creek at Knickerbocker (d) -----	08130500	63
Twin Buttes Reservoir near San Angelo (e) -----	08131200	64
Lake Nasworthy near San Angelo (e) -----	08132000	65
North Concho River at Sterling City (d) -----	08133500	66
North Concho River near Carlsbad (d) -----	08134000	67
O.C. Fisher Lake at San Angelo (e) -----	08134500	68
Concho River at San Angelo (d) -----	08136000	69
Concho River at Paint Rock (d) (c) (t) -----	08136500	71
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Colorado River near Stacy (d) -----	08136700	74
Pecan Bayou:		
Jim Ned Creek:		
Hords Creek:		
Hords Creek Lake near Valera (e) -----	08141000	76
Pecan Bayou near Mullin (d) -----	08143600	77
Colorado River near San Saba (d) -----	08147000	78
Colorado River:		
Beaver Creek near Mason (d) -----	08150800	80
Llano River at Llano (d) -----	08151500	81
Pedernales River near Johnson City (d) -----	08153500	83
Bull Creek at Loop 360 near Austin (d) (c) (b) (t) -----	08154700	85
Lake Austin at Austin (c) (b) (t) -----	08154900	87
Colorado River (Town Lake):		
Barton Creek at State Highway 71 near Oak Hill (d) (c) (b) (t) -----	08155200	90
Barton Creek at Lost Creek Boulevard, Austin (d) (c) (t) (b) -----	08155240	93
Barton Creek at Loop 360, Austin (d) (c) (t) (b) -----	08155300	96
Barton Springs at Austin (d) (c) (b) (t) -----	08155500	98
Barton Creek below Barton Springs at Austin (c) (t) (b) -----	08155505	101
Shoal Creek at 12th Street, Austin (d) (c) (b) (t) -----	08156800	103
East Bouldin Creek at South 1st Street, Austin (c) (t) (b) -----	08157600	105
Town Lake at Austin (c) (b) (t) -----	08157900	106
Colorado River at Austin (d) -----	08158000	111
Boggy Creek at U.S. Highway 183, Austin (d) (c) (b) (t) -----	08158050	113
Walnut Creek at Webberville Road, Austin (d) (c) (b) (t) -----	08158600	117
Onion Creek near Driftwood (d) (c) (b) (t) -----	08158700	119
Bear Creek below Farm Road 1826 near Driftwood (d) (c) (b) (t) -----	08158810	122
Slaughter Creek at Farm Road 1826 near Austin (d) (c) (t) (b) -----	08158840	125
Williamson Creek at Brush Country Blvd., Oak Hill (d) (c) (b) (t) -----	08158922	127
Onion Creek at U.S. Highway 183, Austin (d) -----	08159000	129
Colorado River at Bastrop (d) -----	08159200	131



GAGING STATIONS, IN DOWNSTREAM ORDER,  
FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

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Colorado River above LaGrange (d) -----	08160400	132
<b>WESTERN GULF OF MEXICO BASINS--Continued</b>		
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Redgate Creek near Columbus (d) -----	08160800	133
Colorado River at Columbus (d) -----	08161000	134
Colorado River at Wharton (d) -----	08162000	136
Colorado River near Bay City (d) -----	08162500	138
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<b>LAVACA RIVER BASIN</b>		
Lavaca River at Hallettsville (d) -----	08163500	140
Lavaca River near Edna (d) -----	08164000	141
Navidad River near Hallettsville (d) -----	08164300	143
Navidad River near Speaks (d) (c) (t) -----	08164350	144
Navidad River at Morales (d) -----	08164370	146
Navidad River at Strane Park near Edna (d) -----	08164390	147
Sandy Creek near Ganado (d) (c) (t) -----	08164450	148
Mustang Creek:		
West Mustang Creek near Ganado (d) (c) (t) -----	08164503	150
East Mustang Creek at FM647 near Ganado (d) (c) (t) -----	08164504	152
Lake Texana near Edna (c) (b) (t) -----	08164525	154
<b>GARCITAS CREEK BASIN</b>		
Garcitas Creek near Inez (d) -----	08164600	160
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Guadalupe River near Spring Branch (d) (c) (t) (s) -----	08167500	168
Canyon Lake near New Braunfels (e) -----	08167700	172
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Comal River:		
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<b>SAN ANTONIO RIVER BASIN--Continued</b>		
San Antonio River:		
San Antonio River at Loop 410 at San Antonio (d) (c) (t) -----	08178565	216
Salado Creek (upper station) at San Antonio (d) (c) (b) (t) -----	08178700	225
Salado Creek (lower station) at San Antonio (d) (c) (t) (s) -----	08178800	228
Medina River at Bandera (d) -----	08178880	252
Medina River at Lacoste (d) (c) (t) (s) -----	08180640	253
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San Antonio River near Falls City (d) (t) -----	08183500	304
Cibolo Creek at IH-10 above Boerne (d) -----	08183850	306
Cibolo Creek at Selma (d) -----	08185000	308
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San Antonio River at Goliad (d) (c) (b) (t) -----	08188500	311
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West Nueces River near Brackettville (d) -----	08190500	322
Nueces River below Uvalde (d) -----	08192000	323
Nueces River near Asherton (d) -----	08193000	325
Nueces River at Cotulla (d) -----	08194000	326
San Casimiro Creek near Freer (d) -----	08194200	328
Nueces River near Tilden (d) -----	08194500	329
Frio River at Concan (d) (c) (t) (s) -----	08195000	330
Dry Frio River near Reagan Wells (d) -----	08196000	335
Frio River below Dry Frio River near Uvalde (d) -----	08197500	336
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Nueces River near Mathis (d) -----	08211000	358
Nueces River at Bluntzer (d) -----	08211200	359



GAGING STATIONS, IN DOWNSTREAM ORDER,  
FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

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	Station number	Page
Nueces River at Calallen (d) -----	08211500	360
<b>WESTERN GULF OF MEXICO BASINS--Continued</b>		
<b>OSO CREEK BASIN</b>		
Oso Creek at Corpus Christi (d) -----	08211520	361
<b>RIO GRANDE BASIN</b>		
Rio Grande at El Paso (c) -----	08364000	362
Rio Grande at Foster Ranch near Langtry (c) (b) (t) (s) -----	08377200	369
Pecos River at Red Bluff, NM (d) -----	08407500	373
Delaware River near Red Bluff, NM (d) -----	08408500	374
Red Bluff Reservoir near Orla (e) -----	08410000	375
Pecos River near Orla (d) (c) (t) -----	08412500	376
Pecos River near Girvin (d) -----	08446500	379
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Rio Grande below Amistad Dam near Del Rio (c) (t) (s) -----	08450900	384
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Rio Grande at Fort Ringgold, Rio Grande City (c) (t) -----	08464700	394
Rio Grande near Los Ebanos (c) (t) -----	08466300	395
Rio Grande below Anzalduas Dam (c) (t) -----	08469200	396
Arroyo Colorado at Harlingen (c) (t) (s) -----	08470400	398
Rio Grande near Brownsville (c) (t) (s) -----	08475000	402

## 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 stream-flow 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 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 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)
San Bernard River near West Columbia (e)	08117700	766	1949, 1971-77
Mound Creek Tributary at Guy (e)	08117800	1.48	1966-73
Big Boggy Creek near Wadsworth (d)	08117900	10.30	1970-77
Lake J.B. Thomas near Vincent (e)	08118000	3,389	1954-86
Bull Creek near Ira (d)	08118500	26.30	1948-54, 1959-62
Colorado River below Bull Creek near Ira (e)	08118600	3,524	1975-78
Bluff Creek near Ira (d)	08119000	42.60	1948-65
Bluff Creek at mouth near Ira (e)	08119100	44.1	1975-78
Colorado River near Ira (d)	08119500	3,483	1948-52, 1959-89
Deep Creek near Dunn (d)	08120500	198	1953-86
Morgan Creek near Westbrook (d)	08121500	273	1954-63
Graze Creek near Westbrook (d)	08122000	21.70	1954-59
Morgan Creek near Colorado City (d)	08122500	313	1947-49
Champlin Creek near Colorado City (d)	08123500	198	1948-59
Sulphur Springs Draw near Wellman (e)	08123620	41.80	1966-74
Beals Creek above Big Spring (d)	08123650	9,319	1959-79
Beals Creek at Big Spring (d)	08123700	9,341	1957-59
Beals Creek near Coahoma (d)	08123720	9,383	1983-88
Coahoma Draw Tributary near Big Spring (e)	08123750	2.38	1966-74
Bull Creek Tributary near Forsan (e)	08123760	0.4	1966-74
Colorado River near Silver (d)	08123900	14,997	1957-70
Bitter Creek near Silver (e)	08123920	4.3	1967-74
Salt Creek Tributary near Hylton (e)	08125450	0.25	1966-74
Oak Creek Reservoir near Blackwell (e)	08125500	238	1953-83
Fish Creek Tributary near Hylton (e)	08126300	0.25	1966-71
Colorado River at Ballinger (d)	08126500	16,413	1907-79
Dry Creek near Christoval (e)	08127100	0.79	1965-73
South Concho Irrigation Co. Canal at Christoval (d)	08127500	N/A	1940-83
South Concho River at Christoval (d)	08128000*	412.6	1931-95
Combined Canal and South Concho River at Christoval (d)	08128001	N/A	1940-75
Middle Concho River above Tankersley (d)	08128400*	2,084	1962-95
Middle Concho River near Tankersley (d)	08128500	2,653	1930-61
Spring Creek above Tankersley (d)	08129300*	424.7	1961-95
Dove Creek Springs near Knickerbocker (d)	08129500*	N/A	1944-58
Dove Creek at Knickerbocker (d)	08130500	226.43	1961-95
Spring Creek near Tankersley (d)	08131000	699	1930-60
South Concho River above Pecan Creek near San Angelo (e)	08131300	470	1963-84
Pecan Creek near San Angelo (d)	08131400	81.10	1961-86
Tom Green Co. WCID No. 1 Canal near San Angelo (d)	08131600	N/A	1963-81
South Concho River at San Angelo (d)	08132500	3,866	1932-53
Quarry Creek near Sterling City (e)	08133300	3.25	1965-73
North Concho River at Sterling City (d)	08133500*	588.0	1939-87
Broome Creek near Broome (e)	08133800	0.29	1965-73
Nolke Station Creek near San Angelo (e)	08134300	0.59	1965-73
Gravel Pit Creek near San Angelo (e)	08134400	0.19	1965-74
North Concho River at San Angelo (d)	08135000	1,525	1916-31, 1947-90
Concho River near Veribest (e)	08136150	5,541	1969-73
Puddle Creek near Veribest (e)	08136200	12.0	1966-73
Frog Pond Creek near Eden (e)	08136300	1.96	1967-73

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Mukewater Creek SWS No. 10A near Trickham (e)	08136900	15.3	1965-72
Mukewater Creek SWS No. 9 near Trickham (e)	08137000	4.02	1961-72
Mukewater Creek at Trickham (d)	08137500	70	1951-73
Colorado River at Winchell (d)	08138000*	25,179	1924-34, 1939-93
Deep Creek SWS No. 3 near Placid (e)	08139000	3.42	1954-60
Deep Creek near Mercury (d)	08139500	43.90	1954-73
Deep Creek SWS No. 6 near Mercury (e)	08140000	5.14	1952-71
Dry Prong Deep Creek near Mercury (d)	08140500	8.31	1951-71
Lake Clyde near Clyde (e)	08140600	36.9	1970-85
Pecan Bayou near Cross Cut (d)	08140700	532	1968-79
Jim Ned Creek near Coleman (d)	08140800	333	1965-80
McCall Branch near Coleman (e)	08141100	2.17	1966-73
Hords Creek near Valera	08141500	54.20	1947-91
Hords Creek at Coleman (d)	08142000*	107	1941-70
Brown County WID No. 1 Canal near Brownwood (d)	08142500	N/A	1950-83
Lake Brownwood near Brownwood (e)	08143000	1,535	1948-85
Pecan Bayou at Brownwood (d)	08143500	1,660	1917-18, 1924-83
Brown Creek Tributary near Goldthwaite (e)	08143700	2.48	1966-73
Noyes Canal at Menard (d)	08144000	N/A	1924-83
San Saba River at Menard (d)	08144500	1,135	1916-93
Combined Noyes Canal and San Saba River at Menard (d)	08144501	N/A	1916-68
San Saba River near Brady (d)	08144600	1,633	1979-93
Brady Creek near Eden (d)	08144800	101	1962-85
Brady Creek Reservoir near Brady (e)	08144900	513	1963-83
Brady Creek at Brady (d)	08145000	588	1939-86
Brady Creek Tributary near Brady (e)	08145100	4.05	1967-73
San Saba River at San Saba (d)	08146000	3,046	1916-92, 1905-07, 1993
Lake Buchanan near Burnet (e)	08148000	31,910	1937-90
North Llano River near Junction (d)	08148500	914	1915-77
Llano River near Junction (d)	08150000	1,854.14	1915-93
Llano River Tributary near London (e)	08150200	0.58	1966-73
Llano River near Mason (d)	08150700	3,247.14	1968-93
Stone Creek Tributary near Art (e)	08150900	0.40	1966-73
Llano River near Castell (d)	08151000	3,747	1924-39
Johnson Creek near Valley Spring (e)	08151300	5.66	1967-73
Sandy Creek near Kingsland (d)	08152000	327	1967-93
Little Flatrock Creek near Marble Falls (e)	08152700	3.20	1966-74
Spring Creek near Fredericksburg (e)	08152800	15.20	1967-73
Pedernales River near Fredericksburg (d)	08152900	369	1979-93
Pedernales River at Stonewall (d)	08153000	647	1924-34
Pedernales River near Stonewall (d)	08153050	647	1924-34
Cane Branch at Stonewall (e)	08153100	1.37	1965-71
Pedernales River near Spicewood (d)	08154000	1,294	1924-39
Lake Travis near Austin (d)	08154500	38,755	1940-90
Colorado River below Mansfield Dam, Austin (d)	08154510	38,755	1975-90
West Bull Creek at Loop 360 near Austin (e)	08154750	6.77	1976-82
Bull Creek at FM 2222, Austin (e)	08154760	30.4	1975-78
Bee Creek at West Lake Drive near Austin (e)	08154950	3.28	1980-82
Barton Creek near Camp Craft Road near Austin (d)	08155260	109	1982-89
West Bouldin Creek at Riverside Drive, Austin (e)	08155550	3.12	1976-82
Shoal Creek at Steck Avenue, Austin (e)	08156650	2.79	1975-82
Shoal Creek at Northwest Park at Austin (d)	08156700	6.52	1975-84
Shoal Creek at White Rick Drive, Austin (e)	08156750	12.30	1975-82
Waller Creek at 38th Street, Austin (d)	08157000	2.31	1955-80
Waller Creek at 23rd Street, Austin (d)	08157500	4.13	1955-80
Boggy Creek at U.S. Highway 183, Austin (d)	08158050*	13.10	1976-86



Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Walnut Creek at Farm-Market 1325 near Austin (e)	08158100	12.60	1975-88
Walnut Creek at Dessau Road, Austin (e)	08158200	26.20	1975-88
Ferguson Branch at Springdale Road, Austin (e)	08158300	1.63	1978-82
Little Walnut Creek at Georgian Drive, Austin (e)	08158380	5.22	1975-88
Little Walnut Creek at IH 35, Austin (e)	08158400	5.57	1975-82
Little Walnut Creek at Manor Road, Austin (e)	08158500	12.1	1975-82
Walnut Creek at Southern Pacific Railroad bridge, Austin (e)	08158640	53.5	1975-86
Onion Creek at Buda (e)	08158800	166	1961-78, 1979-83, 1992-95
Bear Creek at Farm-Market Road 1626 near Manchaca (e)	08158820	24.0	1979-83
Little Bear Creek at Farm-Market Road 1626 near Manchaca (d)	08158825	21.0	1979
Slaughter Creek at FM 2304 near Austin (e)	08158860	23.1	1978-83
Boggy Creek (South) at Circle S Road, Austin (e)	08158880	3.58	1976-88
Fox Branch near Oak Hill (e)	08158900	0.12	1965-73
Williamson Creek at Oak Hill (d)	08158920	6.30	1978-93
Williamson Creek at Manchaca Road, Austin (e)	08158930	19	1975-85
Williamson Creek at Jimmy Clay Road, Austin (d)	08158970	27.60	1975-85
Onion Creek below Del Valle (e)	08159100	339	1962-75
Wilbarger Creek near Pflugerville (d)	08159150	4.6	1963-80
Big Sandy Creek near McDade (d)	08159165	38.70	1979-85
Big Sandy Creek near Elgin (d)	08159170	63.80	1979-85
Dogwood Creek near McDade (e)	08159180	0.53	1980-85
Dogwood Creek at Highway 95 near McDade (e)	08159185	5.03	1980-85
Reeds Creek near Bastrop (e)	08159450	5.22	1967-73
Colorado River at Smithville (d)	08159500	39,880	1931-75
Dry Creek at Buescher Lake near Smithville (d)	08160000	1.48	1940-66
Colorado River at La Grange (d)	08160500	40,430	1939-55
Colorado River above Columbus (d)	08160700	41,403	1983-85
Dry Branch Tributary near Altair (e)	08161580	0.68	1966-73
Little Robin Slough near Matagorda (e)	08162530	3.4	1969,
Cashs Creek near Blessing (e)	08162650	14.8	1969-77
East Carancahua Creek near Blessing (e)	08162700	81.2	1968, 1970-83
West Carancahua Creek near Laward (e)	08162800	57.1	1970-76
Navidad River near Ganado (d)	08164500	826	1939-80
Mustang Creek below Ganado (e)	08164505	290	1971-75
Johnson Creek near Ingram (d)	08166000	114	1942-60, 1962-93
Guadalupe River above Bear Creek at Kerrville (d)	08166140*	494	1978-86
Guadalupe River above Kerrville (e)	08166150	488	1976-79
Turtle Creek Tributary near Kerrville (e)	08166300	0.46	1966-74
Guadalupe River near Comfort (d)	08166500	762	1918-32
Rebecca Creek near Spring Branch (d)	08167600	10.90	1960-79
Blieders Creek at New Braunfels (e)	08168600	16.0	1962-89
Panther Canyon at New Braunfels (e)	08168700	0.73	1962-89
Trough Creek near New Braunfels (e)	08168720	0.48	1966-74
W.P. Dry Comal Creek Tributary near New Braunfels (e)	08168750	0.32	1966-74
Guadalupe River at New Braunfels (d)	08169500*	1,652	1915-27
Walnut Branch near Seguin (e)	08169750	5.46	1967-74
East Pecan Branch near Gonzales (e)	08169850	0.24	1965-74
San Marcos River at San Marcos (e)	08169950	83.7	1915-21
San Marcos River at San Marcos (d)	08170500	93	1915-21
West Elm Creek near Niederwald (e)	08172100	0.44	1965-74
Plum Creek near Lockhart (d)	08172500	184	1925-30
Plum Creek near Luling (d)	08173000	309	1930-93
San Marcos River at Ottine (d)	08173500	1,249	1915-43
Peach Creek below Dilworth (d)	08174600	460	1959-79
Guadalupe River below Cuero (d)	08176000	4,923	1903-07, 1916-19, 1921-36
Irish Creek near Cuero (e)	08176200	15.5	1967-74

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Three Mile Creek near Cuero (e)	08176600	0.48	1966-74
Coletto Creek Reservoir inflow (Guadalupe diversion) near Schroeder (d)	08176990	354	1980-94
Coletto Creek near Schroeder (d)	08177000	369	1930-34, 1953-79
Olmos Reservoir at San Antonio (d)	08177700*	21.0	1968-86
Olmos Reservoir at San Antonio (e)	08177800	32.4	1968-71, 1976-89, 1992-95
San Antonio River at Hildebrand Ave., San Antonio (d)	08177820	35.0	1980-87
San Antonio River at Woodlawn Avenue, San Antonio (e)	08177860	36.4	1989-95
San Antonio River at Dolorosa, San Antonio (d)	08177920	N/A	1980-86
San Pedro Creek at Furnish St., San Antonio (d)	08178500*	2.60	1916-29
Harlandale Creek at W. Harding Blvd., San Antonio (e)	08178555	2.43	1977-81
Panther Springs Creek at FM 2696 near San Antonio (e)	08178600	9.54	1969-77
Lorence Creek at Thousand Oaks, San Antonio (e)	08178620	4.05	1980-84
West Elm Creek at San Antonio (e)	08178640	2.45	1976-88
East Elm Creek at San Antonio (e)	08178645	2.33	1976-81
Salado Creek Tributary at Bitters Road, San Antonio (e)	08178690	0.26	1969-81
Salado Creek Tributary at Bee Street, San Antonio (e)	08178736	0.45	1970-77
Bandera Creek Tributary near Bandera (e)	08178900	0.27	1966-74
Medina River near Pipe Creek (d)	08179000	474	1923-35, 1953-82
Red Bluff Creek near Pipe Creek (d)	08179100	56.30	1956-81
Medina River Tributary near Pipe Creek (e)	08179200	0.30	1966-74
Medina Lake near San Antonio (e)	08179500	634	1913-94
Medina Canal near Riomedina (e)	08180000	N/A	1922-34, 1957-93
Medina River near Riomedina (d)	08180500	650	1922-34, 1953-73
Medio Creek at Pearsall Road, San Antonio (e)	08180750	47.9	1987-95
Leon Creek Tributary at FM 1604, San Antonio (e)	08181000	5.57	1968-80
French Creek Tributary near Helotes (e)	08181200	1.08	1966-74
Ranch Creek near Helotes (d)	08181410		1978
Leon Creek Tributary at Kelly Air Force Base (d)	08181450	1.19	1969-79
Calaveras Creek SWS No. 6 (inflow) near Elmendorf (e)	08182400	7.01	1957-77
Calaveras Creek near Elmendorf (d)	08182500	77.20	1954-71
River at Calaveras (d)	08183000	1,786	1918-25
Cibolo Creek near Boerne (d)	08183900	68.4	1963-95
Cibolo Creek near Bulverde (d)	08184000	198	1946-66
Cibolo Creek above Bracken (d)	08184500	250	1946-51
Cibolo Creek at Sutherland Springs (d)	08185500	665	1924-29
Ecletto Creek near Runge (d)	08186500	239	1962-89
Escondido Creek SWS No. 1 (inflow) near Kenedy (e)	08187000	3.29	1955-73
Escondido Creek at Kenedy (d)	08187500	72.40	1954-73
Escondido Creek SWS No. 11 (inflow) near Kenedy (e)	08187900	8.45	1959-77
Dry Escondido Creek near Kenedy (d)	08188000	9.43	1954-59
Baugh Creek at Goliad (e)	08188400	3.02	1966-74
Guadalupe-Blanco River Authority Calhoun Canal-Flume No. 2 near Long Mott (d)	08188750	N/A	1972-86
Guadalupe River at State Highway 35 near Tivoli (e)	08188810	10,280	1975-82
Medio Creek near Beeville (d)	08189300	204	1962-77
Olmos Creek Tributary near Skidmore (e)	08189600	0.58	1966-73
Chilipin Creek at Sinton (d)	08189800	128	1970-91
Nueces River Basin:			
Nueces River near Uvalde (d)	08191500	1,930	1928-39
Nueces River near Cinonia (d)	08192500	2,150	1915-25
Plant Creek near Tilden (e)	08194550	0.36	1965-74
Nueces River at Simmons (d)	08194600	8,561	1965-77
Dry Frio River at Knippa (d)	08196500	179	1953
East Elm Creek near Sabinal (e)	08198900	10.6	1967-74

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Frio River near Frio Town (d)	08199700	1,460	1924-27
Hondo Creek near Hondo (d)	08200500	132	1953-64
Bone Creek near Hondo (e)	08200900	0.19	1965-74
Seco Creek near Utopia (d)	08202000	53.20	1952-61
Seco Creek near D'Hanis (d)	08202500	87.40	1952-64
Leona River Tributary near Uvalde (e)	08203500	1.21	1966-74
Leona River Spring Flow near Uvalde (d)	08204000*	1.21	1939-77
Leona River near Divot (d)	08204500	565	1924-29
Frio River at Calliham (d)	08207000	5,491	1925-26, 1932-81
Rutledge Hollow Creek near Poteet (e)	08207200	9.33	1966-74
Atascosa River near McCoy (d)	08207500	530	1951-57
Lucas Creek near Pleasanton (e)	08207700	32.80	1966-73
Ramirena Creek near George West (d)	08210300	84.40	1968-72
Lagarto Creek near George West (d)	08210400	155	1972-89
Nueces River below Mathis (d)	08211100	16,726	1966-67
Nueces River at Bluntzer (d)	08211200	16,772	1966-67
Pintas Creek Tributary near Banquete (e)	08211550	3.28	1966-74
Hamon Creek near Freer (e)	08211600	0.73	1965-73
San Diego Creek at Alice (d)	08211800	319	1964-89
Lake Alice at Alice (e)	08211850	150	1965-86
San Fernando Creek at Alice (d)	08211900	507	1965-77
San Fernando Creek near Alice (d)	08212000	518	1962-63
North Los Animas Creek Tributary near Freer (e)	08212320	0.07	1969-74
Los Olmos Creek near Falfurrias (d)	08212400	480	1967-73
Rio Grande at Vinton Bridge near Anthony (d)	08363840	28,680	1969-74
Rio Grande below Americal Dam (d)	08365000	29,271	1938-60
Northgate Reservoir at El Paso (e)	08365540	6.89	1973-75
Range Reservoir at El Paso (e)	08365545	11.89	1973-75
Franklin Canal at El Paso (d)	08365550	N/A	1969-72
McKelligon Canyon at El Paso (d)	08365600	2.30	1958-77
Inlet to Fort Bliss Sump at El Paso (d)	08365700	3.50	1961
Government Ditch at El Paso (d)	08365800	6.40	1958-77
Riverside Canal near Socorro (d)	08366400	37,830	1969-72
Rio Grande at Island Station near El Paso (d)	08366500	29,743	1938-60
Rio Grande at Tornillo Branch near Fabens (d)	08367000	N/A	1924-38
Tornillo Drain at mouth near Tornillo (d)	08368000	N/A	1969-72
Tornillo Canal near Tornillo (d)	08368300	N/A	1969-72
Hudspeth Feeder Canal near Tornillo (d)	08368900	N/A	1969-72
Rio Grande at County Line Station near El Paso (d)	08369500	30,610	1938-60
Camo Rice Arroyo Tributary near Fort Hancock (e)	08370200	2.35	1966-74
Rio Grande below Old Fort Quitman (d)	08370500	31,944.0	1976-82
Wild Horse Creek Tributary near Van Horn (e)	08370800	0.74	1966-73
Rio Grande above Rio Conchos near Presidio (d)	08371500	34,966	1900-14, 1920, 1923-60
Cibolo Creek near Presidio (d)	08373200	276	1971-77
Rio Grande above Presidio (lower Station) (d)	08373500	N/A	1901-13, 1924-54
Alamito Creek near Presidio (d)	08374000	1,504	1932-72
Rio Grande below Rio Conchos near Presidio (d)	08374200	66,203	1955-60
Terlingua Creek near Terlingua (d)	08374500	1,070	1932-60
Rio Grande at Johnson Ranch (d)	08375000	70,215	1936-60
Sanderson Canyon at Sanderson (d)	08376300	195	1968-80
Rio Grande at Langtry (d)	08377500	84,795	1900-14, 1920, 1924-60
Rio Grande Tributary near Langtry (e)	08377600	0.32	1966-74
Delware River Tributary near Orla (e)	08407800	1.6	1966-74
Pecos River near Angeles (d)	08409500	20,540	1914-37



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

xv

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Salt Screwbean Draw near Orla (d)	08411500	464	1939-41, 1944-57
Pecos River near Mentone (d)	08414000	21,650	1922-26, 1969-73
Reeves County WID No. 2 Canal near Mentone (d)	08414500	N/A	1922-25, 1939-57, 1964-90
Ward County WID No. 3 Canal near Barstow (d)	08415000	N/A	1939-57, 1964-90
Pecos River above Barstow (d)	08416500	21,800	1916-21
Ward County Irrigation District No. 1 Canal near Barstow (d)	08418000	N/A	1922-25, 1939-57, 1964-90
Pecos River at Pecos (d)	08420500	22,100	1898-1907, 1914-15, 1922-26, 1939-55
Madera Canyon near Toyahvale (d)	08424500	53.80	1932-49
Phantom Lake Spring near Toyahvale (d)	08425500*	N/A	1932-34, 1942-66
Giffin Springs at Toyahvale (d)	08427000*	N/A	1932-33
San Solomon Springs at Toyahvale (d)	08427500	N/A	1932-34, 1941-65
West Sandia Spring at Balmorhea (d)	08429000	N/A	1932-33
East Sandia Spring at Balmorhea (d)	08430000	N/A	1932-33
Toyah Creek near Pecos (d)	08431000	1,024	1940-41, 1944-45
Salt Draw near Pecos (d)	08431500	1,882	1939-41, 1944-45
Limpia Creek above Fort Davis (d)	08431700	52.40	1966-86
Limpia Creek below Fort Davis (d)	08431800	227	1962-77
Limpia Creek near Fort Davis (d)	08432000	303	1925-32
Barrilla Draw near Saragosa (d)	08433000	612	1925-26, 1932, 1976-83
Toyah Creek below Toyah Lake near Pecos (d)	08434000	3,709	1939-51
Grandfalls-Big Valley Canal near Barstow (d)	08435000	N/A	1922-26, 1939-57, 1964-76
Pecos River below Barstow (d)	08435500	25,980	1939-41
Toronto Creek near Alpine (d)	08435600	27.90	1971-76
Alpine Creek at Alpine (d)	08435620	18.10	1971-76
Moss Creek near Alpine (d)	08435660	11.30	1971-76
Sunny Glen Canyon near Alpine (d)	08435700	29.70	1968-77
Coyanosa Draw near Fort Stockton (d)	08435800	1,182	1964-77
Pecos County WID No. 2 (Upper Div.) Canal near Grandfalls (d)	08436500	N/A	1922-25, 1939-57, 1964-90
Courtney Creek Tributary near Fort Stockton (e)	08436800	0.44	1966-74
Pecos County WID No. 2 Canal near Imperial (d)	08437500	N/A	1940-57, 1964-90
Lake Leon Tributary near Fort Stockton (e)	08437550	1.59	1966-74
Pecos County WID No. 3 Canal near Imperial (d)	08437600	N/A	1940-57, 1964-90
Monument Draw Tributary at Pyote (e)	08437650	178	1966-74
Ward County WID No. 2 Canal near Grand Falls (d)	08437700	N/A	1939-57, 1964-90
Pecos River near Grand Falls (d)	08438100	27,810	1916-26
Pecos River below Grand Falls (d)	08441500	27,820	1921-26, 1939-56
Three Mile Mesa Creek near Fort Stockton (e)	08444400	1.04	1966-74

Station name	Station number	Drainage area (mi <sup>2</sup> )	Period of record (water years)
Comanche Springs at Fort Stockton (d)	08444500	N/A	1936-64
Pecos River near Sheffield (d)	08447000	31,600	1922-25, 1940-49
Independence Creek near Sheffield (d)	08447020	763	1974-85
Howards Creek Tributary near Ozona (e)	08447200	7.53	1967-73
Pecos River near Shumla (d)	08447400	35,162	1955-60
Pecos River near Langtry (d)	08447410	35,179	1976-78, 1981-85
Goodenough Springs near Comstock (e)	08448500	N/A	1929-60
Sonora Field Creek near Sonora (e)	08448800	2.60	1965-71
Devils River near Juno (d)	08449000	2,730	1925-49, 1964-73
Devils River near Comstock (d)	08449300	3,903	1955-58
Devils River at Pafford Crossing near Comstock (d)	08449400	3,961	1978-85
Rough Canyon Tributary near Del Rio (e)	08449470	7.90	1967-73
Devils River near Del Rio (d)	08449500	4,185	1900-14, 1924-57
Evans Creek Tributary near Del Rio (e)	08449600	0.39	1966-73
Devils River near mouth, Del Rio (d)	08450500	4,305	1954-60
Rio Grande near Del Rio (d)	08452500	123,303	1900-15, 1920, 1924-54
San Felipe Creek near Del Rio (e)	08453000	46.0	1931-60
Zorro Creek near Del Rio (e)	08453100	10.0	1966-74
East Perdido Creek near Brackettville (e)	08454900	3.39	1965-74
Pinto Creek near Del Rio (d)	08455000	249	1929-69, 1971-72
Rio Grande at Eagle Pass (d)	08458000	127,312	1900-16, 1924-60
Rio Grande at San Antonio Crossing (d)	08458700	129,226	1952-60
Arroyo San Bartolo at Zapata (e)	08459600	0.61	1966-74
Rio Grande at Zapata (d)	08460500	163,344	1932-53
Rio Grande at Roma (d)	08462500	166,464	1900-13, 1923-54
Rio Grande Tributary near Rio Grande City (e)	08466100	1.20	1966-74
Rio Grande Tributary near Sullivan City (e)	08466200	0.40	1966-74
Rio Grande at Hildalgo (d)	08471500	176,100	1928-32, 1935, 1939, 1941-51
Rio Grande near Progreso (d)	08473300	176,228	1953-60
Rio Grande near San Beniot (d)	08473700	176,304	1953-60
Rio Grande near Brownsville (d)	08475000	176,333	1935-50

## DISCONTINUED SURFACE-WATER-QUALITY STATIONS

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The following stations were discontinued as continuous-record surface-water-quality stations prior to the 1996 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)
Colorado River above Bull Creek near Knapp	08118200	N/A	SC, T, Cl	1950-52
Bull Creek near Ira	08118500	26.30	SC, T, pH, Cl	1950-51
Bluff Creek near Ira	08119000	42.60	SC, T, pH, Cl	1950
Colorado River near Ira	08119500	3,483	SC, T	1950-52, 1959-70, 1975-82, 1951-52
Deep Creek near Dunn	08120500	198	Cl	1953-54
Morgan Creek near Westbrook	08121500	273	SC, T	1954-55
Graze Creek near Westbrook	08122000	21.70	T	1954-55
Morgan Creek near Colorado City	08122500	313	T	1947-49
Lake Colorado City near Colorado City	08123000	340	T	1954-55
Beals Creek above Big Spring	08123650	9,319	SC, T	1973-78
Beals Creek near Big Spring	08123700	9,341	SC, T	1956-57
Beals Creek near Coahoma	08123720	9,383	SC, T	1983-88
Colorado River near Silver	08123900	14,997	SC, T	1957-68
Colorado River at Robert Lee	08124000	15,307	SC, T, pH, Cl	1948-51, 1949-51
Oak Creek near Blackwell	08126000	209	SC, T	1950
Colorado River at Ballinger	08126500	16,413	SC, T	1961-79, 1978-79
Elm Creek at Ballinger	08127000	450	SC, T	1968-91
Concho River at Paint Rock	08136500	6,574	SC, T	1946-50, 1967-90, 1978-81
Pecan Bayou at Brownwood	08143500	1,660	S	1948-49
Pecan Bayou near Mullin	08143600	2,073	SC, T	1968-91
San Saba River near San Saba	08145500	N/A	SC, T	1962-65
San Saba River at San Saba	08146000	3,046	SC	1962-69, 1963-70
Colorado River near San Saba	08147000	37,217	SC, T	1947-92, 1951-62
Llano River at Llano	08151500	4,197	S	1979-81
Lake Austin at Austin	08154900	38,240	SC, T	1965-80
Waller Creek at 23rd Street at Austin	08157500	4.13	T	1955-60
Colorado River at Austin	08158000	39,009	SC, T	1948-91
Colorado River above Columbus	08160700	41,403	SC, T	1983-86
Colorado River at Columbus	08161000	41,640	SC	1967-73, 1957-59, 1961-68
Colorado River at Wharton	08162000	42,003	T	1957-73
Lavaca River near Edna	08164000	817	SC	1945-92, 1946-48,
Navidad River near Ganado	08164500	826	SC, T	1978-81
Guadalupe River near Spring Branch	08167500	1,315	SC, T	1960-80
Guadalupe River at Sattler	08167800	1,436	SC	1942-45
Blanco River at Wimberley	08171000	355	T	1984-87
Plum Creek near Luling	08173000	309	T	1977-78
Guadalupe River at Victoria	08176500	5,198	SC, T	1968-86
Coletto Creek Reservoir (Condenser No. 1) near Fannin	08177360	414	SC	1946-81, 1951-81
			T	1980-94



Station name	Station number	Drainage area (mi <sup>2</sup> )	Type of record	Period of record (water years)
Coleta Creek Reservoir (outflow) near Victoria	08177410	494	T	1980-94
San Antonio River at Loop 410 at San Antonio	08178565	119	SC, pH, T, DO	1987-88
Cibolo Creek near Falls City	08186000	827	SC, T	1969-91
Escondido Creek SWS #1 near Kenedy	08187000	3.29	S	1955-65
Guadalupe River at Tivoli	08188800	10,128	SC, T	1966-83
Mission River at Refugio	08189500	690	SC, T	1961-81
Nueces River at Cotulla	08194000	5,171	SC	1942
Nueces River near Tilden	08194500	8,093	SC, T, S	1950
Frio River at Calliham	08207000	5,491	SC, T	1968-81
Nueces River near Three Rivers	08210000	15,427	SC	1945-47,
			SC, T, pH, Cl, S	1951-52,
			SC, T	1975-81
Los Olmos Creek near Falfurrias	08212400	480	SC, T	1975-81
Rio Grande below Old Fort Quitman	08370500	31,944	SC, T	1975-78.
Rio Grande at Foster Ranch near Langtry	08377200	80,742	SC, T	1975-81
Pecos River below Red Bluff Dam near Orla	08410100	20,720	SC	1937-69,
			T	1953-69
Salt Draw near Orla	08411500	464	SC, T	1943-48
Pecos River near Mentone	08414000	21,650	SC	1939
Pecos River at Pecos	08420500	22,100	SC	1939-41
Toyah Creek near Pecos	08431000	1,024	SC	1940,
				1944
Salt Draw near Pecos	08431500	1,882	SC	1940,
				1944
Toyah Creek below Toyah Lake near Pecos	08434000	3,709	SC	1940-50,
			Cl	1940
Pecos River below Grand Falls	08441500	27,820	SC	1939-42,
				1947-56
Pecos River near Girvin	08446500	29,560	SC	1940-41,
				1947,
				1954-82
			T	1954-59,
				1964-82
Pecos River near Sheffield	08447000	31,600	SC	1940-41,
				1947
Pecos River near Langtry	08447410	35,179	SC, T	1971-76,
				1981-85
Devils River at Pafford Crossing near Comstock	08449400	3,961	SC, T	1978-85
Rio Grande at Laredo	08459000	132,578	SC	1975-86,
			T	1974-76
Rio Grande at Roma	08462500	166,464	SC	1942-43
Rio Grande at Mission Pumping Plant	08468000	171,800	SC	1945-50
Rio Grande at Cameron Co. WID #2 near San Benito	08473800	N/A	SC	1942-43
Rio Grande at Los Fresnos Pumping Plant near Brownsville	08474130	N/A	SC	1945-46
Rio Grande near Brownsville	08475000	176,333	SC	1943-44,
			SC, T	1967-83
			S	1966-83

# **WATER RESOURCES DATA—TEXAS, 1997**

## **VOLUME 3**

### **COLORADO RIVER BASIN, LAVACA RIVER BASIN, GUADALUPE RIVER BASIN, NUECES RIVER BASIN, RIO GRANDE 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 U.S. 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 and water levels and water quality of ground water wells. Volume 3 contains records for water discharge at 110 gaging stations; stage only at 1 gaging station; stage and contents at 12 lakes and reservoirs; and water quality at 53 gaging stations. Also included are data for 38 partial-record stations comprised of 9 flood-hydrograph, 17 low-flow, and 12 crest-stage stations. The data in this report represent that part of the National Water Data System collected by the U.S. Geological Survey and cooperating Federal, State, and City 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. Ground-water levels and water quality have been published in a separate volume beginning with the 1991 water year.

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 U.S. Geological Survey for all States. These official U.S. 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-97-3." 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.

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.

#### **COOPERATION**

Federal agencies that assisted the U.S. Geological Survey in the collection of data in this report in the form of funds or services in water year 1997 are:

- o Corps of Engineers, U.S. Army.
- o International Boundary and Water Commission, United States and Mexico, U.S. Section.
- o 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 U.S. Geological Survey are:

Texas Water Development Board, G.E. Kretzschmar, Executive Administrator; the cities of Abilene, Arlington, Austin, Corpus Christi, Fort Worth, Gainesville, Garland, Georgetown, Graham, Houston, Lubbock, Nacogdoches, San Angelo, and Wichita Falls; Bexar, Medina, and Atascosa Counties Water Improvement District No. 1; Barton Springs/Edwards Aquifer Conservation District; Brazos River Authority; Canadian Municipal Water Authority; Coastal Water Authority; Colorado River Municipal Water District; Dallas Public Works Department; Dallas Water Utilities; Edwards Underground Water District; Fort Bend Subsidence District; Franklin County Water District; Galveston County; Greenbelt Municipal and Industrial Water Authority; Guadalupe-Blanco River Authority; Harris-Galveston Coastal Subsidence District; Harris County Flood Control District; Houston-Galveston Area Council; Lavaca-Navidad River Authority; Lower Colorado River Authority; Lower Neches Valley Authority; North Central Texas Council of Governments; 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 River Authority; San Antonio Water System; San Jacinto River Authority; Somervell County Water District; Tarrant Regional Water District; Texas Soil & Water Conservation Board; Texas State Department of Highways & Public Transportation; Texas Natural Resources Conservation 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.

Streamflow across the State during water year 1997 generally was above normal (discharges within the upper 25 percentile of record).

Conservation storage in 77 selected reservoirs throughout the State, with a combined conservation capacity of 34,558,000 acre-feet, increased from 72 percent at the end of September 1996 to 82 percent at the end of September 1997. Records from these reservoirs indicate that storage increased in 46, decreased in 24, and remained the same in 7.

The area for which water resources data are presented in volume 3 includes the entire southwestern one-half of the State, extending from the western tip of the State to the central and lower Texas Gulf Coast. Normal annual precipitation ranges from less than 8 inches in parts of west Texas to more than 40 inches along the middle Texas Gulf Coast. Average annual runoff ranges from less than 0.1 inch in parts of west Texas to more than 10 inches in some places along the Texas Gulf Coast. The area described in volume 3 and the location of selected streamflow-gaging and water-quality stations in the area are shown in figure 1.

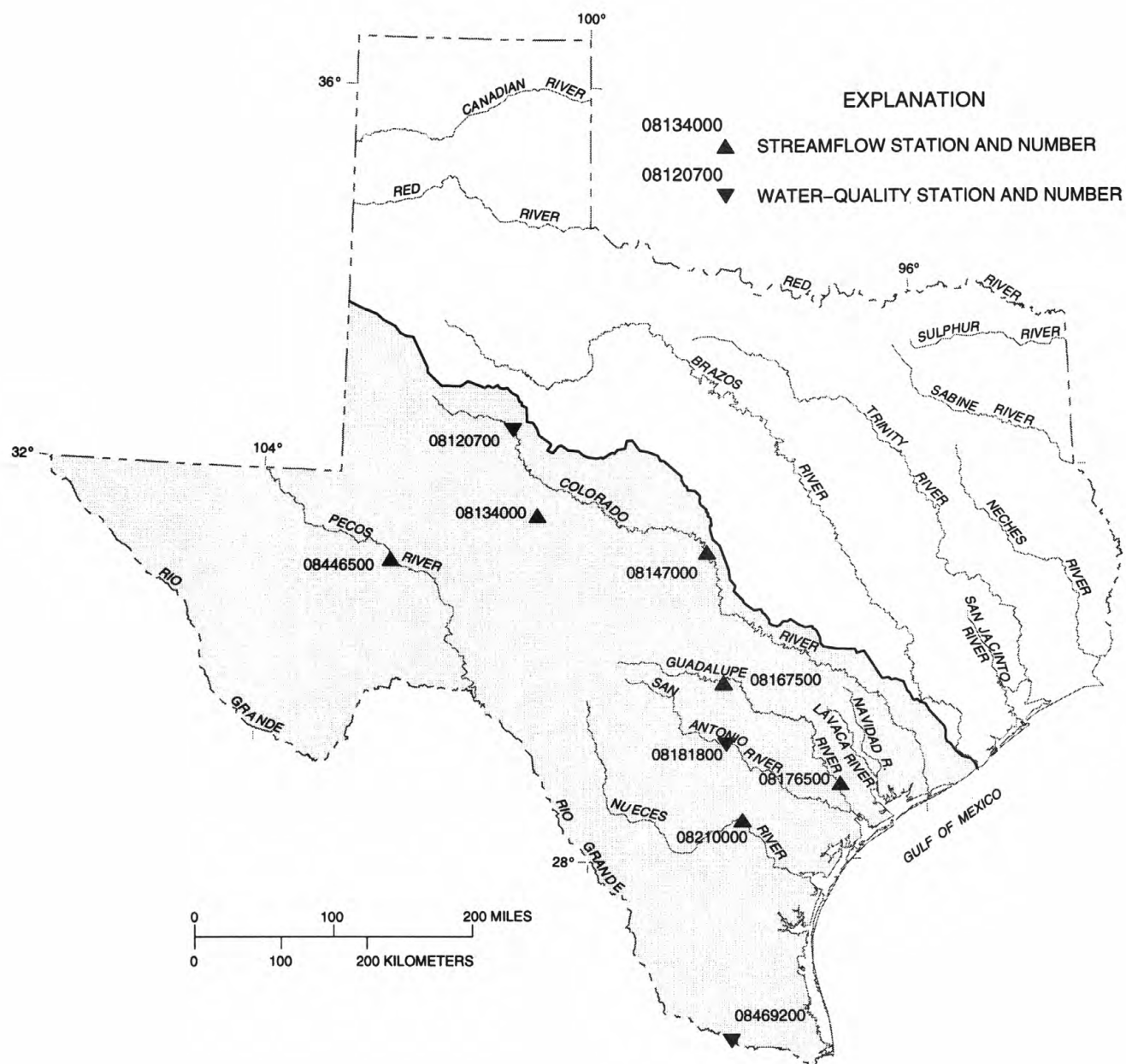
### Streamflow

Streamflow was above normal during water year 1997 in the area covered in volume 3 except for the Rio Grande Basin where streamflow was normal. Streamflow for water year 1997 and streamflow for the period of record at the six selected stations (fig. 1) for which data are included in volume 3 is presented in table 1.

At the four long-term hydrologic index stations in the State, monthly mean streamflow during water year 1997 ranged from normal to above normal. Monthly mean discharges for water year 1997 and the median of the long-term monthly means for water years 1961–90 for the four long-term hydrologic index stations in the State are shown in figure 2. Streamflow at the hydrologic index station North Concho River near Carlsbad had normal streamflow during October, May, July, August, and September, and above normal streamflow for the remaining 7 months. Streamflow for the station Guadalupe River near Spring Branch was normal from October through January, and above normal from February through July (no data available for August and September). Streamflow at the station Neches River near Rockland was normal during October, November, December, January, May, June, July, and September, and above normal for the remaining 4 months of water year 1997. The station North Bosque River near Clifton had normal streamflow during May and September, and above normal streamflow for the remaining 10 months.

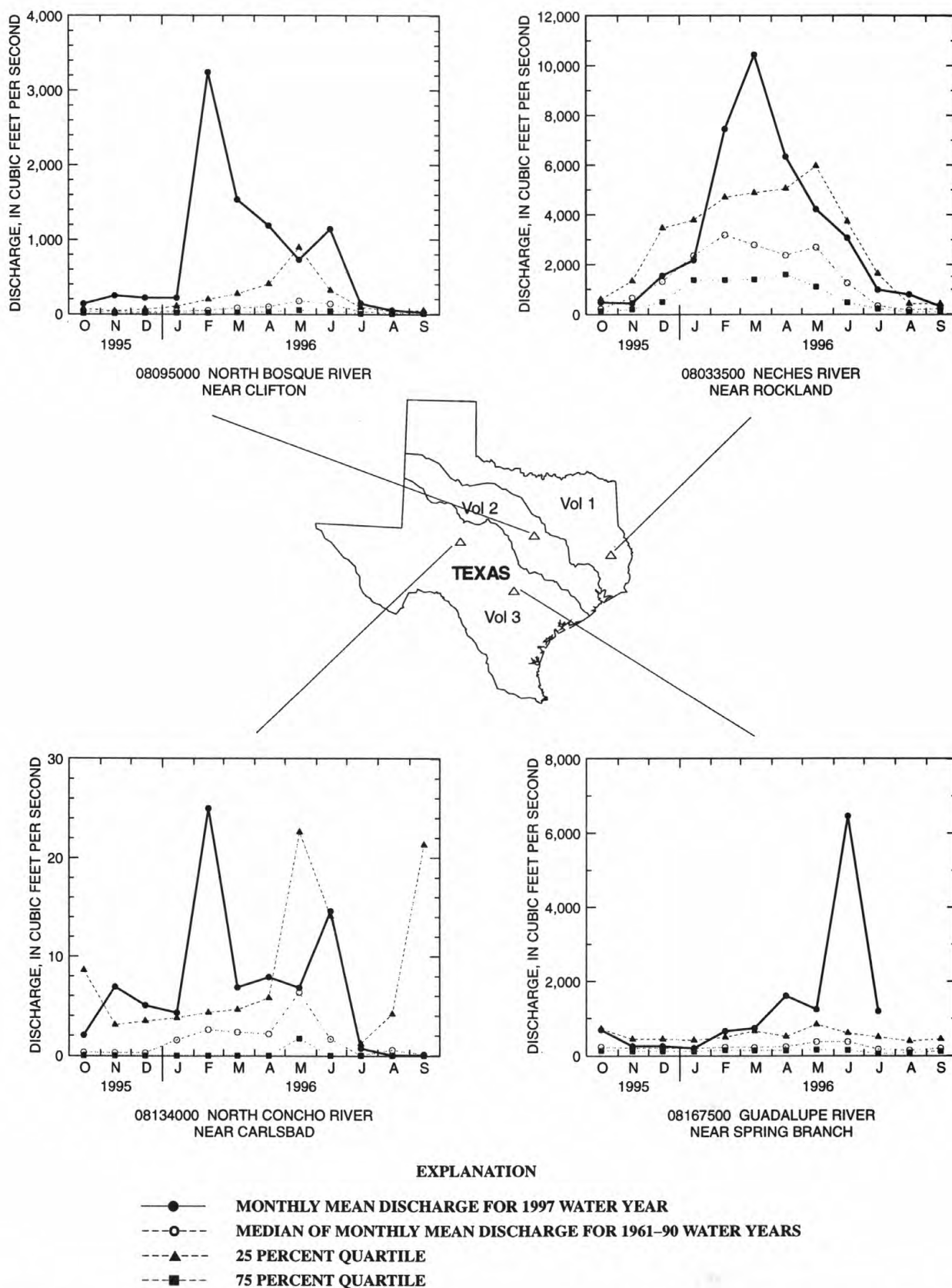
Conservation storage in 20 selected reservoirs in this area of the State, with a total combined conservation capacity of 9,206,000 acre-feet, increased from 46 percent of capacity at the end of September 1996 to 83 percent of capacity at the end of September 1997. Records from these reservoirs indicate that storage increased in 13, decreased in 6, and remained the same in 1.





**Figure 1.** Area of Texas covered by volume 3 (shaded) and location of selected streamflow and water-quality stations in volume 3.

## WATER RESOURCES DATA—TEXAS, 1997



**Figure 2.** Monthly mean discharges at four long-term hydrologic index stations during 1997 water year and median of the monthly mean discharges for 1961–90 water years.

**Water Quality**

Dissolved-solids concentrations in most streams in the State are inversely related to streamflow discharges. 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 concentrations may remain relatively con-

stant despite substantial fluctuations in precipitation and runoff.

Records of discharge-weighted-average concentrations of dissolved solids for water year 1997 are compared with those for water years 1992–97 for selected long-term daily or continuous-record water-quality stations (fig. 1) in the Colorado River, Guadalupe River, and Rio Grande Basins. Results are shown in table 2.

Table 1. Streamflow at six selected stations

Station no. and name	Discharge during 1997 water year (cubic feet per second)			Discharge during period of record (cubic feet per second)		
	Maximum instantaneous	Minimum daily mean	Mean	Maximum instantaneous	Minimum daily mean	Mean
<u>Colorado River Basin</u>						
08134000 North Concho River near Carlsbad, Tex. 1/	2,590	0	6.55	94,600	0	29.6 (1924-97)
08147000 Colorado River near San Saba, Tex.	56,400	82	1,607	224,000	0	1,063 (1931-97)
<u>Guadalupe River Basin</u>						
08167500 Guadalupe River near Spring Branch, Tex. 1/	116,000	65	1,127	160,000	0	353 (1922-97)
08176500 Guadalupe River at Victoria, Tex.	32,700	256	3,022	179,000	14	1,867 (1935-97)
<u>Nueces River Basin</u>						
08210000 Nueces River near Three Rivers, Tex.	6,450	29	460	18,300	0	713 (1946-97)
<u>Rio Grande Basin</u>						
08446500 Pecos River near Girvin, Tex.	129	9.6	24.9	20,000	1.9	74.1 (1939-97)

1/ Hydrologic index station.

Table 2.--Comparison of records of discharge-weighted-average concentrations  
of dissolved solids for the 1997 and 1993-97 water years

Station no. and name	Mean discharge (cubic feet per second)		Discharge-weighted-average concentration of dissolved solids (milligrams per liter)	
	1997	1993-97	1997	1993-97
<u>Colorado River Basin</u>				
08120700 Colorado River near Cuthbert, Tex.	30	13	1,590	1,990
<u>Guadalupe River Basin</u>				
08181800 San Antonio River near Elmendorf, Tex.	496	434	366	403
<u>Rio Grande Basin</u>				
08469200 Rio Grande below Anzalduas Dam, Tex.	985	1,060	824	809

### SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 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 human activities.

National Stream Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of the constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and remobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

Additional information about the NASQAN program is available through the world wide web at:

<http://water.usgs.gov/public/nasqan/>

The National Atmospheric Deposition Program/National Trends Network (NAPD/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO<sub>2</sub> emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO<sub>2</sub> and NO<sub>x</sub> scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

<http://nadp.nrel.colostate.edu/NAPD>

National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key federal, State, and local water resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies. There are currently two NAWQA Programs operating in Texas; the Trinity NAWQA and the South Central Texas NAWQA.

Additional information about the NAWQA Program is available through the world wide web at:

[http://www.wreres.usgs.gov/nawqa/nawqa\\_home.html](http://www.wreres.usgs.gov/nawqa/nawqa_home.html)  
<http://txwww.cr.usgs.gov/trin/index.html>  
<http://txwww.cr.usgs.gov/sctx/index.html>

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.

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.



## EXPLANATION OF THE RECORDS

The surface-water records published in this report are for the 1997 water year that began October 1, 1996, and ended September 30, 1997. 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 U.S. Geological 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 relation 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 U.S. 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 increase 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

Streamflow data in this report are presented in a format that is considerably different from the format in data reports prior to the 1991 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences.

The records published for each continuous-record surface-water discharge station (gaging station) now consists of four parts, the manuscript or station description; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly-mean flow data for a designated period, by water year; and a summary statistics table that includes statistical data of annual, daily, and instantaneous flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration.

### Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content. Comments to follow clarify information presented under the various headings of the station description.

**LOCATION.**--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station

name is given. River mileages, given for only a few stations, were determined by methods given in "River Mileage Measurement," Bulletin 14, Revision of October 1968, prepared by the Water Resources Council or were provided by the U.S. Army Corps of Engineers.

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

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

**REVISED RECORDS.**--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years 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 sea level, 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 U.S. Geological Survey by a cooperating organization are identified here.

**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.

**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.

Headings for AVERAGE DISCHARGE, EXTREMES FOR PERIOD OF RECORD, AND EXTREMES FOR CURRENT YEAR have been deleted and the information contained in these paragraphs, except for the listing of secondary instantaneous peak discharges in the EXTREMES FOR CURRENT YEAR paragraph, is now presented in the tabular summaries following the discharge table or in the REMARKS paragraph, as appropriate. No changes have been made to the data presentations of lake contents.

#### Data table of daily mean values

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 may be 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.

#### Statistics of monthly mean data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the daily mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period, expressed as "FOR WATER YEARS \_\_\_\_-\_\_\_\_, BY WATER YEAR (WY)," will list the first and last water years of the range selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

#### Summary statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS \_\_\_\_-\_\_\_\_," will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. However, data for partial water years, if any, will only be used in the statistical calculations, if appropriate. For example, all of the calculations for the statistical characteristics designated ANNUAL (See line headings below.), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript,

occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the column heading. When this occurs, it should be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff data are also given. Runoff data is omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

**ANNUAL TOTAL.**--The sum of the daily mean values of discharge for the year. At some stations the annual total discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

**ANNUAL MEAN.**--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period. At some stations the yearly mean discharge is adjusted for reservoir storage or diversion. The adjusted figures are identified by a symbol and corresponding footnotes.

**HIGHEST ANNUAL MEAN.**--The maximum annual mean discharge occurring for the designated period.

**LOWEST ANNUAL MEAN.**--The minimum annual mean discharge occurring for the designated period.

**HIGHEST DAILY MEAN.**--The maximum daily mean discharge for the year or for the designated period.

**LOWEST DAILY MEAN.**--The minimum daily mean discharge for the year or for the designated period.

**ANNUAL 7-DAY MINIMUM.**--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

**INSTANTANEOUS PEAK FLOW.**--The maximum instantaneous discharge occurring for the water year or for the designated period.

**INSTANTANEOUS PEAK STAGE.**--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.



**INSTANTANEOUS LOW FLOW.**--The minimum instantaneous discharge occurring for the water year or for the designated period.

**ANNUAL RUNOFF.**--Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

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

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

**10 PERCENT EXCEEDS.**--The discharge that has been exceeded 10 percent of the time for the designated period.

**50 PERCENT EXCEEDS.**--The discharge that has been exceeded 50 percent of the time for the designated period.

**90 PERCENT EXCEEDS.**--The discharge that has been exceeded 90 percent of the time for the designated period.

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 obtained by data logger. 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 measure-

ments 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. Records of surface-water quality at some National Stream Quality Accounting (NAWQA) Sites include data collected by different government agencies as identified in the water-quality data tables under AGENCY COLLECTING SAMPLE (CODE NUMBER). Values for this code are given below:

- 1028 - U.S. Geological Survey
- 84823 - International Boundary & Water Commission

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. Information on the method used to collect the sample at National Stream Quality Accounting Network (NASQAN) sites is given in the water-quality data tables under SAMPLING METHOD. Values for this code are given below:

- 10 - Equal Width Increment (EWI)
- 20 - Equal Discharge Increment (EDI)
- 25 - Timed Sampling Interval
- 30 - Single Vertical
- 40 - Multiple Verticals
- 50 - Point Sample
- 60 - Weighted Bottle
- 70 - Grab Sample (DIP)
- 90 - Discharge Integrated, Centroid
- 120 - Velocity Integrated
- 8010 - Other

Detailed information on sampling methods may be found in the following publications: OFR-90-127 "Guidelines for Collection and Analysis of Water-Quality Samples from Streams in Texas", OFR-94-455 "Field Guide for Collecting and Processing Stream-Water Samples for the National Water-Quality Assessment Program", and OFR-94-539 "U.S. Geological Survey protocol for the collection and processing of surface-water samples for the subsequent determination of inorganic constituents in filtered water". Specific questions pertaining to water-quality sample collection may be directed to the District Water-Quality Specialist in Austin, Texas, or the Regional Water-Quality Specialist in Denver, Colorado.

Additional information about the NASQAN program is available through the world wide web at:

<http://water.usgs.gov/public/nasqan/>

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 water-quality 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 U.S. 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 U.S. 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 (1996) 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 U.S. 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.

### Remarks Codes

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

PRINTED OUTPUT	REMARK
e or E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (Organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
&	Biological organism estimated as dominant.
V	Analyte was detected in both the environmental sample and the associated blanks.

### Dissolved Trace-Element Concentrations

**NOTE:** Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (mg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concen-



trations for a number of trace elements are within the range of 10's to 100's of nanograms per liter (ng/L). Data above the mg/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

#### Change in National Trends Network Procedures

**NOTE:** Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80523 (303-491-5643).

#### WATER QUALITY-CONTROL DATA

Data generated from quality-control (QC) samples are a requisite for evaluating the quality of the sampling and processing techniques as well as data from the actual samples themselves. Without QC data, environmental sample data cannot be adequately interpreted because the errors associated with the sample data are unknown. The various types of QC samples collected by this district are described in the following section. Procedures have been established for the storage of water-quality-control data within the USGS. These procedures allow for storage of all derived QC data and are identified so that they can be related to corresponding environmental samples.

##### Blank Samples

Blank samples are collected and analyzed to ensure that environmental samples have not been contaminated by the overall data-collection process. The blank solution used to develop specific types of blank samples is a solution that is free of the analytes of interest. Any measured value signal in a blank sample for an analyte (a specific component measured in a chemical analysis) that was absent in the blank solution is believed to be due to contamination. There are many types of blank samples possible, each designed to segregate a different part of the overall data-collection process. The types of blank samples collected in this district are:

Field blank - a blank solution that is subjected to all aspects of sample collection, field processing preservation, transportation, and laboratory handling as an environmental sample.

Trip blank - a blank solution that is put in the same type of bottle used for an environmental sample, and kept with the set of sample bottles before and after sample collection.

Equipment blank - a blank solution that is processed through all equipment used for collecting and processing an environmental sample (similar to field blank but normally done in the more controlled conditions of the office).

Sampler blank - a blank solution that is poured or pumped through the same field sampler used for collecting an environmental sample.

Filter blank - a blank solution that is filtered in the same manner and through the same filter apparatus used for an environmental sample.

Splitter blank - a blank solution that is mixed and separated using a field splitter in the same manner and through the same apparatus used for an environmental sample.

Preservation blank - a blank solution that is treated with the sample preservatives used for an environmental sample.

##### Reference Samples

Reference material is a solution or material prepared by a laboratory whose composition is certified for one or more properties so that it can be used to assess a measurement method. Samples of reference material are submitted for analysis to ensure that an analytical method is accurate for the known properties of the reference material. Generally, the selected reference material properties are similar to the environmental sample properties.

##### Replicate Samples

Replicate samples are a set of environmental samples collected in a manner such that the samples are thought to be essentially identical in composition. Replicate is the general case for which a duplicate is the special case consisting of two samples. Replicate samples are collected and analyzed to establish the amount of variability in the data contributed by some part of the collection and analytical process. There are many types of replicate samples possible, each of which may yield slightly different results in a dynamic hydrologic setting, such as a flowing stream. The types of replicate samples collected in this district are:

Sequential sample - a type of replicate sample in which the samples are collected one after the other, typically over a short time.

Split sample - a type of replicate sample in which a sample is split into subsamples contemporaneous in time and space.

### **Spike Samples**

Spike samples are samples to which known quantities of a solution with one or more well-established analyte concentrations have been added. These samples are analyzed to determine the extent of matrix interference or degradation on the analyte concentration during sample processing and analysis.

### **ACCESS TO USGS WATER DATA**

The USGS provides near real-time stage and discharge data for many of the gaging stations equipped with necessary telemetry and historic daily-mean and peak-flow discharge data for most current or discontinued gaging stations through the world wide web (WWW). These data may be accessed at

<http://txwww.water.usgs.gov>

Some water-quality and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on magnetic tape or 3-1/2 inch floppy disk. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division District Offices (See address on the back of the title page.)

### **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 or -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 or -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 or -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 or liters.

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 mm 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:

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

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.

Supplementary gage is a gage used to obtain additional data. A supplementary gage may be used in place of the principal gage if the latter is isolated or cut off from the channel, or registers only above (or below) a certain gage height. One or more supplementary gages may be used on bypass channels or overflow channels, or on streams that flow in several channels, each of which is rated independently.

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 ( $\text{CaCO}_3$ ).

Hydrologic Benchmark Network is a network of 53 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 ( $\mu\text{g/g}$ ) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

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

Milligrams per liter ( $\text{MG/L}$ ,  $\text{mg/L}$ ) 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  $\text{mg/L}$  and is based on the mass of dry sediment per liter of water-sediment mixture.

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 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objectives of NASQAN are: (1) To obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting such that the data may be used for; (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs; (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics; and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

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

Organism is any living entity.

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



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

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

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

Partial-record station is a particular site where limited stream-flow 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:

ClassificationSize (mm)Method of analysis

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

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

Sea level 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.

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 ( $\text{mg/L}$ ).

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 ( $\text{mg/L}$ )  $\times$  discharge ( $\text{ft}^3/\text{s}$ )  $\times$  0.0027.

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

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

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

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

Solute is any substance that is dissolved in water.

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

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 emerged 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 hard-board) for benthic organism collection, and plexiglass strips for periphyton collection.

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

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

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

Suspended, recoverable is the amount of a given constituent that is in solution after the part of a representative water-suspended sediment sample that is retained on a 0.45 mm mem-

brane 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 mm 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 U.S. 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, 1990, is called the "water year 1990."

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.
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- 3-A19. *Levels of streamflow gaging stations*, by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 27 p.
- 3-A20. *Simulation of soluble waste transport and buildup in surface waters using tracers*, by F.A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 p.
- 3-A21. *Stream-gaging cableways*, by C. Russell Wagner: USGS--TWRI Book 3, Chapter A21. 1995. 56 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-B4. *Supplement 1. Regression modeling of ground-water flow-Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems*, by R.L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 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-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow*, by E.J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 190 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.
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- 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.
- 6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S.A. Leake and D.E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 p.
- 6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L.J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 p.
- 6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R.L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 p.
- 6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details*, by L.J. Torak: USGS--TWRI Book 6, Chapter A5. 1993. 243 p.
- 6-A6. *A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction*, by Eric D. Swain and Eliezer J. Wexler. 1995. 125 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.

# COLORADO RIVER MAIN STEM

25

08117995 COLORADO RIVER NEAR GAIL, TX

**LOCATION.**--Lat 32°37'43", long 101°17'06", Borden County, Hydrologic Unit 12080002, near right downstream end of bridge on FM 1205, 5.0 mi north of junction with FM 1785, 14 mi northwest of Vincent, 25 mi west of Ira, and 13 mi southeast of Gail.

**DRAINAGE AREA.**--498 mi<sup>2</sup>.

**PERIOD OF RECORD.**--March 1988 to current year.

**GAGE.**--Water-stage recorder. Elevation of gage is 2,240 ft above sea level, from topographic map.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation or diversions. One observation of water temperature was made during the year. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 600 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 9	1415	982	11.63				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.00	.00	5.7	.00	.00	e.00	.00	1.3	8.7	.00	.00	.00
2	e.00	.00	1.5	.00	.00	e.00	.00	.19	1.3	.00	.00	.00
3	e.00	.00	.41	.00	.00	e.00	.00	.00	.07	.00	.00	.00
4	e.00	.00	.15	.00	.00	e.00	5.5	.00	.00	.00	.00	.00
5	e.00	.00	.04	.00	.00	e.00	20	.00	.00	.00	.00	.00
6	e.00	.00	.00	.00	.00	e.00	3.4	.00	.00	.00	.00	.00
7	e.00	.00	.00	.00	.00	e.00	.62	.00	11	.00	.00	.00
8	e.00	.00	.00	.00	.00	e.00	.09	.00	257	.00	.00	.00
9	.00	.00	.00	.00	.00	e.00	.00	45	853	.00	.00	.00
10	.00	.00	.00	.00	.00	e.00	.00	75	346	.00	.00	.00
11	.00	.00	.00	.00	.00	e.00	30	103	119	.46	.00	.00
12	.00	.00	.00	.00	.00	e.00	10	30	67	.00	.00	.00
13	.00	.00	.00	.00	.00	e.00	5.0	29	12	31	.00	.00
14	.00	.00	.00	.00	.00	e.00	.81	17	61	11	.00	.00
15	.00	.00	.00	.00	.00	e.00	.11	9.5	104	2.5	.00	.00
16	8.8	.00	.00	.00	.00	e.00	.00	3.5	40	.43	.00	.00
17	.09	.00	.00	.00	.00	e.00	.00	.95	49	.04	.00	.00
18	.00	.00	.00	.00	.00	e.00	.00	.22	11	.00	.00	.00
19	.00	.00	.00	.00	.00	e.00	.00	.02	5.1	.00	.00	.00
20	.00	.00	.00	.00	e75	.00	.00	.00	2.4	.00	.00	.00
21	.00	.00	.00	.00	e200	.00	.00	.00	.99	.00	6.1	.00
22	.00	.00	.00	.00	e80	.00	.00	.00	4.6	.00	1.0	.00
23	.00	.00	.00	.00	e20	.00	.00	.00	45	.00	5.1	.00
24	.00	59	.00	.00	e5.0	.00	.00	11	12	.00	4.6	.00
25	.00	11	.00	.00	1.4	.00	1.7	12	5.0	.00	.10	.00
26	.00	2.1	.00	.00	.94	.00	3.5	2.7	2.3	.00	.00	.00
27	.00	.36	.00	.00	e.03	.00	30	.20	1.1	.00	.00	.00
28	.00	1.1	.00	.00	e.00	.00	55	.00	.71	.00	.00	.00
29	.00	31	.00	.00	---	.00	10	.00	.41	.00	.00	.00
30	.00	33	.00	.00	---	.00	6.1	.00	.06	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	5.7	---	.00	.00	---
TOTAL	8.89	137.56	7.80	0.00	382.37	0.00	181.83	346.28	2019.74	45.43	16.90	0.00
MEAN	.29	4.59	.25	.000	13.7	.000	6.06	11.2	67.3	1.47	.55	.000
MAX	8.8	59	5.7	.00	200	.00	55	103	853	31	6.1	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	18	273	15	.00	758	.00	361	687	4010	90	34	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1997, BY WATER YEAR (WY)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	1.79	1.49	2.16	1.87	4.57	2.32	6.69	39.3	39.7	13.2
MAX	10.6	4.71	15.6	8.42	23.8	10.0	51.5	263	166	107
(WY)	1992	1992	1992	1992	1992	1990	1990	1992	1992	1988
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1990	1990	1990	1995	1991	1991	1991	1993	1990	1994

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1988 - 1997

ANNUAL TOTAL	1097.19	3146.80	
ANNUAL MEAN	3.00	8.62	11.2
HIGHEST ANNUAL MEAN			46.2
LOWEST ANNUAL MEAN			1.89
HIGHEST DAILY MEAN	233	853	2060
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		982	4010
INSTANTANEOUS PEAK STAGE		11.63	m16.43
ANNUAL RUNOFF (AC-FT)	2180	6240	8080
10 PERCENT EXCEEDS	.50	10	8.2
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated  
m Result of earthen dam.

## COLORADO RIVER MAIN STEM

08120700 COLORADO RIVER NEAR CUTHBERT, TX

**LOCATION.**--Lat 32°28'38", long 100°56'58", Mitchell County, Hydrologic Unit 12080002, on left bank at downstream side of bridge on Farm Road 1808, 4.0 mi downstream from Deep Creek, 4.8 mi east of Cuthbert, 8.0 mi northwest of Colorado City, and at mile 810.0.

**DRAINAGE AREA.**--3,912 mi<sup>2</sup>, of which 2,381 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--March 1965 to current year.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 2,073.49 ft above sea level.

**REMARKS.**--Records good except those below 10 ft<sup>3</sup>/s after June 10, which are fair. Since installation of gage in March 1965, at least 10% of contributing drainage area has been regulated by Lake J. B. Thomas (capacity, 203,600 acre-ft), 27 mi upstream. There are numerous diversions from Lake J. B. Thomas for municipal use and for oil field operations. No flow at times. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Floods in 1941 and 1946 reached a stage of 36.1 ft, from State Department of Highways and Public Transportation bridge plans.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	1.9	40	5.1	3.9	8.3	6.0	18	4.2	6.8	.03	.08
2	3.0	1.8	18	4.9	3.4	7.8	6.8	14	4.7	5.9	.03	.11
3	2.7	1.6	11	5.1	2.9	6.8	12	12	3.5	5.1	.02	.13
4	2.3	1.2	8.2	5.1	2.5	6.3	36	11	2.4	4.4	.02	.07
5	2.4	1.0	7.1	4.8	2.5	6.0	27	9.7	1.9	10	.11	.05
6	2.5	1.5	6.4	4.5	4.7	5.5	14	9.2	62	5.1	.12	.04
7	2.5	84	5.8	4.7	8.1	5.0	9.0	8.8	78	4.0	.07	.01
8	2.3	29	5.3	5.0	7.4	5.2	7.8	9.0	332	3.6	.27	.01
9	2.1	9.3	5.0	4.8	5.9	5.8	7.7	12	1480	9.2	.28	.00
10	1.8	5.9	5.2	4.8	5.4	5.6	8.0	76	1470	6.4	.23	.00
11	1.4	3.8	5.3	5.0	5.7	5.4	34	89	812	9.8	.24	.00
12	1.1	3.0	5.4	4.9	6.7	5.6	105	51	174	12	.10	.00
13	1.1	2.4	5.5	4.7	8.4	6.0	71	42	53	4.7	.04	8.5
14	.95	2.2	5.5	4.7	9.8	5.6	23	23	56	3.5	.02	5.8
15	.80	1.9	5.2	4.9	7.7	4.9	14	108	580	2.8	.01	1.2
16	.69	2.0	4.6	4.8	6.4	4.4	18	48	600	2.1	.00	.53
17	.64	2.1	4.4	4.5	5.9	4.6	127	23	421	1.7	.00	.26
18	.59	2.0	4.7	4.5	5.5	5.0	26	14	73	1.5	.09	.16
19	.59	1.9	5.3	4.5	5.4	4.5	16	9.6	35	1.0	6.4	.27
20	.59	1.9	5.0	4.3	275	4.3	19	7.8	22	.63	6.4	.27
21	.54	1.9	5.0	4.2	541	4.1	13	6.9	102	.47	1.8	.24
22	.69	1.9	4.8	4.0	159	3.9	9.7	6.5	24	.35	.99	.33
23	.74	1.8	4.7	3.8	39	3.9	8.2	6.7	75	.23	.71	.35
24	.74	192	4.7	3.6	20	4.9	7.8	7.3	28	.24	.55	.27
25	.98	172	4.6	3.1	15	5.4	15	22	21	.24	.39	.31
26	1.2	38	4.2	3.0	13	4.6	96	9.6	13	.15	.25	.18
27	1.2	17	4.2	3.5	11	4.8	112	13	11	.07	.21	.10
28	1.3	9.9	4.4	3.4	9.7	4.9	69	10	11	.07	.33	.06
29	2.0	28	4.7	3.4	---	4.9	44	6.6	9.7	.06	.27	.02
30	2.0	63	5.0	3.4	---	4.9	26	5.3	8.2	.04	.18	.01
31	1.9	---	5.1	3.7	---	5.0	---	4.3	---	.02	.11	---
TOTAL	46.64	685.9	214.3	134.7	1190.9	163.9	988.0	693.3	6567.6	102.17	20.27	19.36
MEAN	1.50	22.9	6.91	4.35	42.5	5.29	32.9	22.4	219	3.30	.65	.65
MAX	3.3	192	40	5.1	541	8.3	127	108	1480	12	6.4	8.5
MIN	.54	1.0	4.2	3.0	2.5	3.9	6.0	4.3	1.9	.02	.00	.00
AC-FT	93	1360	425	267	2360	325	1960	1380	13030	203	40	38

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1997#, BY WATER YEAR (WY)

	MEAN	30.0	8.52	8.29	7.50	11.7	10.6	29.8	77.2	80.1	17.4	59.0	52.4
MAX	304	37.1	51.5	30.2	86.5	66.0	204	403	592	131	771	810	
(WY)	1987	1985	1992	1992	1992	1973	1981	1965	1982	1988	1971	1980	
MIN	.000	.092	.53	.68	.82	.20	.39	.044	.000	.000	.000	.000	
(WY)	1969	1971	1971	1971	1971	1971	1971	1967	1984	1970	1970	1983	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1965 - 1997#

ANNUAL TOTAL	3871.18	10827.04	
ANNUAL MEAN	10.6	29.7	32.2
HIGHEST ANNUAL MEAN			104
LOWEST ANNUAL MEAN			4.15
HIGHEST DAILY MEAN	517	1480	8770
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.01	.00
INSTANTANEOUS PEAK FLOW		1600	11500
INSTANTANEOUS PEAK STAGE		14.55	27.18
ANNUAL RUNOFF (AC-FT)	7680	21480	23290
10 PERCENT EXCEEDS	9.4	39	27
50 PERCENT EXCEEDS	2.3	4.8	4.3
90 PERCENT EXCEEDS	.00	.14	.01

# Period of regulated streamflow.



# COLORADO RIVER MAIN STEM

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08120700 COLORADO RIVER NEAR CUTHBERT, TX--Continued

## WATER-QUALITY RECORDS

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

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: March 1965 to current year.

WATER TEMPERATURE: March 1965 to May 1980, April 1983 to current year.

**INSTRUMENTATION.**--From March 1965 to October 1987, specific conductance was recorded continuously at this station. From April 1983 to October 1987, water temperature was recorded continuously at this station. Since October 1989, specific conductance and water temperature are continuously recorded at this station.

**REMARKS.**--Estimated mean specific conductance and temperature values and interruptions in the maximum and minimum specific conductance values were due to malfunction of the instrument. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 70,000 microsiemens Nov. 17, 1968; minimum, 102 microsiemens Sept. 28, 1980.

WATER TEMPERATURE: Maximum, 36.0°C Aug. 7, 1985; minimum, 0.0°C on many days during winter months.

### EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 13,100 microsiemens Oct. 25; minimum observed, 273 microsiemens June 9.

WATER TEMPERATURE: Maximum, 33.5°C July 30, Aug. 1; minimum, 0.0°C several days.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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 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)	SODIUM, DIS- SOLVED (MG/L AS NA)
OCT 09...	0810	2.0	8540	17.5	1200	1000	300	119	1370
DEC 09...	1520	4.6	5250	11.5	840	650	210	78	776
FEB 13...	1020	8.7	6480	4.5	1100	830	240	109	1080
APR 16...	0800	9.8	2900	16.0	530	380	130	52	421
JUN 09...	1530	1500	310	19.0	98	19	31	4.9	17
13...	1050	55	4420	25.0	670	470	170	58	662

DATE	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 CONSTITU- ENTS, DIS- SOLVED (MG/L)
OCT 09...	17	10	230	640	2500	0.41	5.1	5100
DEC 09...	12	8.1	190	460	1400	0.40	3.2	3040
FEB 13...	14	9.3	220	790	1700	0.85	8.8	4110
APR 16...	8	6.5	150	370	680	0.59	1.4	1760
JUN 09...	0.8	6.6	79	29	23	0.23	6.2	166
13...	11	9.0	200	400	1100	0.40	15	2540

## COLORADO RIVER MAIN STEM

08120700 COLORADO RIVER NEAR CUTHBERT, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	46.64	9460	6150	775	2800	347	1100	138	1400
NOV. 1996	685.9	3130	1950	3600	660	1220	490	900	620
DEC. 1996	214.3	4830	3050	1760	1100	659	690	400	880
JAN. 1997	134.7	6960	4440	1620	1800	647	930	338	1200
FEB. 1997	1190.9	2750	1720	5540	600	1940	420	1340	530
MAR. 1997	163.9	5330	3360	1490	1200	552	770	340	980
APR. 1997	988	3220	2000	5340	680	1810	500	1340	640
MAY 1997	693.3	3650	2270	4260	780	1460	560	1050	720
JUNE 1997	6567.6	1850	1150	20410	380	6810	290	5180	370
JULY 1997	102.17	7330	4690	1300	1900	531	950	263	1200
AUG. 1997	20.27	6420	4110	225	1700	91.6	840	46.1	1100
SEPT 1997	19.36	3780	2360	123	820	43.1	570	30.1	730
TOTAL	10827.04	**	**	46440	**	16120	**	11360	**
WTD.AVG.	30	2540	1590	**	550	**	390	**	500

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	9230	8880	9090	6870	5970	6380	2750	1440	1930	6370	6300	6330
2	8890	8500	8650	6100	5930	6010	3680	2750	3330	6370	6240	6310
3	8720	8460	8550	6350	6060	6170	3900	3640	3760	6360	6280	6320
4	8860	8460	8630	6350	6180	6320	4030	3900	3980	6530	6300	6430
5	9430	8860	9070	6350	5980	6200	4200	3400	4090	6670	6530	6600
6	9480	9130	9350	6360	5950	6220	4640	4200	4380	6860	6670	6780
7	9310	8870	9110	6780	1280	4280	4940	4300	4740	7010	6860	6910
8	8880	8480	8650	3230	1120	2160	5070	4730	4980	7080	6950	7030
9	8690	8400	8570	4800	3230	4040	5330	5080	5200	6990	6620	6800
10	9470	8690	9090	5350	4760	4950	5780	5330	5570	6690	6610	6650
11	10200	9470	9800	5390	4560	4950	5820	5630	5750	6680	6630	6650
12	11200	10000	10600	8310	5180	7350	5740	5620	5650	6660	6590	6630
13	11600	11200	11400	8230	6860	7480	5780	5640	5700	6720	6650	6670
14	11800	11600	11700	7830	6770	7080	5910	5670	5790	6870	6680	6790
15	12000	11800	11900	9010	7830	8450	6070	5870	5970	6900	6820	6850
16	12200	11900	12100	9180	8850	9090	6550	6060	6280	6850	6770	6800
17	11900	11200	11500	8850	8180	8470	6710	6550	6660	6870	6760	6790
18	11200	11100	11100	8180	6680	7380	6930	6700	6820	6910	6860	6890
19	11400	11100	11200	6980	6680	6930	7220	6930	7100	6960	6890	6910
20	11700	11300	11500	6890	6520	6650	7040	6180	6500	7110	6960	7030
21	11900	11600	11800	6610	6520	6560	7170	6340	6920	7250	7100	7200
22	12000	11600	11800	6660	6530	6620	7040	6220	6570	7240	7120	7180
23	12400	11900	12200	6710	5490	6500	6580	6170	6360	7680	7230	7510
24	12800	12400	12600	5540	1010	3320	6810	6530	6700	7830	7680	7760
25	13100	12600	12800	3570	671	1910	6770	6410	6630	7800	7700	7770
26	12600	10300	11200	3610	2440	2770	6440	6270	6360	7900	7760	7820
27	10400	9740	10100	2860	2560	2730	6880	6430	6690	8050	7790	7920
28	9780	7760	8330	3670	2530	3120	7000	6880	6940	8380	8050	8230
29	7930	7020	7290	4810	3370	3650	6980	6840	6910	8380	7760	8140
30	8060	7110	7610	4810	1010	2300	6920	6570	6770	7760	7040	7330
31	8190	6870	7570	---	---	---	6570	6310	6400	7050	6830	6980
MONTH	13100	6870	10200	9180	671	5530	7220	1440	5720	8380	6240	7030

# COLORADO RIVER MAIN STEM

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## 08120700 COLORADO RIVER NEAR CUTHBERT, TX--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	7640	7050	7330	5040	4910	4990	6020	5670	5790	3010	2600	2840
2	7640	6920	7460	5060	4920	4980	6200	5760	5990	3400	3010	3210
3	7750	7440	7610	5170	4970	5030	6280	5590	6100	3620	3400	3510
4	7750	7290	7500	5210	5110	5150	5650	5100	5430	3750	3600	3660
5	7350	7130	7260	5240	5140	5190	5490	5100	5260	3940	3750	3850
6	7240	7080	7120	5260	5140	5200	5490	4900	5150	4010	3850	3940
7	7360	7240	7320	5340	5240	5290	5320	4660	4870	4300	4000	4140
8	7310	6980	7160	5440	5230	5350	5570	5100	5390	4360	4290	4310
9	6980	6500	6730	5290	5130	5230	5230	4810	5090	4580	4210	4370
10	6500	6270	6380	5160	4990	5050	4810	4110	4510	4260	2590	3260
11	6610	6280	6430	5100	4900	4980	4110	2990	3860	6220	3140	4380
12	6640	6560	6600	5320	4990	5190	4300	2420	3210	3870	2010	2400
13	6710	6500	6590	5960	5230	5410	3610	2530	2820	2340	2040	2200
14	7160	6710	6980	5640	5300	5410	2930	2090	2550	3950	2210	2410
15	7310	7090	7200	5430	5350	5380	2520	1880	2120	4600	2830	3610
16	7210	7060	7110	5480	5390	5430	---	---	2800	4460	2860	3750
17	7690	7210	7460	5690	5480	5600	---	---	e2000	4490	3350	3840
18	7650	7420	7540	5650	5510	5570	---	---	e3000	3350	2920	3060
19	7420	7000	7150	5540	5380	5460	---	---	e3500	---	---	4300
20	7000	968	4550	5470	5360	5390	---	---	e3500	---	---	e4500
21	1540	658	1080	5500	5420	5450	---	---	e4000	---	---	e5000
22	2460	925	1580	5500	5370	5440	---	---	4150	---	---	e5500
23	3670	2460	3120	5670	5390	5470	4350	4210	4300	---	---	e5500
24	4290	3670	4000	5690	5540	5620	4540	4350	4450	---	---	e5000
25	4580	4290	4430	5590	5340	5440	4820	4100	4460	---	---	e4500
26	4750	4540	4660	5340	5000	5190	4150	2140	3230	---	---	e5000
27	4870	4700	4780	5340	5090	5200	2890	1810	2400	---	---	e4500
28	4950	4830	4900	5730	5210	5490	3650	2310	2760	---	---	e4000
29	---	---	---	5810	5600	5750	3680	2370	3080	---	---	e4500
30	---	---	---	5930	5720	5830	2600	2290	2390	---	---	e4500
31	---	---	---	6020	5900	5970	---	---	---	---	---	e5000
MONTH	7750	658	6000	6020	4900	5360	6280	1810	3940	6220	2010	4020

e Estimated

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	---	---	e5500	6810	6520	6670	10700	10400	10600	5790	5650	5740
2	---	---	e5000	7250	5510	6460	10900	10600	10800	5830	5710	5770
3	---	---	e5500	6690	6060	6460	11100	10800	11000	7300	5820	5950
4	---	---	e6000	6810	6550	6700	11300	10800	11100	6050	5920	5980
5	---	---	e6000	10400	6500	7910	11300	10900	11200	6140	6040	6100
6	---	---	e5000	10600	8010	9790	11400	11100	11300	6200	6110	6160
7	---	---	e4500	9090	7360	7890	11500	11200	11300	6310	6190	6250
8	---	---	e3500	9100	7360	8270	11600	11300	11500	6360	6260	6320
9	---	273	600	7370	4880	6350	11600	11200	11500	---	---	---
10	---	---	e450	10000	4750	6060	11600	11000	11400	---	---	---
11	---	---	e750	6740	5470	5830	11700	11000	11200	---	---	---
12	---	---	e1500	8900	6740	8230	11100	10800	11000	---	---	---
13	---	---	4000	10200	8900	9650	11000	10600	10800	8560	3080	4870
14	9470	5130	5880	9300	7670	8450	10800	10500	10700	3080	2400	2720
15	7980	2660	3940	7710	6090	7140	10800	10500	10700	2500	2400	2450
16	3450	2300	2900	6720	5990	6340	10800	10700	10800	2530	2360	2460
17	3670	2010	2580	6530	6050	6280	---	---	---	2510	1870	2230
18	5600	3670	4890	7460	6530	7020	10800	4820	10300	1940	1880	1920
19	6430	5370	5950	7840	7450	7670	9250	3850	6990	2080	1920	1990
20	7980	6430	6830	8150	7840	8000	7680	2130	3350	2190	2080	2140
21	7320	2830	4410	8230	8000	8100	8310	7680	8160	2260	2190	2240
22	5440	3540	4620	8540	8230	8380	10900	8310	8710	5060	2250	2940
23	6350	3700	4930	8810	8520	8650	10100	9270	9730	5170	4840	5040
24	4760	4370	4520	9240	8770	9020	9280	6650	8130	5150	3240	4060
25	4830	4240	4470	9550	9170	9370	6650	6200	6440	3650	3490	3560
26	5390	4550	5040	9870	9550	9680	6240	6100	6180	3620	3480	3550
27	6110	5390	5780	10200	9780	9950	6160	5950	6080	3640	3490	3570
28	6450	6040	6270	10400	10100	10200	6060	5800	5930	3650	3520	3590
29	6790	6440	6600	10600	10200	10400	5830	5620	5710	3700	3560	3640
30	6730	6470	6590	10500	10100	10300	5660	5540	5620	3710	3570	3650
31	---	---	---	10600	10300	10500	5750	5630	5680	---	---	---
MONTH	9470	273	4480	10600	4750	8120	11700	2130	9130	8560	1870	4030
YEAR	13100	273	6160									

e Estimated

## COLORADO RIVER MAIN STEM

08120700 COLORADO RIVER NEAR CUTHBERT, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	22.0	16.0	19.0	15.0	12.5	13.5	8.5	6.5	7.5	13.0	9.5	11.0
2	23.5	17.5	20.5	14.0	10.0	12.0	9.0	6.0	7.5	13.5	9.0	11.0
3	21.5	18.0	19.5	14.5	11.5	13.0	9.0	6.0	7.5	15.0	11.0	12.5
4	20.5	19.0	20.0	16.0	12.5	14.0	10.0	6.5	8.0	15.0	12.0	13.5
5	22.0	18.5	20.0	16.5	12.0	14.5	10.0	6.5	8.5	12.0	7.5	10.0
6	22.5	19.0	20.5	18.0	15.5	16.5	11.0	7.5	9.0	7.5	4.0	6.0
7	24.0	18.5	21.0	16.0	11.5	13.5	11.5	8.0	9.5	5.0	3.0	4.0
8	23.0	19.5	21.0	12.5	9.5	11.0	11.0	7.0	9.0	4.0	2.5	3.5
9	23.0	17.5	20.0	13.0	9.0	11.0	11.5	7.5	9.5	6.0	2.0	3.5
10	23.0	18.0	20.5	13.5	9.0	11.0	13.0	8.5	10.5	4.0	2.5	3.5
11	23.0	18.5	20.5	14.5	9.5	12.0	13.5	9.5	11.5	2.5	1.0	2.0
12	23.5	19.0	21.0	15.0	11.0	13.0	13.0	9.5	11.0	1.0	.0	.5
13	23.5	19.0	21.0	16.5	12.5	14.5	12.0	8.0	10.0	.5	.0	.0
14	23.0	19.0	21.0	17.5	14.0	15.5	13.0	8.5	10.5	.5	.0	.0
15	23.0	18.5	20.5	17.5	16.0	16.5	11.0	6.5	8.0	2.5	.0	1.0
16	23.5	19.5	21.5	18.5	16.5	17.5	7.5	3.5	5.5	3.5	.0	1.5
17	22.0	18.5	20.5	16.5	12.5	14.0	5.5	2.5	4.0	4.0	1.0	2.5
18	19.5	15.0	17.0	15.5	11.0	13.0	3.0	.5	1.5	5.0	.5	3.0
19	17.5	14.0	15.5	16.0	11.5	13.5	3.0	.0	1.0	5.0	1.5	3.5
20	20.5	15.5	17.5	16.0	12.0	14.0	3.5	.0	1.5	9.0	3.5	6.0
21	18.5	14.0	17.0	14.0	12.5	13.0	5.5	1.5	3.5	12.0	7.5	9.5
22	15.5	11.5	13.5	12.5	11.5	12.0	7.5	2.5	5.0	11.5	7.0	9.5
23	15.0	10.5	13.0	16.0	12.0	14.0	9.0	5.5	7.0	12.0	8.0	10.0
24	16.5	12.0	14.0	13.5	7.0	9.5	7.0	4.0	5.5	12.0	8.0	10.0
25	17.5	13.0	15.0	7.0	5.0	5.5	5.5	2.5	4.5	11.5	7.0	9.0
26	18.0	14.5	16.5	6.5	4.0	5.5	7.5	4.0	5.5	12.5	9.0	10.5
27	18.0	15.0	17.0	6.0	5.0	5.5	8.0	3.0	5.5	12.0	7.5	10.5
28	15.0	13.5	14.0	6.5	6.0	6.5	9.0	5.0	7.0	8.0	4.5	6.0
29	17.0	14.0	15.0	9.5	6.5	8.0	9.5	5.5	7.5	7.0	3.0	5.0
30	16.0	12.0	14.0	9.5	7.5	8.5	10.0	5.5	7.5	8.0	3.0	5.0
31	16.5	14.5	15.5	---	---	---	10.5	7.5	9.0	10.5	4.5	7.0
MONTH	24.0	10.5	18.0	18.5	4.0	12.0	13.5	.0	7.0	15.0	.0	6.0

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	11.5	6.0	8.5	15.0	10.5	12.5	18.5	13.0	15.0	24.0	18.0	20.5
2	12.0	7.5	9.5	15.5	11.0	13.0	20.0	15.5	17.5	25.0	19.5	22.0
3	13.0	8.5	10.5	16.5	10.5	13.0	18.5	17.0	17.5	23.5	17.0	20.0
4	12.0	8.0	10.0	18.0	12.0	14.5	17.0	15.5	16.5	24.0	18.0	20.5
5	9.5	7.5	8.0	16.0	11.0	13.5	18.0	13.0	15.5	26.5	19.5	22.5
6	7.5	7.0	7.0	15.0	9.5	12.0	20.0	14.0	16.5	28.5	21.5	24.5
7	7.5	6.0	7.0	17.0	11.0	13.5	19.5	15.0	17.0	27.0	22.5	25.0
8	7.5	5.0	6.0	17.0	14.5	15.5	21.5	16.0	18.0	28.0	22.5	25.5
9	5.5	5.0	5.5	17.0	14.0	15.5	16.0	12.0	12.5	26.0	20.0	22.0
10	10.0	5.0	7.0	17.5	12.5	14.5	15.5	12.0	13.5	22.5	18.5	20.5
11	8.5	6.0	7.0	17.0	13.5	15.0	15.5	11.5	13.0	23.0	19.0	21.0
12	8.0	5.0	7.0	18.0	15.0	16.0	12.0	9.0	10.5	22.0	19.0	20.0
13	5.0	4.5	5.0	21.0	15.0	17.5	14.0	9.0	11.0	23.0	17.0	20.0
14	9.0	4.0	6.0	17.5	12.5	14.5	16.0	10.0	13.0	26.0	20.0	23.0
15	11.0	5.0	7.5	15.0	9.5	12.5	19.5	13.0	16.0	23.5	19.5	21.0
16	12.0	6.0	8.5	13.5	11.5	12.5	22.5	e15.5	18.5	25.5	19.0	22.0
17	13.5	7.0	10.0	19.5	12.5	15.5	17.5	10.0	13.5	27.5	21.5	24.5
18	15.0	9.5	12.0	20.0	15.5	17.5	16.5	15.5	16.0	28.5	22.5	25.5
19	15.5	12.5	13.5	19.0	12.5	15.5	22.0	15.5	18.0	26.0	19.5	23.5
20	14.0	11.0	12.0	20.0	12.0	16.0	23.5	17.5	20.5	23.0	18.0	20.5
21	11.0	9.5	10.5	21.5	13.5	17.0	23.5	19.0	21.0	21.5	20.5	21.0
22	10.5	8.0	9.5	20.0	14.0	17.0	23.0	18.0	20.5	26.0	20.0	22.0
23	11.0	8.5	9.5	20.5	13.5	17.0	22.5	18.5	20.5	27.5	21.5	24.0
24	10.0	8.0	9.0	21.5	15.5	18.5	22.5	17.5	19.5	29.5	22.0	25.0
25	8.0	6.0	7.0	19.5	14.5	16.5	19.5	13.5	15.5	28.5	23.5	26.0
26	10.0	6.0	7.5	16.0	11.5	14.0	14.0	12.5	13.5	30.0	23.0	26.0
27	10.0	7.5	8.5	19.0	12.5	15.5	13.5	12.0	12.5	28.5	23.0	25.5
28	12.5	8.0	10.5	20.5	13.5	17.0	17.5	11.0	14.0	28.5	22.5	25.0
29	---	---	---	21.0	14.5	18.0	21.0	14.5	18.0	29.5	22.0	25.5
30	---	---	---	18.5	13.0	15.5	22.0	17.5	20.0	29.5	24.0	26.5
31	---	---	---	16.0	12.5	13.5	---	---	---	28.5	23.0	25.5
MONTH	15.5	4.0	8.5	21.5	9.5	15.0	23.5	9.0	16.0	30.0	17.0	23.0

e Estimated





## COLORADO RIVER MAIN STEM

08121000 COLORADO RIVER AT COLORADO CITY, TX

**LOCATION.**--Lat 32°23'33", long 100°52'42", Mitchell County, Hydrologic Unit 12080002, on right bank at Colorado City, 3,517 ft upstream from bridge on State Highway 377, 4,100 ft upstream from the Texas and Pacific Railroad Company bridge, 1.3 mi downstream from bridge on Interstate Highway 20 and U.S. Highway 80, 1.6 mi upstream from Lone Wolf Creek, and at mile 796.3.

**DRAINAGE AREA.**--3,966 mi<sup>2</sup>, of which 2,381 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--November 1923 to August 1925 (published as "at Colorado"), May 1946 to current year.

**REVISED RECORDS.**--WSP 1512: 1946(M). WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 2,030.16 ft above sea level. Nov. 28, 1923, to Aug. 31, 1925, nonrecording gage at site 1.4 mi downstream at different datum. May 9 to Aug. 5, 1946, nonrecording gage at site 185 ft upstream at present datum.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. Since July 1952 at least 10% of contributing drainage area has been regulated by Lake J. B. Thomas (capacity, 203,600 acre-ft) 31 mi upstream. The Colorado River Municipal Water District diverts low flow into an off channel reservoir 3 mi upstream for brine disposal. There are numerous diversions from Lake J. B. Thomas for municipal use and for oil field operations. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--6 years (water years 1947-52) prior to completion of Lake J.B. Thomas, 85.4 ft<sup>3</sup>/s (61,870 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS, 1947-52).**--Maximum discharge, 24,900 ft<sup>3</sup>/s July 6, 1948 (gage height, 22.37 ft, from floodmark); no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1910, 35.9 ft June 20, 1939, present site and datum, based on floodmarks 1,000 ft upstream and 3,740 ft downstream from gage; discharge, 66,000 ft<sup>3</sup>/s, by slope-area measurement of peak flow at site 2.5 mi upstream from gage.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	.13	11	.61	.40	.62	.62	46	5.3	5.6	.37	.06
2	.17	.11	8.7	.46	.34	.93	1.6	5.1	9.0	1.7	.30	.06
3	.17	.11	28	.47	.41	.61	3.1	5.5	2.4	3.8	.28	.06
4	.26	.08	17	.40	.41	7.3	13	6.8	3.0	2.8	.22	.08
5	.28	.09	2.5	.28	.35	13	7.7	5.1	2.3	2.2	.26	.08
6	.23	.18	3.2	.49	.62	12	1.1	2.4	36	1.9	.62	.08
7	.21	.52	.95	.45	.59	12	1.6	2.8	40	2.1	.94	.07
8	.18	55	.36	.53	.45	12	2.9	3.6	215	1.9	.59	.07
9	.18	.43	.32	.54	.38	12	2.1	21	807	1.2	.48	.06
10	.18	.08	.22	.43	.45	11	3.5	2.6	1440	.95	.56	.07
11	.17	.06	.22	.39	.42	12	4.4	58	1250	1.8	.57	.10
12	.17	.06	.19	.25	.88	12	41	208	566	1.5	.43	.08
13	.19	.06	.21	.24	.71	2.2	151	142	146	1.5	.24	.07
14	.19	.08	.28	.35	.62	.46	96	110	67	2.4	e.25	.06
15	.20	.09	.21	.43	.57	.33	7.6	72	290	5.3	.24	.07
16	.20	.09	.20	.27	.50	2.9	4.2	231	616	2.6	.24	.05
17	.18	.06	.23	.23	.50	1.8	158	123	555	1.3	.24	.05
18	.14	.07	.16	.24	.54	1.1	154	66	253	.59	.24	.04
19	.18	.07	.21	.27	.61	.49	51	45	103	.49	1.4	.06
20	.22	.07	.31	.33	223	1.5	28	28	69	.34	.53	.04
21	.20	.07	.42	.40	589	1.1	30	23	104	.51	.18	.04
22	.31	.09	.48	.32	485	.56	18	20	87	.94	.16	11
23	.26	.19	.43	.28	176	.81	13	2.6	87	.58	.14	1.9
24	.26	15	.25	.33	80	.82	10	10	95	.42	.11	.19
25	.24	344	.32	.32	34	.99	42	8.0	3.3	.32	.11	.14
26	.20	201	.43	.41	1.5	.99	101	2.1	1.6	.36	.11	.13
27	.56	76	.38	.42	.72	.99	212	5.8	1.5	.44	.10	.12
28	.92	26	.40	.29	.84	.84	204	5.0	4.6	1.0	.10	.11
29	.29	3.2	.32	.31	---	.60	152	15	5.7	.85	.10	.09
30	.14	24	.34	.33	---	.40	91	4.0	6.8	.55	.07	.10
31	.14	---	.47	.38	---	.36	---	6.8	---	.40	.06	---
TOTAL	7.38	746.99	78.71	11.45	1599.81	124.70	1605.42	1286.2	6871.5	48.34	10.24	15.13
MEAN	.24	24.9	2.54	.37	57.1	4.02	53.5	41.5	229	1.56	.33	.50
MAX	.92	344	.28	.61	589	.13	212	231	1440	5.6	1.4	.11
MIN	.14	.06	.16	.23	.34	.33	.62	2.1	1.5	.32	.06	.04
AC-FT	15	1480	156	23	3170	247	3180	2550	13630	96	20	30

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1997#, BY WATER YEAR (WY)

	MEAN	38.6	7.84	5.90	4.59	10.6	7.83	38.2	104	82.6	21.5	41.7	60.2
MAX	339	61.1	49.6	33.6	99.0	88.3	332	1048	745	197	684	817	
(WY)	1987	1985	1992	1992	1957	1973	1957	1957	1982	1961	1971	1962	
MIN	.000	.000	.026	.051	.061	.000	.010	.001	.000	.000	.000	.000	
(WY)	1969	1956	1955	1971	1971	1956	1955	1970	1953	1974	1954	1954	

## SUMMARY STATISTICS

## FOR 1997 WATER YEAR

## WATER YEARS 1953 - 1997#

ANNUAL TOTAL	12405.87		
ANNUAL MEAN	34.0		
HIGHEST ANNUAL MEAN		35.6	
LOWEST ANNUAL MEAN		143	1957
HIGHEST DAILY MEAN	1440	.41	1970
LOWEST DAILY MEAN	.04	9560	May 25 1957
ANNUAL SEVEN-DAY MINIMUM	.05	.00	Oct 4 1952
INSTANTANEOUS PEAK FLOW	1510	.00	Oct 4 1952
INSTANTANEOUS PEAK STAGE	14.05	27.81	May 25 1957
ANNUAL RUNOFF (AC-FT)	24610	25790	Sep 29 1980
10 PERCENT EXCEEDS	78	26	
50 PERCENT EXCEEDS	.54	.62	
90 PERCENT EXCEEDS	.09	.00	

e Estimated

# Period of regulated streamflow.

# COLORADO RIVER MAIN STEM

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08121000 COLORADO RIVER AT COLORADO CITY, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: May 1946 to September 1954, November 1956 to current year.

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: May 1946 to September 1954, November 1956 to current year.

WATER TEMPERATURE: November 1952 to September 1954, November 1956 to current year.

**INSTRUMENTATION.**--From 1969 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 U.S. Geological Survey District Office upon request.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 67,400 microsiemens May 14, 17, 1961; minimum daily, 240 microsiemens Sept. 29, 1980.

WATER TEMPERATURE: Maximum daily, 39.0°C July 21, 1995; minimum daily, 0.0°C on many days during winter months.

### EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum estimated daily, 26,400 microsiemens Feb. 6; minimum daily, 420 microsiemens June 11.

WATER TEMPERATURE: Maximum daily, 34.5°C Aug. 1, 21; minimum daily, 0.0°C Dec. 19, Jan. 13, 14.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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 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)	SODIUM, DIS- SOLVED (MG/L AS NA)
OCT 08...	1525	0.29	10400	24.0	1000	850	220	112	1940
DEC 09...	1640	0.40	6770	14.5	760	600	170	81	1190
FEB 13...	1150	0.58	22900	5.5	1800	1700	440	184	4890
APR 15...	1540	12	6100	15.5	820	680	190	83	1040
JUN 09...	1645	974	639	20.5	150	50	43	11	61
AUG 07...	1005	0.92	10900	23.5	1200	1000	250	144	2060

DATE	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 SIO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT 08...	27	9.1	150	1200	2800	0.63	2.1	6420
DEC 09...	19	6.9	160	830	1700	0.52	0.88	4040
FEB 13...	50	13	180	2000	7800	0.41	1.9	15400
APR 15...	16	8.2	150	700	1600	0.54	6.1	3720
JUN 09...	2	8.0	100	80	85	0.34	6.4	355
AUG 07...	26	12	200	1600	2700	0.84	13	6840

## COLORADO RIVER MAIN STEM

## 08121000 COLORADO RIVER AT COLORADO CITY, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	7.38	13150	8440	168	3600	71.6	1700	33.4	1500
NOV. 1996	746.99	2650	1650	3330	610	1230	420	857	360
DEC. 1996	78.71	4700	2950	627	1100	238	720	153	610
JAN. 1997	11.45	19590	12810	396	5900	183	2100	64.0	1900
FEB. 1997	1599.81	2830	1770	7640	660	2850	450	1930	380
MAR. 1997	124.7	8680	5500	1850	2200	740	1200	417	1100
APR. 1997	1605.42	4610	2890	12540	1100	4760	710	3070	600
MAY 1997	1286.2	3540	2220	7700	820	2860	560	1950	470
JUNE 1997	6871.5	1220	763	14150	280	5140	200	3710	170
JULY 1997	48.34	11600	7420	969	3100	405	1500	199	1300
AUG. 1997	10.24	14480	9330	258	4000	112	1800	49.0	1600
SEPT 1997	15.13	17500	11360	464	5100	207	2000	81.9	1800
TOTAL	12405.87	**	**	50110	**	18800	**	12510	**
WTD.AVG.	34	2390	1500	**	560	**	370	**	320

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9750	e18800	e5000	13100	25300	7640	13900	4450	e9500	8160	11400	20300
2	9930	e19200	5260	13400	25000	7230	15800	e4850	9340	8400	11400	20000
3	10100	e19600	3800	13700	25100	8110	12300	e5200	9540	e9000	11300	20000
4	e10200	20100	3530	13900	25200	8400	e8000	e5600	9370	9740	11300	20000
5	e10300	20600	4190	14300	25900	8720	e9000	5980	e6900	10400	11200	e20300
6	e10300	20700	4850	16700	e26400	7960	e10000	6200	2460	10900	11200	e20500
7	10400	e15100	5390	17100	e26100	e8050	10600	6550	3210	11500	11800	e20700
8	10500	5000	5890	16600	e25900	e8100	10600	e4500	3450	11800	e12300	20900
9	10600	6990	6770	16800	e25600	e8200	12000	2500	1600	11800	e12800	20800
10	e10700	7140	7160	e17500	25300	8270	10500	5160	452	11800	e13300	20900
11	e10900	7360	7540	e18300	24700	8340	8690	1230	420	12500	13800	e21200
12	e11000	7600	7930	e19000	23800	8430	11100	3110	770	12300	14200	21500
13	e11200	7890	e8150	19800	23700	8370	5390	4770	e950	13200	14300	21600
14	e11300	8100	e8350	20000	23900	8250	7880	4020	e1000	14600	e14400	21400
15	11400	e8200	e8550	20500	24600	8360	6200	3490	e1100	18100	14400	21300
16	11700	e8300	e8750	21500	25100	9000	6020	e2500	1200	14000	14100	21300
17	12000	e8400	8970	22600	25200	11100	3750	e3000	838	e12000	13800	e21300
18	e12300	8510	9310	22400	25100	11300	e3500	e3200	1100	10400	14000	e21200
19	e12600	8490	9480	22500	25300	10800	e4000	3400	e3000	9980	16000	e21100
20	e12800	8500	9660	22400	4000	11100	e4200	3940	5000	e10000	20300	e21300
21	13000	8500	9930	22200	e2000	e11600	4120	4670	5290	e10000	20500	e21400
22	13400	8480	e10100	e22700	e2500	e12100	4990	5070	3750	e10000	e20600	17300
23	13900	8530	e10300	23200	e3000	e12600	5310	5500	2940	e9900	e20600	15200
24	14400	5070	e10400	e23500	3590	13100	e5000	5000	4050	e10000	e20700	15800
25	15000	e2100	e10600	e23900	4770	11400	4670	3460	3750	e10000	20700	e17100
26	15200	e1770	e10800	e24200	5610	11400	5300	3720	4860	e10000	20700	20300
27	15500	e3600	e10900	24500	6290	12300	4480	4950	e6000	e10000	20800	21600
28	16300	4440	e11100	24700	7220	13100	3180	5530	e7100	9800	e20600	22500
29	17700	e5000	e11300	24300	---	14400	3090	9000	e8000	11100	20300	23100
30	18100	e4500	11500	24600	---	14500	3410	e10000	9380	11400	20000	22400
31	18400	---	12600	25100	---	15000	---	e9500	---	e11400	20000	---
MEAN	12600	9550	8320	20200	18400	10200	7230	4840	4210	11100	15900	20500

e Estimated



## COLORADO RIVER MAIN STEM

08121000 COLORADO RIVER AT COLORADO CITY, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.0	---	---	11.5	14.5	12.5	14.0	22.5	---	26.5	34.5	22.5
2	17.0	---	7.0	12.5	7.5	12.0	17.5	---	23.5	26.0	28.5	24.0
3	19.5	---	7.5	19.0	7.5	10.0	17.0	---	26.0	---	26.5	24.0
4	---	13.0	7.5	14.0	7.0	14.0	---	---	23.0	25.5	25.5	28.5
5	---	14.0	7.5	8.5	7.0	11.0	---	19.0	---	25.5	26.5	---
6	---	18.5	13.5	5.0	---	14.0	---	21.5	21.0	24.0	25.5	---
7	17.5	---	9.0	3.0	---	---	14.0	22.0	21.0	31.5	22.5	---
8	18.0	13.5	6.5	2.5	---	---	18.0	---	22.0	32.0	---	22.5
9	18.0	10.0	7.0	9.0	---	---	11.5	19.5	19.5	27.0	---	24.5
10	---	9.5	12.0	---	6.0	13.0	13.0	17.0	19.5	28.5	---	22.5
11	---	16.0	11.5	---	6.5	15.0	12.0	19.5	21.0	28.5	26.5	---
12	---	13.0	14.5	---	7.0	16.0	8.0	18.5	25.5	27.0	26.5	30.5
13	---	13.5	---	.0	7.0	17.0	11.0	18.0	---	27.0	25.5	24.0
14	---	19.0	---	.0	13.0	15.0	12.0	20.5	---	26.5	---	25.0
15	18.5	---	---	1.5	6.0	11.0	14.0	25.0	---	26.5	34.0	23.0
16	18.5	---	---	1.5	8.0	11.5	16.0	---	24.0	25.0	27.5	24.0
17	21.0	---	2.5	6.5	8.0	14.0	16.5	---	24.0	---	28.0	---
18	---	10.5	.5	2.0	11.5	17.0	---	---	24.0	32.0	26.5	---
19	---	13.5	.0	4.0	13.5	11.0	---	24.0	---	27.5	25.5	---
20	---	11.5	5.5	13.0	---	21.0	---	18.5	27.5	---	25.0	---
21	16.5	11.0	4.5	10.5	---	---	19.0	20.0	25.5	---	34.5	---
22	11.0	12.0	---	---	---	---	19.0	26.0	24.5	---	---	21.5
23	9.5	14.5	---	14.5	---	---	19.5	27.0	23.0	---	---	21.5
24	13.0	5.0	---	---	9.5	16.0	---	21.5	24.0	---	---	19.0
25	18.0	---	---	---	6.5	13.0	14.0	23.5	23.5	---	23.0	---
26	13.5	---	---	---	6.0	11.0	12.5	21.0	28.0	---	24.5	28.0
27	19.0	---	---	11.5	5.5	14.0	12.0	24.0	---	---	24.5	19.0
28	12.5	6.0	---	3.0	15.0	23.0	14.0	21.0	---	26.0	---	21.0
29	14.5	---	---	1.5	---	17.0	19.0	26.5	---	26.5	32.5	19.0
30	10.5	---	4.5	2.0	---	13.0	18.0	---	26.0	26.0	25.0	20.0
31	20.0	---	10.5	14.0	---	12.0	---	---	---	---	24.0	---
MEAN	16.0	12.5	7.5	7.0	8.5	14.0	15.0	21.5	23.5	27.5	27.0	23.0

## 08123000 LAKE COLORADO CITY NEAR COLORADO CITY, TX

**LOCATION.**--Lat 32°20'41", long 100°55'10", Mitchell County, Hydrologic Unit 12080002, on left bank at municipal water- intake structure, 1.7 mi upstream from Colorado City Dam on Morgan Creek, 2.2 mi downstream from the Texas and Pacific Railway Co. bridge, 2.5 mi upstream from mouth, and 4.0 mi southwest of Colorado City.

**DRAINAGE AREA.**--344.7 mi<sup>2</sup>, of which 42.7 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--April 1949 to current year.

Water-quality records.--Chemical analyses: October 1969 to September 1984.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is sea level. Prior to Aug. 23, 1950, non-recording gages at or near powerplant about 0.7 mi downstream at same datum.

**REMARKS.**--Records good. The lake is formed by a rolled earthfill dam 4,800 ft long. Storage began in April 1949, and the dam was completed in September 1949. The dam and lake are owned by the Texas Electric Service Co. to operate their thermal electric powerplant. The uncontrolled spillway is an excavated cut channel through natural ground 1,200 ft wide located 600 ft upstream and to the left of left end of dam. The spillway is designed to discharge 150,000 ft<sup>3</sup>/s at the maximum design flood elevation. The service spillway is an uncontrolled rectangular drop inlet located 100 ft upstream from dam with two uncontrolled openings of 10.0 by 12.0 ft. The spillway is designed for a maximum discharge of 5,000 ft<sup>3</sup>/s. A service outlet is provided for small releases downstream through a 30-inch valve-controlled concrete pipe. Records furnished by the Texas Electric Service Co. will show pumpage from Champion Creek Reservoir (station 08123600), into Lake Colorado City. Satellite 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 .....	2,090.0	-
Design flood .....	2,086.7	70,700
Crest of spillway .....	2,073.7	37,860
Crest of service spillway (top of conservation pool) .....	2,070.2	31,810
Lowest gated outlet (invert) .....	2,024.3	327

**COOPERATION.**--Capacity curve was furnished by the Texas Electric Service Co. Record of diversions for municipal use can be obtained from the city of Colorado City.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 40,280 acre-ft Sept. 7, 1962 (elevation, 2,075.10 ft); minimum since first appreciable storage, 5,800 acre-ft Apr. 11-13, 1950 (elevation, 2,045.72 ft).

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 21,370 acre-ft June 29 at 0530 hours (elevation, 2,062.86 ft); minimum, 17,960 acre-ft Feb. 18 (elevation, 2,059.98 ft).

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

2,045.0	5,530	2,060.0	17,980	2,070.0	31,480
2,050.0	8,740	2,064.0	22,820	2,073.0	36,570
2,055.0	12,880	2,067.0	26,930	2,076.0	42,350

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18770	18910	18910	18480	18030	19260	18700	18490	18150	21310	20830	20880
2	18770	18890	18900	18470	18030	19260	18700	18440	18110	21260	20830	20880
3	18770	18880	18890	18460	18010	19260	18760	18410	18090	21220	20810	20860
4	18810	18870	18890	18440	17990	19240	18760	18380	18090	21220	20800	20860
5	18820	18850	18860	18420	18010	19180	18720	18360	18110	21170	20790	20860
6	18850	18940	18850	18390	18040	19160	18690	18320	18330	21170	20790	20840
7	18890	18900	18840	18360	18030	19140	18660	18310	18530	21220	20860	20840
8	18880	18880	18820	18360	18010	19140	18630	18330	18900	21170	20860	20840
9	18880	18880	18810	18360	18010	19130	18610	18370	19550	21120	20880	20810
10	18880	18870	18800	18320	17990	19110	18600	18340	20100	21100	20880	20810
11	18890	18860	18780	18290	17990	19120	18580	18360	20400	21100	20880	20800
12	18890	18850	18770	18270	18020	19110	18570	18380	20420	21080	20860	20790
13	18890	18840	18770	18240	18010	19100	18550	18380	20410	21080	20860	20780
14	18900	18810	18740	18240	18010	19050	18530	18340	20610	21080	20850	20780
15	18900	18790	18710	18230	18000	19020	18520	18340	20630	21070	20830	20780
16	18900	18790	18680	18220	18000	19010	18500	18330	20800	21070	20840	20750
17	18890	18760	18630	18210	17980	19010	18500	18300	20840	21050	20830	20750
18	18890	18760	18600	18200	17980	18970	18530	18280	20810	21040	20930	20730
19	18880	18740	18580	18200	18010	18960	18520	18240	20790	21010	20940	20700
20	18890	18720	18570	18200	18650	18960	18490	18220	21200	21010	20950	20690
21	18920	18700	18560	18200	19120	18950	18470	18210	21270	21000	20960	20670
22	18930	18690	18560	18190	19250	18890	18450	18230	21260	20970	20970	20810
23	18940	18730	18540	18160	19260	18880	18410	18250	21230	20950	20970	20800
24	18960	18790	18520	18150	19270	18860	18380	18220	21220	20940	20970	20800
25	18960	18820	18500	18140	19300	18840	18460	18190	21220	20910	20970	20790
26	18980	18790	18490	18130	19290	18850	18500	18140	21240	20900	20960	20800
27	19010	18780	18490	18110	19260	18800	18530	18130	21270	20890	20950	20800
28	19020	18860	18480	18080	19290	18790	18530	18130	21270	20880	20940	20780
29	18980	18890	18460	18060	---	18740	18530	18120	21330	20850	20930	20790
30	18970	18910	18460	18060	---	18720	18500	18130	21290	20840	20910	20790
31	18950	---	18480	18040	---	18710	---	18150	---	20830	20900	---
MAX	19020	18940	18910	18480	19300	19260	18760	18490	21330	21310	20970	20880
MIN	18770	18690	18460	18040	17980	18710	18380	18120	18090	20830	20790	20670
(+)	2060.85	2060.82	2060.44	2060.05	2061.14	2060.64	2060.46	2060.15	2062.80	2062.42	2062.48	2062.39
(@)	+200	-40	-430	-440	+1250	-580	-210	-350	+3140	-460	+70	-110

CAL YR 1996 MAX 21200 MIN 16950 (@) -2730  
WTR YR 1997 MAX 21330 MIN 17980 (@) +2040

(+) Elevation, in feet, at end of month.  
(@) Change in contents, in acre-feet.

## 08123600 CHAMPION CREEK RESERVOIR NEAR COLORADO CITY, TX

**LOCATION.**--Lat 32°16'53", long 100°51'30", Mitchell County, Hydrologic Unit 12080002, 50 ft downstream from service outlet structure at Champion Creek Dam on Champion Creek, 1.0 mi upstream from mouth, 4.8 mi downstream from State Highway 208, and 7.2 mi south of Colorado City.

**DRAINAGE AREA.**--206.8 mi<sup>2</sup>, of which 20.8 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--October 1959 to September 1987, May 1997 to September 1997.

**REVISED RECORDS.**--WRD TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is sea level. Prior to Sept. 29, 1959, non-recording gages at same site and datum.

**REMARKS.**--Records good. The reservoir is formed by a rolled earthfill dam about 6,800 ft long. The dam was completed on Apr. 30, 1959. Closure and storage began in February 1959. The capacity curve is based on U.S. Geological Survey topographic map surveyed in 1950: excavation for borrow, estimated not to exceed 1,200 acre-ft, is not included. The dam and reservoir are owned and operated by the Texas Electric Service Company. Water may be pumped from the reservoir through a 24-inch pipeline to Lake Colorado City (station 08123000) for municipal use and for cooling operations of a steam generating powerplant. There are two spillways. The uncontrolled emergency spillway, 450 ft wide and 800 ft long, is located at the right end of dam. The controlled service spillway, is a cut channel 50 ft wide, about 1,800 ft long, and 8 ft deep, and cut into the emergency spillway at the extreme right end. There is a controlled drop-inlet structure, 4.0 by 5.0 ft, with a side opening of 1.5 by 3.0 ft. Satellite 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-ft)
Top of dam .....	2,109.0	-
Design flood .....	2,104.0	90,020
Crest of spillway .....	2,091.0	56,750
Crest of spillway (top of conservation pool) .....	2,083.0	42,500
Lowest gated outlet (invert) .....	2,020.0	882

**COOPERATION.**--Record of diversions into Lake Colorado City may be obtained from Texas Electric Service Co.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 47,060 acre-ft June 29, 1982 (elevation, 2,085.79 ft); minimum, 1,600 acre-ft Oct. 1, 1959 (elevation, 2,025.90 ft).

**EXTREMES FOR CURRENT YEAR.**--Maximum contents during period May to September, 25,910 acre-ft June 24 at 0645 hours (elevation, 2,070.14 ft); minimum, 20,750 acre-ft Sept. 30 (elevation, 2,064.90 ft).

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

2,025.0	1,470	2,055.0	12,860	2,070.0	25,760
2,035.0	3,500	2,060.0	16,560	2,075.0	31,440
2,045.0	7,160	2,065.0	20,840	2,086.0	47,390

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	21980	25710	23920	22140
2	---	---	---	---	---	---	---	---	21970	25700	23850	22080
3	---	---	---	---	---	---	---	---	21930	25660	23790	22030
4	---	---	---	---	---	---	---	---	21890	25600	23710	21970
5	---	---	---	---	---	---	---	---	21810	25500	23650	21910
6	---	---	---	---	---	---	---	---	22170	25460	23610	21860
7	---	---	---	---	---	---	---	---	22260	25440	23650	21800
8	---	---	---	---	---	---	---	---	23030	25430	23580	21740
9	---	---	---	---	---	---	---	---	24350	25420	23520	21680
10	---	---	---	---	---	---	---	---	24450	25410	23470	21620
11	---	---	---	---	---	---	---	---	24480	25390	23410	21550
12	---	---	---	---	---	---	---	---	24510	25310	23350	21620
13	---	---	---	---	---	---	---	---	24510	25250	23280	21550
14	---	---	---	---	---	---	---	---	24570	25190	23210	21510
15	---	---	---	---	---	---	---	---	25590	25130	23140	21450
16	---	---	---	---	---	---	---	---	25680	25050	23080	21390
17	---	---	---	---	---	---	---	---	25700	24990	23010	21340
18	---	---	---	---	---	---	---	---	25700	24910	23010	21270
19	---	---	---	---	---	---	---	---	25700	24830	22980	21220
20	---	---	---	---	---	---	---	---	25710	24770	22920	21150
21	---	---	---	---	---	---	---	---	25770	24690	22860	21080
22	---	---	---	---	---	---	---	---	25800	24630	22790	21150
23	---	---	---	---	---	---	---	---	25870	24570	22730	21130
24	---	---	---	---	---	---	---	---	25890	24490	22660	21080
25	---	---	---	---	---	---	---	---	25850	24410	22610	21020
26	---	---	---	---	---	---	---	---	25810	24340	22530	20970
27	---	---	---	---	---	---	---	---	25760	24270	22470	20920
28	---	---	---	---	---	---	---	22190	25740	24200	22390	20870
29	---	---	---	---	---	---	---	22130	25730	24140	22330	20800
30	---	---	---	---	---	---	---	22100	25720	24070	22260	20750
31	---	---	---	---	---	---	---	22030	---	24000	22200	---
MEAN	---	---	---	---	---	---	---	22110	24530	24970	23100	21420
MAX	---	---	---	---	---	---	---	22190	25890	25710	23920	22140
MIN	---	---	---	---	---	---	---	22030	21810	24000	22200	20750
(+)								2066.27	2069.96	2068.29	2066.45	2064.90
(@)									+3690	-1720	-1800	-1450

WTR YR 1997 MAX 25890 MIN 20750

(+) Elevation, in feet, at end of month.  
(@) Change in contents, in acre-feet.

## COLORADO RIVER BASIN

08123800 BEALS CREEK NEAR WESTBROOK, TX

**LOCATION.**--Lat 32°11'57", long 101°00'49", Mitchell County, Hydrologic Unit 12080007, on left bank at downstream side of bridge on State Highway 163, 2.1 mi downstream from Hackberry Creek, 10.8 mi south of Westbrook, 15.7 mi southwest of Colorado City, and 19.1 mi upstream from mouth.

**DRAINAGE AREA.**--9,802 mi<sup>2</sup>, of which 7,814 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1958 to current year.

**REVISED RECORDS.**--WRD TX-72-1: 1971. WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 2,048.74 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation. Low flow is affected by diversion upstream from station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1908, about 24.5 ft in 1922, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 900 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 21	0230	1,360	11.37	June 9	1515	1,110	10.13
June 7	0845	1,020	9.61				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.71	.12	7.7	.23	.15	3.2	.35	3.1	.53	3.2	.01	.02
2	.56	.12	2.7	.26	.13	3.4	.43	1.9	.48	1.4	12	.02
3	.31	.13	1.2	.30	.15	2.6	.56	1.1	.40	.70	19	.01
4	.34	.13	.82	.26	.11	2.2	2.3	.76	.36	.40	1.7	.02
5	.24	.13	.56	.16	.10	1.6	5.9	.76	.33	.25	.33	.02
6	.32	.22	.42	.16	.17	1.1	2.3	.76	138	.18	.11	.01
7	.28	64	.32	.16	.14	1.0	.96	.73	790	.19	.11	.01
8	.89	7.5	.26	.16	.08	1.1	.57	.70	154	.17	.07	.01
9	.25	1.6	.25	.17	.08	1.7	.30	1.8	749	.16	.04	.01
10	.17	.71	.20	.16	.09	1.1	.34	5.9	123	.11	.03	.01
11	.14	.40	.15	.13	.09	1.1	1.9	6.2	18	.11	.02	.01
12	.13	.26	.15	.09	.38	1.2	8.6	68	7.2	.10	1.9	.01
13	.12	.17	.14	.06	.21	1.2	2.9	32	4.1	.06	.38	.01
14	.11	.14	.18	.05	.11	.80	1.2	9.5	6.5	.04	.13	.01
15	.11	.11	.12	.07	.09	.59	.66	101	417	.03	.16	.01
16	.12	.09	.13	.07	.09	.62	4.7	8.2	232	.03	.07	.01
17	.10	.06	.10	.07	.09	.73	23	3.5	30	.02	.03	.01
18	.06	.10	.08	.09	.09	.60	1.7	2.5	21	.02	1.6	.01
19	.09	.14	.10	.10	.09	.45	4.5	1.9	14	.02	6.9	.01
20	.11	.15	.13	.14	529	.48	2.8	1.9	9.6	.02	8.1	.01
21	.09	.11	.16	.16	668	.51	1.7	1.6	12	.02	.60	.01
22	.10	.13	.21	.13	45	.38	1.2	1.6	13	.01	7.0	.01
23	.07	.35	.21	.15	14	.29	.74	1.6	11	.01	126	.01
24	.12	108	.14	.14	7.0	.32	.44	1.6	3.9	.01	52	.01
25	.14	32	.15	.13	5.1	.30	149	1.6	2.1	.01	8.7	.01
26	.12	7.6	.17	.17	4.8	.25	129	1.4	1.3	.01	2.2	.01
27	.39	2.6	.20	.13	5.3	.28	93	1.4	11	.01	.66	.01
28	.85	3.7	.21	.08	4.1	.34	24	1.0	103	.01	.19	.01
29	.27	117	.17	.09	---	.45	8.9	.84	29	.01	.10	.01
30	.15	48	.18	.11	---	.28	4.5	.74	8.4	.01	.05	.01
31	.16	---	.21	.13	---	.23	---	.61	---	.01	.03	---
TOTAL	7.62	395.77	17.72	4.31	1284.74	30.40	478.45	266.20	2910.20	7.33	250.22	0.34
MEAN	.25	13.2	.57	.14	45.9	.98	15.9	8.59	97.0	.24	8.07	.011
MAX	.89	117	7.7	.30	668	3.4	149	101	790	3.2	126	.02
MIN	.06	.06	.08	.05	.08	.23	.30	.61	.33	.01	.01	.01
AC-FT	15	785	35	8.5	2550	60	949	528	5770	15	496	.7

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1997, BY WATER YEAR (WY)

	MEAN	41.7	6.37	5.59	5.30	9.08	7.22	20.1	61.1	43.4	26.5	18.5	65.8
MAX	572	29.4	49.2	47.0	94.9	75.6	256	334	254	258	168	680	
(WY)	1987	1987	1992	1987	1992	1973	1966	1994	1987	1961	1971	1980	
MIN	.000	.060	.048	.073	.068	.046	.074	.14	.020	.000	.005	.011	
(WY)	1964	1990	1996	1996	1996	1996	1986	1962	1990	1964	1970	1997	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1959 - 1997

ANNUAL TOTAL	5372.25	5653.30	25.9
ANNUAL MEAN	14.7	15.5	107
HIGHEST ANNUAL MEAN			4.30
LOWEST ANNUAL MEAN			1987
HIGHEST DAILY MEAN	1070	790	5890
LOWEST DAILY MEAN	.00	.01	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.01	.00
INSTANTANEOUS PEAK FLOW		1360	8780
INSTANTANEOUS PEAK STAGE		11.37	21.94
ANNUAL RUNOFF (AC-FT)	10660	11210	18780
10 PERCENT EXCEEDS	7.6	11	26
50 PERCENT EXCEEDS	.08	.26	2.3
90 PERCENT EXCEEDS	.01	.01	.04



# COLORADO RIVER BASIN

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08123800 BEALS CREEK NEAR WESTBROOK, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: November 1958 to current year. Chemical and biochemical analyses: October 1974 to October 1977.  
Sediment analyses: October 1974 to October 1977.

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: November 1958 to current year.

WATER TEMPERATURE: November 1958 to current year.

**INSTRUMENTATION.**--Since March 5, 1981, specific conductance and water temperature are recorded continuously at this station.

**REMARKS.**--Estimated mean specific conductance and estimated mean temperature values and interruptions in the maximum and minimum specific conductance and temperature values were due to malfunction of the instrument. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 24,500 microsiemens Aug. 9, 1989; minimum, 162 microsiemens Aug. 23, 1997.

WATER TEMPERATURE: Maximum, 37.0°C June 28, 1960, and July 3, 1976; minimum, 0.0°C on many days during winter months.

### EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 19,800 microsiemens Apr. 12; minimum, 162 microsiemens Aug. 23.

WATER TEMPERATURE: Maximum, 34.5°C July 2; minimum, 3.0°C Jan. 14.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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 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)	SODIUM, DIS- SOLVED (MG/L AS NA)
OCT									
08...	1325	0.56	4610	20.5	940	770	190	116	604
DEC									
09...	1418	0.27	4950	13.5	1000	830	180	131	653
FEB									
24...	1310	6.5	4440	9.0	930	800	160	128	616
MAR									
28...	1050	0.25	12000	17.5	2300	2100	390	328	1740
JUN									
11...	0900	20	2800	22.5	540	410	100	71	362
AUG									
20...	1300	4.1	2870	29.5	520	450	100	64	386

DATE	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)
OCT								
08...	9	13	170	590	1100	0.64	6.5	2710
DEC								
09...	9	15	160	670	1100	0.60	8.5	2900
FEB								
24...	9	17	130	660	1100	0.48	9.4	2740
MAR								
28...	16	21	190	1500	3400	0.68	8.9	7420
JUN								
11...	7	15	130	390	600	0.47	9.7	1630
AUG								
20...	7	14	66	420	590	0.50	5.8	1620

## COLORADO RIVER BASIN

08123800 BEALS CREEK NEAR WESTBROOK, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	7.62	4840	2990	61.4	1200	25.5	620	12.8	1000
NOV. 1996	395.77	2130	1280	1370	540	576	250	266	440
DEC. 1996	17.72	5830	3630	174	1500	71.9	780	37.2	1200
JAN. 1997	4.31	6190	3870	45.1	1600	18.6	840	9.7	1300
FEB. 1997	1284.74	2410	1450	5030	610	2120	280	980	500
MAR. 1997	30.4	8270	5310	436	2200	177	1200	100	1700
APR. 1997	478.45	5030	3220	4160	1300	1700	730	949	1100
MAY 1997	266.2	3910	2420	1740	1000	721	510	364	820
JUNE 1997	2910.2	2480	1520	11970	630	4980	320	2480	520
JULY 1997	7.33	4100	2510	49.7	1000	20.7	510	10.1	850
AUG. 1997	250.22	2020	1250	846	520	351	260	178	420
SEPT 1997	0.34	4480	2770	2.5	1200	1.1	580	0.53	930
TOTAL	5653.3	**	**	25880	**	10760	**	5380	**
WTD.AVG.	15	2750	1700	**	700	**	350	**	570

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	4440	4280	4350	5910	5670	5830	6550	4710	6200	5900	5730	5820
2	4600	4400	4490	5880	5710	5830	6090	5550	5770	6100	5770	5910
3	4680	4560	4600	6040	5760	5870	5550	5390	5490	6100	5980	6010
4	4680	4480	4540	6050	5720	5870	5430	5220	5310	6020	5980	6000
5	4640	4520	4560	5930	5770	5860	5270	4980	5100	6060	5980	6030
6	4720	4560	4630	5930	4950	5680	5060	4940	4990	6180	6020	6040
7	4840	4680	4740	12200	942	4020	5030	4900	4990	6140	6060	6100
8	4720	4520	4590	1840	1150	1400	5110	4900	5020	6220	6060	6120
9	4880	4640	4710	1230	1150	1170	5080	4840	4980	6470	6220	6280
10	5130	4880	4960	1350	1190	1260	5000	4840	4900	6670	6470	6530
11	5210	5050	5140	1560	1350	1400	5000	4880	4950	6710	6380	6550
12	5380	5210	5270	1770	1560	1600	5210	4960	5050	6800	6470	6610
13	5460	5340	5380	1980	1690	1840	5370	5120	5230	6880	6750	6810
14	5540	5390	5440	2430	1890	2130	5580	5210	5360	7330	6790	7130
15	5550	5310	5420	2840	2310	2510	5620	5580	5580	7290	6460	6810
16	5510	5350	5440	2850	2720	2780	5740	5490	5600	6670	6420	6530
17	5560	5480	5510	2760	2190	2550	6240	5740	5880	6630	6380	6510
18	5560	5400	5500	2770	2310	2500	6240	5910	6080	6750	6170	6460
19	5650	5450	5520	3470	2600	3140	6200	5910	6090	6500	5640	6020
20	5530	5370	5450	3720	3020	3330	6400	5990	6230	6250	5840	6020
21	5620	5370	5480	3810	2820	3280	6400	6070	6190	6340	6010	6190
22	5500	5140	5270	3230	2770	2930	6150	5900	6020	6290	5920	6080
23	5510	5140	5300	3900	2280	3270	6030	5900	5970	6420	5880	6130
24	5390	5060	5240	3690	290	1070	6110	5900	5980	6410	5880	6120
25	5600	5110	5330	2030	706	1260	6320	5780	5980	6040	5880	5980
26	5520	5240	5330	4820	1660	2680	5940	5650	5760	6130	6000	6080
27	5280	4750	5130	4990	3540	4280	6070	5490	5790	6330	6040	6170
28	4800	4550	4690	4080	3200	3560	6070	5900	5990	6450	6210	6340
29	5170	4800	4960	5540	750	2270	6020	5860	5930	6490	6210	6370
30	5540	5170	5350	4710	750	1970	5940	5730	5880	6660	6290	6470
31	5910	5500	5640	---	---	---	5940	5770	5850	6740	6490	6610
MONTH	5910	4280	5100	12200	290	3100	6550	4710	5620	7330	5640	6280



## COLORADO RIVER BASIN

08123800 BEALS CREEK NEAR WESTBROOK, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	24.5	17.0	20.5	16.0	13.0	14.0	9.5	7.5	8.5	15.5	12.5	14.0
2	26.0	18.5	21.5	16.0	11.5	13.5	10.5	8.0	9.0	15.5	13.5	14.5
3	21.0	18.0	19.5	15.5	12.5	14.0	10.0	8.0	9.0	16.5	14.5	15.5
4	21.0	19.0	20.0	17.5	14.0	15.5	11.5	8.5	10.0	16.5	15.0	15.5
5	23.0	18.5	20.5	18.5	13.5	16.0	11.0	9.5	10.5	15.0	11.5	13.0
6	24.0	19.5	21.0	20.5	16.0	18.0	12.0	10.0	11.0	11.5	8.0	9.5
7	26.0	19.0	22.0	16.0	11.5	14.0	12.5	10.5	11.5	8.0	7.0	7.0
8	23.5	19.5	21.0	13.0	9.5	11.0	12.5	10.0	11.0	7.0	6.5	7.0
9	24.5	18.0	21.0	13.5	9.0	11.0	14.5	11.0	12.5	8.5	6.0	7.0
10	24.0	18.5	21.0	14.0	9.5	12.0	15.0	13.0	14.0	8.0	7.0	7.0
11	24.0	18.5	21.0	15.5	10.5	13.0	15.5	13.5	14.5	7.0	5.5	6.0
12	24.0	19.0	21.5	15.5	12.5	14.0	15.5	13.5	14.5	5.5	4.0	4.5
13	24.0	19.0	21.5	17.5	13.5	15.5	15.5	12.5	14.0	4.0	3.5	3.5
14	23.5	19.5	21.0	18.0	15.0	16.5	16.0	13.5	14.5	3.5	3.0	3.5
15	23.5	18.5	21.0	18.0	16.5	17.0	14.5	10.0	12.0	7.0	3.5	5.0
16	25.0	20.0	22.0	19.0	17.0	18.0	10.0	8.5	9.5	8.0	5.5	6.0
17	22.5	18.5	20.5	17.5	13.0	15.0	9.5	7.0	8.0	6.5	4.5	5.5
18	19.5	16.0	18.0	16.5	12.0	14.5	7.5	5.5	6.5	8.0	5.0	6.5
19	18.5	15.5	16.5	18.5	14.5	16.5	8.0	5.5	6.5	8.5	6.0	7.5
20	21.0	16.0	18.5	18.0	14.5	16.5	9.5	7.0	8.0	11.5	7.5	9.5
21	19.0	14.5	17.5	16.5	12.5	15.0	9.5	7.0	8.0	13.0	11.0	12.0
22	16.5	12.0	14.0	14.5	12.5	13.5	11.5	8.5	10.0	13.0	11.0	12.5
23	16.5	11.5	14.0	18.0	13.0	16.0	12.5	10.5	11.5	13.5	11.0	12.5
24	18.5	12.5	15.0	13.0	7.0	8.5	11.0	8.0	9.5	13.5	11.5	12.5
25	19.5	14.0	16.5	8.0	5.5	7.0	9.0	7.0	8.0	13.0	10.5	12.0
26	19.0	15.0	17.5	8.0	5.5	7.0	11.0	8.5	9.5	14.5	12.0	13.5
27	20.0	15.5	18.0	8.0	6.0	7.0	11.0	7.0	9.5	15.0	11.5	13.5
28	15.5	13.5	14.0	8.0	7.5	7.5	12.5	10.5	11.5	11.5	9.0	10.0
29	18.0	14.5	16.0	9.0	7.5	8.5	13.0	10.5	11.5	9.5	7.0	8.5
30	18.5	12.5	15.5	10.0	8.5	9.0	13.0	9.5	11.5	10.5	6.5	8.5
31	19.0	15.5	17.0	---	---	---	14.5	11.5	13.0	12.0	8.5	10.5
MONTH	26.0	11.5	19.0	20.5	5.5	13.0	16.0	5.5	10.5	16.5	3.0	9.5

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	13.0	10.5	12.0	17.5	11.0	13.5	22.5	13.5	17.0	27.0	18.5	22.0
2	14.0	11.5	13.0	17.5	11.0	14.0	21.0	17.0	18.5	25.5	19.5	22.5
3	14.5	11.5	13.0	19.0	10.5	14.5	19.0	17.0	18.0	26.0	17.0	21.0
4	14.0	11.5	13.0	20.5	12.5	16.5	18.5	15.5	17.5	26.0	17.5	21.5
5	12.5	10.5	11.5	17.5	11.5	14.5	20.5	12.5	16.5	30.5	18.5	23.5
6	10.5	9.5	10.0	16.5	10.5	13.0	22.5	13.5	17.5	30.5	21.0	25.5
7	10.5	9.5	10.0	19.5	11.5	15.0	21.5	15.0	18.0	27.5	22.5	24.5
8	9.5	8.0	8.5	18.0	15.5	16.5	24.0	17.0	19.0	29.0	22.5	25.0
9	8.5	7.5	8.0	17.5	14.5	16.0	17.0	12.0	13.5	25.5	19.0	21.5
10	12.0	8.0	9.5	19.0	13.0	15.5	19.0	12.5	15.0	25.5	16.5	20.5
11	11.0	9.0	10.0	17.5	14.5	16.0	17.5	10.5	14.0	26.5	18.5	22.5
12	10.5	8.5	9.5	19.5	15.5	17.0	16.0	7.5	11.5	23.5	18.5	20.0
13	8.5	7.5	7.5	23.0	15.0	18.5	18.5	9.0	13.5	24.0	16.0	20.0
14	10.0	7.5	8.5	18.5	11.5	14.5	21.0	11.0	15.5	28.0	20.0	23.5
15	12.0	7.5	10.0	16.0	9.5	12.5	23.5	13.5	18.0	24.5	14.0	19.5
16	13.5	9.0	11.5	14.0	11.5	12.5	25.0	16.0	20.0	27.5	21.0	23.5
17	13.5	10.5	12.5	22.5	13.5	17.0	19.0	8.5	13.0	30.5	21.0	25.5
18	15.0	12.0	13.5	20.0	16.0	17.5	16.5	15.0	15.5	31.5	22.5	26.5
19	15.0	14.5	14.5	20.5	13.0	16.5	24.5	15.0	18.5	27.0	20.5	24.0
20	15.0	10.5	13.0	22.5	13.0	17.5	28.0	17.0	22.0	24.5	18.5	21.0
21	12.0	9.5	11.0	24.0	15.0	19.0	26.5	19.0	22.5	22.5	20.5	21.0
22	11.5	7.0	9.0	21.5	15.0	18.0	23.5	18.5	21.0	27.5	19.5	22.5
23	11.0	8.0	9.5	22.5	15.0	18.5	24.0	18.0	20.5	28.5	21.5	24.5
24	---	---	9.5	22.5	16.5	19.5	23.0	16.5	20.0	31.5	21.5	25.5
25	---	---	e10.0	20.0	15.0	17.0	20.0	13.5	16.0	30.5	23.5	26.5
26	---	---	e10.0	16.0	13.5	15.0	13.5	11.0	12.0	31.5	22.5	26.5
27	e12.5	e7.0	9.5	20.0	13.5	16.5	13.0	10.5	11.5	29.5	22.0	25.5
28	15.5	9.0	12.0	23.5	15.0	18.5	20.0	11.0	15.0	29.0	22.0	25.0
29	---	---	---	23.5	15.5	19.5	24.5	16.0	20.0	30.0	21.5	25.5
30	---	---	---	18.0	14.0	15.5	26.0	18.0	22.0	29.5	22.5	25.5
31	---	---	---	15.5	13.5	14.0	---	---	---	29.5	22.0	25.0
MONTH	15.5	7.0	10.5	24.0	9.5	16.0	28.0	7.5	17.0	31.5	14.0	23.5

e Estimated





## COLORADO RIVER MAIN STEM

08123850 COLORADO RIVER ABOVE SILVER, TX

**LOCATION.**--Lat 32°03'13", long 100°45'42", Coke County, Hydrologic Unit 12080008, on right bank 25 ft downstream from Pan American Oil Co. bridge, 4.7 mi west of Silver, and at mile 756.0.

**DRAINAGE AREA.**--14,910 mi<sup>2</sup>, of which 10,260 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--August 1967 to current year.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,907.66 ft above sea level. Prior to Oct. 4, 1972, water-stage recorder at site 0.5 mi downstream at same datum.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. Since installation of gage in August 1967, at least 10% of contributing drainage area has been regulated by Lake J. B. Thomas (capacity 203,600 acre-ft). Additional regulation by Lake Colorado City (station 08123000), and by Champion Creek Reservoir (station 08123600). The Colorado River Municipal Water District diverts low flow into an off channel reservoir 3 mi above station 08121000 for brine disposal. There are numerous diversions from Lake J.B. Thomas for municipal use and for oil field operations. Satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	4.9	65	4.5	3.6	31	10	51	7.7	27	.40	.79
2	7.2	4.8	26	4.7	3.3	31	11	40	8.1	20	.35	.50
3	6.2	4.4	22	4.7	3.4	29	13	32	7.0	14	.31	.37
4	7.1	3.8	16	4.2	3.3	27	21	25	5.7	11	1.1	.36
5	7.1	3.9	16	4.0	3.5	22	25	17	5.2	9.2	5.4	.36
6	6.6	3.7	17	3.8	5.3	20	25	15	302	8.8	2.6	.37
7	6.0	4.7	15	4.0	5.5	25	25	15	749	8.1	3.7	.30
8	5.6	52	11	4.1	5.2	29	19	13	575	9.9	3.0	.21
9	5.2	19	8.8	4.2	5.1	29	15	11	773	8.1	4.2	.15
10	4.8	11	8.7	4.1	6.2	27	14	9.6	960	8.1	2.9	.15
11	4.2	14	7.5	4.0	5.8	27	15	14	921	7.5	1.9	.15
12	4.0	9.5	6.5	3.8	5.9	27	19	23	1200	10	1.5	.15
13	4.0	7.6	6.2	3.8	6.5	27	17	84	937	7.5	1.3	.15
14	3.9	6.6	6.2	4.1	6.2	25	21	79	367	5.7	1.1	.15
15	3.8	6.2	4.9	4.4	5.8	23	48	228	370	4.3	.77	.10
16	3.6	5.8	5.0	4.2	6.1	19	41	109	699	3.6	.52	.10
17	3.2	4.5	4.2	4.2	6.5	18	42	71	540	3.1	.38	.07
18	2.7	4.2	4.4	4.3	5.7	16	37	72	549	2.6	.31	e.10
19	2.7	4.0	4.2	4.2	5.6	14	65	43	426	2.9	.48	e.10
20	2.6	3.7	4.6	4.5	481	14	48	34	156	2.4	1.3	e.10
21	2.2	3.3	5.0	4.6	1190	14	36	29	159	2.0	6.3	e.10
22	2.9	3.6	4.9	4.2	511	12	29	27	130	1.7	12	.10
23	3.1	4.1	4.8	4.1	459	11	27	24	129	1.4	109	.14
24	2.8	26	4.3	3.6	213	12	26	22	97	1.2	67	.13
25	3.0	152	4.7	3.7	97	11	36	18	98	.99	45	.14
26	2.8	85	4.4	3.9	72	12	205	20	64	.93	12	.13
27	3.0	138	4.8	3.5	50	12	216	43	37	.82	6.0	.13
28	5.2	62	4.4	3.3	38	11	125	22	31	.71	3.7	.16
29	5.8	53	4.4	3.2	---	11	99	15	131	.51	2.3	.84
30	4.9	190	4.4	3.5	---	9.4	68	11	46	.47	1.5	.80
31	4.4	---	4.5	3.6	---	9.5	---	9.0	---	.45	1.0	---
TOTAL	138.1	895.3	309.8	125.0	3209.5	604.9	1398	1225.6	10479.7	184.98	299.32	7.40
MEAN	4.45	29.8	9.99	4.03	115	19.5	46.6	39.5	349	5.97	9.66	.25
MAX	7.5	190	65	4.7	1190	31	216	228	1200	27	109	.84
MIN	2.2	3.3	4.2	3.2	3.3	9.4	10	9.0	5.2	.45	.31	.07
AC-FT	274	1780	614	248	6370	1200	2770	2430	20790	367	594	15

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1997, BY WATER YEAR (WY)

	MEAN	130	20.6	19.7	18.6	32.4	29.3	53.7	163	169	53.7	89.3	160
MAX	1834	67.5	120	90.7	256	280	599	681	1242	313	1122	1853	
(WY)	1987	1973	1992	1987	1992	1973	1981	1994	1982	1988	1971	1980	
MIN	.000	.000	.30	1.17	1.02	.36	2.19	1.91	.23	.000	.010	.000	
(WY)	1969	1971	1971	1971	1971	1971	1980	1984	1984	1970	1984	1968	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1967 - 1997

ANNUAL TOTAL	9290.13	18877.60	78.6
ANNUAL MEAN	25.4	51.7	298
HIGHEST ANNUAL MEAN			11.7
LOWEST ANNUAL MEAN			15900
HIGHEST DAILY MEAN	797	Aug 25	1200
LOWEST DAILY MEAN	.03	Jul 19	.07
ANNUAL SEVEN-DAY MINIMUM	.05	Jul 17	.10
INSTANTANEOUS PEAK FLOW			1450
INSTANTANEOUS PEAK STAGE			7.35
ANNUAL RUNOFF (AC-FT)	18430	37440	56910
10 PERCENT EXCEEDS	39	97	102
50 PERCENT EXCEEDS	3.4	6.2	9.6
90 PERCENT EXCEEDS	.14	.52	.34

e Estimated

08123850 COLORADO RIVER ABOVE SILVER, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: August 1967 to current year. Chemical and biochemical analyses: November 1977 to August 1994.  
Pesticide analyses: October 1969 to August 1981. Sediment analyses: August 1977 to August 1994.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: December 1967 to current year.

WATER TEMPERATURE: December 1967 to current year.

**INSTRUMENTATION.**--Since December 1967, specific conductance was recorded continuously. Since June 1981, specific conductance and water temperature are recorded continuously at this station.

**REMARKS.**--Estimated mean specific conductance and interruptions in the maximum and minimum specific conductance and temperature values were due to malfunctions of the instrument. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum, 19,900 microsiemens Sept. 10, 1988; minimum, 154 microsiemens Sept. 21, 1990.

WATER TEMPERATURE: Maximum, 35.5°C Aug. 2, 7, 1985; minimum, 0.0°C on many days during winter months.

**EXTREMES FOR CURRENT YEAR.**--

SPECIFIC CONDUCTANCE: Maximum, 11,900 microsiemens May 15; minimum, 419 microsiemens Feb. 21.

WATER TEMPERATURE: Maximum, 34.0°C July 14, 15, 16; minimum, 0.5°C Jan. 12.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER CENT SATURATION)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARB DISSOLVED (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)
OCT 18...	1040	2.8	5020	8.0	17.5	7.3	83	1300	1100	340
JAN 22...	1205	4.1	6370	7.9	10.5	10.2	101	1700	1500	440
MAR 05...	1258	23	3360	8.4	14.0	10.7	112	730	580	180
MAY 14...	1257	75	6100	7.9	23.5	7.9	103	1200	1100	220
JUL 09...	1145	8.2	3530	7.8	27.0	6.5	89	860	710	210
SEP 03...	1230	0.39	2350	7.9	29.5	6.9	98	610	520	120
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 WATER DIS-FIX END FIELD CAC03 (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)
OCT 18...	100	650	8	9.5	110	1000	1100	0.50	9.5	3280
JAN 22...	140	820	9	7.7	150	1600	1300	0.50	2.7	4360
MAR 05...	69	440	7	6.5	150	560	710	0.50	5.1	2060
MAY 14...	168	911	11	14	120	900	1600	0.55	3.0	3890
JUL 09...	82	448	7	9.1	150	740	670	0.55	10	2260
SEP 03...	75	223	4	6.0	96	500	410	0.45	9.9	1410
DATE	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS-SOLVED (MG/L AS N)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	PHOSPHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
OCT 18...	--	0.020	<0.050	0.060	0.24	0.30	<0.010	<0.010	1	210
JAN 22...	0.050	0.010	0.060	0.030	0.27	0.30	0.010	<0.010	<1	53
MAR 05...	--	<0.010	0.050	<0.015	--	0.30	<0.010	<0.010	2	130
MAY 14...	--	<0.010	0.086	0.015	0.45	0.47	<0.010	<0.010	2	279
JUL 09...	--	<0.010	<0.050	<0.015	--	<0.20	<0.010	<0.010	2	188
SEP 03...	--	<0.010	<0.050	<0.015	--	0.44	0.021	<0.010	2	216

**COLORADO RIVER MAIN STEM**  
**08123850 COLORADO RIVER ABOVE SILVER, TX--Continued**

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	ZINC, DIS- SOLVED (UG/L AS ZN)
OCT 18...	<1.0	<1.0	<1.0	12	<2.0	14	<0.1	1	<1.0	<12
JAN 22...	<1.0	<1.0	1.0	<15	<1.0	49	<0.1	2	<1.0	<15
MAR 05...	<1.0	<1.0	<1.0	<9.0	<1.0	11	<0.1	<1	<1.0	<9.0
MAY 14...	<2.0	<1.0	2.1	<12	<2.0	6.9	<0.1	<1	<2.0	<12
JUL 09...	<1.0	<1.0	<1.0	<9.0	<1.0	16	<0.1	<1	<1.0	<9.0
SEP 03...	<1.0	<1.0	<1.0	<9.0	<1.0	103	<0.1	<1	<1.0	<9.0

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	138.1	4470	2880	1070	960	357	900	335	1000
NOV. 1996	895.3	3780	2420	5860	800	1940	760	1830	890
DEC. 1996	309.8	3620	2320	1940	770	646	730	608	850
JAN. 1997	125	6220	4110	1390	1400	466	1300	429	1400
FEB. 1997	3209.5	1880	1180	10190	390	3350	370	3220	450
MAR. 1997	604.9	4750	3080	5030	1000	1680	960	1570	1100
APR. 1997	1398	4350	2810	10620	940	3540	880	3310	1000
MAY 1997	1225.6	6630	4450	14710	1500	4960	1400	4530	1500
JUNE 1997	10479.7	2410	1550	43760	510	14530	480	13700	570
JULY 1997	184.98	3440	2180	1090	720	361	690	342	810
AUG. 1997	299.32	3790	2470	1990	820	666	770	620	880
SEPT 1997	7.4	4190	2690	53.8	900	17.9	840	16.8	980
TOTAL	18877.6	**	**	97720	**	32520	**	30510	**
WTD.AVG.	52	2970	1920	**	640	**	600	**	690



# COLORADO RIVER MAIN STEM

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08123850 COLORADO RIVER ABOVE SILVER, TX--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	3250	3040	3130	6100	5900	5990	4100	1850	2600	5710	5520	5600
2	3360	3250	3300	6210	6010	6110	1850	1540	1700	5710	5600	5650
3	3570	3250	3450	6420	6020	6220	1750	1540	1670	5800	5700	5710
4	3570	3460	3530	6530	6320	6440	1960	1650	1740	5800	5700	5780
5	3680	3570	3660	6630	6430	6560	2480	1860	2070	5900	5800	5860
6	3890	3680	3810	6840	6630	6720	3410	2480	2990	6000	5800	5950
7	3990	3780	3940	6850	6550	6670	3830	3410	3650	6000	6000	6000
8	4100	3990	4040	6950	6160	6670	3950	3730	3790	6000	5900	6000
9	4190	4080	4120	6360	4470	4960	4180	3840	4000	6100	6000	6050
10	4370	4070	4260	5080	4570	4850	5050	4170	4500	6200	6100	6130
11	4460	4340	4400	9990	4980	6940	6390	5050	5720	6300	6100	6230
12	4540	4430	4490	10400	9600	10000	6590	6380	6490	6500	6300	6350
13	4620	4510	4570	9710	8110	8960	6560	6050	6250	6600	6400	6510
14	4790	4600	4680	8110	4300	5700	6170	5670	5860	6600	6500	6560
15	4790	4680	4730	4400	4110	4240	5780	5510	5610	6600	6500	6590
16	4960	4760	4830	4210	4110	4120	5620	5470	5500	6600	6400	6450
17	5040	4860	4960	4120	4010	4090	5650	5420	5550	6400	6300	6340
18	5130	4940	5000	4120	4020	4070	5860	5410	5650	6400	6200	6290
19	5140	5040	5060	4230	4020	4130	6020	5600	5840	6400	6300	6310
20	5140	5040	5110	4640	4230	4460	5890	5750	5860	6500	6300	6380
21	5250	5050	5200	4950	4640	4790	5750	5600	5670	6500	6400	6430
22	5350	5150	5230	5060	4850	5020	5710	5240	5490	6400	6300	6390
23	5360	5250	5300	5170	5060	5110	5440	5240	5340	6410	6210	6330
24	5460	5260	5380	5170	2840	3870	5520	5390	5420	6420	6310	6320
25	5470	5360	5400	8750	1830	3740	5500	5370	5420	6430	6320	6360
26	5570	5470	5500	3870	1520	2700	5470	5340	5370	6430	6330	6380
27	5670	5470	5610	5920	2550	3830	5430	5320	5360	6440	6330	6410
28	5580	5290	5400	3260	2450	2700	5510	5320	5410	6550	6440	6510
29	5690	5390	5530	2550	1840	2180	5490	5370	5410	6560	6450	6470
30	5700	5590	5650	4510	1840	2700	5570	5370	5480	6560	6360	6460
31	5900	5600	5780	---	---	---	5630	5450	5530	6480	6370	6460
MONTH	5900	3040	4680	10400	1520	5150	6590	1540	4740	6600	5520	6230

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	6580	6380	6470	3110	2890	3030	6170	6010	6060	---	---	3500
2	6500	6390	6480	3230	3010	3110	6250	6110	6200	---	---	3500
3	6610	6400	6450	3350	3230	3300	6120	5750	5910	---	---	3400
4	6620	6510	6530	3470	3350	3420	5760	5530	5650	---	---	3500
5	6630	6520	6590	3480	3360	3390	5540	4160	5140	---	---	3600
6	6530	6330	6410	3610	3460	3530	4900	3950	4290	---	---	3600
7	6550	6350	6450	3690	3610	3650	5730	4900	5480	---	---	3700
8	6460	6350	6440	4340	3650	3890	6190	5720	5870	---	---	3900
9	6580	6460	6500	4480	4340	4420	6190	5720	5990	---	---	4100
10	6590	6480	6490	4500	4430	4470	5720	5320	5450	---	---	4300
11	6600	6280	6490	4430	4240	4360	5340	4900	5140	---	---	4500
12	6500	6200	6360	4720	4070	4220	5120	4880	4990	---	---	4500
13	6520	6310	6430	7000	4720	6360	5120	4680	4870	---	---	5400
14	6650	6420	6570	6760	6040	6270	5040	4030	4440	---	---	6200
15	6770	6650	6720	6040	5950	6000	8940	4750	6060	11900	6100	8940
16	6890	6770	6810	6090	6020	6060	9270	6260	7960	7660	6570	7060
17	7000	6890	6900	6060	5930	6010	7730	5380	6870	8410	6670	7220
18	7020	6900	6970	5960	5780	5850	5850	4080	4690	9070	8230	8650
19	7030	6920	6990	5790	5600	5670	9980	4240	7090	8540	7670	8100
20	6930	628	3460	5610	5480	5560	7360	5420	6570	9140	8540	8830
21	2410	419	919	5570	5410	5470	5420	3840	4600	8870	8620	8760
22	3470	1150	2410	5630	5450	5500	4140	3630	3770	8880	8030	8580
23	2520	948	1300	5810	5630	5750	4190	3730	4000	8600	7830	8320
24	1480	1060	1380	5780	5700	5750	3730	3290	3470	8490	7090	8000
25	1700	1380	1490	5810	5730	5760	3290	2780	3040	7740	4020	4850
26	2230	1700	1960	5810	5740	5790	7760	2030	4140	4300	4120	4230
27	2670	2230	2450	5800	5710	5770	3290	1430	2010	5140	4160	4650
28	2890	2670	2810	5940	5800	5890	---	---	3700	5870	5140	5480
29	---	---	---	6230	5870	6100	---	---	3000	6050	5620	5860
30	---	---	---	6290	6190	6250	---	---	4000	9430	5560	7860
31	---	---	---	6230	6080	6170	---	---	---	8540	7620	7880
MONTH	7030	419	5120	7000	2890	5060	9980	1430	5020	11900	4020	5840

## COLORADO RIVER MAIN STEM

08123850 COLORADO RIVER ABOVE SILVER, TX--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7780	7250	7560	4510	2390	3220	6750	6630	6680	---	---	2400
2	7500	6850	7170	2460	2380	2400	6820	6700	6740	---	---	2600
3	7490	6960	7240	2660	2460	2560	6890	6720	6790	2910	2690	2790
4	7360	6990	7220	2910	2660	2780	6900	6630	6760	3130	2910	3030
5	7400	7090	7260	3170	2910	3020	7280	6900	7200	---	---	e3300
6	9300	6460	7970	3330	3150	3230	7650	7270	7390	---	---	3480
7	8810	6400	7030	3360	3140	3300	7760	7250	7440	---	---	3660
8	7480	1860	5750	3450	3260	3340	7690	7410	7590	---	---	e3800
9	1990	1350	1580	3550	3420	3480	7820	7490	7640	---	---	3950
10	1730	1380	1540	3650	3270	3450	7950	7800	7890	---	---	4070
11	---	---	1100	3700	3590	3650	7930	7840	7890	---	---	4230
12	820	469	540	3860	2980	3710	8090	7920	8010	---	---	4330
13	1150	820	949	3670	2700	3290	8210	8060	8150	---	---	4450
14	1910	888	1230	3780	3630	3710	8250	8120	8190	---	---	4530
15	2820	1180	1580	4190	3780	3990	8230	8040	8150	---	---	4680
16	3820	1430	2360	4310	4190	4250	8150	7990	8070	---	---	4770
17	3180	1390	2340	4340	4240	4280	8110	7940	8040	---	---	4880
18	1450	1200	1340	4690	4340	4530	8090	7940	8030	---	---	e4900
19	1300	981	1060	5080	4680	4890	7940	7430	7720	---	---	e5000
20	2570	1120	1460	5480	5080	5300	7800	7320	7440	---	---	e5100
21	2430	1580	1960	5820	5470	5660	8550	7760	8230	---	---	e5200
22	2870	2430	2740	6010	5820	5920	8840	6650	8160	---	---	5250
23	3440	2770	3070	6100	6010	6060	9790	3010	4870	5360	5250	5290
24	4250	2910	3650	6160	6090	6120	---	---	1700	5400	5340	5370
25	4820	4230	4490	6210	6110	6160	---	---	1000	5430	5340	5390
26	4310	3440	3660	6210	6100	6170	---	---	1300	5510	5410	5450
27	3850	3480	3650	6300	6210	6250	---	---	1500	5620	5420	5510
28	4130	3850	3990	6400	6300	6350	---	---	1600	5700	5520	5590
29	8730	4130	6770	6510	6400	6460	---	---	1800	5800	5590	5700
30	8530	2780	4730	6600	6500	6550	---	---	2000	5620	5260	5430
31	---	---	---	6660	6570	6620	---	---	2200	---	---	---
MONTH	9300	469	3770	6660	2380	4540	9790	3010	6010	5800	2690	4470
YEAR	11900	419	5060									
e Estimated												

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	---	---	19.5	19.0	13.0	15.0	10.0	7.0	8.5	17.5	14.0	15.5
2	22.0	18.5	20.0	---	---	14.0	11.5	7.0	9.0	17.5	14.0	15.5
3	21.5	18.5	19.5	17.0	13.0	14.5	11.5	7.5	9.5	18.5	16.0	17.0
4	21.0	19.0	20.0	---	---	15.0	13.5	8.5	10.5	18.0	14.5	16.5
5	21.0	19.0	19.5	---	---	15.5	13.0	8.5	10.5	14.5	10.0	12.0
6	21.0	20.0	20.5	---	---	18.5	---	---	12.0	10.0	5.5	8.0
7	21.5	19.5	20.0	18.5	14.0	15.5	15.0	10.5	12.5	6.0	4.5	5.0
8	21.5	20.5	21.0	15.5	12.0	14.0	14.5	9.5	11.5	5.5	4.0	5.0
9	21.5	18.5	19.5	16.5	11.5	13.5	13.5	9.5	12.0	7.5	3.0	5.0
10	22.5	19.5	21.0	17.5	11.5	14.0	15.0	11.0	13.0	6.0	4.5	5.0
11	22.0	16.5	19.5	---	---	15.0	15.5	11.5	13.5	4.5	2.5	3.0
12	22.0	19.0	20.5	---	---	16.0	14.0	11.0	12.0	2.5	.5	2.0
13	22.5	19.0	21.0	17.0	15.5	16.5	14.0	10.5	12.0	2.0	1.0	1.5
14	22.5	20.0	21.5	---	---	17.0	16.5	12.0	14.0	2.0	1.0	1.5
15	22.5	18.5	20.5	---	---	17.5	14.5	7.0	9.5	4.0	1.5	3.0
16	24.0	18.0	21.5	---	---	18.0	9.0	5.0	7.0	5.5	3.5	4.5
17	23.5	20.5	21.5	19.0	15.0	16.5	8.0	2.5	5.0	4.5	3.5	4.0
18	21.0	16.5	18.5	16.0	13.5	14.5	4.0	1.5	2.5	7.0	3.0	5.0
19	18.5	15.0	16.5	17.5	15.5	16.0	4.0	1.5	2.5	7.5	4.5	6.0
20	18.5	16.5	17.5	---	---	16.5	4.5	2.5	3.5	12.0	7.0	9.5
21	19.5	15.0	18.5	17.5	14.5	16.0	7.5	3.0	5.0	15.0	11.0	13.0
22	15.0	11.5	13.5	16.5	14.0	14.5	11.0	7.0	8.5	14.0	10.5	12.0
23	14.5	10.5	12.5	---	---	16.0	12.0	9.5	10.5	15.0	11.5	13.0
24	15.5	13.0	14.5	17.0	6.5	9.5	10.0	6.5	8.0	13.5	10.0	12.0
25	19.5	13.5	16.5	8.0	4.5	6.0	7.0	4.5	6.0	13.5	9.5	11.5
26	---	---	16.5	9.0	5.5	7.0	9.5	7.0	8.0	15.5	11.0	13.0
27	20.5	17.0	19.0	7.5	6.0	6.5	11.0	6.0	8.5	15.5	9.5	14.0
28	17.5	14.5	15.5	7.5	7.0	7.5	11.5	9.5	10.5	9.5	4.0	6.5
29	---	---	16.5	11.5	7.0	9.0	11.5	8.5	9.5	7.5	4.0	5.5
30	---	---	16.0	11.0	9.0	10.0	13.0	9.0	11.0	8.0	4.5	6.0
31	19.5	14.5	17.0	---	---	---	15.5	11.5	13.0	10.0	7.0	8.5
MONTH	24.0	10.5	18.5	19.0	4.5	14.0	16.5	1.5	9.5	18.5	.5	8.5



08123950 E.V. SPENCE RESERVOIR NEAR ROBERT LEE, TX

**LOCATION.**--Lat 31°52'46", long 100°31'01", Coke County, Hydrologic Unit 12080008, in outlet works of Robert Lee Dam on the Colorado River, 2.2 mi west of Robert Lee, and at mile 716.0.

**DRAINAGE AREA.**--15,278 mi<sup>2</sup>, approximately, of which 10,260 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--December 1968 to current year.

Water-Quality records.--Chemical analyses: November 1969 to August 1988. Biochemical analyses: January 1978 to August 1988.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is sea level. Prior to June 24, 1969, non-recording gage at same site and datum.

**REMARKS.**--Records good except for Oct. 1, 2, Jan. 23 to Feb. 4, which are fair. The reservoir is formed by a rolled earthfill dam 21,500 ft long. Closure was made Dec. 30, 1968, and dam was completed in June 1969. The dam is the property of the Colorado River Municipal Water District, which has a permit to divert 50,000 acre-ft annually for municipal, mining, and industrial uses. Inflow into the reservoir is partially regulated by Lake J.B. Thomas (capacity, 283,600 acre-ft), Lake Colorado City (station 08123000), and Champion Creek Reservoir (station 08123600). There are two spillways: The controlled service spillway is a morning-glory type that is partially controlled by 12 lift gates, 14.48 by 22.0 ft, and discharges through a 28.0-foot-diameter concrete conduit. The uncontrolled spillway is a 3,200-foot-wide cut through natural ground near the right end of dam. Satellite 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 .....	1,928.0	-
Crest of spillway .....	1,908.0	653,400
Top of gates .....	1,900.0	519,300
Top of conservation pool .....	1,898.0	488,800
Crest of spillway .....	1,878.0	262,900
Lowest gated outlet (invert) .....	1,815.85	4,000

**COOPERATION.**--Capacity table (dated March 1972) was furnished by the Colorado River Municipal Water District. Records of diversions can be obtained from the city of San Angelo and from the Colorado River Municipal Water District.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 355,300 acre-ft June 16, 1987 (elevation, 1,887.03 ft); minimum since first appreciable storage in June 1969 (not from recorder), about 330 acre-ft May 29, 1971.

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 143,500 acre-ft June 23 at 0945 hours (elevation, 1,862.18 ft); minimum, 112,600 acre-ft Feb. 5 (elevation, 1,856.54 ft).

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

1,806.0	225	1,846.0	67,900	1,873.0	219,900
1,816.0	4,430	1,856.0	109,900	1,878.0	262,900
1,826.0	19,050	1,862.0	142,400	1,883.0	312,000
1,836.0	38,760	1,868.0	182,400	1,888.0	366,000

RESERVOIR STORAGE (ACRE-Feet), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	117100	114800	115300	114700	112800	122200	121300	124000	124200	142800	138600	134800
2	117100	114600	115500	114600	112900	122300	121700	124000	124000	142800	138200	134600
3	116500	114600	115500	114800	113000	122300	122000	123900	123900	142600	138100	134400
4	116500	114600	115500	114700	112800	122400	122200	123800	123800	142600	137800	134400
5	116400	114600	115500	114500	112800	122200	122000	123800	123600	142300	137500	134200
6	116300	114800	115500	114200	113200	122100	122000	123700	124100	142300	137500	134200
7	116200	114600	115400	114100	113100	122200	121900	123800	125100	142500	138100	134200
8	116100	114500	115400	114100	113100	122100	121900	123700	127700	142500	137900	134000
9	116000	114600	115500	114000	113100	122200	121800	123800	128900	142200	137700	133700
10	115900	114500	115600	113800	113000	122300	121800	123700	130500	142100	137700	133700
11	115700	114600	115400	113600	113000	122400	121700	123500	131900	141900	137400	133400
12	115600	114500	115500	113500	113300	122400	121700	123700	133600	141800	137200	133200
13	115600	114400	115500	113400	113200	122500	121700	123700	135700	141600	137200	133300
14	115400	114400	115400	113400	113200	122400	121400	123800	137300	141400	137000	133000
15	115400	114400	115200	113400	113100	122300	121400	124500	138600	141400	136800	133000
16	115300	114400	115200	113300	113000	122300	121700	124800	139500	141300	136500	132800
17	115100	114200	114800	113300	113100	122200	121700	124800	140500	141100	136400	132600
18	114800	114300	114700	113300	113000	122300	121900	124900	141400	141000	136400	132400
19	114700	114300	114700	113500	113100	122200	122000	124900	142200	140700	136200	132400
20	114800	114300	114600	113400	116400	122200	122100	124900	142600	140400	136200	132200
21	114600	114100	114700	113700	118500	122200	122200	124900	142600	140400	136100	132000
22	114400	114000	114800	113500	119800	122200	122100	124900	143100	140400	136100	131900
23	114300	114000	114700	113400	120600	122100	122100	124900	142900	140000	135900	131900
24	114200	114300	114500	113200	121400	122000	121900	124800	143100	139900	136000	131700
25	114100	114200	114500	113200	121700	122000	122700	124800	143100	139600	135900	131500
26	114100	114400	114500	113200	121700	121800	123200	124800	143100	139500	135700	131400
27	114800	114600	114600	113200	121700	121600	123400	124800	143000	139400	135600	131400
28	114900	114900	114700	113000	121900	121600	123600	124700	142900	139200	135400	131200
29	115100	115100	114600	113000	---	121600	123800	124500	142900	139000	135300	131000
30	115100	115200	114700	113000	---	121400	123900	124500	142900	138800	135000	130900
31	115100	---	114700	112900	---	121300	---	124400	---	138700	134700	---
MAX	117100	115200	115600	114800	121900	122500	123900	124900	143100	142800	138600	134800
MIN	114100	114000	114500	112900	112800	121300	121300	123500	123600	138700	134700	130900
(+)	1857.05	1857.06	1856.96	1856.60	1858.37	1858.25	1858.72	1858.81	1862.08	1861.39	1860.69	1860.00
(@)	-2100	+100	-500	-1800	+9000	-600	+2600	+500	+18500	-4200	-4000	-3800

CAL YR 1996 MAX 161000 MIN 101500 (@) -46300  
WTR YR 1997 MAX 143100 MIN 112800 (@) +13700

(+) Elevation, in feet, at end of month.  
(@) Change in contents, in acre-feet.



# COLORADO RIVER MAIN STEM

51

08124000 COLORADO RIVER AT ROBERT LEE, TX

**LOCATION.**--Lat 31°53'07", long 100°28'49", Coke County, Hydrologic Unit 12080008, on left bank 190 ft upstream from bridge on State Highway 208 in Robert Lee, 0.4 mi upstream from Mountain Creek, 2.7 mi downstream from Messbox Creek, 3.6 mi downstream from Robert Lee Dam, and at mile 712.4.

**DRAINAGE AREA.**--15,307 mi<sup>2</sup>, of which 10,260 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--October 1923 to December 1927, April 1939 to May 1956, and October 1968 to current year. Prior to December 1927, published as "near Robert Lee".

Water-quality records.--Chemical analyses: October 1947 to September 1957.

**REVISED RECORDS.**--WSP 1723: 1925(M). WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,771.70 ft above sea level. Prior to Dec. 31, 1927, nonrecording gage at site 9 mi downstream at different datum. Apr. 18 to Sept. 26, 1939, nonrecording gage, and Sept. 27, 1939, to May 9, 1956, water-stage recorder at site 200 ft downstream at same datum.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. Beginning April 1949, flow was affected by Lake Colorado City (see station 08123000) and since July 1952 by Lake J. B. Thomas (capacity 203,600 acre-ft). Since December 1968, flow completely regulated by E. V. Spence Reservoir (station 08123950) 3.6 mi upstream. There are many diversions above station for municipal, mining, agricultural, and industrial uses. Several observations of water temperature were made during the year. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--16 years (water years 1925-27, 1940-52) prior to completion of Lake J.B. Thomas, 220 ft<sup>3</sup>/s (159,100 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS, 1925-27, 1940-52).**--Maximum discharge, 32,500 ft<sup>3</sup>/s Sept. 6, 1926 (gage height, 20.20 ft, site and datum then in use), from rating curve extended above 15,000 ft<sup>3</sup>/s; no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1907, 26.7 ft Oct. 13, 1957, from floodmarks. Flood in April 1922 reached a stage of 25.5 ft, present datum, from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e14	13	13	12	12	11	13	13	12	13	14	e13
2	e14	13	14	12	12	14	14	14	13	13	13	e13
3	14	12	14	12	12	12	19	14	12	12	13	e13
4	13	12	14	12	12	11	15	14	12	13	13	e13
5	13	13	14	12	12	11	13	14	12	13	e13	e13
6	13	13	14	12	15	11	13	15	14	13	e13	e12
7	13	14	14	12	13	11	12	16	13	13	e13	e12
8	13	13	14	13	12	11	13	16	14	13	e13	e12
9	13	13	14	13	13	12	13	16	15	13	e13	e12
10	13	13	14	12	12	12	14	15	13	13	e13	e12
11	13	13	14	12	13	12	14	16	13	13	e12	e12
12	13	13	14	12	14	12	13	17	13	13	e12	e12
13	13	13	14	12	13	12	13	15	12	12	e12	e12
14	12	13	14	12	13	12	13	15	14	12	e12	e12
15	13	13	13	12	13	12	14	20	15	13	e12	e12
16	12	12	13	11	13	12	15	15	12	12	e13	e13
17	12	13	13	11	13	12	17	15	12	12	e13	e13
18	12	13	13	11	13	12	14	15	12	12	e13	e13
19	13	13	14	11	13	11	14	14	12	12	e13	e13
20	13	13	14	11	62	12	13	14	12	12	e13	e13
21	13	13	13	11	14	11	13	14	12	12	e14	e14
22	13	13	13	11	13	12	14	14	13	13	e14	e14
23	13	13	13	11	13	12	13	14	10	13	e14	e14
24	13	18	13	12	12	12	13	13	13	13	e14	e14
25	13	14	13	12	11	12	20	13	13	13	e14	e14
26	13	14	13	12	11	12	15	12	13	13	e13	e15
27	14	14	13	12	11	12	15	13	13	13	e13	e15
28	43	14	13	12	11	12	15	13	13	13	e13	e15
29	15	16	12	12	---	12	14	13	13	13	e13	e15
30	13	14	12	12	---	12	14	13	13	13	e13	e15
31	13	---	12	12	---	12	---	12	---	13	e13	---
TOTAL	435	401	415	366	401	366	425	447	383	394	404	395
MEAN	14.0	13.4	13.4	11.8	14.3	11.8	14.2	14.4	12.8	12.7	13.0	13.2
MAX	43	18	14	13	62	14	20	20	15	13	14	15
MIN	12	12	12	11	11	11	12	12	10	12	12	12
AC-FT	863	795	823	726	795	726	843	887	760	781	801	783

## COLORADO RIVER MAIN STEM

08124000 COLORADO RIVER AT ROBERT LEE, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1997#,h, BY WATER YEAR (WY)

MEAN	40.3	10.1	1.87	1.52	2.00	2.22	30.6	102	42.3	45.4	56.2	35.8
MAX	578	219	13.4	11.8	14.3	12.4	714	1540	473	495	578	438
(WY)	1987	1987	1997	1997	1997	1953	1954	1954	1989	1988	1953	1986
MIN	.000	.000	.000	.000	.000	.000	.000	.011	.000	.000	.000	.000
(WY)	1955	1955	1955	1953	1953	1956	1956	1971	1980	1970	1954	1954

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1953 - 1997#,h

ANNUAL TOTAL	27895.6	4832	30.6	1954
ANNUAL MEAN	76.2	13.2	237	1969
HIGHEST ANNUAL MEAN			1.04	
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	502 Apr 19	62 Feb 20	13400	May 12 1954
LOWEST DAILY MEAN	2.7 Apr 13	10 Jun 23	.00	Oct 4 1952
ANNUAL SEVEN-DAY MINIMUM	2.7 Apr 10	11 Jan 16	.00	Oct 4 1952
INSTANTANEOUS PEAK FLOW		171 Feb 20	24500	Sep 9 1980
INSTANTANEOUS PEAK STAGE		4.02 Feb 20	20.63	Sep 9 1980
ANNUAL RUNOFF (AC-FT)	55330	9580	22170	
10 PERCENT EXCEEDS	436	14	13	
50 PERCENT EXCEEDS	13	13	.57	
90 PERCENT EXCEEDS	3.2	12	.00	

e Estimated

# Period of regulated streamflow.

h See PERIOD OF RECORD paragraph.

# COLORADO RIVER MAIN STEM

53

08126380 COLORADO RIVER NEAR BALLINGER, TX

**LOCATION.**--Lat 31°42'55", long 100°01'34", Runnels County, Hydrologic Unit 12090101, at left downstream end of bridge on Farm Road 2111, 0.4 mi upstream from Rocky Creek, 5.0 mi northwest of Ballinger, and at mile 665.8.

**DRAINAGE AREA.**--16,358 mi<sup>2</sup>, approximately, of which 10,260 mi<sup>2</sup> probably is noncontributing.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--June 1907 to September 1979 (published as "at Ballinger", station 08126500), October 1979 to current year. Monthly discharge only for some periods published in WSP 1312. Gage-height records collected in this vicinity from 1903-29 are contained in reports of the National Weather Service.

**REVISED RECORDS.**--WSP 1118: Drainage area. WSP 1512: 1916-17, 1919-20, 1921(M), 1922-25, 1928(M), 1930(M). WSP 1712: 1935, 1954-55(M). WDR TX-78-3: 1975-77.

**GAGE.**--Water-stage recorder. Datum of gage is 1,606.51 ft above sea level. Prior to Nov. 29, 1930, nonrecording gages at several sites and at various datums near site 5.4 mi downstream. Nov. 29, 1930, to May 1, 1975, water-stage recorder at site 6.2 mi downstream and May 1, 1975, to Sept. 30, 1979, water-stage recorder at site 5.4 mi downstream, both at datum 12.77 ft lower.

**REMARKS.**--No estimated daily discharges. Records good. Since water year 1980 at least 10% of contributing drainage area has been regulated by Robert Lee Dam. Many diversions upstream from station for irrigation, municipal supplies, and for oil field operations. Flow is also affected by E. V. Spence (station 08123950) and Oak Creek Reservoirs (capacity, 39,360 acre-ft), and at times by discharge from the floodwater-retarding structures in the Kickapoo and Valley Creeks drainage basins. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--61 years (water years 1908-68) prior to completion of Robert Lee Dam, 336 ft<sup>3</sup>/s (243,400 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1908-68).**--Maximum discharge, 75,400 ft<sup>3</sup>/s Sept. 18, 1936 (gage height, 28.6 ft, at former site and datum); no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1882, about 36 ft sometime in 1884, at former site and datum, from information by local residents. Flood of Aug. 6, 1906, reached a stage of about 32.0 ft, at former site and datum, from floodmarks (backwater from Elm Creek).

