

# Hydrologic Data for Urban Studies in the Austin, Texas Metropolitan Area, 1974

*By R. N. Mitchell*

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**U.S. GEOLOGICAL SURVEY**

Open-file report



*Prepared in cooperation with the Texas  
Water Development Board*

May 1976

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# HYDROLOGIC DATA FOR URBAN STUDIES IN THE

## AUSTIN, TEXAS METROPOLITAN AREA

1974

By

R. N. Mitchell  
U.S. Geological Survey

### INTRODUCTION

The U.S. Geological Survey, in cooperation with the Texas Water Development Board, began hydrologic studies in the Austin urban area in 1954. The objectives of this project are as follows:

1. To determine the effects of progressive urbanization on infiltration, rates of peak discharge, and rainfall-runoff relations in the Waller Creek watershed.
2. To provide rainfall and runoff data from the rural Wilbarger Creek watershed to be used for comparative purposes in determining the effects of existing and progressive urbanization in the Waller Creek watershed.
3. To provide applied research facilities for studies at the University of Texas at Austin.

The purpose of this report is to present rainfall and runoff data for the Waller Creek and Wilbarger Creek study areas for the 1974 water year (October 1, 1973 to September 30, 1974).

To facilitate the publication and distribution of this report at the earliest feasible time, certain material has been included that does not conform to the formal publication standards of the U.S. Geological Survey.

For those readers interested in using the metric system, metric equivalents of English units of measurements are given in parentheses. The English units used in this report may be converted to metric units by using the following conversion factors:

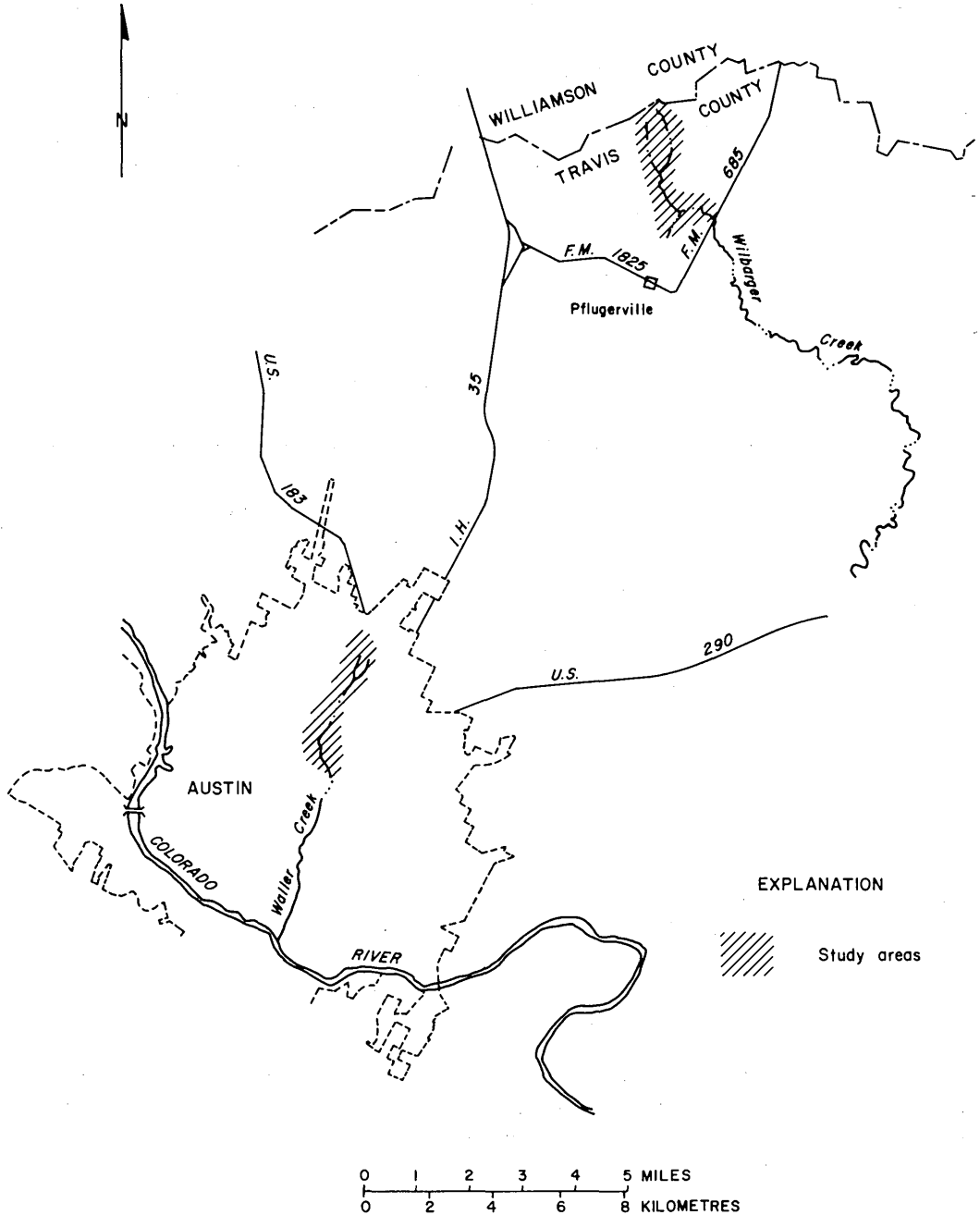
From		Multiply by	To obtain	
Unit	Abbrevia- tion		Unit	Abbrevia- tion
inches	--	25.4	millimetres	mm
feet	--	.3048	metres	m
miles	--	1.609	kilometres	km
square miles	mi <sup>2</sup>	2.590	square kilometres	km <sup>2</sup>
cubic feet per second	ft <sup>3</sup> /s	.02832	cubic metres per second	m <sup>3</sup> /s
feet per mile	ft/mi	.189	metres per kilometre	m/km
acre-feet	--	1233	cubic metres	m <sup>3</sup>
		.001233	cubic hectometres	hm <sup>3</sup>

## WATERSHED FEATURES

### Waller Creek Study Area

The Waller Creek drainage area (fig. 1) lies entirely within the city of Austin, with the headwaters originating in the northern part of the city. The creek flows south for 6.6 miles (10.6 km) to the Colorado River. Storm sewers and street gutters divert runoff both into and out of the natural drainage area.

Throughout the year, low flow is partially sustained by return flow of city water from industrial and residential users. Low flow during the summer months is partly sustained by drainage from municipal and private swimming pools.



Base from General Highway Map of Texas

FIGURE I.-Location of Waller Creek and Wilbarger Creek study areas

In 1954, 20.6 percent of the drainage area above 23d Street was impervious cover, i.e., streets, sidewalks, roofs, etc.; this cover had increased to 28.6 percent by 1962 and to 35.2 percent by 1966. Impervious cover in the drainage area above 38th Street increased from 13 percent in 1954 to 21 percent in 1962 and to 33.3 percent in 1966. Soil in the watershed is predominantly clay, which is underlain by Cretaceous chalk that crops out along most of the channel.

The slope index for Waller Creek is 48.6 ft/mi (9.2 m/km) at 38th Street and 47.3 ft/mi (9.0 m/km) at 23d Street. These indices were computed by determining the difference in elevation between the two points that were 85 and 10 percent of the main channel distance upstream from the gaging station, and then dividing by the distance between the two points.

Records of the National Weather Service show that the mean-annual rainfall (based on the period 1941-70), approximately 1.5 miles (2.4 km) east of the watershed, is 32.49 inches (825 mm). Rainfall is generally well distributed throughout the year; however, individual storms may cause serious flooding in any season. The major storms usually occur during the months of April-May and September-October.

### Wilbarger Creek Study Area

The headwaters of Wilbarger Creek originate in Travis County near the Williamson County line (fig. 1). The creek flows southeasterly about 40 miles (64 km) to the Colorado River. The Wilbarger Creek study area is about 15 miles (24 km) north of the city of Austin.

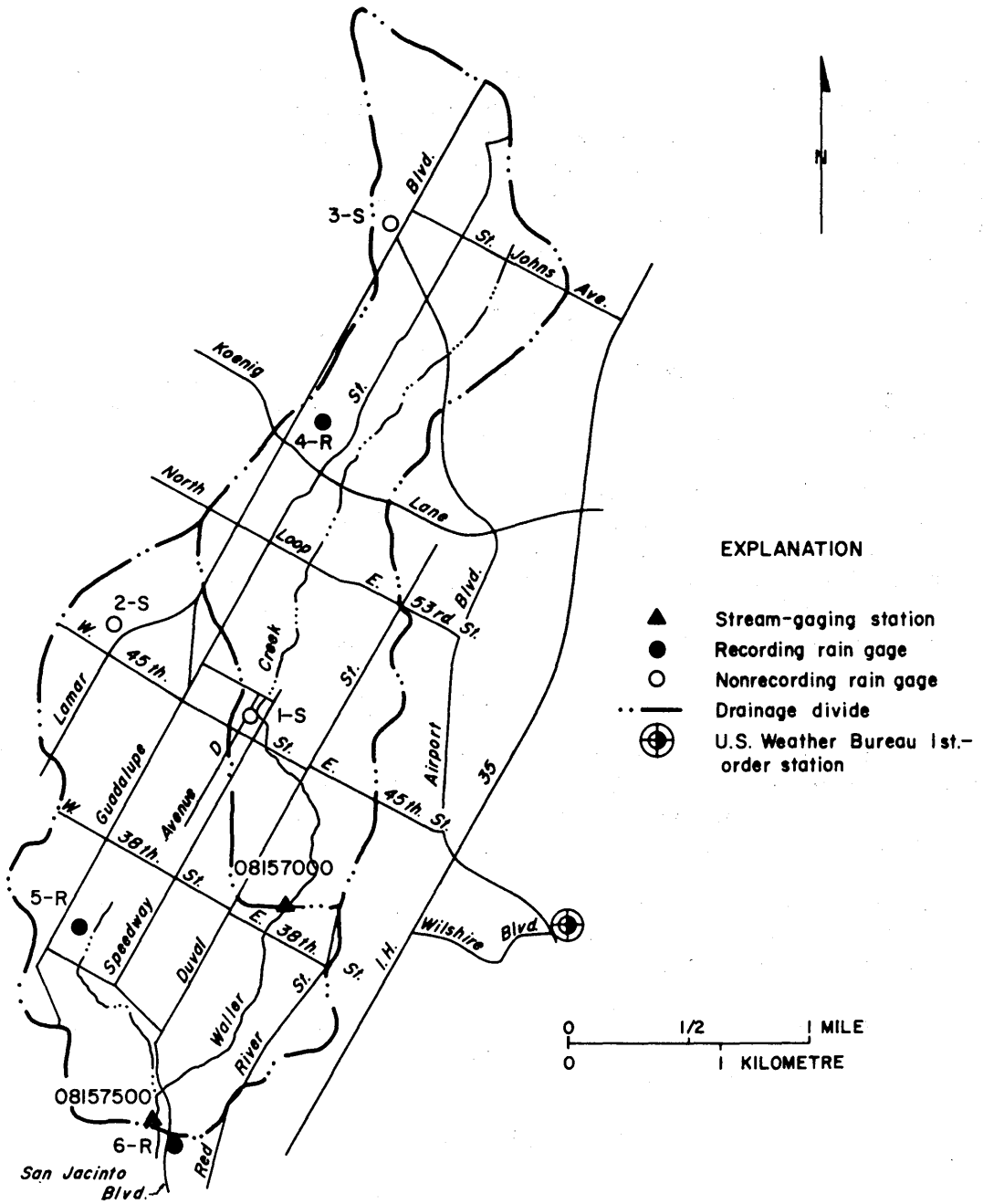
The soil in the watershed is predominantly clay; it is underlain by Cretaceous chalk that crops out at many places along the channel. The principal land use is farming and ranching.

The slope index, calculated by the 85-10 percent method, is 39.2 ft/mi (7.4 m/km). Runoff characteristics are slightly affected by farming practices, stock tanks, and vegetation.

### HYDROLOGIC INSTRUMENTS

#### Waller Creek Study Area

Instruments to collect rainfall and runoff data in the Waller Creek study area consist of a network of three recording and three nonrecording rain gages and two stream-gaging stations. Figure 2 shows the locations of instruments in the study area.



Base from General Highway Map of Texas

FIGURE 2.-- Locations of hydrologic-instrument installations in the Waller Creek study area



The rain gages are distributed in the study area to measure the total rainfall and to define rainfall intensities on the watershed. In this study, a digital computer was used to process precipitation and runoff data. The weighing factors used to determine weighted-mean precipitation above each stream-gaging station are given below. Because only recording rain gages can be used in the computational process for storm rainfall and runoff, the weighing factors for these computations are significantly different from those used to compute weighted-mean precipitation at both 38th and 23d Streets.

At 23d Street

Weighing factors for all rain gages

1-S	2-S	3-S	4-R	5-R	6-R
0.264	0.101	0.190	0.161	0.187	0.097

Weighing factors for recording rain gages only

4-R	5-R	6-R
0.508	0.396	0.096

At 38th Street

Weighing factors for all rain gages

1-S	2-S	3-S	4-R	5-R
0.360	0.006	0.338	0.287	0.009

Weighing factors for recording rain gages only

4-R	5-R
0.811	0.189

One stream-gaging station is maintained at 38th Street and the other at 23d Street. Low-water concrete controls were constructed at each stream-gaging station to stabilize the stage-discharge relationship. Records at the 38th Street station began April 5, 1955, and at the 23d Street station on December 23, 1954. Pertinent station information and records of daily, monthly, and yearly runoff for the 1974 water year for both stations are included in the section "Compilation of data".

## Wilbarger Creek Study Area

Instruments to collect rainfall and runoff data in the Wilbarger Creek study area consist of a network of three recording rain gages and one stream-gaging station. Figure 3 shows the locations of instruments in the study area.

The rain gages are distributed in the study area to measure the total rainfall and to define rainfall intensities on the watershed. The weighing factors used to determine the weighted-mean precipitation are given below.

1-R	2-R	3-R
0.431	0.301	0.268

A continuous-recording stream-gaging station with a concrete low-water control is maintained on Wilbarger Creek. Records at this station began August 9, 1963. Pertinent station information and records of daily, monthly, and yearly runoff for the 1974 water year are included in the section "Compilation of data".