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	97	147	60	45	192	77	115	48	218	21	16
2	60	87	128	61	45	217	77	113	46	222	21	14
3	59	81	111	61	45	234	92	104	44	161	22	13
4	59	75	97	62	45	234	113	100	42	133	22	12
5	58	71	91	60	44	210	144	90	40	121	24	12
6	58	82	86	61	69	174	135	86	46	110	21	12
7	55	216	84	60	78	161	127	83	58	102	26	11
8	52	131	82	59	73	154	121	81	73	103	39	12
9	49	86	80	59	70	150	115	87	188	93	52	11
10	46	74	77	58	67	144	109	81	285	89	39	12
11	43	68	72	56	64	143	113	80	248	89	36	11
12	41	63	69	55	69	152	108	91	367	81	31	11
13	39	59	68	53	71	146	104	99	406	76	32	13
14	37	57	66	51	71	141	105	100	422	73	32	14
15	36	55	66	52	65	129	111	129	546	69	27	13
16	45	52	61	52	63	123	103	163	699	64	25	12
17	46	51	61	48	61	120	103	174	634	58	24	8.8
18	38	48	56	47	60	118	102	133	533	53	22	8.9
19	34	47	54	47	61	113	106	116	460	49	20	8.0
20	32	47	54	48	184	108	104	100	393	46	18	8.5
21	36	45	54	49	341	105	99	92	340	43	19	8.8
22	34	43	55	49	293	102	95	87	304	39	23	12
23	32	43	57	49	256	97	92	84	5730	37	25	15
24	30	296	56	49	248	93	86	80	1350	36	25	15
25	31	262	55	48	243	105	90	73	790	31	24	14
26	30	155	55	48	232	96	115	66	553	29	23	14
27	32	115	56	50	214	93	136	62	441	28	22	15
28	330	95	56	47	201	86	129	58	370	26	21	14
29	224	160	57	44	---	84	123	53	282	25	19	15
30	148	184	57	44	---	81	119	52	221	23	18	15
31	111	---	58	44	---	77	---	52	---	23	17	---
TOTAL	1993	2945	2226	1631	3378	4182	3253	2884	15959	2350	790	371.0
MEAN	64.3	98.2	71.8	52.6	121	135	108	93.0	532	75.8	25.5	12.4
MAX	330	296	147	62	341	234	144	174	5730	222	52	16
MIN	30	43	54	44	44	77	77	52	40	23	17	8.0
AC-FT	3950	5840	4420	3240	6700	8290	6450	5720	31650	4660	1570	736

## COLORADO RIVER MAIN STEM

08126380 COLORADO RIVER NEAR BALLINGER, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1969 - 1997#, BY WATER YEAR (WY)

MEAN	105	41.9	33.8	28.9	58.2	41.9	42.6	96.2	135	54.1	103	134
MAX	1194	374	259	159	756	299	161	427	739	455	639	833
(WY)	1987	1987	1992	1992	1992	1987	1996	1996	1982	1987	1987	1986
MIN	.78	.82	2.33	2.48	1.52	.67	.47	1.07	1.13	.000	.000	.23
(WY)	1980	1980	1984	1986	1984	1980	1980	1971	1974	1984	1984	1983

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1969 - 1997#	
ANNUAL TOTAL	43645.9		41962.0			
ANNUAL MEAN	119		115		72.9	
HIGHEST ANNUAL MEAN					405	
LOWEST ANNUAL MEAN					7.18	
HIGHEST DAILY MEAN	3440	Sep 15	5730	Jun 23	9220	Aug 28 1986
LOWEST DAILY MEAN	1.7	Jul 10	8.0	Sep 19	.00	Mar 20 1971
ANNUAL SEVEN-DAY MINIMUM	2.8	Jul 6	9.6	Sep 16	.00	Mar 20 1971
INSTANTANEOUS PEAK FLOW			9940	Jun 23	16600	Aug 3 1978
INSTANTANEOUS PEAK STAGE			24.75	Jun 23	27.50	Sep 21 1990
ANNUAL RUNOFF (AC-FT)	86570		83230		52810	
10 PERCENT EXCEEDS	421		216		128	
50 PERCENT EXCEEDS	33		64		13	
90 PERCENT EXCEEDS	4.5		21		1.1	

# Period of regulated streamflow.



# COLORADO RIVER MAIN STEM

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08126380 COLORADO RIVER NEAR BALLINGER, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: October 1979 to current year.

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1961 to September 1997 (discontinued).

WATER TEMPERATURE: October 1961 to September 1997 (discontinued).

SUSPENDED SEDIMENT DISCHARGE: January 1978 to September 1981.

**REMARKS.**--Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request. Prior to October 1979, station was operated as 08126500 Colorado River at Ballinger.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 13,500 microsiemens May 3, 1963; minimum daily, 244 microsiemens Sept. 9, 1980.

WATER TEMPERATURE: Maximum daily, 39.0°C July 3, 1977; minimum daily, 0.0°C Jan. 9-11, 1973.

SEDIMENT CONCENTRATION: Maximum daily mean, 3,740 mg/L Sept. 9 1980; minimum daily mean, 4 mg/L Feb. 2, 1980.

SEDIMENT LOADS: Maximum daily, 94,100 tons Aug. 3, 1978; minimum daily, 0 tons on many days during 1978 and 1980-81.

### EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,940 microsiemens Sept. 29; minimum daily, 585 microsiemens June 23.

WATER TEMPERATURE: Maximum daily, 32.0°C on several days; minimum daily, 3.5°C Jan. 17.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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 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)	SODIUM, DIS- SOLVED (MG/L AS NA)
OCT									
04...	0953	59	1080	21.0	300	160	71	31	96
DEC									
11...	1440	71	1580	14.0	440	240	97	47	160
FEB									
14...	1150	71	2390	8.0	640	480	140	72	267
APR									
17...	1245	103	1720	18.5	470	260	97	56	179
JUN									
12...	1112	412	1170	26.0	330	130	61	42	111
23...	1445	9380	388	25.0	120	37	29	12	26

DATE	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)
OCT								
04...	2	5.6	140	190	150	0.40	12	641
DEC								
11...	3	6.1	190	270	230	0.50	10	935
FEB								
14...	5	7.9	170	450	420	0.55	6.9	1460
APR								
17...	4	5.2	210	290	260	0.63	8.7	1020
JUN								
12...	3	4.3	190	170	160	0.57	10	675
23...	1	4.5	82	48	34	0.22	7.0	208

## COLORADO RIVER MAIN STEM

08126380 COLORADO RIVER NEAR BALLINGER, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	1993	1990	1340	7230	280	1490	560	3030	690
NOV. 1996	2945	1270	854	6790	150	1210	370	2970	470
DEC. 1996	2226	1820	1230	7380	240	1430	530	3160	660
JAN. 1997	1631	2570	1730	7630	360	1590	720	3190	880
FEB. 1997	3378	1920	1300	11830	250	2320	550	5030	690
MAR. 1997	4182	1700	1140	12930	220	2440	490	5560	620
APR. 1997	3253	1960	1320	11610	260	2270	560	4950	700
MAY 1997	2884	1850	1250	9710	240	1860	530	4160	670
JUNE 1997	15959	888	596	25670	100	4440	260	11320	340
JULY 1997	2350	1490	1000	6360	180	1170	430	2760	550
AUG. 1997	790	2780	1880	4010	400	860	780	1660	940
SEPT 1997	371	4530	3090	3090	790	791	1200	1190	1400
TOTAL	41962	**	**	114200	**	21870	**	48980	**
WTD.AVG.	115	1500	1010	**	190	**	430	**	540

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	990	1180	1230	2410	2730	1370	2010	1840	1930	1130	2210	3690
2	1000	1170	1490	2420	2730	1430	2140	1650	1960	1240	2210	3690
3	1050	1220	1390	2430	2740	1470	2400	1650	2020	1250	2580	3760
4	1130	1240	1370	2390	2710	e1400	2430	1650	2120	1300	2580	3980
5	1220	1250	1410	2440	2770	1300	2550	1660	2150	1330	2640	3990
6	1490	1250	1400	2430	2750	1420	1850	1690	2380	1380	2700	4270
7	1400	1800	1430	2420	2700	1500	1830	1690	2290	1410	e2800	4270
8	1490	1340	1430	2530	2550	1580	1670	1760	e2400	1530	2980	4380
9	1620	e1150	1430	2490	2250	1630	1760	1810	3070	1550	2690	4400
10	1700	e1150	1500	2570	2240	1610	1770	1800	1820	1580	2850	4420
11	1820	1100	1600	e2600	2260	1660	1740	1800	1400	1600	2860	4500
12	1920	1180	1880	e2600	e2300	1740	1680	1860	1170	1530	2700	4520
13	2020	1170	1880	e2600	e2350	1710	1680	1900	e1200	1530	2830	4640
14	2130	1130	1880	2620	2430	1790	1670	1890	e1100	1520	2920	4740
15	2130	1200	1990	2640	2340	1820	1700	1980	e1050	1540	3000	4740
16	2760	1320	1990	2650	2340	1820	1760	2350	e1000	1580	3000	4660
17	2900	1700	2130	2690	2260	1770	1780	2250	970	1590	3000	4670
18	2760	1700	2130	2630	2290	1800	1800	1940	1020	1640	2860	4660
19	2700	1670	2190	2630	2360	1860	1920	1940	1020	1780	2660	4680
20	2750	1680	2340	2630	2420	1900	1970	1860	1030	1770	2460	4680
21	2710	1680	2310	2620	2050	1930	1820	1820	1070	1780	2390	4520
22	2700	1930	2310	2580	1940	2010	1820	1600	1080	1840	2410	4730
23	2720	1930	2310	2590	e1600	2000	1930	1600	585	1850	2400	4840
24	2730	e950	2240	2590	1350	1990	1930	1730	720	1940	2620	4910
25	2790	1000	e2300	2650	1300	e2200	2030	1730	648	1870	2620	4900
26	2780	1200	2340	2660	1310	e2150	2140	1760	790	1950	2850	4930
27	2780	e1300	2360	2670	1340	e2100	2660	1770	817	e2000	3040	4910
28	3550	1080	2370	2640	1340	e2050	2310	1860	877	e2050	3260	4930
29	1450	1290	2400	2650	---	e2050	1990	1850	1040	2070	3260	4940
30	677	1210	2410	2660	---	2000	1840	1920	1060	2050	3450	4930
31	850	---	2400	2730	---	2030	---	1930	---	2160	3450	---
MEAN	2020	1340	1930	2580	2210	1780	1950	1820	1390	1660	2780	4530

e Estimated

# COLORADO RIVER MAIN STEM

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08126380 COLORADO RIVER NEAR BALLINGER, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY INSTANTANEOUS VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	23.0	18.0	11.0	14.5	12.5	14.0	18.5	21.5	24.0	30.0	31.0	29.0
2	24.0	15.0	12.0	15.0	13.0	11.5	18.0	21.0	27.0	30.0	30.0	28.5
3	20.0	15.5	11.0	17.0	13.5	13.0	18.0	20.5	28.5	30.0	28.0	29.5
4	22.0	18.0	12.0	16.0	13.0	---	17.0	22.0	30.0	29.0	27.5	29.0
5	22.0	15.0	12.5	11.5	10.0	14.0	19.0	23.0	28.5	30.0	31.0	27.0
6	23.0	19.0	13.0	9.0	10.0	14.0	18.0	23.0	25.0	30.0	31.5	27.0
7	24.0	16.5	13.0	9.5	9.5	16.0	16.0	23.0	24.0	30.0	---	28.0
8	22.5	16.0	11.0	7.0	9.0	16.0	19.0	24.0	---	30.5	25.0	29.0
9	22.5	---	14.5	7.0	10.0	16.0	15.0	21.5	25.0	30.5	31.0	29.5
10	23.0	---	15.0	6.0	10.0	16.0	17.0	21.0	26.5	30.0	31.0	27.5
11	24.0	18.0	16.0	---	10.0	16.0	14.0	20.0	25.0	30.0	31.0	27.5
12	24.0	18.0	16.5	---	---	17.0	14.0	19.0	26.0	30.5	31.0	27.5
13	24.0	18.0	16.0	---	---	18.0	14.0	22.5	---	31.0	32.0	26.0
14	22.5	17.0	16.5	8.5	8.5	15.0	17.0	24.5	---	31.0	31.5	29.0
15	22.0	17.5	11.0	7.0	12.0	15.0	16.0	23.0	---	31.0	32.0	30.0
16	24.0	17.5	11.5	5.0	13.0	14.0	19.0	22.0	---	32.0	32.0	30.0
17	23.0	15.0	7.5	3.5	13.5	15.0	19.0	25.0	28.0	32.0	32.0	29.5
18	19.0	17.5	7.0	5.0	11.5	16.5	18.0	25.0	29.0	32.0	30.0	30.0
19	20.0	19.0	7.0	5.0	13.0	17.0	17.0	26.0	29.0	32.0	29.5	30.0
20	19.5	19.0	6.5	8.0	14.0	16.0	19.0	23.0	29.5	29.0	31.0	25.0
21	19.0	16.5	7.0	10.0	12.5	18.0	19.0	22.0	28.0	31.0	31.0	26.0
22	16.5	19.0	7.5	11.0	12.0	17.0	19.0	22.0	27.0	31.0	31.0	25.0
23	19.0	18.0	7.5	12.0	---	17.0	19.0	22.0	25.0	32.0	27.5	24.0
24	19.5	---	7.0	12.0	10.0	18.0	19.0	25.0	25.5	32.0	30.0	23.0
25	20.0	9.0	---	12.5	10.0	---	17.0	26.0	26.0	31.5	30.0	25.0
26	20.0	9.0	10.0	13.0	11.0	---	16.0	29.0	26.0	31.5	30.0	25.0
27	20.5	---	12.0	12.5	11.0	---	15.0	28.0	27.0	---	29.5	21.5
28	17.0	9.0	10.0	12.0	12.0	---	19.5	27.0	28.0	---	29.0	26.0
29	17.0	12.0	12.0	13.0	---	---	22.0	26.0	29.0	31.5	29.0	26.5
30	18.0	11.5	12.5	11.0	---	18.0	21.0	27.0	30.0	32.0	29.0	26.0
31	18.5	---	13.5	11.0	---	18.0	---	26.0	---	31.0	29.0	---
MEAN	21.0	16.0	11.5	10.0	11.5	16.0	17.5	23.5	27.0	31.0	30.0	27.0

## COLORADO RIVER BASIN

08127000 ELM CREEK AT BALLINGER, TX

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

**DRAINAGE AREA.**--450 mi<sup>2</sup>, of which 63.5 mi<sup>2</sup> is above Lake Winters Dam.

**PERIOD OF RECORD.**--April 1932 to current year.

Water-quality records.--Chemical analyses: October 1957 to September 1991. Specific conductance: October 1967 to September 1991. Water temperatures: October 1967 to September 1991.

**REVISED RECORDS.**--WSP 1442: 1935, 1946, 1954. WDR TX-81-3: Drainage area. WDR TX-96-3.

**GAGE.**--Water-stage recorder and masonry dam control. Datum of gage is 1,617.72 ft sea level.

**REMARKS.**--Records good except those below 10 ft<sup>3</sup>/s and estimated daily discharges, which are fair. The stage-discharge relation during periods of low flow are affected by wind action and by occasional accumulation of drift on dam. Since water year 1983 at least 10% of contributing drainage area has been regulated by New Lake Winters. The city of Winters diverts water from New Lake Winters (capacity, 8,374 acre-ft at elevation, 1,790.0 ft) for municipal use. Prior to June 1982, capacity of Old Lake Winters (just upstream from new dam) was 3,060 acre-ft. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--50 years (water years 1933-82) prior to completion of new Lake Winters, 47.6 ft<sup>3</sup>/s (34,490'acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1933-82).**--Maximum discharge, 50,000 ft<sup>3</sup>/s Oct. 13, 1957 (gage height, 14.20 ft, from floodmark); no flow at times. Highest stage not affected by backwater from the Colorado River since at least 1904, was that of Oct. 13, 1957, from information by local residents.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in August 1906 reached a stage of 14.5 ft, affected by backwater from Colorado River.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	60	29	128	33	24	78	58	50	20	143	6.2	.56
2	53	24	90	32	26	158	59	42	19	116	5.5	.51
3	47	24	76	33	28	464	66	38	17	98	5.0	.48
4	44	21	69	33	25	254	113	35	16	85	4.4	.45
5	40	20	64	33	30	162	153	32	14	76	5.4	.46
6	37	27	59	33	65	127	106	30	24	69	4.2	.43
7	33	150	55	e33	149	105	79	29	374	69	5.5	.39
8	32	72	53	e33	87	93	70	29	134	63	7.5	.36
9	29	50	50	e33	66	89	68	44	1780	56	7.7	.35
10	26	38	50	33	56	87	67	56	971	50	7.1	.31
11	24	33	49	33	52	83	66	43	327	48	7.2	.32
12	22	29	47	33	54	85	88	38	245	45	6.4	.33
13	18	29	47	29	77	92	83	35	394	41	5.2	.32
14	17	24	44	29	91	89	68	34	481	35	4.2	.29
15	17	24	39	29	76	83	61	70	296	34	2.8	.29
16	17	24	43	31	63	71	58	115	281	31	2.1	.29
17	17	24	37	33	54	68	58	68	203	27	1.9	.28
18	17	24	36	33	50	68	58	53	210	25	1.2	.26
19	15	24	36	32	50	67	56	45	137	24	.98	.24
20	17	23	33	33	230	63	56	38	106	23	.89	.22
21	17	20	33	33	554	59	54	36	83	22	.83	.19
22	17	20	33	33	233	58	51	33	75	20	.85	.21
23	17	20	33	32	141	58	50	31	11100	20	6.8	.35
24	17	72	31	30	114	58	44	29	2860	19	7.3	.34
25	17	104	29	29	103	65	45	29	1150	17	3.6	.31
26	17	73	32	29	102	68	56	27	677	15	1.9	.30
27	17	57	29	27	101	66	81	23	418	12	1.2	.30
28	141	50	30	24	89	60	77	20	293	10	.89	.28
29	100	166	29	24	---	58	63	18	218	8.3	.79	.26
30	52	258	33	24	---	58	54	20	176	8.1	.69	.24
31	34	---	33	24	---	58	---	22	---	7.2	.62	---
TOTAL	1028	1553	1450	953	2790	3052	2066	1212	23099	1316.6	116.84	9.92
MEAN	33.2	51.8	46.8	30.7	99.6	98.5	68.9	39.1	770	42.5	3.77	.33
MAX	141	258	128	33	554	464	153	115	11100	143	7.7	.56
MIN	15	20	29	24	24	58	44	18	14	7.2	.62	.19
AC-FT	2040	3080	2880	1890	5530	6050	4100	2400	45820	2610	232	20
CFSM	.07	.12	.10	.07	.22	.22	.15	.09	1.71	.09	.01	.00
IN.	.08	.13	.12	.08	.23	.25	.17	.10	1.91	.11	.01	.00



# COLORADO RIVER BASIN

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08127000 ELM CREEK AT BALLINGER, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1997#, BY WATER YEAR (WY)

MEAN	28.7	16.0	51.3	22.5	82.2	41.6	22.8	88.0	132	8.57	13.8	71.8
MAX	165	59.7	576	164	911	268	76.4	655	770	42.5	90.1	760
(WY)	1987	1987	1992	1992	1992	1992	1992	1994	1997	1997	1995	1996
MIN	.000	.000	.46	.42	.85	.39	.17	.000	1.07	.000	.000	.000
(WY)	1984	1989	1994	1986	1984	1986	1986	1984	1984	1984	1983	1983

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1983 - 1997#	
ANNUAL TOTAL	30976.56		38646.36		47.9	
ANNUAL MEAN	84.6		106		188	
HIGHEST ANNUAL MEAN					1992	
LOWEST ANNUAL MEAN					1984	
HIGHEST DAILY MEAN	12400	Sep 15	11100	Jun 23	12400	Sep 15 1996
LOWEST DAILY MEAN	.00	May 27	.19	Sep 21	.00	Jul 20 1983
ANNUAL SEVEN-DAY MINIMUM	.00	Jul 6	.24	Sep 16	.00	Jul 20 1983
INSTANTANEOUS PEAK FLOW			16700	Jun 23	16700	Jun 23 1997
INSTANTANEOUS PEAK STAGE			9.06	Jun 23	9.06	Jun 23 1997
ANNUAL RUNOFF (AC-FT)	61440		76660		34710	
ANNUAL RUNOFF (CFSM)	.19		.24		.11	
ANNUAL RUNOFF (INCHES)	2.56		3.19		1.45	
10 PERCENT EXCEEDS	80		130		68	
50 PERCENT EXCEEDS	8.0		33		3.3	
90 PERCENT EXCEEDS	.00		.89		.00	

e Estimated

# Period of regulated streamflow.

## COLORADO RIVER BASIN

08128000 SOUTH CONCHO RIVER AT CHRISTOVAL, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 31°11'13", long 100°30'06", Tom Green County, Hydrologic Unit 12090102, on left upstream side of U.S. Highway 277 bridge, 9.5 mi upstream from Twin Buttes Dam, and 23.7 mi upstream from mouth.

**DRAINAGE AREA.**--412.6 mi<sup>2</sup>, of which 58.6 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--February 1930 to September 1995 (daily mean discharge). October 1995 to current year (peak discharges greater than base discharge).

**REVISED RECORDS.**--WSP 1118: 1943(M). WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 2,010.22 ft above sea level. Prior to July 17, 1930, nonrecording gage at same site and datum. July 17, 1930, to Nov. 15, 1977, water-stage recorder at same site and datum. Nov. 16, 1977 to May 5, 1987, water-stage recorder at site 160 ft downstream at same datum.

**REMARKS.**--Records good. No known regulation. Low flow is affected by diversions to the South Concho Irrigation Company canal 800 ft upstream from station. Rain gage at station. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 100,000 ft<sup>3</sup>/s July 23, 1938 (gage height, 21.95 ft, from floodmark), from rating curve extended above 15,100 ft<sup>3</sup>/s on basis of slope-area measurement of 80,100 ft<sup>3</sup>/s; prior to Oct. 1, 1995, no flow Feb. 28 and Mar. 1, 1955.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1882, about 23 ft Aug. 6, 1906 (discharge, 115,000 ft<sup>3</sup>/s), from rating curve extended as noted above, from information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 160 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 20	1445	5,800	a8.44	Apr. 25	2345	294	a3.24

a From floodmark.

## COLORADO RIVER BASIN

61

08128400 MIDDLE CONCHO RIVER ABOVE TANKERSLEY, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 31°25'38", long 100°42'39", Irion County, Hydrologic Unit 12090103, on left bank 0.3 mi upstream from East Rocky Creek, 0.5 mi southwest of Tullos Ranch Headquarters, 6.7 mi northwest of Tankersley, and 20.9 mi upstream from mouth.

**DRAINAGE AREA.**--2,084 mi<sup>2</sup>, of which 968 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--March 1961 to September 1995 (daily mean discharge). October 1995 to current year (peak discharges greater than base discharge).

Water-quality records.--Chemical analyses: August 1964 to April 1965.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,986.47 ft above sea level.

**REMARKS.**--Records good. No known regulation or diversions. Rain gage at station. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 15,500 ft<sup>3</sup>/s Sept. 21, 1974 (gage height, 24.98 ft); prior to Oct. 1, 1995, no flow at times most years.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1900, 29.5 ft Sept. 26, 1936. A flood in 1900 reached the same stage, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 250 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 20	0645	1,400	11.26				

## COLORADO RIVER BASIN

08129300 SPRING CREEK ABOVE TANKERSLEY, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 31°19'48", long 100°38'24", Tom Green County, Hydrologic Unit 12090102, on right bank at downstream side of bridge on Farm Road 2335, 1.4 mi south of Tankersley, 2.5 mi upstream from Dove Creek, and 10.4 mi upstream from mouth.

**DRAINAGE AREA.**--424.7 mi<sup>2</sup>, of which 19.7 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--October 1960 to September 1995 (daily mean discharge). October 1995 to current year (peak discharges greater than base discharge).

Water-quality records.--Chemical analyses: September 1964 to May 1967.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 1,964.72 ft above sea level. Prior to Nov. 10, 1960, nonrecording gage at same site and datum.

**REMARKS.**--Records good. No known regulation. There are many small diversions above station for irrigation. Rain gage at station. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 30,400 ft<sup>3</sup>/s Aug. 12, 1971 (gage height, 16.57 ft); prior to Oct. 1, 1995, no flow at times most years.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Notable floods since at least 1853 occurred in 1882 and 1884. Flood of Oct. 3, 1959, reached a stage of 18.4 ft, from floodmarks. At former gage near Tankersley 8 mi downstream, the flood of Oct. 3, 1959, had a discharge of 82,100 ft<sup>3</sup>/s and was found to be about 3 ft lower than the 1882 flood, the greatest at that location since at least 1853.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 250 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 20	0700	2,580	7.25	Mar. 25	0945	283	5.16



## COLORADO RIVER BASIN

63

08130500 DOVE CREEK AT KNICKERBOCKER, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 31°16'26", long 100°37'50", Tom Green County, Hydrologic Unit 12090102, on left downstream end of bridge on Farm Road 2335, 0.5 mi west of Knickerbocker, and 5.7 mi upstream from mouth.

**DRAINAGE AREA.**--226.43 mi<sup>2</sup>, of which 8.43 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--October 1960 to September 1995 (daily mean discharge). October 1995 to current year (peak discharges greater than base discharge).

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 2,001.45 ft above sea level. Prior to Nov. 10, 1960, nonrecording gage, Nov. 10, 1960, to Mar. 17, 1986, water-stage recorder, both at site 278 ft to the right at present datum.

**REMARKS.**--Records good. No known regulation. Flow is affected by diversions from two small upstream channel dams, and by small upstream diversions (for irrigation). Flow is sustained by springflow from Dove Creek Spring about 9 mi upstream. Rain gage at station. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 17,500 ft<sup>3</sup>/s Aug. 12, 1971 (gage height, 20.66 ft); prior to Oct. 1, 1995, no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1882, 30.4 ft in 1906 and Oct. 3, 1959; floods in 1882 and 1884 reached about the same stage, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 20	0645	10,900	a19.06				

a From floodmark..

## 08131200 TWIN BUTTES RESERVOIR NEAR SAN ANGELO, TX

**LOCATION.**--Lat 31°22'55", long 100°32'17", Tom Green County, Hydrologic Unit 12090102, in outlet control tower at Twin Buttes Dam on Middle Concho River, Spring Creek, and South Concho River, 3.8 mi upstream from Lake Nasworthy Dam, 8.1 mi southwest of San Angelo, and 75.0 mi upstream from mouth.

**DRAINAGE AREA.**--3,868 mi<sup>2</sup>, of which 1,055 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--October 1962 to current year.

Water-quality records.--Chemical analyses: October 1969 to September 1984.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder on Middle Concho-Spring Creek pool and nonrecording gage on South Concho pool. Datum of gage is sea level.

**REMARKS.**--Records fair, the South Concho and Middle Concho-Spring Creek pools were not equalized. The reservoir is formed by a rolled earthfill dam 8.1 mi long, including a 200-foot-wide uncontrolled off-channel concrete gravity spillway with ogee weir section. Outlet works consist of three 15.5-foot concrete conduits, each controlled by a 12.0- by 15.0-foot fixed-wheel gate and a 12.0- by 15.0-foot radial gate, located in the Middle Concho-Spring Creek pool. Low-flow releases are made through 2.0- by 2.0-foot gates located in the center of three fixed-wheel gates. The South Concho and Middle Concho-Spring Creek pools are connected by a 3.22-mile equalizing channel. At an elevation of 1,926.5 ft, the two pools join to form one lake. Below elevation 1,926.5 ft, daily contents are obtained from capacity tables for South Concho and Middle Concho-Spring Creek pools and summed to obtain combined daily contents. Lake level elevations below 1,926.5 ft represent Middle Concho-Spring Creek pool only. Deliberate impoundment of water began on Dec. 1, 1962; dam was completed Feb. 13, 1963. Capacity curve is based on a survey made in 1958. Reservoir was built for flood control, irrigation, and municipal uses. Rain gage at station. Satellite 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 .....	1,991.0	
Crest of spillway .....	1,969.1	640,600
Top of conservation storage .....	1,940.2	186,200
Bottom of equalizing channel (Middle Concho-Spring Creek pool) .....	1,926.5	86,480
Dead storage in South Concho pool .....	1,926.5	5,440
Lowest gated outlet (invert at Middle Concho-Spring Creek pool) .....	1,885.0	3,750

**COOPERATION.**--Capacity curve furnished by the U.S. Bureau of Reclamation.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 205,200 acre-ft May 12, 1975 (elevation, 1,942.20 ft); minimum since first appreciable storage, 2,120 acre-ft Apr. 15, 1971.

**EXTREMES FOR CURRENT YEAR.**--Maximum combined daily contents, 79,760 acre-ft Feb. 21; minimum combined daily, 45,260 acre-ft Sept. 30.

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	63920	63410	66140	67200	68810	73020	70880	70940	71140	69690	57020	48900
2	63610	63420	66270	67270	68810	73330	71760	70550	71020	69310	56640	48640
3	63640	63480	66300	67330	68810	73400	71660	70550	70930	69030	56270	48410
4	63700	63510	66450	67330	68810	73480	71400	70520	70800	68770	56000	48290
5	63750	63560	66510	67330	68800	73380	70970	70440	70660	68520	55560	48190
6	63780	63950	66560	67430	69440	73310	70680	70440	70570	68230	55120	48070
7	63840	64040	66620	67500	69600	73350	70740	70530	70470	67890	55380	47980
8	63860	64100	66680	67570	69670	73520	70660	70550	70600	67580	55460	47890
9	63860	64140	66810	67640	69760	73690	70730	70880	70660	67170	55460	47730
10	63820	64140	66840	67640	69850	73900	70820	70880	70760	66900	55560	47680
11	63730	64200	66900	67670	69940	74340	70820	70860	70930	66870	55530	47680
12	63640	64260	66960	67710	70110	74800	70820	70960	70980	65950	55340	47560
13	63580	64350	67060	67780	70180	75040	70820	71300	70980	65550	55120	47410
14	63520	64390	67090	67940	70280	75110	70860	71330	71190	65130	54890	47290
15	63460	64520	67150	67940	70320	75250	70810	71690	71280	64770	54660	47200
16	63400	64540	67210	68000	70410	75410	70810	70870	71290	64260	54420	47090
17	63280	64540	67200	68060	70500	75620	70760	70650	71300	63730	54220	46890
18	63190	64590	67240	68160	70560	75750	70830	70740	71260	63050	53930	46750
19	63100	64610	67270	68260	70590	75780	70780	70810	71230	62490	53620	46570
20	63000	64660	67240	68360	78920	75910	70810	70850	71090	62000	53280	46390
21	62880	64650	67200	68460	79760	75980	70810	70810	71050	61560	52930	46190
22	62850	64750	67140	68490	78490	75980	70810	70940	71090	61040	52580	46120
23	62730	64870	67080	68560	77050	75980	70880	71070	71050	60650	52310	45950
24	62670	65350	67080	68560	75530	75470	70810	71130	70890	60180	51910	45790
25	62590	65440	67080	68590	75350	75090	71350	71200	70650	59790	51540	45680
26	62530	65490	67020	68660	75100	74210	71760	71260	70480	59430	51170	45610
27	62530	65570	67020	68660	75070	72890	71970	71260	70320	59070	50770	45530
28	63160	65790	67050	68780	74310	71280	72070	71290	70200	58680	50390	45420
29	63290	66010	67080	68810	---	70610	72200	71290	69930	58260	50000	45340
30	63300	66110	67080	68830	---	70650	71780	71180	69720	57890	49640	45260
31	63380	---	67140	68830	---	70740	---	71180	---	57420	49260	---
MAX	63920	66110	67270	68830	79760	75980	72200	71690	71300	69690	57020	48900
MIN	62530	63410	66140	67200	68800	70610	70660	70440	69720	57420	49260	45260
(+)	1918.72	1919.60	1919.94	1920.46	1921.36	1920.23	1920.34	1920.19	1919.80	1915.66	1912.43	1910.68
(@)	-540	+2730	+1030	+1690	+5480	-3570	+1040	-600	-1460	-12300	-8160	-4000
CAL YR 1996	MAX 67270	MIN 21790	(@) +26040									
WTR YR 1997	MAX 79760	MIN 45260	(@) -18660									

(+) Elevation, in feet, at end of month of Middle Concho and Spring Creek pool.  
(@) Change in combined contents, in acre-feet.

## 08132000 LAKE NASWORTHY NEAR SAN ANGELO, TX

**LOCATION.**--Lat 31°23'19", long 100°28'41", Tom Green County, Hydrologic Unit 12090102, on left bank 250 ft upstream from Nasworthy Dam on South Concho River, 3.8 mi downstream from Twin Buttes Dam, 6.0 mi southwest of San Angelo, and 68.9 mi upstream from mouth.

**DRAINAGE AREA.**--3,975 mi<sup>2</sup>, of which 3,868 mi<sup>2</sup> is above Twin Buttes Reservoir and 1,055 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--March 1930 to current year. Prior to October 1969, end of month contents only.

Water-quality records.--Chemical analyses: October 1969 to September 1984.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,840.00 ft sea level.

**REMARKS.**--Records good. The lake is formed by a 6,090-foot dam with a 5,590-foot earthen section that has an earthen spillway 300 ft long, a concrete spillway 475 ft long with a bank of fifteen 25.0- by 18.0-foot tainter gates, and a 25.0- by 3.0-foot collapsible floodgate. The dam was completed and storage began Mar. 28, 1930. Since July 1966, West Texas Utilities Co. has operated a steam generating powerplant on the lake. Since September 1962, the lake has been almost totally controlled by releases or pumpage from Twin Buttes Reservoir (station 08131200). Siltation surveys in December 1938 and May 1953 by the National Resource Conservation Service (formerly the Soil Conservation Service) show that 1,191 acre-ft of silt was deposited from March 1930 to December 1938 and an additional 1,023 acre-ft was deposited from December 1938 to May 1953, totaling 2,214 acre-ft. Water is used for part of San Angelo municipal supply and for irrigation east of San Angelo. The capacity curve is based on a survey by the Texas Water Development Board in August and September 1993 and has been used since October 1995. The City of San Angelo is in the process of planning and securing necessary permits to dredge Lake Nasworthy in the next year or two. Satellite 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 .....	1,883.5	-
Crest of spillway (300 ft) .....	1,879.1	-
Top of gates .....	1,873.2	-
Top of collapsible floodgate .....	1,872.2	10,110
Lowest outlet to canal (invert) .....	1,867.5	4,650
Crest of spillway (tainter gates sill) .....	1,855.3	27
Lowest gated outlet (invert) .....	1,836.0	0

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 26,900 acre-ft Sept. 15, 1936 (elevation, 1,878.36 ft); minimum, 209 acre-ft Aug. 22, 1964 (elevation, 1,853.21 ft).

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 9,990 acre-ft May 15 at 1000 hours (elevation, 1,872.15 ft); minimum, 8,050 acre-ft Dec. 19 (elevation, 1,870.66 ft).

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

1,853.0	4	1,865.0	2,640	1,870.0	7,270
1,857.0	102	1,867.0	4,190	1,871.0	8,460
1,861.0	733	1,868.0	5,130	1,872.0	9,710
1,863.0	1,470	1,869.0	6,160	1,872.2	10,110

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8260	8520	8440	8440	8540	9000	8770	9550	9050	8960	8890	9160
2	8470	8480	8430	8480	8550	9190	8990	9490	8990	8900	8900	9210
3	8420	8430	8420	8510	8550	9320	9140	9510	8980	8860	8940	9240
4	8380	8400	8430	8510	8520	9430	9090	9520	8990	8850	9020	9200
5	8350	8370	8430	8490	8510	9520	8960	9530	8990	8830	9070	9200
6	8300	8480	8410	8540	8720	9620	9050	9550	9060	8810	9100	9180
7	8250	8490	8410	8570	8730	9670	9140	9570	9110	8810	9190	9150
8	8200	8480	8400	8600	8740	9690	9190	9570	9320	8790	9020	9140
9	8160	8480	8400	8580	8750	9690	9270	9630	9330	8770	8860	9070
10	8140	8470	8380	8540	8750	9700	9330	9630	9340	8770	8750	9070
11	8170	8430	8380	8510	8750	9760	9350	9630	9370	8790	8700	9060
12	8170	8410	8370	8470	8790	9790	9390	9660	9380	8810	8720	9040
13	8180	8370	8360	8460	8780	9760	9440	9660	9380	8830	8750	9020
14	8200	8350	8300	8440	8780	9740	9480	9660	9490	8830	8780	9000
15	8230	8320	8280	8420	8780	9730	9510	9910	9480	8810	8750	8980
16	8190	8300	8240	8400	8770	9740	9510	9650	9470	8880	8740	8930
17	8160	8260	8160	8370	8770	9740	9530	9620	9470	8930	8700	8890
18	8160	8250	8080	8360	8750	9690	9570	9620	9470	8930	8690	8880
19	8170	8250	8060	8340	8770	9630	9600	9610	9460	8910	8720	8880
20	8170	8230	8110	8340	9280	9580	9630	9610	9380	8930	8750	8850
21	8160	8190	8110	8320	9090	9550	9660	9610	9320	9010	8790	8850
22	8170	8200	8130	8340	8950	9490	9660	9630	9250	9100	8850	8910
23	8170	8240	8140	8360	8850	9470	9690	9650	9180	9130	8880	8960
24	8180	8360	8180	8370	8740	9290	9700	9660	9140	9110	8890	9000
25	8190	8350	8240	8410	8680	9290	9830	9610	9120	9070	8900	9010
26	8200	8340	8260	8430	8800	9210	9940	9530	9090	9040	8930	9010
27	8250	8320	8310	8420	9020	9020	9910	9430	9050	8990	8950	9000
28	8640	8400	8340	8430	9060	8720	9910	9320	9040	8960	8960	8950
29	8640	8460	8360	8460	---	8600	9910	9250	9010	8930	8990	8950
30	8620	8440	8380	8490	---	8630	9700	9160	8990	8890	9010	8940
31	8550	---	8410	8520	---	8700	---	9110	---	8880	9070	---
MAX	8640	8520	8440	8600	9280	9790	9940	9910	9490	9130	9190	9240
MIN	8140	8190	8060	8320	8510	8600	8770	9110	8980	8770	8690	8850
(+)	1871.08	1870.99	1870.96	1871.05	1871.49	1871.20	1871.99	1871.53	1871.43	1871.34	1871.50	1871.39
(@)	+240	-110	-30	+110	+540	-360	+1000	-590	-120	-110	+190	-130

CAL YR 1996 MAX 9770 MIN 8060 (@) -630  
WTR YR 1997 MAX 9940 MIN 8060 (@) +630

(+) Elevation, in feet, at end of month.

(@) Change in contents, in acre-feet.

## COLORADO RIVER BASIN

08133500 NORTH CONCHO RIVER AT STERLING CITY, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 31°49'48", long 100°59'36", Sterling County, Hydrologic Unit 12090104, on right bank 100 ft upstream from bridge on State Highway 163, 0.5 mi south of Sterling City, 4.0 mi upstream from Sterling Creek, 5.1 mi downstream from Lacy Creek, and at mile 57.2.

**DRAINAGE AREA.**--588 mi<sup>2</sup>, of which 19.6 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--September 1939 to September 1985 (daily mean discharge). October 1985 to September 1995 (daily discharges greater than 100 ft<sup>3</sup>/s). October 1995 to current year (peak discharges greater than base discharge).

**REVISED RECORDS.**--WSP 1512: 1945, 1948. WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 2,242.36 ft above sea level. Prior to Dec. 6, 1939, nonrecording gage at same site and datum.

**REMARKS.**--Records good. No known regulation. There are several small diversions above station for irrigation. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 16,300 ft<sup>3</sup>/s July 6, 1948 (gage height, 23.70 ft); prior to Oct. 1, 1985, no flow at times each year. Maximum stage since at least 1891, that of July 6, 1948.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 300 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
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No peak greater than base discharge.



## 08134000 NORTH CONCHO RIVER NEAR CARLSBAD, TX

(Hydrologic index station)

**LOCATION.**--Lat 31°35'33", long 100°38'12", Tom Green County, Hydrologic Unit 12090104, near left bank at downstream side of bridge on county road, 0.6 mi southeast of Carlsbad, 1.5 mi upstream from Mule Creek, 2.5 mi upstream from Grape Creek, 16.2 mi upstream from O.C. Fisher Dam, and 21.3 mi upstream from mouth.

**DRAINAGE AREA.**--1,266 mi<sup>2</sup>, of which 75.1 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--March 1924 to current year.

Water-quality records: Chemical and biochemical analyses: October 1980 to September 1982.

**REVISED RECORDS.**--WSP 1512: 1924(M), 1925, 1926(M), 1928, 1930, 1932(M), 1935, 1937-38(M), 1941(M), 1945(M), 1947- 49(M). WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,968.02 ft above sea level. Prior to Feb. 4, 1925, and Sept. 27, 1936, to Feb. 7, 1937, nonrecording gage; Feb. 4, 1925, to Sept. 26, 1936, and Feb. 8, 1937, to Nov. 6, 1955, water-stage recorder, all at site 2.5 mi upstream at datum 32.76 ft higher.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. No known regulation. There are several diversions (by pumping) upstream from station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since June 1853, that of Sept. 26, 1936.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft³/s)	Gage height (ft)		Date	Time	Discharge (ft³/s)	Gage height (ft)			
	Feb. 20	0630	2,590	11.75								
	DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	1.4	6.3	4.2	4.5	7.8	6.7	7.5	3.7	3.8	.00	.00
2	2.7	1.4	5.5	4.2	4.5	10	6.6	7.1	4.1	3.1	.00	.00
3	1.9	1.5	5.4	4.2	4.5	9.2	9.1	6.4	3.5	2.8	.00	.00
4	2.2	1.8	5.3	4.5	4.5	8.4	8.2	6.2	3.2	2.4	.00	.00
5	2.9	1.8	5.3	4.5	4.5	7.4	7.4	6.0	3.2	2.0	.00	.00
6	2.3	8.2	5.3	4.5	5.0	6.8	6.3	5.9	6.7	1.5	.00	.00
7	2.1	52	5.3	4.5	5.1	6.8	6.1	5.9	7.2	1.5	.00	.00
8	2.0	4.8	5.0	4.5	5.1	6.8	6.4	5.9	6.5	1.3	.00	.00
9	1.9	3.2	4.7	4.5	5.1	6.9	6.3	11	14	1.0	.00	.00
10	1.6	2.8	4.7	4.5	5.1	7.0	6.8	10	7.3	.91	.00	.00
11	1.3	2.7	4.7	4.5	5.1	7.1	7.0	8.7	6.2	.86	.00	.00
12	1.1	2.6	4.7	4.4	5.1	7.3	6.7	9.6	5.8	.62	.00	.00
13	.84	1.5	4.7	4.2	5.1	6.9	6.5	9.0	5.7	.24	.00	.00
14	1.2	2.4	4.7	4.2	5.1	6.6	6.4	7.9	5.5	.16	.00	.00
15	1.3	2.4	4.7	4.2	5.1	6.2	6.4	8.0	214	.07	.00	.00
16	1.0	2.6	4.7	4.2	5.1	6.3	6.3	12	36	.07	.00	.00
17	1.0	2.7	4.7	4.2	5.1	6.6	6.8	9.6	17	.05	.00	.00
18	.91	2.7	4.7	4.2	5.1	6.5	7.6	7.2	12	.04	.02	.00
19	.71	2.7	4.7	4.2	5.1	6.7	7.8	6.5	10	.02	.00	.00
20	.72	2.7	4.5	4.2	487	6.7	13	6.3	8.5	.00	.00	.00
21	1.3	3.4	4.5	4.2	42	6.0	14	6.2	7.4	.00	.00	.00
22	2.3	3.5	4.5	4.2	16	5.9	11	6.2	e7.1	.00	.00	.00
23	2.8	3.5	4.5	4.2	15	5.6	9.3	6.2	e6.8	.00	.00	.00
24	2.5	6.2	4.5	4.1	12	5.7	8.4	5.8	6.4	.00	.00	.00
25	2.4	41	4.5	3.9	10	10	14	5.4	6.0	.00	.00	.00
26	2.4	14	4.5	3.9	9.0	7.5	11	5.1	5.8	.00	.00	.00
27	3.5	9.8	4.5	4.1	8.4	6.2	9.8	4.6	5.5	.00	.00	.00
28	4.5	7.3	4.5	4.5	8.2	5.9	9.3	4.4	4.9	.00	.00	.00
29	3.6	8.2	4.5	4.5	---	6.0	8.7	4.0	4.7	.00	.00	.00
30	2.6	7.2	4.5	4.5	---	6.2	8.2	3.8	4.3	.00	.00	.00
31	2.3	---	4.5	4.5	---	6.3	---	3.8	---	.00	.00	---
TOTAL	62.78	208.0	149.1	133.2	701.4	215.3	248.1	212.2	439.0	22.44	0.02	0.00
MEAN	2.03	6.93	4.81	4.30	25.1	6.95	8.27	6.85	14.6	.72	.001	.000
MAX	4.5	52	6.3	4.5	487	10	14	12	214	3.8	.02	.00
MIN	.71	1.4	4.5	3.9	4.5	5.6	6.1	3.8	3.2	.00	.00	.00
AC-FT	125	413	296	264	1390	427	492	421	871	45	.04	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1997, BY WATER YEAR (WY)

	MEAN	37.0	4.13	4.22	4.03	6.89	10.4	36.1	80.5	27.5	40.6	16.8	84.6
MAX	1463	65.2	20.1	16.0	85.0	307	631	1355	252	1195	255	4019	
(WY)	1958	1935	1931	1937	1935	1926	1925	1925	1937	1948	1953	1936	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1934	1934	1953	1953	1953	1953	1963	1967	1934	1924	1929	1930	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1924 - 1997

ANNUAL TOTAL	4997.24	2391.54	29.6
ANNUAL MEAN	13.7	6.55	336
HIGHEST ANNUAL MEAN			.000
LOWEST ANNUAL MEAN			1936
HIGHEST DAILY MEAN	1740	Aug 29	1970
LOWEST DAILY MEAN	.00	Jan 1	Sep 17 1936
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	Jun 20 1924
INSTANTANEOUS PEAK FLOW		2590	.00 Jun 20 1924
INSTANTANEOUS PEAK STAGE		11.75	94600 Sep 26 1936
ANNUAL RUNOFF (AC-FT)	9910	Feb 20	29.10 Sep 26 1936
10 PERCENT EXCEEDS	8.2	4740	21450
50 PERCENT EXCEEDS	1.3	8.7	12
90 PERCENT EXCEEDS	.00	4.5	1.6
		.00	.00

e Estimated

## 08134500 O.C. FISHER LAKE AT SAN ANGELO, TX

**LOCATION.**--Lat 31°29'04", long 100°28'53", Tom Green County, Hydrologic Unit 12090104, in intake structure of O.C. Fisher Dam on North Concho River, 3.1 mi northwest of San Angelo, and 6.6 mi upstream from mouth.

**DRAINAGE AREA.**--1,488 mi<sup>2</sup>, of which 105 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--February 1952 to current year. Published as San Angelo Reservoir prior to October 1970, and as San Angelo Lake, October 1970 to September 1974.

Water-quality records.--Chemical analyses: October 1969 to September 1984.

**REVISED RECORDS.**--WSP 1922: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is sea level. Prior to May 12, 1953, non-recording gage at same site and datum.

**REMARKS.**--The lake is formed by a rolled earthfill dam 40,885 ft long, including spillway. Closure was completed Mar. 7, 1951, and the dam was completed May 3, 1951. Deliberate impoundment began Feb. 1, 1952. The lake is operated for flood control and recreation with part as municipal supply for the city of San Angelo. The spillway is an uncontrolled off-channel concrete gravity dam with ogee weir section 1,150 ft wide located to the right and upstream from the right end of dam. The spillway is designed to discharge 356,000 ft<sup>3</sup>/s at maximum design flood level. The control outlet works consist of six gate-controlled outlets, 7.5 by 14.5 ft, opening into two 18.0-foot-diameter concrete conduits, and two 2.5-foot gate-controlled outlets for water-supply outlets. Since February 1973, the capacity is based on a survey made in 1962. Prior to 1973, the capacity was based on a survey made in 1944. Satellite 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 .....	1,964.0	-
Design flood .....	1,958.0	690,000
Crest of spillway .....	1,938.5	392,700
Top of conservation pool .....	1,908.0	115,700
Lowest gated outlet (invert) .....	1,840.0	0

**COOPERATION.**--Records of elevations and contents furnished by the U.S. Army Corps of Engineers and reviewed by the U.S. Geological Survey.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 174,100 acre-ft Oct. 14, 1957 (elevation, 1,916.47 ft); minimum since first appreciable storage, lake dry July 16, 1970, to Apr. 15, 1971.

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 20,830 acre-ft June 17-20 (elevation, 1,878.46 ft); minimum, 17,440 acre-ft Oct. 26, 27 (elevation, 1,876.21 ft).

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

1,872.0	12,230	1,883.0	29,550	1,891.0	49,460
1,874.0	14,560	1,885.0	33,940	1,892.0	52,370
1,877.0	18,560	1,887.0	36,680	1,893.0	55,360
1,879.0	21,750	1,888.0	41,220	1,894.0	58,410
1,881.0	25,470	1,890.0	46,620		

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18060	17610	17730	17700	17620	19630	19790	20020	19710	20550	19170	18370
2	18010	17590	17730	17720	17610	19710	19820	20000	19680	20500	19130	18330
3	18000	17580	17820	17750	17610	19740	19880	19960	19630	20470	19080	18310
4	18000	17560	17820	17730	17580	19770	19940	19940	19620	20420	19050	18290
5	17970	17550	17820	17700	17580	19740	19910	19930	19580	20370	19020	18260
6	17960	17550	17820	17700	17730	19740	19850	19930	19620	20320	18990	18230
7	17940	17610	17820	17700	17750	19750	19830	19930	19600	20270	19050	18200
8	17910	17620	17820	17720	17750	19750	19830	19910	19740	20230	19050	18170
9	17890	17650	17800	17720	17750	19770	19830	19940	19820	20180	19020	18130
10	17840	17650	17790	17690	17750	19790	19830	19940	19820	20150	19050	18100
11	17830	17650	17860	17680	17770	19820	19830	19940	19820	20080	19130	18070
12	17800	17620	17840	17630	17770	19860	19790	19960	19830	20040	19110	18030
13	17770	17620	17840	17620	17770	19900	19750	19960	19820	19990	19100	17980
14	17730	17620	17840	17650	17770	19850	19750	19940	19830	19940	19070	17960
15	17720	17620	17830	17650	17770	19830	19740	19970	20520	19900	19020	17940
16	17700	17620	17830	17620	17770	19830	19710	19970	20700	19860	18960	17900
17	17660	17610	17770	17620	17770	19830	19720	19970	20830	19820	18920	17860
18	17610	17590	17750	17620	17770	19830	19740	19970	20830	19770	18870	17820
19	17590	17590	17750	17620	17900	19830	19740	19960	20830	19710	18840	17770
20	17560	17580	17750	17650	18720	19830	19740	19930	20830	19660	18810	17730
21	17560	17560	17750	17660	19110	19830	19740	19930	20810	19630	18770	17690
22	17550	17550	17750	17660	19370	19820	19690	19930	20810	19600	18750	17680
23	17510	17560	17730	17680	19420	19820	19690	19930	20790	19570	18720	17660
24	17500	17690	17700	17660	19460	19820	19690	19930	20760	19510	18690	17620
25	17480	17680	17720	17650	19550	19820	19860	19910	20750	19480	18650	17590
26	17440	17700	17720	17660	19600	19820	19970	19880	20710	19430	18620	17580
27	17440	17720	17720	17630	19580	19830	20020	19830	20700	19390	18580	17550
28	17610	17720	17720	17610	19620	19830	20020	19800	20680	19340	18550	17510
29	17650	17720	17700	17610	---	19820	20020	19770	20630	19290	18500	17480
30	17630	17730	17700	17610	---	19790	20020	19740	20580	19250	18460	17450
31	17630	---	17700	17620	---	19790	---	19720	---	19200	18420	---
MAX	18060	17730	17860	17750	19620	19900	20020	20020	20830	20550	19170	18370
MIN	17440	17550	17700	17610	17580	19630	19690	19720	19580	19200	18420	17450
(+)	1876.35	1876.42	1876.40	1876.34	1877.70	1877.81	1877.96	1877.77	1878.31	1877.43	1876.90	1876.22
(@)	-450	+100	-30	-80	+2000	+170	+230	-300	+860	-1380	-780	-970
CAL YR 1996	MAX	18360	MIN	12770	(@)	-90						
WTR YR 1997	MAX	20830	MIN	17440	(@)	-630						

(+) Elevation, in feet, at end of month.

(@) Change in contents, in acre feet.

# COLORADO RIVER BASIN

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## 08136000 CONCHO RIVER AT SAN ANGELO, TX

**LOCATION.**--Lat 31°27'16", long 100°24'37", Tom Green County, Hydrologic Unit 12090105, on left bank 0.4 mi downstream from confluence of North and South Concho Rivers, 1.8 mi southeast of Tom Green County Courthouse, and 61.9 mi upstream from mouth.

**DRAINAGE AREA.**--5,542 mi<sup>2</sup>, of which 1,131 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--September 1915 to current year. Prior to October 1969, published as "near San Angelo".

**REVISED RECORDS.**--WSP 568: 1915-16, 1919-22. WSP 1148: 1916-22(M), 1924(M), 1925-26, 1929(M), 1930-32, 1935-37. WSP 1512: 1917-18. WSP 1712: 1936. WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 1,776.79 ft above sea level. Prior to Aug. 11, 1917, nonrecording gage at same site and datum. Aug. 11, 1917, to May 15, 1963, water-stage recorder on right bank at same datum.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. Since water year 1931 at least 10% of contributing drainage area has been regulated by Lake Nasworthy (08132000). There are many diversions upstream from station for irrigation, industrial, and municipal supply. Since December 1962, flow regulated by Twin Buttes Reservoir (station 08131200) on the South Concho River and since February 1952 by O. C. Fisher Lake (station 08134500) on the North Concho River. Several observations of water temperatures were made during the year. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--15 years (water years 1916-30) prior to completion of Lake Nasworthy, 142 ft<sup>3</sup>/s (102,600 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS, 1916-30).**--Maximum discharge, 92,000 ft<sup>3</sup>/s Apr. 26, 1922 (gage height, 36.8 ft, from floodmarks), on basis of slope-area measurements of 167,000 and 230,000 ft<sup>3</sup>/s in 1936; no flow at times in 1921.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1853, 47.5 ft Aug. 6, 1906 (discharge, about 246,000 ft<sup>3</sup>/s), from information by local resident. Other large floods are known to have occurred in June 1853, August 1882, and April 1900.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.16	4.7	5.4	e.15	e.15	845	5.5	533	1.5	11	3.6	20
2	.16	3.7	.24	e.15	e.15	159	e20	262	5.0	12	5.0	3.6
3	.16	2.9	.16	e.20	.16	64	137	44	3.7	6.8	6.8	4.0
4	.15	3.4	.16	e.20	.16	56	341	44	5.0	12	16	5.6
5	.12	1.4	.16	e.20	.12	53	310	43	5.7	21	27	2.7
6	.11	.21	.16	e.20	112	54	174	35	33	21	18	3.5
7	.11	146	.16	e.20	14	40	8.9	11	23	8.0	105	2.3
8	.11	14	.16	e.20	5.3	8.6	4.3	9.6	96	7.3	44	3.0
9	.11	6.1	.16	e.20	1.2	3.4	.25	91	101	13	21	1.8
10	.09	3.7	.16	e.20	.03	.35	.22	19	30	11	45	2.4
11	.09	.26	.16	e.20	.02	.44	1.5	9.3	18	8.4	94	5.2
12	.11	.31	.16	e.20	e.06	29	.26	8.7	11	9.1	21	8.4
13	.11	.20	.16	e.20	e2.0	9.9	.41	10	9.5	8.8	6.8	7.3
14	.11	.18	.16	e.20	e.09	5.5	.20	9.6	70	8.1	3.8	7.1
15	.11	.17	.16	e.20	e.02	6.5	3.2	356	122	7.6	5.0	5.8
16	.11	.16	.16	e.20	e.02	3.0	13	583	28	4.4	2.7	5.3
17	.09	.29	.16	e.20	e.02	.34	12	241	29	2.7	2.3	3.8
18	.09	.33	.16	e.20	e.02	.32	.14	16	13	6.1	3.0	5.8
19	.09	.19	.16	e.20	e.02	.26	.14	12	7.3	11	2.8	2.7
20	.08	.22	.16	e.20	e180	.24	.16	11	5.2	10	3.0	2.2
21	.08	.14	.16	e.20	e750	.22	5.5	7.4	3.2	29	6.2	3.1
22	.12	.11	.16	e.20	e950	22	3.5	3.1	2.6	26	8.2	28
23	.09	.15	.16	e.20	e950	52	.20	2.2	15	6.7	34	8.2
24	.09	89	e.15	e.20	e950	298	.24	3.1	6.9	4.1	28	3.1
25	.08	48	e.15	e.20	e950	557	152	7.6	4.0	4.2	19	2.5
26	.08	7.9	e.15	e.20	440	496	132	5.2	4.0	4.7	15	3.2
27	.10	.21	e.15	e.20	8.9	692	68	2.3	5.7	4.8	7.6	2.6
28	421	.19	e.15	e.20	299	927	57	.21	13	11	3.2	3.2
29	28	73	e.15	e.20	---	475	54	.20	16	5.6	2.9	2.4
30	6.3	26	e.15	e.20	---	11	303	.22	15	3.6	3.2	2.9
31	4.5	---	e.15	e.20	---	9.0	---	.20	---	2.8	15	---
TOTAL	462.71	433.12	10.20	6.10	5613.44	4878.07	1807.62	2379.93	702.3	301.8	578.1	161.7
MEAN	14.9	14.4	.33	.20	200	157	60.3	76.8	23.4	9.74	18.6	5.39
MAX	421	146	5.4	.20	950	927	341	583	122	29	105	28
MIN	.08	.11	.15	.15	.02	.22	.14	.20	1.5	2.7	2.3	1.8
AC-FT	918	859	20	12	11130	9680	3590	4720	1390	599	1150	321

## COLORADO RIVER BASIN

## 08136000 CONCHO RIVER AT SAN ANGELO, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1997#, BY WATER YEAR (WY)

MEAN	126	33.9	35.0	31.3	36.9	29.8	97.7	196	88.3	108	41.6	267
MAX	2659	434	274	205	213	242	1604	3984	1132	2137	900	13190
(WY)	1960	1975	1975	1938	1975	1941	1949	1957	1941	1938	1942	1936
MIN	.077	.11	.095	.055	.062	.050	.067	.083	.090	.069	.15	.30
(WY)	1953	1971	1974	1974	1971	1971	1972	1971	1971	1969	1985	1952

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1931 - 1997#

ANNUAL TOTAL	4662.44		17335.09									
ANNUAL MEAN	12.7		47.5							91.0		
HIGHEST ANNUAL MEAN										1132		1936
LOWEST ANNUAL MEAN										1.62		1952
HIGHEST DAILY MEAN	421	Oct 28		950	Feb 22					128000	Sep 17	1936
LOWEST DAILY MEAN	.02	Jul 22		.02	Feb 11					.00	Sep 14	1952
ANNUAL SEVEN-DAY MINIMUM	.02	Jul 22		.09	Oct 20					.00	Sep 16	1952
INSTANTANEOUS PEAK FLOW				1370	Oct 28					c230000	Sep 17	1936
INSTANTANEOUS PEAK STAGE				4.95	Oct 28					a46.60	Sep 17	1936
ANNUAL RUNOFF (AC-FT)	9250			34380						65890		
10 PERCENT EXCEEDS	20			92						70		
50 PERCENT EXCEEDS	4.9			3.6						7.7		
90 PERCENT EXCEEDS	.11			.14						.14		

e Estimated

# Period of regulated streamflow.

a From floodmark.

c From rating curve extended above 105,000 ft<sup>3</sup>/s on basis of slope-area measurements of 167,000 and 230,000 ft<sup>3</sup>/s.





08136500 CONCHO RIVER AT PAINT ROCK, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: April 1946 to October 1949. Chemical and biochemical analyses: March 1964 to current year. Pesticide analyses: April 1968 to October 1981. Sediment analyses: February 1978 to September 1981.

**PERIOD OF DAILY RECORD.--**

**SPECIFIC CONDUCTANCE:** April 1946 to October 1949, October 1967 to September 1990.

**WATER TEMPERATURE:** April 1946 to October 1949, October 1967 to September 1990.

**SUSPENDED SEDIMENT DISCHARGE:** February 1978 to September 1981.

**EXTREMES FOR PERIOD OF DAILY RECORD.--**

**SPECIFIC CONDUCTANCE:** Maximum daily, 3,690 microsiemens June 28, Aug. 12, 1984; minimum daily, 268 microsiemens Sept. 9, 1980.

**WATER TEMPERATURE:** Maximum daily, 35.0°C on several days during summer months; minimum daily, 0.0°C on many days during winter months.

**SEDIMENT CONCENTRATION:** Maximum daily mean, 4.190 mg/L Sept. 9, 1980; minimum daily mean, 3 mg/L Feb. 2, 1979.

**SEDIMENT LOAD:** Maximum daily, 269,000 tons Sept. 9, 1980; minimum daily, 0.0 tons on several days during September 1980.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE,	SPE-CIFIC	PH	TEMPER-ATURE	OXYGEN,	OXYGEN	OXYGEN	HARD-NESS	HARD-NESS	CALCIUM	MAGNE-SIUM,
		CUBIC FEET PER SECOND	CON-DUCT-ANCE (US/CM)	WATER WHOLE FIELD (STAND-ARD UNITS)			DIS-SOLVED (PER-CENT SATUR-ATION)	DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)		NONCARB DISSOLV FLD. AS CACO3 (MG/L)		
OCT 17...	1135	12	1900	8.1	23.0	8.5	107	1.8	550	400	110	68
JAN 22...	1530	14	2870	8.0	11.5	12.0	118	1.3	960	760	220	99
FEB 26...	1550	1100	1200	8.1	11.0	11.6	114	2.3	320	150	73	33
MAY 13...	1045	52	1720	8.0	20.0	8.4	99	2.4	570	370	130	59
JUL 08...	1130	36	1950	8.0	29.5	7.3	102	2.0	590	440	130	65
SEP 04...	1040	22	2280	7.9	28.0	7.1	97	3.6	660	540	180	52

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 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 DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
OCT 17...	170	3	6.4	160	280	370	0.50	19	1120	1.06	0.040	1.10
JAN 22...	240	3	5.3	190	430	560	0.60	14	1760	16.9	0.060	17.0
FEB 26...	110	3	4.9	170	83	220	0.50	14	642	--	<0.010	0.590
MAY 13...	145	3	4.8	190	240	320	0.51	17	1050	4.41	0.053	4.47
JUL 08...	167	3	6.9	150	270	390	0.47	19	1160	3.01	0.106	3.12
SEP 04...	229	4	8.5	120	300	480	0.53	28	1350	0.096	0.015	0.111

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (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...	0.020	0.38	0.40	<0.010	<0.010	--	--	--	--	--	--	--
JAN 22...	<0.015	--	0.30	<0.010	<0.010	1	3.0	--	<1.0	<1.0	--	<1.0
FEB 26...	0.060	0.34	0.40	<0.010	<0.010	--	--	--	--	--	--	--
MAY 13...	0.016	0.43	0.45	<0.010	<0.010	--	--	--	--	--	--	--
JUL 08...	<0.015	--	0.59	<0.010	<0.010	7	152	<0.50	<1.0	<5.0	<3.0	<10
SEP 04...	0.040	0.67	0.71	0.026	<0.010	--	--	--	--	--	--	--

[illegible]

# COLORADO RIVER MAIN STEM

73

08136600 O.H. IVIE RESERVOIR NEAR VOSS, TX

**LOCATION.**--Lat 31°30'00", long 99°40'05", Coleman County, Hydrologic Unit 12090106, on left bank, in outlet structure of Freese-Nichols Dam on Colorado River, 8 mi northeast of Millersview, 10 mi southwest of Voss, and at mile 615.1.

**DRAINAGE AREA.**--24,038 mi<sup>2</sup>, of which 11,391 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--September 1990 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is sea level.

**REMARKS.**--Records good except those for estimated daily contents, which are fair. The lake is formed by a concrete dam and spillway with six 50- by 40-foot tainter gates, and a 6,000 ft overflow spillway with a 2,000 ft tapered fuse plug release feature. Total length of the dam is 12,000 ft. The dam was completed and storage began March 15, 1990. Recording equipment was installed May 30, 1990, but water did not reach the sensing point until September 21, 1990 (at an elevation of 1,502.05 ft). Water is utilized for municipal use for several West Texas communities, the city of San Angelo being the largest user. The capacity curve is based on a survey made in 1989 by Freese and Nichols, Fort Worth, Tex. Satellite 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 .....	1,584.0	-
Crest of overflow spillway .....	1,563.0	806,800
Top of conservation storage .....	1,551.5	554,300
Crest of spillway (tainter gates sill) .....	1,528.0	216,100
Lowest gated outlet (service outlet) .....	1,440.0	90

**COOPERATION.**--The capacity table was furnished by the Colorado River Municipal Water District, and based on a survey made in 1989 by Freese and Nichols, Consulting Engineers, Fort Worth, Texas.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 574,700 acre-ft June 26, 1997 (elevation, 1,552.55 ft); minimum recorded, 57,780 acre-ft Sept. 21, 1990 (elevation, 1,502.05 ft).

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 574,700 acre-ft June 26 at 1515 hours (elevation, 1,552.55 ft); minimum, 408,200 acre-ft Oct. 29 (elevation, 1,543.10 ft).

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

1,502.0	57,610	1,525.0	187,600	1,540.0	361,600
1,515.0	114,900	1,530.0	236,800	1,545.0	438,600
1,520.0	147,300	1,535.0	294,500	1,553.0	583,500

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	442200	409600	419700	423000	423700	453600	481700	491600	501800	567400	545900	536700
2	442100	409600	420600	423700	423300	458800	482200	492500	501200	564500	545300	536500
3	441700	409300	421000	424200	423300	461400	482900	493200	501100	562000	545000	536100
4	441700	409300	421300	424000	423300	463100	484000	493200	500900	559100	545000	536100
5	441600	409300	421900	423800	423200	463900	484900	493200	500500	556100	544600	535600
6	441600	411600	422200	424200	425600	464600	485600	493700	503700	554900	544400	535400
7	441600	411800	422200	424200	426300	465400	486300	493200	503900	554900	547100	535000
8	441200	412100	422200	424200	426400	466300	486400	493500	505400	554900	546700	534500
9	441100	412300	422200	424200	427200	467200	486800	494100	509000	554700	546700	534100
10	440600	412300	422700	423800	427400	467700	486400	494100	511900	554300	546700	533300
11	440200	412300	423200	423200	427700	468500	487500	494200	513500	554300	546500	533000
12	440200	412300	423200	423200	428900	469400	487000	494600	515400	553800	545700	532600
13	440100	412300	423200	422900	429000	470100	487000	494600	515900	553600	545900	532000
14	438400	412400	423300	422700	429700	470200	487100	494600	519200	553200	545700	531500
15	436000	412400	423300	423200	429800	470400	487100	495500	520700	553000	545100	531300
16	434200	412700	423300	423000	430200	470900	487300	496200	523300	553000	544600	530700
17	432100	412700	423200	422900	430200	471400	487500	497600	524400	552400	544000	530100
18	430300	412700	422900	422900	430500	471800	487300	498500	525800	551800	543400	529800
19	428900	412700	422500	422900	431000	471900	487800	499400	526600	551700	542700	529200
20	427900	412700	422400	422900	433900	472300	488000	499800	527500	550900	542700	528500
21	426600	412700	422400	423300	437000	472500	488000	500200	527500	551300	542100	527500
22	424300	412300	422500	423300	438700	472600	487700	500000	530300	550900	541900	527900
23	421300	412300	423200	424300	441600	472800	487700	500500	563500	550500	541200	527700
24	418400	414900	423200	424300	444600	472800	487100	500500	571900	549900	540800	527100
25	415600	414900	422500	424000	447600	473300	488900	500300	574100	549400	540500	526600
26	412900	414900	422700	424000	450400	474200	490100	500500	574500	548600	539700	526000
27	410400	415100	422900	424200	451900	475600	490700	501000	573900	548200	539300	525800
28	408500	415700	423000	423500	452900	477000	491200	e502100	572900	547800	538900	525700
29	408500	417600	423000	423800	---	481900	491000	502300	571400	547200	538000	525100
30	408800	419700	423000	423500	---	481200	491200	501900	569400	546700	537800	524700
31	409600	---	423000	423700	---	481600	---	501900	---	546500	537100	---
MAX	442200	419700	423300	424300	452900	481900	491200	502300	574500	567400	547100	536700
MIN	408500	409300	419700	422700	423200	453600	481700	491600	500500	546500	537100	524700
(+)	1543.19	1543.83	1544.04	1544.08	1545.86	1547.53	1548.08	1548.68	1552.28	1551.09	1550.59	1549.93
(@)	-32800	+10100	+3300	+700	+29200	+28700	+9600	+10700	+67500	-22900	-9400	-12400
CAL YR 1996	MAX 525500	MIN 378000	(@) -102100									
WTR YR 1997	MAX 574500	MIN 408500	(@) +82300									

e Estimated

(+) Elevation, in feet, at end of month.

(@) Change in contents, in acre-feet.

## COLORADO RIVER MAIN STEM

08136700 COLORADO RIVER NEAR STACY, TX

**LOCATION.**--Lat 31°29'37", long 99°34'25", Coleman County, Hydrologic Unit 12090106, on left bank at downstream side of bridge on Farm Road 503, 1.2 mi upstream from Bois d'Arc Creek, 1.8 mi northeast of Stacy, 10.5 mi downstream from O.H. Ivie Reservoir, 24 mi downstream from Concho River, and at mile 604.8.

**DRAINAGE AREA.**--24,193 mi<sup>2</sup>, of which approximately 11,391 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--March 1968 to current year. Prior to October 1970, published as "at Stacy".

Water-quality records.--Chemical analyses: December 1961 to September 1994. Chemical and biochemical analyses: October 1974 to October 1977. Pesticide analyses: April 1975 to August 1977. Sediment analyses: October 1974 to October 1977. Specific conductance and water temperature: April 1968 to September 1994.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,394.66 ft above sea level (State Department of Highways and Public Transportation bridge plans).

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage in March 1968, at least 10% of contributing drainage area has been regulated by upstream reservoirs, and since March 15, 1990, flow completely regulated by O.H. Ivie Reservoir (station 08136600), 10.5 mi upstream. There are many diversions above station for irrigation, municipal, and oil field operations. Wastewater effluent is returned to the river from numerous wastewater plants above station. At times flow may be slightly affected by discharge from the flood-detention pools of 42 floodwater-retarding structures with a combined detention capacity of 56,730 acre-ft. These structures control runoff from 277 mi<sup>2</sup> above this station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum discharge since at least 1882, 356,000 ft<sup>3</sup>/s Sept. 18, 1936 (gage height, 64.59 ft), by slope-area measurement of peak flow. The flood of Sept. 18, 1936, was 4 ft higher than the 1906 flood and 7 to 8 ft higher than the 1882 flood, from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	19	8.1	7.6	8.0	7.2	7.5	8.1	15	14	1420	13	15
2	17	7.6	7.6	8.0	7.4	12	15	14	14	1420	13	15
3	13	7.6	7.6	8.0	7.4	13	19	14	13	1420	13	15
4	17	7.4	7.6	9.1	7.3	9.1	20	14	13	1420	14	19
5	17	7.2	7.6	10	7.3	7.6	16	14	13	1420	17	17
6	17	7.0	7.6	8.4	9.8	6.8	14	14	36	887	13	16
7	18	8.9	7.6	8.4	11	6.8	15	14	35	44	20	15
8	18	10	7.6	8.4	8.9	7.2	16	15	18	23	24	15
9	18	7.9	7.6	8.2	8.2	7.6	15	19	26	21	15	15
10	18	7.2	7.6	8.0	8.0	7.6	17	16	18	20	14	15
11	18	7.4	7.6	8.0	8.1	7.4	16	14	14	20	13	16
12	18	7.6	8.0	8.0	9.4	8.2	15	14	14	19	13	16
13	18	7.6	8.0	8.0	11	8.3	15	15	13	18	14	15
14	320	6.9	8.0	8.0	9.1	7.2	16	14	13	18	14	15
15	1100	6.0	8.0	7.7	8.3	6.8	16	14	17	18	14	15
16	805	5.8	8.0	7.2	7.9	6.9	16	14	15	17	13	15
17	799	5.8	8.0	7.2	7.7	7.4	16	13	20	18	14	14
18	725	5.5	8.0	6.8	7.8	7.6	15	13	13	15	14	14
19	439	5.2	8.4	6.8	8.1	7.2	14	65	13	13	13	14
20	436	5.5	8.4	6.8	13	6.9	13	33	13	14	19	15
21	422	6.1	8.4	6.8	13	6.8	13	22	13	14	24	14
22	673	6.5	8.4	6.8	9.2	6.8	12	15	20	14	23	16
23	1150	6.8	8.4	6.8	7.9	6.8	13	15	2520	14	21	19
24	1260	12	8.4	6.8	7.9	6.9	14	16	4420	13	16	24
25	1270	12	8.4	6.8	8.4	7.6	16	14	1460	13	16	17
26	1270	9.4	8.4	6.8	8.6	7.6	20	14	1430	13	15	17
27	1270	8.1	8.4	6.8	8.3	7.3	16	14	1430	13	15	15
28	1280	8.0	8.0	6.8	7.8	7.0	14	14	1430	13	15	13
29	869	10	8.0	7.2	---	7.4	14	14	1420	13	15	13
30	34	9.2	8.0	7.2	---	9.5	14	14	1430	14	15	13
31	10	---	8.0	7.2	---	9.2	---	17	---	13	15	---
TOTAL	14358	230.3	247.2	235.0	244.0	242.0	453.1	527	15918	8412	487	467
MEAN	463	7.68	7.97	7.58	8.71	7.81	15.1	17.0	531	271	15.7	15.6
MAX	1280	12	8.4	10	13	13	20	65	4420	1420	24	24
MIN	10	5.2	7.6	6.8	7.2	6.8	8.1	13	13	13	13	13
AC-FT	28480	457	490	466	484	480	899	1050	31570	16690	966	926



# COLORADO RIVER MAIN STEM

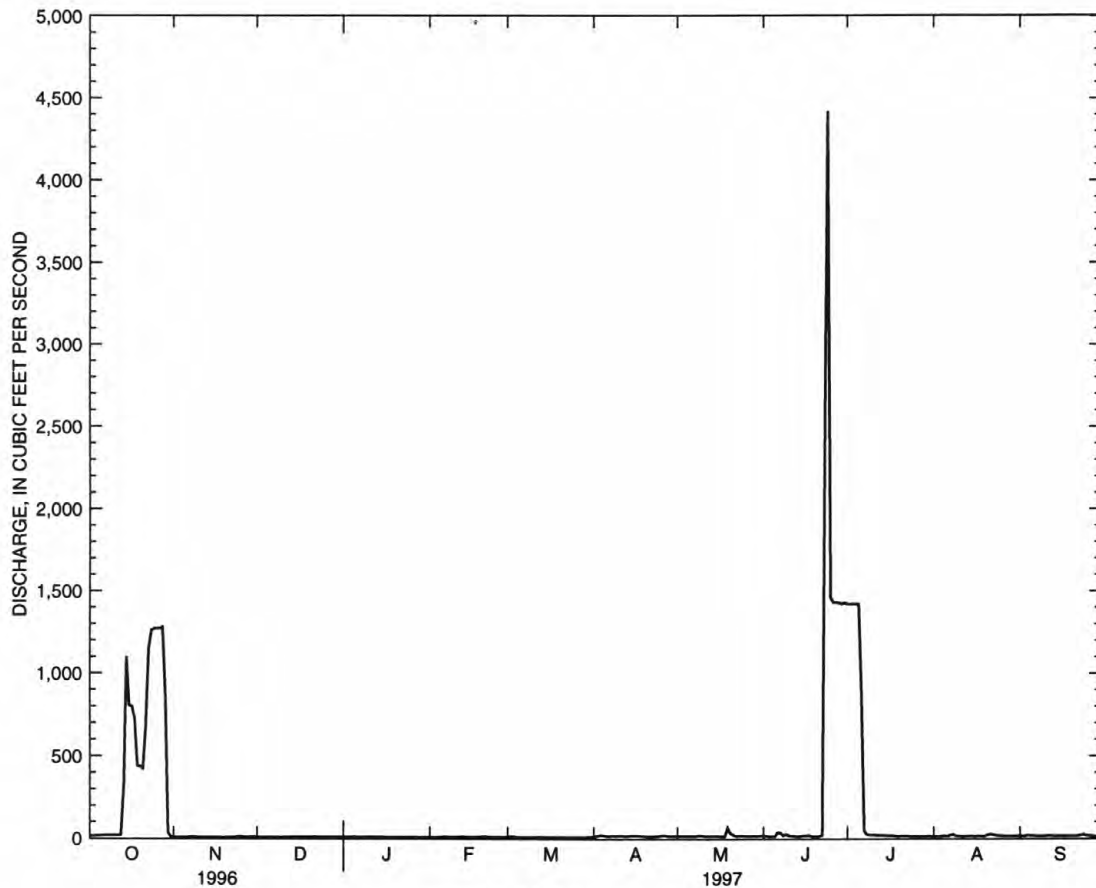
75

08136700 COLORADO RIVER NEAR STACY, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1997, BY WATER YEAR (WY)

MEAN	251	128	110	111	113	147	144	353	400	123	182	289
MAX	1475	1344	562	470	666	732	873	1440	1783	623	1516	2953
(WY)	1987	1975	1975	1975	1975	1987	1977	1987	1996	1987	1978	1980
MIN	7.02	7.61	7.80	6.16	6.48	6.11	.41	.000	.000	.000	2.24	.000
(WY)	1996	1992	1995	1995	1996	1996	1986	1984	1984	1974	1983	1983

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1968 - 1997	
ANNUAL TOTAL	93239.1		41820.6			
ANNUAL MEAN	255		115		194	
HIGHEST ANNUAL MEAN					719	
LOWEST ANNUAL MEAN					24.6	
HIGHEST DAILY MEAN	4660	Jun 8	4420	Jun 24	31300	Sep 10 1980
LOWEST DAILY MEAN	4.9	Mar 23	5.2	Nov 19	.00	Jun 22 1974
ANNUAL SEVEN-DAY MINIMUM	5.2	Mar 18	5.7	Nov 15	.00	Jun 22 1974
INSTANTANEOUS PEAK FLOW			7750	Jun 23	45000	Sep 10 1980
INSTANTANEOUS PEAK STAGE			11.95	Jun 23	28.00	Sep 10 1980
INSTANTANEOUS LOW FLOW			5.2	Nov 18		
ANNUAL RUNOFF (AC-FT)	184900		82950		140900	
10 PERCENT EXCEEDS	801		29		402	
50 PERCENT EXCEEDS	15		13		51	
90 PERCENT EXCEEDS	6.1		7.2		7.2	



08136700 COLORADO RIVER NEAR STACY, TX  
MEAN DAILY DISCHARGE (CFS)

## COLORADO RIVER BASIN

08141000 HORDS CREEK LAKE NEAR VALERA, TX

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

**DRAINAGE AREA.**--48 mi<sup>2</sup>, approximately.

**PERIOD OF RECORD.**--April 1948 to current year. Prior to October 1970, published as Hords Creek Reservoir.

Water-quality records.--Chemical analyses: October 1969 to August 1982.

**GAGE.**--Water-stage recorder. Datum of gage is sea level.

**REMARKS.**--The lake is formed by a rolled earthfill dam 6,800 ft long, including spillway. Deliberate impoundment of water began Apr. 7, 1948, and the dam was completed in June 1948. The spillway is an excavated channel through natural ground, 500 ft wide, located about 600 ft from the right end of dam. The spillway consists of three concrete conduits; two controlled by 5.0- by 6.0-foot slide gates, and a third uncontrolled ogee spillway 4.0 ft wide and 19.5 ft high. The lake is operated for flood control and municipal water supply for the city of Coleman. The capacity table of August 1974 is based on a sedimentation survey made in 1948. Flow is affected at times by discharge from the flood-detention pool of one floodwater-retarding structure with a detention capacity of 1,370 acre-ft. This structure controls runoff from 6.82 mi<sup>2</sup> in the Jim Ned Creek drainage basin. Satellite 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 .....	1,939.0	-
Design flood .....	1,933.6	-
Crest of spillway .....	1,920.0	24,730
Crest of spillway (top of conservation pool) .....	1,900.0	8,110
Lowest gated outlet (invert) .....	1,856.0	3

**COOPERATION.**--Records of elevations and contents furnished by U.S. Army Corps of Engineers and reviewed by the U.S. Geological Survey.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 12,790 acre-ft May 1, 1956 (elevation 1906.86 ft); maximum elevation, Mar. 4, 1992 (elevation, 1907.31 ft); minimum since first appreciable storage in June 1951, 1,550 acre-ft Sept. 2, 1984 (elevation, 1878.01 ft).

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 12,660 acre-ft June 23 (elevation, 1907.46 ft); minimum, 6,360 acre-ft Feb. 4 (elevation, 1896.20 ft).

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

1878.0	1,550	1888.0	3,600	1900.0	8,110
1882.0	2,240	1892.0	4,780	1904.0	10,360
1885.0	2,850	1896.0	6,280	1908.0	13,050

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6900	6670	6710	6570	6380	7000	7560	7840	8090	9530	7990	7620
2	6890	6670	6700	6550	6380	7170	7560	7840	8080	9360	7980	7600
3	6880	6660	6700	6550	6370	7230	7600	7830	8070	9210	7970	7590
4	6880	6650	6700	6540	6360	7270	7670	7830	8050	9080	7960	7580
5	6870	6650	6690	6540	6370	7290	7680	7820	8040	8970	7950	7570
6	6870	6700	6690	6540	6440	7320	7680	7820	8180	8880	7930	7550
7	6860	6710	6690	6530	6440	7340	7680	7820	8190	8790	7950	7540
8	6850	6700	6680	6530	6440	7360	7690	7860	8410	8720	7940	7520
9	6850	6700	6670	6520	6440	7380	7690	8120	8490	8650	7930	7510
10	6830	6690	6670	6510	6440	7400	7700	8140	8480	8590	7930	7500
11	6810	6690	6670	6500	6440	7420	7720	8140	8460	8500	7910	7480
12	6810	6680	6670	6490	6470	7450	7730	8160	8440	8460	7900	7470
13	6800	6670	6660	6480	6480	7470	7730	8160	8410	8420	7880	7450
14	6790	6670	6650	6480	6480	7470	7740	8160	8400	8380	7860	7440
15	6780	6670	6650	6470	6480	7480	7740	8160	8380	8350	7840	7430
16	6780	6670	6640	6470	6490	7480	7740	8160	8360	8320	7820	7410
17	6760	6650	6610	6460	6490	7500	7750	8160	8330	8290	7810	7390
18	6740	6650	6610	6460	6490	7510	7740	8150	8310	8260	7790	7370
19	6730	6640	6610	6460	6510	7510	7740	8140	8290	8230	7780	7360
20	6720	6640	6600	6450	6720	7520	7740	8140	8260	8210	7770	7340
21	6740	6630	6600	6450	6790	7510	7740	8140	8240	8190	7760	7320
22	6720	6620	6600	6450	6820	7510	7740	8130	8730	8170	7750	7330
23	6710	6630	6590	6440	6850	7520	7730	8140	12660	8150	7740	7310
24	6700	6660	6590	6430	6890	7520	7720	8140	12130	8130	7730	7300
25	6700	6650	6580	6430	6920	7540	7770	8130	11630	8110	7720	7290
26	6700	6640	6570	6420	6950	7540	7810	8130	11110	8090	7700	7270
27	6700	6640	6570	6410	6970	7550	7830	8110	10670	8080	7690	7260
28	6710	6670	6570	6410	6980	7550	7840	8100	10290	8060	7680	7240
29	6700	6710	6570	6400	---	7550	7840	8090	9990	8040	7660	7230
30	6700	6710	6560	6400	---	7550	7840	8100	9740	8030	7640	7220
31	6680	---	6560	6390	---	7560	---	8090	---	8010	7630	---
MAX	6900	6710	6710	6570	6980	7560	7840	8160	12660	9530	7990	7620
MIN	6680	6620	6560	6390	6360	7000	7560	7820	8040	8010	7630	7220
(+)	1896.94	1897.01	1896.67	1896.27	1897.62	1898.87	1899.45	1899.96	1902.98	1899.80	1899.02	1898.15
(@)	-230	+30	-150	-170	+590	+580	+280	+250	+1650	-1730	-380	-410
CAL YR 1996	MAX	7010	MIN	5370	(@)	+230						
WTR YR 1997	MAX	12660	MIN	6360	(@)	+310						

(+) Elevation, in feet, at end of month.  
 (@) Change in contents, in acre feet.

# COLORADO RIVER BASIN

77

08143600 PECAN BAYOU NEAR MULLIN, TX

**LOCATION.**--Lat 31°31'02", long 98°44'25", Mills County, Hydrologic Unit 12090107, on right bank 44 ft downstream from bridge on Farm Road 573, 0.6 mi downstream from Blanket Creek, 5.5 mi southwest of Mullin, and 13.6 mi upstream from mouth.

**DRAINAGE AREA.**--2,073 mi<sup>2</sup>.

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

Water-quality records.--Chemical analyses: October 1967 to September 1991. Chemical and biochemical analyses: October 1991 to August 1996.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,202.93 ft above sea level.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. Since installation of gage in water year 1968, at least 10% of contributing drainage area has been regulated by Lake Brownwood (capacity, 143,400 acre-ft) 45 miles upstream. In addition, flow from 152 mi<sup>2</sup> (from an intervening drainage area of 641 mi<sup>2</sup>) above this station and below Lake Brownwood was partly controlled by 41 floodwater-retarding structures, with a combined detention capacity of 43,420 acre-ft below the flood-spillway crests. Rain gage at station. Radio telemeter at station. Satellite telemeter at station.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	254	33	127	23	20	743	182	353	259	2210	78	16
2	250	25	131	23	23	1510	230	318	251	1680	75	18
3	250	21	183	26	24	2330	284	297	180	1290	73	17
4	160	18	227	23	23	2280	1230	280	79	1010	71	16
5	49	16	204	21	20	1810	1190	270	60	822	68	15
6	30	17	191	21	20	1320	583	197	73	706	68	15
7	23	389	176	28	65	982	441	101	78	621	63	16
8	18	334	166	36	63	823	382	86	81	555	e50	14
9	16	115	158	37	46	1020	376	891	279	515	e50	13
10	13	64	154	37	36	960	374	988	2300	476	e35	13
11	11	47	128	35	32	712	358	801	3390	441	e30	13
12	11	32	57	32	45	791	372	702	2550	414	e25	13
13	10	28	38	29	265	847	350	603	1860	398	e25	13
14	9.8	27	34	28	332	690	314	510	1320	394	21	13
15	9.4	23	33	27	321	579	298	458	1680	286	19	12
16	9.4	23	35	27	313	507	286	1010	3070	158	17	12
17	8.3	22	38	27	295	470	282	541	3080	134	17	11
18	7.2	21	36	26	283	439	283	397	2160	126	15	11
19	6.7	20	32	25	279	411	281	326	1450	116	14	12
20	6.6	20	32	24	4350	376	279	759	1010	108	14	14
21	5.9	18	32	24	5010	349	276	1170	774	104	14	11
22	6.2	17	29	24	4880	330	220	918	1300	101	15	12
23	7.0	17	27	24	3260	318	125	773	6980	97	21	14
24	7.4	32	27	23	2070	311	102	717	8100	93	23	12
25	7.8	53	26	23	1570	339	208	561	10500	91	23	14
26	8.3	66	25	22	1320	219	765	454	12700	92	20	14
27	10	56	24	21	1070	152	777	375	9220	88	19	12
28	600	43	23	20	853	133	557	319	5360	85	17	11
29	340	93	23	20	---	119	461	277	3930	85	15	9.4
30	110	183	23	20	---	342	397	270	2860	85	15	7.6
31	54	---	23	20	---	231	---	271	---	82	16	---
TOTAL	2309.0	1873	2462	796	26888	22443	12263	15993	86934	13463	1026	394.0
MEAN	74.5	62.4	79.4	25.7	960	724	409	516	2898	434	33.1	13.1
MAX	600	389	227	37	5010	2330	1230	1170	12700	2210	78	18
MIN	5.9	16	23	20	20	119	102	86	60	82	14	7.6
AC-FT	4580	3720	4880	1580	53330	44520	24320	31720	172400	26700	2040	781

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1997, BY WATER YEAR (WY)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	160	86.3	205	154	255	234	243	310	377	48.9	27.9	85.6																		
MAX	987	1227	4741	1965	4416	2361	3510	1975	2898	434	195	980																		
(WY)	1975	1975	1992	1968	1992	1992	1990	1994	1997	1997	1971	1991																		
MIN	.59	4.79	3.90	4.57	6.55	5.45	3.63	.12	.000	.000	.000	.79																		
(WY)	1989	1989	1984	1986	1983	1996	1984	1984	1984	1974	1980	1989																		

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1968 - 1997
ANNUAL TOTAL	20475.31	186844.0	
ANNUAL MEAN	55.9	512	181
HIGHEST ANNUAL MEAN			1245
LOWEST ANNUAL MEAN			9.01
HIGHEST DAILY MEAN	2590	12700	37000
LOWEST DAILY MEAN	.64	5.9	.00
ANNUAL SEVEN-DAY MINIMUM	1.1	6.7	.00
INSTANTANEOUS PEAK FLOW		13200	38300
INSTANTANEOUS PEAK STAGE		26.61	42.15
ANNUAL RUNOFF (AC-FT)	40610	370600	131500
10 PERCENT EXCEEDS	159	1180	286
50 PERCENT EXCEEDS	12	86	14
90 PERCENT EXCEEDS	3.5	14	2.8

e Estimated

## COLORADO RIVER MAIN STEM

08147000 COLORADO RIVER NEAR SAN SABA, TX

**LOCATION.**--Lat 31°13'04", long 98°33'51", San Saba-Lampasas County line, Hydrologic Unit 12090201, on left bank at downstream side of bridge on U.S. Highway 190, 5.2 mi downstream from San Saba River, 9.2 mi east of San Saba, and at mile 474.3.

**DRAINAGE AREA.**--31,217 mi<sup>2</sup>, approximately, of which 11,398 mi<sup>2</sup> probably is noncontributing.

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

Water-quality records.--Chemical analyses: August 1941, September 1947 to September 1992. Chemical and biochemical analyses: January 1968 to September 1993. Pesticide analyses: January 1968 to April 1982. Sediment analyses: May 1951 to October 1962, October 1977 to September 1993. Specific conductance and water temperature: September 1947 to September 1992. Suspended sediment discharge: December 1950 to September 1962.

**REVISED RECORDS.**--WSP 458: 1916. WSP 858: 1900(M), 1936(M). WDR TX-81-3: Drainage area. WSP 1512: 1916-18(M), 1936. WSP 1732: 1925-26(M).

**GAGE.**--Water-stage recorder. Datum of gage is 1,096.22 ft above sea level. See WSP 1922 for brief history of changes prior to May 23, 1940.

**REMARKS.**--No estimated daily discharges. Records good. Since water year 1931 at least 10% of contributing drainage area has been regulated by Lake Nasworthy (08132000). Since March 15, 1990, 66 percent of the drainage area above this station has been controlled by O.H. Ivie Reservoir (station 08136600), 140.8 miles upstream, and by an additional twelve reservoirs (8 above and 4 below O.H. Ivie Reservoir), for a total combined capacity (13 reservoirs) of 1,897,000 acre-ft at conservation level. Flow is also affected at times by discharge from the flood-detention pools of 187 floodwater-retarding structures with a combined capacity of 205,700 acre-ft. These flood-detention structures control runoff from an 944 mi<sup>2</sup> area above this station. There are many diversions above station for irrigation, municipal use, and for oil field operations. Radio telemeter at station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--12 years (water years 1917-19, 1921-22, 1924-30) prior to completion of Lake Nasworthy, 1,440 ft<sup>3</sup>/s (1,040,000 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1917-19, 1921-22, 1924-30).**--Maximum discharge, 130,000 ft<sup>3</sup>/s Apr. 26, 1922 (gage height about 54.0 ft, present site), from information by local residents; minimum observed discharge, 1.5 ft<sup>3</sup>/s Aug. 22, 23, 1918.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage during period 1878 to July 22, 1938, 58.4 ft Sept. 25, 1900 (discharge, 184,000 ft<sup>3</sup>/s, present site), from floodmarks at former site.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	351	520	649	143	138	1750	1230	953	672	5000	238	129
2	333	310	551	147	137	3910	915	840	551	4230	220	130
3	329	232	462	152	141	7410	854	747	510	3660	212	133
4	329	190	448	152	145	5760	1980	675	446	3260	212	134
5	281	163	458	147	140	4030	6050	630	344	2960	205	135
6	179	147	417	156	148	2930	3210	596	2490	2720	196	132
7	134	192	383	171	327	2270	1780	525	11500	2550	186	123
8	116	773	353	203	436	1900	1310	430	4100	1930	186	117
9	105	559	331	237	278	1700	1080	1280	4020	1280	187	118
10	99	377	315	252	218	8570	1010	2040	6640	1060	426	119
11	95	274	304	246	199	6050	957	1570	7200	932	332	119
12	90	223	289	222	757	2620	919	1340	5130	840	244	116
13	84	206	233	205	1390	3200	893	1160	3590	769	217	114
14	82	186	192	197	786	2470	836	1010	2600	713	209	114
15	83	169	205	190	708	1820	781	897	2570	679	197	114
16	85	157	196	186	624	1530	734	2290	3650	577	186	113
17	580	152	198	184	578	1350	698	1500	4510	449	174	112
18	861	149	202	178	535	1250	667	947	3690	398	161	110
19	858	140	197	173	499	1170	659	785	2580	372	151	107
20	819	136	186	173	14100	1080	656	2110	1930	352	144	103
21	539	132	179	172	34200	993	672	1830	1540	333	141	101
22	477	128	178	169	14600	928	675	2060	2740	318	149	106
23	466	124	177	165	8230	880	557	1650	47200	304	149	110
24	677	176	171	157	5100	848	458	2050	39300	293	148	108
25	1220	270	166	152	3470	1020	514	1600	24100	278	151	107
26	1370	324	159	150	3000	1180	1980	1200	20300	260	152	108
27	1380	295	157	152	2660	995	3400	934	17800	250	152	107
28	3350	268	155	145	2160	862	2070	778	14200	249	148	103
29	2910	459	151	142	---	765	1420	664	8180	238	142	99
30	1960	766	149	137	---	672	1130	607	6240	226	136	97
31	1220	---	145	136	---	1520	---	899	---	228	130	---
TOTAL	21462	8197	8356	5391	95704	73433	40095	36597	250323	37708	5881	3438
MEAN	692	273	270	174	3418	2369	1337	1181	8344	1216	190	115
MAX	3350	773	649	252	34200	8570	6050	2290	47200	5000	426	135
MIN	82	124	145	136	137	672	458	430	344	226	130	97
AC-FT	42570	16260	16570	10690	189800	145700	79530	72590	496500	74790	11660	6820



# COLORADO RIVER MAIN STEM

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08147000 COLORADO RIVER NEAR SAN SABA, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1997#, BY WATER YEAR (WY)

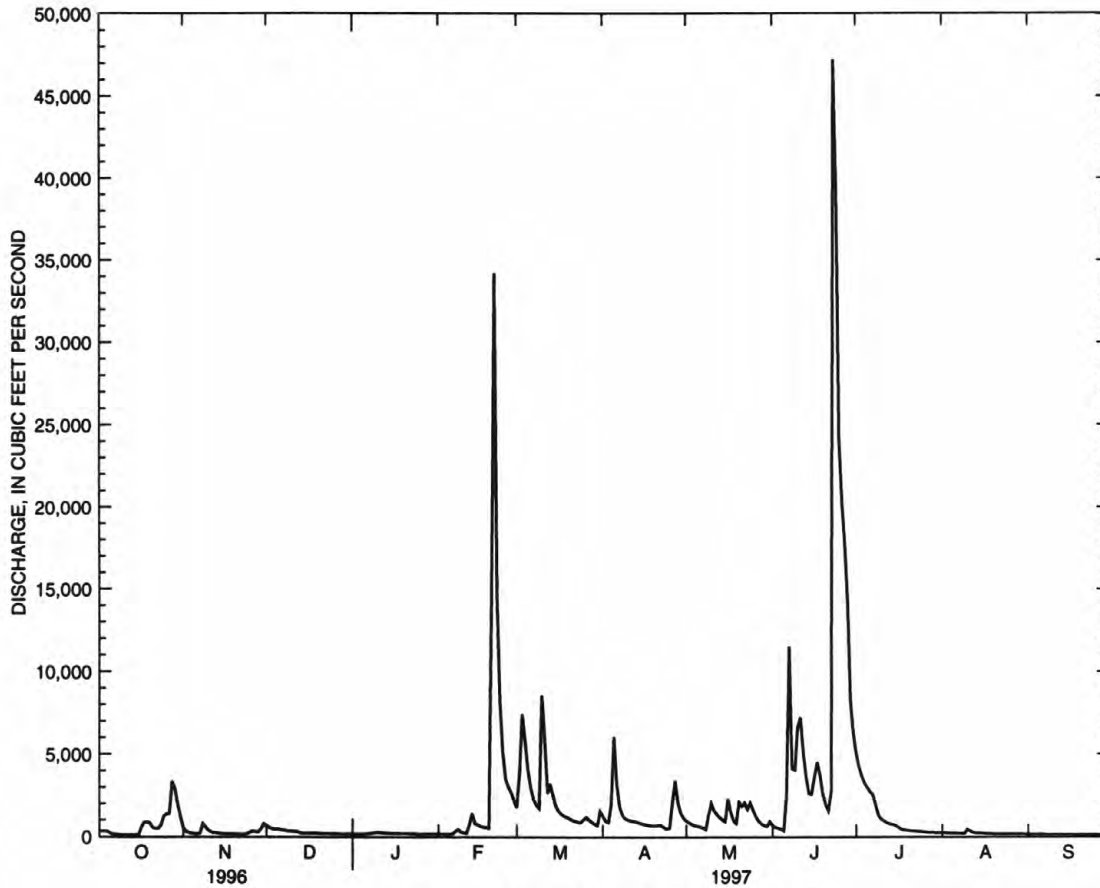
MEAN	1402	417	482	528	671	602	1019	2462	1775	1304	496	1584
MAX	15300	3444	9242	5105	10760	5002	6907	23620	10940	32210	3915	29380
(WY)	1931	1975	1992	1968	1992	1992	1957	1957	1935	1938	1971	1936
MIN	29.5	39.3	31.8	41.5	40.5	24.4	33.6	11.2	4.16	2.06	2.68	11.9
(WY)	1952	1952	1955	1955	1952	1952	1986	1984	1984	1964	1952	1954

SUMMARY STATISTICS FOR 1996 CALENDAR YEAR FOR 1997 WATER YEAR WATER YEARS 1931 - 1997#

ANNUAL TOTAL	168468	586585	
ANNUAL MEAN	460	1607	1063
HIGHEST ANNUAL MEAN			3880
LOWEST ANNUAL MEAN			84.1
HIGHEST DAILY MEAN	6110 Jun 1	47200 Jun 23	191000 Jul 23 1938
LOWEST DAILY MEAN	17 Aug 5	82 Oct 14	.00 Aug 27 1954
ANNUAL SEVEN-DAY MINIMUM	19 Aug 3	88 Oct 10	.00 Aug 3 1963
INSTANTANEOUS PEAK FLOW		56400 Jun 23	224000 Jul 23 1938
INSTANTANEOUS PEAK STAGE		34.48 Jun 23	a62.24 Jul 23 1938
ANNUAL RUNOFF (AC-FT)	334200	1163000	770200
10 PERCENT EXCEEDS	1010	3300	1660
50 PERCENT EXCEEDS	115	417	229
90 PERCENT EXCEEDS	49	130	56

# Period of regulated streamflow.

a From floodmarks, at site then in use, adjusted to present datum.



08147000 COLORADO RIVER NEAR SAN SABA, TX  
MEAN DAILY DISCHARGE (CFS)

## 08150800 BEAVER CREEK NEAR MASON, TX

**LOCATION.**--Lat 30°38'36", long 99°05'44", Mason County, Hydrologic Unit 12090204, on left bank at downstream side of downstream bridge on U.S. Highway 87, 1.8 mi upstream from Llano River, 6.4 mi downstream from Spring Creek, and 11.1 mi southeast of Mason.

**DRAINAGE AREA.**--215 mi<sup>2</sup>.

**PERIOD OF RECORD.**--July 1963 to current year.

**REVISED RECORDS.**--WSP 2122: 1964-65. WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder and crest-stage gage. Datum of gage is 1,253.24 ft above sea level. Prior to Aug. 3, 1978, at site 300 ft upstream at same datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation or diversions. Several observations of water temperature were made during the year. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1130	45,900	a19.45	June 21	Unknown	6,030	a7.00
Feb. 20	1230	18,900	11.90	June 22	2300	6,960	7.42
Mar. 12	0015	5,570	6.78				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	30	31	22	13	54	56	e80	34	e80	e8.0	5.4
2	2.0	23	27	21	13	257	55	e75	33	e75	e7.5	5.2
3	1.9	19	25	20	13	72	58	e70	33	e70	e7.5	5.3
4	1.9	16	25	20	13	57	75	e65	33	e65	e7.5	6.9
5	2.1	16	24	19	12	54	93	e60	34	e55	e7.0	8.2
6	2.4	15	23	19	12	52	60	e55	95	e45	e7.0	6.5
7	2.6	49	22	26	13	48	60	e60	161	e40	e7.5	6.0
8	2.6	35	21	35	14	48	59	e60	70	34	e10	5.6
9	2.4	25	21	31	13	50	61	e65	115	e30	e9.5	5.4
10	2.0	24	21	28	13	291	61	e60	170	e25	e8.0	5.0
11	1.7	22	21	25	13	965	65	e50	176	e20	e7.5	5.2
12	1.4	12	21	24	20	1480	63	e50	105	e20	e7.0	6.6
13	1.4	11	20	23	23	383	60	e55	78	e15	e7.0	5.8
14	1.2	10	20	22	16	157	59	e45	88	e15	e7.0	5.0
15	1.1	9.7	98	22	17	112	59	e40	129	e15	e6.5	4.7
16	.99	9.1	105	22	13	97	59	e45	223	e15	e6.5	4.4
17	.99	8.8	50	20	12	80	58	e35	e300	e10	e6.5	3.9
18	.96	10	39	20	13	69	58	e30	e100	e10	e6.5	3.6
19	.85	9.0	35	20	12	63	58	28	e50	e10	e6.5	3.4
20	.79	8.3	33	20	4320	62	57	38	e45	e10	e6.5	3.5
21	.79	8.4	31	19	323	60	56	35	475	e10	e6.0	3.6
22	.79	8.0	30	18	94	59	56	37	1670	e9.5	e6.0	3.9
23	.79	7.6	28	18	72	59	55	34	480	e9.5	e6.0	4.8
24	.69	21	26	18	62	59	54	36	e300	e9.0	e6.0	5.6
25	.62	30	26	17	61	60	140	33	e200	e8.5	e6.0	4.5
26	.62	26	25	17	66	58	e230	31	e150	e8.5	5.9	4.2
27	.70	23	25	16	58	59	e150	30	e125	e8.0	5.9	4.3
28	9790	20	24	15	56	58	e100	29	e100	e8.0	5.9	4.2
29	246	53	23	14	---	58	e90	30	e90	e8.0	5.7	3.9
30	86	40	22	14	---	57	e85	31	e85	e8.0	5.5	3.6
31	43	---	22	14	---	55	---	32	---	e8.0	5.4	---
TOTAL	10203.58	598.9	964	639	5380	5093	2250	1424	5747	754.0	211.3	148.2
MEAN	329	20.0	31.1	20.6	192	164	75.0	45.9	192	24.3	6.82	4.94
MAX	9790	53	105	35	4320	1480	230	80	1670	80	10	8.2
MIN	.62	7.6	20	14	12	48	54	28	33	8.0	5.4	3.4
AC-FT	20240	1190	1910	1270	10670	10100	4460	2820	11400	1500	419	294
CFSM	1.53	.09	.14	.10	.89	.76	.35	.21	.89	.11	.03	.02
IN.	1.77	.10	.17	.11	.93	.88	.39	.25	.99	.13	.04	.03

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1997, BY WATER YEAR (WY)

	MEAN	32.2	8.02	14.9	13.6	24.1	21.2	20.0	30.4	29.7	4.02	21.1	11.4
MAX	329	32.2	220	183	285	164	132	197	327	24.3	443	167	
(WY)	1997	1970	1992	1968	1992	1997	1977	1975	1987	1997	1978	1964	
MIN	.37	.91	1.44	1.84	1.41	1.29	.49	.72	.21	.003	.000	.021	
(WY)	1983	1980	1983	1971	1984	1967	1984	1996	1971	1964	1985	1977	

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1963 - 1997

ANNUAL TOTAL	12499.42	33412.98	19.3
ANNUAL MEAN	34.2	91.5	91.5
HIGHEST ANNUAL MEAN			1.97
LOWEST ANNUAL MEAN			
HIGHEST DAILY MEAN	9790	Oct 28	12800
LOWEST DAILY MEAN	.00	Jul 4	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jul 4	.00
INSTANTANEOUS PEAK FLOW			45900
INSTANTANEOUS PEAK STAGE			a19.45
ANNUAL RUNOFF (AC-FT)	24790	66270	13960
ANNUAL RUNOFF (CFSM)	.16	.43	.090
ANNUAL RUNOFF (INCHES)	2.16	5.78	1.22
10 PERCENT EXCEEDS	24	94	23
50 PERCENT EXCEEDS	1.8	23	3.1
90 PERCENT EXCEEDS	.07	4.2	.20

e Estimated

a From floodmark.

# COLORADO RIVER BASIN

81

08151500 LLANO RIVER AT LLANO, TX

**LOCATION.**--Lat 30°45'04", long 98°40'10", Llano County, Hydrologic Unit 12090204, on right bank in Llano, 0.4 mi down- stream from bridge on State Highway 16, 7 mi upstream from Little Llano River, and 29.3 mi upstream from mouth.

**DRAINAGE AREA.**--4,197.14 mi<sup>2</sup>, of which 5.14 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--September 1939 to current year.

Water-quality records.--Chemical analyses: April 1948 to October 1967. Chemical and Biochemical analyses: April 1979 to September 1986.  
Sediment analyses: September 1964, April 1979 to September 1986.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 970.01 ft above sea level.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation or diversions. Part of low flow of the Llano River disappears into various formations, many of which are faulted, between this station and Llano River near Junction (station 08150000) operated by Lower Colorado River Authority. Rain gage at station. Radio telemeter at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1879, 41.5 ft June 14, 1935 (discharge, 380,000 ft<sup>3</sup>/s), from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 7,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1300	158,000	30.15	Mar. 12	0145	29,900	13.25
Feb. 20	1315	144,000	28.73	June 23	0300	260,000	38.86
Mar. 10	0700	24,100	11.86				

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	187	1400	596	159	31	827	698	479	173	1110	254	e220
2	168	949	469	149	31	3610	725	393	148	1000	241	e215
3	160	762	423	149	28	1990	843	358	145	920	233	e210
4	157	663	402	136	28	1140	1240	353	111	845	222	e204
5	155	570	392	120	23	880	1800	325	85	796	221	290
6	155	511	359	152	22	724	1130	297	82	762	221	292
7	155	628	335	263	43	640	789	292	590	719	220	294
8	151	742	314	462	46	619	696	297	684	688	374	278
9	150	522	294	407	47	644	661	411	931	658	321	269
10	150	464	276	325	45	14900	657	455	724	627	262	256
11	146	431	264	258	39	12400	666	369	798	619	313	251
12	145	409	248	200	183	17500	639	322	1430	603	260	255
13	145	393	234	172	695	7330	578	294	922	580	219	267
14	145	376	223	153	397	3400	549	287	567	563	205	255
15	135	357	944	148	332	2290	533	365	439	550	194	252
16	124	342	940	146	246	1900	521	389	393	531	211	248
17	121	331	626	128	173	1750	509	312	428	509	211	242
18	116	319	611	112	129	1610	508	245	382	483	203	238
19	116	314	440	107	137	1420	519	213	307	484	208	230
20	114	299	353	106	41300	1260	529	232	261	e470	215	222
21	114	280	318	104	7870	1160	492	345	243	e450	224	220
22	113	268	297	99	3440	1080	487	265	29300	e420	233	264
23	105	260	276	92	2380	992	452	277	78100	e380	226	271
24	109	366	246	81	1830	931	423	367	7710	e360	234	243
25	111	761	214	70	1840	931	1600	369	3900	e330	240	279
26	112	676	199	61	2040	966	3710	282	3160	e310	251	286
27	116	526	188	56	1420	852	1630	213	2140	e287	e246	274
28	39400	476	179	46	984	805	912	180	1740	257	e241	293
29	35800	1110	171	39	---	754	691	161	1460	250	e236	288
30	5520	1030	161	33	---	736	564	180	1240	255	e230	283
31	2270	---	158	33	---	701	---	249	---	273	e225	---
TOTAL	86665	16535	11150	4566	65779	86742	25751	9576	138593	17089	7394	7689
MEAN	2796	551	360	147	2349	2798	858	309	4620	551	239	256
MAX	39400	1400	944	462	41300	17500	3710	479	78100	1110	374	294
MIN	105	260	158	33	22	619	423	161	82	250	194	204
AC-FT	171900	32800	22120	9060	130500	172100	51080	18990	274900	33900	14670	15250

## COLORADO RIVER BASIN

## 08151500 LLANO RIVER AT LLANO, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1940 - 1997, BY WATER YEAR (WY)

MEAN	538	232	295	285	391	320	384	530	588	233	312	456
MAX	3700	1005	3179	2483	3754	2798	3115	3350	4620	1796	3605	3891
(WY)	1974	1975	1992	1968	1992	1997	1977	1957	1997	1988	1974	1952
MIN	18.0	20.7	27.5	31.7	37.7	23.7	20.9	41.0	7.93	.000	.087	.56
(WY)	1952	1957	1955	1957	1954	1954	1955	1984	1953	1956	1952	1954

## SUMMARY STATISTICS

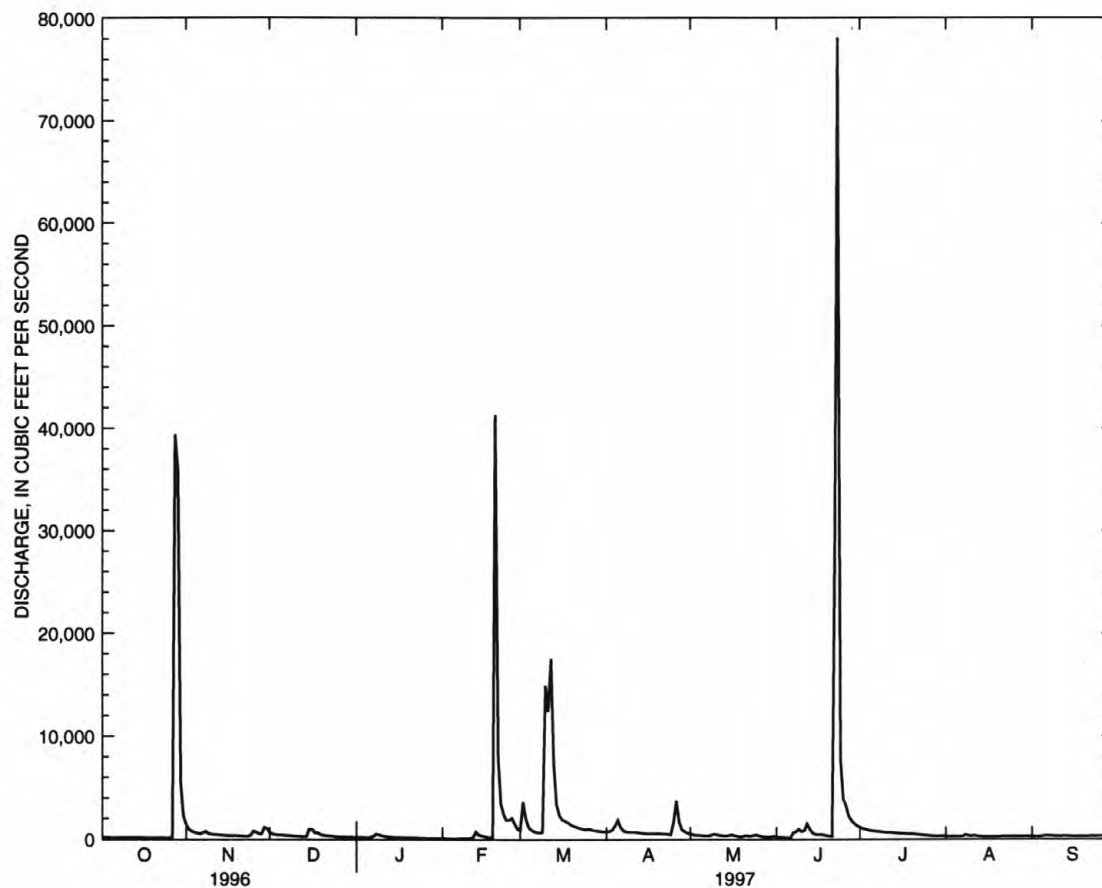
## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1940 - 1997

ANNUAL TOTAL	165912			477529								
ANNUAL MEAN	453			1308								
HIGHEST ANNUAL MEAN										380		
LOWEST ANNUAL MEAN										1308		1997
HIGHEST DAILY MEAN	39400	Oct 28		78100	Jun 23					50.0		1954
LOWEST DAILY MEAN	13	May 8		22	Feb 6					78100	Jun 23	1997
ANNUAL SEVEN-DAY MINIMUM	29	Jul 4		28	Jan 31					.00	Aug 5	1952
INSTANTANEOUS PEAK FLOW				260000	Jun 23					.00	Aug 27	1952
INSTANTANEOUS PEAK STAGE				38.86	Jun 23					260000	Jun 23	1997
ANNUAL RUNOFF (AC-FT)	329100			947200						38.86	Jun 23	1997
10 PERCENT EXCEEDS	523			1420						275300		
50 PERCENT EXCEEDS	119			314						545		
90 PERCENT EXCEEDS	47			116						155		
										40		

e Estimated

08151500 LLANO RIVER AT LLANO, TX  
MEAN DAILY DISCHARGE (CFS)



# COLORADO RIVER BASIN

83

08153500 PEDERNALES RIVER NEAR JOHNSON CITY, TX

**LOCATION.**--Lat 30°17'30", long 98°23'57", Blanco County, Hydrologic Unit 12090206, near left downstream end of bridge on U.S. Highway 281, 0.2 mi downstream from Towhead Creek, 1.1 mi northeast of Johnson City, 3.4 mi downstream from Buffalo Creek, and 48.0 mi upstream from mouth.

**DRAINAGE AREA.**--901 mi<sup>2</sup>.

**PERIOD OF RECORD.**--May 1939 to current year.

Water-quality records.--Chemical analyses: April 1948 to September 1950, October 1971 to September 1985.

**REVISED RECORDS.**--WSP 1632: 1953(M), 1957, 1958(M). WDR TX-81-3: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 1,096.70 ft above sea level. May 4 to Sept. 13, 1939, nonrecording gage, and Sept. 14, 1939, to Sept. 10, 1952, water-stage recorder at upstream side of bridge at same datum. Sept. 11, 1952, to June 29, 1953, nonrecording gage, and June 30, 1953, to Oct. 7, 1954, water-stage recorder at site 360 ft downstream at same datum.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. There are diversions above station for irrigation. During the year, the city of Fredericksburg discharged varying amounts of wastewater effluent into the river upstream from station. The city of Johnson City diverts varying amounts of water from the pool at gage and discharges wastewater effluent into river below the gage. Flow is affected at times by discharge from the flood-detention pools of four floodwater-retarding structures with a combined detention capacity of 4,580 acre-ft. These structures control runoff of 15.6 mi<sup>2</sup> in the Williamson Creek drainage basin. Radio telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of July 1869, reached a stage of 33 ft from information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 4,100 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1215	4,700	12.25	May 20	0130	12,300	14.90
Oct. 28	2200	19,200	16.56	May 23	2330	5,150	12.56
Dec. 15	1130	16,100	15.86	June 6	2030	14,700	15.51
Feb. 20	2200	25,900	17.90	June 10	1200	4,890	12.45
Mar. 12	0330	12,400	14.94	June 22	1030	94,900	25.16
Apr. 4	0330	24,100	17.55	Aug. 9	0830	6,220	12.96
Apr. 26	1030	16,300	15.89				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	182	199	114	153	262	259	587	610	1180	225	56
2	25	153	146	115	148	612	261	512	464	1020	210	55
3	21	134	134	102	147	449	396	461	419	e880	202	50
4	21	112	136	92	142	305	7370	415	388	e780	188	50
5	20	98	141	93	142	249	2940	396	377	e688	190	45
6	22	72	125	86	136	228	1240	379	1680	e610	192	42
7	22	63	106	106	143	211	849	388	1600	e562	628	40
8	19	98	96	164	150	219	722	384	805	e517	1320	41
9	21	94	90	165	151	235	685	780	916	e474	2360	35
10	21	73	82	150	148	332	653	788	1750	e438	2680	35
11	19	67	85	135	138	1550	561	461	1730	417	2510	36
12	15	64	85	126	151	5840	466	385	822	389	1200	46
13	13	65	87	117	181	1280	424	383	592	374	136	45
14	13	61	88	116	144	785	409	360	495	352	124	42
15	12	50	5120	121	128	629	393	360	490	333	123	38
16	11	48	1860	143	108	566	385	413	489	311	117	45
17	8.9	44	482	141	93	582	381	317	427	313	103	61
18	6.5	44	262	136	83	561	357	281	379	296	114	91
19	5.3	43	202	145	76	502	360	268	346	258	112	87
20	4.7	41	171	148	6990	471	350	4120	320	247	99	119
21	4.6	43	157	147	4260	426	345	864	413	242	98	140
22	1.9	45	148	144	831	465	322	997	40100	236	88	103
23	2.0	46	145	147	493	489	308	1990	8510	229	94	63
24	3.4	84	132	141	396	495	298	2240	3470	212	74	47
25	4.5	257	130	143	396	529	4140	976	2660	214	90	43
26	5.2	151	123	144	562	452	7740	698	2280	220	90	48
27	19	125	121	140	409	414	2060	566	1770	216	77	49
28	4560	117	121	133	296	373	1090	1100	1650	197	63	39
29	4770	163	118	151	---	333	826	739	1550	189	57	43
30	481	247	119	151	---	303	681	553	1370	198	58	33
31	257	---	115	147	---	280	---	985	---	230	63	---
TOTAL	10438.0	2884	11126	4103	17195	20427	37271	24146	78872	12822	13685	1667
MEAN	337	96.1	359	132	614	659	1242	779	2629	414	441	55.6
MAX	4770	257	5120	165	6990	5840	7740	4120	40100	1180	2680	140
MIN	1.9	41	82	86	76	211	259	268	320	189	57	33
AC-FT	20700	5720	22070	8140	34110	40520	73930	47890	156400	25430	27140	3310

## COLORADO RIVER BASIN

## 08153500 PEDERNALES RIVER NEAR JOHNSON CITY, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997, BY WATER YEAR (WY)

MEAN	228	88.2	181	128	212	169	244	344	341	103	119	202
MAX	2041	600	3161	1177	2794	1289	2369	1673	2905	872	1953	6332
(WY)	1960	1975	1992	1968	1992	1992	1977	1975	1987	1987	1978	1952
MIN	.44	2.51	2.44	1.68	4.83	2.07	.060	2.05	.52	.001	.000	.000
(WY)	1952	1952	1955	1957	1957	1956	1956	1956	1971	1971	1954	1984

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1939 - 1997	
ANNUAL TOTAL	31735.45		234636.0		197	
ANNUAL MEAN	86.7		643		840	
HIGHEST ANNUAL MEAN					4.12	
LOWEST ANNUAL MEAN					1992	
HIGHEST DAILY MEAN	5120	Dec 15	40100	Jun 22	129000	Sep 11 1952
LOWEST DAILY MEAN	.00	Jul 18	1.9	Oct 22	.00	Aug 8 1951
ANNUAL SEVEN-DAY MINIMUM	.00	Jul 18	3.8	Oct 20	.00	Aug 8 1951
INSTANTANEOUS PEAK FLOW			94900	Jun 22	441000	Sep 11 1952
INSTANTANEOUS PEAK STAGE			25.16	Jun 22	42.50	Sep 11 1952
ANNUAL RUNOFF (AC-FT)	62950		465400		142800	
10 PERCENT EXCEEDS	122		1190		284	
50 PERCENT EXCEEDS	25		192		50	
90 PERCENT EXCEEDS	.00		42		4.8	

e Estimated

08154700 BULL CREEK AT LOOP 360 NEAR AUSTIN, TX

**LOCATION.**--Lat 30°22'19", long 97°47'04", Travis County, Hydrologic Unit 12090205, on right bank at downstream side of bridge at Loop 360, 1.0 mi upstream from West Fork Bull Creek and Farm Road 2222, and 7.1 mi northwest of the State Capitol Building in Austin.

**DRAINAGE AREA.**--22.3 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--April 1976 to July 1978 (operated as a flood-hydrograph partial-record station), July 1978 to current year.

**GAGE.**--Water-stage recorder, concrete control, and crest-stage gage. Datum of gage is 534.08 ft above sea level, (levels from city of Austin benchmark).

**REMARKS.**--No estimated daily discharges. Records good. No known regulation or diversions. Several observations of water temperature were made during the year. Station equipped with an automatic water-quality sampler. Rain gage at station. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 300 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	0945	2,000	6.22	June 6	2100	596	4.84
Apr. 4	2030	1,890	6.13	June 9	0200	1,140	5.49
Apr. 26	0715	408	4.50	June 10	1330	571	4.80
Apr. 26	1100	811	5.14	June 22	0200	408	4.50
May 9	0945	542	4.75	June 22	1515	653	4.93
May 27	2030	342	4.35	July 30	1900	4,500	8.01

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.8	3.3	14	6.4	4.3	17	9.4	29	26	33	12	1.0
2	7.1	3.2	11	6.5	4.1	15	10	26	23	30	8.5	1.0
3	6.2	2.7	10	6.1	4.0	14	14	22	20	29	7.1	.99
4	5.6	2.5	10	5.8	4.0	13	656	20	18	25	6.4	1.1
5	5.5	2.4	11	5.3	3.7	12	251	18	25	21	5.6	1.2
6	5.4	2.5	9.3	4.9	3.9	12	113	17	117	20	5.0	1.3
7	4.8	14	8.3	10	7.7	12	79	16	112	17	11	.91
8	4.8	5.7	7.2	20	5.9	12	60	16	63	15	24	.91
9	4.8	4.2	6.7	14	5.6	12	51	109	364	14	12	1.1
10	4.0	4.2	6.1	11	5.3	12	44	41	206	12	9.3	.80
11	3.8	4.0	5.7	9.9	4.5	16	41	30	118	11	7.7	.74
12	3.3	3.8	5.5	9.2	55	23	36	28	89	8.4	7.4	.70
13	3.2	3.4	4.9	8.4	53	17	33	24	79	7.3	8.8	.71
14	3.2	3.2	4.3	8.2	28	15	30	22	67	6.6	6.8	.68
15	3.2	3.4	81	8.0	22	14	29	22	57	5.9	6.2	.64
16	3.1	3.7	39	7.3	19	13	25	35	47	6.2	4.4	.51
17	3.4	3.2	26	6.7	16	14	23	23	81	7.9	3.6	.38
18	6.7	3.3	19	6.6	15	13	21	20	45	5.9	3.5	.35
19	3.5	3.2	16	6.5	13	12	20	18	40	5.3	3.3	.31
20	3.2	3.4	14	6.6	23	11	18	31	36	4.8	3.2	.27
21	2.9	3.4	12	6.8	18	11	17	22	87	4.7	3.0	.24
22	2.7	3.2	11	6.5	14	11	15	20	243	4.3	2.7	1.7
23	2.5	2.9	10	6.4	13	10	14	37	123	3.6	2.4	3.2
24	2.6	18	8.7	6.4	15	9.4	11	48	89	3.7	2.4	1.9
25	2.8	11	8.2	5.8	19	15	54	32	70	3.3	2.1	1.3
26	2.7	7.6	8.0	5.2	23	14	211	28	58	2.6	2.2	.79
27	4.2	6.3	7.6	5.1	20	12	71	63	51	2.7	1.9	.69
28	6.1	8.6	7.8	4.5	19	11	52	54	45	2.3	1.7	.60
29	4.1	35	7.0	4.7	---	9.8	40	35	40	1.9	1.5	.59
30	3.6	21	6.2	4.8	---	9.4	34	31	37	338	1.3	.55
31	3.2	---	6.1	4.5	---	8.9	---	30	---	49	1.2	---
TOTAL	130.0	196.3	401.6	228.1	438.0	400.5	2082.4	967	2476	701.4	178.2	27.16
MEAN	4.19	6.54	13.0	7.36	15.6	12.9	69.4	31.2	82.5	22.6	5.75	.91
MAX	7.8	35	81	20	55	23	656	109	364	338	24	3.2
MIN	2.5	2.4	4.3	4.5	3.7	8.9	9.4	16	18	1.9	1.2	.24
AC-FT	258	389	797	452	869	794	4130	1920	4910	1390	353	54
CFSM	.19	.29	.58	.33	.70	.58	3.11	1.40	3.70	1.01	.26	.04
IN.	.22	.33	.67	.38	.73	.67	3.47	1.61	4.13	1.17	.30	.05

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1997, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	12.3	9.06	16.1	11.7	17.8	14.9	12.2	27.5	30.1	4.62	4.23	3.82								
MAX	70.3	43.2	130	55.9	114	64.7	69.4	58.9	141	22.6	26.3	15.3								
(WY)	1995	1988	1992	1992	1992	1992	1997	1992	1987	1997	1991	1987								
MIN	.27	.60	.64	1.08	1.92	2.06	1.28	.33	.64	.043	.16	.053								
(WY)	1979	1989	1990	1990	1996	1996	1984	1984	1984	1994	1984	1984								

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1978 - 1997

ANNUAL TOTAL	2497.45	8226.66	
ANNUAL MEAN	6.82	22.5	13.7
HIGHEST ANNUAL MEAN			40.6
LOWEST ANNUAL MEAN			1.86
HIGHEST DAILY MEAN	505	656	1170
LOWEST DAILY MEAN	.00	.24	.00
ANNUAL SEVEN-DAY MINIMUM	.02	.39	.00
INSTANTANEOUS PEAK FLOW		4500	13700
INSTANTANEOUS PEAK STAGE		8.01	12.31
ANNUAL RUNOFF (AC-FT)	4950	16320	9930
ANNUAL RUNOFF (CFSM)	.31	1.01	.61
ANNUAL RUNOFF (INCHES)	4.17	13.72	8.35
10 PERCENT EXCEEDS	12	48	24
50 PERCENT EXCEEDS	2.1	8.9	4.1
90 PERCENT EXCEEDS	.18	2.2	.34

## COLORADO RIVER BASIN

08154700 BULL CREEK AT LOOP 360 NEAR AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: April 1978 to current year. Pesticide analyses: June 1978 to September 1986, January 1993 to June 1995. Radiochemical analyses: January to April 1980.

**REMARKS.**--Samples collected during storm events are collected by automatic sampler.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)
FEB 05...	1044	3.7	694	8.0	12.0	6	0.20	10.5	98	<10	0.2	110
JUL 28...	1026	2.6	553	7.8	28.0	5	0.25	6.3	82	<10	0.8	480
DATE		STREP-TOCOCCEI, WAT DIS KF AGAR (COLS. PER 100 ML)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (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 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
FEB 05...		84	210	<1	<1	--	0.150	0.020	0.170	<0.015	--	--
JUL 28...		420	200	7	6	1	--	<0.010	0.107	<0.015	0.33	0.22
DATE		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)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
FEB 05...		<0.20	<0.010	<0.010	<0.010	2.9	0.200	<0.100	<1	<1	<1	<10
JUL 28...		0.22	<0.010	<0.010	<0.010	3.3	80.080	<0.100	<1	<1	<1	<10



# COLORADO RIVER MAIN STEM

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08154900 LAKE AUSTIN AT AUSTIN, TX

**LOCATION.**--Lat 30°18'53", long 97°47'10", Travis County, Hydrologic Unit 12090205, at city of Austin Waterplant No. 2 and 1.5 mi upstream from Tom Miller Dam on the Colorado River at Austin.

**DRAINAGE AREA.**--38,846 mi<sup>2</sup>, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--Chemical, biochemical, and pesticide analyses: October 1978to August 1990. Chemical and biochemical analyses: October 1990 to current year.

301739097471601 - LAKE AUSTIN SITE AR  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)			
JUL										
31...	1312	1.00	459	7.8	29.5	7.4	98			
31...	1314	10.0	458	7.6	29.0	6.3	82			
31...	1316	24.0	464	7.2	27.5	3.5	45			
DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	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)
JUL										
31...	1324	1.00	456	7.9	30.0	1.58	1.5	7.7	103	3.3
31...	1326	10.0	458	7.7	29.0	--	--	6.3	82	--
31...	1328	20.0	465	7.2	27.5	--	--	3.5	45	--
31...	1330	30.0	462	7.1	27.0	--	--	1.9	24	--
31...	1332	40.0	464	7.1	26.5	--	--	0.7	9	--
31...	1334	48.0	464	7.1	26.5	--	2.3	0.3	4	1.5
DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUL										
31...	K8	K18	140	288	5	0.093	0.010	0.103	<0.015	0.60
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	140	289	9	0.231	0.018	0.249	0.088	0.68
DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	COPPER, DIS- SOLVED (UG/L AS CU)	LEAD, DIS- SOLVED (UG/L AS PB)	
JUL										
31...	0.50	0.50	<0.010	<0.010	<0.010	--	6.3	1.8	<1.0	
31...	--	--	--	--	--	--	--	--	--	
31...	--	--	--	--	--	--	--	--	--	
31...	--	--	--	--	--	--	--	--	--	
31...	--	--	--	--	--	--	--	--	--	
31...	0.34	0.43	<0.010	<0.010	0.013	0.04	4.2	2.1	<1.0	
DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)			
JUL										
31-31	1346	1.00	455	8.0	29.5	7.7	102			
JUL										
31-31	1348	10.0	458	7.7	29.0	6.2	81			
JUL										
31-31	1350	23.0	465	7.3	27.5	3.7	47			

## COLORADO RIVER MAIN STEM

08154900 LAKE AUSTIN AT AUSTIN, TX--Continued

301739097471601 - LAKE AUSTIN SITE AR  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	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)
JUL 31...	1416	1.00	456	7.9	29.5	1.25	1.6	7.8	103	2.8
JUL 31-31	1418	10.0	453	7.3	27.5	--	--	4.3	55	--
JUL 31-31	1420	20.0	422	7.3	27.5	--	--	3.7	47	--
JUL 31...	1422	28.0	337	7.4	27.0	--	53	3.9	49	3.7
DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. / 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUL 31...	200	700	140	290	7	0.082	0.012	0.094	0.019	0.60
JUL 31-31	--	--	--	--	--	--	--	--	--	--
JUL 31-31	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	98	219	88	0.574	0.031	0.605	0.061	1.5
DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	COPPER, DIS- SOLVED (UG/L AS CU)	LEAD, DIS- SOLVED (UG/L AS PB)	
JUL 31...	0.49	0.51	<0.010	<0.010	0.010	0.03	5.3	2.2	<1.0	
JUL 31-31	--	--	--	--	--	--	--	--	--	
JUL 31-31	--	--	--	--	--	--	--	--	--	
JUL 31...	0.80	0.86	0.094	0.010	0.016	0.05	8.4	1.8	1.0	
DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)			
JUL 31-31	1404	1.00	458	7.8	29.5	6.9	91			
JUL 31-31	1406	10.0	460	7.3	27.5	3.4	44			
JUL 31-31	1408	18.0	462	7.4	27.5	3.9	50			
DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	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)
JUL 31...	1440	1.00	456	7.9	29.0	1.71	1.0	7.8	102	3.5
JUL 31-31	1442	10.0	462	7.5	27.0	--	--	5.0	63	--
JUL 31...	1444	22.0	463	7.4	26.5	--	1.5	4.3	54	1.5
DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. / 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUL 31...	<1	<1	150	276	5	0.105	0.012	0.117	0.020	0.59
JUL 31-31	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	140	302	4	0.254	0.010	0.264	0.063	0.60

# COLORADO RIVER MAIN STEM

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08154900 LAKE AUSTIN AT AUSTIN, TX--Continued

301739097471601 - LAKE AUSTIN SITE AR  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	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 ORTH, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTH, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	COPPER, DIS- SOLVED (UG/L AS CU)	LEAD, DIS- SOLVED (UG/L AS PB)
JUL 31...	0.45	0.47	<0.010	<0.010	0.011	0.03	5.7	1.9	<1.0
JUL 31-31	--	--	--	--	--	--	--	--	--
JUL 31...	0.27	0.33	<0.010	<0.010	0.014	0.04	3.7	2.2	<1.0

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	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)
JUL 31...	1506	1.00	458	7.6	27.5	2.13	1.0	5.5	70	1.9
JUL 31-31	1508	10.0	459	7.4	26.5	--	--	4.7	59	--
JUL 31...	1510	15.0	459	7.5	26.5	--	1.2	4.7	59	2.0

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUL 31...	K18	68	140	297	4	0.237	0.010	0.247	0.020	0.58
JUL 31-31	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	140	292	7	0.255	0.010	0.265	0.026	0.62

DATE	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 ORTH, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTH, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	COPPER, DIS- SOLVED (UG/L AS CU)	LEAD, DIS- SOLVED (UG/L AS PB)
JUL 31...	0.31	0.33	<0.010	<0.010	0.011	0.03	3.8	1.9	<1.0
JUL 31-31	--	--	--	--	--	--	--	--	--
JUL 31...	0.32	0.35	<0.010	<0.010	0.012	0.04	4.1	2.4	<1.0

## COLORADO RIVER BASIN

08155200 BARTON CREEK AT STATE HIGHWAY 71 NEAR OAK HILL, TX

**LOCATION.**--Lat 30°17'46", long 97°55'31", Travis County, Hydrologic Unit 12090205, at upstream side of bridge on State Highway 71, 0.1 mi downstream from Little Barton Creek, and 5.8 mi northwest of Oak Hill.

**DRAINAGE AREA.**--89.7 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--August 1975 to February 1978 (operated as a flood-hydrograph partial-record station), February 1978 to September 1982, January 1989 to current year.

**GAGE.**--Water-stage recorder and crest-stage gage. Datum of gage is 737.04 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records poor. No known regulation or diversions. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	0841	2,960	9.26	June 9	0645	5,670	13.74
Apr. 26	1200	1,310	6.59	June 10	1645	8,490	16.57
May 20	0430	1,940	7.69	June 22	0130	2,920	9.62
May 28	0030	2,090	8.00	June 22	1515	2,680	9.16
June 6	2215	2,330	8.53				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.08	.07	.41	6.0	6.1	36	40	86	187	193	3.4	.26
2	.07	.06	.39	6.0	6.7	37	41	79	171	166	3.3	.23
3	.06	.04	.35	6.0	7.0	37	45	71	156	143	3.6	.22
4	.06	.03	.35	5.9	6.0	37	772	63	142	126	2.7	.25
5	.07	.01	.35	5.5	5.4	38	629	60	137	112	2.4	.22
6	.09	.00	.35	5.1	5.6	38	333	57	363	102	2.0	.19
7	.10	.10	.36	5.9	8.2	38	271	55	384	146	1.8	.18
8	.10	.06	.36	9.8	8.2	42	241	51	232	142	8.3	.17
9	.10	.03	.36	14	8.6	47	220	94	1750	124	13	.16
10	.08	.04	.36	15	8.7	47	199	82	3300	79	9.1	.15
11	.06	.04	.36	14	8.0	53	182	66	859	62	3.5	.14
12	.05	.03	.36	14	12	86	161	65	515	51	2.3	.13
13	.05	.01	.35	13	20	77	142	68	408	53	1.9	.13
14	.05	.00	.35	13	19	72	128	70	345	62	1.8	.12
15	.05	.00	5.7	13	18	67	114	72	303	45	1.4	.12
16	.05	.00	9.0	13	18	68	102	148	257	37	1.1	.11
17	.06	.00	20	13	18	67	90	93	254	28	1.0	.10
18	.09	.00	14	13	19	66	81	84	255	20	.85	.10
19	.07	.00	11	12	20	61	75	85	233	11	.69	.09
20	.07	.00	10	12	29	59	65	594	217	9.7	.62	.08
21	.07	.00	9.9	12	28	57	55	205	349	11	.57	.08
22	.04	.00	8.9	12	24	53	50	156	1900	7.5	.52	.09
23	.02	.00	9.8	11	24	51	44	171	742	4.8	.49	.11
24	.02	.22	9.2	10	24	49	41	185	551	3.3	.46	.09
25	.03	.19	8.8	9.6	27	51	60	172	449	2.5	.46	.09
26	.04	.17	8.2	9.5	32	55	420	201	395	1.9	.35	.08
27	.05	.13	7.7	8.7	38	50	180	406	339	1.5	.34	.08
28	.07	.15	7.5	7.1	36	47	141	544	296	1.6	.34	.07
29	.08	.32	7.0	7.0	---	45	115	252	257	1.8	.31	.07
30	.07	.53	6.6	6.8	---	42	97	227	221	1.8	.29	.07
31	.07	---	6.6	5.7	---	40	---	209	---	3.1	.28	---
TOTAL	1.97	2.23	164.96	308.6	484.5	1613	5134	4771	15967	1752.5	69.17	3.98
MEAN	.064	.074	5.32	9.95	17.3	52.0	171	154	532	56.5	2.23	.13
MAX	.10	.53	20	15	38	86	772	594	3300	193	13	.26
MIN	.02	.00	.35	5.1	5.4	36	40	51	137	1.5	.28	.07
AC-FT	3.9	4.4	327	612	961	3200	10180	9460	31670	3480	137	7.9
CFSM	.00	.00	.06	.11	.19	.58	1.91	1.72	5.93	.63	.02	.00
IN.	.00	.00	.07	.13	.20	.67	2.13	1.98	6.62	.73	.03	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1997h, BY WATER YEAR (WY)

	MEAN	12.8	8.28	55.7	44.6	64.3	60.5	50.9	79.7	119	12.8	3.29	2.58
MAX	57.6	43.0	520	293	465	338	196	226	613	56.5	15.2	24.2	
(WY)	1982	1995	1992	1992	1992	1992	1979	1992	1981	1997	1991	1991	
MIN	.000	.059	.039	.046	.072	.020	.057	.001	.000	.000	.000	.004	
(WY)	1991	1990	1990	1990	1990	1996	1996	1996	1996	1978	1996	1990	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1978 - 1997h

ANNUAL TOTAL	204.86	30272.91	
ANNUAL MEAN	.56	82.9	
HIGHEST ANNUAL MEAN			46.7
LOWEST ANNUAL MEAN			182
HIGHEST DAILY MEAN	20	Dec 17	.17
LOWEST DAILY MEAN	.00	Feb 23	4960
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 23	.00
INSTANTANEOUS PEAK FLOW			.00
INSTANTANEOUS PEAK STAGE			.00
ANNUAL RUNOFF (AC-FT)	406	16.57	14900
ANNUAL RUNOFF (CFSM)		60050	18.10
ANNUAL RUNOFF (INCHES)	.006		33850
10 PERCENT EXCEEDS	.43		.52
50 PERCENT EXCEEDS	.01		7.08
90 PERCENT EXCEEDS	.00		88
			4.2
			.07

h See PERIOD OF RECORD paragraph.



# COLORADO RIVER BASIN

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08155200 BARTON CREEK AT STATE HIGHWAY 71 NEAR OAK HILL, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: April 1978 to September 1982, February 1989 to current year. Pesticide analyses: April 1978 to September 1982, January 1993 to current year. Radiochemical analyses: October 1979 to September 1980.

**REMARKS.**--Samples collected during storm events are collected by automatic sampler.

### WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)
OCT 15...	1105	0.05	595	7.5	21.5	8	0.30	6.1	71	<16	0.7	140
FEB 04...	1244	6.0	528	8.0	15.5	4	0.20	10.3	105	<10	0.3	K8
APR 04...	0840	2960	365	7.9	19.0	40	550	--	--	140	8.0	30000
04...	0853	2760	328	7.9	19.0	40	560	--	--	130	6.0	37000
04...	0906	2380	320	7.9	19.0	50	530	--	--	120	8.1	26000
04...	0920	2210	312	7.7	19.0	50	480	--	--	110	6.6	37000
04...	0942	1710	319	7.9	19.0	40	380	--	--	92	3.7	28000
04...	1013	1330	323	7.8	19.5	40	280	--	--	79	5.2	22000
04...	1055	1050	356	7.9	19.0	40	320	--	--	64	3.4	38000
04...	1136	830	372	7.9	19.0	35	190	--	--	60	3.9	34000
04...	1310	785	404	7.8	19.0	30	180	--	--	35	1.8	16000
MAY 20...	0215	249	454	7.6	--	5	3.1	--	--	<10	0.9	K4
20...	0425	1920	460	7.7	--	30	230	--	--	37	4.0	K10000
20...	0530	1460	396	7.7	--	25	370	--	--	35	3.0	21000
20...	0605	1050	353	7.6	--	10	150	--	--	33	2.9	20000
20...	0750	765	323	7.9	--	30	120	--	--	43	2.3	K13000
21...	0700	220	524	8.0	20.5	20	5.8	7.8	89	<10	0.4	1000
JUL 28...	1156	1.5	486	7.9	30.0	2	0.14	6.6	90	<10	0.6	K14
DATE		STREP-TOCOCCEI, FECAL, KF AGAR (COLS. PER 100 ML)	ALKA-LINITY WAT DIS FIX END CAC03 (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 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
OCT 15...		1600	210	1	<1	--	--	0.030	<0.050	<0.015	--	--
FEB 04...		110	180	<1	<1	--	--	0.020	<0.050	<0.015	--	--
APR 04...		88000	130	1360	276	1090	--	<0.010	0.120	0.020	4.9	4.8
04...		96000	120	1080	205	870	--	<0.010	0.100	0.030	4.3	4.2
04...		86000	120	1120	140	975	--	<0.010	0.110	0.030	3.8	3.7
04...		64000	110	1200	150	1050	--	<0.010	0.100	0.030	4.0	3.9
04...		100000	110	888	204	684	--	<0.010	0.100	0.030	3.7	3.6
04...		76000	100	792	188	604	0.110	0.010	0.120	0.030	3.1	3.0
04...		72000	120	648	142	506	0.120	0.010	0.130	0.020	2.5	2.4
04...		72000	130	500	58	442	--	<0.010	0.150	<0.015	2.2	2.1
04...		53000	150	268	82	186	--	<0.010	0.190	0.030	1.6	1.4
MAY 20...		K20	140	21	10	11	--	<0.010	0.072	0.031	0.34	0.23
20...		22000	160	594	106	488	--	<0.010	0.108	<0.015	2.4	2.3
20...		22000	130	306	46	260	--	<0.010	0.116	<0.015	2.5	2.4
20...		22000	130	186	50	136	--	<0.010	0.110	<0.015	3.1	3.0
20...		K19000	140	124	46	78	--	<0.010	0.110	<0.015	0.73	0.62
21...		2400	210	13	15	0	--	<0.010	0.092	<0.015	--	--
JUL 28...		100	190	<1	6	--	--	<0.010	0.060	<0.015	--	--

## COLORADO RIVER BASIN

08155200 BARTON CREEK AT STATE HIGHWAY 71 NEAR OAK HILL, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)
OCT 15...	<0.20	<0.010	<0.010	<0.010	1.2	<0.100	<0.100	<1	--	<1	--
FEB 04...	<0.20	<0.010	<0.010	<0.010	1.5	<0.100	<0.100	--	<1	<1	<10
APR 04...	4.8	0.590	0.010	<0.010	<0.10	--	--	<1	21	24	60
04...	4.2	0.560	0.010	<0.010	45	--	--	<1	7	16	40
04...	3.7	0.540	<0.010	<0.010	44	--	--	<1	11	16	40
04...	3.9	0.510	<0.010	<0.010	50	--	--	<1	7	14	40
04...	3.6	0.480	<0.010	<0.010	45	--	--	<1	6	12	30
04...	3.0	0.390	<0.010	<0.010	29	--	--	<1	6	13	50
04...	2.4	0.320	<0.010	<0.010	26	--	--	<1	4	9	20
04...	2.1	0.290	<0.010	<0.010	22	--	--	<1	4	9	20
04...	1.4	0.180	<0.010	<0.010	17	--	--	<1	4	5	10
MAY 20...	0.26	0.018	<0.010	<0.010	8.4	--	--	--	2	<1	<10
20...	2.3	0.267	<0.010	<0.010	13	--	--	--	6	9	30
20...	2.4	0.266	<0.010	<0.010	19	--	--	--	6	7	30
20...	3.0	0.420	<0.010	<0.010	15	--	--	--	4	10	30
20...	0.62	0.060	<0.010	<0.010	18	--	--	--	6	8	30
21...	<0.20	<0.010	<0.010	<0.010	6.7	--	--	--	<1	<1	<10
JUL 28...	<0.20	0.010	0.012	<0.010	2.3	EO.060	<0.100	--	<1	<1	<10

## 08155240 BARTON CREEK AT LOST CREEK BOULEVARD, AUSTIN, TX

**LOCATION.**--Lat 30°16'26", long 97°50'40", Travis County, Hydrologic Unit 12090205, 1.4 mi southwest of intersection of Lost Creek Boulevard and Loop 360, and 6.2 mi west of State Capitol Building in Austin.

**DRAINAGE AREA.**--107 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--January 1979 to September 1980 (periodic gage heights and discharge measurements only). December 1988 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 600 ft above sea level, from topographic map.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation or diversions. No flow at times. Several observations of water temperature were made during the year. Station equipped with an automatic water-quality sampler. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--The flood of May 28, 1929 was probably the highest since that date (discharge 39,400 ft<sup>3</sup>/s), based on slope-area measurement of peak flow at a site about 2.1 mi downstream.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	1145	2,770	6.42	June 9	1030	5,750	8.68
Apr. 5	0545	1,260	4.95	June 10	2000	10,100	10.84
Apr. 26	1600	1,520	5.23	June 11	1230	1,240	4.93
May 20	0800	1,680	5.40	June 22	0415	2,970	6.59
May 28	0415	2,210	5.92	June 22	1800	3,100	6.70
June 27	0130	2,170	5.88	June 23	1000	1,150	4.83

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	.81	5.4	8.2	7.3	52	45	145	249	228	15	.77
2	1.9	.74	4.4	8.1	7.3	50	46	137	207	189	14	.67
3	1.9	.70	3.9	7.9	7.1	48	52	122	171	160	11	.56
4	1.8	.72	4.0	7.8	6.9	47	1000	112	151	149	10	.50
5	1.8	.68	4.2	7.4	6.6	45	995	104	141	137	9.5	.51
6	2.0	.69	3.9	6.9	6.6	43	560	95	161	126	8.6	.44
7	1.8	1.3	3.7	8.4	8.7	41	412	89	858	118	11	.40
8	1.6	1.1	3.5	11	8.5	44	337	84	392	109	13	.38
9	1.4	.87	3.4	13	8.9	47	283	201	1990	97	14	.34
10	1.3	.85	3.4	13	9.0	47	243	181	3680	85	13	.30
11	1.2	.87	3.3	13	8.9	52	218	126	1330	75	11	.26
12	1.2	.85	3.1	13	26	118	173	108	862	66	9.4	.22
13	1.2	.84	2.9	12	46	124	151	92	682	59	8.1	.19
14	1.1	.85	2.8	12	43	96	139	81	588	52	7.3	.18
15	1.1	.89	16	12	35	77	126	78	531	49	6.4	.16
16	1.2	.90	23	12	31	74	116	164	441	47	5.5	.16
17	1.1	1.0	22	11	29	75	105	118	438	42	4.5	.16
18	.96	1.1	21	11	28	74	91	87	335	38	4.1	.16
19	.84	1.1	18	11	28	67	82	83	285	34	3.7	.16
20	.85	1.0	15	11	36	61	74	656	244	32	3.3	.16
21	.83	.96	14	11	64	57	69	308	351	29	2.6	.15
22	.76	.92	13	11	44	54	63	224	2270	27	2.2	.18
23	.73	.99	12	11	39	51	57	295	1190	24	2.4	.15
24	.71	4.1	11	10	38	49	54	366	855	21	2.9	.15
25	.77	2.6	11	9.7	41	54	73	282	655	19	2.1	.15
26	.86	1.9	11	9.5	49	66	674	202	539	17	1.7	.14
27	.83	2.0	10	9.4	59	54	462	259	451	15	1.5	.14
28	.98	2.4	9.5	11	54	50	306	1020	382	14	1.3	.14
29	1.0	7.6	9.3	8.0	---	48	222	465	322	14	1.1	.15
30	.92	8.1	8.8	7.8	---	46	169	362	273	14	.98	.14
31	.84	---	8.5	7.7	---	44	---	302	---	16	.85	---
TOTAL	37.58	49.43	285.0	315.8	775.8	1855	7397	6948	21024	2102	202.03	8.17
MEAN	1.21	1.65	9.19	10.2	27.7	59.8	247	224	701	67.8	6.52	.27
MAX	2.1	8.1	23	13	64	124	1000	1020	3680	228	15	.77
MIN	.71	.68	2.8	6.9	6.6	41	45	78	141	14	.85	.14
MED	1.1	.94	8.8	11	29	52	145	145	440	47	5.5	.17
AC-FT	.75	.98	565	626	1540	3680	14670	13780	41700	4170	401	.16
CFSM	.01	.02	.09	.10	.26	.56	2.30	2.09	6.55	.63	.06	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1989 - 1997, BY WATER YEAR (WY)

	MEAN	8.45	7.27	92.2	65.4	102	71.2	67.8	115	143	14.7	4.54	3.80
MAX	54.3	33.8	627	307	581	381	247	264	701	67.8	23.2	25.6	
(WY)	1995	1995	1992	1992	1992	1992	1997	1992	1997	1997	1991	1991	
MIN	.10	.23	.22	.40	.96	.81	.84	.42	1.41	.17	.24	.069	
(WY)	1994	1990	1990	1990	1996	1996	1996	1996	1996	1996	1993	1993	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1989 - 1997

ANNUAL TOTAL	702.64	40999.81	
ANNUAL MEAN	1.92	112	60.8
HIGHEST ANNUAL MEAN			212
LOWEST ANNUAL MEAN			1.14
HIGHEST DAILY MEAN	34	3680	7000
LOWEST DAILY MEAN	.04	.14	.00
ANNUAL SEVEN-DAY MINIMUM	.05	.14	.00
INSTANTANEOUS PEAK FLOW		10100	16400
INSTANTANEOUS PEAK STAGE		10.84	12.90
ANNUAL RUNOFF (AC-FT)	1390	81320	44040
ANNUAL RUNOFF (CFSM)	.018	1.05	.57
10 PERCENT EXCEEDS	3.9	298	124
50 PERCENT EXCEEDS	.88	13	5.4
90 PERCENT EXCEEDS	.18	.75	.25

## COLORADO RIVER BASIN

08155240 BARTON CREEK AT LOST CREEK BLVD., AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: December 1988 to current year. Pesticide analyses: January 1993 to May 1995.**REMARKS.**--Samples collected during storm events are collected by automatic sampler.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECA, 0.7 UM-MF (COLS./100 ML)
OCT 15...	1330	1.1	814	7.5	22.5	8	0.30	7.4	87	<11	1.0	39
FEB 04...	1048	6.9	645	7.7	15.0	4	0.40	8.9	90	<10	0.2	100
APR 04...	0855	1220	442	8.0	--	25	220	--	--	80	7.2	12000
04...	1000	1700	346	7.9	--	50	330	--	--	120	7.3	50000
04...	1045	2140	413	8.0	--	30	280	--	--	100	6.4	33000
04...	1145	2770	444	8.0	--	35	300	--	--	120	7.5	34000
04...	1247	1930	413	8.0	--	40	320	--	--	97	6.3	21000
04...	1330	1710	390	8.0	--	30	340	--	--	89	5.0	20000
04...	1417	1300	376	8.0	--	35	270	--	--	75	5.4	K12000
04...	1517	1020	383	8.0	--	35	200	--	--	62	5.3	24000
04...	1650	995	420	8.0	--	30	150	--	--	38	3.6	17000
MAY 20...	0500	229	530	7.6	--	15	28	--	--	13	0.9	K400
20...	0650	1000	398	7.7	--	70	21	--	--	17	1.3	24000
20...	0733	1520	515	7.7	--	10	12	--	--	11	1.2	2300
20...	1004	1170	457	7.6	--	25	120	--	--	26	3.2	K9000
20...	1135	920	432	7.6	--	25	140	--	--	23	2.1	K6000
21...	0810	308	502	7.7	20.5	15	18	7.9	90	13	0.4	K1100
JUL 28...	1235	14	493	7.9	30.0	4	0.23	6.4	87	<10	0.6	180
DATE	STREP-TOCOCCEI FECAL, (COLS. PER 100 ML)	ALKA-LINITY FIX END CAC03 (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	RESIDUE RESIDUE VOLA-TILE, SUS-PENDED (MG/L)	RESIDUE RESIDUE FIXED FILTER-ABLE (MG/L)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA ORGANIC TOTAL (MG/L AS N)
OCT 15...	84	230	2	<1	--	0.050	0.020	0.070	0.020	0.27	0.18	0.20
FEB 04...	800	190	<1	<1	--	0.080	0.020	0.100	<0.015	--	--	<0.20
APR 04...	22000	160	634	88	546	0.230	0.010	0.240	0.030	3.2	3.0	3.0
04...	56000	120	728	220	508	0.200	0.010	0.210	0.040	3.9	3.7	3.7
04...	62000	120	916	308	608	0.160	0.010	0.170	0.020	4.3	4.1	4.1
04...	50000	150	868	236	632	--	<0.010	0.130	<0.015	3.7	3.6	3.6
04...	40000	150	792	212	580	0.150	0.010	0.160	0.020	3.9	3.7	3.7
04...	36000	140	752	244	508	0.160	0.010	0.170	0.020	2.4	2.2	2.2
04...	48000	140	166	44	122	0.200	0.010	0.210	0.030	2.8	2.6	2.6
04...	34000	140	105	20	85	--	<0.010	0.220	0.020	2.6	2.4	2.4
04...	44000	150	312	86	226	--	<0.010	0.250	0.030	1.6	1.4	1.4
MAY 20...	8000	190	56	21	35	--	<0.010	0.212	0.072	0.84	0.56	0.63
20...	K17000	140	22	4	18	--	<0.010	0.230	<0.015	0.56	0.33	0.33
20...	6800	190	22	16	6	--	<0.010	0.089	<0.015	2.1	2.0	2.0
20...	36000	150	132	42	90	--	<0.010	0.101	<0.015	0.96	0.86	0.86
20...	21000	160	204	50	154	--	<0.010	0.111	<0.015	1.1	1.0	1.0
21...	6900	200	30	20	10	--	<0.010	0.149	<0.015	0.47	0.32	0.32
JUL 28...	92	180	17	6	11	--	<0.010	0.056	<0.015	--	--	<0.20



# COLORADO RIVER BASIN

95

08155240 BARTON CREEK AT LOST CREEK BLVD., AUSTIN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)
OCT 15...	<0.010	<0.010	<0.010	--	3.3	E0.200	<0.100	<1	--	<1	--
FEB 04...	<0.010	<0.010	<0.010	--	2.0	0.200	<0.100	--	<1	<1	<10
APR 04...	0.380	<0.010	<0.010	--	44	--	--	<1	7	9	40
04...	0.550	<0.010	<0.010	--	51	--	--	<1	7	14	50
04...	0.470	<0.010	<0.010	--	48	--	--	<1	7	12	50
04...	0.480	<0.010	<0.010	--	50	--	--	<1	7	12	40
04...	0.440	<0.010	<0.010	--	38	--	--	<1	6	11	30
04...	0.250	0.010	<0.010	--	41	--	--	<1	5	11	30
04...	0.330	<0.010	<0.010	--	31	--	--	<1	4	9	30
04...	0.270	<0.010	<0.010	--	25	--	--	<1	4	9	30
04...	0.170	<0.010	<0.010	--	15	--	--	<1	3	7	10
MAY 20...	0.064	0.055	0.037	0.11	4.6	--	--	--	1	1	<10
20...	0.057	0.021	0.017	0.05	8.8	--	--	--	2	1	10
20...	0.223	<0.010	<0.010	--	3.5	--	--	--	1	2	<10
20...	0.090	<0.010	<0.010	--	13	--	--	--	5	8	30
20...	0.113	<0.010	<0.010	--	11	--	--	--	3	8	20
21...	0.021	0.012	<0.010	--	5.1	--	--	--	<1	3	<10
JUL 28...	<0.010	<0.010	<0.010	--	1.9	E0.070	<0.100	--	<1	<1	<10

## COLORADO RIVER BASIN

08155300 BARTON CREEK AT LOOP 360, AUSTIN, TX

**LOCATION.**--Lat 30°14'40", long 97°48'07", Travis County, Hydrologic Unit 12090205, on Loop 360, 0.9 mi west of the intersection of Ben White and Lamar Boulevards, and 4.3 mi southwest of the State Capitol Building in Austin.

**DRAINAGE AREA.**--116 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1975 to January 1977 (operated as a flood-hydrograph partial-record station only), February 1977 to current year.

**GAGE.**--Water-stage recorder and crest-stage gage. Datum of gage is 510.32 ft above sea level (Texas Department of Transportation bench mark).

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation or diversions. Several observations of wster temperature were made during the year. Rain gage telemeter at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--The flood of May 28, 1929, was probably the highest since that date (discharge 39,400 ft<sup>3</sup>/s), based on a slope-area measurement of peak flow at a site about 2 mi upstream.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	1245	2,700	7.80	June 10	0145	1,070	5.82
Apr. 5	0645	1,260	6.06	June 10	2130	9,940	12.63
Apr. 26	1715	1,530	6.46	June 11	1300	1,360	6.28
May 20	0900	1,680	6.67	June 22	0530	3,110	8.08
May 28	0500	2,200	7.29	June 22	1945	3,200	8.11
June 7	0245	2,120	7.20	June 23	1100	1,100	6.09
June 9	1145	6,600	10.76				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	21	11	145	197	199	.00	.00
2	.00	.00	.00	.00	.00	17	12	132	159	170	.00	.00
3	.00	.00	.00	.00	.00	16	19	113	136	148	.00	.00
4	.00	.00	.00	.00	.00	15	920	96	115	125	.00	.00
5	.00	.00	.00	.00	.00	12	942	87	106	103	.00	.00
6	.00	.00	.00	.00	.00	10	397	80	107	82	.00	.00
7	.00	.00	.00	.00	.09	8.8	287	76	763	68	.00	.00
8	.00	.00	.00	.00	.00	9.8	236	70	278	55	.26	.00
9	.00	.00	.00	.00	.00	13	202	174	2100	46	.00	.00
10	.00	.00	.00	.00	.00	15	178	168	3780	37	.00	.00
11	.00	.00	.00	.00	.00	16	163	112	1540	32	.00	.00
12	.00	.00	.00	.00	29	58	142	95	847	26	.00	.00
13	.00	.00	.00	.00	48	73	121	83	595	21	.00	.00
14	.00	.00	.00	.00	33	51	106	73	463	17	.00	.00
15	.00	.00	3.6	.00	16	43	92	70	389	15	.00	.00
16	.00	.00	.03	.00	6.1	42	82	164	317	13	.00	.00
17	.00	.00	.00	.00	1.5	43	73	117	327	11	.00	.00
18	.00	.00	.00	.00	.12	41	65	79	236	9.2	.00	.00
19	.00	.00	.00	.00	.00	37	61	79	191	6.3	.00	.00
20	.00	.00	.00	.00	1.1	33	55	607	158	4.1	.00	.00
21	.00	.00	.00	.00	34	30	48	251	275	2.3	.00	.00
22	.00	.00	.00	.00	18	27	42	184	2360	1.4	.00	.00
23	.00	.00	.00	.00	10	24	36	291	1230	.83	.00	.00
24	.00	.00	.00	.00	9.4	13	33	314	761	.61	.00	.00
25	.00	.00	.00	.00	13	15	54	236	561	.48	.00	.00
26	.00	.00	.00	.00	20	27	622	184	451	.25	.00	.00
27	.00	.00	.00	.00	30	20	391	190	375	.00	.00	.00
28	.00	.00	.00	.00	25	15	253	998	321	.00	.00	.00
29	.00	.00	.00	.00	---	15	200	349	275	.00	.00	.00
30	.00	.00	.00	.00	---	12	166	287	234	.00	.00	.00
31	.00	---	.00	.00	---	10	---	247	---	.00	.00	---
TOTAL	0.00	0.00	3.63	0.00	294.31	782.6	6009	6151	19647	1193.47	0.26	0.00
MEAN	.000	.000	.12	.000	10.5	25.2	200	198	655	38.5	.008	.000
MAX	.00	.00	3.6	.00	48	73	942	998	3780	199	.26	.00
MIN	.00	.00	.00	.00	.00	8.8	11	70	106	.00	.00	.00
AC-FT	.00	.00	7.2	.00	584	1550	11920	12200	38970	2370	.5	.00
CFSM	.00	.00	.00	.00	.09	.22	1.73	1.71	5.65	.33	.00	.00
IN.	.00	.00	.00	.00	.09	.25	1.93	1.97	6.30	.38	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1997, BY WATER YEAR (WY)

MEAN	17.4	8.60	76.9	39.1	63.3	50.6	51.9	87.4	171	9.02	.82	.56
MAX	134	77.3	865	281	609	342	319	321	1142	73.1	13.9	7.57
(WY)	1985	1986	1992	1992	1992	1992	1977	1992	1987	1981	1991	1983
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1978	1978	1978	1978	1978	1978	1978	1978	1978	1977	1977	1977

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1977 - 1997

ANNUAL TOTAL	29.26	34081.27	
ANNUAL MEAN	.080	93.4	
HIGHEST ANNUAL MEAN			47.5
LOWEST ANNUAL MEAN			229
HIGHEST DAILY MEAN	16	Jun 7	10800
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			18100
INSTANTANEOUS PEAK STAGE			15.03
ANNUAL RUNOFF (AC-FT)	58	67600	34450
ANNUAL RUNOFF (CFSM)	.001	.80	.41
ANNUAL RUNOFF (INCHES)	.01	10.93	5.57
10 PERCENT EXCEEDS	.00	236	95
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

# COLORADO RIVER BASIN

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08155300 BARTON CREEK AT LOOP 360, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1979 to current year. Pesticide analyses: January 1979 to September 1986.  
Radiochemical analyses: April 1980.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MGL)
APR											
04...	0820	539	576	8.0	--	10	110	--	--	46	1.8
04...	0902	1030	554	8.0	--	15	110	--	--	27	2.0
04...	1015	1270	536	8.0	--	20	120	--	--	49	2.0
04...	1215	2560	390	7.9	--	50	320	--	--	110	3.4
04...	1357	2110	451	7.8	--	40	300	--	--	96	4.7
04...	1445	1640	423	8.0	--	35	450	--	--	85	2.5
04...	1545	1320	386	7.8	--	40	320	--	--	81	4.1
04...	1750	967	375	7.8	--	40	270	--	--	58	3.3
MAY											
20...	0540	231	526	8.0	--	10	72	--	--	<10	0.4
20...	0810	666	518	7.7	--	15	38	--	--	15	2.0
20...	0830	1430	525	7.7	--	15	72	--	--	13	1.5
20...	0935	1680	511	7.8	--	10	96	--	--	11	1.9
20...	1215	975	458	7.8	--	30	170	--	--	33	2.6
21...	0738	260	469	8.1	21.0	20	26	8.2	94	14	0.9

DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
APR											
04...	K1000	K7000	180	200	38	162	--	<0.010	0.190	0.040	1.6
04...	K7000	K19000	180	288	88	200	--	<0.010	0.210	0.040	1.7
04...	K11000	K19000	170	270	82	188	0.180	0.010	0.190	0.050	2.0
04...	24000	44000	140	216	34	182	0.160	0.010	0.170	0.050	4.7
04...	20000	41000	150	740	220	520	--	<0.010	0.130	0.020	3.6
04...	20000	70000	160	800	102	698	0.140	0.010	0.150	0.030	3.7
04...	22000	66000	140	612	152	460	--	<0.010	0.162	0.024	2.9
04...	11000	21000	120	402	56	346	--	<0.010	0.210	0.030	2.4
MAY											
20...	K1700	7100	210	517	100	417	--	<0.010	0.122	<0.015	1.3
20...	K6000	K15000	190	150	38	112	0.235	0.010	0.245	0.090	2.0
20...	2900	6900	200	206	46	160	--	<0.010	0.192	0.053	2.1
20...	3100	5500	200	276	58	218	--	<0.010	0.096	0.015	1.1
20...	K11000	21000	160	340	72	268	--	<0.010	0.111	<0.015	1.5
21...	3100	4100	190	33	6	27	--	<0.010	0.218	<0.015	0.59

DATE	NITRO- GEN, MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)
APR											
04...	1.4	1.4	0.140	<0.010	<0.010	--	11	<1	2	12	20
04...	1.5	1.5	0.180	<0.010	<0.010	--	14	<1	2	7	20
04...	1.7	1.8	0.200	<0.010	<0.010	--	17	<1	3	7	20
04...	4.5	4.5	0.560	<0.010	<0.010	--	45	<1	8	14	40
04...	3.5	3.5	0.420	<0.010	<0.010	--	43	<1	6	12	40
04...	3.5	3.5	0.430	<0.010	<0.010	--	42	<1	5	10	30
04...	2.7	2.8	0.320	<0.010	<0.010	--	28	<1	5	9	20
04...	2.2	2.2	0.280	<0.010	<0.010	--	17	<1	4	7	20
MAY											
20...	1.2	1.2	0.119	<0.010	<0.010	--	3.4	--	--	5	10
20...	1.7	1.8	0.212	<0.010	<0.010	--	6.3	--	--	3	<10
20...	1.9	1.9	0.232	<0.010	<0.010	--	3.4	--	--	1	<10
20...	0.95	0.97	0.109	<0.010	<0.010	--	5.0	--	--	2	10
20...	1.4	1.4	0.153	<0.010	<0.010	--	16	--	--	3	10
21...	0.37	0.37	0.037	0.037	0.014	0.04	7.7	--	--	<1	<10

## COLORADO RIVER BASIN

08155500 BARTON SPRINGS AT AUSTIN, TX

**LOCATION.**--Lat 30°15'48", long 97°46'16", Travis County, Hydrologic Unit 12090205, at ground-water well (YD 58-42-903), on right bank 0.4 mi upstream from Barton Springs Road bridge over Barton Creek, 0.7 mi upstream from mouth, and 1.8 mi southwest of the State Capitol Building in Austin.

**DRAINAGE AREA.**--Not applicable. Only springflow is published for this station.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--November 1894 to April 1917, and October 1918 to February 1978 (discharge measurements only), May 1917 to September 1918 (published as "Barton Creek at Austin, Texas"), March 1978 to 1994 (daily mean discharge), October 1994 to current year (discharge at 1200 hours).

**GAGE.**--Water-stage recorder. Datum of gage, at ground-water well (YD 58-42-903), is 462.34 ft above sea level. May 1917 to September 1918, nonrecording gage at site 1,000 ft downstream at different datum.

**REMARKS.**--Records poor. No estimated daily discharge. Only springflow from the Edwards and associated limestones in the Balcones Fault Zone is published for this station. Operation of Barton Springs pool significantly affects level recorded in well. Pool is drained at closing and allowed to fill after cleaning operations. Under normal conditions gage height is in direct relation with discharge. Determination of flow from spring is considered best when pool/well level has stabilized at 1200 hrs. Beginning 1995, daily flow has been determined using the recorded level at 1200 hrs. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD (DISCHARGE MEASUREMENTS ONLY).**--Maximum measured discharge, 166 ft<sup>3</sup>/s May 10, 1941; minimum measured, 9.6 ft<sup>3</sup>/s Mar. 29, 1956.

**EXTREMES FOR PERIOD (1917-18).**--Maximum daily spring discharge, 24 ft<sup>3</sup>/s Apr. 20, 21, 1918; minimum daily, 12 ft<sup>3</sup>/s Feb. 25, 1918.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 1200 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	30	31	36	36	56	60	83	96	112	109	97
2	34	30	31	36	36	56	62	83	97	112	109	96
3	34	30	31	36	36	56	62	83	97	112	109	96
4	33	30	31	36	36	56	63	83	97	112	108	96
5	32	31	31	36	36	56	64	83	97	112	108	95
6	32	31	31	36	36	55	66	82	97	112	107	95
7	32	31	31	36	37	55	68	82	97	112	107	95
8	32	31	31	36	36	55	70	82	97	113	109	95
9	32	31	30	36	36	55	72	82	97	113	109	95
10	32	31	30	36	36	55	74	84	97	113	109	94
11	32	31	30	36	36	54	76	85	97	113	108	94
12	32	31	30	36	36	57	77	85	97	113	106	93
13	32	31	30	36	50	58	76	85	97	113	106	93
14	32	31	30	36	54	58	76	84	97	113	106	93
15	31	31	36	36	54	58	76	84	98	113	105	93
16	31	31	42	36	54	58	76	88	98	113	105	92
17	31	32	42	36	54	59	77	88	100	113	104	92
18	31	33	42	36	54	60	77	86	102	113	104	92
19	31	33	38	36	54	59	77	87	103	113	102	91
20	31	32	36	36	54	60	77	87	105	113	102	91
21	31	32	36	36	55	60	77	88	107	112	102	91
22	31	31	36	36	56	60	76	89	108	112	102	91
23	31	31	36	36	56	60	76	89	108	112	102	91
24	31	31	36	36	56	60	76	90	109	112	102	91
25	30	31	36	36	56	60	76	91	110	112	102	91
26	29	31	36	36	56	62	77	92	110	112	102	90
27	29	31	36	36	56	62	78	93	110	111	102	90
28	29	31	36	36	56	61	80	94	111	111	100	90
29	30	31	36	36	---	61	81	95	111	110	98	90
30	30	31	36	36	---	60	82	96	111	110	97	90
31	31	---	36	36	---	60	---	97	---	110	97	---
TOTAL	973	933	1060	1116	1308	1802	2205	2700	3058	3477	3238	2783
MEAN	31.4	31.1	34.2	36.0	46.7	58.1	73.5	87.1	102	112	104	92.8
MAX	34	33	42	36	56	62	82	97	111	113	109	97
MIN	29	30	30	36	36	54	60	82	96	110	97	90
AC-FT	1930	1850	2100	2210	2590	3570	4370	5360	6070	6900	6420	5520



# COLORADO RIVER BASIN

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08155500 BARTON SPRINGS AT AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: October 1903, June 1941 to February 1959. Chemical and biochemical analyses: December 1978 to current year. Radiochemical analyses: January to September 1980. Organics analyses: December 1978 to November 1994.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MGL)
FEB 04...	1000	32	700	7.1	21.0	1	0.20	5.1	58	<10	0.2
APR 07...	0950	68	613	7.0	20.0	5	25	6.4	71	<10	0.6
MAY 21...	0844	88	565	7.4	21.0	15	4.4	6.0	68	<10	0
JUL 28...	1320	111	643	7.1	21.5	2	0.31	7.1	82	<10	0.2
DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB 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)	
FEB 04...	K1	K2	310	57	85	24	25	0.6	1.5	260	
APR 07...	K170	440	290	48	88	17	14	0.4	1.4	240	
APR 08...	49	200	300	47	90	18	14	0.3	1.3	250	
MAY 21...	900	3100	--	--	--	--	--	--	1.5	230	
JUL 28...	K16	K16	300	33	89	19	13	0.3	1.2	270	
DATE	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	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 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	
FEB 04...	42	41	0.30	11	393	<1	<1	--	1.48	0.020	
APR 07...	39	25	0.19	9.8	343	3	3	0	--	<0.010	
APR 08...	37	25	0.19	9.8	348	3	5	0	--	<0.010	
MAY 21...	--	--	--	--	--	2	2	0	--	<0.010	
JUL 28...	23	23	0.22	11	348	<1	3	--	--	<0.010	
DATE	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA 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-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	
FEB 04...	1.50	<0.015	<0.20	<0.010	<0.010	<0.010	--	0.40	<1	62	
APR 07...	0.910	0.020	<0.20	<0.010	<0.010	<0.010	--	3.4	<1	44	
APR 08...	0.960	<0.015	<0.20	<0.010	<0.010	<0.010	--	1.8	<1	45	
MAY 21...	0.782	<0.015	<0.20	0.025	0.012	0.014	0.04	7.2	<1	--	
JUL 28...	1.33	<0.015	<0.20	<0.010	<0.010	0.010	0.03	1.6	<1	48	

## COLORADO RIVER BASIN

08155500 BARTON SPRINGS AT AUSTIN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	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, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
FEB 04...	<0.50	<1	1.0	<5.0	<3.0	<10	<3.0	<1	<10	18
APR 07...	<0.50	<1	<1.0	<5.0	<3.0	<10	<3.0	<1	<10	6
08...	<0.50	<1	<1.0	<5.0	<3.0	<10	<3.0	<1	<10	6
MAY 21...	--	<1	--	--	--	--	--	<1	--	--
JUL 28...	<0.50	<1	<1.0	<5.0	<3.0	<10	<3.0	<1	<10	12
DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ZINC, DIS- SOLVED (UG/L AS ZN)
FEB 04...	<1.0	<0.1	<10	<10	<1	<1.0	2800	<6	<10	<3.0
APR 07...	<1.0	<0.1	<10	<10	<1	<1.0	554	<6	<10	8.8
08...	<1.0	<0.1	<10	<10	<1	<1.0	578	<6	<10	<3.0
MAY 21...	--	<0.1	--	--	<1	--	--	--	<10	--
JUL 28...	<1.0	<0.1	<10	<10	<1	<1.0	646	<6	<10	4.3

# COLORADO RIVER MAIN STEM

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08155505 BARTON CREEK BELOW BARTON SPRINGS AT AUSTIN, TX.

**LOCATION.**--Lat 30°15'54", long 97°45'54", Travis County, Hydrologic Unit 12090205, at bridge on Barton Springs Road and 1.6 miles southwest of the State Capitol Building in Austin.

**DRAINAGE AREA.**--125 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Chemical analyses: June 1965. Chemical and biochemical analyses: January 1975 to September 1983, May 1989 to January 1991, October 1994, May 1995 and April 1997 (discontinued). Pesticide analyses: January 1975 to September 1983. Radiochemical analyses: January 1980.

## MULTIPLE STATION ANALYSES

LOCAL IDENT- I- FIER	DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (NTU)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)
BARTON CREEK BELOW BARTON	01-09-91	1402	1020	207	--	10.0	65	54	86
	01-09-91	1630	1040	251	--	10.0	55	120	37
	01-09-91	1805	1060	286	--	10.0	48	91	31
	01-10-91	1125	567	385	--	12.0	23	50	20
	01-11-91	1215	270	485	--	14.0	12	12	11
	10-08-94	0255	2240	177	7.8	20.0	84	200	68
	10-08-94	0400	1560	220	7.8	20.0	64	120	56
	05-29-95	0910	843	245	7.9	--	66	170	35
	05-29-95	1525	572	338	7.9	--	37	17	12
	LOCAL IDENT- I- FIER	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOC- CI, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE TOTAL (MG/L AS N)
BARTON CREEK BELOW BARTON	4.8	10000	62000	--	676	128	548	0.990	--
	2.8	8000	80000	--	278	45	233	0.580	0.590
	3.0	K6400	K9000	--	178	36	142	0.580	0.580
	1.4	K5200	130000	--	108	42	66	--	--
	0.8	K380	5500	--	13	8	5	--	--
	4.5	14000	22000	52	552	124	428	--	0.550
	3.6	26000	18000	66	364	84	280	--	0.680
	2.1	30000	41000	97	324	38	286	--	0.330
	1.4	K3600	K7600	140	25	6	19	--	0.380
	LOCAL IDENT- I- FIER	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)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)
BARTON CREEK BELOW BARTON	0.010	<0.010	1.00	1.00	0.050	0.060	1.8	0.75	
	0.020	0.010	0.600	0.600	0.040	0.060	1.0	0.36	
	0.020	0.020	0.600	0.600	0.040	0.040	0.90	0.26	
	<0.010	<0.010	0.600	0.700	0.020	0.030	0.80	0.18	
	<0.010	<0.010	0.900	0.900	0.020	0.010	1.3	0.38	
	--	0.020	--	0.570	--	0.030	2.5	1.9	
	--	0.020	--	0.700	--	0.030	2.4	1.7	
	--	0.010	--	0.340	--	0.050	0.64	0.25	
	--	0.010	--	0.390	--	0.030	0.69	0.27	
	LOCAL IDENT- I- FIER	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)	CARBON, ORGANIC TOTAL (MG/L AS C)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)
BARTON CREEK BELOW BARTON	0.80	0.120	0.040	0.030	0.040	0.09	31	29	
	0.40	0.110	0.050	0.050	0.050	0.15	13	9	
	0.30	0.090	0.030	0.030	0.040	0.09	10	11	
	0.20	0.050	<0.010	<0.010	<0.010	--	6.5	22	
	0.40	0.010	<0.010	<0.010	<0.010	--	3.4	7	
	1.9	0.360	0.070	0.070	--	0.21	21	15	
	1.7	0.300	0.070	0.080	--	0.25	18	--	
	0.30	0.050	<0.010	<0.010	--	--	24	14	
	0.30	0.030	<0.010	<0.010	--	--	13	61	

## COLORADO RIVER MAIN STEM

08155505 BARTON CREEK BELOW BARTON SPRINGS AT AUSTIN, TX.--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (NTU)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, 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)
APR										
04...	1220	940	553	8.0	15	110	11	2.7	K6000	31000
04...	1415	2650	387	7.8	40	380	120	4.4	29000	62000

DATE	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	RESIDUE VOLATILE, TILE, SUS- PENDED (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)
APR										
04...	180	208	34	174	0.250	0.010	0.260	0.050	3.0	2.7
04...	140	207	34	173	--	<0.010	0.210	0.040	4.7	4.5

DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)
APR									
04...	2.7	0.480	<0.010	<0.010	3.7	<1	7	16	40
04...	4.5	0.660	<0.010	<0.010	49	<1	10	30	60



08156800 SHOAL CREEK AT 12TH STREET, AUSTIN, TX

**LOCATION.**--Lat 30°16'35", long 97°45'00", Travis County, Hydrologic Unit 12090205, on left bank at downstream side of bridge at 12th Street, and 0.6 mi west of the State Capitol Building in Austin.

**DRAINAGE AREA.**--12.3 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--November 1974 to March 1975, periodic discharge measurement, periodic QW sample collection and associated peak discharges along with annual maximum. April 1975 to September 1984, operated as a flood-hydrograph partial-record site. October 1984 to current year.

**GAGE.**--Water-stage recorder and crest-stage gage. Datum of gage is 455.33 ft above sea level.

**REMARKS.**--Records good. No known regulation or diversions. Several observations of water temperature were made during the year. Station is equipped with an automatic water-quality sampler. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 12	1430	1,220	7.50	May 27	1830	1,820	8.99
Apr. 25	1540	1,230	7.51	June 17	0630	1,270	7.64
May 9	0930	2,670	10.75	July 30	1915	1,740	8.81
May 23	1830	1,390	7.94				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.00	.51	.00	e.00	.00	.59	1.8	2.1	.78	.45	.00
2	.02	.00	.07	.00	e.00	.00	15	1.0	1.7	.56	.00	.00
3	.00	.00	.08	.00	e.00	.00	18	.42	1.4	.41	.00	.00
4	.00	.00	1.1	.00	e.00	.00	108	.14	1.2	.31	.00	.00
5	.02	.00	1.5	.00	.00	.30	39	.03	3.8	.21	.00	.00
6	.00	.00	.17	.00	.00	.00	5.6	.00	49	.16	.00	.00
7	.00	29	.10	9.6	13	.00	4.5	.00	37	.11	.00	.00
8	.00	.61	.06	21	.39	.06	1.7	.00	3.1	.09	.37	.00
9	.00	.01	.04	1.5	.04	.20	1.2	191	192	.09	.60	4.0
10	.00	.00	.04	.09	.00	1.6	.77	7.6	65	.09	.00	.64
11	.00	.00	.04	.01	.00	13	.92	2.5	5.6	.07	.00	.00
12	.00	.00	.03	.00	144	6.5	.47	3.2	2.6	.80	.00	.00
13	.00	.00	.02	.00	20	.14	.23	1.3	1.6	.10	.00	.00
14	.00	.00	.02	.00	2.8	.00	.06	.81	1.2	.07	.00	.00
15	.00	.01	90	.00	.51	.00	.00	14	2.4	.93	.00	.00
16	.00	.00	25	.00	.02	.53	.00	35	.99	3.6	.00	.00
17	.00	.91	1.8	.00	.00	1.9	.00	2.2	65	.14	.00	.00
18	.13	.00	.41	.00	.00	.09	.01	.82	1.6	.07	.00	.00
19	.00	.00	.05	e.00	.00	.00	.01	3.4	.83	.02	.00	.00
20	.00	.00	.02	e.00	21	.00	.01	36	.41	.08	.00	.00
21	.00	.00	.01	e.00	.93	.00	.02	2.7	95	.02	.00	.00
22	.00	.00	.00	e.00	.00	.00	.01	1.3	121	.00	.00	7.0
23	.00	.00	.00	e.00	.00	.00	.00	122	16	.00	.00	3.4
24	.00	35	.00	e.00	7.6	.00	.00	66	7.4	.00	.00	.22
25	.00	1.6	.00	e.00	4.3	28	131	11	3.2	.00	.00	.00
26	.00	.07	.00	e.00	13	2.4	179	2.7	2.5	.00	.00	.00
27	4.9	.04	.00	e.00	.80	.00	21	110	1.9	.00	.00	.00
28	1.8	5.1	.00	e.00	.03	.00	12	14	e1.5	.00	.00	.00
29	.02	33	.00	e.00	---	.00	5.0	3.4	e1.3	.03	.00	.00
30	.00	2.4	.00	e.00	---	.00	3.0	2.7	.97	122	.00	.00
31	.00	---	.00	e.00	---	.00	---	6.0	---	14	.00	---
TOTAL	6.93	107.75	121.07	32.20	228.42	54.72	547.10	643.02	689.30	144.74	70.05	15.26
MEAN	.22	3.59	3.91	1.04	8.16	1.77	18.2	20.7	23.0	4.67	2.26	.51
MAX	4.9	35	90	21	144	28	179	191	192	122	37	7.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.41	.00	.00	.00
AC-FT	14	214	240	64	453	109	1090	1280	1370	287	139	30
CFSM	.02	.29	.32	.08	.66	.14	1.48	1.69	1.87	.38	.18	.04
IN.	.02	.33	.37	.10	.69	.17	1.65	1.94	2.08	.44	.21	.05

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1997, BY WATER YEAR (WY)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	10.6	5.65	11.0	5.23	6.14	5.13	6.19	18.0	12.5	2.34	7.00	5.42	
MAX	42.6	14.9	70.8	22.6	29.2	15.5	18.2	38.7	46.1	11.9	38.9	12.5	
(WY)	1985	1986	1992	1991	1992	1995	1997	1995	1987	1987	1996	1986	
MIN	.22	.000	.065	.000	.069	.012	.48	2.71	2.57	.000	.000	.033	
(WY)	1997	1989	1996	1996	1996	1996	1996	1996	1994	1989	1993	1993	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1985 - 1997

ANNUAL TOTAL	2093.64	2660.56	7.95
ANNUAL MEAN	5.72	7.29	15.7
HIGHEST ANNUAL MEAN			3.26
LOWEST ANNUAL MEAN			948
HIGHEST DAILY MEAN	467	192	.00
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		2670	16000
INSTANTANEOUS PEAK STAGE		10.75	23.11
ANNUAL RUNOFF (AC-FT)	4150	5280	5760
ANNUAL RUNOFF (CFSM)	.47	.59	.65
ANNUAL RUNOFF (INCHES)	6.33	8.05	8.78
10 PERCENT EXCEEDS	4.1	14	13
50 PERCENT EXCEEDS	.00	.01	.03
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

## COLORADO RIVER BASIN

08156800 SHOAL CREEK AT 12TH STREET, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**-- Chemical and biochemical analyses: February 1943, January 1975 to current year. Pesticide analyses: January 1975 to September 1985, January 1993 to May 1996. Radiochemical analyses: April 1980.