### SUMMARY OF DATA FOR WALLER CREEK, 1974 WATER YEAR

The weighted-mean rainfall in the study area upstream from 38th Street was 38.21 inches (971 mm), or 18 percent above the mean annual rainfall for Austin of 32.49 inches (825 mm). Mean daily discharge was 2.04 ft<sup>3</sup>/s (0.058 m<sup>3</sup>/s); annual runoff was 12.01 inches (305 mm), or 31 percent of rainfall.

The weighted-mean rainfall in the study area upstream from 23d Street was 38.40 inches (975 mm), or 18 percent above the mean annual rainfall for Austin. Mean daily discharge was 4.12 ft<sup>3</sup>/s (0.117 m<sup>3</sup>/s); annual runoff was 13.54 inches (344 mm), or 35 percent of rainfall.

A storm event is defined as a period of rainfall separated by at least 6 hours from other rainfall. Storms are selected for detailed rainfall-runoff computations on the basis of rainfall totals and distribution, the peak discharge produced from the rainfall, and the assurance of good rainfall and runoff records for the storm periods selected.

Four storm periods, Oct. 11, 1973; Oct. 12-13, 1973; May 9, 1974; and Aug. 28-29, 1974 were selected for analysis. A summary of rainfall-runoff data for each storm is shown in table 1. Computations with hydrographs and mass curves for each storm are included in the section "Compilation of data".

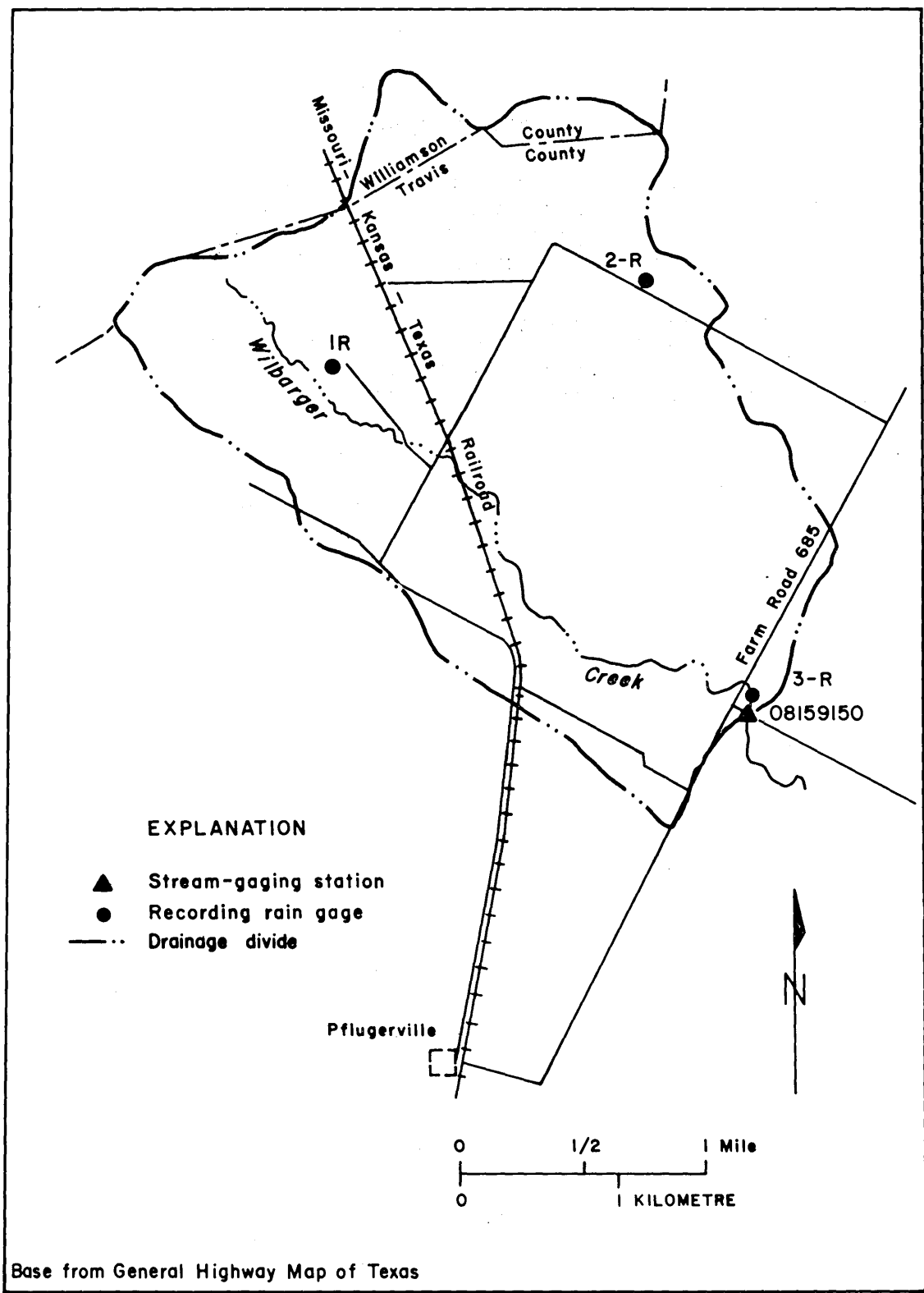


FIGURE 3.-- Locations of hydrologic-instrument installations in the Wilbarger Creek study area

## SUMMARY OF DATA FOR WILBARGER CREEK, 1974 WATER YEAR

Weighted-mean rainfall in the study area was 31.63 inches (803 mm), or 3 percent below the mean annual rainfall for Austin of 32.49 inches (825 mm). Mean daily discharge was 1.72 ft<sup>3</sup>/s (0.049 m<sup>3</sup>/s); annual runoff was 5.05 inches (128 mm), or 16 percent of rainfall.

Two storm periods, Oct. 11, 1973 and Oct. 13, 1973 were selected for analysis. A summary of rainfall-runoff data for each storm is shown in table 1. Computations with hydrograph and mass curves for each storm are included in the section "Compilation of data".

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY--TEXAS DISTRICT

ANNUAL STORM RAINFALL--RUNOFF SUMMARY DATA

Table 1.--Storm rainfall-runoff data, 1974 water year

Date of Storm	Rainfall (inches)					Runoff (inches)	Ratio runoff to rainfall	Maximum discharge (ft <sup>3</sup> /s)
	Duration (hours)	Total	Maximum increment					
			15-minute	30-minute	60-minute			
Waller Creek at 38th St., Austin, Texas (Drainage area 2.31 mi <sup>2</sup> )								
Oct. 11, 1973	17	4.92	0.90	1.53	2.50	2.47	0.50	1,810
Oct. 12-13, 1973	9	1.55	.49	.65	.77	.63	.41	263
May 9, 1974	6	2.48	.53	.93	1.28	.83	.33	644
Aug. 28-29, 1974	24	3.65	.72	1.35	1.92	.84	.23	551
Waller Creek at 23rd St., Austin, Texas (Drainage area 4.13 mi <sup>2</sup> )								
Oct. 11, 1973	17	5.33	.79	1.48	2.70	3.17	.59	4,020
Oct. 12-13, 1973	9	1.65	.41	.60	.74	.79	.48	806
May 9, 1974	6	2.50	.51	.86	1.30	.86	.34	1,600
Aug. 28-29, 1974	24	3.41	.63	1.12	1.66	.83	.24	844

UNITED STATES DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 1.--Storm rainfall-runoff data, 1974 water year--Continued

Date of Storm	Rainfall (inches)					Runoff (inches)	Ratio runoff to rainfall	Maximum discharge (ft <sup>3</sup> /s)
	Duration (hours)	Total	Maximum increment					
			15-minute	30-minute	60-minute			
Wilbarger Creek near Pflugerville, Texas (Drainage area 4.61 mi <sup>2</sup> )								
Oct. 11, 1973	10	2.57	0.34	0.55	0.82	1.04	0.40	908
Oct. 13, 1973	10	1.01	.15	.29	.39	.74	.73	522

COLORADO RIVER BASIN

08157000 Waller Creek at 38th Street, Austin, Tex.

LOCATION.--Lat 30°17'49", long 97°43'36", Travis County, on right bank 200 ft (61 m) upstream from bridge at East 38th Street in Austin, 1.1 miles (1.8 km) upstream from West Branch of Waller Creek, and 3.3 miles (5.3 km) upstream from Colorado River.