**REMARKS.**-- Samples collected during storm events are collected by automatic sampler.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)
APR												
25...	1326	193	408	7.7	--	50	85	--	--	110	8.0	60000
25...	1356	566	299	7.7	--	50	20	--	--	130	5.7	88000
25...	1411	695	235	7.7	--	60	240	--	--	150	3.3	56000
25...	1530	1090	107	7.6	--	110	200	--	--	110	8.3	37000
25...	1600	558	103	7.8	--	100	310	--	--	80	8.3	20000
25...	1655	253	111	7.9	--	100	200	--	--	59	6.8	28000
JUN												
03...	0910	1.5	836	7.6	23.5	8	0.17	6.8	82	<10	0.1	2300
AUG												
01...	0725	1.2	469	7.5	26.5	25	1.0	5.7	72	17	2.4	5000

DATE	STREP-TOCOCCEI FECAL, (COLS. PER 100 ML)	ALKA-LINITY WAT DIS (MG/L)	RESIDUE TOTAL AT 105 (MG/L)	RESIDUE VOLA- (MG/L)	RESIDUE FIXED (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, TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA (MG/L AS N)
APR												
25...	120000	79	340	70	270	1.17	0.051	1.22	0.202	3.8	2.4	2.6
25...	160000	57	588	94	494	0.599	0.032	0.631	0.125	4.6	3.8	3.9
25...	190000	56	733	117	616	0.650	0.035	0.685	0.151	4.6	3.8	3.9
25...	160000	43	334	98	236	0.345	0.025	0.370	<0.015	9.3	8.9	8.9
25...	110000	34	588	84	504	0.122	0.010	0.132	<0.015	1.7	1.6	1.6
25...	100000	34	380	85	295	--	<0.010	<0.050	<0.015	1.7	1.7	1.7
JUN												
03...	1100	180	2	2	0	--	<0.010	1.13	<0.015	--	--	<0.20
AUG												
01...	2000	120	5	12	0	0.437	0.014	0.451	0.029	0.81	0.33	0.35

DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
APR											
25...	0.510	0.054	0.059	0.18	16	--	--	--	17	44	110
25...	1.01	0.059	0.058	0.18	42	--	--	--	19	83	150
25...	1.07	0.089	0.075	0.23	46	--	--	--	20	110	180
25...	3.84	0.074	0.023	0.07	34	--	--	--	18	120	270
25...	0.458	0.047	0.010	0.03	23	--	--	--	9	26	80
25...	0.551	0.049	<0.010	--	20	--	--	--	10	26	90
JUN											
03...	0.107	<0.010	<0.010	--	3.6	0.120	<0.100	--	--	<1	<10
AUG											
01...	0.026	0.016	0.031	0.09	6.7	0.260	<0.100	<1	2	<1	--

# COLORADO RIVER BASIN

105

08157600 EAST BOULDIN CREEK AT SOUTH 1ST STREET, AUSTIN, TX

LOCATION.--Lat 30°15'07", long 97°45'14", Travis County, Hydrologic Unit 12090205.

DRAINAGE AREA.--2.4 mi<sup>2</sup>.

PERIOD OF RECORD.-- Chemical and biochemical analyses: June 1997. Samples collected during storm events are collected by automatic sampler.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (NTU)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
JUN										
17...	0600	12	576	7.8	25.5	25	24	44	7.9	70000
17...	0620	20	460	7.8	25.5	25	34	60	7.6	88000
17...	0645	6.6	296	7.6	25.5	45	63	67	14	84000
17...	0701	4.3	311	7.7	25.5	45	49	50	11	K180000
17...	0750	2.5	419	7.7	25.5	30	19	32	6.2	80000
17...	0930	1.4	475	7.7	25.5	30	6.4	26	6.9	47000

DATE	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDEDED (MG/L)	RESIDUE VOLATILE TILE, SUS- PENDEDED (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUN										
17...	63000	170	58	28	30	2.81	0.031	2.84	0.174	4.1
17...	76000	140	182	112	70	--	<0.010	0.074	0.743	1.6
17...	120000	120	172	48	124	1.51	0.035	1.55	0.233	3.3
17...	96000	95	118	47	71	1.56	0.035	1.59	0.105	3.0
17...	66000	130	40	17	23	1.31	0.052	1.36	1.05	2.3
17...	32000	150	12	3	9	2.07	0.011	2.08	<0.015	2.7

DATE	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)
JUN									
17...	1.1	1.3	0.262	0.151	0.118	0.36	18	18	90
17...	0.83	1.6	0.653	0.560	0.045	0.14	23	28	110
17...	1.5	1.7	0.459	0.221	0.140	0.43	18	20	80
17...	1.3	1.4	0.328	0.152	0.091	0.28	15	15	60
17...	0.0	0.94	0.205	0.135	0.088	0.27	12	6	30
17...	0.59	0.59	0.122	0.081	0.032	0.10	11	2	20

## COLORADO RIVER MAIN STEM

08157900 TOWN LAKE AT AUSTIN, TX

**LOCATION.**--Lat 30°14'56", long 97°43'03", Travis County, Hydrologic Unit 12090205, at Longhorn Dam on the Colorado River at Austin, 1.5 mi downstream from Interstate Highway 35, and 2.3 mi southeast of the State Capitol Building in Austin.

**DRAINAGE AREA.**--39,003 mi<sup>2</sup>, approximately, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--Chemical, biochemical, and pesticide analyses: February 1975 to August 1990. Chemical and biochemical analyses: October 1990 to current year. Trace metal and Pesticide analyses of bed sediments at selected sites February 1991 to current year.

301559097424801 - TOWN LAKE AR  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	COLI- FORM, CHEM- ICAL 0.7 UM-MF (COLS./ 100 ML)
JUL											
31...	0818	1.00	476	7.6	29.5	5.7	75				
31...	0820	10.0	479	7.4	28.5	4.8	62				
31...	0822	20.0	479	7.3	28.0	3.4	44				
31...	0824	26.0	487	7.1	26.0	0.4	5				
AUG											
20...	0900	--	--	--	--	--	--	--	--	--	--
JUL											
31...	0832	1.00	478	7.5	29.5	1.74	1.2	5.4	71	20	2800
31...	0834	10.0	478	7.4	28.5	--	--	4.7	61	--	--
31...	0836	24.0	478	7.5	29.5	--	2.7	5.4	71	--	--
AUG											
20...	0900	--	--	--	--	--	--	--	--	--	--
JUL											
31...	500	140	292	5	0.250	0.010	0.260	--	--	0.054	0.72
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	150	295	12	0.146	0.014	0.160	--	--	0.163	0.72
AUG											
20...	--	--	--	--	--	--	--	43	80	--	--
JUL											
31...	0.40	0.46	<0.010	<0.010	0.011	0.03	4.3	2.60	0.190	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	0.40	0.56	<0.010	<0.010	0.012	0.04	4.5	--	--	--	--
AUG											
20...	--	--	--	--	--	--	--	--	--	5	2
JUL											
31...	--	3.5	--	--	<1.0	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	1.4	--	--	<1.0	--	--	--	--	--	--
AUG											
20...	15	--	24	15000	--	60	750	0.05	90	18000	--
JUL											
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
AUG											
20...	29.0	<0.300	33.0	18.0	32.0	2.50	1.90	<0.200	<0.300	<0.200	--



# COLORADO RIVER MAIN STEM

107

08157900 TOWN LAKE AT AUSTIN, TX.--Continued

301559097424801 - TOWN LAKE AR--Continued  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	HEPTA- CHLOR EPOXIDE TOT. IN BOT- TOM MA- TIAL (UG/KG)	LINDANE TOTAL IN BOT- TOM MA- TIAL (UG/KG)	METH- OXY- CHLOR, TOT. IN BOT- TOM MA- TIAL (UG/KG)	MIREX, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	TOXA- PHENE, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM	BED MAT. SIEVE DIAM. % FINER THAN .125 MM	BED MAT. SIEVE DIAM. % FINER THAN .250 MM	BED MAT. SIEVE DIAM. % FINER THAN .500 MM	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM
JUL 31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
AUG 20...	0.330	<0.200	<2.50	<0.200	<50.0	91	98	100	100	100

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JUL 31...	0854	1.00	479	7.4	30.0	69
31...	0856	10.0	479	7.3	28.5	67
31...	0858	17.0	473	7.3	28.5	65

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JUL 31...	0906	1.00	468	7.4	29.0	73
31...	0908	10.0	462	7.4	28.5	70
31...	0910	20.0	408	7.3	28.0	58
31...	0912	26.0	404	7.3	28.5	59

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	CARBON, INOR- GANIC, TOT IN BOT MAT (G/KG AS C)	CARBON, INOR- GANIC, TOT IN BOT MAT (GM/KG AS C)	ARSENIC TOTAL IN BOT- TOM MA- TIAL (UG/G AS AS)
JUL 31...	0918	1.00	476	7.4	29.0	5.7	74	--	--
31...	0920	10.0	434	7.3	28.5	4.9	63	--	--
31...	0922	20.0	416	7.3	28.0	4.7	60	--	--
31...	0924	28.0	410	7.3	28.0	4.6	59	--	--
AUG 20...	0915	--	--	--	--	--	41	72	5

DATE	CADMIUM RECOV. FM BOT- TOM MA- TIAL (UG/G AS CD)	CHRO- MIUM, RECOV. FM BOT- TOM MA- TIAL (UG/G)	COPPER, RECOV. FM BOT- TOM MA- TIAL (UG/G AS CU)	IRON, RECOV. FM BOT- TOM MA- TIAL (UG/G AS FE)	LEAD, RECOV. FM BOT- TOM MA- TIAL (UG/G AS PB)	MANGA- NESE, RECOV. FM BOT- TOM MA- TIAL (UG/G)	MERCURY RECOV. FM BOT- TOM MA- TIAL (UG/G AS HG)	ZINC, RECOV. FM BOT- TOM MA- TIAL (UG/G AS ZN)	ALUM- INUM, RECOV. FM BOT- TOM MA- TIAL (UG/G)	PCB, TOTAL IN BOT- TOM MA- TIAL (UG/KG)
JUL 31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
AUG 20...	2	21	28	13000	100	370	0.06	150	17000	58.0

DATE	ALDRIN, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	CHLOR- DANE, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	P,P'- DDD, RECOVER IN BOT- TOM MA- TIAL (UG/KG)	P,P'- DDE, RECOVER IN BOT- TOM MA- TIAL (UG/KG)	P,P'- DDT, RECOVER IN BOT- TOM MA- TIAL (UG/KG)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	ENDO- SULFAN I TOTAL IN BOT- TOM MA- TIAL (UG/KG)	ENDRIN, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TIAL (UG/KG)	HEPTA- CHLOR EPOXIDE TOT. IN BOT- TOM MA- TIAL (UG/KG)
JUL 31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--
AUG 20...	<0.500	67.0	44.0	66.0	7.30	4.70	<0.200	<0.200	<0.200	0.620

## COLORADO RIVER MAIN STEM

08157900 TOWN LAKE AT AUSTIN, TX.--Continued

301559097424801 - TOWN LAKE AR--Continued  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METH- OXY- CHLOR, TOT. IN BOTTOM MATL. (UG/KG)	MIREX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOXA- PHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM	BED MAT. SIEVE DIAM. % FINER THAN .125 MM	BED MAT. SIEVE DIAM. % FINER THAN .250 MM	BED MAT. SIEVE DIAM. % FINER THAN .500 MM	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM
JUL 31...	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--
AUG 20...	<0.200	<4.50	<0.200	<50.0	45	70	95	98	99

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL /(HIGH LEVEL)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
JUL 31...	0938	1.00	447	7.4	28.0	5.1	65		
31...	0940	10.0	424	7.3	27.5	4.3	55		
31...	0942	18.0	362	7.3	27.5	3.8	48		

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL /(HIGH LEVEL)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
JUL 31...	0948	1.00	443	7.4	28.0	0.61	6.0	5.3	68	17	24000
31...	0950	10.0	422	7.3	27.5	--	--	4.8	61	--	--
31...	0952	16.0	375	7.3	27.5	--	8.5	5.0	64	--	--
AUG 20...	0940	--	--	--	--	--	--	--	--	--	--

DATE	TIME	STREP- TOCOCI FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LITY WAT DIS FIX END CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	CARBON, INOR- GANIC, TOT IN BOT MAT (G/KG AS C)	CARBON, INOR- GANIC TOT. IN BOT MAT (GM/KG AS C)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUL 31...	3800	120	280	13	0.279	0.013	0.292	--	--	--	0.034	0.78
31...	--	--	--	--	--	--	--	--	--	--	--	--
31...	--	110	234	21	0.397	0.024	0.421	--	--	--	0.077	0.97
AUG 20...	--	--	--	--	--	--	--	57	76	--	--	--

DATE	TIME	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHOS- PHOS- PHATE, DIS- SOLVED (MG/L AS PO4)	PHOS- PHORUS ORTHOS- PHOS- PHATE, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	ARSENIC TOTAL IN BOT- TOM MA- TERIAL (UG/G AS AS)	CADMIUM FM BOT- TOM MA- TERIAL (UG/G AS CD)
JUL 31...	0.46	0.49	0.014	<0.010	0.012	0.04	4.8	3.10	<0.100	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--	--
31...	0.47	0.55	0.040	0.011	0.031	0.09	6.1	--	--	--	--	--
AUG 20...	--	--	--	--	--	--	--	--	--	--	5	2

DATE	TIME	CHRO- MIUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	COPPER, DIS- SOLVED (UG/L AS CU)	COPPER, FM BOT- TOM MA- TERIAL (UG/G AS CU)	IRON, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LEAD, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS PB)	MANGA- NESE, RECOV. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY RECOV. FM BOT- TOM MA- TERIAL (UG/G AS HG)	ZINC, RECOV. FM BOT- TOM MA- TERIAL (UG/G AS ZN)	ALUM- INUM, RECOV. FM BOT- TOM MA- TERIAL (UG/G)
JUL 31...	--	2.1	--	--	<1.0	--	--	--	--	--	--
31...	--	--	--	--	--	--	--	--	--	--	--
31...	--	2.5	--	--	<1.0	--	--	--	--	--	--
AUG 20...	10	--	24	8300	--	100	400	0.07	70	6200	

## 109

301559097424801 - TOWN LAKE AR--Continued  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

	PCB, 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)	P,P'- DDD, RECOVER IN BOT- TOM MA- TERIAL (UG/KG)	P,P'- DDE, RECOVER IN BOT- TOM MA- TERIAL (UG/KG)	P,P'- DDT, RECOVER IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	SULFAN, I TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDRI- NOL, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTA- CHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
JUL 31...	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	--	--	--	--	--	--	--	--
AUG 20...	110	<0.200	9.20	21.0	30.0	0.650	0.310	<0.300	<0.200	<0.200

	HEPTA- CHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METH- OXY- CHLOR, TOT. IN BOTTOM MATL. (UG/KG)	MIREX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOXA- PHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM	BED MAT. SIEVE DIAM. % FINER THAN .125 MM	BED MAT. SIEVE DIAM. % FINER THAN .250 MM	BED MAT. SIEVE DIAM. % FINER THAN .500 MM	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM
JUL 31...	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	--	--	--	--	--	--	--	--
JUL 31...	--	--	--	--	--	--	--	--	--	--
AUG 20...	<0.200	<0.200	<2.50	<0.200	<50.0	80	93	98	100	100

	DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
JUL 31...		1008	1.00	464	7.4	28.0	5.3
JUL 31...		1010	13.0	545	7.1	26.0	4.9
JUL 31...							

	DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
JUL 31...		1018	1.00	465	7.4	28.0	1.31	1.7	5.6	72	15	1300
JUL 31...		1020	10.0	541	7.0	25.5	--	--	5.2	64	--	--
JUL 31...		1022	18.0	551	6.9	25.5	--	1.2	5.3	65	--	--
AUG 20...		0955	--	--	--	--	--	--	--	--	--	--

	DATE	TIME	STREP- TOCOC- CI, FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	CARBON, INOR- GANIC, TOT IN BOT MAT (G/KG AS C)	CARBON, INOR- GANIC TOT. IN BOT MAT (GM/KG AS C)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
JUL 31...		1000	140	284	7	--	<0.010	0.230	--	--	--	0.039	0.66
JUL 31...		--	--	--	--	--	--	--	--	--	--	--	--
JUL 31...		--	200	346	7	0.743	0.011	0.754	--	--	--	0.039	1.0
AUG 20...		--	--	--	--	--	--	--	--	33	64	--	--

	DATE	TIME	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- PHATE, ORTH- O, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	ARSENIC TOTAL IN BOT- TOM MA- TERIAL (UG/G AS AS)	CADMIUM RECOV. FM BOT- TOM MA- TERIAL (UG/G AS CD)
JUL 31...		0.39	0.43	<0.010	<0.010	0.010	0.03	4.5	3.40	0.280	--	--
JUL 31...		--	--	--	--	--	--	--	--	--	--	--
JUL 31...		0.22	0.26	<0.010	<0.010	0.010	0.03	2.9	--	--	--	--
AUG 20...		--	--	--	--	--	--	--	--	--	--	--

## COLORADO RIVER MAIN STEM

08157900 TOWN LAKE AT AUSTIN, TX.--Continued

301559097424801 - TOWN LAKE AR--Continued  
WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		CHROMIUM, RECOVER. FM BOT- TOM MA- TERIAL (UG/G)	COPPER, DIS- SOLVED (UG/L AS CU)	COPPER, RECOVER. FM BOT- TOM MA- TERIAL (UG/G AS CU)	IRON, RECOVER. FM BOT- TOM MA- TERIAL (UG/G AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LEAD, RECOVER. FM BOT- TOM MA- TERIAL (UG/G AS PB)	MANGANESE, RECOVER. FM BOT- TOM MA- TERIAL (UG/G)	MERCURY, RECOVER. FM BOT- TOM MA- TERIAL (UG/G AS HG)	ZINC, RECOVER. FM BOT- TOM MA- TERIAL (UG/G AS ZN)	ALUMINUM, RECOVER. FM BOT- TOM MA- TERIAL (UG/G)
DATE											
JUL 31...		--	2.0	--	--	<1.0	--	--	--	--	--
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		--	2.1	--	--	<1.0	--	--	--	--	--
AUG 20...		15	--	17	13000	--	100	290	0.04	70	13000
DATE		PCB, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ALDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLORDANE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	P,P'- DDD, RECOVER IN BOT- TOM MA- TERIAL (UG/KG)	P,P'- DDE, RECOVER IN BOT- TOM MA- TERIAL (UG/KG)	P,P'- DDT, RECOVER IN BOT- TOM MA- TERIAL (UG/KG)	DI- ELDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDO- SULFAN I TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	ENDRIN, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	HEPTACHLOR, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		--	--	--	--	--	--	--	--	--	--
AUG 20...		20.0	<0.200	18.0	7.60	21.0	1.70	1.00	<0.200	<0.200	<0.200
DATE		HEPTACHLOR- EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METHOXY- CHLOR, TOT. IN BOTTOM MATL. (UG/KG)	MIREX, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	TOXAPHENE, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM	BED MAT. SIEVE DIAM. % FINER THAN .125 MM	BED MAT. SIEVE DIAM. % FINER THAN .250 MM	BED MAT. SIEVE DIAM. % FINER THAN .500 MM	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		--	--	--	--	--	--	--	--	--	--
AUG 20...		<0.200	<0.200	<2.50	<0.200	<50.0	38	44	56	61	63
DATE		TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD ARD UNITS)	TEMPERATURE WATER (DEG C)	TRANSPARENCY (SECCHI DISK) (M)	TURBIDITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
JUL 31...		1052	1.00	463	7.5	28.5	1.77	1.3	5.8	75	17
JUL 31...		1054	10.0	596	6.8	24.0	--	--	5.6	67	--
JUL 31...		1056	16.0	623	6.8	23.0	--	0.40	5.8	68	--
DATE		STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	ALKALINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITROGEN, NITRATE DIS- SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS- SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)
JUL 31...		740	130	283	5	0.151	0.010	0.161	0.031	0.55	0.35
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		--	250	357	6	--	<0.010	1.08	0.025	--	--
DATE		NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOSPHORUS PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOSPHORUS PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOSPHATE, ORTHOPHOS- PHATE, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOROPHYTO- PLANKTON CHROMO- FLUOROM (UG/L)	CHLOROPHYTO- PLANKTON CHROMO- FLUOROM (UG/L)	COPPER, DIS- SOLVED (UG/L AS CU)	LEAD, DIS- SOLVED (UG/L AS PB)
JUL 31...		0.39	<0.010	<0.010	0.010	0.03	5.2	3.00	0.250	1.9	<1.0
JUL 31...		--	--	--	--	--	--	--	--	--	--
JUL 31...		<0.20	<0.010	<0.010	0.016	0.05	1.0	--	--	2.2	<1.0
DATE		TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD ARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PERCENT SATURATION)			
JUL 31...		1036	2.00	636	6.8	22.5	7.2	83			



# COLORADO RIVER MAIN STEM

111

08158000 COLORADO RIVER AT AUSTIN, TX

**LOCATION.**--Lat 30°14'40", long 97°41'39", Travis County, Hydrologic Unit 12090205, on right bank 1,000 ft upstream from upstream bridge on U.S. Highway 183 in Austin, 1.4 mi downstream from Longhorn Dam, and at mile 290.3.

**DRAINAGE AREA.**--39,009 mi<sup>2</sup>, approximately, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--February 1898 to current year. Records of daily discharge for Dec. 13-26, 1914, and Feb. 9-17, 1915, published in WSP 408, have been found unreliable and should not be used.

Water-quality records.--Chemical analyses: October 1947 to September 1993. Specific conductance: October 1947 to September 1991. Water temperature: October 1947 to September 1991.

**REVISED RECORDS.**--WSP 508: 1915(m). WSP 528: 1900(M), 1918(m). WSP 548: 1901-16. WSP 1342: Drainage area. WSP 1562: 1908, 1929(M), 1936.

**GAGE.**--Water-stage recorder. Datum of gage is 402.27 ft above sea level. Prior to June 19, 1939, all records collected at or near Congress Avenue bridge 3.9 mi upstream at datum 19.6 ft higher; prior to June 18, 1915, nonrecording gages, recording gages thereafter; June 20, 1939, to Oct. 16, 1963, at site 1,000 ft downstream from present site at datum 5.0 ft higher.

**REMARKS.**--Records good. Since installation of gage in 1898, at least 10% of contributing drainage area has been regulated by Town Lake, Lake Austin, Lake Travis, and other reservoirs. The city of Austin diverts water for municipal use upstream from station and returns wastewater effluent downstream. There are many other diversions above Lake Buchanan for irrigation, municipal supplies, and oil field operations. Radio telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD OF RECORD.**--100 years (water years 1898-1997), 2,270 ft<sup>3</sup>/s (1,645,000 acre-ft/yr).

**EXTREMES FOR PERIOD OF RECORD (WATER YEARS, 1898-1997).**--Maximum discharge, 481,000 ft<sup>3</sup>/s June 15, 1935 (gage height, 50 ft, present site and datum, from floodmark).

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1833, 51 ft July 7, 1869, present site and datum (adjusted to present site on basis of record for flood of June 15, 1935), determined from information concerning stage at former site furnished by Dean T.U. Taylor.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	599	438	271	e135	150	7560	3250	11700	6450	27700	1320	833
2	581	312	285	125	147	4840	3200	10100	5430	27600	1250	833
3	360	177	285	113	215	4970	3400	6500	4170	27400	1200	868
4	326	319	214	150	192	5120	7430	6560	4200	27200	1180	846
5	297	335	182	122	206	6310	8270	5870	2610	27100	1270	1130
6	423	263	145	191	203	6270	7170	3280	2710	27000	1200	1160
7	447	433	122	161	320	6860	6840	3500	5770	26900	1200	1070
8	436	311	141	257	239	11200	6860	3440	7240	26700	1600	1130
9	346	146	143	166	271	11000	6630	4960	11800	23700	1190	1190
10	205	336	96	162	262	10900	6880	3750	8890	18000	1210	992
11	124	232	165	165	220	11100	6750	3700	11400	12600	1130	978
12	146	143	115	236	787	13700	6720	3770	12700	7360	801	990
13	212	186	158	159	274	16600	6650	3720	12400	6480	823	963
14	210	165	121	141	40	16600	6600	3500	12200	5020	804	920
15	200	244	934	171	21	16500	6630	3760	12200	3620	594	1030
16	182	233	249	157	12	16600	6620	4050	9520	3690	473	947
17	164	214	38	153	222	15700	6620	3850	7550	3290	476	966
18	168	249	274	127	128	13100	5920	3800	6970	1940	433	896
19	168	255	244	127	147	9700	2190	5490	6920	2190	732	882
20	172	428	e250	125	240	8090	1950	7370	6750	1370	722	899
21	186	317	e250	132	1740	5290	4380	6840	7900	3710	712	884
22	147	234	95	117	3840	5030	4360	6780	15600	3660	711	952
23	245	204	150	150	5480	5000	5180	6740	26700	2100	848	942
24	193	429	149	140	6920	5000	6420	4760	27800	1950	850	384
25	347	258	132	132	12200	5220	7710	3560	28500	1670	850	1260
26	177	175	141	125	17200	5010	8510	4130	27900	1650	972	815
27	216	174	157	143	17200	5120	7220	6300	27600	1690	875	917
28	387	75	136	141	13500	5050	6840	7620	27400	1680	838	847
29	306	495	149	126	---	4530	9340	7130	27500	1750	808	880
30	468	226	142	124	---	1720	11700	6890	27400	1480	1000	743
31	346	---	145	134	---	2210	---	6920	---	1310	1050	---
TOTAL	8784	8006	6078	4607	82376	261900	188240	170340	402180	329510	29122	28147
MEAN	283	267	196	149	2942	8448	6275	5495	13410	10630	939	938
MAX	599	495	934	257	17200	16600	11700	11700	28500	27700	1600	1260
MIN	124	75	38	113	12	1720	1950	3280	2610	1310	433	384
AC-FT	17420	15880	12060	9140	163400	519500	373400	337900	797700	653600	57760	55830

## COLORADO RIVER MAIN STEM

08158000 COLORADO RIVER AT AUSTIN, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1898 - 1997#, BY WATER YEAR (WY)

MEAN	2018	1502	1462	1240	1481	1506	2701	4218	3874	2769	1801	2600
MAX	20080	11050	23800	15080	25890	13640	21800	30710	31940	36110	12310	42630
(WY)	1931	1919	1914	1992	1992	1992	1900	1922	1935	1938	1906	1936
MIN	57.5	38.7	43.9	46.2	49.7	55.0	145	964	238	256	70.3	156
(WY)	1935	1990	1964	1967	1964	1964	1907	1921	1910	1933	1917	1907

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1898 - 1997#	
ANNUAL TOTAL	369020		1519290			
ANNUAL MEAN	1008		4162		2270	
HIGHEST ANNUAL MEAN					7535	
LOWEST ANNUAL MEAN					590	
HIGHEST DAILY MEAN	3900	Jun 7	28500	Jun 25	323000	Jun 15 1935
LOWEST DAILY MEAN	38	Dec 17	12	Feb 16	.00	Sep 29 1914
ANNUAL SEVEN-DAY MINIMUM	132	Dec 6	116	Feb 14	18	Oct 25 1990
INSTANTANEOUS PEAK FLOW			31000	Jun 23	481000	Jun 15 1935
INSTANTANEOUS PEAK STAGE			21.99	Jun 23	a50.00	Jun 15 1935
ANNUAL RUNOFF (AC-FT)	732000		3014000		1645000	
10 PERCENT EXCEEDS	2440		11700		3960	
50 PERCENT EXCEEDS	769		990		1130	
90 PERCENT EXCEEDS	182		143		175	

e Estimated

# Period of regulated streamflow

a From floodmark

# COLORADO RIVER BASIN

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08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX

**LOCATION.**--Lat 30°15'47", long 97°40'20", Travis County, Hydrologic Unit 12090205, on U.S. Highway 183, 1.6 mi south of the intersection of Webberville Road and U.S. Highway 183, and 4.1 mi east of the State Capitol Building in Austin.

**DRAINAGE AREA.**--13.1 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--January to July 1975 (periodic discharge measurements only), August 1975 to June 1977 (operated as a flood-hydrograph partial-record station only), June 1977 to September 1986, (daily mean discharge), October 1986 to May 1994 (annual maximum discharge). May 1994 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 411.29 ft sea level (levels from city of Austin benchmark).

**REMARKS.**--Records fair. No known regulation or diversions. Several observations of water temperature were made during the year. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum discharge 4,370 ft<sup>3</sup>/s May 17, 1989, gage height, 14.79 ft, from floodmark.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 750 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 15	0800	805	6.20	June 9	0345	3,890	12.62
Apr. 25	1500	2,390	9.37	June 10	1215	914	6.42
Apr. 26	0700	874	6.34	June 17	0645	1,020	6.64
May 9	0930	2,830	10.32	June 21	2045	1,190	6.98
May 23	1815	2,950	10.57	July 30	2015	1,180	6.97
May 27	1845	3,280	11.28	Aug. 7	2000	1,810	8.20
June 9	0145	3,630	12.07	Aug. 8	0130	1,190	6.98

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.07	.00	1.8	.19	.33	1.3	12	1.6	2.5	e.00	1.4	.00
2	.00	.00	1.1	.12	.31	.96	27	1.3	2.2	e.00	1.1	.00
3	.00	.00	.91	.42	.30	.89	35	1.1	2.0	e.00	.84	3.0
4	.00	.00	7.3	.34	.09	.89	75	1.2	2.0	e.00	.76	1.5
5	.00	.00	4.4	.32	.30	.93	45	1.0	11	e.00	.73	.19
6	.00	.00	1.4	.40	.21	.84	3.4	1.4	35	e.00	.47	.05
7	.00	5.3	.98	23	41	.79	1.9	1.5	61	e.00	78	.00
8	.00	6.3	.75	32	.94	1.9	1.3	1.5	21	e.00	116	.00
9	.00	5.8	.75	3.1	1.6	1.8	1.1	201	536	e.03	2.1	9.0
10	.00	2.2	.76	.90	.66	3.4	.97	9.0	124	.36	.86	1.6
11	.00	.06	.62	.76	.56	19	1.7	3.5	13	.38	.62	.14
12	.00	.00	.63	.63	176	12	.98	19	7.0	.27	.54	.02
13	.00	.00	.63	.60	17	1.8	.72	4.7	4.5	.31	.36	.01
14	.00	.00	.51	.63	5.5	.86	.73	2.3	3.6	.32	.20	.00
15	.00	6.0	386	.87	1.4	.72	.75	32	9.3	4.6	.11	.00
16	.00	e1.3	36	.59	.94	3.5	.73	37	3.2	4.3	.17	.00
17	.00	e.72	4.7	.44	.77	4.6	.74	4.7	52	.55	.45	.00
18	.00	e.74	1.9	.49	.80	1.4	.80	2.9	3.3	.45	.82	.00
19	.00	e.72	1.5	.60	.93	.84	.92	5.2	2.6	.36	.16	.00
20	.00	e.40	1.2	.91	31	.72	.78	64	2.3	.24	.11	.00
21	.00	e.58	.93	2.1	1.6	.69	.90	5.3	187	.33	.08	.00
22	.00	e.07	.94	1.4	.75	.57	.87	4.5	156	.15	.08	20
23	.00	e.05	.80	.57	.68	.51	.73	169	e.00	.06	1.4	5.9
24	.00	e91	.49	.51	20	.53	.77	40	e.00	.08	.57	.98
25	.00	13	.45	.38	10	27	200	9.3	e.00	.08	.23	.40
26	.00	3.5	.63	.44	24	1.9	118	4.1	e.00	.06	.05	.22
27	64	.80	.58	.39	2.9	.83	13	174	e.00	.07	.03	.25
28	13	15	.57	.32	1.7	.76	4.8	17	e.00	.09	.00	.13
29	.66	52	.57	.32	---	.63	2.4	4.4	e.00	.10	.00	.00
30	.10	7.8	.39	.35	---	.54	1.9	3.3	e.00	118	.00	.00
31	.00	---	.64	.34	---	.53	---	9.6	---	9.5	.00	---
TOTAL	77.83	213.34	460.83	74.43	342.27	93.63	554.89	836.4	1240.50	140.69	208.24	43.39
MEAN	2.51	7.11	14.9	2.40	12.2	3.02	18.5	27.0	41.3	4.54	6.72	1.45
MAX	64	91	386	32	176	27	200	201	536	118	116	20
MIN	.00	.00	.39	.12	.09	.51	.72	1.0	.00	.00	.00	.00
AC-FT	154	423	914	148	679	186	1100	1660	2460	279	413	86
CFSM	.19	.54	1.13	.18	.93	.23	1.41	2.06	3.16	.35	.51	.11
IN.	.22	.61	1.31	.21	.97	.27	1.58	2.38	3.52	.40	.59	.12

## COLORADO RIVER BASIN

08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1997h, BY WATER YEAR (WY)

MEAN	7.88	5.71	4.30	2.02	126	5.60	4.95	17.4	12.8	5.44	6.98	6.17
MAX	31.5	16.8	14.9	4.54	1580	18.5	18.5	48.7	55.2	54.5	51.0	17.0
(WY)	1985	1986	1997	1979	1977	1983	1997	1979	1981	1979	1996	1996
MIN	.44	.10	.027	.055	.28	.31	.063	.39	.025	.025	.002	.16
(WY)	1979	1980	1978	1996	1996	1986	1984	1984	1994	1986	1984	1984
SUMMARY STATISTICS												
	FOR 1996 CALENDAR YEAR					FOR 1997 WATER YEAR			WATER YEARS 1977 - 1997h			
ANNUAL TOTAL	3315.78					4286.44			7.13			
ANNUAL MEAN	9.06					11.7			15.1			
HIGHEST ANNUAL MEAN									1.29			
LOWEST ANNUAL MEAN									1979			
HIGHEST DAILY MEAN	750					536			1660			
LOWEST DAILY MEAN	.00					.00			.00			
ANNUAL SEVEN-DAY MINIMUM	.00					.00			.00			
INSTANTANEOUS PEAK FLOW						3890			6100			
INSTANTANEOUS PEAK STAGE						12.62			17.03			
ANNUAL RUNOFF (AC-FT)	6580					8500			5160			
ANNUAL RUNOFF (CFSM)	.69					.90			.54			
ANNUAL RUNOFF (INCHES)	9.42					12.17			7.39			
10 PERCENT EXCEEDS	8.2					20			8.9			
50 PERCENT EXCEEDS	.02					.75			.25			
90 PERCENT EXCEEDS	.00					.00			.00			

e Estimated

h See PERIOD OF RECORD paragraph.



# COLORADO RIVER BASIN

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08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: January 1975 to September 1986, April 1994 to current year. Pesticide analyses: January 1975 to December 1984. Radiochemical analyses: January 1980.

### WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)
DEC											
15...	0725	266	208	7.5	--	110	400	--	--	67	12
15...	0755	805	234	7.6	--	72	400	--	--	90	13
15...	0825	686	182	7.5	--	84	430	--	--	62	9.8
15...	0855	719	134	7.5	--	74	140	--	--	46	9.8
15...	1445	59	153	7.6	--	52	56	--	--	20	5.6
FEB											
05...	1208	0.51	680	7.9	13.0	12	1.8	11.0	105	13	1.3
APR											
25...	1408	1080	110	--	17.5	40	100	--	--	44	5.7
25...	1438	2230	137	--	17.5	100	610	--	--	160	8.0
25...	1508	2310	94	--	17.5	130	650	--	--	120	8.4
25...	1538	1340	99	--	17.5	160	650	--	--	140	8.0
25...	1622	546	87	--	17.5	100	440	--	--	81	8.4
25...	1808	124	123	--	17.5	100	210	--	--	39	5.4
AUG											
01...	0816	1.6	419	7.7	27.0	20	2.0	6.0	76	21	2.9
DATE	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB 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)
DEC											
15...	56000	K250000	--	--	--	--	--	--	--	66	--
15...	48000	160000	90	24	32	2.5	9.9	0.5	4.0	66	16
15...	48000	K230000	--	--	--	--	--	--	--	60	--
15...	42000	150000	--	--	--	--	--	--	--	48	--
15...	18000	78000	--	--	--	--	--	--	--	53	--
FEB											
05...	28	21	--	--	--	--	--	--	--	190	--
APR											
25...	26000	76000	--	--	--	--	--	--	--	41	--
25...	55000	260000	--	--	--	--	--	--	--	49	--
25...	26000	180000	--	--	--	--	--	--	--	36	--
25...	37000	190000	--	--	--	--	--	--	--	39	--
25...	31000	150000	--	--	--	--	--	--	--	43	--
25...	34000	100000	--	--	--	--	--	--	--	85	--
AUG											
01...	2100	220	--	--	--	--	--	--	--	130	--
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, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)
DEC											
15...	--	--	--	--	848	60	788	0.370	0.020	0.390	0.060
15...	15	0.20	4.0	126	1080	80	1000	0.400	0.020	0.420	0.030
15...	--	--	--	--	750	60	690	0.380	0.020	0.400	0.080
15...	--	--	--	--	280	20	260	0.280	0.020	0.300	0.070
15...	--	--	--	--	55	5	50	0.250	0.040	0.290	0.040
FEB											
05...	--	--	--	--	<1	<1	--	--	0.010	<0.050	<0.015
APR											
25...	--	--	--	--	264	38	226	0.166	0.016	0.182	<0.015
25...	--	--	--	--	1740	215	1520	--	<0.010	0.341	<0.015
25...	--	--	--	--	1720	195	1520	0.176	0.011	0.187	<0.015
25...	--	--	--	--	2010	225	1780	0.224	0.014	0.238	<0.015
25...	--	--	--	--	1150	124	1020	0.055	0.014	0.069	<0.015
25...	--	--	--	--	186	30	156	--	<0.010	<0.050	<0.015
AUG											
01...	--	--	--	--	7	9	0	0.136	0.011	0.147	0.048

## 08158050 BOGGY CREEK AT U.S. HIGHWAY 183, AUSTIN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		NITRO- GEN, ORGANIC	NITRO- GEN,AM- MONIA + ORGANIC	PHOS- PHORUS TOTAL	PHOS- PHORUS DIS- SOLVED	PHOS- PHORUS ORTHO, DIS- SOLVED	PHOS- PHATE, ORTHO, DIS- SOLVED	CARBON, ORGANIC TOTAL	ARSENIC DIS- SOLVED	BARIUM, DIS- SOLVED
DATE	(MG/L AS N)	(MG/L AS N)	(MG/L AS N)	(MG/L AS P)	(MG/L AS P)	(MG/L AS P)	(MG/L AS PO4)	(MG/L AS C)	(UG/L AS AS)	(UG/L AS BA)
DEC										
15...	2.8	2.3	2.4	0.760	<0.010	0.100	0.31	30	--	--
15...	3.2	2.8	2.8	1.00	0.120	0.070	0.21	39	2	38
15...	2.0	1.5	1.6	0.620	0.090	0.100	0.31	25	--	--
15...	1.7	1.3	1.4	0.490	0.120	0.130	0.40	15	--	--
15...	0.59	0.26	0.30	0.110	0.210	0.080	0.25	7.1	--	--
FEB										
05...	--	--	<0.20	<0.010	<0.010	<0.010	--	4.1	--	--
APR										
25...	1.8	1.6	1.6	0.349	0.041	<0.010	--	13	--	--
25...	5.9	5.5	5.5	1.71	0.029	0.011	0.03	--	--	--
25...	4.1	3.9	3.9	1.40	0.050	0.017	0.05	--	--	--
25...	5.8	5.6	5.6	1.87	0.069	0.016	0.05	52	--	--
25...	2.8	2.7	2.7	0.980	0.056	0.019	0.06	29	--	--
25...	1.2	1.2	1.2	0.481	0.062	0.021	0.06	14	--	--
AUG										
01...	0.64	0.44	0.49	0.014	<0.010	0.020	0.06	6.4	--	--
	BERYL- LIUM, DIS- SOLVED	CADMIUM DIS- SOLVED	CHRO- MIUM, DIS- SOLVED	COBALT, DIS- SOLVED	COPPER, TOTAL RECOV- ERABLE	COPPER, DIS- SOLVED	IRON, DIS- SOLVED	LEAD, TOTAL RECOV- ERABLE	LEAD, DIS- SOLVED	LITHIUM DIS- SOLVED
DATE	(UG/L AS BE)	(UG/L AS CD)	(UG/L AS CR)	(UG/L AS CO)	(UG/L AS CU)	(UG/L AS CU)	(UG/L AS FE)	(UG/L AS PB)	(UG/L AS PB)	(UG/L AS LI)
DEC										
15...	--	--	--	--	--	--	--	--	--	--
15...	<0.50	<1.0	<5.0	<3.0	--	<10	86	--	10	<4
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	--	--	--	--	<1	--	--	<1	--	--
APR										
25...	--	--	--	--	10	--	--	20	--	--
25...	--	--	--	--	23	--	--	150	--	--
25...	--	--	--	--	18	--	--	110	--	--
25...	--	--	--	--	24	--	--	140	--	--
25...	--	--	--	--	13	--	--	70	--	--
25...	--	--	--	--	8	--	--	23	--	--
AUG										
01...	--	--	--	--	2	--	--	<1	--	--
	MANGA- NESE, DIS- SOLVED	MERCURY DIS- SOLVED	MOLYB- DENUM, DIS- SOLVED	NICKEL, DIS- SOLVED	SELE- NIUM, DIS- SOLVED	SILVER, DIS- SOLVED	STRON- TIUM, DIS- SOLVED	VANA- DIUM, DIS- SOLVED	ZINC, TOTAL RECOV- ERABLE	ZINC, DIS- SOLVED
DATE	(UG/L AS MN)	(UG/L AS HG)	(UG/L AS MO)	(UG/L AS NI)	(UG/L AS SE)	(UG/L AS AG)	(UG/L AS SR)	(UG/L AS V)	(UG/L AS ZN)	(UG/L AS ZN)
DEC										
15...	--	--	--	--	--	--	--	--	--	--
15...	2.0	<0.1	<10	<10	<1	1.0	160	<6	--	25
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
FEB										
05...	--	--	--	--	--	--	--	--	<10	--
APR										
25...	--	--	--	--	--	--	--	--	90	--
25...	--	--	--	--	--	--	--	--	350	--
25...	--	--	--	--	--	--	--	--	230	--
25...	--	--	--	--	--	--	--	--	320	--
25...	--	--	--	--	--	--	--	--	150	--
25...	--	--	--	--	--	--	--	--	50	--
AUG										
01...	--	--	--	--	--	--	--	--	<10	--

## 08158600 WALNUT CREEK AT WEBBERVILLE ROAD, AUSTIN, TX

**LOCATION.**--Lat 30°16'59", long 97°39'17", Travis County, Hydrologic Unit 12090205, on left bank 190 ft downstream from bridge on Farm Road 969, 0.8 mi downstream from Little Walnut Creek, 2.8 mi upstream from Colorado River, 5.2 mi east of the State Capitol Building in Austin, and 2.8 mi upstream from mouth.

**DRAINAGE AREA.**--51.3 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--May 1966 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 425.96 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records fair except those above 150 ft<sup>3</sup>/s, which are poor. No known regulation or diversions. Station equipped with an automatic water-quality sampler. Several observations of water temperature were made during the year. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of June 15, 1935, reached a stage of 24 ft, backwater from Colorado River. A flood in 1919 reached a stage of 22 ft, from information by local residents. Maximum stage since at least 1891, that of May 25, 1981.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 25	1545	2,240	13.51	May 27	2030	2,470	14.14
May 9	1015	2,880	15.17	June 9	0430	4,490	18.48
May 23	1930	3,550	16.68	July 30	2030	1,950	12.70

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	6.7	22	18	6.9	43	31	33	35	29	23	4.4
2	8.0	5.6	18	18	6.9	40	32	29	30	28	18	4.2
3	7.4	5.6	19	18	6.4	39	58	26	28	28	17	6.8
4	7.3	5.0	16	17	6.2	38	346	24	26	27	14	5.1
5	8.8	4.6	25	17	5.9	38	157	22	78	26	12	4.8
6	10	4.6	21	17	6.2	35	56	22	125	22	11	4.4
7	8.1	90	14	47	47	31	44	22	117	22	68	4.8
8	7.8	63	12	68	13	32	38	21	48	21	94	4.3
9	6.8	25	16	25	15	30	36	506	1040	20	21	34
10	6.0	19	16	20	13	66	34	54	165	20	17	22
11	5.8	18	16	18	12	62	37	35	64	15	15	7.7
12	5.6	17	16	16	334	58	31	39	55	12	13	5.1
13	5.5	17	21	15	159	36	28	31	48	11	11	3.2
14	5.3	16	27	15	62	33	26	26	43	10	9.1	2.0
15	5.4	16	307	15	49	32	25	32	48	18	7.9	2.0
16	5.4	15	98	13	43	35	24	91	39	23	8.2	2.1
17	18	34	57	13	39	44	23	30	123	10	6.4	2.0
18	16	19	39	12	37	38	23	25	37	9.9	6.0	1.8
19	5.9	19	37	12	36	35	22	24	32	9.7	6.3	1.2
20	5.4	19	32	13	71	32	22	78	29	9.1	5.5	.59
21	5.0	19	29	15	41	30	21	30	213	5.3	5.3	.44
22	5.6	19	26	11	37	23	20	26	464	4.9	4.7	27
23	4.6	19	24	10	35	22	19	628	172	3.6	6.8	15
24	4.6	59	23	9.8	63	23	19	175	76	3.2	5.3	3.9
25	5.0	28	22	9.8	60	71	399	62	56	3.6	4.1	2.9
26	5.0	23	22	9.0	80	36	495	49	48	4.7	4.2	2.8
27	23	23	21	9.3	50	26	79	409	41	4.7	4.0	2.1
28	33	46	20	8.1	45	24	58	116	37	5.2	3.9	2.1
29	10	93	19	7.8	---	22	40	58	33	4.9	3.9	1.4
30	7.9	25	18	7.8	---	21	36	48	31	326	3.7	1.7
31	6.7	---	18	7.1	---	20	---	45	---	95	3.6	---
TOTAL	267.1	773.1	1071	511.7	1379.5	1115	2279	2816	3381	831.8	432.9	181.83
MEAN	8.62	25.8	34.5	16.5	49.3	36.0	76.0	90.8	113	26.8	14.0	6.06
MAX	33	93	307	68	334	71	495	628	1040	326	94	34
MIN	4.6	4.6	12	7.1	5.9	20	19	21	26	3.2	3.6	.44
AC-FT	530	1530	2120	1010	2740	2210	4520	5590	6710	1650	859	361
CFSM	.17	.50	.67	.32	.96	.70	1.48	1.77	2.20	.52	.27	.12
IN.	.19	.56	.78	.37	1.00	.81	1.65	2.04	2.45	.60	.31	.13

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1997, BY WATER YEAR (WY)

	MEAN	28.2	20.5	34.0	29.6	32.2	26.5	25.5	60.3	45.1	11.6	11.9	13.4
MAX	175	161	367	237	203	121	90.0	170	435	55.7	77.6	51.7	
(WY)	1985	1975	1992	1968	1992	1992	1977	1981	1981	1987	1996	1973	
MIN	1.37	1.03	1.22	1.07	1.88	1.06	1.79	.58	.23	.052	.32	1.42	
(WY)	1979	1967	1967	1967	1967	1967	1971	1971	1967	1971	1977	1972	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1966 - 1997

ANNUAL TOTAL	7038.02	15039.93	28.4	
ANNUAL MEAN	19.2	41.2	94.6	1992
HIGHEST ANNUAL MEAN			1.91	1967
LOWEST ANNUAL MEAN			4330	Dec 21 1991
HIGHEST DAILY MEAN	1520	Aug 24	.00	Jun 17 1967
LOWEST DAILY MEAN	.00	Jul 20	.00	Jun 17 1967
ANNUAL SEVEN-DAY MINIMUM	.06	Jul 17	1.4	Sep 15
INSTANTANEOUS PEAK FLOW			4490	Jun 9
INSTANTANEOUS PEAK STAGE			18.48	Jun 9
ANNUAL RUNOFF (AC-FT)	13960	29830	20540	May 25 1981
ANNUAL RUNOFF (CFSM)	.37	.80	.55	May 25 1981
ANNUAL RUNOFF (INCHES)	5.10	10.91	7.51	
10 PERCENT EXCEEDS	31	67	43	
50 PERCENT EXCEEDS	4.6	21	7.3	
90 PERCENT EXCEEDS	.90	4.7	1.1	

## COLORADO RIVER BASIN

08158600 WALNUT CREEK AT WEBBERVILLE ROAD, AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: April 1976 to current year. Pesticide analyses: November 1976 to September 1986.  
Sediment analyses: December 1977 to July 1982. Radiochemical analyses: January 1980.

**REMARKS.**--Samples collected during storm events are collected by automatic sampler.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)
FEB 05...	1133	6.1	615	8.1	12.0	5	0.30	11.1	103	11	0.3	400
MAR 25...	1120	30	615	7.7	19.0	9	5.1	--	--	17	1.8	K700
25...	1207	81	589	7.7	19.0	7	130	--	--	33	3.4	K180
25...	1320	174	372	7.6	19.0	38	270	--	--	92	8.1	K22000
25...	1350	213	414	7.6	19.0	27	240	--	--	84	7.9	K16000
25...	1517	146	280	7.7	19.0	41	190	--	--	67	8.0	K18000
26...	0715	36	400	7.6	15.0	26	8.7	--	--	20	2.0	K2000
JUL 28...	0942	5.6	615	7.6	28.0	6	0.45	6.7	87	<10	0.5	80
DATE		STREP-TOCOCCI FECAL, (COLS. PER 100 ML)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (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 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
FEB 05...	120	170	<1	<1	--	0.560	0.030	0.590	<0.015	--	--	--
MAR 25...	K1600	160	13	2	11	--	<0.010	0.690	0.050	1.1	0.35	1.1
25...	3000	160	144	14	130	0.690	0.010	0.700	0.020	1.8	1.1	1.1
25...	72000	110	562	56	506	0.690	0.030	0.720	0.310	4.0	3.0	3.0
25...	K30000	130	612	58	554	0.820	0.020	0.840	0.200	3.8	2.8	2.8
25...	64000	89	342	40	302	0.660	0.020	0.680	0.190	2.6	1.7	1.7
26...	K16000	130	9	2	7	--	<0.010	0.730	0.080	1.2	0.42	0.42
JUL 28...	480	150	<1	3	--	--	<0.010	0.423	<0.015	0.68	0.26	0.26
DATE		NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CHLOR-A PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANK-TON CHROMO FLUOROM (UG/L)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
FEB 05...	<0.20	<0.010	<0.010	<0.010	--	3.7	E0.100	<0.100	<1	<1	<10	<10
MAR 25...	0.40	0.030	<0.010	<0.010	--	6.0	--	--	<1	<1	<10	<10
25...	1.1	0.290	<0.010	<0.010	--	8.3	--	--	3	5	30	30
25...	3.3	0.800	0.020	<0.010	--	32	--	--	10	23	120	120
25...	3.0	0.810	<0.010	<0.010	--	28	--	--	10	20	110	110
25...	1.9	0.460	0.050	0.030	0.09	4.3	--	--	8	17	80	80
26...	0.50	0.040	<0.010	0.020	0.06	4.8	--	--	2	4	20	20
JUL 28...	0.26	<0.010	<0.010	<0.010	--	6.4	E0.090	<0.100	1	<1	<10	<10



# COLORADO RIVER BASIN

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08158700 ONION CREEK NEAR DRIFTWOOD, TX

**LOCATION (REVISED).**--Lat 30°04'58", long 98°00'27". Hays County, Hydrologic Unit 12090205, on left bank, 160 ft left of the upstream side of bridge at low-water crossing on Farm Road 150, 3.2 mi southeast of Driftwood, and 10 mi west of Buda.

**DRAINAGE AREA.**--124 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--April 1958, November 1961 to June 1979 (periodic discharge measurements only), July 1979 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 878.13 ft above sea level.

**REMARKS.**--Records fair. No known regulation or diversions. Several observations of water temperature were made during the year. Rain gage at station. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	0830	1,930	7.06	June 6	2100	2,090	7.26
Apr. 4	1730	1,370	6.43	June 9	0545	11,000	17.56
Apr. 4	2330	1,460	6.51	June 10	1615	7,920	14.93
Apr. 26	1500	1,650	6.71	June 22	0515	5,740	12.37
May 27	2115	715	5.68	June 22	1800	6,630	13.48
May 28	0115	4,260	10.38				

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	.37	.28	2.0	5.8	56	55	202	163	390	23	4.1
2	1.1	.32	.28	2.1	5.9	59	56	196	145	332	21	4.0
3	1.0	.32	.25	2.2	5.8	56	76	184	132	305	21	3.7
4	1.2	.31	.26	2.5	5.8	54	814	176	112	278	20	3.7
5	1.7	.31	.28	2.5	5.6	54	768	169	100	254	18	3.9
6	1.2	.31	.28	3.3	6.3	50	376	162	460	228	17	3.8
7	1.2	.37	.29	4.9	6.9	49	301	159	700	196	17	3.8
8	1.1	.34	.45	5.2	5.5	54	275	152	335	160	20	3.5
9	.93	.31	.47	4.7	6.3	59	255	172	3100	130	22	3.1
10	.86	.26	.45	5.5	6.4	55	239	169	2610	114	20	3.1
11	.85	.25	.41	5.7	6.5	58	230	136	1060	101	18	3.1
12	.79	.23	.40	6.1	11	119	203	122	710	89	16	2.6
13	.72	.23	.41	5.7	21	108	184	113	571	80	15	1.9
14	.63	.23	.42	5.8	26	95	173	102	487	76	13	1.4
15	.54	.24	.51	6.1	24	86	162	95	449	69	12	1.0
16	.56	.23	.87	6.1	22	86	148	186	375	63	12	.75
17	.57	.20	1.3	6.2	21	90	135	94	325	56	11	.62
18	.63	.18	1.9	6.0	21	86	125	78	291	49	9.9	.52
19	.58	.18	2.0	6.4	22	78	119	70	266	45	9.3	.51
20	.56	.17	1.6	7.2	56	74	108	213	240	43	8.7	.48
21	.56	.15	1.4	7.1	62	72	104	110	626	39	8.2	.52
22	.45	.15	1.5	6.9	48	68	95	91	3610	37	8.0	1.9
23	.36	.14	1.5	7.1	42	65	86	112	1500	34	7.8	4.5
24	.32	.20	1.7	7.2	41	63	82	135	953	32	7.5	e2.6
25	.30	.17	1.8	6.7	44	66	113	103	795	29	7.1	2.6
26	.29	.18	2.0	7.0	57	75	662	92	707	28	6.7	2.6
27	.29	.18	2.2	7.2	60	65	311	256	624	27	6.6	2.5
28	.32	.20	2.0	6.0	57	62	250	920	564	25	6.0	2.6
29	.32	.24	1.8	6.0	---	58	220	271	510	24	5.4	2.6
30	.32	.29	1.7	6.7	---	56	209	227	455	22	4.8	2.3
31	.33	---	2.0	6.1	---	53	---	195	---	24	4.4	---
TOTAL	21.78	7.26	32.71	170.2	701.8	2129	6934	5462	22975	3379	396.4	74.30
MEAN	.70	.24	1.06	5.49	25.1	68.7	231	176	766	109	12.8	2.48
MAX	1.7	.37	2.2	7.2	62	119	814	920	3610	390	23	4.5
MIN	.29	.14	.25	2.0	5.5	49	55	70	100	22	4.4	.48
AC-FT	43	14	65	338	1390	4220	13750	10830	45570	6700	786	147
CFSM	.01	.00	.01	.04	.20	.55	1.86	1.42	6.18	.88	.10	.02
IN.	.01	.00	.01	.05	.21	.64	2.08	1.64	6.89	1.01	.12	.02

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1997, BY WATER YEAR (WY)

	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	19.4	17.4	71.6	54.0	68.3	68.0	53.1	79.9	168	27.7	5.95	5.64							
MAX	109	85.9	548	316	506	356	231	202	792	109	22.0	34.6							
(WY)	1987	1986	1992	1992	1992	1992	1997	1992	1987	1997	1987	1991							
MIN	.22	.10	.10	.43	.87	2.29	1.16	.27	.089	.13	.055	.006							
(WY)	1990	1989	1989	1990	1990	1989	1996	1996	1996	1996	1996	1994							

## SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1979 - 1997
ANNUAL TOTAL	451.80	42283.45	
ANNUAL MEAN	1.23	116	53.1
HIGHEST ANNUAL MEAN			196
LOWEST ANNUAL MEAN			2.06
HIGHEST DAILY MEAN	6.0 Sep 1	3610 Jun 22	5060 Dec 21 1991
LOWEST DAILY MEAN	.00 Aug 7	.14 Nov 23	.00 Aug 21 1984
ANNUAL SEVEN-DAY MINIMUM	.00 Aug 7	.17 Nov 19	.00 Sep 14 1984
INSTANTANEOUS PEAK FLOW		11000 Jun 9	11000 Jun 9 1997
INSTANTANEOUS PEAK STAGE		17.56 Jun 9	17.56 Jun 9 1997
ANNUAL RUNOFF (AC-FT)	896	83870	38460
ANNUAL RUNOFF (CFSM)	.010	.93	.43
ANNUAL RUNOFF (INCHES)	.14	12.69	5.82
10 PERCENT EXCEEDS	3.5	268	120
50 PERCENT EXCEEDS	.55	13	9.0
90 PERCENT EXCEEDS	.03	.32	.36

e Estimated

## COLORADO RIVER BASIN

08158700 ONION CREEK NEAR DRIFTWOOD, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: January 1974 to current year. Pesticide analyses: January 1978 to September 1986.  
Radiochemical analyses: January 1980.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)
FEB											
05...	0914	5.6	589	7.9	12.5	3	0.30	9.6	91	0.3	K12
21...	0905	66	511	8.2	15.5	5	1.5	9.6	98	0.6	190
23...	1415	41	523	8.2	14.5	7	0.60	10.0	100	0.3	K40
MAR											
12...	1150	138	520	7.7	18.0	5	1.2	--	--	0.5	130
13...	0810	110	505	8.1	18.0	5	0.90	8.7	94	0.3	170
MAY											
27...	2223	606	457	8.0	25.0	15	68	--	--	1.2	K4000
27...	2336	2730	350	7.8	25.0	50	240	--	--	4.5	K16000
28...	0128	4220	261	7.8	23.0	60	580	--	--	5.7	K11000
28...	0230	2510	245	7.8	22.0	60	380	--	--	4.5	K16000

DATE	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)	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)	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)
FEB										
05...	120	--	--	--	--	--	--	--	210	--
21...	440	260	64	77	16	9.5	0.3	1.4	200	49
23...	K44	--	--	--	--	--	--	--	200	--
MAR										
12...	130	250	48	75	16	8.5	0.2	1.2	210	38
13...	250	--	--	--	--	--	--	--	210	--
MAY										
27...	K6400	--	--	--	--	--	--	--	190	--
27...	36000	--	--	--	--	--	--	--	150	--
28...	36000	--	--	--	--	--	--	--	120	--
28...	28000	--	--	--	--	--	--	--	110	--

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, 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 SOLVED (MG/L AS N)	NITRO-GEN, NITRITE SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
FEB										
05...	--	--	--	--	<1	<1	--	0.150	0.020	0.170
21...	17	0.20	6.9	296	<1	5	--	0.440	0.040	0.480
23...	--	--	--	--	<1	6	--	0.630	0.050	0.680
MAR										
12...	17	0.20	7.1	289	10	7	3	0.360	0.020	0.380
13...	--	--	--	--	14	10	4	0.360	0.020	0.380
MAY										
27...	--	--	--	--	141	32	109	--	<0.010	0.146
27...	--	--	--	--	648	136	512	--	<0.010	0.167
28...	--	--	--	--	905	255	650	0.195	0.019	0.214
28...	--	--	--	--	815	155	660	0.191	0.023	0.214

DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, 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 DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS-SOLVED (UG/L AS AS)
FEB										
05...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	--	1.6	--
21...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	--	3.5	<1
23...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	--	3.0	--
MAR										
12...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	--	2.3	<1
13...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	--	2.9	--
MAY										
27...	<0.015	0.92	0.77	0.77	0.058	<0.010	<0.010	--	7.8	--
27...	0.037	2.4	2.2	2.2	0.245	<0.010	<0.010	--	42	--
28...	0.076	4.4	4.2	4.2	0.465	<0.010	<0.010	--	38	--
28...	0.079	1.4	1.1	1.2	0.113	<0.010	0.010	0.03	40	--

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08158700 ONION CREEK NEAR DRIFTWOOD, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible]

## COLORADO RIVER BASIN

08158810 BEAR CREEK BELOW FARM ROAD 1826 NEAR DRIFTWOOD, TX

**LOCATION.**--Lat 30°09'19", long 97°56'23", Hays County, Hydrologic Unit 12090205, 0.8 mi southeast of Farm Road 1826 and 5.9 mi northeast of Driftwood.

**DRAINAGE AREA.**--12.2 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--March 1978 to July 1979 (periodic discharge measurements only), October 1978 to June 1979 (peak discharges above base only), July 1979 to current year.

**GAGE.**--Water-stage recorder. Elevation of gage is 860 ft above sea level from topographic map.

**REMARKS.**--Records poor. No known regulation or diversions. Several observations of water temperature were made during the year. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of June 9, 1939 (corrected), reached a stage of 16.2 ft; discharge, 14,200 ft<sup>3</sup>/s, and is the highest since at least 1924, from information by local resident. A flood in 1915 was purported to be 2 ft higher than the 1939 flood, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 27	1730	541	5.33	June 10	0345	527	5.29
June 8	1915	889	6.15	June 10	0845	1,790	7.60
June 9	0230	636	5.59				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.65	.09	.68	.93	.75	3.8	6.1	16	18	e20	3.3	.28
2	.59	.08	.62	.90	.75	3.8	6.3	15	17	e18	3.2	.25
3	.51	.08	.65	.93	.75	3.8	9.7	14	16	e17	3.0	.27
4	.48	.08	.61	.93	.73	3.8	36	14	15	e16	2.8	.29
5	.50	.08	.61	.85	.70	3.8	41	14	15	e15	2.6	.27
6	.57	.08	.58	.80	.66	3.7	39	14	120	e14	2.4	.22
7	.58	.23	.48	1.3	2.4	3.7	36	14	213	e13	2.4	.22
8	.48	.22	.53	1.5	3.6	3.7	34	14	224	e11	2.5	.18
9	.39	.14	.50	1.1	3.2	3.6	32	15	199	e10	2.4	.15
10	.36	.09	.48	1.1	.82	3.6	30	14	250	e9.3	2.1	.18
11	.21	.08	.54	.94	.90	5.1	29	14	101	e8.8	2.0	.24
12	.09	.08	.60	.93	4.0	5.7	27	14	86	e8.1	1.9	.24
13	.09	.08	.60	.93	3.6	6.8	25	14	76	e7.6	1.6	.18
14	.08	.07	.50	.93	3.8	7.0	24	14	66	e7.1	1.2	.19
15	.08	.07	2.3	.99	3.6	7.1	23	13	60	e6.7	.89	.20
16	.08	.07	1.5	1.1	3.4	7.0	22	13	52	e6.3	1.0	.10
17	.12	.07	1.3	.99	3.5	7.1	20	13	45	e6.0	.87	.09
18	.22	.06	1.3	.93	3.5	7.1	19	13	e38	e5.7	.80	.09
19	.08	.06	1.3	.93	3.7	7.3	19	18	e32	e5.3	.73	.08
20	.08	.07	1.4	.86	3.9	7.3	18	18	e28	e5.0	.67	.08
21	.08	.08	1.4	.80	3.8	7.1	17	15	e50	e4.8	.68	.08
22	.08	.06	1.3	.80	3.7	6.9	16	14	e90	e4.6	.64	.17
23	.08	.06	1.2	.80	3.7	6.8	15	25	e65	e4.4	.64	.13
24	.07	.94	1.2	.80	3.8	6.6	14	20	e50	e4.3	.54	.09
25	.07	.67	1.1	.80	3.8	6.9	15	18	e43	e4.1	.50	.10
26	.17	.41	1.1	.80	4.0	6.3	29	17	e37	e3.9	.41	.11
27	.22	.26	1.1	.75	3.9	6.1	18	56	e34	3.8	.38	.09
28	.25	.30	1.1	.77	3.9	6.1	18	26	e29	3.9	.38	.08
29	.33	.78	.96	.80	---	6.2	17	23	e26	3.7	.31	.08
30	.11	.73	.93	.76	---	6.2	16	21	e23	3.8	.31	.07
31	.09	---	.93	.75	---	6.2	---	19	---	3.5	.31	---
TOTAL	7.79	6.17	29.40	28.50	78.86	176.2	671.1	542	2118	254.7	43.46	4.80
MEAN	.25	.21	.95	.92	2.82	5.68	22.4	17.5	70.6	8.22	1.40	.16
MAX	.65	.94	2.3	1.5	4.0	7.3	41	56	250	20	3.3	.29
MIN	.07	.06	.48	.75	.66	3.6	6.1	13	15	3.5	.31	.07
AC-FT	15	12	58	57	156	349	1330	1080	4200	505	86	9.5
CFSM	.02	.02	.08	.08	.23	.47	1.83	1.43	5.79	.67	.11	.01
IN.	.02	.02	.09	.09	.24	.54	2.05	1.65	6.46	.78	.13	.01



# COLORADO RIVER BASIN

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08158810 BEAR CREEK BELOW FARM ROAD 1826 NEAR DRIFTWOOD, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1997, BY WATER YEAR (WY)

MEAN	2.56	1.97	9.42	6.02	7.77	7.26	6.37	9.18	20.7	2.45	.76	.61
MAX	22.5	11.6	91.8	33.3	49.4	32.3	26.2	23.7	144	8.22	3.59	2.71
(WY)	1987	1987	1992	1992	1992	1992	1991	1992	1981	1997	1979	1991
MIN	.000	.000	.000	.000	.017	.053	.048	.013	.001	.000	.000	.000
(WY)	1989	1989	1989	1989	1990	1996	1996	1996	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR			FOR 1997 WATER YEAR			WATER YEARS 1979 - 1997		
ANNUAL TOTAL	73.72			3960.98					
ANNUAL MEAN	.20			10.9			6.21		
HIGHEST ANNUAL MEAN							22.3		
LOWEST ANNUAL MEAN							.10		
HIGHEST DAILY MEAN	2.5 Sep 1			250 Jun 10			1000 Dec 20 1991		
LOWEST DAILY MEAN	.00 May 14			.06 Nov 18			.00 Aug 28 1980		
ANNUAL SEVEN-DAY MINIMUM	.00 May 14			.07 Nov 17			.00 Aug 28 1980		
INSTANTANEOUS PEAK FLOW				1790 Jun 10			10200 Dec 20 1991		
INSTANTANEOUS PEAK STAGE				7.60 Jun 10			14.23 Dec 20 1991		
ANNUAL RUNOFF (AC-FT)	146			7860			4500		
ANNUAL RUNOFF (CFSM)	.017			.89			.51		
ANNUAL RUNOFF (INCHES)	.22			12.08			6.92		
10 PERCENT EXCEEDS	.65			25			13		
50 PERCENT EXCEEDS	.05			2.3			1.2		
90 PERCENT EXCEEDS	.00			.09			.00		

e Estimated

## COLORADO RIVER BASIN

08158810 BEAR CREEK BELOW FARM ROAD 1826 NEAR DRIFTWOOD, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: March 1978 to current year. Pesticide analyses: June 1978 to September 1986, January to September 1993. Radiochemical analyses: January 1980.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM-ICAL (HIGH LEVEL) (MG/L)
OCT										
15...	0955	0.08	666	7.3	21.0	8	0.30	6.4	74	<10
FEB										
05...	0953	0.66	649	7.8	13.0	4	0.30	9.1	87	<10
JUN										
06...	1733	304	581	7.8	22.0	8	4.5	--	--	13
06...	1810	338	584	7.9	22.0	5	9.3	--	--	<10
06...	1922	434	365	7.8	22.0	30	82	--	--	32
06...	2012	258	377	7.8	22.0	40	48	--	--	27
DATE	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCHI, KF AGAR (COLS. PER 100 ML)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (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 DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)
OCT										
15...	0.5	1200	300	200	4	2	2	--	0.030	<0.050
FEB										
05...	0.3	K5	24	210	<1	<1	--	0.090	0.020	0.110
JUN										
06...	1.0	K1700	12000	250	10	6	4	--	<0.010	0.313
06...	1.1	K1400	8600	250	31	9	22	--	<0.010	0.324
06...	3.8	16000	43000	160	174	28	146	--	<0.010	0.279
06...	3.6	9200	22000	150	106	18	88	--	<0.010	0.194
DATE	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, 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 DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	
OCT										
15...	<0.015	--	--	<0.20	<0.010	0.010	<0.010	1.9	<1	
FEB										
05...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	3.8	<1	
JUN										
06...	0.027	0.53	0.19	0.22	<0.010	<0.010	<0.010	4.1	<1	
06...	0.025	--	--	<0.20	<0.010	<0.010	<0.010	7.5	<1	
06...	0.037	1.3	1.0	1.0	0.106	<0.010	<0.010	14	<1	
06...	<0.015	1.1	0.88	0.88	0.071	<0.010	<0.010	13	<1	

08158840 SLAUGHTER CREEK AT FARM ROAD 1826 NEAR AUSTIN, TX

**LOCATION.**--Lat 30°12'32", long 97°54'11", Travis County, Hydrologic Unit 12090205, 1.7 mi south of the intersection on U.S. Highway 290 and Farm Road 1826, and 11.9 mi southwest of the State Capitol Building in Austin.

**DRAINAGE AREA.**--8.24 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--January 1978 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 876.14 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation or diversions. Several observations of water temperature were made during year. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 27	1900	660	6.75	June 10	0815	3,290	9.17
June 9	0100	808	6.99	June 10	1115	3,860	9.48
June 9	0315	654	6.74				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	1.1	2.8	6.9	23	15	2.0	.73
2	.00	.00	.00	.00	.00	1.1	3.0	5.7	20	14	1.9	.66
3	.00	.00	.00	.00	.00	1.2	7.0	4.1	18	13	1.8	.65
4	.00	.00	.00	.00	.00	1.3	74	3.8	17	11	1.7	.64
5	.00	.00	.00	.00	.00	1.3	59	3.7	16	9.9	1.6	.55
6	.00	.00	.00	.00	.00	1.2	31	3.6	41	8.9	1.6	.43
7	.00	.00	.00	.00	.00	1.3	22	3.5	55	7.6	1.7	.36
8	.00	.00	.00	.00	.00	1.4	18	3.3	40	6.6	1.9	.28
9	.00	.00	.00	.00	.00	1.4	15	15	184	6.0	2.0	.21
10	.00	.00	.00	.00	.00	1.4	14	9.1	564	5.2	1.8	.14
11	.00	.00	.00	.00	.00	1.9	13	4.9	81	4.6	1.7	.06
12	.00	.00	.00	.00	.54	2.3	9.7	4.5	55	4.3	1.6	.01
13	.00	.00	.00	.00	.35	2.4	8.4	4.1	43	4.0	1.5	.00
14	.00	.00	.00	.00	.19	2.6	6.4	3.8	34	3.7	1.5	.00
15	.00	.00	.31	.00	.07	2.6	4.6	14	34	3.5	1.4	.00
16	.00	.00	.05	.00	.00	2.9	4.2	21	28	3.4	1.4	.00
17	.00	.00	.00	.00	.00	3.3	3.7	10	24	3.1	1.3	.00
18	.00	.00	.00	.00	.00	3.2	3.6	8.3	20	2.9	1.3	.00
19	.00	.00	.00	.00	.00	3.0	3.6	15	17	2.8	1.3	.00
20	.00	.00	.00	.00	.24	3.1	3.3	61	15	2.7	1.2	.00
21	.00	.00	.00	.00	.11	3.0	3.1	36	68	2.6	1.2	.00
22	.00	.00	.00	.00	.05	2.8	2.9	30	87	2.5	1.1	.00
23	.00	.00	.00	.00	.06	2.7	2.8	59	71	2.4	1.2	.00
24	.00	.20	.00	.00	.13	2.6	2.8	52	61	2.2	1.1	.00
25	.00	.00	.00	.00	.24	3.6	8.0	38	46	2.1	1.1	.00
26	.00	.00	.00	.00	.48	3.4	44	30	35	2.1	.99	.00
27	.00	.00	.00	.00	.56	3.1	23	67	29	2.0	.93	.00
28	.00	.00	.00	.00	.61	2.9	18	55	25	1.9	.86	.00
29	.00	.18	.00	.00	---	2.7	13	37	21	1.8	.86	.00
30	.00	.00	.00	.00	---	2.6	10	30	17	1.9	.82	.00
31	.00	---	.00	.00	---	2.5	---	27	---	2.2	.78	---
TOTAL	0.00	0.38	0.36	0.00	3.63	71.9	433.9	666.3	1789	155.9	43.14	4.72
MEAN	.000	.013	.012	.000	.13	2.32	14.5	21.5	59.6	5.03	1.39	.16
MAX	.00	.20	.31	.00	.61	3.6	74	67	564	15	2.0	.73
MIN	.00	.00	.00	.00	.00	1.1	2.8	3.3	15	1.8	.78	.00
AC-FT	.00	.8	.7	.00	7.2	143	861	1320	3550	309	86	9.4
CFSM	.00	.00	.00	.00	.02	.28	1.76	2.61	7.24	.61	.17	.02
IN.	.00	.00	.00	.00	.02	.32	1.96	3.01	8.08	.70	.19	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1997, BY WATER YEAR (WY)

MEAN	3.31	2.45	9.10	5.12	5.78	5.30	4.71	11.1	17.3	1.24	.40	.46
MAX	35.5	18.5	75.0	24.4	40.6	20.3	27.1	33.0	101	5.31	2.28	4.33
(WY)	1987	1986	1992	1992	1992	1992	1979	1995	1981	1979	1983	1991
MIN	.000	.000	.000	.000	.000	.000	.000	.021	.002	.000	.000	.000
(WY)	1983	1989	1989	1990	1996	1989	1996	1984	1996	1984	1980	1984

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1978 - 1997

ANNUAL TOTAL	1.71	3169.23	
ANNUAL MEAN	.005	8.68	
HIGHEST ANNUAL MEAN			5.72
LOWEST ANNUAL MEAN			17.9
HIGHEST DAILY MEAN	.84 May 30	564 Jun 10	.003 1992
LOWEST DAILY MEAN	.00 Jan 1	.00 Oct 1	.00 1996
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Oct 1	.00 Jun 11 1981
INSTANTANEOUS PEAK FLOW		3860 Jun 10	.00 Jan 26 1978
INSTANTANEOUS PEAK STAGE		9.48 Jun 10	.00 Jan 26 1978
ANNUAL RUNOFF (AC-FT)	3.4	6290	6330 Dec 20 1991
ANNUAL RUNOFF (CFSM)	.001	1.05	10.79 Jun 11 1981
ANNUAL RUNOFF (INCHES)	.01	14.31	4140
10 PERCENT EXCEEDS	.00	23	.69
50 PERCENT EXCEEDS	.00	.82	9.43
90 PERCENT EXCEEDS	.00	.00	10

08158840 SLAUGHTER CREEK AT FARM ROAD 1826 NEAR AUSTIN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: June 1983 to current year. Pesticide analyses: June 1983 to September 1986.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	COLOR (PLAT-INUM-COBALT UNITS)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)
MAR										
12...	0725	2.1	992	7.7	17.0	16	0.50	--	--	0.5
14...	0735	2.6	979	7.7	17.5	8	0.40	8.1	87	0.5
MAY										
27...	2035	120	509	7.7	--	50	130	--	--	4.4
JUN										
03...	1035	18	845	8.0	23.5	10	0.16	9.7	119	<10

[illegible]

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, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLA- TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)
MAR										
12...	76	0.20	7.7	579	5	6	0	1.58	0.020	1.60
14...	80	0.19	7.5	596	8	4	4	1.28	0.020	1.30
MAY										
27...	--	--	--	--	262	56	206	0.247	0.012	0.259
JUN										
03...	--	--	--	--	2	8	0	--	<0.010	0.550

DATE	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, 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 DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	ARSENIC DIS- SOLVED (UG/L AS AS)
MAR										
12...	<0.015	1.8	0.20	0.20	<0.010	<0.010	<0.010	--	4.9	<1
14...	<0.015	--	--	<0.20	<0.010	<0.010	<0.010	--	2.8	<1
MAY										
27...	0.019	1.8	1.5	1.6	0.202	<0.010	0.017	0.05	23	--
JUN										
03...	0.024	--	--	<0.20	<0.010	<0.010	<0.010	--	3.1	--

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, TOTAL RECOV- ERABLE (UG/L AS PB)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)
MAR										
12...	51	<0.50	<1.0	<5.0	<3.0	<10	<3.0	--	<10	4
14...	52	<0.50	<1.0	<5.0	<3.0	<10	<3.0	--	<10	5
MAY										
27...	--	--	--	--	--	--	--	6	--	--
JUN										
03...	--	--	--	--	--	--	--	<1	--	--

[illegible]



08158922 WILLIAMSON CREEK AT BRUSH COUNTRY BOULEVARD, OAK HILL, TX

**LOCATION.**--Lat 30°13'34", long 97°52'28", Travis County, Hydrologic Unit 12090205, at downstream side of bridge on Brush Country Boulevard near Oak Hill, and 7.7 mi southwest of the State Capitol Building in Austin.

**DRAINAGE AREA.**--6.79 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--March 1993 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 740.25 ft above sea level, (levels from city of Austin benchmark).

**REMARKS.**--Records good. No known regulation or diversions. Several observations of water temperature were made during the year. Station is equipped with an automatic water-quality sampler. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
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No peak greater than base discharge.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.12	.00	.00	.00	.00	.00
4	.00	.00	.01	.00	.00	.00	38	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	28	.00	.02	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	3.3	.00	3.3	.00	.00	.00
7	.00	.01	.00	.01	.02	.00	.00	.00	7.7	.00	.15	.00
8	.00	.00	.00	.01	.00	.00	.00	.00	1.3	.00	.19	.00
9	.00	.00	.00	.00	.00	.00	.00	7.1	84	.00	.00	.00
10	.00	.00	.00	.00	.00	.01	.00	.05	76	.00	.00	.00
11	.00	.00	.00	.00	.00	.10	.00	.00	28	.00	.00	.00
12	.00	.00	.00	.00	4.6	.00	.00	.02	14	.00	.00	.00
13	.00	.00	.00	.00	.13	.00	.00	.00	6.9	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	3.2	.00	.00	.00
15	.00	.00	.47	.00	.00	.00	.00	7.9	2.5	.00	.00	.00
16	.00	.00	.01	.00	.00	.04	.00	8.2	.61	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.39	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	16	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	84	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	18	44	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	8.4	e58	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	66	e27	.00	.00	.00
24	.00	.04	.00	.00	.00	.00	.00	40	16	.00	.00	.00
25	.00	.00	.00	.00	.00	e.24	2.4	15	9.1	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	22	5.2	5.4	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	8.0	19	3.5	.00	.00	.00
28	.00	.01	.00	.00	.00	.00	2.5	17	2.0	.00	.00	.00
29	.00	.03	.00	.00	---	.00	.00	5.7	.86	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	1.9	.00	.01	.00	.00
31	.00	---	.00	.00	---	.00	---	.04	---	.00	.00	---
TOTAL	0.00	0.09	0.49	0.02	4.75	0.39	104.42	319.51	393.78	0.01	0.34	0.00
MEAN	.000	.003	.016	.001	.17	.013	3.48	10.3	13.1	.000	.011	.000
MAX	.00	.04	.47	.01	4.6	.24	38	84	84	.01	.19	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.2	1.0	.04	9.4	.8	207	634	781	.02	.7	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1997, BY WATER YEAR (WY)

	1993	1994	1995	1996	1997
MEAN	1.25	.056	.60	.027	.058
MAX	4.97	.17	2.38	.11	.17
(WY)	1995	1995	1995	1995	1997
MIN	.000	.001	.000	.000	.000
(WY)	1997	1994	1996	1994	1996

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1993 - 1997

ANNUAL TOTAL	13.17	823.80	
ANNUAL MEAN	.036	2.26	
HIGHEST ANNUAL MEAN			1.05
LOWEST ANNUAL MEAN			2.26
HIGHEST DAILY MEAN	7.7	May 30	169
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			1300
INSTANTANEOUS PEAK STAGE			5.69
ANNUAL RUNOFF (AC-FT)	26	1630	761
10 PERCENT EXCEEDS	.00	2.5	.01
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

## COLORADO RIVER BASIN

08158922 WILLIAMSON CREEK AT BRUSH COUNTRY BOULEVARD, OAK HILL, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: October 1993 to current year.

REMARKS.--Samples collected during storm events are collected by automatic sampler.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (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, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	
MAY												
19...	2255	27	317	7.4	--	20	18	--	--	24	4.0	
19...	2325	313	268	7.2	--	30	60	--	--	50	5.7	
19...	2340	405	207	7.3	--	50	180	--	--	75	8.0	
20...	0012	473	205	7.2	--	50	62	--	--	22	6.7	
20...	0135	230	341	7.4	--	75	38	--	--	30	3.6	
20...	0953	62	490	7.8	--	40	4.3	--	--	21	1.1	
21...	0618	21	667	8.2	19.5	15	0.60	8.3	93	17	0.3	
		COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	ALKA- LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	RESIDUE VOLATILE TILE, SUS- PENDE (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)
MAY												
19...	10000	60000	100	35	22	13	--	<0.010	0.208	0.044	0.79	
19...	23000	84000	69	174	36	138	0.249	0.017	0.266	<0.015	1.7	
19...	33000	90000	89	132	31	101	0.246	0.019	0.265	<0.015	2.8	
20...	46000	130000	72	89	18	71	--	<0.010	0.096	<0.015	2.0	
20...	K17000	110000	120	49	11	38	0.298	0.013	0.311	<0.015	3.3	
20...	4400	18000	210	5	5	0	0.336	0.011	0.347	<0.015	0.69	
21...	1100	4200	280	<1	2	--	--	<0.010	0.479	<0.015	0.69	
		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 ORTHOPHOS- PHATE, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)		
MAY												
19...	0.53	0.58	0.123	0.069	0.065	0.20	6.8	2	2	10		
19...	1.4	1.4	0.281	0.113	0.075	0.23	20	8	14	60		
19...	2.6	2.6	0.489	0.069	0.026	0.08	32	6	7	30		
20...	1.9	1.9	0.390	0.067	<0.010	--	9.8	12	22	100		
20...	3.0	3.0	0.550	0.050	0.047	0.14	9.2	2	3	10		
20...	0.34	0.34	0.025	<0.010	<0.010	--	9.5	1	<1	<10		
21...	0.21	0.21	0.015	<0.010	<0.010	--	7.7	1	<1	<10		

# COLORADO RIVER BASIN

129

08159000 ONION CREEK AT U.S. HIGHWAY 183, AUSTIN, TX

**LOCATION.**--Lat 30°10'40", long 97°41'18", Travis County, Hydrologic Unit 12090205, on right bank at downstream side of downstream bridge on U.S. Highway 183, 2.4 mi downstream from Williamson Creek, 3.2 mi southwest of Del Valle, and 7.5 mi southeast of the State Capitol Building in Austin.

**DRAINAGE AREA.**--321 mi<sup>2</sup>.

**PERIOD OF RECORD.**--May 1924 to March 1930, March 1976 to current year. In 1924-30 station was published as "near Del Valle".

Water-quality records.--Chemical and biochemical analyses: October 1976 to September 1988. Pesticide analyses: October 1976 to September 1986. Sediment analyses: October 1976 to September 1982. Radiochemical analyses: January 1980.

**GAGE.**--Water-stage recorder. Datum of gage is 442.85 ft above sea level (Texas Department of Transportation datum). May 15, 1924 to Mar. 15, 1930, nonrecording gage at highway bridge 1,700 ft upstream at 6.42 ft higher datum.

**REMARKS.**--Records good. No known regulation or diversions. Flow is slightly affected by several small ponds on main channel and tributaries above station. Several observations of water temperature were made during the year. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1869 occurred about July 3, 1869, stage about 38 ft, from newspaper accounts, and Sept. 9, 1921, stage 38.0 ft, from floodmark, present site and datum.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
May 28	1115	3,130	12.30	June 10	2015	11,900	21.08
June 7	2045	6,230	16.70	June 22	1100	6,190	16.65
June 9	1600	14,100	22.24	June 23	0300	6,530	17.05

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.62	.00	4.2	3.7	1.7	11	7.6	67	227	353	13	e1.0
2	.51	.00	2.0	3.6	1.9	9.9	16	44	195	317	10	e.78
3	.45	.00	.82	3.7	1.9	8.1	46	40	166	290	9.3	e.65
4	.72	.00	1.2	3.9	1.8	6.9	165	39	138	259	8.4	e.40
5	.48	.00	4.0	3.6	1.7	7.4	934	18	191	234	7.5	e.20
6	.70	.00	2.0	3.2	1.6	6.8	423	15	238	217	6.9	e.05
7	.83	5.0	1.3	6.0	29	6.5	253	14	2950	198	6.1	.00
8	.46	2.4	1.2	22	15	6.7	187	13	1000	180	73	.00
9	.89	.23	.73	15	6.1	8.9	144	167	7750	170	23	.00
10	.22	.00	.75	8.8	4.9	8.4	103	e49	5840	150	13	.00
11	.02	.00	.49	6.0	3.9	13	79	e23	3660	134	9.2	.00
12	.00	.00	.76	5.1	156	27	62	e37	1140	116	7.0	.00
13	.00	.00	.81	5.2	135	16	41	e24	864	104	6.0	.00
14	.00	.00	1.6	5.8	32	12	29	17	716	93	5.2	.00
15	.00	.00	100	5.1	19	10	22	18	628	85	4.6	.00
16	.00	.00	40	4.8	12	9.9	18	170	553	74	3.8	.00
17	.00	.00	17	4.7	9.1	15	16	47	492	64	3.1	.00
18	.00	.00	10	3.1	7.8	14	15	29	414	55	2.8	.00
19	.00	.09	7.6	2.0	6.9	11	15	18	372	48	2.7	.00
20	.00	.00	5.9	2.0	18	10	14	558	336	42	2.5	.00
21	.00	.00	6.6	2.6	16	9.4	8.7	178	779	38	2.2	.00
22	.00	.00	6.6	2.6	7.8	8.7	8.3	70	5400	34	2.5	.00
23	.00	.00	5.8	2.2	5.8	8.2	7.3	336	2880	31	2.1	3.1
24	.00	38	5.2	2.6	7.0	7.6	6.6	969	1150	26	2.0	e1.5
25	.00	18	4.7	2.3	17	16	248	256	880	22	1.7	e.80
26	.02	4.3	4.8	1.9	24	24	623	130	731	19	1.6	e.65
27	.00	1.6	4.5	1.8	20	15	600	151	612	15	1.5	e.40
28	.01	1.0	4.7	1.7	13	12	237	1290	521	13	1.4	e.20
29	.05	28	4.1	1.7	---	9.5	164	505	453	12	1.3	e.01
30	.05	14	3.4	1.7	---	8.6	108	343	395	12	1.2	.00
31	.00	---	3.4	1.7	---	6.7	---	276	---	20	1.2	---
TOTAL	6.03	112.62	256.16	140.1	575.9	344.2	4600.5	5911	41671	3425	235.8	9.74
MEAN	.19	3.75	8.26	4.52	20.6	11.1	153	191	1389	110	7.61	.32
MAX	.89	38	100	22	156	27	934	1290	7750	353	73	3.1
MIN	.00	.00	.49	1.7	1.6	6.5	6.6	13	138	12	1.2	.00
AC-FT	12	223	508	278	1140	683	9130	11720	82650	6790	468	.19
CFSM	.00	.01	.03	.01	.06	.03	.48	.59	4.33	.34	.02	.00
IN.	.00	.01	.03	.02	.07	.04	.53	.69	4.83	.40	.03	.00

## COLORADO RIVER BASIN

08159000 ONION CREEK AT U.S. HIGHWAY 183, AUSTIN, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1997h, BY WATER YEAR (WY)

MEAN	40.5	25.8	98.4	53.8	79.9	80.6	113	193	260	34.9	7.65	8.80
MAX	282	231	1526	487	908	576	847	1767	2305	133	47.6	48.0
(WY)	1926	1986	1992	1992	1992	1992	1926	1929	1981	1981	1983	1986
MIN	.000	.27	.000	.002	1.65	1.80	1.39	1.40	.010	.000	.000	.000
(WY)	1929	1994	1990	1990	1925	1996	1994	1984	1925	1925	1925	1988

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR			FOR 1997 WATER YEAR			WATER YEARS 1924 - 1997h		
ANNUAL TOTAL	1468.70			57288.05			81.8		
ANNUAL MEAN	4.01			157			379		
HIGHEST ANNUAL MEAN							1.49		
LOWEST ANNUAL MEAN							30500		
HIGHEST DAILY MEAN	171	Jun	7	7750	Jun	9	May 28 1929		
LOWEST DAILY MEAN	.00	Apr	15	.00	Oct	12	.00 Jun 3 1925		
ANNUAL SEVEN-DAY MINIMUM	.00	Apr	15	.00	Oct	12	.00 Jun 3 1925		
INSTANTANEOUS PEAK FLOW				14100	Jun	9	76000 May 28 1929		
INSTANTANEOUS PEAK STAGE				22.24	Jun	9	30.50 Dec 21 1991		
ANNUAL RUNOFF (AC-FT)	2910			113600			59290		
ANNUAL RUNOFF (CFSM)	.013			.49			.25		
ANNUAL RUNOFF (INCHES)	.17			6.64			3.46		
10 PERCENT EXCEEDS	6.6			301			127		
50 PERCENT EXCEEDS	.64			7.4			6.3		
90 PERCENT EXCEEDS	.00			.00			.00		

e Estimated

h See PERIOD OF RECORD paragraph

**LOCATION.**--Lat 30°06'16", long 97°19'09", Bastrop County, Hydrologic Unit 12090301, at the downstream side of bridge on State Highway 71 bridge, at Bastrop, 0.3 mi upstream from Gills Branch, 1.2 mi downstream from Piney Creek, and at mile 236.6.

**PERIOD OF RECORD.**--October 1973 to September 1975, daily discharges estimated by hydrographic comparison with streamflow stations 08158000 and 08159500. March 1960 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 307.38 ft above sea level. Prior to May 10, 1960, nonrecording gage at a site 400 ft upstream from present site and at same datum. May 10, 1960 to Sept. 30, 1973, Oct. 1, 1975 to Oct. 28, 1986, at a site 400 ft upstream from present site and at same datum.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1845, 60.3 ft July 7 or 8, 1869. Flood of June 16, 1935, reached a stage of 57.0 ft, and flood of Dec. 4, 1913, reached a stage of 53.3 ft, from information by local resident.

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	766	580	731	412	419	14600	2830	12800	7880	29700	2080	1300
2	814	555	639	404	433	8360	3580	12800	7370	29900	1840	1030
3	739	521	568	387	447	5600	3640	10200	5960	29700	1730	1100
4	694	473	501	e420	461	5550	4150	7410	4820	29500	1670	1120
5	577	435	606	e410	501	5760	10100	7240	4530	29300	1610	1110
6	532	481	525	e410	484	6720	10700	6180	3600	29100	1680	1250
7	535	534	493	e400	501	6730	8310	3760	5660	29000	1640	1400
8	576	642	410	454	668	7950	7820	3980	10400	28800	1980	1260
9	603	643	383	655	650	11700	7670	4330	14000	28200	2300	1350
10	555	510	403	674	649	11900	7390	8500	26400	24800	1720	1460
11	518	476	375	514	613	12100	7560	4770	19800	19700	1660	1300
12	432	479	350	467	927	12400	7400	4380	17300	14600	1560	1190
13	370	425	380	495	5150	15100	7300	4470	15300	9680	1350	1220
14	360	355	364	492	1980	17500	7210	4320	14600	8510	1270	1180
15	402	387	468	419	868	17600	7160	4120	14200	6380	1220	1160
16	419	378	2000	485	631	17700	7160	6800	14100	4980	1120	1210
17	416	472	1290	452	495	17900	7120	5930	11300	4760	943	1170
18	387	461	681	428	481	17000	7120	4350	9450	4410	910	1170
19	396	525	582	427	624	14400	5830	4200	8390	3040	838	1120
20	395	451	593	410	577	11000	2800	7760	8140	2910	942	1090
21	379	444	456	472	864	8860	2380	9660	8010	2430	1070	1100
22	378	659	317	452	1970	6120	4800	7830	11900	3930	1040	1110
23	379	458	336	395	3780	5740	4570	7570	24100	3210	1020	1230
24	373	499	360	419	5450	5620	5710	9770	30300	2730	1100	1220
25	413	705	419	453	7030	5600	6810	7190	30600	2530	1150	930
26	393	820	371	436	12700	5920	12100	4620	30600	2260	1140	1110
27	452	511	333	396	17700	5590	14100	4810	30100	2170	1200	1090
28	406	451	365	394	17900	5610	9000	8870	29900	2190	1220	1100
29	449	423	366	471	---	5520	7940	10300	29800	2180	1090	1070
30	545	696	378	431	---	4630	11000	8460	29700	2220	1070	1080
31	531	---	398	419	---	2550	---	8030	---	2400	1330	---
TOTAL	15184	15449	16441	13953	84953	299330	211260	215410	478210	395220	42493	35230
MEAN	490	515	530	450	3034	9656	7042	6949	15940	12750	1371	1174
MAX	814	820	2000	674	17900	17900	14100	12800	30600	29900	2300	1460
MIN	360	355	317	387	419	2550	2380	3760				

MEAN	1379	1253	1503	1742	2193	2267	2551	3534	4657	2651	1917	1746
MAX	6380	11330	14770	17490	29140	16910	11080	10420	23620	12750	3705	4930
(WY)	1974	1975	1992	1992	1992	1992	1977	1975	1987	1997	1961	1974
MIN	291	94.6	111	109	138	131	565	1471	1489	1302	1182	1048
(WY)	1965	1964	1964	1964	1964	1964	1962	1962	1993	1967	1964	1971

ANNUAL TOTAL	443709		1823133				
ANNUAL MEAN	1212		4995		2282		
HIGHEST ANNUAL MEAN					9073		1992
LOWEST ANNUAL MEAN					828		1964
HIGHEST DAILY MEAN	4470	Jun 8	30600	Jun 25	65800	Dec 22	1991
LOWEST DAILY MEAN	317	Dec 22	317	Dec 22	75	Apr 1	1964
ANNUAL SEVEN-DAY MINIMUM	357	Dec 22	357	Dec 22	84	Oct 19	1964
INSTANTANEOUS PEAK FLOW			31200	Jun 10	79600	Oct 29	1960
INSTANTANEOUS PEAK STAGE			21.67	Jun 10	37.48	Dec 22	1991
ANNUAL RUNOFF (AC-FT)	880100		3616000		1654000		
10 PERCENT EXCEEDS	2670		14100		4280		
50 PERCENT EXCEEDS	907		1290		1570		
90 PERCENT EXCEEDS	399		408		246		

# Period of regulated streamflow.



## COLORADO RIVER MAIN STEM

08160400 COLORADO RIVER ABOVE LAGRANGE, TX

**LOCATION.**--Lat 29°54'44", long 96°54'13", Fayette County, Hydrologic Unit 12090301, at right downstream end of bridge on new State Highway 71, 1.4 mi upstream from Buckners Creek, and at mile 177.

**DRAINAGE AREA.**--40,874 mi<sup>2</sup>, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--1979-82 (discharge measurements only), April 1988 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 210.04 ft above sea level. Dec. 12, 1979 to Sept. 30, 1982, discharge measurements only were made at old State Highway 71 bridge, 1.0 mi downstream and at different datum.

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage, at least 10% of contributing drainage area has been regulated by Town Lake, Lake Austin, Lake Travis, and other reservoirs. At times, low-flow releases from Lake Travis (station 08154500) are made for generation of electric power and to fulfill downstream water contracts. There are many diversions above station for irrigation and for municipal supply. One observation of water temperature was made during the year. Radio telemeter at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1869, about 56.7 ft on July 9, 1869 (from marble high-water marker in LaGrange). Stages of other floods are as follows: Dec. 5, 1913, 56.4 ft, from floodmark; June 17, 1935, 50.84 ft, from floodmarks (discharge 255,000 ft<sup>3</sup>/s from rating curve extended above 200,000 ft<sup>3</sup>/s); July 27, 1938, 42.95 ft (discharge, 200,000 ft<sup>3</sup>/s). This data was collected at a site 2.6 mi downstream at streamflow station Colorado River at LaGrange (discontinued) at different datum than at present site.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	759	449	554	378	359	15900	2950	11200	7670	27300	2520	1290
2	730	494	872	387	354	13000	3330	12200	7470	27400	2190	1280
3	781	477	653	393	360	7740	3890	12100	7120	27500	1960	1070
4	748	530	634	377	376	5990	4200	9270	5650	27600	1850	1100
5	728	463	609	361	385	5900	5980	7530	4790	27500	1770	1110
6	661	396	582	348	419	6320	11300	7240	4520	27300	1700	1100
7	581	458	637	355	450	6860	10200	6000	13100	27100	1750	1190
8	538	497	533	382	449	6870	8170	4050	13100	27000	1980	1350
9	557	536	525	451	511	8610	7810	4350	11700	26900	2130	1240
10	583	644	416	581	623	11100	7650	6540	14800	26400	2260	1320
11	572	531	465	645	578	11300	7430	8210	24300	23200	1790	1390
12	529	461	463	549	839	12300	7530	5010	21300	18400	1710	1270
13	492	477	386	480	2910	13500	7390	4810	16900	13100	1630	1160
14	411	483	405	451	5750	14700	7300	4730	14700	9170	1440	1170
15	350	387	563	481	2180	16100	7230	4450	14000	8300	1340	1120
16	336	389	1050	445	1100	16700	7210	4970	13600	6260	1290	1110
17	355	407	2520	381	774	21000	7190	8940	13400	5280	1200	1130
18	337	440	1620	448	593	18700	7160	6260	11000	4940	1050	1100
19	329	483	903	403	488	16100	7180	4540	9380	4700	993	1090
20	339	522	664	435	2210	13400	5540	4830	8480	3210	917	1040
21	352	513	661	4080	4370	10700	3030	10500	8280	3230	941	1010
22	352	469	592	2540	1080	8300	2780	9430	8720	2930	1090	1030
23	345	633	432	725	2110	6460	4960	7760	14500	3940	1060	1060
24	336	718	334	527	3740	6090	4670	8590	21800	3430	1050	1130
25	350	802	352	443	5540	5920	8010	10300	26800	2950	1100	1110
26	356	772	400	421	7160	5880	14800	7100	27800	2750	1170	949
27	373	986	452	393	12200	6130	14700	4900	27900	2480	1150	885
28	357	693	400	374	15500	5800	13100	4960	27600	2370	1190	1010
29	398	560	343	317	---	5790	8950	9170	27500	2360	1240	987
30	362	518	377	357	---	5690	8340	9270	27400	2370	1120	956
31	469	---	376	414	---	4500	---	8030	---	2390	1100	---
TOTAL	14766	16188	19773	19322	73408	313350	219980	227240	455280	399760	45681	33757
MEAN	476	540	638	623	2622	10110	7333	7330	15180	12900	1474	1125
MAX	781	986	2520	4080	15500	21000	14800	12200	27900	27600	2520	1390
MIN	329	387	334	317	354	4500	2780	4050	4520	2360	917	885
AC-FT	29290	32110	39220	38330	145600	621500	436300	450700	903000	792900	90610	66960

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1997#, BY WATER YEAR (WY)

	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	1200	478	2610	3276	4515	4192	3112	3756	5238	3142
MAX	4341	769	16350	18640	31160	18080	7333	8290	15180	12900
(WY)	1995	1995	1992	1992	1992	1992	1997	1992	1997	1992
MIN	476	244	248	247	356	403	987	1915	1989	1543
(WY)	1997	1989	1990	1990	1990	1990	1990	1988	1993	1996

SUMMARY STATISTICS FOR 1996 CALENDAR YEAR FOR 1997 WATER YEAR WATER YEARS 1988 - 1997#

ANNUAL TOTAL	442822	1838505	
ANNUAL MEAN	1210	5037	2950
HIGHEST ANNUAL MEAN			9913
LOWEST ANNUAL MEAN			1157
HIGHEST DAILY MEAN	10200	Sep 21	27900
LOWEST DAILY MEAN	329	Oct 19	317
ANNUAL SEVEN-DAY MINIMUM	341	Oct 18	341
INSTANTANEOUS PEAK FLOW			28100
INSTANTANEOUS PEAK STAGE			24.29
ANNUAL RUNOFF (AC-FT)	878300	3647000	2137000
10 PERCENT EXCEEDS	2700	13800	5440
50 PERCENT EXCEEDS	784	1390	1460
90 PERCENT EXCEEDS	406	387	376

# Period of regulated streamflow.

## 08160800 REDGATE CREEK NEAR COLUMBUS, TX

**LOCATION.**--Lat 29°47'56", long 96°31'55", Colorado County, Hydrologic Unit 12090301, on left bank at downstream side of bridge on Farm Road 109, 1.9 mi upstream from Cummins Creek, and 7.0 mi north of Columbus.

**DRAINAGE AREA.**--17.3 mi<sup>2</sup>.

**PERIOD OF RECORD.**--April 1962 to current year.

**REVISED RECORDS.**--WSP 2122: Drainage area.

**GAGE.**--Water-stage recorder and crest-stage gages. Datum of gage is 210.82 ft above sea level. Prior to Oct. 1, 1975, datum 10.00 ft higher.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. No known regulation or diversions. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1860, about 33.4 ft in late June or early July 1940, from information by State Department of Highways and Public Transportation and local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 25	1630	1,160	16.96	Apr. 25	1845	1,150	16.92
Jan. 21	1415	1,210	17.08	May 31	0300	1,060	16.64
Feb. 20	1515	1,670	18.39				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.81	.56	.88	.66	3.6	7.6	6.4	4.2	6.8	1.4	.54	.33
2	.97	.52	.65	.67	3.5	12	8.4	3.7	3.3	1.3	.54	.26
3	.87	.52	.58	.69	3.4	7.5	13	3.2	2.3	1.2	.55	.27
4	.69	.56	.52	.57	e3.2	6.5	114	2.8	1.9	1.1	.45	.31
5	.72	.59	.77	.54	e3.3	6.4	78	2.6	1.7	1.1	.42	.33
6	.69	.64	.62	.50	e3.0	5.7	15	2.5	18	1.0	.38	.25
7	.61	.88	.55	.60	e2.9	5.4	8.1	2.4	107	.95	.40	.29
8	.63	.59	.43	33	e3.0	5.7	5.8	2.5	17	.86	.58	.29
9	.57	.52	.46	4.6	e3.4	5.4	4.7	4.1	8.4	.86	.65	.29
10	.55	.53	.49	1.4	4.4	5.2	3.7	5.0	5.2	.69	.37	.44
11	.51	.54	.51	.90	4.2	6.2	3.2	2.9	3.8	.62	.32	.45
12	.52	.52	.49	.87	46	149	2.7	2.9	3.0	.61	.28	.49
13	.73	.53	.57	1.1	16	21	2.4	3.3	2.5	.56	.27	.86
14	.53	.50	.50	.97	7.8	11	2.3	2.5	2.2	.50	.24	.54
15	.60	.53	35	1.3	6.0	7.5	2.2	2.3	2.0	.45	.23	.57
16	.64	.57	13	.83	5.1	140	2.4	2.5	1.8	.48	.20	.50
17	.58	.55	2.2	.64	4.7	120	2.2	2.3	11	.47	.15	.41
18	.53	.52	1.0	.66	4.4	32	2.2	2.2	4.8	.41	.15	.40
19	.47	.58	.79	.61	4.5	19	3.6	2.2	3.0	.41	.19	.41
20	.50	.59	.71	41	318	11	2.9	2.6	2.5	.45	.21	.48
21	.60	.58	.68	394	33	9.3	2.8	2.7	32	.50	.19	.57
22	.56	.53	.67	24	10	8.1	2.3	2.9	30	.44	.23	2.6
23	.64	.62	.64	9.0	7.1	7.3	2.1	3.2	9.0	.41	1.5	2.3
24	.76	7.7	.55	6.8	6.1	7.0	2.0	124	5.8	.42	.39	1.5
25	81	1.3	.55	5.2	9.0	6.9	196	21	3.5	.41	.26	.91
26	4.3	.78	.65	4.6	18	7.4	35	5.2	2.6	.41	.25	.72
27	1.3	.60	.65	4.5	11	6.7	70	2.8	2.2	.42	.31	.66
28	1.1	.58	.58	4.1	8.0	6.7	15	2.2	1.9	.43	.44	.63
29	.95	.88	.65	3.6	---	6.5	7.0	1.8	1.7	.45	.45	.63
30	.67	2.0	.56	3.5	---	6.1	5.0	1.6	1.5	.49	.39	.59
31	.58	---	.65	3.4	---	5.8	---	137	---	.66	.37	---
TOTAL	105.18	26.91	67.55	554.81	552.6	661.9	620.4	363.1	298.4	20.46	11.90	19.28
MEAN	3.39	.90	2.18	17.9	19.7	21.4	20.7	11.7	9.95	.66	.38	.64
MAX	81	7.7	35	394	318	149	196	137	107	1.4	1.5	2.6
MIN	.47	.50	.43	.50	2.9	5.2	2.0	1.6	1.5	.41	.15	.25
AC-FT	209	53	134	1100	1100	1310	1230	720	592	.41	.24	.38
CFSM	.20	.05	.13	1.03	1.14	1.23	1.20	.68	.57	.04	.02	.04
IN.	.23	.06	.15	1.19	1.19	1.42	1.33	.78	.64	.04	.03	.04

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1997, BY WATER YEAR (WY)

	MEAN	4.79	2.33	4.65	7.00	7.75	6.58	7.78	12.6	9.99	1.04	1.27	3.46
MAX	49.0	17.8	25.4	31.9	67.5	38.1	39.9	55.5	83.4	4.44	17.4	38.5	
(WY)	1971	1986	1992	1974	1992	1973	1991	1979	1993	1993	1974	1974	
MIN	.000	.070	.25	.24	.21	.19	.24	.33	.065	.007	.000	.040	
(WY)	1964	1967	1967	1967	1967	1967	1971	1971	1990	1971	1970	1963	

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1962 - 1997

ANNUAL TOTAL	627.14	3302.49	
ANNUAL MEAN	1.71	9.05	5.81
HIGHEST ANNUAL MEAN			20.7
LOWEST ANNUAL MEAN			.82
HIGHEST DAILY MEAN	106	394	1180
LOWEST DAILY MEAN	.03	.15	.00
ANNUAL SEVEN-DAY MINIMUM	.03	.19	.00
INSTANTANEOUS PEAK FLOW		1670	5360
INSTANTANEOUS PEAK STAGE		18.39	27.19
ANNUAL RUNOFF (AC-FT)	1240	6550	4210
ANNUAL RUNOFF (CFSM)	.099	.52	.34
ANNUAL RUNOFF (INCHES)	1.35	7.10	4.56
10 PERCENT EXCEEDS	1.1	11	5.2
50 PERCENT EXCEEDS	.52	1.1	.86
90 PERCENT EXCEEDS	.09	.41	.10

e Estimated

## COLORADO RIVER MAIN STEM

08161000 COLORADO RIVER AT COLUMBUS, TX

**LOCATION.**--Lat 29°42'22", long 96°32'12", Colorado County, Hydrologic Unit 12090302, near right bank at downstream side of pier of bridge on U.S. Highway 90 at eastern edge of Columbus, 340 ft downstream from Texas and New Orleans Railroad Co. bridge, 2.6 mi downstream from Cummins Creek, and at mile 135.1.

**DRAINAGE AREA.**--41,640 mi<sup>2</sup>, approximately, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--January 1903 to December 1911 (gage heights only), May 1916 to current year. Discharge records for 1902-11, published in WSP 84, 99, 132, 174, 210, 288, and 308, have been found to be unreliable and should not be used. Records collected at site 23 mi downstream October 1930 to May 1939, published as "near Eagle Lake". Gage-height records collected in this vicinity since 1903 are contained in reports of the National Weather Service.

Water-quality records.--Chemical analyses: October 1967 to September 1971. Chemical and biochemical analyses: February 1968 to September 1981. Sediment records: March 1957 to September 1973.

**REVISED RECORDS.**--WSP 1562: 1920-21(M), 1922. WDR TX-81-3: Drainage area. See also PERIOD OF RECORD.

**GAGE.**--Water-stage recorder. Datum of gage is 145.52 ft above sea level. Prior to May 1, 1919, various nonrecording gages at sites in the immediate vicinity at datum 7.00 ft higher. May 1, 1919 to Nov. 23, 1930, water-stage recorder at site about 300 ft downstream at datum 7.00 ft higher. Sept. 17, 1930 to June 12, 1939 (Oct. 1, 1930, to May 31, 1939, used herein), water-stage recorder at site 23 mi downstream at different datum. May 17 to Nov. 14, 1939, nonrecording gage at present site and datum 10.00 ft higher; Nov. 15, 1939 to Dec. 31, 1988, water-stage recorder at present site and at datum 10.00 ft higher.

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage in May 1916, at least 10% of contributing drainage area has been regulated by Lake Austin. Flow is also affected at times by discharge from the flood-detention pools of 20 floodwater-retarding structures with a combined detention capacity of 25,570 acre-ft. These structures control runoff from a 73.1 mi<sup>2</sup> area in the Cummins Creek watershed. There are many other diversions above this station for irrigation and for municipal supply. Low-flow releases from Lake Travis, 251 mi upstream, are made for the generation of electric power to fulfill downstream water contracts. During the current year, the Lower Colorado River Authority also reported that 11,036 acre-ft was diverted from the river upstream to Cedar Creek Reservoir. Cedar Creek Reservoir is located 10 mi north of the Colorado River and 3.5 mi west of Fayetteville. Gage-height telemeter at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1852, 51.6 ft, present datum, in July 1869 and Dec. 6, 1913, from information by local resident. River divided each time and left Columbus on an island.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	969	502	538	486	542	15200	4070	9400	7850	27900	3060	1160
2	930	500	554	465	505	14700	3220	11600	7520	27800	3250	1340
3	847	535	759	461	486	11100	3930	12000	7110	27800	2790	1340
4	818	537	632	468	481	6780	6970	11200	6650	27800	2560	1140
5	781	570	614	458	482	6020	7500	8220	5230	27900	2430	1180
6	743	525	585	443	486	6320	9050	7540	5020	27700	2310	1200
7	669	494	536	443	521	6550	11400	7010	18200	27500	2240	1180
8	606	511	539	585	548	6660	9060	5510	15700	27400	2330	1310
9	569	531	467	1080	545	6840	7920	4520	13500	27400	2910	1480
10	580	558	455	768	582	9510	7690	5080	12000	27200	2940	1360
11	592	641	396	731	677	10700	7480	8330	19400	26100	2840	1450
12	585	573	388	747	853	14700	7380	6770	23800	22000	2320	1530
13	554	512	380	676	2920	14400	7340	5180	20200	16600	2170	1380
14	531	503	363	596	4640	13700	7220	5150	15700	11600	2040	1250
15	480	500	963	569	4690	15100	7130	4970	14300	9460	1750	1260
16	444	450	1640	581	2110	16700	7060	5930	13700	8330	1610	1220
17	436	423	1650	548	1280	23000	7050	7170	13800	6610	1540	1190
18	442	431	2380	496	978	22700	7030	9050	12800	6100	1410	1210
19	436	439	1480	540	800	18100	7040	5430	10300	5630	1260	1130
20	431	484	965	568	1790	15100	6830	4720	9060	5340	1180	1110
21	421	501	744	10300	8740	12000	4760	7230	8860	3800	1110	1070
22	427	500	713	9320	3800	9930	3020	10500	10300	4150	1110	1100
23	419	469	658	3530	1750	7520	3480	8230	10800	4110	1270	1110
24	409	1070	536	1540	2980	6560	4970	9290	17300	4500	1200	1110
25	522	1560	452	1030	4370	6270	6370	10900	23500	4020	1170	1190
26	588	953	451	822	6270	6110	20300	9300	27300	3700	1220	1170
27	459	778	483	707	9080	6140	17300	5980	28200	3470	1270	968
28	457	865	551	609	13500	6140	15200	5140	28300	3210	1260	968
29	440	684	509	558	---	5930	11300	6320	28100	3080	1300	1030
30	469	586	455	506	---	5870	8820	9730	27900	3060	1310	1000
31	441	---	472	505	---	5660	---	9240	---	3220	1200	---
TOTAL	17495	18185	22308	41136	76406	332010	237890	236640	462400	434490	58360	36136
MEAN	564	606	720	1327	2729	10710	7930	7634	15410	14020	1883	1205
MAX	969	1560	2380	10300	13500	23000	20300	12000	28300	27900	3250	1530
MIN	409	423	363	443	481	5660	3020	4520	5020	3060	1110	968
AC-FT	34700	36070	44250	81590	151600	658500	471900	469400	917200	861800	115800	71680

# COLORADO RIVER MAIN STEM

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08161000 COLORADO RIVER AT COLUMBUS, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1916 - 1997#, BY WATER YEAR (WY)

MEAN	2941	2273	2132	2398	2685	2519	3567	5554	5405	3332	1953	2931
MAX	25310	13360	16450	19800	33800	20220	17350	40630	30060	25710	10030	32690
(WY)	1937	1975	1992	1992	1992	1992	1922	1922	1935	1938	1938	1936
MIN	204	197	162	182	203	275	308	1257	574	569	128	347
(WY)	1935	1918	1964	1964	1967	1952	1925	1937	1934	1933	1917	1934

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1916 - 1997#
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ANNUAL TOTAL	452898	1973456	
ANNUAL MEAN	1237	5407	3151
HIGHEST ANNUAL MEAN			10810
LOWEST ANNUAL MEAN			653
HIGHEST DAILY MEAN	10400	Sep 22	28300
LOWEST DAILY MEAN	340	Mar 15	363
ANNUAL SEVEN-DAY MINIMUM	378	Mar 13	426
INSTANTANEOUS PEAK FLOW			28600
INSTANTANEOUS PEAK STAGE			28.64
ANNUAL RUNOFF (AC-FT)	898300	3914000	2283000
10 PERCENT EXCEEDS	3030	14900	6000
50 PERCENT EXCEEDS	833	1790	1630
90 PERCENT EXCEEDS	427	481	397

# Period of regulated streamflow.



## COLORADO RIVER MAIN STEM

08162000 COLORADO RIVER AT WHARTON, TX

**LOCATION.**--Lat 29°18'32", long 96°06'13", Wharton County, Hydrologic Unit 12090302, near left bank at downstream side of downstream bridge on U.S. Highway 59 in Wharton, 1,100 ft downstream from Texas and New Orleans Railroad Company bridge, 12 mi upstream from Jones Creek, and at mile 66.6.

**DRAINAGE AREA.**--42,003 mi<sup>2</sup>, approximately, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--July 1916 to August 1918 (intermittent periods), March 1919 to September 1925, July and August 1938 (flood discharge measurements only), October 1938 to current year. June to November 1901, May to September 1902, daily records published in U.S. Department of Agriculture, Office of Experiment Stations, Bulletin Nos. 119 and 133. Gage-height records collected in this vicinity since 1935 are contained in reports of the National Weather Service.

Water-quality records.--Chemical analyses: April 1944 to September 1995. Chemical and biochemical analyses: January 1968 to September 1995.

Pesticide analyses: October 1967 to June 1982. Sediment analyses: October 1974 to September 1995. Radiochemical analyses: December 1973 to September 1995.

**REVISED RECORDS.**--WSP 878: 1938(M). WDR TX-81-3: Drainage area. WDR TX-88-3: 1985.

**GAGE.**--Water-stage recorder. Datum of gage is 52.42 ft above sea level. Prior to Oct. 1, 1938, various types of recording and nonrecording gages 800 ft upstream at different datum. Oct. 1, 1938 to June 1, 1956, nonrecording gage 100 ft upstream at datum 13.00 ft higher. June 1, 1966 to Sept. 30, 1975, water-stage recorder at present site at datum 13.00 ft higher. Oct. 1, 1975 to Mar. 1, 1983, water-stage recorder at present site at datum 10.00 ft higher.

**REMARKS.**--Records fair. Since installation of gage in Oct. 1938, at least 10% of contributing drainage area has been regulated by Lake Austin. Flow is also affected at times by discharge from the flood-detention pools of 20 floodwater-retarding structures with a combined detention capacity of 25,570 acre-ft. There are many diversions above station for irrigation, municipal supply, cooling water for thermal-electric power plant, and for oil field operations. Satellite telemeter at gage.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1869, 51.9 ft Dec. 8, 1913, present datum, from information by local residents; below Wharton floodwater combined with that of the Brazos River. Flood of about July 12, 1869, reached about same height. Flood of June 20, 1935, reached a stage of 51.2 ft, present datum, furnished by National Weather Service (discharge, 159,000 ft<sup>3</sup>/s), from rating curve defined by current-meter measurements below 145,000 ft<sup>3</sup>/s. Flood of July 30, 1938, reached a stage of 50.4 ft, present datum, observed by U.S. Geological Survey personnel (discharge, 145,000 ft<sup>3</sup>/s).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	935	496	752	689	916	14800	6160	9430	10500	29100	2420	876
2	950	487	675	858	906	16700	5090	9780	8530	29100	2370	793
3	869	530	622	758	884	15500	5460	11600	7620	29200	2480	759
4	696	534	735	676	859	10800	9460	12000	7000	29300	2260	771
5	558	576	766	621	829	7230	12400	11200	6230	29400	1980	696
6	515	581	723	580	794	6510	10700	8620	4790	29400	1880	600
7	459	606	687	557	795	6700	10300	7780	6750	29200	1810	609
8	399	571	651	551	822	6910	12000	7120	20200	29000	1520	623
9	357	520	624	559	833	7000	9940	5810	17200	28900	1390	653
10	363	539	602	1040	827	7300	8710	5000	13900	28800	1710	805
11	332	564	552	1140	816	9790	12600	5370	12900	28700	1800	847
12	331	615	529	907	1120	16000	9360	8110	20500	27400	1850	870
13	338	641	467	925	2010	21300	8480	7210	23800	22700	1550	920
14	327	587	449	871	3610	17600	8240	5550	20000	16300	1460	900
15	305	542	480	806	5050	15700	7740	5380	15600	10900	1330	826
16	417	538	782	733	5250	17100	7630	5300	14000	8840	1190	824
17	463	529	1830	698	2860	24200	7530	6140	13200	7470	1040	817
18	422	486	1870	683	1940	29900	7480	7790	14600	5850	936	798
19	449	467	2470	646	1530	28000	7560	9220	13000	5290	847	782
20	482	466	1910	647	1550	21400	7820	5890	10300	4840	742	813
21	484	487	1320	1460	3480	17100	7390	4890	9210	4520	640	869
22	478	511	973	13800	9420	13200	5600	7890	13200	3320	600	1060
23	467	533	811	11700	5050	10800	3890	11200	12900	3420	625	1520
24	469	1030	766	5080	2640	8440	3780	9240	12800	3430	944	2170
25	482	1080	672	2760	3220	7530	5360	11500	19000	3820	1060	1370
26	485	1640	615	2000	4870	7640	8040	12500	24700	3550	980	1220
27	662	1260	580	1600	7070	7020	20800	10400	28100	3160	948	1190
28	569	910	573	1370	10100	6820	19700	7230	29000	2930	973	1080
29	511	957	634	1190	---	6690	16700	6870	29100	2660	952	910
30	499	893	637	1070	---	6530	12100	6580	29100	2510	936	951
31	499	---	691	987	---	6440	---	10100	---	2440	934	---
TOTAL	15572	20176	26448	57962	80051	398650	278020	252700	467730	465450	42157	27922
MEAN	502	673	853	1870	2859	12860	9267	8152	15590	15010	1360	931
MAX	950	1640	2470	13800	10100	29900	20800	12500	29100	29400	2480	2170
MIN	305	466	449	551	794	6440	3780	4890	4790	2440	600	600
AC-FT	30890	40020	52460	115000	158800	790700	551500	501200	927700	923200	83620	55380



# COLORADO RIVER MAIN STEM

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08162000 COLORADO RIVER AT WHARTON, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997#, BY WATER YEAR (WY)

MEAN	2111	2301	2257	2533	2998	2737	3136	4259	4867	2574	1385	1903
MAX	12350	13870	15060	21810	35520	21550	13730	27300	30910	15010	3916	9394
(WY)	1958	1975	1992	1992	1992	1992	1977	1957	1987	1997	1945	1961
MIN	296	220	253	224	268	328	566	825	838	706	406	436
(WY)	1957	1957	1990	1964	1967	1952	1951	1962	1948	1967	1964	1954

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1939 - 1997#	
ANNUAL TOTAL	362209		2132838		2750	
ANNUAL MEAN	990		5843		11120	1992
HIGHEST ANNUAL MEAN					615	1964
LOWEST ANNUAL MEAN					90600	Jul 3 1940
HIGHEST DAILY MEAN	10300	Sep 23	29900	Mar 18	42	Aug 22 1964
LOWEST DAILY MEAN	231	Aug 10	305	Oct 15	110	Dec 11 1956
ANNUAL SEVEN-DAY MINIMUM	336	Oct 9	336	Oct 9	100000	Jul 3 1940
INSTANTANEOUS PEAK FLOW			30600	Mar 18	48.99	Jul 3 1940
INSTANTANEOUS PEAK STAGE			31.29	Mar 18	1992000	
ANNUAL RUNOFF (AC-FT)	718400		4230000		5490	
10 PERCENT EXCEEDS	1960		16500		1320	
50 PERCENT EXCEEDS	618		1850		470	
90 PERCENT EXCEEDS	447		529			

e Estimated

# Period of regulated streamflow.

08162500 COLORADO RIVER NEAR BAY CITY, TX

**LOCATION.**--Lat 28°58'26", long 96°00'44", Matagorda County, Hydrologic Unit 12090302, on left bank, 6,300 ft downstream from bridge on State Highway 35, 7,100 ft downstream from Texas and New Orleans Railroad Co. bridge, 2.8 mi west of Bay City, and at mile 32.5.

**DRAINAGE AREA.**--42,240 mi<sup>2</sup>, approximately, of which 11,403 mi<sup>2</sup> probably is noncontributing.

**PERIOD OF RECORD.**--July 1940 (WSP 1046), April 1948 to current year. Records of elevation collected in this vicinity since 1946 are contained in reports of the National Weather Service.

Water-quality records.--Chemical and biochemical analyses: October 1974 to September 1975.

**REVISED RECORDS.**--WDR TX-81-3: Drainage area. WDR TX-88-3: 1985.

**GAGE.**--Water-stage recorder. Datum of gage is sea level. July 2-6, 1940, nonrecording gage at highway bridge, 6,300 ft upstream at datum 30.60 ft lower. On February 19, 1992, gage was temporarily moved 6,200 ft upstream at same datum. Gage re-established on left bank 6,300 ft downstream on May 12, 1993.

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage in April 1948, at least 10% of contributing drainage area has been regulated by Lake Austin. Flow is also affected at times by discharge from the flood-detention pools of 20 floodwater-retarding structures with a combined detention capacity of 25,570 acre-ft. These structures control runoff from a 73.1 mi<sup>2</sup> area in the Cummins Creek watershed. There are many other diversions above this station for irrigation and for municipal supply. Radio telemeter at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum elevation since 1869, 56.1 ft Dec. 10, 1913. Flood in July 1869 probably reached about same elevation. Elevation of other floods are as follows: May 8, 1922, 55.4 ft; June 1929, 55.0 ft; June 22, 1935, 54.6 ft; Oct. 5, 1936, 52.2 ft; Aug. 2, 1938, 53.4 ft; Nov. 27, 1940, 47.6 ft. All above flood data from information by Texas and New Orleans Railroad Co. and adjusted to present site. 48.2 ft, present datum, July 4, 1940, at site 6,300 ft upstream at bridge on State Highway 35, observed by U.S. Army Corps of Engineers (elevation, 46.6 ft), adjusted to present site; no flow at times in 1951-53 and 1956.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	736	821	823	3890	777	12000	6120	9680	9960	26800	1670	825
2	586	539	679	2230	701	15200	5970	8790	8230	27000	1700	733
3	613	517	610	1340	696	15500	9600	10300	6880	27100	1660	621
4	531	679	561	926	653	12800	13400	11100	6120	27100	1740	675
5	488	517	738	684	607	8250	18800	11000	5550	27300	1420	609
6	640	555	680	555	575	6270	15400	8700	4370	27300	1260	527
7	753	607	619	245	561	6180	9690	7060	3610	27300	1210	513
8	649	517	563	188	533	6350	11400	6640	13200	27600	1340	503
9	370	473	534	198	567	6580	10300	6050	17300	27500	1080	551
10	267	463	535	880	574	6590	8570	6130	13300	27200	910	721
11	275	446	496	1270	558	8020	17600	5180	11200	27300	1100	895
12	247	455	447	1170	1030	17100	19300	6270	15300	26700	1790	844
13	264	528	388	1500	3260	24200	12400	7660	22300	23600	1560	997
14	276	531	359	1740	3000	19300	8530	5560	20600	17800	1290	1060
15	302	534	405	1110	3800	15300	7630	4940	15900	12000	1320	948
16	375	625	1310	876	5280	15700	7120	5030	13300	8690	1210	841
17	597	669	1870	678	3700	27700	6910	5360	12500	7540	1020	866
18	464	512	1980	621	2210	35400	6790	6280	12900	5900	796	858
19	448	494	1990	567	1610	34800	6880	8730	13200	4940	684	797
20	609	504	2210	536	1330	23500	8030	6450	10700	4590	631	844
21	565	474	1680	1280	3260	18100	7330	4570	9010	4200	549	961
22	458	393	1210	9770	7000	14100	6080	5120	10800	3460	470	3190
23	425	515	915	15200	7270	11400	4170	12100	13000	2570	510	8580
24	642	820	743	7360	3260	9130	3210	10200	11300	2840	709	10200
25	994	3600	680	3680	2410	7470	4230	11500	15200	3180	1000	6220
26	1070	2080	691	2290	3640	12000	5230	12700	21300	3040	1070	2620
27	793	1640	646	1730	5520	8690	15900	10600	25700	2660	973	1980
28	750	1140	547	1570	7590	7010	19700	7320	27300	2360	994	1650
29	616	968	516	1170	---	6590	17100	5410	27100	2150	1040	1370
30	638	1000	625	964	---	6370	13400	5490	27000	1980	940	1220
31	1030	---	2230	865	---	6440	---	7910	---	1770	897	---
TOTAL	17471	23616	28280	67083	71972	424040	306790	239830	424130	441470	34543	53219
MEAN	564	787	912	2164	2570	13680	10230	7736	14140	14240	1114	1774
MAX	1070	3600	2230	15200	7590	35400	19700	12700	27300	27600	1790	10200
MIN	247	393	359	188	533	6180	3210	4570	3610	1770	470	503
AC-FT	34650	46840	56090	133100	142800	841100	608500	475700	841300	875700	68520	105600

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1948 - 1997#, BY WATER YEAR (WY)

	MEAN	2215	2184	2248	2619	3288	2765	2889	4079	4682	1743	847	1747
MAX	12820	13470	16200	25780	42200	25780	13410	27750	30360	14240	2876	11160	
(WY)	1958	1975	1992	1992	1992	1992	1977	1957	1987	1997	1961	1961	
MIN	254	226	292	249	246	257	125	227	155	1.00	114	93.9	
(WY)	1990	1957	1990	1957	1967	1967	1964	1964	1971	1967	1964	1966	

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1948 - 1997#
ANNUAL TOTAL	323881	2132444	
ANNUAL MEAN	885	5842	2617
HIGHEST ANNUAL MEAN			14270
LOWEST ANNUAL MEAN			375
HIGHEST DAILY MEAN	10800	35400	69800
LOWEST DAILY MEAN	20	188	.00
ANNUAL SEVEN-DAY MINIMUM	20	286	.44
INSTANTANEOUS PEAK FLOW		37900	84100
INSTANTANEOUS PEAK STAGE		29.29	46.40
ANNUAL RUNOFF (AC-FT)	642400	4230000	1896000
10 PERCENT EXCEEDS	1880	15900	5760
50 PERCENT EXCEEDS	565	1980	895
90 PERCENT EXCEEDS	171	517	241

# Period of regulated streamflow.

## TRES PALACIOS RIVER MAIN STEM

139

08162600 TRES PALACIOS RIVER NEAR MIDFIELD, TX

**LOCATION.**--Lat 28°55'40", long 96°10'15", Matagorda County, Hydrologic Unit 12100401, at left downstream end of bridge on Farm Road 456, 1.0 mi downstream from Juanita Creek, and 2.4 mi southeast of Midfield.

**DRAINAGE AREA.**--145 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1970 to current year. Prior to October 1973, published as Tres Palacios Creek near Midfield.

Water-quality records.--Chemical, biochemical, and pesticide analyses: October 1968 to September 1981.

**GAGE.**--Water-stage recorder. Datum of gage is 5.38 ft above sea level. June 17, 1970, to Apr. 28, 1988, at same site and datum. Apr. 29, 1988, to Sept. 4, 1991, at right downstream end of bridge at same datum.

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation. There are ten known diversions above station, but amounts are unknown. An undetermined amount of water from irrigated rice fields enters the river at various points upstream from station. Extensive channel cleaning upstream and downstream from the gage was begun during the 1983 water year and completed during the 1984 water year. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1885, 37 ft in June 1960, and 35 ft in August 1945, from information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,600 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 25	0900	1,660	17.57	Mar. 26	1200	3,380	23.50
Dec. 31	2400	2,820	21.94	Apr. 3	2200	4,290	25.57
Jan. 22	0600	2,840	21.98	Apr. 11	2300	5,760	27.35
Feb. 21	1200	1,660	17.55	May 10	0800	7,030	28.41
Mar. 12	1900	4,800	26.44	May 23	0515	2,190	19.75
Mar. 17	2000	7,610	28.86	Sept. 23	0630	6,920	28.67

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	15	29	2610	21	61	111	17	53	14	23	13
2	12	11	25	1580	20	42	228	13	46	16	23	11
3	10	8.1	19	491	17	33	2970	11	27	13	21	9.9
4	9.1	7.0	16	214	15	27	3260	8.4	22	12	23	8.1
5	8.6	6.4	14	116	13	21	2540	7.4	21	14	22	9.0
6	8.6	6.0	12	71	12	17	1170	6.8	19	34	17	10
7	8.0	14	10	48	12	20	384	6.2	21	27	11	8.3
8	8.1	17	9.0	36	12	16	160	5.3	22	24	8.1	8.9
9	7.7	9.9	8.4	34	13	13	96	772	31	20	8.1	5.4
10	8.5	8.1	8.1	34	13	12	64	6020	20	21	7.1	12
11	9.0	6.0	7.8	30	11	12	2940	1910	30	15	12	22
12	8.4	5.6	7.3	24	192	3080	4150	462	24	13	11	25
13	9.0	5.2	7.3	207	736	2830	1230	177	23	12	11	21
14	11	6.0	7.8	303	266	558	373	91	16	9.2	11	16
15	14	7.1	68	116	101	191	169	56	15	8.1	12	24
16	12	6.9	680	70	52	156	99	123	13	7.9	11	20
17	13	5.5	412	54	32	5300	64	104	21	8.3	8.8	15
18	15	5.4	143	38	24	6270	45	48	30	9.4	8.1	11
19	11	6.1	67	27	19	6130	37	30	64	13	12	12
20	8.8	5.9	36	36	84	2030	186	24	66	12	11	12
21	7.3	5.0	25	938	1370	483	116	23	30	16	9.0	48
22	12	3.8	20	2340	528	211	48	445	26	21	9.6	2280
23	15	3.4	17	720	151	117	28	1850	37	40	11	6650
24	45	288	14	254	74	74	20	1300	36	44	22	6290
25	326	1450	13	130	61	114	16	923	18	24	29	4690
26	508	577	12	73	96	2750	16	524	20	14	26	2100
27	169	187	12	53	249	1100	34	186	26	17	15	685
28	62	90	20	92	115	319	32	91	32	29	9.9	350
29	28	52	19	47	---	158	49	59	20	30	8.9	194
30	18	35	19	27	---	284	29	39	15	25	24	110
31	21	---	1360	21	---	376	---	75	---	24	23	---
TOTAL	1417.1	2853.4	3117.7	10834	4309	32805	20664	15407.1	844	586.9	458.6	23670.6
MEAN	45.7	95.1	101	349	154	1058	689	497	28.1	18.9	14.8	789
MAX	508	1450	1360	2610	1370	6270	4150	6020	66	44	29	6650
MIN	7.3	3.4	7.3	21	11	12	16	5.3	13	7.9	7.1	5.4
AC-FT	2810	5660	6180	21490	8550	65070	40990	30560	1670	1160	910	46950

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1997, BY WATER YEAR (WY)

	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	238	130	138	150	157	126	159	247	192	114	53.6	233																
MAX	1375	582	568	542	978	1058	689	1080	699	623	163	1308																
(WY)	1985	1993	1992	1991	1992	1997	1997	1982	1996	1981	1974	1979																
MIN	10.2	9.53	5.87	4.83	6.66	7.79	10.4	19.7	10.4	18.9	14.8	14.5																
(WY)	1992	1991	1991	1971	1976	1996	1989	1978	1990	1997	1997	1990																

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1970 - 1997

ANNUAL TOTAL	44482.1	116967.4	
ANNUAL MEAN	122	320	
HIGHEST ANNUAL MEAN			162
LOWEST ANNUAL MEAN			325
HIGHEST DAILY MEAN	6780	6650	12500
LOWEST DAILY MEAN	2.9	3.4	42.2
ANNUAL SEVEN-DAY MINIMUM	4.8	5.0	1.0
INSTANTANEOUS PEAK FLOW		7610	17000
INSTANTANEOUS PEAK STAGE		28.86	32.43
ANNUAL RUNOFF (AC-FT)	88230	232000	117200
10 PERCENT EXCEEDS	174	682	257
50 PERCENT EXCEEDS	12	23	24
90 PERCENT EXCEEDS	6.0	8.1	8.5

## LAVACA RIVER MAIN STEM

08163500 LAVACA RIVER AT HALLETTSVILLE, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 29°26'35", long 96°56'41", Lavaca County, Hydrologic Unit 12100101, at downstream side of bridge on U.S. Highway 77 in Hallettsville and 0.7 mi downstream from Campbell Branch.

**DRAINAGE AREA.**--108 mi<sup>2</sup>.

**PERIOD OF RECORD.**--July 1939 to April 1993 (daily mean discharge). April 1993 to current year (peak discharges).

**REVISED RECORDS.**--WSP 1312: 1942(M), 1944(M). WSP 1732: 1952(M). WSP 2123: Drainage area.

**GAGE.**--Crest-stage gage. Datum of gage is 186.72 ft above sea level. Prior to Apr. 19, 1960, water-stage recorder for high stages and movable nonrecording gage for stages below about 6.2 ft, Apr. 20, 1960, to June 2, 1961, movable nonrecording gage at same site. June 3, 1961 to Apr. 7, 1993, water-stage recorder at site 75 ft downstream. All gages at same datum.

**REMARKS.**--Records good. No known regulation or diversions. The Lavaca County Flood Control District No. 3 began channel rectification 1.6 mi downstream from gage in August 1983. This rectification project reached the gage on Jan. 26, 1984, and was completed in June 1984. The channel was previously rectified in 1959-60.

**AVERAGE DISCHARGE.**--53 years (water years 1940-92), 50.8 ft<sup>3</sup>/s (6.39 in/yr), 36,780 acre-ft/yr.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 99,500 ft<sup>3</sup>/s Aug. 31, 1981 (gage height, 41.1 ft, from floodmark), from rating curve extended above 23,000 ft<sup>3</sup>/s on basis of slope-area measurement of peak flow; no flow at times in 1953, 1956, and 1990.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage from about 1870 to 1940, 32.8 ft July 16, 1936, from information by local resident. Maximum stage since at least 1840, that of Aug. 31, 1981.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,300 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 21	Unknown	3,480	15.74	Apr. 11	Unknown	21,600	28.25
Mar. 17	Unknown	5,640	18.17	June 8	Unknown	13,500	24.08

## LAVACA RIVER MAIN STEM

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08164000 LAVACA RIVER NEAR EDNA, TX

**LOCATION.**--Lat 28°57'35", long 96°41'10", Jackson County, Hydrologic Unit 12100101, at downstream side near center of upstream bridge of two bridges on U.S. Highway 59, 660 ft upstream from Texas and New Orleans Railroad Co. bridge, and 2.8 mi southwest of Edna.

**DRAINAGE AREA.**--817 mi<sup>2</sup>.

**PERIOD OF RECORD.**--August 1938 to current year.

Water-quality records.--Chemical analyses: August 1945 to September 1977. Chemical and biochemical analyses: February 1971 to August 1993.

Pesticide analyses: January 1968 to August 1981. Sediment analyses: November 1977 to August 1993.

**REVISED RECORDS.**--WSP 1923: 1955. WRD TX-73-1: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 14.10 ft above sea level. Prior to June 6, 1939, nonrecording gage (property of U.S. Army Corps of Engineers); June 6, 1939 to Apr. 3, 1957, nonrecording gage at site 110 ft downstream; Apr. 4, 1957, to Mar. 21, 1961, nonrecording gage; all at same datum.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation. Small diversions above station for irrigation.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1880, 33.8 ft May 25, 1936 (discharge, 83,400 ft<sup>3</sup>/s), from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 4,100 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 23	0100	10,600	23.24	May 10	2300	7,340	21.43
Mar. 13	0600	9,310	22.63	May 18	1700	6,680	20.92
Mar. 18	2000	22,400	26.79	May 26	1100	12,600	24.06
Mar. 27	0100	7,410	21.48	June 9	1300	13,100	24.24
Apr. 5	1300	26,100	27.47	June 23	0100	32,300	28.43
Apr. 12	1800	49,800	30.38				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	17	30	1010	113	120	216	178	974	282	90	46
2	57	15	26	1100	106	108	1870	169	889	257	92	46
3	51	13	24	438	101	98	6370	162	364	239	90	45
4	46	12	22	217	97	89	13600	152	263	225	87	44
5	42	12	22	145	88	82	23000	144	549	213	84	44
6	41	12	22	106	81	75	16200	139	2620	203	81	43
7	38	13	21	84	80	69	6700	134	3970	191	78	42
8	34	14	20	73	82	66	1080	131	9520	183	78	41
9	32	14	18	177	77	63	676	947	12600	175	77	41
10	29	13	17	509	73	61	498	5870	8620	168	79	42
11	27	14	17	183	69	87	3110	4190	4190	162	88	40
12	25	13	17	113	100	5350	33700	731	1890	155	78	39
13	24	13	16	89	1020	8140	28500	383	686	150	73	39
14	23	12	17	77	449	3010	8940	261	456	145	71	39
15	21	12	48	70	180	744	1180	211	353	139	69	37
16	26	13	200	67	119	482	712	842	296	135	65	38
17	26	14	332	61	91	6230	543	3460	271	131	63	39
18	23	13	117	57	76	17800	446	6210	258	127	62	38
19	27	13	69	53	68	17700	389	1850	670	123	62	35
20	22	13	50	71	93	9640	350	445	475	123	64	35
21	21	13	41	3370	1700	1480	314	421	541	122	68	36
22	20	13	37	8870	2780	659	278	1600	14100	127	62	46
23	20	12	35	9800	511	446	248	5190	24500	123	63	59
24	20	30	32	2430	222	334	229	7890	10300	115	59	71
25	20	154	29	504	163	333	216	7390	1680	109	54	118
26	18	277	29	312	145	5010	210	11900	793	104	53	65
27	18	95	28	236	152	3940	224	6720	1170	102	52	49
28	25	55	27	189	138	532	224	1030	703	99	51	43
29	30	42	27	156	---	339	199	726	422	97	51	40
30	23	36	26	136	---	259	187	519	324	93	49	38
31	20	---	641	123	---	230	---	769	---	92	47	---
TOTAL	915	992	2057	30826	8974	83576	150409	70764	104447	4709	2140	1378
MEAN	29.5	33.1	66.4	994	321	2696	5014	2283	3482	152	69.0	45.9
MAX	66	277	641	9800	2780	17800	33700	11900	24500	282	92	118
MIN	18	12	16	53	68	61	187	131	258	92	47	35
AC-FT	1810	1970	4080	61140	17800	165800	298300	140400	207200	9340	4240	2730
CFSM	.04	.04	.08	1.22	.39	3.30	6.14	2.79	4.26	.19	.08	.06
IN.	.04	.05	.09	1.40	.41	3.81	6.85	3.22	4.76	.21	.10	.06



## LAVACA RIVER MAIN STEM

08164000 LAVACA RIVER NEAR EDNA, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1997, BY WATER YEAR (WY)

MEAN	373	277	243	290	388	274	515	690	664	215	82.0	320
MAX	7118	3431	2400	1564	5214	2696	5014	3239	5005	3999	713	2842
(WY)	1995	1941	1977	1979	1992	1997	1997	1982	1973	1940	1946	1978
MIN	.58	.003	.19	.055	13.5	6.58	4.43	8.16	.72	2.14	.16	.13
(WY)	1991	1957	1991	1957	1954	1956	1956	1956	1990	1954	1990	1989

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1938 - 1997

ANNUAL TOTAL	34066.5		461187									
ANNUAL MEAN	93.1		1264							360		
HIGHEST ANNUAL MEAN										1385		1992
LOWEST ANNUAL MEAN										6.12		1956
HIGHEST DAILY MEAN	4940	Sep 21				33700	Apr 12			122000		Oct 19 1994
LOWEST DAILY MEAN	2.8	Aug 12				12	Nov 4			.00		Nov 10 1954
ANNUAL SEVEN-DAY MINIMUM	3.6	Aug 9				13	Nov 3			.00		Jul 2 1956
INSTANTANEOUS PEAK FLOW						49800	Apr 12			150000		Oct 19 1994
INSTANTANEOUS PEAK STAGE						30.38	Apr 12			35.49		Oct 19 1994
ANNUAL RUNOFF (AC-FT)	67570					914800				260900		
ANNUAL RUNOFF (CFSM)	.11					1.55				.44		
ANNUAL RUNOFF (INCHES)	1.55					21.00				5.99		
10 PERCENT EXCEEDS	118					3210				411		
50 PERCENT EXCEEDS	19					101				52		
90 PERCENT EXCEEDS	7.0					20				9.0		

## LAVACA RIVER BASIN

143

08164300 NAVIDAD RIVER NEAR HALLETTSVILLE, TX

**LOCATION.**--Lat 29°28'00", long 96°48'45", Lavaca County, Hydrologic Unit 12100102, on right bank 28 ft downstream from bridge on U.S. Highway 90-A, 0.8 mi downstream from Mixons Creek, 1.2 mi southwest of Sublime, and 8 mi northeast of Hallettsville.

**DRAINAGE AREA.**--332 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1961 to current year.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 159.28 ft above sea level.

**REMARKS.**--Records good. No known regulation or diversion.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1860, 40 ft in June 1940; flood in July 1936 reached a stage of 39 ft, from information by local residents and Southern Pacific Railroad Company.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 21	2100	7,910	25.36	Apr. 11	0900	6,060	24.00
Feb. 21	1500	3,160	20.75	May 22	0400	4,920	22.95
Mar. 17	1400	5,660	23.65	June 8	0200	16,300	29.14
Apr. 4	1300	7,220	24.90				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	5.7	17	88	40	59	35	63	150	e44	e9.0	1.3
2	11	5.2	15	35	38	58	821	58	74	e41	e9.0	1.8
3	11	4.6	14	20	37	55	1280	54	58	e38	e9.0	4.4
4	9.9	4.8	14	17	35	52	4720	50	52	e35	8.8	30
5	9.5	5.4	14	15	32	49	2480	48	51	e32	e8.3	20
6	9.2	5.7	14	14	30	45	363	46	108	e31	e7.8	4.6
7	9.1	7.4	13	13	31	44	160	45	6660	e28	e7.6	3.2
8	8.4	8.3	12	153	32	44	97	43	9870	e26	7.1	2.8
9	7.6	7.7	12	284	30	44	81	46	588	e24	6.9	2.5
10	6.9	6.5	12	59	29	43	79	119	184	e23	7.2	2.3
11	6.5	6.4	12	34	28	43	2900	81	134	e22	6.0	2.0
12	6.1	5.9	12	26	214	1150	259	54	108	20	5.1	2.0
13	5.9	5.9	12	24	180	476	106	49	89	19	4.8	2.1
14	5.9	5.9	12	22	68	144	80	53	76	18	4.1	2.0
15	5.9	6.4	202	22	43	67	72	46	67	17	3.8	2.0
16	6.8	6.7	479	21	34	477	66	1490	61	16	3.5	1.9
17	7.0	6.7	118	18	31	4670	67	690	68	e15	3.1	1.6
18	5.4	6.2	30	18	29	1890	64	222	174	e15	2.6	1.5
19	4.8	6.9	28	17	28	282	65	113	91	e14	2.5	1.3
20	4.8	7.2	22	193	590	149	72	122	83	e13	2.4	1.7
21	4.7	7.1	20	5590	2940	86	67	612	244	e13	2.1	2.9
22	4.2	6.7	19	4470	e520	71	62	2270	1550	e12	1.9	6.6
23	3.9	7.1	18	261	e165	60	56	224	266	e11	1.9	13
24	3.9	601	16	115	e110	54	53	707	115	e11	1.8	28
25	23	412	15	80	80	49	54	1060	87	e10	1.8	15
26	31	56	15	64	71	47	1150	179	81	e9.8	1.6	7.8
27	19	31	15	56	71	44	346	e372	65	e9.7	1.5	5.8
28	11	23	14	49	65	42	120	e477	59	e9.4	1.6	5.2
29	8.3	21	15	46	---	41	83	e239	e53	e9.2	1.7	4.8
30	7.2	20	14	43	---	38	70	e113	e48	e9.2	1.6	4.5
31	6.4	---	22	41	---	36	---	197	---	e9.1	1.4	---
TOTAL	276.3	1310.4	1247	11908	5601	10409	15928	9942	21314	604.4	137.5	184.6
MEAN	8.91	43.7	40.2	384	200	336	531	321	710	19.5	4.44	6.15
MAX	31	601	479	5590	2940	4670	4720	2270	9870	44	9.0	30
MIN	3.9	4.6	12	13	28	36	35	43	48	9.1	1.4	1.3
AC-FT	548	2600	2470	23620	11110	20650	31590	19720	42280	1200	273	366
CFSM	.03	.13	.12	1.16	.60	1.01	1.60	.97	2.14	.06	.01	.02
IN.	.03	.15	.14	1.33	.63	1.17	1.78	1.11	2.39	.07	.02	.02

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1997, BY WATER YEAR (WY)

	MEAN	197.2	103	120	139	167	121	213	339	265	24.9	27.7	161
MAX	1538	932	943	691	1251	611	1158	1502	1792	91.6	332	1975	
(WY)	1995	1966	1977	1968	1992	1992	1973	1972	1973	1973	1971	1974	
MIN	.000	.035	.97	6.38	8.46	9.87	7.17	2.39	.68	.16	.014	.014	
(WY)	1991	1991	1991	1990	1996	1991	1996	1996	1990	1990	1990	1990	

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1962 - 1997

ANNUAL TOTAL	11259.48	78862.2	148
ANNUAL MEAN	30.8	216	508
HIGHEST ANNUAL MEAN			1992
LOWEST ANNUAL MEAN			1990
HIGHEST DAILY MEAN	2070	Sep 21	30500
LOWEST DAILY MEAN	.02	Aug 7	.00
ANNUAL SEVEN-DAY MINIMUM	.05	Aug 3	.00
INSTANTANEOUS PEAK FLOW		16300	53500
INSTANTANEOUS PEAK STAGE		29.14	36.05
ANNUAL RUNOFF (AC-FT)	22330	156400	107000
ANNUAL RUNOFF (CFSM)	.093	.65	.44
ANNUAL RUNOFF (INCHES)	1.26	8.84	6.04
10 PERCENT EXCEEDS	29	263	130
50 PERCENT EXCEEDS	8.0	28	22
90 PERCENT EXCEEDS	.54	4.0	2.2

e Estimated

## LAVACA RIVER BASIN

08164350 NAVIDAD RIVER NEAR SPEAKS, TX

LOCATION.--Lat 29°19'18", long 96°42'32", Lavaca County, Hydrologic Unit 12100102, at right downstream end of bridge on Farm Road 530, 100 ft downstream from Ragsdale Creek, and 4.6 mi north of Speaks.

DRAINAGE AREA.--537 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1981 to September 1989, October 1994 to September 1996 (discharge measurements only), October 1996 to September 1997..

GAGE.--Water-stage recorder. Datum of gage is 120.00 ft above sea level.

REMARKS.--Records fair. No known regulation or diversions. Satellite telemeter at station.

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Feb. 22	0330	3,490	18.28	May 22	1945	5,570	21.68
Mar. 13	1045	2,560	16.18	May 25	1545	3,420	18.13
Mar. 17	2100	7,270	23.63	June 8	2115	10,300	25.62
Apr. 3	0030	4,960	20.86	June 22	0200	6,590	22.93
Apr. 5	0245	7,460	23.77	June 22	1230	7,370	23.70
Apr. 11	1000	9,500	25.13				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	1.6	10	103	59	104	129	88	382	83	e18	5.2
2	16	1.4	7.2	190	55	96	2920	77	191	77	e19	4.8
3	15	1.2	4.8	52	52	91	4570	69	142	73	e18	4.2
4	14	1.1	3.6	26	46	78	5740	59	120	68	e19	7.4
5	12	.91	3.2	18	41	67	6670	52	109	64	e18	66
6	12	1.0	3.2	13	35	56	2900	48	139	58	e17	22
7	11	2.0	3.0	10	36	48	372	44	2810	55	e18	9.4
8	9.4	2.5	2.4	21	48	46	228	40	7750	54	e20	7.2
9	7.8	3.4	1.8	594	37	44	182	186	6800	49	e22	6.1
10	6.9	2.8	1.1	167	34	42	157	507	753	46	e19	5.8
11	6.5	1.9	1.0	77	30	36	6680	202	317	43	e17	5.5
12	6.2	1.3	1.1	47	491	43	4220	93	195	40	e18	5.2
13	5.8	1.2	1.1	39	843	788	317	67	147	38	e17	4.8
14	5.8	1.0	.84	34	202	393	197	65	122	36	e16	4.5
15	5.9	1.0	8.3	30	113	166	150	64	106	34	15	4.5
16	6.3	1.1	786	34	84	837	128	848	93	34	9.7	4.5
17	7.0	1.6	227	26	69	5890	114	1910	89	31	9.4	4.4
18	7.7	1.5	91	19	62	6080	105	692	195	29	8.5	4.1
19	6.3	1.0	50	19	58	2110	106	175	175	27	8.1	3.8
20	5.4	1.1	31	107	478	355	110	136	121	27	7.4	3.6
21	5.1	1.4	22	3420	2370	213	113	399	1570	26	7.1	4.3
22	5.7	1.3	18	e6690	2480	163	100	4280	5110	e25	7.0	21
23	5.7	1.2	16	3390	215	140	87	2730	2020	e24	e7.6	e37
24	6.0	158	14	263	131	126	79	1730	290	e23	e7.1	e32
25	5.9	1100	11	162	121	945	80	3070	178	e22	e6.5	e27
26	45	161	8.7	122	168	994	595	780	219	e21	6.7	e30
27	42	56	8.9	102	164	191	1320	209	194	e20	6.70	e10
28	17	28	8.4	84	121	159	243	481	117	e19	6.20	e8.0
29	5.8	16	8.0	72	---	142	140	822	99	e18	5.6	e9.0
30	3.1	13	8.1	67	---	191	104	175	90	e18	5.6	e8.0
31	2.2	---	25	61	---	137	---	737	---	19	5.3	---
TOTAL	328.5	1566.51	1385.74	16059	8643	20771	38856	20835	30643	1201	385.50	369.3
MEAN	10.6	52.2	44.7	518	309	670	1295	672	1021	38.7	12.4	12.3
MAX	45	1100	786	6690	2480	6080	6680	4280	7750	83	22	66
MIN	2.2	.91	.84	10	30	36	79	40	89	18	5.3	3.6
AC-FT	652	3110	2750	31850	17140	41200	77070	41330	60780	2380	765	733

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1982 - 1997h, BY WATER YEAR (WY)

	MEAN	60.6	248	148	153	203	205	203	313	327	31.6	8.73	52.2
	MAX	202	905	744	518	433	670	1295	833	1445	146	38.1	324
	(WY)	1985	1986	1987	1997	1987	1997	1997	1982	1987	1983	1983	1996
	MIN	1.01	1.62	3.63	35.4	22.8	34.9	12.1	24.3	18.5	4.16	.56	.70
	(WY)	1989	1989	1989	1988	1988	1986	1989	1984	1985	1986	1989	1989

SUMMARY STATISTICS

FOR 1997 WATER YEAR

WATER YEARS 1982 - 1997h

ANNUAL TOTAL	141043.55		
ANNUAL MEAN	386		
HIGHEST ANNUAL MEAN		160	
LOWEST ANNUAL MEAN		386	1997
HIGHEST DAILY MEAN		38.6	1988
LOWEST DAILY MEAN	7750		
ANNUAL SEVEN-DAY MINIMUM	.84	Jun 8	
INSTANTANEOUS PEAK FLOW	1.2	Dec 14	
INSTANTANEOUS PEAK STAGE	10300	Nov 14	
ANNUAL RUNOFF (AC-FT)	25.62	Jun 8	
10 PERCENT EXCEEDS	279800	Jun 8	
50 PERCENT EXCEEDS	782		
90 PERCENT EXCEEDS	42		
	3.6		
		13000	Nov 1 1981
		.00	Sep 1 1989
		.00	Sep 1 1989
		10300	Jun 8 1997
		25.62	Jun 8 1997
		115600	
		172	
		25	
		2.6	

e Estimated

h See PERIOD OF RECORD paragraph

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08164350 NAVIDAD RIVER NEAR SPEAKS, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Pesticide analyses: April 1996 to Current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	2,4,5-T TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
MAR 30...	1230	242	652	7.8	20.5	8.3	92	<0.010	<0.010
JUN 04...	1010	297	678	7.8	23.5	6.6	78	<0.010	0.160
JUL 16...	1610	33	879	8.2	28.5	7.4	95	<0.010	<0.010
AUG 15...	1000	15	870	8.0	27.0	6.5	82	<0.010	<0.010

DATE	SILVEX, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	PIC- LORAM UNFILTR RECOVER (UG/L)	TOTAL TRI- THION (UG/L)	CHLOR- PYRIFOS TOTAL RECOVER (UG/L)	DI- AZINON, TOTAL (UG/L)	DISUL- FOTON UNFILTR RECOVER (UG/L)	ETHION TOTAL (UG/L)
MAR 30...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	<0.010
JUN 04...	<0.010	<0.010	<0.010	0.210	<0.010	<0.010	<0.010	--	<0.010
JUL 16...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AUG 15...	<0.010	<0.010	<0.010	0.090	<0.010	<0.010	<0.010	<0.010	<0.010

[illegible]

## LAVACA RIVER BASIN

08164370 NAVIDAD RIVER AT MORALES, TX

LOCATION.--Lat 29°08'07", long 96°44'39", Jackson County, Hydrologic Unit 12100102, on County Road 283, 1.2 mi northeast of Morales.

DRAINAGE AREA.--549 mi<sup>2</sup>.

PERIOD OF RECORD.--October 1994 to September 1995 (discharge measurements only), October 1996 to September 1997.

GAGE.--Water-stage recorder. Datum of gage is 65.44 ft above sea level.

REMARKS.--Records fair. No known regulation. Much of low flow during the irrigation season (April to September) comes from drainage from rice fields irrigated by diversions originating from the Colorado River. Satellite telemeter at station.

PEAK DISCHARGES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 23	1700	6,560	29.30	May 23	1600	4,910	26.61
Mar. 13	0230	6,280	28.89	May 25	1015	4,890	26.58
Mar. 19	0300	7,670	30.83	June 10	0245	7,470	30.57
Apr. 4	2315	7,480	30.58	June 22	0730	8,470	31.75
Apr. 12	0400	7,740	30.92				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	7.2	17	290	69	128	195	119	657	117	26	9.9
2	15	7.0	16	398	65	109	1970	107	320	103	28	9.8
3	14	6.4	13	155	61	100	4930	97	195	94	26	10
4	12	6.0	12	69	57	86	6750	87	147	86	27	10
5	11	5.4	11	43	51	77	7280	79	131	e75	29	13
6	11	4.3	10	30	45	68	6770	73	143	e68	27	72
7	11	4.3	9.9	24	44	59	1990	69	1510	e63	28	22
8	9.6	3.9	9.3	22	48	55	399	66	3410	e61	31	14
9	9.4	4.4	8.7	403	48	54	286	619	6180	e56	36	11
10	9.2	4.8	8.2	348	42	54	224	2150	5990	e56	40	13
11	8.4	5.2	7.6	101	39	72	4500	552	870	e52	40	10
12	7.8	5.6	7.5	57	257	4720	7500	269	394	e49	32	10
13	7.4	5.8	7.4	43	1350	5360	3460	162	294	e47	27	8.1
14	7.3	6.0	7.4	39	426	1210	e300	120	234	e45	30	7.2
15	6.7	6.1	21	36	178	410	e225	108	197	e43	29	6.7
16	6.6	5.7	445	35	101	378	e200	800	172	e42	20	6.8
17	6.4	5.5	522	35	72	5200	e175	2540	157	e41	15	6.0
18	5.8	6.6	127	28	58	7460	e160	1290	207	e37	13	4.5
19	5.9	7.8	64	25	49	7130	e150	377	443	e35	13	4.0
20	6.0	6.9	42	53	183	1790	e145	266	341	e37	13	4.4
21	5.8	7.2	32	2360	1720	493	e145	355	1840	e33	12	5.2
22	5.3	6.3	27	4870	2450	342	e135	2090	8140	e33	12	9.7
23	5.0	6.6	25	6360	789	270	e120	4520	6560	e32	13	41
24	5.6	19	23	2590	198	224	107	3290	1470	e31	13	40
25	5.5	837	21	372	146	462	100	4480	443	e31	12	32
26	5.4	452	20	237	173	2850	169	2510	325	e30	11	36
27	26	79	18	167	278	552	1290	540	429	e29	11	16
28	29	38	18	126	169	325	445	395	252	e28	11	13
29	16	25	18	97	---	239	198	1060	171	e27	10	17
30	10	20	18	83	---	207	143	383	140	e27	9.9	14
31	8.2	---	161	75	---	265	---	586	---	28	9.9	---
TOTAL	308.3	1605.0	1747.0	19571	9166	40749	50461	30159	41762	1536	654.8	476.3
MEAN	9.95	53.5	56.4	631	327	1314	1682	973	1392	49.5	21.1	15.9
MAX	29	837	522	6360	2450	7460	7500	4520	8140	117	40	72
MIN	5.0	3.9	7.4	22	39	54	100	66	131	27	9.9	4.0
AC-FT	612	3180	3470	38820	18180	80830	100100	59820	82830	3050	1300	945

WTR YR 1997 TOTAL 198195.4 MEAN 543 MAX 8140 MIN 3.9 AC-FT 393100

e Estimated



## LAVACA RIVER BASIN

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08164390 NAVIDAD RIVER AT STRANE PARK NEAR EDNA, TX

**LOCATION.**--Lat 29°08'07", long 96°44'39", Jackson County, Hydrologic Unit 12100102, on County Road 401, 6.3 mi north of Edna.**DRAINAGE AREA.**--549 mi<sup>2</sup>.**PERIOD OF RECORD.**--June 1996 to September 1997. Discharge measurements only prior to October 1996.**GAGE.**--Water-stage recorder. Datum of gage is 42.53 ft above sea level.**REMARKS.**--No estimated daily discharges. Records fair. No known regulation or diversions. Much of low flow during the irrigation season (April to September) comes from drainage from rice fields irrigated by diversions originating from the Colorado River. Satellite telemeter at station.**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 4,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 24	0415	6,690	25.59	May 23	2345	4,890	23.84
Mar. 13	1245	6,710	25.61	May 25	2015	4,890	23.84
Apr. 3	1415	9,190	26.74	June 10	1445	7,370	26.07
Apr. 12	1845	10,000	27.01	June 22	1900	13,200	27.89

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	33	11	34	398	83	130	216	125	810	198	30	12
2	28	8.8	30	514	77	109	1680	112	347	178	31	12
3	24	8.4	26	250	74	96	4870	102	204	166	31	12
4	22	7.4	22	115	71	85	7380	93	147	147	31	12
5	20	6.7	20	69	63	75	8850	85	124	130	31	12
6	17	5.8	18	47	57	67	8300	78	123	116	31	40
7	15	5.6	17	36	53	59	4380	74	961	101	31	27
8	14	5.1	16	32	53	52	648	72	2890	95	33	16
9	12	5.0	15	231	56	50	394	518	4770	90	32	16
10	11	5.3	14	464	49	49	300	2700	6690	94	37	15
11	11	5.6	13	125	44	58	3110	918	2420	83	37	13
12	9.3	5.7	12	70	79	4010	8420	396	498	74	33	11
13	8.7	5.8	13	54	1420	6460	6960	213	320	68	26	11
14	8.2	5.8	12	48	557	2560	845	139	252	65	25	10
15	7.6	6.0	50	45	213	523	413	112	211	62	22	9.3
16	9.0	6.1	327	42	118	390	294	593	182	60	20	9.2
17	8.3	6.0	735	43	81	4570	234	2550	163	59	19	8.9
18	8.0	5.9	184	37	64	8060	201	1770	183	56	17	8.4
19	7.4	7.5	92	31	54	9100	180	513	481	51	16	7.4
20	7.5	7.5	60	47	74	4290	180	269	413	48	15	7.1
21	7.1	7.3	46	2060	1550	667	178	289	807	50	14	7.7
22	6.5	6.8	38	4540	2360	401	157	1590	8970	47	13	11
23	6.0	6.2	33	5970	1280	292	139	3990	10300	48	14	20
24	5.7	29	29	4710	240	230	118	3970	3970	44	15	77
25	6.2	618	26	491	160	332	110	4220	766	43	15	53
26	5.7	694	25	270	158	3040	115	3500	512	42	20	49
27	14	133	22	193	258	939	1160	740	564	41	19	27
28	39	72	21	150	183	367	691	421	381	38	17	19
29	27	51	21	120	---	245	221	1070	278	36	15	16
30	15	40	20	100	---	180	152	522	235	34	13	14
31	12	---	208	90	---	247	---	444	---	32	13	---
TOTAL	425.2	1788.3	2199	21392	9529	47733	60896	32188	48972	2396	716	563.0
MEAN	13.7	59.6	70.9	690	340	1540	2030	1038	1632	77.3	23.1	18.8
MAX	39	694	735	5970	2360	9100	8850	4220	10300	198	37	77
MIN	5.7	5.0	12	31	44	49	110	72	123	32	13	7.1
AC-FT	843	3550	4360	42430	18900	94680	120800	63840	97140	4750	1420	1120

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1996 - 1997, BY WATER YEAR (WY)

	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
MEAN	13.7	59.6	70.9	690	340	1540	2030	1038	1632	42.7	42.9	226
MAX	13.7	59.6	70.9	690	340	1540	2030	1038	1632	77.3	62.6	434
(WY)	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1996	1996
MIN	13.7	59.6	70.9	690	340	1540	2030	1038	1632	8.11	23.1	18.8
(WY)	1997	1997	1997	1997	1997	1997	1997	1997	1997	1996	1997	1997

## SUMMARY STATISTICS

## FOR 1997 WATER YEAR

## WATER YEARS 1996 - 1997

ANNUAL TOTAL	228797.5	
ANNUAL MEAN	627	627
HIGHEST ANNUAL MEAN		627
LOWEST ANNUAL MEAN		627
HIGHEST DAILY MEAN	10300	10300
LOWEST DAILY MEAN	5.0	1.2
ANNUAL SEVEN-DAY MINIMUM	5.4	1.3
INSTANTANEOUS PEAK FLOW	13200	13200
INSTANTANEOUS PEAK STAGE	27.89	27.89
ANNUAL RUNOFF (AC-FT)	453800	454100
10 PERCENT EXCEEDS	1630	1240
50 PERCENT EXCEEDS	62	53
90 PERCENT EXCEEDS	8.4	5.6

**LOCATION.**--Lat 29°09'36", long 96°32'46", Jackson County, Hydrologic Unit 12100102, on left bank at downstream end of bridge on Farm Road 710, 0.9 mi upstream from Goldenrod Creek, and 9.1 mi northwest of Louise.

**DRAINAGE AREA.**--289 mi<sup>2</sup>.

### WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1977 to current year. Prior to October 1997, published as "near Louise, Tx."

**GAGE.**--Water-stage recorder. Datum of gage is 59.72 ft above sea level.

**REMARKS.**--Records fair except those for discharges below 10 ft<sup>3</sup>/s, which are poor. Much of the low flow during the irrigation season (April to September) is drainage from rice fields irrigated by water originally diverted from the Colorado River. No known regulation or diversions.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 22	1900	4,520	16.63	May 17	0400	2,210	12.86
Feb. 13	1100	2,200	12.89	May 22	1800	3,030	14.41
Feb. 21	1400	2,050	12.51	May 25	2100	4,740	16.86
Mar. 13	0800	7,060	18.86	June 1	0600	3,990	15.90
Mar. 18	1100	8,180	19.64	June 7	2100	2,360	13.19
Mar. 26	1200	2,440	13.37	June 22	2400	7,050	18.85
Apr. 5	1300	8,090	19.58	Sept. 24	1900	1,500	11.16
Apr. 12	0600	5,160	17.29				

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	79	7.9	11	113	22	196	133	114	3290	12	6.3	5.8
2	66	7.3	8.0	693	18	149	999	84	1460	6.5	27	1.6
3	50	3.1	4.8	464	14	138	3820	68	592	4.0	29	1.1
4	29	.40	3.0	129	12	109	5180	56	245	3.3	25	.79
5	21	.00	2.3	62	12	79	7460	46	87	2.2	23	2.3
6	23	.00	1.5	29	10	64	4600	26	48	.85	24	8.6
7	17	.12	.81	15	11	55	2260	23	978	1.3	24	6.8
8	15	1.4	.40	8.7	9.8	47	1130	25	928	1.0	35	3.3
9	13	2.3	.28	45	16	41	518	68	374	1.6	96	1.1
10	9.4	1.0	.28	97	15	37	306	367	239	.75	167	2.7
11	7.1	.22	.39	29	13	41	2990	331	118	2.4	120	.76
12	9.3	.00	.51	19	112	3160	4350	155	80	2.3	91	.60
13	7.1	.00	.54	14	1860	6160	2050	90	53	2.7	88	6.4
14	6.4	.00	.66	11	1250	3570	899	99	35	6.4	88	8.9
15	6.7	.00	8.8	10	785	1940	381	77	24	9.9	74	16
16	7.8	.00	118	15	307	1030	212	740	20	1.2	44	10
17	8.8	.00	337	11	184	4220	126	1490	20	1.1	28	15
18	15	.00	148	8.5	107	7260	81	780	75	.75	15	10
19	33	.00	71	5.9	76	4880	66	576	169	.75	8.4	5.6
20	53	.00	36	10	95	3040	129	253	116	.75	5.4	5.1
21	38	.00	22	1710	1520	1780	159	137	513	13	6.1	17
22	28	.00	11	4180	1140	891	89	2040	5300	33	4.4	205
23	32	.00	6.5	3000	709	406	56	2150	5360	30	45	869
24	36	68	4.1	1820	261	249	43	2900	3090	22	284	1400
25	25	414	3.0	934	140	270	38	4240	1910	13	204	1200
26	33	226	2.5	399	146	1840	62	3550	919	13	139	623
27	34	76	1.8	208	349	901	266	2130	421	9.8	106	291
28	23	37	1.3	132	350	465	551	1220	138	17	66	146
29	12	22	.85	78	---	265	354	779	50	5.3	39	82
30	9.4	15	.47	45	---	158	179	365	24	3.5	25	48
31	8.2	---	51	30	---	154	---	2190	---	3.5	16	---
TOTAL	755.2	881.74	857.79	14325.1	9543.8	43595	39487	27169	26676	224.85	1952.6	4993.45
MEAN	24.4	29.4	27.7	462	341	1406	1316	876	889	7.25	63.0	166
MAX	79	414	337	4180	1860	7260	7460	4240	5360	33	284	1400
MIN	6.4	.00	.28	5.9	9.8	37	38	23	20	.75	4.4	.60
AC-FT	1500	1750	1700	28410	18930	86470	78320	53890	52910	446	3870	9900
CFSM	.08	.10	.10	1.60	1.18	4.87	4.55	3.03	3.08	.03	.22	.58
IN.	.10	.11	.11	1.84	1.23	5.61	5.08	3.50	3.43	.03	.25	.64

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1997, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	211	137	130	288	279	180	240	337	385	129	36.4	239								
MAX	2101	964	746	956	2331	1406	1316	1150	1866	475	147	1364								
(WY)	1995	1986	1992	1992	1992	1997	1997	1993	1993	1983	1996	1978								
MIN	19.4	3.93	.008	1.36	.28	.080	3.14	1.82	.030	7.25	3.21	11.8								
(WY)	1980	1992	1991	1982	1988	1996	1980	1996	1990	1997	1991	1988								

### SUMMARY STATISTICS

#### FOR 1996 CALENDAR YEAR

#### FOR 1997 WATER YEAR

#### WATER YEARS 1978 - 1997

ANNUAL TOTAL	23550.96	170461.53	
ANNUAL MEAN	64.3	467	
HIGHEST ANNUAL MEAN			215
LOWEST ANNUAL MEAN			606
HIGHEST DAILY MEAN	1810	7460	51.2
LOWEST DAILY MEAN	.00	.00	1990
ANNUAL SEVEN-DAY MINIMUM	.00	.00	1990
INSTANTANEOUS PEAK FLOW		8180	22500
INSTANTANEOUS PEAK STAGE		19.64	Oct 19 1994
ANNUAL RUNOFF (AC-FT)	46710	338100	24900
ANNUAL RUNOFF (CFSM)	.22	1.62	28.45
ANNUAL RUNOFF (INCHES)	3.03	21.94	Oct 19 1994
10 PERCENT EXCEEDS	165	1500	448
50 PERCENT EXCEEDS	1.7	39	19
90 PERCENT EXCEEDS	.01	1.0	.06

## LAVACA RIVER BASIN

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08164450 SANDY CREEK NEAR GANADO, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: October 1977 to August 1996. Pesticide analyses: November 1977 to July 1981, April 1996 to current year. Sediment analyses: September 1978 to April 1979.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	2,4,5-T TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
MAR 30...	1150	156	107	7.3	22.0	8.6	98	<0.010	0.430
JUN 04...	1140	253	105	7.2	26.5	7.9	99	<0.010	0.050
JUL 16...	1530	1.2	342	8.1	32.0	7.3	98	<0.010	0.188
AUG 15...	0910	82	516	8.0	26.5	6.7	83	<0.010	<0.010

DATE	SILVEX, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	PIC- LORAM UNFILT RECOVER (UG/L)	TOTAL TRI- THION (UG/L)	CHLOR- PYRIFOS TOTAL RECOVER (UG/L)	DI- AZINON, TOTAL (UG/L)	DISUL- FOTON UNFILT RECOVER (UG/L)	ETHION, TOTAL (UG/L)
MAR 30...	<0.010	0.030	<0.010	0.170	<0.010	<0.010	<0.010	--	<0.010
JUN 04...	<0.010	<0.010	<0.010	0.060	<0.010	<0.010	<0.010	--	<0.010
JUL 16...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AUG 15...	<0.010	<0.010	<0.010	0.020	--	--	--	--	--

DATE	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	MALA- THION, TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	PHORATE TOTAL (UG/L)	DEF TOTAL (UG/L)	SAMPLE VOLUME SCHED- ULE- 1319 (ML)	SET NUMBER SCHED- ULE- 1319 (NO.)
MAR 30...	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	837	4153
JUN 04...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	951	4397
JUL 16...	<0.010	<0.010	<0.010	0.030	<0.010	<0.010	954	4605
AUG 15...	--	--	--	--	--	--	--	--

## LAVACA RIVER BASIN

08164503 WEST MUSTANG CREEK NEAR GANADO, TX

**LOCATION.**--Lat 29°04'17", long 96°28'01", Jackson County, Hydrologic Unit 12100102, on right bank at downstream end of downstream bridge on U.S. Highway 59, 2.1 mi upstream from Middle Mustang Creek, and 3.6 mi east of Ganado.

**DRAINAGE AREA.**--178 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1977 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 40.12 ft above sea level.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation. Much of low flow during the irrigation season (April to September) comes from drainage from rice fields irrigated by diversions originating from the Colorado River. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Nov. 25	1600	1,640	13.69	Apr. 5	1000	6,770	19.42
Jan. 22	1700	3,690	16.44	Apr. 12	1600	5,850	18.57
Feb. 21	1800	1,640	13.68	May 26	0100	1,930	14.18
Mar. 13	0700	5,120	17.91	June 1	0600	1,820	13.99
Mar. 18	0700	5,820	18.06	June 23	1100	2,590	15.14
Mar. 26	1700	2,150	14.52	Sept. 24	2200	2,080	14.42

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	55	7.1	33	892	15	70	87	25	1720	44	63	18
2	47	4.8	25	685	9.7	58	945	14	830	38	109	14
3	40	3.9	18	385	6.2	47	2120	8.2	275	34	125	12
4	32	6.3	11	135	4.1	33	4750	6.0	105	32	92	10
5	33	9.3	8.1	68	3.2	22	6220	3.8	60	36	74	48
6	32	7.7	7.2	35	2.6	15	3680	2.9	37	33	61	53
7	34	3.4	7.0	18	2.7	8.5	1680	4.9	59	32	68	29
8	24	5.4	5.9	10	5.4	5.8	544	7.4	78	31	54	20
9	19	2.7	4.3	11	5.3	4.5	185	199	201	29	67	15
10	25	2.0	3.2	18	4.4	3.5	99	908	590	25	104	18
11	18	2.9	2.3	11	4.3	5.2	2510	354	186	21	106	18
12	16	7.0	2.2	4.6	40	1890	5800	103	87	25	84	17
13	12	2.7	3.1	11	788	4420	2870	53	53	29	70	18
14	6.7	1.7	2.5	43	479	2470	540	27	36	31	66	19
15	6.0	1.2	27	87	203	1670	141	19	26	32	53	15
16	11	.89	434	92	102	750	86	13	22	31	50	14
17	16	.79	635	40	58	3460	58	34	21	41	48	13
18	25	.65	239	17	33	4920	36	77	142	43	41	12
19	22	.61	104	7.2	21	3780	23	83	148	40	32	9.7
20	27	.51	51	13	110	2290	137	53	91	39	30	8.9
21	15	.37	31	1220	1360	774	119	33	147	48	45	14
22	27	.17	21	3340	1060	274	41	146	1350	85	51	243
23	16	.17	13	2390	223	130	21	864	2480	91	64	1350
24	19	242	8.6	908	91	86	12	933	1770	69	200	1870
25	18	1380	5.8	370	59	121	7.3	1700	814	46	221	1700
26	24	927	4.5	156	52	1680	6.4	1760	306	44	121	608
27	28	168	3.7	88	106	1200	76	833	138	53	75	e232
28	34	71	3.4	49	106	215	192	336	93	49	52	e125
29	34	48	3.7	30	---	96	172	166	69	44	37	e76
30	24	36	3.5	19	---	60	56	209	55	44	24	e47
31	13	---	905	19	---	62	---	1120	---	52	21	---
TOTAL	752.7	2944.26	2626.0	11171.8	4953.9	30620.5	33213.7	10095.2	11989	1291	2308	6646.6
MEAN	24.3	98.1	84.7	360	177	988	1107	326	400	41.6	74.5	222
MAX	55	1380	905	3340	1360	4920	6220	1760	2480	91	221	1870
MIN	6.0	.17	2.2	4.6	2.6	3.5	6.4	2.9	21	21	21	8.9
AC-FT	1490	5840	5210	22160	9830	60740	65880	20020	23780	2560	4580	13180
CFSM	.14	.55	.48	2.02	.99	5.55	6.22	1.83	2.25	.23	.42	1.24
IN.	.16	.62	.55	2.33	1.04	6.40	6.94	2.11	2.51	.27	.48	1.39

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1997, BY WATER YEAR (WY)

	MEAN	202	117	116	202	168	119	182	223	218	110	50.1	191
	MAX	1746	399	587	881	1243	988	1107	702	958	412	159	1063
	(WY)	1995	1986	1992	1980	1992	1997	1993	1993	1993	1983	1996	1979
	MIN	14.2	7.29	.17	.72	.87	.81	12.3	11.2	5.56	38.1	24.2	5.33
	(WY)	1988	1981	1991	1982	1986	1986	1983	1978	1990	1986	1982	1988

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1978 - 1997

ANNUAL TOTAL	27676.97	118612.66	158
ANNUAL MEAN	75.6	325	325
HIGHEST ANNUAL MEAN			45.2
LOWEST ANNUAL MEAN			1997
HIGHEST DAILY MEAN	1460	6220	18700
LOWEST DAILY MEAN	.17	.17	.00
ANNUAL SEVEN-DAY MINIMUM	.36	.47	.01
INSTANTANEOUS PEAK FLOW		6770	20000
INSTANTANEOUS PEAK STAGE		19.42	28.39
ANNUAL RUNOFF (AC-FT)	54900	235300	114400
ANNUAL RUNOFF (CFSM)	.42	1.83	.89
ANNUAL RUNOFF (INCHES)	5.78	24.79	12.06
10 PERCENT EXCEEDS	162	929	300
50 PERCENT EXCEEDS	11	41	23
90 PERCENT EXCEEDS	.85	4.5	1.4

e Estimated

## LAVACA RIVER BASIN

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08164503 WEST MUSTANG CREEK NEAR GANADO, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: October 1977 to August 1996. Pesticide analyses: November 1977 to July 1981, April 1996 to current year. Sediment analyses: September 1978 to April 1979.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	2,4,5-T TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
MAR 30...	1100	64	157	6.9	20.5	7.8	86	<0.010	0.240
APR 03...	1305	2360	68	7.4	22.0	10.3	117	<0.010	0.110
JUN 04...	1230	103	156	7.2	27.0	6.0	76	<0.010	0.060
JUL 16...	1419	31	548	8.1	29.0	6.2	79	<0.010	<0.010
AUG 14...	1400	67	631	7.8	29.0	7.2	93	<0.010	<0.010

DATE	SILVEX, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	PIC- LORAM UNFILT RECOVER (UG/L)	TOTAL TRI- THION (UG/L)	CHLOR- PYRIFOS TOTAL RECOVER (UG/L)	DI- AZINON, TOTAL (UG/L)	DISUL- FOTON UNFILT RECOVER (UG/L)	ETHION, TOTAL (UG/L)
MAR 30...	<0.010	0.060	<0.010	0.080	--	--	--	--	--
APR 03...	<0.010	0.030	<0.010	0.090	<0.010	<0.010	0.010	--	<0.010
JUN 04...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	--	<0.010
JUL 16...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AUG 14...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010

DATE	FONOFOS (DY- FONATE) WATER WHOLE TOT. REC (UG/L)	MALA- THION, TOTAL (UG/L)	PARA- THION, TOTAL (UG/L)	METHYL PARA- THION, TOTAL (UG/L)	PHORATE TOTAL (UG/L)	DEF TOTAL (UG/L)	SAMPLE VOLUME SCHED- ULE 1319 (ML)	SET NUMBER SCHED- ULE 1319 (NO.)
MAR 30...	--	--	--	--	--	--	--	--
APR 03...	<0.010	0.010	<0.010	<0.010	<0.010	<0.010	913	4167
JUN 04...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	944	4397
JUL 16...	<0.010	<0.010	<0.010	0.060	<0.010	<0.010	988	4605
AUG 14...	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	899	4722



## LAVACA RIVER BASIN

08164504 EAST MUSTANG CREEK AT FM 647 NEAR GANADO, TX

**LOCATION.**--Lat 29°04'14", long 96°25'01", Wharton County, Hydrologic Unit 12100102, on right bank, 50 ft downstream from right end of bridge on Farm Road 647, 2.7 mi south of Louise.

**DRAINAGE AREA.**--90.8 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--June 20, 1996, to current year. Prior to October 1996, discharge measurements only..

**GAGE.**--Water-stage recorder. Datum of gage is 43.02 ft above sea level.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation or diversions. Releases from rice fields eventually drain into creek. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	1630	2,050	20.85	Apr. 11	2000	2,090	21.00

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	1.3	5.8	1370	1.9	5.6	13	5.8	132	5.3	11	4.3
2	2.2	1.4	4.2	490	1.4	4.1	595	4.6	32	5.5	13	3.6
3	1.8	.98	2.7	118	1.1	3.0	1570	e4.2	16	5.8	e9.0	3.4
4	1.5	.81	1.8	56	.96	2.1	1760	e3.9	12	5.7	e8.0	3.9
5	1.3	.49	1.3	27	.80	1.3	1800	e3.6	9.8	e5.2	e5.9	6.8
6	1.1	.34	.96	14	.69	2.4	661	e3.4	7.7	e5.0	6.9	8.2
7	.95	.39	.82	7.8	.69	1.0	132	e3.1	6.5	e5.8	7.6	5.5
8	1.8	.29	.64	5.5	.61	.98	42	e2.9	7.1	e6.3	7.4	4.3
9	1.7	.25	.48	5.2	.52	1.5	16	393	14	e6.0	6.5	3.8
10	1.5	.25	.42	4.6	.52	.60	7.9	1010	31	e4.8	5.4	3.7
11	1.4	.25	.36	3.7	.52	1.1	1600	137	12	e4.4	4.5	3.4
12	1.3	.23	.32	3.2	188	1490	1890	37	9.2	e4.2	3.5	3.4
13	1.2	.21	.28	7.4	334	820	773	e18	7.8	e4.4	3.3	3.6
14	.97	.20	.27	17	54	118	142	e12	6.9	e4.4	3.2	3.5
15	2.1	.21	31	45	16	31	45	e10	e6.8	e3.8	3.5	3.5
16	1.7	.21	164	33	6.4	298	19	11	7.4	e3.8	3.9	2.8
17	1.3	.21	75	11	3.7	1910	12	e13	8.1	e4.0	4.0	2.5
18	2.3	.19	35	5.2	2.2	1800	7.8	e10	11	e4.3	4.3	2.2
19	3.8	.20	18	3.6	1.3	1370	5.8	9.2	17	e4.4	4.5	2.1
20	2.0	.23	11	5.3	182	310	10	e8.1	15	e4.8	3.9	2.3
21	2.1	.22	7.0	1130	782	83	11	e8.4	20	e4.6	2.9	3.0
22	1.2	.21	4.7	1250	112	31	e6.1	74	49	e5.6	3.0	290
23	.71	.23	3.4	238	26	14	e4.0	223	49	e6.7	3.2	976
24	.50	326	2.4	65	11	7.2	3.7	303	24	e5.5	3.4	875
25	e1.3	405	1.6	28	7.9	42	4.3	528	14	e5.0	4.2	317
26	2.3	88	2.4	12	8.6	1010	6.0	153	10	4.6	4.4	105
27	2.9	33	5.8	6.3	17	171	15	48	8.4	4.2	5.0	43
28	1.6	15	3.1	6.7	11	48	37	28	6.7	4.7	4.8	19
29	.99	8.2	1.9	4.1	---	20	21	225	5.8	5.5	3.8	9.6
30	3.6	6.8	3.9	3.2	---	8.5	8.3	282	5.5	4.8	3.8	5.8
31	1.7	---	1520	2.5	---	4.6	---	500	---	5.4	5.6	---
TOTAL	53.62	891.30	1910.55	4978.3	1772.81	9609.98	11217.9	4072.2	561.7	154.5	163.4	2720.2
MEAN	1.73	29.7	61.6	161	63.3	310	374	131	18.7	4.98	5.27	90.7
MAX	3.8	405	1520	1370	782	1910	1890	1010	132	6.7	13	976
MIN	.50	.19	.27	2.5	.52	.60	3.7	2.9	5.5	3.8	2.9	2.1
AC-FT	106	1770	3790	9870	3520	19060	22250	8080	1110	306	324	5400

e Estimated

## LAVACA RIVER BASIN

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08164504 EAST MUSTANG CREEK AT FM 647 NEAR GANADO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Pesticide analyses: April 1996 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	2,4,5-T TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
MAR 30...	1115	7.7	137	7.1	22.5	8.4	96	<0.010	1.52
JUN 04...	1310	14	164	7.3	29.0	6.4	84	<0.010	<0.010
JUL 16...	1447	5.6	713	8.4	31.0	10.1	134	<0.010	<0.010
AUG 15...	0800	3.3	700	7.8	27.0	4.5	56	<0.010	<0.010
DATE	SILVEX, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	PIC- LORAM UNFILT RECOVER (UG/L)	TOTAL TRI- THION (UG/L)	CHLOR- PYRIFOS TOTAL RECOVER (UG/L)	DI- AZINON, TOTAL (UG/L)	DISUL- FOTON UNFILT RECOVER (UG/L)	ETHION, TOTAL (UG/L)
MAR 30...	<0.010	0.010	<0.010	0.030	<0.010	<0.010	0.010	--	<0.010
JUN 04...	<0.010	<0.010	<0.010	0.050	<0.010	<0.010	<0.010	--	<0.010
JUL 16...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
AUG 15...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
DATE	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	MALA- THON, TOTAL (UG/L)	PARA- THON, TOTAL (UG/L)	METHYL PARA- THON, TOTAL (UG/L)	PHORATE TOTAL (UG/L)	DEF TOTAL (UG/L)	SAMPLE VOLUME SCHED- ULE 1319 (ML)	SET NUMBER SCHED- ULE 1319 (NO.)	
MAR 30...	<0.010	<0.010	<0.010	<0.010	<0.020	<0.010	840	4153	
JUN 04...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	916	4397	
JUL 16...	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	898	4605	
AUG 15...	<0.010	<0.010	<0.010	0.010	<0.010	<0.010	903	4722	

## LAVACA RIVER BASIN

08164525 LAKE TEXANA NEAR EDNA, TX

**LOCATION.**--Lat 28°53'30", long 96°34'00", Jackson County, Hydrologic Unit 12100102, at upstream side of dam at old river channel on the Navidad River, 4.9 mi upstream from confluence with Lavaca River, 4.0 mi north of Lolita, and 7.2 mi southeast of Edna.