DRAINAGE AREA.--2.31 mi<sup>2</sup> (5.98 km<sup>2</sup>).

PERIOD OF RECORD.--April 1955 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 555.44 ft (169.298 m) above mean sea level.

AVERAGE DISCHARGE.--19 years, 1.68 ft<sup>3</sup>/s (0.0476 m<sup>3</sup>/s), 9.87 in/yr (251 mm/yr), 1,220 acre-ft/yr (1.50 hm<sup>3</sup>/yr).

EXTREMES.--Current year: Maximum discharge, 1,810 ft<sup>3</sup>/s (51.3 m<sup>3</sup>/s) Oct. 11 (gage height, 7.59 ft or 2.313 m); minimum daily, 0.16 ft<sup>3</sup>/s (0.005 m<sup>3</sup>/s) July 29.

Period of record: Maximum discharge, 1,970 ft<sup>3</sup>/s (55.8 m<sup>3</sup>/s) Oct. 29, 1960 (gage height, 7.77 ft or 2.368 m); no flow for many days in 1955-57, 1964.

REMARKS.--Records good. Flow slightly regulated at times by a small reservoir at Holy Cross High School (formerly St. Mary's Academy) on East 41st Street and a small swimming pool at the school which is drained into the creek every week or two during the summer. Water from other swimming pools also drain into the creek. Station is part of hydrologic research project to study rainfall-runoff relation for small urban areas. Two recording and three nonrecording rain gages are distributed in the area so that rainfall on the watershed can be determined.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.25	.47	.29	.29	.34	.48	.44	11	5.7	.24	.47	.59
2	.23	.43	.28	.29	.33	.48	.43	.63	.66	.43	.42	.53
3	.22	.37	.28	.28	.31	.47	.32	.85	.28	.48	.50	.26
4	14	.36	.25	.28	.32	.46	.40	1.7	.47	.45	7.4	.21
5	1.7	.32	.26	.28	.32	.42	.37	11	.50	.42	.20	.21
6	1.9	.33	.27	.28	.32	.37	.41	.34	.51	.50	4.9	.22
7	.43	.35	.26	.28	.30	.53	.41	.31	.52	.40	9.2	.21
8	.28	.34	.26	.28	.29	.55	.41	.31	.49	.22	4.9	.19
9	.26	.34	.26	.33	.31	.48	.42	47	1.0	.41	.81	2.0
10	1.8	.32	.26	.34	.30	.46	.42	3.9	.29	.45	.62	.85
11	154	.30	.26	.28	.30	.58	13	.63	.46	.42	.64	.25
12	5.5	.30	.27	.26	.30	.46	.58	.47	.66	5.2	.25	2.6
13	33	.29	.30	.29	.31	.44	.46	.39	.49	.50	.46	5.1
14	7.6	.28	.32	.29	.35	.47	4.4	.36	.52	.49	.48	.84
15	36	.29	.28	.28	.30	1.3	.50	.33	.47	.30	.55	.25
16	11	.28	.26	.35	.30	.49	.35	.32	.51	2.2	.47	.30
17	3.1	.29	.27	.26	.29	.47	.33	.30	.23	.49	.47	.30
18	1.6	.30	.28	10	.29	.45	.31	.27	.42	1.2	.52	.17
19	1.2	.29	5.3	.83	.34	.46	.30	.27	.41	.51	.24	.20
20	.92	2.8	.43	.32	.35	.44	.28	.26	.63	.50	.43	.19
21	.78	.31	.35	.30	2.8	.44	.29	.31	.51	.57	.44	1.7
22	.66	.30	.29	.29	.45	.44	4.0	.26	.50	.21	.48	.31
23	.61	1.6	.28	3.0	.42	.43	.34	.26	.49	.72	.37	.26
24	.58	.37	.28	7.6	.30	.21	.30	.24	.41	.48	.41	.24
25	.57	.30	.28	3.9	.54	.77	.27	.24	.42	.46	.38	5.0
26	.90	.85	.27	5.0	.52	.61	.29	6.8	.49	.49	.97	.25
27	3.2	.29	.26	.48	.48	.47	.28	.30	.45	.49	.21	.21
28	.57	.28	.27	.40	.44	.49	.25	.29	.49	.46	.29	.19
29	.42	.29	.28	.37	-----	.42	.28	.26	.46	.16	23	.18
30	4.3	.29	.28	.35	-----	.48	4.4	.57	.49	.42	17	.18
31	1.8	-----	.27	.34	-----	.47	-----	.52	-----	.43	1.2	-----
TOTAL	289.38	13.93	13.75	38.12	12.22	36.28	35.24	90.69	19.73	20.70	151.49	23.99
MEAN	9.33	.46	.44	1.23	.44	1.17	1.17	2.93	.66	.67	4.89	.80
MAX	154	2.8	5.3	10	2.8	21	13	.47	5.7	5.2	.49	5.1
MIN	.22	.28	.25	.26	.29	.37	.25	.24	.21	.16	.20	.17
CFSM	4.04	.20	.19	.53	.19	.51	.51	1.27	.29	.29	2.12	.35
IN.	4.66	.22	.22	.61	.20	.58	.57	1.46	.32	.33	2.44	.39
AC-FT	574	.28	.27	.76	.24	.72	.70	180	.39	.41	300	.48
(††)	10.55	.70	.58	2.55	.29	1.65	2.08	5.29	.65	1.01	10.61	2.25

CAL YR 1973 TOTAL 842.82 MEAN 2.31 MAX 154 MIN .11 CFSM 1.00 IN 13.57 AC-FT 1,670 †† 43.69  
WTR YR 1974 TOTAL 745.52 MEAN 2.04 MAX 154 MIN .16 CFSM .88 IN 12.01 AC-FT 1,480 †† 38.21

PEAK DISCHARGE (BASE, 300 FT<sup>3</sup>/S)

DATE	TIME	G.HT.	DISCHARGE
10-11	0945	7.59	1,810
5- 9	2115	5.81	644
8-28	1815	5.59	551

†† Weighted-mean rainfall, in inches.