**DRAINAGE AREA.**--1,370 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Chemical, biochemical, and pesticide analyses: January 1988 to current year. Pesticide analyses of bottom sediments: May 1994 to current year.

285331096343501 - LAKE TEXANA SITE AC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		PH									
		RESER- VOIR STORAGE (AC-FT)	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	COLOR (PLAT- INUM- COBALT UNITS)	TUR- BID- ITY (NTU)	OXYGEN, DIS- SOLVED (MG/L)	
FEB											
11...	0822	162000	1.00	157	7.7	12.0	0.12	240	90	9.4	
11...	0824	--	10.0	170	7.7	12.0	--	--	--	9.3	
11...	0826	--	20.0	170	7.7	12.0	--	--	--	9.3	
11...	0828	--	30.0	170	7.7	12.0	--	--	--	9.3	
11...	0830	--	40.0	170	7.7	12.0	--	--	--	9.3	
11...	0832	--	50.0	170	7.7	12.0	--	--	--	9.4	
11...	0834	--	64.0	170	7.6	12.0	--	220	88	9.4	
MAY											
15...	0818	163000	1.00	87	7.2	22.5	0.12	250	95	6.9	
15...	0820	--	10.0	88	7.2	22.5	--	--	--	6.9	
15...	0822	--	20.0	87	7.1	22.0	--	--	--	6.8	
15...	0824	--	30.0	82	7.1	22.0	--	--	--	6.7	
15...	0825	--	32.0	--	--	--	--	--	--	--	
15...	0826	--	40.0	80	7.0	21.5	--	--	--	6.5	
15...	0828	--	50.0	80	6.9	21.5	--	--	--	6.0	
15...	0830	--	64.0	82	6.9	21.5	--	--	--	5.3	
AUG											
19...	0754	156000	1.00	128	7.7	30.0	0.24	--	--	5.6	
19...	0756	--	10.0	128	7.7	29.5	--	--	--	5.7	
19...	0758	--	20.0	128	7.6	29.5	--	--	--	5.6	
19...	0800	--	30.0	128	7.5	29.5	--	--	--	5.1	
19...	0802	--	40.0	123	7.0	28.0	--	--	--	0.2	
19...	0804	--	50.0	126	6.9	25.5	--	--	--	0	
19...	0806	--	62.0	139	6.9	24.0	--	--	--	0.5	
DATE		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)	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)
FEB											
11...	86	53	7	17	2.5	9.2	0.6	4.4	46	5.7	
11...	85	--	--	--	--	--	--	--	--	--	
11...	85	--	--	--	--	--	--	--	--	--	
11...	85	--	--	--	--	--	--	--	--	--	
11...	85	--	--	--	--	--	--	--	--	--	
11...	86	--	--	--	--	--	--	--	--	--	
11...	86	50	4	16	2.4	9.2	0.6	4.4	46	5.7	
MAY											
15...	79	34	1	11	1.4	3.3	0.2	2.3	33	2.6	
15...	79	--	--	--	--	--	--	--	--	--	
15...	77	--	--	--	--	--	--	--	--	--	
15...	76	--	--	--	--	--	--	--	--	--	
15...	--	--	--	--	--	--	--	--	--	--	
15...	73	--	--	--	--	--	--	--	--	--	
15...	67	--	--	--	--	--	--	--	--	--	
15...	59	32	0	11	1.4	3.0	0.2	2.3	33	2.4	
AUG											
19...	74	48	2	16	1.9	5.3	0.3	2.5	46	3.6	
19...	74	--	--	--	--	--	--	--	--	--	
19...	73	--	--	--	--	--	--	--	--	--	
19...	66	--	--	--	--	--	--	--	--	--	
19...	3	--	--	--	--	--	--	--	--	--	
19...	0	--	--	--	--	--	--	--	--	--	
19...	6	50	0	16	2.2	4.3	0.3	2.5	54	1.2	

## LAVACA RIVER BASIN

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08164525 LAKE TEXANA NEAR EDNA, TX--Continued

285331096343501 - LAKE TEXANA SITE AC--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	RESIDUE VOLATILE, SUS- PENDED (MG/L)	RESIDUE FIXED NON FILTER- ABLE (MG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)
FEB										
11...	12	0.10	10	89	23	6	17	--	E0.400	<0.100
11...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
11...	12	0.10	10	88	44	8	36	--	--	--
MAY										
15...	3.8	0.12	6.8	51	38	22	16	5	0.490	<0.100
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	2	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	3.3	0.15	7.2	50	--	--	--	--	--	--
AUG										
19...	7.2	0.11	8.4	72	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	5.2	0.10	12	79	--	--	--	--	--	--

DATE	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)	LITHIUM DIS- SOLVED (UG/L AS LI)
FEB										
11...	2	61	<0.50	<1.0	<5.0	<3.0	<10	15	<10	<4
11...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--
11...	2	61	<0.50	<1.0	<5.0	<3.0	<10	32	<10	<4
MAY										
15...	2	45	<0.50	<1.0	<5.0	<3.0	<10	38	<10	<4
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	23	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	2	42	<0.50	<1.0	<5.0	<3.0	<10	27	<10	<4
AUG										
19...	3	54	<0.50	<1.0	<5.0	<3.0	<10	6.9	<10	<4
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	15	66	<0.50	<1.0	<5.0	23	<10	2300	<10	<4

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY DIS- SOLVED (UG/L AS HG)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO)	NICKEL, DIS- SOLVED (UG/L AS NI)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	SILVER, DIS- SOLVED (UG/L AS AG)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)
FEB									
11...	6.0	<0.1	<10	<10	<1	<1.0	62	<6	<3.0
11...	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--
11...	<1.0	<0.1	<10	<10	<1	<1.0	62	<6	<3.0
MAY									
15...	1.1	<0.1	<10	<10	<1	<1.0	37	<6	<3.0
15...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	11	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	15	<0.1	<10	<10	<1	<1.0	37	<6	<3.0
AUG									
19...	21	<0.1	<10	<10	<1	<1.0	53	<6	11
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--
19...	928	<0.1	<10	<10	<1	<1.0	62	<6	9.6

## LAVACA RIVER BASIN

## 08164525 LAKE TEXANA NEAR EDNA, TX--Continued

285326096342101 - LAKE TEXANA SITE AL

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
11...	0855	1.00	170	7.7	12.0	9.3	85
11...	0857	10.0	170	7.7	12.0	9.3	85
11...	0859	20.0	170	7.7	12.0	9.3	85
11...	0901	30.0	171	7.7	11.5	9.4	85
MAY							
15...	0920	1.00	87	7.2	22.0	6.9	78
15...	0922	10.0	87	7.2	22.0	6.8	77
15...	0924	20.0	87	7.1	22.0	6.7	76
15...	0926	34.0	84	7.1	22.0	6.6	74
AUG							
19...	0830	1.00	129	7.7	29.5	5.6	73
19...	0832	10.0	129	7.7	29.5	5.8	76
19...	0834	20.0	129	7.7	29.5	5.8	76
19...	0836	30.0	129	7.6	29.5	5.4	70

285534096322301 - LAKE TEXANA SITE BC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)
FEB							
11...	0913	1.00	171	7.7	12.5	9.2	85
11...	0915	10.0	170	7.7	12.5	9.1	84
11...	0917	20.0	170	7.7	12.5	9.1	84
11...	0919	30.0	171	7.7	12.5	9.1	84
11...	0921	45.0	171	7.7	12.5	9.0	83
MAY							
15...	0940	1.00	94	7.3	23.5	6.9	80
15...	0942	10.0	94	7.2	23.5	6.8	79
15...	0944	20.0	145	6.9	22.5	4.4	50
15...	0946	30.0	146	6.9	22.0	3.5	40
15...	0948	42.0	142	6.9	21.5	2.8	32
AUG							
19...	0856	1.00	132	7.8	30.0	6.0	79
19...	0858	10.0	131	7.8	30.0	5.8	76
19...	0900	20.0	131	7.7	30.0	5.9	77
19...	0902	30.0	132	7.7	30.0	5.4	71
19...	0904	37.0	133	7.5	29.5	5.1	67

285816096320201 - LAKE TEXANA SITE CC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (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)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
FEB												
11...	0939	1.00	138	7.6	12.5	0.12	8.9	82	49	3	16	2.1
11...	0941	10.0	151	7.6	12.5	--	8.9	82	--	--	--	--
11...	0943	18.0	--	--	--	--	--	--	--	--	--	--
11...	0947	30.0	151	7.6	42.5	--	8.9	141	--	--	--	--
11...	0949	36.0	138	7.6	12.5	--	8.8	81	49	3	16	2.1
MAY												
15...	1000	1.00	141	7.2	23.5	0.09	5.9	69	57	8	19	2.2
15...	1002	10.0	147	7.1	23.0	--	5.5	63	--	--	--	--
15...	1004	15.0	142	6.9	22.5	--	3.6	41	--	--	--	--
15...	1006	18.0	--	--	--	--	--	--	--	--	--	--
15...	1008	20.0	127	6.7	21.5	--	2.3	26	--	--	--	--
15...	1010	30.0	118	6.7	21.5	--	1.9	21	--	--	--	--
15...	1012	37.0	117	6.7	21.5	--	1.9	21	45	5	15	1.9
AUG												
19...	0920	1.00	159	7.7	30.0	0.24	5.3	70	--	--	--	--
19...	0922	10.0	159	7.7	30.0	--	5.3	70	--	--	--	--
19...	0924	15.0	159	7.7	30.0	--	5.3	70	--	--	--	--
19...	0926	20.0	161	7.7	30.0	--	5.3	69	--	--	--	--
19...	0928	34.0	157	7.6	30.0	--	5.3	70	--	--	--	--



## LAVACA RIVER BASIN

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08164525 LAKE TEXANA NEAR EDNA, TX--Continued

285816096320201 - LAKE TEXANA SITE CC--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	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 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)	CHLOR-A PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO- PLANK- TON CHROMO FLUOROM (UG/L)	IRON, DIS- SOLVED (UG/L AS FE)
FEB												
11...	6.7	0.4	4.5	46	4.7	8.5	0.10	10	80	E0.400	<0.100	34
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	6.8	0.4	4.4	46	4.8	8.2	0.10	9.9	80	--	--	43
MAY												
15...	6.2	0.4	2.5	49	4.2	7.7	0.12	8.4	80	E1.00	<0.100	15
15...	--	--	--	--	--	--	--	--	--	--	--	13
15...	--	--	--	--	--	--	--	--	--	--	--	21
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	5.7	0.4	2.5	39	4.8	7.3	0.12	7.5	68	--	--	29
AUG												
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--

DATE	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	DI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	DI- AZINON, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	CHLOR- PYRIFOS TOTAL RECOVER (UG/L)	DISUL- FOTON UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	MALA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	MALA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METHYL PARA- THION, TOT. IN BOTTOM MATL. (UG/KG)
FEB												
11...	4.0	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	<0.010	--	<0.010	--	<0.010	<0.010	--	<0.010	--	<0.010	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	<1.0	<0.010	--	<0.010	--	<0.010	<0.010	--	<0.010	--	<0.010	--
MAY												
15...	3.1	--	--	--	--	--	--	--	--	--	--	--
15...	6.8	--	--	--	--	--	--	--	--	--	--	--
15...	13	--	--	--	--	--	--	--	--	--	--	--
15...	--	0.010	--	0.050	<0.010	<0.010	<0.010	--	<0.010	--	<0.010	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	22	0.010	<0.200	0.050	<0.010	<0.010	<0.010	<0.200	<0.010	<0.200	<0.010	<0.200
AUG												
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	--	<0.010	--	<0.010	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	<0.010	--	<0.010	<0.010	<0.010	<0.010	--	<0.010	--	<0.010	--

DATE	PARA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/L)	PARA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PIC- LORAM UNFILT RECOVER (UG/L)	2,4-D, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT. REC (UG/L)	2,4,5-T TOTAL (UG/L)
FEB												
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	<0.010	--	--	<0.010	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
11...	--	--	--	--	--	--	--	--	--	--	--	--
11...	<0.010	--	--	<0.010	<0.010	--	<0.010	0.020	<0.010	<0.010	<0.010	<0.010
MAY												
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	<0.010	--	<0.010	<0.010	<0.010	--	0.110	0.050	<0.010	<0.010	<0.010	<0.010
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--	--	--
15...	<0.010	<0.200	0.010	<0.010	<0.010	<0.200	0.100	0.110	<0.010	<0.010	<0.010	<0.010
AUG												
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	<0.010	--	<0.010	--	<0.010	--	--	--	--	--	<0.010	--
19...	--	--	--	--	--	--	--	--	--	--	--	--
19...	<0.010	--	<0.010	--	<0.010	--	--	--	--	--	<0.010	--

**LAVACA RIVER BASIN**  
**08164525 LAKE TEXANA NEAR EDNA, TX--Continued**

290042096331401 - LAKE TEXANA SITE DC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TRANS-PAR-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)
FEB										
11...	1043	1.00	199	7.7	12.0	0.15	8.7	79	74	2
11...	1045	9.00	198	7.7	12.0	--	8.6	78	--	--
11...	1047	18.0	200	7.6	12.0	--	8.5	78	71	0
MAY										
15...	1138	1.00	133	7.0	25.0	0.09	5.1	61	48	6
15...	1140	5.00	139	7.0	24.5	--	4.8	57	--	--
15...	1142	9.00	--	--	--	--	--	--	--	--
15...	1144	10.0	145	6.9	24.0	--	4.0	47	--	--
15...	1146	18.0	135	6.7	23.0	--	2.2	25	47	4
AUG										
19...	1010	1.00	376	7.9	30.5	--	4.5	60	--	--
19...	1012	8.00	375	7.8	30.5	--	4.4	58	--	--
19...	1014	17.0	353	7.7	31.5	--	4.6	62	--	--

DATE	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WAT DIS FIX END FIELD CAC03 (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)
FEB										
11...	25	2.7	9.4	0.5	4.9	71	5.8	12	0.10	11
11...	--	--	--	--	--	--	--	--	--	--
11...	24	2.6	9.4	0.5	4.9	70	5.8	12	0.10	11
MAY										
15...	16	2.0	7.6	0.5	2.5	43	5.9	9.8	0.14	7.6
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	15	2.1	8.1	0.5	2.6	43	6.3	11	0.14	7.8
AUG										
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	--	--	--	--

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	OIL AND GREASE, TOTAL RECOVER. GRAVIMETRIC (MG/L)	CHLOR-A PHYTO-PLANKTON CHROMO FLUOROM (UG/L)	CHLOR-B PHYTO-PLANKTON CHROMO FLUOROM (UG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)	DI-AZINON, TOTAL (UG/L)	DI-AZINON, IN BOTTOM MATERIAL (UG/KG)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	DISULFOTON UNFILT RECOVER (UG/L)
FEB										
11...	114	--	<0.100	<0.100	40	3.0	--	--	--	--
11...	--	--	--	--	--	--	<0.010	--	<0.010	--
11...	112	--	--	--	45	5.0	<0.010	--	<0.010	--
MAY										
15...	77	2	1.80	<0.100	31	21	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	<0.010	--	0.020	<0.010
15...	--	--	--	--	44	49	--	--	--	--
15...	79	--	--	--	63	90	<0.010	<0.200	0.010	<0.010
AUG										
19...	--	--	--	--	--	--	--	--	--	--
19...	--	--	--	--	--	--	<0.010	--	<0.010	<0.010
19...	--	--	--	--	--	--	<0.010	--	<0.010	<0.010

DATE	DEF TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHION, IN BOTTOM MATERIAL (UG/KG)	MALATHION, TOTAL (UG/L)	MALATHION, IN BOTTOM MATERIAL (UG/KG)	METHYL PARATHION, TOTAL (UG/L)	METHYL PARATHION, IN BOTTOM MATERIAL (UG/KG)	PARATHION, TOTAL (UG/L)	PARATHION, IN BOTTOM MATERIAL (UG/KG)	PHORATE TOTAL (UG/L)
FEB										
11...	--	--	--	--	--	--	--	--	--	--
11...	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--	--
11...	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--	--
MAY										
15...	--	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--	--
15...	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--	<0.010
15...	--	--	--	--	--	--	--	--	--	--
15...	<0.010	<0.010	<0.200	<0.010	<0.200	<0.010	<0.200	<0.010	<0.200	<0.010
AUG										
19...	--	--	--	--	--	--	--	--	--	--
19...	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--	<0.010
19...	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--	<0.010

## LAVACA RIVER BASIN

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## 08164525 LAKE TEXANA NEAR EDNA, TX--Continued

290042096331401 - LAKE TEXANA SITE DC--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	SILVEX, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PIC- LORAM UNFILT RECOVER (UG/L)	2,4-D, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	2,4,5-T TOTAL (UG/L)
FEB									
11...	--	--	--	--	--	--	--	--	--
11...	<0.010	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
11...	<0.010	<0.010	--	0.040	<0.010	<0.010	<0.010	<0.010	<0.010
MAY									
15...	--	--	--	--	--	--	--	--	--
15...	--	--	--	--	--	--	--	--	--
15...	<0.010	<0.010	--	0.170	0.210	<0.010	<0.010	<0.010	<0.010
15...	--	--	--	--	--	--	--	--	--
15...	<0.010	<0.010	<0.200	0.160	0.200	<0.010	<0.010	<0.010	<0.010
AUG									
19...	--	--	--	--	--	--	--	--	--
19...	--	<0.010	--	--	--	--	--	<0.010	--
19...	--	<0.010	--	--	--	--	--	<0.010	--

285940096312101 - LAKE TEXANA SITE EC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAM- PLING DEPTH (FEET)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TRANS- PAR- ENCY (SECCHI DISK) (M)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED SATUR- ATION	DI- AZINON, TOTAL (UG/L)	DI- AZINON, TOTAL (UG/KG)	CHLOR- PYRIFOS TOTAL RECOVER (UG/L)
FEB											
11...	1012	1.00	132	7.4	12.5	0.12	8.0	--	--	--	--
11...	1014	13.0	132	7.4	12.5	--	8.0	74	<0.010	--	<0.010
11...	1016	20.0	132	7.4	12.5	--	7.9	73	--	--	--
11...	1018	27.0	116	7.4	12.5	--	8.0	74	<0.010	--	<0.010
MAY											
15...	1100	13.0	93	6.3	21.5	0.09	1.1	12	0.010	--	0.040
15...	1102	20.0	89	6.3	21.0	--	0.5	5	--	--	--
15...	1104	26.0	88	6.3	21.0	--	0.4	4	0.010	0.260	0.020
AUG											
19...	0948	1.00	285	7.5	30.5	--	4.7	62	--	--	--
19...	0950	13.0	296	7.3	30.0	--	3.9	51	<0.010	--	<0.010
19...	0952	20.0	304	7.2	30.0	--	3.7	48	--	--	--
19...	0954	26.0	307	7.2	30.0	--	3.6	47	<0.010	--	<0.010

285940096312101 - LAKE TEXANA SITE EC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	DISUL- FOTON UNFILT RECOVER (UG/L)	DEF TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	MALA- THION, TOTAL (UG/L)	MALA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	METHYL THION, TOTAL (UG/L)	METHYL PARA- THION, TOT. IN BOTTOM MATL. (UG/KG)	PARA- THION, TOTAL (UG/L)	PARA- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)
FEB										
11...	--	--	--	--	--	--	--	--	--	--
11...	--	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--
11...	--	--	--	--	--	--	--	--	--	--
11...	--	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--
MAY										
15...	<0.010	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--
15...	--	--	--	--	--	--	--	--	--	--
15...	<0.010	<0.010	<0.010	<0.200	<0.010	<0.200	<0.010	<0.200	<0.010	<0.200
AUG										
19...	--	--	--	--	--	--	--	--	--	--
19...	<0.010	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--
19...	--	--	--	--	--	--	--	--	--	--
19...	<0.010	<0.010	<0.010	--	<0.010	--	<0.010	--	<0.010	--

285940096312101 - LAKE TEXANA SITE EC

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOTAL TRI- THION (UG/L)	TRI- THION, TOTAL IN BOT- TOM MA- TERIAL (UG/KG)	PIC- LORAM UNFILT RECOVER (UG/L)	2,4-D, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	FONOFOS (DY- FONATE) WATER WHOLE TOT.REC (UG/L)	2,4,5-T TOTAL (UG/L)
FEB										
11...	--	--	--	--	--	--	--	--	--	--
11...	--	<0.010	<0.010	--	<0.010	0.040	<0.010	<0.010	<0.010	<0.010
11...	--	--	--	--	--	--	--	--	--	--
11...	--	<0.010	<0.010	--	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010
MAY										
15...	0.010	<0.010	<0.010	--	0.040	0.080	<0.010	<0.010	<0.010	<0.010
15...	--	--	--	--	--	--	--	--	--	--
15...	0.010	<0.010	<0.010	<0.200	0.040	0.070	<0.010	<0.010	<0.010	<0.010
AUG										
19...	--	--	--	--	--	--	--	--	--	--
19...	<0.010	<0.010	<0.010	--	0.100	0.030	<0.010	<0.010	<0.010	<0.010
19...	--	--	--	--	--	--	--	--	--	--
19...	<0.010	<0.010	<0.010	--	0.090	0.010	<0.010	<0.010	<0.010	<0.010

## GARCITAS CREEK MAIN STEM

08164600 GARCITAS CREEK NEAR INEZ, TX

**LOCATION.**--Lat 28°53'28", long 96°49'08", Victoria County, Hydrologic Unit 12100402, at right downstream end of bridge on U.S. Highway 59 access road, 0.3 mi upstream from Southern Pacific Railroad bridge, 2.0 mi southwest of Inez, and 3.6 mi upstream from Casa Blanca Creek.

**DRAINAGE AREA.**--91.7 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1970 to current year.

Water-quality records.--Chemical and biochemical analyses: April 1965 to August 1988. Pesticide analyses: July 1970 to July 1981.

**REVISED RECORDS.**--WDR TX-94-3: 1992-93.

**GAGE.**--Water-stage recorder. Datum of gage is 29.16 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation or diversions. An undetermined amount of return water from irrigation enters the stream above this station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage during period 1903-70, 24.5 ft Oct. 26, 1960. In 1929, a flood nearly as high as the 1960 flood occurred, and a flood in September 1967 reached a stage of 23.4 ft, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 12	1700	4,460	21.47	May 10	0900	2,100	17.04
Mar. 18	0100	6,210	23.74	May 29	1215	1,920	16.56
Apr. 4	2000	10,000	27.47				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	.62	.78	16	6.6	3.6	18	4.7	57	15	2.1	.72
2	5.8	.52	.67	23	5.6	3.7	770	4.3	38	13	2.8	.73
3	4.0	.44	.56	18	4.8	3.0	4040	3.9	25	11	2.8	.84
4	2.9	.40	.51	11	4.1	2.4	6700	3.4	16	10	2.3	1.1
5	2.3	.50	.51	5.8	3.4	2.1	4210	3.5	62	9.2	1.6	.94
6	1.9	1.0	.55	3.2	3.1	1.7	513	4.1	46	8.2	1.5	.69
7	1.5	.92	.51	1.9	3.3	1.5	173	3.7	246	7.2	1.5	.83
8	1.2	.65	.45	1.4	3.1	1.5	96	4.0	170	6.4	1.6	.72
9	.93	.56	.42	1.1	2.8	1.4	71	362	73	5.9	1.7	.65
10	.75	.50	.41	.93	2.4	1.3	53	1790	58	5.8	1.4	.96
11	.62	.46	.43	.80	2.2	9.9	111	491	595	5.4	1.2	.89
12	.52	.40	.40	.64	3.7	3100	236	130	155	5.0	1.2	3.2
13	.50	.36	.43	.67	3.7	1910	76	70	66	4.7	1.1	2.1
14	.44	.34	.52	.60	3.6	274	44	42	37	5.2	5.4	.65
15	.37	.48	9.4	.67	3.2	113	30	27	23	5.5	5.9	.49
16	.84	.52	5.6	.73	2.7	74	22	54	14	5.1	2.4	.44
17	.62	.47	2.5	.58	2.2	3900	17	114	9.3	4.5	12	.38
18	1.1	.35	1.4	.52	2.0	4130	14	68	12	4.0	8.9	.42
19	2.5	.32	1.1	.51	1.9	2400	13	35	8.6	4.0	6.9	.52
20	2.4	.32	.90	2.4	7.8	464	11	37	95	3.8	3.3	.54
21	1.8	.35	.75	548	61	159	10	69	56	3.6	1.5	1.3
22	1.2	.37	.58	1250	60	85	9.6	377	700	3.4	.85	20
23	.92	.34	.52	269	26	56	8.5	1080	793	3.1	.77	38
24	1.3	2.2	.43	105	13	40	7.3	642	105	2.8	.71	867
25	1.8	2.2	.38	65	7.5	36	6.7	883	53	2.8	.96	223
26	1.4	2.2	.39	41	5.3	522	7.1	534	33	2.6	1.5	53
27	1.0	1.8	.40	29	3.9	428	7.3	132	48	2.2	1.0	31
28	.81	1.4	.40	20	3.4	84	6.1	80	37	2.3	.80	22
29	.70	1.2	.40	14	---	52	5.3	1270	24	2.3	.63	16
30	.74	1.0	.42	10	---	36	4.9	246	18	2.1	.55	12
31	.71	---	3.0	7.8	---	25	---	91	---	1.9	.55	---
TOTAL	52.27	23.19	35.72	2449.25	252.3	17920.1	17290.8	8655.6	3672.9	168.0	77.42	1301.11
MEAN	1.69	.77	1.15	79.0	9.01	578	576	279	122	5.42	2.50	43.4
MAX	8.7	2.2	9.4	1250	61	4130	6700	1790	793	15	12	867
MIN	.37	.32	.38	.51	1.9	1.3	4.9	3.4	8.6	1.9	.55	.38
AC-FT	104	46	71	4860	500	35540	34300	17170	7290	333	154	2580
CFSM	.02	.01	.01	.86	.10	6.30	6.29	3.04	1.34	.06	.03	.47
IN.	.02	.01	.01	.99	.10	7.27	7.01	3.51	1.49	.07	.03	.53

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1997, BY WATER YEAR (WY)

	54.8	27.5	38.9	43.7	54.2	46.4	89.7	122	126	22.4	4.96	65.9
MEAN	54.8	27.5	38.9	43.7	54.2	46.4	89.7	122	126	22.4	4.96	65.9
MAX	695	291	263	220	558	578	658	503	745	218	39.1	789
(WY)	1995	1983	1977	1992	1992	1997	1991	1979	1981	1983	1972	1978
MIN	.000	.000	.006	.022	.14	.48	.25	.045	.000	.51	.056	.000
(WY)	1990	1990	1990	1990	1990	1996	1996	1996	1990	1989	1988	1988

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1970 - 1997

ANNUAL TOTAL	4464.81	51898.66	
ANNUAL MEAN	12.2	142	58.0
HIGHEST ANNUAL MEAN			144
LOWEST ANNUAL MEAN			2.65
HIGHEST DAILY MEAN	543	6700	13100
LOWEST DAILY MEAN	.00	.32	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.36	.00
INSTANTANEOUS PEAK FLOW		10000	19700
INSTANTANEOUS PEAK STAGE		27.47	33.43
ANNUAL RUNOFF (AC-FT)	8860	102900	42020
ANNUAL RUNOFF (CFSM)	.13	1.55	.63
ANNUAL RUNOFF (INCHES)	1.81	21.05	8.59
10 PERCENT EXCEEDS	14	163	56
50 PERCENT EXCEEDS	.50	3.6	3.2
90 PERCENT EXCEEDS	.00	.51	.30



# PLACEDO CREEK MAIN STEM

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08164800 PLACEDO CREEK NEAR PLACEDO, TX

**LOCATION.**--Lat 28°43'30", long 96°46'07", Victoria County, Hydrologic Unit 12100401, on right bank at downstream end of bridge on Farm Road 616, 0.1 mi downstream from confluence of Lone Tree Creek and Arroyo Palo Alto, 1.2 mi upstream from Ninemile Creek, and 4.4 mi northeast of Placedo.

**DRAINAGE AREA.**--68.3 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1970 to current year.

Water-quality records.--Chemical, biochemical, and pesticide analyses: October 1968 to September 1979.

**GAGE.**--Water-stage recorder. Datum of gage is 5.58 ft above sea level.

**REMARKS.**--Records fair. No known regulation or diversions. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1930, 31.9 ft in September 1967 and 30.4 ft in 1960 (probably October), from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Jan. 21	1300	1,900	20.35	Apr. 2	2400	5,820	25.82
Mar. 12	1400	3,910	23.86	Apr. 4	1100	3,070	22.63
Mar. 17	0800	12,100	30.05	May 9	2200	3,870	23.82
Mar. 18	1800	4,490	24.49				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.79	.46	.47	1.5	1.1	.87	2.3	2.1	9.1	1.6	.99	.39
2	.79	.43	.44	31	1.1	.87	1570	2.1	6.6	1.6	.95	.43
3	.82	.42	.43	4.0	1.0	.80	3310	2.0	3.8	1.6	.88	.43
4	.76	.44	.46	1.6	1.0	.72	1990	1.7	2.7	1.5	.83	.41
5	.75	.48	.47	1.1	.95	.72	764	1.7	9.4	1.4	.77	.44
6	.76	.51	.49	.70	.91	.72	117	1.8	6.9	1.4	.72	9.0
7	.69	.52	.52	.65	.93	.70	44	1.7	34	1.3	.66	2.3
8	.65	.49	.48	.62	.95	.73	21	1.6	49	1.3	.64	.88
9	.62	.47	.49	.62	.92	.72	14	1000	21	1.3	.64	.55
10	.64	.47	.57	.56	.93	.73	9.4	1520	7.4	1.2	.63	.44
11	.59	.48	.63	.53	.95	.84	8.3	116	3.4	1.2	.60	.39
12	.60	.48	.62	.53	3.6	2130	6.6	39	2.4	1.1	.58	.37
13	.59	.49	.63	.56	3.3	659	6.1	22	2.0	1.1	.55	.39
14	.58	.49	.63	.58	1.5	103	5.9	12	1.9	1.1	.54	.36
15	.57	.64	.76	.55	1.0	26	5.6	e100	1.8	1.0	.49	.36
16	.70	.62	1.1	.53	.90	664	5.2	60	1.7	1.1	.46	.36
17	.64	.59	.72	.53	.83	7930	3.0	37	114	1.1	.43	.35
18	.54	.51	.63	.53	.83	2550	2.9	54	377	1.0	.42	.32
19	.53	.49	.59	.53	.83	968	2.9	27	176	1.0	.44	.30
20	.56	.50	.59	.76	4.6	117	2.8	75	83	1.3	.43	.32
21	.59	.53	.60	1110	6.4	37	2.7	86	41	1.2	.42	.41
22	.60	.50	.68	412	1.8	12	2.7	318	15	1.0	.42	.97
23	.55	.53	.72	74	1.1	6.3	2.3	554	9.3	.95	.42	84
24	.53	1.7	.69	24	.95	4.0	2.2	173	6.8	.91	.47	40
25	.57	1.2	.66	8.6	.92	115	2.2	697	3.7	.90	.44	24
26	.59	.79	.67	4.0	.91	558	2.3	133	39	.92	.41	7.2
27	.56	.60	.68	2.5	.88	66	2.8	38	9.9	.92	.40	2.4
28	.56	.50	.68	3.0	.87	19	2.7	17	3.0	.88	.40	1.2
29	.53	.51	.71	1.4	---	8.2	2.3	28	2.1	.85	.40	.86
30	.51	.52	.69	1.2	---	4.7	2.1	35	1.8	.79	.40	.70
31	.48	---	.81	1.1	---	2.9	---	16	---	.85	.37	---
TOTAL	19.24	17.36	19.31	1689.78	41.96	15988.52	7915.3	5171.7	1044.7	35.37	17.20	180.53
MEAN	.62	.58	.62	54.5	1.50	516	264	167	34.8	1.14	.55	6.02
MAX	.82	1.7	1.1	1110	6.4	7930	3310	1520	377	1.6	.99	84
MIN	.48	.42	.43	.53	.83	.70	2.1	1.6	1.7	.79	.37	.30
AC-FT	38	34	38	3350	83	31710	15700	10260	2070	70	34	358

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1997, BY WATER YEAR (WY)

	MEAN	65.1	55.4	46.4	45.3	57.8	49.7	67.9	101	96.3	63.5	13.0	112
MAX	239	465	389	262	455	516	541	354	510	559	107	913	
(WY)	1982	1982	1992	1991	1992	1997	1991	1972	1973	1990	1972	1978	
MIN	.004	.021	.015	.052	.002	.086	.019	.17	.000	.031	.012	.013	
(WY)	1990	1989	1990	1990	1994	1989	1989	1996	1989	1989	1988	1988	

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1970 - 1997

ANNUAL TOTAL	4521.92	32140.97	
ANNUAL MEAN	12.4	88.1	
HIGHEST ANNUAL MEAN			64.3
LOWEST ANNUAL MEAN			154
HIGHEST DAILY MEAN	967	Jun 27	11400
LOWEST DAILY MEAN	.03	Jun 17	1.20
ANNUAL SEVEN-DAY MINIMUM	.04	Jun 14	.00
INSTANTANEOUS PEAK FLOW			.00
INSTANTANEOUS PEAK STAGE			18300
ANNUAL RUNOFF (AC-FT)	8970	63750	30.80
10 PERCENT EXCEEDS	3.7	56	48
50 PERCENT EXCEEDS	.59	.92	1.7
90 PERCENT EXCEEDS	.14	.45	.13

e Estimated



## GUADALUPE RIVER MAIN STEM

08165300 NORTH FORK GUADALUPE RIVER NEAR HUNT, TX

**LOCATION.**--Lat 30°03'50", long 99°23'12", Kerr County, Hydrologic Unit 12100201, on right bank, 1,000 ft upstream from Ranch Road 1340, 1.9 mi downstream from Bear Creek, 3.1 mi west of Hunt, and 3.5 mi upstream from Honey Creek.

**DRAINAGE AREA.**--169.0 mi<sup>2</sup>.

**PERIOD OF RECORD.**--August 1967 to current year. Low-flow records not equivalent prior to June 7, 1989, because of undetermined channel flow loss between sites.

**REVISED RECORDS.**--WRD TX-74-1: 1971(P).

**GAGE.**--Water-stage recorder. Datum of gage is 1,800.10 ft above sea level. Prior to June 7, 1989, at site 0.58 mi upstream at same datum.

**REMARKS.**--Records good except those for estimated daily discharges and daily discharges above 200 ft<sup>3</sup>/s, which are fair. No known regulation or diversions.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1900 occurred July 1, 1932 (gage height, 37.3 ft, at site 0.58 mi upstream), discharge, 140,000 ft<sup>3</sup>/s, by slope-area measurements, combined flow of North Fork Guadalupe River 5 mi upstream and Bear Creek 2 mi upstream from mouth, and adjusted for difference in drainage area.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	0945	26,300	13.77	June 21	1845	1,760	6.04
Feb. 20	1036	3,560	7.20	June 22	1300	5,490	8.08

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	e85	e47	37	35	63	48	52	36	77	49	38
2	21	e70	e44	37	36	68	49	51	38	74	47	38
3	21	e63	e43	37	36	62	56	50	38	73	46	38
4	21	e60	42	36	36	61	61	48	37	72	46	40
5	21	e58	e42	35	35	62	68	46	39	70	45	40
6	21	e57	e42	35	36	62	62	46	53	69	46	40
7	21	e57	e40	36	36	62	61	46	56	68	57	40
8	20	e50	e35	39	35	63	60	47	47	67	51	39
9	20	e49	e35	36	34	61	55	53	51	72	48	39
10	20	e51	e35	35	36	63	52	48	76	64	46	38
11	20	e49	33	35	34	69	52	46	65	63	44	37
12	20	e48	e31	34	34	109	50	55	53	61	43	40
13	20	e48	e31	34	35	70	49	55	49	63	41	39
14	20	e47	e31	35	34	63	49	49	47	61	54	40
15	20	e47	e51	35	34	59	49	47	48	61	41	39
16	20	e49	e53	36	34	57	49	46	48	61	41	38
17	20	e50	e50	36	33	57	48	45	47	59	41	37
18	19	e47	e48	36	33	55	48	45	47	58	41	37
19	19	e46	e47	35	33	52	48	44	46	58	41	36
20	20	e46	e46	36	388	50	48	45	44	57	40	37
21	20	e47	e45	36	109	50	47	44	194	55	40	37
22	20	e49	e45	36	89	50	46	51	1920	53	40	37
23	20	e46	e44	35	79	49	45	49	196	53	40	51
24	21	e53	e43	35	72	48	45	51	114	52	40	42
25	21	e49	e40	34	67	49	51	48	102	52	40	38
26	22	e45	39	34	66	47	65	46	94	52	40	37
27	22	e43	38	35	62	47	57	45	88	52	40	36
28	5250	e44	38	34	61	47	57	43	85	51	41	36
29	e413	e55	38	34	---	47	57	42	82	50	41	36
30	e150	e54	38	34	---	47	54	39	80	53	40	34
31	e101	---	37	35	---	47	---	37	---	63	39	---
TOTAL	6465	1562	1271	1097	1652	1796	1586	1459	3920	1894	1349	1154
MEAN	209	52.1	41.0	35.4	59.0	57.9	52.9	47.1	131	61.1	43.5	38.5
MAX	5250	85	53	39	388	109	68	55	1920	77	57	51
MIN	19	43	31	34	33	47	45	37	36	50	39	34
AC-FT	12820	3100	2520	2180	3280	3560	3150	2890	7780	3760	2680	2290
CFSM	1.23	.31	.24	.21	.35	.34	.31	.28	.77	.36	.26	.23
IN.	1.42	.34	.28	.24	.36	.40	.35	.32	.86	.42	.30	.25

# GUADALUPE RIVER MAIN STEM

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08165300 NORTH FORK GUADALUPE RIVER NEAR HUNT, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1997, BY WATER YEAR (WY)

MEAN	68.6	31.4	43.3	31.7	30.6	29.7	41.2	44.2	44.9	41.1	52.9	40.2
MAX	529	54.4	296	113	108	144	351	149	278	465	452	198
(WY)	1986	1975	1985	1968	1992	1992	1977	1990	1981	1987	1978	1986
MIN	12.5	14.8	16.2	15.2	13.3	13.6	13.6	11.8	10.8	11.0	10.6	10.8
(WY)	1984	1984	1990	1990	1984	1971	1971	1971	1971	1971	1984	1984

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1967 - 1997	
ANNUAL TOTAL	14143.9		25205			
ANNUAL MEAN	38.6		69.1		41.9	
HIGHEST ANNUAL MEAN					103	
LOWEST ANNUAL MEAN					13.4	
HIGHEST DAILY MEAN	5250		5250		14900	
LOWEST DAILY MEAN	8.9		19		6.6	
ANNUAL SEVEN-DAY MINIMUM	11		20		8.3	
INSTANTANEOUS PEAK FLOW			26300		57000	
INSTANTANEOUS PEAK STAGE			13.77		29.81	
ANNUAL RUNOFF (AC-FT)	28050		49990		30380	
ANNUAL RUNOFF (CFSM)	.23		.41		.25	
ANNUAL RUNOFF (INCHES)	3.11		5.55		3.37	
10 PERCENT EXCEEDS	46		67		49	
50 PERCENT EXCEEDS	18		46		24	
90 PERCENT EXCEEDS	13		34		14	

e Estimated

## GUADALUPE RIVER MAIN STEM

08165500 GUADALUPE RIVER AT HUNT, TX

**LOCATION.**--Lat 30°04'11", long 99°19'17", Kerr County, Hydrologic Unit 12100201, on left bank, 56 ft upstream and 252 ft to left of left end of bridge on State Highway 39, 0.6 mi downstream from confluence of North and South Forks, 0.8 mi east of Hunt, and at mile 430.9.

**DRAINAGE AREA.**--288 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1941 to September 1949, discharge not computed above 600 ft<sup>3</sup>/s, and April 1965 to current year. Occasional discharge measurements made 1950-64.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder and crest-stage gages. Datum of gage is 1,722.7 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good except those above 300 ft<sup>3</sup>/s, which are fair. No known regulation. There are numerous diversions for irrigation above station, but amounts are unknown. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1900, 36.6 ft July 2, 1932, from information by local resident (discharge, 206,000 ft<sup>3</sup>/s, determined by slope-area measurement 4.5 mi downstream from gage).

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1045	35,900	19.73	June 22	1330	9,960	13.99
Feb. 20	1145	10,800	14.25				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	108	71	51	41	86	83	98	71	177	82	61
2	28	94	67	51	41	102	88	93	67	166	79	62
3	28	88	66	51	41	92	110	93	71	170	79	62
4	28	81	66	50	40	87	126	89	68	157	77	63
5	29	78	66	50	39	83	135	85	68	145	75	65
6	30	75	66	47	38	81	118	85	76	140	74	61
7	29	75	63	48	40	80	110	85	105	136	81	63
8	28	66	58	52	39	79	107	85	80	131	92	62
9	27	65	58	50	39	80	114	99	90	134	80	63
10	27	69	58	47	39	86	105	90	150	130	77	64
11	26	64	56	45	40	109	105	84	171	127	75	63
12	26	63	54	43	40	254	96	96	108	131	74	64
13	26	63	54	44	43	169	110	107	98	118	73	56
14	26	61	54	43	42	135	114	89	90	117	69	59
15	26	60	81	42	41	123	101	86	88	112	71	57
16	26	62	83	43	39	116	96	79	90	109	70	57
17	26	63	74	43	38	107	93	81	103	105	69	56
18	28	61	68	43	36	105	84	81	96	105	66	56
19	28	59	65	43	35	99	82	80	87	102	69	53
20	28	59	64	43	2030	96	85	120	81	100	67	58
21	28	60	63	42	309	93	85	93	474	96	66	59
22	28	62	63	41	181	90	83	105	4770	96	70	60
23	28	58	61	41	139	88	77	108	749	95	73	78
24	27	78	59	41	122	85	64	104	371	92	69	65
25	28	70	56	41	110	89	94	95	307	90	65	61
26	29	60	55	40	105	91	160	90	263	90	64	58
27	29	58	55	41	95	89	125	89	237	89	64	58
28	7940	59	55	40	90	88	117	82	206	87	64	58
29	616	83	55	40	---	85	110	77	194	86	64	57
30	196	80	53	40	---	83	102	74	185	85	63	56
31	130	---	52	40	---	83	---	74	---	95	62	---
TOTAL	9627	2082	1919	1376	3932	3133	3079	2796	9614	3613	2223	1815
MEAN	311	69.4	61.9	44.4	140	101	103	90.2	320	117	71.7	60.5
MAX	7940	108	83	52	2030	254	160	120	4770	177	92	78
MIN	26	58	52	40	35	79	64	74	67	85	62	53
AC-FT	19100	4130	3810	2730	7800	6210	6110	5550	19070	7170	4410	3600
CFSM	1.08	.24	.21	.15	.49	.35	.36	.31	1.11	.40	.25	.21
IN.	1.24	.27	.25	.18	.51	.40	.40	.36	1.24	.47	.29	.23

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1997, BY WATER YEAR (WY)

	MEAN	106	60.8	72.9	60.6	62.7	62.9	77.6	89.1	85.3	81.4	107	72.4
MAX	677	114	322	151	213	257	570	286	551	956	992	312	
(WY)	1986	1975	1985	1968	1992	1992	1977	1994	1987	1987	1978	1980	
MIN	33.4	34.0	35.3	31.1	30.4	28.8	28.6	21.1	17.0	14.9	14.6	17.1	
(WY)	1966	1966	1966	1966	1966	1966	1984	1984	1984	1984	1984	1984	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1965 - 1997

ANNUAL TOTAL	23426	45209	78.9	
ANNUAL MEAN	64.0	124	223	1987
HIGHEST ANNUAL MEAN			27.6	1984
LOWEST ANNUAL MEAN			8.2	1987
HIGHEST DAILY MEAN	7940	Oct 28	22200	Jul 17 1987
LOWEST DAILY MEAN	17	Aug 6	8.2	Jul 17 1984
ANNUAL SEVEN-DAY MINIMUM	18	Aug 1	9.4	Jul 12 1984
INSTANTANEOUS PEAK FLOW			108000	Jul 17 1987
INSTANTANEOUS PEAK STAGE			28.38	Jul 17 1987
ANNUAL RUNOFF (AC-FT)	46470	89670	57180	
ANNUAL RUNOFF (CFSM)	.22	.43	.27	
ANNUAL RUNOFF (INCHES)	3.03	5.84	3.72	
10 PERCENT EXCEEDS	63	128	99	
50 PERCENT EXCEEDS	37	74	48	
90 PERCENT EXCEEDS	21	40	28	

# GUADALUPE RIVER MAIN STEM

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08166200 GUADALUPE RIVER AT KERRVILLE, TX

**LOCATION.**--Lat 30°03'11", long 99°09'47", Kerr County, Hydrologic Unit 12100201, on left bank 300 ft below left end of Kerrville Dam, 1.0 mi upstream from mouth of Town Creek, and 1.4 mi upstream from State Highway 16 on Guadalupe Street at Guadalupe Park in Kerrville, Texas.

**DRAINAGE AREA.**--510 mi<sup>2</sup>.

**PERIOD OF RECORD.**--July 1986 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 1,601.00 ft above sea level. Prior to Apr. 4, 1989, at site 300 ft upstream, and on opposite bank at datum 1.0 ft lower.

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage in 1986, at least 10% of contributing drainage area has been regulated by Kerrville Dam. Numerous diversions for irrigation above station, amounts unknown.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum estimated discharge, 196,000 ft<sup>3</sup>/s July 2, 1932 (estimated gage height, 39 ft).

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	57	242	135	102	80	206	185	232	197	423	206	131
2	55	189	124	102	81	253	201	225	192	401	197	130
3	53	167	116	102	101	233	255	214	193	383	191	131
4	52	160	116	99	94	205	315	209	189	366	186	136
5	57	146	114	94	83	197	400	205	180	349	183	135
6	59	143	108	90	83	189	313	200	182	338	180	131
7	58	142	100	90	88	186	277	203	218	323	205	130
8	54	128	96	111	86	227	270	204	199	312	242	129
9	52	110	91	107	86	208	270	232	251	305	203	129
10	48	108	92	97	88	234	265	224	350	294	193	124
11	48	109	91	94	89	297	257	199	483	283	185	120
12	47	106	88	88	98	1210	236	240	279	274	179	118
13	47	106	86	86	94	456	230	266	236	266	172	119
14	45	105	88	86	96	347	235	217	214	262	165	114
15	48	98	125	86	94	306	237	206	223	259	157	131
16	47	103	197	89	90	292	235	194	214	256	157	142
17	47	97	154	90	87	286	225	190	218	247	156	120
18	42	92	137	90	86	272	216	189	207	243	152	115
19	42	86	131	90	86	259	215	364	194	236	152	108
20	41	85	126	92	4690	247	207	761	187	233	153	104
21	44	84	125	94	921	238	202	295	1250	229	149	98
22	39	84	125	94	439	229	195	296	11300	228	146	100
23	39	83	124	91	334	222	193	307	2140	226	154	101
24	41	128	117	91	291	217	177	322	942	219	147	99
25	45	137	110	90	261	212	155	272	738	213	143	98
26	47	111	111	86	245	205	500	247	632	204	142	98
27	86	97	111	90	225	200	339	230	553	199	139	96
28	10100	102	111	82	214	196	285	226	508	195	134	95
29	1490	147	109	80	---	189	262	216	474	194	135	95
30	435	165	104	77	---	184	247	212	445	202	133	101
31	324	---	102	82	---	183	---	206	---	235	130	---
TOTAL	13689	3660	3564	2842	9310	8385	7599	7803	23588	8397	5166	3478
MEAN	442	122	115	91.7	333	270	253	252	786	271	167	116
MAX	10100	242	197	111	4690	1210	500	761	11300	423	242	142
MIN	39	83	86	77	80	183	155	189	180	194	130	95
AC-FT	27150	7260	7070	5640	18470	16630	15070	15480	46790	16660	10250	6900
CFSM	.87	.24	.23	.18	.65	.53	.50	.49	1.54	.53	.33	.23
IN.	1.00	.27	.26	.21	.68	.61	.55	.57	1.72	.61	.38	.25

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1986 - 1997#, BY WATER YEAR (WY)

	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	139	110	153	123	164	165	132	189	255	253	107	124
MAX	442	180	572	282	555	547	329	313	1089	1572	281	256
(WY)	1997	1987	1992	1992	1992	1992	1992	1994	1987	1987	1987	1986
MIN	64.8	74.1	64.1	56.6	59.4	68.6	66.6	55.6	40.1	27.3	34.1	38.5
(WY)	1990	1994	1990	1996	1996	1996	1991	1996	1996	1996	1996	1989

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1986 - 1997#	
ANNUAL TOTAL	36934		97481			
ANNUAL MEAN	101		267		160	
HIGHEST ANNUAL MEAN					399	
LOWEST ANNUAL MEAN					63.6	
HIGHEST DAILY MEAN	10100	Oct 28	11300	Jun 22	36100	Jul 17 1987
LOWEST DAILY MEAN	17	Aug 7	39	Oct 22	17	Aug 7 1996
ANNUAL SEVEN-DAY MINIMUM	19	Aug 4	41	Oct 18	19	Aug 4 1996
INSTANTANEOUS PEAK FLOW			54400	Oct 28	141000	Jul 17 1987
INSTANTANEOUS PEAK STAGE			17.73	Oct 28	37.72	Jul 17 1987
ANNUAL RUNOFF (AC-FT)	73260		193400		116200	
ANNUAL RUNOFF (CFSM)	.20		.52		.31	
ANNUAL RUNOFF (INCHES)	2.69		7.11		4.27	
10 PERCENT EXCEEDS	115		318		245	
50 PERCENT EXCEEDS	58		165		92	
90 PERCENT EXCEEDS	27		84		47	

# Period of regulated streamflow.

## GUADALUPE RIVER MAIN STEM

08167000 GUADALUPE RIVER AT COMFORT, TX

**LOCATION.**--Lat 29°58'10", long 98°53'33", Kendall County, Hydrologic Unit 12100201, on right bank at downstream side of southbound bridge on Interstate Highway 10 at Comfort, 0.5 mi downstream from Cypress Creek, and at mile 396.2.

**DRAINAGE AREA.**--839 mi<sup>2</sup>.

**PERIOD OF RECORD.**--May 1939 to current year.

**REVISED RECORDS.**--WSP 1632: 1958. WSP 1732: 1939(M). WSP 2123: Drainage area, 1944(M), 1952(M), 1957(M), 1960(M).

**GAGE.**--Water-stage recorder. Datum of gage is 1,369.83 ft above sea level. Prior to Nov. 27, 1939, nonrecording gage. Nov. 27, 1939, to June 2, 1980, water-stage recorder at site 0.4 mi upstream at datum 2.22 ft higher. June 2, 1980, to Sept. 30, 1986, at present site at datum 2.00 ft higher.

**REMARKS.**--Records good. No known regulation. There are many small diversions above station for irrigation. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of July 1869 reached a stage of 42.3 ft, present datum, from report by U.S. Army Corps of Engineers. Flood of July 1, 1932, reached a stage of 38.4 ft, from floodmark, and from information by State Department of Highways and Public Transportation. Flood of July 16, 1900, reached about the same stage as that of July 1, 1932, from information by local residents. All stages are at site and datum then in use. Maximum stage since at least 1848, that of Aug. 2, 1978.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,600 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 27	2300	16,800	15.72	Mar. 12	0900	3,340	8.36
Oct. 28	1700	48,900	22.49	Apr. 4	0300	13,000	14.44
Feb. 20	1900	25,200	17.96	May 20	0100	3,840	8.96
Mar. 11	2200	3,380	8.41	June 22	0500	73,700	25.91

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	433	253	169	137	380	360	523	485	e1450	435	226
2	81	351	222	167	137	439	366	508	468	e1310	397	223
3	79	299	207	167	136	420	612	471	450	e1180	377	222
4	79	273	201	167	149	377	4100	450	434	e1050	361	225
5	81	254	204	163	140	359	1590	440	432	e980	349	233
6	85	241	196	160	135	333	1090	430	453	e900	341	225
7	85	240	187	e160	140	325	889	434	515	e850	336	219
8	80	221	180	e168	143	340	820	439	476	e810	432	217
9	77	202	176	e183	140	366	761	522	537	e770	409	215
10	73	190	172	e193	138	400	738	507	602	e730	364	214
11	70	187	172	e178	136	804	727	444	830	e700	343	209
12	70	186	170	e167	145	2170	641	446	586	e675	329	205
13	68	182	167	e157	155	1040	600	563	495	e650	316	203
14	67	180	165	e157	149	738	580	475	459	e630	304	201
15	65	179	222	e154	148	616	571	430	452	612	295	197
16	64	176	257	e152	143	586	562	412	449	595	287	224
17	63	178	266	149	141	587	545	393	443	569	285	231
18	63	172	223	148	137	560	526	382	417	548	276	213
19	e62	167	207	148	137	519	522	382	394	527	283	204
20	e61	163	200	148	6860	482	499	2200	373	514	274	202
21	59	159	197	148	2380	456	481	813	1060	505	264	198
22	60	157	196	148	901	438	458	697	37500	507	259	197
23	59	157	193	147	644	419	437	759	e10000	494	253	205
24	56	211	189	147	543	406	432	804	e6000	482	256	198
25	58	239	181	147	496	394	434	693	e4000	458	247	198
26	61	206	179	144	487	387	1450	606	e3000	441	242	200
27	1200	189	179	143	433	377	896	699	e2500	426	240	196
28	14100	179	178	141	400	376	685	733	e2200	411	236	192
29	3620	236	175	136	---	355	605	573	e1900	395	234	190
30	864	275	172	136	---	346	556	542	e1620	385	234	188
31	565	---	173	134	---	344	---	513	---	424	230	---
TOTAL	22157	6482	6059	4826	15830	16139	23533	18283	79530	20978	9488	6270
MEAN	715	216	195	156	565	521	784	590	2651	677	306	209
MAX	14100	433	266	193	6860	2170	4100	2200	37500	1450	435	233
MIN	56	157	165	134	135	325	360	382	373	385	230	188
AC-FT	43950	12860	12020	9570	31400	32010	46680	36260	157700	41610	18820	12440



# GUADALUPE RIVER MAIN STEM

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## 08167000 GUADALUPE RIVER AT COMFORT, TX--Continued

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997, BY WATER YEAR (WY)

MEAN	271	152	203	175	221	209	239	298	292	167	222	153
MAX	2417	518	2700	987	1728	1559	1598	1122	2820	1974	4782	575
(WY)	1986	1975	1992	1992	1992	1992	1977	1975	1987	1987	1978	1978
MIN	.000	3.63	10.5	16.8	24.4	16.6	13.2	14.9	.097	.000	.000	.000
(WY)	1957	1957	1957	1957	1957	1956	1955	1956	1956	1956	1954	1954

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1939 - 1997	
ANNUAL TOTAL	55408.7		229575		218	
ANNUAL MEAN	151		629		894	
HIGHEST ANNUAL MEAN					14.5	
LOWEST ANNUAL MEAN					1992	
HIGHEST DAILY MEAN	14100	Oct 28	37500	Jun 22	74200	Aug 2 1978
LOWEST DAILY MEAN	9.7	Aug 6	56	Oct 24	.00	Aug 31 1952
ANNUAL SEVEN-DAY MINIMUM	11	Aug 5	59	Oct 20	.00	Aug 31 1952
INSTANTANEOUS PEAK FLOW			73700	Jun 22	240000	Aug 2 1978
INSTANTANEOUS PEAK STAGE			25.91	Jun 22	g40.90	Aug 2 1978
ANNUAL RUNOFF (AC-FT)	109900		455400		157800	
10 PERCENT EXCEEDS	196		811		370	
50 PERCENT EXCEEDS	85		304		109	
90 PERCENT EXCEEDS	24		138		25	

e Estimated

g At site and datum then in use.

## GUADALUPE RIVER MAIN STEM

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX  
(Hydrologic index station)

**LOCATION.**--Lat 29°51'37", long 98°23'00", Comal County, Hydrologic Unit 12100201, at downstream side of bridge on Ranch Road 311, 1.9 mi southeast of Spring Branch Post Office, 7.5 mi downstream from Curry Creek, and at mile 334.4.

**DRAINAGE AREA.**--1,315 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1922 to current year.

Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to August 1995.

**REVISED RECORDS.**--WSP 1562: 1923-24, 1926, 1927-28(M), 1929, 1930(M). WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder and crest-stage gages. Datum of gage is 948.10 ft above sea level. Prior to Jan. 14, 1981, at site 220 ft downstream at same datum.

**REMARKS.**--Records fair except for those estimated discharges which are poor. No known regulation. Several small diversions above station for irrigation. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1859, about 53 ft in 1869; flood in July 1900 reached a stage of about 49 ft, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 4,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 29	1230	26,600	24.15	June 6	2200	10,300	14.13
Feb. 21	1245	15,300	18.04	June 9	0200	14,600	17.55
Apr. 4	1400	12,500	15.94	June 22	1700	116,000	a45.12
May 28	0800	6,640	10.93				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	113	665	291	199	161	536	532	867	1220	2850	e654	e311
2	104	478	279	198	164	512	555	810	1210	2590	e609	e301
3	96	397	253	196	162	573	624	771	1100	2390	e566	e294
4	95	345	242	194	160	532	8550	723	927	2180	e542	e270
5	93	312	234	189	165	492	5240	693	890	2000	e528	e292
6	94	287	234	182	172	453	3040	676	2350	1870	e528	e285
7	96	272	223	182	166	431	2220	667	3040	1740	e514	e282
8	96	255	210	195	161	429	1850	671	1500	1620	e550	e279
9	94	242	198	219	171	449	1660	716	4370	1520	e870	e276
10	89	224	197	235	165	459	1520	825	1730	1430	e624	e270
11	84	205	191	216	163	508	1470	728	1720	1340	e580	e258
12	83	196	186	202	201	2050	1300	672	1680	1240	e528	e258
13	80	196	182	190	245	2280	1150	710	1320	1160	e501	e229
14	80	192	178	188	235	1360	1060	754	1160	1100	e475	e252
15	77	195	239	188	214	1050	1000	680	1170	1040	e450	e243
16	75	191	397	185	207	929	955	656	1110	983	e425	e237
17	74	187	347	181	196	906	912	628	989	936	e429	e234
18	72	180	323	176	191	872	868	605	892	894	e429	e255
19	71	175	277	176	188	780	848	588	842	859	e409	e261
20	71	170	256	178	579	727	827	1520	798	825	e378	e249
21	71	163	248	178	8020	693	791	1990	3330	800	e367	e243
22	69	156	242	176	1970	655	754	1080	69400	781	e378	e237
23	65	154	237	177	1070	623	704	2860	41800	e772	e378	e232
24	66	173	228	173	799	599	684	3040	10900	e728	e371	e229
25	70	199	222	171	691	e594	677	1890	6960	e696	e364	e226
26	71	253	218	171	650	e594	1410	1510	5670	e675	e349	e223
27	73	230	211	171	647	e599	2260	1310	4560	e654	e339	e223
28	2760	212	208	164	576	594	1330	3760	3950	e629	e335	e221
29	13600	216	206	163	---	e590	1080	1790	3530	e614	e328	e221
30	2620	245	201	159	---	e556	942	1500	3090	e609	e321	e218
31	1060	---	200	158	---	524	---	1360	---	e644	e318	---
TOTAL	22262	7365	7358	5730	18489	22949	46813	37050	183208	38169	14437	7609
MEAN	718	246	237	185	660	740	1560	1195	6107	1231	466	254
MAX	13600	665	397	235	8020	2280	8550	3760	69400	2850	870	311
MIN	65	154	178	158	160	429	532	588	798	609	318	218
AC-FT	44160	14610	14590	11370	36670	45520	92850	73490	363400	75710	28640	15090

# GUADALUPE RIVER MAIN STEM

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## 08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 1997, BY WATER YEAR (WY)

MEAN	340	227	308	290	363	349	389	521	587	322	238	299
MAX	1584	939	4927	1903	4164	3306	2417	2216	6329	3744	4980	4055
(WY)	1982	1975	1992	1992	1992	1992	1977	1992	1987	1932	1978	1936
MIN	5.91	11.1	6.48	10.9	29.3	16.8	6.11	19.3	.000	.000	.25	.29
(WY)	1952	1957	1957	1957	1956	1956	1956	1956	1956	1956	1954	1954

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1922 - 1997	
ANNUAL TOTAL	61644.4		411439		353	
ANNUAL MEAN	168		1127		1819	
HIGHEST ANNUAL MEAN					13.3	
LOWEST ANNUAL MEAN					1992	
HIGHEST DAILY MEAN	13600	Oct 29	69400	Jun 22	76500	Aug 3 1978
LOWEST DAILY MEAN	4.7	Aug 9	65	Oct 23	.00	Aug 19 1951
ANNUAL SEVEN-DAY MINIMUM	6.3	Aug 7	69	Oct 19	.00	Aug 31 1951
INSTANTANEOUS PEAK FLOW			116000	Jun 22	160000	Aug 3 1978
INSTANTANEOUS PEAK STAGE			a45.12	Jun 22	45.25	Aug 3 1978
ANNUAL RUNOFF (AC-FT)	122300		816100		255900	
10 PERCENT EXCEEDS	234		1860		645	
50 PERCENT EXCEEDS	96		429		150	
90 PERCENT EXCEEDS	22		163		33	

e Estimated

a From floodmark.

## GUADALUPE RIVER MAIN STEM

08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to August 1995, April 1996 to September 1997. Sediment analyses: April 1996 to September 1997.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED 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)
APR 17...	1100	86	477	8.4	20.0	8.5	97	210	28	50
MAY 29...	0930	44	470	8.2	27.0	7.1	93	200	15	49
JUN 28...	1000	31	450	8.2	28.0	7.3	97	190	13	45
AUG 02...	0945	12	460	8.2	29.0	6.4	87	190	1	43
SEP 06...	1000	71	460	8.3	26.0	6.6	85	190	12	49

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
APR 17...	21	14	0.4	12	1.7	180	19	20	0.30	11
MAY 29...	20	15	0.5	14	2.0	190	17	22	0.30	14
JUN 28...	19	15	0.5	14	2.0	180	15	22	0.30	14
AUG 02...	20	17	0.5	16	2.1	190	15	25	0.30	17
SEP 06...	17	15	0.5	14	2.2	180	16	25	0.40	12

DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
APR 17...	252	258	--	<0.010	0.150	<0.015	0.45	0.30	--	<0.20
MAY 29...	264	256	--	<0.010	0.140	0.040	0.64	0.46	--	<0.20
JUN 28...	238	242	0.070	0.020	0.090	0.020	0.29	0.18	--	<0.20
AUG 02...	252	251	--	<0.010	0.060	0.040	0.26	0.16	0.26	0.30
SEP 06...	256	247	--	<0.010	0.180	0.020	0.48	0.28	--	<0.20

DATE	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)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
APR 17...	0.30	0.020	0.020	<0.010	1.6	0.5	7.2	31	7	2
MAY 29...	0.50	0.020	<0.010	<0.010	1.9	0.6	3.7	31	<3	<1
JUN 28...	0.20	<0.010	<0.010	<0.010	2.2	0.3	3.3	40	<3	1
AUG 02...	0.20	<0.010	<0.010	<0.010	2.1	0.6	1.0	31	<3	1
SEP 06...	0.30	0.010	<0.010	<0.010	2.4	0.80	8.6	45	7	2

## GUADALUPE RIVER MAIN STEM

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08167500 GUADALUPE RIVER NEAR SPRING BRANCH, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)	
OCT 15...	1230	77	460	8.3	24.0	8.0	99	200	12	52	
NOV 06...	1315	288	460	8.2	22.0	8.3	99	220	17	62	
FEB 21...	0945	13200	360	7.7	17.0	7.9	85	150	12	42	
MAR 31...	1015	590	520	7.9	17.0	9.5	101	260	28	69	
MAY 08...	0945	665	530	7.7	23.0	8.4	102	260	28	69	
JUL 10...	1130	1450	562	7.5	28.0	7.7	102	260	24	72	
JUL 29...	1215	614	523	7.4	30.0	7.6	104	250	34	66	
AUG 22...	0945	395	520	7.4	28.0	7.0	93	230	29	61	
SEP 19...	0900	262	500	8.2	27.0	7.7	101	230	17	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 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)	
OCT 15...	18	12	0.4	11	2.2	190	17	19	0.30	5.5	
NOV 06...	15	8.9	0.3	8	2.3	200	20	16	0.20	13	
FEB 21...	12	7.0	0.2	9	2.4	140	11	11	0.20	8.2	
MAR 31...	20	9.8	0.3	8	1.6	230	24	16	0.2	8.3	
MAY 08...	21	10	0.3	8	1.4	230	23	17	0.3	9.8	
JUL 10...	20	9.7	0.3	7	1.6	240	21	15	0.3	13	
JUL 29...	20	11	0.3	9	1.6	220	23	16	0.3	13	
AUG 22...	19	11	0.3	10	1.6	200	20	17	0.2	8.6	
SEP 19...	19	12	0.4	10	1.5	210	20	18	0.2	13	
DATE		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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
OCT 15...	212	247	0.110	0.010	0.120	0.070	--	--	--	<0.20	
NOV 06...	265	261	2.07	0.030	2.10	0.020	2.4	0.28	0.18	0.20	
FEB 21...	191	188	0.520	0.010	0.530	<0.015	1.5	1.0	--	0.30	
MAR 31...	295	287	--	<0.010	0.730	<0.015	--	--	--	<0.20	
MAY 08...	299	283	--	<0.01	0.77	<0.01	--	--	--	<0.2	
JUL 10...	304	295	--	<0.01	1.3	<0.01	--	--	--	<0.2	
JUL 29...	294	267	--	<0.01	1.2	<0.01	--	--	--	<0.2	
AUG 22...	294	257	--	<0.01	0.89	<0.01	--	--	--	<0.2	
SEP 19...	290	259	--	<0.01	0.83	<0.01	--	--	--	<0.2	
DATE		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)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
OCT 15...	<0.20	0.010	<0.010	<0.010	<0.010	2.3	0.40	15	71	<3.0	1.0
NOV 06...	0.30	<0.010	<0.010	<0.010	<0.010	4.7	0.10	37	47	<3.0	1.0
FEB 21...	1.0	0.050	0.020	<0.010	<0.010	4.8	>5.0	83000	2330	4.0	<1.0
MAR 31...	<0.20	<0.010	<0.010	<0.010	<0.010	1.8	0.2	32	20	<3	<1
MAY 08...	<0.2	0.02	<0.01	<0.01	<0.01	1.8	0.3	54	30	<3	<1
JUL 10...	<0.2	<0.01	<0.01	<0.01	<0.01	1.8	0.5	117	30	<3	2
JUL 29...	<0.2	<0.01	<0.01	<0.01	<0.01	1.4	0.2	36	22	<3	<1
AUG 22...	<0.2	<0.01	<0.01	<0.01	<0.01	1.5	0.3	22	21	<3	2
SEP 19...	<0.2	<0.01	<0.01	<0.01	<0.01	1.3	0.3	13	19	<3	3



## GUADALUPE RIVER MAIN STEM

08167700 CANYON LAKE NEAR NEW BRAUNFELS, TX

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

**DRAINAGE AREA.**--1,432 mi<sup>2</sup>.

**PERIOD OF RECORD.**--July 1962 to current year. Prior to October 1970, published as Canyon Reservoir.

Water-quality records.--Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to August 1995.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is sea level (levels by U.S. Army Corps of Engineers). Prior to Sept. 24, 1964, nonrecording gage at present site and datum.

**REMARKS.**--The lake is formed by a rolled earthfill dam 6,830 ft long, consisting of the main dam 4,410 ft long, an earthen dike 210 ft long, a 1,260-foot-long uncontrolled broad-crested-type spillway, and a 950-foot concrete and earthen nonoverflow section. Deliberate impoundment began June 16, 1964, and main part of dam was completed in August 1964. The flood-control outlet works consist of a 10.0-foot-diameter conduit controlled by two 5.7 by 10.0-foot hydraulically operated slide gates. The lake was built for water conservation and flood control. Capacity table beginning Oct. 1, 1974, is based on a sedimentation survey of August 1972. Small diversions above the lake for irrigation. Satellite 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 .....	974.0	-
Crest of spillway .....	943.0	736,700
Top of conservation pool .....	909.0	382,000
Lowest gated outlet (invert) .....	775.0	240

**COOPERATION.**--Records of elevations and contents furnished by the U.S. Army Corps of Engineers and reviewed by the U.S. Geological Survey.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 732,600 acre-ft June 19, 1987 (elevation, 942.68 ft); minimum observed since conservation pool first reached in April 1968, 311,200 acre-ft Nov. 24, 1984 (elevation, 899.85 ft).

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 668,900 acre-ft June 27 (elevation, 937.57 ft); minimum, 343,600 acre-ft Oct. 26 (elevation, 904.19 ft).

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

901.0	319,600	918.0	460,800	931.0	592,700
906.0	357,800	922.0	498,800	934.0	626,600
910.0	390,300	925.0	528,800	936.0	650,100
914.0	424,600	928.0	560,100	938.0	674,100

RESERVOIR STORAGE (ACRE-Feet), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	348400	376400	380400	383500	381800	401400	397100	394900	397000	652000	416500	387600
2	348200	376400	380500	383500	381800	401400	397500	395400	394300	646500	408300	387300
3	348000	376300	380500	383600	381800	400600	397800	395400	393700	640400	400800	387100
4	347900	376400	380800	383600	381600	399800	413300	395400	393300	634300	396500	386700
5	347700	376600	380800	383500	381600	398900	422400	395400	393000	627800	394400	386400
6	347600	377000	380900	383500	381800	397800	426800	395200	395400	621000	393800	386000
7	347400	377300	380900	383600	382200	396900	429000	395100	400500	613900	393900	385600
8	347300	377400	380800	383700	382000	396700	427800	394900	403300	606700	399100	385200
9	347100	377500	380800	383600	382100	396400	424200	395400	411700	599400	400100	385000
10	346900	377600	380700	383600	382200	396000	419800	395500	415600	591900	400100	384600
11	346700	377600	380800	383500	382100	396100	418300	395600	419000	584400	399700	384100
12	346300	377600	380700	383400	383300	398400	419600	395700	420500	576700	398700	383600
13	346300	377700	380600	383200	383500	401000	421100	394900	420100	569000	396000	383200
14	346100	377800	380500	383100	383700	401400	419600	394500	421700	561200	394500	382700
15	346000	378000	382000	383100	383800	400400	413000	394300	422700	553400	394200	382300
16	345900	378100	382300	382900	383900	399300	406300	394200	418100	545500	393500	381800
17	345700	378300	382600	382800	384000	399000	402000	394200	410700	537500	392900	381500
18	345300	378300	382600	382700	384100	398900	400500	393900	403100	529500	392200	381300
19	345000	378500	382700	382700	384600	398400	401300	394200	397600	521500	391700	381000
20	344900	378600	382700	382800	385800	397800	402100	395700	396700	513500	391400	380800
21	344800	378600	382800	382800	399700	397600	401800	398100	405900	505400	391000	380400
22	344500	378600	383000	382800	402300	397600	398800	398800	527300	497400	390600	380800
23	344100	378600	383200	382800	403200	397400	395800	403100	621900	489300	390500	380700
24	343900	379700	383200	382800	403500	397200	395000	407400	644600	481200	390100	380300
25	343800	379400	383200	382700	403200	397900	395800	409500	657800	473100	389800	379900
26	343600	379500	383200	382700	402700	398000	398200	411000	667400	465000	389600	379500
27	343800	379400	383200	382800	402100	397900	401000	411500	668900	456900	389200	379200
28	347700	379800	383300	382400	401400	397700	402300	413500	665700	448700	389000	378900
29	370500	380200	383400	382200	---	397500	401700	410700	661800	440600	388600	378600
30	374700	380400	383400	382200	---	397300	397800	406800	657200	432600	388300	378600
31	375900	---	383500	381900	---	397000	---	402100	---	424600	388000	---
MAX	375900	380400	383500	383700	403500	401400	429000	413500	668900	652000	416500	387600
MIN	343600	376300	380400	381900	381600	396000	395000	393900	393000	424600	388000	378600
(+)	908.26	908.81	909.18	908.99	911.31	910.79	910.89	911.39	936.60	914.00	909.72	908.59
(@)	+27400	+4500	+3100	-1600	+19500	-4400	+800	+4300	+255100	-232600	-36600	-9400

CAL YR 1996 MAX 383500 MIN 341900 (@) +11800  
WTR YR 1997 MAX 668900 MIN 343600 (@) +30100

(+) Elevation, in feet, at end of month.  
(@) Change in contents, in acre feet.

## 08167800 GUADALUPE RIVER AT SATTTLER, TX

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

**DRAINAGE AREA.**--1,436 mi<sup>2</sup>, of which 1,432 mi<sup>2</sup> is above Canyon Dam.

**PERIOD OF RECORD.**--March 1960 to current year.

Water-quality records.--Water temperature: June 1984 to September 1987. Chemical and biochemical analyses: October 1980 to September 1982, October 1989 to August 1995.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 742.24 ft above sea level (U.S. Army Corps of Engineers bench mark).

**REMARKS.**--No estimated daily discharges. Records good. Since July 21, 1962, flow completely regulated by Canyon Lake (station 08167700) 1.8 mi upstream. Small diversions above station for irrigation. Rain gage at station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--3 years (water years 1960-62) prior to regulation by Canyon Lake Reservoir, 397 ft<sup>3</sup>/s (2pstre87,600 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1961-62).**--Maximum discharge, 20,800 ft<sup>3</sup>/s Oct. 29, 1960 (gage height, 12.20 ft); no flow July 31 to Aug. 6, 1962 (result of closure of Canyon Dam).

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in July 1869 (stage unknown) has not been exceeded since that date; flood in July 1900 (stage unknown) exceeded 39 ft; maximum stage since at least 1904, 39 ft in July 1932 and June 1935, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	106	302	148	182	184	701	699	2420	3820	5540	5070	465
2	106	299	140	182	184	745	701	790	2450	5540	5170	465
3	106	300	170	182	189	988	733	716	1330	5530	4670	458
4	106	230	179	182	164	999	776	714	1110	5510	2870	466
5	106	150	179	182	121	999	772	760	994	5500	1540	466
6	106	124	179	179	126	992	772	809	919	5490	796	466
7	106	97	179	176	129	936	954	809	685	5460	708	465
8	104	96	179	176	130	699	2480	810	685	5440	729	465
9	104	97	179	176	132	701	3580	802	707	5440	717	465
10	104	101	178	176	134	707	3910	729	478	5420	722	465
11	104	101	176	176	134	707	2680	729	147	5400	790	465
12	104	100	177	176	138	707	438	855	968	5370	1040	465
13	104	99	179	176	136	874	437	1040	1700	5360	1600	465
14	104	99	179	176	136	1050	1950	1040	463	5350	1150	465
15	103	99	181	177	137	1420	4810	891	869	5320	618	463
16	98	99	181	177	139	1430	4800	716	3670	5310	714	454
17	98	99	179	176	141	1090	3380	707	5060	5290	714	399
18	97	102	179	176	141	1010	1750	707	5030	5310	725	355
19	97	103	179	176	163	1010	614	709	3890	5290	673	355
20	97	102	179	176	245	1010	614	715	1280	5270	612	355
21	97	102	179	178	359	845	1050	709	760	5240	600	355
22	96	102	179	179	588	699	2320	712	457	5220	567	356
23	92	102	181	179	594	699	2280	731	159	5190	537	359
24	95	104	182	179	793	700	1080	725	134	5180	541	361
25	95	102	179	179	988	699	651	722	139	5150	499	360
26	95	115	179	179	994	696	726	745	467	5130	469	360
27	95	144	179	180	993	699	722	1190	3810	5110	468	360
28	101	145	179	181	956	702	674	2310	5600	5090	468	360
29	106	147	179	182	---	699	1390	3080	5570	5070	468	287
30	159	148	179	182	---	699	3090	3410	5560	5040	467	186
31	287	---	181	182	---	699	---	3840	---	5020	467	---
TOTAL	3378	4010	5475	5535	9268	26611	50833	35642	58911	164580	37179	12231
MEAN	109	134	177	179	331	858	1694	1150	1964	5309	1199	408
MAX	287	302	182	182	994	1430	4810	3840	5600	5540	5170	466
MIN	92	96	140	176	121	696	437	707	134	5020	467	186
AC-FT	6700	7950	10860	10980	18380	52780	100800	70700	116800	326400	73740	24260

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1997#, BY WATER YEAR (WY)

	315	330	287	444	409	487	531	524	681	670	496	307
MEAN	315	330	287	444	409	487	531	524	681	670	496	307
MAX	1317	1177	1138	4437	2089	3949	3705	2318	2783	5309	3854	1306
(WY)	1987	1974	1987	1992	1992	1992	1992	1992	1992	1997	1978	1987
MIN	43.1	66.2	41.4	60.4	13.4	71.7	45.6	47.1	36.1	22.1	10.1	10.5
(WY)	1964	1976	1966	1964	1965	1988	1971	1971	1963	1963	1963	1963

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1963 - 1997#	
ANNUAL TOTAL	40173		413653			
ANNUAL MEAN	110		1133		457	
HIGHEST ANNUAL MEAN					1900	
LOWEST ANNUAL MEAN					69.4	
HIGHEST DAILY MEAN	302	Nov 1	5600	Jun 28	5680	Aug 5 1978
LOWEST DAILY MEAN	25	Aug 4	92	Oct 23	.80	Jan 29 1965
ANNUAL SEVEN-DAY MINIMUM	25	Aug 4	95	Oct 21	1.2	Sep 24 1984
INSTANTANEOUS PEAK FLOW			5670	Jun 27	5850	Aug 5 1978
INSTANTANEOUS PEAK STAGE			8.26	Jun 27	8.31	Aug 5 1978
ANNUAL RUNOFF (AC-FT)	79680		820500		331100	
10 PERCENT EXCEEDS	157		5030		800	
50 PERCENT EXCEEDS	120		467		215	
90 PERCENT EXCEEDS	33		104		69	

# Period of regulated streamflow.

## GUADALUPE RIVER MAIN STEM

08168500 GUADALUPE RIVER ABOVE COMAL RIVER AT NEW BRAUNFELS, TX

**LOCATION.**--Lat 29°42'53", long 98°06'35", Comal County, Hydrologic Unit 12100202, on right bank at New Braunfels, 1.1 mi upstream from Comal River, 21.9 mi downstream from Canyon Lake, and at mile 281.1.

**DRAINAGE AREA.**--1,518 mi<sup>2</sup>, of which 1,432 mi<sup>2</sup> is above Canyon Dam.

**PERIOD OF RECORD.**--December 1927 to current year.

**REVISED RECORDS.**--WSP 898: 1935. WSP 1562: 1932. WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 586.65 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. Since July 21, 1962, at least 10% of contributing drainage area has been regulated by Canyon Lake (station 08167700) 21.9 mi upstream. Small diversions for irrigation below station 08167800 and above this station. Rain gage at station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--34 years (water years 1929-62) prior to regulation by Canyon Lake, 372 ft<sup>3</sup>/s (269,500 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1929-62).**--Maximum discharge, 101,000 ft<sup>3</sup>/s June 15, 1935 (gage height, 32.95 ft). Maximum discharge since closure of Canyon Dam on July 21, 1962, 92,600 ft<sup>3</sup>/s May 12, 1972 (gage height, 31.65 ft); no flow July 8, 9, and July 17 to Aug. 20, 1956.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1845, 38 ft July 8, 1869, and in December 1913, from information by local residents.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	121	274	178	209	205	834	776	2540	3570	5710	4820	517
2	118	267	176	205	205	787	786	998	2840	5660	5000	513
3	116	264	174	205	205	1030	837	822	1310	5630	4680	512
4	114	261	208	205	206	1070	986	818	1290	5590	2990	531
5	114	161	210	205	153	1070	1060	828	1090	5540	1660	519
6	113	154	210	205	145	1060	1010	886	1120	5510	996	519
7	111	116	202	205	153	1060	917	884	864	5480	780	519
8	107	106	191	205	151	820	2190	887	829	5450	840	515
9	106	105	191	205	151	781	3200	903	1740	5420	812	514
10	106	105	194	205	151	781	3630	828	1190	5390	806	519
11	106	108	193	205	151	785	3030	814	667	5360	857	513
12	108	109	191	205	181	781	625	853	762	5330	931	513
13	107	107	191	203	192	872	560	1080	2110	5300	1520	512
14	108	106	193	201	190	1020	1130	1080	667	5280	1400	511
15	107	108	228	203	185	1470	4100	1030	846	5250	663	513
16	103	111	237	205	182	1470	4660	807	2900	5220	789	503
17	98	112	233	205	180	1250	3220	772	5260	5200	794	489
18	96	113	226	204	180	1060	1990	772	5230	5160	800	403
19	96	113	223	205	185	1060	726	773	4490	5140	785	403
20	96	114	222	205	261	1060	706	888	1630	5110	689	403
21	98	115	225	205	302	990	886	813	1210	5090	664	403
22	98	116	225	205	654	786	1840	806	1640	5060	655	422
23	93	114	223	205	674	781	2310	849	842	5030	583	409
24	91	140	220	205	760	781	1270	915	692	5010	608	406
25	99	124	215	205	1070	786	783	866	558	4980	571	403
26	98	120	215	205	1090	781	900	853	567	4970	525	406
27	96	149	215	205	1090	781	865	1050	3010	4950	519	403
28	99	171	210	205	1090	781	804	1980	5850	4920	523	403
29	115	180	210	205	---	777	957	2800	5810	4890	521	400
30	119	182	209	205	---	774	2730	2990	5760	4860	519	231
31	224	---	205	205	---	774	---	3590	---	4820	520	---
TOTAL	3381	4325	6443	6350	10342	28913	49484	36775	66344	162310	38820	13827
MEAN	109	144	208	205	369	933	1649	1186	2211	5236	1252	461
MAX	224	274	237	209	1090	1470	4660	3590	5850	5710	5000	531
MIN	91	105	174	201	145	774	560	772	558	4820	519	231
AC-FT	6710	8580	12780	12600	20510	57350	98150	72940	131600	321900	77000	27430

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1997#, BY WATER YEAR (WY)

	MEAN	381	398	367	526	502	575	609	647	802	743	559	368
MAX	1409	1307	1302	4704	2379	4254	3826	2450	2948	5236	3866	1484	
(WY)	1987	1974	1987	1992	1992	1992	1992	1992	1992	1997	1978	1987	
MIN	39.0	85.4	67.9	71.2	105	93.8	57.5	59.3	47.4	24.8	23.2	16.0	
(WY)	1964	1964	1964	1964	1963	1963	1971	1971	1984	1984	1963	1963	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1963 - 1997#

ANNUAL TOTAL	42523			427314								
ANNUAL MEAN	116			1171								
HIGHEST ANNUAL MEAN										540		
LOWEST ANNUAL MEAN										2057		1992
HIGHEST DAILY MEAN	274	Nov 1		5850	Jun 28					84.9		1984
LOWEST DAILY MEAN	13	Aug 5		91	Oct 24					13300	May 12	1972
ANNUAL SEVEN-DAY MINIMUM	13	Aug 5		95	Oct 18					2.6	Sep 28	1984
INSTANTANEOUS PEAK FLOW				5860	Jun 27					2.7	Sep 25	1984
INSTANTANEOUS PEAK STAGE				6.65	Jun 27					92600	May 12	1972
ANNUAL RUNOFF (AC-FT)	84340			847600						31.65	May 12	1972
10 PERCENT EXCEEDS	181			4840						391200		
50 PERCENT EXCEEDS	127			567						976		
90 PERCENT EXCEEDS	21			114						296		
										92		

# Period of regulated streamflow.



# GUADALUPE RIVER BASIN

175

08168710 COMAL SPRINGS AT NEW BRAUNFELS, TX

**LOCATION.**--Lat 29°42'21", long 98°07'20", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels, and 1.1 mi upstream from mouth.

**DRAINAGE AREA.**--Not applicable. This is a springflow station.

**PERIOD OF RECORD.**--October 1929 to current year.

**GAGE.**--Water-stage recorder. Concrete control. Datum of gage is 582.80 ft above sea level.

**REMARKS.**--No estimated daily discharges. The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones Fault Zone. Flow is mainly from Comal Springs except during local runoff events. Springflow is separated from runoff using computer techniques. Flow is affected at times by cleanup operations by the city of New Braunfels at Landa Park Lake.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	170	164	185	198	197	214	230	259	261	313	298	268
2	170	165	186	196	197	215	234	258	258	312	296	264
3	169	165	184	195	196	216	237	255	255	313	292	267
4	169	166	185	195	194	218	241	255	258	310	288	271
5	170	165	184	196	194	219	247	254	262	311	289	269
6	170	166	185	196	196	216	253	256	269	309	289	272
7	169	165	186	196	198	218	252	254	276	308	291	273
8	168	163	187	198	196	219	250	251	283	304	290	271
9	166	163	187	195	198	220	251	252	281	304	295	275
10	165	165	187	196	199	220	252	252	278	308	294	274
11	165	167	187	195	198	223	252	254	276	304	291	275
12	165	164	187	197	201	222	253	255	275	305	288	275
13	164	164	187	197	204	222	257	254	271	303	289	273
14	163	164	188	197	207	222	255	254	274	305	285	273
15	163	167	193	196	206	222	251	256	279	300	285	271
16	163	169	198	193	206	225	251	254	277	300	286	267
17	163	170	196	193	205	227	251	253	279	300	284	266
18	163	170	195	194	203	230	251	254	277	296	280	265
19	162	171	194	195	207	229	254	254	277	298	278	263
20	162	170	194	196	211	229	255	256	273	302	277	264
21	162	170	193	195	207	231	254	256	282	306	276	265
22	159	170	194	195	208	228	250	256	291	303	275	266
23	161	171	195	198	209	231	250	261	301	303	279	268
24	162	173	193	198	212	228	253	266	311	303	278	268
25	163	174	195	196	211	228	256	262	321	303	275	269
26	164	176	198	197	215	227	259	266	322	303	274	269
27	164	176	197	197	213	227	262	262	318	303	273	269
28	164	179	196	193	214	227	265	265	317	301	270	269
29	164	182	197	196	---	225	261	263	317	298	268	268
30	164	185	197	192	---	226	259	267	317	301	272	267
31	164	---	196	194	---	228	---	264	---	300	272	---
TOTAL	5110	5079	5926	6065	5702	6932	7546	7978	8536	9429	8777	8074
MEAN	165	169	191	196	204	224	252	257	285	304	283	269
MAX	170	185	198	198	215	231	265	267	322	313	298	275
MIN	159	163	184	192	194	214	230	251	255	296	268	263
AC-FT	10140	10070	11750	12030	11310	13750	14970	15820	16930	18700	17410	16010

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1997, BY WATER YEAR (WY)

MEAN	274	283	292	298	299	298	293	292	286	269	256	260
MAX	465	450	437	430	446	477	474	456	481	465	465	427
(WY)	1974	1974	1974	1974	1992	1992	1992	1992	1992	1992	1992	1992
MIN	.000	21.5	35.6	51.1	49.5	65.4	41.5	27.8	3.67	.000	.000	.000
(WY)	1957	1957	1957	1957	1957	1957	1956	1956	1956	1956	1956	1956

## SUMMARY STATISTICS

### FOR 1996 CALENDAR YEAR

### FOR 1997 WATER YEAR

### WATER YEARS 1930 - 1997

ANNUAL TOTAL	63195	85154	
ANNUAL MEAN	173	233	
HIGHEST ANNUAL MEAN			283
LOWEST ANNUAL MEAN			402
HIGHEST DAILY MEAN	271	Jan 1	534
LOWEST DAILY MEAN	83	Aug 16	159
ANNUAL SEVEN-DAY MINIMUM	83	Aug 14	162
ANNUAL RUNOFF (AC-FT)	125300	168900	204900
10 PERCENT EXCEEDS	253	299	378
50 PERCENT EXCEEDS	170	231	302
90 PERCENT EXCEEDS	91	167	168

## GUADALUPE RIVER BASIN

08169000 COMAL RIVER AT NEW BRAUNFELS, TX

**LOCATION.**--Lat 29°42'21", long 98°07'20", Comal County, Hydrologic Unit 12100202, on right bank 200 ft upstream from San Antonio Street viaduct in New Braunfels and 1.1 mi upstream from mouth.

**DRAINAGE AREA.**--130 mi<sup>2</sup>. Normal flow of river comes from springs; drainage area not applicable.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--1882 to September 1932 (discharge measurements and fragmentary daily discharge record), October 1932 to current year.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Concrete control since Oct. 1, 1955. Datum of gage is 582.80 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. Since water year 1974 at least 10% of contributing drainage area has been regulated by Landa Park Lake. The flow from Comal Springs emerges from the Edwards and associated limestones in the Balcones Fault Zone. Except during periods of rainfall, flow of river is primarily from Comal Springs about 1.0 mi upstream. No flow from Comal Springs from June 13 to Nov. 3, 1956. Flow is affected at times by cleanup operations by the city of New Braunfels at Landa Park Lake and at times by discharge from the flood-detention pools of five floodwater-retarding structures with a combined detention capacity of 17,580 acre-ft. These structures control runoff from 74.6 mi<sup>2</sup> above station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--41 years (water years 1933-73), 286 ft<sup>3</sup>/s (207,200 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION.**--Maximum discharge, 60,800 ft<sup>3</sup>/s May 11, 1972 (gage height, 36.55 ft, from floodmark), from rating curve extended above 13,000 ft<sup>3</sup>/s on basis of contracted-opening measurements on Blieders and Dry Comal Creeks and unit rainfall-runoff studies; no flow from Comal Springs from June 13 to Nov. 3, 1956.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood information begins with flood of July 8, 1869, which reached a stage of 36.91 ft, from painted and dated marks in old Remmert Brewery 0.5 mi downstream; the flood of Oct. 17, 1870, reached a stage of 37.65 ft at same site (probably some backwater from Guadalupe River).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	171	164	185	198	197	214	230	259	280	313	298	268
2	170	165	186	196	197	215	245	258	273	312	296	264
3	169	165	184	195	196	216	304	255	255	313	292	277
4	169	166	185	195	194	218	333	255	258	310	288	271
5	170	165	184	196	194	219	356	254	262	311	289	269
6	170	166	185	196	196	216	259	256	307	309	289	272
7	169	165	186	196	198	218	252	254	403	308	291	273
8	168	163	187	198	196	219	250	251	283	304	290	271
9	166	163	187	195	198	220	256	259	354	304	295	275
10	165	165	187	196	199	220	267	252	284	308	294	274
11	165	167	187	195	198	223	263	254	276	304	295	275
12	165	164	187	197	223	222	253	255	275	305	288	275
13	164	164	187	197	213	222	257	254	271	303	289	273
14	163	164	188	197	207	222	255	254	274	305	285	273
15	163	167	213	196	206	222	251	256	279	300	285	271
16	163	169	198	193	206	225	251	254	277	300	286	267
17	163	170	196	193	205	227	251	253	279	300	284	266
18	163	170	195	194	203	230	251	254	277	296	280	265
19	162	171	194	195	208	229	254	254	277	298	278	263
20	162	170	194	196	211	229	255	256	273	302	277	264
21	162	170	193	195	207	231	254	256	538	306	276	265
22	159	170	194	195	208	228	250	256	885	303	275	277
23	161	171	195	198	209	231	250	263	648	303	279	268
24	162	206	193	198	212	228	253	283	358	303	278	268
25	163	182	195	196	211	228	261	271	321	303	275	269
26	164	176	198	197	215	227	306	269	322	303	274	269
27	164	176	197	197	213	227	274	262	318	303	273	269
28	164	181	196	193	214	227	265	265	317	301	270	269
29	164	189	197	196	---	225	261	263	317	298	268	268
30	164	185	197	192	---	226	259	267	317	301	272	267
31	164	---	196	197	---	231	---	279	---	306	272	---
TOTAL	5111	5129	5946	6068	5734	6935	7926	8031	10058	9435	8781	8095
MEAN	165	171	192	196	205	224	264	259	335	304	283	270
MAX	171	206	213	198	223	231	356	283	885	313	298	277
MIN	159	163	184	192	194	214	230	251	255	296	268	263
AC-FT	10140	10170	11790	12040	11370	13760	15720	15930	19950	18710	17420	16060



# GUADALUPE RIVER BASIN

177

08169000 COMAL RIVER AT NEW BRAUNFELS, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1974 - 1997#, BY WATER YEAR (WY)

MEAN	290	309	323	324	329	319	318	331	316	283	264	267
MAX	490	486	437	443	527	536	531	547	520	466	466	428
(WY)	1974	1975	1992	1977	1992	1992	1977	1975	1987	1992	1992	1992
MIN	100	144	166	174	175	199	146	101	78.5	35.4	36.4	43.7
(WY)	1990	1990	1990	1990	1990	1990	1984	1984	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR			FOR 1997 WATER YEAR			WATER YEARS 1974 - 1997#		
ANNUAL TOTAL	63854			87249					
ANNUAL MEAN	174			239			306		
HIGHEST ANNUAL MEAN							431		
LOWEST ANNUAL MEAN							145		
HIGHEST DAILY MEAN	271			885			2890		
LOWEST DAILY MEAN	83			159			26		
ANNUAL SEVEN-DAY MINIMUM	86			162			28		
INSTANTANEOUS PEAK FLOW				1880			9540		
INSTANTANEOUS PEAK STAGE				7.04			16.54		
ANNUAL RUNOFF (AC-FT)	126700			173100			221500		
10 PERCENT EXCEEDS	254			303			420		
50 PERCENT EXCEEDS	170			231			308		
90 PERCENT EXCEEDS	95			167			178		

# Period of regulated streamflow.

## GUADALUPE RIVER BASIN

08169000 COMAL RIVER AT NEW BRAUNFELS, TX--Continued

## WATER QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: April 1996 to September 1997. Sediment analyses: April 1996 to September 1997.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)
APR 18...	1400	209	546	7.8	26.0	9.2	117	260	37	78
MAY 22...	0930	145	550	7.7	25.0	8.1	101	270	34	79
JUN 26...	1000	85	544	7.8	25.0	8.0	99	270	35	80
AUG 01...	0900	98	550	7.7	26.0	7.2	91	260	27	78
SEP 05...	0930	139	550	7.6	25.0	7.6	95	260	32	79
DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
APR 18...	16	10	0.3	8	1.3	220	23	16	0.20	12
MAY 22...	17	10	0.3	7	1.4	230	22	16	0.20	13
JUN 26...	16	9.9	0.3	7	1.5	230	22	15	0.30	13
AUG 01...	16	10	0.3	8	1.3	230	22	17	0.30	12
SEP 05...	16	9.6	0.3	7	1.4	230	24	16	0.20	12
DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
APR 18...	274	285	--	<0.010	1.60	<0.015	--	--	<0.20	<0.20
MAY 22...	315	293	1.59	0.010	1.60	0.040	--	--	<0.20	<0.20
JUN 26...	280	296	1.49	0.010	1.50	0.020	--	--	<0.20	<0.20
AUG 01...	302	305	1.48	0.020	1.50	0.030	1.8	0.27	<0.20	0.30
SEP 05...	306	275	1.69	0.010	1.70	0.020	--	--	<0.20	<0.20
DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
APR 18...	<0.010	<0.010	<0.010	--	0.5	0.1	3.4	6	<3	<1
MAY 22...	<0.010	<0.010	<0.010	--	0.5	0.1	3.5	9	3	<1
JUN 26...	<0.010	<0.010	<0.010	--	0.6	0.1	0.46	2	<3	2
AUG 01...	<0.010	<0.010	0.010	0.03	0.5	0.1	0.79	3	<3	2
SEP 05...	<0.010	<0.010	<0.010	--	0.50	0.10	1.1	3	<3.0	1.0

## GUADALUPE RIVER BASIN

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08169000 COMAL RIVER AT NEW BRAUNFELS, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)
OCT 09...	0900	167	550	7.7	22.0	7.4	87	260	30	78
NOV 05...	1000	167	550	7.8	23.0	7.8	93	260	30	79
JAN 22...	0830	197	540	7.4	20.0	8.4	95	260	33	79
FEB 18...	0945	203	540	7.5	19.0	8.7	95	250	19	74
MAR 26...	0945	226	535	7.5	18.0	8.4	90	270	36	81
APR 24...	1000	251	545	7.3	23.0	8.4	101	250	10	73
MAY 19...	0945	236	545	7.2	24.0	7.8	96	260	30	77
JUL 17...	1030	281	545	7.0	27.0	9.0	116	260	36	77
JUL 31...	0945	292	545	7.0	26.0	7.9	99	250	29	74
AUG 20...	1230	277	547	7.1	28.0	8.6	113	240	27	72
SEP 18...	0930	262	545	7.6	25.5	8.3	104	260	31	78

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
OCT 09...	16	10	0.3	8	1.3	230	24	17	0.20	12
NOV 05...	16	9.7	0.3	7	1.4	230	23	17	0.20	12
JAN 22...	16	9.0	0.2	7	1.5	230	24	17	0.20	12
FEB 18...	16	11	0.3	9	1.3	230	24	17	0.30	11
MAR 26...	16	10	0.3	7	1.3	230	25	17	0.3	12
APR 24...	16	9.9	0.3	8	1.4	240	24	17	0.2	11
MAY 19...	16	9.6	0.3	7	1.4	230	24	16	0.2	12
JUL 17...	16	10	0.3	8	1.3	220	24	16	0.2	12
JUL 31...	16	9.8	0.3	8	1.4	220	24	17	0.2	12
AUG 20...	15	9.9	0.3	8	1.3	220	22	16	0.2	11
SEP 18...	17	10	0.3	8	1.3	230	22	17	0.2	12

DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA 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)
OCT 09...	282	292	--	<0.010	1.60	0.020	<0.20	<0.20	<0.010
NOV 05...	310	297	1.68	0.020	1.70	0.030	<0.20	<0.20	0.020
JAN 22...	299	279	--	<0.010	1.60	<0.015	<0.20	<0.20	<0.010
FEB 18...	307	285	--	<0.010	1.80	<0.015	<0.20	<0.20	<0.010
MAR 26...	309	289	--	<0.010	1.70	0.020	<0.20	<0.20	<0.010
APR 24...	310	271	--	<0.01	1.7	0.04	<0.2	<0.2	0.03
MAY 19...	323	284	1.63	0.02	1.7	0.05	<0.2	<0.2	0.01
JUL 17...	327	273	--	<0.01	1.7	<0.01	<0.2	<0.2	<0.01
JUL 31...	328	273	--	<0.01	1.7	<0.01	<0.2	<0.2	<0.01
AUG 20...	299	264	1.64	0.01	1.7	<0.01	<0.2	<0.2	<0.01
SEP 18...	317	279	--	<0.01	1.7	<0.01	<0.2	<0.2	0.01

## GUADALUPE RIVER BASIN

08169000 COMAL RIVER AT NEW BRAUNFELS, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SEDI- MENT, SUS- PENDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 09...	<0.010	<0.010	--	0.40	<0.10	10	23	<3	2
NOV 05...	<0.010	<0.010	--	0.40	0.10	0.90	2	<3.0	1.0
JAN 22...	<0.010	<0.010	--	0.30	0.20	14	27	<3.0	<1.0
FEB 18...	<0.010	<0.010	--	0.40	0.20	1.1	2	<3.0	2.0
MAR 26...	<0.010	<0.010	--	0.3	0.1	2.4	4	<3	<1
APR 24...	<0.01	<0.01	--	0.5	0.1	8.1	12	<3	1
MAY 19...	<0.01	<0.01	--	0.4	0.1	11	17	<3	2
JUL 17...	<0.01	<0.01	--	0.4	<0.2	8.3	11	<3	<1
31...	<0.01	<0.01	--	0.4	<0.2	3.2	4	<3	<1
AUG 20...	<0.01	0.01	0.03	0.5	0.2	5.2	7	<3	2
SEP 18...	<0.01	<0.01	--	0.4	<0.2	2.8	4	<3	<1

# GUADALUPE RIVER BASIN

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## 08170000 SAN MARCOS RIVER SPRINGFLOW AT SAN MARCOS, TX

**LOCATION.**--Lat 29°53'20", long 97°56'02", Hays County, Hydrologic Unit 12100203, on left bank at downstream side of bridge on Aquarena Springs Drive (Loop 82), 500 ft downstream from Spring Lake, and 4.2 mi upstream from Blanco River.

**DRAINAGE AREA.**--Not applicable. This is a springflow station.

**PERIOD OF RECORD.**--May 1956 to current year. May 1956 to September 1988, at site 0.7 mi downstream from bridge on Interstate Highway 35 and 2.1 mi upstream from Blanco River. October 1988 to September 1994, at site of ground-water well No. LR-67-09-110, 0.2 mi southwest of intersection of FM 2439 and McCarty Lane and 3.7 mi south of San Marcos. Water-level data and measurements of springflow were used to compute springflow. Records prior to October 1956 published as San Marcos River at San Marcos (station 08170500).

**REVISED RECORDS.**--WSP 1923: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 557.67 ft above sea level. May 1956 to September 1988, water-stage recorder 0.7 mi downstream from Interstate Highway 35 and 2.1 mi upstream from Blanco River, datum 536.82 ft above sea level. October 1988 to September 1994, water-stage recorder at ground-water well No. LR-67-09-110, 0.2 mi southwest of intersection of FM 2439 and McCarty Lane and 3.7 mi south of San Marcos, datum 678.50 ft above sea level.

**REMARKS.**--No estimated daily discharge. Records fair. Entire flow of river is from San Marcos Springs, located about 1.1 mi upstream from Interstate Highway 35, except during periods of local runoff. San Marcos Springs emerge from the Edwards and associated limestones in the Balcones Fault Zone. Springflow is separated from runoff using computer techniques. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum daily spring discharge, 451 ft<sup>3</sup>/s Mar. 12, 1992; minimum daily, 46 ft<sup>3</sup>/s Aug. 15, 16, 1956.

**EXTREMES FOR CURRENT YEAR.**--Maximum daily spring discharge, 338 ft<sup>3</sup>/s June 25; minimum daily, 86 ft<sup>3</sup>/s Nov. 19, 25, 26, 27.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	104	87	98	95	106	120	173	203	327	283	243
2	108	102	88	99	95	106	124	173	202	327	283	240
3	108	100	88	99	95	106	129	170	201	327	280	240
4	108	100	88	100	94	106	129	171	199	322	278	236
5	109	101	89	100	94	108	132	171	196	318	276	236
6	109	102	89	101	94	108	135	171	206	315	273	237
7	109	100	89	102	94	108	138	171	217	313	274	241
8	108	98	88	103	94	110	138	171	228	314	274	237
9	108	97	88	103	94	111	139	171	240	313	275	235
10	108	97	89	103	95	112	139	171	253	314	273	235
11	108	96	89	102	95	113	138	172	266	314	274	235
12	109	95	89	101	96	114	137	173	279	312	274	234
13	108	94	89	100	97	115	136	174	294	310	274	231
14	108	94	89	100	97	113	136	173	291	307	274	229
15	108	93	90	99	98	114	135	174	289	309	274	227
16	108	91	90	98	98	116	135	174	287	309	273	223
17	108	89	90	98	100	118	134	176	285	308	268	221
18	108	87	90	98	100	118	135	176	281	308	264	221
19	109	86	91	98	100	118	135	179	281	306	265	220
20	108	87	92	98	101	119	135	180	280	302	264	223
21	108	87	93	99	100	118	133	182	295	302	263	221
22	107	87	94	99	100	117	131	184	310	300	261	219
23	106	88	95	98	100	117	131	189	313	301	258	220
24	106	87	94	99	102	115	132	193	326	299	256	221
25	106	86	95	98	103	117	149	198	338	298	254	219
26	105	86	96	98	105	116	156	203	337	296	254	217
27	104	86	96	97	104	116	169	204	333	292	252	216
28	104	87	97	96	105	118	171	201	331	289	250	213
29	104	88	97	96	---	118	174	204	329	288	250	211
30	104	88	97	95	---	117	174	202	326	285	250	207
31	104	---	98	95	---	118	---	203	---	285	247	---
TOTAL	3324	2783	2834	3070	2745	3526	4199	5627	8216	9510	8268	6808
MEAN	107	92.8	91.4	99.0	98.0	114	140	182	274	307	267	227
MAX	109	104	98	103	105	119	174	204	338	327	283	243
MIN	104	86	87	95	94	106	120	170	196	285	247	207
AC-FT	6590	5520	5620	6090	5440	6990	8330	11160	16300	18860	16400	13500
CAL YR 1996	TOTAL	36332	MEAN	99.3	MAX	126	MIN	76	AC-FT	72060		
WTR YR 1997	TOTAL	60910	MEAN	167	MAX	338	MIN	86	AC-FT	120800		



## GUADALUPE RIVER BASIN

08170500 SAN MARCOS RIVER AT SAN MARCOS, TX

**LOCATION.**--Lat 29°53'20", long 97°56'02", Hays County, Hydrologic Unit 12100203, on left bank at downstream side of bridge on Aquarena Springs Drive (Loop 82), 500 ft downstream from Spring Lake, and 4.2 mi upstream from Blanco River.

**DRAINAGE AREA.**--Normal flow of river comes from springs and artesian wells; drainage area of stream not applicable.

**PERIOD OF RECORD (REVISED).**--July 1915 to September 1921 (partial-record site), May to September 1956, October 1994 to current year. Periodic measurements were made outside period of record since Nov. 14, 1894, and are published as miscellaneous measurements.

**REVISED RECORDS.**--WSP 1923: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 557.67 ft above sea level. July 1915 to January 1916, nonrecording gage at site 0.5 mi upstream from Interstate Highway 35, and March 1916 to September 1921, water-stage recorder about 0.7 mi downstream from Interstate Highway 35; datum relations unknown. May to September 1956, water-stage recorder 0.7 mi downstream from Interstate Highway 35 and 2.1 mi upstream from Blanco River, at datum 536.82 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records fair. Entire flow of river is from San Marcos Springs, located about 1.1 mi upstream from Interstate Highway 35, except during periods of local runoff. San Marcos Springs emerge from the Edwards and associated limestones in the Balcones Fault Zone. Satellite telemeter at station.

**EXTREMES FOR WATER YEAR 1995 (REVISED).**--Maximum discharge, 785 ft<sup>3</sup>/s Sept. 20 (gage height, 7.72 ft); minimum daily, 122 ft<sup>3</sup>/s Oct. 3.

**EXTREMES FOR CURRENT YEAR.**--Maximum discharge, 787 ft<sup>3</sup>/s June 21 (gage height, 7.73 ft); minimum daily, 86 ft<sup>3</sup>/s Nov. 19, 25-27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	109	104	87	98	95	106	120	173	203	327	283	243
2	108	103	88	99	95	106	125	173	202	327	283	240
3	108	100	88	99	95	106	129	170	201	327	280	240
4	108	100	88	100	94	106	142	171	199	326	278	236
5	109	101	89	100	94	108	138	171	196	318	276	236
6	109	102	89	101	94	108	139	171	215	315	273	237
7	109	100	89	102	94	108	138	171	332	313	279	241
8	108	98	88	103	94	110	138	171	250	314	282	237
9	108	97	88	103	94	111	139	175	510	313	275	235
10	108	97	89	103	95	112	139	171	389	314	273	235
11	108	96	89	102	95	113	140	172	313	314	274	235
12	109	95	89	101	101	114	137	186	300	312	274	234
13	108	94	89	100	97	115	136	174	294	310	274	231
14	108	94	89	100	97	113	136	173	291	307	274	233
15	108	93	93	99	98	114	135	174	289	309	274	227
16	108	93	90	98	98	117	135	174	287	309	273	223
17	108	91	90	98	100	118	134	176	285	308	268	221
18	108	87	90	98	100	118	135	176	281	308	264	221
19	109	86	91	98	100	118	135	179	281	306	265	220
20	108	87	92	98	101	119	135	189	280	302	264	223
21	108	87	93	99	100	118	133	182	389	302	263	221
22	107	87	94	99	100	117	131	184	541	300	261	219
23	106	88	95	98	100	117	131	193	361	301	258	224
24	106	90	94	99	102	115	132	199	343	299	256	221
25	106	86	95	98	103	117	167	205	338	298	254	219
26	105	86	96	98	105	116	172	203	337	296	254	217
27	104	86	96	97	104	116	169	204	333	292	252	216
28	104	87	97	96	105	118	174	201	331	289	250	216
29	104	89	97	96	---	118	174	204	329	288	250	211
30	107	88	97	95	---	117	174	202	326	285	250	207
31	107	---	97	95	---	118	---	203	---	285	247	---
TOTAL	3330	2792	2836	3070	2750	3527	4262	5670	9226	9514	8281	6819
MEAN	107	93.1	91.5	99.0	98.2	114	142	183	308	307	267	227
MAX	109	104	97	103	105	119	174	205	541	327	283	243
MIN	104	86	87	95	94	106	120	170	196	285	247	207
AC-FT	6610	5540	5630	6090	5450	7000	8450	11250	18300	18870	16430	13530

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 1997, BY WATER YEAR (WY)

	1995	1996	1997	1995	1996	1997	1995	1996	1997	1995	1996	1997
MEAN	127	128	124	125	117	126	136	145	204	193	173	165
MAX	142	147	150	160	145	156	164	183	308	307	267	227
(WY)	1996	1995	1995	1995	1995	1995	1995	1997	1997	1997	1997	1997
MIN	107	93.1	91.5	99.0	98.2	108	101	99.6	94.4	84.4	84.2	109
(WY)	1997	1997	1997	1997	1997	1996	1996	1996	1996	1996	1996	1996

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1995 - 1997
ANNUAL TOTAL	36495	62077	
ANNUAL MEAN	99.7	170	147
HIGHEST ANNUAL MEAN			170
LOWEST ANNUAL MEAN			110
HIGHEST DAILY MEAN	146	541	541
LOWEST DAILY MEAN	76	86	76
ANNUAL SEVEN-DAY MINIMUM	77	87	77
INSTANTANEOUS PEAK FLOW		787	787
INSTANTANEOUS PEAK STAGE		7.73	7.73
INSTANTANEOUS LOW FLOW		71	71
ANNUAL RUNOFF (AC-FT)	72390	123100	106400
10 PERCENT EXCEEDS	110	300	221
50 PERCENT EXCEEDS	101	120	139
90 PERCENT EXCEEDS	83	93	94

# GUADALUPE RIVER BASIN

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08171000 BLANCO RIVER AT WIMBERLEY, TX

**LOCATION.**--Lat 29°59'39", long 98°05'19", Hays County, Hydrologic Unit 12100203, on left bank at downstream side of highway, near left end of bridge on Ranch Road 12, 0.3 mi southeast of Wimberley, 2,200 ft downstream from Cypress Creek, and at mile 29.0.

**DRAINAGE AREA.**--355 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--August 1924 to September 1926, June 1928 to current year.

**REVISED RECORDS.**--WSP 1562: 1929, 1930-31(M), 1935-36(M), 1938(M), 1941-42(M), 1947(M), 1949(M). WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder and crest-stage gage. Datum of gage is 797.23 ft above sea level. Aug. 6, 1924, to Sept. 30, 1926, nonrecording gage at site 1,030 ft upstream at datum 5.00 ft higher. Recording gage from June 6, 1928, to June 12, 1975, at site 1,000 ft upstream at datum 5.00 ft higher.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. No known regulation. There are many small diversions above station. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in July 1869 reached a stage of 25 ft, from information by local residents. Maximum stage since at least 1869, that of May 28, 1929.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,800 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	1000	20,900	a16.31	June 7	0200	13,800	13.63
Apr. 5	0500	4,340	8.64	June 9	0245	34,100	a20.46
Apr. 26	1715	2,710	7.36	June 10	1445	5,260	9.26
May 28	0500	10,300	12.10	June 22	0530	33,800	20.38
June 6	2000	1,900	6.60	June 22	1415	33,900	a20.40

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	14	32	36	29	104	110	356	500	999	169	78
2	17	12	29	36	31	110	121	335	446	910	157	77
3	17	13	27	36	31	105	169	310	402	842	146	75
4	17	13	29	35	29	107	4590	275	362	775	139	76
5	18	14	28	33	28	102	2750	263	336	722	134	81
6	18	16	25	31	29	94	1280	255	632	681	127	79
7	16	19	24	33	32	92	983	249	3680	620	127	75
8	14	14	22	34	29	95	828	248	1010	570	173	75
9	14	12	22	34	29	93	728	257	8310	528	207	75
10	14	12	22	36	29	92	651	305	2620	490	188	76
11	14	12	21	36	28	98	618	258	1820	453	151	74
12	13	13	21	35	43	109	524	232	1420	411	136	73
13	13	13	20	34	47	152	456	220	1220	381	126	71
14	13	13	20	33	48	156	421	214	1060	355	123	71
15	13	16	44	34	47	135	384	203	1030	332	118	71
16	14	17	74	33	46	130	355	216	909	327	107	70
17	14	16	87	33	45	134	332	205	798	309	100	70
18	11	16	75	33	46	135	311	185	714	289	98	69
19	10	14	62	33	51	131	295	177	654	272	98	68
20	12	14	56	34	97	126	282	260	606	250	97	67
21	13	13	52	35	105	123	277	299	1230	239	94	68
22	12	12	50	34	120	121	259	220	e22100	234	93	76
23	9.8	12	49	34	106	118	229	296	e5340	222	93	80
24	11	32	45	33	97	114	218	755	2810	210	92	73
25	13	23	41	32	91	128	245	520	2130	197	88	71
26	14	19	42	32	99	120	1190	387	1880	186	87	71
27	16	17	41	33	103	121	801	432	1540	177	86	70
28	19	19	40	30	106	121	537	2820	1360	161	82	66
29	15	28	39	29	---	117	450	772	1210	162	82	66
30	13	36	37	29	---	113	396	626	1100	155	81	64
31	14	---	37	28	---	107	---	563	---	161	79	---
TOTAL	439.8	494	1213	1031	1621	3603	20790	12713	69229	12620	3678	2176
MEAN	14.2	16.5	39.1	33.3	57.9	116	693	410	2308	407	119	72.5
MAX	19	36	87	36	120	156	4590	2820	22100	999	207	81
MIN	9.8	12	20	28	28	92	110	177	336	155	79	64
AC-FT	872	980	2410	2040	3220	7150	41240	25220	137300	25030	7300	4320

## GUADALUPE RIVER BASIN

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1997h, BY WATER YEAR (WY)

MEAN	100	81.9	117	123	161	148	180	223	237	104	49.9	89.0
MAX	872	509	1364	1134	1401	977	953	1470	2308	935	201	1413
(WY)	1974	1947	1992	1968	1992	1992	1957	1929	1997	1973	1973	1952
MIN	6.24	7.41	7.87	6.66	8.13	5.93	5.19	12.5	3.44	1.70	2.89	6.93
(WY)	1941	1956	1956	1956	1956	1956	1956	1956	1956	1956	1956	1928
SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR				FOR 1997 WATER YEAR				WATER YEARS 1924 - 1997h			
ANNUAL TOTAL	7711.5				129607.8							
ANNUAL MEAN	21.1				355							
HIGHEST ANNUAL MEAN									134			
LOWEST ANNUAL MEAN									566			
HIGHEST DAILY MEAN	87				22100				6.45			
LOWEST DAILY MEAN	7.6				9.8				36900			
ANNUAL SEVEN-DAY MINIMUM	8.1				11				.70			
INSTANTANEOUS PEAK FLOW					34100				.79			
INSTANTANEOUS PEAK STAGE					a20.46				113000			
INSTANTANEOUS LOW FLOW					9.1				33.30			
ANNUAL RUNOFF (AC-FT)	15300				257100				97000			
10 PERCENT EXCEEDS	32				724				274			
50 PERCENT EXCEEDS	20				92				52			
90 PERCENT EXCEEDS	10				14				12			

e Estimated

a From floodmark.

h See PERIOD OF RECORD paragraph.

GUADALUPE RIVER BASIN

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08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: April 1962 to December 1973. Chemical and biochemical analyses: January 1974 to September 1979, February 1988 to September 1993, April 1996 to September 1997. Pesticide analyses: January 1974 to September 1979, February 1988 to September 1993. Sediment analyses: November 1965 to April 1966, April 1996 to September 1997.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)
APR 18...	0930	19	485	7.7	21.0	9.7	113	230	44	61
MAY 22...	1400	18	440	8.2	31.0	9.1	128	220	55	57
JUN 26...	1400	33	403	8.3	27.0	--	--	190	30	48
AUG 01...	1215	9.1	410	8.3	31.0	7.6	106	190	43	42
SEP 05...	1230	41	470	8.3	29.0	8.9	120	220	34	62
DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	'SODIUM PERCENT	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)
APR 18...	19	8.7	0.2	8	1.3	190	37	13	0.20	8.9
MAY 22...	20	8.8	0.3	8	1.5	170	34	13	0.30	15
JUN 26...	18	7.6	0.2	8	1.5	160	33	12	0.20	15
AUG 01...	20	8.4	0.3	9	1.5	140	41	14	0.30	16
SEP 05...	17	7.5	0.2	7	1.4	190	34	12	0.30	11
DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
APR 18...	260	269	--	<0.010	0.140	0.020	0.34	0.18	--	<0.20
MAY 22...	264	254	--	<0.010	0.070	0.050	--	--	--	<0.20
JUN 26...	222	231	--	<0.010	0.060	0.030	0.26	0.17	0.17	0.20
AUG 01...	227	233	--	<0.010	<0.050	0.030	0.20	0.17	0.27	0.30
SEP 05...	248	245	0.270	0.010	0.280	0.030	--	--	--	<0.20
DATE	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)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
APR 18...	0.20	<0.010	<0.010	<0.010	1.7	0.2	0.46	9	<3	2
MAY 22...	<0.20	<0.010	<0.010	<0.010	2.0	0.1	0.19	4	22	3
JUN 26...	0.20	<0.010	<0.010	<0.010	2.0	0.1	0.53	6	4	2
AUG 01...	0.20	<0.010	<0.010	<0.010	2.0	0.2	0.02	1	<3	1
SEP 05...	<0.20	<0.010	<0.010	<0.010	1.7	0.20	0.44	4	<3	1

## GUADALUPE RIVER BASIN

08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)
OCT 09...	1215	14	475	8.4	24.0	9.2	113	220	33	60
NOV 05...	1315	14	505	8.2	22.0	9.8	116	240	38	65
JAN 22...	1145	33	510	7.7	16.0	10.4	109	260	42	73
FEB 18...	1245	46	530	7.8	16.0	11.0	115	240	13	68
MAR 26...	1345	121	510	7.8	20.0	9.8	111	250	35	73
APR 24...	1300	219	510	7.6	22.0	9.5	113	230	18	68
MAY 19...	1330	177	497	7.6	25.0	9.2	116	230	15	66
JUN 06-07	2330	--	--	--	--	--	--	120	5	37
JUL 17...	1430	305	487	7.4	30.0	7.3	100	220	28	64
31...	1245	162	487	7.4	28.0	8.4	111	220	21	63
AUG 20...	0945	98	470	7.4	28.0	7.9	104	210	26	59
SEP 18...	1215	69	460	8.1	29.5	8.4	114	220	29	60

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
OCT 09...	18	8.1	0.2	7	1.3	190	37	14	0.20	11
NOV 05...	19	8.3	0.2	7	1.6	200	38	14	0.20	9.9
JAN 22...	18	7.6	0.2	6	1.3	210	42	14	0.20	6.4
FEB 18...	18	8.6	0.2	7	1.2	230	38	14	0.20	6.8
MAR 26...	16	8.0	0.2	7	1.2	210	27	14	0.2	8.2
APR 24...	15	6.7	0.2	6	1.3	220	23	12	0.1	8.1
MAY 19...	15	6.9	0.2	6	1.2	210	22	12	0.2	9.1
JUN 06-07	6.9	2.9	0.1	5	2.6	120	8.2	4.6	0.1	7.6
JUL 17...	16	7.4	0.2	7	1.2	200	22	11	0.2	9.7
31...	15	7.6	0.2	7	1.3	200	24	12	0.2	10
AUG 20...	15	7.4	0.2	7	1.3	180	24	12	0.2	11
SEP 18...	16	7.6	0.2	7	1.3	190	28	12	0.2	12

DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
OCT 09...	256	261	--	<0.010	0.110	0.040	--	--	<0.20	<0.20
NOV 05...	265	275	0.080	0.020	0.100	0.020	--	--	<0.20	<0.20
JAN 22...	272	270	--	<0.010	0.250	<0.015	--	--	<0.20	<0.20
FEB 18...	274	276	--	<0.010	0.320	<0.015	--	--	<0.20	<0.20
MAR 26...	261	266	--	<0.010	0.250	0.030	0.95	0.67	<0.20	0.70
APR 24...	264	254	--	<0.01	0.57	0.03	--	--	<0.2	<0.2
MAY 19...	273	246	0.358	0.02	0.37	<0.01	--	--	<0.2	<0.2
JUN 06-07	161	146	0.320	0.01	0.33	<0.01	4.1	3.8	0.2	3.8
JUL 17...	239	232	--	<0.01	0.68	<0.01	--	--	<0.2	<0.2
31...	262	238	--	<0.01	0.51	<0.01	--	--	<0.2	<0.2
AUG 20...	242	232	--	<0.01	0.45	0.01	--	--	<0.2	<0.2
SEP 18...	258	237	--	<0.01	0.35	<0.01	--	--	<0.2	<0.2



# GUADALUPE RIVER BASIN

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08171000 BLANCO RIVER AT WIMBERLEY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SEDI- MENT, SUS- PENDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 09...	<0.010	0.020	<0.010	1.4	<0.10	0.26	7	<3	1
NOV 05...	<0.010	<0.010	<0.010	1.6	0.10	1.2	31	<3.0	<1.0
JAN 22...	<0.010	<0.010	<0.010	1.2	0.10	0.45	5	<3.0	<1.0
FEB 18...	<0.010	<0.010	<0.010	1.1	0.20	0.75	6	<3.0	1.0
MAR 26...	0.070	<0.010	<0.010	1.3	0.1	3.9	12	<3	2
APR 24...	<0.01	<0.01	<0.01	1.2	0.2	7.1	12	<3	1
MAY 19...	<0.01	<0.01	<0.01	1.2	0.1	12	25	<3	2
JUN 06-07	0.44	<0.01	<0.01	4.8	0.9	--	1310	13	<1
JUL 17...	<0.01	<0.01	<0.01	1.1	<0.2	9.1	11	<3	<1
JUL 31...	<0.01	<0.01	<0.01	1.2	<0.2	4.8	11	<3	1
AUG 20...	<0.01	<0.01	<0.01	1.1	0.2	1.3	5	<3	2
SEP 18...	<0.01	<0.01	<0.01	0.9	<0.2	8.8	47	<3	<1

## GUADALUPE RIVER BASIN

08171300 BLANCO RIVER NEAR KYLE, TX

**LOCATION.**--Lat 29°58'45", long 97°54'35", Hays County, Hydrologic Unit 12100203, on left bank 800 ft downstream from Tarbuton Ranch House (Hatchett Ranch), 2.2 mi southwest of Kyle, 4.2 mi downstream from Halifax Creek, and 6.3 mi upstream from bridge on U.S. Highway 81.

**DRAINAGE AREA.**--412 mi<sup>2</sup>.

**PERIOD OF RECORD.**--May 1956 to current year.

**REVISED RECORDS.**--WSP 1923: 1957-58, 1960(M). WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 620.12 ft above sea level (levels by U.S. Army Corps of Engineers).

**REMARKS.**--Records fair. No known regulation. Small diversions above station for irrigation. Most of the low flow of the Blanco River enters the Edwards and associated limestones in the Balcones Fault Zone which crosses the basin upstream from this station and below the station at Wimberley. Rain gage at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1882, about 40 ft in May 1929, from information by local residents (discharge, 139,000 ft<sup>3</sup>/s). Flood of Sept. 11, 1952, reached a stage of 38.0 ft (discharge, 115,000 ft<sup>3</sup>/s).

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	1330	18,200	21.13	June 9	0800	31,000	25.12
Apr. 5	0830	3,860	12.22	June 10	1830	6,230	14.36
May 28	1000	9,000	16.41	June 22	1100	32,000	25.37
June 7	0700	13,900	19.27	June 22	1930	33,600	25.78
June 7	1430	8,970	16.39				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	10	16	11	e95	97	385	519	984	168	61
2	.00	.00	9.2	15	11	e101	107	361	465	886	160	59
3	.00	.00	6.6	15	11	e96	177	338	428	805	148	57
4	.00	.00	5.4	14	11	93	3860	313	392	733	144	56
5	.00	.00	7.9	13	9.2	92	2740	299	366	668	134	58
6	.00	.00	7.6	11	8.8	82	1360	291	457	615	128	59
7	.00	.00	4.5	13	12	78	984	285	5090	568	124	56
8	.00	.00	3.1	20	15	80	821	281	1260	527	153	55
9	.00	.00	2.9	20	12	83	724	294	9000	494	181	54
10	.00	.00	2.5	19	11	78	644	309	3230	466	187	52
11	.00	.00	2.4	19	11	80	612	295	2440	437	142	52
12	.00	.00	2.2	20	21	94	547	268	1700	409	124	51
13	.00	.00	1.6	19	38	111	487	257	1390	384	114	51
14	.00	.00	1.2	19	35	142	456	244	1200	366	107	50
15	.00	.00	8.9	19	35	119	425	245	1110	346	101	49
16	.00	.00	38	19	33	112	401	254	1070	329	97	47
17	.00	.00	61	19	32	116	379	244	904	311	93	45
18	.00	.00	58	18	30	117	360	220	799	296	89	43
19	.00	.00	46	18	30	114	348	209	724	280	87	43
20	.00	.00	37	18	e88	109	334	275	664	264	85	43
21	.00	.00	33	20	e97	104	324	331	753	245	83	42
22	.00	.00	29	19	e114	101	314	264	19600	238	81	46
23	.00	.00	27	17	e98	99	285	309	7050	229	78	54
24	.00	.00	23	16	e88	95	267	649	3260	213	78	50
25	.00	.00	20	15	e81	112	298	586	2430	200	75	44
26	.00	.12	19	14	e90	115	930	423	2050	189	73	44
27	.00	.45	19	14	e95	105	950	384	1660	182	71	43
28	.00	.20	19	13	e98	106	549	2530	1420	170	70	43
29	.00	3.5	18	12	---	103	470	842	1250	162	68	42
30	.00	8.2	16	12	---	100	419	631	1100	158	65	40
31	.00	---	16	12	---	97	---	557	---	154	63	---
TOTAL	0.00	12.47	555.0	508	1226.0	3129	20669	13173	73781	12308	3371	1489
MEAN	.000	.42	17.9	16.4	43.8	101	689	425	2459	397	109	49.6
MAX	.00	8.2	61	20	114	142	3860	2530	19600	984	187	61
MIN	.00	.00	1.2	11	8.8	78	97	209	366	154	63	40
AC-FT	.00	25	1100	1010	2430	6210	41000	26130	146300	24410	6690	2950
CFSM	.00	.00	.04	.04	.11	.24	1.67	1.03	5.97	.96	.26	.12
IN.	.00	.00	.05	.05	.11	.28	1.87	1.19	6.66	1.11	.30	.13

# GUADALUPE RIVER BASIN

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08171300 BLANCO RIVER NEAR KYLE, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 1997, BY WATER YEAR (WY)

MEAN	124	99.9	154	155	200	168	192	253	334	111	44.7	54.9
MAX	1078	387	1775	1319	1511	1078	906	1148	2459	828	196	348
(WY)	1974	1958	1992	1968	1992	1992	1977	1958	1997	1973	1973	1986
MIN	.000	.000	.000	.000	.000	10.0	9.04	1.96	.000	.000	.000	.000
(WY)	1964	1964	1964	1957	1990	1967	1996	1964	1956	1956	1956	1956

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1956 - 1997
ANNUAL TOTAL	2616.62	130221.47	
ANNUAL MEAN	7.15	357	158
HIGHEST ANNUAL MEAN			625
LOWEST ANNUAL MEAN			4.65
HIGHEST DAILY MEAN	72 Sep 1	19600 Jun 22	19600 Jun 22 1997
LOWEST DAILY MEAN	.00 May 23	.00 Oct 1	.00 Jun 1 1956
ANNUAL SEVEN-DAY MINIMUM	.00 Jun 13	.00 Oct 1	.00 Jun 1 1956
INSTANTANEOUS PEAK FLOW		33600 Jun 22	98000 May 2 1958
INSTANTANEOUS PEAK STAGE		25.78 Jun 22	36.30 May 2 1958
ANNUAL RUNOFF (AC-FT)	5190	258300	114600
ANNUAL RUNOFF (CFSM)	.017	.87	.38
ANNUAL RUNOFF (INCHES)	.24	11.76	5.21
10 PERCENT EXCEEDS	19	724	328
50 PERCENT EXCEEDS	2.5	78	52
90 PERCENT EXCEEDS	.00	.00	3.0

e Estimated

## GUADALUPE RIVER BASIN

08172000 SAN MARCOS RIVER AT LULING, TX

**LOCATION.**--Lat 29°39'58", long 97°39'02", Caldwell County line, Hydrologic Unit 12100203, at downstream side of bridge on State Highway 80, 0.9 mi south of U.S. Post Office at Luling, and 9.5 mi upstream from Plum Creek.

**DRAINAGE AREA.**--838 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--April 1939 to current year.

**REVISED RECORDS.**--WSP 958: 1940. WSP 1312: 1940(M), 1945(M), 1947(M). WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 322.05 ft above sea level. Prior to Oct. 21, 1988, at site 390 ft downstream at same datum.

**REMARKS.**--Records good. Since water year 1984, at least 10% of contributing drainage area has been regulated by upstream reservoirs. Flow is affected at times by discharge from the flood-detention pools of 18 floodwater-retarding structures with a combined detention capacity of 26,830 acre-ft. These structures control runoff from 105 mi<sup>2</sup> in the Town and York Creeks drainage basins. Rain gage at station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--44 years (water years 1940-83), 370 ft<sup>3</sup>/s (268,100 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1940-83).**--Maximum discharge, 57,000 ft<sup>3</sup>/s Sept. 12, 1952 (gage height, 34.95 ft); minimum daily, 43 ft<sup>3</sup>/s Aug. 12, 1951.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1859, 40.4 ft in 1869 or 1870, from information by State Department of Highways and Public Transportation. Flood of May 29, 1929, reached a stage of 37.1 ft and is the second highest known.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	117	104	101	116	103	202	218	698	785	1710	543	e293
2	117	98	94	113	106	204	241	641	736	1570	e575	e290
3	117	99	92	113	104	198	571	586	686	1450	e547	288
4	120	97	99	114	106	203	938	543	650	1350	523	305
5	113	97	103	110	104	202	e4260	507	606	1260	e504	299
6	112	96	100	106	105	205	e3930	475	668	1180	456	280
7	111	105	95	106	104	197	e2000	456	3350	1120	427	283
8	112	103	92	113	106	192	e1310	442	6480	1060	519	289
9	109	96	92	115	106	192	1040	461	2490	1020	e579	290
10	107	96	95	113	104	193	937	487	8660	973	e600	291
11	104	94	96	110	102	196	861	460	5820	933	e515	280
12	101	94	94	110	122	206	816	456	2960	899	456	289
13	103	95	94	111	204	207	746	565	2140	860	e427	284
14	104	96	94	109	195	205	688	433	1810	836	414	275
15	103	95	99	109	165	221	650	396	1700	812	403	274
16	103	94	157	108	153	234	610	451	1540	788	e390	264
17	101	97	134	108	150	244	568	571	1400	759	e377	261
18	103	95	111	110	147	239	535	445	1260	726	365	258
19	102	92	99	110	146	235	516	391	1150	705	e350	259
20	99	88	104	114	153	231	501	472	1070	688	344	261
21	99	89	123	117	153	227	492	617	1900	671	341	263
22	100	90	123	118	170	224	463	548	7460	657	330	276
23	102	89	124	115	185	220	437	457	18900	640	325	277
24	98	120	120	113	191	219	406	616	7440	635	324	283
25	104	131	116	114	194	217	914	889	4250	631	e321	279
26	99	100	116	114	193	222	1410	798	3240	609	e319	272
27	100	90	115	112	199	227	1690	690	2810	595	e317	260
28	101	92	114	109	198	224	1200	764	2390	582	e314	251
29	99	101	114	105	---	224	886	2250	2100	573	e310	255
30	99	113	125	101	---	220	775	1020	1870	564	e303	253
31	100	---	121	105	---	215	---	862	---	559	e298	---
TOTAL	3259	2946	3356	3441	4068	6645	30609	19447	98321	27415	12816	8282
MEAN	105	98.2	108	111	145	214	1020	627	3277	884	413	276
MAX	120	131	157	118	204	244	4260	2250	18900	1710	600	305
MIN	98	88	92	101	102	192	218	391	606	559	298	251
AC-FT	6460	5840	6660	6830	8070	13180	60710	38570	195000	54380	25420	16430

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1997#, BY WATER YEAR (WY)

	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	230	268	574	456	553	465	410	529	1049	365	221	226		
MAX	685	991	3520	1948	3358	2438	1170	1519	4850	884	515	471		
(WY)	1987	1986	1992	1992	1992	1992	1992	1992	1987	1997	1992	1986		
MIN	80.7	90.4	87.1	91.3	95.8	114	103	84.5	83.7	68.4	63.7	64.4		
(WY)	1990	1990	1990	1990	1990	1996	1996	1996	1984	1984	1984	1984		

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1984 - 1997#

ANNUAL TOTAL	43020	220605	
ANNUAL MEAN	118	604	444
HIGHEST ANNUAL MEAN			1482
LOWEST ANNUAL MEAN			119
HIGHEST DAILY MEAN	745	Sep 21	18900
LOWEST DAILY MEAN	62	Jul 21	88
ANNUAL SEVEN-DAY MINIMUM	63	Aug 7	91
INSTANTANEOUS PEAK FLOW			25200
INSTANTANEOUS PEAK STAGE			32.65
ANNUAL RUNOFF (AC-FT)	85330	437600	321900
10 PERCENT EXCEEDS	140	1160	766
50 PERCENT EXCEEDS	103	241	221
90 PERCENT EXCEEDS	69	99	94

e Estimated

# Period of regulated streamflow.

# GUADALUPE RIVER BASIN

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08172000 SAN MARCOS RIVER AT LULING, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: February 1944 to February 1959, September 1961 to April 1966, November 1968 to current year. Pesticide analyses: June 1986 to current year. Sediment analyses: October 1960 to April 1966.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED 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)
OCT 24...	1220	97	582	8.2	18.0	8.9	94	280	29	82
DEC 10...	1005	94	629	8.0	14.0	8.8	86	280	34	82
MAR 30...	1415	219	533	8.0	20.5	8.9	99	250	34	72
JUN 04...	0730	661	510	8.1	25.5	8.1	100	240	24	71
JUL 16...	1802	781	524	7.6	28.0	7.8	99	250	--	71
AUG 15...	1200	403	509	8.0	27.0	7.7	98	240	--	67

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 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)
OCT 24...	18	17	0.4	2.1	250	29	27	0.30	7.3	333
DEC 10...	18	18	0.5	2.0	250	30	26	0.30	6.1	329
MAR 30...	17	14	0.4	1.7	220	31	22	0.20	7.7	295
JUN 04...	16	9.2	0.3	1.7	220	22	15	0.21	11	279
JUL 16...	17	12	0.3	1.5	--	25	23	0.22	10	--
AUG 15...	17	13	0.4	1.6	--	26	21	0.22	8.2	--



## GUADALUPE RIVER BASIN

08172400 PLUM CREEK AT LOCKHART, TX

**LOCATION.**--Lat 29°55'22", long 97°40'44", Caldwell County, Hydrologic Unit 12100203, on right bank 548 ft upstream from bridge on U.S. Highway 183, 2.7 mi north of Lockhart, 3.7 mi upstream from Town Creek, 5.0 mi downstream from Brushy Creek, and 30.4 mi upstream from mouth.

**DRAINAGE AREA.**--112 mi<sup>2</sup>.

**PERIOD OF RECORD.**--April 1959 to current year.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 431.19 ft above sea level. Apr. 30, 1959, to July 25, 1968, at site 548 ft downstream at present datum.

**REMARKS.**--No estimated daily discharges. Records good. Since water year 1963, at least 10% of contributing drainage area has been regulated by upstream reservoirs. No known diversions above station. Flow is affected at times by discharge from the flood-detention pools of 17 floodwater-retarding structures with a combined capacity of 24,850 acre-ft. These structures control runoff from 67.8 mi<sup>2</sup> above this station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--3 years (water years 1960-62), 60.2 ft<sup>3</sup>/s (43,610 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1960-62).**--Maximum discharge, 26,600 ft<sup>3</sup>/s Oct. 29, 1960 (gage height, 20.62 ft); no flow for several days in each year.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1905, 22 ft in June 1936 at present site; flood in 1951 reached a stage of 20 ft at present site, from information by local resident.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	.00	.00	.42	.20	10	.94	32	9.2	112	.31	.00
2	.76	.00	.00	.32	.16	8.5	4.8	22	6.6	94	.23	.00
3	.37	.00	.00	.27	.44	7.3	90	16	4.8	66	.12	.00
4	.19	.00	.00	.37	.35	4.8	208	12	3.0	42	.05	.00
5	.07	.00	.00	.35	.25	4.6	846	8.9	3.3	29	.00	.00
6	.03	.00	.00	.31	.35	3.5	283	6.4	26	22	.00	.00
7	.01	.00	.00	.18	.50	3.0	178	4.0	2310	17	.00	.00
8	.02	.00	.00	.49	.57	2.2	105	3.4	2040	14	.09	.00
9	.00	.00	.00	.36	.53	2.0	56	5.0	2190	11	.67	.00
10	.00	.00	.00	.31	.95	1.6	37	10	1390	9.3	.17	.00
11	.00	.00	.00	.60	.98	1.3	28	11	1770	7.7	.08	.00
12	.00	.00	.00	.50	85	2.3	21	7.4	640	6.8	.26	.00
13	.00	.00	.00	.38	196	4.8	16	46	501	5.9	.09	.00
14	.00	.00	.00	.29	85	4.1	11	37	405	4.9	.02	.00
15	.00	.00	33	.28	47	3.0	7.2	24	345	3.9	.00	.00
16	.00	.00	105	.22	29	3.0	5.2	239	295	3.1	.00	.00
17	.00	.00	46	.20	20	19	4.0	129	261	2.6	.00	.00
18	.00	.00	25	.28	14	23	3.3	63	226	2.6	.00	.00
19	.00	.00	16	.31	11	16	2.7	34	182	2.5	.02	.00
20	.00	.00	11	.35	24	10	2.8	134	155	1.8	.00	.00
21	.00	.00	8.0	.81	23	7.0	3.3	157	581	1.5	.00	.00
22	.00	.00	6.1	.83	16	4.6	3.2	82	3000	1.0	.00	.00
23	.00	.00	5.3	1.8	11	2.7	3.5	54	695	.94	.00	.00
24	.00	.24	3.9	1.4	7.1	1.7	2.4	114	464	.64	.00	.00
25	.00	.01	2.6	.90	5.9	1.5	73	97	368	.48	.00	.00
26	.00	.00	2.1	.67	6.7	1.8	575	51	293	.43	.00	.00
27	.00	.00	1.6	.51	15	1.4	345	34	229	.31	.00	.00
28	.00	.00	1.2	.37	13	1.6	189	25	184	.20	.00	.00
29	.00	.01	.86	.24	---	1.2	97	21	153	.10	.00	.00
30	.00	.01	.64	.28	---	1.1	54	16	127	.07	.00	.00
31	.00	---	.55	.30	---	.86	---	13	---	.30	.00	---
TOTAL	2.95	0.27	268.85	14.90	613.98	159.46	3255.34	1508.1	18856.9	464.07	2.11	0.00
MEAN	.095	.009	8.67	.48	21.9	5.14	109	48.6	629	15.0	.068	.000
MAX	1.5	.24	105	1.8	196	.23	846	239	3000	112	.67	.00
MIN	.00	.00	.00	.18	.16	.86	.94	3.4	3.0	.07	.00	.00
AC-FT	5.9	.5	533	30	1220	316	6460	2990	37400	920	4.2	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1997#, BY WATER YEAR (WY)

	MEAN	25.5	42.4	56.5	46.0	67.5	39.1	44.3	116	111	12.1	3.71	8.22
MAX	394	590	605	416	815	332	343	595	905	151	118	142	
(WY)	1974	1986	1992	1968	1992	1992	1976	1975	1981	1985	1974	1974	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1964	1964	1964	1964	1985	1964	1967	1971	1963	1963	1963	1963	

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1963 - 1997#

ANNUAL TOTAL	780.58	25146.93	
ANNUAL MEAN	2.13	68.9	47.5
HIGHEST ANNUAL MEAN			238
LOWEST ANNUAL MEAN			.10
HIGHEST DAILY MEAN	138	3000	9700
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		5480	27700
INSTANTANEOUS PEAK STAGE		16.19	20.89
ANNUAL RUNOFF (AC-FT)	1550	49880	34430
10 PERCENT EXCEEDS	.99	119	62
50 PERCENT EXCEEDS	.00	.86	.30
90 PERCENT EXCEEDS	.00	.00	.00

# Period of regulated streamflow.

# GUADALUPE RIVER MAIN STEM

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08173900 GUADALUPE RIVER AT GONZALES, TX

**LOCATION.**--Lat 29°29'2206", long 97°27'01", Gonzales County, Hydrologic Unit 12100202, in City Park on left bank 0.2 mi upstream from U.S. Highway 183 bridge, and 4.4 mi downstream from San Marcos River.

**DRAINAGE AREA.**--3,490 mi<sup>2</sup>.

## WATER DISCHARGE RECORDS

**PERIOD OF RECORD.**--July 1915 to September 1922. Records published in WSP's 408, 438, 458, 478, 528, and 548 later discredited and not to be used. October 1951 to September 1952. Discharge measurements only at site 0.2 mi downstream published in WSP 1312. March 1977 to September 1996. (peak stage). October 1996 to September 1997.

**GAGE.**--Water-stage recorder. Datum of gage is 231.80 ft above sea level. July 1915 to September 1922, 0.2 mi downstream, datum not known. March 1977 to September 1996, 1.2 mi upstream at Gonzales hydroelectric plant at National Weather Service datum.

**REMARKS.**--Records fair. Since water year 1964, at least 10% of contributing drainage area has been regulated by Canyon Lake (station 08167700) and a series of small power dams. Some water is diverted for irrigation and municipal use (amounts unknown). Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of May 29, 1929, reached a stage of 38.3 ft, to National Weather Service datum.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e430	445	484	598	523	1630	1390	3340	4760	7060	5700	1100
2	e440	462	442	565	529	1660	1800	4020	4800	6950	5670	1040
3	e420	395	418	509	564	1320	2920	2560	4600	6860	5680	1050
4	e370	562	476	540	552	1240	3840	1890	2460	6740	5710	1230
5	e400	505	488	514	512	1430	3970	1740	2410	6640	4930	1120
6	e460	e530	448	492	493	1410	5000	1620	2290	6560	3470	1110
7	e340	e580	460	533	543	1540	4460	1540	4650	6460	2500	1320
8	e320	e340	495	505	492	1500	3160	1570	5040	6410	2020	1210
9	e350	419	456	487	496	1470	3120	1660	5050	6360	2140	1140
10	e345	396	515	517	461	1170	4430	1780	5010	6300	1900	1000
11	e340	313	406	458	525	1140	4860	1710	5060	6270	1910	1370
12	328	415	507	503	528	1220	4690	1380	5080	6210	1890	863
13	335	379	488	493	561	1310	2490	1650	5010	6170	1930	984
14	470	393	419	473	934	1180	1650	1750	5010	6130	1980	1090
15	310	331	521	493	750	1380	1630	1570	4190	6090	2560	1080
16	e295	375	526	512	583	1720	4050	1790	3900	6060	2190	1050
17	e280	438	666	618	641	2740	5000	2250	4080	6020	1650	1140
18	e260	378	681	488	595	2260	4680	1910	5070	5990	1690	1170
19	e240	395	527	550	587	2070	3670	1620	5070	5960	1570	984
20	e205	329	527	519	670	1810	2070	1690	5090	5940	1450	830
21	e260	447	550	544	748	1710	1760	1940	4640	5920	1320	1030
22	e394	389	516	554	920	1720	1640	1890	5060	5850	1390	995
23	e250	363	494	520	1050	1530	2060	1740	e6260	5780	1280	1060
24	e340	420	548	501	1230	1360	3520	1600	e17400	5830	1370	1200
25	e420	666	458	536	1200	1330	2580	1970	e13700	5820	1320	1040
26	e470	535	551	516	1460	1330	3720	2270	7600	5770	1470	1050
27	e430	411	523	510	1520	1310	4670	2020	5270	5760	1200	1070
28	e360	391	512	539	1340	1380	4140	3190	5690	5720	1180	1010
29	309	414	467	511	---	1340	2800	3510	7240	5720	1040	986
30	410	470	550	520	---	1410	2290	4770	7200	5690	1140	1020
31	323	---	638	514	---	1280	---	4440	---	5690	1000	---
TOTAL	10904	12886	15757	16132	21007	46900	98060	68380	168690	190730	72250	32342
MEAN	352	430	508	520	750	1513	3269	2206	5623	6153	2331	1078
MAX	470	666	681	618	1520	2740	5000	4770	17400	7060	5710	1370
MIN	205	313	406	458	461	1140	1390	1380	2290	5690	1000	830
AC-FT	21630	25560	31250	32000	41670	93030	194500	135600	334600	378300	143300	64150

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1997 - 1997, BY WATER YEAR (WY)

MEAN	352	430	508	520	750	1513	3269	2206	5623	6153	2331	1078
MAX	352	430	508	520	750	1513	3269	2206	5623	6153	2331	1078
(WY)	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997
MIN	352	430	508	520	750	1513	3269	2206	5623	6153	2331	1078
(WY)	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997	1997

### SUMMARY STATISTICS

### FOR 1997 WATER YEAR

ANNUAL TOTAL	754038	
ANNUAL MEAN	2066	
HIGHEST DAILY MEAN	17400	Jun 24
LOWEST DAILY MEAN	205	Oct 20
ANNUAL SEVEN-DAY MINIMUM	264	Oct 15
INSTANTANEOUS PEAK FLOW	18500	Jun 24
INSTANTANEOUS PEAK STAGE	38.80	Jun 24
ANNUAL RUNOFF (AC-FT)	1496000	
10 PERCENT EXCEEDS	5700	
50 PERCENT EXCEEDS	1220	
90 PERCENT EXCEEDS	404	

e Estimated

**GUADALUPE RIVER MAIN STEM**  
**08173900 GUADALUPE RIVER AT GONZALES, TX--Continued**

**WATER-QUALITY RECORDS**

**PERIOD OF RECORD.**--Chemical and biochemical analyses: April 1996 to September 1997. Sediment analyses: April 1996 to September 1997.

**WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996**

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (MG/L)	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)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
APR 25...	1330	116	570	8.0	25.0	6.1	75	230	32	62	18	
MAY 28...	1400	214	530	8.0	30.0	5.9	80	200	11	53	17	
JUN 25...	1230	165	516	7.9	29.0	6.0	79	190	18	49	16	
JUL 30...	1030	132	548	8.1	30.0	5.9	79	190	13	48	17	
SEP 09...	1100	475	405	8.0	28.0	5.8	75	140	3	39	10	

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	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 SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
APR 25...	29	0.8	21	2.3	200	32	34	0.30	10	316
MAY 28...	26	0.8	22	2.4	190	31	31	0.30	15	305
JUN 25...	32	1	27	2.6	170	29	36	0.30	15	293
JUL 30...	35	1	28	2.6	180	31	42	0.30	16	300
SEP 09...	22	0.8	25	3.7	140	27	24	0.20	14	236

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
APR 25...	316	0.560	0.010	0.570	0.050	0.87	0.25	0.15	0.20	0.30
MAY 28...	292	0.300	0.010	0.310	0.060	0.61	0.24	--	<0.20	0.30
JUN 25...	287	--	<0.010	0.140	0.110	0.44	0.19	--	<0.20	0.30
JUL 30...	303	0.140	0.010	0.150	0.110	0.55	0.29	--	<0.20	0.40
SEP 09...	223	0.570	0.080	0.650	0.040	1.0	0.36	0.26	0.30	0.40

DATE	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SEDI- MENT, SUS- PENDE (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
APR 25...	0.040	0.030	0.020	0.06	1.8	0.4	14	46	<3	3
MAY 28...	0.050	0.040	0.020	0.06	2.0	0.5	22	38	8	3
JUN 25...	0.040	0.040	0.030	0.09	2.0	--	6.2	14	<3	3
JUL 30...	0.020	0.040	0.020	0.06	1.8	0.4	6.4	18	<3	3
SEP 09...	0.070	0.080	0.080	0.25	4.2	0.7	51	40	5	1

# GUADALUPE RIVER MAIN STEM

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08173900 GUADALUPE RIVER AT GONZALES, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
OCT 08...	1130	135	555	8.0	24.0	5.7	69	220	16	64	15
NOV 12...	1030	665	582	8.3	20.0	8.3	91	240	21	67	17
FEB 13...	1100	474	530	8.0	10.0	8.7	78	220	24	59	18
MAR 24...	1100	1340	470	7.8	21.0	8.3	95	190	16	50	16
APR 18...	1145	4720	433	7.7	18.0	10.6	113	190	20	49	16
JUL 11...	1100	6390	383	7.5	28.0	8.4	109	170	21	50	12
JUL 28...	1045	5660	388	7.6	29.0	7.5	99	180	7	54	12
AUG 18...	1045	1630	497	7.5	30.0	7.5	100	220	27	66	14
SEP 15...	1000	960	515	7.4	29.0	6.9	91	230	26	67	16

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	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)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
OCT 08...	27	0.8	21	3.0	210	33	34	0.30	14	316
NOV 12...	28	0.8	20	2.4	220	34	35	0.30	11	338
FEB 13...	23	0.7	18	2.2	200	32	29	0.30	3.3	302
MAR 24...	16	0.5	15	2.2	170	25	23	0.2	9.4	268
APR 18...	12	0.4	12	2.2	170	22	18	0.2	9.6	256
JUL 11...	8.1	0.3	9	2.1	150	15	12	0.2	9.8	224
JUL 28...	7.7	0.2	8	2.2	180	14	11	0.2	11	238
AUG 18...	13	0.4	11	2.1	200	21	18	0.2	11	296
SEP 15...	15	0.4	12	2.1	210	22	20	0.2	12	301

DATE	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
OCT 08...	317	0.790	0.020	0.810	0.050	1.1	0.25	0.15	0.20	0.30
NOV 12...	334	0.700	0.030	0.730	0.050	0.93	0.15	--	<0.20	0.20
FEB 13...	291	0.770	0.030	0.800	<0.015	--	--	--	<0.20	<0.20
MAR 24...	255	0.600	0.020	0.620	0.030	0.92	0.27	--	<0.20	0.30
APR 18...	238	0.344	0.01	0.36	0.05	1.1	0.71	--	<0.2	0.8
JUL 11...	207	--	<0.01	0.53	<0.01	1.0	0.48	--	<0.2	0.5
JUL 28...	217	--	<0.01	0.57	<0.01	0.80	0.23	--	0.2	0.2
AUG 18...	270	0.792	0.01	0.80	<0.01	--	--	--	<0.2	--
SEP 15...	286	--	<0.01	0.77	0.02	--	--	--	<0.2	<0.2

## GUADALUPE RIVER MAIN STEM

08173900 GUADALUPE RIVER AT GONZALES, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDEDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDEDED (T/DAY)	SEDI- MENT, SUS- PENDEDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 08...	0.100	0.060	0.060	0.18	2.9	0.40	17	48	<3	3
NOV 12...	0.080	0.030	0.040	0.12	1.7	0.30	104	58	<3.0	2.0
FEB 13...	<0.010	0.020	<0.010	--	1.5	0.30	37	29	<3.0	1.0
MAR 24...	0.090	0.030	0.040	0.12	2.1	0.5	137	38	4	<1
APR 18...	0.21	0.02	0.02	0.07	2.5	5.1	3900	306	<3	<1
JUL 11...	0.11	<0.01	0.02	0.07	3	3	3490	202	<3	<1
JUL 28...	0.05	<0.01	0.02	0.06	3	0.8	1990	130	<3	<1
AUG 18...	--	0.03	0.02	0.06	2.1	0.3	--	--	<3	<1
SEP 15...	0.01	<0.01	0.01	0.04	1.8	0.2	70	27	<3	2



# GUADALUPE RIVER BASIN

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08175000 SANDIES CREEK NEAR WESTHOFF, TX

**LOCATION.**--Lat 29°2'54", long 97°26'57", De Witt County, Hydrologic Unit 12100202, on left bank 100 ft downstream from bridge on county highway, 1.9 mi upstream from Birds Creek, 2.0 mi northeast of Westhoff, and 20.4 mi upstream from mouth.

**DRAINAGE AREA.**--549 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--March 1930 to November 1934, August 1959 to current year.

**REVISED RECORDS.**--WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 178.27 ft above sea level. Prior to Nov. 9, 1934, water-stage recorder at site 150 ft upstream at datum 0.86 ft higher. Aug. 10, 1959, to Feb. 2, 1960, nonrecording gage at present site and datum.

**REMARKS.**--Records good. No known regulation or diversions. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum discharge since at least 1864, 92,700 ft<sup>3</sup>/s July 2, 1936 (gage height, 33.1 ft, from floodmarks), on basis of computation of peak flow, at present site and datum. Flood in October 1913 reached a stage of 26.0 ft, present site and datum, from information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 2,000 ft<sup>3</sup>/s:

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	6,450	23.26	June 23	1900	4,320	22.08

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	6.9	8.9	375	8.3	12	22	12	618	23	4.9	3.7
2	8.5	6.2	8.1	298	8.3	11	997	11	250	20	4.9	3.7
3	6.6	6.2	7.7	95	8.0	11	1510	11	141	18	5.0	3.7
4	5.9	5.9	7.8	34	8.2	12	1460	9.8	72	17	5.1	3.5
5	5.1	5.9	8.1	22	8.4	11	1590	9.8	36	16	5.2	3.5
6	5.0	5.9	7.9	16	7.9	9.9	1490	9.4	96	15	4.9	3.7
7	4.4	5.9	7.8	14	8.1	9.5	1060	9.2	1350	13	4.9	4.0
8	4.2	7.0	7.8	17	8.1	8.9	521	8.2	1800	13	4.6	3.7
9	4.1	7.0	7.7	28	7.9	8.4	169	9.6	1630	12	4.1	3.7
10	4.0	7.2	7.7	25	8.5	7.7	85	12	862	11	4.0	3.6
11	4.4	7.5	8.1	18	8.8	8.4	3010	18	357	10	3.8	3.6
12	4.2	7.4	8.4	14	9.2	69	5920	18	628	11	3.8	3.6
13	3.8	6.6	7.6	12	9.9	152	3490	15	424	10	4.0	3.6
14	3.9	6.4	7.3	11	11	120	1460	13	282	9.4	4.0	3.3
15	4.2	7.3	16	11	12	58	297	12	108	9.0	4.0	3.1
16	4.3	7.6	39	10	12	44	98	12	54	8.3	3.7	3.1
17	4.8	7.3	59	10	11	373	53	33	51	8.0	3.7	2.9
18	4.5	6.7	39	11	10	829	35	105	47	7.6	3.5	2.9
19	4.3	6.9	22	12	10	655	26	111	26	7.1	3.4	3.1
20	3.9	6.5	16	38	14	291	22	77	34	7.1	3.3	3.2
21	4.1	6.2	13	545	15	130	20	365	604	7.7	3.1	3.5
22	4.0	6.7	13	596	13	60	18	522	1960	6.9	3.2	4.2
23	4.3	6.7	12	241	13	32	17	618	3820	6.3	3.5	4.2
24	4.5	16	11	70	13	22	16	402	3330	6.3	4.4	6.1
25	4.9	20	9.7	35	13	18	14	514	1490	6.5	60	7.3
26	13	20	9.4	23	13	16	14	719	322	6.0	22	6.8
27	13	17	8.6	18	12	14	13	343	114	5.5	13	6.5
28	11	14	8.2	15	12	13	13	495	68	5.1	7.1	6.1
29	10	13	9.1	12	---	12	13	1320	43	4.9	5.0	5.5
30	8.7	11	10	11	---	11	12	1630	29	4.8	4.3	5.1
31	7.5	---	126	9.3	---	11	---	1270	---	4.7	4.1	---
TOTAL	186.1	264.9	531.9	2646.3	293.6	3039.8	23465	8714.0	20646	310.2	214.5	124.5
MEAN	6.00	8.83	17.2	85.4	10.5	98.1	782	281	688	10.0	6.92	4.15
MAX	13	20	126	596	15	829	5920	1630	3820	23	60	7.3
MIN	3.8	5.9	7.3	9.3	7.9	7.7	12	8.2	26	4.7	3.1	2.9
AC-FT	369	525	1060	5250	582	6030	46540	17280	40950	615	425	247
CFSM	.01	.02	.03	.16	.02	.18	1.42	.51	1.25	.02	.01	.01
IN.	.01	.02	.04	.18	.02	.21	1.59	.59	1.40	.02	.01	.01

## GUADALUPE RIVER BASIN

08175000 SANDIES CREEK NEAR WESTHOFF, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1930 - 1997, BY WATER YEAR (WY)

MEAN	106	64.9	62.7	121	143	69.7	168	262	295	30.1	22.4	206
MAX	1719	470	969	778	1485	418	1361	2062	2820	139	248	4060
(WY)	1961	1961	1977	1974	1992	1969	1977	1972	1987	1961	1933	1967
MIN	.26	1.19	1.85	4.08	4.05	2.66	3.26	.88	.32	.23	.071	.26
(WY)	1964	1932	1989	1967	1967	1967	1963	1963	1934	1964	1962	1959

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1930 - 1997h	
ANNUAL TOTAL	20147.41		60436.8		131	
ANNUAL MEAN	55.0		166		532	
HIGHEST ANNUAL MEAN					8.71	
LOWEST ANNUAL MEAN					1992	
HIGHEST DAILY MEAN	2830	Sep 10	5920	Apr 12	67900	Sep 22 1967
LOWEST DAILY MEAN	.30	Jun 19	2.9	Sep 17	.00	Aug 11 1932
ANNUAL SEVEN-DAY MINIMUM	.51	Jun 16	3.1	Sep 14	.00	Aug 18 1959
INSTANTANEOUS PEAK FLOW			6450	Apr 12	c79700	Sep 22 1967
INSTANTANEOUS PEAK STAGE			23.26	Apr 12	32.34	Sep 22 1967
ANNUAL RUNOFF (AC-FT)	39960		119900		94830	
ANNUAL RUNOFF (CFSM)	.10		.30		.24	
ANNUAL RUNOFF (INCHES)	1.37		4.10		3.24	
10 PERCENT EXCEEDS	50		386		120	
50 PERCENT EXCEEDS	6.3		11		9.0	
90 PERCENT EXCEEDS	1.0		4.0		1.4	

e Estimated

c From rating curve extended above 21,000 ft<sup>3</sup>/s on basis of slope-area measurement of 92,700 ft<sup>3</sup>/s.

h See PERIOD OF RECORD paragraph.

# GUADALUPE RIVER BASIN

199

08175000 SANDIES CREEK NEAR WESTHOFF, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: April 1962 to current year. Sediment analyses: November 1965 to May 1966. Pesticide analyses October 1992 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
DEC 13...	1155	8.0	1550	7.9	17.0	4.5	48	100	0	32	5.4
MAR 28...	1200	13	728	7.4	22.0	8.2	94	120	0	36	6.8
JUN 04...	1720	60	313	7.4	26.5	5.7	72	54	0	17	3.0
JUL 16...	1003	8.4	1270	7.9	27.0	4.8	60	200	0	61	12
AUG 14...	0920	4.0	1900	7.9	28.0	3.2	42	160	0	50	8.9
SEP 10...	0840	3.6	1440	7.4	26.0	2.3	29	78	0	24	4.5

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
DEC 13...	300	13	85	11	400	33	250	1.0	19	891
MAR 28...	100	4	62	11	140	53	110	0.30	20	422
JUN 04...	36	2	55	8.0	74	18	34	0.15	17	176
JUL 16...	183	6	65	11	240	80	210	0.49	19	719
AUG 14...	342	12	81	13	430	47	310	1.4	19	1050
SEP 10...	264	13	86	13	360	19	240	1.1	20	797

## GUADALUPE RIVER MAIN STEM

08175800 GUADALUPE RIVER AT CUERO, TX

**LOCATION.**--Lat 29°03'57", long 97°19'16", De Witt County, Hydrologic Unit 12100204, on left bank at downstream side of bridge on U.S. Highways 77A, 87, and 183, 2.1 mi upstream from Gohlke Creek, 2.4 mi southwest of Cuero, 4.2 mi downstream from mouth of Sandies Creek, and at mile 100.6.

**DRAINAGE AREA.**--4,934 mi<sup>2</sup> of which 1,432 mi<sup>2</sup> is above Canyon Dam.

**PERIOD OF RECORD.**--January 1903 to December 1906, September 1916 to April 1919, September 1920 to November 1935, and January 1964 to current year. Published in WSP 1312 as "near Cuero" January 1903 to December 1906, and as "below Cuero" September 1920 to April 1935. Records from 1903 to 1935 not used in statistical computation. Gage-height records collected 7.1 mi upstream from 1941 to 1966 and published in National Weather Service reports.

Water-quality records.--Chemical analyses: March 1968 to September 1985.

**REVISED RECORDS.**--WRD TX-68-1, TX-69-1: Drainage areas at all sites.

**GAGE.**--Water-stage recorder. Datum of gage is 128.64 ft above sea level. From Dec. 26, 1902, to June 1903, nonrecording gage at site 7.1 mi upstream at different datum (gage heights adjusted to site 3.3 mi upstream from present site before computation); from July 1903 to December 1906, nonrecording gage 3.3 mi upstream at different datum; and Aug. 19, 1916, to Dec. 16, 1935, water-stage recorder at site 5.0 mi downstream at datum 3.19 ft lower.

**REMARKS.**--No estimated daily discharges. Records fair. Since water year 1928, at least 10% of contributing drainage area has been regulated by Lake Dunlap and Lake McQueeney (combined capacity of 10,950 acre-ft). Additional regulation since July 21, 1962, by Canyon Lake (storage capacity of 386,200 acre-ft) 202.4 mi upstream. Flow below New Braunfels is partly regulated by a series of small power dams, combined capacity of six largest dams 33,550 acre-ft. Flow is affected at times by discharge from the flood-detention pools of 53 floodwater-retarding structures with a combined detention capacity of 87,200 acre-ft. These structures control runoff from 302 mi<sup>2</sup> in the Comal, San Marcos, and Plum Creek drainage basins. Many small diversions above station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--10 years (water years 1904-6, 1917-18, 1921-27) 1,220 ft<sup>3</sup>/s (839,900 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1904-6, 1917-18, 1921-27).**--Maximum stage since at least 1900 probably occurred on Mar. 1, 1903, at 43.0 ft (at different site and datum), but discharge was not determined.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1900 probably occurred July 2, 1936, 44.33 ft, present site and datum, from information by State Department of Highways and Public Transportation. Other floods at this station occurred Oct. 4, 1913, 37.57 ft, at different site and datum; Dec. 6, 1913, 34.57 ft (at different site and datum); Oct. 20, 1919, 32.2 ft (site and datum then in use), and June 21, 1961, 37.0 ft at present site and datum

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	707	233	466	1220	529	1340	1220	2580	6800	7990	5750	1200
2	485	403	608	1070	540	1450	4610	3220	5410	7780	5760	971
3	476	416	472	864	529	1510	6520	3750	5060	7640	5730	1150
4	481	498	522	653	604	1370	7900	2790	4720	7530	5740	1110
5	461	497	484	616	825	1270	7640	2170	3040	7370	5750	1230
6	405	690	547	603	638	1350	7190	2010	3510	7230	4930	1280
7	420	349	484	561	412	1350	8380	1880	7370	7100	3500	1250
8	459	370	485	617	431	1460	6940	1760	11500	6970	2630	1170
9	517	595	534	602	446	1440	3760	1910	14900	6880	2280	1300
10	395	249	519	593	454	1430	3270	2230	16900	6810	2330	1240
11	397	685	588	607	457	1270	14300	2310	17400	6740	2120	1070
12	393	330	485	545	637	1300	18900	2490	16500	6680	1980	1150
13	382	294	483	562	626	1640	12100	2080	15100	6580	1970	1250
14	354	446	517	554	394	1730	7410	1950	9510	6540	1940	857
15	337	352	522	540	764	1580	3670	2100	5840	6480	1970	998
16	482	366	560	545	1050	1560	2180	3700	4640	6430	2360	1080
17	469	317	660	565	611	4020	3810	4120	4040	6380	2230	1120
18	355	284	831	673	683	5910	4980	4660	4250	6320	1770	1110
19	323	416	858	601	667	5740	4700	4880	6200	6250	1690	1100
20	296	424	671	644	726	3770	3700	3280	7000	6200	1590	1110
21	281	404	510	2310	777	2270	2480	3110	10700	6170	1550	1070
22	206	325	581	3420	816	1800	2000	4820	18500	6140	1470	843
23	293	362	744	2860	829	1630	1870	3840	13700	6060	1460	950
24	460	379	410	1860	970	1490	2210	3370	15000	5940	1390	1330
25	262	462	518	763	966	1330	3270	5420	17300	6010	1420	1230
26	374	607	573	648	1100	1210	2780	4840	17300	5980	1430	1150
27	460	727	555	622	1240	1240	3940	3620	15200	5900	1490	988
28	494	461	610	535	1420	1220	5450	4790	7870	5870	1340	963
29	464	378	581	581	---	1210	5270	8260	6210	5810	1310	1100
30	422	466	559	529	---	1210	3300	7220	7710	5790	1230	1020
31	188	---	658	534	---	1210	---	7960	---	5750	1230	---
TOTAL	12498	12785	17595	27897	20141	58310	165750	113120	299180	203320	79340	33390
MEAN	403	426	568	900	719	1881	5525	3649	9973	6559	2559	1113
MAX	707	727	858	3420	1420	5910	18900	8260	18500	7990	5760	1330
MIN	188	233	410	529	394	1210	1220	1760	3040	5750	1230	843
AC-FT	24790	25360	34900	55330	39950	115700	328800	224400	593400	403300	157400	66230

# GUADALUPE RIVER MAIN STEM

201

08175800 GUADALUPE RIVER AT CUERO, TX--Continue

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1997#, BY WATER YEAR (WY)

MEAN	1426	1530	1736	1896	2168	1827	2319	3174	3473	1570	1179	1729
MAX	9585	5023	10500	10830	16740	10370	11100	12270	21470	6559	4149	11210
(WY)	1974	1977	1992	1992	1992	1992	1977	1972	1987	1997	1987	1981
MIN	242	411	432	397	403	504	381	309	242	95.7	112	124
(WY)	1990	1990	1990	1990	1990	1967	1971	1984	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1964 - 1997#	
ANNUAL TOTAL	207583		1043326			
ANNUAL MEAN	567		2858		2033	
HIGHEST ANNUAL MEAN					6885	
LOWEST ANNUAL MEAN					435	
HIGHEST DAILY MEAN	10600	Sep 21	18900	Apr 12	112000	Sep 1 1981
LOWEST DAILY MEAN	40	Aug 14	188	Oct 31	28	Jul 22 1984
ANNUAL SEVEN-DAY MINIMUM	46	Aug 12	303	Oct 19	45	Jul 18 1984
INSTANTANEOUS PEAK FLOW			20500	Apr 12	132000	Sep 1 1981
INSTANTANEOUS PEAK STAGE			24.32	Apr 12	41.83	Sep 1 1981
ANNUAL RUNOFF (AC-FT)	411700		2069000		1473000	
10 PERCENT EXCEEDS	739		6980		3660	
50 PERCENT EXCEEDS	469		1270		1050	
90 PERCENT EXCEEDS	135		416		460	

# Period of regulated streamflow.



**LOCATION.**--Lat 28°47'34", long 97°00'46", Victoria County, Hydrologic Unit 12100204, on left bank near left downstream corner of downstream bridge of two bridges on U.S. Highway 59 in Victoria, 1,200 ft upstream from Southern Pacific Railroad Co. bridge, 15 mi upstream from Coleta Creek, and at mile 50.7.

**DRAINAGE AREA.**--5,198 mi<sup>2</sup>, of which 1,432 mi<sup>2</sup> is above Canyon Dam.

**PERIOD OF RECORD.**--November 1934 to current year. Gage-height records collected in this vicinity since 1904 are contained in reports of the National Weather Service.

Water-quality records.--Chemical analyses: August 1945 to August 1994. Chemical and biochemical analyses: January 1968 to August 1994.

Pesticide analyses: February 1974 to August 1981. Sediment analyses: April 1959, August 1973 to August 1994. Specific conductance: October 1945 to September 1981. Water temperature: November 1950 to September 1981.

**REVISED RECORDS.--**WSP 2123: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 29.15 ft above sea level. Nov. 1, 1934, to July 27, 1992, at site just upstream from pier on left bank of upstream bridge at same datum.

**REMARKS.**--Records good. Since installation of gage in November 1934, at least 10% of contributing drainage area has been regulated by Lake Dunlap and Lake McQueeney (combined capacity of 10,950 acre-ft). Flow is also partially regulated by Canyon Lake (capacity 386,200 acre-ft) 252.3 mi upstream. There are many diversions above station. Records provided by the city of Victoria show that during the current year about 8,410 acre-ft of wastewater effluent was released into the river below this station. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of June 1, 1929, reached a stage of 30.2 ft, present site and datum, maximum stage since at least 1833, that of July 3, 1936..

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	489	288	486	921	615	1360	1320	3020	7440	7500	5500	1340
2	720	256	505	e1080	609	1300	4410	2610	6000	7540	5520	1250
3	493	405	619	e930	622	1430	12200	3530	5140	7380	5500	1170
4	471	435	498	e850	604	1450	22500	3560	4870	7260	5470	1430
5	473	541	555	e730	721	1310	14200	2460	4150	7110	5490	1280
6	458	518	508	670	877	1270	8310	2110	2950	6970	5360	1380
7	410	676	566	633	702	1350	7360	1960	6190	6840	4410	1370
8	412	417	501	604	505	1350	7950	1840	8410	6730	3400	1300
9	442	385	502	696	508	1420	5740	2400	10600	6620	2730	1340
10	498	576	549	644	518	1420	3710	4110	13000	6540	2460	1370
11	398	379	547	616	517	1530	7630	2500	15200	6480	2430	1330
12	389	e590	604	633	540	5280	14000	2390	15800	6400	2180	1130
13	384	e370	508	575	754	2400	15900	2350	15400	6330	2120	1330
14	377	340	502	585	657	1840	11400	1940	13800	6250	2050	1290
15	359	445	554	590	475	1730	6330	1920	8330	6210	2030	948
16	340	387	579	568	846	1610	3250	2390	5720	6150	2130	1190
17	445	391	601	569	984	8270	2790	4660	4620	6100	2380	1210
18	434	354	741	594	665	8640	4480	4120	4280	6050	2080	1210
19	368	326	856	709	747	7700	5020	4810	5200	5990	1790	1240
20	335	411	888	712	764	5390	4440	4550	6670	5960	1760	1220
21	312	431	669	2310	1110	3310	3460	3140	7400	5910	1680	1260
22	304	415	539	3590	914	2180	2410	3940	20000	5880	1620	1350
23	258	366	627	3070	899	1790	2080	5250	19700	5840	1550	1080
24	261	413	e790	2520	943	1660	1990	3900	14300	5710	1530	1540
25	439	429	e620	1410	961	1760	2610	4990	14300	5690	1490	1500
26	352	461	600	869	1060	3230	3270	5840	15600	5710	1500	1370
27	361	717	590	763	1100	1540	2760	4420	15700	5670	1510	1250
28	466	687	574	707	1280	1430	4630	3510	13500	5620	1540	1100
29	499	504	623	628	---	1360	5390	7040	7270	5580	1430	1160
30	477	433	591	662	---	1320	4530	7320	6720	5540	1400	1210
31	445	---	643	606	---	1300	---	7290	---	5520	1350	---
TOTAL	12869	13346	18535	31044	21497	78930	196070	115870	298260	195080	83390	38148
MEAN	415	445	598	1001	768	2546	6536	3738	9942	6293	2690	1272
MAX	720	717	888	3590	1280	8640	22500	7320	20000	7540	5520	1540
MIN	258	256	486	568	475	1270	1320	1840	2950	5520	1350	948
AC-FT	25530	26470	36760	61580	42640	156600	388900	229800	591600	386900	165400	75676

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1935 - 1997, BY WATER YEAR (WY)

[illegible]

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1935 - 1997
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ANNUAL TOTAL	205596		1103039						
ANNUAL MEAN	562		3022			1867			
HIGHEST ANNUAL MEAN						6993			1992
LOWEST ANNUAL MEAN						132			1956
HIGHEST DAILY MEAN	9470	Sep 22	22500	Apr 4		129000	Jul 3		1936
LOWEST DAILY MEAN	38	Aug 20	256	Nov 2		14	Aug 20		1956
ANNUAL SEVEN-DAY MINIMUM	50	Aug 15	323	Oct 20		22	Sep 29		1956
INSTANTANEOUS PEAK FLOW			32700	Apr 4		179000	Jul 3		1936
INSTANTANEOUS PEAK STAGE			29.07	Apr 4		31.22	Jul 3		1936
INSTANTANEOUS LOW FLOW						36	Aug 21		1996
ANNUAL RUNOFF (AC-FT)	407800		2188000			1353000			
10 PERCENT EXCEEDS	718		7260			3480			
50 PERCENT EXCEEDS	479		1370			977			
90 PERCENT EXCEEDS	151		435			359			

e Estimated

## GUADALUPE RIVER BASIN

203

08176550 FIFTEENMILE CREEK NEAR WESER, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 28°53'51", long 97°21'17", De Witt County, Hydrologic Unit 12100204, at DeWitt-Goliad County line, on right downstream end of bridge on U.S. Highway 183, and 2.4 mi northeast of Weser.

**DRAINAGE AREA.**--167 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1984 to September 1989 (daily mean discharge), October 1989 to current year (peak discharges greater than base discharge).

**GAGE.**--Water-stage recorder. Datum of gage is 158.40 ft above sea level.

**REMARKS.**--Records poor until Mar. 17, but good thereafter. No known regulation or diversions.

**AVERAGE DISCHARGE.**--5 years (water years 1985-89), 18.7 ft<sup>3</sup>/s (13,550 acre-ft/yr).

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 19,400 ft<sup>3</sup>/s June 22, 1997 (gage height, 26.68 ft), from rating curve extended above 2,840 ft<sup>3</sup>/s; minimum daily, no flow for several days in 1989.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 17	Unknown	Unknown	Unknown	Apr. 3	0500	5,380	17.83
Mar. 25	1900	1,450	12.12	Apr. 4	0500	7,140	a19.45
Apr. 2	1800	4,400	16.77	June 22	2000	19,400	26.68

a From floodmark.

## GUADALUPE RIVER BASIN

08176900 COLETO CREEK AT ARNOLD ROAD CROSSING NEAR SCHROEDER, TX

**LOCATION.**--Lat 28°51'41", long 97°13'34", Goliad County, Hydrologic Unit 12100204, on right bank at downstream side of Arnold Road Crossing, 0.7 mi downstream from confluence of Twelvemile and Fifteenmile Creeks, 3.2 mi north of Schroeder, 12.8 mi upstream from Coletto Creek Reservoir, and 26.0 mi upstream from mouth.

**DRAINAGE AREA.**--357 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1978 to current year. Records equivalent for January 1930 to December 1933 and October 1952 to September 1979, published as "near Schroeder" (station 08177000).

**GAGE.**--Water-stage recorder. Datum of gage is 100.43 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation or diversions. Radio telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum discharges since at least 1872 at site 3.5 mi downstream, 122,000 ft<sup>3</sup>/s Sept. 21, 1967 (slope-area measurement of peak flow), 63,700 ft<sup>3</sup>/s Oct. 16, 1946, and 46,700 ft<sup>3</sup>/s in October 1925, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 4,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 26	0200	4,260	13.84	June 22	0300	44,500	31.17
Apr. 4	1000	28,800	26.63				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	.68	1.2	1.7	4.1	3.1	17	35	424	86	20	8.8
2	3.4	.56	1.1	2.2	3.9	3.1	2070	35	191	74	20	8.8
3	3.0	.51	1.1	2.1	3.7	3.1	8850	34	79	67	20	8.5
4	2.8	.53	1.1	2.0	3.5	3.0	15200	32	53	61	19	8.4
5	2.6	.53	1.2	1.9	3.3	3.0	1690	31	45	56	19	8.5
6	2.4	.55	1.2	1.9	3.3	2.9	559	31	72	51	19	8.2
7	2.2	.58	1.2	1.9	3.7	2.9	285	31	1270	48	19	7.9
8	2.0	.50	1.1	2.0	3.7	3.0	193	30	407	45	19	7.6
9	1.9	.46	1.1	2.3	3.4	3.0	156	204	165	42	18	7.4
10	1.7	.45	1.1	2.2	3.0	3.1	143	118	82	40	18	7.4
11	1.7	.42	1.1	2.0	2.2	12	235	49	134	38	17	6.9
12	1.6	.39	1.1	2.0	2.3	1090	178	37	67	37	17	6.8
13	1.4	.36	1.0	1.9	2.5	409	141	34	52	35	16	6.7
14	1.3	.34	1.0	1.9	2.3	56	101	31	44	34	15	6.6
15	1.3	.34	1.1	1.9	2.2	22	82	30	40	33	15	6.6
16	1.3	.35	1.3	1.8	2.2	118	72	210	36	31	14	6.4
17	1.3	.36	1.3	1.8	2.3	2320	65	169	35	30	14	6.2
18	1.1	.38	1.3	1.8	2.3	706	62	64	63	29	13	6.0
19	1.0	.39	1.3	1.7	2.3	749	58	40	271	28	13	5.9
20	1.0	.38	1.3	2.3	9.9	176	54	208	145	28	13	6.2
21	.99	.42	1.4	132	14	62	50	239	4080	28	12	6.5
22	.90	.46	1.5	63	4.2	33	47	412	24600	27	11	8.4
23	.83	.43	1.5	23	3.3	23	42	421	1770	26	11	20
24	.81	.98	1.4	13	3.2	17	41	163	460	25	11	444
25	.89	1.2	1.3	9.0	3.2	281	41	290	315	24	11	53
26	.93	.96	1.4	6.9	3.2	1780	40	179	248	23	11	23
27	.87	.89	1.4	5.8	3.1	184	39	112	194	22	10	17
28	.83	.89	1.4	4.8	3.1	59	38	63	155	21	10	15
29	.79	1.0	1.4	4.6	---	35	37	51	125	21	9.8	14
30	.78	1.2	1.4	4.2	---	25	36	39	102	20	9.6	14
31	.73	---	1.5	4.2	---	19	---	83	---	20	9.1	---
TOTAL	48.15	17.49	38.8	309.8	103.4	8206.2	30622	3505	35724	1150	453.5	760.7
MEAN	1.55	.58	1.25	9.99	3.69	265	1021	113	1191	37.1	14.6	25.4
MAX	3.8	1.2	1.5	132	14	2320	15200	421	24600	86	20	444
MIN	.73	.34	1.0	1.7	2.2	2.9	17	30	35	20	9.1	5.9
AC-FT	96	35	77	614	205	16280	60740	6950	70860	2280	900	1510

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1979 - 1997, BY WATER YEAR (WY)

	MEAN	65.5	41.1	41.8	57.0	72.2	59.6	150	133	198	29.1	23.7	26.2
MAX	648	357	301	400	486	265	1021	608	1191	114	309	183	
(WY)	1995	1983	1987	1979	1992	1997	1997	1979	1997	1990	1981	1981	
MIN	.046	.049	.94	2.62	2.71	2.78	1.56	.29	.73	.14	.000	.000	
(WY)	1989	1990	1990	1990	1996	1996	1996	1996	1990	1989	1996	1989	

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1979 - 1997

ANNUAL TOTAL	1569.08	80939.04	
ANNUAL MEAN	4.29	222	74.5
HIGHEST ANNUAL MEAN			222
LOWEST ANNUAL MEAN			2.47
HIGHEST DAILY MEAN	486 Sep 21	24600 Jun 22	24600 Jun 22 1997
LOWEST DAILY MEAN	.00 May 23	.34 Nov 14	.00 Aug 20 1989
ANNUAL SEVEN-DAY MINIMUM	.00 May 23	.36 Nov 12	.00 Aug 20 1989
INSTANTANEOUS PEAK FLOW		44500 Jun 22	44500 Jun 22 1997
INSTANTANEOUS PEAK STAGE		31.17 Jun 22	31.17 Jun 22 1997
ANNUAL RUNOFF (AC-FT)	3110	160500	53960
10 PERCENT EXCEEDS	2.9	181	62
50 PERCENT EXCEEDS	1.1	10	11
90 PERCENT EXCEEDS	.00	.97	.90

# GUADALUPE RIVER BASIN

205

08177300 PERDIDO CREEK AT FARM ROAD 622 NEAR FANNIN, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 28°45'05", long 97°19'01", Goliad County, Hydrologic Unit 12100204, at right downstream end of bridge on Farm Road 622, 1.2 mi downstream from Farmer Creek, 3.1 mi upstream from Kilgore Creek, and 6.1 mi northwest of Fannin.