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

Sheet 1 of 1 Sheets

08157000

yearly weighted-mean rainfall  
Monthly and  $\lambda$  in \_\_\_\_\_ inches, of \_\_\_\_\_ Waller Creek \_\_\_\_\_ River <sup>at</sup> near 38th St., Austin, Tex.  
[Drainage area, 2.31 square miles]

16-70450-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	Cal. Yr.
1956	-	-	-	-	-	0.49	0.60	3.00	1.40	0.44	1.37	0.21	-	
1957	1.31	2.04	2.08	0.49	2.73	3.49	9.37	7.07	5.06	.57	.03	6.85	41.09	50.37
1958	10.21	3.24	1.26	3.06	6.81	2.65	5.02	3.34	4.62	2.15	.84	7.20	50.40	43.99
1959	6.18	.92	1.20	.44	2.80	.26	4.86	2.20	3.30	4.39	5.07	4.00	35.62	38.60
1960	7.41	1.68	2.19	1.22	2.43	1.30	1.12	1.03	4.25	2.52	3.52	1.46	30.13	37.50
1961	12.11	2.13	4.41	1.48	5.03	.72	.15	1.21	11.95	8.37	.76	3.89	52.21	38.67
1962	1.01	2.36	1.74	.69	.99	1.19	4.87	1.43	8.71	.03	3.38	4.19	30.59	33.82
1963	3.96	1.26	3.12	.53	2.64	.24	2.77	1.42	3.59	.10	.47	1.30	21.40	16.92
1964	.91	1.68	1.27	2.85	1.51	2.25	1.47	1.91	5.71	1.19	1.62	7.91	30.28	34.36
1965	4.10	2.79	1.05	4.29	5.80	1.34	1.72	9.22	1.85	.32	.69	6.43	39.60	43.64
1966	3.50	3.33	5.15	1.42	2.73	.59	4.29	3.49	.94	.35	7.04	3.70	36.53	26.25
1967	.96	.08	.66	.15	1.43	.91	4.27	3.77	0	.99	5.03	6.71	24.96	36.13
1968	4.80	4.55	3.52	8.37	1.63	2.77	2.49	6.68	2.90	2.90	.77	2.98	44.36	38.35
1969	.58	5.59	.69	.40	4.16	2.90	4.92	2.91	2.13	.30	4.52	1.15	30.25	32.37
1970	3.26	.88	4.84	1.98	6.03	2.93	1.26	7.58	.21	.31	1.56	4.98	35.82	31.87
1971	4.92	0	.11	.04	.98	.59	1.08	1.47	2.16	1.56	7.09	2.66	22.66	29.12
1972	2.81	4.44	4.24	1.64	.35	.11	2.29	6.86	4.96	2.64	3.35	1.72	35.41	32.16
1973	4.40	2.94	.90	4.30	2.68	2.84	3.39	1.53	5.49	4.34	.27	7.02	40.10	43.69
1974	10.55	.70	.58	2.55	.29	1.65	2.08	5.29	.65	1.01	10.61	2.25	38.21	



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

08157000

Monthly and <sup>yearly mean</sup> discharge, in ft<sup>3</sup>/s, of Waller Creek at 38th Street, Austin, Tex.  
[Drainage area, 2.31 square miles]

16-26489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	
1955	-	-	-	-	-	-	0.15	0.78	0.37	0.30	0.28	0.04	-	
1956	0	0.04	0.24	0.21	0.29	0.05	.03	.62	.24	.20	.27	.04	0.19	
1957	.05	.39	.38	.11	.84	.90	5.87	4.21	5.26	.77	.68	1.94	1.77	
1958	9.52	1.70	1.14	1.82	7.91	1.92	2.82	2.87	2.77	1.80	1.05	2.62	3.13	
1959	2.63	1.53	1.43	1.04	1.65	1.00	2.72	.93	1.42	2.07	1.65	1.75	1.65	
1960	3.59	1.14	1.12	.87	1.17	.92	.72	.54	1.82	1.26	1.52	.67	1.28	
1961	10.0	1.41	2.86	1.59	3.99	.82	.47	.60	8.28	6.07	.97	2.17	3.27	
1962	.78	1.19	1.02	.80	.82	.89	1.96	.82	5.81	.70	2.30	2.02	1.59	
1963	1.40	.59	1.32	.67	1.91	.59	1.68	.65	1.52	.85	.84	.56	1.04	
1964	.22	.34	.44	1.00	.82	1.04	.59	.64	3.18	.55	.62	4.23	1.13	
1965	2.07	1.30	.68	2.66	4.85	1.00	1.23	6.10	1.39	.84	.90	3.03	2.15	
1966	1.97	1.87	3.10	.89	1.73	.76	2.06	1.62	.89	.59	3.21	1.32	1.67	
1967	.46	.22	.29	.21	.57	.35	1.72	1.32	.45	.55	2.34	3.07	.96	
1968	2.67	3.44	2.10	10.1	1.47	2.11	1.56	4.44	1.83	1.80	.66	1.04	2.78	
1969	.35	2.19	.57	.37	2.59	1.60	2.60	1.66	1.33	.55	2.29	.55	1.38	
1970	1.01	.31	2.16	1.00	4.50	2.19	.73	4.53	.63	.54	.77	1.58	1.65	
1971	2.45	.26	.22	.23	.49	.38	.51	.52	1.01	.74	3.68	.94	.96	
1972	.93	2.21	2.47	.78	.33	.22	.97	4.29	3.83	1.09	1.35	.63	1.60	
1973	2.16	1.08	.42	2.24	1.67	1.57	1.82	.78	2.45	2.65	.45	3.75	1.75	
1974	9.33	.46	.44	1.23	.44	1.17	1.17	2.93	.66	.67	4.89	.80	2.04	



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

08157500

yearly weighted-mean rainfall

Monthly and <sup>^</sup> in \_\_\_\_\_ inches, of \_\_\_\_\_ Waller Creek \_\_\_\_\_ at \_\_\_\_\_ 23rd St., Austin, Tex.  
[Drainage area, 4.13 square miles]

16-2649-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	Cal. Yr.
1956	-	-	-	-	-	0.42	0.58	3.08	1.04	0.43	1.38	0.21	-	
1957	1.31	2.06	2.08	0.50	2.51	3.73	9.53	6.84	5.04	.63	.02	6.70	40.95	49.99
1958	10.11	3.14	1.24	3.05	6.62	2.60	4.82	3.16	4.02	2.02	.68	7.32	48.78	42.38
1959	6.01	.88	1.20	.44	2.69	.22	4.80	2.04	3.41	4.79	4.70	4.04	35.22	38.23
1960	7.22	1.67	2.21	1.17	2.35	1.29	1.12	.98	4.34	2.39	3.60	1.49	29.83	37.93
1961	12.53	2.17	4.50	1.44	4.92	.67	.18	1.09	11.98	8.27	.88	3.82	52.47	38.19
1962	.94	2.30	1.68	.65	.92	1.20	4.82	1.39	8.32	.02	3.75	4.35	30.34	33.49
1963	3.83	1.12	3.12	.49	2.64	.22	2.92	1.16	3.56	.07	.49	1.27	20.89	16.74
1964	.86	1.70	1.36	3.00	1.56	2.14	1.46	1.75	5.52	.98	1.74	8.00	30.06	34.12
1965	4.16	2.78	1.04	4.36	5.79	1.46	1.85	9.92	1.57	.32	.65	6.38	40.28	44.34
1966	3.58	3.41	5.05	1.33	2.86	.62	4.06	3.52	.89	.32	7.33	3.86	36.83	26.62
1967	1.02	.10	.71	.17	1.43	.87	4.40	3.87	0	.80	5.09	6.32	24.78	35.62
1968	4.62	4.54	3.51	8.63	1.56	2.53	2.38	7.28	2.69	2.87	.82	2.82	44.25	38.44
1969	.60	5.62	.64	.34	4.08	2.78	4.97	3.03	2.18	.27	4.85	1.32	30.68	32.71
1970	3.27	.83	4.79	1.92	5.85	2.81	1.24	6.91	.23	.43	1.88	4.79	34.95	31.01
1971	4.86	0	.09	.04	.90	.69	1.06	1.50	2.39	1.84	6.39	2.88	22.64	28.92
1972	2.78	4.21	4.24	1.64	.33	.09	2.36	7.11	4.37	2.38	3.64	1.79	34.94	31.79
1973	4.29	2.88	.91	4.36	2.48	2.84	3.51	1.49	5.86	4.26	.16	7.09	40.13	44.32
1974	11.02	.75	.50	2.60	.27	1.56	2.12	5.31	.66	1.13	10.36	2.11	38.40	

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

08157500

yearly mean  
Monthly and  $\lambda$  discharge, in ft<sup>3</sup>/s, of Waller Creek @ 23rd St Austin, Tex.  
[Drainage area, 4.13 square miles]

16-20489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL
1955	-	-	-	1.29	3.92	1.21	0.86	3.70	1.80	1.04	0.81	0.56	-
1956	0.55	0.72	0.84	.75	1.21	.56	.59	2.53	.76	.79	1.08	.60	0.92
1957	.97	1.44	1.31	.52	2.35	3.55	12.7	9.02	11.1	1.82	1.42	4.39	4.19
1958	18.1	3.63	2.50	4.09	14.7	4.42	6.98	6.45	5.50	4.32	2.37	6.11	6.55
1959	5.62	2.51	2.03	1.58	3.03	1.67	6.44	2.27	3.15	5.13	3.47	4.28	3.43
1960	8.92	2.77	2.63	2.27	3.21	2.52	2.12	1.65	4.12	2.70	3.15	1.81	3.16
1961	21.7	3.20	5.45	3.71	8.81	2.17	1.47	1.95	18.7	14.8	2.15	4.20	7.36
1962	1.63	2.85	2.32	1.66	1.88	2.02	4.31	1.91	10.8	1.33	5.21	4.67	3.37
1963	4.07	1.33	2.84	1.24	3.90	1.42	4.34	1.90	3.82	1.70	1.74	1.76	2.49
1964	1.10	1.22	1.14	2.30	1.86	2.36	1.60	1.68	6.66	1.51	1.79	9.54	2.71
1965	5.24	2.98	1.59	5.02	8.84	2.33	2.53	14.7	2.91	1.80	1.85	6.41	4.66
1966	3.44	3.49	5.20	1.65	3.14	1.64	3.48	3.10	1.66	1.42	6.91	2.72	3.16
1967	1.14	.63	.83	.65	1.37	1.01	4.00	3.03	1.06	1.25	4.91	5.41	2.11
1968	5.01	5.79	3.85	14.7	2.91	3.61	2.90	8.56	3.29	3.79	1.61	2.13	4.87
1969	1.01	4.06	1.17	.95	4.56	2.73	4.34	3.85	2.65	1.30	4.37	1.61	2.70
1970	2.46	1.26	3.67	2.12	7.77	4.07	1.68	7.73	1.58	1.42	1.96	3.44	3.24
1971	4.89	.94	.86	1.05	1.64	1.48	1.60	1.70	2.99	2.43	6.83	2.61	2.43
1972	2.33	4.62	4.84	1.87	1.20	1.01	2.53	8.57	6.46	2.28	3.52	1.97	3.44
1973	4.65	2.46	1.24	4.57	3.56	3.45	4.05	1.94	5.34	5.10	1.03	7.96	3.77
1974	19.4	1.14	.96	2.44	.88	1.92	2.23	5.60	1.22	1.93	9.46	1.63	4.12



UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

yearly weighted-mean rainfall  
Monthly and, in inches, of Wilbarger Creek near Pflugerville, Tex.  
[Drainage area, 4.61 square miles]

16-26489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	Cal. Yr.
1964	1.33	1.85	1.44	2.86	1.43	2.24	2.87	4.70	7.43	0.23	1.59	7.52	35.49	38.01
1965	2.99	2.97	1.18	5.07	6.39	.87	1.65	5.87	2.00	.23	3.23	4.97	37.42	40.75
1966	2.60	3.36	4.51	1.40	2.86	.71	5.64	2.67	1.63	.15	4.95	4.00	34.48	25.43
1967	.55	.10	.77	.28	1.94	.85	4.01	4.60	0	.64	2.46	4.87	21.07	32.15
1968	5.13	4.10	3.27	8.17	1.63	2.32	2.62	6.55	4.00	2.36	2.37	3.20	45.72	39.32
1969	.29	4.69	1.12	.32	3.97	2.80	4.63	1.33	2.76	.18	4.85	.98	27.92	29.98
1970	3.33	.66	4.17	1.59	5.20	3.50	.95	7.58	.36	.49	.63	5.21	33.67	30.89
1971	5.30	0	.08	0	1.09	.93	1.01	1.12	.95	1.23	4.95	1.65	18.31	24.27
1972	2.68	4.84	3.82	1.34	.45	.44	.87	5.86	2.62	2.02	3.85	1.56	30.35	27.41
1973	5.69	2.04	.67	3.67	2.12	3.38	3.35	2.04	2.98	2.39	.49	7.50	36.32	36.58
1974	7.60	.50	.56	2.38	.42	1.01	2.61	2.67	2.26	.29	7.39	3.94	31.63	

UNITED STATES  
DEPARTMENT OF THE INTERIOR  
GEOLOGICAL SURVEY  
WATER RESOURCES DIVISION

081591500

yearly mean  
Monthly and discharge, in ft<sup>3</sup>/s, of Wilbarger Creek near Pflugerville, Tex.  
[Drainage area, 4.61 square miles]

16-20489-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL
1963	-	-	-	-	-	-	-	-	-	-	0	0	-
1964	0	0	0	0	0	0.03	1.67	4.23	10.4	0.07	0	2.02	1.53
1965	.43	1.62	.71	6.45	15.4	2.01	.75	3.32	.57	.05	.08	.72	2.59
1966	.13	1.50	7.36	1.88	3.73	2.01	5.90	3.57	.18	.03	.18	.79	2.26
1967	.26	.10	.12	.091	.15	.043	.30	1.87	.042	0	.0003	.026	.25
1968	.97	6.03	5.69	16.7	3.80	4.63	3.15	8.59	2.27	1.18	.078	.085	4.45
1969	.020	.16	.46	.22	3.74	5.43	7.07	.89	.15	.011	.019	.012	1.49
1970	.006	.003	.51	1.26	9.53	11.4	1.07	8.94	1.37	.058	.002	.013	2.82
1971	2.29	.26	.15	.095	.068	.059	.029	0	0	0	.002	0	.25
1972	0	1.78	3.40	1.26	.82	.22	.059	3.29	.54	.065	.018	0	.96
1973	2.83	.64	.86	4.13	5.31	4.50	3.01	2.90	.18	.072	.001	2.02	2.19
1974	15.9	1.23	.42	.74	.53	.19	.087	.15	.024	0	.020	1.06	1.72