**DRAINAGE AREA.**--28.0 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1978 to September 1991 (daily mean discharge); October 1991 to current year (peak discharges greater than base discharge).

**GAGE.**--Water-stage recorder. Datum of gage is 134.66 ft above sea level.

**REMARKS.**--Records good. No known regulation or diversions. Radio telemeter at station.

**AVERAGE DISCHARGE.**--13 years (water years 1979-91), 5.05 ft<sup>3</sup>/s (2.45 in/yr), 3,660 acre-ft/yr.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 26,510 ft<sup>3</sup>/s Apr. 4, 1997 (gage height, 17.89 ft), from rating curve extended above 22,700 ft<sup>3</sup>/s; no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of Apr. 20, 1976, reached a stage of 26.28 ft, and flood of Sept. 15, 16, 1967, reached a stage of 26.08 ft, from information by the State Department of Highways and Public Transportation.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 400 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar 12	0130	991	7.77	May 9	1700	597	7.05
Mar. 12	1900	674	7.21	May 20	0800	535	6.91
Mar. 17	1000	736	7.33	June 6	2300	1,358	8.29
Mar. 18	1600	434	6.66	June 21	1730	3,299	10.12
Apr. 2	1730	7,291	12.35	Sept. 23	2000	4,852	11.12
Apr. 4	0500	26,510	a17.89				

a From floodmark.

## GUADALUPE RIVER BASIN

08177400 COLETO CREEK RESERVOIR NEAR VICTORIA, TX

**LOCATION.**--Lat 28°43'51", long 97°09'53", Victoria County, Hydrologic Unit 12100204, on right bank 175 ft upstream from right end of spillway of dam on Coleta Creek, 1.6 mi upstream from U.S. Highway 59, 11.6 mi west of Victoria, and 12.8 mi upstream from mouth.

**DRAINAGE AREA.**--494 mi<sup>2</sup>.

**PERIOD OF RECORD.**--February 1980 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 80.00 ft above sea level.

Supplementary gage (Turkey Creek Arm).--Water-stage recorder 2.7 mi upstream at datum 90.00 ft above sea level. Coleta Creek Reservoir (Turkey Creek Arm) near Schroeder (station 08177240) is locally known as Dike No. 2.

Supplementary gage (Sulphur Creek Arm).--Water-stage recorder 2.8 mi upstream at datum 90.00 ft above sea level. Coleta Creek Reservoir (Sulphur Creek Arm) near Fannin (station 08177380) is locally known as Dike No. 1.

**REMARKS.**--The reservoir system consists of the main reservoir (station 08177400), Turkey Creek Arm (station 08177240), and Sulphur Creek Arm (station 08177380). Figures shown below are the combined contents of the three stations. Cooling water is diverted from the main reservoir through the Central Power and Light coal-fired generating plant, through a canal to the Sulphur Creek Arm, and then through a canal to Turkey Creek Arm where it is released back into the main reservoir. The system was built for the Guadalupe-Blanco River Authority, and storage began in February 1980.

The main reservoir is formed by a compacted earthfill dam 20,800 ft long, including a 2,000-foot uncontrolled spillway and a 403-foot wide concrete outlet structure with seven 40- x 28-foot spillway gates. Low-flow releases are made through the dam by a controlled 8-inch pipe. Turkey Creek Arm is formed by a compacted earthfill dam 2,250 ft long, including a 186-foot wide concrete outlet structure with two 40- x 11-foot spillway gates. Sulphur Creek Arm is formed by a compacted earthfill dam 1,030 ft long, including a 186-foot wide concrete outlet structure with two 40- by 11-foot spillway gates. Data regarding the dams and reservoirs are given in the following table:

	Coleta Creek Reservoir		Turkey Creek Arm		Sulphur Creek Arm	
	Gage height	Contents	Gage height	Contents	Gage height	Contents
	(feet)	(acre-feet)	(feet)	(acre-feet)	(feet)	(acre-feet)
Top of dam .....	39.0	140,200	17.0	7,330	17.0	2,550
Spillway .....	27.3	63,560	--	--	--	--
Top of spillway gates .....	19.0	34,000	12.9	4,950	12.9	1,640
Crest of spillway .....	-9.0	954	1.89	1,400	1.91	306

**COOPERATION.**--Elevations and capacity tables were provided by Forrest and Cotton Engineers, Consulting Engineers for the Guadalupe-Blanco River Authority.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents, 40,550 acre-ft May 5, 1993; minimum since reservoir was first filled in May 1980, 22,790 acre-ft Aug. 20, 21, 1996.

**EXTREMES FOR CURRENT YEAR.**--Maximum contents, 38,230 acre-ft June 21; minimum, 25,960 acre-ft Jan. 19.

RESERVOIR STORAGE (ACRE-Feet), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 2400 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29720	29040	27460	26630	27170	27100	35990	36330	37400	37460	36640	34320
2	29730	28850	27420	26590	27170	27020	37560	36430	36840	37540	36630	34230
3	29700	28780	27380	26590	27200	27020	36130	36370	36960	37580	36550	34150
4	29670	28730	27310	26570	27170	27010	35770	36310	37010	37710	36510	34110
5	29670	28690	27310	26540	27060	26960	35320	36290	37060	37790	36430	34040
6	29670	28610	27310	26390	27060	26850	35780	36270	37870	37600	36320	33930
7	29650	28580	27240	26350	27120	26830	35610	36270	37860	37560	36200	33900
8	29650	28460	27160	26380	27040	26780	35570	36220	37670	37610	36180	33800
9	29600	28390	27140	26320	27040	26760	35750	37520	36950	37610	35970	33710
10	27260	28320	27110	26320	27040	26790	35850	37290	37960	37560	35950	33910
11	29550	28260	27110	26210	26980	29720	35560	37390	37290	37570	35890	33850
12	29530	28210	27090	26180	27090	35830	35740	37450	37360	37570	35820	33740
13	29530	28180	27040	26130	27040	35360	35480	37280	37350	37570	35750	33680
14	29530	28140	27010	26110	26980	35290	35650	37250	37360	37570	35650	33670
15	29560	28060	27090	26110	26960	35260	35790	37410	37390	37550	35540	33590
16	29590	28020	27050	26090	26910	35740	35910	37560	37390	37510	35410	33470
17	29590	27970	26980	26000	26910	35170	35780	37420	37190	37440	35360	33390
18	29480	27920	26850	25980	26870	35390	35870	37450	37090	37380	35300	33310
19	29430	27920	26800	25960	26870	35040	35820	37520	37210	37370	35200	33260
20	29430	27840	26750	26520	27140	34930	35910	37730	37190	37310	35080	33250
21	29430	27800	26720	27040	27200	35140	35970	37460	38230	37340	35030	33270
22	29400	27690	26720	27290	27120	35260	36010	37720	37820	37240	34920	33690
23	29370	27660	26720	27320	27090	35380	36050	37080	37040	37190	35090	34510
24	29370	27820	26640	27380	27060	35390	36050	36950	36890	37110	35020	35630
25	29400	27710	26630	27360	27090	36020	35960	37170	36940	37040	34900	35750
26	29350	27630	26610	27380	27120	35710	35990	36800	37030	37020	34850	35770
27	29290	27560	26590	27380	27060	35770	36050	36970	37230	36930	34770	35710
28	29240	27530	26570	27250	27060	35660	36140	37120	37100	36890	34660	35710
29	29240	27530	26590	27230	---	35740	36240	36880	37300	36800	34580	35610
30	29150	27550	26550	27170	---	35850	36330	36920	37470	36740	34480	35570
31	29070	---	26540	27170	---	35860	---	37010	---	36690	34410	---
MAX	29730	29040	27460	27380	27200	36020	37560	37730	38230	37790	36640	35770
MIN	27260	27530	26540	25960	26870	26760	35320	36220	36840	36690	34410	33250
(@)	-650	-1520	-1010	+630	-110	+8800	+470	+680	+460	-780	-2280	+1160
CAL YR 1996	MAX 29940	MIN 22790	@ +130									
WTR YR 1997	MAX 38230	MIN 25960	@ +5850									

@ Change in contents, in acre-feet.



08177500 COLETO CREEK NEAR VICTORIA, TX

**LOCATION.**--Lat 28°43'51", long 97°08'18", Victoria County, Hydrologic Unit 12100204, on left bank at downstream side of westbound bridge on U.S. Highway 59, 1.6 mi downstream from Coletto Creek dam, 9.0 mi southwest of Victoria, and 11.2 mi upstream from mouth.

**DRAINAGE AREA.**--514 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1939 to September 1954, June 1978 to current year.

**REVISED RECORDS.**--WSP 1562: 1939-40. WSP 1732: 1941.

**GAGE.**--Water-stage recorder. Datum of gage is 44.18 ft above sea level. Prior to Jan. 17, 1955, at datum 5.0 ft higher.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. Since Feb. 21, 1980, at least 10% of contributing drainage area has been regulated by Coletto Creek Reservoir, 1.6 mi upstream. Beginning on Mar. 6, 1980, water is diverted from the Guadalupe River basin to the Coletto Creek basin upstream from Coletto Creek Reservoir. There are no other large diversions above station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--16 years (water years 1940-54, 1979) prior to regulation by Coletto Creek Reservoir, 92.7 ft<sup>3</sup>/s (67,160 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1940-54, 1979-80).**--Maximum discharge, 89,000 ft<sup>3</sup>/s Oct. 16, 1946 (gage height, 36.64 ft, present datum, from floodmark), on basis of slope-area measurement of peak flow; no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum discharge since at least 1875, 236,000 ft<sup>3</sup>/s Sept. 22, 1967 (gage height, 42.0 ft, from floodmark), present site and datum, on basis of slope-area measurement of peak flow. Flood of Apr. 20, 1976, reached a stage of 37.85 ft, at site 0.2 mi upstream at present datum. Flood of July 1, 1936, reached a stage of 32.2 ft, present site and datum, from information by railroad company.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.7	1.6	4.3	2.9	2.7	17	3.6	111	e60	6.3	5.3
2	1.5	2.0	2.1	3.5	2.7	2.6	6560	3.5	266	e10	6.4	8.6
3	1.5	2.0	3.1	2.9	4.0	4.8	15200	3.4	10	9.8	6.2	5.7
4	1.5	4.6	2.2	2.5	5.3	4.3	27500	3.6	7.3	9.4	6.2	5.1
5	1.6	4.5	1.8	2.4	3.8	3.6	3400	3.4	7.0	9.2	6.1	5.1
6	1.6	2.5	1.7	2.4	3.3	3.3	476	3.3	13	71	6.0	4.9
7	3.1	2.0	1.5	2.7	3.4	2.7	306	3.2	2510	9.1	6.1	5.0
8	3.4	1.8	1.6	3.1	3.5	2.6	146	3.1	616	8.1	6.1	4.9
9	2.1	1.7	1.6	3.1	3.4	2.6	41	16	388	7.7	6.1	4.8
10	1.8	1.6	1.6	2.7	3.3	2.5	56	329	33	7.5	6.1	5.8
11	1.6	1.5	1.5	2.7	3.2	19	340	6.8	411	7.2	9.8	5.0
12	1.5	1.4	1.5	2.7	3.1	1220	13	6.3	49	7.1	7.4	4.8
13	1.5	1.4	1.5	2.8	3.2	1330	151	56	37	6.9	6.3	4.8
14	1.5	1.4	1.5	2.8	3.1	119	26	4.6	15	6.9	6.0	4.9
15	1.5	1.4	1.8	2.6	2.9	15	6.4	e4.6	14	6.7	6.0	4.8
16	1.6	1.5	2.3	2.7	2.8	27	5.7	e200	13	6.6	6.2	4.5
17	1.5	1.5	2.0	4.7	2.8	6350	71	e150	73	6.5	6.2	4.7
18	1.5	1.6	1.8	4.6	2.7	3330	11	e10	80	6.5	6.2	4.7
19	1.5	1.5	2.0	4.6	2.3	1660	65	e6.0	291	6.6	6.2	4.7
20	1.5	1.5	2.1	6.5	2.5	302	18	e550	221	6.6	6.0	5.2
21	1.5	1.4	1.8	29	2.8	20	5.3	e350	1480	6.6	6.0	5.7
22	1.7	1.5	1.7	13	2.7	9.9	4.9	e200	23200	6.5	6.2	7.7
23	1.8	1.5	1.8	7.5	2.7	7.5	4.8	600	3040	6.5	6.3	7.0
24	1.8	2.2	1.9	4.6	2.8	6.0	4.8	179	514	6.4	6.3	6.3
25	1.7	2.5	2.1	3.6	3.1	9.8	56	e200	212	6.4	5.8	6.2
26	1.6	2.0	2.1	3.1	3.1	2150	6.5	148	140	6.3	5.8	6.2
27	1.6	1.8	2.1	3.0	2.9	158	5.2	16	55	6.3	5.7	6.2
28	1.6	1.8	2.0	3.2	2.9	116	5.9	65	144	6.3	5.7	6.3
29	1.6	1.7	1.9	3.0	---	11	4.5	177	21	6.3	5.6	8.5
30	1.6	1.6	3.6	2.9	---	5.2	3.8	8.1	12	6.2	5.6	7.2
31	1.6	---	4.4	2.8	---	4.3	---	335	---	6.2	5.4	---
TOTAL	53.0	57.1	62.2	142.0	87.2	16901.4	54510.8	3644.5	33983.3	339.4	192.3	170.6
MEAN	1.71	1.90	2.01	4.58	3.11	545	1817	118	1133	10.9	6.20	5.69
MAX	3.4	4.6	4.4	29	5.3	6350	27500	600	23200	71	9.8	8.6
MIN	1.5	1.4	1.5	2.4	2.3	2.5	3.8	3.1	7.0	6.2	5.4	4.5
AC-FT	105	113	123	282	173	33520	108100	7230	67410	673	381	338

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1997#, BY WATER YEAR (WY)

	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	124	50.0	49.0	38.4	119	102	236	164	302	62.6	10.1	18.2					
MAX	1074	338	434	347	961	545	1817	940	1426	397	89.3	245					
(WY)	1995	1983	1992	1992	1992	1997	1997	1993	1993	1990	1981	1981					
MIN	1.61	1.90	2.01	1.93	1.98	2.05	2.07	2.09	1.82	1.31	1.06	1.56					
(WY)	1996	1997	1997	1996	1996	1996	1996	1996	1990	1996	1989	1989					

SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1981 - 1997#
ANNUAL TOTAL	718.73	110143.8	
ANNUAL MEAN	1.96	302	106
HIGHEST ANNUAL MEAN			302
LOWEST ANNUAL MEAN			1.98
HIGHEST DAILY MEAN	13 Aug 31	27500 Apr 4	27500 Apr 4 1997
LOWEST DAILY MEAN	.80 Aug 25	1.4 Nov 12	.00 May 6 1981
ANNUAL SEVEN-DAY MINIMUM	.84 Aug 21	1.4 Nov 11	.66 Mar 3 1994
INSTANTANEOUS PEAK FLOW		50100 Apr 4	50100 Apr 4 1997
INSTANTANEOUS PEAK STAGE		a32.05 Apr 4	32.05 Apr 4 1997
ANNUAL RUNOFF (AC-FT)	1430	218500	76550
10 PERCENT EXCEEDS	2.3	166	24
50 PERCENT EXCEEDS	1.9	4.9	5.0
90 PERCENT EXCEEDS	1.3	1.6	2.0

a From floodmark.

e Estimated.

# Period of regulated flow.

## GUADALUPE RIVER BASIN

08177700 OLMOS CREEK AT DRESDEN DRIVE, SAN ANTONIO, TX  
(Flood-hydrograph partial-record station)

**LOCATION.**--Lat 29°29'56", long 98°30'36", Bexar County, Hydrologic Unit 12100301, on right bank 30 ft downstream from low-water bridge on Dresden Drive at San Antonio, 0.15 mi west of intersection of Blanco Road and Dresden Drive, and 4.0 mi upstream from Olmos Dam.

**DRAINAGE AREA.**--21.2 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1968 to September 1981 (daily mean discharge), October 1982 to current year (peak discharges greater than base discharge).

Water-quality records.--Chemical, biochemical, and pesticide analyses: November 1968 to April 1995. Sediment analyses: October 1972 to September 1973. Water temperatures: November 1968 to April 1995. Bacteria analyses: April 1976 to April 1995.

**GAGE.**--Water-stage recorder. Datum of gage is 726.10 ft above sea level.

**REMARKS.**--Records poor. No known regulation or diversions.

**AVERAGE DISCHARGE.**--13 years (water years 1968-81), 4.34 ft<sup>3</sup>/s (2.78 in/yr), 3,140 acre-ft/yr.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 19,700 ft<sup>3</sup>/s Apr. 5, 1991 (gage height, 14.38 ft, from floodmark); maximum gage height, 14.82 ft (from floodmark) Sept. 13, 1978; no flow at times. Maximum stage since 1935, that of Sept. 13, 1978.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Floods in September and November 1947 reached a stage of 8.5 ft, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 700 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Dec. 15	0830	715	4.72	June 21	1300	2,720	6.78
Apr. 1	1800	722	4.73	June 22	0730	1,690	5.88
Apr. 26	0715	1,760	5.94	June 22	1210	5,130	8.39
May 15	1900	2,120	6.26	June 25	1800	2,140	6.28
May 20	0145	1,490	5.69	Sept. 23	1545	986	5.13
June 15	0500	2,120	6.26				

# GUADALUPE RIVER BASIN

209

08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX

**LOCATION.**--Lat 29°24'34", long 98°29'41", Bexar County, Hydrologic Unit 12100301, on left bank 193 ft downstream from South Alamo Street Bridge in San Antonio, 2.1 mi upstream from San Pedro Creek, and 230.6 mi upstream from mouth.

**DRAINAGE AREA.**--41.8 mi<sup>2</sup>. Flow of river comes from intermittent spring flow and from artesian wells; drainage area of streams not applicable.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--December 1895 to June 1906 (periodic discharge measurements only), January 1915 to November 1929, February 1939 to current year. Ground-water discharge into river is discussed by Petit and George, Texas Board of Water Engineers Bull. 5608, vol. 1 (1956, p. 45).

**REVISED RECORDS.**--WSP 1312: 1917. WSP 1923: Drainage area. WRD TX-72-1: 1971(m).

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 605.26 ft above sea level. Jan. 26, 1915, to Feb. 27, 1916, nonrecording gage at site 1.3 mi upstream at different datum. Feb. 28, 1916, to Apr. 7, 1920, nonrecording gage at site 1.1 mi upstream at different datum. Apr. 8, 1920, to Nov. 16, 1929, Feb. 15, 1939, to Apr. 25, 1967, water-stage recorder in vicinity of South Alamo Street Bridge at 7.00-foot higher datum. Apr. 25, 1967, to May 13, 1969, water-stage recorder at site 307 ft downstream at same datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. Since water year 1927, at least 10% of contributing drainage area has been regulated by Olmos flood-control reservoir (capacity, 14,240 acre-ft), about 8.5 mi upstream. Olmos Dam was completed in 1926 and rebuilt in 1980. Springs emerge intermittently from the Edwards and associated limestones along the Balcones Fault Zone upstream from station. No flow at times due to regulation.

**AVERAGE DISCHARGE PRIOR TO REGULATION.**--12 years (water years 1915-26) prior to regulation by Olmos Dam, 90.5 ft<sup>3</sup>/s (65,570 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1915-26).**--Maximum discharge 15,300 ft<sup>3</sup>/s Sept. 10, 1921 (gage height 20.14 ft), at former site and datum, from rating curve extended above 2,000 ft<sup>3</sup>/s on the basis of slope-area measurement of peak flow. Minimum discharge, 5.10 ft<sup>3</sup>/s, July 12, 1925.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of July 5, 1819, equaled or exceeded that of Sept. 10, 1921.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	7.4	6.3	.56	8.0	9.2	75	8.8	7.7	13	13	5.3
2	4.0	6.6	6.1	2.4	18	56	59	8.7	8.1	7.5	13	5.2
3	5.2	6.7	6.0	8.0	.56	.69	80	8.3	8.0	12	13	25
4	5.3	7.0	15	7.5	5.0	8.5	.71	8.3	9.5	11	13	27
5	2.2	7.3	14	7.0	6.7	12	6.8	8.0	8.5	11	12	3.8
6	1.7	7.7	6.3	7.0	6.8	9.0	8.8	8.9	18	11	11	6.0
7	7.7	12	6.0	7.9	12	8.7	10	8.4	9.3	11	11	5.7
8	6.1	7.9	4.7	15	8.6	9.2	9.1	8.3	9.7	11	19	6.2
9	5.2	8.5	4.2	13	7.3	8.8	9.1	23	23	10	7.9	59
10	4.8	8.1	5.5	7.9	25	9.3	8.8	7.2	12	9.5	7.1	41
11	.29	8.3	5.9	7.4	18	35	9.3	8.9	8.7	10	7.0	5.5
12	.68	8.2	6.0	7.2	38	24	8.2	46	8.2	11	6.9	5.4
13	6.4	8.4	5.9	7.1	5.5	16	8.3	.28	8.4	9.8	7.0	5.1
14	8.0	8.1	6.2	7.6	2.2	10	8.3	1.4	8.2	9.0	6.4	5.0
15	8.3	23	59	8.1	1.1	8.7	8.3	91	93	8.7	7.2	5.1
16	8.3	14	8.0	7.1	.07	20	8.3	.47	4.6	7.8	5.4	5.0
17	8.3	24	7.6	6.5	.20	8.3	8.2	2.7	11	4.6	5.4	5.0
18	7.9	11	7.0	6.3	3.8	17	8.2	6.0	8.7	19	5.1	4.9
19	9.1	6.7	6.9	6.8	8.3	16	8.5	6.1	8.5	4.0	5.1	5.0
20	11	7.4	7.1	8.5	17	9.9	8.3	96	8.3	2.1	5.4	4.8
21	12	7.1	7.2	36	16	9.2	8.2	.38	138	3.3	7.7	8.5
22	10	6.8	7.1	.97	8.5	8.7	7.9	64	95	4.2	5.6	e43
23	11	7.2	8.3	.87	8.1	8.8	7.9	.49	3.1	3.1	13	e35
24	10	178	6.9	2.2	14	8.7	7.9	2.8	39	5.9	8.5	e6.0
25	7.4	.40	7.6	9.3	12	8.8	8.6	3.7	37	6.4	5.7	e5.8
26	7.1	1.2	7.7	9.2	16	9.1	130	6.3	5.4	6.7	7.8	e5.6
27	8.7	6.8	8.3	8.4	18	28	.45	52	8.8	6.7	6.0	e5.3
28	8.2	34	7.5	11	10	7.4	.70	.52	5.6	6.7	5.6	e5.0
29	7.5	57	7.9	2.7	---	.45	7.1	8.3	5.3	6.9	5.2	e5.8
30	7.6	9.8	6.5	6.4	---	4.3	8.7	8.7	4.8	7.3	5.4	e5.6
31	8.1	---	56	10	---	26	---	7.2	---	12	5.1	---
TOTAL	215.37	506.60	324.7	245.90	294.73	415.74	538.66	511.14	623.4	262.2	256.5	360.6
MEAN	6.95	16.9	10.5	7.93	10.5	13.4	18.0	16.5	20.8	8.46	8.27	12.0
MAX	12	178	59	36	38	56	130	96	138	19	19	59
MIN	.29	.40	4.2	.56	.07	.45	.45	.28	3.1	2.1	5.1	3.8
AC-FT	427	1000	644	488	585	825	1070	1010	1240	520	509	715
CFSM	.17	.40	.25	.19	.25	.32	.43	.39	.50	.20	.20	.29
IN.	.19	.45	.29	.22	.26	.37	.48	.45	.55	.23	.23	.32

## GUADALUPE RIVER BASIN

08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1927 - 1997#, BY WATER YEAR (WY)

MEAN	51.3	49.2	50.4	50.8	53.6	49.4	51.9	70.1	60.3	39.0	33.2	48.5
MAX	244	198	195	209	252	272	251	358	350	206	215	278
(WY)	1974	1993	1977	1977	1992	1992	1977	1993	1992	1992	1992	1973
MIN	6.95	9.66	8.28	7.63	8.06	7.07	6.93	12.2	7.67	7.29	8.27	8.65
(WY)	1997	1956	1956	1956	1984	1956	1956	1967	1956	1984	1997	1955

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1927 - 1997#

ANNUAL TOTAL	4920.27		4555.54			
ANNUAL MEAN	13.4		12.5			
HIGHEST ANNUAL MEAN					50.8	
LOWEST ANNUAL MEAN					200	1992
HIGHEST DAILY MEAN	287	Sep 15	178	Nov 24	9.23	1956
LOWEST DAILY MEAN	.25	Jun 26	.07	Feb 16	2690	Sep 27 1946
ANNUAL SEVEN-DAY MINIMUM	3.8	Oct 6	3.0	Feb 13	.06	May 23 1971
INSTANTANEOUS PEAK FLOW			2760	May 15	3.0	Feb 13 1997
INSTANTANEOUS PEAK STAGE			12.09	May 15	6090	Sep 27 1973
ANNUAL RUNOFF (AC-FT)	9760		9040		15.11	Oct 8 1994
ANNUAL RUNOFF (CFSM)	.32		.30		36810	
ANNUAL RUNOFF (INCHES)	4.38		4.05		1.22	
10 PERCENT EXCEEDS	14		23		16.52	
50 PERCENT EXCEEDS	8.3		8.0		117	
90 PERCENT EXCEEDS	4.5		3.8		23	
					9.8	

e Estimated

# Period of regulated streamflow.

# GUADALUPE RIVER BASIN

211

08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: December 1991 to August 1992, January 1996 to August 1996, February to April 1997(discontinued). Bacteria analyses: December 1991 to August 1992, January 1996 to August 1996, February to April 1997(discontinued).

### WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
FEB 12...	1030	74	300	7.9	12.5	10.0	95	49	8.7	6100	15000
MAR 11...	1200	122	480	8.1	18.5	7.6	81	20	8.6	11000	42000
APR 03...	1030	13	243	<8.5	18.5	9.5	103	21	--	7900	12000

DATE	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)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS-SOLVED (AS SO4)	CHLO-RIDE, DIS-SOLVED (AS CL)
FEB 12...	110	13	32	6.1	12	0.5	19	2.4	92	20	15
MAR 11...	200	26	60	12	19	0.6	17	2.9	170	30	29
APR 03...	94	8	30	4.7	9.3	0.4	17	2.5	86	15	12

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
FEB 12...	166	156	220	0.920	0.290	1.5	0.31	0.21	0.50	0.60	0.060
MAR 11...	283	263	30	1.10	0.160	1.7	0.44	0.35	0.51	0.60	0.130
APR 03...	146	129	31	0.530	0.170	1.2	0.53	0.22	0.39	0.70	0.160

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
FEB 12...	0.060	19	<0.010	<1	2	3	<10	<1	9	28	63
MAR 11...	0.130	5.9	<0.010	6	<1	1	<10	<1	2	5	8
APR 03...	0.140	5.9	<0.010	4	--	2	<10	<1	3	7	17

DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	ENDO-SULFAN-I WATER WHOLE REC (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOR 1016 PCB TOTAL (UG/L)	AROCLOR 1221 PCB TOTAL (UG/L)	AROCLOR 1232 PCB TOTAL (UG/L)
FEB 12...	<0.10	5	<1	<1	150	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
MAR 11...	<0.10	2	<1	<1	40	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
APR 03...	<0.10	1	<1	<1	50	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100



GUADALUPE RIVER BASIN  
08178000 SAN ANTONIO RIVER AT SAN ANTONIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	ENDO- SULFAN TOTAL (UG/L)
FEB 12...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600
MAR 11...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600
APR 03...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600

DATE	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	P,P' DDD, TOTAL (UG/L)	P,P' DDE, TOTAL (UG/L)	P,P' DDT, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)
FEB 12...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
MAR 11...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
APR 03...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100

# GUADALUPE RIVER BASIN

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08178050 SAN ANTONIO RIVER AT MITCHELL ST., SAN ANTONIO, TX

**LOCATION.**--Lat 29°23'34", long 98°29'40", Bexar County, Hydrologic Unit 12100301, on left bank 15 ft upstream from Mitchell Street Bridge in San Antonio, 0.2 mi upstream from San Pedro Creek, and 228.7 mi upstream from mouth.

**DRAINAGE AREA.**--42.4 mi<sup>2</sup>. Flow of river comes from intermittent spring flow and from artesian wells; drainage area of streams not applicable.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1992 to current year. Ground-water discharge into river is discussed by Petit and George, Texas Board of Water Engineers Bull. 5608, vol. 1 (1956, p. 45).

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 585.07 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records fair. Since installation of gage in October 1992, at least 10% of contributing drainage area has been regulated by Olmos flood-control reservoir (capacity, 14,240 acre-ft), about 10.6 mi upstream. Olmos Dam was completed in 1926 and rebuilt in 1980. Springs emerge intermittently from the Edwards and associated limestones along the Balcones Fault Zone upstream from station. No flow at times due to regulation.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of July 5, 1819, equaled or exceeded that of Sept. 10, 1921.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	4.6	7.0	.85	7.2	7.6	243	6.9	6.8	46	5.7	4.2
2	3.2	4.9	7.1	.89	23	191	286	6.5	7.2	32	5.8	4.4
3	3.4	4.9	6.2	3.5	1.9	3.3	437	6.8	6.7	36	6.3	19
4	4.6	4.3	14	3.3	3.9	5.6	41	6.2	8.3	35	5.6	56
5	3.1	4.3	13	3.9	6.4	10	95	6.3	8.1	34	5.6	3.7
6	1.4	4.3	6.2	3.9	7.0	8.7	15	6.7	40	32	5.7	4.7
7	6.2	8.6	6.2	4.5	11	7.7	8.7	6.5	38	30	5.5	4.5
8	4.7	4.9	4.8	9.4	8.6	8.0	8.1	6.5	6.6	27	16	5.2
9	4.3	4.7	4.8	8.2	8.0	7.1	8.8	87	72	25	5.8	59
10	4.5	4.9	4.1	4.8	29	7.7	8.0	12	11	23	5.4	67
11	1.0	4.6	4.3	4.5	38	168	8.4	7.6	7.9	20	5.8	5.3
12	1.1	4.5	4.2	4.9	278	90	7.2	67	6.2	20	5.4	4.9
13	5.1	5.0	4.8	4.9	23	13	7.2	11	5.7	17	5.1	4.8
14	6.8	5.1	4.6	5.1	5.9	8.9	7.3	2.2	8.8	16	5.2	4.4
15	6.2	17	166	5.0	3.5	8.2	7.2	233	385	13	6.4	4.6
16	5.2	17	6.8	4.6	2.6	30	7.3	156	4.7	13	4.4	4.5
17	6.8	24	6.7	4.6	2.6	11	7.2	3.1	9.4	11	4.4	4.3
18	6.6	10	5.8	5.5	2.7	13	7.1	5.8	6.5	31	4.7	4.1
19	7.1	6.7	5.7	5.7	7.9	14	6.8	5.3	8.4	9.0	4.7	4.7
20	6.3	5.5	5.5	6.1	38	9.0	7.2	359	7.4	14	4.5	4.0
21	6.3	5.8	5.3	51	14	7.8	7.0	6.5	601	13	6.5	7.9
22	7.6	5.4	4.4	1.3	8.3	8.0	6.7	181	1010	16	4.7	113
23	7.4	5.9	4.7	.98	7.9	7.2	6.3	19	804	8.7	11	110
24	6.9	313	4.6	1.7	14	6.6	6.4	22	204	9.9	7.6	24
25	4.8	3.2	4.6	6.6	24	7.9	9.3	11	178	12	4.7	8.5
26	4.0	2.0	4.5	6.6	37	7.5	522	7.8	225	7.3	6.3	8.1
27	5.2	6.8	5.0	7.0	17	27	8.2	58	40	6.7	4.6	7.6
28	5.1	44	4.3	10	9.7	7.2	2.5	29	37	6.3	4.7	7.8
29	4.1	79	3.9	3.9	---	2.0	5.2	7.0	40	6.5	4.2	8.6
30	4.5	12	3.4	5.5	---	2.8	7.3	6.5	39	5.4	4.2	8.4
31	5.0	---	87	10	---	22	---	6.5	---	4.8	4.0	---
TOTAL	153.9	626.9	419.5	198.72	640.1	727.8	1804.4	1355.7	3832.7	580.6	180.5	577.2
MEAN	4.96	20.9	13.5	6.41	22.9	23.5	60.1	43.7	128	18.7	5.82	19.2
MAX	7.6	313	166	51	278	191	522	359	1010	46	16	113
MIN	1.0	2.0	3.4	.85	1.9	2.0	2.5	2.2	4.7	4.8	4.0	3.7
AC-FT	305	1240	832	394	1270	1440	3580	2690	7600	1150	358	1140

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 1997#, BY WATER YEAR (WY)

	1993	1994	1995	1996	1997
MEAN	79.9	68.6	70.1	61.8	66.8
MAX	157	203	209	185	209
(WY)	1993	1993	1993	1993	1993
MIN	4.96	17.0	13.5	6.41	19.0
(WY)	1997	1996	1997	1997	1996

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1993 - 1997#
ANNUAL TOTAL	5819.8	11098.02	
ANNUAL MEAN	15.9	30.4	66.4
HIGHEST ANNUAL MEAN			172
LOWEST ANNUAL MEAN			16.4
HIGHEST DAILY MEAN	356	1010	1900
LOWEST DAILY MEAN	1.0	.85	.85
ANNUAL SEVEN-DAY MINIMUM	3.3	3.0	3.0
INSTANTANEOUS PEAK FLOW		2640	5090
INSTANTANEOUS PEAK STAGE		5.33	7.98
ANNUAL RUNOFF (AC-FT)	11540	22010	48140
10 PERCENT EXCEEDS	17	42	173
50 PERCENT EXCEEDS	7.8	6.8	23
90 PERCENT EXCEEDS	3.9	4.1	5.6

# Period of regulated streamflow.

## GUADALUPE RIVER BASIN

08178050 SAN ANTONIO RIVER AT MITCHELL ST. AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: December 1991 to current year. Bacteria analyses: December 1991 to current year.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCHI, KF AGAR (COLS./100 ML)
FEB 12...	1140	462	421	8.0	16.5	9.5	99	10	4.5	2200	10000
MAR 11...	1125	134	221	7.3	19.0	8.2	89	69	12	76000	230000
APR 03...	0930	176	263	7.7	19.0	9.1	101	34	7.1	7400	19000
JUN 22...	1445	949	191	7.8	22.5	9.8	114	28	3.6	19000	30000
DATE	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)	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
FEB 12...	170	14	50	11	13	0.4	14	7.6	160	29	16
MAR 11...	100	16	32	4.8	11	0.5	18	2.8	84	16	15
APR 03...	100	11	36	3.6	8.7	0.4	15	4.1	93	23	9.1
JUN 22...	81	4	29	2.3	4.6	0.2	10	4.1	77	10	4.9
DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + DIS. (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
FEB 12...	246	226	88	0.800	0.070	1.1	0.23	--	<0.20	0.30	0.050
MAR 11...	146	150	590	0.720	0.040	2.1	1.4	0.49	0.53	1.4	0.640
APR 03...	166	147	62	0.710	0.060	1.5	0.74	0.35	0.41	0.80	0.180
JUN 22...	116	103	107	0.485	<0.015	2.7	2.2	--	0.46	2.2	0.636
DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
FEB 12...	0.050	14	<0.010	<1	<1	2	<10	<1	3	8	18
MAR 11...	0.080	25	<0.010	6	3	4	<10	<1	11	27	110
APR 03...	0.100	11	<0.010	6	1	2	<10	<1	3	10	15
JUN 22...	0.214	13	<0.010	<1	2	3	<10	<1	4	6	13
DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	ENDO-SULFAN-I WATER WHOLE REC (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOP 1016 PCB TOTAL (UG/L)	AROCLOP 1221 PCB TOTAL (UG/L)	AROCLOP 1232 PCB TOTAL (UG/L)
FEB 12...	<0.10	2	<1	<1	40	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
MAR 11...	<0.10	9	<1	<1	200	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
APR 03...	<0.10	2	<1	<1	40	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
JUN 22...	<0.10	3	<1	<1	50	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100

# GUADALUPE RIVER BASIN

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08178050 SAN ANTONIO RIVER AT MITCHELL ST. AT SAN ANTONIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)	ENDO- SULFAN SULFATE TOTAL (UG/L)
FEB 12...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600
MAR 11...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	0.140	<0.100	<0.090	<0.020	<0.600
APR 03...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600
JUN 22...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600

DATE	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	P,P' DDD, TOTAL (UG/L)	P,P' DDE, TOTAL (UG/L)	P,P' DDT, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)
FEB 12...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
MAR 11...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
APR 03...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
JUN 22...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100

## GUADALUPE RIVER BASIN

08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX

**LOCATION.**--Lat 29°19'19", long 98°27'00", Bexar County, Hydrologic Unit 12100301, on right bank between westbound bridges on Interstate Highway 410 in San Antonio, 4.5 mi upstream from Salado Creek, and 222.3 mi upstream from mouth.

**DRAINAGE AREA.**--125 mi<sup>2</sup>. Flow of river comes from intermittent springflow and from artesian wells; drainage area of streams not applicable.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1986 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 488.11 ft above sea level. Dec. 20, 1986, to Aug. 15, 1989, at site 0.2 mi downstream at Camino Coahuilteca crossing at same datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. Since installation of gage in water year 1987, at least 10% of contributing drainage area has been regulated by Olmos Reservoir. Satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	11	15	14	13	13	331	21	23	58	14	11
2	7.9	9.5	12	8.0	25	315	476	18	23	47	16	9.9
3	5.7	9.2	10	8.5	13	17	756	19	21	51	15	10
4	7.1	10	26	12	8.9	6.9	114	18	21	49	15	96
5	23	8.8	44	11	9.3	18	130	23	26	48	13	28
6	12	8.7	14	9.4	13	14	e45	17	78	47	14	14
7	6.9	18	11	10	37	8.7	e26	19	135	45	14	13
8	10	17	8.7	34	27	11	e19	18	54	42	33	12
9	8.2	11	7.0	27	18	12	e18	241	205	43	17	49
10	8.3	9.9	7.0	14	17	10	19	51	55	37	15	87
11	7.2	9.1	7.9	9.1	48	269	e20	21	23	35	15	18
12	3.3	8.6	8.3	8.3	e450	195	20	145	24	35	14	14
13	3.8	8.8	8.4	7.9	e30	28	18	70	22	32	13	14
14	10	12	8.4	7.8	e21	15	19	16	20	30	15	14
15	12	72	219	9.0	e17	10	17	320	468	27	15	13
16	9.7	52	26	9.1	e12	29	17	235	33	26	14	17
17	e11	61	14	8.6	e12	34	16	26	22	25	13	13
18	e11	35	12	9.5	e9.0	22	17	22	17	35	12	10
19	e12	18	9.8	10	e10	33	18	22	18	23	13	6.7
20	e13	12	9.5	11	e50	15	19	852	19	20	11	11
21	e14	11	9.5	39	22	10	18	54	1320	65	13	15
22	e13	9.1	9.4	7.9	14	9.5	18	224	1450	72	13	155
23	13	8.4	9.4	6.5	9.0	8.0	17	133	482	25	79	100
24	14	393	10	6.2	20	7.6	17	111	385	23	66	62
25	13	25	8.6	7.4	57	8.4	31	51	317	23	17	18
26	10	8.8	9.2	12	109	7.5	830	39	222	20	15	15
27	10	5.4	9.8	15	29	22	51	153	66	18	14	14
28	16	83	10	12	16	9.4	21	266	59	17	12	13
29	13	192	10	13	---	4.5	16	32	58	17	12	13
30	10	35	10	8.8	---	2.2	22	27	56	16	11	12
31	11	---	129	13	---	41	---	25	---	13	11	---
TOTAL	325.3	1172.3	702.9	379.0	1116.2	1205.7	3156	3289	5722	1064	564	877.6
MEAN	10.5	39.1	22.7	12.2	39.9	38.9	105	106	191	34.3	18.2	29.3
MAX	23	393	219	39	450	315	830	852	1450	72	79	155
MIN	3.3	5.4	7.0	6.2	8.9	2.2	16	16	17	13	11	6.7
AC-FT	645	2330	1390	752	2210	2390	6260	6520	11350	2110	1120	1740

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1997#, BY WATER YEAR (WY)

MEAN	101	91.8	152	113	148	132	130	262	208	150	69.7	94.4
MAX	232	294	479	263	483	420	345	937	622	692	263	262
(WY)	1987	1993	1992	1993	1992	1992	1992	1992	1987	1990	1992	1992
MIN	10.5	21.7	19.6	12.2	29.3	18.2	25.8	27.6	27.6	19.6	18.0	25.6
(WY)	1997	1992	1991	1997	1996	1996	1996	1989	1996	1994	1989	1989

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1987 - 1997#

ANNUAL TOTAL	10799.6	19574.0	
ANNUAL MEAN	29.5	53.6	
HIGHEST ANNUAL MEAN			138
LOWEST ANNUAL MEAN			353
HIGHEST DAILY MEAN	671	Sep 15	30.6
LOWEST DAILY MEAN	3.3	Jul 17	12100
ANNUAL SEVEN-DAY MINIMUM	4.8	Jul 16	2.2
INSTANTANEOUS PEAK FLOW			4.8
INSTANTANEOUS PEAK STAGE			5850
ANNUAL RUNOFF (AC-FT)	21420	38830	16.74
10 PERCENT EXCEEDS	38	98	Jun 21
50 PERCENT EXCEEDS	13	16	Oct 7
90 PERCENT EXCEEDS	5.8	8.6	14

e Estimated.

# Period of regulated streamflow.

a From floodmark.

c From rating curve extended above 8,400 ft<sup>3</sup>/s.



# GUADALUPE RIVER BASIN

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08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX--Continued

## WATER QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: March 1987 to current year. Pesticide analyses: December 1992 to current year.

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: December 1986 to August 1988, March 1993 to current year.

pH: December 1986 to August 1988, March 1993 to current year.

WATER TEMPERATURE: December 1986 to August 1988, March 1993 to current year.

DISSOLVED OXYGEN: December 1986 to August 1988, March 1993 to current year.

**INSTRUMENTATION.**--From December 1986 to August 1988 and from March 1993 to current year, a four-parameter water-quality monitor continuously records specific conductance, pH, water temperature, and dissolved oxygen.

**REMARKS.**--Interruptions in the record were due to malfunctions of the instruments or probe fouling. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,870 microsiemens Aug. 20, 1996; minimum, 107 microsiemens June 29, 1995

pH: Maximum, 9.2 units, May 27, 1996; minimum, 7.0 units June 30, July 1, 1995.

WATER TEMPERATURE: Maximum, 36.5°C Aug. 12, 1996; minimum, 2.0°C, Jan.14, 1997.

DISSOLVED OXYGEN: Maximum, 20.1 mg/L Feb. 3, 1996; minimum, 0.5 mg/L May 21, July 21, 1988.

### EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 1,490 microsiemens Feb. 7; minimum, 140 microsiemens May 20.

pH: Maximum, 8.9 units July 29; minimum, 7.3 units on several days.

WATER TEMPERATURE: Maximum, 35.5°C Aug. 6, 21; minimum, 2.0°C Jan. 14.

DISSOLVED OXYGEN: Maximum, 20.0 mg/L Feb. 10; minimum, 1.2 mg/L Aug. 26.

### WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIOCHEMICAL, 5 DAY (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARBONATE (MG/L AS CaCO3)	CALCIUM DISSOLVED (MG/L AS Ca)	MAGNESIUM, DISSOLVED (MG/L AS Mg)	SODIUM, DISSOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	SODIUM PERCENT	POTASSIUM, DISSOLVED (MG/L AS K)
NOV 24-24	0533	284	100	11	100	21	33	5.4	13	0.6	20	4.0
MAR 11-11	1158	390	52	9.0	130	28	42	6.4	23	0.9	27	3.7
APR 01-02	1630	309	73	--	120	16	38	5.2	13	0.5	19	3.4
APR 26-26	0545	264	90	25	94	13	30	4.6	12	0.5	21	3.4
DATE	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)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)
NOV 24-24	84	24	17	168	166	570	0.630	0.160	3.4	2.6	0.35	0.51
MAR 11-11	100	41	30	232	216	210	0.640	<0.015	1.9	1.3	--	0.80
APR 01-02	100	24	17	182	173	350	0.530	0.080	2.7	2.1	0.31	0.39
APR 26-26	81	20	15	151	154	560	0.595	0.145	3.5	2.7	0.33	0.47
DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM, UNFLTRD TOTAL (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)
NOV 24-24	2.8	0.910	0.100	28	<0.010	<1	<1	5	<10	<1	<1	24
MAR 11-11	1.3	0.310	0.060	16	<0.010	2	2	3	<10	<1	6	10
APR 01-02	2.2	0.640	0.110	25	<0.010	<1	<1	4	<10	<1	11	17
APR 26-26	2.9	0.855	0.074	30	<0.010	<1	<1	5	<10	<1	14	20

## GUADALUPE RIVER BASIN

08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX--Continued

DATE	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	ENDO- SULFAN- I WATER WHOLE REC (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOR 1016 PCB TOTAL (UG/L)	AROCLOR 1221 PCB TOTAL (UG/L)
NOV 24-24	74	<0.10	9	<1	<1	270	<0.040	<0.100	<0.030	<0.100	<1.00
MAR 11-11	25	<0.10	4	<1	<1	110	<0.040	<0.100	<0.030	<0.100	<1.00
APR 01-02	61	<0.10	6	<1	<1	190	<0.040	<0.100	<0.030	<0.100	<1.00
APR 26-26	76	<0.10	9	<1	<1	200	<0.040	<0.100	<0.030	<0.100	<1.00

DATE	AROCLOR 1232 PCB TOTAL (UG/L)	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)
NOV 24-24	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020
MAR 11-11	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020
APR 01-02	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	E0.080	<0.100	<0.090	0.026
APR 26-26	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	0.110	<0.100	<0.090	<0.020

DATE	ENDO- SULFAN SULFATE TOTAL (UG/L)	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	P, P' DDD, TOTAL (UG/L)	P, P' DDE, TOTAL (UG/L)	P, P' DDT, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)
NOV 24-24	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
MAR 11-11	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
APR 01-02	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
APR 26-26	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	E0.030	<0.100	<2.00	<0.100

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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.	1996	325.3	599	335	294	43	37.8	50	43.6	230
NOV.	1996	1172.3	405	231	731	26	81.8	35	111	170
DEC.	1996	702.9	487	276	524	32	61.2	42	78.8	200
JAN.	1997	379	664	368	377	50	51.6	54	55.2	250
FEB.	1997	1116.2	476	269	812	32	96.1	40	122	190
MAR.	1997	1205.7	427	243	793	27	88.9	37	120	170
APR.	1997	3156	351	202	1720	21	183	31	261	150
MAY	1997	3289	337	194	1730	20	178	30	264	140
JUNE	1997	5722	336	194	3000	20	305	30	459	140
JULY	1997	1064	531	300	861	36	104	45	129	210
AUG.	1997	564	546	308	468	38	57.7	46	69.9	210
SEPT	1997	877.6	472	268	635	31	73.7	40	95.6	190
TOTAL		19574	**	**	11940	**	1320	**	1810	**
WTD. AVG.		54	395	226	**	25	**	34	**	160

GUADALUPE RIVER BASIN

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08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	498	459	468	617	605	612	364	343	354	465	394	431
2	529	498	513	621	608	615	386	363	374	475	465	470
3	558	529	547	624	613	619	429	385	404	519	474	503
4	588	556	581	634	619	627	486	427	445	602	516	533
5	653	566	601	641	623	633	616	402	472	653	584	613
6	662	623	646	649	629	639	415	403	408	663	635	650
7	629	604	618	714	640	674	431	403	413	779	659	715
8	611	543	574	703	660	677	445	426	436	904	576	776
9	557	534	547	662	633	647	492	445	467	904	601	709
10	586	545	564	649	634	642	525	491	501	601	554	568
11	612	586	600	642	624	635	553	505	530	592	560	570
12	627	604	617	654	635	642	591	528	560	627	581	595
13	623	600	616	662	645	655	600	538	579	650	627	634
14	620	604	612	669	649	659	601	555	582	676	650	660
15	634	607	618	842	426	635	747	263	481	680	614	656
16	---	---	615	474	342	405	477	447	465	682	617	651
17	---	---	615	580	474	520	483	476	480	662	634	651
18	---	---	610	490	388	414	491	475	481	664	628	652
19	---	---	605	476	418	456	518	491	506	671	649	662
20	---	---	600	495	467	482	545	509	533	703	656	683
21	---	---	595	531	486	500	547	537	543	781	654	711
22	595	591	593	551	531	539	552	529	543	771	720	742
23	594	581	589	548	527	538	567	533	550	752	736	746
24	601	586	593	577	200	319	568	540	555	789	680	737
25	622	601	613	311	251	291	588	553	573	746	638	692
26	629	610	620	341	308	323	607	559	583	731	659	694
27	620	589	609	360	341	354	629	578	611	748	698	729
28	625	599	615	569	274	386	652	599	628	748	683	722
29	629	606	618	301	259	281	640	562	611	717	662	697
30	625	608	617	344	301	330	628	570	603	720	646	689
31	622	597	611	---	---	---	1170	274	474	687	600	650
MONTH	662	459	595	842	200	525	1170	263	508	904	394	651

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	653	585	626	505	417	465	615	226	388	595	523	572
2	659	576	627	595	215	336	319	153	265	611	569	593
3	626	559	595	396	353	377	233	144	207	599	564	580
4	692	620	647	432	396	413	340	219	284	579	562	572
5	690	646	668	531	428	444	354	234	272	591	572	581
6	682	665	670	621	531	582	401	303	341	584	568	577
7	1490	676	827	585	556	573	458	400	425	588	572	579
8	753	686	706	575	553	565	474	458	466	615	588	603
9	696	634	667	578	542	566	511	462	488	918	252	454
10	652	597	634	590	547	574	557	511	534	351	281	316
11	670	623	647	955	235	455	591	557	574	395	351	374
12	1150	271	444	355	258	310	623	591	611	512	238	398
13	318	267	290	418	355	384	632	599	618	345	280	302
14	353	318	339	464	418	445	633	584	614	408	345	380
15	427	351	391	500	463	483	634	574	609	429	215	390
16	477	427	447	569	500	531	632	576	607	304	215	270
17	502	454	481	655	542	572	633	596	617	353	304	340
18	502	452	478	548	506	527	648	623	636	398	353	371
19	---	---	460	558	495	525	668	648	658	476	398	436
20	---	---	320	561	534	546	696	659	675	476	140	239
21	523	312	337	534	516	527	666	611	652	378	305	339
22	458	341	377	544	515	533	663	620	644	554	211	337
23	467	446	458	562	522	544	639	614	627	375	219	286
24	547	456	485	577	528	555	660	619	651	423	300	344
25	638	478	591	603	559	587	1260	649	745	387	318	352
26	478	305	375	601	569	589	968	222	423	475	387	435
27	355	315	331	643	590	607	369	284	330	633	215	480
28	417	355	385	644	603	626	445	367	415	317	212	267
29	---	---	---	615	565	596	469	438	451	358	317	340
30	---	---	---	593	566	579	523	461	494	453	358	412
31	---	---	---	905	580	613	---	---	---	509	440	470
MONTH	1490	267	511	955	215	517	1260	144	511	918	140	419

## GUADALUPE RIVER BASIN

08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	565	509	537	569	510	532	568	506	536	581	542	565
2	597	565	576	557	491	519	563	531	548	581	538	562
3	604	572	591	563	525	546	594	551	572	577	540	561
4	591	553	574	570	519	542	601	556	579	592	528	550
5	579	550	563	576	517	548	613	560	589	590	503	538
6	811	364	585	577	509	549	608	542	581	513	461	481
7	376	282	351	567	502	540	616	572	596	469	436	454
8	518	376	414	566	510	541	---	---	470	499	460	484
9	567	264	371	---	---	540	632	609	622	626	409	494
10	440	281	343	---	---	545	645	606	628	443	389	421
11	410	372	402	---	---	545	647	596	622	419	402	410
12	445	403	433	---	---	550	624	573	596	431	414	424
13	488	440	470	---	---	550	607	552	579	464	430	444
14	513	483	495	---	---	550	583	552	567	599	464	528
15	522	242	333	---	---	550	585	554	569	594	563	579
16	315	248	287	---	---	555	585	560	575	581	501	544
17	386	315	349	557	526	555	598	557	579	567	530	550
18	426	386	417	601	541	555	591	556	575	600	555	571
19	475	422	453	567	544	557	589	564	577	671	581	617
20	502	472	489	563	548	556	595	562	581	605	556	590
21	795	201	331	610	464	559	594	557	578	744	576	635
22	---	---	277	464	358	405	589	554	573	590	290	506
23	---	---	300	515	462	502	907	326	558	408	288	368
24	---	---	325	520	497	512	465	333	438	333	298	321
25	---	---	350	525	495	515	492	465	481	402	333	368
26	---	---	375	533	505	522	527	490	513	446	402	429
27	---	---	395	543	496	523	541	520	532	474	445	462
28	449	416	430	543	487	519	550	514	536	494	473	483
29	523	449	496	535	481	511	555	517	539	503	479	495
30	549	523	541	536	464	507	558	519	543	502	452	477
31	---	---	---	540	475	512	572	539	557	---	---	---
MONTH	811	201	428	610	358	533	907	326	561	744	288	497
YEAR	1490	140	522									

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	8.3	7.8	8.0	7.9	7.5	7.7	7.9	7.6	7.7	7.9	7.4	7.5
2	8.3	7.8	8.0	7.9	7.6	7.7	8.0	7.6	7.8	7.9	7.4	7.6
3	8.1	7.7	7.9	8.0	7.6	7.8	8.1	7.6	7.8	8.0	7.4	7.6
4	8.1	7.7	7.9	8.0	7.6	7.8	7.9	7.7	7.8	8.2	7.4	7.6
5	8.2	7.8	8.0	8.0	7.6	7.8	7.8	7.5	7.6	8.3	7.4	7.8
6	8.1	7.7	7.9	8.0	7.6	7.8	7.9	7.5	7.6	8.0	7.6	7.8
7	8.0	7.6	7.8	7.9	7.6	7.8	8.2	7.6	7.8	8.2	7.7	7.9
8	8.2	7.6	7.8	8.0	7.7	7.8	8.2	7.6	7.8	8.0	7.8	7.9
9	8.1	7.6	7.8	8.0	7.6	7.8	8.3	7.6	8.0	8.2	7.7	8.0
10	8.1	7.6	7.8	8.0	7.6	7.8	8.3	7.5	7.9	8.3	7.6	7.9
11	8.1	7.7	7.9	8.0	7.5	7.8	8.4	7.6	7.9	8.4	7.7	8.0
12	8.1	7.6	7.9	8.0	7.5	7.8	8.4	7.6	7.9	8.3	7.8	8.1
13	8.1	7.6	7.9	8.0	7.5	7.7	8.6	7.8	8.1	8.4	8.0	8.2
14	8.1	7.7	7.9	8.0	7.6	7.8	8.6	7.8	8.1	8.4	8.0	8.2
15	8.3	7.7	7.9	8.0	7.4	7.8	8.0	7.6	7.7	8.4	7.9	8.2
16	8.3	7.7	8.0	7.6	7.4	7.5	8.0	7.6	7.8	8.5	7.8	8.1
17	---	---	---	7.8	7.4	7.6	8.1	7.6	7.8	8.4	7.8	8.1
18	---	---	---	7.7	7.4	7.5	8.1	7.8	7.9	8.4	7.8	8.1
19	---	---	---	7.8	7.4	7.6	8.1	7.8	7.9	8.4	7.8	8.0
20	---	---	---	8.0	7.4	7.6	8.1	7.8	7.9	8.5	7.8	8.1
21	---	---	---	8.1	7.5	7.7	8.2	7.8	8.0	8.2	7.8	8.0
22	8.0	7.7	7.9	7.9	7.6	7.7	8.3	7.7	8.0	8.3	7.7	7.9
23	7.9	7.6	7.7	8.1	7.6	7.8	8.3	7.6	7.9	8.2	7.6	7.8
24	7.9	7.6	7.7	7.8	7.5	7.6	8.5	7.7	8.1	8.4	7.6	8.0
25	7.9	7.6	7.7	7.7	7.5	7.6	8.5	7.7	8.1	8.3	7.6	7.9
26	7.9	7.5	7.7	7.8	7.5	7.6	8.6	7.7	8.1	8.3	7.6	7.9
27	7.9	7.5	7.7	7.8	7.6	7.7	8.6	7.7	8.1	8.2	7.6	7.9
28	7.9	7.5	7.7	7.9	7.6	7.7	8.5	7.6	8.0	8.4	7.7	8.0
29	7.9	7.6	7.7	7.7	7.7	7.7	8.5	7.6	8.0	8.4	7.8	8.1
30	7.9	7.5	7.7	7.9	7.6	7.7	8.5	7.6	8.0	8.3	7.8	8.0
31	7.9	7.5	7.7	---	---	---	8.0	7.4	7.6	8.4	7.7	8.0
MONTH	8.3	7.5	7.8	8.1	7.4	7.7	8.6	7.4	7.9	8.5	7.4	7.9

LE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible]



## GUADALUPE RIVER BASIN

08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	27.0	19.0	23.0	25.5	19.0	23.5	16.0	11.5	13.5	20.0	17.0	18.5
2	28.5	21.0	24.5	21.5	16.5	19.0	15.5	10.5	13.0	19.0	16.5	17.5
3	25.5	23.5	24.5	20.5	15.0	17.5	15.0	12.5	13.5	21.0	18.0	19.0
4	23.5	22.0	22.5	20.5	16.5	18.5	13.5	13.0	13.0	22.0	18.0	19.5
5	22.5	21.5	22.0	23.0	17.5	20.5	17.0	13.5	15.0	19.5	15.5	17.5
6	27.5	21.0	23.5	25.5	21.0	23.0	18.5	14.0	16.0	15.5	10.5	13.0
7	28.0	21.0	24.5	24.0	19.0	22.0	18.5	13.5	15.5	10.5	8.0	9.0
8	27.5	21.5	24.0	21.0	16.5	18.5	17.5	12.5	15.0	9.0	7.0	8.5
9	27.5	20.0	24.0	20.0	14.0	17.0	18.0	12.0	15.0	11.0	6.5	8.5
10	27.5	20.5	24.0	21.0	14.0	17.5	20.0	14.5	17.0	12.5	6.5	9.5
11	27.5	21.5	24.5	22.0	15.5	18.5	20.5	16.5	18.0	9.0	6.0	7.0
12	28.0	20.5	24.0	21.5	17.5	19.5	20.5	15.0	17.5	6.0	3.5	4.5
13	28.0	21.0	24.0	22.5	18.5	20.0	20.5	15.0	17.5	3.5	2.5	3.0
14	26.5	22.0	24.0	23.0	18.5	20.5	20.5	17.5	19.0	4.0	2.0	3.0
15	27.5	22.5	22.5	22.0	19.5	20.5	19.5	14.0	16.5	10.5	3.5	6.5
16	28.0	23.5	25.5	23.0	21.0	22.0	15.0	12.0	13.5	10.5	4.5	7.5
17	---	---	---	23.0	20.5	21.5	12.0	8.0	10.5	8.0	5.0	7.0
18	---	---	---	21.0	19.0	20.0	9.5	6.0	7.5	9.5	7.0	8.0
19	---	---	---	20.5	18.0	19.0	9.0	4.0	6.5	9.5	8.0	8.5
20	---	---	---	24.0	18.5	21.0	7.5	5.5	6.5	11.0	9.0	10.0
21	---	---	---	22.5	18.0	20.5	11.5	7.5	9.5	14.5	10.5	12.5
22	21.5	18.0	19.5	20.0	18.0	18.5	15.5	10.5	13.0	17.5	11.5	14.0
23	21.0	14.5	18.0	22.0	18.0	20.0	18.0	14.5	16.0	16.5	14.5	15.5
24	20.0	17.0	18.5	20.5	13.5	17.0	16.0	11.0	13.0	18.5	12.5	15.0
25	23.5	19.0	21.0	15.0	11.5	13.0	12.0	9.0	10.5	18.0	12.0	15.0
26	25.0	20.5	22.5	15.0	9.5	12.0	14.0	11.0	12.0	18.5	14.5	16.0
27	27.0	23.5	25.0	12.0	10.0	11.0	15.0	12.0	13.0	19.0	14.0	17.5
28	27.0	24.0	25.0	11.5	10.5	11.0	15.0	12.5	13.5	14.0	9.5	11.0
29	26.5	23.0	24.5	14.5	11.5	13.0	17.5	12.0	14.5	13.5	7.5	10.5
30	27.0	23.0	24.5	16.5	13.5	15.0	17.5	14.0	15.5	14.0	7.0	10.5
31	27.0	23.5	25.0	---	---	---	18.0	16.0	17.0	13.0	8.5	11.0
MONTH	28.5	14.5	23.0	25.5	9.5	18.5	20.5	4.0	14.0	22.0	2.0	11.5

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	15.5	10.0	12.5	24.0	16.5	19.5	18.0	17.0	17.5	28.0	23.5	25.5
2	19.5	13.0	15.5	21.0	15.0	17.0	19.0	18.0	18.5	30.0	24.0	26.5
3	22.0	16.5	18.5	21.5	14.5	17.5	19.5	18.0	18.5	28.5	22.0	25.0
4	20.0	15.5	17.5	20.0	16.5	18.0	22.5	19.5	20.5	27.5	21.0	24.0
5	16.0	13.0	13.5	19.5	16.5	19.0	21.5	17.5	20.0	27.5	21.5	24.0
6	13.0	11.5	12.5	20.0	14.0	17.0	24.0	18.5	21.0	26.0	23.0	24.0
7	14.5	11.5	12.0	18.5	16.0	17.0	23.0	18.5	21.0	25.5	23.0	24.0
8	11.5	10.0	11.0	19.0	17.5	18.5	21.5	20.0	21.0	28.0	22.5	25.0
9	14.0	9.5	11.5	23.0	18.5	20.5	22.5	19.5	20.5	25.0	19.5	22.5
10	14.5	11.0	12.5	22.5	20.0	21.0	21.5	19.5	20.0	24.0	18.5	21.0
11	12.5	11.0	12.0	20.5	18.0	19.0	24.0	19.5	21.5	26.0	19.5	22.5
12	14.0	11.5	12.5	20.5	18.0	19.0	21.5	16.0	18.5	28.0	21.5	24.0
13	11.5	10.0	11.0	24.5	18.5	21.5	18.5	15.0	17.0	26.5	21.0	23.5
14	11.5	9.5	10.5	22.0	16.5	19.5	22.0	15.0	18.0	30.5	23.0	26.0
15	15.0	8.0	11.5	16.5	15.0	15.5	23.0	15.5	19.0	31.0	23.0	26.5
16	16.5	9.0	13.0	15.0	14.5	14.5	24.5	17.5	20.5	25.5	22.0	23.5
17	17.0	10.5	13.5	17.5	14.5	16.0	23.5	19.0	21.0	29.0	22.5	25.0
18	18.0	12.0	15.0	19.5	17.0	18.5	22.0	19.5	20.5	30.5	24.0	27.0
19	18.5	16.5	17.5	21.5	16.5	18.5	24.5	19.5	21.5	29.5	25.0	27.0
20	19.5	17.0	18.5	23.5	15.5	19.5	28.0	19.5	23.5	27.5	22.0	24.5
21	20.5	15.5	17.5	25.0	16.5	20.5	29.5	22.5	25.5	27.0	24.5	25.5
22	17.0	13.5	15.5	25.5	18.0	21.5	28.0	23.5	25.5	25.0	23.5	24.0
23	15.5	13.5	14.5	27.0	20.0	23.0	28.0	21.5	24.5	25.0	23.0	24.0
24	14.0	13.0	13.5	27.0	21.0	23.5	26.0	21.5	24.0	27.0	24.0	25.5
25	13.0	11.5	12.0	23.0	19.0	22.0	25.5	21.5	22.5	31.0	25.5	28.0
26	15.0	11.5	13.0	23.5	17.0	20.0	22.0	16.0	18.0	31.5	27.5	29.0
27	16.0	13.0	14.5	20.5	19.0	19.5	16.5	15.5	16.0	32.0	23.5	29.0
28	18.0	14.0	15.5	26.5	19.0	22.5	23.0	14.5	18.5	27.5	23.0	25.0
29	---	---	---	26.5	20.0	23.0	26.5	17.0	21.5	26.5	24.5	27.0
30	---	---	---	23.5	18.0	21.0	28.5	21.0	24.5	31.5	26.5	28.5
31	---	---	---	18.5	16.5	18.0	---	---	---	30.0	27.0	28.0
MONTH	22.0	8.0	14.0	27.0	14.0	19.5	29.5	14.5	20.5	32.0	18.5	25.5

# GUADALUPE RIVER BASIN

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08178565 SAN ANTONIO RIVER AT LOOP 410 AT SAN ANTONIO, TX--Continued

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	31.5	24.5	27.5	31.5	28.0	29.5	34.0	29.0	31.0	33.0	27.5	30.0
2	31.5	25.0	28.5	31.5	28.0	29.5	34.0	29.0	31.5	33.0	27.0	30.0
3	32.5	25.5	29.0	31.5	28.0	29.5	34.0	29.5	31.5	32.0	28.0	30.0
4	32.5	26.5	29.5	32.5	28.5	30.0	34.0	29.0	31.5	30.5	27.0	28.5
5	32.0	28.5	30.0	32.5	28.5	30.0	34.5	29.0	31.5	31.5	27.5	29.0
6	31.5	26.5	29.0	32.5	28.0	30.0	35.5	28.5	31.5	32.5	26.5	29.0
7	27.5	25.0	26.0	32.5	28.5	30.0	35.0	29.0	31.5	32.5	26.5	29.5
8	29.0	26.0	27.5	31.5	28.0	29.5	30.5	28.0	29.0	33.5	28.0	30.5
9	28.5	24.5	27.0	31.5	28.0	29.5	32.5	27.5	29.5	34.5	28.0	30.5
10	29.5	27.0	28.0	32.0	28.0	29.5	33.0	28.0	29.5	31.5	27.5	29.5
11	32.5	26.0	29.0	32.5	27.5	29.5	33.5	27.5	30.0	30.0	27.0	28.5
12	33.5	28.0	30.5	32.5	28.0	30.0	33.5	28.0	30.5	32.5	26.5	28.5
13	32.5	28.0	29.5	33.0	28.5	30.5	35.0	28.0	31.0	32.5	27.0	29.0
14	32.0	28.0	30.0	34.0	29.0	31.0	34.0	28.0	30.5	32.5	27.0	29.5
15	30.0	25.5	27.5	34.0	29.0	31.5	33.0	27.5	30.0	33.5	27.0	30.0
16	31.0	26.5	28.5	34.0	29.0	31.5	33.5	28.0	30.0	32.5	27.5	30.0
17	32.0	28.0	29.5	34.0	29.0	31.5	34.5	28.0	30.5	33.5	27.5	30.0
18	33.5	27.5	30.5	33.0	29.0	31.0	34.0	28.5	30.5	32.5	27.5	29.5
19	34.0	28.5	31.0	33.0	28.5	30.5	33.0	28.0	30.0	32.0	26.5	28.5
20	32.5	28.5	30.5	33.5	28.5	30.5	35.0	28.0	31.0	31.0	26.5	28.5
21	30.0	23.0	25.0	32.5	29.0	30.5	35.5	28.5	31.5	29.0	26.5	27.5
22	24.5	22.5	23.0	32.0	27.5	29.5	34.5	28.5	31.5	28.5	26.5	27.0
23	25.0	22.5	24.0	34.0	28.5	30.5	33.5	29.0	31.0	29.0	27.0	27.5
24	27.5	24.5	25.5	34.0	29.0	31.0	32.0	28.5	30.0	28.5	25.0	26.5
25	29.5	25.0	26.0	34.0	28.5	31.0	32.0	27.0	29.5	27.5	23.5	25.0
26	29.5	25.0	27.0	34.5	28.5	31.0	33.0	26.5	29.5	29.0	22.5	25.5
27	30.0	27.5	28.5	34.0	29.0	31.0	33.0	26.5	29.5	29.5	23.0	26.0
28	30.0	27.5	29.0	34.5	28.5	31.5	33.0	27.5	30.0	30.0	23.0	26.5
29	30.5	27.5	29.0	35.0	29.0	32.0	33.5	28.0	30.0	30.5	24.0	27.0
30	31.0	27.5	29.0	35.0	29.5	32.0	33.5	27.0	30.0	31.0	24.5	27.5
31	---	---	---	34.0	29.0	31.0	33.0	27.5	30.0	---	---	---
MONTH	34.0	22.5	28.0	35.0	27.5	30.5	35.5	26.5	30.5	34.5	22.5	28.5
YEAR	35.5	2.0	22.0									

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	13.1	6.6	9.4	8.7	4.3	6.2	10.6	8.1	9.1	8.2	4.4	5.9
2	12.5	6.0	8.8	10.2	6.1	7.7	10.7	8.3	9.3	8.6	4.2	6.2
3	11.0	5.3	7.8	10.1	6.0	8.0	11.2	7.7	9.3	9.7	4.4	6.2
4	10.2	5.7	7.6	10.0	6.6	7.9	10.1	8.0	9.0	10.0	4.2	6.2
5	9.2	6.2	7.6	10.3	6.4	7.7	9.5	6.4	8.0	12.4	4.2	7.6
6	11.6	5.7	8.1	9.6	5.7	7.0	9.4	6.5	7.6	10.3	5.9	7.7
7	11.9	4.6	7.4	9.4	5.6	7.0	11.1	6.9	8.5	11.7	7.4	9.3
8	11.5	4.2	7.1	10.8	6.4	8.3	12.8	7.0	9.1	10.3	8.1	9.3
9	11.9	4.2	7.3	11.6	6.6	8.9	14.0	7.0	9.8	12.2	7.9	9.8
10	11.1	4.0	6.8	11.6	6.9	9.0	15.1	5.9	9.9	11.7	7.3	9.2
11	11.4	4.1	7.0	11.4	6.3	8.7	15.5	6.0	9.4	12.4	7.7	10.1
12	11.0	3.7	6.7	11.0	6.0	8.4	17.1	6.3	10.1	12.9	8.9	10.9
13	11.2	4.2	7.2	11.2	5.3	8.2	17.6	6.1	10.2	14.3	10.0	12.0
14	10.5	4.2	7.0	11.1	6.4	8.4	13.7	4.6	8.4	15.0	10.2	12.6
15	10.8	4.9	7.1	10.2	6.4	8.1	9.0	4.8	7.4	19.0	9.7	14.7
16	---	---	---	7.6	5.8	6.9	9.7	7.5	8.4	19.6	13.1	16.5
17	---	---	---	9.3	5.2	7.3	11.5	7.8	9.5	18.9	12.7	15.8
18	---	---	---	9.3	6.5	7.7	12.8	10.0	11.2	19.2	13.4	16.1
19	---	---	---	9.7	6.5	7.7	12.7	9.6	11.2	16.0	12.9	14.6
20	---	---	---	10.6	5.8	7.7	12.4	9.4	10.8	16.7	11.3	13.7
21	---	---	---	11.5	5.8	8.2	12.8	9.2	10.8	13.7	11.1	12.4
22	10.5	7.2	9.3	10.2	6.0	7.7	13.3	8.1	10.2	17.6	9.3	13.2
23	9.7	6.7	8.0	11.0	5.6	7.8	13.1	6.3	9.2	15.6	8.4	11.9
24	8.4	5.9	7.0	9.3	6.0	8.3	16.0	7.1	10.8	18.1	9.2	14.4
25	9.4	5.2	6.9	9.5	8.4	8.9	16.1	7.9	11.1	18.4	9.2	14.2
26	8.9	5.4	6.5	9.8	8.3	9.2	16.9	7.0	11.1	17.8	7.6	12.6
27	7.8	4.5	5.7	10.6	8.3	9.4	17.4	6.9	11.2	16.9	6.8	10.8
28	7.9	4.3	5.6	11.1	8.8	10.0	15.7	6.7	10.2	19.7	9.1	13.9
29	7.9	3.8	5.7	10.6	8.9	9.9	17.4	6.5	10.9	19.8	10.0	14.9
30	8.4	4.2	5.8	9.4	8.0	8.7	14.9	6.0	9.8	19.7	10.1	15.2
31	8.6	4.2	5.9	---	---	---	8.6	5.3	6.6	19.3	10.3	14.3
MONTH	13.1	3.7	7.2	11.6	4.3	8.2	17.6	4.6	9.6	19.8	4.2	11.7



## 08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX

**LOCATION.**--Lat 29°30'57", long 98°25'51", Bexar County, Hydrologic Unit 12100301, on right bank at downstream side of eastbound bridge on Interstate Highway 410 in San Antonio, 1.0 mi west of Northeast School, 1.1 mi upstream from Perrin-Beitel Creek, and 2.7 mi east of San Antonio International Airport.

**DRAINAGE AREA.**--137 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--September 1960 to current year.

**GAGE.**--Water-stage recorder with concrete control. Datum of gage is 684.60 ft above sea level.

**REMARKS.**--Records fair. Some diversions for irrigation upstream from gage. Since water year 1973, at least 10% of contributing drainage area has been affected at times by discharge from the flood-detention pools of eleven floodwater-retarding structures with a combined detention capacity of 26,770 acre-ft. These structures control runoff from 74.6 mi<sup>2</sup> above this station. Recording rain gage at station with two additional recording rain gages in the watershed. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--12 years (water years 1961-72), 7.21 ft<sup>3</sup>/s (5,220 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1961-72).**--Maximum discharge, 24,900 ft<sup>3</sup>/s May 12, 1972 (gage height, 15.22 ft), from rating curve extended above 8,000 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 1853, 23 to 24 ft in October 1913. Flood in September 1921 reached a stage of 18 ft, and flood of Sept. 27, 1946, reached a stage of 18.2 ft, and are the second and third highest since 1899.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.09	.00	.00	.58	6.1	.09	.09	27	e.00	.02
2	.00	.00	.00	.00	.00	4.9	19	.07	.02	19	e.00	.00
3	.00	.00	.00	.00	.00	1.3	48	.01	.00	13	e.00	.19
4	.00	.00	.07	.00	.00	.41	22	.01	.02	e10	e.00	.01
5	.02	.00	.00	.00	.00	.29	24	.01	.00	e7.0	e.00	.00
6	.00	.00	.00	.00	.00	.21	3.6	.00	.45	e4.6	e.00	.00
7	.00	.04	.00	.00	.05	.24	.63	.00	5.6	e3.0	e.00	.00
8	.00	.00	.00	.07	.00	.22	.36	.00	.52	e1.8	e2.0	.00
9	.00	.00	.00	.00	.00	.21	.21	.15	7.0	e1.0	e.70	.29
10	.00	.00	.00	.00	.00	.19	.37	.00	1.0	e.60	e.30	.04
11	.00	.00	.00	.00	.00	2.6	.37	.00	.92	e.40	e.10	.00
12	.00	.00	.00	.00	16	3.3	.22	.15	.15	e.21	e.03	.03
13	.00	.00	.00	.00	8.4	.73	.26	2.1	.05	e.13	.00	.01
14	.00	.00	.00	.00	.98	.18	.27	.22	1.3	e.08	.05	.00
15	.00	.10	8.1	.00	.42	.18	.15	30	17	e.05	.05	.00
16	.00	.00	2.2	.00	.18	.35	.07	27	6.3	e.04	.00	.00
17	.00	.01	.23	.00	.11	.34	.12	1.9	3.7	e.03	.00	.00
18	.00	.00	.01	.00	.09	.57	.06	.21	.55	e.02	.00	.00
19	.00	.00	.00	.00	.29	1.2	.05	.08	.11	e.01	.00	.00
20	.00	.00	.00	.00	3.7	.44	.06	8.1	.69	e.01	.00	.00
21	.00	.00	.00	.01	.99	.19	.06	.74	236	e.01	.00	.00
22	.00	.00	.00	.00	.27	.15	.01	20	1380	e.01	.00	.16
23	.00	.00	.00	.00	.13	.16	.01	12	296	e.00	.00	.16
24	.00	2.1	.00	.00	.16	.16	.00	1.5	104	e.00	.01	.28
25	.00	.65	.00	.00	.29	.13	.02	.41	94	e.00	.00	.04
26	.00	.05	.00	.00	3.3	.06	64	.13	119	e.00	.00	.00
27	.02	.00	.00	.00	1.1	.03	11	.09	72	e.00	.00	.00
28	.00	.38	.00	.00	.79	.05	1.2	.05	62	e.00	.00	.00
29	.00	5.6	.00	.00	---	.05	.33	2.6	55	e.00	.00	.00
30	.00	.74	.00	.00	---	.01	.14	4.1	43	e.00	.00	.00
31	.00	---	.09	.00	---	.14	---	.55	---	e.00	.03	---
TOTAL	0.04	9.67	10.79	0.08	37.25	19.57	202.67	112.27	2506.47	88.00	3.27	1.23
MEAN	.001	.32	.35	.003	1.33	.63	6.76	3.62	83.5	2.84	.11	.041
MAX	.02	5.6	8.1	.07	16	4.9	64	30	1380	27	2.0	.29
MIN	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
AC-FT	.08	19	21	.2	74	39	402	223	4970	175	6.5	2.4

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1997#, BY WATER YEAR (WY)

	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	8.36	6.99	8.84	4.33	7.21	7.25	13.9	39.7	29.4	12.3	2.95	17.0													
MAX	40.7	74.7	155	38.8	71.0	93.7	116	576	151	153	36.6	187													
(WY)	1995	1978	1992	1992	1992	1992	1991	1993	1987	1973	1974	1973													
MIN	.001	.008	.006	.000	.013	.044	.000	.045	.006	.000	.000	.041													
(WY)	1992	1992	1996	1996	1996	1996	1984	1989	1984	1984	1986	1997													

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1973 - 1997#

ANNUAL TOTAL	253.29	2991.31	
ANNUAL MEAN	.69	8.20	
HIGHEST ANNUAL MEAN			13.2
LOWEST ANNUAL MEAN			57.1
HIGHEST DAILY MEAN	103	Sep 25	8680
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW			28100
INSTANTANEOUS PEAK STAGE		8.31	15.91
ANNUAL RUNOFF (AC-FT)	502	5930	9550
10 PERCENT EXCEEDS	.09	4.7	10
50 PERCENT EXCEEDS	.00	.01	.90
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

# Period of regulated streamflow.



## GUADALUPE RIVER BASIN

08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical, biochemical, and pesticide analyses: November 1968 to current year. Sediment analyses: November 1971 to September 1973. Water temperatures: November 1968 to current year. Bacteria analyses: May 1976 to current year.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI, FECAL, KF AGAR (COLS. PER 100 ML)
FEB 12...	1315	31	262	8.2	11.0	9.4	88	20	5.4	K1000	8200
MAR 11...	1040	0.93	142	7.5	18.0	8.9	96	50	5.8	20000	23000
JUN 22...	1320	1800	139	7.8	22.5	7.3	86	29	3.9	11000	31000
DATE	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)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
FEB 12...	110	18	38	3.1	8.4	0.4	14	3.9	90	22	9.5
MAR 11...	57	7	21	1.1	3.6	0.2	12	2.2	50	10	3.7
JUN 22...	63	0	23	1.1	2.8	0.2	8	3.8	65	5.2	3.7
DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
FEB 12...	152	145	50	0.300	0.030	0.60	0.27	0.17	0.20	0.30	0.140
MAR 11...	81	91	76	1.10	0.150	2.0	0.75	0.38	0.53	0.90	0.160
JUN 22...	90	80	240	0.228	<0.015	1.2	0.95	--	<0.20	0.95	0.392
DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRED TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
FEB 12...	<0.010	8.3	<0.010	<1	5	2	<10	<1	3	3	5
MAR 11...	0.060	13	<0.010	4	2	<1	<10	<1	4	9	15
JUN 22...	0.108	12	<0.010	<1	<1	4	<10	<1	5	4	7
DATE	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	ENDO-SULFAN-I WATER WHOLE REC (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOR 1016 PCB TOTAL (UG/L)	AROCLOR 1221 PCB TOTAL (UG/L)	AROCLOR 1232 PCB TOTAL (UG/L)
FEB 12...	<0.10	2	<1	<1	20	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
MAR 11...	<0.10	2	<1	<1	90	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
JUN 22...	<0.10	3	<1	<1	30	<0.040	<0.100	<0.030	<0.100	<1.00	<0.100
DATE	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)	ENDO-SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA-CHLOR-IDE TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	DANE CIS WATER WHOLE TOTAL (UG/L)	BENZENE HEXA-CHLOR-IDE TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN SULFATE TOTAL (UG/L)
FEB 12...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600
MAR 11...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600
JUN 22...	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020	<0.600



# GUADALUPE RIVER BASIN

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08178700 SALADO CREEK (UPPER STATION) AT SAN ANTONIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	P,P' DDD, TOTAL (UG/L)	P,P' DDE, TOTAL (UG/L)	P,P' DDT, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)
FEB 12...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
MAR 11...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
JUN 22...	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100

## 08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX

**LOCATION.**--Lat 29°21'25", long 98°24'45", Bexar County, Hydrologic Unit 12100301, on right bank at upstream side of bridge on Loop 13 at San Antonio, 1.4 mi east of Brooks Air Force Base, and 3.3 mi upstream from Rosillo Creek.

**DRAINAGE AREA.**--189 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--September 1960 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 526.95 ft above sea level.

**REMARKS.**--Records good except those for estimated discharge, which are poor. Since water year 1973, at least 10% of contributing drainage area has been regulated by eleven Soil Conservation floodwater-retarding structures (combined capacity of 26,770 acre-ft). Several small diversions above station. A recording rain gage is located in watershed above station. Most of low flow comes from artesian wells and springs within the city of San Antonio. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--12 years (water years 1961-72) prior to regulation by Soil Conservation Service flood retarding structures, 30.6 ft<sup>3</sup>/s (22,170 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1961-72).**--Maximum discharge, 7,120 ft<sup>3</sup>/s May 12, 1972 (gage height, 24.53 ft); no flow Aug. 13, 1967.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Floods of Sept. 27, 1946, and Aug. 15, 1960, were about equal magnitude. Flood of Aug. 15, 1960, reached a stage of 26.8 ft, from floodmarks. Maximum stage since at least 1941, that of Sept. 27, 1973.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	3.6	10	13	3.1	6.2	42	22	14	85	23	5.4
2	4.6	3.2	5.6	4.8	3.6	97	362	23	9.4	75	21	4.7
3	3.2	2.9	4.1	6.0	3.5	36	509	20	7.9	67	17	8.9
4	3.3	2.7	3.9	4.7	3.2	10	286	14	7.8	62	17	66
5	3.7	2.8	9.8	3.1	3.2	6.7	118	10	44	50	9.2	40
6	5.4	2.7	9.3	2.7	3.2	5.7	58	18	12	46	5.1	14
7	3.8	3.4	6.4	2.8	4.3	4.7	22	17	62	44	5.7	7.9
8	3.1	6.2	4.7	4.9	7.0	4.8	15	19	34	42	18	7.6
9	2.8	6.3	2.9	8.6	5.9	5.2	12	47	53	42	31	7.6
10	2.5	5.9	2.9	4.9	4.9	4.2	11	43	53	40	11	27
11	2.6	4.9	5.2	3.6	4.2	36	14	23	16	35	6.9	16
12	2.7	3.5	4.8	3.1	77	71	12	e17	9.9	36	6.3	12
13	2.9	3.2	4.9	2.9	133	15	9.9	e25	8.1	31	12	12
14	2.9	8.0	5.6	2.7	21	7.5	8.6	e23	7.8	32	3.2	8.8
15	2.7	10	22	2.6	9.2	4.9	7.7	e400	273	27	9.1	8.8
16	2.6	20	61	2.7	6.1	4.5	7.5	e262	65	26	13	15
17	2.2	8.8	11	2.7	5.1	10	7.6	e58	25	26	8.0	15
18	2.0	4.9	5.8	2.6	4.3	9.9	7.3	22	15	26	7.2	14
19	1.7	9.3	4.5	2.7	3.9	11	7.6	12	12	26	11	14
20	1.6	6.9	3.9	2.9	21	9.8	7.2	212	9.1	24	11	14
21	1.3	5.2	3.4	3.4	22	5.7	6.6	60	377	52	12	11
22	1.5	6.1	3.3	4.6	8.7	4.2	6.5	69	1700	29	12	28
23	1.6	4.2	3.3	3.7	5.3	3.5	6.4	134	1520	25	11	35
24	1.8	79	3.5	3.2	4.7	3.3	5.8	56	249	24	8.0	52
25	2.4	37	4.4	3.0	7.4	3.2	6.1	47	185	23	5.0	25
26	2.5	8.8	3.6	3.1	23	3.2	653	21	181	23	11	17
27	2.8	5.6	6.0	3.4	24	3.2	163	14	137	19	11	13
28	2.8	5.3	7.8	3.0	9.2	3.9	40	33	112	19	12	10
29	2.3	51	3.6	3.1	---	3.1	31	18	101	21	5.4	9.1
30	2.7	35	2.8	2.8	---	3.1	27	12	94	18	10	12
31	3.1	---	23	2.9	---	3.8	---	13	---	22	5.1	---
TOTAL	88.8	356.4	253.0	120.2	431.0	400.3	2469.8	1764	5394.0	1117	348.2	530.8
MEAN	2.86	11.9	8.16	3.88	15.4	12.9	82.3	56.9	180	36.0	11.2	17.7
MAX	7.7	79	61	13	133	97	653	400	1700	85	31	66
MIN	1.3	2.7	2.8	2.6	3.1	3.1	5.8	10	7.8	18	3.2	4.7
AC-FT	176	707	502	238	855	794	4900	3500	10700	2220	691	1050

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1973 - 1997#, BY WATER YEAR (WY)

	MEAN	44.1	41.1	47.6	37.4	45.6	40.0	54.5	86.5	92.9	44.6	27.7	54.1
MAX	154	146	376	136	285	206	188	337	349	234	176	400	
(WY)	1995	1978	1992	1992	1992	1992	1977	1993	1987	1973	1974	1973	
MIN	2.86	6.35	8.16	3.88	5.27	7.70	7.80	6.67	6.01	1.49	4.31	6.44	
(WY)	1997	1992	1997	1997	1996	1996	1984	1996	1990	1996	1984	1984	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1973 - 1997#

ANNUAL TOTAL	3621.21	13273.5	51.3
ANNUAL MEAN	9.89	36.4	149
HIGHEST ANNUAL MEAN			9.96
LOWEST ANNUAL MEAN			1992
HIGHEST DAILY MEAN	610	1700	8080
LOWEST DAILY MEAN	.07	1.3	.07
ANNUAL SEVEN-DAY MINIMUM	.10	1.6	.10
INSTANTANEOUS PEAK FLOW		2730	13100
INSTANTANEOUS PEAK STAGE		16.46	28.83
ANNUAL RUNOFF (AC-FT)	7180	26330	37150
10 PERCENT EXCEEDS	11	59	65
50 PERCENT EXCEEDS	4.7	8.9	23
90 PERCENT EXCEEDS	.89	2.9	7.0

e Estimated

# Period of regulated streamflow.

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical, biochemical, and pesticide analyses: November 1968 to current year. Sediment analyses: October 1968 to September 1973, April 1996 to September 1997. Biological analyses: May 1989 to September 1995.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: January 1987 to current year.

pH: January 1987 to current year.

WATER TEMPERATURE: January 1987 to current year.

DISSOLVED OXYGEN: January 1987 to current year.

**INSTRUMENTATION.**--Beginning January 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, probe fouling or probe being out of the water and these days were deleted from the record. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum, 1,290 microsiemens Aug. 23, 1994; minimum, 39 microsiemens Nov. 9, 1990.

pH: Maximum, 9.0 units on Apr. 26, 27, 1997; minimum, 7.3 units on many days during 1988, 1990, 1992, 1994, and 1996.

WATER TEMPERATURE: Maximum, 31.0°C July 17-20, 1988, July 30, 1993, July 17, 19, 1996; minimum, 0.0°C Dec. 24, 1989.

DISSOLVED OXYGEN: Maximum, 16.7 mg/L Jan. 27, 1988, Mar. 11, 1996; minimum, 0.6 mg/L July 27, 1996.

**EXTREMES FOR CURRENT YEAR.**--

SPECIFIC CONDUCTANCE: Maximum, 1,280 microsiemens Nov. 9; minimum, 158 microsiemens June 22.

pH: Maximum, 9.0 units Apr. 26, 27; minimum, 7.4 units June 15, Sept. 4, 5.

WATER TEMPERATURE: Maximum, 29.0°C many days; minimum, 3.5°C Jan. 13 - 15.

DISSOLVED OXYGEN: Maximum, 15.1 mg/L Feb. 1; minimum, 1.5 mg/L Nov. 2.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
APR 22...	0915	3.7	1120	7.9	24.0	4.2	51	340	36	110	17
MAY 21...	0930	1.3	1040	7.7	26.0	2.6	33	320	74	100	16
JUN 27...	0930	8.7	357	7.8	27.0	5.1	65	130	10	42	5.1
JUL 29...	1115	0.83	795	8.0	28.0	3.0	39	230	7	78	9.7
SEP 03...	0945	2.2	444	7.7	27.0	4.4	57	120	17	41	4.1

DATE	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY 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)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)
APR 22...	110	3	41	3.8	310	90	110	0.40	21	639
MAY 21...	88	2	37	3.7	240	80	110	0.30	24	644
JUN 27...	18	0.7	23	3.8	120	25	19	0.20	8.4	202
JUL 29...	68	2	38	3.8	230	61	72	0.30	18	422
SEP 03...	18	0.7	24	3.2	100	30	18	0.20	8.4	192

DATE	SOLIDS, SUM OF CONSTITU- ENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
APR 22...	656	0.300	0.010	0.310	0.110	0.81	0.39	0.19	0.30	0.50
MAY 21...	608	0.280	0.020	0.300	0.150	0.90	0.45	0.15	0.30	0.60
JUN 27...	195	0.550	0.050	0.600	0.100	1.3	0.60	0.30	0.40	0.70
JUL 29...	454	--	<0.010	0.200	0.120	0.90	0.58	0.28	0.40	0.70
SEP 03...	188	0.370	0.020	0.390	0.050	0.79	0.35	0.25	0.30	0.40

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

		PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SEDI- MENT, SUS- PENDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	
	DATE											
	APR 22...	0.100	0.040	0.030	0.09	3.8	0.4	1.2	116	7	61	
	MAY 21...	0.200	0.070	0.080	0.25	3.6	0.5	0.55	157	4	88	
	JUN 27...	0.150	0.070	0.060	0.18	5.7	0.6	1.4	58	12	2	
	JUL 29...	0.120	0.030	0.040	0.12	4.9	1.0	0.31	139	5	33	
	SEP 03...	0.070	0.040	0.060	0.18	3.6	0.70	0.12	21	8	7	
DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN, DIS- SOLVED (MG/L)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS- SOLVED (MG/L AS CA)
OCT 15...	0930	2.7	900	7.9	22.0	3.5	41	--	--	280	8	93
NOV 06...	0945	2.4	1120	7.9	21.0	4.2	48	--	--	330	0	110
DEC 05...	0930	11	613	8.0	17.0	6.8	72	--	--	220	32	72
JAN 23...	0930	3.8	945	7.7	17.0	10.2	108	--	--	310	25	98
FEB 07...	1000	3.6	975	7.7	13.0	6.9	67	--	--	290	8	93
FEB 12-13	1758	226	679	--	--	--	--	31	27	240	25	73
20...	1400	24	695	7.5	20.0	8.2	92	--	--	200	22	65
MAR 06...	0930	6.0	505	7.5	16.0	7.4	76	--	--	170	17	58
20...	1000	11	570	7.6	17.0	7.1	75	--	--	200	16	65
APR 01-02	2133	394	470	--	--	--	--	60	--	170	14	55
09...	1015	12	605	7.4	18.0	7.0	75	--	--	200	14	68
16...	0915	7.0	785	7.7	16.0	7.9	82	--	--	280	38	92
23...	1000	6.3	905	7.6	22.0	6.2	73	--	--	290	18	95
APR 26-26	0746	789	355	--	--	--	--	80	20	130	15	43
26...	1200	834	328	7.7	16.5	7.2	--	--	--	110	10	36
MAY 02...	1045	21	615	7.6	26.0	6.6	84	--	--	230	27	72
07...	1000	17	663	7.5	23.0	6.3	75	--	--	260	20	81
14...	0930	23	580	7.4	22.0	5.5	65	--	--	220	0	70
22...	1000	21	390	7.2	23.0	5.4	64	--	--	140	19	49
27...	0940	15	504	7.3	27.0	4.6	59	--	--	190	27	63
JUN 02...	1100	9.8	600	7.3	25.0	4.7	59	--	--	210	17	68
17...	1000	24	375	7.1	28.0	5.3	70	--	--	140	15	46
JUL 03...	1015	68	560	7.6	29.0	6.3	84	--	--	240	32	77
14...	1015	31	620	7.5	29.0	6.1	81	--	--	240	22	73
22...	1000	27	570	7.3	28.0	5.3	69	--	--	240	48	74
29...	0900	21	608	7.4	29.0	6.7	89	--	--	250	31	77
AUG 06...	0845	5.4	623	7.5	28.0	5.6	73	--	--	250	26	75
12...	0845	5.7	713	7.4	28.0	4.2	55	--	--	280	48	84
21...	1200	12	630	7.4	30.0	5.6	75	--	--	250	32	74
27...	0915	13	609	7.4	27.0	6.0	77	--	--	240	24	71
SEP 03...	0900	12	682	7.4	28.0	5.7	74	--	--	250	21	74
09...	0900	10	605	7.2	29.0	5.3	71	--	--	230	24	71
17...	0930	15	578	8.1	29.0	6.5	87	--	--	250	36	75
25...	0900	25	534	7.9	25.0	6.3	78	--	--	230	38	70

GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	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)	SOLIDS, RESIDUE AT 180 DEG C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT 15...	11	70	2	35	4.1	270	77	84	0.30	16	522	525
NOV 06...	14	100	2	39	4.0	330	92	110	0.30	18	662	653
DEC 05...	9.3	43	1	30	4.1	190	60	45	0.30	11	380	365
JAN 23...	15	82	2	36	3.2	280	81	86	0.30	3.2	530	529
FEB 07...	15	74	2	35	2.9	290	88	90	0.30	1.8	566	519
FEB 12-13	13	48	1	30	3.9	210	59	57	--	--	403	384
20...	9.0	50	2	35	3.4	180	62	56	0.30	6.2	377	360
MAR 06...	7.1	33	1	29	3.4	160	45	34	0.20	7.2	304	288
20...	8.8	36	1	28	3.8	180	49	38	0.3	8.3	341	327
APR 01-02	7.9	29	1	26	4.4	160	40	30	--	--	288	263
09...	7.9	35	1	27	4.1	190	59	40	0.2	12	361	339
16...	12	54	1	29	4.3	240	75	57	0.3	14	477	462
23...	14	63	2	31	4.4	280	85	70	0.3	11	538	503
APR 26-26	5.7	20	0.7	24	4.0	110	29	20	--	--	205	197
26...	4.9	15	0.6	22	3.9	100	26	17	0.2	4.8	192	177
MAY 02...	11	35	1	25	4.0	200	50	39	0.2	12	368	352
07...	13	37	1	24	3.5	240	48	42	0.3	13	394	384
14...	11	31	0.9	23	4.2	230	48	33	0.3	10	346	331
22...	5.6	20	0.7	22	3.4	120	28	20	0.2	8.8	234	217
27...	7.2	29	0.9	25	4.2	160	40	28	0.2	12	293	288
JUN 02...	9.0	37	1	28	3.9	190	48	38	0.3	12	348	336
17...	5.6	20	0.7	23	3.7	120	27	18	0.2	8.2	219	207
JUL 03...	11	19	0.5	15	3.8	200	37	24	0.3	12	337	313
14...	15	26	0.7	19	2.7	220	39	34	0.3	12	366	341
22...	14	24	0.7	18	2.6	200	37	31	0.3	11	329	321
29...	15	29	0.8	20	2.2	220	35	36	0.3	11	359	343
AUG 06...	16	31	0.9	21	2.0	230	38	38	0.3	9.8	355	343
12...	17	44	1	25	2.7	230	51	49	0.3	12	412	406
21...	15	32	0.9	22	2.4	220	39	39	0.3	11	358	333
27...	16	30	0.8	21	2.0	220	35	38	0.3	10	366	339
SEP 03...	16	41	1	26	2.2	230	43	46	0.3	11	398	358
09...	13	31	0.9	22	2.9	210	37	35	0.3	11	365	335
17...	15	26	0.7	18	2.1	210	33	33	0.3	12	342	333
25...	14	24	0.7	18	2.5	190	29	32	0.3	12	310	305



## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
OCT 15...	--	0.180	0.020	0.200	0.070	0.50	0.23	0.13	0.20	0.30	0.050	0.040
NOV 06...	--	0.080	0.010	0.090	0.030	0.29	0.17	--	<0.20	0.20	0.030	0.040
DEC 05...	--	0.370	0.010	0.380	0.030	0.68	0.27	--	<0.20	0.30	0.080	0.060
JAN 23...	--	0.220	0.030	0.250	<0.015	0.65	0.40	--	<0.20	0.40	0.060	0.020
FEB 07...	--	0.150	0.010	0.160	0.020	0.56	0.38	0.28	0.30	0.40	0.040	<0.010
FEB 12-13	210	--	--	0.320	0.170	0.82	0.33	0.19	0.36	0.50	0.070	0.070
20...	--	0.470	0.030	0.500	<0.015	0.90	0.40	--	0.30	0.40	0.040	0.010
MAR 06...	--	0.550	0.020	0.570	0.080	0.97	0.32	0.22	0.30	0.40	0.080	0.070
20...	--	0.470	0.030	0.500	0.070	0.80	0.23	0.23	0.30	0.30	0.120	0.110
APR 01-02	376	--	--	0.320	0.060	2.4	2.0	0.29	0.35	2.1	0.550	0.070
09...	--	0.676	0.04	0.71	0.09	1.2	0.42	0.28	0.4	0.5	0.10	0.06
16...	--	0.616	0.02	0.64	0.04	1.0	0.33	0.24	0.3	0.4	0.07	0.06
23...	--	--	<0.01	0.43	0.05	0.73	0.25	0.17	0.2	0.3	0.08	0.08
APR 26-26	468	--	--	0.46	0.11	2.4	1.9	0.29	0.40	2.0	0.66	0.09
26...	--	0.483	0.02	0.51	0.12	2.2	1.6	0.23	0.4	1.7	0.53	0.10
MAY 02...	--	0.804	0.02	0.83	0.05	1.1	0.18	0.25	0.3	0.2	0.09	0.07
07...	--	0.665	0.02	0.69	0.04	1.0	0.28	--	<0.2	0.3	0.05	0.04
14...	--	0.335	0.03	0.37	0.06	0.74	0.32	0.18	0.2	0.4	0.09	0.06
22...	--	0.540	0.02	0.56	0.05	1.0	0.43	0.30	0.3	0.5	0.15	0.11
27...	--	0.530	0.02	0.55	0.05	0.95	0.35	0.32	0.4	0.4	0.12	0.11
JUN 02...	--	0.403	0.01	0.41	0.02	0.71	0.28	0.24	0.3	0.3	0.13	0.06
17...	--	0.502	0.01	0.52	0.03	0.93	0.39	0.23	0.3	0.4	0.11	0.07
JUL 03...	--	0.591	0.01	0.60	<0.01	0.84	0.24	--	0.4	0.2	0.02	0.02
14...	--	--	<0.01	0.98	<0.01	--	--	--	<0.2	<0.2	0.01	<0.01
22...	--	--	<0.01	0.86	0.03	1.2	0.26	0.25	0.3	0.3	0.05	0.03
29...	--	--	<0.01	0.74	<0.01	--	--	--	<0.2	<0.2	0.02	0.04
AUG 06...	--	0.593	0.01	0.60	0.02	--	--	--	<0.2	<0.2	<0.01	<0.01
12...	--	--	<0.01	0.34	0.03	0.68	0.31	--	<0.2	0.3	0.02	0.03
21...	--	0.538	0.01	0.55	<0.01	--	--	--	<0.2	<0.2	0.06	0.03
27...	--	--	<0.01	0.56	0.01	--	--	--	<0.2	<0.2	0.03	0.02
SEP 03...	--	--	<0.01	0.43	0.02	--	--	--	<0.2	<0.2	0.02	0.02
09...	--	--	<0.01	0.65	<0.01	0.86	0.21	--	<0.2	0.2	0.02	0.01
17...	--	--	<0.01	0.84	<0.01	--	--	--	0.2	<0.2	0.02	0.02
25...	--	--	<0.01	0.78	0.02	1.1	0.26	--	<0.2	0.3	0.09	0.03

GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	PHOS- PHORUS ORTH- DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTH- DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SEDI- MENT, SUS- PENDE (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)
OCT												
15...	0.040	0.12	--	3.5	0.20	--	--	--	0.98	134	--	--
NOV												
06...	0.030	0.09	--	3.4	0.10	--	--	--	0.71	109	--	--
DEC												
05...	0.040	0.12	--	4.1	0.20	--	--	--	3.5	118	--	--
JAN												
23...	<0.010	--	--	2.7	0.20	--	--	--	0.58	57	--	--
FEB												
07...	<0.010	--	--	2.9	1.7	--	--	--	0.47	48	--	--
FEB												
12-13	--	--	15	--	--	<0.010	<1	<1	--	--	3	<10
20...	0.020	0.06	--	4.4	0.50	--	--	--	1.7	26	--	--
MAR												
06...	0.060	0.18	--	3.7	0.50	--	--	--	0.37	23	--	--
20...	0.040	0.12	--	4.4	0.30	--	--	--	0.95	32	--	--
APR												
01-02	--	--	23	--	--	<0.01	<1	1	--	--	4	<10
09...	0.07	0.23	--	4.7	0.7	--	--	--	0.65	20	--	--
16...	0.07	0.21	--	4.1	0.3	--	--	--	1.2	62	--	--
23...	0.05	0.16	--	4	0.3	--	--	--	1.8	107	--	--
APR												
26-26	--	--	16	--	--	<0.01	<1	<1	--	--	5	<10
26...	0.10	0.30	--	6	>5	--	--	--	1060	472	--	--
MAY												
02...	0.07	0.22	--	3.1	0.2	--	--	--	2.3	41	--	--
07...	0.07	0.21	--	2.7	1.3	--	--	--	2.9	63	--	--
14...	0.06	0.20	--	4.9	0.4	--	--	--	2.1	34	--	--
22...	0.08	0.26	--	4.9	0.5	--	--	--	1.2	21	--	--
27...	0.08	0.26	--	4.7	0.4	--	--	--	0.77	19	--	--
JUN												
02...	0.08	0.24	--	5	0.3	--	--	--	0.29	11	--	--
17...	0.07	0.22	--	4.8	0.4	--	--	--	1.2	19	--	--
JUL												
03...	0.03	0.08	--	4.1	0.5	--	--	--	7.3	40	--	--
14...	0.03	0.08	--	1.6	0.3	--	--	--	2.5	30	--	--
22...	0.03	0.09	--	2.9	0.3	--	--	--	1.5	20	--	--
29...	0.03	0.08	--	1.6	0.3	--	--	--	1.8	31	--	--
AUG												
06...	0.02	0.05	--	1.4	0.3	--	--	--	0.32	22	--	--
12...	0.03	0.09	--	2.4	0.4	--	--	--	0.20	13	--	--
21...	0.02	0.08	--	2.1	0.3	--	--	--	0.71	22	--	--
27...	0.02	0.07	--	1.5	0.2	--	--	--	0.46	13	--	--
SEP												
03...	0.02	0.05	--	1.7	0.4	--	--	--	0.78	24	--	--
09...	0.02	0.07	--	3.2	0.3	--	--	--	0.57	21	--	--
17...	0.03	0.09	--	1.7	0.4	--	--	--	0.97	24	--	--
25...	0.04	0.11	--	3.1	0.8	--	--	--	1.7	25	--	--

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	1-NAPH THOL, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT 15...	--	--	--	3.0	--	17	--	--	--	--	--	--
NOV 06...	--	--	--	8.0	--	20	--	--	--	--	--	--
DEC 05...	--	--	--	12	--	21	--	--	--	--	--	--
JAN 23...	--	--	--	7.0	--	15	--	--	--	--	--	<0.007
FEB 07...	--	--	--	10	--	30	--	--	--	--	--	--
FEB 12-13	<1	4	5	--	12	--	<0.10	4	<1	<1	40	--
20...	--	--	--	7.0	--	18	--	--	--	--	--	<0.007
MAR 06...	--	--	--	7.0	--	18	--	--	--	--	--	--
20...	--	--	--	6	--	13	--	--	--	--	--	<0.007
APR 01-02	<1	7	10	--	27	--	<0.1	7	<1	<1	70	--
09...	--	--	--	10	--	22	--	--	--	--	--	<0.007
16...	--	--	--	12	--	20	--	--	--	--	--	<0.007
23...	--	--	--	5	--	21	--	--	--	--	--	<0.007
APR 26-26	<1	8	17	--	29	--	<0.1	8	<1	<1	70	--
26...	--	--	--	18	--	<3	--	--	--	--	--	<0.007
MAY 02...	--	--	--	9	--	12	--	--	--	--	--	<0.007
07...	--	--	--	10	--	12	--	--	--	--	--	<0.007
14...	--	--	--	11	--	10	--	--	--	--	--	<0.007
22...	--	--	--	16	--	17	--	--	--	--	--	<0.007
27...	--	--	--	8	--	21	--	--	--	--	--	<0.007
JUN 02...	--	--	--	5	--	20	--	--	--	--	--	<0.007
17...	--	--	--	9	--	10	--	--	--	--	--	<0.007
JUL 03...	--	--	--	<3	--	7	--	--	--	--	--	<0.007
14...	--	--	--	<3	--	4	--	--	--	--	--	<0.007
22...	--	--	--	<3	--	6	--	--	--	--	--	<0.007
29...	--	--	--	<3	--	4	--	--	--	--	--	<0.007
AUG 06...	--	--	--	4	--	7	--	--	--	--	--	--
12...	--	--	--	3	--	13	--	--	--	--	--	<0.007
21...	--	--	--	<3	--	5	--	--	--	--	--	<0.007
27...	--	--	--	<3	--	4	--	--	--	--	--	<0.007
SEP 03...	--	--	--	3	--	5	--	--	--	--	--	<0.007
09...	--	--	--	<3	--	5	--	--	--	--	--	<0.007
17...	--	--	--	<3	--	3	--	--	--	--	--	<0.007
25...	--	--	--	<3	--	5	--	--	--	--	--	<0.007

GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	2,4,5-T DIS- SOLVED (UG/L)	2,4-D, DIS- SOLVED (UG/L)	2,4-DB WATER, FLTRD, GF 0.7U REC (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	SILVEX, DIS- SOLVED (UG/L)	3HYDRXY CARBO- FURAN WAT,FLT GF 0.7U REC (UG/L)	DNOC WAT,FLT GF 0.7U REC (UG/L)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	ACIFL- UORFEN WATER, FLTRD, GF 0.7U REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	ALDI- CARB, WATER, FLTRD, GF 0.7U REC (UG/L)	ALDI- CARB SULFONE WAT,FLT GF 0.7U REC (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
FEB 07...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13 20...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
MAR 06...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 20...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	0.009	<0.016	<0.016
APR 01-02 09...	--	--	--	--	--	--	--	--	--	--	--	--
APR 16...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
APR 23...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
APR 26-26 26...	--	--	--	--	--	--	--	--	--	--	--	--
APR 26...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	0.018	<0.016	<0.016
MAY 02...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	0.004	<0.016	<0.016
MAY 07...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
MAY 14...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
MAY 22...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
MAY 27...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUN 02...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUN 17...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUL 03...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUL 14...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUL 22...	<0.035	0.22	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUL 29...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
AUG 06...	<0.035	<0.035	<0.035	<0.003	<0.021	--	<0.035	<0.002	<0.035	<0.002	--	--
AUG 12...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
AUG 21...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
AUG 27...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
SEP 03...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
SEP 09...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
SEP 17...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
SEP 25...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	ALDICA- RB SUL- FOXIDE, WAT, FLT GF 0.7U REC (UG/L)	ALDRIN, TOTAL (UG/L)	ENDO- SULFAN- I WATER WHOLE REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOR 1016 PCB TOTAL (UG/L)	AROCLOR 1221 PCB TOTAL (UG/L)	AROCLOR 1232 PCB TOTAL (UG/L)	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
FEB 07...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13	--	<0.040	<0.100	--	<0.030	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100
20...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
MAR 06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
APR 01-02	--	<0.040	<0.1	--	<0.030	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
09...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
16...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
23...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
APR 26-26	--	<0.040	<0.1	--	<0.030	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
26...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
MAY 02...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
07...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
14...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
22...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
27...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
JUN 02...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
17...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
JUL 03...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
14...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
22...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
29...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
AUG 06...	--	--	--	<0.002	--	--	--	--	--	--	--	--
12...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
21...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
27...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
SEP 03...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
09...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
17...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
25...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--



GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	ATRA- ZINE, WATER, DISS, REC (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BENTA- ZON, WATER, FLTRD, GF 0.7U REC (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	BRO- MACIL, WATER, DISS, REC (UG/L)	BRO- MOXYNIL WATER, FLTRD, GF 0.7U REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	CAR- BARYL, WATER, FLTRD, GF 0.7U REC (UG/L)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO- FURAN, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	0.016	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.016	<0.028
FEB 07...	--	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13 20...	0.054	<0.001	<0.002	<0.014	<0.040	<0.030	<0.035	<0.035	<0.002	<0.008	E0.013	<0.028
MAR 06...	--	--	--	--	--	--	--	--	--	--	--	--
MAR 20...	0.209	<0.001	<0.002	<0.014	--	--	E1.5	<0.035	<0.002	0.15	E0.168	<0.028
APR 01-02 09...	-- 0.752	-- <0.001	-- <0.002	-- <0.014	<0.040	<0.030	-- 0.42	-- <0.035	-- <0.002	-- <0.008	-- E0.041	-- <0.028
APR 16...	0.575	<0.001	<0.002	<0.014	--	--	0.33	<0.035	<0.002	<0.008	E0.028	<0.028
APR 23...	0.258	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.008	<0.028
APR 26-26 26...	-- 0.348	-- <0.001	-- <0.002	-- <0.014	<0.040	<0.030	-- <0.035	-- <0.035	-- <0.002	-- 0.20	-- E0.153	-- <0.028
MAY 02...	0.424	<0.001	<0.002	<0.014	--	--	0.14	<0.035	<0.002	<0.008	E0.039	<0.028
MAY 07...	0.207	<0.001	<0.002	<0.014	--	--	0.14	<0.035	<0.002	<0.008	E0.007	<0.028
MAY 14...	0.277	<0.001	<0.002	<0.014	--	--	0.63	<0.035	<0.002	E0.11	E0.098	<0.028
MAY 22...	0.145	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	E0.10	E0.067	<0.028
MAY 27...	0.292	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	E0.06	E0.064	<0.028
JUN 02...	0.154	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.032	<0.028
JUN 17...	0.057	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.134	<0.028
JUL 03...	0.032	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
JUL 14...	0.012	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
JUL 22...	0.009	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	0.06	E0.082	<0.028
JUL 29...	0.005	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
AUG 06...	0.005	<0.001	<0.002	<0.014	--	--	--	<0.035	<0.002	--	<0.003	--
AUG 12...	0.009	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
AUG 21...	0.007	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
AUG 27...	0.005	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
SEP 03...	0.005	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
SEP 09...	0.014	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
SEP 17...	0.006	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
SEP 25...	0.019	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.010	<0.028

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- AMBN, WATER, FLTRD, GF 0.7U REC (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLORO- THALO- NIL, WAT,FLT GF 0.7U REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	CLOPYR- ALID, WATER, FLTRD, GF 0.7U REC (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DACTHAL MONO- ACID, WAT,FLT GF 0.7U REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)
OCT												
15...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
06...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
23...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.050	<0.004	<0.017	<0.002	E0.031
FEB												
07...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
12-13	--	--	<0.100	--	--	<0.100	--	--	--	--	--	--
20...	<0.003	<0.011	--	<0.035	0.010	--	<0.005	<0.050	<0.004	<0.017	<0.002	<0.002
MAR												
06...	--	--	--	--	--	--	--	--	--	--	--	--
20...	<0.003	<0.011	--	<0.035	0.009	--	<0.005	<0.05	0.011	<0.017	<0.002	E0.022
APR												
01-02	--	--	<0.1	--	--	<0.1	--	--	--	--	--	--
09...	<0.003	<0.011	--	<0.035	0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.054
16...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.039
23...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.029
APR												
26-26	--	--	<0.1	--	--	<0.1	--	--	--	--	--	--
26...	<0.003	<0.011	--	<0.035	0.006	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.021
MAY												
02...	<0.003	<0.011	--	<0.035	0.006	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.033
07...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.021
14...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.037
22...	<0.003	<0.011	--	<0.035	0.009	--	<0.005	<0.05	0.005	<0.017	E0.001	E0.022
27...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	E0.001	E0.025
JUN												
02...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.023
17...	<0.003	<0.011	--	<0.035	0.008	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.007
JUL												
03...	<0.003	<0.011	--	<0.035	E0.003	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.004
14...	<0.003	<0.011	--	<0.035	0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.006
22...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.006
29...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.005
AUG												
06...	<0.003	--	--	--	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.005
12...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.006
21...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.004
27...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.005
SEP												
03...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.010
09...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.006
17...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.004
25...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.002

GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DICAMBA WATER, FLTRD, GF 0.7U REC (UG/L)	DICHLO- BENIL, WATER, FLTRD, GF 0.7U REC (UG/L)	DICHLOR PROP, WATER, FLTRD, GF 0.7U REC (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	DINOSEB WATER, FLTRD, GF 0.7U REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	DIURON, WATER, FLTRD, GF 0.7U REC (UG/L)	ENDO- SULFAN SULFATE TOTAL (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	--	0.012	<0.035	<0.020	<0.032	--	<0.001	<0.035	<0.017	<0.020	--
FEB 07...	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13 20...	<0.090	--	--	--	--	<0.020	--	--	--	--	<0.600
MAR 06...	--	0.038	<0.035	<0.020	<0.032	--	<0.001	<0.035	<0.017	<0.020	--
MAR 20...	--	0.068	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.77	--
APR 01-02	<0.090	--	--	--	--	0.023	--	--	--	--	<0.6
APR 09...	--	0.170	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.12	--
APR 16...	--	0.091	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.10	--
APR 23...	--	0.040	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.07	--
APR 26-26 26...	<0.090	--	--	--	--	<0.020	--	--	--	--	<0.6
MAY 02...	--	0.160	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	1.1	--
MAY 07...	--	0.181	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.08	--
MAY 14...	--	0.072	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.05	--
MAY 22...	--	0.096	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.07	--
MAY 27...	--	0.088	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.61	--
JUN 02...	--	0.138	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.41	--
JUN 17...	--	0.332	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.26	--
JUL 03...	--	0.095	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.25	--
JUL 14...	--	0.011	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.02	--
JUL 22...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
JUL 29...	--	0.021	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
AUG 06...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
AUG 12...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
AUG 21...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
AUG 27...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
SEP 03...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
SEP 09...	--	0.008	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
SEP 17...	--	0.006	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
SEP 25...	--	0.066	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ESFEN- VAL- ERATE, WAT, FLT GF 0.7U REC (UG/L)	ETHAL- FLUR- ALIN WAT FLT GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FEN- URON, WATER, FLTRD, GF 0.7U REC (UG/L)	FLUO- METURON WATER, FLTRD, GF 0.7U REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)
OCT											
15...	--	--	--	--	--	--	--	--	--	--	--
NOV											
06...	--	--	--	--	--	--	--	--	--	--	--
DEC											
05...	--	--	--	--	--	--	--	--	--	--	--
JAN											
23...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
FEB											
07...	--	--	--	--	--	--	--	--	--	--	--
FEB											
12-13	<0.200	<0.060	--	--	--	--	--	--	--	<0.030	<0.800
20...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
MAR											
06...	--	--	--	--	--	--	--	--	--	--	--
20...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
APR											
01-02	<0.2	<0.060	--	--	--	--	--	--	--	<0.030	<0.8
09...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
16...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
23...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
APR											
26-26	<0.2	<0.060	--	--	--	--	--	--	--	<0.030	<0.8
26...	--	--	<0.060	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
MAY											
02...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
07...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
14...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
22...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
27...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
JUN											
02...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
17...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
JUL											
03...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
14...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
22...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
29...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
AUG											
06...	--	--	<0.002	--	<0.004	<0.003	--	--	<0.003	--	--
12...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
21...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
27...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
SEP											
03...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
09...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
17...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
25...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--

GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	LINDANE TOTAL (UG/L)	LINDANE DIS- SOLVED (UG/L)	LINURON WATER, FLTRD, GF 0.7U REC (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	MCPA, WATER, FLTRD, GF 0.7U REC (UG/L)	MCPB, WATER, FLTRD, GF 0.7U REC (UG/L)	METHIO- CARB, WATER, FLTRD, GF 0.7U REC (UG/L)	METH- OMYL, WATER, FLTRD, GF 0.7U REC (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	--	<0.004	<0.018	<0.002	<0.005	<0.050	<0.035	<0.026	<0.017	<0.002	<0.004
FEB 07...	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13 20...	<0.030	--	--	--	--	--	--	--	--	--	--
MAR 06...	--	--	--	--	--	--	--	--	--	--	--
20...	--	<0.004	<0.018	<0.002	0.107	<0.05	<0.035	<0.026	<0.017	0.012	<0.004
APR 01-02	<0.030	--	--	--	--	--	--	--	--	--	--
09...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
16...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	E0.003	<0.004
23...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	E0.003	<0.004
APR 26-26 26...	<0.030	--	--	--	--	--	--	--	--	--	--
MAY 02...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.007	<0.004
07...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.004	<0.004
14...	--	<0.004	<0.018	<0.002	0.011	<0.05	<0.035	<0.026	<0.017	0.006	<0.004
22...	--	<0.004	<0.018	<0.002	0.030	<0.05	<0.035	<0.026	<0.017	E0.003	<0.004
27...	--	<0.004	<0.018	<0.002	0.008	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
JUN 02...	--	<0.004	<0.018	<0.002	0.006	<0.05	<0.035	<0.026	<0.017	E0.003	<0.004
17...	--	<0.004	<0.018	<0.002	0.005	<0.05	<0.035	<0.026	<0.017	0.008	<0.004
JUL 03...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
14...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
22...	--	<0.004	<0.018	<0.002	0.024	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
29...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
AUG 06...	--	<0.004	--	<0.002	<0.005	<0.05	<0.035	--	--	<0.002	<0.004
12...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
21...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
27...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
SEP 03...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
09...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
17...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
25...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004



## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	NEB- URON, WATER, FLTRD, GF 0.7U REC (UG/L)	NORFLUR AZON, WATER, FLTRD, GF 0.7U REC (UG/L)	ORY- ZALIN, WATER, FLTRD, GF 0.7U REC (UG/L)	OXAMYL, WATER, FLTRD, GF 0.7U REC (UG/L)	P, P' DDD, TOTAL (UG/L)	P, P' DDE DISSOLV (UG/L)	P, P' DDE, TOTAL (UG/L)	P, P' DDT, TOTAL (UG/L)	PARA- THION, DIS- SOLVED (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
FEB 07...	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13	--	--	--	--	--	--	<0.100	--	<0.040	<0.100	--
20...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
MAR 06...	--	--	--	--	--	--	--	--	--	--	--
20...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
APR 01-02	--	--	--	--	--	--	<0.1	--	<0.040	<0.1	--
09...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
16...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
23...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
APR 26-26	--	--	--	--	--	--	<0.1	--	<0.040	<0.1	--
26...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
MAY 02...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
07...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
14...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
22...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
27...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
JUN 02...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
17...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
JUL 03...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
14...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
22...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
29...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	E0.002	--	--	<0.004
AUG 06...	<0.004	<0.003	--	--	--	--	--	<0.006	--	--	<0.004
12...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
21...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
27...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
SEP 03...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
09...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
17...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	E0.002	--	--	<0.004
25...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004

GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PIC- LORAM, WATER, FLTRD, GF 0.7U REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PHAM, WATER, FLTRD, GF 0.7U REC (UG/L)	PRO- POXUR, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.006	<0.004	<0.004	<0.002	<0.050	0.092	<0.007	<0.004	<0.013	<0.035	<0.035
FEB 07...	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13 20...	<0.006	<0.004	<0.004	<0.002	<0.050	0.047	<0.007	<0.004	<0.013	<0.035	<0.035
MAR 06...	--	--	--	--	--	--	--	--	--	--	--
MAR 20...	<0.006	<0.004	<0.004	<0.002	<0.05	0.048	<0.007	<0.004	<0.013	<0.035	<0.035
APR 01-02 09...	<0.006	<0.004	<0.004	<0.002	<0.05	0.045	<0.007	<0.004	<0.013	<0.035	<0.035
APR 16...	<0.006	<0.004	<0.004	<0.002	<0.05	0.052	<0.007	<0.004	<0.013	<0.035	<0.035
APR 23...	<0.006	<0.004	<0.004	<0.002	<0.05	0.057	<0.007	<0.004	<0.013	<0.035	<0.035
APR 26-26 26...	<0.006	<0.004	<0.040	<0.002	<0.05	0.032	<0.007	<0.004	<0.013	<0.035	<0.035
MAY 02...	<0.006	<0.004	<0.020	<0.002	<0.05	0.031	<0.007	<0.004	<0.013	<0.035	<0.035
MAY 07...	<0.006	<0.004	<0.004	<0.002	<0.05	0.032	<0.007	<0.004	<0.013	<0.035	<0.035
MAY 14...	<0.006	<0.004	<0.004	<0.002	<0.05	0.057	<0.007	<0.004	<0.013	<0.035	<0.035
MAY 22...	<0.006	<0.004	<0.004	<0.002	<0.05	0.042	<0.007	<0.004	<0.013	<0.035	<0.035
MAY 27...	<0.006	<0.004	<0.004	<0.002	<0.05	0.041	<0.007	<0.004	<0.013	<0.035	<0.035
JUN 02...	<0.006	<0.004	<0.004	<0.002	<0.05	0.064	<0.007	<0.004	<0.013	<0.035	<0.035
JUN 17...	<0.006	<0.004	<0.004	<0.002	<0.05	0.031	<0.007	<0.004	<0.013	<0.035	<0.035
JUL 03...	<0.006	<0.004	<0.004	<0.002	<0.05	0.016	<0.007	<0.004	<0.013	<0.035	<0.035
JUL 14...	<0.006	<0.004	<0.004	<0.002	<0.05	0.020	<0.007	<0.004	<0.013	<0.035	<0.035
JUL 22...	<0.006	<0.004	<0.004	<0.002	<0.05	0.023	<0.007	<0.004	<0.013	<0.035	<0.035
JUL 29...	<0.006	<0.004	<0.004	<0.002	<0.05	0.021	<0.007	<0.004	<0.013	<0.035	<0.035
AUG 06...	<0.006	<0.004	<0.004	<0.002	<0.05	0.018	<0.007	<0.004	<0.013	--	--
AUG 12...	<0.006	<0.004	<0.004	<0.002	<0.05	0.033	<0.007	<0.004	<0.013	<0.035	<0.035
AUG 21...	<0.006	<0.004	<0.004	<0.002	<0.05	0.028	<0.007	<0.004	<0.013	<0.035	<0.035
AUG 27...	<0.006	<0.004	<0.004	<0.002	<0.05	0.019	<0.007	<0.004	<0.013	<0.035	<0.035
SEP 03...	<0.006	<0.004	<0.004	<0.002	<0.05	0.028	<0.007	<0.004	<0.013	<0.035	<0.035
SEP 09...	<0.006	<0.004	<0.004	<0.002	<0.05	0.053	<0.007	<0.004	<0.013	<0.035	<0.035
SEP 17...	<0.006	<0.004	<0.004	<0.002	<0.05	0.027	<0.007	<0.004	<0.013	<0.035	<0.035
SEP 25...	<0.006	<0.004	<0.004	<0.002	<0.05	0.034	<0.007	<0.004	<0.013	<0.035	<0.035

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	SI- MAZINE, WATER, DISS, REC (UG/L)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- CLOPYR, WATER, FLTRD, GF 0.7U REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)
OCT 15...	--	--	--	--	--	--	--	--	--	--	--
NOV 06...	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.003	0.049	E0.333	<0.007	<0.013	<0.002	--	--	<0.001	<0.050	<0.002
FEB 07...	--	--	--	--	--	--	--	--	--	--	--
FEB 12-13 20...	-- 0.014	-- 0.119	-- 0.120	-- <0.007	-- <0.013	-- <0.002	<2.00 --	<0.100 --	-- <0.001	-- <0.050	-- <0.002
MAR 06...	--	--	--	--	--	--	--	--	--	--	--
MAR 20...	<0.003	0.033	E0.135	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
APR 01-02 09...	-- <0.003	-- 0.019	-- 0.207	-- <0.007	-- <0.013	-- <0.002	<2 --	<0.1 --	-- <0.001	-- <0.05	-- <0.002
APR 16...	<0.003	0.015	0.175	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
APR 23...	<0.003	0.013	E0.214	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
APR 26-26 26...	-- <0.003	-- <0.005	-- 2.83	-- <0.007	-- <0.013	-- <0.002	<2 --	<0.1 --	-- <0.001	-- 0.81	-- <0.002
MAY 02...	<0.003	0.010	0.557	<0.007	<0.013	<0.002	--	--	<0.001	0.07	<0.002
MAY 07...	<0.003	0.009	E0.752	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
MAY 14...	<0.003	0.012	E0.522	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
MAY 22...	<0.003	0.008	1.07	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
MAY 27...	<0.003	0.010	0.546	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUN 02...	<0.003	<0.005	1.13	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUN 17...	<0.003	0.009	0.510	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUL 03...	<0.003	<0.005	0.049	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUL 14...	<0.003	E0.005	0.095	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUL 22...	<0.003	<0.005	E0.084	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUL 29...	<0.003	E0.004	E0.104	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
AUG 06...	<0.003	E0.004	0.079	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
AUG 12...	<0.003	E0.005	E0.178	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
AUG 21...	<0.003	<0.005	0.103	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
AUG 27...	<0.003	<0.005	0.075	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
SEP 03...	<0.003	E0.004	0.136	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
SEP 09...	<0.003	0.007	0.116	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
SEP 17...	<0.003	0.008	0.091	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
SEP 25...	<0.003	0.016	0.041	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002

# GUADALUPE RIVER BASIN

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## 08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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.	1996	88.8	842	487	117	77	18.5	73	17.5	300
NOV.	1996	356.4	736	424	408	64	61.3	62	59.8	270
DEC.	1996	253	629	359	245	47	31.8	50	34.0	240
JAN.	1997	120.2	787	453	147	68	22.0	66	21.5	290
FEB.	1997	431	570	326	379	42	49.4	45	52.7	220
MAR.	1997	400.3	521	296	320	35	37.7	40	42.9	200
APR.	1997	2469.8	373	211	1400	22	146	27	181	150
MAY	1997	1764	468	266	1270	31	148	36	169	180
JUNE	1997	5394	278	156	2270	14	207	19	282	120
JULY	1997	1117	592	337	1020	42	126	46	139	230
AUG.	1997	348.2	649	371	349	49	45.7	52	48.6	250
SEPT	1997	530.8	550	313	449	37	53.3	42	60.4	220
TOTAL		13273.5	**	**	8370	**	946	**	1110	**
WTD.AVG.		36	412	234	**	26	**	31	**	160

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	610	532	561	1150	1120	1130	429	400	414	595	438	507
2	628	592	618	1120	1110	1120	482	428	451	644	570	609
3	592	537	551	1160	1120	1140	528	482	505	732	644	682
4	589	538	564	1160	1150	1150	596	528	560	764	716	747
5	687	589	626	1150	1130	1140	762	595	670	716	697	703
6	785	687	752	1130	1120	1130	762	530	612	726	706	719
7	805	771	787	1130	1120	1120	537	526	529	715	696	702
8	815	796	806	1150	1120	1120	558	537	547	890	703	757
9	796	743	773	1280	1150	1210	607	558	582	874	714	804
10	743	720	726	1190	1180	1190	646	607	626	715	634	665
11	763	730	742	1180	1030	1130	727	646	685	730	646	687
12	815	758	781	1030	988	1010	804	727	785	759	730	752
13	838	812	826	1000	981	988	810	784	799	795	755	772
14	888	838	861	992	963	982	824	810	817	842	795	821
15	921	888	904	1110	962	1010	835	679	806	881	842	868
16	941	919	931	1140	918	986	679	515	567	904	881	896
17	953	940	947	918	809	855	598	575	583	925	904	916
18	952	947	950	847	810	827	620	598	612	938	915	929
19	964	952	960	939	847	888	619	609	615	941	921	931
20	989	964	975	1020	939	986	609	602	605	948	922	940
21	1000	988	996	1020	938	988	631	607	619	965	944	957
22	998	988	993	938	896	911	664	631	646	958	905	938
23	1020	991	1000	931	896	909	694	664	680	954	886	918
24	1050	1020	1040	937	260	718	713	694	705	950	883	927
25	1070	1050	1060	590	282	458	730	712	724	884	849	867
26	1120	1070	1080	591	549	576	731	727	729	887	850	876
27	1150	1120	1140	557	539	544	735	650	694	920	884	908
28	1150	1150	1150	600	557	574	735	561	634	945	909	931
29	1150	1130	1140	692	390	539	624	582	605	957	927	942
30	1160	1130	1140	401	359	377	582	550	567	949	924	941
31	1160	1150	1160	---	---	---	852	574	678	946	922	935
MONTH	1160	532	888	1280	260	924	852	400	634	965	438	824





GUADALUPE RIVER BASIN

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08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	8.0	7.9	8.0	7.7	7.6	7.7	7.9	7.8	7.8	7.9	7.7	7.8
2	8.0	7.9	8.0	7.7	7.6	7.6	7.9	7.8	7.8	7.9	7.8	7.8
3	7.9	7.9	7.9	7.8	7.7	7.7	7.9	7.8	7.8	7.9	7.8	7.9
4	7.9	7.8	7.8	7.8	7.7	7.8	7.8	7.8	7.8	7.9	7.9	7.9
5	7.9	7.7	7.8	7.8	7.8	7.8	7.9	7.8	7.9	7.9	7.8	7.9
6	7.9	7.8	7.9	7.8	7.8	7.8	7.9	7.8	7.9	7.9	7.8	7.9
7	7.9	7.8	7.8	7.9	7.8	7.8	7.8	7.8	7.8	7.9	7.8	7.9
8	7.8	7.7	7.8	7.9	7.7	7.8	7.8	7.7	7.7	8.1	7.9	8.0
9	7.7	7.6	7.7	8.0	7.9	7.9	7.8	7.7	7.7	8.1	7.8	8.0
10	7.8	7.6	7.7	8.0	8.0	8.0	7.7	7.7	7.7	7.9	7.8	7.9
11	7.7	7.6	7.7	8.0	7.9	8.0	7.7	7.6	7.7	7.9	7.8	7.9
12	7.7	7.7	7.7	8.0	7.9	8.0	7.7	7.6	7.7	8.0	7.8	7.9
13	7.7	7.7	7.7	8.0	7.9	7.9	7.8	7.7	7.7	8.0	7.9	7.9
14	7.8	7.7	7.7	7.9	7.9	7.9	7.8	7.7	7.7	8.1	7.9	8.0
15	7.8	7.7	7.8	8.0	7.9	7.9	8.0	7.7	7.8	8.2	8.0	8.1
16	7.8	7.7	7.7	8.0	7.8	8.0	7.9	7.7	7.8	8.2	8.0	8.1
17	7.8	7.7	7.7	7.9	7.8	7.9	7.8	7.7	7.8	8.2	7.9	8.0
18	7.7	7.7	7.7	7.8	7.8	7.8	7.9	7.8	7.8	8.1	7.9	8.0
19	7.7	7.7	7.7	7.9	7.8	7.9	7.8	7.7	7.8	8.1	7.9	7.9
20	7.8	7.7	7.7	8.0	7.9	7.9	7.8	7.8	7.8	8.0	7.8	7.9
21	7.8	7.7	7.7	7.9	7.9	7.9	7.8	7.8	7.8	8.0	7.8	7.9
22	7.8	7.7	7.7	7.9	7.9	7.9	7.8	7.6	7.7	8.0	7.8	7.9
23	7.7	7.6	7.7	7.9	7.8	7.9	7.8	7.6	7.7	7.9	7.8	7.8
24	7.7	7.7	7.7	8.0	7.7	7.8	7.8	7.7	7.7	7.9	7.7	7.8
25	7.8	7.7	7.7	7.9	7.8	7.9	7.9	7.7	7.8	8.0	7.7	7.8
26	7.8	7.8	7.8	7.9	7.8	7.9	7.9	7.8	7.8	7.9	7.7	7.8
27	7.8	7.8	7.8	7.9	7.9	7.9	8.0	7.8	7.9	7.9	7.7	7.8
28	7.8	7.8	7.8	7.9	7.9	7.9	8.1	7.9	7.9	7.9	7.7	7.8
29	7.8	7.7	7.7	8.0	7.8	7.9	8.0	7.9	7.9	8.0	7.7	7.8
30	7.7	7.6	7.7	7.9	7.8	7.8	8.0	7.7	7.8	8.0	7.8	7.9
31	7.7	7.7	7.7	---	---	---	8.1	7.7	7.9	8.1	7.8	7.9
MONTH	8.0	7.6	7.8	8.0	7.6	7.9	8.1	7.6	7.8	8.2	7.7	7.9

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	8.1	7.9	8.0	8.0	7.8	7.9	8.1	7.9	8.0	8.1	8.0	8.1
2	8.1	7.9	8.0	8.0	7.7	7.9	8.1	7.9	8.0	8.2	8.1	8.1
3	8.0	7.8	7.9	7.8	7.7	7.7	8.1	8.0	8.1	8.2	8.2	8.2
4	7.9	7.8	7.8	---	---	---	8.1	8.0	8.0	8.2	8.2	8.2
5	7.9	7.8	7.8	7.7	7.7	7.7	8.0	8.0	8.0	8.2	8.2	8.2
6	7.9	7.8	7.8	7.8	7.7	7.7	8.0	7.9	8.0	8.3	8.2	8.2
7	8.0	7.8	7.9	7.7	7.7	7.7	7.9	7.8	7.9	8.3	8.2	8.2
8	8.1	7.8	7.9	7.7	7.7	7.7	7.9	7.8	7.8	8.3	8.2	8.2
9	8.1	8.0	8.0	7.8	7.7	7.7	7.8	7.7	7.7	8.3	7.9	8.2
10	8.1	8.0	8.0	7.8	7.7	7.7	7.7	7.7	7.7	8.2	7.9	8.1
11	8.1	7.9	8.0	8.0	7.7	7.8	7.9	7.8	7.9	8.2	8.2	8.2
12	8.2	7.9	8.1	7.9	7.8	7.8	7.9	7.9	7.9	---	---	---
13	8.0	7.9	8.0	7.8	7.8	7.8	8.0	7.9	7.9	---	---	---
14	7.9	7.8	7.9	7.8	7.7	7.8	8.0	8.0	8.0	---	---	---
15	7.9	7.9	7.9	7.9	7.8	7.8	8.0	8.0	8.0	---	---	---
16	8.0	7.9	7.9	7.9	7.9	7.9	8.1	8.0	8.1	---	---	---
17	8.1	7.9	8.0	7.9	7.9	7.9	8.1	8.0	8.1	---	---	---
18	8.1	7.9	8.0	7.9	7.8	7.8	8.2	8.0	8.1	---	---	---
19	8.0	7.9	8.0	8.0	7.8	7.9	8.2	8.1	8.1	8.1	8.1	8.1
20	8.1	7.9	8.0	8.0	7.8	7.9	8.2	8.1	8.1	8.5	7.8	8.1
21	7.9	7.7	7.8	7.9	7.8	7.9	8.2	8.1	8.2	8.2	8.1	8.1
22	7.9	7.6	7.7	8.0	7.9	7.9	8.2	8.1	8.1	8.2	8.0	8.1
23	7.9	7.7	7.8	8.0	7.9	7.9	8.2	8.1	8.1	8.2	8.0	8.1
24	7.9	7.8	7.8	8.0	7.9	7.9	8.2	8.1	8.1	8.1	8.0	8.0
25	7.9	7.8	7.8	8.0	7.9	7.9	8.2	8.1	8.1	8.1	8.1	8.1
26	7.9	7.8	7.9	8.0	7.8	7.9	9.0	7.7	8.3	8.1	8.0	8.0
27	7.9	7.8	7.8	8.0	7.9	7.9	9.0	8.0	8.2	8.1	8.1	8.1
28	7.9	7.8	7.8	8.0	7.9	7.9	8.0	7.7	7.9	8.2	8.0	8.1
29	---	---	---	8.0	7.9	8.0	8.0	8.0	8.0	8.1	8.0	8.1
30	---	---	---	8.0	7.9	7.9	8.0	8.0	8.0	8.1	7.6	7.9
31	---	---	---	8.0	7.9	7.9	---	---	---	7.7	7.5	7.6
MONTH	8.2	7.6	7.9	8.0	7.7	7.8	9.0	7.7	8.0	8.5	7.5	8.1

## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	7.7	7.6	7.7	8.0	7.9	8.0	8.1	8.0	8.0	7.9	7.8	7.8
2	7.9	7.7	7.8	8.0	7.9	7.9	8.1	8.0	8.1	7.9	7.8	7.8
3	8.0	7.9	7.9	8.0	7.9	7.9	8.1	8.0	8.1	7.9	7.8	7.9
4	8.1	7.7	7.9	8.0	7.9	7.9	8.1	8.0	8.1	7.9	7.4	7.7
5	7.8	7.6	7.7	8.0	7.9	8.0	8.1	8.0	8.1	7.7	7.4	7.5
6	7.7	7.6	7.6	8.0	8.0	8.0	8.0	7.9	8.0	7.7	7.6	7.6
7	7.8	7.6	7.7	8.1	8.0	8.0	7.9	7.8	7.9	7.7	7.6	7.7
8	7.7	7.6	7.7	8.1	8.0	8.1	8.0	7.8	7.9	7.8	7.7	7.8
9	7.8	7.6	7.7	8.1	8.1	8.1	8.0	7.9	7.9	7.8	7.7	7.7
10	7.7	7.6	7.6	8.1	8.1	8.1	8.0	7.9	8.0	7.8	7.7	7.7
11	7.7	7.7	7.7	8.1	8.0	8.1	8.0	7.9	8.0	7.8	7.7	7.7
12	7.7	7.7	7.7	8.1	8.0	8.0	8.0	7.9	7.9	7.8	7.7	7.7
13	7.7	7.7	7.7	8.1	8.0	8.1	8.0	7.9	7.9	7.8	7.7	7.7
14	7.7	7.7	7.7	8.1	8.0	8.1	8.0	7.9	7.9	7.8	7.7	7.8
15	8.0	7.4	7.6	8.1	8.0	8.1	8.0	7.8	7.9	7.9	7.8	7.8
16	7.7	7.6	7.7	8.1	8.1	8.1	7.9	7.9	7.9	7.9	7.8	7.9
17	7.7	7.6	7.7	8.2	8.1	8.1	8.0	7.9	7.9	7.9	7.8	7.9
18	7.8	7.7	7.7	8.2	8.1	8.1	7.9	7.9	7.9	8.0	7.9	7.9
19	7.8	7.7	7.8	8.2	8.1	8.1	8.2	7.7	7.8	8.0	7.9	7.9
20	7.8	7.8	7.8	8.2	8.1	8.1	7.8	7.7	7.7	8.0	7.9	7.9
21	8.0	7.5	7.8	8.1	7.9	8.0	7.8	7.7	7.8	8.0	7.9	7.9
22	8.1	7.6	7.8	8.0	7.8	7.9	7.8	7.7	7.8	8.0	7.6	7.9
23	8.1	7.6	7.9	8.0	7.9	7.9	7.8	7.8	7.8	7.9	7.7	7.8
24	8.2	7.9	8.1	8.1	7.9	8.0	7.8	7.8	7.8	7.8	7.6	7.7
25	8.1	7.9	8.0	8.1	7.9	8.0	7.9	7.8	7.8	7.8	7.8	7.8
26	8.0	7.8	7.9	8.1	8.0	8.1	7.9	7.8	7.8	7.9	7.8	7.8
27	8.1	7.7	7.9	8.1	8.0	8.1	7.9	7.8	7.8	7.9	7.9	7.9
28	7.8	7.7	7.8	8.1	8.1	8.1	7.9	7.8	7.8	8.0	7.9	7.9
29	7.9	7.8	7.9	8.1	8.0	8.1	7.9	7.8	7.8	8.1	7.8	8.0
30	8.0	7.9	7.9	8.1	8.0	8.0	7.9	7.8	7.9	8.1	7.9	8.0
31	---	---	---	8.1	8.0	8.0	7.9	7.8	7.9	---	---	---
MONTH	8.2	7.4	7.8	8.2	7.8	8.0	8.2	7.7	7.9	8.1	7.4	7.8
YEAR	9.0	7.4	7.9									

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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



## GUADALUPE RIVER BASIN

08178800 SALADO CREEK (LOWER STATION) AT SAN ANTONIO, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	7.7	6.9	7.4	3.0	2.1	2.6	10.2	9.5	9.8	8.8	7.9	8.3
2	7.5	6.9	7.3	2.4	1.5	1.8	10.3	9.4	9.9	8.4	7.3	7.9
3	7.0	6.0	6.4	3.3	2.4	2.8	10.1	8.3	9.6	7.9	6.6	7.4
4	6.0	5.3	5.7	4.0	2.7	3.2	9.6	8.9	9.2	7.6	6.1	6.7
5	5.5	4.9	5.2	4.7	3.4	4.0	10.5	8.7	9.7	7.3	5.8	6.3
6	5.8	5.4	5.6	4.9	4.1	4.5	10.1	9.2	9.7	7.3	5.6	6.5
7	6.0	5.2	5.7	4.4	2.6	3.4	9.4	8.0	8.9	8.4	6.5	7.3
8	6.0	5.2	5.6	4.9	2.2	3.5	8.7	7.5	8.2	10.0	8.2	9.0
9	6.1	5.1	5.5	6.7	4.8	5.4	8.7	7.6	8.1	10.9	9.8	10.5
10	5.5	5.2	5.4	6.9	5.7	6.4	8.3	7.1	7.7	10.9	9.9	10.4
11	5.3	4.9	5.1	6.9	5.9	6.4	7.9	6.3	7.0	10.8	9.4	10.2
12	5.1	4.4	4.8	6.6	5.5	6.1	6.8	5.0	5.9	11.4	9.3	10.6
13	5.1	4.5	4.8	5.8	5.2	5.5	6.6	4.6	5.5	12.1	10.3	11.2
14	5.4	4.4	4.9	6.2	5.0	5.4	5.8	3.9	4.6	13.0	10.8	12.0
15	5.1	4.4	4.7	6.3	4.9	5.6	7.6	4.3	5.6	13.7	11.9	12.7
16	4.8	4.1	4.4	7.0	5.1	6.5	---	---	---	13.8	11.5	12.5
17	4.4	3.7	4.1	6.4	4.8	5.4	---	---	---	14.3	11.3	12.5
18	4.3	2.8	3.5	4.9	3.9	4.3	---	---	---	14.3	11.1	12.5
19	4.2	2.9	3.5	6.3	4.1	5.2	---	---	---	14.4	10.7	12.4
20	4.4	3.0	3.7	6.0	5.6	5.8	---	---	---	13.1	10.1	11.6
21	4.1	3.3	3.8	5.7	4.6	5.0	---	---	---	13.0	9.5	11.1
22	3.9	2.7	3.1	5.1	4.4	4.8	---	---	---	12.9	9.0	11.1
23	3.6	2.4	2.9	5.1	4.2	4.6	---	---	---	10.7	8.8	9.5
24	3.9	3.2	3.6	8.4	4.2	6.7	---	---	---	13.5	7.7	10.3
25	4.8	3.5	4.4	8.7	7.9	8.5	---	---	---	14.0	9.2	11.4
26	4.9	4.4	4.7	9.7	8.3	9.0	---	---	---	13.7	9.1	11.3
27	4.7	3.0	3.8	9.8	8.9	9.3	---	---	---	13.1	8.7	10.4
28	---	---	---	10.1	6.3	9.5	---	---	---	11.3	8.0	9.5
29	---	---	---	10.8	9.8	10.2	---	---	---	14.0	9.7	11.3
30	3.0	2.4	2.7	10.1	9.7	9.9	---	---	---	14.4	10.9	12.4
31	3.0	2.6	2.8	---	---	---	9.8	8.8	9.3	15.0	11.4	13.0
MONTH	7.7	2.4	4.7	10.8	1.5	5.7	10.5	3.9	8.0	15.0	5.6	10.3

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	15.1	11.3	13.2	9.6	7.3	8.3	7.4	5.6	6.7	6.4	5.9	6.2
2	14.7	10.8	12.6	8.2	6.7	7.6	7.8	6.3	7.2	6.0	5.5	5.8
3	12.9	9.3	10.6	7.8	7.4	7.6	7.6	6.9	7.3	5.8	5.6	5.7
4	11.2	7.8	9.3	---	---	---	7.6	6.8	7.2	5.8	5.7	5.7
5	10.5	7.6	8.8	7.3	6.9	7.1	7.8	7.5	7.6	5.7	5.1	5.4
6	10.2	7.6	8.5	7.8	6.9	7.4	7.9	7.2	7.7	5.8	5.1	5.4
7	10.6	8.0	9.1	7.5	6.9	7.3	8.6	7.2	7.8	5.6	4.8	5.2
8	11.3	8.4	9.8	7.1	6.6	6.9	8.2	6.0	7.6	5.3	4.8	5.1
9	12.5	9.9	10.9	7.2	6.4	6.7	7.2	6.9	7.0	5.3	4.7	5.1
10	13.2	10.0	11.1	6.6	6.1	6.4	7.9	6.7	7.2	4.9	4.5	4.7
11	12.7	9.7	11.2	7.8	5.7	6.7	7.8	5.7	7.1	5.1	4.5	5.0
12	12.5	9.4	10.4	7.8	7.1	7.6	7.5	6.7	7.2	---	---	---
13	10.4	9.6	10.0	7.4	6.9	7.2	8.4	7.4	7.9	---	---	---
14	10.2	9.8	10.0	7.2	5.8	6.8	8.9	8.2	8.5	---	---	---
15	10.6	9.5	10.2	7.9	7.0	7.4	8.5	7.9	8.3	---	---	---
16	10.6	9.6	10.1	8.0	7.5	7.8	8.4	7.7	8.1	---	---	---
17	10.8	9.5	10.0	8.3	7.5	8.0	8.4	7.6	8.0	---	---	---
18	10.6	9.1	9.7	7.8	7.0	7.2	8.7	7.2	8.3	---	---	---
19	9.5	8.3	8.7	8.1	5.5	7.4	8.8	7.9	8.3	4.7	4.3	4.5
20	8.8	7.5	8.0	8.0	7.1	7.6	8.7	7.6	8.1	5.8	4.3	5.3
21	10.2	7.9	9.1	7.9	6.8	7.4	8.2	6.8	7.6	5.7	4.8	5.2
22	11.0	9.0	9.8	7.7	4.9	7.1	7.3	6.3	6.7	5.6	4.6	4.9
23	10.4	9.1	9.7	7.6	6.1	7.0	7.0	5.8	6.5	5.8	5.1	5.6
24	9.7	8.8	9.3	6.9	4.5	6.4	6.8	5.8	6.3	5.5	5.1	5.3
25	10.0	8.7	9.5	6.2	5.1	5.6	6.4	5.7	6.0	5.4	4.8	5.1
26	10.0	8.9	9.5	6.6	4.2	5.8	9.0	5.7	7.7	4.8	4.4	4.6
27	9.7	8.8	9.2	6.7	5.2	6.1	9.1	8.2	8.8	4.6	4.3	4.4
28	9.4	8.1	8.7	6.4	3.9	5.8	8.8	7.7	8.2	5.2	3.7	4.7
29	---	---	---	5.8	4.4	5.5	7.9	7.2	7.6	4.6	4.2	4.3
30	---	---	---	5.4	3.9	4.8	7.2	6.4	6.9	5.4	4.1	4.7
31	---	---	---	5.9	3.9	5.0	---	---	---	5.1	4.3	4.8
MONTH	15.1	7.5	9.9	9.6	3.9	6.8	9.1	5.6	7.5	6.4	3.7	5.1





## GUADALUPE RIVER BASIN

08178880 MEDINA RIVER AT BANDERA, TX

**LOCATION.**--Lat 29°43'25", long 99°04'11", Bandera County, Hydrologic Unit 12100302, on left bank, 40 ft downstream from centerline of State Highway 173 at Bandera, 1.9 mi upstream from Bandera Creek, and 5.6 mi downstream from Indian Creek.

**DRAINAGE AREA.**--427 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1982 to current year.

Water-quality records.--Chemical, biochemical, and pesticide analyses: January 1983 to September 1993.

**GAGE.**--Water-stage recorder. Datum of gage is 1,189.46 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation. There are several small diversions upstream from station. Telephone telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1880, 46.62 ft Aug. 2, 1978.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,400 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	2100	4,180	11.55	June 21	1830	6,260	13.29
Apr. 4	0430	7,700	14.34	June 22	0515	52,000	24.49
Apr. 5	0015	1,530	7.91				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	117	105	50	30	131	110	213	196	715	142	57
2	19	96	94	48	32	131	118	207	187	646	133	56
3	17	85	85	48	31	140	186	195	178	587	128	55
4	17	81	81	48	29	128	2350	183	172	537	123	62
5	17	76	85	46	28	122	1260	176	169	493	116	59
6	18	71	84	43	27	106	859	171	183	456	111	58
7	16	67	77	42	31	99	617	170	171	425	171	56
8	16	61	69	59	30	98	503	169	164	398	131	55
9	15	54	66	58	30	99	432	182	176	382	120	53
10	14	50	64	54	31	100	397	176	185	359	116	53
11	13	47	64	47	29	138	381	165	174	337	109	52
12	12	46	63	43	43	294	335	164	159	318	104	51
13	12	44	60	38	41	273	309	183	148	304	99	50
14	11	44	60	36	40	237	294	173	143	290	95	49
15	11	43	83	39	40	215	277	162	170	273	93	48
16	13	47	72	38	37	207	265	156	147	257	89	47
17	13	52	73	36	32	206	255	151	150	245	85	45
18	12	50	68	35	30	203	246	146	144	232	82	44
19	10	44	59	35	30	188	239	143	137	221	80	43
20	11	43	52	36	412	177	227	504	131	211	79	42
21	12	40	52	36	491	167	215	346	1860	209	77	42
22	10	38	54	37	268	158	204	264	16800	222	75	46
23	8.2	37	55	37	224	154	197	260	3340	200	79	47
24	8.4	53	51	36	198	144	191	370	2050	187	77	44
25	10	65	47	35	182	146	192	324	1730	170	76	43
26	12	70	48	34	170	127	541	284	1420	164	72	42
27	13	64	48	37	151	123	352	272	1170	158	69	42
28	897	62	49	32	140	118	286	249	1020	152	66	41
29	717	73	49	31	---	111	253	228	900	145	65	40
30	230	97	47	31	---	107	230	214	800	139	62	39
31	153	---	48	30	---	105	---	205	---	150	58	---
TOTAL	2357.6	1817	2012	1255	2857	4752	12321	6805	34374	9582	2982	1461
MEAN	76.1	60.6	64.9	40.5	102	153	411	220	1146	309	96.2	48.7
MAX	897	117	105	59	491	294	2350	504	16800	715	171	62
MIN	8.2	37	47	30	27	98	110	143	131	139	58	39
AC-FT	4680	3600	3990	2490	5670	9430	24440	13500	68180	19010	5910	2900

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1997, BY WATER YEAR (WY)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997
MEAN	96.1	85.7	174	137	141	161	134	182	379	138	52.1	72.8			
MAX	630	373	1278	638	922	985	547	696	2785	440	156	249			
(WY)	1987	1987	1992	1992	1992	1992	1992	1987	1987	1988	1987	1986			
MIN	25.7	27.3	27.0	28.4	35.8	32.7	28.6	14.6	8.77	2.36	2.00	6.80			
(WY)	1985	1994	1994	1990	1996	1996	1996	1996	1996	1996	1996	1984			

SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1983 - 1997

ANNUAL TOTAL	12434.99	82575.6	146
ANNUAL MEAN	34.0	226	560
HIGHEST ANNUAL MEAN			33.7
LOWEST ANNUAL MEAN			1987
HIGHEST DAILY MEAN	897	Oct 28	16800
LOWEST DAILY MEAN	.00	Aug 4	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 4	.00
INSTANTANEOUS PEAK FLOW		52000	55800
INSTANTANEOUS PEAK STAGE		24.49	24.90
INSTANTANEOUS LOW FLOW		38	.00
ANNUAL RUNOFF (AC-FT)	24660	163800	105800
10 PERCENT EXCEEDS	62	348	271
50 PERCENT EXCEEDS	26	96	61
90 PERCENT EXCEEDS	.87	30	20

# GUADALUPE RIVER BASIN

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08180640 MEDINA RIVER AT LA COSTE, TX

**LOCATION.**--Lat 29°19'26", long 98°48'46", Medina County, Hydrologic Unit 12100302, at downstream side of bridge on Farm Road 471, 1.0 mi north of La Coste, 5.0 mi upstream from Sherer Creek, and 27.4 mi upstream from mouth.

**DRAINAGE AREA.**--805 mi<sup>2</sup>, of which 634 mi<sup>2</sup> is above dam forming Medina Lake.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--December 1986 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 667.15 ft above sea level.

**REMARKS.**--Records good. Since installation of gage in water year 1987, at least 10% of contributing drainage area has been regulated by Medina Lake and by Medina Diversion Lake. A large part of the streamflow is lost into the Edwards and associated limestones where the Balcones Fault crosses the basin between the upstream end of Medina Lake and about 5 mi downstream from Medina Dam, or 0.9 mi downstream from the diversion dam. There are several small diversions below Medina Diversion Dam. Satellite telemeter at station.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	31	28	27	24	25	29	34	33	e1350	87	54
2	25	29	26	27	24	33	59	33	32	e1190	92	54
3	25	29	25	26	24	33	73	31	32	e1050	87	55
4	26	30	24	26	25	29	50	30	34	e934	82	55
5	31	31	24	24	25	26	43	30	35	e837	76	58
6	29	32	24	22	25	24	40	30	37	e752	70	54
7	28	32	22	21	25	22	35	32	49	e674	65	52
8	27	32	21	23	26	22	33	33	41	e602	65	52
9	26	32	19	24	26	22	33	40	54	e538	64	52
10	26	33	19	21	25	22	32	40	59	e485	62	52
11	26	33	18	19	25	26	33	34	57	450	60	50
12	27	33	18	18	32	33	32	45	43	394	59	50
13	27	33	17	18	36	30	32	64	43	349	58	50
14	26	34	18	18	32	26	32	36	42	319	57	49
15	26	34	23	17	28	23	32	33	63	296	56	50
16	26	34	25	16	26	23	32	33	55	281	56	49
17	26	34	23	16	25	24	34	32	47	262	56	50
18	25	33	22	15	25	24	35	31	42	241	55	49
19	25	34	23	15	25	24	36	30	40	221	54	49
20	26	34	26	15	50	24	37	32	39	206	54	50
21	27	34	28	15	43	25	37	32	79	199	54	51
22	28	33	29	16	29	24	37	32	7140	206	55	52
23	26	38	30	18	26	24	35	41	10400	214	55	57
24	26	56	30	20	25	23	35	37	8040	204	59	53
25	28	41	30	21	25	23	37	35	5310	191	56	51
26	29	35	29	23	28	23	45	34	3740	176	55	50
27	30	34	29	23	27	22	42	34	2780	160	55	50
28	31	34	29	23	25	22	38	41	2170	134	55	49
29	31	36	29	22	---	24	36	37	1820	118	55	48
30	31	32	28	22	---	24	35	34	1560	102	55	48
31	31	---	27	23	---	25	---	34	---	88	54	---
TOTAL	845	1020	763	634	781	774	1139	1094	43916	13223	1923	1543
MEAN	27.3	34.0	24.6	20.5	27.9	25.0	38.0	35.3	1464	427	62.0	51.4
MAX	31	56	30	27	50	33	73	64	10400	1350	92	58
MIN	24	29	17	15	24	22	29	30	32	88	54	48
AC-FT	1680	2020	1510	1260	1550	1540	2260	2170	87110	26230	3810	3060

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1987 - 1997#, BY WATER YEAR (WY)

MEAN	43.0	50.8	76.8	153	276	249	151	281	763	173	65.2	49.1
MAX	84.8	138	319	647	2256	1943	1052	1335	4718	702	213	125
(WY)	1988	1993	1992	1992	1992	1992	1992	1992	1987	1987	1987	1987
MIN	23.5	21.4	21.6	20.5	24.9	24.3	26.4	25.5	17.7	22.7	21.9	18.8
(WY)	1992	1990	1990	1997	1991	1990	1996	1990	1990	1989	1989	1989

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1987 - 1997#
ANNUAL TOTAL	10352	67655	
ANNUAL MEAN	28.3	185	140
HIGHEST ANNUAL MEAN			836
LOWEST ANNUAL MEAN			29.1
HIGHEST DAILY MEAN	106	10400	18900
LOWEST DAILY MEAN	12	15	12
ANNUAL SEVEN-DAY MINIMUM	13	15	13
INSTANTANEOUS PEAK FLOW		24200	24600
INSTANTANEOUS PEAK STAGE		23.97	24.05
ANNUAL RUNOFF (AC-FT)	20530	134200	101600
10 PERCENT EXCEEDS	34	144	320
50 PERCENT EXCEEDS	28	33	38
90 PERCENT EXCEEDS	23	23	24

e Estimated

# Period of regulated streamflow.

## GUADALUPE RIVER BASIN

08180640 MEDINA RIVER AT LA COSTE, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: February 1987 to August 1995, April 1996 to September 1997. Pesticide analyses: April 1971 to September 1981, April 1996 to September 1997. Sediment analyses: April 1996 to September 1997.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: January 1987 to September 1995.

pH: January 1987 to September 1995.

WATER TEMPERATURE: January 1987 to September 1995.

DISSOLVED OXYGEN: January 1987 to September 1995.

**INSTRUMENTATION.**--Beginning January 1987, a four-parameter water-quality monitor continuously recorded specific conductance, pH, water temperature, and dissolved oxygen at this station. The monitor was removed September 30, 1995. In March 1996, the monitor was re-installed for the South Central Texas NAWQA program.

**REMARKS.**--Interruptions in the record were due to malfunction of the instrument. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum, 720 microsiemens Sept. 3, 4, 1987; minimum, 135 microsiemens May 6, 1993.

pH: Maximum, 8.7 units June 20, 1989; minimum, 6.8 units Aug. 4, 5, 1989.

WATER TEMPERATURE: Maximum, 30.5°C June 24, 26, 27, 1990; minimum, 2.5°C Dec. 24, 1989.

DISSOLVED OXYGEN: Maximum, 13.1 mg/L Jan. 10, 11, 1988; minimum, 3.7 mg/L May 23, 1992.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	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)
APR 16...	1030	23	545	8.1	18.0	7.2	77	240	63	67
MAY 23...	1000	22	510	7.8	26.0	6.0	77	230	56	66
JUN 24...	1030	35	500	8.1	28.0	6.3	83	220	50	61
AUG 06...	1015	29	510	8.0	28.0	6.0	79	220	50	63
SEP 04...	1000	18	495	7.9	26.0	5.4	69	220	44	62
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 SO4)	CHLORIDE, DIS-SOLVED (MG/L AS CL)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
APR 16...	17	16	0.5	13	2.0	170	56	16	0.30	10
MAY 23...	17	14	0.4	11	1.9	180	54	14	0.30	13
JUN 24...	16	12	0.4	11	1.9	170	56	14	0.30	12
AUG 06...	16	13	0.4	11	1.8	170	56	14	0.30	13
SEP 04...	15	13	0.4	11	2.0	170	51	15	0.20	11
DATE		SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)	NITROGEN, NITRATE DIS-SOLVED (MG/L AS N)	NITROGEN, NITRITE DIS-SOLVED (MG/L AS N)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
APR 16...	304	308	2.19	0.010	2.20	0.020	2.5	0.28	<0.20	0.30
MAY 23...	315	298	1.59	0.010	1.60	0.040	1.9	0.26	<0.20	0.30
JUN 24...	286	285	1.49	0.010	1.50	0.050	1.8	0.25	<0.20	0.30
AUG 06...	293	292	1.99	0.010	2.00	0.020	2.3	0.28	<0.20	0.30
SEP 04...	260	283	2.09	0.010	2.10	<0.015	2.4	0.30	<0.20	0.30

# GUADALUPE RIVER BASIN

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08180640 MEDINA RIVER AT LA COSTE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SEDI- MENT, SUS- PENDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	
		DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)
APR 16...		0.030	0.010	0.010	0.03	1.8	0.3	--	--	<3	2	
MAY 23...		0.020	<0.010	<0.010	--	1.7	0.5	3.4	58	<3	1	
JUN 24...		<0.010	<0.010	<0.010	--	1.8	0.5	--	--	<3	<1	
AUG 06...		0.030	0.030	0.010	0.03	1.5	0.6	4.1	52	<3	1	
SEP 04...		0.030	<0.010	<0.010	--	1.7	0.70	2.3	47	<3	1	
OCT 07...	1015	29	565	8.1	22.0	4.9	58	240	41	70	16	17
NOV 08...	1000	32	550	8.1	19.0	6.8	75	240	46	69	17	15
DEC 06...	1000	24	545	8.0	16.0	9.1	95	250	63	72	18	15
JAN 24...	1000	21	585	7.7	15.0	10.0	102	260	65	74	18	19
MAR 05...	0930	26	555	7.7	18.0	8.2	89	240	60	71	16	17
MAR 21...	0930	25	590	7.7	19.0	7.9	88	250	39	72	18	21
APR 08...	1100	33	595	7.7	20.0	8.2	93	240	59	68	17	24
APR 16...	1200	32	580	7.7	19.0	9.3	103	240	36	69	17	22
APR 22...	1000	37	555	7.5	22.0	6.5	77	240	48	67	17	15
MAY 02...	1345	33	540	7.7	25.0	7.7	97	240	53	67	17	15
MAY 08...	1245	33	545	7.5	24.0	7.1	87	250	59	70	17	15
MAY 14...	1245	36	445	7.5	23.0	7.0	84	190	--	55	13	12
MAY 21...	1000	32	543	7.5	24.0	6.6	80	240	58	67	17	17
MAY 27...	1235	33	536	7.4	27.0	6.4	83	250	65	71	18	15
JUN 03...	1030	32	540	7.6	25.0	6.6	83	230	48	64	17	15
JUN 17...	1330	46	500	7.5	30.0	6.4	88	230	57	64	16	15
JUN 22...	1415	2760	350	7.7	23.0	6.0	--	150	40	45	8.8	15
JUL 03...	1345	1050	434	7.5	29.0	7.3	98	200	29	61	12	6.4
JUL 15...	1030	296	470	7.4	29.0	6.7	89	230	55	69	14	8.1
JUL 22...	1300	198	496	7.2	29.0	6.7	90	220	45	65	15	9.8
JUL 30...	1215	102	511	7.3	30.5	6.5	89	230	42	66	15	11
AUG 05...	1000	78	550	7.4	29.0	6.4	85	250	54	72	16	14
AUG 12...	1145	59	572	7.4	29.0	6.6	88	270	64	78	17	16
AUG 19...	0900	54	558	7.4	28.0	6.2	82	240	39	70	16	14
AUG 27...	1130	56	543	7.3	28.0	6.9	91	250	46	73	15	13
SEP 03...	1130	54	538	7.3	29.0	5.2	69	240	45	69	17	14
SEP 10...	0930	52	517	7.3	27.0	6.2	80	230	43	68	15	13
SEP 16...	0915	49	520	7.4	28.0	6.2	82	240	47	70	16	13
SEP 24...	1315	54	507	8.1	25.0	5.7	71	240	42	69	16	12

## GUADALUPE RIVER BASIN

08180640 MEDINA RIVER AT LA COSTE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LINITY WAT DIS PIX END FIELD CAC03 (MG/L)	SULFATE SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)
OCT												
07...	0.5	13	2.1	200	53	16	0.30	13	322	321	--	<0.010
NOV												
08...	0.4	12	2.1	200	56	16	0.20	12	331	318	2.58	0.020
DEC												
06...	0.4	11	2.3	190	58	18	0.20	11	324	324	2.58	0.020
JAN												
24...	0.5	14	2.2	190	62	18	0.20	10	351	342	3.59	0.010
MAR												
05...	0.5	13	2.0	180	64	20	0.20	9.1	329	325	--	<0.010
21...	0.6	15	2.1	220	67	23	0.30	9.9	358	344	--	<0.010
APR												
08...	0.7	17	2.5	180	76	27	0.3	9.9	360	347	1.79	0.010
16...	0.6	16	2.3	210	68	23	0.3	11	351	334	--	<0.01
22...	0.4	12	2.1	190	66	18	0.2	8.9	332	319	--	<0.01
MAY												
02...	0.4	12	2.1	180	62	17	0.2	9.8	327	311	--	<0.01
08...	0.4	12	1.9	190	61	17	0.3	11	320	318	--	<0.01
14...	0.4	11	2.5	--	49	14	0.2	9.3	265	255	1.22	0.01
21...	0.5	13	2.2	180	61	19	0.2	11	331	291	--	<0.01
27...	0.4	11	2.0	180	57	16	0.2	12	320	311	--	<0.01
JUN												
03...	0.4	12	2.0	180	60	18	0.3	11	325	304	--	<0.01
17...	0.4	12	2.3	170	55	16	0.2	11	302	291	--	<0.01
22...	0.5	18	4.4	110	40	17	0.2	11	218	214	--	<0.01
JUL												
03...	0.2	6	2.0	170	30	9.5	0.2	11	265	239	--	<0.01
15...	0.2	7	2.1	170	38	11	0.2	12	296	268	--	<0.01
22...	0.3	9	2.1	180	40	12	0.2	11	287	272	--	<0.01
30...	0.3	9	1.9	180	43	14	0.2	12	313	284	--	<0.01
AUG												
05...	0.4	11	1.8	190	45	15	0.2	12	360	304	2.47	0.01
12...	0.4	11	2.1	200	47	17	0.2	13	340	328	2.98	0.01
19...	0.4	11	2.0	200	43	16	0.2	12	333	305	3.03	0.01
27...	0.4	10	1.9	200	42	15	0.2	11	328	300	2.62	0.01
SEP												
03...	0.4	11	2.1	200	43	15	0.2	10	324	295	--	<0.01
10...	0.4	11	2.2	190	40	14	0.3	9.6	309	294	--	<0.01
16...	0.4	10	2.0	190	42	13	0.2	9.9	310	297	--	<0.01
24...	0.3	10	2.0	200	39	13	0.2	10	301	282	--	<0.01

DATE	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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 ORTHOR- THO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHOR- THO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)
OCT												
07...	3.40	<0.015	--	--	--	<0.20	<0.20	<0.010	<0.010	<0.010	--	1.4
NOV												
08...	2.60	0.030	2.8	0.17	--	<0.20	0.20	<0.010	<0.010	<0.010	--	1.6
DEC												
06...	2.60	<0.015	--	--	--	<0.20	<0.20	0.060	0.020	<0.010	--	2.2
JAN												
24...	3.60	<0.015	--	--	--	<0.20	<0.20	0.030	<0.010	<0.010	--	1.4
MAR												
05...	2.40	0.020	2.6	0.18	--	<0.20	0.20	<0.010	<0.010	<0.010	--	1.9
21...	2.40	<0.015	--	--	--	<0.20	<0.20	0.040	<0.010	<0.010	--	1.8
APR												
08...	1.80	0.020	--	--	--	<0.20	<0.20	0.010	<0.010	<0.010	--	2.5
16...	2.0	<0.01	2.2	0.24	--	<0.2	0.2	0.03	<0.01	<0.01	--	2.2
22...	2.0	0.09	2.2	0.17	--	<0.2	0.3	0.01	<0.01	<0.01	--	1.6
MAY												
02...	1.7	<0.01	--	--	--	0.2	<0.2	0.01	0.01	<0.01	--	1.6
08...	1.7	<0.01	1.9	0.21	--	<0.2	0.2	0.02	<0.01	<0.01	--	1.6
14...	1.2	0.02	1.5	0.20	--	<0.2	0.2	0.03	<0.01	<0.01	--	2.3
21...	1.5	0.02	1.7	0.22	--	<0.2	0.2	0.03	<0.01	<0.01	--	1.9
27...	1.6	0.02	1.8	0.24	--	<0.2	0.3	0.03	<0.01	<0.01	--	1.8
JUN												
03...	1.6	<0.01	--	--	--	<0.2	<0.2	0.06	0.04	0.01	0.03	2
17...	1.2	<0.01	1.5	0.28	--	<0.2	0.3	0.03	0.02	0.03	0.09	5.2
22...	0.58	0.06	6.4	5.8	0.17	0.2	5.8	1.3	0.02	0.02	0.05	5.2
JUL												
03...	0.42	0.01	0.72	0.29	0.29	0.3	0.3	<0.01	<0.01	<0.01	--	4.8
15...	0.88	0.03	1.1	0.20	--	<0.2	0.2	<0.01	<0.01	0.01	0.04	3
22...	1.2	<0.01	1.5	0.26	--	0.3	0.3	0.03	<0.01	0.01	0.04	2.6
30...	1.7	<0.01	--	--	--	<0.2	<0.2	<0.01	<0.01	<0.01	--	2.4
AUG												
05...	2.5	0.02	--	--	0.22	0.2	<0.2	<0.01	<0.01	0.01	0.04	1.9
12...	3.0	<0.01	--	--	--	<0.2	<0.2	<0.01	<0.01	0.01	0.05	1.8
19...	3.0	<0.01	--	--	--	<0.2	<0.2	<0.01	<0.01	<0.01	--	1.7
27...	2.6	<0.01	--	--	--	<0.2	<0.2	<0.01	<0.01	<0.01	--	1.6
SEP												
03...	2.4	<0.01	--	--	--	<0.2	<0.2	<0.01	0.02	<0.01	--	1.6
10...	2.5	<0.01	--	--	--	<0.2	<0.2	<0.01	<0.01	<0.01	--	2.2
16...	2.5	<0.01	--	--	--	<0.2	<0.2	<0.01	<0.01	<0.01	--	1.5
24...	2.5	<0.01	--	--	--	<0.2	<0.2	0.01	<0.01	<0.01	--	1.8



## GUADALUPE RIVER BASIN

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08180640 MEDINA RIVER AT LA COSTE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	SEDI- MENT, SUS- PENDE (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	1-NAPH THOL, WATER, FLTRD, GF 0.7U REC (UG/L)	2,4,5-T DIS- SOLVED (UG/L)	2,4-D, DIS- SOLVED (UG/L)	2,4-DB WATER, FLTRD, GF 0.7U REC (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	SILVEX, DIS- SOLVED (UG/L)	3HYDRXY CARBO- FURAN WAT, FLT GF 0.7U REC (UG/L)
OCT												
07...	0.50	7.0	90	<3	<1	--	--	--	--	--	--	--
NOV												
08...	0.30	6.0	70	<3.0	1.0	--	--	--	--	--	--	--
DEC												
06...	0.40	3.3	51	<3.0	<1.0	--	--	--	--	--	--	--
JAN												
24...	0.40	2.8	49	<3.0	1.0	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
MAR												
05...	0.70	5.3	76	<3.0	2.0	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
21...	0.50	6.0	89	<3.0	2.0	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
APR												
08...	0.9	7.3	82	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
16...	0.6	7.2	83	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
22...	--	8.4	84	<3	<1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
MAY												
02...	--	6.1	69	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
08...	0.7	7.2	81	5	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
14...	0.6	5.4	56	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
21...	1.2	6.1	71	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
27...	--	6.2	70	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
JUN												
03...	0.9	5.2	60	<3	1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
17...	0.6	5.6	45	<3	2	<0.007	<0.035	0.09	<0.035	<0.003	<0.021	<0.014
22...	>5	18500	2480	7	1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
JUL												
03...	0.6	133	47	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
15...	0.7	16	20	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
22...	0.4	14	27	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
30...	0.4	--	--	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
AUG												
05...	0.2	6.7	32	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
12...	0.4	4.6	29	<3	1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
19...	0.3	2.5	17	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
27...	0.4	3.3	22	<3	1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
SEP												
03...	0.5	3.4	23	<3	1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
10...	--	4.4	31	<3	<1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
16...	0.2	2.6	20	<3	2	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014
24...	0.6	1.3	9	<3	<1	<0.007	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014

DATE	DNOC WAT, FLT GF 0.7U REC (UG/L)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	ACIFL- UORFEN FLTRD, GF 0.7U REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	ALDI- CARB, WATER, FLTRD, GF 0.7U REC (UG/L)	ALDI- CARB SULFONE WAT, FLT GF 0.7U REC (UG/L)	ALDICA- RB SUL- FOXIDE, WAT, FLT GF 0.7U REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BENTA- ZON, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT												
07...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
08...	--	--	--	--	--	--	--	--	--	--	--	--
DEC												
06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
24...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.043	<0.001	<0.002	<0.014
MAR												
05...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.052	<0.001	<0.002	<0.014
21...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.044	<0.001	<0.002	<0.014
APR												
08...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.059	<0.001	<0.002	<0.014
16...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.060	<0.001	<0.002	<0.014
22...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.031	<0.001	<0.002	<0.014
MAY												
02...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.034	<0.001	<0.002	<0.014
08...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.034	<0.001	<0.002	<0.014
14...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.106	<0.001	<0.002	<0.014
21...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.101	<0.001	<0.002	<0.014
27...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.038	<0.001	<0.002	<0.014
JUN												
03...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.030	<0.001	<0.002	<0.014
17...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.030	<0.001	<0.002	<0.014
22...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.061	<0.001	<0.002	<0.014
JUL												
03...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.006	<0.001	0.003	<0.014
15...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.011	<0.001	<0.002	<0.014
22...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.010	<0.001	<0.002	<0.014
30...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.011	<0.001	<0.002	<0.014
AUG												
05...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.013	--	<0.002	<0.014
12...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.016	<0.001	<0.002	<0.014
19...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.014	<0.001	<0.002	<0.014
27...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.013	<0.001	<0.002	<0.014
SEP												
03...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.014	<0.001	<0.002	<0.014
10...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.014	<0.001	<0.002	<0.014
16...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.015	<0.001	<0.002	<0.014
24...	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016	<0.021	<0.002	0.014	<0.001	<0.002	<0.014

## GUADALUPE RIVER BASIN

08180640 MEDINA RIVER AT LA COSTE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	BRO-MACIL, WATER, DISS, REC (UG/L)	BRO-MOXYNIL WATER, FLTRD, GF 0.7U REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	CAR-BARYL, WATER, FLTRD, GF 0.7U REC (UG/L)	CAR-BARYL WATER, FLTRD 0.7 U GF, REC (UG/L)	CARBO-FURAN, WATER, FLTRD, GF 0.7U REC (UG/L)	CARBO-FURAN WATER, FLTRD 0.7 U GF, REC (UG/L)	CHLOR-AMBN, WATER, FLTRD, GF 0.7U REC (UG/L)	CHLORO-THALO- NIL, WAT,FLT GF 0.7U REC (UG/L)	CHLOR-PYRIFOS DIS- SOLVED (UG/L)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	CLOPYR- ALID, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT 07...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 08...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 24...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.050
MAR 05...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
21...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
APR 08...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
16...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
22...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
MAY 02...	<0.035	<0.035	<0.002	<0.008	E0.004	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
08...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
14...	<0.035	<0.035	<0.002	<0.008	E0.012	<0.028	<0.003	<0.011	<0.035	0.007	<0.005	<0.05
21...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.008	<0.011	<0.035	<0.004	<0.005	<0.05
27...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
JUN 03...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	E0.003	<0.005	<0.05
17...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	0.006	<0.005	<0.05
22...	<0.035	<0.035	<0.002	<0.008	E0.090	<0.028	<0.003	<0.011	<0.035	0.007	<0.005	<0.05
JUL 03...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
15...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	0.005	<0.005	<0.05
22...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	0.004	<0.005	<0.05
30...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
AUG 05...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
12...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	E0.004	<0.005	<0.05
19...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
27...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
SEP 03...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
10...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
16...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
24...	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028	<0.003	<0.011	<0.035	<0.004	<0.005	<0.05
DATE	CYANA-ZINE, WATER, DISS, REC (UG/L)	DACTHAL MONO- ACID, WAT,FLT GF 0.7U REC (UG/L)	DCPA WATER, FLTRD 0.7 U GF, REC (UG/L)	DEETHYL- ATRA- ZINE, WATER, DISS, REC (UG/L)	DI-AZINON, DIS- SOLVED (UG/L)	DICAMBA WATER, FLTRD, GF 0.7U REC (UG/L)	DICHLOR- BENIL, WATER, FLTRD, GF 0.7U REC (UG/L)	DICHLOR PROP, WATER, FLTRD, GF 0.7U REC (UG/L)	DI-ELDRIN DIS- SOLVED (UG/L)	DINOSEB WATER, FLTRD, GF 0.7U REC (UG/L)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	DIURON, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT 07...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 08...	--	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 24...	<0.004	<0.017	<0.002	E0.106	<0.002	<0.035	<0.020	<0.032	<0.001	<0.035	<0.017	<0.020
MAR 05...	<0.004	<0.017	<0.002	E0.023	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
21...	<0.004	<0.017	<0.002	E0.056	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
APR 08...	<0.004	<0.017	<0.002	E0.032	0.006	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
16...	<0.004	<0.017	<0.002	E0.045	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
22...	<0.004	<0.017	<0.002	E0.039	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
MAY 02...	<0.004	<0.017	<0.002	E0.032	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
08...	<0.004	<0.017	E0.002	E0.040	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
14...	<0.004	<0.017	<0.002	E0.038	0.059	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
21...	<0.004	<0.017	<0.002	E0.041	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
27...	<0.004	<0.017	<0.002	E0.035	0.005	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
JUN 03...	<0.004	<0.017	<0.002	E0.034	E0.004	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
17...	<0.004	<0.017	<0.002	E0.018	0.005	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
22...	<0.004	<0.017	<0.002	E0.018	0.024	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
JUL 03...	<0.004	<0.017	<0.002	E0.002	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
15...	<0.004	<0.017	<0.002	E0.008	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
22...	<0.004	<0.017	<0.002	E0.010	0.005	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
30...	<0.004	<0.017	<0.002	E0.010	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
AUG 05...	<0.004	<0.017	<0.002	E0.014	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
12...	<0.004	<0.017	<0.002	E0.026	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
19...	<0.004	<0.017	<0.002	E0.019	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
27...	<0.004	<0.017	<0.002	E0.020	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
SEP 03...	<0.004	<0.017	<0.002	E0.030	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
10...	<0.004	<0.017	<0.002	E0.023	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
16...	<0.004	<0.017	<0.002	E0.028	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02
24...	<0.004	<0.017	<0.002	E0.025	<0.002	<0.035	<0.02	<0.032	<0.001	<0.035	<0.017	<0.02

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WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	MCPB, WATER, FLTRD, GF 0.7U	METHIO- CARB, WATER, FLTRD, GF 0.7U	METH- OMYL, WATER, FLTRD, GF 0.7U	METO- LACHLOR WATER DISSOLV	METRI- BUZIN SENSOR WATER DISSOLV	MOL- INATE WATER FLTRD 0.7 U	NAPROP- AMIDE WATER FLTRD 0.7 U	NEB- URON, WATER, FLTRD, GF 0.7U	NORFLUR AZON, WATER, FLTRD, GF 0.7U	ORY- ZALIN, WATER, FLTRD, GF 0.7U	OXAMYL, WATER, FLTRD, GF 0.7U
	REC (UG/L)	REC (UG/L)	REC (UG/L)	REC (UG/L)	REC (UG/L)	GF, REC (UG/L)	GF, REC (UG/L)	REC (UG/L)	REC (UG/L)	REC (UG/L)	REC (UG/L)
OCT 07...	--	--	--	--	--	--	--	--	--	--	--
NOV 08...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 24...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
MAR 05...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
21...	<0.035	<0.026	<0.017	E0.003	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
APR 08...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
16...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
22...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
MAY 02...	<0.035	<0.026	<0.017	E0.003	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
08...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
14...	<0.035	<0.026	<0.017	E0.001	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
21...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
27...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
JUN 03...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
17...	<0.035	<0.026	<0.017	E0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
22...	<0.035	<0.026	<0.017	0.004	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
JUL 03...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
15...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
22...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
30...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
AUG 05...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
12...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
19...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
27...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
SEP 03...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
10...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
16...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018
24...	<0.035	<0.026	<0.017	<0.002	<0.004	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018



## GUADALUPE RIVER BASIN

08180640 MEDINA RIVER AT LA COSTE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	P, P' DDE DISSOLV (UG/L)	PARA- THION, DIS- SOLVED (UG/L)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PIC- LORAM, WATER, FLTRD, GF 0.7U REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
OCT 07...	--	--	--	--	--	--	--	--	--	--	--
NOV 08...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 24...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.050	E0.007	<0.007	<0.004	<0.013
MAR 05...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.005	<0.007	<0.004	<0.013
21...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.005	<0.007	<0.004	<0.013
APR 08...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
16...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
22...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
MAY 02...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.009	<0.007	<0.004	<0.013
08...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.006	<0.007	<0.004	<0.013
14...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.006	<0.007	<0.004	<0.013
21...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
27...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.002	<0.007	<0.004	<0.013
JUN 03...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.004	<0.007	<0.004	<0.013
17...	E0.002	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.004	<0.007	<0.004	<0.013
22...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.004	<0.007	<0.004	<0.013
JUL 03...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
15...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
22...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.005	<0.007	<0.004	<0.013
30...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.005	<0.007	<0.004	<0.013
AUG 05...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.005	<0.007	<0.004	<0.013
12...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.006	<0.007	<0.004	<0.013
19...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
27...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
SEP 03...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.006	<0.007	<0.004	<0.013
10...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.004	<0.007	<0.004	<0.013
16...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	<0.018	<0.007	<0.004	<0.013
24...	<0.006	<0.004	<0.006	<0.004	<0.004	<0.002	<0.05	E0.004	<0.007	<0.004	<0.013
DATE	PRO- PHAM, WATER, FLTRD, GF 0.7U REC (UG/L)	PRO- POXUR, WATER, FLTRD, GF 0.7U REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	SI- MAZINE, WATER, DISS, REC (UG/L)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- CLOPYR, WATER, FLTRD, GF 0.7U REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)
OCT 07...	--	--	--	--	--	--	--	--	--	--	--
NOV 08...	--	--	--	--	--	--	--	--	--	--	--
DEC 06...	--	--	--	--	--	--	--	--	--	--	--
JAN 24...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.050	<0.002
MAR 05...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
21...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
APR 08...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
16...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
22...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
MAY 02...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
08...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
14...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
21...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
27...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
JUN 03...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
17...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
22...	<0.035	<0.035	<0.003	E0.002	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
JUL 03...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	E0.002
15...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
22...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
30...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
AUG 05...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
12...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
19...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
27...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
SEP 03...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
10...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
16...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002
24...	<0.035	<0.035	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	<0.001	<0.05	<0.002

# GUADALUPE RIVER BASIN

261

08180700 MEDINA RIVER NEAR MACDONA, TX

**LOCATION.**--Lat 29°20'05", long 98°41'22", Bexar County, Hydrologic Unit 12100302, at downstream side of Loop 1604 bridge, 0.1 mi downstream from Polecat Creek, 0.7 mi north of Macdonna, 2.2 mi downstream from Potranca Creek, and 21.2 mi upstream from mouth.