A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

DATE	G A G E N U M B E R								
	WALLER CREEK BASIN						WILBARGER CREEK BASIN		
	1-S	2-S	3-S	4-R	5-R	6-R	1-R	2-R	3-R
OCT									
4	1.20	1.12	0.00	0.87	0.00	1.04	0.77	0.96	1.19
5	0.07	0.17	0.61	0.20	0.06	0.10	0.26	0.41	0.49
6	0.00	0.00	0.42	0.05	0.00	0.09	0.09	0.09	0.11
10	0.46	0.12	0.04	0.20	0.08	0.26	0.00	0.00	0.00
11	5.56	7.00	3.25	4.70	5.89	6.40	2.31	2.69	2.85
12	0.00	0.06	0.00	0.35	0.61	0.43	0.29	0.22	0.04
13	1.46	1.30	2.30	1.12	1.33	1.30	1.04	1.00	0.96
14	0.41	0.59	0.08	0.36	0.38	0.41	0.37	0.34	0.32
15	1.46	2.10	0.61	1.52	1.38	1.49	1.39	1.35	0.71
16	0.00	0.00	1.46	0.13	0.11	0.12	0.09	0.05	0.00
26	0.05	0.05	0.05	0.04	0.02	0.02	0.06	0.04	0.00
27	0.27	0.27	0.30	0.32	0.25	0.27	0.00	0.00	0.00
30	0.55	0.55	0.54	0.50	0.32	0.30	0.76	0.95	0.65
MTOT	11.49	13.33	9.66	10.36	10.43	12.23	7.43	8.10	7.32
NOV									
6	0.03	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00
7	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
15	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04	0.09
19	0.35	0.00	0.27	0.00	0.00	0.00	0.00	0.00	0.00
20	0.00	0.34	0.00	0.29	0.40	0.43	0.17	0.15	0.00
21	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
23	0.19	0.08	0.32	0.19	0.21	0.10	0.17	0.30	0.36
24	0.00	0.16	0.00	0.00	0.05	0.02	0.00	0.00	0.00
25	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
26	0.00	0.24	0.08	0.10	0.15	0.25	0.04	0.05	0.13
27	0.21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MTOT	0.81	0.82	0.68	0.58	0.81	0.83	0.43	0.54	0.58

MTOT=MONTHLY TOTALS



A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

G A G E N U M B E R

DATE

WALLER CREEK BASIN

WILBARGER CREEK BASIN

1-S

2-S

3-S

4-R

5-R

6-R

1-R

2-R

3-R

DATE	1-S	2-S	3-S	4-R	5-R	6-R	1-R	2-R	3-R
DEC									
2	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00
19	0.69	0.54	0.43	0.48	0.06	0.66	0.45	0.65	0.53
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.06
21	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.03
23	0.04	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MTOT	0.75	0.58	0.49	0.48	0.06	0.66	0.45	0.65	0.62
CTOT	44.95	47.49	43.95	41.65	44.31	44.51	34.78	36.33	39.77

MTOT=MONTHLY TOTALS

CTOT=CALENDAR YEAR TOTALS

A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

DATE	G A G E N U M B E R								
	WALLER CREEK BASIN						WILBARGER CREEK BASIN		
	1-S	2-S	3-S	4-R	5-R	6-R	1-R	2-R	3-R
JAN									
2	0.03	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
3	0.01	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
4	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.04	0.10
7	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
8	0.08	0.00	0.06	0.02	0.04	0.02	0.04	0.00	0.01
9	0.10	0.08	0.05	0.12	0.05	0.02	0.03	0.05	0.01
10	0.05	0.03	0.10	0.05	0.03	0.04	0.02	0.00	0.01
11	0.07	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
12	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
13	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.02	0.08	0.07	0.00	0.03	0.00	0.04	0.04	0.03
15	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
18	0.78	0.00	0.92	0.89	0.92	0.86	1.03	0.74	0.89
19	0.00	0.96	0.00	0.00	0.00	0.00	0.02	0.00	0.00
20	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
21	0.00	0.00	0.00	0.00	0.05	0.02	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00
23	0.38	0.05	0.05	0.31	0.20	0.37	0.21	0.22	0.32
24	0.60	0.67	0.75	0.50	0.57	0.52	0.53	0.46	0.50
25	0.05	0.16	0.05	0.51	0.55	0.52	0.45	0.42	0.50
26	0.62	0.66	0.00	0.10	0.09	0.15	0.09	0.13	0.13
31	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MTOT	3.00	2.69	2.11	2.50	2.58	2.54	2.51	2.10	2.50

MTOT=MONTHLY TOTALS

-27-

A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

G A G E N U M B E R

DATE

WALLER CREEK BASIN

WILBARGER CREEK BASIN

1-S

2-S

3-S

4-R

5-R

6-R

1-R

2-R

3-R

FEB

7	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
14	0.00	0.00	0.01	0.00	0.02	0.00	0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02
20	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01
21	0.27	0.29	0.34	0.23	0.21	0.24	0.35	0.46	0.44
24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02

MTOT

0.28	0.29	0.35	0.23	0.23	0.24	0.35	0.46	0.49
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MAR

12	0.00	0.00	0.00	0.00	0.00	0.00	0.08	0.05	0.00
13	0.00	0.00	0.00	0.00	0.00	0.00	0.10	0.12	0.07
14	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00
15	0.07	0.00	0.22	0.13	0.13	0.20	0.00	0.00	0.00
16	0.01	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.11	0.04
23	0.04	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
24	1.16	0.00	0.00	1.47	1.30	1.17	0.80	0.74	0.75
25	0.00	1.28	1.17	0.00	0.00	0.00	0.00	0.00	0.00

MTOT

1.34	1.48	2.00	1.65	1.48	1.37	1.10	1.02	0.86
------	------	------	------	------	------	------	------	------

MTOT=MONTHLY TOTALS

A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

G A G E N U M B E R

DATE

WALLER CREEK BASIN

WILBARGER CREEK BASIN

	1-S	2-S	3-S	4-R	5-R	6-R		1-R	2-R	3-R
APR										
10	0.00	0.00	0.00	0.00	0.00	0.06		0.00	0.00	0.09
11	0.96	0.07	0.00	1.11	1.01	0.85		0.82	0.87	0.64
12	0.06	0.98	1.13	0.00	0.00	0.00		0.00	0.00	0.00
13	0.30	0.00	0.00	0.20	0.00	0.00		0.59	0.50	0.22
14	0.06	0.40	0.33	0.18	0.32	0.26		0.03	0.04	0.00
15	0.00	0.02	0.04	0.02	0.00	0.02		0.05	0.05	0.11
16	0.00	0.00	0.06	0.00	0.00	0.00		0.00	0.00	0.00
18	0.02	0.00	0.00	0.00	0.00	0.02		0.00	0.00	0.00
19	0.00	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.02
20	0.00	0.00	0.03	0.00	0.00	0.00		0.00	0.00	0.00
21	0.50	0.00	0.00	0.00	0.00	0.00		0.00	0.00	0.00
22	0.00	0.30	0.42	0.31	0.30	0.41		0.69	0.85	0.31
30	0.03	0.00	0.00	0.52	0.71	0.76		0.87	0.41	0.40
MTOT	1.93	1.77	2.01	2.34	2.34	2.38		3.05	2.72	1.79