**DRAINAGE AREA.**--885 mi<sup>2</sup>, of which 634 mi<sup>2</sup> is above dam forming Medina Lake.

**PERIOD OF RECORD.**--January 1981 to September 1995, May to September 1997.

## WATER-DISCHARGE RECORDS

**GAGE.**--Water-stage recorder. Datum of gage is 589.86 ft above sea level.

**REMARKS.**--Records good. Since installation of gage in water year 1981, at least 10% of contributing drainage area has been regulated by Medina Lake (08179500) and by Medina Diversion Lake. A large part of the streamflow is lost into the Edwards and associated limestones where the Balcones Fault crosses the basin between the upstream end of Medina Lake and about 5 mi downstream from Medina Dam, or 0.9 mi downstream from the diversion dam. There are several small diversions below Medina Diversion Dam. Satellite telemeter at station.

**EXTREMES FOR CURRENT YEAR.**--Maximum discharge during period May to September, 22,100 ft<sup>3</sup>/s June 23 at 0215 hours (gage height, 18.65 ft); minimum daily, 34 ft<sup>3</sup>/s June 2-4.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	35	1540	106	62
2	---	---	---	---	---	---	---	---	34	1340	113	61
3	---	---	---	---	---	---	---	---	34	1200	111	61
4	---	---	---	---	---	---	---	---	34	1080	104	62
5	---	---	---	---	---	---	---	---	36	977	98	65
6	---	---	---	---	---	---	---	---	38	887	90	62
7	---	---	---	---	---	---	---	---	46	775	86	61
8	---	---	---	---	---	---	---	---	45	674	85	59
9	---	---	---	---	---	---	---	---	53	599	86	60
10	---	---	---	---	---	---	---	---	57	552	85	64
11	---	---	---	---	---	---	---	39	67	512	83	58
12	---	---	---	---	---	---	---	e50	50	465	83	56
13	---	---	---	---	---	---	---	e64	45	408	81	55
14	---	---	---	---	---	---	---	e40	43	375	78	54
15	---	---	---	---	---	---	---	39	55	348	75	54
16	---	---	---	---	---	---	---	38	60	327	74	52
17	---	---	---	---	---	---	---	36	50	309	72	52
18	---	---	---	---	---	---	---	35	45	287	70	51
19	---	---	---	---	---	---	---	35	43	264	69	51
20	---	---	---	---	---	---	---	37	42	244	68	51
21	---	---	---	---	---	---	---	35	71	232	68	52
22	---	---	---	---	---	---	---	35	2190	243	67	52
23	---	---	---	---	---	---	---	39	13700	253	68	55
24	---	---	---	---	---	---	---	44	10300	245	70	56
25	---	---	---	---	---	---	---	39	6580	234	71	52
26	---	---	---	---	---	---	---	38	4470	210	67	50
27	---	---	---	---	---	---	---	37	3180	191	67	50
28	---	---	---	---	---	---	---	42	2540	163	66	50
29	---	---	---	---	---	---	---	41	2100	145	65	48
30	---	---	---	---	---	---	---	37	1780	129	63	46
31	---	---	---	---	---	---	---	36	---	112	64	---
TOTAL	---	---	---	---	---	---	---	---	47823	15320	2453	1662
MEAN	---	---	---	---	---	---	---	---	1594	494	79.1	55.4
MAX	---	---	---	---	---	---	---	---	13700	1540	113	65
MIN	---	---	---	---	---	---	---	---	34	112	63	46
AC-FT	---	---	---	---	---	---	---	---	94860	30390	4870	3300

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1981 - 1997h, BY WATER YEAR (WY)

MEAN	105	72.2	111	145	235	222	152	275	776	199	75.7	60.2
MAX	485	178	432	698	2333	2097	1302	1636	5726	765	280	165
(WY)	1982	1993	1992	1992	1992	1992	1992	1992	1987	1987	1992	1992
MIN	32.3	25.7	18.0	22.1	34.2	39.0	34.1	29.6	25.1	27.4	25.1	27.8
(WY)	1992	1985	1985	1985	1985	1990	1986	1989	1990	1989	1989	1989

### SUMMARY STATISTICS

### WATER YEARS 1981 - 1997h

ANNUAL MEAN	188
HIGHEST ANNUAL MEAN	954
LOWEST ANNUAL MEAN	38.1
HIGHEST DAILY MEAN	22300
LOWEST DAILY MEAN	14
ANNUAL SEVEN-DAY MINIMUM	16
INSTANTANEOUS PEAK FLOW	36800
INSTANTANEOUS PEAK STAGE	20.58
ANNUAL RUNOFF (AC-FT)	136200
10 PERCENT EXCEEDS	295
50 PERCENT EXCEEDS	51
90 PERCENT EXCEEDS	31

e Estimated

h See PERIOD OF RECORD paragraph.



## GUADALUPE RIVER BASIN

08180700 MEDINA RIVER NEAR MACDONA, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: July to September 1997. Pesticide analyses: July to September 1997. Bacteria analyses: July to September 1997.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS. / 100 ML)	STREP-TOCOCCI, KF AGAR (COLS. PER 100 ML)
JUL 02...	0910	1360	429	7.9	26.0	6.8	85	<10	2.9	150	480
JUL 31...	0840	139	573	7.5	27.0	6.2	79	<10	0.5	260	510
AUG 13...	1630	80	633	7.7	30.0	7.5	100	<10	1.1	93	<100
SEP 10...	1802	59	620	7.7	27.0	6.6	85	<10	0.7	400	230
DATE	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)	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)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)
JUL 02...	190	30	58	12	7.2	0.2	2.4	160	32	10	267
JUL 31...	250	38	72	16	19	0.5	2.4	210	48	21	361
AUG 13...	280	46	82	17	27	0.7	2.5	230	51	26	403
SEP 10...	250	47	73	17	23	0.6	2.8	200	49	25	365
DATE	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
JUL 02...	228	39	0.499	<0.015	0.79	0.29	<0.20	0.29	<0.010	<0.010	1
JUL 31...	318	16	2.49	0.025	--	--	<0.20	<0.20	0.010	0.016	<1
AUG 13...	357	11	3.99	0.017	4.2	0.21	<0.20	0.22	0.013	<0.010	<1
SEP 10...	336	8	3.80	<0.015	4.0	0.23	0.22	0.23	0.018	0.019	<1
DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
JUL 02...	4.9	<0.010	<1	<1	<10	<1	1	1	<1	<0.10	1
JUL 31...	3.4	<0.010	<1	<1	<10	<1	<1	1	<1	<0.10	<1
AUG 13...	2.7	<0.010	<1	<1	<10	<1	<1	1	<1	<0.10	<1
SEP 10...	3.4	<0.010	<1	1	<10	<1	<1	1	<1	<0.10	<1
DATE	SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)
JUL 02...	<1	<1	<10	<0.040	<0.100	<0.020	<0.060	<0.030	<0.800	<0.030	<2.00
JUL 31...	<1	<1	<10	<0.040	<0.100	<0.020	<0.060	<0.030	<0.800	<0.030	<2.00
AUG 13...	<1	<1	20	--	--	--	--	--	--	--	--
SEP 10...	<1	<1	<10	--	<0.100	<0.020	<0.060	--	<0.800	<0.030	<2.00

# GUADALUPE RIVER BASIN

263

08180800 MEDINA RIVER NEAR SOMERSET, TX

**LOCATION.**--Lat 29°15'43", long 98°34'52", Bexar County, Hydrologic Unit 12100302, on left bank at downstream side of downstream bridge on State Highway 16, 2.0 mi upstream from Elm Creek, 5.0 mi downstream from Medio Creek, 5.2 mi northeast of Somerset, and 14.0 mi upstream from mouth.

**DRAINAGE AREA.**--967 mi<sup>2</sup>, of which 634 mi<sup>2</sup> is above dam forming Medina Lake.

**PERIOD OF RECORD.**--October 1970 to September 1995, April to September 1997.

**GAGE.**--Water-stage recorder. Datum of gage is 493.56 ft above sea level. Prior to June 16, 1993, at site 300 ft upstream at same datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. Since installation of gage in water year 1971, at least 10% of contributing drainage area has been regulated by Medina Lake and by Medina Diversion Lake. A large part of the streamflow is lost into the Edwards and associated limestones where the Balcones Fault crosses the basin between the upstream end of Medina Lake and about 5 mi downstream from Medina Dam, or 0.9 mi downstream from the diversion dam. There are several small diversions below Medina Diversion Dam. Satellite telemeter at station.

**EXTREMES FOR CURRENT YEAR.**--Maximum discharge during period April to September, 14,800 ft<sup>3</sup>/s June 23 at 0315 hours (gage height, 23.4 ft, from floodmark); minimum daily, 37 ft<sup>3</sup>/s May 5 and June 4.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	46	41	e1700	152	71
2	---	---	---	---	---	---	---	43	39	e1500	148	70
3	---	---	---	---	---	---	---	41	38	e1350	146	70
4	---	---	---	---	---	---	---	39	37	e1200	139	73
5	---	---	---	---	---	---	---	37	39	e1100	133	73
6	---	---	---	---	---	---	---	38	45	e1000	126	73
7	---	---	---	---	---	---	---	39	63	e890	118	70
8	---	---	---	---	---	---	---	40	54	e800	114	69
9	---	---	---	---	---	---	---	45	92	e700	110	69
10	---	---	---	---	---	---	---	57	80	628	108	73
11	---	---	---	---	---	---	---	52	75	583	104	66
12	---	---	---	---	---	---	---	50	66	538	100	65
13	---	---	---	---	---	---	---	64	54	481	97	64
14	---	---	---	---	---	---	---	64	50	438	95	64
15	---	---	---	---	---	---	---	49	58	409	92	64
16	---	---	---	---	---	---	---	47	66	384	95	63
17	---	---	---	---	---	---	---	43	62	363	90	62
18	---	---	---	---	---	---	---	41	54	e345	87	61
19	---	---	---	---	---	---	---	40	49	e320	84	60
20	---	---	---	---	---	---	---	50	47	e295	82	60
21	---	---	---	---	---	---	---	44	123	e278	81	63
22	---	---	---	---	---	---	---	43	e1230	e288	79	63
23	---	---	---	---	---	---	---	48	e13000	e300	79	67
24	---	---	---	---	---	---	---	60	e11000	e286	80	66
25	---	---	---	---	---	---	45	59	e7200	264	82	63
26	---	---	---	---	---	---	66	51	e5000	249	80	61
27	---	---	---	---	---	---	81	50	e3700	234	79	60
28	---	---	---	---	---	---	62	56	e3000	215	78	60
29	---	---	---	---	---	---	52	53	e2400	194	77	60
30	---	---	---	---	---	---	49	56	e2000	181	75	58
31	---	---	---	---	---	---	---	45	---	163	73	---
TOTAL	---	---	---	---	---	---	---	1490	49762	17676	3083	1961
MEAN	---	---	---	---	---	---	---	48.1	1659	570	99.5	65.4
MAX	---	---	---	---	---	---	---	64	13000	1700	152	73
MIN	---	---	---	---	---	---	---	37	37	163	73	58
AC-FT	---	---	---	---	---	---	---	2960	98700	35060	6120	3890

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1971 - 1997h#, BY WATER YEAR (WY)

MEAN	191	159	146	173	259	233	209	302	656	297	174	136
MAX	1284	648	549	751	2449	2326	1480	1663	6432	2875	1222	868
(WY)	1974	1977	1977	1992	1992	1992	1992	1992	1987	1973	1978	1973
MIN	41.2	40.2	33.5	37.2	33.4	34.4	35.6	31.1	27.4	22.3	24.5	22.7
(WY)	1989	1985	1985	1985	1971	1971	1971	1971	1990	1984	1984	1984

## SUMMARY STATISTICS

## WATER YEARS 1971 - 1997h#

ANNUAL MEAN	243
HIGHEST ANNUAL MEAN	1033
LOWEST ANNUAL MEAN	40.0
HIGHEST DAILY MEAN	24800
LOWEST DAILY MEAN	16
ANNUAL SEVEN-DAY MINIMUM	19
INSTANTANEOUS PEAK FLOW	30500
INSTANTANEOUS PEAK STAGE	29.39
ANNUAL RUNOFF (AC-FT)	176000
10 PERCENT EXCEEDS	486
50 PERCENT EXCEEDS	76
90 PERCENT EXCEEDS	40

e Estimated

h See PERIOD OF RECORD paragraph.

# Period of regulated streamflow.

## GUADALUPE RIVER BASIN

08181400 HELOTES CREEK AT HELOTES, TX

**LOCATION.**--Lat 29°34'42", long 98°41'29", Bexar County, Hydrologic Unit 12100302, 42 ft to left and 44 ft downstream from centerline of bridge on State Highway 16, 0.1 mi northwest of Helotes, and 8.6 mi upstream from mouth.

**DRAINAGE AREA.**--15.0 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--June 1968 to current year.

**REVISED RECORDS.**--WRD TX-73-1: 1972(M).

**GAGE.**--Water-stage recorder. Datum of gage is 1,014.82 ft above sea level.

**REMARKS.**--Records fair. No known regulation. An undetermined amount of flow is diverted for domestic use above station, and some streamflow enters the Edwards and associated limestones through the Balcones Fault Zone in the vicinity of the gage. Rain gage at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1923, 13.7 ft in 1927, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 140 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 15	Unknown	463	3.59	June 22	0530	4,560	7.96
June 21	1915	980	4.43				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	e.00	e.00	.00	.00	.00	.08	.00	9.9	25	.00	.00
2	.00	e.00	e.00	.00	.00	.06	.04	.00	6.9	20	.00	.00
3	.00	e.00	.00	.00	.00	.00	.07	.00	4.0	16	.00	.35
4	.00	e.00	.00	.00	.00	.00	10	.00	2.2	13	.00	.00
5	.00	e.00	.00	.00	.00	.00	35	.00	1.6	11	.00	.00
6	.00	e.00	.00	.00	.00	.00	28	.00	e3.5	9.4	.00	.00
7	.00	e.00	.00	.00	.00	.00	17	.00	e7.0	7.9	.00	.00
8	.00	e.00	.00	.00	.00	.00	11	.00	e4.5	6.6	.00	.00
9	.00	e.00	.00	.00	.00	.00	7.6	.00	e8.0	5.4	.00	.00
10	.00	e.00	.00	.00	.00	.00	5.2	.00	e5.0	4.3	.00	.00
11	.00	e.00	.00	.00	.00	.27	3.0	.00	e3.5	3.5	.00	.00
12	.00	e.00	.00	.00	.10	.62	.51	.00	e4.5	2.7	.00	.00
13	.00	e.00	.00	.00	.00	1.0	.00	.00	e3.0	2.3	.00	.00
14	.00	e.00	.00	.00	.00	.35	.00	.00	e2.0	1.7	.00	.00
15	.00	e.00	.08	.00	.00	.00	.00	.00	e35	1.3	.00	.00
16	.00	e.00	.00	.00	.00	.00	.00	.00	e28	1.0	.00	.00
17	.00	e.00	.00	.00	.00	.00	.00	.00	18	.80	.00	.00
18	.00	e.00	.00	.00	.00	.00	.00	.00	15	.56	.00	.00
19	.00	e.00	.00	.00	.00	.00	.00	.00	12	.38	.00	.00
20	.00	e.00	.00	.00	.11	.00	.00	.00	9.7	.27	.00	.00
21	.00	e.00	.00	.00	.00	.00	.00	.00	219	.20	.00	.00
22	.00	e.00	.00	.00	.00	.00	.00	2.5	1020	.14	.00	.00
23	.00	e.00	.00	.00	.00	.00	.00	22	384	.05	.00	.00
24	.00	e.00	.00	.00	.00	.00	.00	38	244	.02	.00	.00
25	.00	e.00	.00	.00	.00	.00	.00	31	155	.00	.00	.00
26	e.00	e.00	.00	.00	.00	.00	.43	21	106	.00	.00	.00
27	e.00	e.00	.00	.00	.00	.00	.00	19	76	.00	.00	.00
28	e.00	e.00	.00	.00	.00	.00	.00	27	58	.00	.00	.00
29	e.00	e.00	.00	.00	---	.00	.00	20	44	.00	.00	.00
30	e.00	e.00	.00	.00	---	.00	.00	17	33	.00	.00	.00
31	e.00	---	.00	.00	---	.00	---	13	---	.00	.00	---
TOTAL	0.00	0.00	0.08	0.00	0.21	2.30	117.93	210.50	2522.3	133.52	0.00	0.35
MEAN	.000	.000	.003	.000	.008	.074	3.93	6.79	84.1	4.31	.000	.012
MAX	.00	.00	.08	.00	.11	1.0	35	38	1020	25	.00	.35
MIN	.00	.00	.00	.00	.00	.00	.00	.00	1.6	.00	.00	.00
AC-FT	.00	.00	.2	.00	.4	4.6	234	418	5000	265	.00	.7
CFSM	.00	.00	.00	.00	.00	.00	.26	.45	5.61	.29	.00	.00
IN.	.00	.00	.00	.00	.00	.01	.29	.52	6.26	.33	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1997, BY WATER YEAR (WY)

	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979
MEAN	4.68	2.00	4.11	1.97	3.81	3.41	3.48	7.63	16.5	4.17	.92	1.79
MAX	66.7	16.4	79.0	31.0	66.3	32.3	40.0	66.6	142	84.4	13.5	36.1
(WY)	1974	1977	1992	1992	1992	1985	1973	1992	1987	1973	1971	1973
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1979	1971	1971	1969	1971	1971	1983	1989	1980	1969	1968	1969

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1968 - 1997

ANNUAL TOTAL	2.16	2987.19	4.59
ANNUAL MEAN	.006	8.18	28.3
HIGHEST ANNUAL MEAN			.003
LOWEST ANNUAL MEAN			1992
HIGHEST DAILY MEAN	.65	1020	1020
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		4560	7680
INSTANTANEOUS PEAK STAGE		7.96	10.80
ANNUAL RUNOFF (AC-FT)	4.3	5930	3330
ANNUAL RUNOFF (CFSM)	.000	.55	.31
ANNUAL RUNOFF (INCHES)	.01	7.41	4.16
10 PERCENT EXCEEDS	.00	9.5	6.8
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

# GUADALUPE RIVER BASIN

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08181400 HELOTES CREEK AT HELOTES, TX--Continued

## WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyses: May 1969 to current year. Pesticide analyses: May 1969 to June 1981, October 1984 to current year. Sediment analyses: October 1968 to September 1973. Bacteria analyses: May 1969 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	OXYGEN DEMAND, CHEM-ICAL (HIGH LEVEL)	OXYGEN DEMAND, BIO-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)
APR 04...	1825	14	255	7.9	19.0	7.9	89	25	4.9	K5000	K17000	110
JUN 22...	1220	1390	252	7.7	23.5	8.9	107	50	5.9	--	--	120
25...	1044	148	553	8.0	22.0	8.7	101	<10	0.5	60	840	270
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)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
APR 04...		12	34	4.9	5.7	0.2	1.9	94	14	10	152	133
JUN 22...		1	43	4.0	2.5	0.1	2.4	120	6.3	3.2	156	134
25...		21	90	12	7.7	0.2	1.3	250	19	13	342	273
DATE		RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
APR 04...		97	0.220	0.050	0.92	0.65	0.21	0.26	0.70	0.120	0.030	<1
JUN 22...		333	0.216	<0.015	1.0	0.82	--	<0.20	0.82	0.118	<0.010	<1
25...		<1	0.636	<0.015	--	--	--	<0.20	<0.20	0.051	<0.010	<1
DATE		CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
APR 04...		9.2	<0.010	<1	<1	<10	<1	2	2	7	<0.10	2
JUN 22...		23	<0.010	<1	2	<10	<1	3	3	6	<0.10	3
25...		4.7	<0.010	<1	<1	<10	<1	<1	<1	<1	<0.10	<1
DATE		SELE-NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TECH-NICAL TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)
APR 04...		<1	<1	20	<0.040	<0.100	<0.020	<0.060	<0.030	<0.800	<0.030	<2.00
JUN 22...		<1	<1	20	<0.040	<0.100	<0.020	<0.060	<0.030	<0.800	<0.030	<2.00
25...		<1	<1	<10	<0.040	<0.100	<0.020	<0.060	<0.030	<0.800	<0.030	<2.00



## GUADALUPE RIVER BASIN

08181440 INGRAM ROAD OUTFALL AT LEON CREEK TRIB. AT SAN ANTONIO, TX

**LOCATION.**--Lat 29°26'25", long 98°39'26", Bexar County, Hydrologic Unit 12100302, 445 ft. south of the intersection of Ingram Rd. and Richland Hills Dr. on the east side of the northbound lane of Ingram Rd.

**DRAINAGE AREA.**-- 0.0218 mi<sup>2</sup>.

**PERIOD OF RECORD.**-- Chemical and biochemical analyses: December 1993 to current year. Pesticide analyses: December 1993 to current year.

**REMARKS.**--Water-quality samples and associated discharge data were collected for selected storm events from storm sewer systems draining urban basins. This study is in cooperation with the city of San Antonio to fulfill requirements (by EPA) for the Texas Department of Transportation in applying for a National Pollution Discharge Elimination System (NPDES) storm-water discharge permit.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	PRECIP- ITATION TOTAL INCHES/ STORM	ELAPSED TIME OF STORM (HOURS)	STORM WATER FLOW (MGD)	SPE- CIFIC CON- DUCT- ANCE (US/CM)	SPE- CIFIC CON- DUCT- ANCE LAB (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	PH WATER WHOLE LAB (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO- CHEM- ICAL, 5 DAY (MG/L)	COLI- FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	
SEP 09-09 09...	1719 1734	0.86 --	1.5 --	3.8 --	54 --	68 --	8.3 --	7.6 --	28.5 --	-- 50	9.7 --	-- 8000	
DATE	TIME	STREP- TOCOCCHI FECAL, KF AGAR (COLS. PER 100 ML)	HARD- NESS TOTAL (MG/L AS CACO3)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	ALKA- LINITY WAT DIS FIX END FIELD CACO3 (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDE (MG/L)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (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	
SEP 09-09 09...	-- 5000	-- 25	-- 7	18 --	-- 25	-- 140	-- 51	-- 9.3	0.31 --	0.7 --	5 --	0.1 --	
DATE	TIME	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	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)	ANTIMONY TOTAL OF CODE AS SB)	ARSENIC TOTAL (UG/L AS AS)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)
SEP 09-09 09...	1.5 --	2.6 --	0.3 --	1.5 --	0.26 --	0.09 --	-- <0.01	-- 2	<10 --	<1 --	5 --	10 --	
DATE	TIME	CYANIDE TOTAL EPA (MG/L AS CN)	CYANIDE TOTAL (MG/L AS CN)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	SILVER, TOTAL RECOV- ERABLE EPA (UG/L AS AG)	THAL- LIUM, TOTAL (UG/L AS TL)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)
SEP 09-09 09...	-- <0.010	-- <0.01	-- 13	-- <0.1	-- 4	-- <1	-- <1	-- <0.001	-- 110	-- 17	-- 17	-- 17	-- <1
DATE	TIME	PHENOLS TOTAL (UG/L)	ACRO- LEIN TOTAL (UG/L)	ACRYLO- NITRILE TOTAL (UG/L)	BENZENE TOTAL (UG/L)	BROMO- BENZENE WATER, WHOLE, TOTAL (UG/L)	METHANE BROMO- CHLORO- WAT UNFLTRD REC (UG/L)	BROMO- FORM TOTAL (UG/L)	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L)	BENZENE SEC BUTYL- WATER UNFLTRD REC (UG/L)	BENZENE TERT- BUTYL- WATER UNFLTRD REC (UG/L)	CARBON- TETRA- CHLO- RIDE TOTAL (UG/L)	CHLORO- BENZENE TOTAL (UG/L)
SEP 09-09 09...	-- 2	-- <200	-- <200	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2
DATE	TIME	CHLORO- DI- BROMO- METHANE TOTAL (UG/L)	CHLORO- ETHANE TOTAL (UG/L)	CHLORO- FORM TOTAL (UG/L)	METHYL- CHLO- RIDE TOTAL (UG/L)	O- CHLORO- TOLUENE WATER WHOLE TOTAL (UG/L)	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L)	DIBROMO CHLORO- PROPANE WATER WHOLE TOT. REC (UG/L)	DI- BROMO- METHANE WATER WHOLE RECOVER (UG/L)	1,2- DIBROMO ETHANE WATER WHOLE TOTAL (UG/L)	DI- CHLORO- BROMO- METHANE TOTAL (UG/L)	1,1-DI- CHLORO- ETHYL- ENE TOTAL (UG/L)	1,1-DI- CHLORO- PRO- PENE, WAT, WH TOTAL (UG/L)
SEP 09-09 09...	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2	-- <2	-- <10	-- <2	-- <2	-- <2	-- <2	-- <2



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WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	BENZENE O-DI- CHLORO- WATER UNFLTRD REC (UG/L)	BENZENE 1,3-DI- CHLORO- WATER UNFLTRD REC (UG/L)	BENZENE 1,4-DI- CHLORO- WATER UNFLTRD REC (UG/L)	DI- CHLORO- DI- FLUORO- METHANE TOTAL (UG/L)	1,1-DI- CHLORO- ETHANE TOTAL (UG/L)	1,2-DI- CHLORO- ETHANE TOTAL (UG/L)	1,2-DI- PHENYL- HYDRA- ZINE WATER TOT.REC (UG/L)	CIS-1,2 -DI- CHLORO- ETHENE WATER TOTAL (UG/L)	1,2- TRANSDI- CHLORO- ETHENE TOTAL (UG/L)	1,2-DI- CHLORO- PROPANE TOTAL (UG/L)	1,3-DI- CHLORO- PROPANE WAT. WH TOTAL (UG/L)	2,2-DI- CHLORO- PRO- PANE WAT, WH TOTAL (UG/L)
	SEP 09-09 09...	<2 <2	<2 <2	<2 <2	-- <2	-- <2	-- <2	<5 --	-- <2	-- <2	-- <2	-- <2
DATE	CIS 1,3-DI- CHLORO- PROPENE TOTAL (UG/L)	TRANS- 1,3-DI- CHLORO- PROPENE TOTAL (UG/L)	ETHYL- BENZENE TOTAL (UG/L)	HEXA- CHLORO- BUT- ADIENE TOTAL (UG/L)	ISO- PROPYL- BENZENE WATER WHOLE REC (UG/L)	P-ISO- PROPYL- TOLUENE WATER WHOLE REC (UG/L)	METHYL- BROMIDE TOTAL (UG/L)	METHYL- ENE CHLO- RIDE TOTAL (UG/L)	METHYL TERT- BUTYL ETHER WAT UNF REC (UG/L)	NAPHTH- ALENE TOTAL (UG/L)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L)	STYRENE TOTAL (UG/L)
	SEP 09-09 09...	-- <2	-- <2	-- <2	<2 <2	-- <2	-- <2	-- <2	-- <2	-- <2	<2 <2	-- <2
DATE	ETHANE, 1112- TETRA- CHLORO- WAT UNF REC (UG/L)	ETHANE, 1,1,2,2 TETRA- CHLORO- WAT UNF REC (UG/L)	TETRA- CHLORO- ETHYL- ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)	1,2,3- TRI- CHLORO BENZENE WAT, WH REC (UG/L)	BENZENE 1,2,4- TRI- CHLORO- WAT UNF REC (UG/L)	1,1,1- TRI- CHLORO- ETHANE TOTAL (UG/L)	1,1,2- TRI- CHLORO- ETHANE TOTAL (UG/L)	TRI- CHLORO- ETHYL- ENE TOTAL (UG/L)	TRI- CHLORO- FLUORO- METHANE TOTAL (UG/L)	123-TRI CHLORO- PROPANE WATER WHOLE TOTAL (UG/L)	FREON- 113 WATER UNFLTRD REC (UG/L)
	SEP 09-09 09...	-- <2	-- <2	-- <2	-- <2	-- <2	<2 <2	-- <2	-- <2	-- <2	-- <2	-- <2
DATE	BENZENE 124-TRI METHYL UNFLT RECOVER (UG/L)	BENZENE 135-TRI METHYL WATER UNFLTRD REC (UG/L)	VINYL CHLO- RIDE TOTAL (UG/L)	XYLENE WATER UNFLTRD REC (UG/L)	ACE- NAPHTH- ENE TOTAL (UG/L)	ACE- NAPHTH- YLENE TOTAL (UG/L)	ANTHRA- CENE TOTAL (UG/L)	BENZI- DINE TOTAL (UG/L)	BENZO A ANTHRAC ENE1,2- BENZANT HRACENE TOTAL (UG/L)	BENZO- A- PYRENE TOTAL (UG/L)	BENZO B FLUOR- AN- THENE TOTAL (UG/L)	BENZO K FLUOR- AN- THENE TOTAL (UG/L)
	SEP 09-09 09...	-- <2	-- <2	-- <2	-- <2.0	<5 --	<5 --	<5 --	<40 --	<10 --	E0.1 --	E0.4 --
DATE	BENZOGH I PERYL ENEL,12 -BENZOP ERYLENE TOTAL (UG/L)	4- BROMO- PHENYL PHENYL ETHER TOTAL (UG/L)	N-BUTYL BENZYL PHTHAL- ATE TOTAL (UG/L)	BIS (2- CHLORO- ETHOXY) METHANE TOTAL (UG/L)	BIS 2- CHLORO- ETHYL ETHER UNFLTRD RECOVER (UG/L)	BIS (2- CHLORO- ISO- PROPYL) ETHER TOTAL (UG/L)	PARA- CHLORO- META CRESOL TOTAL (UG/L)	2- CHLORO- NAPH- THALENE TOTAL (UG/L)	2- CHLORO- PHENOL TOTAL (UG/L)	4- CHLORO- PHENYL PHENYL ETHER TOTAL (UG/L)	CHRY- SENE TOTAL (UG/L)	1,2,5,6 -DIBENZ -ANTHRA -CENE TOTAL (UG/L)
	SEP 09-09 09...	<10 --	<5 --	<5 --	<5 --	<5 --	<5 --	<30 --	<5 --	<5 --	<5 --	E0.4 --
DATE	3,3'- DI- CHLORO- BENZI- DINE TOTAL (UG/L)	2,4-DI- CHLORO- PHENOL TOTAL (UG/L)	DIETHYL PHTHAL- ATE TOTAL (UG/L)	DI- METHYL PHTHAL- ATE TOTAL (UG/L)	2,4-DI- METHYL- PHENOL TOTAL (UG/L)	DI-N- BUTYL PHTHAL- ATE TOTAL (UG/L)	4,6- DINITRO -ORTHO- CRESOL TOTAL (UG/L)	2,4,- DI- NITRO- PHENOL TOTAL (UG/L)	2,4-DI- NITRO- TOLUENE TOTAL (UG/L)	2,6-DI- NITRO- TOLUENE TOTAL (UG/L)	DI-N- OCTYL PHTHAL- ATE TOTAL (UG/L)	BIS(2- ETHYL HEXYL) PHTHAL- ATE TOTAL (UG/L)
	SEP 09-09 09...	<20 --	<5 --	<5 --	<5 --	<5 --	<5 --	<30 --	<20 --	<5 --	<5 --	<10 --
DATE	FLUOR- ANTHENE TOTAL (UG/L)	FLUOR- ENE TOTAL (UG/L)	HEXA- CHLORO- BENZENE TOTAL (UG/L)	CYCLOPE NTADIEN HEXA- CHLORO- UNFLTRD RECOVER (UG/L)	ETHANE HEXA- CHLORO- WATER UNFLTRD RECOVER (UG/L)	INDENO (1,2,3- CD) PYRENE TOTAL (UG/L)	ISO- PHORONE TOTAL (UG/L)	BENZENE NITRO- WATER UNFLTRD RECOVER (UG/L)	N-NITRO -SODI- METHY- LAMINE TOTAL (UG/L)	2- NITRO- PHENOL TOTAL (UG/L)	4- NITRO- PHENOL TOTAL (UG/L)	N- NITRO- SODI-N- PROPYL- AMINE TOTAL (UG/L)
	SEP 09-09 09...	<5 --	<5 --	<5 --	<20 --	<5 --	<10 --	<5 --	<5 --	<5 --	<5 --	<30 --

08181440 INGRAM ROAD OUTFALL AT LEON CREEK TRIB. AT SAN ANTONIO, TX--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible]

# GUADALUPE RIVER BASIN

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08181480 LEON CREEK AT INTERSTATE HIGHWAY 35 AT SAN ANTONIO, TX

**LOCATION.**--Lat 29°19'47", long 98°35'02", Bexar County, Hydrologic Unit 12100302, on left bank between bridges on Interstate Highway 35 in San Antonio, 1.7 mi northeast of the intersection of Interstate Highway 35 and Loop 410, and 11.8 mi upstream from mouth.

**DRAINAGE AREA.**--219 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

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

**GAGE.**--Water-stage recorder. Datum of gage is 573.49 ft above sea level.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. No known regulation or diversions. Satellite telemeter at station.

### DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	2.9	3.5	4.6	2.7	2.4	25	8.8	9.2	56	4.1	.67
2	3.1	2.4	3.9	3.2	2.9	77	69	8.3	7.1	44	5.1	2.1
3	2.8	2.6	3.6	3.7	2.1	16	134	5.1	6.3	35	2.8	2.6
4	2.8	2.0	5.6	3.7	2.3	5.7	61	5.5	6.3	e31	3.5	7.1
5	4.4	2.8	9.5	3.0	2.2	4.5	46	5.0	6.4	e26	3.3	10
6	3.6	2.9	4.5	2.8	1.9	3.5	37	5.0	17	e22	3.4	3.1
7	2.6	3.3	4.2	2.9	4.5	2.9	24	5.1	46	16	3.8	1.5
8	2.7	2.4	3.7	8.2	4.0	2.9	15	e5.5	15	15	5.6	2.0
9	2.4	2.3	3.2	6.6	3.1	3.1	10	e8.0	59	13	4.0	2.4
10	2.4	2.2	3.7	4.5	1.9	e2.4	9.1	e25	33	13	3.7	5.3
11	2.6	2.0	4.5	3.4	2.6	38	7.8	e10	25	13	3.7	2.1
12	2.4	2.2	4.2	3.5	37	48	6.8	e9.0	32	10	4.5	1.3
13	1.8	2.1	4.3	3.9	28	13	5.3	e44	19	9.9	3.2	1.6
14	1.8	2.0	4.6	4.0	10	5.1	5.8	e15	13	9.5	4.8	.74
15	2.3	4.9	38	3.9	4.9	3.4	5.8	e12	61	9.4	7.7	.52
16	2.5	4.5	20	3.8	3.3	3.6	5.1	e10	52	9.3	4.9	1.2
17	2.6	2.8	7.5	4.0	2.6	4.4	4.8	8.2	44	9.1	2.3	1.3
18	1.9	2.4	5.0	3.2	2.1	4.5	3.9	6.0	22	8.7	3.1	1.3
19	2.4	2.2	4.4	3.3	2.0	5.7	4.5	5.6	13	e8.6	2.4	1.2
20	2.6	3.8	4.3	4.2	43	3.6	3.1	76	9.2	e8.5	2.0	1.6
21	2.6	3.0	4.7	3.8	10	2.8	3.3	14	310	e8.4	3.0	2.1
22	5.3	3.0	3.9	3.7	2.8	2.4	3.6	12	7860	8.2	3.6	4.2
23	2.7	2.6	4.1	4.0	2.0	2.3	2.8	38	4930	6.6	16	3.0
24	2.8	49	4.1	4.8	3.0	2.1	3.3	53	720	7.2	10	2.2
25	2.9	7.0	3.8	3.7	5.4	3.0	5.2	26	339	5.9	3.7	1.6
26	3.1	4.3	3.8	3.1	11	2.1	99	12	303	5.3	4.5	1.6
27	2.9	4.2	3.8	2.6	5.1	1.8	32	20	161	4.8	1.6	1.3
28	2.9	8.7	4.4	2.2	3.2	2.6	14	97	112	3.2	1.9	1.3
29	2.8	30	3.8	2.8	---	1.6	11	33	90	4.3	3.0	1.3
30	2.9	7.3	4.4	2.7	---	1.6	9.3	19	73	4.0	2.7	1.8
31	3.0	---	11	2.7	---	4.8	---	13	---	3.9	2.3	---
TOTAL	86.8	173.8	194.0	116.5	205.6	276.8	666.5	614.1	15393.5	428.8	130.2	70.03
MEAN	2.80	5.79	6.26	3.76	7.34	8.93	22.2	19.8	513	13.8	4.20	2.33
MAX	5.3	49	38	8.2	43	77	134	97	7860	56	16	10
MIN	1.8	2.0	3.2	2.2	1.9	1.6	2.8	5.0	6.3	3.2	1.6	.52
AC-FT	172	345	385	231	408	549	1320	1220	30530	851	258	139

### STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1985 - 1997, BY WATER YEAR (WY)

	MEAN	23.9	11.4	54.5	20.3	41.9	29.0	22.9	74.2	164	22.7	8.37	14.6
MAX	92.0	37.9	575	116	355	192	82.6	356	824	144	23.0	38.3	
(WY)	1995	1993	1992	1992	1992	1992	1991	1992	1987	1990	1992	1988	
MIN	2.80	3.95	4.62	3.76	5.93	5.11	3.69	2.14	2.72	2.56	1.94	1.97	
(WY)	1997	1992	1990	1997	1989	1996	1995	1996	1996	1989	1989	1989	

### SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1985 - 1997
ANNUAL TOTAL	2104.68	18356.63	
ANNUAL MEAN	5.75	50.3	40.5
HIGHEST ANNUAL MEAN			156
LOWEST ANNUAL MEAN			6.22
HIGHEST DAILY MEAN	124	7860	7860
LOWEST DAILY MEAN	.54	.52	.52
ANNUAL SEVEN-DAY MINIMUM	.78	1.1	.78
INSTANTANEOUS PEAK FLOW		27900	27900
INSTANTANEOUS PEAK STAGE		24.60	24.60
ANNUAL RUNOFF (AC-FT)	4170	36410	29320
10 PERCENT EXCEEDS	8.5	34	38
50 PERCENT EXCEEDS	3.3	4.2	8.0
90 PERCENT EXCEEDS	1.1	2.1	3.0

e Estimated

## GUADALUPE RIVER BASIN

08181480 LEON CREEK AT INTERSTATE HIGHWAY 35 AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: July 1984 to current year. Pesticide analyses**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: September 1984 to current year.

pH: April 1989 to current year.

WATER TEMPERATURE: September 1984 to current year.

DISSOLVED OXYGEN: April 1989 to current year.

**INSTRUMENTATION.**--Since September 1984, a 2-parameter water-quality monitor continuously measured specific conductance and water temperature at this station. Since April 1989, a 4-parameter water-quality monitor has continuously measured specific conductance, temperature, pH, and dissolved oxygen.**REMARKS.**--Interruptions in the record were due to malfunctions of the instrument. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum, 1,260 microsiemens Nov. 19, 1988, June 29, 1995; minimum, 39 microsiemens Jan. 18, 1991.

pH: Maximum, 8.5 units Mar. 29, 1990; minimum, 6.7 units June 30, 1991.

WATER TEMPERATURE: Maximum, 32.5°C July 16, 17, 1989; minimum, 4.0°C Dec. 24, 1989.

DISSOLVED OXYGEN: Maximum, 19.8 mg/L Oct. 13, 14, 1989; minimum, 1.2 mg/L on several days in water years 1990, 1993, 1996, and 1997.

**EXTREMES FOR CURRENT YEAR.**--

SPECIFIC CONDUCTANCE: Maximum, 1190 microsiemens Nov. 21; minimum, 151 microsiemens May 20.

pH: Maximum, 8.0 units several days in Feb., Mar., June, and Sept.; minimum, 7.1 units Aug. 24, 25.

WATER TEMPERATURE: Maximum, 30.5°C Aug. 17; minimum, 5.5°C Jan. 13, 14.

DISSOLVED OXYGEN: Maximum, 14.1 mg/L Jan. 17; minimum, 1.2 mg/L Aug. 24.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	OXYGEN DEMAND, CHEM- ICAL (HIGH LEVEL) (MG/L)	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)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT
APR 02-03	1755	149	330	45	--	120	21	42	4.1	17	0.7	23
APR 26-26	0644	192	385	82	28	140	23	46	5.6	22	0.8	25
DATE	POTAS- SIUM, DIS- SOLVED (MG/L AS K)	ALKA- LITY WAT DIS FIX END FIELD CAC03 (MG/L)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDED (MG/L)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC TOTAL (MG/L AS N)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N)
APR 02-03	3.6	100	29	21	201	186	616	0.410	0.040	2.4	2.0	0.21
APR 26-26	3.7	110	32	27	223	217	860	0.793	0.110	4.5	3.6	0.28
DATE	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)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)
APR 02-03	0.25	2.0	0.750	0.070	21	<0.010	<1	<1	4	<10	2	23
APR 26-26	0.39	3.7	1.88	0.065	30	<0.010	<1	1	15	<10	4	43
DATE	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	ENDO- SULFAN- I WATER WHOLE REC (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOR 1016 PCB TOTAL (UG/L)	AROCLOR 1221 PCB TOTAL (UG/L)
APR 02-03	15	37	<0.10	13	<1	2	120	<0.040	<0.100	<0.030	<0.100	<1.00
APR 26-26	29	64	0.16	47	<1	3	190	<0.040	<0.100	<0.030	<0.100	<1.00

## 08181480 LEON CREEK AT INTERSTATE HIGHWAY 35 AT SAN ANTONIO, TX--Continued

DATE	AROCLOR 1232 PCB TOTAL (UG/L)	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)
APR 02-03	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	0.024
APR 26-26	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020
DATE	ENDO- SULFAN SULFATE TOTAL (UG/L)	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	P,P' DDD, TOTAL (UG/L)	P,P' DDE, TOTAL (UG/L)	P,P' DDT, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)
APR 02-03	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
APR 26-26	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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.	1996	86.8	752	449	105	48	11.3	89	20.8	260
NOV.	1996	173.8	629	374	175	39	18.2	70	32.6	220
DEC.	1996	194	677	403	211	42	22.1	76	39.9	240
JAN.	1997	116.5	832	499	157	56	17.5	100	32.7	290
FEB.	1997	205.6	627	373	207	39	21.4	69	38.4	220
MAR.	1997	276.8	524	310	232	31	23.0	54	40.0	190
APR.	1997	666.5	480	283	510	28	49.6	47	85.1	180
MAY	1997	614.1	505	298	494	29	48.1	50	82.5	190
JUNE	1997	15393.5	294	171	7120	15	622	24	980	110
JULY	1997	428.8	775	464	537	50	58.3	93	108	270
AUG.	1997	130.2	719	429	151	46	16.1	84	29.5	250
SEPT	1997	70.03	719	429	81.1	46	8.6	83	15.7	250
TOTAL		18356.63	**	**	9980	**	916	**	1510	**
WTD. AVG.		50	343	201	**	18	**	30	**	130

## SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	699	638	664	784	752	761	550	471	522	842	564	710
2	721	690	710	806	754	765	561	541	552	708	557	609
3	690	643	662	878	806	857	600	541	563	714	655	680
4	658	640	644	877	846	868	616	571	604	754	666	713
5	679	658	672	846	797	814	677	544	623	805	754	780
6	754	671	709	827	797	804	585	545	570	824	805	814
7	754	724	738	857	827	844	566	546	551	825	801	818
8	725	706	718	829	775	802	593	561	582	877	821	830
9	706	661	679	775	750	758	651	593	624	901	732	821
10	700	668	682	817	759	780	744	651	701	749	711	736
11	792	700	733	835	812	827	746	728	739	726	708	716
12	828	792	815	812	766	787	775	728	744	828	719	790
13	818	787	803	910	805	863	798	775	782	896	821	860
14	787	766	775	894	806	841	850	798	833	921	829	891
15	766	753	760	806	737	775	846	273	664	947	921	935
16	760	754	757	757	673	744	675	545	615	923	854	892
17	762	751	756	673	610	621	545	445	497	863	824	839
18	762	747	755	742	619	692	484	435	452	872	863	869
19	748	728	740	729	648	676	576	484	518	871	846	858
20	741	728	737	864	660	741	641	576	607	853	837	843
21	761	739	744	1190	864	1080	726	641	682	887	853	876
22	856	761	801	1080	943	982	798	726	774	870	786	828
23	956	856	925	1050	959	1030	797	785	791	923	785	835
24	908	789	841	1030	168	591	828	787	813	941	921	929
25	789	730	765	644	546	598	828	824	826	928	896	916
26	730	696	707	546	499	514	824	810	815	940	896	914
27	784	714	752	544	500	513	888	823	858	954	940	949
28	839	784	810	620	544	577	887	848	870	951	902	920
29	861	839	854	698	283	417	848	824	832	958	898	920
30	853	817	829	471	305	395	868	828	857	956	911	935
31	833	784	813	---	---	---	865	780	840	911	833	861
MONTH	956	638	753	1190	168	744	888	273	687	958	557	835





# GUADALUPE RIVER BASIN

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08181480 LEON CREEK AT INTERSTATE HIGHWAY 35 AT SAN ANTONIO, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	7.5	7.4	7.5	7.6	7.4	7.5	7.5	7.4	7.5	7.7	7.5	7.6
2	7.6	7.4	7.4	7.6	7.4	7.5	7.5	7.4	7.5	7.5	7.4	7.4
3	7.5	7.4	7.4	7.6	7.4	7.5	7.5	7.4	7.4	7.5	7.5	7.5
4	7.5	7.4	7.4	7.7	7.5	7.5	7.4	7.3	7.4	7.6	7.4	7.5
5	7.5	7.4	7.4	7.7	7.4	7.5	7.4	7.3	7.3	7.7	7.6	7.6
6	7.6	7.5	7.5	7.7	7.5	7.6	7.3	7.2	7.3	7.7	7.6	7.7
7	7.5	7.4	7.5	7.6	7.4	7.5	7.3	7.2	7.3	7.8	7.7	7.7
8	7.5	7.4	7.4	7.6	7.4	7.5	7.4	7.3	7.3	7.9	7.7	7.8
9	7.5	7.4	7.4	7.6	7.4	7.5	7.4	7.3	7.3	7.9	7.8	7.8
10	7.5	7.4	7.4	7.7	7.5	7.5	7.4	7.3	7.3	7.9	7.7	7.8
11	7.6	7.4	7.5	7.7	7.5	7.6	7.4	7.3	7.3	7.9	7.7	7.8
12	7.7	7.4	7.5	7.6	7.4	7.5	7.5	7.3	7.4	---	---	---
13	7.7	7.5	7.6	7.6	7.4	7.5	7.5	7.4	7.4	---	---	---
14	7.6	7.5	7.5	7.6	7.4	7.5	7.5	7.4	7.4	---	---	---
15	7.6	7.4	7.5	7.6	7.5	7.5	7.6	7.4	7.5	7.8	7.6	7.7
16	7.6	7.4	7.5	7.6	7.4	7.6	7.7	7.5	7.6	7.8	7.6	7.7
17	7.7	7.5	7.6	7.5	7.3	7.4	7.5	7.4	7.5	7.8	7.7	7.7
18	7.7	7.5	7.6	7.5	7.3	7.4	7.5	7.4	7.4	7.9	7.7	7.8
19	7.7	7.5	7.6	7.5	7.4	7.4	7.6	7.4	7.5	7.7	7.6	7.7
20	7.7	7.5	7.6	7.6	7.4	7.5	7.6	7.5	7.5	7.7	7.6	7.6
21	7.6	7.5	7.5	7.7	7.5	7.6	7.6	7.5	7.6	7.7	7.5	7.7
22	7.7	7.4	7.6	7.6	7.5	7.5	7.6	7.5	7.6	7.8	7.6	7.7
23	7.7	7.5	7.5	7.7	7.5	7.6	7.6	7.4	7.5	7.8	7.6	7.6
24	7.6	7.4	7.5	7.9	7.6	7.8	7.7	7.5	7.6	7.8	7.5	7.6
25	7.7	7.4	7.5	7.9	7.6	7.8	7.7	7.6	7.7	7.8	7.6	7.7
26	7.6	7.4	7.5	7.7	7.6	7.6	7.8	7.6	7.7	7.8	7.6	7.7
27	7.6	7.4	7.5	7.6	7.5	7.6	7.8	7.7	7.7	7.7	7.6	7.6
28	7.5	7.4	7.4	7.7	7.5	7.6	7.8	7.6	7.7	7.7	7.6	7.7
29	7.5	7.4	7.4	7.7	7.5	7.6	7.8	7.6	7.7	7.8	7.6	7.7
30	7.5	7.4	7.5	7.6	7.5	7.5	7.8	7.6	7.7	7.8	7.7	7.8
31	7.6	7.4	7.5	---	---	---	7.8	7.6	7.7	7.8	7.8	7.8
MONTH	7.7	7.4	7.5	7.9	7.3	7.5	7.8	7.2	7.5	7.9	7.4	7.7

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	7.9	7.7	7.8	8.0	7.7	7.8	7.5	7.2	7.4	---	---	---
2	7.8	7.7	7.8	8.0	7.7	7.8	7.6	7.4	7.5	---	---	---
3	7.8	7.7	7.8	7.8	7.6	7.7	7.6	7.4	7.5	7.7	7.6	7.6
4	7.8	7.6	7.7	7.8	7.7	7.7	7.4	7.3	7.3	7.7	7.6	7.6
5	7.8	7.6	7.7	7.8	7.7	7.7	7.4	7.3	7.4	7.7	7.6	7.6
6	7.7	7.6	7.7	7.7	7.6	7.7	7.5	7.4	7.5	7.7	7.6	7.6
7	7.9	7.6	7.7	7.7	7.5	7.6	7.5	7.4	7.5	7.7	7.6	7.6
8	7.9	7.7	7.8	7.6	7.4	7.5	7.4	7.4	7.4	7.7	7.6	7.7
9	7.9	7.7	7.8	7.6	7.5	7.6	7.5	7.4	7.4	7.8	7.6	7.7
10	7.8	7.7	7.7	---	---	---	7.5	7.4	7.5	7.8	7.5	7.6
11	7.7	7.6	7.7	7.6	7.4	7.5	7.5	7.5	7.5	7.7	7.5	7.7
12	7.9	7.7	7.8	7.6	7.5	7.5	7.6	7.5	7.5	7.7	7.7	7.7
13	7.9	7.6	7.7	7.6	7.4	7.5	7.6	7.5	7.6	---	---	---
14	7.7	7.6	7.6	7.6	7.4	7.5	7.7	7.5	7.6	---	---	---
15	7.8	7.5	7.7	7.6	7.5	7.5	7.7	7.6	7.6	---	---	---
16	7.9	7.6	7.7	7.5	7.4	7.4	7.7	7.6	7.6	---	---	---
17	7.9	7.6	7.8	7.5	7.4	7.4	7.7	7.5	7.6	---	---	---
18	7.9	7.7	7.8	7.4	7.4	7.4	7.7	7.6	7.6	7.7	7.5	7.5
19	7.9	7.7	7.7	7.7	7.4	7.5	7.7	7.6	7.6	7.7	7.5	7.6
20	7.9	7.7	7.8	7.6	7.4	7.5	7.7	7.6	7.6	7.8	7.6	7.7
21	7.8	7.6	7.7	7.6	7.4	7.5	7.7	7.6	7.6	7.6	7.5	7.5
22	7.8	7.6	7.7	7.5	7.3	7.4	7.6	7.5	7.6	7.6	7.5	7.5
23	7.8	7.6	7.7	7.5	7.3	7.4	7.7	7.5	7.6	7.8	7.5	7.6
24	7.8	7.6	7.7	7.5	7.3	7.4	7.7	7.5	7.6	7.8	7.6	7.7
25	7.7	7.7	7.7	---	---	---	7.7	7.5	7.6	7.8	7.7	7.8
26	7.9	7.6	7.8	7.5	7.3	7.4	7.8	7.6	7.7	7.7	7.6	7.6
27	8.0	7.7	7.8	7.4	7.3	7.3	7.6	7.5	7.5	7.8	7.6	7.7
28	8.0	7.8	7.9	7.4	7.3	7.3	7.7	7.6	7.6	7.8	7.6	7.7
29	---	---	---	7.5	7.3	7.4	7.6	7.6	7.6	7.8	7.6	7.7
30	---	---	---	7.4	7.3	7.3	7.6	7.5	7.6	7.7	7.6	7.6
31	---	---	---	7.5	7.3	7.4	---	---	---	7.8	7.6	7.7
MONTH	8.0	7.5	7.7	8.0	7.3	7.5	7.8	7.2	7.5	7.8	7.5	7.6

## GUADALUPE RIVER BASIN

08181480 LEON CREEK AT INTERSTATE HIGHWAY 35 AT SAN ANTONIO, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	7.9	7.7	7.7	7.6	7.6	7.6	7.7	7.5	7.6	7.6	7.4	7.5
2	7.9	7.7	7.8	7.6	7.5	7.6	7.8	7.6	7.6	7.6	7.4	7.5
3	7.8	7.6	7.7	---	---	---	7.7	7.5	7.6	7.5	7.4	7.5
4	7.8	7.6	7.7	---	---	---	7.6	7.4	7.5	7.6	7.4	7.5
5	7.8	7.6	7.6	---	---	---	7.6	7.4	7.5	7.8	7.5	7.6
6	7.8	7.6	7.7	---	---	---	7.6	7.4	7.5	7.7	7.5	7.6
7	7.8	7.5	7.6	---	---	---	7.6	7.4	7.5	7.6	7.4	7.5
8	7.6	7.4	7.5	7.6	7.5	7.6	7.5	7.4	7.4	7.6	7.4	7.4
9	7.8	7.4	7.6	7.6	7.5	7.6	7.5	7.4	7.4	7.7	7.4	7.5
10	7.6	7.4	7.5	7.6	7.6	7.6	7.5	7.4	7.4	7.7	7.5	7.6
11	7.7	7.4	7.6	7.6	7.5	7.6	7.5	7.3	7.4	7.8	7.6	7.6
12	7.9	7.7	7.8	7.6	7.5	7.6	7.5	7.3	7.4	7.8	7.6	7.7
13	7.8	7.6	7.7	7.6	7.5	7.6	7.5	7.4	7.4	7.8	7.6	7.6
14	7.8	7.7	7.7	7.7	7.5	7.6	7.6	7.4	7.4	7.8	7.6	7.6
15	7.8	7.7	7.7	7.6	7.5	7.6	7.6	7.4	7.5	7.8	7.5	7.6
16	7.8	7.5	7.7	7.6	7.5	7.5	7.6	7.4	7.5	7.8	7.5	7.6
17	7.8	7.7	7.8	7.6	7.5	7.5	7.6	7.4	7.5	7.8	7.5	7.6
18	7.8	7.6	7.7	7.6	7.5	7.5	7.6	7.4	7.5	7.8	7.6	7.6
19	7.9	7.7	7.8	7.6	7.5	7.5	7.6	7.4	7.5	7.8	7.6	7.7
20	7.9	7.7	7.8	7.6	7.4	7.5	7.7	7.4	7.5	7.8	7.6	7.7
21	7.9	7.7	7.8	7.6	7.5	7.5	7.7	7.4	7.5	7.7	7.6	7.7
22	7.9	7.6	7.7	7.6	7.5	7.5	7.7	7.4	7.5	7.8	7.6	7.7
23	7.8	7.8	7.8	7.5	7.3	7.4	7.7	7.3	7.5	7.9	7.8	7.8
24	7.9	7.8	7.9	7.5	7.3	7.4	7.4	7.1	7.2	7.9	7.7	7.8
25	7.9	7.9	7.9	7.6	7.5	7.5	7.2	7.1	7.2	7.9	7.8	7.8
26	8.0	7.9	7.9	7.6	7.4	7.5	7.4	7.2	7.2	7.9	7.8	7.8
27	7.9	7.7	7.8	7.6	7.4	7.5	7.5	7.2	7.3	7.9	7.7	7.8
28	7.8	7.7	7.8	7.6	7.4	7.5	7.4	7.2	7.3	7.9	7.7	7.8
29	7.8	7.7	7.7	7.7	7.5	7.5	7.5	7.3	7.3	8.0	7.7	7.8
30	7.7	7.6	7.7	7.7	7.5	7.6	7.6	7.3	7.4	8.0	7.8	7.9
31	---	---	---	7.7	7.5	7.6	7.6	7.4	7.5	---	---	---
MONTH	8.0	7.4	7.7	7.7	7.3	7.5	7.8	7.1	7.4	8.0	7.4	7.6
YEAR	8.0	7.1	7.6									

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

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



## GUADALUPE RIVER BASIN

08181480 LEON CREEK AT INTERSTATE HIGHWAY 35 AT SAN ANTONIO, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	8.0	3.7	5.4	5.0	2.2	3.1	7.6	6.1	6.6	7.7	5.1	6.4
2	8.6	5.6	6.5	5.8	2.6	3.8	7.6	5.7	6.6	6.4	4.6	5.7
3	7.2	5.3	6.0	7.2	3.6	4.8	7.6	5.9	6.6	6.8	4.6	5.6
4	6.1	5.0	5.4	7.3	4.2	5.4	6.1	5.0	5.5	6.5	4.3	5.7
5	5.8	4.8	5.2	8.0	4.4	5.7	7.9	4.2	6.3	7.1	4.4	5.9
6	7.3	4.9	5.5	7.5	4.1	5.2	7.7	5.3	6.2	6.9	5.4	6.1
7	6.8	4.5	5.3	6.5	3.4	4.5	7.3	5.1	6.0	9.7	5.7	7.2
8	6.9	4.1	5.0	7.1	3.7	4.9	7.8	5.4	6.4	10.1	7.1	8.4
9	6.6	4.2	5.0	7.7	4.4	5.6	8.5	6.1	6.9	10.0	7.9	8.9
10	7.5	4.1	5.1	8.4	5.0	6.2	8.1	5.5	6.7	10.5	7.7	9.1
11	7.3	4.3	5.3	8.5	5.2	6.4	7.4	5.0	6.1	10.7	8.5	9.7
12	7.7	3.9	5.2	7.3	4.8	5.7	7.5	4.5	5.9	10.9	9.3	9.9
13	7.3	4.1	5.3	7.3	4.2	5.3	7.9	4.5	6.0	11.4	10.2	10.8
14	6.7	3.6	4.8	6.8	4.0	5.2	6.8	4.6	5.7	12.6	8.5	11.1
15	6.6	3.8	4.8	5.8	3.9	4.7	7.4	4.7	6.0	13.6	10.1	12.5
16	6.7	3.4	4.6	6.6	3.9	4.9	8.3	6.6	7.3	13.9	10.8	12.8
17	7.2	3.4	4.6	4.8	2.5	3.4	8.7	6.9	7.7	14.1	10.7	12.3
18	6.3	3.4	4.5	5.1	2.4	3.5	9.5	7.3	8.4	13.7	10.7	12.3
19	6.8	3.5	4.7	4.9	3.1	3.7	10.3	8.1	9.3	12.9	9.9	11.2
20	6.3	3.7	4.6	6.6	3.3	4.4	10.2	8.7	9.5	11.0	8.6	9.9
21	5.8	3.4	4.2	6.9	3.5	4.9	10.6	8.2	9.7	10.9	7.7	9.7
22	5.4	3.0	3.9	4.9	3.3	4.1	10.1	7.1	8.7	12.6	7.9	10.6
23	5.8	2.9	3.9	6.3	3.5	4.5	9.0	6.2	7.9	11.8	7.2	8.7
24	5.0	3.2	3.8	8.4	3.8	5.9	10.1	5.8	8.1	10.8	6.2	8.7
25	6.2	3.0	4.0	7.1	5.9	6.4	10.3	6.9	8.7	10.7	6.5	8.9
26	5.8	3.2	4.1	8.4	6.5	7.5	11.4	7.7	9.8	10.7	6.8	8.9
27	5.8	2.8	3.8	8.9	7.4	8.0	11.8	8.8	10.6	9.4	6.2	7.7
28	5.1	2.0	3.2	8.0	4.4	7.4	11.8	8.1	9.8	9.4	6.5	7.8
29	5.7	2.0	3.3	7.9	5.7	7.0	11.4	7.3	9.4	10.3	7.2	8.9
30	6.3	2.3	3.7	7.6	6.2	6.9	10.8	7.3	9.2	11.3	8.4	9.9
31	5.0	1.2	3.2	---	---	---	10.5	6.8	8.4	11.3	8.7	10.2
MONTH	8.6	1.2	4.6	8.9	2.2	5.3	11.8	4.2	7.6	14.1	4.3	9.1

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	10.8	8.3	9.7	13.2	6.3	9.3	6.2	4.4	5.1	---	---	---
2	10.1	7.3	9.1	10.1	6.9	8.9	6.8	5.4	6.1	---	---	---
3	9.8	6.7	8.6	8.8	7.7	8.4	6.8	6.2	6.6	7.5	4.1	5.5
4	9.7	6.3	8.1	8.6	6.7	7.5	6.5	4.9	5.8	7.9	4.6	5.9
5	9.8	6.4	8.2	8.0	5.7	6.8	5.8	5.4	5.5	8.8	4.8	6.2
6	8.6	7.0	7.8	9.6	5.5	7.4	6.1	5.3	5.6	7.0	4.5	5.5
7	11.4	7.1	9.0	8.8	5.7	7.2	6.2	5.3	5.5	7.0	4.7	5.6
8	12.0	6.9	9.6	8.1	5.2	6.4	5.3	4.7	5.0	8.1	4.7	6.0
9	12.2	8.0	10.4	7.5	4.6	5.6	5.7	4.5	4.9	7.3	4.6	5.6
10	12.6	8.4	10.8	---	---	---	5.2	4.5	4.7	6.7	5.7	6.3
11	11.2	6.7	10.2	6.6	4.3	5.9	5.7	4.3	4.8	7.0	5.6	6.1
12	10.7	7.9	9.1	7.4	6.8	-6.4	6.1	4.4	5.1	5.7	5.2	5.4
13	10.0	8.9	9.4	8.8	6.2	7.1	6.6	4.7	5.5	---	---	---
14	10.4	6.9	9.1	8.3	5.2	6.6	7.1	4.8	5.7	7.4	4.9	5.7
15	12.0	8.3	9.9	8.0	5.7	6.8	7.4	5.0	5.9	---	---	---
16	12.5	7.7	9.9	8.0	6.2	7.0	7.4	3.5	5.6	---	---	---
17	12.7	7.1	9.9	8.2	6.1	7.0	7.6	4.3	5.5	---	---	---
18	12.5	7.4	10.4	8.0	6.0	6.9	9.5	5.3	6.8	7.4	4.8	5.7
19	11.9	6.5	8.2	11.0	6.2	7.9	9.5	4.5	7.2	7.8	3.8	5.2
20	8.1	6.2	7.3	10.1	6.6	8.1	10.2	5.1	7.2	11.0	5.3	9.1
21	8.3	5.9	6.8	10.1	6.0	7.8	9.0	5.2	6.7	7.9	5.8	7.0
22	9.3	5.9	7.4	9.8	5.6	7.5	8.2	4.5	6.0	6.7	4.9	5.7
23	9.4	5.9	7.6	10.5	5.2	7.6	9.1	4.5	6.2	7.8	3.9	5.8
24	8.4	5.9	6.9	9.3	5.3	7.3	8.1	4.6	6.0	8.1	6.9	7.3
25	7.5	6.2	6.8	---	---	---	6.6	4.3	5.2	8.5	5.9	7.2
26	10.0	6.5	7.8	7.8	4.6	6.8	9.1	4.5	7.4	7.6	5.3	6.0
27	11.9	7.1	9.2	6.9	4.7	5.6	7.9	6.8	7.3	11.3	5.1	6.2
28	12.1	7.8	9.6	7.6	4.1	5.7	7.8	6.5	7.0	12.6	8.2	9.9
29	---	---	---	7.2	4.1	5.4	7.4	5.9	6.6	9.3	7.2	8.1
30	---	---	---	5.3	3.5	4.4	7.1	5.1	6.0	9.3	6.5	7.3
31	---	---	---	5.8	3.8	4.8	---	---	---	8.6	5.7	6.7
MONTH	12.7	5.9	8.8	13.2	3.5	6.9	10.2	3.5	5.9	12.6	3.8	6.4





## GUADALUPE RIVER BASIN

08181500 MEDINA RIVER AT SAN ANTONIO, TX

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

**DRAINAGE AREA.**--1,317 mi<sup>2</sup>, of which 634 mi<sup>2</sup> is above dam forming Medina Lake.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1929 to December 1930, July 1939 to current year. October 1929 to December 1930, records below about 50 ft--s in connection with seepage investigation (published as "at Losoya"). Published as "near San Antonio" July 1939 to September 1970.

**REVISED RECORDS.**--WSP 1562: 1957. WSP 1923: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 439.0 ft above sea level (levels by U.S. Army Corps of Engineers). October 1929 to December 1930, nonrecording gage at Losoya 1.5 mi downstream at different datum. July 27, 1939, to Sept. 30, 1987, at site near left bank at downstream side of pier of upstream bridge of two bridges at same datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. Since installation of gage in water year 1939, at least 10% of contributing drainage area has been regulated by Medina Lake (08179500) 60 mi upstream and by diversion dam reservoir, capacity 4,500 acre-ft. Streamflow is lost into the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin between the upstream end of Medina Lake and about 5 mi downstream from Medina Dam, or 0.9 mi downstream from the diversion dam. Several small diversions below diversion dam reservoir. Records furnished by the city of San Antonio show that during the current year, 2,746 acre-ft from Mitchell Lake and wastewater effluent in the amount of 38,149 acre-ft from the Leon Creek plant was discharged into the Medina River above this station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage, 55 ft sometime prior to construction of Medina Dam in 1913, from information by State Department of Highways and Public Transportation.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	88	122	123	68	122	149	142	159	1740	159	115
2	77	85	110	115	70	325	348	135	146	1550	149	118
3	71	85	113	109	77	346	771	127	132	1340	147	117
4	73	89	110	108	70	157	822	121	125	1230	139	128
5	73	87	115	105	68	127	552	125	126	1130	133	132
6	74	89	116	102	68	120	400	122	141	1060	135	126
7	73	94	115	89	79	115	309	125	325	997	138	119
8	71	92	112	93	82	112	238	126	245	917	141	120
9	73	86	111	91	86	118	205	159	398	850	142	121
10	88	90	107	98	93	119	187	273	499	788	143	121
11	85	94	108	82	e84	142	185	194	370	746	144	111
12	80	96	108	68	e104	390	166	148	344	701	143	109
13	79	93	105	65	e129	305	157	251	e225	646	144	105
14	83	93	103	79	169	163	153	240	e155	599	147	104
15	84	95	106	95	135	125	145	174	e270	563	147	104
16	84	105	135	97	120	119	142	381	e310	531	147	98
17	92	107	103	90	114	123	143	194	396	503	145	98
18	90	108	83	96	113	126	138	149	280	472	147	97
19	80	97	87	90	109	124	141	135	172	439	146	98
20	80	77	104	90	222	121	145	453	146	407	145	93
21	87	78	118	97	213	119	145	239	708	384	144	118
22	85	75	121	97	190	116	136	181	2020	383	143	140
23	80	79	125	96	138	111	133	192	11200	373	137	140
24	84	124	121	99	124	114	130	299	10300	370	146	143
25	81	117	102	96	124	115	137	294	8070	354	138	136
26	81	107	112	92	143	118	435	196	6130	334	130	111
27	84	110	116	99	154	114	389	174	4570	307	127	100
28	88	113	114	80	129	113	258	492	3280	280	120	97
29	86	146	114	72	---	115	187	356	2520	239	131	105
30	84	158	114	73	---	113	157	273	2050	212	121	123
31	87	---	115	73	---	115	---	200	---	189	118	---
TOTAL	2524	2957	3445	2859	3275	4662	7603	6670	55812	20634	4336	3447
MEAN	81.4	98.6	111	92.2	117	150	253	215	1860	666	140	115
MAX	92	158	135	123	222	390	822	492	11200	1740	159	143
MIN	71	75	83	65	68	111	130	121	125	189	118	93
AC-FT	5010	5870	6830	5670	6500	9250	15080	13230	110700	40930	8600	6840

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997#, BY WATER YEAR (WY)

	1939	1940	1941	1942	1943	1944	1945	1946	1947	1948	1949	1950
MEAN	196	151	148	165	223	176	188	267	412	209	151	184
MAX	1734	835	961	979	2923	2558	1621	2018	7006	3261	1175	1427
(WY)	1974	1977	1992	1968	1992	1992	1992	1992	1987	1973	1978	1973
MIN	7.60	8.50	12.7	5.58	12.7	9.77	6.63	8.71	6.52	6.13	6.40	8.24
(WY)	1956	1956	1955	1957	1953	1956	1956	1953	1956	1954	1952	1954

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1939 - 1997#

ANNUAL TOTAL	35380	118224	
ANNUAL MEAN	96.7	324	
HIGHEST ANNUAL MEAN			206
LOWEST ANNUAL MEAN			1218
HIGHEST DAILY MEAN	464	Sep 10	11200
LOWEST DAILY MEAN	40	May 17	65
ANNUAL SEVEN-DAY MINIMUM	43	May 17	71
INSTANTANEOUS PEAK FLOW			13000
INSTANTANEOUS PEAK STAGE			28.14
ANNUAL RUNOFF (AC-FT)	70180	234500	149000
10 PERCENT EXCEEDS	121	418	361
50 PERCENT EXCEEDS	97	124	93
90 PERCENT EXCEEDS	62	83	18

e Estimated

# Period of regulated streamflow.

# GUADALUPE RIVER BASIN

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08181500 MEDINA RIVER AT SAN ANTONIO, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical and biochemical analyses: June 1965 to current year. Pesticide analyses: April 1971 to September 1981; December 1992 to current year.

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1987 to current year.

pH: January 1987 to current year.

WATER TEMPERATURE: January 1987 to current year.

DISSOLVED OXYGEN: January 1987 to current year.

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

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,190 microsiemens Oct. 16, 1996; minimum, 30 microsiemens July 16, 1990.

pH: Maximum, 8.8 units Dec. 4, 5, 1988, Mar. 22, 1989; minimum, 7.0 units Apr. 1-3, 1989, Mar. 5, 6, 1990.

WATER TEMPERATURE: Maximum, 32.0°C June 11, 1989; minimum, 9.0°C Jan. 11, 1988, Dec. 23, 1989.

DISSOLVED OXYGEN: Maximum, 14.3 mg/L Feb. 18, 1997; minimum, 1.8 mg/L Oct. 17, Nov. 8, 1987.

### EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 1,090 microsiemens Nov. 6; minimum, 207 microsiemens June 23.

pH: Maximum, 8.3 units several days in Oct., Nov., Dec., and Feb.; minimum, 7.4 units several days in Feb., Mar., and Sept.

WATER TEMPERATURE: Maximum, 30.0°C on Aug 17, 18, 20, and 21.; minimum, 10.5°C Jan. 13.

DISSOLVED OXYGEN: Maximum, 10.6 mg/L Jan. 30; minimum, 3.3 mg/L June 1, Aug 31.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	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	SODIUM PERCENT
FEB 12-13	2207	123	982	<10	6.5	300	78	87	19	80	2	36
APR 03-04	1047	840	660	32	7.1	230	79	71	13	43	1	28
DATE	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY, WAT DIS 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)	RESIDUE TOTAL AT 105 DEG. C, DIS-SOLVED (MG/L)	NITROGEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITROGEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITROGEN, DIS-SOLVED TOTAL (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DIS-SOLVED (MG/L AS N)
FEB 12-13	6.8	220	98	99	588	561	62	8.80	0.210	9.5	0.49	0.52
APR 03-04	5.2	150	86	58	411	384	522	3.50	0.070	5.4	1.8	0.41
DATE	NITROGEN, AMMONIA + ORGANIC DIS. (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)	CARBON, ORGANIC TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYLLIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM, WATER UNFLTRD TOTAL (UG/L AS CD)	CHROMIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
FEB 12-13	0.73	0.70	1.40	1.40	6.1	<0.010	<1	<1	<1	<10	<1	1
APR 03-04	0.48	1.9	1.00	0.570	16	<0.010	<1	1	3	<10	<1	7
DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ALDRIN, TOTAL (UG/L)	ENDO-SULFAN- I WATER WHOLE REC (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCOR 1016 PCB TOTAL (UG/L)	AROCOR 1221 PCB TOTAL (UG/L)
FEB 12-13	3	2	<0.10	3	<1	<1	60	<0.040	<0.100	<0.030	<0.100	<1.00
APR 03-04	8	10	<0.10	7	<1	<1	60	<0.040	<0.100	<0.030	<0.100	<1.00

## GUADALUPE RIVER BASIN

## 08181500 MEDINA RIVER AT SAN ANTONIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	AROCLOR 1232 PCB TOTAL (UG/L)	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- ELDRIN TOTAL (UG/L)
FEB 12-13	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020
APR 03-04	<0.100	<0.100	<0.100	<0.100	<0.100	<0.040	<0.030	<0.100	<0.100	<0.090	<0.020
DATE	ENDO- SULFAN SULFATE TOTAL (UG/L)	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	P,P' DDD, TOTAL (UG/L)	P,P' DDE, TOTAL (UG/L)	P,P' DDT, TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)
FEB 12-13	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100
APR 03-04	<0.600	<0.200	<0.060	<0.030	<0.800	<0.030	<0.100	<0.040	<0.100	<2.00	<0.100

MONTH YEAR	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)	
	DISCHARGE (CFS-DAYS)															
OCT. 1996	2524		982	548	3740		95	646		94	639		320			
NOV. 1996	2957		940	528	4220		88	702		91	726		310			
DEC. 1996	3445		934	526	4890		87	807		91	842		310			
JAN. 1997	2859		939	528	4080		88	677		91	702		310			
FEB. 1997	3275		928	523	4620		86	759		90	797		310			
MAR. 1997	4662		922	520	6540		85	1070		90	1130		310			
APR. 1997	7603		840	480	9850		73	1500		83	1710		290			
MAY 1997	6670		850	485	8740		74	1340		84	1520		300			
JUNE 1997	55812		413	252	37920		24	3670		46	6890		170			
JULY 1997	20634		580	347	19310		39	2180		62	3460		230			
AUG. 1997	4336		843	482	5650		73	852		84	984		300			
SEPT 1997	3447		852	487	4530		74	689		85	789		300			
TOTAL	118224		**	**	114100		**	14890		**	20190		**			
WTD.AVG.	324		610	357	**		47	**		63	**		230			

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	984	963	971	1000	938	957	901	861	888	943	880	915
2	990	971	981	996	944	975	931	881	906	929	878	908
3	994	966	981	998	912	963	948	888	928	940	890	919
4	998	957	976	998	908	952	963	933	947	927	888	908
5	1020	984	1000	996	931	969	970	909	938	933	890	910
6	998	968	985	1090	948	1020	953	912	938	945	890	921
7	999	963	982	1040	950	977	956	927	942	931	896	919
8	992	955	978	1010	976	999	978	912	943	950	911	927
9	997	958	983	1030	965	997	963	920	941	940	903	923
10	985	961	973	992	941	967	986	923	968	930	903	920
11	1010	955	982	962	913	939	985	946	963	945	904	928
12	1010	961	991	978	914	959	1020	951	990	946	905	929
13	999	974	986	988	949	968	987	953	970	957	901	935
14	995	969	983	982	951	967	991	951	971	944	898	930
15	1010	959	995	996	951	974	984	940	960	931	914	923
16	1010	959	989	979	946	968	980	848	902	951	915	940
17	1010	966	986	986	945	963	917	772	867	959	930	949
18	984	960	969	1010	935	971	954	902	932	969	929	952
19	1000	960	974	986	936	962	945	903	928	970	935	952
20	1000	922	969	967	931	948	954	918	938	976	925	955
21	1030	920	963	952	908	934	948	917	933	971	924	955
22	1000	918	958	958	913	939	972	917	945	979	931	961
23	1020	917	998	959	922	942	956	902	933	1010	946	992
24	1010	969	990	966	735	901	952	902	929	982	937	965
25	1050	969	1010	840	711	807	954	918	935	967	937	957
26	1010	974	997	862	817	851	949	891	924	996	921	968
27	1020	922	973	928	852	905	935	891	917	966	904	939
28	988	929	966	930	879	908	941	903	919	969	905	951
29	1010	936	974	943	888	914	955	902	936	974	941	961
30	1050	937	985	890	829	852	947	887	924	986	938	967
31	1070	939	1010	---	---	---	929	887	908	985	956	970
MONTH	1070	917	983	1090	711	945	1020	772	934	1010	878	940





## GUADALUPE RIVER BASIN

08181500 MEDINA RIVER AT SAN ANTONIO, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	8.1	8.0	8.0	8.2	8.1	8.1	8.3	8.1	8.2	8.2	8.1	8.1
2	8.1	8.0	8.0	8.2	8.1	8.1	8.3	8.1	8.2	8.2	8.0	8.1
3	8.1	8.0	8.0	8.2	8.1	8.1	8.3	8.1	8.2	8.1	8.0	8.1
4	8.0	7.8	7.9	8.3	8.1	8.1	8.2	8.1	8.2	8.0	7.8	8.0
5	8.1	7.9	8.0	8.2	8.0	8.1	8.1	8.0	8.0	8.0	7.8	7.9
6	8.1	8.0	8.0	8.1	7.9	8.0	8.1	8.0	8.1	8.1	7.9	8.1
7	8.0	7.9	8.0	8.1	8.0	8.0	8.2	8.0	8.1	8.2	8.1	8.1
8	8.0	7.9	8.0	8.0	7.8	8.0	8.2	8.0	8.1	8.1	8.0	8.1
9	8.1	7.9	8.0	8.1	7.9	8.0	8.2	8.0	8.1	8.2	8.0	8.1
10	8.0	7.9	8.0	8.1	7.9	8.0	8.2	8.0	8.1	8.2	8.0	8.1
11	7.9	7.8	7.9	8.1	8.0	8.0	8.1	8.0	8.1	8.2	8.1	8.1
12	7.9	7.8	7.8	8.1	7.9	8.0	8.1	8.0	8.0	8.2	8.1	8.1
13	7.9	7.7	7.8	8.1	8.0	8.0	8.0	7.9	8.0	8.2	8.1	8.1
14	7.9	7.8	7.8	8.1	8.0	8.0	8.0	7.9	7.9	8.2	8.1	8.1
15	7.9	7.8	7.9	8.1	8.0	8.0	8.0	7.9	7.9	8.2	8.1	8.1
16	8.0	7.8	7.9	8.1	8.0	8.0	8.0	7.9	8.0	8.2	8.1	8.1
17	8.1	8.0	8.0	8.1	8.0	8.0	8.1	7.8	7.9	8.2	8.1	8.1
18	8.1	8.0	8.0	8.1	8.0	8.1	8.1	8.0	8.1	8.2	8.1	8.2
19	8.2	8.0	8.1	8.1	8.0	8.1	8.2	8.0	8.1	8.2	8.1	8.1
20	8.2	8.1	8.1	8.1	7.8	8.0	8.2	8.1	8.1	8.2	8.0	8.1
21	8.2	8.0	8.1	8.1	7.9	8.0	8.2	8.1	8.1	8.1	8.0	8.0
22	8.2	8.0	8.1	8.1	8.0	8.0	8.2	8.0	8.1	8.1	7.9	8.0
23	8.2	8.1	8.1	8.1	7.9	8.0	8.2	8.0	8.1	8.0	7.9	8.0
24	8.2	8.1	8.1	8.0	7.9	7.9	8.2	8.1	8.1	8.1	8.0	8.0
25	8.2	8.1	8.1	8.0	7.9	7.9	8.3	8.1	8.2	8.2	8.0	8.1
26	8.2	8.1	8.2	8.1	7.9	8.0	8.3	8.1	8.2	8.2	8.0	8.1
27	8.3	8.0	8.1	8.3	7.9	8.1	8.3	8.1	8.2	8.1	7.9	8.0
28	8.2	8.0	8.1	8.2	8.1	8.2	8.3	8.1	8.2	8.1	8.0	8.1
29	8.2	8.0	8.1	8.2	8.1	8.1	8.3	8.1	8.1	8.1	8.0	8.1
30	8.2	8.0	8.1	8.2	8.1	8.2	8.3	8.1	8.2	8.2	8.0	8.1
31	8.2	8.1	8.1	---	---	---	8.2	8.1	8.1	8.2	8.0	8.1
MONTH	8.3	7.7	8.0	8.3	7.8	8.0	8.3	7.8	8.1	8.2	7.8	8.1

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	8.3	8.0	8.1	7.6	7.5	7.5	7.7	7.5	7.6	7.9	7.8	7.9
2	8.2	7.9	8.0	7.6	7.4	7.5	7.6	7.5	7.6	7.9	7.8	7.9
3	8.2	7.9	8.0	7.6	7.4	7.5	7.7	7.5	7.6	8.0	7.8	7.9
4	8.3	8.0	8.2	7.5	7.5	7.5	7.7	7.6	7.6	8.0	7.9	8.0
5	8.3	8.1	8.2	7.5	7.4	7.5	7.6	7.6	7.6	8.0	7.8	7.9
6	8.3	8.1	8.2	7.6	7.5	7.6	7.8	7.6	7.7	7.9	7.7	7.8
7	8.2	8.0	8.1	7.6	7.5	7.6	7.8	7.7	7.8	7.8	7.6	7.7
8	8.2	8.0	8.1	7.6	7.5	7.6	7.8	7.7	7.8	7.8	7.7	7.8
9	8.2	8.0	8.1	7.6	7.5	7.6	7.9	7.8	7.8	7.9	7.8	7.9
10	7.7	7.6	7.6	7.6	7.5	7.6	7.9	7.8	7.8	8.0	7.9	7.9
11	---	---	---	7.6	7.5	7.6	7.9	7.8	7.8	8.0	7.8	8.0
12	---	---	---	7.6	7.5	7.6	8.0	7.8	7.9	8.0	7.9	8.0
13	---	---	---	7.7	7.6	7.6	8.1	7.9	8.0	8.0	8.0	8.0
14	7.6	7.5	7.6	7.6	7.5	7.6	8.1	8.0	8.0	8.1	7.9	8.0
15	7.6	7.4	7.5	7.7	7.6	7.6	8.1	8.0	8.0	8.1	8.0	8.0
16	7.6	7.4	7.5	7.7	7.6	7.6	8.1	8.0	8.0	8.1	8.0	8.0
17	7.6	7.5	7.5	7.7	7.6	7.6	---	---	---	8.1	8.0	8.1
18	7.6	7.4	7.5	7.6	7.5	7.6	---	---	---	8.2	8.0	8.1
19	7.5	7.4	7.5	7.7	7.6	7.6	---	---	---	8.2	8.0	8.1
20	7.5	7.4	7.4	7.8	7.6	7.7	---	---	---	8.1	8.0	8.0
21	7.6	7.4	7.5	7.7	7.6	7.7	7.9	7.9	7.9	8.0	7.9	7.9
22	7.6	7.5	7.6	7.7	7.6	7.7	7.9	7.8	7.9	8.1	7.9	8.0
23	7.6	7.5	7.6	7.8	7.6	7.7	8.0	7.8	7.9	8.1	8.0	8.1
24	7.6	7.4	7.5	7.8	7.6	7.7	8.0	7.9	7.9	8.2	8.0	8.1
25	7.5	7.5	7.5	7.6	7.4	7.5	8.0	7.9	7.9	8.1	8.0	8.0
26	7.6	7.4	7.5	7.7	7.4	7.6	8.0	7.9	8.0	8.1	8.0	8.1
27	7.6	7.5	7.5	7.7	7.5	7.6	7.9	7.9	7.9	8.1	8.0	8.0
28	7.6	7.5	7.6	7.5	7.5	7.5	8.0	7.9	7.9	8.0	7.7	7.8
29	---	---	---	7.6	7.4	7.5	8.0	7.9	7.9	7.9	7.5	7.7
30	---	---	---	7.7	7.4	7.5	8.0	7.9	7.9	7.9	7.8	7.8
31	---	---	---	7.7	7.6	7.7	---	---	---	7.9	7.8	7.9
MONTH	8.3	7.4	7.7	7.8	7.4	7.6	8.1	7.5	7.8	8.2	7.5	7.9

GUADALUPE RIVER BASIN

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08181500 MEDINA RIVER AT SAN ANTONIO, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997												
DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
JUNE			JULY			AUGUST			SEPTEMBER			
1	7.9	7.8	7.8	8.0	8.0	8.0	8.0	7.8	7.9	8.0	7.8	7.9
2	7.9	7.8	7.8	---	---	---	8.0	7.8	7.9	8.0	7.8	7.9
3	7.9	7.8	7.9	7.8	7.8	7.8	8.1	7.8	8.0	7.8	7.7	7.8
4	7.9	7.8	7.9	7.8	7.8	7.8	8.1	7.9	8.0	7.8	7.6	7.7
5	7.9	7.7	7.8	7.8	7.8	7.8	8.1	7.9	8.0	7.7	7.6	7.6
6	7.9	7.8	7.8	7.8	7.8	7.8	8.1	7.9	8.0	7.7	7.4	7.5
7	7.9	7.7	7.8	7.8	7.8	7.8	8.1	7.9	8.0	7.8	7.4	7.6
8	7.8	7.6	7.7	7.8	7.8	7.8	8.0	7.7	7.9	7.7	7.5	7.6
9	7.7	7.6	7.6	7.7	7.7	7.7	8.1	7.8	7.9	7.7	7.5	7.6
10	7.8	7.6	7.7	7.8	7.8	7.8	8.2	7.9	8.0	7.7	7.5	7.6
11	7.9	7.8	7.8	7.8	7.8	7.8	8.2	8.0	8.1	7.8	7.5	7.6
12	7.9	7.8	7.8	7.9	7.8	7.8	8.2	8.0	8.1	7.9	7.7	7.8
13	---	---	---	7.9	7.8	7.9	8.1	7.9	8.0	7.9	7.7	7.8
14	---	---	---	7.9	7.8	7.9	8.1	7.9	8.0	7.9	7.7	7.8
15	---	---	---	7.9	7.8	7.8	8.1	7.9	8.0	7.9	7.8	7.8
16	---	---	---	7.9	7.8	7.9	8.2	7.9	8.0	7.9	7.7	7.8
17	7.9	7.8	7.9	7.9	7.8	7.9	8.2	7.9	8.0	8.0	7.8	7.9
18	7.9	7.8	7.8	7.9	7.8	7.8	8.2	7.9	8.0	8.0	7.8	7.9
19	7.9	7.8	7.8	7.8	7.8	7.8	8.1	7.8	8.0	8.0	7.9	7.9
20	7.9	7.8	7.8	7.9	7.8	7.8	8.1	7.9	8.0	8.0	7.8	7.9
21	7.9	7.7	7.8	7.9	7.8	7.8	8.1	7.8	7.9	8.0	7.8	7.9
22	7.9	7.6	7.7	7.9	7.8	7.8	8.1	7.8	8.0	7.9	7.8	7.9
23	7.8	7.6	7.7	7.9	7.8	7.9	8.1	7.8	8.0	7.9	7.8	7.9
24	7.9	7.7	7.8	7.9	7.9	7.9	8.0	7.8	7.9	7.9	7.7	7.9
25	7.9	7.9	7.9	8.0	7.9	7.9	8.0	7.8	7.9	8.0	7.9	7.9
26	7.9	7.9	7.9	8.0	7.9	7.9	8.1	7.8	7.9	8.0	7.9	8.0
27	7.9	7.9	7.9	8.0	7.9	7.9	8.1	7.9	8.0	8.1	7.9	8.0
28	7.9	7.9	7.9	8.0	7.8	7.9	8.1	7.9	8.0	8.1	7.9	8.0
29	7.9	7.9	7.9	8.0	7.8	7.9	8.0	7.8	7.9	8.0	7.8	7.9
30	8.0	7.9	8.0	8.0	7.8	7.9	7.9	7.7	7.8	8.0	7.9	7.9
31	---	---	---	8.0	7.8	7.9	8.0	7.7	7.9	---	---	---
MONTH	8.0	7.6	7.8	8.0	7.7	7.8	8.2	7.7	8.0	8.1	7.4	7.8
YEAR	8.3	7.4	7.9									

STATION NUMBER 08181500 MEDINA RIVER AT SAN ANTONIO, TX  
WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	---	---	---	26.0	24.5	25.5	18.5	16.0	17.0	20.5	19.5	20.0
2	25.0	22.5	23.5	24.5	22.0	23.0	18.5	16.0	17.5	21.0	19.5	20.0
3	25.0	24.0	24.5	23.0	20.5	21.5	19.0	17.0	18.0	21.0	20.5	20.5
4	24.5	23.5	24.0	23.0	21.5	22.0	19.0	17.0	18.0	22.0	21.0	21.0
5	24.5	23.0	24.0	24.0	22.5	23.0	19.5	18.5	19.0	21.5	19.0	20.0
6	25.0	23.5	24.0	25.0	24.0	24.5	20.0	18.5	19.0	20.0	17.0	18.0
7	25.0	23.5	24.5	25.0	23.5	24.0	20.0	18.0	19.0	17.0	15.0	16.0
8	24.5	23.5	24.0	23.5	21.0	22.0	19.5	17.5	18.5	16.0	14.5	15.5
9	24.5	22.5	23.5	21.5	19.5	20.5	19.5	17.5	18.5	15.5	14.0	15.0
10	25.5	23.5	24.5	21.5	19.5	20.5	20.5	19.0	19.5	16.0	14.0	15.0
11	25.5	24.0	24.5	22.5	20.5	21.0	21.5	20.0	20.5	15.5	12.5	14.0
12	25.5	24.0	24.5	22.5	21.0	22.0	21.0	20.0	20.5	14.5	11.0	13.0
13	25.5	24.0	25.0	23.0	22.0	22.5	21.0	19.5	20.0	13.5	10.5	12.5
14	25.5	24.0	24.5	23.5	22.0	22.5	22.0	20.5	21.0	13.5	11.0	12.5
15	26.0	25.0	25.0	23.5	22.5	23.0	22.0	18.5	20.5	15.0	13.0	14.0
16	26.0	25.0	25.5	24.0	23.0	23.5	19.5	16.5	17.5	15.0	13.0	14.0
17	26.5	25.5	26.0	24.0	22.5	23.5	17.0	15.5	16.5	14.5	12.5	14.0
18	26.0	23.5	24.5	23.0	22.0	22.5	16.0	14.0	15.0	15.5	13.0	14.0
19	24.5	22.5	23.0	23.0	21.5	22.0	15.0	13.5	14.5	16.0	13.0	14.5
20	25.5	24.0	24.5	23.5	22.0	22.5	15.5	13.0	14.5	17.0	14.0	15.5
21	26.0	25.0	25.5	23.0	21.5	22.5	17.5	14.5	15.5	18.0	16.0	17.0
22	26.0	23.0	24.0	22.5	20.5	21.5	19.0	16.5	17.5	19.0	17.5	18.0
23	23.0	21.0	21.5	23.5	21.5	22.0	20.0	18.5	19.0	19.5	18.0	19.0
24	23.0	21.5	22.0	23.5	18.5	21.0	20.0	16.5	18.0	19.5	18.0	18.5
25	24.5	23.0	23.5	18.5	17.0	17.5	17.5	15.0	16.0	19.0	17.5	18.0
26	25.5	24.0	24.5	18.0	16.0	17.0	18.0	16.0	16.5	20.0	18.5	19.0
27	26.0	25.0	25.5	18.0	15.5	17.0	18.5	17.0	17.5	20.5	19.5	20.0
28	26.5	26.0	26.0	18.0	15.5	17.0	19.0	17.0	18.0	19.5	15.5	17.0
29	26.5	25.5	26.0	18.0	16.5	17.5	19.0	17.5	18.0	15.5	14.0	15.0
30	26.5	25.5	26.0	18.5	16.5	17.5	20.0	18.0	19.0	16.0	14.0	14.5
31	26.5	26.0	26.0	---	---	---	20.5	19.0	20.0	16.5	14.5	15.0
MONTH	26.5	21.0	24.5	26.0	15.5	21.5	22.0	13.0	18.0	22.0	10.5	16.5



# GUADALUPE RIVER BASIN

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08181500 MEDINA RIVER AT SAN ANTONIO, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	8.1	7.3	7.6	7.3	6.4	6.8	7.2	6.4	6.7	8.5	7.3	7.8
2	8.2	7.7	7.9	8.1	6.9	7.5	7.5	6.5	6.8	8.2	7.1	7.5
3	8.2	7.6	7.9	8.0	7.2	7.6	7.3	6.5	6.8	7.6	6.7	7.2
4	8.0	7.2	7.7	8.1	7.1	7.6	7.1	6.5	6.7	7.2	6.4	6.8
5	7.5	7.0	7.2	8.0	7.2	7.7	7.2	6.4	6.7	7.6	6.5	6.9
6	7.5	6.8	7.1	7.7	6.8	7.2	7.4	6.6	6.8	7.7	6.6	7.2
7	7.4	6.8	7.0	7.4	6.5	6.9	7.6	6.6	7.0	7.3	6.6	6.9
8	8.1	6.9	7.6	---	---	---	8.0	6.8	7.2	7.0	6.4	6.6
9	8.3	7.4	7.8	---	---	---	8.1	7.0	7.3	7.5	6.7	7.0
10	8.0	7.4	7.6	---	---	---	7.8	6.7	7.1	7.7	6.9	7.2
11	8.0	7.3	7.5	---	---	---	7.4	6.4	6.8	8.2	7.0	7.4
12	7.8	7.1	7.5	---	---	---	7.5	6.4	6.8	8.6	7.4	7.8
13	7.8	7.1	7.4	---	---	---	7.8	6.6	7.0	8.9	7.7	8.2
14	7.8	7.2	7.4	---	---	---	7.7	6.5	7.0	9.3	8.0	8.3
15	7.6	6.9	7.2	---	---	---	7.4	6.5	6.9	9.0	7.9	8.3
16	7.5	6.9	7.1	---	---	---	8.6	7.4	8.0	9.2	8.0	8.4
17	7.5	6.7	7.1	---	---	---	8.8	8.0	8.4	9.5	8.1	8.6
18	7.9	7.0	7.4	---	---	---	10.1	8.8	9.2	9.9	8.4	9.0
19	8.1	7.3	7.7	---	---	---	10.5	9.3	9.7	9.5	8.1	8.7
20	7.7	7.0	7.4	---	---	---	10.5	9.3	9.7	9.4	7.9	8.4
21	7.3	6.7	7.0	---	---	---	10.5	8.8	9.5	9.1	7.5	8.1
22	7.5	6.8	7.2	7.3	6.7	7.0	9.8	8.3	8.9	9.6	7.5	8.2
23	8.1	7.4	7.7	7.8	6.8	7.2	9.1	7.9	8.3	8.6	7.5	8.0
24	8.0	7.5	7.8	7.7	6.9	7.2	9.3	7.7	8.3	9.4	7.9	8.5
25	8.0	7.2	7.5	7.6	7.0	7.4	10.0	8.3	8.9	9.9	8.3	8.9
26	7.7	6.8	7.2	7.2	6.0	6.8	9.9	8.4	8.8	9.3	7.6	8.4
27	7.3	6.6	6.9	6.9	5.9	6.3	9.6	8.0	8.6	---	---	---
28	7.1	6.4	6.7	6.9	6.2	6.4	9.3	8.0	8.4	9.5	8.1	8.6
29	7.1	6.4	6.7	6.9	6.2	6.5	9.5	7.9	8.4	10.5	8.8	9.4
30	7.2	6.4	6.7	6.9	6.4	6.6	9.2	7.8	8.3	10.6	8.9	9.5
31	7.2	6.3	6.7	---	---	---	8.7	7.5	7.9	10.5	8.6	9.3
MONTH	8.3	6.3	7.3	8.1	5.9	7.0	10.5	6.4	7.8	10.6	6.4	8.0

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	10.2	8.0	9.0	8.9	8.2	8.5	7.2	6.3	6.8	6.8	5.3	6.0
2	9.3	7.4	8.1	9.3	7.6	8.3	7.2	6.4	6.8	6.6	5.1	5.9
3	8.6	6.6	7.7	9.3	8.7	9.1	7.7	7.1	7.3	7.2	5.3	6.2
4	9.8	7.5	8.5	8.7	8.3	8.5	7.4	6.9	7.2	7.8	6.3	7.1
5	9.8	8.2	8.8	8.4	7.8	8.1	7.3	6.9	7.0	7.7	6.8	7.2
6	9.2	8.3	8.7	9.4	8.2	8.8	7.2	6.7	6.9	7.1	5.7	6.4
7	9.9	8.3	8.9	9.1	8.6	8.8	7.3	6.6	6.9	6.7	6.2	6.4
8	10.0	8.5	9.1	8.6	8.1	8.3	7.2	6.4	6.8	6.8	6.3	6.6
9	10.1	8.7	9.2	8.5	7.8	8.2	7.4	6.7	7.0	6.7	6.2	6.4
10	---	---	---	8.2	7.7	7.9	7.4	6.7	7.1	7.3	6.6	6.9
11	---	---	---	8.0	7.5	7.7	7.3	6.8	7.1	7.5	6.4	7.0
12	---	---	---	8.4	7.8	8.2	7.9	6.7	7.2	7.3	6.6	6.9
13	---	---	---	8.5	7.8	8.2	8.4	7.3	7.8	6.9	5.4	6.4
14	---	---	---	8.2	7.6	7.9	8.2	7.5	8.0	6.9	5.3	6.3
15	10.1	8.7	9.2	9.1	7.9	8.5	8.1	7.4	7.8	6.6	5.7	6.3
16	10.2	8.9	9.4	9.3	8.7	8.9	8.3	7.5	7.7	7.0	6.0	6.6
17	10.3	9.1	9.5	9.0	8.4	8.7	8.6	6.9	7.7	7.0	5.6	6.4
18	10.0	8.9	9.4	8.7	7.4	7.8	8.0	7.3	7.8	7.1	5.8	6.5
19	9.3	8.6	8.9	8.4	6.8	7.7	8.6	7.1	7.9	7.0	5.7	6.4
20	8.6	8.1	8.3	8.8	8.1	8.4	8.7	7.4	8.1	7.4	6.0	6.7
21	9.2	7.6	8.4	8.5	7.9	8.2	8.9	6.6	8.2	6.5	6.0	6.2
22	9.8	8.7	9.2	8.4	7.4	8.0	8.4	5.6	7.2	7.9	5.6	6.3
23	9.6	8.8	9.1	8.4	7.5	8.0	8.6	6.1	7.3	7.5	5.5	6.7
24	9.1	8.5	8.8	8.0	7.0	7.5	8.6	6.3	7.3	7.6	6.7	7.1
25	9.3	8.7	9.0	7.0	5.6	6.5	8.9	6.2	7.5	7.3	6.6	7.0
26	9.6	8.8	9.1	7.7	6.5	7.1	10.5	7.4	8.9	7.2	5.4	6.4
27	9.8	8.8	9.1	7.6	6.9	7.2	10.3	9.1	9.5	7.0	6.0	6.6
28	9.4	8.7	9.0	7.3	6.7	7.0	9.3	6.3	7.8	6.9	5.8	6.4
29	---	---	---	7.0	6.3	6.7	7.4	6.0	6.7	7.0	3.5	5.5
30	---	---	---	7.3	6.2	6.6	7.0	5.6	6.3	6.9	5.2	6.2
31	---	---	---	7.5	7.1	7.3	---	---	---	6.9	3.6	5.6
MONTH	10.3	6.6	8.9	9.4	5.6	8.0	10.5	5.6	7.5	7.9	3.5	6.5

[illegible]



## 08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX

**LOCATION.**--Lat 29°13'19", long 98°21'20", Bexar County, Hydrologic Unit 12100301, at downstream side of bridge on Farm Road 1604, 2.7 mi southwest of Elmendorf, 3.3 mi downstream from Braunig Plant lake, and 203.0 mi upstream from mouth.

**DRAINAGE AREA.**--1,743 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--September 1962 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 380.00 ft above sea level. Sept. 12, 1962, to Dec. 19, 1980, at site 2.5 mi upstream at different datum. Dec. 19, 1980, to Dec. 23, 1986, at same site and datum. Dec. 24, 1986, to June 15, 1993, at site 2.8 mi upstream at different datum.

**REMARKS.**--Records fair. Since installation of gage in water year 1962, at least 10% of contributing drainage area has been regulated by Medina Lake (station 08179500) and by Olmos flood-control reservoir (combined capacity, 269,500 acre-ft). Additional regulation since 1973 by eleven Soil Conservation Service floodwater-retarding structures (combined capacity of 26,770 acre-ft). Storage began in Medina Lake in 1913, and Olmos Dam was completed in 1926. Water is diverted above station from Medina River for irrigation in the vicinity of Devine and Lytle, with some water diverted for irrigation near San Antonio. During the current year, the city of San Antonio discharged 135,300 acre-ft of wastewater effluent into the San Antonio River from their Leon Creek, Salado Creek, and Dos Rios plants, but no wastewater effluent was discharged from their Mitchell Lake plant upstream from this station. There was, however, 746 acre-ft (not wastewater effluent) released from Mitchell Lake during the year. The San Antonio City Public Service Board pumped 4,962 acre-ft into Braunig Lake and 20,946 acre-ft into Calaveras Lake upstream from this station and released 133 acre-ft from Braunig Lake and 464 acre-ft from Calaveras Lake upstream from this station. Records furnished by the city of San Antonio show that during the current year, 2,746 acre-ft from Mitchell Lake and wastewater effluent in the amount of 38,149 acre-ft from the Leon Creek plant was discharged into the Medina River above this station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1900, 61 ft in 1946. Second highest stage was 53 ft in 1913, from information by local residents. At site and datum in use prior to Dec. 19, 1980.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	168	183	286	302	138	266	333	e223	284	2070	300	112
2	138	200	260	241	200	669	1170	e216	248	1800	280	135
3	140	199	244	237	191	531	2070	206	210	e1540	279	146
4	144	186	234	236	137	328	1930	205	202	e1480	280	283
5	149	e186	288	233	123	253	883	197	233	e1400	e240	257
6	162	e188	267	227	129	231	554	192	235	e1310	e210	282
7	158	e170	241	225	207	263	428	200	528	e1300	224	269
8	147	156	239	238	235	249	352	199	413	e1180	287	276
9	144	138	236	246	224	259	322	374	579	e1050	223	277
10	157	138	231	194	214	266	304	456	619	e900	201	396
11	158	148	229	166	190	404	303	304	490	e850	197	246
12	148	156	227	161	458	780	282	273	e430	e880	184	168
13	143	147	223	163	725	427	275	503	300	e810	179	148
14	149	148	220	189	369	328	274	330	239	e760	173	151
15	167	154	390	212	295	272	270	272	992	e700	161	156
16	159	256	430	179	268	264	264	1170	718	e640	157	152
17	136	190	270	192	254	298	270	417	445	e600	150	159
18	104	264	193	150	251	299	265	299	380	e540	147	183
19	91	247	187	153	243	292	258	282	348	e490	139	204
20	84	218	184	152	370	281	264	1960	333	e430	144	195
21	102	211	169	193	381	264	273	698	1760	e400	138	209
22	102	206	176	169	300	251	259	450	5620	e480	136	274
23	97	193	183	162	269	241	249	648	11700	e400	124	490
24	91	650	173	156	265	246	255	485	12100	e390	271	434
25	93	450	157	153	295	245	247	463	10200	e385	153	318
26	87	276	157	151	386	240	1440	356	7600	e375	129	282
27	89	244	184	172	362	239	1170	325	5580	e370	128	260
28	102	244	235	160	301	234	394	823	4020	e370	126	253
29	105	485	235	145	---	177	324	374	3070	e365	132	263
30	99	402	232	142	---	170	301	272	2470	341	118	233
31	111	---	334	140	---	158	---	258	---	325	120	---
TOTAL	3924	7033	7314	5839	7780	9425	15983	13430	72346	24931	5730	7211
MEAN	127	234	236	188	278	304	533	433	2412	804	185	240
MAX	168	650	430	302	725	780	2070	1960	12100	2070	300	490
MIN	84	138	157	140	123	158	247	192	202	325	118	112
AC-FT	7780	13950	14510	11580	15430	18690	31700	26640	143500	49450	11370	14300

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1997#, BY WATER YEAR (WY)

	MEAN	485	436	452	494	567	491	522	768	1013	516	395	478
MAX	2424	1255	2176	2191	3803	3031	1997	3293	8527	3764	1760	2761	
(WY)	1974	1977	1992	1968	1992	1992	1992	1992	1987	1973	1978	1973	
MIN	127	153	160	168	146	143	150	130	88.6	81.9	52.8	120	
(WY)	1997	1967	1971	1967	1967	1971	1967	1967	1967	1964	1963	1989	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1962 - 1997#

ANNUAL TOTAL	74902	180946	
ANNUAL MEAN	205	496	
HIGHEST ANNUAL MEAN			551
LOWEST ANNUAL MEAN			1784
HIGHEST DAILY MEAN	1280	Sep 1	1992
LOWEST DAILY MEAN	69	Jun 15	1963
ANNUAL SEVEN-DAY MINIMUM	76	Jun 15	27600
INSTANTANEOUS PEAK FLOW			25
INSTANTANEOUS PEAK STAGE			42
ANNUAL RUNOFF (AC-FT)	148600	358900	40000
10 PERCENT EXCEEDS	274	721	53.06
50 PERCENT EXCEEDS	185	247	399000
90 PERCENT EXCEEDS	99	141	986
			314
			146

e Estimated

# Period of regulated streamflow.

## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: September 1964 to current year. Chemical and biochemical analyses: January 1968 to current year.  
Pesticide analyses: January 1968 to September 1981; December 1992 to current year.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: October 1966 to current year.

pH: June 1984 to current year.

WATER TEMPERATURE: October 1966 to current year.

DISSOLVED OXYGEN: June 1984 to current year.

**INSTRUMENTATION.**--Beginning June 1984, 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 instruments or probe fouling. Mean monthly and annual concentrations and loads for selected chemical constituents have been computed using the daily (or continuous) records of specific conductance and regression relationships between each chemical constituent and specific conductance. Regression equations developed for this station may be obtained from the U.S. Geological Survey District Office upon request.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum, 1,240 microsiemens Jan. 29, 1973, Aug. 8, 1975; minimum, 110 microsiemens July 16, 1990.

pH: Maximum, 9.0 units June 16, 17, 1993; minimum, 7.0 units Oct. 25 and 28, 1988, Jan. 11, 1989.

WATER TEMPERATURE: Maximum, 33.5°C June 19, 20, Sept. 2, 1996; minimum, 5.5°C Jan. 10, 1973.

DISSOLVED OXYGEN: Maximum, 13.2 mg/L Feb. 4, 1996; minimum, 0.0 mg/L Mar. 2, Apr. 14, 15, 1985.

**EXTREMES FOR CURRENT YEAR.**--

SPECIFIC CONDUCTANCE: Maximum, 1,090 microsiemens Feb. 7; minimum, 182 microsiemens May 20.

pH: Maximum, 8.4 units on June 4-6; minimum, 7.5 units Mar. 2.

WATER TEMPERATURE: Maximum, 32.0°C Aug. 20, 21; minimum, 11.0°C Jan. 13.

DISSOLVED OXYGEN: Maximum, 12.5 mg/L Jan. 31; minimum, 4.6 mg/L May 28, 29.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)
APR 16...	1600	140	1010	8.5	24.0	8.1	98	290	87	85	19
MAY 21...	1330	120	987	8.0	30.0	7.1	97	270	120	80	18
JUN 27...	1230	292	784	8.0	29.0	6.2	82	220	50	67	13
AUG 05...	1045	95	993	8.1	29.0	6.2	82	280	30	82	18
SEP 03...	1300	241	786	7.9	29.0	6.5	87	250	86	75	15
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 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, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	
APR 16...	91	2	40	9.6	200	77	110	0.60	15	598	
MAY 21...	80	2	38	9.7	160	72	110	0.50	14	624	
JUN 27...	63	2	37	7.3	170	64	79	0.50	13	466	
AUG 05...	84	2	39	9.9	250	65	110	0.70	15	575	
SEP 03...	60	2	34	7.6	160	68	77	0.50	14	477	
DATE		SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
APR 16...	607	14.8	0.200	15.0	0.240	16	0.76	0.66	0.90	1.0	
MAY 21...	587	15.9	0.070	16.0	0.090	17	0.71	0.61	0.70	0.80	
JUN 27...	449	8.06	0.040	8.10	0.110	9.1	0.89	0.59	0.70	1.0	
AUG 05...	575	12.0	0.030	12.0	0.040	13	0.66	0.56	0.60	0.70	
SEP 03...	475	12.0	0.030	12.0	0.060	13	0.74	0.54	0.60	0.80	

## 08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

		PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGANESE, DIS-SOLVED (UG/L AS MN)	
DATE												
APR 16...		2.20	1.90	1.90	5.8	4.1	0.5	12	32	6	9	
MAY 21...		2.90	2.60	2.60	8.0	4.2	0.4	15	45	3	5	
JUN 27...		0.850	0.710	0.720	2.2	4.9	0.8	132	167	11	3	
AUG 05...		2.20	2.10	2.00	6.1	3.8	0.4	5.6	22	<3	3	
SEP 03...		2.00	1.90	1.80	5.5	4.3	0.70	38	58	8	4	
DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PERCENT SATURATION)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	OXYGEN DEMAND, BIO-CHEMICAL, 5 DAY (MG/L)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS Ca)
OCT 11...	1045	148	1040	8.1	24.0	7.0	84	--	--	280	75	83
NOV 04...	1000	209	1040	8.2	19.0	7.6	84	--	--	270	53	79
NOV 24-24	1215	1040	582	--	--	--	--	59	9.9	180	41	54
DEC 05...	1230	302	990	8.2	19.0	8.0	88	--	--	280	70	84
JAN 23...	1230	150	1020	7.7	20.0	7.8	88	--	--	280	64	82
FEB 12-13	1727	920	604	--	--	--	--	31	11	190	35	55
MAR 06...	1245	201	940	7.8	18.0	8.4	89	--	--	260	63	76
MAR 20...	1300	260	965	7.7	22.0	8.3	97	--	--	270	66	83
APR 01-02	2345	1270	558	--	--	--	--	50	--	170	28	53
APR 09...	1300	302	10	7.6	20.0	7.9	88	--	--	270	73	84
APR 23...	1230	222	1010	7.6	24.0	7.0	85	--	--	280	72	84
APR 26...	1800	2750	456	8.3	18.0	7.7	--	--	--	130	18	41
MAY 06...	1030	186	960	7.7	24.0	6.3	76	--	--	290	75	87
MAY 22...	1300	315	770	7.5	25.0	7.1	88	--	--	240	67	73
JUN 02...	1415	197	895	7.6	28.0	6.3	--	--	--	260	59	78
JUN 21-22	1215	--	--	--	--	--	--	--	--	110	28	37
JUL 14...	1330	856	705	7.5	31.0	7.3	--	--	--	260	64	79
JUL 30...	0915	365	828	7.5	29.0	6.9	91	--	--	290	68	85
AUG 14...	0930	180	975	7.6	29.0	6.1	81	--	--	290	89	85
AUG 21...	1000	135	965	7.6	30.0	5.6	76	--	--	300	94	88
SEP 11...	0930	299	860	7.4	27.0	6.5	84	--	--	260	70	75
SEP 17...	1130	142	905	8.1	29.0	6.5	87	--	--	290	82	85
DATE	MAGNESIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM ADSORPTION RATIO	SODIUM PERCENT	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)	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)
OCT 11...	18	89	2	40	9.4	210	73	130	0.80	15	620	617
NOV 04...	17	88	2	41	9.6	210	71	120	0.60	14	611	597
NOV 24-24	11	45	1	34	6.5	140	45	60	--	--	342	329
DEC 05...	17	86	2	39	10	210	72	110	0.70	14	587	577
JAN 23...	18	90	2	40	9.5	220	77	110	0.70	13	600	603
FEB 12-13	12	44	1	33	6.1	150	47	56	--	--	354	333
MAR 06...	16	74	2	38	9.4	190	75	100	0.60	13	562	553
MAR 20...	16	76	2	37	9.0	210	78	100	0.6	13	581	559
APR 01-02	9.6	40	1	32	5.5	150	45	49	--	--	341	310
APR 09...	16	71	2	35	9.0	200	83	92	0.5	14	556	539
APR 23...	18	83	2	38	8.4	210	82	110	0.6	13	598	594
APR 26...	6.8	27	1	30	4.4	110	34	34	0.2	6.5	152	239
MAY 06...	18	79	2	36	8.8	220	77	97	0.6	14	587	572
MAY 22...	13	58	2	34	7.4	170	67	73	0.5	14	467	450
JUN 02...	16	70	2	36	7.4	200	74	90	0.5	14	553	521
JUN 21-22	5.5	17	0.7	24	5.2	87	22	22	0.2	7.7	221	183
JUL 14...	16	37	1	23	4.4	200	61	48	0.3	13	443	403
JUL 30...	18	57	1	30	5.9	220	67	73	0.4	14	513	484
AUG 14...	19	76	2	36	8.2	200	73	100	0.6	14	599	562
AUG 21...	19	80	2	36	8.2	200	74	100	0.5	14	577	567
SEP 11...	17	67	2	35	7.6	190	62	88	0.5	13	521	499
SEP 17...	18	74	2	35	8.3	210	66	94	0.6	15	554	543

## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	RESIDUE TOTAL AT 105 DEG. C, SUS- PENDEED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
OCT												
11...	--	15.0	0.030	15.0	0.050	16	0.65	0.65	0.70	0.70	2.00	2.00
NOV												
04...	--	14.0	0.040	14.0	0.030	15	0.77	0.57	0.60	0.80	2.30	2.10
NOV												
24-24	758	--	--	4.80	0.080	5.7	0.82	0.46	0.54	0.90	1.60	0.780
DEC												
05...	--	12.0	0.020	12.0	0.090	13	0.71	0.51	0.60	0.80	1.90	1.90
JAN												
23...	--	14.8	0.170	15.0	0.150	16	0.85	0.85	1.0	1.0	2.10	2.20
FEB												
12-13	200	--	--	4.60	0.130	5.1	0.37	0.35	0.48	0.50	0.870	0.840
MAR												
06...	--	13.9	0.090	14.0	0.170	15	0.93	0.73	0.90	1.1	1.80	1.70
20...	--	10.9	0.070	11.0	0.090	12	0.91	0.71	0.80	1.0	1.60	1.50
APR												
01-02	340	--	--	4.40	0.100	6.5	2.0	0.45	0.55	2.1	1.40	0.780
09...	--	9.46	0.040	9.50	0.080	10	0.82	0.52	0.60	0.90	2.00	1.90
23...	--	12.6	0.17	13	0.23	14	0.74	0.58	0.8	1	2.1	2.0
26...	--	2.41	0.03	2.4	0.14	5.3	2.7	0.24	0.4	2.8	1.4	0.37
MAY												
06...	--	12.1	0.10	12	0.12	13	0.72	0.54	0.7	0.8	2.2	2.0
22...	--	7.89	0.03	7.9	0.05	8.9	0.90	0.47	0.5	1	0.88	0.72
JUN												
02...	--	9.40	0.08	9.5	0.03	10	0.71	0.52	0.6	0.7	1.1	1.1
JUN												
21-22	--	1.78	0.06	1.8	0.05	2.9	1.1	0.23	0.3	1.1	0.54	0.49
JUL												
14...	--	4.45	0.03	4.5	0.04	4.9	0.40	--	<0.2	0.4	0.52	0.42
30...	--	7.57	0.06	7.6	0.08	8.2	0.54	0.47	0.6	0.6	1.2	1.1
AUG												
14...	--	10.6	0.04	11	0.04	11	0.70	0.52	0.6	0.7	1.5	1.4
21...	--	10.5	0.05	11	0.02	11	0.60	0.48	0.5	0.6	1.5	1.3
SEP												
11...	--	10.3	0.15	10	0.08	11	0.73	0.50	0.6	0.8	1.6	1.5
17...	--	11.3	0.05	11	0.03	12	0.67	0.60	0.6	0.7	1.9	1.8
DATE	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDEED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS TOTAL (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI- METRIC (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDEED (T/DAY)	SEDI- MENT, SUS- PENDEED (MG/L)	ARSENIC TOTAL (UG/L AS AS)	BERYL- LIUM, TOTAL RECOV- ERABLE (UG/L AS BE)
OCT												
11...	1.10	3.4	--	4.0	--	--	--	--	12	30	--	--
NOV												
04...	1.10	3.4	--	3.6	0.50	--	--	--	36	63	--	--
NOV												
24-24	--	--	33	--	--	<0.010	2	<1	--	--	6	<10
DEC												
05...	1.10	3.4	--	4.1	0.50	--	--	--	41	50	--	--
JAN												
23...	2.10	6.4	--	4.0	0.60	--	--	--	22	55	--	--
FEB												
12-13	--	--	15	--	--	<0.010	<1	<1	--	--	2	<10
MAR												
06...	1.60	4.9	--	4.3	0.40	--	--	--	41	76	--	--
20...	1.50	4.6	--	4.4	0.50	--	--	--	73	104	--	--
APR												
01-02	--	--	23	--	--	<0.01	<1	2	--	--	3	<10
09...	1.10	3.4	--	4.3	0.8	--	--	--	33	40	--	--
23...	2.0	6.1	--	3.9	0.6	--	--	--	20	33	--	--
26...	0.40	1.2	--	5.2	>5	--	--	--	8580	1150	--	--
MAY												
06...	2.0	6.2	--	3.8	0.4	--	--	--	14	28	--	--
22...	0.72	2.2	--	4.4	0.8	--	--	--	51	60	--	--
JUN												
02...	1.0	3.1	--	4.2	0.8	--	--	--	12	23	--	--
JUN												
21-22	0.27	0.82	--	5	>5	--	--	--	--	855	--	--
JUL												
14...	0.41	1.3	--	3.5	0.6	--	--	--	162	70	--	--
30...	0.96	2.9	--	3.1	0.4	--	--	--	38	39	--	--
AUG												
14...	1.4	4.2	--	3.5	0.5	--	--	--	11	22	--	--
21...	1.3	4.1	--	3.6	0.3	--	--	--	6.9	19	--	--
SEP												
11...	1.3	4.1	--	4.2	0.5	--	--	--	35	43	--	--
17...	1.7	5.1	--	3.4	0.4	--	--	--	11	28	--	--



GUADALUPE RIVER BASIN

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08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD)	CHRO- MIUM, TOTAL RECOV- ERABLE (UG/L AS CR)	COPPER, TOTAL RECOV- ERABLE (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV- ERABLE (UG/L AS PB)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV- ERABLE (UG/L AS HG)	NICKEL, TOTAL RECOV- ERABLE (UG/L AS NI)	SELE- NIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOV- ERABLE (UG/L AS AG)	ZINC, TOTAL RECOV- ERABLE (UG/L AS ZN)	1-NAPH THOL, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT 11...	--	--	--	8.0	--	3.0	--	--	--	--	--	--
NOV 04...	--	--	--	8.0	--	3.0	--	--	--	--	--	--
NOV 24-24	2	13	21	--	61	--	<0.10	14	<1	<1	160	--
DEC 05...	--	--	--	15	--	3.0	--	--	--	--	--	--
JAN 23...	--	--	--	13	--	3.0	--	--	--	--	--	<0.007
FEB 12-13	<1	6	8	--	16	--	<0.10	5	<1	<1	70	--
MAR 06...	--	--	--	8.0	--	5.0	--	--	--	--	--	<0.007
MAR 20...	--	--	--	6	--	4	--	--	--	--	--	<0.007
APR 01-02	<1	9	10	--	31	--	<0.1	6	<1	<1	120	--
APR 09...	--	--	--	12	--	5	--	--	--	--	--	<0.007
APR 23...	--	--	--	6	--	5	--	--	--	--	--	<0.007
APR 26...	--	--	--	6	--	<3	--	--	--	--	--	<0.007
MAY 06...	--	--	--	5	--	4	--	--	--	--	--	<0.007
MAY 22...	--	--	--	11	--	4	--	--	--	--	--	<0.007
JUN 02...	--	--	--	3	--	4	--	--	--	--	--	<0.007
JUN 21-22	--	--	--	7	--	<1	--	--	--	--	--	<0.007
JUL 14...	--	--	--	4	--	3	--	--	--	--	--	<0.007
JUL 30...	--	--	--	5	--	2	--	--	--	--	--	<0.007
AUG 14...	--	--	--	11	--	5	--	--	--	--	--	<0.007
AUG 21...	--	--	--	4	--	6	--	--	--	--	--	<0.007
SEP 11...	--	--	--	8	--	3	--	--	--	--	--	<0.007
SEP 17...	--	--	--	7	--	4	--	--	--	--	--	<0.007

DATE	2,4,5-T DIS- SOLVED (UG/L)	2,4-D, DIS- SOLVED (UG/L)	2,4-DB WATER, FLTRD, GF 0.7U REC (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	SILVEX, DIS- SOLVED (UG/L)	3HYDRXY CARBO- FURAN WAT, FLT GF 0.7U REC (UG/L)	DNOC WAT, FLT GF 0.7U REC (UG/L)	ACETO- CHLOR, WATER, FLTRD REC (UG/L)	ACIFL- UORFEN WATER, FLTRD, GF 0.7U REC (UG/L)	ALA- CHLOR, WATER, DISS, REC (UG/L)	ALDI- CARB, WATER, FLTRD, GF 0.7U REC (UG/L)	ALDI- CARB SULFONE WAT, FLT GF 0.7U REC (UG/L)
OCT 11...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV 24-24	--	--	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
FEB 12-13	--	--	--	--	--	--	--	--	--	--	--	--
MAR 06...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
MAR 20...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	E0.003	<0.016	<0.016
APR 01-02	--	--	--	--	--	--	--	--	--	--	--	--
APR 09...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	0.007	<0.016	<0.016
APR 23...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
APR 26...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	0.008	<0.016	<0.016
MAY 06...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
MAY 22...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUN 02...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUN 21-22	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUL 14...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
JUL 30...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	0.020	<0.016	<0.016
AUG 14...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
AUG 21...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
SEP 11...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016
SEP 17...	<0.035	<0.035	<0.035	<0.003	<0.021	<0.014	<0.035	<0.002	<0.035	<0.002	<0.016	<0.016



## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	ALDICA- RB SUL- FOXIDE, WAT, FLT GF 0.7U REC (UG/L)	ALDRIN, TOTAL (UG/L)	ENDO- SULFAN- I WATER WHOLE REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	ALPHA BHC TOTAL (UG/L)	AROCLOR 1016 PCB TOTAL (UG/L)	AROCLOR 1221 PCB TOTAL (UG/L)	AROCLOR 1232 PCB TOTAL (UG/L)	AROCLOR 1242 PCB TOTAL (UG/L)	AROCLOR 1248 PCB TOTAL (UG/L)	AROCLOR 1254 PCB TOTAL (UG/L)	AROCLOR 1260 PCB TOTAL (UG/L)
OCT												
11...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
24-24	--	<0.040	<0.100	--	<0.030	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100
DEC												
05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
23...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
FEB												
12-13	--	<0.040	<0.100	--	<0.030	<0.100	<1.00	<0.100	<0.100	<0.100	<0.100	<0.100
MAR												
06...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
20...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
APR												
01-02	--	<0.040	<0.1	--	<0.030	<0.1	<1	<0.1	<0.1	<0.1	<0.1	<0.1
09...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
23...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
26...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
MAY												
06...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
22...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
JUN												
02...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
JUN												
21-22	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
JUL												
14...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
30...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
AUG												
14...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
21...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
SEP												
11...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--
17...	<0.021	--	--	<0.002	--	--	--	--	--	--	--	--

DATE	ATRA- ZINE, WATER, DISS, REC (UG/L)	METHYL AZIN- PHOS WAT FLT GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD GF, REC (UG/L)	BENTA- ZON, WATER, FLTRD, GF 0.7U REC (UG/L)	ENDO- SULFAN II TOTAL (UG/L)	BETA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	BRO- MACIL, WATER, DISS, REC (UG/L)	BRO- MOXYNIL WATER, FLTRD, GF 0.7U REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	CAR- BARYL, WATER, FLTRD, GF 0.7U REC (UG/L)	CAR- BARYL WATER FLTRD GF, REC (UG/L)	CARBO- FURAN, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT												
11...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
24-24	--	--	--	--	<0.040	<0.030	--	--	--	--	--	--
DEC												
05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
23...	0.033	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
FEB												
12-13	--	--	--	--	<0.040	<0.030	--	--	--	--	--	--
MAR												
06...	0.040	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.010	<0.028
20...	0.078	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.011	<0.028
APR												
01-02	--	--	--	--	<0.040	<0.030	--	--	--	--	--	--
09...	0.376	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.012	<0.028
23...	0.101	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
26...	0.285	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	0.14	E0.172	<0.028
MAY												
06...	0.081	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.007	<0.028
22...	0.165	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.024	<0.028
JUN												
02...	0.089	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.007	<0.028
JUN												
21-22	0.052	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.087	<0.028
JUL												
14...	0.015	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.006	<0.028
30...	0.011	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
AUG												
14...	0.014	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.005	<0.028
21...	0.011	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028
SEP												
11...	0.014	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	E0.012	<0.028
17...	0.011	<0.001	<0.002	<0.014	--	--	<0.035	<0.035	<0.002	<0.008	<0.003	<0.028

GUADALUPE RIVER BASIN

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08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- AMBEN, WATER, FLTRD, GF 0.7U REC (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	CHLORO- THALO- NIL, WAT,FLT GF 0.7U REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CHLOR- DANE CIS WATER WHOLE TOTAL (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	CLOPYR- ALID, WATER, FLTRD, GF 0.7U REC (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DACTHAL MONO- ACID, WAT,FLT GF 0.7U REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)
OCT												
11...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
04...	--	--	--	--	--	--	--	--	--	--	--	--
NOV												
24-24	--	--	<0.100	--	--	<0.100	--	--	--	--	--	--
DEC												
05...	--	--	--	--	--	--	--	--	--	--	--	--
JAN												
23...	<0.003	<0.011	--	<0.035	0.009	--	<0.005	<0.050	<0.004	<0.017	<0.002	<0.040
FEB												
12-13	--	--	<0.100	--	--	<0.100	--	--	--	--	--	--
MAR												
06...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.008
20...	<0.003	<0.011	--	<0.035	0.006	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.021
APR												
01-02	--	--	<0.1	--	--	<0.1	--	--	--	--	--	--
09...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	E0.001	E0.029
23...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.020
26...	<0.003	<0.011	--	<0.035	0.009	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.017
MAY												
06...	E0.012	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.024
22...	<0.003	<0.011	--	<0.035	0.005	--	<0.005	<0.05	<0.004	<0.017	E0.001	E0.025
JUN												
02...	<0.003	<0.011	--	<0.035	0.006	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.013
JUN												
21-22	<0.003	<0.011	--	<0.035	0.007	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.007
JUL												
14...	<0.003	<0.011	--	<0.035	0.005	--	<0.005	<0.05	<0.004	<0.017	E0.002	E0.011
30...	<0.003	<0.011	--	<0.035	E0.003	--	<0.005	<0.05	<0.004	<0.017	0.016	E0.009
AUG												
14...	<0.003	<0.011	--	<0.035	<0.004	--	<0.005	<0.050	<0.004	<0.017	<0.002	E0.012
21...	E0.012	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.010
SEP												
11...	E0.014	<0.011	--	<0.035	<0.004	--	<0.005	<0.05	<0.004	<0.017	<0.002	E0.012
17...	E0.031	<0.011	--	<0.035	E0.004	--	<0.005	<0.05	<0.004	<0.017	E0.002	E0.007

DATE	DELTA BENZENE HEXA- CHLOR- IDE TOTAL (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DICAMBA WATER, FLTRD, GF 0.7U REC (UG/L)	DICHLO- BENIL, WATER, FLTRD, GF 0.7U REC (UG/L)	DICHLOR PROP, WATER, FLTRD, GF 0.7U REC (UG/L)	DI- ELDRIN TOTAL (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	DINOSEB WATER, FLTRD, GF 0.7U REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	DIURON, WATER, FLTRD, GF 0.7U REC (UG/L)	ENDO- SULFAN SULFATE TOTAL (UG/L)
OCT											
11...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
NOV											
24-24	<0.090	--	--	--	--	<0.020	--	--	--	--	<0.600
DEC											
05...	--	--	--	--	--	--	--	--	--	--	--
JAN											
23...	--	<0.002	<0.035	<0.020	<0.032	--	<0.001	<0.035	<0.017	<0.020	--
FEB											
12-13	<0.090	--	--	--	--	<0.020	--	--	--	--	<0.600
MAR											
06...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
20...	--	0.023	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
APR											
01-02	<0.090	--	--	--	--	0.024	--	--	--	--	<0.6
09...	--	0.037	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	E0.07	--
23...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
26...	--	0.159	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.19	--
MAY											
06...	--	0.051	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
22...	--	0.060	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	0.24	--
JUN											
02...	--	0.038	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
JUN											
21-22	--	0.114	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
JUL											
14...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
30...	--	0.026	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
AUG											
14...	--	0.015	<0.035	<0.020	<0.032	--	<0.001	<0.035	<0.017	<0.020	--
21...	--	<0.002	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
SEP											
11...	--	0.039	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--
17...	--	0.008	<0.035	<0.02	<0.032	--	<0.001	<0.035	<0.017	<0.02	--

## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	ENDRIN ALDE- HYDE TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ESFEN- VAL- ERATE, WAT, FLT GF 0.7U REC (UG/L)	ETHAL- FLUR- ALIN WAT FLT GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FEN- URON, WATER, FLTRD, GF 0.7U REC (UG/L)	FLUO- METURON WATER, FLTRD, GF 0.7U REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)
OCT 11...	--	--	--	--	--	--	--	--	--	--	--
NOV 04...	--	--	--	--	--	--	--	--	--	--	--
NOV 24-24	<0.200	<0.060	--	--	--	--	--	--	--	<0.030	<0.800
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
FEB 12-13	<0.200	<0.060	--	--	--	--	--	--	--	<0.030	<0.800
MAR 06...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
MAR 20...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
APR 01-02	<0.2	<0.060	--	--	--	--	--	--	--	<0.030	<0.8
APR 09...	--	--	<0.016	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
APR 23...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
APR 26...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
MAY 06...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
MAY 22...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
JUN 02...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
JUN 21-22	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
JUL 14...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
JUL 30...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
AUG 14...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
AUG 21...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
SEP 11...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--
SEP 17...	--	--	<0.002	<0.019	<0.004	<0.003	<0.013	<0.035	<0.003	--	--

DATE	LINDANE TOTAL (UG/L)	LINDANE DIS- SOLVED (UG/L)	LINURON WATER, FLTRD, GF 0.7U REC (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	MCPA, WATER, FLTRD, GF 0.7U REC (UG/L)	MCPB, WATER, FLTRD, GF 0.7U REC (UG/L)	METHIO- CABB, WATER, FLTRD, GF 0.7U REC (UG/L)	METH- OMYL, WATER, FLTRD, GF 0.7U REC (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L)
OCT 11...	--	--	--	--	--	--	--	--	--	--	--
NOV 04...	--	--	--	--	--	--	--	--	--	--	--
NOV 24-24	<0.030	--	--	--	--	--	--	--	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	--	0.044	<0.018	<0.002	<0.005	<0.050	<0.035	<0.026	<0.017	<0.002	<0.004
FEB 12-13	<0.030	--	--	--	--	--	--	--	--	--	--
MAR 06...	--	0.024	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.006	<0.004
MAR 20...	--	0.026	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.004	<0.004
APR 01-02	<0.030	--	--	--	--	--	--	--	--	--	--
APR 09...	--	0.032	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.016	<0.004
APR 23...	--	<0.060	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.006	<0.004
APR 26...	--	<0.004	<0.018	<0.002	0.019	<0.05	<0.035	<0.026	<0.017	0.014	<0.004
MAY 06...	--	0.043	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.006	<0.004
MAY 22...	--	--	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.004	<0.004
JUN 02...	--	<0.040	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
JUN 21-22	--	<0.004	<0.018	<0.002	0.036	<0.05	<0.035	<0.026	<0.017	0.007	<0.004
JUL 14...	--	0.010	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	0.006	<0.004
JUL 30...	--	<0.015	<0.018	<0.002	0.006	<0.05	<0.035	<0.026	<0.017	0.004	<0.004
AUG 14...	--	0.041	<0.018	<0.002	<0.005	<0.050	<0.035	<0.026	<0.017	0.007	<0.004
AUG 21...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
SEP 11...	--	<0.004	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004
SEP 17...	--	0.030	<0.018	<0.002	<0.005	<0.05	<0.035	<0.026	<0.017	<0.002	<0.004

GUADALUPE RIVER BASIN

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08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	NEB- URON, WATER, FLTRD, GF 0.7U REC (UG/L)	NORFLUR AZON, WATER, FLTRD, GF 0.7U REC (UG/L)	ORY- ZALIN, WATER, FLTRD, GF 0.7U REC (UG/L)	OXAMYL, WATER, FLTRD, GF 0.7U REC (UG/L)	P, P' DDD, TOTAL (UG/L)	P, P' DDE DISSOLV (UG/L)	P, P' DDE, TOTAL (UG/L)	P, P' DDT, TOTAL (UG/L)	PARA- THION, DIS- SOLVED (UG/L)
OCT											
11...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
NOV											
24-24	--	--	--	--	--	--	<0.100	--	<0.040	<0.100	--
DEC											
05...	--	--	--	--	--	--	--	--	--	--	--
JAN											
23...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
FEB											
12-13	--	--	--	--	--	--	<0.100	--	<0.040	<0.100	--
MAR											
06...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
20...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
APR											
01-02	--	--	--	--	--	--	<0.1	--	<0.040	<0.1	--
09...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
23...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
26...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
MAY											
06...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
22...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
JUN											
02...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
JUN											
21-22	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
JUL											
14...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
30...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
AUG											
14...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
21...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
SEP											
11...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004
17...	<0.004	<0.003	<0.015	<0.024	<0.019	<0.018	--	<0.006	--	--	<0.004

DATE	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PIC- LORAM, WATER, FLTRD, GF 0.7U REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PHAM, WATER, FLTRD, GF 0.7U REC (UG/L)	PRO- POXUR, WATER, FLTRD, GF 0.7U REC (UG/L)
OCT											
11...	--	--	--	--	--	--	--	--	--	--	--
NOV											
04...	--	--	--	--	--	--	--	--	--	--	--
NOV											
24-24	--	--	--	--	--	--	--	--	--	--	--
DEC											
05...	--	--	--	--	--	--	--	--	--	--	--
JAN											
23...	<0.006	<0.004	<0.004	<0.002	<0.050	E0.015	<0.007	<0.004	<0.013	<0.035	<0.035
FEB											
12-13	--	--	--	--	--	--	--	--	--	--	--
MAR											
06...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.013	<0.007	<0.004	<0.013	<0.035	<0.035
20...	<0.006	<0.004	<0.004	<0.002	<0.05	0.018	<0.007	<0.004	<0.013	<0.035	<0.035
APR											
01-02	--	--	--	--	--	--	--	--	--	--	--
09...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.017	<0.007	<0.004	<0.013	<0.035	<0.035
23...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.016	<0.007	<0.004	<0.013	<0.035	<0.035
26...	<0.006	<0.004	<0.004	<0.002	<0.05	0.044	<0.007	<0.004	<0.013	<0.035	<0.035
MAY											
06...	<0.006	<0.004	<0.004	<0.002	<0.05	0.020	<0.007	<0.004	<0.013	<0.035	<0.035
22...	<0.006	<0.004	<0.004	<0.002	<0.05	0.021	<0.007	<0.004	<0.013	<0.035	<0.035
JUN											
02...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.017	<0.007	<0.004	<0.013	<0.035	<0.035
JUN											
21-22	<0.006	<0.004	<0.004	<0.002	<0.05	E0.016	E0.001	<0.004	<0.013	<0.035	<0.035
JUL											
14...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.010	<0.007	<0.004	<0.013	<0.035	<0.035
30...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.009	<0.007	<0.004	<0.013	<0.035	<0.035
AUG											
14...	<0.006	<0.004	<0.004	<0.002	<0.050	E0.009	<0.007	<0.004	<0.013	<0.035	<0.035
21...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.009	<0.007	<0.004	<0.013	<0.035	<0.035
SEP											
11...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.015	<0.007	<0.004	<0.013	<0.035	<0.035
17...	<0.006	<0.004	<0.004	<0.002	<0.05	E0.014	<0.007	<0.004	<0.013	<0.035	<0.035

## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

DATE	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	SI- MAZINE, WATER, DISS, REC (UG/L)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TOX- APHENE, TOTAL (UG/L)	CHLOR- DANE TRANS WATER WHOLE TOTAL (UG/L)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- CLOPYR, WATER, FLTRD, GF 0.7U REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)
OCT 11...	--	--	--	--	--	--	--	--	--	--	--
NOV 04...	--	--	--	--	--	--	--	--	--	--	--
NOV 24-24	--	--	--	--	--	--	<2.00	<0.100	--	--	--
DEC 05...	--	--	--	--	--	--	--	--	--	--	--
JAN 23...	<0.003	<0.005	E0.022	<0.007	<0.013	<0.002	--	--	<0.001	<0.050	<0.002
FEB 12-13	--	--	--	--	--	--	<2.00	<0.100	--	--	--
MAR 06...	<0.003	0.008	<0.030	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
MAR 20...	<0.003	0.009	E0.034	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
APR 01-02	--	--	--	--	--	--	<2	<0.1	--	--	--
APR 09...	<0.003	0.008	E0.081	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
APR 23...	<0.003	<0.005	0.031	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
APR 26...	<0.003	0.033	0.430	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
MAY 06...	<0.003	0.010	E0.317	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
MAY 22...	<0.003	0.009	0.303	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUN 02...	<0.003	0.012	0.063	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUN 21-22	<0.003	E0.003	0.044	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUL 14...	<0.003	E0.005	<0.010	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
JUL 30...	<0.003	<0.005	<0.010	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
AUG 14...	<0.003	0.012	<0.010	<0.007	<0.013	<0.002	--	--	<0.001	<0.050	<0.002
AUG 21...	<0.003	0.007	<0.010	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
SEP 11...	<0.003	<0.005	0.015	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002
SEP 17...	<0.003	0.010	<0.010	<0.007	<0.013	<0.002	--	--	<0.001	<0.05	<0.002

## MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	3924	997	554	5870	110	1120	80	844	300
NOV. 1996	7033	896	501	9520	89	1700	73	1390	280
DEC. 1996	7314	929	519	10250	94	1860	75	1490	290
JAN. 1997	5839	984	547	8620	100	1630	79	1240	300
FEB. 1997	7780	914	511	10730	92	1940	74	1560	290
MAR. 1997	9425	894	500	12730	89	2280	73	1860	280
APR. 1997	15983	715	404	17450	66	2830	60	2580	240
MAY 1997	13430	718	408	14780	63	2300	61	2200	250
JUNE 1997	72346	412	240	46890	28	5490	37	7250	160
JULY 1997	24931	641	367	24730	52	3520	55	3730	230
AUG. 1997	5730	902	505	7820	90	1390	74	1140	290
SEPT 1997	7211	879	494	9610	86	1680	72	1410	280
TOTAL	180946	**	**	179000	**	27730	**	26690	**
WTD. AVG.	496	645	366	**	57	**	55	**	220



GUADALUPE RIVER BASIN

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08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	1000	947	972	1020	988	1000	835	754	780	916	744	837
2	1010	998	1000	1010	987	1000	879	835	853	954	916	942
3	1010	996	1010	1020	982	1000	933	879	901	989	948	968
4	1030	1010	1020	1000	953	986	971	933	959	1020	987	1010
5	1050	1020	1030	965	941	957	989	889	959	1020	990	1010
6	1040	980	1010	1010	965	984	948	864	905	996	959	981
7	980	948	957	1020	1000	1010	966	948	956	1010	954	981
8	973	933	957	1040	1000	1020	973	951	961	1030	1000	1010
9	1000	973	990	1040	1020	1030	965	927	950	1010	946	981
10	1020	971	996	1040	998	1020	961	927	946	989	952	966
11	1020	971	991	1010	961	990	1010	961	991	996	986	992
12	1020	988	1010	985	947	967	1030	1010	1020	1000	981	994
13	1030	991	1010	1010	953	985	1040	1010	1020	982	955	973
14	1000	957	988	1020	990	1010	1010	986	1000	973	943	963
15	980	940	963	1020	988	1000	1010	546	925	967	944	956
16	1010	961	994	1060	894	956	832	533	713	974	948	964
17	1020	996	1000	936	871	901	901	832	868	1000	970	993
18	1030	997	1010	938	841	891	950	901	924	1010	990	1000
19	1030	998	1010	938	881	908	966	949	958	1010	988	998
20	1020	994	1010	971	938	959	969	949	954	988	965	978
21	1010	972	1000	980	966	971	976	960	967	1050	952	983
22	993	949	972	1000	979	994	973	952	963	1020	940	975
23	1020	972	1000	1030	993	1010	960	934	952	1040	996	1020
24	1030	1000	1020	1020	387	761	967	929	953	1060	1020	1040
25	1040	1020	1030	757	526	707	990	962	977	1060	1030	1050
26	1040	989	1020	880	726	803	977	937	964	1050	1010	1030
27	1030	971	1010	928	880	907	959	930	948	1030	977	1010
28	1000	958	988	944	913	931	975	945	964	998	964	984
29	983	942	966	956	571	742	977	945	963	1020	986	1000
30	1020	974	1000	770	596	693	967	941	957	1030	1000	1020
31	1040	1000	1020	---	---	---	1060	744	957	1050	1020	1040
MONTH	1050	933	999	1060	387	936	1060	533	939	1060	744	989

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	FEBRUARY			MARCH			APRIL			MAY		
1	1070	1030	1050	890	819	863	976	832	916	---	---	925
2	1050	1030	1040	971	427	702	840	433	552	---	---	950
3	1040	989	1020	840	664	741	560	245	384	998	965	979
4	1030	963	993	891	790	826	614	361	483	1000	968	979
5	1070	1020	1040	940	889	900	644	540	600	979	958	969
6	1070	1040	1060	956	918	940	761	641	687	976	956	965
7	1090	1050	1080	978	937	950	1060	759	830	1010	975	994
8	1080	1000	1050	1000	978	988	999	881	914	1010	994	1000
9	1030	982	1010	1020	1000	1010	1010	960	973	1030	613	948
10	1010	984	1000	1010	955	979	1020	989	1010	850	559	716
11	1030	980	1000	997	541	923	1030	1010	1020	881	828	850
12	1030	505	871	684	478	606	1030	995	1010	900	855	874
13	746	501	671	875	684	769	1040	1020	1020	916	563	724
14	842	727	781	947	859	887	1030	990	1000	893	815	858
15	922	827	864	1020	935	960	1020	998	1010	949	892	923
16	932	893	912	1040	990	1010	1050	1020	1040	948	295	563
17	938	914	926	1010	919	949	1070	1050	1060	789	601	676
18	954	926	937	972	903	935	1070	1050	1060	904	789	845
19	1010	954	985	994	954	969	1070	1040	1050	916	870	893
20	1030	800	973	997	949	969	1060	1030	1040	917	182	517
21	890	819	844	1030	988	1000	1040	992	1020	635	415	519
22	950	882	903	1040	1010	1020	1020	994	1010	840	564	727
23	962	928	942	1020	996	1010	1050	1010	1040	662	541	577
24	958	929	941	1020	978	997	1070	1040	1050	778	632	696
25	971	946	964	1010	975	990	1060	1040	1050	734	659	692
26	971	830	930	1020	1010	1010	1050	234	735	813	729	761
27	910	813	854	1040	1020	1030	586	373	451	866	799	825
28	943	832	900	1060	986	1020	801	586	691	877	402	628
29	---	---	---	1030	983	1010	910	797	841	823	671	727
30	---	---	---	1040	994	1010	957	894	916	939	823	858
31	---	---	---	1040	962	1010	---	---	---	946	887	909
MONTH	1090	501	948	1060	427	935	1070	234	882	1030	182	809



# GUADALUPE RIVER BASIN

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## 08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	7.9	7.8	7.8	7.9	7.8	7.9	8.0	7.9	8.0	8.0	7.9	7.9
2	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.0	8.0	8.1	8.0	8.0
3	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.0	8.0	8.1	8.0	8.0
4	7.9	7.8	7.8	8.0	7.9	7.9	8.0	8.0	8.0	8.1	8.0	8.0
5	7.9	7.8	7.8	8.0	7.9	7.9	8.1	8.0	8.0	8.2	8.0	8.1
6	7.9	7.7	7.8	8.0	7.9	7.9	8.0	8.0	8.0	8.2	8.1	8.1
7	7.9	7.8	7.8	8.0	7.9	8.0	8.1	8.0	8.0	8.2	8.1	8.1
8	7.8	7.7	7.8	8.0	7.9	8.0	8.1	8.0	8.0	8.1	8.0	8.1
9	7.9	7.8	7.8	8.0	7.9	8.0	8.1	8.0	8.0	8.2	8.0	8.0
10	8.0	7.8	7.9	8.0	7.9	8.0	8.1	8.0	8.0	8.2	8.1	8.1
11	7.9	7.7	7.8	8.1	7.9	8.0	8.1	8.0	8.0	8.2	8.1	8.1
12	7.8	7.7	7.8	8.1	8.0	8.0	8.1	8.0	8.0	8.2	8.1	8.1
13	7.9	7.7	7.8	8.1	8.0	8.0	8.1	8.0	8.0	8.2	8.1	8.1
14	7.9	7.7	7.8	8.1	8.0	8.0	8.1	8.0	8.0	8.2	8.1	8.1
15	7.9	7.7	7.8	8.1	8.0	8.0	8.1	7.9	8.0	8.2	8.0	8.1
16	7.9	7.8	7.8	8.0	8.0	8.0	8.1	7.9	8.0	8.2	8.1	8.1
17	7.9	7.8	7.8	8.1	7.9	8.0	8.1	8.0	8.0	8.2	8.0	8.1
18	8.0	7.8	7.9	8.1	7.9	8.0	8.1	8.0	8.1	8.2	8.1	8.1
19	8.0	7.9	7.9	8.1	8.0	8.0	8.1	8.1	8.1	8.2	8.0	8.1
20	8.0	7.8	7.9	8.0	8.0	8.0	8.1	8.1	8.1	8.2	8.1	8.1
21	7.9	7.8	7.9	8.1	8.0	8.0	8.1	8.1	8.1	8.2	8.0	8.1
22	8.0	7.9	7.9	8.1	8.0	8.0	8.2	8.0	8.1	8.2	8.1	8.1
23	8.0	7.9	7.9	8.1	8.0	8.0	8.1	8.1	8.1	8.1	7.9	8.0
24	8.0	7.9	7.9	8.1	7.8	7.9	8.2	8.0	8.1	8.0	7.9	7.9
25	8.0	7.9	7.9	8.0	7.9	8.0	8.2	8.1	8.1	8.1	7.9	8.0
26	8.0	7.9	7.9	8.0	7.9	8.0	8.2	8.1	8.1	8.1	7.9	8.0
27	8.0	7.9	7.9	8.0	7.9	8.0	8.2	8.0	8.1	8.1	8.0	8.0
28	8.0	7.9	8.0	8.0	8.0	8.0	8.2	8.0	8.1	8.1	8.0	8.0
29	8.0	7.9	7.9	8.0	7.9	7.9	8.2	8.1	8.1	8.1	8.0	8.1
30	8.0	7.9	8.0	8.0	7.9	7.9	8.2	8.1	8.1	8.2	8.0	8.1
31	8.0	7.9	7.9	---	---	---	8.2	7.9	8.0	8.2	7.8	8.0
MONTH	8.0	7.7	7.9	8.1	7.8	8.0	8.2	7.9	8.0	8.2	7.8	8.1

STATION NUMBER 08181800 SAN ANTONIO RIVER NR ELMENDORF, TX

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY				MARCH			APRIL			MAY		
1	7.9	7.6	7.8	7.9	7.8	7.8	8.1	7.9	8.1	---	---	---
2	8.0	7.6	7.8	7.9	7.5	7.8	8.0	7.8	7.9	---	---	---
3	7.9	7.7	7.8	7.9	7.8	7.8	7.9	7.7	7.8	7.9	7.8	7.8
4	8.0	7.7	7.8	7.9	7.8	7.8	8.0	7.8	7.9	7.9	7.8	7.8
5	7.9	7.7	7.8	7.9	7.8	7.8	7.9	7.9	7.9	7.9	7.8	7.9
6	7.9	7.7	7.8	7.9	7.8	7.9	8.0	7.9	8.0	7.9	7.8	7.9
7	7.9	7.8	7.8	7.9	7.9	7.9	8.0	7.9	8.0	7.9	7.8	7.9
8	7.9	7.8	7.8	8.0	7.9	7.9	8.0	7.9	7.9	8.0	7.9	7.9
9	8.0	7.8	7.9	8.0	7.9	7.9	8.0	7.9	7.9	7.9	7.6	7.9
10	8.0	7.8	7.9	8.0	7.9	7.9	8.0	8.0	8.0	7.8	7.6	7.7
11	7.9	7.8	7.8	8.0	7.8	7.9	8.0	8.0	8.0	7.9	7.8	7.8
12	7.9	7.7	7.8	7.9	7.7	7.8	8.1	8.0	8.0	7.9	7.8	7.8
13	7.8	7.7	7.8	8.0	7.9	7.9	8.1	8.0	8.0	7.9	7.6	7.7
14	7.8	7.8	7.8	8.0	7.9	7.9	8.2	8.0	8.1	8.0	7.8	7.8
15	7.9	7.8	7.8	8.0	7.9	7.9	8.2	8.0	8.1	7.9	7.9	7.9
16	8.0	7.8	7.8	8.0	8.0	8.0	---	---	---	8.0	7.6	7.8
17	8.0	7.8	7.9	8.0	8.0	8.0	8.2	8.1	8.1	7.9	7.8	7.8
18	8.0	7.9	7.9	8.0	8.0	8.0	8.2	8.0	8.1	7.9	7.9	7.9
19	7.9	7.8	7.9	8.1	7.9	8.0	8.2	8.1	8.1	8.0	7.9	7.9
20	7.9	7.8	7.9	8.1	8.0	8.0	8.3	8.1	8.2	8.0	7.7	7.8
21	7.9	7.8	7.8	8.2	8.0	8.0	8.3	8.1	8.2	7.8	7.7	7.8
22	8.0	7.9	7.9	8.2	8.0	8.1	8.2	8.1	8.1	7.9	7.8	7.9
23	8.0	7.9	7.9	8.2	8.0	8.1	8.2	8.0	8.1	7.9	7.8	7.9
24	8.0	7.9	7.9	8.2	8.0	8.1	8.2	8.0	8.1	8.0	7.9	7.9
25	8.0	7.9	7.9	8.2	8.0	8.1	8.2	8.0	8.1	8.0	7.9	8.0
26	8.0	7.9	7.9	8.2	8.0	8.1	8.1	7.8	8.0	8.1	8.0	8.0
27	8.0	7.8	7.9	8.1	8.0	8.1	---	---	---	8.1	8.0	8.0
28	7.9	7.8	7.9	8.2	8.0	8.1	---	---	---	8.0	7.8	7.9
29	---	---	---	8.2	8.0	8.1	---	---	---	8.0	7.8	7.9
30	---	---	---	8.2	8.1	8.1	---	---	---	8.0	7.9	8.0
31	---	---	---	8.2	8.1	8.1	---	---	---	8.1	8.0	8.0
MONTH	8.0	7.6	7.8	8.2	7.5	8.0	8.3	7.7	8.0	8.1	7.6	7.9

## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

PH, WATER, WHOLE, FIELD, STANDARD UNITS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	JUNE			JULY			AUGUST			SEPTEMBER		
1	8.2	8.1	8.1	8.3	8.2	8.2	8.0	7.9	7.9	8.0	7.8	7.9
2	8.2	8.1	8.1	8.3	8.1	8.2	8.0	7.9	7.9	8.0	7.9	7.9
3	8.3	8.1	8.2	8.2	8.0	8.1	8.1	7.9	8.0	8.0	7.9	7.9
4	8.4	8.1	8.2	---	---	---	8.1	8.0	8.0	8.0	7.9	7.9
5	8.4	8.2	8.3	---	---	---	---	---	---	8.0	7.8	7.9
6	8.4	8.1	8.2	---	---	---	8.1	8.0	8.0	7.9	7.8	7.8
7	8.3	7.9	8.1	---	---	---	8.2	8.0	8.1	7.9	7.7	7.8
8	8.2	8.1	8.1	---	---	---	8.1	7.9	8.0	7.9	7.8	7.8
9	8.2	8.1	8.2	---	---	---	8.1	8.0	8.1	8.1	7.8	7.9
10	8.2	8.1	8.1	7.9	7.9	7.9	8.0	7.9	8.0	8.0	7.9	8.0
11	---	---	---	7.9	7.9	7.9	8.1	8.0	8.0	8.0	7.9	7.9
12	---	---	---	8.0	7.9	7.9	8.1	8.0	8.0	8.1	8.0	8.0
13	---	---	---	8.0	7.9	7.9	8.1	7.9	8.0	8.1	8.0	8.0
14	8.1	8.0	8.0	8.0	7.9	8.0	8.1	8.0	8.0	8.1	8.0	8.0
15	8.1	7.8	8.0	8.0	7.9	7.9	8.1	8.0	8.1	8.1	8.0	8.1
16	8.1	7.9	8.0	7.9	7.9	7.9	8.1	8.0	8.1	8.1	8.1	8.1
17	8.1	8.0	8.0	7.9	7.9	7.9	8.1	7.9	8.0	8.2	8.1	8.1
18	8.1	8.0	8.0	7.9	7.9	7.9	8.1	7.9	8.0	8.2	8.1	8.1
19	8.1	8.0	8.0	7.9	7.9	7.9	8.1	7.9	8.0	8.2	8.1	8.2
20	8.1	8.0	8.1	7.9	7.9	7.9	8.1	7.9	8.0	8.2	8.1	8.2
21	8.1	7.9	8.0	7.9	7.9	7.9	8.1	8.0	8.0	8.2	8.1	8.2
22	8.1	7.9	7.9	7.9	7.9	7.9	8.2	8.0	8.1	8.2	8.1	8.1
23	8.0	7.8	7.9	8.0	7.9	7.9	8.1	7.9	8.0	8.1	8.0	8.0
24	8.0	7.8	7.9	8.0	7.9	7.9	8.0	7.7	7.8	8.2	8.0	8.1
25	8.1	8.0	8.0	8.0	7.9	8.0	7.9	7.7	7.8	8.2	8.1	8.1
26	8.1	8.0	8.0	8.0	8.0	8.0	8.0	7.8	7.9	8.2	8.1	8.1
27	8.0	7.9	8.0	8.0	8.0	8.0	8.1	7.9	7.9	8.2	8.1	8.1
28	8.1	8.0	8.1	8.0	8.0	8.0	8.1	7.9	8.0	8.1	8.0	8.1
29	8.2	8.1	8.1	8.0	7.9	8.0	8.1	7.9	8.0	8.2	7.9	8.0
30	8.2	8.2	8.2	8.0	7.9	7.9	8.1	7.8	7.9	8.2	8.0	8.1
31	---	---	---	8.0	7.9	7.9	7.9	7.8	7.9	---	---	---
MONTH	8.4	7.8	8.1	8.3	7.9	8.0	8.2	7.7	8.0	8.2	7.7	8.0
YEAR	8.4	7.5	8.0									

WATER TEMPERATURE, DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
	OCTOBER			NOVEMBER			DECEMBER			JANUARY		
1	25.5	23.5	24.5	26.5	24.5	26.0	18.0	17.0	17.5	21.0	19.0	20.5
2	26.5	24.5	25.5	24.5	22.0	23.0	18.5	17.0	17.5	21.0	20.0	20.5
3	26.5	26.0	26.0	22.0	21.0	21.5	19.0	18.0	18.5	22.0	21.0	21.5
4	26.0	25.0	25.5	22.5	21.5	22.0	19.0	18.0	18.5	22.5	22.0	22.0
5	25.0	24.5	24.5	24.5	22.5	23.5	20.5	19.0	19.5	22.0	19.5	21.0
6	26.0	24.5	25.5	25.5	24.5	25.0	20.5	19.0	19.5	19.5	16.5	18.0
7	26.5	25.0	26.0	25.5	23.5	24.5	20.5	19.0	19.5	16.5	15.0	16.0
8	26.5	25.0	25.5	23.5	21.5	22.5	20.0	18.5	19.0	16.0	15.0	15.5
9	26.0	24.5	25.5	21.5	20.0	21.0	19.5	18.5	19.0	16.0	15.0	15.5
10	26.0	24.5	25.5	21.5	20.0	21.0	21.0	19.5	20.5	15.5	14.5	15.0
11	26.5	25.0	25.5	22.5	20.5	21.5	22.0	21.0	21.5	15.5	12.5	14.0
12	26.5	25.0	25.5	23.0	22.0	22.5	21.5	21.0	21.5	14.0	11.0	12.5
13	26.5	25.0	25.5	23.5	22.5	23.0	21.5	20.5	21.0	12.5	11.0	12.0
14	26.0	25.0	25.5	24.0	23.0	23.5	22.5	21.0	22.0	12.5	11.0	12.0
15	26.5	25.0	26.0	24.0	23.0	23.5	22.5	16.5	20.5	15.0	12.5	14.0
16	27.0	26.0	26.5	24.0	23.0	23.5	17.0	16.0	17.0	15.5	14.0	15.0
17	28.0	26.5	27.0	24.5	23.0	24.0	17.0	15.0	16.0	15.0	13.5	14.0
18	27.0	23.5	25.0	23.0	22.5	22.5	15.5	14.0	14.5	15.0	14.0	14.5
19	24.0	22.5	23.0	23.0	22.5	22.5	14.5	13.5	14.0	16.0	14.5	15.5
20	25.5	23.5	24.5	24.5	23.0	23.5	15.0	14.0	14.5	17.0	15.5	16.5
21	27.0	25.0	26.0	24.0	23.0	23.5	17.0	15.0	16.5	18.5	16.5	18.0
22	26.0	22.5	24.5	23.5	21.5	22.5	19.5	17.0	18.5	19.0	17.5	18.5
23	23.0	21.0	22.0	23.5	22.0	23.0	21.0	19.0	20.5	20.0	19.0	19.5
24	22.5	21.5	22.0	23.5	17.5	21.0	21.0	17.0	19.0	20.5	19.0	19.5
25	24.5	22.5	23.5	17.5	17.0	17.0	17.0	16.0	16.5	19.5	18.5	19.0
26	26.0	24.0	25.0	18.0	16.5	17.0	17.5	16.0	17.0	20.0	18.5	19.5
27	27.0	25.5	26.5	18.0	16.5	17.5	18.5	17.5	18.0	21.0	19.5	20.5
28	27.5	26.5	27.0	18.0	16.5	17.5	19.0	18.0	19.0	19.5	16.0	17.0
29	27.0	26.0	26.5	18.5	15.5	16.5	19.5	19.0	19.0	16.0	15.0	15.5
30	27.0	26.0	26.5	18.0	16.5	17.5	20.0	19.0	19.5	16.5	14.5	15.5
31	27.0	26.0	26.5	---	---	---	21.5	19.0	20.5	17.0	15.5	16.0
MONTH	28.0	21.0	25.5	26.5	15.5	21.5	22.5	13.5	18.5	22.5	11.0	17.0





## GUADALUPE RIVER BASIN

08181800 SAN ANTONIO RIVER NEAR ELMENDORF, TX--Continued

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
OCTOBER			NOVEMBER			DECEMBER			JANUARY			
1	8.0	7.5	7.8	8.3	7.6	7.9	9.3	8.7	9.1	8.8	8.4	8.6
2	7.9	7.4	7.7	9.0	8.2	8.6	9.0	8.4	8.7	8.9	8.4	8.7
3	8.2	7.3	7.6	9.4	8.5	9.0	8.8	8.2	8.4	8.6	8.2	8.3
4	8.2	7.4	7.7	9.1	8.6	8.8	8.6	8.1	8.3	8.4	7.4	7.9
5	8.3	7.5	8.0	8.7	8.2	8.4	8.4	7.9	8.2	8.4	7.2	7.8
6	8.5	7.8	8.1	8.5	8.2	8.3	8.2	7.7	8.0	9.0	7.9	8.4
7	8.1	7.5	7.7	8.5	7.9	8.2	8.3	7.6	7.9	10.0	8.8	9.5
8	8.1	7.3	7.6	8.8	7.9	8.3	8.6	7.8	8.2	10.3	9.6	9.9
9	8.4	7.2	7.7	9.1	8.2	8.6	8.6	8.0	8.3	10.7	9.8	10.1
10	8.7	7.5	8.0	9.0	8.3	8.6	8.2	7.7	8.0	10.6	9.8	10.3
11	8.8	7.2	7.9	8.8	8.1	8.4	7.8	7.3	7.5	11.2	9.9	10.5
12	8.6	7.6	8.0	8.6	7.9	8.2	7.7	7.1	7.4	11.8	10.3	11.0
13	8.5	7.7	8.0	8.5	7.7	8.0	7.9	7.2	7.6	12.0	10.9	11.4
14	8.3	7.7	8.0	8.4	7.5	7.8	7.6	7.1	7.4	11.9	10.9	11.4
15	8.2	7.6	7.8	7.9	7.3	7.6	8.7	6.9	7.6	11.3	10.3	10.6
16	7.9	7.2	7.5	7.8	7.2	7.4	9.2	8.6	8.8	11.2	9.8	10.4
17	7.6	7.2	7.4	7.6	7.0	7.3	9.6	8.8	9.2	11.4	10.1	10.7
18	8.4	7.3	7.8	8.0	7.2	7.6	10.3	9.3	9.8	11.0	9.8	10.4
19	8.6	7.5	8.0	7.8	7.4	7.6	10.5	9.8	10.2	10.6	9.5	9.9
20	8.3	7.5	7.8	7.5	7.3	7.4	10.3	9.7	9.9	10.1	9.0	9.6
21	8.0	7.2	7.5	7.6	7.1	7.4	9.7	9.1	9.3	9.7	8.9	9.3
22	8.3	7.2	7.7	7.8	7.3	7.5	9.2	8.5	8.7	10.2	8.9	9.4
23	8.7	7.9	8.2	7.8	7.5	7.6	8.5	7.7	8.0	8.9	8.2	8.5
24	8.4	7.8	8.1	8.4	6.8	7.6	9.2	7.6	8.4	9.6	8.0	8.7
25	8.3	7.6	7.9	9.0	8.4	8.7	9.7	8.8	9.3	9.8	8.2	8.9
26	8.1	7.3	7.6	9.2	8.6	8.9	9.6	8.7	9.1	9.6	8.3	8.8
27	7.7	7.1	7.3	9.5	8.6	9.0	9.6	8.4	9.1	9.2	8.1	8.6
28	7.8	7.1	7.3	9.4	8.9	9.1	9.2	8.5	8.8	10.3	8.3	9.4
29	7.7	7.0	7.2	9.8	8.7	9.4	9.3	8.4	8.8	10.9	9.2	10.0
30	7.9	6.9	7.2	9.4	8.8	9.0	9.1	8.4	8.8	11.4	9.5	10.3
31	8.5	6.8	7.4	---	---	---	9.3	8.2	8.7	12.5	9.3	10.6
MONTH	8.8	6.8	7.7	9.8	6.8	8.2	10.5	6.9	8.6	12.5	7.2	9.6

OXYGEN DISSOLVED (MG/L), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
FEBRUARY			MARCH			APRIL			MAY			
1	12.4	9.8	10.9	9.5	8.9	9.2	8.8	8.1	8.5	---	---	---
2	11.7	9.1	10.3	9.1	7.8	8.7	8.6	8.1	8.4	---	---	---
3	11.0	8.5	9.6	9.3	8.9	9.1	8.7	7.2	8.3	7.6	7.2	7.4
4	11.3	8.4	9.6	9.1	8.6	8.9	8.3	7.8	8.1	7.7	7.4	7.5
5	10.8	8.5	9.5	8.7	8.3	8.5	8.4	7.7	8.1	8.0	7.5	7.8
6	9.6	8.8	9.3	9.2	8.7	9.0	8.2	7.3	7.9	7.9	7.4	7.6
7	10.2	9.0	9.5	9.1	8.7	8.9	8.1	7.3	7.8	7.7	7.2	7.4
8	10.4	9.2	9.8	8.7	8.4	8.6	8.0	7.6	7.8	7.7	7.2	7.4
9	10.8	9.6	10.2	8.7	8.4	8.6	8.1	7.7	7.9	7.6	6.7	7.3
10	10.4	9.4	9.9	8.6	8.1	8.3	8.1	7.8	7.9	7.1	6.3	6.8
11	9.9	9.3	9.6	8.4	7.9	8.1	7.9	7.7	7.8	7.4	6.9	7.2
12	10.4	8.9	9.6	8.7	8.1	8.4	8.3	7.7	8.0	7.6	7.1	7.3
13	10.4	10.0	10.3	8.2	7.7	8.0	8.7	8.1	8.4	7.6	6.4	6.9
14	10.4	9.9	10.2	8.2	7.6	7.9	8.9	8.5	8.7	7.2	6.6	6.9
15	10.2	9.6	10.0	8.8	8.2	8.5	8.8	8.3	8.5	7.1	6.7	6.9
16	9.9	9.4	9.7	9.0	8.6	8.8	---	---	---	7.4	5.5	6.9
17	9.7	9.1	9.4	8.8	8.4	8.6	8.7	7.9	8.3	7.1	6.4	6.9
18	9.3	8.8	9.1	8.4	8.0	8.2	8.7	7.9	8.3	7.1	6.4	6.8
19	8.8	8.2	8.4	8.3	7.9	8.1	8.7	8.0	8.3	6.9	6.5	6.7
20	8.4	7.8	8.0	8.4	8.0	8.2	8.6	7.8	8.2	7.6	5.6	7.0
21	8.3	7.8	8.1	8.3	7.9	8.1	8.4	7.3	7.8	7.6	6.6	7.1
22	9.0	8.2	8.7	8.8	7.7	8.3	9.0	7.2	7.8	7.3	6.6	6.9
23	9.1	8.5	8.8	8.9	7.9	8.4	8.4	7.4	7.9	7.3	6.4	6.9
24	9.1	8.6	8.8	9.0	7.9	8.5	8.4	7.5	7.9	7.4	6.9	7.2
25	9.1	8.7	8.9	8.7	7.9	8.3	8.1	7.5	7.8	7.4	6.8	7.1
26	9.2	8.8	9.0	9.3	8.3	8.8	8.7	7.6	8.1	7.0	6.5	6.8
27	9.2	8.7	8.9	8.8	8.2	8.5	9.1	8.6	9.0	6.9	6.4	6.7
28	9.8	8.6	9.1	9.0	8.1	8.5	8.7	7.9	8.4	6.7	4.6	5.9
29	---	---	---	8.9	7.6	8.2	7.9	7.3	7.7	5.6	4.6	5.1
30	---	---	---	8.4	7.3	7.8	7.5	7.2	7.3	6.0	5.3	5.6
31	---	---	---	8.7	8.0	8.4	---	---	---	7.3	5.2	6.2
MONTH	12.4	7.8	9.4	9.5	7.3	8.5	9.1	7.2	8.1	8.0	4.6	6.9



## GUADALUPE RIVER BASIN

08183500 SAN ANTONIO RIVER NEAR FALLS CITY, TX

**LOCATION.**--Lat 28°57'05", long 98°03'50", Karnes County, Hydrologic Unit 12100303, on left bank 23 ft downstream from bridge on Farm Road 791, 0.9 mi upstream from Scared Dog Creek, 3.6 mi southwest of Falls City, and 150.5 mi upstream from mouth.

**DRAINAGE AREA.**--2,113 mi<sup>2</sup>.

**PERIOD OF RECORD.**--April 1925 to current year.

Water-quality record.--Chemical analyses: April 1959.. Chemical and biochemical analyses: May 1965 to September 1981, October 1986 to August 1995. Sediment analyses: January 1987 to September 1996.

SPECIFIC CONDUCTANCE: January 1987 to September 1996.

pH: January 1987 to September 1996

WATER TEMPERATURE: January 1987 to September 1996.

DISSOLVED OXYGEN: January 1987 to September 1996.

**REVISED RECORDS.**--WSP 1732: 1947(M). WSP 1923: Drainage area. WDR TX-87-3: 1983-84.

**GAGE.**--Water-stage recorder. Datum of gage is 285.49 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage in April 1925, at least 10% of contributing drainage area has been regulated by Medina Lake (station 08179500) and Olmos flood-control structure (combined capacity of 269,500 acre-ft). Storage began in Medina Lake in 1913 and Olmos Dam was completed in 1926. Additional regulation by Calaveras Lake on Calaveras Creek and by Brauning Lake. Flow from Brauning Lake enters the San Antonio River above the station near Elmendorf, and flow from Calaveras Creek enters the San Antonio River some distance downstream from the station near Elmendorf. Records provided by the San Antonio City Public Service Board show that during the current year, 464 acre-ft of water was released into Calaveras Creek from Calaveras Lake and that 133 acre-ft was released from Brauning Lake. Flow is also regulated by eleven Soil Conservation Service floodwater-retarding structures (combined capacity of 26,770 acre-ft). Floodwater-retarding structures were completed in 1972. Some diversions for municipal uses and irrigation above station (amount unknown). Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in October 1913 reached a stage of 28.4 ft, from floodmark, from information by local residents. Maximum stage since at least 1875, that of Sept. 29, 1946.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	229	122	536	296	171	368	177	301	281	2530	342	136
2	230	146	361	461	171	308	276	278	304	2180	315	125
3	181	233	279	311	193	566	1230	252	295	1930	294	120
4	172	246	261	280	248	752	1920	185	222	1730	284	145
5	174	243	244	272	194	449	2430	166	200	1590	268	200
6	171	249	259	273	153	327	1380	154	330	1470	262	297
7	181	254	297	269	145	247	734	156	884	1370	228	288
8	180	256	266	271	185	269	478	157	591	1300	216	288
9	175	206	253	273	271	274	383	171	497	1200	282	271
10	163	178	243	306	281	276	322	213	461	1080	232	266
11	161	159	245	266	270	292	293	595	846	996	213	348
12	174	157	240	225	231	329	283	362	528	930	188	329
13	177	171	238	199	319	893	274	289	333	874	185	183
14	168	173	236	191	893	620	258	511	302	819	167	162
15	160	175	228	193	521	415	249	392	313	756	165	157
16	182	194	249	243	359	340	251	323	854	713	154	151
17	188	234	587	227	310	303	247	1130	1040	671	161	155
18	179	277	405	227	278	316	241	637	547	617	165	157
19	140	256	267	209	270	340	245	352	440	554	147	162
20	124	315	224	184	264	325	240	526	365	535	150	201
21	113	298	223	182	288	319	241	1780	1410	496	147	209
22	101	263	216	190	482	296	245	1440	1730	482	146	217
23	115	259	201	231	353	281	245	534	3430	566	143	224
24	119	297	205	203	308	269	226	818	5150	487	150	488
25	116	518	207	187	280	259	227	628	9510	461	230	472
26	113	729	200	176	297	270	227	573	11200	449	215	375
27	112	339	181	173	359	262	1100	457	9280	446	152	310
28	108	264	187	174	449	263	1580	452	6490	439	139	281
29	111	245	248	191	---	273	535	897	4570	473	135	272
30	128	402	283	174	---	219	343	612	3170	375	139	265
31	131	---	283	169	---	189	---	338	---	359	146	---
TOTAL	4776	7858	8352	7226	8543	10909	16880	15679	65573	28878	6160	7254
MEAN	154	262	269	233	305	352	563	506	2186	932	199	242
MAX	230	729	587	461	893	893	2430	1780	11200	2530	342	488
MIN	101	122	181	169	145	189	177	154	200	359	135	120
AC-FT	9470	15590	16570	14330	16950	21640	33480	31100	130100	57280	12220	14390

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1925 - 1997#, BY WATER YEAR (WY)

	423	369	368	403	459	385	462	632	765	423	290	480
MEAN	423	369	368	403	459	385	462	632	765	423	290	480
MAX	2926	1592	2668	2705	4803	3536	2615	4303	10120	3662	1564	4100
(WY)	1974	1977	1992	1968	1992	1992	1992	1992	1987	1973	1978	1946
MIN	57.5	67.3	70.6	89.0	94.9	75.6	61.2	84.7	38.0	55.3	40.4	57.7
(WY)	1956	1956	1955	1957	1956	1956	1956	1956	1956	1954	1954	1930

# GUADALUPE RIVER BASIN

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08183500 SAN ANTONIO RIVER NEAR FALLS CITY, TX--Continued

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1925 - 1997#	
ANNUAL TOTAL	86742		188088		456	
ANNUAL MEAN	237		515		2253	1992
HIGHEST ANNUAL MEAN					92.0	1956
LOWEST ANNUAL MEAN					42200	Sep 29 1946
HIGHEST DAILY MEAN	1540	Aug 30	11200	Jun 26	19	Jun 27 1956
LOWEST DAILY MEAN	59	Aug 12	101	Oct 22	23	Jun 8 1956
ANNUAL SEVEN-DAY MINIMUM	67	Aug 7	112	Oct 22	47400	Sep 29 1946
INSTANTANEOUS PEAK FLOW			11500	Jun 26	33.80	Sep 29 1946
INSTANTANEOUS PEAK STAGE			13.41	Jun 26	330600	
ANNUAL RUNOFF (AC-FT)	172100		373100		820	
10 PERCENT EXCEEDS	369		878		247	
50 PERCENT EXCEEDS	197		269		91	
90 PERCENT EXCEEDS	94		156			

# Period of regulated steamflow.

## GUADALUPE RIVER BASIN

08183850 CIBOLO CREEK AT IH-10 ABOVE BOERNE, TX

**LOCATION.**--Lat 29°48'52", long 98°45'12", Kendall County, Hydrologic Unit 12100304, on right bank between westbound Interstate Highway 10 bridge and frontage road bridge, 600 ft downstream from Ranger Creek, 0.7 mi downstream from Boerne Lake, and 1.9 mi northwest of Boerne.

**DRAINAGE AREA.**--29.0 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1995 to current year. Discharge measurements only prior to May 1996.

**GAGE.**--Water-stage recorder. Datum of gage is 1,428.5 ft above sea level.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. No known diversion above station. Flow impounded by Boerne Lake Reservoir (capacity 4,043 acre-ft) from drainage area of 19.8 mi<sup>2</sup>. The reservoir was completed January 1978. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 20,100 ft<sup>3</sup>/s June 22, 1997, from slope-area measurement of peak flow (gage height 20.82 ft, from floodmark); no flow July 23, 30, 31, Aug. 3-10, 13, and 15-18, 1996.

**EXTREMES FOR CURRENT PERIOD.**--May to September 1996: Maximum discharge during period, 76 ft<sup>3</sup>/s Sept. 1 (gage height, 2.13 ft); no flow July 23, 30, 31, Aug. 3-10, 13, and 15-18. Water year 1997: Maximum discharge 20,100 ft<sup>3</sup>/s June 22, from slope-area measurement of peak flow (gage height, 20.82 ft, from floodmark), minimum daily, 0.06 ft<sup>3</sup>/s Oct. 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.75	.13	.01	5.6
2	---	---	---	---	---	---	---	---	.91	.10	.01	.70
3	---	---	---	---	---	---	---	---	.93	.11	.00	.09
4	---	---	---	---	---	---	---	---	.98	.12	.00	.25
5	---	---	---	---	---	---	---	---	1.0	.12	.00	.21
6	---	---	---	---	---	---	---	---	.97	.10	.00	.25
7	---	---	---	---	---	---	---	---	.98	.11	.00	.23
8	---	---	---	---	---	---	---	---	.81	.09	.00	.22
9	---	---	---	---	---	---	---	---	.69	.08	.00	.20
10	---	---	---	---	---	---	---	---	.64	.13	.00	.15
11	---	---	---	---	---	---	---	---	.54	.17	.01	.12
12	---	---	---	---	---	---	---	---	.51	.09	.01	.10
13	---	---	---	---	---	---	---	---	.49	.08	.00	.12
14	---	---	---	---	---	---	---	---	.47	.08	.18	.13
15	---	---	---	---	---	---	---	---	.41	.07	.00	.37
16	---	---	---	---	---	---	---	---	.27	.07	.00	.07
17	---	---	---	---	---	---	---	---	.20	.06	.00	.07
18	---	---	---	---	---	---	---	---	.24	.04	.00	.14
19	---	---	---	---	---	---	---	---	.21	.02	.01	.26
20	---	---	---	---	---	---	---	---	.20	.04	.02	.22
21	---	---	---	---	---	---	---	---	.16	.04	.01	.19
22	---	---	---	---	---	---	---	---	.16	.02	.04	.22
23	---	---	---	---	---	---	---	.36	.19	.00	.03	.18
24	---	---	---	---	---	---	---	.36	.19	.01	.15	1.9
25	---	---	---	---	---	---	---	.37	.31	.03	.09	.48
26	---	---	---	---	---	---	---	.36	.37	.05	1.1	.19
27	---	---	---	---	---	---	---	.81	.26	.04	.19	.18
28	---	---	---	---	---	---	---	.53	.17	.04	.07	.15
29	---	---	---	---	---	---	---	.51	.16	.02	.14	.15
30	---	---	---	---	---	---	---	.52	.15	.00	2.8	.16
31	---	---	---	---	---	---	---	.61	---	.00	2.8	---
TOTAL	---	---	---	---	---	---	---	---	14.32	2.06	7.67	13.30
MEAN	---	---	---	---	---	---	---	---	.48	.066	.25	.44
MAX	---	---	---	---	---	---	---	---	1.0	.17	2.8	5.6
MIN	---	---	---	---	---	---	---	---	.15	.00	.00	.07
AC-FT	---	---	---	---	---	---	---	---	28	4.1	15	26



# GUADALUPE RIVER BASIN

307

08183850 CIBOLO CREEK AT IH-10 ABOVE BOERNE, TX--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.17	.16	.29	.41	.80	3.9	16	19	24	e140	10	3.1
2	.18	.10	.29	.41	.80	7.3	23	18	21	e120	9.1	3.0
3	.21	.14	.25	.47	.79	4.4	40	15	19	e100	8.7	3.0
4	.24	.16	.38	.43	.70	4.3	422	13	18	e88	9.5	3.1
5	.29	.19	.32	.47	.68	4.3	186	12	19	e78	9.4	3.0
6	.30	.22	.14	.45	.76	3.8	113	11	46	e69	8.9	2.9
7	.30	.31	.13	.72	.82	3.9	78	12	45	e61	8.4	2.8
8	.34	.13	.13	1.9	.55	4.9	65	12	33	e55	14	2.9
9	.34	.12	.15	.53	.66	4.8	57	24	30	e50	14	2.8
10	.34	.15	.20	.48	.72	4.6	54	19	45	e45	12	2.7
11	.33	.19	.26	.38	.76	16	53	14	41	e40	10	2.6
12	.29	.21	.27	.37	2.9	17	44	13	30	e36	9.0	2.5
13	.25	.22	.28	.34	1.4	7.4	39	12	23	e32	8.2	2.3
14	.28	.24	.38	.36	.99	9.0	37	11	20	e28	7.7	2.2
15	.25	.21	11	.40	.96	8.5	35	12	54	25	7.0	2.2
16	.24	.75	1.1	.37	1.1	9.9	33	13	36	e23	6.4	2.1
17	.22	.15	.38	.35	1.2	11	32	13	29	e21	6.0	2.0
18	.15	.09	.23	.37	1.2	10	30	12	23	e19	5.6	1.9
19	.09	.11	.19	.46	1.3	8.3	29	12	19	e18	5.0	1.7
20	.15	.15	.18	.57	17	7.0	27	24	16	e17	4.9	1.6
21	.16	.14	.24	.63	3.1	6.6	24	17	1010	e16	4.9	1.6
22	.09	.15	.27	.64	1.9	6.0	20	26	e4940	15	4.8	2.3
23	.06	.20	.31	.69	1.8	5.5	17	69	e750	14	4.6	2.6
24	.13	1.6	.25	.70	2.7	5.3	16	45	e540	13	4.4	2.5
25	.17	.24	.25	.73	2.9	22	27	36	e410	12	4.3	2.0
26	.22	.18	.27	.83	5.9	28	55	30	e330	11	4.0	1.7
27	.51	.17	.22	.89	4.1	21	44	43	e270	10	3.7	1.6
28	.53	.57	.25	.69	4.1	17	35	47	e220	9.8	3.5	1.6
29	.23	1.3	.30	.64	---	15	29	36	e180	9.1	3.4	1.6
30	.15	.41	.37	.70	---	15	24	31	e160	8.6	3.3	1.7
31	.15	---	.43	.73	---	15	---	28	---	10	3.1	---
TOTAL	7.36	8.96	19.71	18.11	62.59	306.7	1704	699	9401	1193.5	217.8	69.6
MEAN	.24	.30	.64	.58	2.24	9.89	56.8	22.5	313	38.5	7.03	2.32
MAX	.53	1.6	11	1.9	17	28	422	69	4940	140	14	3.1
MIN	.06	.09	.13	.34	.55	3.8	16	11	16	8.6	3.1	1.6
AC-FT	15	18	39	36	124	608	3380	1390	18650	2370	432	138

WTR YR 1997 TOTAL 13708.33 MEAN 37.6 MAX 4940 MIN .06 AC-FT 27190

e Estimated

## GUADALUPE RIVER BASIN

08185000 CIBOLO CREEK AT SELMA, TX

**LOCATION.**--Lat 29°35'38", long 98°18'39", Bexar-Guadalupe County line, Hydrologic Unit 12100304, on right bank 0.6 mi downstream from Missouri-Kansas-Texas Railroad Co. bridge and 0.9 mi upstream from bridge on Interstate Highway 35 at Selma.

**DRAINAGE AREA.**--274 mi<sup>2</sup>.

**PERIOD OF RECORD.**--March 1946 to current year. Figures for water year 1960 in WSP 1813 are in error and should be disregarded.

**REVISED RECORDS.**--WSP 1923: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 728.34 ft above sea level.

**REMARKS.**--Records fair. One known diversion above station. Since water year 1980, at least 10% of contributing drainage area has been regulated by Boerne Lake Reservoir (capacity 4,043 acre-ft) from drainage area of 19.8 mi<sup>2</sup>. Considerable flow of Cibolo Creek enters the Edwards and associated limestones in the Balcones Fault Zone that crosses basin between this station and the station at Boerne (station 08183850). Rain gage at station was destroyed by June 22 flood and was not reactivated..

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--33 years (water years 1947-79), 15.3 ft<sup>3</sup>/s (11,080 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1947-79).**--Maximum discharge, 65,000 ft<sup>3</sup>/s July 16, 1973 (gage height, 26.2 ft, from floodmark), from rating curve extended above 16,000 ft<sup>3</sup>/s on basis of field estimate of 54,000 ft<sup>3</sup>/s and contracted-opening measurement of 65,000 ft<sup>3</sup>/s; no flow most of time.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--A stage of 26 ft occurred in 1889, from information by local residents. Maximum stage since at least 1869, that of June 22, 1997.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	328	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	235	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	167	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	109	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	69	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	40	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	17	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	4.4	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	3800	.01	39	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	351	.00	8.0	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	56	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	15	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	2.0	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	12	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	24900	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	7870	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	e2710	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	e2020	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	1590	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	1280	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	1100	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	814	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	477	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	46997.00	969.41	47.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	1567	31.3	1.52	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	24900	328	39	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	93220	1920	93	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1980 - 1997#, BY WATER YEAR (WY)

	MEAN	.54	.58	69.3	4.30	36.8	26.9	4.59	36.5	203	4.28	.084	.023
MAX	5.23	6.35	1143	76.9	646	483	75.5	494	1567	44.7	1.52	.35	
(WY)	1987	1982	1992	1992	1992	1992	1991	1992	1997	1985	1997	1996	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1980	1981	

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1980 - 1997#
ANNUAL TOTAL	10.52	48013.41	
ANNUAL MEAN	.029	132	32.0
HIGHEST ANNUAL MEAN			257
LOWEST ANNUAL MEAN			.000
HIGHEST DAILY MEAN	9.7 Sep 25	24900 Jun 22	24900 Jun 22 1997
LOWEST DAILY MEAN	.00 Jan 1	.00 Oct 1	.00 Oct 1 1979
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Oct 1	.00 Oct 1 1979
INSTANTANEOUS PEAK FLOW		69600 Jun 22	69600 Jun 22 1997
INSTANTANEOUS PEAK STAGE		a29.73 Jun 22	a29.73 Jun 22 1997
ANNUAL RUNOFF (AC-FT)	21	95230	23170
10 PERCENT EXCEEDS	.00	.00	.00
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

a From floodmark.

# Period of regulated streamflow.

# GUADALUPE RIVER BASIN

309

08186000 CIBOLO CREEK NEAR FALLS CITY, TX

**LOCATION.**--Lat 29°00'50", long 97°55'48", Karnes County, Hydrologic Unit 12100304, at right downstream abutment of bridge on State Highway 123, 5.7 mi northeast of Falls City, and 10.4 mi upstream from mouth.

**DRAINAGE AREA.**--827 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1930 to current year. Monthly discharge only for some periods, published in WSP 1312.

Water-quality record.--Chemical analyses: October 1961 to September 1996.. Chemical and biochemical analyses: December 1969 to September 1996. Sediment analyses: 1960, November 1965 to May 1975.

SPECIFIC CONDUCTANCE: October 1968 to September 1991.

WATER TEMPERATURE: October 1968 to September 1991.

**REVISED RECORDS.**--WSP 733: 1931. WSP 1058: 1935. WSP 1562: 1931(M), 1933. WSP 1923: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 264.28 ft above sea level. Nov. 4, 1930, to Aug. 4, 1940, water-stage recorder at site 1,600 ft upstream at datum 0.56 ft higher. Aug. 5 to Sept. 13, 1940, nonrecording gage at site 150 ft to the left at same datum. Sept. 14, 1940, to Mar. 15, 1990, water-stage recorder at site 150 ft to the left at same datum. Mar. 16, 1990, to July 15, 1993, water-stage recorder at site 50 ft downstream at same datum.

**REMARKS.**--No estimated daily discharges. Records good. There are several diversions for irrigation above station. Much of the base flow is effluent from the Carrizo Sands in the vicinity of Sutherland Springs. Flow is affected at times by discharge from the flood-detention pools of ten floodwater-retarding structures with a combined detention capacity of 16,620 acre-ft. These structures control runoff from 62.9 mi<sup>2</sup>. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--A stage of 35 ft occurred in October 1913 (discharge, about 35,000 ft<sup>3</sup>/s). Maximum stage since at least 1890, that of Sept. 28, 1973.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 3,600 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 24	1800	17,300	28.40				

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	17	34	28	25	39	26	57	54	692	47	29
2	33	17	41	28	25	37	36	48	37	504	46	29
3	29	16	37	26	24	34	212	40	32	397	45	28
4	26	16	34	27	24	31	739	34	29	325	44	30
5	25	16	32	26	23	31	644	30	28	271	42	31
6	24	17	29	25	24	32	602	28	323	227	42	45
7	23	17	28	24	25	32	239	27	1740	197	42	52
8	21	18	27	24	26	30	135	26	839	167	41	40
9	20	18	28	24	25	29	102	27	264	147	45	36
10	19	16	26	23	26	29	85	28	637	127	49	32
11	18	15	26	23	27	31	78	27	1470	116	51	30
12	17	16	26	23	28	36	68	28	291	106	44	28
13	17	17	25	23	31	34	60	30	168	98	41	28
14	17	17	25	23	34	33	54	27	113	93	39	28
15	17	17	46	24	62	35	49	34	146	89	38	27
16	17	18	29	25	56	34	45	282	109	84	38	25
17	17	18	47	26	46	39	41	338	91	80	37	27
18	17	19	55	26	41	37	39	125	75	76	36	27
19	16	20	41	26	37	33	37	75	61	71	35	27
20	17	20	36	27	37	31	35	665	51	68	35	27
21	17	20	33	28	36	31	34	514	1230	66	34	29
22	17	20	31	28	34	30	32	892	1870	64	32	29
23	17	20	31	28	36	30	31	158	3780	64	32	31
24	17	25	29	28	37	29	29	99	13500	62	40	31
25	18	205	28	28	36	27	28	92	7560	59	34	30
26	18	153	28	27	35	27	29	94	2440	56	31	31
27	18	76	28	27	33	26	35	110	2000	54	32	36
28	19	47	28	25	34	26	103	401	1500	50	32	33
29	18	39	28	24	---	25	91	88	1230	49	30	30
30	18	34	28	25	---	25	69	59	1050	48	30	28
31	17	---	27	25	---	24	---	47	---	45	29	---
TOTAL	621	984	991	794	927	967	3807	4530	42718	4552	1193	934
MEAN	20.0	32.8	32.0	25.6	33.1	31.2	127	146	1424	147	38.5	31.1
MAX	37	205	55	28	62	39	739	892	13500	692	51	52
MIN	16	15	25	23	23	24	26	26	28	45	29	25
AC-FT	1230	1950	1970	1570	1840	1920	7550	8990	84730	9030	2370	1850

## GUADALUPE RIVER BASIN

08186000 CIBOLO CREEK NEAR FALLS CITY, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1931 - 1997, BY WATER YEAR (WY)

MEAN	103	84.4	101	95.3	114	67.5	164	248	266	99.3	53.8	156
MAX	996	565	2156	1627	1756	860	1492	2230	2821	1357	909	1579
(WY)	1974	1941	1992	1968	1992	1992	1977	1972	1987	1942	1946	1973
MIN	8.49	8.08	9.99	10.3	9.64	7.04	5.23	4.59	1.74	1.96	2.40	5.41
(WY)	1932	1932	1955	1956	1956	1956	1971	1971	1967	1971	1956	1984

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1931 - 1997

ANNUAL TOTAL	9172.8	63018	129	
ANNUAL MEAN	25.1	173	717	1992
HIGHEST ANNUAL MEAN			10.4	1956
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	331	Sep 8	27300	Sep 28 1973
LOWEST DAILY MEAN	3.9	Aug 8	.00	Jul 30 1956
ANNUAL SEVEN-DAY MINIMUM	5.6	Jul 23	.00	Aug 4 1956
INSTANTANEOUS PEAK FLOW			33600	Jul 6 1942
INSTANTANEOUS PEAK STAGE			35.44	Sep 28 1973
ANNUAL RUNOFF (AC-FT)	18190		93510	
10 PERCENT EXCEEDS	36	180	125	
50 PERCENT EXCEEDS	21	32	27	
90 PERCENT EXCEEDS	7.0	18	9.6	

# GUADALUPE RIVER BASIN

311

08188500 SAN ANTONIO RIVER AT GOLIAD, TX

**LOCATION.**--Lat 28°38'58", long 97°23'04", Goliad County, Hydrologic Unit 12100303, on right bank at upstream side of bridge on U.S. Highway 183, 1.2 mi southeast of courthouse in Goliad, 11.7 mi upstream from Manahuilla Creek, and 66.5 mi upstream from mouth.

**DRAINAGE AREA.**--3,921 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1924 to March 1929, February 1939 to current year.

Water-quality records.--Chemical analyses: December 1941 to December 1942, November 1944 to September 1946, September 1958 to September 13, 1996. Chemical and biochemical analyses: January 1968 to September 13, 1996. Pesticide analyses: January 1968 to May 1982. Sediment analyses: April 1959, October 1974 to August 1994..

**REVISED RECORDS.**--WSP 1923: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 91.08 ft above sea level. Prior to Mar. 31, 1929, nonrecording gage at Texas and New Orleans Railroad Co. bridge 1.1 mi upstream at same datum.

**REMARKS.**--Records good. There are many diversions and regulations above station (see station 08181800). Flow is affected at times by discharge from the flood-detention pools of 36 floodwater-retarding structures, with a combined detention capacity of 66,730 acre-ft. These structures control runoff from 213 mi<sup>2</sup> in the drainage area above this station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Floods in October 1913 and June 15, 1935, reached about the same stage as flood in 1942. Maximum stage since about 1800 occurred in 1869 and was several feet higher than flood of Sept. 23, 1967. Maximum stage since 1869, that of Sept. 23, 1967. Flood of July 9, 1942, reached a stage of 44.9 ft.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 6,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	1600	9,370	27.50	June 28	1200	12,600	31.78
June 23	0500	9,640	27.90				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	342	131	292	280	212	377	262	533	627	6580	e520	218
2	304	136	439	276	202	414	288	436	580	4110	e480	220
3	287	131	460	306	199	360	3010	392	428	3160	e450	213
4	276	129	358	384	197	319	8740	365	e380	2660	434	210
5	236	184	307	301	203	614	5530	335	e350	2310	416	201
6	219	200	291	282	238	569	3240	288	418	2060	394	217
7	213	199	279	277	223	400	2450	270	683	1860	375	261
8	206	205	288	282	193	332	1370	259	3630	1690	415	333
9	207	203	307	281	183	286	834	515	2540	1560	408	334
10	205	205	283	274	199	297	653	392	1190	1460	341	325
11	197	187	276	270	255	317	615	303	935	1320	377	316
12	187	167	270	289	269	426	1270	399	2620	1200	342	306
13	181	155	268	266	266	368	664	652	1240	1120	326	376
14	186	151	264	243	246	464	477	528	731	1060	301	333
15	187	157	267	228	430	727	432	394	580	992	293	245
16	182	165	273	223	678	504	405	646	485	925	276	223
17	176	164	309	222	460	434	388	729	478	874	272	213
18	183	173	322	253	367	393	379	1170	1040	832	259	206
19	188	199	498	243	330	372	372	1090	712	818	260	206
20	183	230	373	254	306	385	363	638	538	e760	260	210
21	163	217	285	249	308	361	356	1580	431	e720	246	220
22	145	248	253	223	295	346	347	2110	6560	e680	244	251
23	137	236	246	216	334	339	343	3210	9350	e650	240	357
24	131	228	238	217	423	324	341	1630	7660	e640	238	342
25	133	294	227	242	356	319	335	874	7730	e700	243	318
26	140	336	229	226	329	343	323	821	9860	e620	242	467
27	162	741	231	217	308	346	318	728	11800	570	295	446
28	137	589	226	211	318	304	352	732	12600	558	282	372
29	132	379	214	208	---	294	1450	2220	12200	542	238	334
30	130	316	216	205	---	292	902	1310	10300	530	226	312
31	130	---	250	218	---	292	---	904	---	e600	220	---
TOTAL	5885	7055	9039	7866	8327	11918	36809	26453	108676	44161	9913	8585
MEAN	190	235	292	254	297	384	1227	853	3623	1425	320	286
MAX	342	741	498	384	678	727	8740	3210	12600	6580	520	467
MIN	130	129	214	205	183	286	262	259	350	530	220	201
AC-FT	11670	13990	17930	15600	16520	23640	73010	52470	215600	87590	19660	17030



## GUADALUPE RIVER BASIN

08188500 SAN ANTONIO RIVER AT GOLIAD, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1997h, BY WATER YEAR (WY)

MEAN	752	586	530	569	685	521	763	1076	1197	608	391	914
MAX	7084	2574	4628	4309	7682	4379	4488	6169	15370	4723	1736	12050
(WY)	1974	1941	1992	1968	1992	1992	1992	1992	1987	1973	1978	1967
MIN	75.1	76.2	86.5	104	107	83.9	86.8	137	26.2	52.4	47.9	66.8
(WY)	1956	1956	1955	1956	1956	1956	1956	1971	1956	1956	1963	1954

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1924 - 1997h	
ANNUAL TOTAL	97921		284687		723	
ANNUAL MEAN	268		780		3289	
HIGHEST ANNUAL MEAN					98.2	
LOWEST ANNUAL MEAN					121000	
HIGHEST DAILY MEAN	1960	Sep 26	12600	Jun 28	121000	Sep 23 1967
LOWEST DAILY MEAN	67	Aug 12	129	Nov 4	2.1	Jun 14 1956
ANNUAL SEVEN-DAY MINIMUM	74	Aug 10	131	Oct 29	5.0	Jun 12 1956
INSTANTANEOUS PEAK FLOW			12600	Jun 28	138000	Sep 23 1967
INSTANTANEOUS PEAK STAGE			31.78	Jun 28	53.70	Sep 23 1967
ANNUAL RUNOFF (AC-FT)	194200		564700		523900	
10 PERCENT EXCEEDS	404		1290		1210	
50 PERCENT EXCEEDS	225		319		326	
90 PERCENT EXCEEDS	112		197		117	

e Estimated

h See PERIOD OF RECORD paragraph.

# GUADALUPE RIVER BASIN

313

08188600 GBRA CALHOUN CANAL PUMP STATION NEAR LONG MOTT, TX

**LOCATION.**--Lat 28°30'00", long 96°46'43", Calhoun County, Hydrologic Unit 12100204, at raw water pump station on Goff Bayou, 0.6 mi upstream from State Highway 185, and 1.3 mi northwest of Long Mott.

**PERIOD OF RECORD.**--March 1968 to February 1970 (monthly discharge only), March 1970 to current year.

**GAGE.**--Totalizing flow meters on rated pumps. March 1968 to Mar. 6, 1981, Parshall flume and deflection-vane recorder. Mar. 7, 1981, to Oct. 5, 1989, water-stage and velocity recorders with duplex water-stage recorder. Oct. 6, 1989, to June 30, 1992, non-recording gage. All at former site 0.5 mi downstream.

**REMARKS.**--Records good except those for estimated daily discharges which are fair. Flow is diverted from Guadalupe River 550 ft upstream from Guadalupe River near Tivoli (station 08188800), and then through a system of canals, Hog Bayou, and Goff Bayou, a distance of 8.2 mi to the pumping station on Goff Bayou. Satellite telemeter at station.

**COOPERATION.**--Log of pumping station on Goff Bayou provided by the Guadalupe-Blanco River Authority.

**AVERAGE DISCHARGE.**--29 years (water years 1969-97), 88.5 ft<sup>3</sup>/s (64,120 acre-ft/yr).

**EXTREMES FOR PERIOD OF RECORD.**--Maximum daily discharge, 311 ft<sup>3</sup>/s July 7, 1968; no flow at times in 1968-74 and 1977-96.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	23	18	34	30	52	35	44	42	127	121	122
2	84	22	39	19	45	41	15	44	63	143	109	110
3	88	21	49	22	21	22	12	53	55	169	114	e89
4	87	31	45	18	35	21	17	53	66	181	123	e87
5	68	26	47	16	32	21	4.4	61	59	170	125	76
6	69	26	29	38	23	21	.00	70	54	138	125	76
7	69	26	21	51	40	21	.00	80	75	144	125	75
8	68	26	19	33	49	41	.00	88	80	152	118	76
9	68	26	18	17	41	52	15	75	80	153	109	76
10	66	34	31	18	21	62	28	44	89	139	98	76
11	72	40	49	19	21	67	35	28	70	130	92	80
12	63	52	32	19	21	62	21	40	92	126	92	83
13	62	52	20	34	21	53	36	47	109	132	92	76
14	60	53	18	49	32	53	24	24	122	127	76	76
15	62	62	16	49	51	53	37	23	87	136	70	77
16	61	33	39	39	22	53	36	36	92	139	70	67
17	26	22	46	31	22	21	23	28	93	137	77	74
18	23	45	51	22	22	.00	52	28	88	132	78	80
19	22	70	58	22	22	.00	28	39	100	134	74	114
20	40	72	60	28	22	16	36	53	88	128	75	98
21	31	69	62	31	22	23	29	45	78	106	63	94
22	28	66	60	32	22	23	27	9.6	78	102	64	74
23	42	66	49	49	22	23	27	24	83	135	61	53
24	39	63	44	21	22	23	26	22	98	128	52	52
25	33	49	58	22	41	23	23	22	119	124	52	52
26	22	70	34	22	36	23	21	22	121	124	52	53
27	33	40	13	22	22	23	21	27	127	103	57	66
28	22	18	.00	22	49	22	30	46	149	101	73	73
29	34	35	.00	29	---	.00	35	48	135	110	66	74
30	30	18	7.9	42	---	.00	38	55	128	108	70	66
31	23	---	33	39	---	.00	---	50	---	98	100	---
TOTAL	1569	1256	1065.90	909	829	915.00	731.40	1328.6	2720	4076	2673	2345
MEAN	50.6	41.9	34.4	29.3	29.6	29.5	24.4	42.9	90.7	131	86.2	78.2
MAX	88	72	62	51	51	67	52	88	149	181	125	122
MIN	22	18	.00	16	21	.00	.00	9.6	42	98	52	52
AC-FT	3110	2490	2110	1800	1640	1810	1450	2640	5400	8080	5300	4650

CAL YR 1996 TOTAL 30970.90 MEAN 84.6 MAX 264 MIN .00 AC-FT 61430  
WTR YR 1997 TOTAL 20417.90 MEAN 55.9 MAX 181 MIN .00 AC-FT 40500

e Estimated

## GUADALUPE RIVER MAIN STEM

08188800 GUADALUPE RIVER NEAR TIVOLI, TX

**LOCATION.**--Lat 28°30'20", long 96°53'04", Calhoun-Refugio County line, Hydrologic Unit 12100204, on right bank at diversion and saltwater barrier, one orifice located upstream and one downstream, 550 ft downstream from Calhoun County Irrigation Canal intake, 0.4 mi downstream from San Antonio River, 3.5 mi north of Tivoli, and at mile 10.2.

**DRAINAGE AREA.**--10,128 mi<sup>2</sup>.

## WATER-STAGE RECORDS

**PERIOD OF RECORD.**--September 1965 to current year.

**REVISED RECORDS.**--WRD TX-68-1: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 0.04 ft above sea level.

**REMARKS.**--Since installation of gage in September 1965, at least 10% of contributing drainage area has been regulated by Canyon Lake (station 08167700). Some regulation by powerplants. Many small diversions above station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum gage height (upstream from barrier), 13.7 ft Sept. 22, 1967; minimum, 1.2 ft July 2, 1984, Jan. 25, 1990. Maximum gage height (downstream from barrier), 13.6 ft Sept. 22, 1967; minimum, 0.5 ft July 12, 14, 1967, Mar. 25, 1996. Maximum stage since at least 1936, that of Sept. 22, 1967.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in July 1936 reached a stage of 11 ft, present site and datum. Levees along the Navigation Canal from San Antonio Bay to Victoria were built in 1961, thus decreasing the flood plain.

**EXTREMES FOR CURRENT YEAR.**--Maximum gage height (upstream from barrier), 10.2 ft Apr. 5, 6; minimum, 2.2 ft Nov. 26. Maximum gage height (downstream from barrier), 10.0 ft Apr. 5; minimum, 2.0 ft Nov. 26, Dec. 18.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN
	OCTOBER		NOVEMBER		DECEMBER		JANUARY		FEBRUARY		MARCH	
1	6.7	6.4	3.2	3.2	3.5	3.3	3.1	2.8	3.5	3.2	5.2	4.8
2	5.6	5.4	2.4	2.2	2.9	2.6	4.0	3.6	3.4	3.1	5.3	4.9
3	4.5	4.3	2.4	2.3	2.8	2.6	4.6	4.3	3.4	3.0	5.3	4.8
4	4.4	4.2	2.7	2.6	3.3	3.1	4.6	4.3	3.3	3.0	5.5	5.0
5	4.3	4.1	2.8	2.7	3.3	3.1	4.1	3.7	3.2	2.9	5.5	5.1
6	4.7	4.6	3.2	3.1	3.2	3.0	3.7	3.4	3.9	3.6	5.4	5.0
7	4.7	4.6	3.3	3.2	3.0	2.8	3.2	2.9	4.1	3.8	5.8	5.4
8	4.5	4.4	2.9	2.7	2.8	2.5	3.3	3.0	3.7	3.4	5.9	5.5
9	4.1	4.0	2.7	2.4	2.8	2.6	3.4	3.1	3.2	2.9	5.8	5.4
10	3.7	3.6	2.4	2.3	2.9	2.6	3.1	2.7	2.9	2.6	5.6	5.3
11	3.2	3.0	2.6	2.4	2.9	2.7	2.9	2.6	2.9	2.6	5.7	5.5
12	3.2	3.0	2.6	2.4	2.9	2.6	2.9	2.6	3.2	3.0	8.0	7.8
13	3.0	2.9	3.0	2.8	2.8	2.5	3.1	2.8	3.0	2.7	8.2	8.0
14	3.1	3.0	2.8	2.8	2.8	2.6	3.2	3.0	3.3	2.9	8.1	8.0
15	3.3	3.2	3.2	3.1	2.9	2.7	3.3	3.1	3.3	2.9	7.8	7.6
16	3.5	3.4	3.6	3.5	2.6	2.3	3.3	3.0	3.0	2.7	7.8	7.6
17	3.3	3.2	3.7	3.6	2.6	2.4	2.8	2.5	4.4	4.0	8.2	8.0
18	3.1	3.0	3.3	3.2	2.3	2.0	2.7	2.4	4.8	4.4	8.2	8.0
19	3.3	3.2	3.3	3.2	2.8	2.4	2.6	2.3	4.5	4.2	8.2	8.0
20	3.4	3.4	3.3	3.2	3.4	3.0	3.0	2.6	4.3	4.0	8.2	8.0
21	3.4	3.4	3.3	3.2	3.8	3.5	4.1	4.1	4.0	3.8	8.0	7.8
22	3.5	3.4	3.0	2.8	3.8	3.5	5.9	5.5	4.2	3.7	7.8	7.6
23	2.5	2.4	3.4	3.3	3.4	3.2	6.4	5.9	4.0	3.7	7.6	7.4
24	2.7	2.6	3.7	3.6	3.1	2.8	6.6	6.1	4.2	3.9	7.4	7.2
25	3.3	3.2	2.4	2.3	3.3	3.0	6.6	6.2	4.5	4.1	7.3	7.0
26	3.6	3.5	2.2	2.0	3.3	3.0	6.6	6.1	4.6	4.3	7.2	7.0
27	3.6	3.6	2.4	2.2	3.0	2.8	6.2	5.8	4.6	4.3	7.4	7.2
28	3.3	3.3	3.8	3.5	3.0	2.7	5.6	5.2	4.8	4.4	7.4	7.2
29	3.5	3.4	4.4	4.1	2.9	2.6	4.4	4.5	---	---	7.3	7.0
30	3.4	3.4	4.0	3.8	3.0	2.7	3.8	3.5	---	---	7.1	6.8
31	3.3	3.2	---	---	3.0	2.8	3.6	3.2	---	---	6.8	6.5
MAX	6.7	6.4	4.4	4.1	3.8	3.5	6.6	6.2	4.8	4.4	8.2	8.0
MIN	2.5	2.4	2.2	2.0	2.3	2.0	2.6	2.3	2.9	2.6	5.2	4.8

# GUADALUPE RIVER MAIN STEM

315

08188800 GUADALUPE RIVER NEAR TIVOLI, TX--Continued

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DAY	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN	UP	DOWN
	APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER	
1	6.6	6.3	7.7	7.5	7.8	7.6	8.8	8.5	7.3	7.1	5.1	---
2	6.9	6.7	7.6	7.5	7.7	7.5	8.8	8.5	7.3	7.1	4.9	---
3	8.1	7.8	7.5	7.3	7.5	7.4	8.7	8.4	7.4	7.1	4.7	---
4	8.9	8.6	7.2	7.1	7.4	7.2	8.5	8.2	7.4	7.1	4.8	---
5	10.2	10.0	7.2	7.0	7.3	7.1	8.3	8.0	7.3	7.0	5.0	---
6	10.2	9.9	7.1	7.0	7.2	7.0	8.2	7.9	7.3	7.0	4.9	---
7	9.4	9.9	7.0	6.9	7.2	7.0	8.1	7.8	7.3	6.9	5.0	---
8	8.7	8.6	6.9	6.8	7.6	7.3	8.1	7.7	7.2	7.0	5.0	---
9	8.4	8.2	7.1	6.9	7.9	7.6	8.1	7.7	7.2	6.9	5.0	---
10	8.1	8.0	7.4	7.2	8.0	7.7	8.0	7.7	7.2	6.9	5.2	---
11	8.0	7.9	7.5	7.4	8.0	7.7	8.0	7.6	7.2	6.8	5.1	4.8
12	7.8	7.7	7.5	7.4	8.0	7.6	8.0	7.6	7.0	6.7	5.1	4.8
13	7.8	7.6	7.2	7.1	8.0	7.7	7.9	7.6	6.9	6.6	5.1	4.7
14	7.8	7.6	7.2	7.0	8.1	7.7	7.9	7.5	6.8	6.5	5.0	4.7
15	7.7	7.6	7.2	7.0	8.0	7.7	7.8	7.5	6.7	6.4	5.1	4.7
16	7.6	7.4	7.1	7.0	7.8	7.6	7.8	7.4	6.6	6.4	5.0	4.6
17	7.5	7.3	7.2	7.0	7.7	7.4	7.7	7.4	6.6	6.3	4.6	4.2
18	7.3	7.2	7.4	7.2	7.6	7.3	7.7	7.4	6.6	6.2	4.6	4.2
19	7.2	7.1	7.6	7.4	7.7	7.4	7.7	7.3	6.5	6.2	4.5	4.2
20	7.2	7.0	7.7	7.5	7.8	7.5	7.6	7.3	6.4	6.0	4.5	4.3
21	7.2	7.0	7.7	7.5	7.8	7.5	7.6	7.3	6.2	5.9	4.7	4.6
22	7.1	7.0	7.7	7.6	7.9	7.6	7.6	7.2	6.0	5.7	5.3	5.2
23	7.0	6.9	7.9	7.7	8.6	8.2	7.5	7.2	5.9	5.6	5.4	5.2
24	7.0	6.9	8.0	7.8	8.9	8.6	7.5	7.1	5.9	5.5	5.4	5.2
25	7.1	6.9	8.0	7.8	8.9	8.6	7.4	7.1	5.8	5.5	5.6	5.4
26	7.0	6.9	8.0	7.8	8.7	8.5	7.4	7.0	5.7	5.4	5.5	5.4
27	7.0	6.8	7.8	7.7	8.6	8.3	7.4	7.1	5.7	5.4	5.4	5.2
28	7.0	6.8	7.7	7.5	8.6	8.4	7.6	7.0	5.7	5.4	5.4	5.2
29	6.9	6.8	7.5	7.4	8.8	8.4	7.6	7.0	5.7	5.4	5.2	4.9
30	7.5	7.4	7.8	7.6	8.8	8.4	7.5	7.0	5.5	5.2	4.9	4.6
31	---	---	7.9	7.6	---	---	7.4	7.1	5.3	---	---	---
MAX	10.2	10.0	8.0	7.8	8.9	8.6	8.8	8.5	7.4	---	5.6	---
MONTH	6.6	6.3	6.9	6.8	7.2	7.0	7.4	7.0	5.3	---	4.5	---

## GUADALUPE RIVER MAIN STEM

08188800 GUADALUPE RIVER NEAR TIVOLI, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: August 1965 to current year. Chemical and biochemical analyses: January 1968 to September 1996.  
Pesticide analyses: October 1970 to current year.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: August 1965 to October 1982.

WATER TEMPERATURES: August 1965 to October 1982.

**INSTRUMENTATION.**--From August 1965 to October 1982, a water-quality monitor continuously recorded conductance at this station. From March 1981 to October 1982, a water-quality monitor continuously recorded water temperature at this station.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum daily, 1,000 microsiemens June 1, 1971, Aug. 3, 1978; minimum daily, 159 microsiemens Apr. 28, 1980.

WATER TEMPERATURES (1965-69, 1981-82): Maximum daily, 32.0°C on many days during summer months; minimum daily, 8.0°C Jan. 15, 1968.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATURATION)	HARDNESS TOTAL (MG/L AS CaCO3)	HARDNESS NONCARBONATE DISSOLVED (MG/L AS CaCO3)	CALCIUM DIS-SOLVED (MG/L AS Ca)	MAGNESIUM, DIS-SOLVED (MG/L AS Mg)
DEC 12...	1303	774	8.1	18.0	7.8	83	260	41	77	17
MAR 28...	0950	397	7.3	22.0	7.9	90	130	25	41	7.9
JUN 04...	1525	442	7.7	28.0	6.6	85	160	8	48	8.8
JUL 16...	1145	564	8.2	29.5	5.8	75	230	26	67	14
AUG 14...	1210	577	8.0	29.0	6.3	82	220	24	66	14
SEP 10...	1140	690	7.7	29.5	6.3	83	240	32	70	17

DATE	SODIUM, DIS-SOLVED (MG/L AS Na)	SODIUM ADSORPTION RATIO	POTASSIUM, DIS-SOLVED (MG/L AS K)	ALKALINITY WATER DIS-FIX END FIELD (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLORIDE, DIS-SOLVED (MG/L AS Cl)	FLUORIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS-SOLVED (MG/L)
DEC 12...	60	2	7.0	220	55	75	0.40	12	436
MAR 28...	26	1	4.6	110	23	33	0.20	12	214
JUN 04...	24	0.8	5.6	150	25	29	0.20	14	243
JUL 16...	27	0.8	3.5	200	41	36	0.25	12	320
AUG 14...	29	0.9	3.5	200	31	40	0.24	14	316
SEP 10...	44	1	3.5	210	49	60	0.32	11	382



## CAPANO CREEK MAIN STEM

317

08189200 COPANO CREEK NEAR REFUGIO, TX

**LOCATION.**--Lat 28°18'12", long 97°06'44", Refugio County, Hydrologic Unit 12100405, on right bank at downstream end of bridge on Farm Road 774, 3.6 mi upstream from Alameda Creek, 8.1 mi east of Refugio, and 11.9 mi upstream from mouth.

**DRAINAGE AREA.**--87.8 mi<sup>2</sup>.

**PERIOD OF RECORD.**--June 1970 to current year.

Water-quality records.--Chemical and biochemical analyses: July 1970 to December 1988. Pesticide analyses: July 1970 to July 1981.

**GAGE.**--Water-stage recorder. Datum of gage is 17.25 ft above sea level.

**REMARKS.**--Records good. No known regulation or diversions. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1921, 22 ft in September 1967, from information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 14	1500	1,330	12.77	Apr. 7	1200	784	10.79
Mar. 19	1600	2,320	15.43				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.03	.02	.00	44	1.4	.00	58	.87	e30	.00	.00	.00
2	.00	.00	.00	14	.98	.00	49	.73	e15	.00	.00	.00
3	.00	.00	.00	4.6	.76	.00	192	.48	e6.0	.02	.00	.00
4	.03	.00	.00	1.7	.48	.00	539	.24	1.6	3.0	.00	.00
5	.05	.00	.00	.78	.29	.00	588	.08	1.4	2.2	.00	.00
6	.11	.00	.00	.28	.21	.00	649	.02	1.1	1.4	.00	.00
7	.20	.00	.00	.12	.21	.00	772	.00	20	.80	.00	.00
8	.13	.00	.00	.08	.19	.00	693	.00	38	.41	.00	.00
9	.05	.00	.00	.04	.14	.00	570	1.0	23	.10	.00	.00
10	.00	.00	.00	.04	.14	.00	433	15	12	.00	.00	.00
11	.00	.00	.00	.02	.14	2.3	290	37	7.0	.00	.00	.00
12	.00	.00	.00	.00	.18	572	168	41	4.0	.00	.00	.00
13	.00	.00	.00	.00	.26	901	86	34	2.5	.00	.00	.00
14	.00	.00	.00	.00	.38	1260	51	23	1.8	.00	.00	.00
15	.00	.00	.00	.00	.26	1120	31	15	1.4	.00	.00	.00
16	.00	.00	.00	.00	.21	804	18	13	1.0	.00	.00	.00
17	.00	.00	.00	.00	.15	932	12	22	.67	.00	.00	.00
18	.00	.00	.00	.00	.10	1410	9.0	17	.42	.00	.00	.00
19	.00	.00	.00	.00	.08	2190	9.3	23	.20	.00	.00	.00
20	.00	.00	.00	4.2	.04	1990	24	25	.11	.00	.00	.00
21	.00	.00	.00	270	.04	1530	31	24	.17	.00	.00	.00
22	.00	.00	.00	e296	.01	988	22	55	.39	.00	.00	11
23	.00	.00	.00	e106	.00	674	10	261	.07	.00	.00	27
24	.00	.00	.00	e45	.00	493	5.2	330	.07	.00	.00	167
25	1.8	.00	.00	e24	.00	354	3.0	107	.08	.00	.00	172
26	3.1	.00	.00	e15	.00	267	2.2	53	.02	.00	.00	92
27	1.1	.00	.00	12	.00	213	1.8	39	.00	.00	.00	71
28	.45	.00	.00	9.2	.00	185	1.5	26	.00	.00	.00	49
29	.17	.00	.00	7.8	---	155	1.3	30	.00	.00	.00	31
30	.07	.00	.00	3.8	---	123	1.0	42	.00	.00	.00	20
31	.04	---	.01	2.0	---	86	---	e40	---	.00	.00	---
TOTAL	7.33	0.02	0.01	860.66	6.65	16249.30	5320.3	1275.42	168.00	7.93	0.00	640.00
MEAN	.24	.001	.000	27.8	.24	524	177	41.1	5.60	.26	.000	21.3
MAX	3.1	.02	.01	296	1.4	2190	772	330	38	3.0	.00	172
MIN	.00	.00	.00	.00	.00	.00	1.0	.00	.00	.00	.00	.00
AC-FT	15	.04	.02	1710	13	32230	10550	2530	333	16	.00	1270

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1970 - 1997, BY WATER YEAR (WY)

	MEAN	50.3	39.8	23.4	25.0	38.4	40.7	30.4	65.7	71.7	44.1	2.46	88.0
MAX	551	589	240	189	459	524	229	508	499	416	16.6	1028	
(WY)	1984	1982	1992	1979	1992	1997	1992	1981	1981	1990	1973	1971	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1978	1989	1971	1983	1971	1971	1971	1971	1971	1971	1974	1977	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1970 - 1997

ANNUAL TOTAL	1089.28	24535.62	43.4
ANNUAL MEAN	2.98	67.2	138
HIGHEST ANNUAL MEAN			1992
LOWEST ANNUAL MEAN			1989
HIGHEST DAILY MEAN	149	2190	5960
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		2320	6300
INSTANTANEOUS PEAK STAGE		15.43	21.00
ANNUAL RUNOFF (AC-FT)	2160	48670	31440
10 PERCENT EXCEEDS	2.4	106	64
50 PERCENT EXCEEDS	.00	.01	.05
90 PERCENT EXCEEDS	.00	.00	.00

e Estimated

**LOCATION.**--Lat 28°17'30", long 97°16'44", Refugio County, Hydrologic Unit 12100406, on left bank at upstream side of upstream bridge of two bridges on U.S. Highway 77, 560 ft upstream from Missouri Pacific Railroad Co. bridge, and 0.2 mi southwest of Refugio.

**DRAINAGE AREA.**--690 mi<sup>2</sup>.

**PERIOD OF RECORD.**--July 1939 to current year.

Water-quality records: Chemical analyses: September 1961 to August 1993. Chemical and biochemical analyses: January 1968 to August 1993.

**Pesticide analyses:** October 1970 to April 1979. **Sediment analyses:** January 1978 to August 1993.

**REVISED RECORDS.--WSP 1923: Drainage area.**

**GAGE.**--Water-stage recorder. Datum of gage is 1.00 ft above sea level. Prior to Nov. 25, 1958, nonrecording gage at site 59 ft downstream at same datum. Nov. 26, 1958, to Apr. 18, 1963, nonrecording gage at present site and datum.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation. There are several small diversions above station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Floods in August 1914 and May 17, 1938, reached a stage of 32.3 ft, from information by local residents. Maximum stage since about 1899, that of Sept. 12, 1971.

**PEAK DISCHARGES FOR CURRENT YEAR.--**Peak discharges greater than base discharge of 3,000 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)		Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)			
	Mar. 20	0100	5,680	25.22		Apr. 5	1700	8,870	28.18			
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.4	2.9	3.2	8.0	5.5	6.8	40	28	25	16	9.4	5.7
2	8.8	2.6	3.1	5.8	5.8	6.5	37	27	24	15	9.4	5.5
3	7.3	2.3	3.1	5.2	5.8	6.5	217	26	23	15	9.4	6.0
4	9.5	2.3	3.1	5.1	5.8	6.1	2820	26	21	14	9.1	6.9
5	10	2.3	3.1	4.8	5.8	6.4	7320	25	21	14	9.0	7.5
6	16	2.4	3.1	4.7	5.8	6.1	6400	24	24	14	8.6	7.5
7	26	2.5	3.2	4.6	6.0	5.8	2180	24	29	13	8.3	8.0
8	18	2.1	3.3	4.6	6.1	5.3	503	24	46	13	8.3	7.3
9	5.8	2.1	3.6	4.8	5.9	5.5	243	51	67	13	8.3	6.8
10	5.1	2.2	3.6	4.9	6.1	5.5	182	1280	47	12	8.2	6.7
11	4.9	2.5	3.8	4.6	6.1	42	156	1360	165	12	8.3	6.4
12	4.3	2.5	4.3	4.6	7.1	1370	129	293	257	12	8.2	6.3
13	3.8	2.5	4.3	4.6	6.4	1360	110	384	95	11	7.9	6.4
14	3.8	2.5	4.4	4.9	6.1	352	99	635	56	11	7.8	5.7
15	3.8	2.6	8.0	5.0	6.1	99	91	209	27	11	7.4	5.5
16	4.1	3.0	6.5	5.2	6.1	69	84	147	23	11	6.9	5.5
17	3.6	2.9	4.6	5.2	5.9	370	78	202	21	11	6.8	5.5
18	3.4	2.7	4.7	5.2	5.8	1440	75	337	20	11	6.8	5.4
19	3.3	2.7	4.9	5.2	5.8	4820	75	269	19	11	6.8	5.2
20	3.6	2.8	4.9	11	6.2	4710	69	190	18	11	6.8	5.6
21	3.5	3.0	4.9	9.3	6.4	1510	60	492	18	14	6.8	9.7
22	3.9	3.1	4.9	6.2	6.1	386	53	234	19	14	6.8	26
23	3.9	3.0	4.9	6.4	6.1	174	46	125	17	12	6.8	12
24	5.6	4.6	4.9	6.1	6.5	107	43	97	66	11	6.8	324
25	3.8	2.6	4.9	5.9	6.5	81	43	82	69	9.8	6.8	580
26	3.7	2.5	4.9	5.4	6.8	320	39	69	31	9.8	6.5	126
27	3.6	2.6	5.2	5.2	7.2	706	37	62	24	9.6	6.5	35
28	3.0	2.7	5.2	4.9	7.2	221	35	47	21	9.4	6.5	19
29	2.9	3.3	5.3	5.0	---	115	31	31	19	9.3	6.5	15
30	2.9	3.3	5.2	5.2	---	71	29	27	17	9.1	6.7	13
31	2.9	---	5.5	5.2	---	49	---	26	---	8.7	6.3	---
TOTAL	193.2	81.1	138.6	172.8	173.0	18432.5	21324	6853	1329	367.7	234.7	1285.1
MEAN	6.23	2.70	4.47	5.57	6.18	595	711	221	44.3	11.9	7.57	42.8
MAX	26	4.6	8.0	11	7.2	4820	7320	1360	257	16	9.4	580
MIN	2.9	2.1	3.1	4.6	5.5	5.3	29	24	17	8.7	6.3	5.2
AC-FT	383	161	275	343	343	36560	42300	13590	2640	729	466	2550
CFSM	.01	.00	.01	.01	.01	.86	1.03	.32	.06	.02	.01	.06
IN.	.01	.00	.01	.01	.01	.99	1.15	.37	.07	.02	.01	.02

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997, BY WATER YEAR (WY)

MEAN	155	61.7	60.8	46.6	105	59.2	105	189	184	138	56.4	301
MAX	1882	1380	849	417	1178	595	851	1387	1848	2135	1076	7646
(WY)	1974	1982	1992	1992	1958	1997	1992	1972	1973	1990	1942	1967
MIN	.051	.63	.62	.66	.66	2.20	1.90	.46	.65	.40	.096	.027
(WY)	1990	1990	1990	1990	1990	1989	1940	1989	1990	1989	1989	1989

### SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

## WATER YEARS 1939 - 1997

ANNUAL TOTAL	10855.07		50584.7						
ANNUAL MEAN	29.7		139			122			
HIGHEST ANNUAL MEAN						647			1967
LOWEST ANNUAL MEAN						1.74			1989
HIGHEST DAILY MEAN	3430	Jun 27	7320	Apr 5		78800		Sep 22	1967
LOWEST DAILY MEAN	.01	Jun 19	2.1	Nov 8		.00		Sep 1	1989
ANNUAL SEVEN-DAY MINIMUM	.02	Jun 16	2.3	Nov 4		.00		Aug 30	1989
INSTANTANEOUS PEAK FLOW			8870	Apr 5		79000		Sep 12	1971
INSTANTANEOUS PEAK STAGE			28.18	Apr 5		38.25		Sep 12	1971
ANNUAL RUNOFF (AC-FT)	21530		100300			88430			
ANNUAL RUNOFF (CFSM)	.043		.20			.18			
ANNUAL RUNOFF (INCHES)	.59		2.73			2.40			
10 PERCENT EXCEEDS	16		169			92			
50 PERCENT EXCEEDS	4.8		7.3			11			
90 PERCENT EXCEEDS	1.8		3.2			2.2			

## ARANSAS RIVER MAIN STEM

319

08189700 ARANSAS RIVER NEAR SKIDMORE, TX

**LOCATION.**--Lat 28°16'56", long 97°37'14", Bee County, Hydrologic Unit 12100407, on right bank 160 ft downstream from centerline of county road bridge, 3.8 mi downstream from confluence of West Aransas and Poesta Creeks, and 4.4 mi northeast of Skidmore.

**DRAINAGE AREA.**--247 mi<sup>2</sup>.

**PERIOD OF RECORD.**--March 1964 to current year.

Water-quality records.--Chemical analyses: October 1965 to September 1966. Sediment records: February 1966 to September 1975.

**GAGE.**--Water-stage recorder. Datum of gage is 72.37 ft above sea level.

**REMARKS.**--Records good. The city of Beeville discharges wastewater effluent into the river via Poesta Creek 3.8 mi upstream. No known regulation or diversions. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of September 1954 reached a stage of 33 ft (discharge, 19,600 ft<sup>3</sup>/s), from information by local resident. Maximum stage since at least 1914, that of Sept. 22, 1967.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Mar. 19	0400	824	10.99	Apr. 4	1700	4,850	20.99

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	3.0	4.0	3.2	3.8	4.0	5.4	6.2	6.3	3.3	1.7	2.6
2	3.3	2.8	3.6	3.3	3.8	4.0	5.8	6.2	5.5	3.3	3.5	2.6
3	3.3	2.8	3.2	3.4	4.0	3.5	57	6.3	5.0	3.2	2.9	2.6
4	5.3	2.7	3.2	3.2	4.0	3.0	2410	6.4	4.6	3.1	2.2	3.1
5	5.3	3.2	3.2	3.3	3.8	3.3	675	5.6	4.5	3.0	2.1	3.8
6	7.8	3.5	3.3	3.2	3.7	3.7	73	5.5	4.2	2.9	1.6	3.5
7	5.6	3.6	3.5	2.7	4.0	3.1	37	5.8	5.3	2.7	1.5	3.6
8	3.8	3.4	3.1	3.0	4.8	3.1	25	5.9	11	2.6	1.5	3.5
9	3.4	3.1	2.1	5.0	5.0	3.4	18	87	5.9	2.6	1.3	5.9
10	3.3	2.9	2.1	6.6	4.4	3.3	15	63	5.5	2.6	1.3	4.8
11	3.1	2.9	2.1	3.8	3.8	3.7	14	20	63	2.6	1.3	3.7
12	3.0	3.1	2.2	3.4	3.9	21	12	10	27	2.4	1.3	3.7
13	2.8	3.3	2.3	3.0	4.0	19	10	22	10	2.3	1.3	3.7
14	2.8	3.4	2.2	2.9	4.0	8.3	9.5	21	6.7	2.3	1.3	3.5
15	2.9	3.2	3.0	3.4	3.7	4.8	9.1	10	5.6	2.3	1.3	3.5
16	3.1	3.4	20	3.5	3.7	4.1	8.6	220	5.1	2.3	1.3	3.6
17	3.3	3.5	9.9	3.5	3.7	5.0	8.3	129	4.2	2.2	1.3	3.9
18	2.8	3.5	4.4	3.6	3.5	53	9.9	41	6.2	2.3	1.3	3.5
19	2.5	3.1	3.1	3.7	3.8	393	13	20	8.7	2.4	1.3	3.2
20	2.6	2.9	3.0	4.1	4.0	42	e15	15	34	5.6	1.4	3.3
21	3.8	3.3	3.0	4.7	6.6	17	e13	23	30	4.0	1.5	4.6
22	3.6	3.3	3.1	6.1	7.0	10	e11	12	16	3.4	1.4	6.7
23	3.5	3.2	3.0	5.0	4.1	7.9	e10	8.6	9.0	2.9	1.5	8.1
24	3.4	4.0	2.9	4.4	3.7	6.6	e9.5	7.7	7.1	2.4	1.7	47
25	3.4	12	2.6	3.9	3.7	5.9	e9.0	42	5.7	2.1	4.4	20
26	3.6	6.8	2.7	3.8	4.0	60	e9.0	33	6.3	2.1	5.7	6.7
27	3.7	3.1	3.0	3.8	3.9	23	e8.7	14	9.7	1.9	3.1	4.2
28	3.6	2.8	3.2	3.8	3.9	11	8.3	15	5.7	1.9	2.5	3.2
29	3.5	3.4	3.3	3.5	---	8.1	6.8	27	4.2	1.9	2.4	2.7
30	3.4	3.8	3.3	3.2	---	6.4	6.2	13	3.5	1.8	2.3	2.6
31	3.3	---	3.3	3.5	---	5.6	---	8.2	---	1.7	2.5	---
TOTAL	112.1	109.0	116.9	117.5	116.3	749.8	3522.1	909.4	325.5	82.1	61.7	177.4
MEAN	3.62	3.63	3.77	3.79	4.15	24.2	117	29.3	10.9	2.65	1.99	5.91
MAX	7.8	12	20	6.6	7.0	393	2410	220	63	5.6	5.7	47
MIN	2.5	2.7	2.1	2.7	3.5	3.0	5.4	5.5	3.5	1.7	1.3	2.6
AC-FT	222	216	232	233	231	1490	6990	1800	646	163	122	352

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1997, BY WATER YEAR (WY)

MEAN	29.9	7.64	19.0	7.73	14.4	14.0	29.7	57.2	52.2	29.2	12.4	139
MAX	318	39.0	327	38.9	119	117	255	349	512	451	176	2356
(WY)	1974	1982	1992	1992	1969	1992	1992	1972	1973	1990	1980	1967
MIN	.000	.17	.72	1.05	1.10	.55	.31	1.04	.026	.031	.000	.000
(WY)	1990	1965	1965	1971	1967	1966	1967	1989	1967	1986	1965	1965

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1964 - 1997

ANNUAL TOTAL	2428.16	6399.8	
ANNUAL MEAN	6.63	17.5	35.0
HIGHEST ANNUAL MEAN			199
LOWEST ANNUAL MEAN			3.15
HIGHEST DAILY MEAN	367	Aug 27	49300
LOWEST DAILY MEAN	.90	Aug 6	.00
ANNUAL SEVEN-DAY MINIMUM	.99	Jul 19	.00
INSTANTANEOUS PEAK FLOW			82800
INSTANTANEOUS PEAK STAGE			42.22
ANNUAL RUNOFF (AC-FT)	4820	12690	25330
10 PERCENT EXCEEDS	7.0	15	15
50 PERCENT EXCEEDS	3.5	3.7	3.9
90 PERCENT EXCEEDS	1.7	2.3	.61

e Estimated

## NUECES RIVER MAIN STEM

08190000 NUECES RIVER AT LAGUNA, TX

**LOCATION.**--Lat 29°25'42", long 99°59'49", Uvalde County, Hydrologic Unit 12110101, on right bank 0.5 mi downstream from Sycamore Creek, 1.0 mi northeast of Laguna, and at mile 370.8.

**DRAINAGE AREA.**--737 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1923 to current year.

Water-quality records.--Chemical analyses: May 1949 to June 1952, September 1964 to September 1993. Chemical, biochemical, and pesticide analyses: February 1970 to September 1993. Sediment analyses: January 1966.

**REVISED RECORDS.**--WSP 1562: 1930, 1931(M), 1932, 1939. WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,119.72 ft above sea level. Prior to Jan. 26, 1925, nonrecording gage at site 2 mi downstream at different datum.

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation. There are many small diversions above station for irrigation. Rain gage at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in June 1913 reached a stage of about 29 ft (discharge, 210,000 ft<sup>3</sup>/s); flood of Sept. 21, 1923, reached a stage of about 26.5 ft (discharge, 160,000 ft<sup>3</sup>/s); from information by local residents. Maximum stage since at least 1866, that of Sept. 24, 1955.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 700 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1400	142,000	a25.6	June 22	1300	139,000	a25.4
June 16	1900	15,800	11.68				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	202	725	271	205	142	199	228	212	172	805	257	131
2	182	624	270	201	141	199	254	206	164	739	255	130
3	167	547	268	199	141	188	301	199	158	670	253	133
4	152	488	262	195	138	181	332	190	150	620	242	138
5	153	439	259	191	138	173	385	185	146	586	234	135
6	143	412	252	188	139	167	353	180	147	556	230	135
7	134	391	244	188	141	162	319	178	245	527	223	133
8	121	365	238	194	139	162	296	174	368	503	225	131
9	112	342	231	191	138	158	280	193	399	480	220	129
10	109	322	227	186	137	254	271	187	375	457	219	124
11	101	304	223	181	135	370	265	173	357	442	213	120
12	94	288	218	179	138	493	256	167	327	427	206	118
13	94	272	215	176	138	520	248	173	303	410	200	116
14	90	266	210	175	136	444	243	177	281	396	195	115
15	84	253	212	172	131	380	237	180	292	379	190	113
16	83	246	246	169	129	350	232	176	3330	369	184	107
17	83	239	327	166	128	331	224	169	2330	358	180	106
18	78	231	318	164	126	316	222	165	802	349	175	105
19	71	225	304	164	127	305	224	163	525	338	171	104
20	70	219	292	164	160	289	219	180	430	330	168	105
21	69	213	280	161	302	276	215	167	395	322	164	109
22	70	207	270	157	351	267	210	173	37900	321	159	110
23	64	203	262	155	296	260	205	173	7740	316	165	105
24	61	232	252	153	265	252	199	180	2840	308	182	127
25	62	258	243	151	250	247	202	172	1940	296	165	139
26	61	242	238	151	239	243	227	165	1510	286	158	132
27	59	233	231	150	222	242	227	161	1260	277	151	124
28	34700	235	226	145	209	237	233	246	1090	269	145	120
29	7200	262	222	145	---	230	226	205	969	262	141	116
30	1420	270	214	145	---	227	219	185	887	256	138	113
31	946	---	208	144	---	229	---	178	---	256	134	---
TOTAL	47035	9553	7733	5305	4876	8351	7552	5632	67832	12910	5942	3623
MEAN	1517	318	249	171	174	269	252	182	2261	416	192	121
MAX	34700	725	327	205	351	520	385	246	37900	805	257	139
MIN	59	203	208	144	126	158	199	161	146	256	134	104
AC-FT	93290	18950	15340	10520	9670	16560	14980	11170	134500	25610	11790	7190
CFSM	2.06	.43	.34	.23	.24	.37	.34	.25	3.07	.57	.26	.16
IN.	2.37	.48	.39	.27	.25	.42	.38	.28	3.42	.65	.30	.18

# NUECES RIVER MAIN STEM

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08190000 NUECES RIVER AT LAGUNA, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1997, BY WATER YEAR (WY)

MEAN	228	123	118	105	116	107	111	156	271	164	142	244
MAX	2030	544	894	610	1160	867	766	868	5407	1580	2500	2668
(WY)	1974	1924	1992	1992	1949	1992	1977	1935	1935	1939	1971	1955
MIN	7.39	5.42	5.58	5.46	5.10	7.04	23.7	18.2	12.2	8.11	6.99	8.60
(WY)	1953	1957	1957	1957	1957	1957	1935	1953	1953	1953	1953	1956

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1924 - 1997	
ANNUAL TOTAL	86082		186344		157	
ANNUAL MEAN	235		511		23.1	
HIGHEST ANNUAL MEAN					611	
LOWEST ANNUAL MEAN					23.1	
HIGHEST DAILY MEAN	34700	Oct 28	37900	Jun 22	107000	Jun 14 1935
LOWEST DAILY MEAN	18	Aug 18	59	Oct 27	3.0	Feb 27 1957
ANNUAL SEVEN-DAY MINIMUM	19	Aug 16	64	Oct 21	3.2	Mar 10 1957
INSTANTANEOUS PEAK FLOW			142000	Oct 28	307000	Sep 24 1955
INSTANTANEOUS PEAK STAGE			a25.60	Oct 28	32.70	Sep 24 1955
ANNUAL RUNOFF (AC-FT)	170700		369600		113800	
ANNUAL RUNOFF (CFSM)	.32		.69		.21	
ANNUAL RUNOFF (INCHES)	4.34		9.41		2.90	
10 PERCENT EXCEEDS	269		434		237	
50 PERCENT EXCEEDS	52		212		76	
90 PERCENT EXCEEDS	22		123		24	

a From floodmark.



## NUECES RIVER BASIN

08190500 WEST NUECES RIVER NEAR BRACKETTVILLE, TX

**LOCATION.**--Lat 29°28'21", long 100°14'10", Kinney County, Hydrologic Unit 12110102, at Wilson Ranch on Farm Road 3199, 1.3 mi upstream from Miguel Canyon, 16.0 mi northeast of Brackettville, and 40.2 mi upstream from mouth.

**DRAINAGE AREA.**--694 mi<sup>2</sup>.

**PERIOD OF RECORD.**--September 1939 to September 1950, April 1956 to current year.

**REVISED RECORDS.**--WSP 1312: 1949(M). WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,326.79 ft above sea level. Prior to Mar. 14, 1940, nonrecording gage at same site and datum.

**REMARKS.**--Records fair. No known regulation or diversions. In ordinary years, a large part of streamflow is lost by seepage into the Balcones Fault Zone of the Edwards and associated limestones above station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1879, about 40 ft June 14, 1935 (discharge, 550,000 ft<sup>3</sup>/s, based on slope-area measurements of 580,000 ft<sup>3</sup>/s at site 33 mi upstream from gage) and 536,000 ft<sup>3</sup>/s (at site 24 mi downstream from gage, present site and datum), from gage-height relation of 1935 and 1955 flood peaks at site 0.6 mi upstream. Flood in 1900 reached a stage about 34 ft, and flood of Sept. 24, 1955, reached a stage of 27.1 ft, from floodmark at present site (discharge, 150,000 ft<sup>3</sup>/s, by slope-area measurement).

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)					
Oct. 28	1230	230,000	a30.74	June 22	1745	72,300	22.71					
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	213	8.4	2.3	.84	5.9	7.4	3.9	3.8	151	12	2.2
2	.89	171	7.8	2.2	.84	5.3	7.6	3.7	3.6	132	11	2.1
3	.79	135	7.3	2.1	.84	5.1	7.6	3.4	3.4	121	11	2.1
4	.71	107	6.8	2.0	.84	5.1	7.0	3.3	3.1	109	10	2.1
5	.67	79	6.4	2.0	.84	4.3	7.0	3.2	2.9	98	9.5	1.9
6	.51	65	5.9	1.8	.84	3.9	7.4	3.0	3.2	88	9.2	1.6
7	.43	52	5.5	1.8	.79	4.0	7.7	2.9	2.9	78	9.0	1.6
8	.38	42	5.0	1.7	.75	3.8	7.6	2.9	2.9	70	8.7	1.5
9	.29	36	4.7	1.5	.84	3.5	7.0	2.8	3.3	63	8.4	1.4
10	.23	30	4.5	1.5	.84	5.5	6.8	2.3	3.7	57	7.8	1.4
11	.21	25	4.3	1.5	.88	7.6	6.2	2.3	5.4	52	7.4	1.4
12	.16	21	4.1	1.5	.93	9.9	5.8	2.4	7.1	48	7.0	1.3
13	.12	17	3.8	1.4	.93	11	5.8	2.4	7.9	44	6.3	1.3
14	.08	14	3.8	1.4	.89	12	5.7	2.3	7.4	40	5.8	1.4
15	.06	13	3.6	1.3	.84	16	5.5	2.3	7.5	37	5.5	1.4
16	.04	11	3.4	1.2	.84	21	5.5	2.3	8.2	31	5.3	1.2
17	.04	9.7	3.1	1.2	.84	20	5.3	2.2	9.0	29	5.1	1.2
18	.02	9.0	3.2	1.2	.85	17	5.3	2.0	9.7	28	4.5	1.2
19	.01	8.3	3.4	1.2	.95	15	5.2	2.0	9.7	25	4.4	1.1
20	.01	7.4	3.4	1.2	3.3	13	5.1	2.1	9.4	24	4.1	1.1
21	.01	7.1	3.2	1.2	5.5	12	4.8	1.9	9.2	22	4.0	1.1
22	.00	6.7	3.2	1.1	8.5	11	4.5	2.2	24000	25	3.8	1.0
23	.00	6.8	3.0	1.1	9.0	11	4.3	2.4	4010	23	3.9	1.0
24	.00	6.1	2.9	1.0	9.0	10	4.3	3.3	697	20	3.5	.97
25	.00	6.1	2.8	.95	8.5	9.4	4.9	3.5	389	18	3.3	.87
26	.00	6.0	2.7	.93	7.8	8.9	4.5	3.5	284	16	3.2	.84
27	.00	5.8	2.7	.89	6.8	9.0	4.3	3.1	242	15	3.0	.84
28	32200	5.9	2.7	.75	6.6	8.7	4.3	2.7	216	14	2.9	.84
29	e2300	6.4	2.5	.81	---	8.4	4.3	3.6	194	13	2.9	.84
30	636	8.1	2.3	.84	---	7.9	4.1	4.2	173	13	2.7	.84
31	348	---	2.3	.84	---	7.7	---	4.2	---	12	2.4	---
TOTAL	35490.76	1130.4	128.7	42.41	81.21	292.9	172.8	88.3	30328.3	1516	187.6	39.64
MEAN	1145	37.7	4.15	1.37	2.90	9.45	5.76	2.85	1011	48.9	6.05	1.32
MAX	32200	213	8.4	2.3	9.0	21	7.7	4.2	24000	151	12	2.2
MIN	.00	5.8	2.3	.75	.75	3.5	4.1	1.9	2.9	12	2.4	.84
AC-FT	70400	2240	255	84	161	581	343	175	60160	3010	372	79

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997h, BY WATER YEAR (WY)

	MEAN	83.4	5.44	5.01	2.45	21.6	3.78	9.95	12.5	109	48.0	45.5	71.5
MAX	1145	76.5	164	68.4	978	60.2	238	266	1880	737	1308	2180	
(WY)	1997	1959	1985	1985	1949	1979	1990	1957	1958	1976	1971	1964	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1941	1941	1940	1940	1940	1940	1942	1942	1942	1941	1940	1940	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1939 - 1997h

ANNUAL TOTAL	41214.04	69499.02	
ANNUAL MEAN	113	190	35.3
HIGHEST ANNUAL MEAN			237
LOWEST ANNUAL MEAN			.000
HIGHEST DAILY MEAN	32200	Oct 28	42500
LOWEST DAILY MEAN	.00	Apr 27	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Apr 27	.00
INSTANTANEOUS PEAK FLOW		230000	246000
INSTANTANEOUS PEAK STAGE		a30.74	31.30
ANNUAL RUNOFF (AC-FT)	81750	137900	25560
10 PERCENT EXCEEDS	6.9	36	8.3
50 PERCENT EXCEEDS	.12	4.1	.01
90 PERCENT EXCEEDS	.00	.84	.00

e Estimated

a From floodmark.

h See PERIOD OF RECORD paragraph.

# NUECES RIVER MAIN STEM

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08192000 NUECES RIVER BELOW UVALDE, TX

**LOCATION.**--Lat 29°07'25", long 99°53'40", Uvalde County, Hydrologic Unit 12110103, on right bank at McDaniel Ranch, 5.7 mi upstream from bridge on U.S. Highway 83, 8.8 mi southwest of Uvalde, 18.2 mi downstream from West Nueces River, and at mile 338.7.

**DRAINAGE AREA.**--1,861 mi<sup>2</sup>.

**PERIOD OF RECORD.**--April 1939 to current year. October 1927 to April 1939, published as "near Uvalde" (station 08191500); records are equivalent only during periods of flood flow.

**REVISED RECORDS.**--WSP 1732: 1956(M). WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 796.12 ft above sea level. Oct. 4, 1927, to Apr. 30, 1939, water-stage recorder at site 6.2 mi upstream at different datum.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation. Part of the flow of the Nueces River enters the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin downstream from Laguna (station 08190000) and upstream from this station. At low stage, most of headwater flow enters this formation. There are many small diversions above station for irrigation. Rain gage at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1836, 40.4 ft June 14, 1935, from floodmark (discharge at former site, 616,000 ft<sup>3</sup>/s, by slope-area measurement). Large floods also occurred in 1901 and 1913, stages unknown.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 250 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	2330	201,000	24.88	June 17	0400	8,340	9.83
Mar. 14	0730	455	4.52	June 22	1930	102,000	a18.88
Apr. 4	0100	513	4.55	June 23	0430	95,000	18.39
June 15	0330	394	4.45				

a From floodmark.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	70	1930	155	114	55	103	171	174	120	784	204	85
2	53	1180	162	110	55	96	202	167	113	705	198	81
3	43	844	164	107	54	94	286	158	105	651	192	81
4	38	608	165	104	53	91	389	149	100	599	190	91
5	38	461	163	100	52	88	336	142	95	559	178	86
6	32	371	159	95	52	83	359	139	91	530	173	85
7	30	309	151	92	51	79	335	133	86	499	165	81
8	28	273	142	93	51	77	308	129	92	469	164	80
9	27	251	136	91	50	75	281	136	254	437	163	78
10	26	228	132	91	49	74	263	141	288	416	160	77
11	25	205	127	89	49	171	253	135	297	401	152	74
12	24	194	122	86	50	266	239	129	294	388	149	73
13	24	189	117	84	49	384	228	129	279	370	142	70
14	24	180	114	81	47	440	220	127	252	358	136	68
15	23	177	114	80	47	378	213	125	333	342	132	65
16	23	167	108	79	46	328	206	124	263	323	128	64
17	23	155	113	77	46	300	201	123	4390	308	124	62
18	22	143	172	75	47	279	197	119	1560	298	118	61
19	22	137	197	73	46	257	192	115	810	288	113	60
20	23	130	197	71	46	241	191	120	473	277	111	59
21	22	123	191	71	44	228	188	120	395	272	107	61
22	20	114	183	71	44	218	179	120	24400	275	104	60
23	21	108	174	69	63	209	169	120	45600	263	106	58
24	21	105	163	66	123	206	163	130	7000	253	112	56
25	21	109	152	63	125	199	157	131	3590	241	111	55
26	21	127	147	62	122	187	175	123	2130	231	115	55
27	21	131	140	60	117	182	179	117	1490	223	109	54
28	33700	132	134	57	110	178	180	110	1180	213	104	54
29	51600	144	128	57	---	175	183	126	989	203	99	54
30	6830	148	123	57	---	169	178	138	876	198	94	56
31	3530	---	119	55	---	167	---	128	---	195	89	---
TOTAL	96425	9373	4564	2480	1743	6022	6821	4077	97945	11569	4242	2044
MEAN	3110	312	147	80.0	62.3	194	227	132	3265	373	137	68.1
MAX	51600	1930	197	114	125	440	389	174	45600	784	204	91
MIN	20	105	108	55	44	74	157	110	86	195	89	54
AC-FT	191300	18590	9050	4920	3460	11940	13530	8090	194300	22950	8410	4050

## NUECES RIVER MAIN STEM

08192000 NUECES RIVER BELOW UVALDE, TX--Continued

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997, BY WATER YEAR (WY)

MEAN	271	85.6	78.8	69.6	96.9	62.0	74.2	100	275	142	153	221
MAX	3153	380	811	656	2487	909	785	972	3496	1525	3654	3081
(WY)	1974	1959	1992	1985	1949	1992	1977	1987	1958	1976	1971	1964
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1953	1953	1952	1952	1952	1952	1952	1953	1953	1951	1951	1951

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1939 - 1997	
ANNUAL TOTAL	118801.7		247305		135	
ANNUAL MEAN	325		678		678	
HIGHEST ANNUAL MEAN					3.63	
LOWEST ANNUAL MEAN					1997	
HIGHEST DAILY MEAN	51600	Oct 29	51600	Oct 29	51600	Oct 29 1996
LOWEST DAILY MEAN	1.4	Aug 19	20	Oct 22	.00	May 10 1951
ANNUAL SEVEN-DAY MINIMUM	1.5	Aug 14	21	Oct 21	.00	Jun 18 1951
INSTANTANEOUS PEAK FLOW			201000	Oct 28	201000	Oct 28 1996
INSTANTANEOUS PEAK STAGE			24.88	Oct 28	24.88	Oct 28 1996
ANNUAL RUNOFF (AC-FT)	235600		490500		98140	
10 PERCENT EXCEEDS	160		388		192	
50 PERCENT EXCEEDS	16		129		26	
90 PERCENT EXCEEDS	2.9		49		2.7	

# NUECES RIVER MAIN STEM

325

08193000 NUECES RIVER NEAR ASHERTON, TX

**LOCATION.**--Lat 28°30'00", long 99°40'54", Dimmit County, Hydrologic Unit 12110103, on right bank 28 ft downstream from bridge on Farm Road 190, 0.1 mi downstream from El Moro Creek, 5.8 mi northeast of Asherton, and at mile 266.0.

**DRAINAGE AREA.**--4,082 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1939 to current year.

**REVISED RECORDS.**--WSP 1118: 1944.

**GAGE.**--Water-stage recorder. Datum of gage is 470.92 ft above sea level. Prior to Feb. 2, 1940, nonrecording gage at same site and datum.

**REMARKS.**--No estimated daily discharges. Records good. Part of flow of the Nueces River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses basin between Laguna and Uvalde (stations 08190000 and 08192000). Considerable loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Since March 1948, at least 10% of contributing drainage area has been regulated by Upper Nueces Reservoir (capacity, 7,590 acre-ft), 13 mi upstream. Many small diversions above station for irrigation.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--8 years (water years 1940-48), 140 ft<sup>3</sup>/s (101,700 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1940-48).**--Maximum discharge, 24,000 ft<sup>3</sup>/s Sept. 2, 1944 (gage height 30.40, corrected); now flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1900, 33 ft June 17, 1935; flood of June 30, 1913, reached about same stage, from information by local residents.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.3	10600	135	115	36	38	197	152	88	1390	170	36
2	3.1	5370	135	104	34	68	203	141	64	1190	172	33
3	1.0	1990	139	98	29	83	217	129	54	1030	161	33
4	.17	1040	142	89	30	81	249	114	46	904	153	33
5	.30	752	157	84	30	78	277	99	36	808	148	37
6	.09	575	166	81	28	69	307	92	32	733	146	39
7	.07	493	157	80	25	60	309	85	86	678	140	39
8	.03	403	152	92	24	53	307	74	245	625	125	38
9	.02	339	151	101	24	49	308	71	501	585	116	38
10	.01	305	144	101	20	46	300	82	634	549	104	38
11	.00	276	137	86	21	47	289	102	770	511	98	41
12	.00	252	136	73	23	58	269	113	399	480	94	38
13	.00	228	131	72	24	72	254	109	318	452	90	30
14	.00	208	128	71	25	115	243	91	281	430	87	24
15	.00	194	127	71	28	215	232	90	510	403	84	21
16	.00	177	125	68	25	289	222	86	1790	374	81	19
17	.00	165	117	64	22	301	215	59	1860	346	77	14
18	.00	149	108	60	21	292	214	50	1680	323	70	8.1
19	.00	140	97	59	21	276	219	51	2510	300	67	4.3
20	.00	135	101	63	23	258	213	55	1740	280	61	3.0
21	.00	128	130	63	23	245	205	67	1120	273	55	22
22	.00	118	167	53	19	234	190	72	808	270	53	112
23	.00	107	177	43	15	220	172	118	1340	255	45	72
24	.00	118	179	36	14	214	153	117	5920	247	45	78
25	.00	121	173	36	13	203	141	118	10700	237	58	76
26	.00	103	177	40	13	200	159	126	12700	228	60	61
27	.00	91	167	46	13	187	175	125	9540	218	53	47
28	.00	94	153	48	16	181	170	141	5510	210	46	41
29	.00	122	148	45	---	180	165	289	2930	199	40	32
30	4740	137	148	39	---	175	160	361	1790	189	39	30
31	11000	---	135	36	---	186	---	148	---	176	39	---
TOTAL	15751.09	24930	4439	2117	639	4773	6734	3527	66002	14893	2777	1137.4
MEAN	508	831	143	68.3	22.8	154	224	114	2200	480	89.6	37.9
MAX	11000	10600	179	115	36	301	309	361	12700	1390	172	112
MIN	.00	91	97	36	13	38	141	50	32	176	39	3.0
AC-FT	31240	49450	8800	4200	1270	9470	13360	7000	130900	29540	5510	2260

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1997, BY WATER YEAR (WY)

MEAN	375	102	56.4	64.8	81.8	80.4	98.3	239	460	225	189	279
MAX	3254	831	537	724	1498	1347	1256	1738	4349	1845	5246	3674
(WY)	1960	1997	1992	1985	1949	1949	1957	1957	1987	1971	1971	1964
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1953	1951	1949	1949	1950	1950	1950	1956	1953	1951	1951	1952

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1949 - 1997	
ANNUAL TOTAL	45155.53		147719.49		188	
ANNUAL MEAN	123		405		700	
HIGHEST ANNUAL MEAN					.003	
LOWEST ANNUAL MEAN					1971	
HIGHEST DAILY MEAN	11000	Oct 31	12700	Jun 26	24800	Oct 6 1959
LOWEST DAILY MEAN	.00	Jan 8	.00	Oct 11	.00	Oct 1 1948
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 12	.00	Oct 11	.00	Oct 1 1948
INSTANTANEOUS PEAK FLOW			13100	Jun 26	28500	Oct 6 1959
INSTANTANEOUS PEAK STAGE			29.28	Jun 26	30.88	Oct 6 1959
ANNUAL RUNOFF (AC-FT)	89570		293000		136100	
10 PERCENT EXCEEDS	141		510		276	
50 PERCENT EXCEEDS	.00		112		.20	
90 PERCENT EXCEEDS	.00		14		.00	

## NUECES RIVER MAIN STEM

08194000 NUECES RIVER AT COTULLA, TX

**LOCATION.**--Lat 28°25'34", long 99°14'23", La Salle County, Hydrologic Unit 12110105, on left bank at downstream side of bridge on U.S. Highway 81, 0.4 mi upstream from Missouri Pacific Railroad Co. bridge, 0.8 mi southwest of Cotulla, 1.0 mi upstream from Lind Dam, and at mile 216.9.

**DRAINAGE AREA.**--5,171 mi<sup>2</sup>.

**PERIOD OF RECORD.**--November 1923 to current year. November 1923 to September 1926 monthly discharge only, published in WSP 1312; figures of daily discharge for Oct. 31, 1923, to Sept. 30, 1926, published in WSP 588, 608, and 628, have been found to be unreliable and should not be used. Gage-height records collected in this vicinity in 1914-17 and since 1922 are contained in reports of the National Weather Service.

**REVISED RECORDS.**--WSP 1732: 1957(M). WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 368.08 ft above sea level. From Oct. 31, 1923, to Aug. 3, 1924, nonrecording gage at approximate site of present gage at datum 7.28 ft higher. Aug. 4, 1924, to Nov. 19, 1934, nonrecording gage at site 5,000 ft downstream at datum 8.42 ft higher. From Nov. 20, 1934, to July 14, 1938, water-stage recorder, and July 15, 1938, to Apr. 30, 1963, nonrecording gage, at present site and datum.

**REMARKS.**--No estimated daily discharges. Records fair. Since water year 1949, at least 10% of contributing drainage area has been regulated by Upper Nueces Reservoir (capacity 7,590 acre-ft). Part of the flow of the Nueces River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses basin between Laguna and Uvalde (stations 08190000 and 08192000, respectively). Many small diversions above station for irrigation (amount unknown). Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--22 years (water years 1927-48), 315 ft<sup>3</sup>/s (228,000 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1927-48).**--Maximum discharge 82,600 ft<sup>3</sup>/s June 13, 1935, (gage height 32.4 ft from flood marks), by slope-area method; no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of June 19, 1899, reached a stage of 29.7 ft, from information by local residents. Maximum stage since at least 1879, that of June 18, 1935.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.51	315	64	102	23	6.5	133	124	545	7260	218	38
2	.31	1710	82	101	24	5.4	131	122	462	4710	205	35
3	.10	7700	93	92	23	4.9	140	123	297	2960	196	35
4	.03	8410	94	77	20	4.2	186	117	202	2130	195	33
5	.27	4740	94	66	15	7.7	249	106	141	1710	184	30
6	.32	2370	97	58	18	33	267	95	107	1450	173	30
7	.17	1600	99	54	16	43	273	84	80	1240	166	30
8	.06	1150	108	52	14	45	274	74	64	1070	162	30
9	.01	739	112	50	13	43	286	67	207	932	158	31
10	.00	480	111	48	13	38	283	70	329	829	141	33
11	.00	375	108	48	12	36	273	63	532	744	129	33
12	.00	324	104	52	11	35	263	58	738	674	116	34
13	.00	289	99	55	11	33	253	59	916	609	105	33
14	3.8	259	93	54	9.3	28	236	77	955	556	101	30
15	7.6	228	89	47	9.3	27	213	88	1300	512	97	28
16	7.4	198	84	44	9.3	27	197	91	1500	475	93	26
17	4.9	176	81	42	11	101	179	83	985	441	90	22
18	2.9	158	77	42	13	198	178	72	1250	410	86	17
19	1.7	145	76	42	13	232	172	74	2070	380	83	14
20	1.1	130	71	40	15	238	165	58	2690	357	77	11
21	.59	117	67	39	13	231	163	46	2780	338	71	12
22	.26	109	61	36	12	213	162	41	2870	318	68	13
23	.12	104	61	36	10	197	158	39	2840	308	61	8.6
24	.05	94	81	36	10	184	151	44	2350	299	56	54
25	.01	84	111	36	10	172	138	68	1850	284	49	89
26	.00	77	119	33	10	163	149	107	1620	275	45	75
27	.00	78	120	26	8.9	152	127	128	2760	269	44	80
28	.00	79	120	21	7.8	141	117	173	6720	260	51	74
29	.00	74	120	20	---	139	123	135	9830	249	55	59
30	.00	65	115	20	---	128	124	166	9710	237	50	49
31	.00	---	106	21	---	131	---	328	---	227	44	---
TOTAL	32.21	32377	2917	1490	374.6	3036.7	5763	2980	58700	32513	3369	1086.6
MEAN	1.04	1079	94.1	48.1	13.4	98.0	192	96.1	1957	1049	109	36.2
MAX	7.6	8410	120	102	24	238	286	328	9830	7260	218	89
MIN	.00	65	61	20	7.8	4.2	117	39	64	227	44	8.6
AC-FT	64	64220	5790	2960	743	6020	11430	5910	116400	64490	6680	2160

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1997, BY WATER YEAR (WY)

	MEAN	MAX	(WY)	MIN	(WY)
1949	489	3906	1960	.000	1953
1950	141	1098	1977	.000	1951
1951	59.3	414	1970	.000	1949
1952	69.6	761	1985	.000	1949
1953	54.9	619	1992	.000	1951
1954	102	2351	1949	.000	1950
1955	114	1444	1957	.000	1950
1956	261	1873	1957	.000	1956
1957	555	5280	1987	.000	1953
1958	300	3922	1971	.000	1951
1959	240	6412	1971	.000	1951
1960	347	5417	1964	.000	1951



# NUECES RIVER MAIN STEM

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08186000 CIBOLO CREEK NEAR FALLS CITY, TX--Continued

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR			FOR 1997 WATER YEAR			WATER YEARS 1949 - 1997		
ANNUAL TOTAL	37377.21			144639.11			228		
ANNUAL MEAN	102			396			1003		
HIGHEST ANNUAL MEAN							2.24		
LOWEST ANNUAL MEAN							37400		
HIGHEST DAILY MEAN	8410	Nov	4	9830	Jun	29		Sep	18
LOWEST DAILY MEAN	.00	Jan	1	.00	Oct	10		Oct	8
ANNUAL SEVEN-DAY MINIMUM	.00	Jan	1	.00	Oct	25		Oct	8
INSTANTANEOUS PEAK FLOW				10400	Jun	29		Jun	18
INSTANTANEOUS PEAK STAGE				18.85	Jun	29		Jun	18
ANNUAL RUNOFF (AC-FT)	74140			286900				Jun	18
10 PERCENT EXCEEDS	108			741				165500	
50 PERCENT EXCEEDS	.00			88				359	
90 PERCENT EXCEEDS	.00			7.8				.40	
								.00	

## NUECES RIVER BASIN

08194200 SAN CASIMIRO CREEK NEAR FREER, TX

**LOCATION.**--Lat 27°57'53", long 98°58'00", Webb County, Hydrologic Unit 12110105, at downstream side of bridge on State Highway 44, 11.4 mi upstream from mouth, and 22 mi northwest of Freer.

**DRAINAGE AREA.**--469 mi<sup>2</sup>.

**PERIOD OF RECORD.**--January 1962 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 298 ft above sea level, from Texas Department of Transportation datum.

**REMARKS.**--Records poor. No known regulation or diversions.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1946, that of Oct. 17, 1971. The next highest stage, 26 ft (discharge 65,200 ft<sup>3</sup>/s), occurred in 1954, from information by Texas Department of Transportation.

**PEAK DISCHARGES.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)		Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)			
	June 9	Unknown	Unknown	Unknown		June 21	Unknown	662	a14.22			
	DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	.00	.00	.00	.00	.00	.00	e1.5	e.00	e.40	.00	.00
2	11	.00	.00	.00	.00	.00	.00	e.45	e.00	e.08	.00	.00
3	9.5	.00	.00	.00	.00	.00	6.9	e.18	e.00	.00	.00	.00
4	10	.00	.00	.00	.00	.00	81	e.10	e.00	.00	.00	.00
5	19	.00	.00	.00	.00	.00	93	e.00	e.00	.00	.00	.00
6	46	.00	.00	.00	.00	.00	82	e.00	e.00	.00	.00	.00
7	40	.00	.00	.00	.00	.00	60	e.00	e.00	.00	.00	.00
8	45	.00	.00	.00	.00	.00	51	e.00	e8.0	.00	.00	.00
9	33	.00	.00	.00	.00	.00	38	e.00	e500	.00	.00	.00
10	19	.00	.00	.00	.00	.00	13	e20	e400	.00	.00	.00
11	11	.00	.00	.00	.00	.00	3.9	e.80	e350	.00	.00	.00
12	9.2	.00	.00	.00	.00	31	1.1	e.00	e80	.00	.00	.00
13	8.3	.00	.00	.00	.00	1.6	.10	e.00	e3.0	.00	.00	.00
14	7.6	.00	.00	.00	.00	.00	.00	e.00	e.40	.00	.00	.00
15	6.9	.00	.00	.00	.00	.00	.00	e.00	e.08	.00	.00	.00
16	6.5	.00	.00	.00	.00	.00	.00	e.00	e.00	.00	.00	.00
17	6.3	.00	.00	.00	.00	.00	.00	e.00	e.00	.00	.00	.00
18	4.4	.00	.00	.00	.00	.00	.00	e.00	e.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	e.00	e.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	e.00	e80	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	e.00	e500	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	e.00	e90	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	e28	e40	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	e3.0	e30	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	e.80	e34	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	e6.0	e.10	e25	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	e250	e.04	e120	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	e231	e60	e50	.00	.00	.00
29	.00	.00	.00	.00	---	.00	e40	e6.0	e4.0	.00	.00	.00
30	.00	.00	.00	.00	---	.04	e6.0	e.50	e1.0	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	e.00	---	.00	.00	---
TOTAL	309.70	0.00	0.00	0.00	0.00	32.64	963.00	121.47	2315.48	0.48	0.00	0.00
MEAN	9.99	.000	.000	.000	.000	1.05	32.1	3.92	77.2	.015	.000	.000
MAX	46	.00	.00	.00	.00	31	250	60	500	.40	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	614	.00	.00	.00	.00	65	1910	241	4590	1.0	.00	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1997, BY WATER YEAR (WY)

MEAN	130	18.7	8.57	2.18	2.36	8.18	19.8	122	83.1	16.4	23.8	143
MAX	3021	288	247	40.2	19.5	145	297	747	606	365	377	2367
(WY)	1972	1986	1977	1977	1973	1985	1985	1981	1981	1976	1980	1967
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1964	1965	1965	1962	1962	1962	1965	1962	1965	1965	1963	1965

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1962 - 1997

ANNUAL TOTAL	4480.77	3742.77	49.3	
ANNUAL MEAN	12.2	10.3	2.44	1972
HIGHEST ANNUAL MEAN			323	1984
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	1140	Sep 27	36600	Oct 17 1971
LOWEST DAILY MEAN	.00	Jan 1	.00	Jan 1 1962
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Jan 1 1962
INSTANTANEOUS PEAK FLOW			662	Jun 21
INSTANTANEOUS PEAK STAGE			14.22	Jun 21
ANNUAL RUNOFF (AC-FT)	8890	7420	26.87	Oct 17 1971
10 PERCENT EXCEEDS	9.3	10	17	
50 PERCENT EXCEEDS	.00	.00	.00	
90 PERCENT EXCEEDS	.00	.00	.00	

e Estimated

a From floodmark.

# NUECES RIVER MAIN STEM

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08194500 NUECES RIVER NEAR TILDEN, TX

**LOCATION.**--Lat 28°18'31", long 98°33'25", McMullen County, Hydrologic Unit 12110105, on right bank at downstream side of bridge on State Highway 16, 1.8 mi upstream from Kings Branch, 10.5 mi south of Tilden, and at mile 135.4.

**DRAINAGE AREA.**--8,093 mi<sup>2</sup>.

**PERIOD OF RECORD.**--November 1942 to current year.

**REVISED RECORDS.**--WSP 1512: 1947. WSP 1732: 1951(M). WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 183.5 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records good. Since water year 1948, at least 10% of contributing drainage area has been regulated by Upper Nueces Reservoir. Part of flow of Nueces River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone, which crosses basin between Laguna and Uvalde (stations 08190000 and 08192000). Some loss of flow into various permeable formations occurs downstream from the Balcones Fault Zone. Some diversions for irrigation above station. Rain gage at station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--6 years (water years 1943-48), 510 ft<sup>3</sup>/s (369,500 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1943-48).**--Maximum discharge 57,500 ft<sup>3</sup>/s, Oct. 11 (gage height 26.46 ft), from rating curve extended above 30,000 ft<sup>3</sup>/s; no flow at times.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Floods in June 1935 reached a stage of 23.7 ft and in July 1942 about 22 ft, from information by local residents. Maximum stage since about 1902, that of Sept. 24, 1967. Flood of Oct. 11, 1946, reached a stage of 26.46 ft (discharge, 70,000 ft<sup>3</sup>/s).

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	974	.00	92	120	15	9.4	142	290	719	2580	232	48
2	644	.00	91	123	14	8.8	156	221	830	2540	222	50
3	85	.00	78	292	19	8.0	199	139	967	2400	224	44
4	60	.00	70	225	19	7.4	337	114	1130	2230	260	28
5	237	273	74	104	22	6.7	429	105	1300	2160	219	18
6	439	568	92	87	24	8.1	633	99	1440	2520	189	13
7	543	666	103	79	24	9.5	747	92	1600	4500	179	11
8	636	758	105	69	19	8.0	570	86	1620	6300	161	9.1
9	693	920	106	62	18	6.0	389	92	806	5590	148	29
10	609	1220	108	57	16	4.5	333	101	242	4520	139	32
11	342	1750	115	53	17	17	290	144	415	3760	135	30
12	108	2670	121	49	8.5	82	272	107	604	3120	132	28
13	44	2450	122	46	6.0	58	259	81	693	2600	122	28
14	22	2120	119	46	4.4	53	244	74	742	2180	112	28
15	10	1830	113	50	2.7	50	228	66	794	1890	103	29
16	5.1	793	108	54	1.9	39	216	70	850	1490	94	29
17	2.6	279	106	55	1.3	34	199	67	922	778	88	28
18	1.3	223	101	54	1.0	30	184	78	1000	525	83	27
19	.21	191	99	49	.80	25	169	94	1080	475	80	28
20	.02	168	95	45	.72	33	160	140	1190	447	77	28
21	.00	147	92	43	.78	111	156	124	1360	421	74	29
22	.02	134	89	42	2.1	202	145	92	2430	397	72	25
23	.00	123	89	42	7.9	219	135	78	2490	377	69	22
24	.00	123	85	42	8.3	217	129	68	2060	358	67	19
25	.00	108	80	39	8.2	247	126	69	1920	329	63	16
26	.00	104	74	38	11	236	128	106	1920	307	58	18
27	.00	104	71	37	8.3	193	144	115	1980	293	54	19
28	.00	92	93	35	9.7	164	212	126	2080	278	50	25
29	.00	85	123	35	---	148	372	176	2230	265	45	62
30	.00	84	132	34	---	135	394	382	2460	253	42	66
31	.00	---	129	29	---	140	---	599	---	241	42	---
TOTAL	5455.25	17983.00	3075	2135	290.60	2509.4	8097	4195	39874	56124	3635	866.1
MEAN	176	599	99.2	68.9	10.4	80.9	270	135	1329	1810	117	28.9
MAX	974	2670	132	292	24	247	747	599	2490	6300	260	66
MIN	.00	.00	70	29	.72	4.5	126	66	242	241	42	9.1
AC-FT	10820	35670	6100	4230	576	4980	16060	8320	79090	111300	7210	1720

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1949 - 1997#, BY WATER YEAR (WY)

MEAN	840	277	92.3	119	154	117	166	534	721	430	343	676
MAX	11250	3509	1275	1912	4793	2104	2028	4122	5404	6291	7197	10150
(WY)	1972	1977	1977	1958	1958	1949	1949	1957	1987	1971	1971	1967
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.003	.000	.000	.000
(WY)	1953	1953	1951	1951	1964	1954	1955	1971	1984	1953	1951	1952

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1949 - 1997#
ANNUAL TOTAL	42401.01	144239.35	
ANNUAL MEAN	116	395	373
HIGHEST ANNUAL MEAN			1736
LOWEST ANNUAL MEAN			14.0
HIGHEST DAILY MEAN	2670	Nov 12	70000
LOWEST DAILY MEAN	.00	Jan 1	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00
INSTANTANEOUS PEAK FLOW		6490	76500
INSTANTANEOUS PEAK STAGE		18.79	26.57
ANNUAL RUNOFF (AC-FT)	84100	286100	270400
10 PERCENT EXCEEDS	368	1200	725
50 PERCENT EXCEEDS	.00	103	6.3
90 PERCENT EXCEEDS	.00	8.0	.00

# Period of regulated streamflow.

## NUECES RIVER BASIN

08195000 FRIO RIVER AT CONCAN, TX

**LOCATION.**--Lat 29°29'18", long 99°42'16", Uvalde County, Hydrologic Unit 12110106, on left bank 0.7 mi southeast of Concan Post Office, 15 mi upstream from Dry Frio River, and 222.8 mi upstream from mouth.

**DRAINAGE AREA.**--389 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1923 to September 1929, October 1930 to current year.

**REVISED RECORDS.**--WSP 1342: Drainage area. WSP 1512: 1926, 1931-32, 1934(M), 1935-36. WSP 1712: 1958. WSP 1923: 1954(M), 1957(M). WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,203.71 ft above sea level. Oct. 26, 1923, to July 28, 1924, nonrecording gage at site 86 ft upstream at datum 5.08 ft lower. July 29, 1924, to Oct. 3, 1930, nonrecording gage, and Oct. 4, 1930, to May 18, 1939, water-stage recorder, at site 130 ft downstream at present datum.

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation. Many small diversions for irrigation above station. Rain gage at station. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1415	47,500	21.59	June 16	1815	4,810	7.69
Apr. 2	2000	2,710	6.52	June 22	0630	61,000	a24.40

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	84	369	186	111	83	109	154	190	134	610	212	111
2	80	315	175	108	86	113	763	184	133	572	209	108
3	80	283	170	108	86	107	604	175	130	546	203	110
4	80	261	171	108	85	107	444	170	127	511	198	117
5	80	245	166	105	83	103	587	165	126	491	193	115
6	78	231	160	105	83	101	473	162	123	466	192	115
7	74	216	154	108	83	98	419	162	122	442	189	111
8	71	200	149	113	83	100	387	159	139	430	204	110
9	69	189	146	110	83	95	363	163	180	418	191	109
10	68	180	146	108	83	113	352	158	172	403	183	108
11	67	174	142	105	83	155	340	152	196	386	175	105
12	66	170	139	102	83	219	317	150	211	369	170	102
13	65	167	137	100	83	239	307	166	182	349	165	101
14	65	163	136	98	83	222	298	157	169	339	158	98
15	65	162	138	96	81	206	284	152	241	325	154	97
16	63	165	171	98	80	201	274	150	1090	312	153	94
17	62	158	177	97	80	199	264	142	779	303	149	92
18	60	154	156	95	78	198	256	132	410	295	145	91
19	60	147	150	95	81	191	256	129	329	285	141	89
20	59	141	146	95	103	185	245	135	297	279	137	89
21	62	138	141	95	205	181	237	134	329	277	133	89
22	56	133	141	95	177	177	228	132	22800	285	129	89
23	56	131	137	95	145	176	221	137	2920	268	129	89
24	55	153	133	92	132	173	216	146	1510	259	129	89
25	56	156	126	92	124	170	219	159	1150	252	129	89
26	56	158	122	92	119	167	237	146	958	243	125	85
27	58	148	122	92	115	159	230	137	831	236	123	83
28	13800	151	118	86	112	152	218	149	747	228	121	82
29	1800	164	115	86	---	150	206	146	696	222	118	80
30	622	190	111	85	---	149	197	145	649	216	117	80
31	442	---	111	83	---	152	---	139	---	213	114	---
TOTAL	18459	5612	4492	3058	2802	4867	9596	4723	37880	10830	4888	2927
MEAN	595	187	145	98.6	100	157	320	152	1263	349	158	97.6
MAX	13800	369	186	113	205	239	763	190	22800	610	212	117
MIN	55	131	111	83	78	95	154	129	122	213	114	80
AC-FT	36610	11130	8910	6070	5560	9650	19030	9370	75130	21480	9700	5810
CFSM	1.53	.48	.37	.25	.26	.40	.82	.39	3.25	.90	.41	.25
IN.	1.77	.54	.43	.29	.27	.47	.92	.45	3.62	1.04	.47	.28

# NUECES RIVER BASIN

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## 08195000 FRIO RIVER AT CONCAN, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1924 - 1997h, BY WATER YEAR (WY)

MEAN	147	100	101	90.0	96.6	96.9	108	137	191	170	99.9	140
MAX	648	391	767	525	613	762	859	1041	2468	2823	1050	1333
(WY)	1970	1959	1992	1992	1992	1992	1981	1935	1935	1932	1971	1936
MIN	.000	.000	.000	3.01	8.25	11.8	8.52	6.48	1.08	1.25	.019	.000
(WY)	1957	1957	1957	1957	1957	1956	1956	1956	1956	1953	1956	1956
SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR				FOR 1997 WATER YEAR				WATER YEARS 1924 - 1997h			
ANNUAL TOTAL	43180				110134							
ANNUAL MEAN	118				302							
HIGHEST ANNUAL MEAN									123			
LOWEST ANNUAL MEAN									434			
HIGHEST DAILY MEAN	13800				22800				8.80			
LOWEST DAILY MEAN	13				55				52000			
ANNUAL SEVEN-DAY MINIMUM	13				57				.00			
INSTANTANEOUS PEAK FLOW					61000				.00			
INSTANTANEOUS PEAK STAGE					a24.40				162000			
ANNUAL RUNOFF (AC-FT)	85650				218500				d34.44			
ANNUAL RUNOFF (CFSM)	.30				.78				89220			
ANNUAL RUNOFF (INCHES)	4.13				10.53				.32			
10 PERCENT EXCEEDS	157				365				4.30			
50 PERCENT EXCEEDS	56				147				198			
90 PERCENT EXCEEDS	19				83				68			
									18			

a From floodmark.

d Maximum stage since at least 1869.

h See PERIOD OF RECORD paragraph.



## NUECES RIVER BASIN

08195000 FRIO RIVER AT CONCAN, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: June 1952, December 1964 to July 1965. Chemical and biochemical analyses: August 1968 to September 1993, April 1996 to September 1997. Pesticide analyses: August 1968 to September 1993. Sediment analyses: April 1996 to September 1997.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED SATUR-ATION	HARD-NESS TOTAL (MG/L AS CAC03)	HARD-NESS NONCARB DISSOLV FLD. AS CAC03 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)
APR 23...	1000	42	408	8.1	20.0	6.3	72	190	29	55
MAY 30...	1045	35	390	8.1	27.0	7.4	98	190	20	52
JUL 01...	1000	24	370	8.0	28.0	7.1	95	170	14	46
JUL 31...	1130	14	373	8.1	29.0	7.4	101	170	18	45
SEP 10...	1100	56	400	8.0	27.0	7.9	104	190	13	52

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)
APR 23...	13	6.7	0.2	7	0.80	160	14	11	0.10	11
MAY 30...	14	7.2	0.2	8	0.90	170	13	11	0.20	14
JUL 01...	14	7.0	0.2	8	0.90	160	12	11	0.20	14
JUL 31...	14	7.2	0.2	8	1.0	150	14	13	0.10	14
SEP 10...	14	6.9	0.2	7	0.90	170	13	12	0.10	12

DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (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)
APR 23...	213	220	--	<0.010	0.320	0.020	--	<0.20	<0.20	0.010
MAY 30...	228	217	0.260	0.010	0.270	0.030	--	<0.20	<0.20	0.010
JUL 01...	183	202	--	<0.010	0.150	0.040	0.16	0.20	<0.20	<0.010
JUL 31...	203	204	--	<0.010	0.170	0.040	--	<0.20	<0.20	<0.010
SEP 10...	219	217	--	<0.010	0.370	0.020	--	<0.20	<0.20	<0.010

DATE	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
APR 23...	<0.010	<0.010	--	1.3	0.2	0.79	7	<3	<1
MAY 30...	<0.010	<0.010	--	1.1	0.1	1.2	13	<3	<1
JUL 01...	<0.010	<0.010	--	1.2	0.1	0.52	8	4	<1
JUL 31...	<0.010	0.010	0.03	1.2	0.1	0.42	11	<3	1
SEP 10...	<0.010	<0.010	--	1.1	<0.1	0.30	2	3	<1

NUECES RIVER BASIN

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08195000 FRIO RIVER AT CONCAN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT										
10...	1045	72	435	7.8	22.0	9.0	107	210	23	59
NOV										
07...	1100	218	452	8.1	21.0	7.5	88	220	19	64
DEC										
03...	1030	171	440	8.4	14.0	12.2	123	220	19	65
JAN										
21...	1030	95	435	7.9	14.0	10.2	103	220	21	63
FEB										
19...	1100	80	415	7.8	18.0	9.2	102	210	20	59
MAR										
19...	1100	190	425	7.8	17.0	8.9	96	200	14	60
APR										
21...	1115	238	460	7.7	25.0	8.8	113	220	11	67
MAY										
20...	1145	137	435	7.5	23.0	8.8	107	210	17	60
JUL										
16...	1115	314	455	7.4	29.0	8.0	109	220	24	64
AUG										
11...	1030	176	443	7.3	27.0	6.5	85	200	20	57
26...	1015	126	429	7.3	27.0	7.6	100	200	6	59
SEP										
22...	1130	89	414	8.0	26.5	7.9	104	190	6	54

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	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)
OCT									
10...	15	6.4	0.2	6	0.80	190	14	11	0.10
NOV									
07...	14	6.1	0.2	6	1.0	200	12	9.0	0.10
DEC									
03...	15	6.4	0.2	6	0.90	200	14	10	0.20
JAN									
21...	14	5.6	0.2	5	0.80	190	15	11	0.10
FEB									
19...	14	6.3	0.2	6	0.80	180	15	10	0.10
MAR									
19...	13	6.2	0.2	6	0.80	190	15	10	0.20
APR									
21...	13	6.2	0.2	6	0.9	210	16	11	0.1
MAY									
20...	14	6.6	0.2	6	0.8	190	15	11	0.1
JUL									
16...	15	7.2	0.2	7	1	200	15	11	0.1
AUG									
11...	15	7.2	0.2	7	0.9	180	14	11	0.1
26...	13	6.7	0.2	7	0.9	200	13	12	0.1
SEP									
22...	15	7.8	0.2	8	1	190	15	13	0.1

DATE	SILICA, DIS- SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA 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)
OCT									
10...	12	258	234	--	<0.010	0.630	0.020	<0.20	<0.20
NOV									
07...	12	258	244	1.88	0.020	1.90	0.020	<0.20	<0.20
DEC									
03...	11	239	244	--	<0.010	1.20	0.020	<0.20	<0.20
JAN									
21...	9.8	227	220	0.930	0.030	0.960	<0.015	<0.20	<0.20
FEB									
19...	10	230	226	0.800	0.030	0.830	<0.015	<0.20	<0.20
MAR									
19...	10	241	226	--	<0.010	1.10	<0.015	<0.20	<0.20
APR									
21...	11	257	244	--	<0.01	1.1	0.03	<0.2	<0.2
MAY									
20...	11	255	230	--	<0.01	0.65	<0.01	<0.2	<0.2
JUL									
16...	12	251	226	--	<0.01	1.1	<0.01	<0.2	<0.2
AUG									
11...	12	248	228	--	<0.01	0.84	0.05	<0.2	<0.2
26...	12	235	223	0.662	0.01	0.67	<0.01	<0.2	<0.2
SEP									
22...	13	215	213	--	<0.01	0.59	<0.01	<0.2	<0.2

## NUECES RIVER BASIN

08195000 FRIO RIVER AT CONCAN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS TOTAL (MG/L AS P)	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SEDI- MENT, SUS- PENDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 10...	<0.010	<0.010	<0.010	1.0	<0.10	4.9	25	<3	<1
NOV 07...	<0.010	<0.010	<0.010	1.7	0.10	2.9	5	<3.0	<1.0
DEC 03...	<0.010	<0.010	<0.010	1.2	0.10	3.7	8	<3.0	<1.0
JAN 21...	<0.010	<0.010	<0.010	0.80	0.10	4.1	16	<3.0	<1.0
FEB 19...	<0.010	<0.010	<0.010	0.80	0.10	0.65	3	<3.0	<1.0
MAR 19...	<0.010	<0.010	<0.010	1.1	0.10	1.5	3	<3.0	<1.0
APR 21...	<0.01	<0.01	<0.01	1.1	0.1	1.9	3	<3	<1
MAY 20...	<0.01	<0.01	<0.01	1	0.1	1.5	4	<3	<1
JUL 16...	<0.01	<0.01	<0.01	1.1	<0.2	5.9	7	<3	<1
AUG 11...	<0.01	<0.01	<0.01	1	<0.2	2.9	6	<3	<1
26...	<0.01	<0.01	<0.01	1	<0.2	0.68	2	<3	<1
SEP 22...	<0.01	<0.01	<0.01	0.9	0.2	0.24	1	<3	<1

**LOCATION.**--Lat 29°30'16", long 99°46'52", Uvalde County, Hydrologic Unit 12110106, on right bank 2.3 mi upstream from bridge on U.S. Highway 83, 3.1 mi upstream from Rocky Creek, 4.3 mi southeast of Reagan Wells, and 25.9 mi upstream from mouth.

Water-quality records.--Chemical and biochemical analyses: January 1966 to September 1993. Pesticide analyses: January 1974 to September 1993. Sediment analyses: January 1966.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation. There are several small diversions above station. Rain gage at station. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.--**Peak discharges greater than base discharge of 200 ft<sup>3</sup>/s:

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1997, BY WATER YEAR (WY)

MEAN	55.6	29.6	27.8	22.3	24.1	28.3	30.0	40.1	64.9	37.9	33.5	37.8
MAX	258	134	185	120	131	208	257	338	483	277	365	277
(WY)	1970	1968	1992	1992	1992	1992	1981	1987	1987	1976	1966	1958
MIN	.000	.000	.055	.51	.87	2.24	1.50	.86	.19	.077	.000	.000
(WY)	1957	1957	1957	1957	1957	1954	1956	1956	1953	1953	1956	1956

### SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

## WATER YEARS 1952 - 1997

ANNUAL TOTAL	12475.20		31330.1						
ANNUAL MEAN	34.1		85.8				36.1		
HIGHEST ANNUAL MEAN							121		1987
LOWEST ANNUAL MEAN							2.99		1956
HIGHEST DAILY MEAN	6160	Oct 28	7080	Jun 22	8100			Aug 13	1966
LOWEST DAILY MEAN	.31	Aug 19	3.4	Sep 30		.00		Jul 10	1953
ANNUAL SEVEN-DAY MINIMUM	.33	Aug 15	3.7	Sep 24		.00		Jul 30	1953
INSTANTANEOUS PEAK FLOW			55000	Oct 28	123000			Aug 13	1966
INSTANTANEOUS PEAK STAGE			a25.57	Oct 28		27.60		Aug 13	1966
ANNUAL RUNOFF (AC-FT)	24740		62140			26150			
ANNUAL RUNOFF (CFSM)	.27		.68			.29			
ANNUAL RUNOFF (INCHES)	3.68		9.25			3.89			
10 PERCENT EXCEEDS	35		100			64			
50 PERCENT EXCEEDS	9.2		26			15			
90 PERCENT EXCEEDS	.66		11			2.3			

e Estimated  
a From floodmark.

## 08197500 FRIO RIVER BELOW DRY FRIO RIVER NEAR UVALDE, TX

**LOCATION.**--Lat 29°14'44", long 99°40'27", Uvalde County, Hydrologic Unit 12110106, on right bank 1.1 mi upstream from Farm Road 1023, 5.7 mi downstream from Dry Frio River, 6.3 mi downstream from bridge on U.S. Highway 90, 7.2 mi northeast of Uvalde, and 194.5 mi upstream from mouth.

**DRAINAGE AREA.**--631 mi<sup>2</sup>.

**PERIOD OF RECORD.**--September 1952 to current year. Sum of records published as Frio River at Knippa and Dry Frio River at Knippa for period September 1952 to September 1953 is equivalent to record for this station.

**REVISED RECORDS.**--WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 882.47 ft above sea level.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation. Part of flow of Frio River enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses the basin between Concan (station 08195000) and this station. Most of the low flow enters this formation. Many diversions for irrigation above station. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1887, about 35 ft in 1894. Flood of July 1, 1932, reached a stage of about 30 ft. A higher flood than that of 1894 occurred prior to 1887. Above information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)					
Oct. 28	1900	68,400	a21.58	June 17	0330	2,030	6.59					
Apr. 3	0330	4,730	8.33	June 22	1330	100,000	a25.09					
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	140	e.00	e.00	.00	.00	.00	.00	.00	e500	.28	.07
2	.00	76	e.00	e.00	.00	.00	.00	.00	.00	e410	.25	.07
3	.00	36	e.00	e.00	.00	.00	1300	.00	.00	e355	.25	.07
4	.00	16	e.00	e.00	.00	.00	180	.00	.00	e295	.25	.07
5	.00	5.5	e.00	e.00	.00	.00	264	.00	.00	e245	.25	.07
6	.00	1.7	e.00	e.00	.00	.00	224	.00	.00	e200	.25	.07
7	.00	e.60	e.00	e.00	.00	.00	146	.00	.00	e170	.25	.07
8	.00	e.23	e.00	e.00	.00	.00	103	.00	.00	e135	.25	.05
9	.00	e.08	e.00	e.00	.00	.00	77	.00	.00	e100	.25	.05
10	.00	e.03	e.00	e.00	.00	.00	59	.00	.00	e78	.20	.05
11	.00	e.01	e.00	e.00	.00	.00	52	.00	.00	e59	.20	.05
12	.00	e.01	e.00	e.00	.00	.00	31	.00	.00	45	.20	.05
13	.00	e.01	e.00	e.00	.00	.00	16	.00	.00	27	.20	.04
14	.00	e.00	e.00	e.00	.00	.00	8.7	.00	.00	14	.20	.05
15	.00	e.00	e.00	e.00	.00	.00	4.2	.00	.00	5.0	.20	.05
16	.00	e.00	.00	e.00	.00	.00	1.2	.00	.00	2.7	.20	.05
17	.00	e.00	e.00	e.00	.00	.00	.07	.00	802	1.8	.20	.05
18	.00	e.00	e.00	e.00	.00	.00	.00	.00	184	1.2	.20	.04
19	.00	e.00	e.00	e.00	.00	.00	.00	.00	55	.73	.17	.03
20	.00	e.00	e.00	e.00	.00	.00	.00	.00	8.7	.65	.16	.03
21	.00	e.00	e.00	e.00	.00	.00	.00	.00	1.0	.62	.16	.03
22	.00	e.00	e.00	e.00	.00	.00	.00	.00	32300	.58	.12	.03
23	.00	e.00	e.00	e.00	.00	.00	.00	.00	6650	.53	.12	.03
24	.00	e.00	e.00	.00	.00	.00	.00	.00	1950	.47	.12	.01
25	.00	e.00	e.00	.00	.00	.00	.00	.00	1300	.44	.12	.01
26	.00	e.00	e.00	.00	.00	.00	.00	.00	e1200	.37	.12	.00
27	.00	e.00	e.00	.00	.00	.00	.00	.00	e960	.37	.10	.00
28	19800	e.00	e.00	.00	.00	.00	.00	.00	e810	.31	.09	.00
29	5380	e.00	e.00	.00	---	.00	.00	.00	e700	.30	.09	.00
30	657	e.00	e.00	.00	---	.00	.00	.00	e598	.30	.09	.00
31	266	---	e.00	.00	---	.00	---	.00	---	.30	.08	---
TOTAL	26103.00	276.17	0.00	0.00	0.00	0.00	2466.17	0.00	47518.70	2649.67	5.62	1.19
MEAN	842	9.21	.000	.000	.000	.000	82.2	.000	1584	85.5	.18	.040
MAX	19800	140	.00	.00	.00	.00	1300	.00	32300	500	.28	.07
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.30	.08	.00
AC-FT	51780	548	.00	.00	.00	.00	4890	.00	94250	5260	.11	2.4

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1997, BY WATER YEAR (WY)

	MEAN	77.4	4.12	29.7	11.0	7.08	11.8	28.3	39.6	126	37.2	45.6	49.3
MAX	842	81.3	710	241	300	455	702	865	1584	597	897	699	699
(WY)	1997	1959	1985	1992	1992	1992	1981	1987	1997	1973	1971	1958	1958
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1954	1954	1954	1954	1954	1954	1954	1955	1954	1954	1954	1954	1954

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1954 - 1997

ANNUAL TOTAL	26567.68	79020.52	39.0	1987
ANNUAL MEAN	72.6	216	.000	1962
HIGHEST ANNUAL MEAN				
LOWEST ANNUAL MEAN				
HIGHEST DAILY MEAN	19800	Oct 28	32300	Jun 22 1997
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1 1953
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1 1953
INSTANTANEOUS PEAK FLOW			100000	Jun 22 1997
INSTANTANEOUS PEAK STAGE			a25.09	Jun 22 1997
ANNUAL RUNOFF (AC-FT)	52700	156700	28280	
10 PERCENT EXCEEDS	.00	57	.16	
50 PERCENT EXCEEDS	.00	.00	.00	
90 PERCENT EXCEEDS	.00	.00	.00	

e Estimated

a From floodmark.



**LOCATION.**--Lat 29°29'27", long 99°29'33", Uvalde County, Hydrologic Unit 12110106, on right bank 108 ft upstream from concrete dam, 2.3 mi downstream from mouth of Onion Creek, 12.5 mi north of Sabinal, and 41.6 mi upstream from mouth.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--October 1942 to current year.

**REVISED RECORDS.--**WSP 1312: 1943(M), 1944(M), 1947(M).

**GAGE.**--Water-stage recorder. Datum of gage is 1,131.20 ft above sea level. Prior to Apr. 9, 1971, at site 0.3 mi downstream at same datum.

**REMARKS.**--Records fair. No known regulation. There are several small diversions above station for irrigation.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1892, about 33 ft July 2, 1932, from information by local residents. A flood in the middle 1800's reached a stage of nearly 63 ft. Information indicates that a flood in 1858 covered the townsite of Sabinal. The stage would have been 70 to 80 ft, which seems unlikely. However, it is possible that a flood occurred in 1858 that covered part of the townsite and was higher than any flood since that date.

**PEAK DISCHARGES FOR CURRENT YEAR.--**Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date				Time		Discharge (ft <sup>3</sup> /s)		Gage height (ft)		Date				Time		Discharge (ft <sup>3</sup> /s)		Gage height (ft)	
Oct. 28				1530		12,500		13.54		Apr. 26				0400		1,170		6.81	
Apr. 3				2300		1,070		6.72		June 22				0715		52,500		a28.50	
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997																			
DAILY MEAN VALUES																			
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP							
1	1.4	43	36	27	22	31	69	124	105	512	98	37							
2	1.3	33	36	27	22	32	73	120	102	464	93	37							
3	1.3	26	34	27	22	37	308	113	98	424	90	38							
4	1.3	24	32	27	21	36	271	108	95	383	87	44							
5	1.6	23	33	26	20	35	513	104	96	349	83	41							
6	2.1	23	33	25	20	32	350	101	104	322	80	40							
7	1.9	21	32	24	21	30	281	102	99	298	79	39							
8	1.7	20	31	28	20	32	249	100	96	277	80	38							
9	1.5	20	31	28	20	34	228	103	124	261	79	36							
10	1.5	22	31	27	20	38	216	98	119	243	73	36							
11	1.4	22	31	22	20	104	211	93	111	229	70	34							
12	1.4	21	31	23	21	116	189	97	105	216	67	34							
13	1.4	22	30	23	21	99	180	107	102	204	64	34							
14	1.5	21	30	24	20	84	172	101	100	192	62	33							
15	1.6	21	33	26	21	79	164	93	140	178	60	33							
16	1.7	22	31	26	21	77	157	88	114	168	59	32							
17	1.7	21	30	24	20	78	151	82	124	159	57	31							
18	1.8	21	30	24	20	79	146	80	116	150	55	30							
19	1.7	21	30	24	20	75	145	78	111	145	55	30							
20	1.7	21	30	24	35	76	137	120	107	138	e53	30							
21	1.9	21	30	24	34	76	129	95	114	134	e51	30							
22	2.0	20	30	25	46	73	124	89	12800	134	e49	31							
23	2.1	22	29	24	41	73	121	161	2070	129	e48	30							
24	2.2	30	28	24	37	72	118	147	1300	121	e47	29							
25	2.2	26	27	23	34	72	123	125	1080	115	e46	28							
26	2.1	27	28	23	34	71	379	115	918	110	e45	28							
27	2.1	28	29	23	32	70	167	110	792	124	43	27							
28	2010	30	29	22	31	67	151	122	703	115	42	27							
29	278	33	29	22	---	67	139	113	635	98	41	27							
30	81	33	27	22	---	68	131	109	567	94	40	27							
31	59	---	27	23	---	68	---	107	---	94	39	---							
TOTAL	2474.1	738	948	761	716	1981	5792	3305	23147	6580	1935	991							
MEAN	79.8	24.6	30.6	24.5	25.6	63.9	193	107	772	212	62.4	33.0							
MAX	2010	43	36	28	46	116	513	161	12800	512	98	44							
MIN	1.3	20	27	22	20	30	69	78	95	94	39	27							
AC-FT	4910	1460	1880	1510	1420	3930	11490	6560	45910	13050	3840	1970							
CFSM	.39	.12	.15	.12	.12	.31	.94	.52	3.75	1.03	.30	.16							
IN.	.45	.13	.17	.14	.13	.36	1.05	.60	4.18	1.19	.35	.16							

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1997, BY WATER YEAR (WY)

MEAN	65.9	48.6	49.6	46.3	52.8	58.1	58.1	69.8	128	80.3	54.4	50.2
MAX	318	321	612	408	584	624	392	389	1527	1035	669	306
(WY)	1972	1959	1992	1992	1992	1992	1992	1987	1987	1973	1971	1980
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1952	1952	1952	1952	1952	1952	1954	1953	1953	1953	1948	1951

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

## WATER YEARS 1943 - 1997

ANNUAL TOTAL	6544.44		49368.1				
ANNUAL MEAN	17.9		135			63.5	1992
HIGHEST ANNUAL MEAN						340	1955
LOWEST ANNUAL MEAN						.82	1958
HIGHEST DAILY MEAN	2010	Oct 28	12800	Jun 22	13000		Jun 17 1958
LOWEST DAILY MEAN	.00	Aug 5	1.3	Oct 2	.00		Aug 10 1946
ANNUAL SEVEN-DAY MINIMUM	.00	Aug 5	1.5	Oct 9	.00		Aug 10 1946
INSTANTANEOUS PEAK FLOW			52500	Jun 22	55200		Jun 17 1958
INSTANTANEOUS PEAK STAGE			a28.50	Jun 22	a28.50		Jun 22 1997
ANNUAL RUNOFF (AC-FT)	12980		97920		46010		
ANNUAL RUNOFF (CFSM)	.087		.66		.31		
ANNUAL RUNOFF (INCHES)	1.18		8.92		4.19		
10 PERCENT EXCEEDS	29		184		122		
50 PERCENT EXCEEDS	8.0		40		26		
90 PERCENT EXCEEDS	.44		20		.00		

e Estimated  
a From floodmark.

## NUECES RIVER BASIN

08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: November 1964 to July 1965. Chemical and biochemical analyses: February 1970 to September 1993, April 1996 to September 1997. Pesticide analyses: August 1971 to September 1993. Sediment analyses: November 1965, April 1996 to September 1997.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1995 TO SEPTEMBER 1996

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	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)	CALCIUM DIS-SOLVED (MG/L AS CA)	
APR 23...	1430	8.8	452	7.9	22.0	6.4	76	220	37	66	
MAY 30...	1415	3.9	445	8.0	27.0	7.7	102	210	33	64	
JUL 01...	1400	1.6	475	7.6	29.0	5.6	76	230	36	70	
JUL 31...	1530	0.13	476	7.8	31.0	6.9	97	230	30	68	
SEP 10...	1400	0.88	522	7.5	27.0	4.3	57	240	24	73	
DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM AD-SORP-TION RATIO	SODIUM PERCENT	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)	
APR 23...	13	7.8	0.2	7	0.90	180	29	11	0.20	12	
MAY 30...	13	8.2	0.2	8	1.0	180	29	11	0.20	15	
JUL 01...	13	8.3	0.2	7	1.0	190	31	12	0.20	15	
JUL 31...	14	8.7	0.3	8	1.1	200	29	12	0.20	17	
SEP 10...	14	8.8	0.2	7	1.1	220	37	13	0.20	15	
DATE	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, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
APR 23...	251	256	--	<0.010	<0.050	0.020	--	--	<0.20	<0.20	
MAY 30...	269	253	0.050	0.010	0.060	0.020	--	--	<0.20	<0.20	
JUL 01...	282	264	--	<0.010	0.070	0.030	--	--	<0.20	<0.20	
JUL 31...	273	271	--	<0.010	0.120	0.040	0.32	0.16	<0.20	0.20	
SEP 10...	286	295	--	<0.010	0.160	<0.020	--	--	<0.20	<0.20	
DATE	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)		
APR 23...	<0.010	<0.010	<0.010	1.5	0.2	0.12	5	3	1		
MAY 30...	0.010	0.010	<0.010	1.2	0.1	0.06	6	8	4		
JUL 01...	<0.010	<0.010	<0.010	1.3	0.1	0.02	4	16	9		
JUL 31...	<0.010	<0.010	<0.010	1.5	0.2	0.00	12	15	5		
SEP 10...	<0.010	<0.010	<0.010	1.0	<0.1	0.01	6	11	10		

# NUECES RIVER BASIN

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08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT										
10...	1330	1.8	480	7.6	24.0	6.8	84	230	24	70
NOV										
07...	1400	22	500	8.0	21.0	7.6	89	240	16	73
DEC										
03...	1315	35	--	--	--	--	--	250	30	75
JAN										
21...	1345	24	490	7.6	16.0	10.1	107	250	30	77
FEB										
19...	1345	20	480	7.7	18.0	9.4	104	240	35	73
MAR										
19...	1400	75	480	7.7	19.0	9.5	106	220	17	70
APR										
21...	1400	130	483	7.6	25.0	8.5	109	220	18	68
JUL										
16...	1415	168	490	7.3	29.0	7.7	105	240	28	73
AUG										
11...	1330	69	475	7.3	28.0	7.6	102	220	31	65
26...	1245	45	466	7.3	28.0	7.8	104	220	31	65
SEP										
22...	1400	32	459	7.9	27.0	7.8	103	220	25	65

DATE	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG)	SODIUM, DIS- SOLVED (MG/L AS NA)	SODIUM AD- SORP- TION RATIO	SODIUM PERCENT	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)
OCT										
10...	13	7.6	0.2	7	1.1	200	33	12	0.20	15
NOV										
07...	14	7.4	0.2	6	1.2	220	35	12	0.20	13
DEC										
03...	15	7.6	0.2	6	1.1	220	35	11	0.20	11
JAN										
21...	14	6.7	0.2	5	1.0	220	33	11	0.10	11
FEB										
19...	14	7.5	0.2	6	1.0	200	34	11	0.20	11
MAR										
19...	12	6.5	0.2	6	1.0	210	30	11	0.20	10
APR										
21...	12	6.4	0.2	6	1	200	26	10	0.2	11
JUL										
16...	13	7.9	0.2	7	1.0	210	22	11	0.2	13
AUG										
11...	13	7.9	0.2	7	1.0	180	22	11	0.2	13
26...	13	8.0	0.2	7	1.0	190	24	12	0.2	14
SEP										
22...	13	8.8	0.3	8	1.0	190	26	13	0.2	14

DATE	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (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)
OCT										
10...	298	275	--	<0.010	<0.050	0.020	0.18	0.20	<0.20	<0.010
NOV										
07...	303	282	0.730	0.020	0.750	0.020	--	<0.20	<0.20	<0.010
DEC										
03...	287	274	--	<0.010	0.350	<0.015	--	<0.20	<0.20	<0.010
JAN										
21...	246	262	0.280	0.010	0.290	<0.015	--	<0.20	<0.20	<0.010
FEB										
19...	281	266	0.220	0.030	0.250	<0.015	--	<0.20	<0.20	<0.010
MAR										
19...	272	252	--	<0.010	0.420	<0.015	--	<0.20	<0.20	<0.010
APR										
21...	273	246	--	<0.01	0.54	0.10	--	<0.2	<0.2	<0.01
JUL										
16...	268	243	--	<0.01	1.1	<0.01	--	<0.2	<0.2	<0.01
AUG										
11...	263	242	--	<0.01	0.93	0.06	--	<0.2	<0.2	<0.01
26...	265	247	--	<0.01	0.90	<0.01	--	<0.2	<0.2	<0.01
SEP										
22...	244	238	--	<0.01	0.72	<0.01	--	<0.2	<0.2	<0.01

## NUECES RIVER BASIN

08198000 SABINAL RIVER NEAR SABINAL, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	PHOS- PHATE, ORTHO, DIS- SOLVED (MG/L AS PO4)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	SEDI- MENT, SUS- PENDED (MG/L)	IRON, DIS- SOLVED (UG/L AS FE)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)
OCT 10...	<0.010	<0.010	--	0.80	<0.10	0.03	7	3.0	4.0
NOV 07...	<0.010	<0.010	--	1.8	0.10	0.77	13	3.0	3.0
DEC 03...	<0.010	<0.010	--	1.1	0.10	2.0	21	<3.0	<1.0
JAN 21...	<0.010	<0.010	--	0.80	0.10	0.19	3	<3.0	<1.0
FEB 19...	<0.010	<0.010	--	0.70	0.10	0.05	1	<3.0	<1.0
MAR 19...	<0.010	<0.010	--	1.1	--	0.81	4	<3.0	2.0
APR 21...	<0.01	<0.01	--	1	0.1	1.1	3	<3	2
JUL 16...	<0.01	<0.01	--	0.9	<0.2	6.8	15	3	<1
AUG 11...	<0.01	<0.01	--	0.8	<0.2	0.93	5	<3	<1
26...	0.01	0.01	0.03	0.8	<0.2	0.0	0	<3	<1
SEP 22...	<0.01	<0.01	--	0.8	<0.2	0.0	0	<10	<1

## 08198500 SABINAL RIVER AT SABINAL, TX

**LOCATION.**--Lat 29°18'05", long 99°28'46", Uvalde County, Hydrologic Unit 12110106, on left bank 80 ft downstream from bridge on U.S. Highway 90, 1,100 ft downstream from Southern Pacific Lines railroad bridge, 0.8 mi west of Sabinal, 5.8 mi upstream from Ranchero Creek, and 223 mi upstream from mouth.

**DRAINAGE AREA.**--241 mi<sup>2</sup>.

**PERIOD OF RECORD.**--September 1952 to current year.

**REVISED RECORDS.**--WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 882.17 ft above sea level. Prior to July 29, 1958, nonrecording gage, and July 29, 1958, to Mar. 19, 1964, water-stage recorder at site 80 ft upstream at same datum.

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation. Several small diversions for irrigation above station. Most of low flow of the Sabinal River enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses basin upstream from this station and downstream from Sabinal River near Sabinal (station 08198000). Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1890, 40 ft Aug. 24, 1919, from information by local residents. Flood of July 2, 1932, reached a stage of 31 ft (discharge, 60,000 ft<sup>3</sup>/s), from information by Southern Pacific Lines. Information indicates that a flood in 1858 covered the townsite of Sabinal. The stage would have been 70 to 80 ft, which seems unlikely. However, it is possible that a flood occurred in 1858 that covered part of the townsite and was higher than any flood since that date.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 100 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	2130	5,910	14.08	June 15	1100	418	6.70
Apr. 4	0300	3,630	11.92	June 22	1100	93,500	a35.86
Apr. 26	1230	540	7.00				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	1.3	1.7	.93	1.3	3.2	2.6	22	6.5	346	10	3.9
2	.00	1.0	1.6	.93	1.4	3.7	2.7	18	4.3	304	9.8	3.9
3	.00	.97	1.6	.93	1.4	3.7	3.2	15	3.5	266	9.3	3.7
4	.00	.93	1.4	.85	1.1	4.0	579	10	3.9	235	8.9	3.9
5	.18	.90	1.4	.78	1.1	4.1	306	7.5	4.2	204	8.7	3.9
6	.27	.82	1.5	.78	1.1	4.0	275	6.3	4.0	179	8.4	3.9
7	.22	.70	1.5	.71	1.1	3.9	183	5.0	4.6	157	7.9	3.9
8	.14	.64	1.4	.90	.93	3.9	142	4.3	4.3	137	7.7	3.9
9	.09	.57	1.3	.66	.93	5.3	117	5.2	7.0	122	7.6	3.7
10	.09	.51	1.3	.78	.93	6.9	97	4.6	5.6	108	7.3	3.4
11	.09	.50	1.3	.91	.93	7.5	95	3.6	5.0	95	7.0	3.4
12	.09	.46	1.2	.93	.96	4.3	75	3.5	4.6	84	5.5	3.3
13	.11	.45	1.1	.99	1.0	3.6	63	3.5	4.9	74	5.5	3.1
14	.16	.39	1.0	1.1	1.0	3.4	56	3.5	4.3	64	5.3	2.9
15	.21	.35	1.2	1.1	1.0	3.3	49	3.7	101	55	5.1	2.9
16	.25	.35	1.5	1.3	1.0	3.2	41	3.7	29	48	5.0	2.9
17	.25	.35	1.5	1.3	1.0	3.1	35	3.8	10	41	4.7	2.8
18	.25	.46	1.5	1.3	1.0	3.1	30	3.5	6.6	36	4.5	2.7
19	.31	.73	1.5	1.4	1.0	3.0	28	3.6	5.8	31	4.4	2.7
20	.35	.87	1.5	1.3	1.2	3.0	26	5.0	4.4	26	4.6	2.6
21	.33	1.3	1.5	1.3	1.4	3.0	20	2.9	3.8	23	4.6	2.4
22	.39	1.1	1.5	1.3	2.9	2.9	16	6.8	16100	21	4.6	2.4
23	.64	.85	1.4	1.2	3.5	3.0	11	3.7	3190	19	4.5	2.4
24	.67	.80	1.1	1.2	3.7	3.1	8.3	4.2	1200	17	4.5	2.4
25	.70	1.1	1.0	1.2	3.7	2.9	7.0	20	944	14	4.5	2.4
26	.71	.99	.99	1.2	3.6	2.8	180	17	753	13	4.5	2.3
27	.70	1.1	.92	1.3	3.4	2.6	85	13	626	13	4.4	2.1
28	611	1.5	.82	1.2	3.3	2.6	51	11	524	12	4.3	2.1
29	524	1.8	.73	1.2	---	2.5	37	11	449	11	4.1	2.1
30	34	1.8	.72	1.3	---	2.5	27	12	398	11	4.0	1.9
31	5.0	---	.82	1.3	---	2.5	---	9.1	---	10	3.9	---
TOTAL	1181.20	25.59	39.51	33.58	46.88	110.6	2647.8	246.0	24411.3	2776	185.1	89.9
MEAN	38.1	.85	1.27	1.08	1.67	3.57	88.3	7.94	814	89.5	5.97	3.00
MAX	611	1.8	1.7	1.4	3.7	7.5	579	22	16100	346	10	3.9
MIN	.00	.35	.72	.66	.93	2.5	2.6	2.9	3.5	10	3.9	1.9
AC-FT	2340	51	78	67	93	219	5250	488	48420	5510	367	178

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1997, BY WATER YEAR (WY)

	MEAN	35.8	15.0	20.1	16.0	21.9	25.7	28.7	35.5	121	60.6	32.9	22.8
MAX	261	219	498	292	510	535	349	427	1493	1066	709	210	
(WY)	1970	1959	1992	1992	1992	1992	1992	1987	1987	1973	1971	1958	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1953	1953	1953	1953	1953	1956	1956	1953	1953	1953	1962	1962	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1953 - 1997

ANNUAL TOTAL	1420.57	31793.46	36.3	1992
ANNUAL MEAN	3.88	87.1	265	1963
HIGHEST ANNUAL MEAN			.070	
LOWEST ANNUAL MEAN			.00	Jun 17 1958
HIGHEST DAILY MEAN	611	16100	.00	Oct 1 1952
LOWEST DAILY MEAN	.00	.10	.00	Oct 1 1952
ANNUAL SEVEN-DAY MINIMUM	.00	93500	.00	Jun 22 1997
INSTANTANEOUS PEAK FLOW		a35.86	a35.86	Jun 22 1997
INSTANTANEOUS PEAK STAGE		26300	45	
ANNUAL RUNOFF (AC-FT)	2820	63060	1.5	
10 PERCENT EXCEEDS	1.4	68	.10	
50 PERCENT EXCEEDS	.58	3.3		
90 PERCENT EXCEEDS	.25	.69		

a From floodmark.



## NUECES RIVER BASIN

08200000 HONDO CREEK NEAR TARPLEY, TX

**LOCATION.**--Lat 29°34'10", long 99°14'47", Medina County, Hydrologic Unit 12110107, on left bank 460 ft downstream from bridge on Ranch Road 462, 6.3 mi southeast of Tarpley, and 16.6 mi northwest of Hondo.

**DRAINAGE AREA.**--95.6 mi<sup>2</sup>.

**PERIOD OF RECORD.**--August 1952 to current year.

Water-quality records.--Chemical analyses: November 1965 to September 1969. Chemical and biochemical analyses: February 1970 to September 1993. Pesticide analyses: August 1971 to September 1993. Sediment analyses: November to December 1965.

**REVISED RECORDS.**--WSP 1712: 1957. WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 1,169.1 ft, from Magnolia Oil Co. datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation. There are several small diversions for irrigation above station. Rain gage at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood in July 1932 reached a stage of about 26 ft (discharge, 58,500 ft<sup>3</sup>/s), from information by local resident. Maximum stage since at least 1907, that of June 17, 1958.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 500 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)		Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)			
	Apr. 4	0115	13,900	13.22		June 22	0800	27,300	a18.35			
	June 22	0500	76,900	a29.64								
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.29	e.08	e7.4	e2.7	e1.7	14	23	75	91	220	34	e19
2	e.25	e.09	e6.6	e2.3	e1.6	15	25	74	86	159	32	e19
3	e.22	e.08	e5.8	e3.1	e1.6	14	45	67	82	140	30	e18
4	e.35	e.08	e7.0	e2.7	e1.5	14	1460	64	79	125	30	e18
5	e.43	e.09	e6.2	e2.5	e1.5	14	279	62	78	111	29	e18
6	e.38	e.08	e5.8	e2.3	e2.3	13	206	61	82	100	29	e18
7	e.27	e.08	e5.8	e2.2	e2.2	12	173	61	74	92	28	e17
8	e.20	e.08	e5.7	e8.0	e3.9	13	158	58	70	84	32	e17
9	e.17	e.08	e5.0	e3.0	e3.4	14	140	68	84	87	29	e17
10	e.14	e.07	e4.8	e2.5	e3.0	15	132	56	71	74	26	e17
11	e.12	e.08	e5.0	e2.3	e2.8	51	123	53	70	69	26	e17
12	e.09	e.08	e5.2	e2.2	e7.5	61	105	215	63	66	e25	e16
13	e.08	e.07	e4.2	e2.0	e6.0	37	96	93	61	63	e25	e16
14	e.08	e.07	e4.8	e1.9	e6.4	32	90	63	59	59	e24	e16
15	e.07	e.08	e10	e1.9	e5.8	29	84	66	107	57	e24	e15
16	e.07	e.12	e5.5	e1.8	e5.2	30	79	70	63	54	e23	e15
17	e.06	e1.8	e4.4	e1.8	e5.0	30	75	62	60	50	e23	e15
18	e.05	e.31	e3.5	e1.9	e4.5	28	69	58	57	48	e22	e15
19	e.07	e.29	e3.2	e1.9	e4.3	26	66	58	55	48	e22	e14
20	e.06	e.27	e3.1	e1.9	35	25	61	142	54	46	e22	e14
21	e.06	e.26	e3.0	e1.9	27	24	57	80	177	44	e22	e14
22	e.07	e.24	e2.9	e1.9	21	24	55	95	11100	52	e21	e14
23	e.07	e.23	e2.8	e1.8	18	24	52	195	1230	44	e21	e14
24	e.07	e2.3	e2.7	e1.8	17	23	51	170	758	42	e21	e14
25	e.07	e4.8	e2.6	e1.7	16	23	52	156	556	40	e21	e14
26	e.07	e6.8	e2.5	e1.7	16	22	412	143	428	38	e20	e14
27	e.07	e7.0	e2.4	e1.7	15	22	100	132	353	34	e20	e13
28	e1.5	e7.0	e2.4	e1.7	14	22	89	125	282	34	e20	e13
29	e.15	e7.8	e2.3	e1.8	---	21	83	111	253	33	e20	e13
30	e.08	e8.4	e2.2	e1.8	---	22	79	105	223	32	e19	e12
31	e.08	---	e2.2	e1.8	---	21	---	97	---	36	e19	---
TOTAL	5.74	48.81	137.0	70.5	249.2	735	4519	2935	16806	2181	759	466
MEAN	.19	1.63	4.42	2.27	8.90	23.7	151	94.7	560	70.4	24.5	15.5
MAX	1.5	8.4	10	8.0	35	61	1460	215	11100	220	34	19
MIN	.05	.07	2.2	1.7	1.5	12	23	53	54	32	19	12
AC-FT	11	97	272	140	494	1460	8960	5820	33330	4330	1510	924
CFSM	.00	.02	.05	.02	.09	.25	1.58	.99	5.86	.74	.26	.16
IN.	.00	.02	.05	.03	.10	.29	1.76	1.14	6.54	.85	.30	.18

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1997, BY WATER YEAR (WY)

	MEAN	33.8	24.7	33.1	26.6	34.3	36.2	37.9	67.1	102	39.4	36.1	28.1
MAX	254	134	541	172	342	323	178	402	1056	574	654	153	
(WY)	1972	1959	1992	1992	1992	1992	1992	1987	1987	1973	1971	1958	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	
(WY)	1956	1955	1955	1956	1956	1956	1956	1956	1956	1996	1984	1955	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1952 - 1997

ANNUAL TOTAL	771.88	28912.25	41.7
ANNUAL MEAN	2.11	79.2	205
HIGHEST ANNUAL MEAN			.41
LOWEST ANNUAL MEAN			1992
HIGHEST DAILY MEAN	10	11100	Jun 17 1958
LOWEST DAILY MEAN	.00	.05	Oct 18 1952
ANNUAL SEVEN-DAY MINIMUM	.00	.06	Oct 15 1952
INSTANTANEOUS PEAK FLOW		76900	Jun 22 1997
INSTANTANEOUS PEAK STAGE		a29.64	Jun 22 1997
ANNUAL RUNOFF (AC-FT)	1530	57350	30190
ANNUAL RUNOFF (CFSM)	.022	.83	5.44
ANNUAL RUNOFF (INCHES)	.30	11.25	5.92
10 PERCENT EXCEEDS	5.9	102	82
50 PERCENT EXCEEDS	.88	18	12
90 PERCENT EXCEEDS	.00	.15	.10

e Estimated

a From floodmark.

## 08200700 HONDO CREEK AT KING WATERHOLE NEAR HONDO, TX

**LOCATION.**--Lat 29°23'26", long 99°09'04", Medina County, Hydrologic Unit 12110107, on left bank 0.3 mi downstream from county road low-water crossing, 3.1 mi north of Hondo, 7.8 mi upstream from Verde Creek, and 55.4 mi upstream from mouth.

**DRAINAGE AREA.**--149 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1960 to current year.

**REVISED RECORDS.**--WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 897.87 ft above sea level.

**REMARKS.**--No estimated daily discharges. Records fair. No known regulation. Most of the low flow enters the Edwards and associated limestones in the Balcones Fault Zone, that crosses the basin between Tarpley (station 08200000) and this station. There are several small diversions above station for irrigation. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1875, 21 ft in September 1919, from information by local resident. Other outstanding floods occurred in July 1932, stage 18 ft, and June 17, 1958, stage 17 ft.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharge greater than base discharge of 500 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft³/s)	Gage height (ft)		Date	Time	Discharge (ft³/s)	Gage height (ft)			
	Apr. 4	0400	8,790	7.96		June 22	0730	63,600	a18.96			
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.2	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	725	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	111	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	35	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	7.3	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.72	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	13900	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	869	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	468	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	348	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	59	.00	234	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	26	.00	151	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	2.0	.00	81	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.07	.00	39	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	11	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	966.13	0.00	16101.00	1.20	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	32.2	.000	537	.039	.000	.000
MAX	.00	.00	.00	.00	.00	.00	725	.00	13900	1.2	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	1920	.00	31940	2.4	.00	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1997, BY WATER YEAR (WY)

	MEAN	9.09	.51	11.3	2.96	7.40	8.82	7.57	31.3	66.7	15.0	33.7	7.56
MAX	160	10.8	379	56.9	187	168	89.5	468	1060	509	1015	151	
(WY)	1972	1972	1992	1968	1992	1992	1981	1987	1987	1973	1971	1980	
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1962	1961	1962	1961	1962	1962	1961	1961	1962	1962	1961	1961	1961

## SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1961 - 1997
ANNUAL TOTAL		17068.33	
ANNUAL MEAN		46.8	16.9
HIGHEST ANNUAL MEAN			128
LOWEST ANNUAL MEAN			.000
HIGHEST DAILY MEAN		13900	13900
LOWEST DAILY MEAN	.00 Jan 1	.00 Oct 1	.00 Oct 1
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Oct 1	.00 Oct 1
INSTANTANEOUS PEAK FLOW		63600	63600
INSTANTANEOUS PEAK STAGE		a18.96	a18.96
ANNUAL RUNOFF (AC-FT)		33860	12220
10 PERCENT EXCEEDS	.00	.00	.30
50 PERCENT EXCEEDS	.00	.00	.00
90 PERCENT EXCEEDS	.00	.00	.00

a From floodmark.

## NUECES RIVER BASIN

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX

**LOCATION.**--Lat 29°34'23", long 99°24'10", Medina County, Hydrologic Unit 12110107, on right bank 200 ft upstream from county road crossing, 4.5 mi downstream from Cascade Creek, 7.9 mi southeast of Utopia, and 58.0 mi upstream from mouth.

**DRAINAGE AREA.**--45.0 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--May 1961 to current year.

**REVISED RECORDS.**--WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder, crest-stage gage, and concrete control. Datum of gage is 1,265.8 ft, from Magnolia Oil Company datum, adjustment unknown.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. No known regulation or diversions. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1901, 16.4 ft June 17, 1958, from floodmarks (discharge, 52,600 ft<sup>3</sup>/s, by slope-area measurement of peak flow).

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 600 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Oct. 28	1315	1,240	a3.92	May 23	1100	618	3.27
Apr. 3	2315	2,750	a4.96	June 22	0345	64,900	a17.7
Apr. 26	0315	1,990	a4.50	June 22	0730	8,940	7.8
May 12	1900	729	3.40				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.29	e3.6	3.2	3.5	2.3	8.8	15	47	51	102	17	4.2
2	.29	e3.4	3.3	3.3	2.3	11	15	45	48	97	16	4.1
3	.29	3.1	3.4	3.4	2.3	9.4	160	41	45	92	16	4.2
4	.29	2.6	4.5	3.0	2.2	8.7	160	39	43	87	15	6.1
5	.42	2.6	5.6	2.8	2.0	8.3	93	37	44	84	13	6.4
6	.58	2.5	4.4	2.6	2.2	7.4	75	36	43	80	12	4.7
7	.68	2.4	3.9	2.9	2.9	7.4	64	36	39	76	12	4.4
8	.68	2.0	3.7	5.7	2.3	8.4	57	34	37	70	12	4.3
9	.58	1.8	3.8	3.6	2.2	8.0	52	35	48	66	12	4.2
10	.50	e1.8	3.9	3.1	2.2	13	50	31	37	61	11	4.1
11	.42	e1.8	3.9	2.9	2.1	54	47	29	35	58	10	3.8
12	.36	1.8	3.9	2.8	3.5	48	42	78	33	54	9.2	3.8
13	.36	1.8	3.5	2.8	3.1	42	41	44	31	52	8.9	3.7
14	.29	1.8	3.5	2.9	2.5	36	38	33	30	49	8.5	3.6
15	.29	1.7	9.4	2.9	2.3	32	36	32	36	46	8.2	3.5
16	.29	2.9	6.3	2.6	2.1	31	34	30	30	43	8.1	3.3
17	.29	2.6	4.7	2.5	2.1	29	32	28	28	39	7.9	3.2
18	.29	1.9	3.9	2.5	2.1	27	31	27	26	36	7.4	3.0
19	.29	1.8	3.8	2.6	2.3	24	30	28	25	34	7.0	3.2
20	.29	1.8	3.6	2.7	2.3	23	27	63	24	32	6.8	3.1
21	.29	1.7	3.6	2.8	15	22	25	42	31	31	6.5	3.1
22	e.29	1.6	3.9	2.7	13	21	24	44	e5000	30	6.1	3.2
23	.29	1.6	4.2	2.6	12	20	23	121	388	28	6.4	3.2
24	.29	6.8	3.8	2.6	12	19	22	86	293	24	6.0	2.9
25	.30	3.7	3.6	2.3	11	18	27	80	257	22	6.0	2.7
26	.33	2.4	3.9	2.4	11	16	252	75	e231	21	5.7	2.8
27	.51	2.1	3.7	2.6	9.6	15	67	71	190	20	5.5	2.7
28	93	3.3	3.5	2.3	9.0	15	61	68	158	20	5.3	2.5
29	17	5.3	3.4	2.1	---	14	55	61	135	18	4.9	2.5
30	5.5	3.8	3.4	2.3	---	14	51	57	114	17	4.5	2.5
31	e3.9	---	3.7	2.3	---	14	---	54	---	17	4.3	---
TOTAL	129.47	78.0	126.9	88.1	160.6	624.4	1706	1532	7530	1506	279.2	109.0
MEAN	4.18	2.60	4.09	2.84	5.74	20.1	56.9	49.4	251	48.6	9.01	3.63
MAX	93	6.8	9.4	5.7	23	54	252	121	5000	102	17	6.4
MIN	.29	1.6	3.2	2.1	2.0	7.4	15	27	24	17	4.3	2.5
AC-FT	257	155	252	175	319	1240	3380	3040	14940	2990	554	216
CFSM	.09	.06	.09	.06	.13	.45	1.26	1.10	5.58	1.08	.20	.08
IN.	.11	.06	.10	.07	.13	.52	1.41	1.27	6.22	1.24	.23	.09

# NUECES RIVER BASIN

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## 08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1997, BY WATER YEAR (WY)

MEAN	18.7	11.3	16.9	12.5	14.6	16.0	16.0	27.6	44.9	23.5	20.8	14.9
MAX	169	48.8	241	92.9	136	134	91.1	120	471	276	279	63.1
(WY)	1972	1987	1992	1992	1992	1992	1992	1987	1987	1973	1971	1967
MIN	.24	.50	.40	.67	1.08	.70	1.29	.64	.15	.010	.005	.000
(WY)	1964	1964	1964	1963	1963	1963	1996	1984	1989	1989	1989	1989

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR		FOR 1997 WATER YEAR		WATER YEARS 1961 - 1997	
ANNUAL TOTAL	761.49		13869.67		19.9	
ANNUAL MEAN	2.08		38.0		87.4	
HIGHEST ANNUAL MEAN					.97	
LOWEST ANNUAL MEAN					1992	
HIGHEST DAILY MEAN	93	Oct 28	5000	Jun 22	5000	Jun 22 1997
LOWEST DAILY MEAN	.00	Aug 18	.29	Oct 1	.00	Jul 30 1963
ANNUAL SEVEN-DAY MINIMUM	.01	Aug 13	.29	Oct 14	.00	Jul 30 1963
INSTANTANEOUS PEAK FLOW			64900	Jun 22	64900	Jun 22 1997
INSTANTANEOUS PEAK STAGE			a17.70	Jun 22	a17.70	Jun 22 1997
ANNUAL RUNOFF (AC-FT)	1510		27510		14410	
ANNUAL RUNOFF (CFSM)	.046		.84		.44	
ANNUAL RUNOFF (INCHES)	.63		11.47		6.01	
10 PERCENT EXCEEDS	3.9		61		40	
50 PERCENT EXCEEDS	1.4		7.4		5.3	
90 PERCENT EXCEEDS	.03		1.8		.80	

e Estimated

a From floodmark.

## NUECES RIVER BASIN

08201500 SECO CREEK AT MILLER RANCH NEAR UTOPIA, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: November 1965 to September 1969. Chemical and biochemical analyses: March 1970 to 1993, August 1994 to current year. Pesticide analyses: January 1974 to 1993, August 1994 to current year. Bacteria analyses: November 1976 to current year. Sediment analyses: November 1965, August 1994 to current year.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DEMAND, DIS-SOLVED (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 CaCO3)	HARD-NESS NONCARB DISSOLV FLD. AS CaCO3 (MG/L)
NOV 19...	1110	1.8	465	8.1	18.0	9.1	100	0.4	--	47	220	78
MAR 26...	1145	16	465	8.3	16.5	10.4	110	0.7	K19	21	210	40
APR 17...	1250	34	467	8.2	20.0	9.8	111	0.6	K15	K10	230	41
JUN 12...	1400	33	415	8.0	30.5	8.2	115	0.2	100	280	210	38
JUL 23...	1415	30	425	8.0	30.0	8.4	116	0.4	K10	K11	200	40
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	SODIUM PERCENT	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)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
NOV 19...	68	13	6.4	0.2	6	1.7	150	77	10	0.20	11	276
MAR 26...	65	12	5.5	0.2	5	0.91	170	49	10	0.20	9.4	256
APR 17...	73	11	5.9	0.2	5	0.89	190	35	10	0.20	10	261
JUN 12...	66	11	6.2	0.2	6	0.82	170	29	10	0.17	13	242
JUL 23...	65	9.9	7.1	0.2	7	0.93	160	27	11	0.26	13	234
DATE	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SEDI-MENT, SUS-PENDED (MG/L)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)
NOV 19...	0.110	0.020	0.130	<0.015	<0.20	<0.010	<0.010	0.19	40	100	<1	31
MAR 26...	--	<0.010	0.380	0.030	<0.20	<0.010	<0.010	--	--	--	<1	29
APR 17...	--	<0.010	0.419	<0.015	<0.20	<0.010	<0.010	--	--	--	<1	30
JUN 12...	--	<0.010	0.221	<0.015	<0.20	<0.010	<0.010	--	--	--	<1	30
JUL 23...	--	<0.010	0.388	<0.015	<0.20	<0.010	<0.010	--	--	--	<1	31
DATE	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM, DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM, DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY, DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)
NOV 19...	<0.50	<1.0	<5.0	<3.0	<10	3.0	<1.0	<4	2.0	<0.1	<10	<10
MAR 26...	<0.50	<1.0	<5.0	<3.0	<10	<3.0	<1.0	<4	1.2	<0.1	<10	<10
APR 17...	<0.50	<1.0	<5.0	<3.0	<10	<3.0	<1.0	<4	1.0	0.1	<10	<10
JUN 12...	0.55	<1.0	<5.0	<3.0	<10	<3.0	<1.0	5	1.6	<0.1	<10	<10
JUL 23...	<0.50	<1.0	<5.0	<3.0	<10	<3.0	<1.0	4	1.6	0.2	<10	<10
DATE	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)	2,4,5-T TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	DICAMBA TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	PIC-LORAM UNFILT RECOVER (UG/L)	
NOV 19...	<1	<1.0	480	<6	<3.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
MAR 26...	<1	<1.0	552	<6	<3.0	<0.010	<0.010	<0.010	0.050	<0.010	<0.010	
APR 17...	<1	<1.0	473	<6	<3.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
JUN 12...	<1	<1.0	448	<6	<3.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	
JUL 23...	<1	<1.0	392	<6	<3.0	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	



## 08202700 SECO CREEK AT ROWE RANCH NEAR D'HANIS, TX

**LOCATION.**--Lat 29°21'43", long 99°17'05", Medina County, Hydrologic Unit 12110107, on left bank 2.9 mi north of D'Hanis and 8.0 mi downstream from Rocky Creek.

**DRAINAGE AREA.**--168 mi<sup>2</sup>.

**PERIOD OF RECORD.**--November 1960 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 900.88 ft above sea level. Prior to October 1970, published as "at Crook Ranch, near D'Hanis".

**REMARKS.**--No estimated daily discharges. Records good. No known regulation or diversions. All of low flow from Seco Creek enters the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin between Miller Ranch (station 08201500) and this station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1852, 35.7 ft May 31, 1935, from information by local resident. Other floods occurred Aug. 31, 1894, 33 ft; September 1919, 28 ft; July 2, 1932, 28.2 ft (discharge, 35,800 ft<sup>3</sup>/s, by slope-area measurement); and June 17, 1958, 32.4 ft.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 600 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 4	0530	3,300	a12.56	June 22	2030	5,770	14.22
June 22	1115	51,400	a30.62				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.36	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.13	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	306 2.4	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.19	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	31	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	2.0	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	11800	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	429	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	42	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	13	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	6.5	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	3.3	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.00	.00	1.8	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	.00	.88	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.50	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	308.61	0.00	12330.00	0.51	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	10.3	.000	411	.016	.000	.000
MAX	.00	.00	.00	.00	.00	.00	306	.00	11800	.36	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	612	.00	24460	1.0	.00	.00

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1997, BY WATER YEAR (WY)

MEAN	6.80	.002	4.69	.68	1.03	1.65	3.57	12.1	30.3	8.34	26.6	4.55
MAX	183	.057	117	24.7	33.2	27.0	74.6	277	411	275	862	58.5
(WY)	1972	1977	1992	1968	1992	1992	1981	1987	1997	1973	1971	1980
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1962	1961	1961	1961	1961	1961	1961	1961	1962	1962	1961	1961

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1961 - 1997

ANNUAL TOTAL		12639.12		
ANNUAL MEAN		34.6		
HIGHEST ANNUAL MEAN			8.51	
LOWEST ANNUAL MEAN			73.3	1971
HIGHEST DAILY MEAN		11800	.000	1962
LOWEST DAILY MEAN	.00	Jan 1	.00	Jun 22 1997
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Nov 1 1960
INSTANTANEOUS PEAK FLOW		51400		Jun 22 1997
INSTANTANEOUS PEAK STAGE		a30.62		Jun 22 1997
ANNUAL RUNOFF (AC-FT)		25070		6170
10 PERCENT EXCEEDS	.00		.00	
50 PERCENT EXCEEDS	.00		.00	
90 PERCENT EXCEEDS	.00		.00	

a From floodmark.

**LOCATION.**--Lat 28°44'11", long 99°08'40", Frio County, Hydrologic Unit 12110106, on right bank 17 ft downstream from centerline of railroad tracks, 35 ft right of the Missouri Pacific Railroad Co. bridge abutment, 167 ft downstream from Interstate Highway 35, 917 ft downstream from Leona River, 2.5 mi south of Derby, and 115.1 mi upstream from mouth.

**DRAINAGE AREA.**--3,429 mi<sup>2</sup>.

**PERIOD OF RECORD.**--August 1915 to current year.

**REVISED RECORDS.**--WSP 568: 1915-16, 1918-22. WSP 1312: 1917-18(M). WSP 1923: 1954. WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 449.11 ft above sea level. Aug. 1, 1915, to Apr. 21, 1931, nonrecording gage, and Apr. 22, 1931, to Mar. 6, 1940, water-stage recorder at same site and datum. Mar. 7, 1940, to May 4, 1972, water-stage recorder, and May 5 to Nov. 1, 1972, nonrecording gage at site 167 ft upstream at same datum.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation. Part of flow of the Frio River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone upstream from U.S. Highway 90. There is considerable loss of flow into various permeable formations downstream from the Balcones Fault Zone. There are many small diversions for irrigation above station. Maximum stage since at least 1860 that of July 4, 1932. Rain gage at station. Satellite telemeter at station.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,100 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft³/s)	Gage height (ft)		Date	Time	Discharge (ft³/s)	Gage height (ft)			
	Oct. 30	2000	6,290	8.88		June 24	1000	56,400	21.77			
	DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES											
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	778	.03	.00	.00	.00	.00	43	.56	1070	36	.02
2	.00	397	.02	.00	.00	.00	.48	31	.29	976	33	.02
3	.00	232	.02	.00	.00	.00	10	24	.23	883	30	.01
4	.00	148	.01	.00	.00	.00	159	16	.20	828	29	.03
5	.00	94	.01	.00	.00	.00	850	9.1	.20	766	28	.04
6	.00	62	.01	.00	.00	.00	786	4.9	.20	702	26	.04
7	.00	44	.01	.00	.00	.00	603	1.8	.20	639	22	.03
8	.00	29	.01	.00	.00	.00	445	.73	.20	579	18	.01
9	.00	18	.01	.00	.00	.00	324	.49	.13	529	15	.00
10	.00	9.4	.01	.00	.00	.00	240	.37	.11	467	12	.00
11	.00	5.5	.00	.00	.00	.00	183	.23	.09	417	8.4	.00
12	.00	4.1	.00	.00	.00	.00	142	.16	.06	380	6.9	.00
13	.00	1.8	.00	.00	.00	.00	115	.15	.04	344	6.9	.00
14	.00	.84	.00	.00	.00	.00	98	.11	4.6	301	6.9	.00
15	.00	.38	.00	.00	.00	.00	77	.09	8.3	265	6.3	.00
16	.00	.25	.00	.00	.00	.00	61	.09	2.8	233	4.6	.00
17	.00	.18	.00	.00	.00	.00	48	.09	.92	208	3.5	.00
18	.00	.14	.00	.00	.00	.00	39	.08	.43	183	3.0	.00
19	.00	.12	.00	.00	.00	.00	31	.06	166	157	2.2	.00
20	.00	.11	.00	.00	.00	.00	25	.09	247	139	1.6	.00
21	.00	.05	.00	.00	.00	.00	18	.09	295	126	1.3	.00
22	.00	.05	.00	.00	.00	.00	14	.09	134	112	.87	.00
23	.00	.05	.00	.00	.00	.00	10	.11	2350	105	.60	.00
24	.00	.05	.00	.00	.00	.00	7.0	.12	46500	99	.59	.00
25	.00	.05	.00	.00	.00	.00	4.6	.12	18100	89	.66	.00
26	.00	.04	.00	.00	.00	.00	3.8	.12	5740	79	.61	.00
27	.00	.03	.00	.00	.00	.00	2.8	20	3910	68	.38	.00
28	.00	.02	.00	.00	.00	.00	1.3	99	2510	59	.21	.00
29	484	.03	.00	.00	---	.00	17	8.5	1560	52	.13	.00
30	4270	.03	.00	.00	---	.00	60	1.9	1230	46	.07	.00
31	3410	---	.00	.00	---	.00	---	.89	---	40	.03	---
TOTAL	8164.00	1825.22	0.14	0.00	0.00	0.00	4374.98	263.48	82761.56	10941	304.75	0.20
MEAN	263	60.8	.005	.000	.000	.000	146	8.50	2759	353	9.83	.007
MAX	4270	778	.03	.00	.00	.00	850	99	46500	1070	36	.04
MIN	.00	.02	.00	.00	.00	.00	.00	.06	.04	40	.03	.00
AC-FT	16190	3620	.3	.00	.00	.00	8680	523	164200	21700	604	.1

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1915 - 1997, BY WATER YEAR (WY)

MEAN	161	46.6	46.0	51.3	60.7	47.8	117	201	385	256	139	196
MAX	1813	674	950	559	988	1079	1072	2320	8069	8943	5648	3247
(WY)	1920	1920	1992	1992	1992	1992	1957	1935	1935	1932	1971	1919
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1918	1916	1916	1916	1916	1916	1917	1917	1918	1918	1917	1922

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

## WATER YEARS 1915 - 1997

ANNUAL TOTAL	11628.52		108635.33						
ANNUAL MEAN	31.8		298			142			
HIGHEST ANNUAL MEAN						1087			1935
LOWEST ANNUAL MEAN						1.76			1952
HIGHEST DAILY MEAN	4270	Oct 30	46500	Jun 24	135000			Jul 4	1932
LOWEST DAILY MEAN	.00	May 7	.00	Oct 1	.00			Aug 1	1915
ANNUAL SEVEN-DAY MINIMUM	.00	May 7	.00	Oct 1	.00			Aug 1	1915
INSTANTANEOUS PEAK FLOW			56400	Jun 24	230000			Jul 4	1932
INSTANTANEOUS PEAK STAGE			21.77	Jun 24	29.45			Jul 4	1932
ANNUAL RUNOFF (AC-FT)	23070		215500		103100				
10 PERCENT EXCEEDS	19		236		151				
50 PERCENT EXCEEDS	.00		.03		5.1				
90 PERCENT EXCEEDS	.00		.00		.00				

# NUECES RIVER BASIN

349

08206600 FRIO RIVER AT TILDEN, TX

**LOCATION.**--Lat 28°28'02", long 98°32'50", McMullen County, Hydrologic Unit 12110108, on left bank 80 ft downstream from bridge on State Highway 16 in Tilden, 300 ft downstream from Leoncita Creek, 1.3 mi upstream from Salt Branch, 1.8 mi downstream from Big Slough, and 44.2 mi upstream from mouth.

**DRAINAGE AREA.**--4,493 mi<sup>2</sup>.

**PERIOD OF RECORD.**--July 1978 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 216.04 ft above sea level. July 14, 1978, to Sept. 13, 1994, at site 80 ft upstream at same datum.

**REMARKS.**--Records fair except those for estimated daily discharges, which are poor. No known regulation. Part of the flow of the Frio River and its headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone that crosses the basin upstream from U. S. Highway 90. Considerable flow into various permeable formations also occurs downstream from the Balcones Fault Zone. There are many small diversions above station for irrigation. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Flood of July 1932 reached a stage of 38.44 ft, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

	Date	Time	Discharge (ft³/s)	Gage height (ft)		Date	Time	Discharge (ft³/s)	Gage height (ft)			
	Nov. 4	0500	2230	a17.45		June 28	1300	20800	29.56			
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.6	203	.88	.63	.36	1.4	1.5	6.9	88	4960	27	e3.2
2	5.9	e548	.79	.76	.36	1.6	1.8	5.3	48	3000	24	e3.2
3	3.8	e1320	.66	.82	.36	7.5	153	4.2	29	2030	21	e3.1
4	2.4	e1960	.58	.77	.32	3.8	79	13	18	1500	21	e3.1
5	2.2	1000	.56	.71	.29	1.9	27	22	12	1180	19	e2.9
6	1.8	229	.56	.58	.25	1.3	33	17	13	966	16	e2.9
7	1.4	93	.61	.48	.24	1.2	196	13	195	804	13	e2.6
8	.99	54	.66	.54	.32	.99	479	11	141	666	13	e2.6
9	.83	37	.66	.56	.60	.83	614	11	58	540	12	e2.5
10	.75	27	.57	.47	.69	.63	578	8.9	23	446	19	e2.5
11	.54	20	.48	.40	.71	2.1	368	7.7	11	376	17	e2.4
12	.37	15	.48	.40	.95	6.1	231	6.2	7.0	322	9.9	e2.4
13	.30	11	.48	.40	1.1	4.9	154	4.8	4.6	281	8.6	e2.2
14	.25	8.6	.47	.40	1.1	2.7	111	3.5	3.1	242	7.6	e2.2
15	.22	6.7	.40	.40	1.1	1.8	83	86	2.8	211	6.9	e2.1
16	.17	5.3	.34	.34	1.1	1.4	66	1130	2.3	181	6.3	e2.1
17	.15	4.3	.33	.29	1.1	1.3	55	135	88	155	5.6	e2.1
18	.14	3.4	.31	.27	1.1	2.5	47	62	113	132	5.4	e1.9
19	.11	2.9	.30	.27	1.1	17	40	34	36	111	5.4	e1.9
20	.08	2.4	.30	.29	1.1	4.7	33	89	27	93	4.8	e8.4
21	.07	1.9	.31	.36	1.1	2.0	28	82	276	79	4.4	e4.3
22	.05	1.4	.33	.39	1.1	2.0	24	71	1650	68	e3.9	e1.8
23	.03	1.1	.35	.40	1.1	1.7	19	28	973	58	e3.9	e1.7
24	.03	2.1	.36	.43	1.2	1.2	16	16	1210	51	e3.9	e1.7
25	.03	1.6	.36	.44	1.3	21	13	15	2490	46	e3.9	e1.6
26	.02	1.4	.36	.44	1.4	5.3	40	17	2550	42	e3.9	e1.5
27	.01	1.1	.36	.44	1.4	1.3	26	17	6690	40	e3.9	e1.5
28	.00	.92	.39	.44	1.4	.58	16	26	19900	37	e3.8	e1.4
29	.00	.94	.46	.44	---	.38	10	19	17300	34	e3.7	e1.4
30	.00	.92	.49	.39	---	.69	8.5	40	10600	31	e3.6	e1.4
31	.00	---	.55	.36	---	2.5	---	138	---	27	e3.5	---
TOTAL	29.24	5563.98	14.74	14.31	24.25	104.30	3550.8	2139.5	64558.8	18709	304.9	74.6
MEAN	.94	185	.48	.46	.87	3.36	118	69.0	2152	604	9.84	2.49
MAX	6.6	1960	.88	.82	1.4	21	614	1130	19900	4960	27	8.4
MIN	.00	.92	.30	.27	.24	.38	1.5	3.5	2.3	27	3.5	1.4
AC-FT	58	11040	29	28	48	207	7040	4240	128100	37110	605	148

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1997, BY WATER YEAR (WY)

	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989
MEAN	180	61.1	117	119	137	110	136	215	906	213	92.5	102
MAX	861	185	1314	877	1745	1188	935	1171	8992	1232	609	315
(WY)	1986	1997	1992	1992	1992	1992	1992	1980	1992	1990	1978	1991
MIN	.12	.25	.27	.45	.32	2.91	.55	1.03	.032	.000	.045	.52
(WY)	1991	1991	1991	1991	1990	1984	1984	1996	1984	1996	1985	1989

SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1978 - 1997
ANNUAL TOTAL	11748.09	95088.42	196
ANNUAL MEAN	32.1	261	1000
HIGHEST ANNUAL MEAN			7.06
LOWEST ANNUAL MEAN			1987
HIGHEST DAILY MEAN	1960	Nov 4	19900
LOWEST DAILY MEAN	.00	May 26	.00
ANNUAL SEVEN-DAY MINIMUM	.00	Jun 23	.01
INSTANTANEOUS PEAK FLOW			.00
INSTANTANEOUS PEAK STAGE			.00
ANNUAL RUNOFF (AC-FT)	23300	188600	20900
10 PERCENT EXCEEDS	24	206	29.56
50 PERCENT EXCEEDS	2.3	3.1	141800
90 PERCENT EXCEEDS	.00	.35	270
			28
			.33

a From floodmark.  
e Estimated.

08206700 SAN MIGUEL CREEK NEAR TILDEN, TX

**LOCATION.**--Lat 28°35'14", long 98°32'44", McMullen County, Hydrologic Unit 12110109, on left bank 25 ft downstream from State Highway 16, 0.3 mi upstream from mouth of Bruce Branch, 0.9 mi downstream from mouth of Far Live Oak Creek, 3 mi upstream from San Patricio Creek, 7 mi downstream from Clear Creek, 8.7 mi north of Tilden, and 12.9 mi upstream from mouth.

**DRAINAGE AREA.**--783 mi<sup>2</sup>.

**PERIOD OF RECORD.**--January 1964 to current year.

Water-quality records.--Chemical and biochemical analyses: July 1978 to September 1984.

**REVISED RECORDS.**--WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 242.95 ft above sea level.

**REMARKS.**--Records good. No known regulation. There are five diversions above station, but amounts are unknown. At times, excessive amount of water from Bexar-Medina-Atascosa Counties Water Improvement District No. 1 system enters San Miguel Creek basin via Chacon Creek 52 mi upstream (amounts unknown). Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since 1919, 32.6 ft in 1942; stage of 1919 flood not known, from information by local residents.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 900 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)					
June 22	2300	1,680	13.81									
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES												
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.09	.00	.00	.00	.00	.00	.00	.02	24	20	.00	.00
2	.03	.00	.00	.00	.00	.00	3.4	.01	13	14	.00	.00
3	.02	.00	.00	.00	.00	.00	78	.00	7.3	11	.00	.00
4	.01	.00	.00	.00	.00	.00	83	.00	4.3	8.6	.00	.00
5	.00	.00	.00	.00	.00	.00	105	.00	2.1	6.6	.00	.00
6	.00	.00	.00	.00	.00	.00	139	.00	37	5.2	.00	.00
7	.00	.00	.00	.00	.00	.00	68	.00	162	4.0	.00	.00
8	.00	.00	.00	.00	.00	.00	35	.00	18	3.2	.00	.00
9	.00	.00	.00	.00	.00	.00	20	.50	7.2	2.4	.00	.00
10	.00	.00	.00	.00	.00	.00	12	1.1	3.0	1.7	.00	.00
11	.00	.00	.00	.00	.00	.00	8.3	.07	1.3	1.1	.00	.00
12	.00	.00	.00	.00	.00	.00	5.4	.01	.31	.43	.00	.00
13	.00	.00	.00	.00	.00	.00	3.3	.00	.07	.14	.00	.00
14	.00	.00	.00	.00	.00	.00	2.2	.00	.03	.03	.00	.00
15	.00	.00	.00	.00	.00	.00	1.2	5.3	3.3	.02	.00	.00
16	.00	.00	.00	.00	.00	.00	.36	95	127	.01	.00	.00
17	.00	.00	.00	.00	.00	.00	.15	31	51	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.69	6.8	30	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.13	2.4	31	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.03	3.1	19	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.01	.66	441	.00	.00	44
22	.00	.00	.00	.00	.00	.00	.00	.04	1100	.00	.00	6.4
23	.00	.00	.00	.00	.00	.00	.00	.02	844	.00	.00	.65
24	.00	.00	.00	.00	.00	.00	.00	.01	249	.00	.00	.04
25	.00	.00	.00	.00	.00	.00	.00	30	523	.00	.00	.01
26	.00	.00	.00	.00	.00	.00	42	26	444	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	1.2	16	99	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	.02	15	59	.00	.00	.00
29	.00	.00	.00	.00	---	.00	.00	70	40	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.01	109	28	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	54	---	.00	.00	---
TOTAL	0.15	0.00	0.00	0.00	0.00	0.00	608.40	466.04	4367.91	78.43	0.00	51.10
MEAN	.005	.000	.000	.000	.000	.000	20.3	15.0	146	2.53	.000	1.70
MAX	.09	.00	.00	.00	.00	.00	139	109	1100	20	.00	44
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.03	.00	.00	.00
AC-FT	.3	.00	.00	.00	.00	.00	1210	924	8660	156	.00	101

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1997, BY WATER YEAR (WY)

MEAN	67.0	21.0	17.6	28.4	24.8	9.32	60.0	128	108	40.1	52.1	91.2
MAX	486	286	226	641	352	78.0	1065	900	690	748	741	1233
(WY)	1982	1993	1987	1968	1992	1992	1977	1980	1987	1990	1980	1967
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1980	1995	1989	1989	1995	1996	1996	1971	1967	1996	1991	1989

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1964 - 1997

ANNUAL TOTAL	2649.95	5572.03	55.2
ANNUAL MEAN	7.24	15.3	161
HIGHEST ANNUAL MEAN			2.43
LOWEST ANNUAL MEAN			1968
HIGHEST DAILY MEAN	503	1100	16700
LOWEST DAILY MEAN	.00 Aug 31	.00 Jun 22	.00 May 16 1980
ANNUAL SEVEN-DAY MINIMUM	.00 Jan 1	.00 Oct 5	.00 Feb 1 1964
INSTANTANEOUS PEAK FLOW	.00 Jan 1	.00 Oct 5	.00 Feb 7 1964
INSTANTANEOUS PEAK STAGE		1680 Jun 22	20600 May 16 1980
ANNUAL RUNOFF (AC-FT)	5260	13.81 Jun 22	27.31 May 16 1980
10 PERCENT EXCEEDS	2.4	11050	39960
50 PERCENT EXCEEDS	.00	17	37
90 PERCENT EXCEEDS	.00	.00	2.0
			.00



# NUECES RIVER BASIN

351

## 08206900 CHOKE CANYON RESERVOIR NEAR THREE RIVERS, TX

**LOCATION.**--Lat 28°29'01", long 98°14'44", Live Oak County, Hydrologic Unit 12110108, at Choke Canyon Dam on Frio River, 3.9 mi upstream from Atascosa River, and 4.0 mi west of Three Rivers.

**DRAINAGE AREA.**--5,490 mi<sup>2</sup>.

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

**GAGE.**--Nonrecording gage read twice daily. Supplemental water-stage recorder operated by city of Corpus Christi. Datum of gage is sea level.

**REMARKS.**--The reservoir is formed by a rolled earthfill dam, 3.5 mi long. The dam was completed and deliberate impoundment began on Oct. 12, 1982. The spillway has seven radial gates, each 50 ft long and 24 ft high. Water for municipal and industrial use to meet the needs of the Coastal Bend area is released downstream through a 5.0- x 5.0-foot square slide gate. Satellite 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 .....	241.1	-
Top of spillway gate .....	222.5	743,900
Crest of spillway .....	199.5	269,600
Lowest gated outlet (invert) .....	136.3	52

**COOPERATION.**--Capacity table computed June 1, 1983, provided by the city of Corpus Christi. Elevation and reservoir contents record provided by the city of Corpus Christi.

**EXTREMES (AT 0600 HOURS) FOR PERIOD OF RECORD.**--Maximum daily contents, 733,100 acre-ft June 21, 1987 (elevation, 222.1 ft); minimum daily, 4,500 acre-ft Oct. 1-9, 1984 (elevation, 156.9 ft).

**EXTREMES (AT 0600 HOURS) FOR CURRENT YEAR.**--Maximum daily contents, 318,800 acre-ft July 21 (elevation, 202.65 ft); minimum daily, 167,800 acre-ft Mar. 9 (elevation, 191.53 ft).

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

156.0	4,000	180.0	69,720	210.0	452,600
160.0	6,860	190.0	151,500	220.0	678,300
170.0	25,000	200.0	277,100	223.0	757,500

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 0600 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	182700	176200	180700	176000	172800	169400	168000	174200	176200	292700	316000	303600
2	182600	175800	180200	175900	172500	169500	168200	174000	176200	301800	316500	303300
3	182600	176500	180100	175800	172400	169300	169300	173800	176100	307100	316300	303100
4	182400	178700	179900	175800	172400	168900	171000	173400	176000	310200	315700	302800
5	182300	182200	180000	175600	171900	168600	171400	173400	175900	312900	315400	302600
6	182400	184100	179900	175800	171800	168400	171300	173000	175500	314500	314900	302300
7	182200	184700	179800	175300	172200	168300	171300	172900	176800	315700	314200	302000
8	181800	184600	179400	175200	171900	168000	171500	172900	177300	316700	313900	301500
9	181500	184000	179200	175200	171600	167800	172300	172500	176700	317500	313700	301000
10	181300	183900	179000	174900	171600	167900	173300	173200	177500	318000	313200	300900
11	180900	183700	179100	174600	171500	167900	174700	173000	177400	318500	312600	300600
12	180700	183600	179100	174300	171300	169300	175100	172800	177100	318600	312600	299800
13	180400	183300	178900	174200	171500	169300	175200	172900	176700	318800	311800	299300
14	180200	183200	178700	174100	171300	169000	175200	172700	176500	318800	311500	299000
15	180100	183100	178600	174300	171300	168700	175200	172500	176800	318800	311000	298800
16	179900	183100	179100	173800	171100	168600	175200	173100	176500	318800	309800	298400
17	179800	183000	178200	173700	171100	168400	175300	175300	176400	318800	309800	298000
18	179100	182700	178100	173700	170700	168300	175300	175600	176400	318600	309200	297900
19	178600	182600	177600	173500	170500	169100	175800	175700	176400	318300	308900	297300
20	178500	182500	177100	173500	170400	168900	175800	176500	176700	318300	308600	297100
21	178200	182500	177100	173700	170500	168900	175700	176100	177400	318800	308100	296800
22	179000	182100	177000	173700	170300	168700	175800	176200	184100	318500	307800	297300
23	177700	181700	176900	173700	170200	168700	175500	176500	188900	318100	307300	297100
24	177300	182900	176700	173700	169900	168400	175100	176600	192700	318000	307400	297600
25	177300	182600	176400	173500	169800	168300	174900	176500	195800	317500	307100	297300
26	177300	181400	176700	173500	170000	168300	175300	176200	200400	317200	306600	296500
27	176900	180800	176500	173400	169900	168200	175100	176200	205300	316700	306000	296300
28	176900	180700	176400	173300	169900	168200	175000	176700	210600	316300	305300	295800
29	176900	181300	176400	173000	---	168100	174600	176400	236400	315800	305000	295500
30	176700	181400	176100	173000	---	168000	174400	176200	271800	315500	304500	295500
31	176500	---	175900	172800	---	168000	---	176200	---	315200	304200	---
MAX	182700	184700	180700	176000	172800	169500	175800	176700	271800	318800	316500	303600
MIN	176500	175800	175900	172800	169800	167800	168000	172500	175500	292700	304200	295500
(+)	192.3	192.7	192.3	192.0	191.7	191.6	192.1	192.3	199.6	202.4	201.8	201.2
(@)	-6600	+4900	-5500	-3100	-2900	-1900	+6400	+1800	+95600	+43400	-11000	-8700
CAL YR 1996	MAX 273000	MIN 170800	(@) -97100									
WTR YR 1997	MAX 318800	MIN 167800	(@) 112400									

(+) Elevation, in feet, at end of month.  
(@) Change in contents, in acre-feet.



## NUECES RIVER BASIN

08206910 CHOKE CANYON RESERVOIR OWC NEAR THREE RIVERS, TX

**LOCATION.**--Lat 28°29'09", long 98°14'29", Live Oak County, Hydrologic Unit 12110108, 0.2 mi downstream from Choke Canyon Dam on Frio River, 3.7 mi upstream from Atascosa River, and 3.8 mi west of Three Rivers.

**DRAINAGE AREA.**--5,490 mi<sup>2</sup>.

**PERIOD OF RECORD.**--November 1991 to current year (low flow).

**GAGE.**--Water-stage recorder. Datum of gage is 124.06 ft above sea level.

**REMARKS.**--Records fair. Discharges are not published for days when instantaneous discharge exceeds 73 ft<sup>3</sup>/s. Since installation of gage in water year 1992, at least 10% of contributing drainage area has been regulated by Choke Canyon Reservoir (station 08206900) 0.2 mi upstream.

**EXTREMES FOR CURRENT YEAR.**--Maximum gage height, 20.28 ft (backwater from Atascosa River) June 22 at 2000 hours; minimum recorded daily discharge, 30 ft<sup>3</sup>/s Jan. 2-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	37	32	32	35	33	32	31	31	33	31	30	e33
2	37	32	32	35	33	32	32	31	33	32	30	e33
3	37	32	32	35	33	32	33	31	33	32	30	e33
4	37	32	32	35	33	32	35	31	33	32	30	e33
5	37	32	32	33	33	32	35	31	33	32	30	e33
6	37	32	32	33	33	32	32	31	33	32	30	e33
7	37	31	34	33	32	32	32	31	---	32	30	e33
8	37	31	34	33	32	32	32	32	---	32	31	e33
9	35	31	34	33	32	32	32	33	---	31	31	e33
10	35	32	34	33	32	32	32	33	34	30	31	e33
11	35	32	34	33	32	32	34	33	34	30	31	e33
12	35	32	34	33	32	32	34	32	34	30	32	e33
13	35	31	31	33	32	33	34	32	34	31	e32	e32
14	34	31	31	33	32	34	34	32	34	32	e32	e32
15	34	31	32	33	32	34	34	32	34	32	e32	32
16	34	33	34	33	32	34	34	32	33	32	e33	32
17	34	33	34	33	32	34	34	32	31	32	e33	32
18	34	32	34	33	32	34	34	32	31	32	e33	32
19	34	31	34	33	32	34	34	32	31	32	e34	32
20	34	31	34	33	32	34	34	32	31	31	e34	32
21	34	31	34	33	33	34	34	33	---	31	e34	32
22	34	31	35	33	33	34	32	33	---	31	e34	32
23	34	31	35	33	33	34	32	34	---	31	e34	32
24	34	31	34	33	33	33	32	35	---	31	e34	32
25	34	31	35	33	33	33	32	35	---	31	e34	32
26	33	31	35	33	33	32	32	33	32	31	e34	32
27	33	31	35	33	32	31	32	33	32	30	e33	32
28	33	31	35	33	32	31	31	33	32	30	e33	32
29	33	31	35	33	---	31	31	34	32	30	e33	32
30	33	32	35	33	---	31	31	34	32	30	e33	32
31	33	---	35	33	---	31	---	33	---	30	e33	---
TOTAL	1077	945	1043	1031	908	1010	985	1006	---	966	998	972
MEAN	34.7	31.5	33.6	33.3	32.4	32.6	32.8	32.5	---	31.2	32.2	32.4
MAX	37	33	35	35	33	34	35	35	---	32	34	33
MIN	33	31	31	33	32	31	31	31	---	30	30	32

e Estimated

## 08208000 ATASCOSA RIVER AT WHITSETT, TX

**LOCATION.**--Lat 28°37'19", long 98°16'52", Live Oak County, Hydrologic Unit 12110110, on right bank at downstream side of bridge on Farm Road 99, 1.1 mi southwest of Whitsett, 4.2 mi downstream from La Parita Creek, and 12.9 mi upstream from mouth.

**DRAINAGE AREA.**--1,171 mi<sup>2</sup>.

**PERIOD OF RECORD.**--September 1924 to May 1926, May 1932 to current year.

**GAGE.**--Water-stage recorder. Datum of gage is 159.04 ft above sea level. Prior to May 8, 1926, nonrecording gage at bridge destroyed in 1956 at site 200 ft downstream at 1.38 ft higher datum. May 21, 1932, to Feb. 16, 1983, water-stage recorder at site 1,000 ft upstream at same datum.

**REMARKS.**--Records good. Considerable loss of flow into various permeable formations occurs upstream from this station. The Campbellton water wells discharge into the Atascosa River 12 mi upstream from this station to supplement streamflow during dry periods; however, records provided by the city of Corpus Christi indicate that during the current year, the Campbellton water wells did not discharge into the Atascosa River. No known regulation. There are several small diversions above station. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1881, that of Sept. 23, 1967. Second highest stage, 41 ft (discharge 106,000 ft<sup>3</sup>/s), occurred in September 1919.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,500 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
June 8	2000	1,780	16.92	June 23	1200	2,970	20.67

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	1.2	2.3	1.9	1.5	e1.8	1.9	15	22	43	1.1	.00
2	6.9	1.0	2.2	4.1	1.4	e1.8	9.1	13	18	33	1.2	.00
3	5.7	1.0	1.8	2.8	1.4	e1.8	81	9.5	13	26	.83	.00
4	5.0	1.1	1.4	2.5	1.5	e1.7	229	5.5	9.0	22	.54	.01
5	4.8	.96	1.9	2.4	1.9	e1.7	328	4.1	6.1	19	.39	.03
6	4.5	.66	1.6	2.3	1.6	1.7	461	3.3	64	e16	2.6	.00
7	4.2	1.1	1.6	2.2	1.5	1.8	138	2.5	1490	e14	3.2	.00
8	3.7	.98	1.6	2.2	1.5	1.8	57	2.3	1660	e13	3.7	.00
9	3.5	.81	1.6	2.1	1.3	1.9	34	2.1	804	e11	2.7	.00
10	3.3	.79	1.6	2.0	1.3	1.9	24	3.1	97	9.9	1.5	.00
11	3.3	.85	1.4	1.8	1.3	2.3	19	3.7	53	9.0	.90	.00
12	3.0	.86	1.3	1.7	1.3	3.6	15	3.8	36	8.6	.48	.00
13	2.8	.78	1.3	1.7	1.4	4.5	13	12	32	7.5	.19	.00
14	2.6	.71	1.3	1.7	1.9	4.0	11	16	25	6.5	.49	.00
15	2.4	.75	1.3	1.6	2.8	7.8	8.8	19	20	5.3	1.1	.00
16	2.3	.93	1.2	1.6	2.5	5.8	7.2	50	32	4.8	.98	.00
17	1.8	.96	1.2	1.6	1.9	4.8	5.4	34	102	4.5	.54	.00
18	1.1	.81	1.2	1.6	2.1	4.4	5.0	22	74	4.1	.19	.00
19	1.0	4.8	1.2	1.6	2.2	3.6	4.9	24	53	3.8	.01	.00
20	.95	3.9	1.1	1.6	2.0	3.2	4.6	17	34	3.2	.00	.00
21	.98	2.0	1.1	1.8	2.0	3.2	4.1	61	395	3.0	.00	.00
22	.97	1.5	1.1	2.0	1.9	2.8	3.8	95	1950	2.7	.00	.00
23	.88	1.3	1.2	2.1	1.6	2.5	3.4	62	2780	2.7	.00	.00
24	.85	4.1	1.3	2.1	1.5	2.4	1.4	28	1200	2.5	.00	.00
25	.98	5.2	1.3	2.1	1.5	24	.82	16	298	2.0	.00	.00
26	1.1	16	1.4	2.0	1.6	5.8	.74	10	339	1.9	.00	.00
27	.92	8.6	1.4	1.9	1.7	2.2	6.6	7.1	407	1.4	.00	.00
28	.94	4.8	1.5	1.8	e1.8	2.2	30	13	140	1.2	.00	.00
29	1.2	3.4	1.6	1.8	---	1.9	28	347	89	1.1	.00	.00
30	1.2	2.7	1.7	1.6	---	1.9	20	93	59	.89	.00	.00
31	1.3	---	2.0	1.6	---	1.9	---	32	---	.90	.00	---
TOTAL	83.57	74.55	45.7	61.8	47.9	112.7	1555.76	1026.0	12301.1	284.49	22.64	0.04
MEAN	2.70	2.49	1.47	1.99	1.71	3.64	51.9	33.1	410	9.18	.73	.001
MAX	9.4	16	2.3	4.1	2.8	24	461	347	2780	43	3.7	.03
MIN	.85	.66	1.1	1.6	1.3	1.7	.74	2.1	6.1	.89	.00	.00
AC-FT	166	148	91	123	95	224	3090	2040	24400	564	45	.08

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1997, BY WATER YEAR (WY)

	MEAN	104	50.0	59.2	81.3	92.4	31.7	153	234	243	122	75.5	250
MAX	788	399	1060	2053	1590	250	2298	1365	3445	2879	1207	5006	
(WY)	1947	1941	1992	1968	1992	1970	1977	1957	1935	1942	1946	1967	
MIN	.048	.21	.19	1.52	1.57	1.51	.57	.000	.000	.89	.000	.001	
(WY)	1989	1989	1989	1996	1990	1996	1996	1996	1989	1971	1954	1997	

SUMMARY STATISTICS FOR 1996 CALENDAR YEAR FOR 1997 WATER YEAR WATER YEARS 1932 - 1997

ANNUAL TOTAL	10574.74	15616.25	
ANNUAL MEAN	28.9	42.8	125
HIGHEST ANNUAL MEAN			472
LOWEST ANNUAL MEAN			2.29
HIGHEST DAILY MEAN	3290	2780	65000
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		2970	121000
INSTANTANEOUS PEAK STAGE		20.67	41.30
ANNUAL RUNOFF (AC-FT)	20970	30970	90400
10 PERCENT EXCEEDS	19	33	94
50 PERCENT EXCEEDS	1.4	2.0	11
90 PERCENT EXCEEDS	.00	.00	.99

e Estimated

## NUECES RIVER MAIN STEM

08210000 NUECES RIVER NEAR THREE RIVERS, TX

**LOCATION.**--Lat 28°25'38", long 98°10'40", Live Oak County, Hydrologic Unit 12110111, on right bank at U.S. Highway 281, 1.0 mi downstream from Frio River, 2.2 mi south of Three Rivers, and at mile 100.2.

**DRAINAGE AREA.**--15,427 mi<sup>2</sup>.

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--July 1915 to current year. Monthly discharge only for November 1919 to January 1920, published in WSP 1312.

**REVISED RECORDS.**--WSP 548: 1920-21. WSP 1562: 1916, 1918-21, 1922(M), 1923, 1929. WDR TX-83-3: Drainage area.

**GAGE.**--Water-stage recorder. Datum of gage is 99.26 ft above sea level. Prior to Apr. 5, 1932, nonrecording gage at railroad bridge 0.8 mi upstream at datum 1.87 ft higher. Apr. 5, 1932, to Aug. 9, 1983, recording gage at a site 0.8 mi upstream at datum 1.87 ft higher.

**REMARKS.**--No estimated daily discharges. Records fair. Since water year 1949, at least 10% of contributing drainage area has been regulated by the Upper Nueces Reservoir. Flow of the Frio River is impounded in Choke Canyon Reservoir (see station 08206900), about 11 mi upstream from this station on the Frio River. Part of flow of the Nueces and Frio Rivers and their headwater tributaries enters the Edwards and associated limestones in the Balcones Fault Zone upstream from U.S. Highway 90. Considerable loss of flow into various permeable formations also occurs downstream from the Balcones Fault Zone. There are many small diversions for irrigation and for municipal supply above this station. Satellite telemeter at station.

**AVERAGE DISCHARGE FOR PERIOD PRIOR TO REGULATION.**--33 years (water years 1916-48) prior to partial regulation by Choke Canyon Reservoir, 945 ft<sup>3</sup>/s (684,500 acre-ft/yr).

**EXTREMES FOR PERIOD PRIOR TO REGULATION (WATER YEARS 1916-48).**--Maximum discharge, 85,000 ft<sup>3</sup>/s Sept. 18, 1919 (gage height, 46.0 ft), site and datum then in use; no flow at times. Maximum stage since about 1875, that of Sept. 23, 1967.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	901	31	117	145	64	43	160	418	607	2040	286	79
2	1000	29	120	145	61	43	182	319	711	2160	280	78
3	716	29	122	147	58	43	299	247	814	2270	263	82
4	158	29	114	285	56	43	1140	172	919	2310	261	84
5	113	29	106	249	54	43	859	143	1030	2260	285	77
6	275	185	106	143	54	42	806	131	1160	2150	255	69
7	455	551	114	123	55	41	1020	126	2260	2050	229	64
8	568	675	122	114	56	41	864	119	3010	2150	220	61
9	660	770	124	103	56	41	666	113	2960	2660	207	60
10	711	890	125	94	56	41	470	122	1460	3510	201	58
11	629	1090	126	89	53	43	733	126	382	4110	188	59
12	364	1310	130	86	53	57	361	167	470	4030	181	65
13	152	1630	136	83	53	87	306	142	622	3630	177	66
14	90	2130	138	80	51	93	290	120	697	3180	168	66
15	67	2400	138	79	47	79	271	113	738	2770	157	66
16	56	2190	133	79	45	81	257	187	772	2310	148	65
17	48	1280	129	79	44	74	244	224	852	1780	140	64
18	42	335	125	82	43	68	235	124	943	968	133	64
19	37	267	121	83	42	101	223	110	997	582	130	63
20	36	234	120	83	41	65	203	132	1050	523	127	62
21	34	212	118	80	40	59	194	182	1390	488	119	63
22	33	192	116	77	39	112	186	232	4990	452	116	65
23	32	178	114	74	39	199	172	234	6210	422	114	65
24	32	174	112	74	39	220	166	150	5290	398	119	80
25	32	233	109	74	39	222	160	113	3770	374	112	66
26	31	157	107	73	39	437	156	98	2620	350	104	61
27	31	153	103	69	41	274	154	120	2390	335	99	56
28	31	149	101	67	43	207	168	152	2110	324	96	55
29	31	136	107	66	---	179	262	230	1930	312	91	54
30	31	124	132	66	---	165	397	491	1940	301	87	67
31	31	---	143	66	---	158	---	438	---	292	80	---
TOTAL	7427	17792	3728	3157	1361	3401	11604	5795	55094	51491	5173	1984
MEAN	240	593	120	102	48.6	110	387	187	1836	1661	167	66.1
MAX	1000	2400	143	285	64	437	1140	491	6210	4110	286	84
MIN	31	29	101	66	39	41	154	98	382	292	80	54
AC-FT	14730	35290	7390	6260	2700	6750	23020	11490	109300	102100	10260	3940

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1946 - 1997, BY WATER YEAR (WY)

	MEAN	1387	446	210	317	353	217	457	1187	1336	669	625	1343
MAX	13810	4944	1801	4833	7868	2285	5082	8645	8451	5723	10550	23650	
(WY)	1972	1977	1977	1958	1958	1949	1977	1957	1987	1971	1971	1967	
MIN	.54	.033	.63	3.61	5.80	6.21	4.30	1.85	8.72	3.05	.026	1.28	
(WY)	1963	1951	1951	1967	1951	1963	1984	1971	1967	1967	1962	1984	

## SUMMARY STATISTICS

## FOR 1996 CALENDAR YEAR

## FOR 1997 WATER YEAR

## WATER YEARS 1946 - 1997

ANNUAL TOTAL	86478	168007	713
ANNUAL MEAN	236	460	2110
HIGHEST ANNUAL MEAN			82.3
LOWEST ANNUAL MEAN			1971
HIGHEST DAILY MEAN	3050	6210	128000
LOWEST DAILY MEAN	29	29	.00
ANNUAL SEVEN-DAY MINIMUM	30	30	.00
INSTANTANEOUS PEAK FLOW		6450	18300
INSTANTANEOUS PEAK STAGE		30.11	37.29
ANNUAL RUNOFF (AC-FT)	171500	333200	516500
10 PERCENT EXCEEDS	561	1290	1520
50 PERCENT EXCEEDS	135	132	84
90 PERCENT EXCEEDS	55	43	5.3

# NUECES RIVER MAIN STEM

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08210000 NUECES RIVER NEAR THREE RIVERS, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: August 1941 to September 1952. Chemical and biochemical analyses: May 1965 to current year. Pesticide analyses: January 1968 to May 1982. Sediment analyses: October 1941 to August 1945, March 1951 to September 1952, October 1974 to August 1994.

### PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: October 1941 to September 1952, October 1974 to September 1981.

WATER TEMPERATURE: October 1950 to September 1952, October 1974 to September 1981.

SUSPENDED-SEDIMENT DISCHARGE: October 1950 to September 1951.

### EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 4,310 microsiemens Jan. 17, 1977; minimum daily, 157 microsiemens May 26, 1975.

WATER TEMPERATURE: Maximum daily, 32.0°C on several days during summers of 1977, 1978, and 1981; minimum daily, 7.0°C Jan. 2, 3, 1979.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (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)	COLI-FORM, FECAL, UM-MF (COLS./100 ML)	STREP-TOCOCCHI, FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CaCO3)
DEC 11...	1110	126	688	8.0	17.0	8.9	93	4.2	33	100	230
APR 01...	1030	155	714	8.0	19.0	--	--	--	130	500	230
JUN 04...	1020	914	356	7.5	27.0	6.4	80	6.4	180	810	110
JUL 23...	1100	423	573	8.0	30.0	6.9	93	1.0	K200	K200	230
AUG 13...	1400	178	593	7.7	30.0	7.5	99	1.1	94	K52	210
SEP 10...	1450	58	691	7.8	30.0	6.8	90	0.9	120	130	180

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	SODIUM PERCENT	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)
DEC 11...	44	71	13	48	1	30	7.2	190	53	74	0.20
APR 01...	46	68	14	45	1	30	4.5	180	55	78	<0.10
JUN 04...	0	38	3.7	25	1	31	8.6	120	14	30	0.13
JUL 23...	40	69	13	26	0.7	20	3.9	190	34	42	0.14
AUG 13...	37	61	14	37	1	27	4.5	170	41	60	0.16
SEP 10...	32	52	12	62	2	41	10	150	52	93	0.26

DATE	SILICA, DIS-SOLVED (MG/L AS SiO2)	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, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS-SOLVED (MG/L AS N)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)
DEC 11...	13	396	0.910	0.030	0.940	0.060	0.54	0.60	0.060	0.040
APR 01...	7.5	386	0.890	0.030	0.920	0.070	0.23	0.30	0.040	0.050
JUN 04...	17	207	0.067	0.010	0.077	0.031	0.63	0.67	0.256	0.217
JUL 23...	13	319	1.23	0.021	1.25	0.024	0.23	0.26	0.058	0.064
AUG 13...	13	336	--	<0.010	0.579	<0.015	--	0.31	0.038	0.040
SEP 10...	15	384	0.118	0.011	0.129	0.082	0.41	0.50	0.041	0.043

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible][illegible]



## 08210500 LAKE CORPUS CHRISTI NEAR MATHIS, TX

**LOCATION.**--Lat 28°02'17", long 97°52'15", San Patricio-Jim Wells County line, Hydrologic Unit 12110111, on right upstream corner of outlet tower at right end of Wesley E. Seale Dam on Nueces River, 0.6 mi upstream from bridge on State Highway 359, and 4.5 mi southwest of Mathis.

**DRAINAGE AREA.**--16,656 mi<sup>2</sup>.

**PERIOD OF RECORD.**--September 1948 to current year. Prior to October 1960, month end records only. The Natural Resources Conservation Service, in cooperation with the Texas Natural Resources Conservation Commission, collected fragmentary gage-height records in connection with sedimentation studies from Feb. 2, 1942, to July 10, 1947.

**REVISED RECORDS.**--WSP 1923: 1953(M), 1957(M).

**GAGE.**--Nonrecording gage read twice daily. Supplemental water-stage recorder operated by city of Corpus Christi. Datum of gage is sea level. Prior to Oct. 1, 1957, nonrecording gage at various sites 0.2 mi upstream at datum 0.52 ft higher. Oct. 1, 1957, to Apr. 3, 1961, nonrecording gage near left end of Mathis Dam 0.2 mi upstream at present datum.

**REMARKS.**--Mathis Dam was completed and storage began July 24, 1934. The original capacity at spillway crest (elevation, 74.5 ft) was 54,000 acre-ft, but by March 1948 had decreased to 39,400 acre-ft because of sedimentation. Wesley E. Seale Dam was completed and deliberate impoundment began on Apr. 26, 1958, submerging the old Mathis Dam. Wesley E. Seale Dam is a rolled earthfill dam, 5,930 ft long, including two spillways. The 1,320-foot north spillway has 33 gates that are operated by movable hydraulic lifts. The 1,080-foot south spillway has 27 gates that are electrically operated from the control tower. The gates were repaired and modified in August 1966. All gates in both spillways are 37.5 by 8.75 ft wide. Water for municipal supply for the city of Corpus Christi is released downstream through a 4.0-foot-diameter cylinder valve and three 2.5- by 4.0-foot rectangular openings. The releases are diverted from the river at Calallen 35 mi downstream for domestic, municipal, irrigation, mining, and industrial uses in the Corpus Christi area. The cities of Alice, Beeville, and Mathis withdrew 7,074 acre-ft from the lake during the current year for municipal use. 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 .....	106.0	-
Top of north spillway gates .....	94.46	-
Top of south spillway gate .....	94.0	241,200
Crest of spillways .....	88.0	137,100
Lowest gated outlet (invert) .....	55.5	-

**COOPERATION.**--Capacity curve 5-C is from a January 1987 survey provided by the city of Corpus Christi. Figures for new capacity curve were used beginning Oct. 1, 1989. Elevation and content records were provided by the city of Corpus Christi.

**EXTREMES (AT 0600 HOURS) FOR PERIOD OF RECORD.**--Maximum daily contents, 320,000 acre-ft Sept. 22, 1967, and Sept. 12, 1971; maximum elevation, 94.82 ft Sept. 22, 1967; minimum daily, 14,740 acre-ft May 5, 1951 (elevation, 67.62 ft).

**EXTREMES (AT 0600 HOURS) FOR CURRENT YEAR.**--Maximum daily contents, 186,300 acre-ft June 24 (elevation, 91.0 ft); minimum daily, 98,310 acre-ft Nov. 8 (elevation, 85.3 ft).

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

80.0	47,250	86.0	107,900	92.0	204,000
82.0	63,030	88.0	137,100	93.0	222,300
84.0	82,870	90.0	169,200	94.0	241,200

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 0600 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	103200	100900	119800	115800	112100	107100	107000	128000	136500	186300	184000	167700
2	104000	100700	119500	115900	111800	106700	107100	128000	136900	186300	184000	166700
3	106600	100100	119100	115800	111600	106400	108400	128000	137500	186300	184000	166300
4	107100	99610	118900	115700	111300	106100	109300	128000	138300	186300	184400	165800
5	107200	99350	118700	115700	111000	105700	117100	128200	138900	186300	184500	165700
6	107900	98960	118400	116200	110700	105500	119400	128200	140200	186300	184200	165200
7	107900	98570	118200	116200	110700	105100	121400	128000	142500	186300	183800	164300
8	107900	98310	118100	116400	110700	104700	122300	127400	145500	186300	183300	163700
9	108200	98960	117900	116500	110700	104400	123300	127400	148000	186300	183000	163200
10	108500	100100	117800	116400	110600	104100	124300	127600	153200	186300	182800	162700
11	108800	101800	117500	116400	110600	103800	125100	128300	157600	186300	182500	162200
12	109000	103300	117500	116400	110600	104500	126500	129200	158400	186300	181800	162000
13	109300	104900	117400	116400	110600	105200	127300	129400	158400	186300	181100	161500
14	109300	107200	117200	116400	110400	105100	127300	129700	159100	186300	180600	161000
15	108900	110300	116900	116200	110400	104800	127000	129800	159200	186300	179900	160500
16	108600	113500	116900	115700	110200	104800	127000	132200	159700	186300	179200	159700
17	108200	118200	117800	115400	110000	104800	127000	132700	160200	186300	178700	158900
18	107900	119700	117800	115100	109700	104800	127000	133600	161700	186300	178000	158300
19	107700	120700	117800	114800	109700	104800	127600	134000	164800	186300	177300	157600
20	107400	120700	117800	114500	109600	105300	128000	134300	167800	186300	176400	157000
21	106700	120800	117800	114700	109600	105900	128200	134900	169700	186300	175600	156500
22	105900	120800	117700	114800	109300	105700	128200	135200	173400	186300	174900	156500
23	105200	120700	117500	114700	109300	105900	128200	135200	181400	185700	174200	156800
24	104500	120200	117200	114500	108800	105500	128000	135600	186300	185400	173400	157300
25	104100	120000	117100	114500	108500	105300	127700	135900	186300	185200	173000	157400
26	103600	120000	117100	114200	107900	106100	127700	135900	186300	185200	172500	157300
27	103200	120200	116900	114100	107500	106600	127900	135900	186300	184900	172000	156500
28	102600	120000	116700	114000	107400	106600	127900	136000	186300	184900	170900	155700
29	101800	120000	116500	113800	---	106700	127900	135900	186300	184500	170000	154800
30	101600	119800	116200	113400	---	106800	127700	135700	186300	184000	169500	153600
31	101200	---	115900	112700	---	106800	---	136000	---	184000	168000	---
MAX	109300	120800	119800	116500	112100	107100	128200	136000	186300	186300	184500	167700
MIN	101200	98310	115900	112700	107400	103800	107000	127400	136500	184000	168000	153600
(+)	85.5	86.8	86.6	86.3	86.0	85.9	87.4	87.9	91.0	90.9	89.9	89.1
(@)	-1300	+18600	-3900	-3200	-5300	-600	+20900	+8300	+50300	-2300	-16000	-14400

CAL YR 1996 MAX 129800 MIN 68340 (@) -14500  
WTR YR 1997 MAX 186300 MIN 98310 (@) +51100

(+) Elevation, in feet, at end of month.  
(@) Change in contents, in acre-feet.

**LOCATION.**--Lat 28°02'17", long 97°51'36", San Patricio-Jim Wells County line, Hydrologic Unit 12110111, at downstream side of bridge on State Highway 359. 0.6 mi downstream from Wesley E. Seale Dam. 4 mi southwest of Mathis. and at mile 46.7.

**DRAINAGE AREA.**--16,660 mi<sup>2</sup>, of which 16,656 mi<sup>2</sup> is above Wesley E. Seale Dam.

**PERIOD OF RECORD.**--August 1939 to current year.

Water-quality records.--Chemical analyses: October 1947 to September 1991. Specific conductance: October 1947 to September 1991. Water temperature: October 1947 to September 1991.

**GAGE.**--Water-stage recorder. Datum of gage is 26.53 ft above sea level. Aug. 5, 1939, to Aug. 29, 1984, on left bank 9 ft upstream at datum 1.0 ft higher. Aug. 29 to Nov. 5, 1984, on left bank 9 ft upstream at present datum. Nov. 5, 1984, to Aug. 5, 1987, on left bank 154 ft downstream at present datum.

**REMARKS.**--Records fair. Since installation of gage in water year 1939, at least 10% of contributing drainage area has been regulated by Lake Corpus Christi (station 08210500) 0.6 mi upstream. Upstream from Lake Corpus Christi, flow is affected by recharge to permeable formations, small diversions, and minor regulation. Water for municipal and industrial uses at Corpus Christi is released from Lake Corpus Christi above gage and is diverted from river at Calallen 34 mi downstream. Rain gage at station. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--A stage of about 41 ft, present datum, occurred Sept. 20, 1919, from information by Texas and New Orleans Railroad Co. and is the second highest known. Maximum stage since at least 1888, that of Sept. 24, 1967.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	182	144	129	111	167	113	93	195	125	1700	151	207
2	172	132	136	110	154	109	97	99	167	1670	154	199
3	146	123	148	111	123	115	80	90	186	1660	155	183
4	145	94	154	111	122	116	76	113	206	1660	156	172
5	117	92	146	111	122	112	80	111	196	1690	149	161
6	80	93	163	102	117	107	77	120	160	1690	149	161
7	121	96	162	90	105	106	93	145	109	1640	149	156
8	174	117	135	92	96	102	115	145	151	1610	150	156
9	346	130	133	93	95	121	120	133	168	1800	153	163
10	370	135	124	93	95	121	121	79	152	2530	154	165
11	393	146	106	92	94	119	103	103	142	3310	163	187
12	393	165	99	90	95	73	106	111	142	3880	176	210
13	283	178	97	87	95	92	123	100	140	3710	177	198
14	154	172	97	99	94	106	133	e99	137	3600	195	191
15	152	154	98	126	94	96	134	e128	160	3280	184	224
16	152	141	96	145	94	104	135	e150	188	2010	177	224
17	151	117	96	167	94	86	140	e160	184	1470	208	211
18	147	95	96	147	103	104	123	e188	180	582	200	198
19	141	95	96	104	116	80	101	e157	159	432	199	196
20	142	95	97	89	122	108	116	e120	131	360	205	195
21	141	121	97	130	122	117	135	100	142	311	195	190
22	141	167	98	99	126	116	144	93	344	178	207	169
23	140	161	100	149	113	106	142	98	3220	155	203	157
24	140	147	107	111	156	126	131	75	6990	155	217	155
25	140	237	113	112	281	218	129	75	4890	155	215	212
26	237	276	125	110	147	311	124	93	3270	151	206	328
27	250	210	248	112	204	312	135	114	2280	143	258	354
28	250	213	253	210	133	196	310	132	2090	143	346	355
29	182	128	251	287	---	128	207	138	1840	137	434	315
30	149	125	151	194	---	108	247	127	1750	145	463	144
31	149	---	114	118	---	117	---	112	---	153	218	---
TOTAL	5880	4299	4065	3802	3479	3945	3870	3703	29999	42110	6366	6136
MEAN	190	143	131	123	124	127	129	119	1000	1358	205	205
MAX	393	276	253	287	281	312	310	195	6990	3880	463	355
MIN	80	92	96	87	94	73	76	75	109	137	149	144
AC-FT	11660	8530	8060	7540	6900	7820	7680	7340	59500	83530	12630	12170

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997#, BY WATER YEAR (WY)

MEAN	1263	429	200	301	336	286	442	1242	1323	846	532	1524
MAX	14850	4552	1871	4994	5165	4377	4639	10500	8204	10440	10050	24950
(WY)	1972	1977	1977	1958	1958	1958	1977	1941	1987	1942	1971	1967
MIN	55.3	31.0	27.9	28.1	24.3	31.0	37.3	39.3	43.7	67.0	41.6	44.0
(WY)	1953	1940	1940	1940	1942	1948	1948	1948	1948	1951	1943	1945

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1939 - 1997#
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ANNUAL TOTAL	58523		117654			
ANNUAL MEAN	160		322		729	1967
HIGHEST ANNUAL MEAN					2167	1967
LOWEST ANNUAL MEAN					104	1964
HIGHEST DAILY MEAN	393	Oct 11	6990	Jun 24	125000	Sep 25 1967
LOWEST DAILY MEAN	40	Aug 23	73	Mar 12	6.8	Aug 15 1940
ANNUAL SEVEN-DAY MINIMUM	81	Aug 22	85	Apr 1	15	Aug 9 1940
INSTANTANEOUS PEAK FLOW			7400	Jun 24	138000	Sep 24 1967
INSTANTANEOUS PEAK STAGE			25.85	Jun 24	48.70	Sep 24 1967
ANNUAL RUNOFF (AC-FT)	116100		233400		528000	
10 PERCENT EXCEEDS	236		346		1280	
50 PERCENT EXCEEDS	146		143		129	
90 PERCENT EXCEEDS	108		95		52	

e Estimated

# Period of regulated streamflow.

# NUECES RIVER MAIN STEM

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08211200 NUECES RIVER AT BLUNTZER, TX

**LOCATION.**--Lat 27°56'15", long 97°46'32", Nueces County, Hydrologic Unit 12110111, on right bank, at downstream end of bridge on Farm Road 666, 1.2 mi south of San Patricio, 5.5 mi upstream from Cayamon Creek, and 10.3 mi northwest of Calallen.

**DRAINAGE AREA.**--16,772 mi<sup>2</sup>.

**PERIOD OF RECORD.**--January 1966 to February 1967, March 1992 to current year (operated as a low-flow station only). Prior to October 1994, published as "above Calallen".

**GAGE.**--Water-stage recorder. Datum of gage is sea level. Prior to Mar. 27, 1992, at same site at datum 6.04 ft higher.

**REMARKS.**--Records good. Daily discharges are published only for days when instantaneous maximum discharge does not exceed 2,950 ft<sup>3</sup>/s. Since installation of gage in January 1966, at least 10% of contributing drainage area has been regulated by Lake Corpus Christi (station 08210500). Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum gage height, 27.18 ft Mar. 29, 1992, at 1500 hours; minimum daily discharge, 83 ft<sup>3</sup>/s Feb. 7-9, 1966.

**EXTREMES FOR CURRENT YEAR.**--Maximum gage height, 25.39 ft June 25 at 0700 hours; minimum daily discharge, 102 ft<sup>3</sup>/s Oct. 7, Jan. 11.

DISCHARGE, CUBIC FEET PER					SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997							
					DAILY MEAN VALUES							
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	144	167	134	e160	142	154	141	273	125	1900	193	195
2	163	161	131	e140	181	126	122	232	133	1820	191	174
3	163	152	133	e140	153	125	144	154	165	1770	194	164
4	152	139	145	e135	139	125	142	132	182	1750	196	156
5	150	115	151	e135	134	125	131	141	195	1750	195	148
6	123	109	150	e125	135	122	112	138	192	1770	190	140
7	102	106	171	e110	132	123	113	141	171	1760	187	137
8	117	106	160	e107	122	120	118	164	138	1700	184	135
9	185	116	146	e107	118	121	136	167	160	1700	183	132
10	271	123	141	104	117	125	137	172	172	2220	183	133
11	322	126	127	102	117	131	133	141	165	---	183	134
12	346	136	116	104	117	130	124	149	157	---	188	146
13	347	152	112	104	117	108	123	150	154	---	190	155
14	249	161	109	105	117	116	134	146	144	---	195	149
15	183	161	115	112	117	120	139	150	140	---	201	153
16	169	158	118	122	117	119	139	215	154	---	190	163
17	163	148	112	141	117	125	140	244	178	2060	193	166
18	160	127	112	152	117	116	146	277	191	1390	204	163
19	155	111	112	134	120	139	133	162	184	782	200	158
20	151	106	109	116	128	118	119	121	169	514	198	157
21	150	105	109	112	126	132	132	120	151	417	200	158
22	148	125	109	119	128	135	142	135	389	331	197	159
23	149	156	123	139	127	130	146	145	1090	246	200	156
24	150	157	135	132	125	129	145	159	---	220	201	150
25	151	159	135	124	186	151	142	125	---	213	207	147
26	223	230	217	125	229	246	139	112	---	209	211	199
27	230	253	264	125	181	301	135	113	---	204	208	247
28	228	209	341	131	188	296	182	135	2500	199	257	270
29	239	205	338	225	---	216	287	147	2240	197	295	273
30	196	148	326	263	---	151	226	145	2030	188	353	224
31	172	---	215	181	---	143	---	136	---	190	299	---
TOTAL	5851	4427	4916	4131	3847	4518	4302	4941	---	---	6466	5041
MEAN	189	148	159	133	137	146	143	159	---	---	209	168
MAX	347	253	341	263	229	301	287	277	---	---	353	273
MIN	102	105	109	102	117	108	112	112	---	---	183	132
AC-FT	11610	8780	9750	8190	7630	8960	8530	9800	---	---	12830	10000

e Estimated

## NUECES RIVER MAIN STEM

08211500 NUECES RIVER AT CALALLEN, TX

**LOCATION.**--Lat 27°52'34", long 97°37'32", Nueces County, Hydrologic Unit 12110111, at the Cunningham pumping station in Corpus Christi, 0.4 mi upstream from Calallen Dam, 0.5 mi northwest of Calallen, about 1.4 mi upstream from bridge on Interstate Highway 37, about 1.5 mi upstream from Missouri-Pacific Railroad bridge, and about 8 mi upstream from Nueces Bay.

**DRAINAGE AREA.**--16,920 mi<sup>2</sup>.

**PERIOD OF RECORD.**--October 1989 to current year (low flow). Maximum annual gage height and discharge were published at this site from October 1983 to September 1989. Gage-height records collected from April 1920 to July 1950 were not published but are filed in the District Office in Austin. Records collected from August 1915 to September 1918 (referenced in WSP 1312) are unreliable and should not be used.

**GAGE.**--Water-stage recorder and concrete control. Datum of gage is 0.84 ft above sea level. From Aug. 12, 1915, to Mar. 31, 1919, and Apr. 1, 1920, to July 31, 1950, nonrecording gage at same site and datum.

**REMARKS.**--No estimated daily discharges. Records fair. Daily discharges are published only for days when instantaneous maximum discharge does not exceed 2,570 ft<sup>3</sup>/s. Since installation of gage in water year 1990, at least 10% of contributing drainage area has been regulated by Lake Corpus Christi (station 08210500). There are numerous diversions above station for agricultural, municipal, and industrial supply. The cities of Corpus Christi, San Patricio, Robstown, and the Nueces River Water Control and Improvement District No. 3 have a combined withdrawal capacity of 205,500 gallons/minute. Satellite telemeter at station.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum discharge, 3,780 ft<sup>3</sup>/s June 11, 1987 (gage height, 9.25 ft), from extension of rating above 2,500 ft<sup>3</sup>/s; no flow at times.

**EXTREMES FOR CURRENT YEAR.**--Maximum discharge, 2,350 ft<sup>3</sup>/s June 26 at 1800 hours (gage height, 7.76 ft); no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	13	2.2	4.0	9.0	33	3.7	64	.00	1500	.00	38
2	.00	19	.00	5.6	14	17	.00	62	.00	1430	.01	18
3	.00	15	.00	3.3	29	4.4	84	26	.00	1400	14	8.8
4	.00	3.2	.00	3.8	9.0	.00	19	.94	.00	1390	11	6.2
5	3.5	.00	.70	9.2	14	.00	8.7	.00	.00	1370	9.1	6.5
6	.00	.00	15	6.9	12	.00	8.3	.00	.00	1400	2.5	.00
7	.00	.00	23	6.4	11	.00	.00	.00	7.8	1370	.00	7.2
8	.00	.00	21	3.0	15	.00	.00	.00	2.1	1360	.00	.49
9	.00	.00	8.8	.57	13	.00	.00	.00	.00	1350	.01	.00
10	11	.00	14	.00	3.3	.00	.00	2.9	.46	1420	1.2	.00
11	81	.00	16	.00	.00	.00	.00	12	1.3	1590	.00	.00
12	165	.00	13	.00	.00	6.6	.00	9.8	.00	1750	.00	.00
13	127	.00	.00	.00	.00	2.4	.00	7.8	.00	1940	.00	.00
14	58	.00	.00	.00	.00	.00	.00	1.6	.00	2120	.00	.00
15	35	.00	.00	.00	.00	.00	.00	.51	.00	2170	.00	.00
16	16	5.3	.50	.00	.00	.00	.00	26	.00	2170	.00	.00
17	4.4	17	.00	.00	.00	.00	.00	119	.00	1950	.00	.00
18	9.2	.73	.00	.00	.00	.00	.00	89	.00	1560	.00	.00
19	6.1	.00	.00	.00	.00	.00	.00	40	.86	987	.00	.00
20	3.0	.00	.00	.00	.00	.00	.00	1.4	11	582	.00	.00
21	2.0	.00	.00	.00	.00	.00	.00	.00	.38	397	.00	.00
22	.72	.00	.00	.00	.00	.00	.00	.00	397	256	.00	24
23	4.6	.00	.00	.00	.00	.00	.00	5.5	750	76	.00	16
24	3.5	.09	.00	7.6	.00	.00	.00	24	1400	40	.00	13
25	21	.18	.00	7.1	9.3	.00	.00	11	1910	27	4.1	14
26	13	17	.02	4.0	67	22	.00	2.2	2320	20	6.8	26
27	36	75	7.3	4.3	61	99	.00	.00	2260	17	14	92
28	53	59	60	.89	47	151	.00	.00	2010	13	16	123
29	46	46	69	30	---	67	54	.00	1770	10	64	154
30	31	24	61	112	---	21	41	.00	1600	.00	170	83
31	5.9	---	50	61	---	25	---	.00	---	.00	181	---
TOTAL	735.92	294.50	361.52	269.66	313.60	448.40	218.70	505.65	14440.90	31665.00	493.72	630.19
MEAN	23.7	9.82	11.7	8.70	11.2	14.5	7.29	16.3	481	1021	15.9	21.0
MAX	165	75	69	112	67	151	84	119	2320	2170	181	154
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	1460	584	717	535	622	889	434	1000	28640	62810	979	1250

CAL YR 1996 TOTAL 3239.40 MEAN 8.85 MAX 171 MIN .00 AC-FT 6430  
WTR YR 1997 TOTAL 50377.76 MEAN 138 MAX 2320 MIN .00 AC-FT 99920



## OSO CREEK MAIN STEM

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08211520 OSO CREEK AT CORPUS CHRISTI, TX

**LOCATION.**--Lat 27°42'40", long 97°30'06", Nueces County, Hydrologic Unit 12110202, on left downstream end of bridge on Farm Road 763, 1.5 mi south of intersection of Farm Roads 763 and 665, 1.6 mi downstream from mouth of West Oso Creek, and 1.9 mi southwest of intersection of Farm Road 665 and State Highway 357.

**DRAINAGE AREA.**--90.3 mi<sup>2</sup>.

**PERIOD OF RECORD.**--September 1972 to current year.

Water-quality records.--Chemical and biochemical analyses: July 1972 to August 1988. Pesticide analyses: July 1972 to July 1981.

**GAGE.**--Water-stage recorder. Datum of gage is 1.91 ft below sea level.

**REMARKS.**--No estimated daily discharges. Records good. No known regulation or diversions. An undetermined amount of water from oil-field operations enters the stream upstream from station at various points. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--A stage of 24.5 ft occurred in May 1968, from information by local resident.

**PEAK DISCHARGES FOR CURRENT YEAR.**--Peak discharges greater than base discharge of 1,000 ft<sup>3</sup>/s:

Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)	Date	Time	Discharge (ft <sup>3</sup> /s)	Gage height (ft)
Apr. 3	0700	4,730	25.82				

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	1.9	2.1	2.0	1.5	1.9	2.1	3.5	2.4	1.1	1.1	1.3
2	2.3	1.8	2.0	2.2	1.5	1.7	18	3.5	2.4	1.1	1.4	1.2
3	2.1	1.8	2.1	2.7	1.6	1.7	3560	3.5	2.3	1.2	1.2	1.1
4	2.7	1.8	2.0	2.4	1.6	1.6	1210	3.3	2.4	1.2	1.1	1.1
5	9.8	1.8	2.2	2.1	1.6	1.5	257	3.3	2.5	1.2	1.0	1.2
6	9.4	1.9	2.1	1.9	1.6	1.5	82	3.3	2.4	1.2	1.0	1.3
7	5.1	1.9	2.0	1.7	1.5	1.5	32	3.2	171	1.2	.97	1.3
8	3.0	1.8	1.9	1.7	1.5	1.6	20	3.3	73	1.2	.98	1.1
9	2.3	1.8	1.9	1.7	1.5	1.6	14	10	5.6	1.2	.97	1.1
10	2.1	1.8	1.8	1.8	1.9	1.7	9.7	47	3.5	1.2	.98	1.1
11	2.1	1.8	1.8	1.7	1.9	4.4	7.8	80	2.6	1.1	1.0	1.1
12	2.1	2.0	1.8	1.6	1.9	20	6.0	27	2.1	1.1	1.0	1.0
13	2.0	2.0	1.8	1.4	1.8	38	5.2	11	1.8	1.2	.98	.97
14	2.1	2.0	1.8	1.5	2.0	8.6	4.7	5.6	1.6	1.2	.98	.98
15	2.1	2.0	1.9	1.6	1.9	3.2	4.4	4.2	1.6	1.3	1.0	.98
16	2.3	2.1	2.0	1.7	1.7	15	4.2	21	1.5	1.2	1.1	1.0
17	2.3	2.1	2.9	1.8	1.6	35	4.2	64	1.8	1.2	1.0	1.0
18	2.1	2.1	3.0	1.7	1.6	50	4.3	48	2.3	1.2	1.1	1.1
19	1.9	2.2	2.4	1.5	1.6	78	4.2	33	2.1	1.1	1.1	1.1
20	2.0	2.1	2.2	1.8	1.8	29	4.3	11	2.4	1.1	.89	1.0
21	2.1	2.0	2.0	2.2	1.8	8.6	4.5	12	2.0	1.2	.93	1.8
22	1.9	1.9	1.9	1.9	1.8	4.1	4.5	14	1.7	1.2	1.2	16
23	1.9	1.9	1.9	1.8	1.6	2.9	4.1	9.1	1.6	1.1	1.1	13
24	2.0	3.0	1.8	1.7	1.8	2.4	4.1	9.6	1.5	1.1	1.3	26
25	2.1	2.5	1.7	1.7	2.0	2.1	3.9	17	1.5	1.1	1.4	4.4
26	2.1	4.2	1.8	1.6	2.0	2.0	3.8	7.0	1.4	1.1	1.1	3.3
27	2.0	3.6	1.8	1.6	2.0	1.9	3.7	4.1	1.3	1.1	1.1	2.6
28	2.0	2.7	1.7	1.6	1.9	1.9	3.6	3.4	1.3	1.1	1.1	2.3
29	2.0	2.4	1.7	1.6	---	1.9	3.5	3.0	1.2	1.0	1.1	2.0
30	2.3	2.3	1.7	1.5	---	1.8	3.5	2.8	1.2	1.1	1.0	1.9
31	2.1	---	1.9	1.5	---	1.8	---	2.6	---	1.1	1.0	---
TOTAL	85.0	65.2	61.6	55.2	48.5	328.9	5293.3	473.3	302.0	35.7	33.18	95.33
MEAN	2.74	2.17	1.99	1.78	1.73	10.6	176	15.3	10.1	1.15	1.07	3.18
MAX	9.8	4.2	3.0	2.7	2.0	78	3560	80	171	1.3	1.4	26
MIN	1.9	1.8	1.7	1.4	1.5	1.5	2.1	2.6	1.2	1.0	.89	.97
AC-FT	169	129	122	109	96	652	10500	939	599	71	66	189

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1972 - 1997, BY WATER YEAR (WY)

	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996	1997	
MEAN	50.5	20.6	15.5	13.1	21.7	17.5	22.5	33.7	57.3	24.7	23.8	45.6															
MAX	355	119	181	130	238	128	176	185	379	339	454	228															
(WY)	1974	1982	1992	1984	1982	1995	1997	1993	1993	1976	1980	1979															
MIN	1.26	1.40	1.27	1.53	1.29	.89	1.05	1.71	1.28	.86	1.07	1.91															
(WY)	1991	1994	1991	1993	1975	1988	1975	1978	1980	1996	1997	1986															

## SUMMARY STATISTICS

FOR 1996 CALENDAR YEAR

FOR 1997 WATER YEAR

WATER YEARS 1972 - 1997

ANNUAL TOTAL	2106.74	6877.21	
ANNUAL MEAN	5.76	18.8	28.9
HIGHEST ANNUAL MEAN			54.3
LOWEST ANNUAL MEAN			3.03
HIGHEST DAILY MEAN	364	Aug 25	6160
LOWEST DAILY MEAN	.68	Aug 6	.27
ANNUAL SEVEN-DAY MINIMUM	.71	Aug 2	.35
INSTANTANEOUS PEAK FLOW			
INSTANTANEOUS PEAK STAGE			
ANNUAL RUNOFF (AC-FT)	4180	13640	20900
10 PERCENT EXCEEDS	4.4	9.5	20
50 PERCENT EXCEEDS	1.8	1.9	2.4
90 PERCENT EXCEEDS	.86	1.1	1.2



## RIO GRANDE MAIN STEM

08364000 RIO GRANDE AT EL PASO, TX  
(National Stream-Quality Accounting Network  
and National Water-Quality Assessment Program Station)

**LOCATION.**--Lat 31°48'10", long 106°32'25", El Paso County, Hydrologic Unit 13030102, at gaging station on the downstream side of the Courchesne Bridge, 5.6 mi upstream from the Santa Fe Street-Juarez Avenue bridge between El Paso, Tx., and Cd. Juarez, Chihuahua, at mile 1,249, and 1.7 mi upstream from the American Dam.

**DRAINAGE AREA.**--29,267 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Chemical analyses: February 1930 to current year.

**REMARKS.**--Records of specific conductance and discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT									
10...	0810	308	1610	7.9	19.5	310	110	88	23
17...	0810	292	1940	8.0	17.0	390	150	110	27
31...	0830	219	2180	8.1	13.0	450	210	130	30
NOV									
20...	0805	123	3000	8.2	11.5	520	260	150	35
21...	0805	123	3000	8.0	11.5	490	240	140	35
DEC									
12...	0815	87	2850	8.1	10.0	480	230	140	32
16...	0950	82	2600	8.1	2.5	480	230	140	31
JAN									
16...	0825	84	2320	8.0	3.5	450	200	130	30
FEB									
20...	0825	351	1200	7.7	10.0	250	68	73	17
MAR									
20...	0810	1210	948	7.8	15.0	210	56	60	14
APR									
17...	0810	667	1120	7.8	16.0	260	81	76	17
JUL									
17...	0800	1130	1050	7.6	25.0	230	73	68	15
SEP									
25...	0815	505	1090	8.4	19.5	230	67	68	14

DATE	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 SIO2)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT									
10...	200	5	10	210	340	160	0.70	25	971
17...	260	6	11	230	400	210	0.70	24	1180
31...	300	6	11	240	440	290	0.70	26	1370
NOV									
20...	470	9	15	260	580	610	0.70	26	2040
21...	470	9	11	260	580	470	0.80	27	1890
DEC									
12...	430	9	13	250	530	410	0.80	24	1730
16...	410	8	11	250	500	370	0.80	26	1640
JAN									
16...	330	7	9.9	250	460	320	0.80	28	1460
FEB									
20...	140	4	8.1	180	200	150	0.80	15	714
MAR									
20...	110	3	6.2	150	150	86	0.60	14	532
APR									
17...	140	4	7.4	180	220	110	0.77	16	687
JUL									
17...	126	4	7.1	160	200	88	0.68	14	613
SEP									
25...	114	3	6.2	160	220	97	0.65	20	634

# RIO GRANDE MAIN STEM

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08364000 RIO GRANDE AT EL PASO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	TUR- BID- ITY (NTU) (00076)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED SATUR- ATION (00301)	HARD- NESS TOTAL (MG/L AS CACO3) (00900)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)
OCT 1996												
23...	0815	214	2000	8.6	2.0	9.5	4.2	663	9.0	91	390	--
NOV												
19...	0815	145	2660	8.3	10.0	11.0	8.4	667	9.2	96	480	220
DEC												
12...	0900	94	2810	8.5	5.0	10.0	16	670	9.1	93	480	220
JAN 1997												
29...	1350	335	1360	8.6	15.0	8.5	15	669	11.0	108	270	87
29...	1400	335	1360	8.6	15.5	8.5	15	669	11.0	108	290	110
FEB												
13...	0945	72	1880	8.6	9.5	8.5	8.0	661	9.4	93	350	100
MAR												
11...	1115	833	900	8.3	23.0	13.5	170	668	8.2	90	190	39
APR												
23...	0930	692	1060	8.5	17.5	16.0	35	662	7.8	92	240	63
MAY												
22...	1030	660	1100	8.4	21.0	20.0	44	668	6.8	86	210	26
JUN												
25...	0945	936	1010	8.5	25.0	22.5	43	665	6.7	89	210	39
JUL												
31...	0945	1410	933	8.5	21.5	25.0	48	667	6.0	84	200	37
AUG												
19...	0900	1120	957	8.0	24.0	25.0	47	670	6.3	87	200	35
SEP												
10...	0900	844	1040	8.6	22.5	23.5	28	667	6.0	81	230	60

DATE	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	ALKA- LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LINITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)
OCT 1996											
23...	110	27	270	6	9.4	--	--	--	--	440	260
NOV											
19...	140	32	400	8	12	321	0	263	--	540	400
DEC											
12...	140	31	410	8	11	299	8	258	--	570	430
JAN 1997											
29...	79	17	150	4	7.5	211	5	181	--	230	180
29...	86	18	160	4	7.6	211	5	181	187	230	180
FEB											
13...	100	24	250	6	11	286	8	248	--	400	220
MAR											
11...	55	12	93	3	6.0	181	0	149	--	150	94
APR											
23...	70	16	128	4	8.1	206	5	177	--	210	98
MAY											
22...	61	14	113	3	6.8	199	12	182	--	210	100
JUN											
25...	62	14	108	3	6.5	211	1	174	--	190	86
JUL											
31...	59	13	99	3	6.4	194	4	165	--	180	77
AUG											
19...	58	13	97	3	6.0	191	4	163	--	170	76
SEP											
10...	68	16	118	3	6.8	205	4	175	--	200	87

## RIO GRANDE MAIN STEM

08364000 RIO GRANDE AT EL PASO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS SiO2) (00955)	SOLIDS, RESIDUE AT 180 DEG. C DIS- SOLVED (MG/L) (70300)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L) (70301)	NITRO- GEN, NITRATE DIS- SOLVED (MG/L AS N) (00618)	NITRO- GEN, NITRITE DIS- SOLVED (MG/L AS N) (00613)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N) (00631)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N) (00608)	NITRO- GEN, ORGANIC DIS- SOLVED (MG/L AS N) (00607)	NITRO- GEN,AM- MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO- GEN,AM- MONIA + ORGANIC DIS. (MG/L AS N) (00623)
OCT 1996											
23...	0.70	24	1330	--	0.790	0.050	0.840	0.080	0.22	0.30	0.30
NOV											
19...	0.80	24	1740	1710	1.06	0.040	1.10	0.070	0.23	0.60	0.30
DEC											
12...	0.70	22	1870	1780	0.850	0.040	0.890	0.120	0.28	0.60	0.40
JAN 1997											
29...	0.80	14	840	791	0.480	0.040	0.520	<0.015	--	0.80	0.30
29...	0.80	15	836	810	0.480	0.050	0.530	0.020	--	0.80	--
FEB											
13...	0.80	22	1240	1180	1.02	0.080	1.10	0.210	0.29	0.70	0.50
MAR											
11...	0.70	12	549	514	0.210	0.010	0.220	<0.015	--	1.5	0.30
APR											
23...	0.69	14	654	652	--	<0.010	0.221	0.023	0.20	0.62	0.22
MAY											
22...	0.68	12	664	633	0.271	0.011	0.282	<0.015	--	0.69	0.25
JUN											
25...	0.74	11	631	587	--	<0.010	0.166	<0.015	--	0.65	<0.20
JUL											
31...	0.64	12	588	547	0.341	0.012	0.353	0.017	0.20	0.89	0.21
AUG											
19...	0.67	13	585	535	0.246	0.012	0.258	<0.015	--	0.66	<0.20
SEP											
10...	0.70	15	656	621	--	<0.010	0.119	<0.015	--	0.92	0.22
DATE	PHOS- PHORUS TOTAL (MG/L AS P) (00665)	PHOS- PHORUS DIS- SOLVED (MG/L AS P) (00666)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P) (00671)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C) (00689)	ALUM- INUM, DIS- SOLVED (UG/L AS AL) (01106)	ANTI- MONY, DIS- SOLVED (UG/L AS SB) (01095)	ARSENIC DIS- SOLVED (UG/L AS AS) (01000)	BARIUM, DIS- SOLVED (UG/L AS BA) (01005)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE) (01010)	BORON, DIS- SOLVED (UG/L AS B) (01020)
OCT 1996											
23...	0.100	0.060	0.080	3.2	0.60	3.0	<1.0	4	101	<1.0	309
NOV											
19...	0.190	0.140	0.130	3.7	0.60	3.0	<2.0	3	84	<2.0	422
DEC											
12...	0.220	0.140	0.130	<3.6	0.70	3.0	<2.0	3	75	<2.0	429
JAN 1997											
29...	0.220	0.090	0.090	3.6	1.8	5.0	<1.0	2	61	<1.0	198
29...	0.200	0.120	0.100	--	--	<5.0	--	3	61	--	--
FEB											
13...	0.320	0.260	0.260	3.8	0.50	2.0	<1.0	5	87	<1.0	330
MAR											
11...	0.510	0.030	0.040	3.5	3.0	1.0	<1.0	2	60	<1.0	130
APR											
23...	0.162	0.040	0.042	3.5	1.7	1.3	<1.0	4	68	<1.0	194
MAY											
22...	0.183	0.040	0.039	3.5	2.1	1.8	<1.0	3	63	<1.0	169
JUN											
25...	0.194	<0.010	0.017	5.7	2.0	3.6	<1.0	3	72	<1.0	169
JUL											
31...	0.222	0.033	0.031	3.4	2.0	3.6	<1.0	3	72	<1.0	158
AUG											
19...	0.195	0.019	0.039	3.0	2.2	2.5	<1.0	3	71	<1.0	154
SEP											
10...	0.201	0.023	0.010	3.3	1.6	2.8	<1.0	3	76	<1.0	193

# RIO GRANDE MAIN STEM

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08364000 RIO GRANDE AT EL PASO, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	CADMIUM DIS- SOLVED (UG/L AS CD) (01025)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR) (01030)	COBALT, DIS- SOLVED (UG/L AS CO) (01035)	COPPER, DIS- SOLVED (UG/L AS CU) (01040)	IRON, DIS- SOLVED (UG/L AS FE) (01046)	LEAD, DIS- SOLVED (UG/L AS PB) (01049)	LITHIUM DIS- SOLVED (UG/L AS LI) (01130)	MANGA- NESE, DIS- SOLVED (UG/L AS MN) (01056)	MERCURY DIS- SOLVED (UG/L AS HG) (71890)	MOLYB- DENUM, DIS- SOLVED (UG/L AS MO) (01060)	NICKEL, DIS- SOLVED (UG/L AS NI) (01065)
OCT 1996											
23...	<1.0	2.0	<1.0	2.0	15	<1.0	170	39	--	12	3.0
NOV											
19...	<2.0	<2.0	<2.0	<2.0	<9.0	<2.0	220	87	--	14	<2.0
DEC											
12...	<2.0	2.0	<2.0	<2.0	<9.0	<2.0	230	126	--	14	<2.0
JAN 1997											
29...	<1.0	2.0	<1.0	1.0	<3.0	<1.0	110	22	--	9.0	1.0
29...	<1.0	<1.0	<3.0	<1.0	<3.0	<1.0	110	26	<0.1	<10	<1.0
FEB											
13...	<1.0	<1.0	<1.0	1.0	<3.0	<1.0	160	82	--	12	<1.0
MAR											
11...	<1.0	2.0	<1.0	1.0	<3.0	<1.0	74	3.0	--	7.0	1.0
APR											
23...	<1.0	1.8	<1.0	<1.0	<3.0	<1.0	100	2.6	--	8.7	<1.0
MAY											
22...	<1.0	2.8	<1.0	<1.0	<3.0	<1.0	87	2.1	--	8.7	1.2
JUN											
25...	<1.0	1.2	<1.0	1.5	<3.0	<1.0	89	1.4	--	8.7	1.7
JUL											
31...	<1.0	2.1	<1.0	1.2	<3.0	<1.0	84	1.0	--	8.1	1.3
AUG											
19...	<1.0	<1.0	<1.0	4.4	<3.0	<1.0	80	<1.0	--	7.7	<1.0
SEP											
10...	<1.0	1.1	<1.0	2.0	<3.0	<1.0	95	1.2	--	8.4	<1.0

DATE	SELE- NIUM, DIS- SOLVED (UG/L AS SE) (01145)	SILVER, DIS- SOLVED (UG/L AS AG) (01075)	STRON- TIUM, DIS- SOLVED (UG/L AS SR) (01080)	VANA- DIUM, DIS- SOLVED (UG/L AS V) (01085)	ZINC, DIS- SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS- SOLVED (UG/L AS U) (22703)	H-2 / H-1 STABLE ISOTOPE RATIO PER MIL (82082)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (MG/L) (80154)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 1996											
23...	<1	<1.0	1600	<18	5.0	5.0	--	--	130	75	31
NOV											
19...	<1	<2.0	2100	<18	5.0	5.0	--	--	148	58	25
DEC											
12...	<1	<2.0	2000	<18	3.0	5.0	--	--	139	35	49
JAN 1997											
29...	<1	<1.0	1000	<6	6.0	4.0	--	--	66	60	61
29...	<1	<1.0	1100	<6	6.0	--	--	--	--	--	--
FEB											
13...	<1	<1.0	1400	<6	5.0	5.0	--	--	102	20	37
MAR											
11...	<1	<1.0	730	<6	1.0	3.0	--	--	798	1790	65
APR											
23...	<1	<1.0	888	<6	<1.0	3.5	--	--	182	340	58
MAY											
22...	<1	<1.0	804	<6	1.3	3.4	-69.6	-7.62	206	367	62
JUN											
25...	<1	<1.0	785	<6	2.1	3.6	--	--	231	584	56
JUL											
31...	<1	<1.0	732	<6	1.9	3.3	--	--	326	1240	53
AUG											
19...	<1	<1.0	724	<6	1.3	3.3	--	--	324	980	59
SEP											
10...	<1	<1.0	852	<6	2.7	3.5	--	--	174	397	53

## RIO GRANDE MAIN STEM

08364000 RIO GRANDE AT EL PASO, TX--Continued

CHEMICAL ANALYSES OF ORGANIC COMPOUNDS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	PROP-CHLOR, WATER, DISS, REC	BUTYL-ATE, WATER, DISS, REC	SI-MAZINE, WATER, DISS, REC	PRO-METON, WATER, DISS, REC	DEETHYL ATRA-ZINE, WATER, DISS, REC	CYANA-ZINE, WATER, DISS, REC	FONOFOS WATER DISS REC	ALPHA BHC DIS- SOLVED	P, P' DDE DISSOLV	CHLOR-PYRIFOS DIS- SOLVED	LINDANE DIS- SOLVED	
		(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	(UG/L)	
		(04024)	(04028)	(04035)	(04037)	(04040)	(04041)	(04095)	(34253)	(34653)	(38933)	(39341)	
OCT 1996													
23...	0815	<0.007	<0.002	E0.002	<0.018	E0.003	<0.004	<0.003	<0.002	<0.006	E0.003	<0.004	
NOV													
19...	0815	<0.007	<0.002	<0.005	<0.018	E0.002	<0.004	<0.003	<0.002	<0.006	E0.004	<0.004	
DEC													
12...	0900	<0.007	<0.002	<0.005	<0.018	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	
JAN 1997													
29...	1350	<0.007	<0.002	0.005	0.024	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	
29...	1400	--	--	--	--	--	--	--	--	--	--	--	
FEB													
13...	0945	<0.007	<0.002	<0.005	E0.006	<0.002	<0.004	<0.003	<0.002	<0.006	E0.003	<0.004	
MAR													
11...	1115	<0.007	<0.002	0.009	E0.017	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	
APR													
23...	0930	<0.007	<0.002	0.009	E0.008	<0.002	<0.004	<0.003	<0.002	<0.006	<0.004	<0.004	
MAY													
22...	1030	<0.007	<0.002	0.010	E0.007	<0.002	E0.003	<0.003	<0.002	<0.006	E0.003	<0.004	
JUN													
25...	0945	<0.007	<0.002	0.012	E0.009	<0.002	E0.004	<0.003	<0.002	<0.006	<0.004	<0.004	
JUL													
31...	0945	<0.007	<0.002	0.012	E0.014	E0.002	0.086	<0.003	<0.002	<0.006	<0.004	<0.004	
AUG													
19...	0900	<0.007	<0.002	0.008	E0.006	<0.002	0.078	<0.003	<0.002	E0.002	<0.004	<0.020	
SEP													
10...	0900	<0.007	<0.002	0.006	0.071	<0.002	0.030	<0.003	<0.002	<0.006	0.020	<0.004	
DATE		DI-ELDRIN DIS- SOLVED	METO-LACHLOR WATER DISSOLV	MALA-THION, DIS- SOLVED	PARA-THION, DIS- SOLVED	DI-AZINON, DIS- SOLVED	ATRA-ZINE, WATER, DISS, REC	ALA-CHLOR, WATER, DISS, REC	ACETO-CHLOR, WATER FLTRD REC	METRI-BUZIN SENCOR WATER DISSOLV	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC
		(UG/L) (39381)	(UG/L) (39415)	(UG/L) (39532)	(UG/L) (39542)	(UG/L) (39572)	(UG/L) (39632)	(UG/L) (46342)	(UG/L) (49260)	(UG/L) (82630)	(UG/L) (82660)	(UG/L) (82661)	(UG/L) (82663)
OCT 1996													
23...	<0.001	0.013	0.029	<0.004	E0.004	0.009	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
NOV													
19...	<0.001	0.006	<0.005	<0.004	<0.002	E0.004	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
DEC													
12...	<0.001	E0.003	<0.005	<0.004	<0.002	0.004	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
JAN 1997													
29...	<0.001	<0.002	<0.005	<0.004	<0.002	<0.001	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
29...	--	--	--	--	--	--	--	--	--	--	--	--	
FEB													
13...	<0.001	0.004	<0.005	<0.004	<0.002	<0.001	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
MAR													
11...	<0.001	<0.002	<0.005	<0.004	<0.002	E0.003	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
APR													
23...	<0.001	0.005	<0.005	<0.004	E0.003	E0.003	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
MAY													
22...	<0.001	0.006	<0.005	<0.004	E0.001	E0.003	<0.002	<0.002	<0.004	<0.003	E0.001	<0.004	
JUN													
25...	<0.001	0.004	<0.005	<0.004	<0.002	E0.003	<0.002	<0.002	<0.004	<0.003	<0.002	<0.004	
JUL													
31...	<0.001	0.008	<0.005	<0.004	0.005	E0.002	<0.002	<0.002	<0.004	<0.003	E0.003	<0.004	
AUG													
19...	<0.001	0.005	<0.005	<0.004	<0.002	E0.002	<0.002	<0.002	<0.020	<0.003	<0.002	<0.004	
SEP													
10...	<0.001	0.004	0.026	<0.004	<0.002	<0.001	<0.002	<0.002	0.021	<0.003	<0.002	<0.004	



# RIO GRANDE MAIN STEM

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08364000 RIO GRANDE AT EL PASO, TX--Continued

CHEMICAL ANALYSES OF ORGANIC COMPOUNDS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)
OCT 1996												
23...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
NOV												
19...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
DEC												
12...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
JAN 1997												
29...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
29...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
13...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
MAR												
11...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
APR												
23...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	E0.010	<0.004	<0.003	<0.002	<0.003	<0.013
MAY												
22...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	E0.004	<0.004	<0.003	<0.002	<0.003	<0.013
JUN												
25...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	E0.004	<0.004	<0.003	<0.002	<0.003	<0.013
JUL												
31...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	E0.003	<0.003	<0.013
AUG												
19...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
SEP												
10...	<0.002	<0.007	<0.002	<0.006	<0.002	<0.004	<0.010	<0.004	<0.003	<0.002	<0.003	<0.013
	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)
OCT 1996												
23...	<0.003	<0.017	<0.001	<0.004	E0.005	<0.002	0.006	<0.004	<0.003	<0.013	<0.001	<0.005
NOV												
19...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.003	<0.004	<0.003	<0.013	<0.001	<0.005
DEC												
12...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.002	<0.004	<0.003	<0.013	<0.001	<0.005
JAN 1997												
29...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.004	<0.004	<0.003	<0.013	<0.001	<0.005
29...	--	--	--	--	--	--	--	--	--	--	--	--
FEB												
13...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	0.009	<0.004	<0.003	<0.013	<0.001	<0.005
MAR												
11...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	0.004	<0.004	<0.003	<0.013	<0.001	<0.005
APR												
23...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.004	<0.004	<0.003	<0.013	<0.001	<0.005
MAY												
22...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.003	<0.004	<0.003	<0.013	<0.001	<0.005
JUN												
25...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.001	<0.004	<0.003	<0.013	<0.001	<0.005
JUL												
31...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.003	<0.004	<0.003	<0.013	--	<0.005
AUG												
19...	<0.003	<0.017	<0.001	<0.004	<0.003	<0.002	E0.001	<0.004	<0.003	<0.013	<0.001	<0.005
SEP												
10...	<0.003	<0.017	<0.001	<0.004	E0.010	<0.002	<0.002	<0.004	<0.003	<0.013	<0.001	<0.005

## RIO GRANDE MAIN STEM

08364000 RIO GRANDE AT EL PASO, TX--Continued

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	SAMPLE LOC- ATION, CROSS SECTION (FT FM L BANK) (000009)	DEPTH AT SAMPLE LOC- ATION, TOTAL (FEET) (81903)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE WATER (DEG C) (00010)	OXYGEN, DIS- SOLVED (MG/L) (00300)
MAR 1997							
11...	1440	8.00	5.20	1030	8.2	17.0	8.5
11...	1443	28.0	4.60	949	8.3	17.0	8.5
11...	1446	48.0	4.00	944	8.3	17.0	8.5
11...	1448	68.0	3.20	913	8.3	17.0	8.5
11...	1452	88.0	2.60	900	8.3	17.0	8.2
11...	1454	108	2.10	894	8.3	16.5	8.1
11...	1457	128	2.00	873	8.3	17.0	7.8
11...	1500	148	2.20	855	8.3	17.0	8.1
11...	1503	168	2.40	841	8.3	17.0	8.0

# RIO GRANDE MAIN STEM

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08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX  
(National Stream-Quality Accounting Network)

**LOCATION.**--Lat 29°46'50", long 101°45'20", Val Verde County, Hydrologic Unit 13040212, at gaging station 0.1 mi downstream from Terrell-Val Verde County line, 16.9 mi from Langtry, and 597.2 mi downstream from the American Dam at El Paso.

**DRAINAGE AREA.**--80,742 mi<sup>2</sup>, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

**PERIOD OF RECORD.**--Inorganic chemical analyses: April 1944 to current year. Biochemical analyses: October 1974 to August 1995. Organic chemical analyses: July 1975 to June 1982, October 1995 to current year. Sediment analyses: October 1974 to current year.

## 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, 2,110 microsiemens Dec. 4, 1974; minimum daily, 225 microsiemens May 2, 1981.

WATER TEMPERATURE: Maximum daily, 32.0°C June 13, 1977, July 25, 26, 1979, July 4, 1980, and June 8, 1981; minimum daily, 9.0°C Jan. 12, 1975, Jan. 8, 1976, and Jan. 18, 1981.

**REMARKS.**--Discharges published in the table were obtained directly from rating table furnished by International Boundary and Water Commission. .  
Records of daily mean discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67. Since September 1995, quality assurance data for this station may be obtained from the U.S. Geological Survey upon request.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	SAM-PLING METHOD, CODES	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	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)
DEC												
18...	1125	1028	10	468	1760	8.1	9.5	12	9.2	84	400	240
JAN												
29...	1120	1028	10	419	1790	7.9	12.0	6.2	10.1	98	300	150
MAR												
11...	1100	1028	10	382	1230	7.9	19.0	67	8.6	97	340	190
APR												
01...	1050	1028	10	347	1250	7.8	18.0	27	9.0	100	310	170
15...	1115	1028	10	382	1710	7.8	17.0	90	9.7	105	390	250
MAY												
22...	1945	1028	8010	7200	506	7.7	23.0	880	6.1	75	180	88
28...	1230	1028	10	1940	973	7.6	26.5	6100	6.5	85	300	200
JUL												
01...	1015	1028	10	561	628	7.7	26.5	1500	8.0	105	160	33
16...	1020	1028	10	1000	967	7.4	27.5	10000	5.5	73	260	160
AUG												
07...	1030	1028	10	605	1040	7.8	26.5	2700	7.0	92	280	140
SEP												
10...	1110	1028	10	305	1090	7.8	27.5	69	7.5	100	290	160

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)	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)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SiO2)
DEC												
18...	110	29	220	5	6.7	0	190	158	380	240	1.2	15
JAN												
29...	83	23	180	5	5.1	0	190	156	380	250	1.1	7.3
MAR												
11...	97	22	120	3	5.1	0	173	142	300	120	1.1	14
APR												
01...	85	23	138	3	5.4	0	177	145	290	130	1.2	17
15...	100	31	218	5	6.6	0	175	143	390	230	1.4	19
MAY												
22...	55	8.7	70	2	4.2	0	106	87	170	51	0.74	9.6
28...	100	11	83	2	5.7	0	128	105	320	46	0.96	13
JUL												
01...	53	7.3	57	2	3.7	0	159	131	120	33	0.87	14
16...	88	10	102	3	5.5	0	124	101	290	49	0.78	13
AUG												
07...	92	12	108	3	5.4	0	171	140	270	65	1.2	17
SEP												
10...	79	21	119	3	5.5	0	151	124	250	110	1.1	21

## RIO GRANDE MAIN STEM

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	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, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
DEC 18...	1130	1100	--	<0.001	0.470	<0.002	0.67	0.20	<0.20	0.20	<0.010	<0.010
JAN 29...	1140	1030	0.234	0.026	0.260	0.013	0.66	0.39	<0.20	0.40	<0.010	<0.010
MAR 11...	804	769	0.497	0.003	0.500	0.006	0.88	0.37	<0.20	0.38	0.088	<0.010
APR 01...	815	789	0.599	0.001	0.600	<0.002	--	--	<0.20	<0.20	0.040	0.010
APR 15...	1150	1100	0.387	0.002	0.389	0.008	0.95	0.55	<0.20	0.56	0.104	0.038
MAY 22...	449	423	0.373	0.007	0.380	<0.002	0.80	0.42	<0.20	0.42	0.120	<0.010
MAY 28...	683	655	1.07	0.003	1.07	0.011	19	18	0.22	18	8.25	0.012
JUL 01...	404	376	0.901	0.001	0.902	<0.002	1.6	0.69	<0.20	0.69	0.572	<0.010
JUL 16...	660	623	1.46	0.003	1.46	<0.002	4.3	2.9	<0.20	2.9	1.67	<0.010
AUG 07...	788	666	1.65	0.002	1.65	0.003	7.0	5.3	<0.20	5.3	0.792	<0.010
SEP 10...	719	682	0.713	0.003	0.716	0.012	1.2	0.43	<0.20	0.44	0.105	<0.010

DATE	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)
DEC 18...	<0.001	1.8	1.8	66	83	1.0	<1.0	1	89	<1.0	283	<1.0
JAN 29...	<0.001	2.1	2.2	47	53	3.0	<1.0	<2	62	<1.0	217	<1.0
MAR 11...	<0.001	1.6	--	171	176	<1.0	<1.0	2	83	<1.0	188	<1.0
APR 01...	0.001	1.3	1.4	129	121	<1.0	<1.0	3	83	<1.0	223	<1.0
APR 15...	0.002	1.7	3.3	385	397	<1.0	<1.0	3	104	<1.0	303	<1.0
MAY 22...	0.002	4.5	>5.0	3000	58400	1.3	<1.0	2	72	<1.0	138	<1.0
MAY 28...	0.005	2.9	>5.2	10700	56200	2.7	<1.0	1	93	<1.0	144	<1.0
JUL 01...	0.006	2.7	>5.0	3200	4840	4.5	<1.0	2	66	<1.0	113	<1.0
JUL 16...	0.010	3.0	>5.0	21900	59000	2.1	<1.0	1	121	<1.0	147	<1.0
AUG 07...	0.012	2.7	>20	4820	7870	2.9	<1.0	3	89	<1.0	215	<1.0
SEP 10...	0.003	1.1	0.70	155	128	1.8	<1.0	2	99	<1.0	226	<1.0

DATE	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)	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 18...	2.0	<1.0	<1.0	<3.0	<1.0	110	1.0	9.0	2.0	<1	<1.0	2300
JAN 29...	<1.0	<1.0	<1.0	<3.0	<1.0	80	2.0	7.0	<1.0	<1	<1.0	1700
MAR 11...	3.0	<1.0	2.0	<3.0	<1.0	68	<1.0	7.0	2.0	1	<1.0	2100
APR 01...	1.7	<1.0	<1.0	<3.0	<1.0	75	1.6	8.4	1.2	1	<1.0	1860
APR 15...	2.3	<1.0	<1.0	<3.0	<1.0	110	<1.0	10	1.3	<1	<1.0	2530
MAY 22...	1.8	<1.0	2.0	<3.0	<1.0	39	<1.0	5.2	1.6	<1	<1.0	815
MAY 28...	2.4	<1.0	2.0	<3.0	<1.0	41	<1.0	7.6	2.0	1	<1.0	1630
JUL 01...	1.2	<1.0	1.4	<3.0	<1.0	30	<1.0	6.1	1.5	<1	<1.0	910
JUL 16...	2.4	<1.0	2.1	<3.0	<1.0	38	<1.0	7.9	1.4	2	<1.0	1530
AUG 07...	1.9	<1.0	2.4	<3.0	<1.0	60	<1.0	9.6	1.7	1	<1.0	1600
SEP 10...	<1.0	<1.0	<1.0	<3.0	<1.0	76	<1.0	8.7	<1.0	1	<1.0	1880

# RIO GRANDE MAIN STEM

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08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	PCB, TOTAL (UG/L)	PCNS UNFILT RECOVER (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR- DANE, TECH- NICAL TOTAL (UG/L)	P,P'- DDD UNFILT RECOVER (UG/L)	P,P'- DDE, TOTAL (UG/L)	P,P'- DDT UNFILT RECOVER (UG/L)	DI- ELDRIN TOTAL (UG/L)
DEC 18...	<6	3.0	5.0	<0.002	--	--	--	--	--	--	--	--
JAN 29...	<6	3.0	4.0	<0.002	--	--	--	--	--	--	--	--
MAR 11...	<6	2.0	4.0	<0.002	--	--	--	--	--	--	--	--
APR 01...	<6	<1.0	4.1	<0.002	<0.100	<0.100	<0.010	<0.100	<0.010	<0.010	<0.010	<0.010
15...	<6	<1.0	5.3	<0.002	--	--	--	--	--	--	--	--
MAY 22...	<6	<1.0	3.0	<0.002	--	--	--	--	--	--	--	--
28...	<6	<1.0	3.7	<0.002	--	--	--	--	--	--	--	--
JUL 01...	7	1.4	3.4	<0.002	--	--	--	--	--	--	--	--
16...	7	1.1	3.9	<0.002	--	--	--	--	--	--	--	--
AUG 07...	9	<1.0	5.8	<0.002	--	--	--	--	--	--	--	--
SEP 10...	15	<1.0	4.3	<0.002	--	--	--	--	--	--	--	--

DATE	ENDO- SULFAN, I TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	HEPTA- CHLOR, TOTAL (UG/L)	HEPTA- CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	METH- OXY- CHLOR, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PER- THANE TOTAL (UG/L)	TOX- APHENE, TOTAL (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)
DEC 18...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	<0.001
JAN 29...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	<0.001
MAR 11...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	<0.001
APR 01...	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	<0.100	<1.00	<0.002	<0.002	<0.001
15...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	<0.001
MAY 22...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	E0.004
28...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	E0.003
JUL 01...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	E0.002
16...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	E0.003
AUG 07...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	<0.001
SEP 10...	--	--	--	--	--	--	--	--	--	<0.002	<0.002	<0.001

DATE	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)
DEC 18...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	0.464	<0.002	<0.006	E0.008	<0.001	<0.003
JAN 29...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	E0.003	<0.001	<0.003
MAR 11...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	E0.001	<0.006	<0.002	<0.001	<0.003
APR 01...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003
15...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003
MAY 22...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	E0.001	<0.006	<0.002	<0.001	<0.003
28...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	E0.001	<0.006	<0.002	<0.001	<0.003
JUL 01...	<0.001	<0.002	<0.002	<0.003	<0.017	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003
16...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	E0.002	<0.002	<0.001	<0.003
AUG 07...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003
SEP 10...	<0.001	<0.002	<0.002	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003



## RIO GRANDE MAIN STEM

08377200 RIO GRANDE AT FOSTER RANCH NEAR LANGTRY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENSOR WATER DISSOLV (UG/L)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)
DEC 18...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
JAN 29...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
MAR 11...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
APR 01...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
APR 15...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
MAY 22...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	--	<0.002	<0.005	<0.002	<0.004	<0.004
MAY 28...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
JUL 01...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
JUL 16...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
AUG 07...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004
SEP 10...	<0.017	<0.002	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004

DATE	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PARA- THION, DIS- SOLVED (UG/L)	METHYL- PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
DEC 18...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JAN 29...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
MAR 11...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
APR 01...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
APR 15...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
MAY 22...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
MAY 28...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUL 01...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUL 16...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
AUG 07...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
SEP 10...	<0.003	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013

DATE	SI- MAZINE, WATER, DISS, REC (UG/L)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	SAMPLE VOLUME SCHED- ULE 2001 (ML)
DEC 18...	E0.004	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	90.2	77.3	97.3	980
JAN 29...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	79.5	89.1	99.9	980
MAR 11...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	100	95.6	104	877
APR 01...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	81.7	84.1	116	952
APR 15...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	88.5	89.9	94.8	970
MAY 22...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	98.4	95.9	112	819
MAY 28...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	81.7	96.7	103	833
JUL 01...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	106	110	119	862
JUL 16...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	99.2	127	115	854
AUG 07...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	103	96.3	124	917
SEP 10...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	91.8	106	110	909

## 373

**LOCATION.**--Lat 32°04'30", long 104°02'21", in SW1/4NW1/4NE1/4 sec.1, T.26 S., R.28 E., Eddy County, Hydrologic Unit 13060011, on right bank at Red Bluff, 0.2 mi downstream from Red Bluff Draw, 1.6 mi northwest of the El Paso Natural Gas (Pecos River) compressor station, 5.2 mi north of the New Mexico-Texas State line, 5.5 mi upstream from Delaware River, and at mile 411.2.

Water-quality records.-- October 1936 to September 1994.

**REMARKS.**--No estimated daily discharges. Records good. Since installation of gage in water year 1938, at least 10% of contributing drainage area has been regulated by many reservoirs and diversion dams. Diversions and ground-water withdrawals upstream from station for irrigation of about 202,000 acres, 1959 determination. Several observations of water temperature were made during the year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

MEAN	274	150	125	113	97.6	70.3	58.6	220	182	114	158	285
MAX	5255	1382	813	703	534	295	681	6954	3181	1273	4210	6521
(WY)	1942	1942	1942	1942	1942	1942	1942	1941	1941	1941	1966	1941
MIN	10.0	6.71	8.57	10.7	13.7	7.76	6.38	7.90	4.30	2.55	5.08	5.77
(WY)	1965	1978	1978	1965	1965	1978	1978	1971	1990	1966	1964	1977

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR			FOR 1997 WATER YEAR			WATER YEARS 1938 - 1997		
ANNUAL TOTAL	36381			31474					
ANNUAL MEAN	99.4			86.2			154		
HIGHEST ANNUAL MEAN							1655		
LOWEST ANNUAL MEAN							19.2		
HIGHEST DAILY MEAN	632	Sep 12		386	Jul 5		50700	Aug 24	1966
LOWEST DAILY MEAN	29	May 23		41	Apr 2		.22	Aug 1	1966
ANNUAL SEVEN-DAY MINIMUM	34	May 17		49	Apr 14		.33	Jul 26	1966
INSTANTANEOUS PEAK FLOW				917			all 1000		
INSTANTANEOUS PEAK STAGE				6.82			33.32		
INSTANTANEOUS LOW FLOW				39			.19		
ANNUAL RUNOFF (AC-FT)	72160			62430			111800	Aug 1	1966
10 PERCENT EXCEEDS	317			108			208		
50 PERCENT EXCEEDS	67			68			57		
90 PERCENT EXCEEDS	47			50			14		

a From rating curve extended above 32,000 ft<sup>3</sup>/s, on basis of slope-area measurement of peak flow.

## RIO GRANDE BASIN

08408500 DELAWARE RIVER NEAR RED BLUFF, NM

**LOCATION.**--Lat 32°01'23", long 104°03'15", in NE1/4SW1/4SE1/4 sec. 23, T. 26 S., R. 28 E., Eddy County, Hydrologic Unit 13070002, near center of channel on downstream side of pier of bridge on U.S. Highway 285, 2.1 mi north of the New Mexico-Texas State line, 3.6 mi southwest of Red Bluff, 3.7 mi upstream from mouth and 14 mi south of Malaga. Mouth at Pecos River mile 405.6.

**DRAINAGE AREA.**--689 mi<sup>2</sup>.

**PERIOD OF RECORD.**--April 1912 to September 1913, May 1914 to June 1915, October 1937 to current year. Published as "near Malaga" 1912-13, and as "near Angeles, Tex." 1914-15.

**GAGE.**--Water-stage recorder. Elevation of gage is 2,900.66 ft above sea level (U.S. Boundary Commission post). Prior to May 1914, at site 3.0 mi upstream at different datum. May 1914 to June 1915, at site 2.5 mi downstream at different datum.

**REMARKS.**--Records good. No known regulation. One small upstream diversion. Several observations of water temperature were made during the year. No flow for many days most years.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	1.7	1.9	2.2	1.8	1.9	1.6	1.1	.67	.18	.00	.00
2	1.9	1.7	1.9	2.2	1.8	1.9	1.8	1.1	.47	.16	.00	.00
3	1.8	1.8	1.9	2.4	1.9	1.8	7.3	.99	.38	.91	.00	.00
4	1.9	1.8	1.9	2.5	1.9	1.8	7.2	.88	1.0	118	.00	.00
5	2.0	1.6	2.0	2.5	1.9	1.7	1.9	.91	8.0	107	.00	.00
6	1.9	1.5	2.0	2.5	1.9	1.7	1.8	.88	1.6	7.5	.00	.00
7	1.8	1.4	2.0	2.6	1.8	1.7	1.8	.82	.59	3.3	.00	.00
8	1.7	1.5	2.0	2.7	1.8	1.7	1.7	.72	160	2.5	.00	.00
9	1.7	1.5	2.1	2.7	1.8	1.7	1.6	.83	135	2.2	.00	.00
10	1.6	1.5	2.3	2.7	1.8	1.7	1.7	.79	19	2.1	.00	.00
11	1.6	1.6	2.2	2.6	1.8	1.7	1.5	.74	6.9	2.1	.00	.00
12	1.4	1.6	2.2	2.6	2.0	1.7	1.5	.82	3.3	2.0	.00	.00
13	1.4	1.6	2.3	2.5	2.0	1.8	1.6	.88	2.2	2.0	6.5	.00
14	1.4	1.6	2.3	2.4	1.9	1.6	1.7	.74	1.5	1.9	1.7	.00
15	1.4	1.6	2.3	2.3	1.8	1.6	1.8	.67	1.3	1.8	1.4	.00
16	1.4	1.7	2.3	2.3	1.8	1.6	1.8	.57	1.0	1.6	1.3	.00
17	1.3	1.6	2.2	2.2	1.7	1.6	1.7	.50	.84	1.5	1.3	.00
18	1.3	1.6	2.2	2.3	1.7	1.6	1.7	.48	.69	1.5	1.2	.00
19	1.4	1.6	2.2	2.4	1.8	1.6	1.7	.45	.54	1.4	7.0	.00
20	1.4	1.6	2.3	2.5	1.9	1.6	1.5	.48	.50	1.4	5.2	.00
21	1.4	1.6	2.4	2.4	1.8	1.6	1.4	19	.40	1.3	1.7	.00
22	1.5	1.6	2.4	2.2	1.8	1.7	1.7	20	.33	.12	1.4	.06
23	1.6	1.6	2.4	2.2	1.7	1.7	1.7	3.8	.28	.01	1.3	.00
24	1.6	1.7	2.3	2.2	1.8	1.7	1.5	1.7	.21	.01	1.0	.00
25	1.6	1.6	2.3	2.1	1.9	1.7	1.7	1.2	.19	.01	.00	.00
26	1.6	1.6	2.3	2.1	1.9	1.7	1.9	.93	.19	.00	.00	.00
27	1.6	1.7	2.4	2.1	1.9	1.7	1.8	.73	11	.00	.00	.00
28	1.6	1.9	2.4	2.0	1.9	1.7	1.6	.66	2.2	.00	.00	.00
29	1.7	2.0	2.3	2.1	---	1.7	1.6	.61	.48	.00	.00	.00
30	1.7	1.9	2.2	2.0	---	1.6	1.3	.71	.25	.00	.00	.00
31	1.7	---	2.2	2.0	---	1.6	---	1.4	---	.00	.00	---
TOTAL	49.8	49.3	68.1	72.5	51.5	52.4	61.1	66.09	361.01	352.59	31.00	0.06
MEAN	1.61	1.64	2.20	2.34	1.84	1.69	2.04	2.13	12.0	11.4	1.00	.002
MAX	2.0	2.0	2.4	2.7	2.0	1.9	7.3	20	160	118	7.0	.06
MIN	1.3	1.4	1.9	2.0	1.7	1.6	1.3	.45	.19	.00	.00	.00
AC-FT	99	98	135	144	102	104	121	131	716	699	61	.1

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1997, BY WATER YEAR (WY)

	MEAN	28.9	3.48	3.25	3.32	3.10	2.77	5.72	9.50	18.4	14.1	22.2	22.0
MAX	748	18.9	7.99	8.57	8.77	9.44	9.44	135	233	281	166	326	303
(WY)	1956	1979	1987	1987	1987	1987	1954	1941	1938	1952	1966	1978	1978
MIN	.000	.030	.17	.41	.13	.42	.23	.003	.000	.000	.000	.000	.000
(WY)	1952	1965	1966	1965	1966	1993	1968	1950	1950	1947	1983	1953	

SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1938 - 1997
ANNUAL TOTAL	2846.81	1215.45	
ANNUAL MEAN	7.78	3.33	11.5
HIGHEST ANNUAL MEAN			66.1
LOWEST ANNUAL MEAN			1.78
HIGHEST DAILY MEAN	466	160	22000
LOWEST DAILY MEAN	.00	.00	.00
ANNUAL SEVEN-DAY MINIMUM	.00	.00	.00
INSTANTANEOUS PEAK FLOW		1270	a81400
INSTANTANEOUS PEAK STAGE		6.95	b27.00
INSTANTANEOUS LOW FLOW		.00	.00
ANNUAL RUNOFF (AC-FT)	5650	2410	8300
10 PERCENT EXCEEDS	4.2	2.4	7.0
50 PERCENT EXCEEDS	1.8	1.7	2.2
90 PERCENT EXCEEDS	.00	.00	.00

a From rating curve extended above 6,500 ft<sup>3</sup>/s, on basis of slope-area measurements at gage heights, 12.84 ft, 17.55 ft, and 27.0 ft.

b From floodmarks.

## 08410000 RED BLUFF RESERVOIR NEAR ORLA, TX

**LOCATION.**--Lat 31°54'04", long 103°54'35", Reeves County, Hydrologic Unit 13070001, at right end of Red Bluff Dam on the Pecos River, 2.8 mi upstream from Salt Creek, and 5.2 mi north of Orla.

**DRAINAGE AREA.**--20,720 mi<sup>2</sup>, approximately (contributing area).

**PERIOD OF RECORD.**--February 1937 to current year. Monthly contents only for some periods, published in WSP 1312.

**GAGE.**--Nonrecording gage. Datum of gage is 0.43 ft below sea level.

**REMARKS.**--Reservoir is formed by a rock-faced earthfill dam 9,200 ft long. The dam was completed and storage began in September 1936. The dam and reservoir are owned and operated by the Red Bluff Water Power Control District. The water is used for power development and for irrigation from Mentone to Grandfalls. The uncontrolled emergency spillway, 790 ft wide, is a cut through natural ground located to the right of right end of dam. The controlled service spillway is equipped with 12 tainter gates that are 25- by 15-ft high. Inflow is regulated by many reservoirs and diversion dams. The capacity curve is based on U.S. Geological Survey topographic map and aerial photography, survey of 1986. Figures given herein represent total contents. Data regarding the dam and reservoir are given in the following table:

	Gage height (feet)	Capacity (acre-feet)
Top of dam .....	2,856.0	-
Crest of emergency spillway .....	2,845.0	324,000
Top of gates (top of conservation pool) .....	2,842.0	289,700
Crest of service spillway and bottom of tainter gates .....	2,827.0	155,700
Lowest gated outlet (invert) .....	2,764.0	2,800

**COOPERATION.**--Gage height records and capacity curve were furnished by Red Bluff Water Power and Control District.

**EXTREMES FOR PERIOD OF RECORD.**--Maximum contents observed, 352,000 acre-ft, Sept. 27, 28, 1941, gage height, 2,846.2 ft, observed on nonrecording gage at service spillway (affected by variable drawdown due to flow through tainter gates); minimum observed, 11,080 acre-ft, May 13, 1948, gage height, 2,781.4 ft.

**EXTREMES (AT 0800) FOR CURRENT YEAR.**--Maximum contents observed, 81,150 acre-ft, Mar. 26-27, gage height, 2,813.66 ft; minimum observed, 48,690 acre-ft, Aug. 4-5, gage height, 2,804.74 ft.

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

2,806.0	52,460	2,814.0	82,630	2,820.0	112,200
2,808.0	59,000	2,816.0	91,830	2,822.0	123,600
2,810.0	66,220	2,818.0	101,700	2,824.0	135,800
2,812.0	74,090				

RESERVOIR STORAGE (ACRE-FEET), WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY OBSERVATION AT 0800 HOURS

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	64520	64920	71280	73890	77110	79930	78280	73130	64670	60910	49920	49770
2	64590	64850	71360	74010	77190	80020	77610	73130	64370	60270	49490	49800
3	64670	64780	71440	74130	77270	80100	76940	73170	64080	59570	49090	49740
4	64740	64740	71520	74260	77360	80190	76270	73170	63780	59010	48690	49680
5	64810	65040	71600	74380	77440	80280	75600	73210	63490	59010	48690	49620
6	64890	65400	71680	74510	77520	80370	74930	72890	63190	58870	48720	49550
7	64960	65850	71760	74640	77610	80450	74260	72560	62970	58670	48720	49490
8	65040	66290	71840	74760	77690	80540	73610	72200	62970	58130	48750	49440
9	65110	66750	71920	74890	77780	80630	72970	71760	62970	57530	48780	49380
10	65180	67220	72000	75010	77860	80710	72320	71400	63040	56860	48810	49320
11	65260	67680	72080	75100	77940	80710	72320	71040	63040	56190	48830	49260
12	65330	68140	72160	75180	78070	80760	72360	70670	63040	55520	48860	49200
13	65400	68610	72240	75260	78190	80760	72400	70310	63040	54890	48890	49230
14	65480	69070	72320	75350	78320	80800	72440	69950	63040	54250	48920	49260
15	65550	69530	72400	75430	78450	80800	72480	69690	63040	53610	48980	49320
16	65590	69920	72480	75520	78580	80850	72520	69340	63040	53100	49030	49380
17	65630	70150	72560	75600	78710	80850	72560	68990	63040	52650	49090	49440
18	65660	70230	72640	75730	78840	80890	72770	68640	62900	52650	49150	49490
19	65700	70310	72720	75850	78970	80930	72680	68300	62750	52680	49200	49350
20	65740	70390	72800	75970	79100	80970	72600	67950	62600	52680	49260	49200
21	65770	70470	72890	76100	79230	81020	72520	67640	62460	52710	49320	49060
22	65660	70550	72970	76230	79320	81060	72440	67450	62320	52710	49380	49150
23	65520	70630	73050	76350	79410	81060	72480	67260	62180	52750	49440	49150
24	65370	70710	73130	76350	79500	81110	72560	66990	62040	52750	49490	49150
25	65260	70790	73210	76480	79590	81110	72640	66680	61890	52780	49550	49150
26	65220	70880	73290	76600	79670	81150	72720	66370	61750	52620	49620	49200
27	65180	70960	73370	76690	79760	81150	72800	66110	61610	52160	49680	49350
28	65150	71040	73450	76770	79840	80630	72890	65850	61610	51700	49710	49490
29	65110	71120	73530	76850	---	80060	72970	65550	61540	51250	49740	49650
30	65070	71200	73610	76940	---	79500	73050	65260	61470	50800	49740	49800
31	65000	---	73690	77020	---	78930	---	64960	---	50340	49770	---
MAX	65770	71200	73690	77020	79840	81150	78280	73210	64670	60910	49920	49800
MIN	64520	64740	71280	73890	77110	78930	72320	64960	61470	50340	48690	49060
(+)	2809.67	2811.28	2811.90	2812.70	2813.36	2813.15	2811.74	2809.66	2808.70	2805.30	2805.11	2805.12
(@)	+560	+6200	+2490	+3330	+2820	-910	-5880	-8090	-3490	-11130	-570	+30

CAL YR 1996 MAX 77520 MIN 56690  
WTR YR 1997 MAX 81150 MIN 48690

(+) Gage height, in feet, at end of month.  
(@) Change in contents, in acre-feet.



## RIO GRANDE BASIN

08412500 PECOS RIVER NEAR ORLA, TX

**LOCATION.**--Lat 31°52'21", long 103°49'52", Reeves County, Hydrologic Unit 1300001, on right bank at bridge on Farm Road 652, 5.5 mi downstream from Salt Creek (Screw Bean Arroyo), 5.9 mi northeast of Orla, and 8.5 mi downstream from Red Bluff Reservoir.

**DRAINAGE AREA.**--21,210 mi<sup>2</sup> approximately (contributing area).

## WATER-DISCHARGE RECORDS

**PERIOD OF RECORD.**--May 1937 to current year.

**REVISED RECORDS.**--WSP 928: 1937.

**GAGE.**--Water-stage recorder. Datum of gage is 2,730.86 ft above sea level. Prior to Nov. 16, 1969, at site 6.9 mi downstream at datum 12.81 ft lower.

**REMARKS.**--Records good except those for estimated daily discharges, which are poor. Since water year 1938, at least 10% of contributing drainage area has been regulated by Red Bluff Reservoir (station 08410000). Most of flow is released from storage in Red Bluff Reservoir 8.5 mi upstream. Occasional runoff occurs from draws between dam and station. There are many diversions above Red Bluff Reservoir for irrigation.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	97	11	3.5	2.4	4.5	344	9.7	197	348	233	8.2
2	10	110	11	4.1	2.3	4.5	346	8.7	196	351	234	16
3	9.2	110	11	3.9	2.5	4.2	347	8.5	195	351	234	67
4	9.0	111	11	3.2	2.5	4.0	348	8.4	195	373	186	68
5	8.6	111	11	2.8	2.3	5.3	350	45	194	381	64	67
6	8.8	108	11	3.1	2.2	4.6	348	201	200	356	65	67
7	8.7	102	11	3.5	2.5	4.1	347	200	197	354	66	67
8	8.5	102	11	3.2	2.0	4.1	346	200	257	351	58	66
9	8.2	103	11	3.0	1.7	3.7	346	206	197	349	e12	66
10	8.3	103	11	2.9	1.7	3.3	246	234	114	348	e12	68
11	8.4	103	11	3.0	1.7	3.5	15	234	39	346	e11	66
12	8.2	103	11	e3.3	1.8	3.6	13	226	37	345	e53	54
13	7.8	104	11	e3.3	4.9	3.7	11	205	36	344	e55	11
14	7.6	104	11	e3.0	4.9	3.5	9.7	201	36	343	e53	9.3
15	7.3	104	11	e2.6	4.3	3.2	8.4	202	36	326	e53	8.8
16	7.2	104	11	e2.3	3.7	3.3	8.7	202	36	284	e53	9.1
17	7.1	104	10	2.2	3.6	3.5	9.1	202	37	283	e53	8.3
18	7.4	105	10	2.0	3.7	3.1	20	201	74	283	e55	84
19	9.2	105	10	2.0	3.4	3.2	96	200	73	284	e52	79
20	8.6	71	10	2.0	4.3	3.1	96	198	73	284	e52	79
21	23	14	10	3.7	4.0	3.1	97	178	73	285	e51	79
22	86	12	10	3.7	4.2	2.6	73	177	73	285	e11	80
23	75	12	e8.9	3.3	4.0	2.9	11	175	73	286	e11	63
24	76	11	e8.1	2.5	3.9	3.0	9.7	162	73	287	e11	11
25	74	12	e7.3	2.2	4.4	2.8	9.6	164	72	287	e9.0	8.9
26	43	11	e6.1	2.3	4.8	3.2	11	165	73	284	e9.0	8.2
27	38	11	e5.5	2.0	4.3	91	10	169	75	283	e8.0	7.5
28	38	12	e5.0	2.9	4.5	293	10	186	73	281	e8.0	7.0
29	38	11	e4.8	2.8	---	294	10	188	73	281	8.6	6.5
30	55	11	e4.5	2.7	---	298	9.8	194	148	266	8.6	6.4
31	94	---	e4.2	2.4	---	312	---	198	---	234	8.6	---
TOTAL	809.1	2181	290.4	89.4	92.5	1381.6	3906.0	5148.3	3225	9743	1797.8	1246.2
MEAN	26.1	72.7	9.37	2.88	3.30	44.6	130	166	108	314	58.0	41.5
MAX	94	111	11	4.1	4.9	312	350	234	257	381	234	84
MIN	7.1	11	4.2	2.0	1.7	2.6	8.4	8.4	36	234	8.0	6.4
AC-FT	1600	4330	576	177	183	2740	7750	10210	6400	19330	3570	2470

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1997#, BY WATER YEAR (WY)

	MEAN	157	70.1	42.3	39.3	45.0	86.8	198	200	227	239	195	234
MAX	5717	1474	838	712	617	288	601	2717	3481	1425	686	6515	
(WY)	1942	1942	1942	1942	1942	1955	1942	1941	1941	1941	1941	1941	
MIN	1.78	1.38	1.77	.76	.46	.84	1.05	5.86	17.1	8.11	.74	8.70	
(WY)	1948	1960	1962	1965	1965	1965	1965	1978	1953	1984	1965	1953	

SUMMARY STATISTICS	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1938 - 1997#
ANNUAL TOTAL	26991.0	29910.3	
ANNUAL MEAN	73.7	81.9	145
HIGHEST ANNUAL MEAN			1284
LOWEST ANNUAL MEAN			13.1
HIGHEST DAILY MEAN	1140	381	23700
LOWEST DAILY MEAN	4.2	1.7	.00
ANNUAL SEVEN-DAY MINIMUM	5.3	1.9	.00
INSTANTANEOUS PEAK FLOW		422	23700
INSTANTANEOUS PEAK STAGE		5.10	20.74
INSTANTANEOUS LOW FLOW		1.7	.00
ANNUAL RUNOFF (AC-FT)	53540	59330	104900
10 PERCENT EXCEEDS	239	284	365
50 PERCENT EXCEEDS	12	12	34
90 PERCENT EXCEEDS	8.0	3.1	5.3

e Estimated

# Period of regulated streamflow.



# RIO GRANDE BASIN

377

08412500 PECOS RIVER NEAR ORLA, TX--Continued

## WATER-QUALITY RECORDS

**PERIOD OF RECORD.**--Chemical analyses: July 1937 to current year.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: July 1937 to current year.

WATER TEMPERATURE: March 1953 to current year.

**REMARKS.**--October 1937 to September 1969, this station was published as 08410100 Pecos River below Red Bluff Dam, near Orla. Water-quality station operation transferred from the Texas District to the New Mexico District beginning with the 1993 water year.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum daily, 29,400 microsiemens May 16, 1978; minimum daily, 1,600 microsiemens June 19, 1984.

WATER TEMPERATURE: Maximum daily, 32.0°C, Aug 4, 1991; minimum daily, 0.0°C, many days during winter months.

**EXTREMES FOR CURRENT YEAR.**--

SPECIFIC CONDUCTANCE: Maximum daily, 20,000 microsiemens Mar. 7; minimum daily, 7,390 microsiemens Aug. 13.

WATER TEMPERATURE: Maximum daily, 28.5 °C, Aug. 22; minimum daily 0°C, Jan. 13.

### WATER QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE- CIFIC CON- DUCT- ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND- ARD UNITS) (00400)	TEMPER- ATURE AIR (DEG C) (00020)	TEMPER- ATURE WATER (DEG C) (00010)	BARO- METRIC PRES- SURE (MM OF HG) (00025)	OXYGEN, DIS- SOLVED (MG/L) (00300)	OXYGEN, DIS- SOLVED (PER- CENT SATUR- ATION) (00301)	
		HARD- NESS TOTAL (MG/L AS CACO3) (00900)	HARD- NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L) (00904)	CALCIUM DIS- SOLVED (MG/L AS CA) (00915)	MAGNE- SIUM, DIS- SOLVED (MG/L AS MG) (00925)	SODIUM, DIS- SOLVED (MG/L AS NA) (00930)	SODIUM AD- SORP- TION RATIO (00931)	POTAS- SIUM, DIS- SOLVED (MG/L AS K) (00935)	BICAR- BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR- BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)
NOV 1996 14...	1300	105	8260	8.1	26.0	14.0	693	11.4	125	
MAR 1997 24...	1030	4.2	15900	7.9	21.0	18.0	690	11.0	136	
JUN 17...	1300	36	9240	7.8	36.0	25.0	691	10.3	142	
AUG 01...	1015	250	8690	7.8	30.0	26.0	704	8.0	110	
15...	0915	66	8610	7.7	31.0	26.0	688	9.8	138	
SEP 08...	1245	59	9030	8.0	34.5	26.0	694	9.1	127	
DATE		ALKA- LITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	ALKA- LITY LAB (MG/L AS CACO3) (90410)	SULFATE DIS- SOLVED (MG/L AS SO4) (00945)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL) (00940)	FLUO- RIDE, DIS- SOLVED (MG/L AS F) (00950)	SILICA, DIS- SOLVED (MG/L AS STO2) (00955)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L) (70301)	BORON, DIS- SOLVED (UG/L AS B) (01020)	IRON, DIS- SOLVED (UG/L AS FE) (01046)
NOV 1996 14...	83	--	2000	2000	0.90	13	6020	--	--	
MAR 1997 24...	120	--	2500	4100	1.2	5.7	10400	--	--	
JUN 17...	83	--	2000	2100	0.84	18	6260	--	--	
AUG 01...	90	84	2000	2000	0.69	25	6250	531	<30	
15...	72	--	2000	2100	0.86	25	6230	--	--	
SEP 08...	82	--	2100	2100	0.87	11	6230	--	--	



# RIO GRANDE BASIN

379

08446500 PECOS RIVER NEAR GIRVIN, TX

**LOCATION.**--Lat 31°06'47", long 102°25'02", Pecos County, Hydrologic Unit 13070008, on right bank 2.1 mi upstream from Comanche Creek, 3.8 mi northwest of Girvin, and 7.2 mi upstream from bridge on U.S. Highway 67.

**DRAINAGE AREA.**--29,560 mi<sup>2</sup> approximately, for contributing area of supplementary gage 7.2 mi downstream.

**PERIOD OF RECORD.**--August 1939 to current year.

Water-quality records.--Chemical analyses: October 1939 to June 1941, October 1946 to September 1947, October 1953 to September 1982.

Pesticide analyses: October 1968 to September 1974.

**GAGE.**--Water-stage recorder with concrete control and measuring flume. Datum of gage not determined. Supplementary water-stage recorder, used as regular gage prior to July 17, 1951, is now used only for peaks exceeding about 750 ft<sup>3</sup>/s, 7.2 mi downstream at datum 2,269.65 ft above sea level.

**REMARKS.**--Records good except those for estimated daily discharges, which are fair. Since installation of gage in water year 1939, at least 10% of contributing drainage area has been regulated by Red Bluff Reservoir (08410000). There are also numerous diversions above station for irrigation. Satellite telemeter at station.

**EXTREMES OUTSIDE PERIOD OF RECORD.**--Maximum stage since at least 1932 occurred Oct. 5, 1941.

## DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997 DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	26	30	33	28	33	24	18	47	13	12	10
2	26	26	28	33	28	33	23	17	31	12	13	10
3	26	26	26	33	28	33	24	16	27	12	14	11
4	27	26	26	33	28	33	24	15	25	12	17	21
5	28	33	25	33	28	32	24	16	27	11	18	26
6	27	35	25	33	30	32	24	15	26	10	18	37
7	28	35	24	32	31	32	24	15	25	10	20	18
8	29	33	24	31	30	31	27	15	e25	10	19	14
9	31	30	24	31	30	31	29	15	e28	9.6	18	12
10	31	30	24	32	30	30	31	15	91	10	20	13
11	30	34	24	31	29	30	32	15	87	10	19	12
12	29	34	30	31	30	30	32	16	38	9.8	17	11
13	28	30	35	31	30	29	33	16	24	10	17	12
14	27	29	36	29	31	29	33	15	26	31	17	15
15	27	28	36	34	30	29	33	14	38	23	15	16
16	27	28	36	31	30	28	33	34	33	17	15	16
17	27	28	36	32	30	28	34	35	28	14	13	14
18	27	27	34	31	29	29	40	25	26	12	12	13
19	26	25	34	31	30	28	33	19	27	11	33	13
20	25	24	34	32	43	27	30	17	26	11	23	12
21	25	23	34	32	56	27	27	16	22	11	21	12
22	24	22	34	32	47	26	24	17	20	10	24	13
23	24	22	34	31	41	26	22	17	20	11	23	12
24	24	26	34	31	40	25	21	19	20	12	18	13
25	23	28	34	31	39	25	31	21	18	10	14	13
26	24	26	34	31	36	25	23	22	16	10	16	14
27	25	25	34	30	34	26	24	21	15	11	16	14
28	25	25	34	30	33	26	22	30	15	12	14	13
29	25	29	34	29	---	25	20	33	14	11	13	13
30	25	36	34	28	---	24	19	34	14	12	12	12
31	25	---	33	29	---	24	---	46	---	11	11	---
TOTAL	820	849	964	971	929	886	820	639	879	379.4	532	435
MEAN	26.5	28.3	31.1	31.3	33.2	28.6	27.3	20.6	29.3	12.2	17.2	14.5
MAX	31	36	36	34	56	33	40	46	91	31	33	37
MIN	23	22	24	28	28	24	19	14	14	9.6	11	10
AC-FT	1630	1680	1910	1930	1840	1760	1630	1270	1740	753	1060	863

## STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1997, BY WATER YEAR (WY)

	MEAN	204	109	69.9	65.7	55.8	45.6	36.9	47.3	104	48.0	34.8	66.3
MAX	8506	3007	1192	935	769	314	143	538	3556	813	376	1168	
(WY)	1942	1942	1942	1942	1942	1942	1957	1942	1941	1941	1941	1941	
MIN	9.52	13.0	15.7	18.3	14.5	16.7	11.3	7.62	2.84	3.86	4.13	6.05	
(WY)	1980	1974	1984	1984	1982	1966	1985	1985	1983	1964	1969	1983	

## SUMMARY STATISTICS

	FOR 1996 CALENDAR YEAR	FOR 1997 WATER YEAR	WATER YEARS 1939 - 1997
ANNUAL TOTAL	8566.9	9103.4	
ANNUAL MEAN	23.4	24.9	74.1
HIGHEST ANNUAL MEAN			1386
LOWEST ANNUAL MEAN			16.2
HIGHEST DAILY MEAN	65	Mar 24	19400
LOWEST DAILY MEAN	6.2	Jul 9	1.9
ANNUAL SEVEN-DAY MINIMUM	6.8	Jul 6	2.3
INSTANTANEOUS PEAK FLOW		129	20000
INSTANTANEOUS PEAK STAGE		2.07	20.49
ANNUAL RUNOFF (AC-FT)	16990	18060	53660
10 PERCENT EXCEEDS	34	34	86
50 PERCENT EXCEEDS	26	26	30
90 PERCENT EXCEEDS	8.9	12	11

e Estimated

## RIO GRANDE BASIN

08447410 PECOS RIVER NEAR LANGTRY, TX  
(National Stream-Quality Accounting Network)

**LOCATION.**--Lat 29°48'10", long 101°26'45", Val Verde County, Hydrologic Unit 13040212, at gaging station 7.4 mi east of Langtry, and 15.0 mi upstream from confluence with the Rio Grande.

**DRAINAGE AREA.**--35,179 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Inorganic chemical analyses: October 1954 to current year. Biochemical analyses: October 1974 to August 1995. Organic analyses: July 1975 to June 1982, October 1995 to current year. Sediment analyses: October 1974 to current year.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: October 1970 to September 1976, October 1980 to September 1985.

WATER TEMPERATURE: October 1970 to September 1985.

**INSTRUMENTATION.**--Specific conductance and water temperature were recorded continuously from November 1980 to September 1985.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum daily, 6,000 microsiemens Mar. 21, 22, 1981; minimum daily, 230 microsiemens Oct. 11, 1981.

WATER TEMPERATURE: Maximum daily, 32.5°C June 8, 1981; minimum daily, 1.5°C Dec. 26, 27, 1983.

**REMARKS.**--Discharges published in the table were obtained directly from rating table furnished by International Boundary and Water Commission.

Records of daily mean discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67. Since October 1995, quality assurance data for this station may be obtained from the U.S. Geological Survey upon request.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	AGENCY COL- LECTING SAMPLE (CODE NUMBER)	SAM- PLING METHOD, METHOD, CODES	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	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)
DEC												
17...	0950	1028	20	191	3630	7.9	11.0	0.30	10.9	105	710	550
JAN												
30...	1000	1028	20	172	4230	8.1	10.5	1.7	10.3	97	810	650
FEB												
20...	1645	1028	8010	4400	850	7.6	15.5	0.30	10.3	110	150	92
MAR												
12...	1100	1028	20	720	3260	8.0	18.0	0.64	9.3	104	640	480
APR												
02...	0945	1028	20	228	3650	8.0	17.5	0.60	8.5	94	690	530
16...	0945	1028	20	198	3740	8.0	18.5	0.50	9.3	105	710	560
MAY												
29...	1110	1028	20	169	2810	8.0	28.0	0.63	7.2	97	510	380
JUN												
30...	1505	1028	20	228	2180	8.2	29.0	1.9	8.2	113	440	280
JUL												
15...	1140	1028	20	172	2240	8.0	29.0	0.25	7.2	99	430	300
AUG												
06...	1440	1028	20	130	2310	8.2	30.5	0.40	8.3	117	420	300
SEP												
09...	1500	1028	20	145	2190	8.1	29.5	0.55	7.9	110	410	290

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)	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)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)	SILICA, DIS- SOLVED (MG/L AS SIO2)
DEC												
17...	160	75	490	8	8.4	0	202	166	500	810	0.90	14
JAN												
30...	180	87	550	8	8.9	0	194	159	580	940	1.0	11
FEB												
20...	43	11	67	2	3.1	0	75	61	75	110	0.20	5.6
MAR												
12...	140	67	457	8	7.5	0	190	156	440	750	0.78	10
APR												
02...	150	76	507	8	8.4	0	198	162	490	860	0.91	11
16...	150	79	531	9	8.2	0	187	154	510	880	1.0	11
MAY												
29...	110	57	366	7	7.2	0	150	123	360	620	0.88	9.3
JUN												
30...	100	44	271	6	5.8	0	190	156	270	440	0.76	14
JUL												
15...	94	47	295	6	5.7	0	161	132	280	460	0.81	15
AUG												
06...	92	47	294	6	5.8	0	147	121	290	480	0.81	14
SEP												
09...	90	44	267	6	5.8	0	146	120	270	440	0.81	14



RIO GRANDE BASIN

381

08447410 PECOS RIVER NEAR LANGTRY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	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, NITRITE DIS- SOLVED (MG/L AS N)	NITRO- GEN, NO2+NO3 DIS- SOLVED (MG/L AS N)	NITRO- GEN, AMMONIA DIS- SOLVED (MG/L AS N)	NITRO- GEN, TOTAL (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)
DEC 17...	2270	2160	0.730	0.020	0.750	0.050	--	--	<0.20	<0.20	<0.010	<0.010
JAN 30...	2550	2460	0.670	0.010	0.680	<0.015	--	--	<0.20	<0.20	<0.010	<0.010
FEB 20...	387	356	0.840	0.030	0.870	<0.015	1.8	0.90	0.40	0.90	0.070	<0.010
MAR 12...	1650	1980	0.560	0.012	0.572	<0.015	0.84	0.27	<0.20	0.27	<0.010	<0.010
APR 02...	5940	2210	--	<0.010	0.690	<0.015	--	--	<0.20	<0.20	<0.010	<0.010
16...	2380	2270	--	<0.010	0.673	0.020	--	--	<0.20	<0.20	<0.010	<0.010
MAY 29...	1660	1610	0.150	0.010	0.160	0.031	0.51	0.32	<0.20	0.35	<0.010	<0.010
JUN 30...	1340	1250	--	<0.010	0.591	<0.015	--	--	<0.20	<0.20	<0.010	<0.010
JUL 15...	1370	1280	--	<0.010	0.439	<0.015	--	--	<0.20	<0.20	<0.010	<0.010
AUG 06...	1380	1300	--	<0.010	0.247	0.031	--	--	<0.20	<0.20	<0.010	<0.010
SEP 09...	1320	1210	--	<0.010	0.307	0.019	--	--	<0.20	<0.20	0.011	<0.010

DATE	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDED TOTAL (MG/L AS C)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDED (T/DAY)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)	CADMIUM DIS- SOLVED (UG/L AS CD)
DEC 17...	<0.001	2.2	0.30	18	9.3	<2.0	<2.0	<1	80	<2.0	241	<2.0
JAN 30...	<0.001	1.1	0.20	8	3.7	<2.0	<2.0	<1	79	<2.0	254	<2.0
FEB 20...	<0.001	7.3	2.6	86	1020	4.0	<1.0	<1	29	<1.0	46	<1.0
MAR 12...	<0.001	2.4	0.40	19	37	<2.0	<2.0	<1	68	<2.0	195	<2.0
APR 02...	<0.001	1.5	0.20	14	8.6	<2.0	<2.0	1	79	<2.0	229	<2.0
16...	0.001	1.7	0.20	10	5.3	2.7	<2.0	<1	78	<2.0	242	<2.0
MAY 29...	<0.001	2.3	0.30	15	6.8	4.4	<2.0	<1	68	<2.0	210	<2.0
JUN 30...	<0.001	1.9	0.20	7	4.3	2.2	<1.0	1	77	<1.0	182	<1.0
JUL 15...	<0.001	1.6	0.20	5	2.3	1.1	<1.0	1	72	<1.0	191	<1.0
AUG 06...	0.001	1.6	0.20	8	2.8	1.0	<1.0	<1	70	<1.0	183	<1.0
SEP 09...	<0.001	1.6	<0.20	3	1.2	1.2	<1.0	1	70	<1.0	179	<1.0

DATE	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)	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)
DEC 17...	<2.0	<2.0	<2.0	<9.0	<2.0	66	<2.0	7.0	<2.0	<1	<2.0
JAN 30...	<2.0	<2.0	<2.0	10	<2.0	77	<2.0	7.0	<2.0	<1	<2.0
FEB 20...	<1.0	<1.0	<1.0	4.0	<1.0	9	2.0	1.0	<1.0	<1	<1.0
MAR 12...	3.1	<2.0	4.3	<9.0	<2.0	56	2.3	6.1	4.3	<1	<2.0
APR 02...	<2.0	<2.0	<2.0	<9.0	<2.0	70	<2.0	7.1	<2.0	<1	<2.0
16...	<2.0	<2.0	<2.0	<9.0	<2.0	75	2.3	7.0	<2.0	<1	<2.0
MAY 29...	2.2	<2.0	<2.0	<9.0	<2.0	55	3.6	5.9	<2.0	<1	<2.0
JUN 30...	1.2	<1.0	1.5	<9.0	<1.0	48	<1.0	5.5	<1.0	<1	<1.0
JUL 15...	2.7	<1.0	1.1	<9.0	<1.0	50	<1.0	5.4	1.0	<1	<1.0
AUG 06...	1.7	<1.0	2.0	<9.0	<1.0	52	<1.0	5.5	1.2	<1	<1.0
SEP 09...	<1.0	<1.0	1.0	<9.0	<1.0	52	1.4	5.8	<1.0	<1	<1.0



## RIO GRANDE BASIN

08447410 PECOS RIVER NEAR LANGTRY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)
DEC 17...	3000	<18	3.0	4.0	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
JAN 30...	3300	<18	2.0	5.0	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
FEB 20...	430	<6	1.0	<1.0	<0.002	<0.002	<0.002	0.008	<0.001	<0.002	<0.002
MAR 12...	2610	<18	6.5	3.2	<0.002	<0.002	<0.002	0.003	<0.001	<0.002	<0.002
APR 02...	2800	<18	2.1	3.7	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
APR 16...	3020	<18	2.6	3.8	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
MAY 29...	2220	<18	3.7	2.6	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
JUN 30...	1800	<18	2.8	2.6	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
JUL 15...	1880	<18	<1.0	2.6	<0.002	<0.002	<0.002	0.002	<0.001	<0.002	<0.002
AUG 06...	1860	<18	1.5	2.4	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
SEP 09...	1720	<18	1.9	2.4	<0.002	<0.002	<0.002	<0.001	<0.001	<0.002	<0.002
DATE	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)
DEC 17...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
JAN 30...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
FEB 20...	<0.003	<0.003	<0.004	<0.004	0.003	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
MAR 12...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
APR 02...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
APR 16...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
MAY 29...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
JUN 30...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
JUL 15...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	0.013	<0.001	<0.003	<0.017	<0.002
AUG 06...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
SEP 09...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
DATE	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)
DEC 17...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
JAN 30...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
FEB 20...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
MAR 12...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
APR 02...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
APR 16...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
MAY 29...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
JUN 30...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
JUL 15...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
AUG 06...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
SEP 09...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003

# RIO GRANDE BASIN

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08447410 PECOS RIVER NEAR LANGTRY, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PARA- THION, DIS- SOLVED (UG/L)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
DEC 17...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JAN 30...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
FEB 20...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
MAR 12...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
APR 02...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
APR 16...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
MAY 29...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUN 30...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUL 15...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
AUG 06...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
SEP 09...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013

DATE	SI- MAZINE, WATER, DISS, REC (UG/L)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	SAMPLE VOLUME SCHED- ULE 2001 (ML)
DEC 17...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	85.9	76.7	97.9	952
JAN 30...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	85.5	88.9	100	925
FEB 20...	E0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	87.8	70.4	96.2	961
MAR 12...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	84.0	93.8	121	895
APR 02...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	83.8	85.3	128	952
APR 16...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	97.8	94.1	101	917
MAY 29...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	96.5	105	125	877
JUN 30...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	97.4	114	120	862
JUL 15...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	122	138	131	909
AUG 06...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	112	105	135	952
SEP 09...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	94.6	107	112	892

## RIO GRANDE MAIN STEM

08450900 RIO GRANDE BELOW AMISTAD DAM NEAR DEL RIO, TX  
(National Stream-quality Accounting Network)

**LOCATION.**--Lat 29°25'30", long 101°27'00", Val Verde County, Hydrologic Unit 13080001, 2.2 mi downstream from Amistad Dam and 10 mi northwest of Del Rio.

**DRAINAGE AREA.**--123,143 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Inorganic chemical analyses: July 1968 to current year. Organic chemical and sediment analyses: October 1995 to current year.

**REMARKS.**--The flow is controlled largely by releases from Amistad Reservoir. Discharges published in the table were obtained directly from rating table furnished by International Boundary and Water Commission. Records of daily mean discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67. Since June 1996, quality assurance data for this station may be obtained from the U.S. Geological Survey upon request.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		AGENCY COL- LECTING SAMPLE (CODE NUMBER)	SAM- PLING METHOD, CODES	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	TUR- BID- ITY (NTU)	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)	
OCT													
16...	1205	84823	70	1520	1210	7.8	32.0	--	--	--	270	170	
NOV													
20...	0820	84823	70	1590	1190	8.0	19.5	--	--	--	280	170	
DEC													
18...	0920	84823	70	2610	1160	8.0	14.0	--	--	--	280	170	
JAN													
15...	1045	84823	70	1300	1170	8.0	11.0	--	--	--	280	160	
28...	1430	1028	8010	1610	1210	7.9	11.5	2.0	9.9	93	290	160	
FEB													
19...	1330	84823	70	1700	1230	7.9	11.0	--	--	--	280	160	
MAR													
10...	1320	1028	8010	1590	1200	7.9	13.0	0.60	9.8	96	300	170	
19...	1145	84823	70	1540	1210	7.8	12.5	--	--	--	290	160	
APR													
03...	1015	1028	10	1370	1180	7.7	14.0	0.82	9.7	98	290	160	
16...	0715	84823	70	590	1210	7.9	14.5	--	--	--	310	190	
MAY													
21...	1305	84823	70	1620	1210	7.9	16.5	--	--	--	290	170	
30...	0845	1028	10	140	1190	7.7	17.5	0.52	6.1	67	290	160	
JUN													
18...	0955	84823	70	158	1220	7.3	19.5	--	--	--	280	160	
JUL													
16...	1255	84823	70	1620	1240	7.5	19.0	--	--	--	290	170	
AUG													
08...	0940	1028	10	340	1220	7.4	19.0	0.36	3.4	38	300	170	
21...	0835	84823	70	258	1140	7.6	20.5	--	--	--	270	150	
SEP													
11...	0920	1028	10	166	1220	7.5	21.0	0.55	2.1	25	290	160	
17...	0850	84823	70	353	1200	7.9	21.0	--	--	--	--	--	
		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)	ALKA- LINITY WAT DIS FIX END FIELD (MG/L AS CACO3)	SULFATE DIS- SOLVED (MG/L AS SO4)	CHLO- RIDE, DIS- SOLVED (MG/L AS CL)	FLUO- RIDE, DIS- SOLVED (MG/L AS F)
OCT													
16...	72	23	140	4	5.2	--	--	--	100	230	160	0.90	
NOV													
20...	74	23	140	4	5.2	--	--	--	110	230	150	0.80	
DEC													
18...	77	22	130	3	5.2	--	--	--	110	220	150	0.90	
JAN													
15...	74	22	130	3	5.1	--	--	--	120	220	150	0.90	
28...	78	22	130	3	5.0	0	151	121	--	240	160	0.90	
FEB													
19...	77	22	130	3	5.3	--	--	--	120	230	160	0.80	
MAR													
10...	80	23	130	3	4.9	0	152	125	--	230	160	0.90	
19...	78	22	130	3	4.9	--	--	--	120	230	160	0.80	
APR													
03...	79	21	126	3	5.2	0	152	124	--	230	160	0.86	
16...	85	23	134	3	5.2	--	--	--	120	220	160	0.84	
MAY													
21...	78	23	135	3	5.1	--	--	--	120	210	140	0.72	
30...	78	22	130	3	5.3	0	157	128	--	220	160	0.82	
JUN													
18...	78	21	129	3	5.5	--	--	--	120	210	150	0.76	
JUL													
16...	78	22	137	4	4.9	--	--	--	110	220	160	0.77	
AUG													
08...	82	23	134	3	5.0	0	160	131	--	220	160	0.79	
21...	74	21	124	3	4.6	--	--	--	120	220	150	0.80	
SEP													
11...	78	23	134	3	4.7	0	159	131	--	230	170	0.77	
17...	--	--	--	--	--	--	--	--	130	220	160	0.82	

## 385

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible]

## 08450900 RIO GRANDE BELOW AMISTAD DAM NEAR DEL RIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible][illegible]



## 387

08450900 RIO GRANDE BELOW AMISTAD DAM NEAR DEL RIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

	CAR- BARYL WATER FLTRD 0.7 U	CARBO- FURAN WATER FLTRD 0.7 U	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)
DATE	GF, REC (UG/L)	GF, REC (UG/L)	SOLVED (UG/L)	REC (UG/L)	GF, REC (UG/L)	DISSOLV (UG/L)	SOLVED (UG/L)	SOLVED (UG/L)	GF, REC (UG/L)	GF, REC (UG/L)	GF, REC (UG/L)
OCT 16...	--	--	--	--	--	--	--	--	--	--	--
NOV 20...	--	--	--	--	--	--	--	--	--	--	--
DEC 18...	--	--	--	--	--	--	--	--	--	--	--
JAN 15... 28...	-- <0.003	-- <0.003	-- <0.004	-- <0.004	-- <0.002	-- <0.006	-- 0.010	-- <0.001	-- <0.003	-- <0.017	-- <0.002
FEB 19...	--	--	--	--	--	--	--	--	--	--	--
MAR 10... 19...	<0.003 --	<0.003 --	<0.004 --	<0.004 --	<0.002 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --
APR 03... 16...	<0.003 --	<0.003 --	<0.004 --	<0.004 --	<0.002 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --
MAY 21... 30...	-- <0.003	-- <0.003	-- <0.004	-- <0.004	-- E0.001	-- <0.006	-- <0.002	-- <0.001	-- <0.003	-- <0.017	-- <0.002
JUN 18...	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--	--
AUG 08... 21...	<0.003 --	<0.003 --	<0.004 --	<0.004 --	<0.002 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --
SEP 11... 17...	<0.003 --	<0.003 --	<0.004 --	<0.004 --	<0.002 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --

[illegible]

## RIO GRANDE MAIN STEM

08450900 RIO GRANDE BELOW AMISTAD DAM NEAR DEL RIO, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

	PARA- THION, DIS- SOLVED (UG/L)	METHYL- PARA- THION WAT FLT 0.7 U , GF, REC (UG/L)	PEN- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
OCT 16...	--	--	--	--	--	--	--	--	--	--	--
NOV 20...	--	--	--	--	--	--	--	--	--	--	--
DEC 18...	--	--	--	--	--	--	--	--	--	--	--
JAN 15...	--	--	--	--	--	--	--	--	--	--	--
28...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
FEB 19...	--	--	--	--	--	--	--	--	--	--	--
MAR 10... 19...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --
APR 03... 16...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --
MAY 21... 30...	-- <0.004	-- <0.006	-- <0.004	-- <0.004	-- <0.005	-- <0.002	-- <0.003	-- <0.018	-- <0.007	-- <0.004	-- <0.013
JUN 18...	--	--	--	--	--	--	--	--	--	--	--
JUL 16...	--	--	--	--	--	--	--	--	--	--	--
AUG 08... 21...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --
SEP 11... 17...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --

[illegible]

# RIO GRANDE MAIN STEM

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08459000 RIO GRANDE AT LAREDO, TX

**LOCATION.**--Lat 27°29'45", long 99°29'30", Webb County, Hydrologic Unit 13080002, at gaging station 1.1 mi downstream from the highway bridge between Laredo and Nuevo Laredo, Tamaulipas, Mex., and 891.0 mi downstream from the American Dam at El Paso.

**DRAINAGE AREA.**--132,578 mi<sup>2</sup>, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

**PERIOD OF RECORD.**--Chemical analyses: April 1952, July 1955 to September 1986, October 1989 to current year. Chemical and biochemical analyses: January 1973 to September 1986. Pesticide analyses: March to May 1979. Sediment analyses: January 1973 to September 1986.

## PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1954 to September 1986.

WATER TEMPERATURE: February 1973 to August 1976.

**REMARKS.**--Records of daily mean discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

## EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum daily, 1,690 microsiemens June 1, 1963; minimum daily, 214 microsiemens Sept. 26, 1964.

### WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT									
16...	0810	1270	1180	7.9	25.0	270	160	73	22
NOV									
20...	1014	1480	1180	7.9	22.5	280	160	77	22
DEC									
11...	1037	1450	1160	8.1	17.0	280	170	79	21
JAN									
15...	1000	1560	122	8.0	6.0	310	180	85	23
FEB									
19...	1015	1410	1210	7.7	16.5	290	160	79	22
MAR									
19...	1030	1870	953	7.8	18.5	270	140	79	17
APR									
16...	0830	1530	1160	7.9	19.0	330	200	96	22
MAY									
21...	1027	1700	1080	7.9	27.5	280	160	77	21
JUN									
18...	1040	1910	890	7.3	29.0	220	110	64	15
JUL									
16...	0950	960	1100	7.7	29.5	240	160	64	21
AUG									
20...	1040	1000	1190	7.6	29.0	260	160	69	22
SEP									
17...	1128	1230	1180	8.0	28.5	270	160	71	22

DATE	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 SiO2)	SOLIDS, SUM OF CONSTITUENTS, DIS- SOLVED (MG/L)
OCT									
16...	130	3	5.1	110	230	150	0.80	12	690
NOV									
20...	120	3	4.7	120	220	150	0.70	13	678
DEC									
11...	120	3	4.4	120	210	140	0.80	12	658
JAN									
15...	130	3	4.8	130	240	150	0.80	11	723
FEB									
19...	120	3	4.7	120	230	150	0.80	5.0	686
MAR									
19...	86	2	4.1	130	170	100	0.50	12	544
APR									
16...	122	3	4.6	130	210	140	0.82	13	695
MAY									
21...	115	3	4.8	120	190	140	0.62	11	630
JUN									
18...	82	2	4.7	110	140	95	0.51	9.1	479
JUL									
16...	123	3	4.0	82	200	140	0.68	8.7	608
AUG									
20...	127	3	4.5	100	230	160	0.78	13	683
SEP									
17...	127	3	4.8	100	220	160	0.78	14	674

08461300 RIO GRANDE BELOW FALCON DAM, TX  
(National Stream-Quality Accounting Network)

**LOCATION.**--Lat 26°33'25", long 99°10'05", Starr County, Hydrologic Unit 13090001, U.S. Tailrace at Falcon Dam.

**DRAINAGE AREA.**--159,270 mi<sup>2</sup>, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

**PERIOD OF RECORD.**--Chemical analyses: July 1955 to current year. Biochemical analyses: October 1995 to current year. Pesticide analyses: October 1995 to current year.

**REMARKS.**--The flow is controlled by releases from Falcon Reservoir. Discharges published in the table were obtained directly from rating table furnished by International Boundary and Water Commission. Records of daily mean discharge and specific conductance for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

		AGENCY COL-LECTING SAMPLE (CODE NUMBER)	SAM-PLING METHOD, CODES	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	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)
OCT	22...	0755	84823	--	477	1010	7.6	23.0	--	--	230	120
NOV	19...	0806	84823	--	1010	1010	7.8	22.0	--	--	240	140
DEC	03...	1400	1028	10	1670	1020	8.4	18.5	4.9	10.4	240	130
	17...	0806	84823	--	1010	1020	7.7	--	--	--	240	130
JAN	09...	1330	1028	10	2060	1070	8.5	15.5	4.0	11.0	240	140
	15...	1048	84823	--	1360	1040	7.7	9.0	--	--	250	130
MAY	14...	1045	1028	--	1060	1100	7.7	23.0	--	--	270	150
JUN	25...	0940	1028	30	3260	1110	7.9	28.5	4.0	7.9	260	150
JUL	23...	0810	--	--	3180	1110	7.3	28.0	--	--	250	150
SEP	03...	0940	1028	30	5400	1130	7.6	28.0	7.2	5.3	240	130
	24...	1055	84823	--	953	1100	7.8	27.5	--	--	--	--

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)	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	ALKA- LINITY 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)
OCT 22...	61	18	110	3	6.1	--	--	--	100	190	130	0.70
NOV 19...	66	19	120	3	5.7	--	--	--	110	190	120	0.60
DEC 03...	66	18	110	3	6.0	0	136	111	110	190	130	0.70
17...	68	18	110	3	5.9	--	--	--	110	190	120	0.70
JAN 09...	65	19	110	3	5.6	3	123	106	110	200	130	0.60
15...	67	19	110	3	5.7	--	--	--	110	200	130	0.70
MAY 14...	75	21	121	3	5.7	--	--	--	120	200	130	0.55
JUN 25...	70	19	113	3	5.6	0	136	112	110	220	140	0.67
JUL 23...	69	20	119	3	5.7	--	--	--	100	200	130	0.64
SEP 03...	63	20	122	3	6.0	0	138	113	110	210	140	0.72
24...	--	--	--	--	--	--	--	--	98	210	140	0.68

[illegible]

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08461300 RIO GRANDE BELOW FALCON DAM, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible][illegible][illegible]



08461300 RIO GRANDE BELOW FALCON DAM, TX--Continued

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

	CAR- BARYL WATER FLTRD 0.7 U	CARBO- FURAN WATER FLTRD 0.7 U	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS., REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P,P' DDE DISSOLV (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)
DATE	GF, REC (UG/L)	GF, REC (UG/L)	SOLVED (UG/L)	REC (UG/L)	GF, REC (UG/L)	DISSOLV (UG/L)	SOLVED (UG/L)	SOLVED (UG/L)	GF, REC (UG/L)	GF, REC (UG/L)	GF, REC (UG/L)
OCT 22...	--	--	--	--	--	--	--	--	--	--	--
NOV 19...	--	--	--	--	--	--	--	--	--	--	--
DEC 03... 17...	<0.003 --	<0.003 --	0.007 --	<0.004 --	E0.003 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --
JAN 09... 15...	<0.003 --	<0.003 --	0.061 --	<0.004 --	E0.003 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --
MAY 14...	--	--	--	--	--	--	--	--	--	--	--
JUN 25...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
JUL 23...	--	--	--	--	--	--	--	--	--	--	--
SEP 03... 24...	<0.003 --	<0.003 --	<0.004 --	<0.004 --	<0.002 --	<0.006 --	<0.002 --	<0.001 --	<0.003 --	<0.017 --	<0.002 --

	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHO- PROP WATER FLT RD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLT RD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENSOR WATER DISSOLV (UG/L)	MOL- INATE WATER FLT RD 0.7 U GF, REC (UG/L)	NAPROP- AMIDE WATER FLT RD 0.7 U GF, REC (UG/L)
OCT 22...	--	--	--	--	--	--	--	--	--	--	--
NOV 19...	--	--	--	--	--	--	--	--	--	--	--
DEC 03... 17...	<0.004 --	<0.003 --	<0.003 --	<0.002 --	<0.004 --	<0.002 --	<0.005 --	<0.002 --	<0.004 --	<0.004 --	<0.003 --
JAN 09... 15...	<0.004 --	<0.003 --	<0.003 --	<0.002 --	<0.004 --	<0.002 --	<0.005 --	<0.002 --	0.004 --	<0.004 --	<0.003 --
MAY 14...	--	--	--	--	--	--	--	--	--	--	--
JUN 25... JUL 23...	<0.004 --	<0.003 --	<0.003 --	<0.002 --	<0.004 --	<0.002 --	<0.005 --	<0.002 --	<0.004 --	<0.004 --	<0.003 --
SEP 03... 24...	<0.004 --	<0.003 --	<0.003 --	<0.002 --	<0.004 --	<0.002 --	<0.005 --	<0.002 --	0.014 --	<0.004 --	<0.003 --

DATE	PARA- THION, DIS- SOLVED (UG/L)	METHYL- PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FLTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
OCT 22...	--	--	--	--	--	--	--	--	--	--	--
NOV 19...	--	--	--	--	--	--	--	--	--	--	--
DEC 03... 17...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --
JAN 09... 15...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --
MAY 14...	--	--	--	--	--	--	--	--	--	--	--
JUN 25...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUL 23...	--	--	--	--	--	--	--	--	--	--	--
SEP 03... 24...	<0.004 --	<0.006 --	<0.004 --	<0.004 --	<0.005 --	<0.002 --	<0.003 --	<0.018 --	<0.007 --	<0.004 --	<0.013 --

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

[illegible]

## RIO GRANDE MAIN STEM

08464700 RIO GRANDE AT FORT RINGGOLD, RIO GRANDE CITY, TX

**LOCATION.**--Lat 26°22'05", long 98°48'20", Starr County, Hydrologic Unit 13090001, at gaging station about 1 mi downstream from Rio Grande City, 3.9 mi downstream from mouth of Rio San Juan, and 1,014.3 mi downstream from the American Dam at El Paso.

**DRAINAGE AREA.**--174,362 mi<sup>2</sup>, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

**PERIOD OF RECORD.**--Chemical analyses: January 1959 to current year.

**REMARKS.**--Records of specific conductance and discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT									
22...	0905	406	1150	7.7	24.0	220	130	58	19
NOV									
19...	0920	1010	1090	7.8	23.5	240	130	64	19
DEC									
17...	0900	1060	1080	7.7	4.5	260	150	71	19
JAN									
15...	0950	1410	1070	7.7	8.0	250	140	67	20
FEB									
20...	0855	1870	1120	7.5	19.0	260	140	70	20
MAR									
18...	0845	53	1240	7.2	23.0	250	120	72	17
APR									
16...	0945	141	1500	7.4	20.5	320	210	87	26
MAY									
14...	0935	1450	1180	7.5	24.5	270	150	74	21
JUN									
19...	0940	3530	1160	7.2	29.5	260	150	71	20
JUL									
16...	0945	2370	1150	7.2	28.0	260	160	71	20
AUG									
20...	0947	2120	1170	7.3	29.0	240	140	64	20
SEP									
24...	0905	1160	1210	7.9	27.0	250	150	65	20

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 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 CONSTITUENTS, DIS- SOLVED (MG/L)
OCT									
22...	130	4	6.2	92	210	150	0.70	9.5	639
NOV									
19...	120	3	5.9	110	200	140	0.60	9.6	624
DEC									
17...	120	3	6.3	110	190	130	0.70	8.5	610
JAN									
15...	120	3	6.0	110	200	130	0.70	11	622
FEB									
20...	110	3	6.0	110	210	140	0.70	9.1	635
MAR									
18...	150	4	6.2	120	190	180	0.40	7.9	698
APR									
16...	192	5	11	110	270	210	0.68	3.5	870
MAY									
14...	124	3	6.2	120	210	130	0.63	8.9	654
JUN									
19...	119	3	8.1	110	210	140	0.63	11	641
JUL									
16...	126	3	7.4	100	210	140	0.64	11	641
AUG									
20...	121	3	6.4	100	220	150	0.66	11	654
SEP									
24...	130	4	8.8	98	220	160	0.66	11	672

# RIO GRANDE MAIN STEM

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08466300 RIO GRANDE NEAR LOS EBANOS, TX

**LOCATION.**--Lat 26°14'15", long 98°33'49", Hidalgo County, Hydrologic Unit 13090001, on Farm Road 886 at U.S. Border Port of Entry near Los Ebanos and at mile 204.37.

**PERIOD OF RECORD.**--Chemical analyses: June 1977 to current year.

**REMARKS.**--Records of specific conductance and discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT 16...	1035	410	1240	7.9	27.0	240	150	60	21
NOV 20...	1115	1200	1140	7.9	24.0	250	140	69	20
DEC 17...	1305	322	1100	8.0	16.0	260	150	72	20
JAN 21...	1105	1440	1100	7.9	11.5	260	140	71	19
MAY 13...	1030	664	1170	7.8	26.0	270	150	74	21
SEP 15...	1145	544	1220	8.1	29.5	260	170	69	22

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 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 CONSTITUENTS, DIS- SOLVED (MG/L)
OCT 16...	150	4	5.9	85	230	180	0.60	10	708
NOV 20...	120	3	5.9	110	210	150	0.60	10	654
DEC 17...	120	3	5.7	110	200	140	0.70	7.0	634
JAN 21...	120	3	5.7	120	210	140	0.70	11	647
MAY 13...	132	3	5.3	110	220	150	0.61	9.6	674
SEP 15...	132	4	6.5	98	230	160	0.71	11	695

## RIO GRANDE MAIN STEM

08469200 RIO GRANDE BELOW ANZALDUAS DAM, TX

**LOCATION.**--Lat 26°08'00", long 98°20'05", Hidalgo County, Hydrologic Unit 13090002, at gaging station 0.5 mi downstream from Anzalduas Dam, 12.2 mi from Hidalgo, and 1,077.1 mi downstream from the American Dam at El Paso.

**DRAINAGE AREA.**--176,112 mi<sup>2</sup>, United States and Mexico; from International Boundary and Water Commission Water Bulletin No. 44.

**PERIOD OF RECORD.**--Chemical analyses: March 1959 to current year. Pesticide analyses: October 1967 to July 1972.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: October 1977 to current year.

**REMARKS.**--Records of daily mean discharge and specific conductance for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67. 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 for this station may be obtained from the Geological Survey District Office upon request.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum daily, 3,310 microsiemens Feb. 12, 1984; minimum daily, 363 microsiemens Nov. 26 and 29, 1995.

**EXTREMES FOR CURRENT YEAR.**--

SPECIFIC CONDUCTANCE: Maximum daily, 2,670 microsiemens Apr 19; minimum daily, 683 microsiemens June 2.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	DIS- CHARGE, INST. CUBIC FEET PER SECOND	SPE- CIFIC CON- DUCT- ANCE (US/CM)	PH WATER WHOLE FIELD (STAND- ARD UNITS)	TEMPER- ATURE WATER (DEG C)	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)
OCT									
16...	0945	480	1290	7.8	27.0	270	180	69	24
NOV									
20...	1030	512	1040	8.1	24.0	240	140	65	19
DEC									
17...	1145	724	1310	7.9	19.0	300	180	81	23
JAN									
21...	1015	1610	1120	8.0	10.5	260	150	71	21
MAY									
13...	1240	830	1530	7.9	26.5	310	210	79	28
AUG									
19...	1020	1540	1250	7.5	30.0	240	140	64	20
SEP									
15...	1025	900	1210	8.1	30.0	270	160	70	22

DATE	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 SiO2)	SOLIDS, SUM OF CONSTI- TUENTS, DIS- SOLVED (MG/L)
OCT									
16...	150	4	6.3	90	250	180	0.70	12	746
NOV									
20...	120	3	6.0	100	190	130	0.60	10	604
DEC									
17...	150	4	6.1	120	240	180	0.70	7.7	759
JAN									
21...	130	3	5.7	120	210	140	0.70	11	660
MAY									
13...	187	5	6.5	100	290	210	0.64	6.2	874
AUG									
19...	121	3	5.4	100	220	150	0.72	11	655
SEP									
15...	136	4	6.2	110	230	160	0.68	12	706



# RIO GRANDE MAIN STEM

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## 08469200 RIO GRANDE BELOW ANZALDUAS DAM, TX--Continued

MONTHLY AND ANNUAL MEANS AND LOADS FOR OCTOBER 1996 TO SEPTEMBER 1997

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. 1996	13279	1300	798	28600	170	6130	270	9790	290
NOV. 1996	20419	1100	675	37210	140	7580	230	12830	250
DEC. 1996	16523	1260	770	34330	160	7250	260	11780	280
JAN. 1997	26625	1180	725	52090	150	10810	250	17920	270
FEB. 1997	37979	1160	712	73010	150	15080	250	25130	270
MAR. 1997	12781	1230	756	26080	160	5480	260	8960	280
APR. 1997	5471	1700	1040	15400	240	3620	350	5200	360
MAY 1997	20102	1390	853	46290	190	10240	290	15780	310
JUNE 1997	65731	1440	883	156600	190	34540	300	53420	320
JULY 1997	67840	1410	864	158200	190	34490	300	54050	310
AUG. 1997	47690	1440	881	113500	190	24880	300	38730	320
SEPT 1997	25258	1400	858	58510	190	12740	290	19990	310
TOTAL	359698	**	**	799800	**	172800	**	273600	**
WTD.AVG.	985	1340	824	**	180	**	280	**	300

SPECIFIC CONDUCTANCE, US/CM @ 25 DEGREES CELSIUS, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997  
DAILY EQUIVALENT MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	890	1180	1180	1260	1230	1220	1010	1880	735	1490	1390	1400
2	1030	1160	1180	1240	1220	1230	1100	1890	683	1500	1410	1400
3	1050	1140	1220	1270	1200	1200	1240	1870	817	1500	1410	1450
4	1090	1130	1260	1300	1180	1180	1520	1840	1110	1480	1420	1470
5	1170	1130	1280	1280	1200	1170	1580	1860	1230	1470	1360	1440
6	1210	1070	1270	1220	1140	1180	1680	1840	e1250	1450	1400	1350
7	1210	1070	1260	1170	1150	1190	1840	1870	e1350	1430	1450	1350
8	1220	1080	1250	1150	1150	1220	1880	1860	e1450	1410	1400	1310
9	1230	1090	1260	1120	1130	1250	1840	1890	e1520	1430	1450	1320
10	1240	1070	1270	1170	1120	1260	1850	1960	1530	1390	1440	1340
11	1290	1060	1300	1210	1120	1290	1870	2030	1560	1400	1450	1360
12	1290	1060	1370	1220	1120	1250	1860	1860	1560	1410	1450	1430
13	1280	1070	1400	1260	e1120	1230	1850	1640	1550	1420	1530	1510
14	1300	1080	1380	1240	1110	1360	1840	1430	1570	1430	1490	1600
15	1300	1080	1370	1220	1130	1320	1800	1350	1530	1360	1470	1500
16	1310	1120	1240	1160	1130	1420	1750	1310	1600	1360	1460	1450
17	1350	1110	1340	1110	1140	1380	1690	1230	1560	1410	1410	1460
18	1400	1110	1380	1120	1170	1370	1690	1300	1470	1370	1430	1470
19	1430	1090	1360	1130	1170	1330	2670	1240	1750	1370	1450	1500
20	1470	1070	1300	1140	1170	1380	2600	1200	1330	1360	1460	1510
21	1660	1090	1260	1150	1160	1350	2550	1200	1290	1400	1450	1460
22	1900	1100	1240	1160	1200	1330	1540	1210	1370	1410	1480	1450
23	1500	1090	1200	1130	1180	1320	1520	1220	1400	1320	1430	1260
24	1280	1110	1170	1130	1170	1360	1570	1170	1480	1400	1420	1170
25	e1280	1120	1160	1120	1170	1420	1590	1180	1340	1320	1420	1210
26	1200	1120	1160	1140	1190	1320	1630	1200	1320	1370	1420	1250
27	1180	e1130	1160	1170	1230	1280	1670	1200	1360	1410	1490	1250
28	1140	1160	1160	1170	1240	1260	1700	1000	1380	1430	1460	1210
29	1190	1160	1170	1200	---	1230	1750	e900	1440	1380	1470	1200
30	1280	1160	1210	1230	---	1150	1860	e783	1480	1400	1440	1190
31	1380	---	1270	1230	---	1040	---	741	---	1450	1420	---
MEAN	1280	1110	1260	1190	1170	1270	1750	1460	1370	1410	1440	1380

e Estimated

## RIO GRANDE BASIN

08470400 ARROYO COLORADO AT HARLINGEN, TX  
(National Stream-Quality Accounting Network)

**LOCATION.**--Lat 26°10'24", long 97°42'01", Cameron County, Hydrologic Unit 13090002, on downstream side of northbound service road on U.S. Highways 83 & 77, about 18 mi from point of main floodway that divides into North Floodway and Arroyo Colorado.

**DRAINAGE AREA.**--182 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Chemical and biochemical analyses: November 1986 to current year. Pesticide analyses: October 1995 to current year.

**REMARKS.**--Discharges published in the table were obtained directly from rating table furnished by International Boundary and Water Commission. Records of daily mean discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

## WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	SAM-PLING METHOD, CODES	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD WATER UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	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)
NOV 14...	1200	1028	10	161	4720	7.8	21.5	62	8.3	94	950	700
JAN 22...	0930	1028	10	174	4450	7.6	18.0	75	7.9	84	900	660
MAR 25...	1220	1028	10	256	4010	7.9	23.5	84	6.8	80	830	600
APR 08...	1400	1028	10	249	4620	7.8	23.5	120	7.1	84	880	650
23...	1410	1028	10	230	5110	7.9	27.0	110	8.4	106	1100	820
MAY 06...	1310	1028	10	166	5570	7.9	25.5	73	8.6	105	1100	850
20...	1220	1028	10	187	4980	8.0	24.5	120	6.3	76	980	760
JUN 24...	1240	1028	10	183	4300	7.9	26.0	220	7.1	88	840	630
JUL 16...	1120	1028	10	164	4460	8.0	29.0	95	9.5	124	880	660
AUG 13...	0940	1028	10	149	4160	8.0	28.0	78	8.1	103	820	610
SEP 10...	0930	1028	10	113	4760	7.9	28.0	81	6.8	87	900	690

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)	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 (MG/L AS CaCO3)	ALKA-LINITY WAT DIS FIX END (MG/L AS CaCO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS Cl)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
NOV 14...	230	89	660	9	10	0	300	246	250	830	910	1.0
JAN 22...	220	85	618	9	12	0	284	233	240	780	810	0.90
MAR 25...	210	73	550	8	10	0	276	226	220	710	790	0.80
APR 08...	210	83	610	9	9.9	0	283	232	230	830	920	0.83
23...	270	99	708	9	11	0	322	264	260	930	1000	0.84
MAY 06...	260	110	815	11	10	0	320	263	260	1000	1200	0.99
20...	230	95	682	10	12	0	261	214	210	900	1000	0.86
JUN 24...	200	79	569	9	10	0	249	204	210	780	870	0.82
JUL 16...	210	86	637	9	11	0	276	226	220	800	890	0.17
AUG 13...	190	80	583	9	11	0	249	204	200	730	800	0.89
SEP 10...	210	89	656	10	11	0	262	215	210	900	1000	0.97

DATE	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
NOV 14...	27	3090	2930	4.76	0.140	4.90	0.040	6.1	1.2	0.40	1.2	0.590
JAN 22...	23	2840	2720	5.58	0.220	5.80	0.230	7.0	0.97	0.80	1.2	0.720
MAR 25...	24	2620	2520	2.91	0.332	3.24	0.101	4.5	1.1	0.71	1.2	0.472
APR 08...	22	3040	2860	3.12	0.290	3.41	0.065	4.7	1.2	0.42	1.3	0.533
23...	26	3290	3260	3.39	0.157	3.55	0.059	5.0	1.4	0.46	1.5	0.606
MAY 06...	27	3840	3580	3.42	0.191	3.61	<0.015	4.8	1.2	0.29	1.2	0.465
20...	26	3350	3100	3.08	0.180	3.26	0.046	4.0	0.74	0.38	0.79	0.340
JUN 24...	24	2840	2680	3.52	0.119	3.64	0.030	5.5	1.8	0.32	1.8	0.683
JUL 16...	23	2990	2810	2.86	0.092	2.95	<0.015	4.3	1.4	0.48	1.4	0.501
AUG 13...	24	2740	2560	3.01	0.074	3.08	<0.015	3.8	0.74	0.49	0.74	0.589
SEP 10...	26	3200	3050	4.24	0.145	4.38	0.016	5.4	0.98	0.41	1.0	0.537

# RIO GRANDE BASIN

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08470400 ARROYO COLORADO AT HARLINGEN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)
NOV 14...	0.340	0.310	3.8	2.1	520	226	22	<5.0	5	63	<5.0	1550
JAN 22...	0.510	0.490	4.1	1.6	214	101	<2.0	<2.0	6	69	<2.0	1190
MAR 25...	0.292	0.269	5.5	3.1	263	182	<2.0	<2.0	9	143	<2.0	1270
APR 08...	0.271	0.265	4.9	4.7	578	389	4.0	<2.0	7	105	<2.0	1410
23...	0.270	0.306	4.7	4.7	721	448	<3.0	<3.0	7	122	<3.0	1680
MAY 06...	0.302	0.318	4.2	2.1	1100	491	3.7	<3.0	7	96	<3.0	1900
20...	0.199	0.215	4.1	1.9	343	173	<2.0	<2.0	7	100	<2.0	1630
JUN 24...	0.205	0.199	4.4	4.6	304	150	5.7	<2.0	7	101	<2.0	1390
JUL 16...	0.120	0.128	4.3	3.1	223	99	5.1	<2.0	6	98	<2.0	1540
AUG 13...	0.155	0.172	4.1	4.2	299	120	12	<2.0	6	81	<2.0	1400
SEP 10...	0.267	0.255	4.2	1.6	211	64	2.3	<2.0	5	76	<2.0	1590

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	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)
NOV 14...	<5.0	<5.0	<5.0	<5.0	20	<5.0	130	12	22	<5.0	2	<5.0
JAN 22...	<2.0	2.0	<2.0	5.0	<9.0	<2.0	120	13	18	4.0	2	<2.0
MAR 25...	<2.0	4.0	<2.0	4.0	<9.0	<2.0	100	14	20	4.0	1	<2.0
APR 08...	<2.0	<2.0	<2.0	<2.0	<9.0	<2.0	110	8.2	19	3.1	2	<2.0
23...	<3.0	<3.0	<3.0	<3.0	<9.0	<3.0	140	3.8	23	<3.0	1	<3.0
MAY 06...	<3.0	3.2	<3.0	<3.0	<9.0	<3.0	160	9.0	23	<3.0	1	<3.0
20...	<2.0	3.8	<2.0	3.2	<9.0	<2.0	140	3.9	22	4.0	2	<2.0
JUN 24...	<2.0	2.7	<2.0	5.2	<9.0	<2.0	120	11	19	4.8	1	<2.0
JUL 16...	<2.0	<2.0	<2.0	4.1	<9.0	<2.0	140	2.5	20	4.7	1	<2.0
AUG 13...	<2.0	<2.0	<2.0	2.1	<9.0	<2.0	130	2.9	18	4.7	2	<2.0
SEP 10...	<2.0	<2.0	<2.0	3.0	<9.0	<2.0	130	3.1	20	3.1	2	<2.0

DATE	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)
NOV 14...	4700	<24	12	11	<0.002	<0.002	E0.051	5.63	<0.001	<0.002	<0.002
JAN 22...	4400	<18	9.0	10	<0.002	<0.002	E0.029	0.054	<0.001	<0.002	<0.002
MAR 25...	3900	<18	6.0	11	<0.002	0.013	E0.088	0.655	<0.001	<0.002	<0.002
APR 08...	4260	<18	4.2	11	<0.002	<0.002	E0.038	0.180	<0.001	<0.002	<0.002
23...	4940	<18	<3.0	13	<0.002	0.005	E0.075	0.316	<0.001	<0.002	<0.002
MAY 06...	5640	<18	7.5	13	<0.002	<0.002	E0.026	0.080	<0.001	<0.002	<0.002
20...	4870	20	4.1	11	<0.002	<0.002	E0.091	0.749	<0.001	<0.002	<0.002
JUN 24...	4130	<18	13	10	<0.002	<0.002	E0.039	0.257	E0.185	<0.002	<0.002
JUL 16...	4550	<18	5.3	10	<0.002	<0.002	E0.044	0.129	E0.378	<0.002	<0.002
AUG 13...	4210	<18	7.2	10	<0.002	<0.002	E0.027	0.101	<0.001	<0.002	<0.002
SEP 10...	4560	29	4.4	11	<0.002	<0.002	E0.015	0.252	<0.001	<0.002	<0.002

## RIO GRANDE BASIN

08470400 ARROYO COLORADO AT HARLINGEN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P, P' DDE DISSOLV (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)
NOV 14...	<0.003	<0.003	0.012	<0.004	0.224	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
JAN 22...	E0.010	<0.003	E0.003	<0.004	0.055	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
MAR 25...	<0.003	<0.015	0.005	<0.004	0.031	E0.003	0.016	<0.001	<0.003	<0.017	<0.002
APR 08...	E0.008	E0.123	0.012	<0.004	E0.004	E0.003	0.021	<0.001	<0.003	<0.017	<0.002
23...	<0.003	<0.003	0.055	<0.004	0.004	<0.006	0.027	<0.001	<0.003	<0.017	<0.002
MAY 06...	<0.003	E0.006	0.004	<0.004	E0.002	<0.006	0.011	<0.001	<0.003	<0.017	<0.002
20...	<0.003	E0.066	0.021	<0.004	E0.002	E0.002	0.007	<0.001	<0.003	<0.017	<0.002
JUN 24...	E0.015	E0.059	0.015	<0.004	E0.002	<0.006	0.021	<0.001	<0.003	<0.017	<0.002
JUL 16...	<0.003	E0.056	0.110	<0.004	<0.002	E0.004	0.009	<0.001	<0.003	<0.017	<0.002
AUG 13...	<0.003	<0.003	0.009	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
SEP 10...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	0.009	<0.001	<0.003	<0.017	<0.002
DATE	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	ALPHA BHC, DIS- SOLVED (UG/L)	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN SENCOR WATER DISSOLV (UG/L)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)
NOV 14...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	E0.005	0.010	<0.004	<0.004	<0.003
JAN 22...	<0.004	<0.003	<0.003	<0.002	0.006	<0.002	0.019	<0.002	<0.004	<0.004	<0.003
MAR 25...	<0.004	<0.003	<0.003	<0.002	<0.004	0.037	<0.005	0.058	<0.004	<0.004	<0.003
APR 08...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	0.008	0.008	<0.004	<0.004	<0.003
23...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	0.015	<0.004	<0.004	<0.003
MAY 06...	<0.004	<0.003	<0.003	<0.002	0.007	<0.002	<0.005	E0.004	<0.004	<0.004	<0.003
20...	<0.004	<0.003	<0.003	<0.002	<0.004	0.107	<0.005	0.005	<0.004	<0.004	<0.003
JUN 24...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	0.039	0.005	<0.004	<0.004	<0.003
JUL 16...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
AUG 13...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	0.017	<0.004	<0.003
SEP 10...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	0.009	<0.004	<0.004	<0.003
DATE	PARA- THION, DIS- SOLVED (UG/L)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
NOV 14...	<0.004	<0.006	<0.004	0.138	<0.005	<0.002	<0.003	0.033	<0.007	<0.004	<0.013
JAN 22...	<0.004	<0.006	<0.004	<0.012	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
MAR 25...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	E0.009	<0.007	<0.004	<0.013
APR 08...	<0.004	<0.006	<0.004	<0.004	<0.005	E0.003	<0.003	E0.011	<0.007	<0.004	<0.013
23...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	E0.011	<0.007	<0.004	<0.013
MAY 06...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	E0.009	<0.007	<0.004	<0.013
20...	<0.004	0.009	<0.004	0.012	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUN 24...	<0.004	<0.006	<0.004	0.023	<0.005	<0.002	<0.003	E0.011	<0.007	<0.004	<0.013
JUL 16...	<0.004	0.046	<0.004	0.016	<0.005	<0.002	<0.003	E0.009	<0.007	<0.004	<0.013
AUG 13...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
SEP 10...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	E0.011	<0.007	<0.004	<0.013

# RIO GRANDE BASIN

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08470400 ARROYO COLORADO AT HARLINGEN, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	SI- MAZINE, WATER, DISS, REC (UG/L)	THIO- BENCARB WATER FLTRD GF, REC (UG/L)	TEBU- THIURON WATER FLTRD GF, REC (UG/L)	TER- BACIL WATER FLTRD GF, REC (UG/L)	TER- BUFOS WATER FLTRD GF, REC (UG/L)	TRIAL- LATE WATER FLTRD GF, REC (UG/L)	TRI- FLUR- ALIN WAT FLT GF, REC (UG/L)	DIAZ- INON D10 SRG WAT FLT GF, REC PERCENT	HCH ALPHA D6 SRG WAT FLT GF, REC PERCENT	TERBUTH YLAZINE SURROGT WAT FLT GF, REC PERCENT	SAMPLE VOLUME SCHED- ULE 2001 (ML)
NOV 14...	0.149	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	108	117	122	943
JAN 22...	0.047	<0.002	<0.010	<0.007	<0.013	<0.001	E0.004	90.8	89.0	103	833
MAR 25...	0.071	<0.002	<0.010	<0.007	<0.013	<0.001	<0.009	117	100	134	884
APR 08...	0.021	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	87.7	99.1	112	943
23...	0.024	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	109	90.8	116	847
MAY 06...	0.025	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	88.9	94.9	125	854
20...	0.030	<0.002	<0.010	<0.007	<0.013	<0.001	E0.002	110	110	118	847
JUN 24...	0.027	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	104	102	159	729
JUL 16...	0.013	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	103	128	121	840
AUG 13...	0.011	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	105	89.0	129	917
SEP 10...	0.014	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	93.0	97.4	111	877



## RIO GRANDE MAIN STEM

08475000 RIO GRANDE NEAR BROWNSVILLE, TX  
(National Stream-Quality Accounting Network)

**LOCATION.**--Lat 25°52'35", long 97°27'15", Cameron County, Hydrologic Unit 13090002, at International Boundary and Water Commission gaging station, 1,000 ft downstream from El Jardin pumping plant, 6.8 mi below International Bridge between Brownsville and Matamoros, Tamps., Mex., and 48.8 mi above the Gulf of Mexico.

**DRAINAGE AREA.**--176,333 mi<sup>2</sup>.

**PERIOD OF RECORD.**--Chemical analyses: January 1932, March 1943 to February 1944, February 1966 to September 1974. Chemical and biochemical analyses: October 1974 to current year. Pesticide analyses: May 1975 to May 1982, October 1995 to current year. Sediment analyses: February 1966 to current year. Radiochemical analyses: October 1995 to current year.

**PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: March 1943 to February 1944, April 1967 to September 1983.

WATER TEMPERATURE: October 1966 to September 1983.

SUSPENDED-SEDIMENT DISCHARGE: February 1966 to September 1983.

**EXTREMES FOR PERIOD OF DAILY RECORD.**--

SPECIFIC CONDUCTANCE: Maximum daily, 4,130 microsiemens May 29, 1972; minimum daily, 337 microsiemens Sept. 3, 1967.

WATER TEMPERATURE: Maximum daily, 35.0°C on several days during summer months of 1982 and 1983; minimum daily, 8.0°C Jan. 10, 1967.

SEDIMENT CONCENTRATION: Maximum daily mean, 6,000 mg/L Feb. 28, 1983; minimum daily mean, 4 mg/L Apr. 26, 1970, Aug. 16, 18, 24, 27, 1977.

SEDIMENT LOAD: Maximum daily, 181,000 tons Feb. 28, 1983; minimum daily, 0.12 tons Aug. 26, 1983.

**REMARKS.**--The flow is controlled largely by releases from Falcon Reservoir. Discharges published in the table were obtained directly from rating table furnished by International Boundary and Water Commission. Records of daily mean discharge for water year 1997 are given in International Boundary and Water Commission Water Bulletins Nos. 66 and 67.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	TIME	AGENCY COL-LECTING SAMPLE (CODE NUMBER)	SAM-PLING METHOD, CODES	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	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)
NOV 13...	1040	1028	10	88	1810	8.2	22.0	75	8.5	96	440	260
JAN 07...	1120	1028	10	40	1590	8.2	16.0	29	9.7	97	370	200
APR 22...	1100	1028	10	146	1820	8.3	26.0	5.6	11.0	137	440	250
JUL 15...	1130	1028	10	77	1300	8.3	31.0	20	6.4	85	300	180
AUG 12...	0950	1028	10	130	1210	8.3	30.5	20	6.5	86	270	150
SEP 09...	1030	1028	10	44	1410	8.4	30.0	12	7.2	95	310	190

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)	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)	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)
NOV 13...	120	34	200	4	6.5	0	218	178	180	330	280	0.70
JAN 07...	100	28	170	4	6.6	0	205	168	170	290	220	0.70
APR 22...	120	35	207	4	7.6	14	193	181	180	290	300	0.53
JUL 15...	81	24	148	4	6.0	0	147	121	120	250	170	0.67
AUG 12...	71	22	135	4	6.2	0	141	115	110	230	160	0.74
SEP 09...	80	26	158	4	6.1	0	145	119	120	280	220	0.78

DATE	SILICA, DIS-SOLVED (MG/L AS SiO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, TOTAL (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)
NOV 13...	15	1140	1100	--	0.001	<0.005	0.003	0.60	0.60	0.30	0.60	0.160
JAN 07...	9.9	968	929	0.134	0.016	0.150	0.203	1.1	0.80	0.60	1.0	0.180
APR 22...	13	1090	1080	0.059	0.022	0.081	0.010	1.4	1.3	0.37	1.3	0.177
JUL 15...	13	727	764	0.008	0.001	0.009	0.017	0.75	0.73	0.39	0.75	0.187
AUG 12...	13	751	707	--	0.003	<0.005	0.020	--	--	0.39	<0.20	0.122
SEP 09...	15	871	857	--	<0.001	<0.005	0.003	0.67	0.67	0.31	0.67	0.154

# RIO GRANDE MAIN STEM

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08475000 RIO GRANDE NEAR BROWNSVILLE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	PHOS- PHORUS DIS- SOLVED (MG/L AS P)	PHOS- PHORUS ORTHO, DIS- SOLVED (MG/L AS P)	CARBON, ORGANIC DIS- SOLVED (MG/L AS C)	CARBON, ORGANIC SUS- PENDE TOTAL (MG/L AS C)	SEDI- MENT, SUS- PENDE (MG/L)	SEDI- MENT, DIS- CHARGE, SUS- PENDE (T/DAY)	ALUM- INUM, DIS- SOLVED (UG/L AS AL)	ANTI- MONY, DIS- SOLVED (UG/L AS SB)	ARSENIC DIS- SOLVED (UG/L AS AS)	BARIUM, DIS- SOLVED (UG/L AS BA)	BERYL- LIUM, DIS- SOLVED (UG/L AS BE)	BORON, DIS- SOLVED (UG/L AS B)
NOV 13...	0.100	0.093	4.2	1.6	191	45	<1.0	<1.0	6	111	<1.0	429
JAN 07...	0.050	0.061	3.6	2.3	88	9.5	<1.0	<1.0	3	102	<1.0	373
APR 22...	0.043	0.044	5.1	2.5	33	13	1.5	<1.0	6	99	<1.0	545
JUL 15...	0.063	0.063	4.0	0.50	44	9.1	3.5	<1.0	4	118	<1.0	291
AUG 12...	0.047	0.053	3.7	1.4	60	21	<1.0	<1.0	3	113	<1.0	253
SEP 09...	0.086	0.041	3.9	0.80	32	3.8	<1.0	<1.0	4	121	<1.0	319

DATE	CADMIUM DIS- SOLVED (UG/L AS CD)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	COBALT, DIS- SOLVED (UG/L AS CO)	COPPER, DIS- SOLVED (UG/L AS CU)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	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)
NOV 13...	<1.0	1.0	<1.0	1.0	<3.0	<1.0	51	<1.0	7.0	1.0	<1	<1.0
JAN 07...	<1.0	<1.0	<1.0	1.0	<3.0	<1.0	46	2.0	7.0	2.0	<1	<1.0
APR 22...	<1.0	3.0	<1.0	<1.0	<3.0	<1.0	49	<1.0	5.6	1.5	<1	<1.0
JUL 15...	<1.0	<1.0	<1.0	1.7	<3.0	<1.0	49	<1.0	7.2	1.7	<1	<1.0
AUG 12...	<1.0	1.0	<1.0	2.4	<3.0	<1.0	47	<1.0	7.3	2.2	<1	<1.0
SEP 09...	<1.0	<1.0	<1.0	1.1	<3.0	<1.0	49	<1.0	7.8	1.5	<1	<1.0

DATE	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	VANA- DIUM, DIS- SOLVED (UG/L AS V)	ZINC, DIS- SOLVED (UG/L AS ZN)	URANIUM NATURAL DIS- SOLVED (UG/L AS U)	ACETO- CHLOR, WATER FLTRD REC (UG/L)	ALA- CHLOR, WATER, DISS, REC, (UG/L)	DEETHYL ATRA- ZINE, WATER, DISS, REC (UG/L)	ATRA- ZINE, WATER, DISS, REC (UG/L)	METHYL AZIN- PHOS WAT FLT 0.7 U GF, REC (UG/L)	BEN- FLUR- ALIN WAT FLD 0.7 U GF, REC (UG/L)	BUTYL- ATE, WATER, DISS, REC (UG/L)
NOV 13...	1900	<6	2.0	2.0	<0.002	<0.002	E0.003	0.008	<0.001	<0.002	<0.002
JAN 07...	1700	<6	2.0	3.0	<0.002	<0.002	E0.003	0.005	<0.001	<0.002	<0.002
APR 22...	1800	<6	<1.0	1.9	<0.002	<0.002	E0.005	0.022	<0.001	<0.002	<0.002
JUL 15...	1470	<6	3.2	2.8	<0.002	<0.002	E0.002	0.007	<0.001	<0.002	<0.002
AUG 12...	1330	6	1.6	2.7	<0.002	<0.002	<0.002	0.006	<0.001	<0.002	<0.002
SEP 09...	1460	7	6.4	2.6	<0.002	<0.002	E0.002	0.015	<0.001	<0.002	<0.002

DATE	CAR- BARYL WATER FLTRD 0.7 U GF, REC (UG/L)	CARBO- FURAN WATER FLTRD 0.7 U GF, REC (UG/L)	CHLOR- PYRIFOS DIS- SOLVED (UG/L)	CYANA- ZINE, WATER, DISS, REC (UG/L)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L)	P, P' DDE DISSOLV (UG/L)	DI- AZINON, DIS- SOLVED (UG/L)	DI- ELDRIN DIS- SOLVED (UG/L)	2,6-DI- ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L)	DISUL- FOTON WATER FLTRD 0.7 U GF, REC (UG/L)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L)
NOV 13...	<0.003	<0.003	<0.004	<0.004	0.021	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
JAN 07...	<0.003	<0.003	<0.004	<0.004	E0.004	<0.006	0.005	<0.001	<0.003	<0.017	<0.002
APR 22...	<0.003	<0.003	0.009	<0.004	0.005	<0.006	0.005	<0.001	<0.003	<0.017	<0.002
JUL 15...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
AUG 12...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002
SEP 09...	<0.003	<0.003	<0.004	<0.004	<0.002	<0.006	<0.002	<0.001	<0.003	<0.017	<0.002

## RIO GRANDE MAIN STEM

08475000 RIO GRANDE NEAR BROWNSVILLE, TX--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1996 TO SEPTEMBER 1997

DATE	ETHAL- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	ETHO- PROP WATER FLTRD 0.7 U GF, REC (UG/L)	FONOFOS WATER DISS REC (UG/L)	ALPHA BHC DIS- SOLVED (UG/L)	LINDANE DIS- SOLVED (UG/L)	LIN- URON WATER FLTRD 0.7 U GF, REC (UG/L)	MALA- THION, DIS- SOLVED (UG/L)	METO- LACHLOR WATER DISSOLV (UG/L)	METRI- BUZIN WATER DISSOLV (UG/L)	MOL- INATE WATER FLTRD 0.7 U GF, REC (UG/L)	NAPROP- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)
NOV 13...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	E0.003	<0.004	<0.004	<0.003
JAN 07...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
APR 22...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
JUL 15...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
AUG 12...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	0.011	<0.004	<0.003
SEP 09...	<0.004	<0.003	<0.003	<0.002	<0.004	<0.002	<0.005	<0.002	<0.004	<0.004	<0.003
DATE	PARA- THION, DIS- SOLVED (UG/L)	METHYL PARA- THION WAT FLT 0.7 U GF, REC (UG/L)	PEB- ULATE WATER FILTRD 0.7 U GF, REC (UG/L)	PENDI- METH- ALIN WAT FLT 0.7 U GF, REC (UG/L)	PER- METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L)	PRON- AMIDE WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- METON, WATER, DISS, REC (UG/L)	PROP- CHLOR, WATER, DISS, REC (UG/L)	PRO- PANIL WATER FLTRD 0.7 U GF, REC (UG/L)	PRO- PARGITE WATER FLTRD 0.7 U GF, REC (UG/L)
NOV 13...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JAN 07...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
APR 22...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
JUL 15...	<0.004	0.017	<0.004	<0.004	<0.020	<0.002	<0.003	E0.008	<0.007	<0.004	<0.013
AUG 12...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
SEP 09...	<0.004	<0.006	<0.004	<0.004	<0.005	<0.002	<0.003	<0.018	<0.007	<0.004	<0.013
DATE	SI- MAZINE, WATER, DISS, REC (UG/L)	THIO- BENCARB WATER FLTRD 0.7 U GF, REC (UG/L)	TEBU- THIURON WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BACIL WATER FLTRD 0.7 U GF, REC (UG/L)	TER- BUFOS WATER FLTRD 0.7 U GF, REC (UG/L)	TRIAL- LATE WATER FLTRD 0.7 U GF, REC (UG/L)	TRI- FLUR- ALIN WAT FLT 0.7 U GF, REC (UG/L)	DIAZ- INON D10 SRG WAT FLT 0.7 U GF, REC PERCENT	HCH ALPHA D6 SRG WAT FLT 0.7 U GF, REC PERCENT	TERBUTH YLAZINE SURROGT WAT FLT 0.7 U GF, REC PERCENT	SAMPLE VOLUME SCHED- ULE 2001 (ML)
NOV 13...	0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	107	117	109	925
JAN 07...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	E0.003	103	88.9	97.9	925
APR 22...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	112	103	126	884
JUL 15...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	85.2	118	104	877
AUG 12...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	120	94.3	133	952
SEP 09...	<0.005	<0.002	<0.010	<0.007	<0.013	<0.001	<0.002	90.8	103	112	925

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 U.S. 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 1997

Station number	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Measurements	
					Date	Dis-charge (ft <sup>3</sup> /s)
Colorado River Basin						
08129500	Dove Creek Spring near Knickerbocker, Tex.	Lat 31°11'06", long 100°43'51", Irion County, at headquarters ranch house, 500 ft upstream from Dove Creek, 1.8 mi upstream from Stilson Dam on Dove Creek and 8.5 mi southwest of Knickerbocker.	--	1944-58†, 1959-97	12-09-96 01-03-97 05-08-97 07-08-97 08-05-97 09-08-97	11.3 9.02 13.2 10.2 9.41 11.5
08143900	Springs at Fort McKavett, Tex.	Lat 30°50'03", long 100°05'37", Menard County, at Fort McKavett.	--	1902, 1905, 1922, 1942, 1948-49, 1951-52, 1955-56, 1958-97	10-03-96 12-16-96 03-20-97 07-08-97 08-19-97	18.1 18.6 19.7 15.5 16.1
08146500	San Saba Srpings at San Saba, Tex.	Lat 31°11'44", long 98°42'42", San Saba County, 150 ft upstream from bridge on U.S. Highway 190 at San Saba and 0.8 mi east of courthouse.	--	1939, 1952, 1957, 1959-97	10-02-96 12-16-96 02-10-97 03-31-97 05-19-97 07-08-97 08-26-97	11.8 12.0 20.6 16.4 15.0 17.4 11.3
08149400	South Llano River near Telegraph, Tex.	Lat 30°15'43", long 99°56'01", Edwards County, 3.7 mi upstream from Paint Creek, 5.7 mi south of Telegraph, and 18.7 mi southwest of Junction.	508	1939, 1952, 1956, 1959-97	10-03-96 03-20-97 05-02-97 07-08-97 08-18-97	20.4 49.0 31.8 50.6 36.6
08149500	Seven Hundred Springs near Telegraph, Tex.	Lat 30°16'12", long 99°55'22", Edwards County, about 3 mi upstream from Paint Creek, about 5 mi south of Telegraph, and about 18 mi southwest of Junction.	--	1939, 1952, 1955-56, 1959-97	10-03-96 03-20-97 05-02-97 07-08-97 08-18-97	19.2 29.7 24.7 27.6 24.5
08155400	Barton Creek above Barton Springs at Austin, Tex.	Lat 30°15'48", long 97°46'19", Travis County, upstream from upper dam of Barton Creek swimming pool in Zilder Park and upstream from all springs known as Barton Springs at Austin.	125	1919-97	04-15-97 04-21-97 05-19-97 07-14-97	89.2 48.0 58.2 32.2
08164350	Navidad River near Speaks, Tex.	Lat 29°19'18", long 96°42'32", Lavaca County on Farm Road 530, 100 ft downstream from Ragsdale Creek, and 4.6 mi north of Speaks.	--	1996	10-31-95 01-17-96 03-06-96 05-15-96 06-19-96 06-26-96 08-29-96	3.10 11.8 13.2 3.46 1.44 698 13.8

See footnote at end of table.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

Discharge measurements made at low-flow partial-record station during water year 1997--Continued

Station number	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Measurements						
					Date	Dis-charge (ft <sup>3</sup> /s)					
Lavaca River Basin											
08164370	Navidad River at Morales, Tex.	Lat 29°08'08", long 96°44'41", Jackson County, on County Road 283, 1.2 mi northeast of Morales.	--	1996	10-31-95	4.74					
					01-19-96	9.66					
					03-07-96	13.7					
					05-16-96	0.73					
					06-26-96	1,160					
					06-26-96	1,340					
					06-27-96	1,210					
					07-03-96	17.4					
08164390	Navidad River at Strone Park near Edna, Tex.	Lat 29°03'55", long 96°40'26", Jackson County.	--	1996	08-26-96	9.78					
					06-18-96	0					
					06-21-96	1.03					
					06-27-96	1,190					
					06-28-96	358					
					07-01-96	69.1					
					07-03-96	24.9					
					08-26-96	34.3					
Guadalupe River Basin											
08166140	Guadalupe River above Bear Creek at Kerrville, Tex.	Lat 30°40'10". long 99°11'42", Kerr County, 600 ft downstream from Goat Creek, 900 ft upstream from Bear Creek and Bear Creek Crossing, and 2.4 mi east of intersection of State Highways 27 and 39 in Ingram.	--	1978-86, 1997	10-03-96	57.2					
					12-05-96	115					
					01-29-97	77.7					
					03-26-97	210					
					05-29-97	200					
					07-30-97	217					
08168000	Hueco Springs near New Braunfels, Tex	Lat 29°45'33", long 98°08'23", Comal County, two springs located 400 and 500 ft west of the Guadalupe River, 600 ft downstream from the mouth of Elm Creek, and 4.2 mi north of New Braunfels.	--	1944-97	10-03-96	17.0					
					12-06-96	3.94					
					01-30-97	2.85					
					03-28-97	40.6					
					05-30-97	66.9					
					07-31-97	78.6					
08177818	San Antonio Springs at San Antonio, Tex.	Lat 29°27'56", long 98°28'04", Bexar County, just below Hildebrandt Street in San Antonio.	--	1951-52, 1959-62, 1972, 1974-77, 1979-97	09-29-97	60.6					
					10-15-96	0					
					01-15-97	0					
					02-28-97	0					
					03-20-97	0					
					04-23-97	0					
					06-02-97	0					
					07-08-97	18.9					
					08-28-97	0					
					09-29-97	0					
08178090	San Pedro Springs at San Antonio, Tex.	Lat 29°26'42", long 98°30'06", Bexar County, at San Pedro Park in San Antonio.	--	1933-35, 1951-52, 1958-61, 1966, 1971, 1974-77, 1979-97	10-15-96	0					
					01-15-97	0					
					03-20-97	1.29					
					04-23-97	2.16					
					06-02-97	3.44					
					07-08-97	7.29					
					08-28-97	2.33					
					09-29-97	2.57					
					Nueces River Basin						
					08204000	Leona River spring flow near Uvalde Tex.	Lat 29°09'15", long 99°44'35", Uvalde County, at old road crossing on White's Ranch, 2.0 mi downstream from Cooks Slough, and 4.7 mi southeast of Uvalde.	--	1935-65†, 1966-97	11-01-96	0
12-20-96	3.57										
02-28-97	5.65										
04-25-97	14.3										
06-09-97	17.9										
08-22-97	20.9										

See footnote at end of table.



## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Discharge measurements made at low-flow partial-record station during water year 1997--Continued

ion number	Station name	Location	Drainage area (mi <sup>2</sup> )	Period of record	Measurements	
					Date	Dis- charge (ft <sup>3</sup> /s)
Rio Grande Basin						
08425500	Phantom Lake Spring near Toyahvale, Tex.	Lat 30°56'01", long 103°50'43", Jeff Davis County, 375 ft down- stream from source of spring, 3.5 mi southwest of Toyahvale, and 7.0 mi southwest of Bahmorhea.	--	1931-33†, 1942-66†, 1967-97	10-08-96 01-10-97 03-05-97 04-16-97 07-09-97 08-12-97	4.37 1.84 3.36 1.38 1.01 1.17
08427000	Giffin Springs at Toyahvale, Tex.	Lat 30°56'51", long 103°47'19", Reeves County, 2,000 ft northwest of post office in Toyahvale.	--	1919, 1922-23, 1925, 1932-33†, 1941-86, 1988-97	10-08-96 01-10-97 03-05-97 04-16-97 07-09-97 08-12-97	1.04 4.82 4.26 4.12 3.83 3.93
08456300	Las Moras Springs at Brackettville, Tex. <u>b/</u>	Lat 29°18'33", long 100°25'13", Kinney County, in springflow pool at Brackettville, 160 ft south of U.S. Highway 90, and 1,550 ft upstream from bridge on Brackettville-Fort Clark Road.	--	1896, 1899- 1900, 1902, 1904-06, 1910, 1912, 1925, 1928, 1951-97	10-08-96 11-12-96 12-10-96 01-14-97 02-11-97 03-12-97 04-08-97 05-13-97 06-10-97 07-08-97 08-12-97 09-09-97	29.5 36.9 41.3 36.6 30.3 41.4 41.5 40.2 34.7 41.8 45.5 38.8

† Operated as a continuous-record station.

## 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), the 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 inspection 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 1997

Station name and number	Location	Period of record	Water Year 1997 maximum			Period of record maximum			
			Date	Gage height (ft)	Dis-charge (ft <sup>3</sup> /s)	Date	Gage height (ft)	Dis-charge (ft <sup>3</sup> /s)	
Guadalupe River Basin									
Guadalupe River at New Braunfels, Tex. 08169500	Lat 29°41'52", long 98°06'23", Comal County, Comal Mills in New Braunfels and 0.4 mi upstream from IH-35. Drainage area is 1,652 mi <sup>2</sup> .	1988†, 1902, 1915-72, 1974-97	05-30-95 05-15-94 06-28-97	12.57 12.45 12.80	6,180 5,800 6,950	09-10-21	28.60	56	
San Antonio River at Navarro St., San Antonio, Tex. 08177900	Lat 29°25'50", long 98°29'24", Bexar County, at bridge on Navarro Street in San Antonio. Drainage area is unknown.	1973-97	11-24-97	*632.57	--	08-08-74	*642.77		
San Pedro Creek at Santa Rosa St., San Antonio, Tex. 08178100	Lat 29°25'51", long 98°29'49", Bexar County, at bridge on Santa Rosa Street in San Antonio. Drainage area is unknown.	1973-97	04-02-97	*638.06	--	07-16-90	*648.38		
Martinez Creek at Fredericksburg Rd., San Antonio, Tex. 08178350	Lat 29°27'22", long 98°31'04", Bexar County, at bridge on Fredericksburg Road in San Antonio. Drainage area is unknown.	1973-97	06-22-97	*682.33	--	09-27-73	*683.84		
Alazan Creek at West Martin St., San Antonio, Tex. 08178400	Lat 29°25'51", long 98°30'51", Bexar County, at bridge on West Martin Street in San Antonio. Drainage area is unknown.	1973-97	06-22-97	*635.94	--	08-03-92	*644.20		
Apache Creek at S. Zarzamora St., San Antonio, Tex. 08178450	Lat 29°24'47", long 98°31'42", Bexar County, at bridge on South Zarzamora Street in San Antonio. Drainage area is unknown.	1973-97	06-22-97	*627.86	--	09-27-73	*643.74		
San Pedro Creek at Furnish St., San Antonio, Tex. 08178500	Lat 29°24'22", long 98°30'38", Bexar County, at bridge on Furnish Street in San Antonio. Drainage area is unknown.	1973-97	06-22-97	*604.95	--	06-04-86	*616.28		
San Antonio River at Ashley Street (Berg's Mill), San Antonio, Tex. 08178550	Lat 29°20'04", long 98°27'20", Bexar County, at bridge on Ashley Street in San Antonio. Drainage area is unknown.	1973-97	12-15-97	*512.56	--	07-16-90	*522.94		
Nueces River Basin									
Rutledge Hollow at 7th Street, Poteet, Tex. 08207220	Lat 29°02'07", long 98°34'18", Atascosa in city of Poteet at 7th Street, and 2.0 mi above atascosa River. Drainage area is 9.74 mi <sup>2</sup> .	1979-97	06-22-97	419.38	--	07-17-90	*424.89		
Atascosa River at U.S. Highway 281, Pleasanton, Tex. 08207300	Lat 28°57'44", long 98°28'51", Atascosa County, at bridge on U.S. Highway 281 in Pleasanton. Drainage area is unknown.	1973-97	06-22-97	339.32	--	06-28-93	*352.84		
San Fernando Creek Basin									
Tranquitas Creek at Kingsville, Tex. 08212300	Lat 27°31'33", long 97°52'02", Kleberg County, at bridge on U.S. Highway 77 Business Route in Kingsville, 4.9 mi above San Fernando Creek, and 5.9 mi downstream from Tranquitas Dam. Drainage area is 48.5 mi <sup>2</sup> .	1965-82, 1984-97	04-30-97	2.06	--	08-10-80	6.88		

\* Elevation, in feet.

† Operated as a continuous-record station.

## DISCHARGE AT PARTIAL-RECORD STATIONS AND MISCELLANEOUS SITES

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Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table:

Discharge measurements made at miscellaneous sites during water year 1997

Station number	Tributary to	Location	Drainage area (mi <sup>2</sup> )	Measured previously (water years)	Measurements	
					Date	Dis-charge (ft <sup>3</sup> /s)
Colorado River Basin						
Clear Creek near Menard	San Saba River	Lat 30°54'13", long 99°55'27", Menard County, at bridge on U.S. Highway 190, about 9 mi west of Menard.	106	1984-97	10-03-96 03-20-97 07-08-97	16.8 18.1 16.3
Colorado River at Winchell 08138000	Colorado River	Lat 31°28'04", long 99°09'43", McCulloch-Brown County line near left bank at downstream end of pier of old abandoned bridge 300 ft upstream from bridge on U.S. Highway 377, 0.3 mi south of Winchell, 5.9 mi downstream from Home Creek and at mile 560.7.	13,788	1924-34†, 1939-93†, 1994-97	10-01-96 07-03-97 08-05-97 08-27-97	16.9 1,560 6.73 13.4
Tanner Springs near Telegraph	South Llano River	Lat 30°15'45", long 99°56'03", Edwards County, about 5.6 mi south of Telegraph, Kimble County, and 18.6 mi southwest of Junction at mouth.	--	1939, 1962, 1989-97	10-03-96 03-20-97 05-02-97 07-08-97 08-18-97	10.7 16.5 14.1 17.7 15.6
Barton Creek blw Barton Springs, Austin, Tex. 08155505	--	Lat 30°15'54", long 97°45'54", Travis County, on Barton Creek bridge on Barton Springs Road.	--	1989-97	05-17-89 01-09-91 01-09-91 01-10-91 01-11-91 04-12-91 10-08-94 10-08-94 05-29-95 05-29-95 04-04-97 04-04-97	1,830 1,020 1,060 567 270 151 2,240 1,560 843 572 940 2,650
Guadalupe River Basin						
Dry Creek nr Wimberly, Tex.	--	Lat 30°02'06", long 98°08'05", Hays County, on Dry Creek at Valley Spring Road crossing.			06-08-97	12,600
Rio Grande Basin						
Mud Springs <sup>1/</sup>	Mud Creek	Lat 29°27'10", long 100°37'30", Kinney County, on Mays Ranch about 16 mi northwest of Brackettville.	--	1939-41, 1952-53, 1962, 1965-96	--	--
Pinto Springs <sup>1/</sup>	Pinto Creek	Lat 29°24'10", long 100°27'15", Kinney County, on C.C. Belcher Ranch 7.5 mi northwest of Brackettville.	--	1939-41, 1952-53, 1965-96	--	--

† Operated as a continuous-record station.

<sup>1/</sup> Measurements by International Boundary and Water Commission.



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## CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
<i>Length</i>		
inch (in.)	$2.54 \times 10^1$	millimeter
	$2.54 \times 10^{-2}$	meter
foot (ft)	$3.048 \times 10^{-1}$	meter
mile (mi)	$1.609 \times 10^0$	kilometer
<i>Area</i>		
acre	$4.047 \times 10^3$	square meter
	$4.047 \times 10^{-1}$	square hectometer
	$4.047 \times 10^{-3}$	square kilometer
square mile (mi <sup>2</sup> )	$2.590 \times 10^0$	square kilometer
<i>Volume</i>		
gallon (gal)	$3.785 \times 10^0$	liter
	$3.785 \times 10^0$	cubic decimeter
	$3.785 \times 10^{-3}$	cubic meter
million gallons (Mgal)	$3.785 \times 10^3$	cubic meter
	$3.785 \times 10^{-3}$	cubic hectometer
cubic foot (ft <sup>3</sup> )	$2.832 \times 10^1$	cubic decimeter
	$2.832 \times 10^{-2}$	cubic meter
cubic-foot-per-second day [(ft <sup>3</sup> /s) d]	$2.447 \times 10^3$	cubic meter
	$2.447 \times 10^{-3}$	cubic hectometer
acre-foot (acre-ft)	$1.233 \times 10^3$	cubic meter
	$1.233 \times 10^{-3}$	cubic hectometer
	$1.233 \times 10^{-6}$	cubic kilometer
<i>Flow</i>		
cubic foot per second (ft <sup>3</sup> /s)	$2.832 \times 10^1$	liter per second
	$2.832 \times 10^1$	cubic decimeter per second
	$2.832 \times 10^{-2}$	cubic meter per second
gallon per minute (gal/min)	$6.309 \times 10^{-2}$	liter per second
	$6.309 \times 10^{-2}$	cubic decimeter per second
	$6.309 \times 10^{-5}$	cubic meter per second
million gallons per day (Mgal/d)	$4.381 \times 10^1$	cubic decimeter per second
	$4.381 \times 10^{-2}$	cubic meter per second
<i>Mass</i>		
ton (short)	$9.072 \times 10^{-1}$	megagram or metric ton

*Sea level:* In this report “sea level” refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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