MTOT=MONTHLY TOTALS

A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

G A G E N U M B E R

DATE

WALLER CREEK BASIN

WILBARGER CREEK BASIN

1-S

2-S

3-S

4-R

5-R

6-R

1-R

2-R

3-R

MAY

1	1.07	1.10	1.01	0.67	1.11	0.48	0.38	0.39	0.41
2	0.77	0.31	0.17	0.00	0.00	0.04	0.00	0.00	0.00
3	0.00	0.00	0.00	0.19	0.36	0.07	0.00	0.00	0.00
4	0.00	0.42	0.26	0.00	0.00	0.00	0.00	0.00	0.00
5	0.90	0.58	0.73	0.75	0.74	0.61	0.54	0.66	0.80
9	0.00	0.00	0.00	2.49	2.45	2.76	1.24	1.48	1.71
10	1.80	2.52	2.45	0.03	0.02	0.02	0.02	0.04	0.00
11	0.00	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
13	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
21	0.10	0.00	0.00	0.00	0.03	0.00	0.00	0.00	0.00
25	0.00	0.00	0.67	0.00	0.00	0.00	0.00	0.00	0.00
26	0.62	0.60	0.00	0.62	0.72	0.69	0.10	0.23	0.05
29	0.00	0.00	0.00	0.10	0.03	0.00	0.00	0.00	0.00
30	0.00	0.00	0.00	0.00	0.00	0.09	0.05	0.10	0.00
31	0.12	0.00	0.17	0.06	0.04	0.03	0.00	0.00	0.00

MTOT

5.40	5.53	5.48	4.91	5.50	4.79	2.33	2.90	2.97
------	------	------	------	------	------	------	------	------

JUN

1	0.50	0.50	0.48	0.43	0.54	0.51	0.41	0.75	0.73
4	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
6	0.00	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.00
9	0.00	0.00	0.00	0.14	0.15	0.06	1.81	1.56	0.68
10	0.14	0.10	0.12	0.04	0.03	0.00	0.11	0.37	0.26
29	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00

MTOT

0.74	0.63	0.60	0.61	0.72	0.60	2.33	2.68	1.67
------	------	------	------	------	------	------	------	------

MTOT=MONTHLY TOTALS

AUSTIN URBAN HYDROLOGY STUDY

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

G A G E N U M B E R

DATE

WALLER CREEK BASIN

WILBARGER CREEK BASIN

1-S      2-S      3-S      4-R      5-R      6-R      1-R      2-R      3-R

JUL

12	0.62	0.00	0.15	0.88	0.56	0.14	0.04	0.25	0.15
13	0.00	0.62	0.00	0.00	0.00	0.06	0.00	0.00	0.00
14	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00
16	0.71	0.00	0.00	0.00	0.77	0.00	0.00	0.00	0.00
17	0.02	0.20	0.02	0.00	0.00	0.18	0.00	0.00	0.00
18	0.02	0.00	0.01	0.23	0.23	0.28	0.06	0.15	0.34
19	0.20	0.30	0.13	0.00	0.00	0.05	0.00	0.00	0.00
22	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
24	0.00	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.00

MTOT

1.57      1.12      0.31      1.11      1.56      0.78      0.10      0.40      0.49

AUG

2	0.00	0.00	0.04	0.00	0.00	0.01	0.04	0.05	0.04
3	0.00	0.10	0.00	0.00	0.00	0.03	0.37	0.19	0.66
4	0.78	0.66	0.48	0.93	0.92	0.92	0.00	0.00	0.00
5	0.60	0.16	0.13	0.04	0.04	0.04	0.00	0.00	0.00
6	0.78	0.12	0.14	0.50	0.75	0.75	0.94	0.90	0.67
7	0.00	0.03	0.20	0.56	0.56	0.56	0.74	0.70	0.72
8	3.08	1.64	1.78	3.26	3.00	3.00	1.78	1.74	1.78
9	0.30	1.84	1.66	0.00	0.00	0.00	0.00	0.00	0.00
10	0.00	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
11	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00
25	0.00	0.00	0.00	0.04	0.05	0.04	0.08	0.05	0.06
26	0.31	0.02	0.05	0.16	0.32	0.44	0.00	0.00	0.00
27	0.30	0.24	0.21	0.00	0.06	0.06	0.00	0.00	0.00
28	0.60	0.09	0.06	2.68	2.22	1.40	1.78	1.48	1.63
29	3.30	2.82	3.26	1.10	0.89	1.28	1.06	0.99	0.96
30	0.00	1.48	1.43	1.14	1.03	1.10	0.93	0.83	0.80
31	1.30	0.76	0.57	0.00	0.00	0.02	0.00	0.00	0.03

MTOT

11.35      9.96      10.01      10.41      9.84      9.69      7.72      6.93      7.35

MTOT=MONTHLY TOTALS

A U S T I N U R B A N H Y D R O L O G Y S T U D Y

DAILY AND MONTHLY RAINFALL SUMMARY

PERIOD: 1974 WATER YEAR

G A G E N U M B E R

DATE

WALLER CREEK BASIN

WILBARGER CREEK BASIN

1-S

2-S

3-S

4-R

5-R

6-R

1-R

2-R

3-R

Sept.

2	0.09	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.03
2	0.00	0.06	0.04	0.00	0.02	0.03	0.00	0.00	0.00
6	0.00	0.00	0.00	0.00	0.00	0.00	0.12	0.16	0.06
7	0.00	0.00	0.00	0.00	0.02	0.03	0.00	0.00	0.00
9	0.06	0.00	0.00	0.36	0.40	0.24	0.29	0.14	0.28
10	0.07	0.42	0.35	0.10	0.02	0.04	0.31	0.35	0.61
11	0.00	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.04
12	0.41	0.00	0.00	0.38	0.50	0.56	0.57	0.30	0.44
13	0.50	0.74	0.96	0.44	0.18	0.11	0.21	0.23	0.39
14	0.05	0.08	0.12	0.09	0.08	0.07	0.11	0.10	0.09
15	0.05	0.00	0.02	0.00	0.00	0.00	0.00	0.00	0.00
16	0.07	0.02	0.04	0.00	0.00	0.02	0.00	0.00	0.00
17	0.07	0.00	0.00	0.00	0.00	0.01	0.09	0.03	0.02
18	0.03	0.00	0.00	0.00	0.00	0.03	0.00	0.00	0.00
20	0.00	0.00	0.29	0.00	0.00	0.00	0.00	0.00	0.00
21	0.00	0.12	0.00	0.21	0.15	0.07	2.41	1.67	1.41
22	0.00	0.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
25	0.78	0.55	0.62	0.52	0.49	0.45	0.38	0.35	0.34
26	0.00	0.00	0.03	0.00	0.00	0.02	0.00	0.00	0.03

MTOT	2.18	2.16	2.47	2.10	1.86	1.71	4.49	3.33	3.74
------	------	------	------	------	------	------	------	------	------

WTOT	40.84	40.36	36.17	37.28	37.41	37.82	32.29	31.83	30.36
------	-------	-------	-------	-------	-------	-------	-------	-------	-------

MTOT=MONTHLY TOTALS

WTOT=WATER YEAR TOTALS

STA. NO.08157000

STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 38TH STREET, AUSTIN, TEXAS

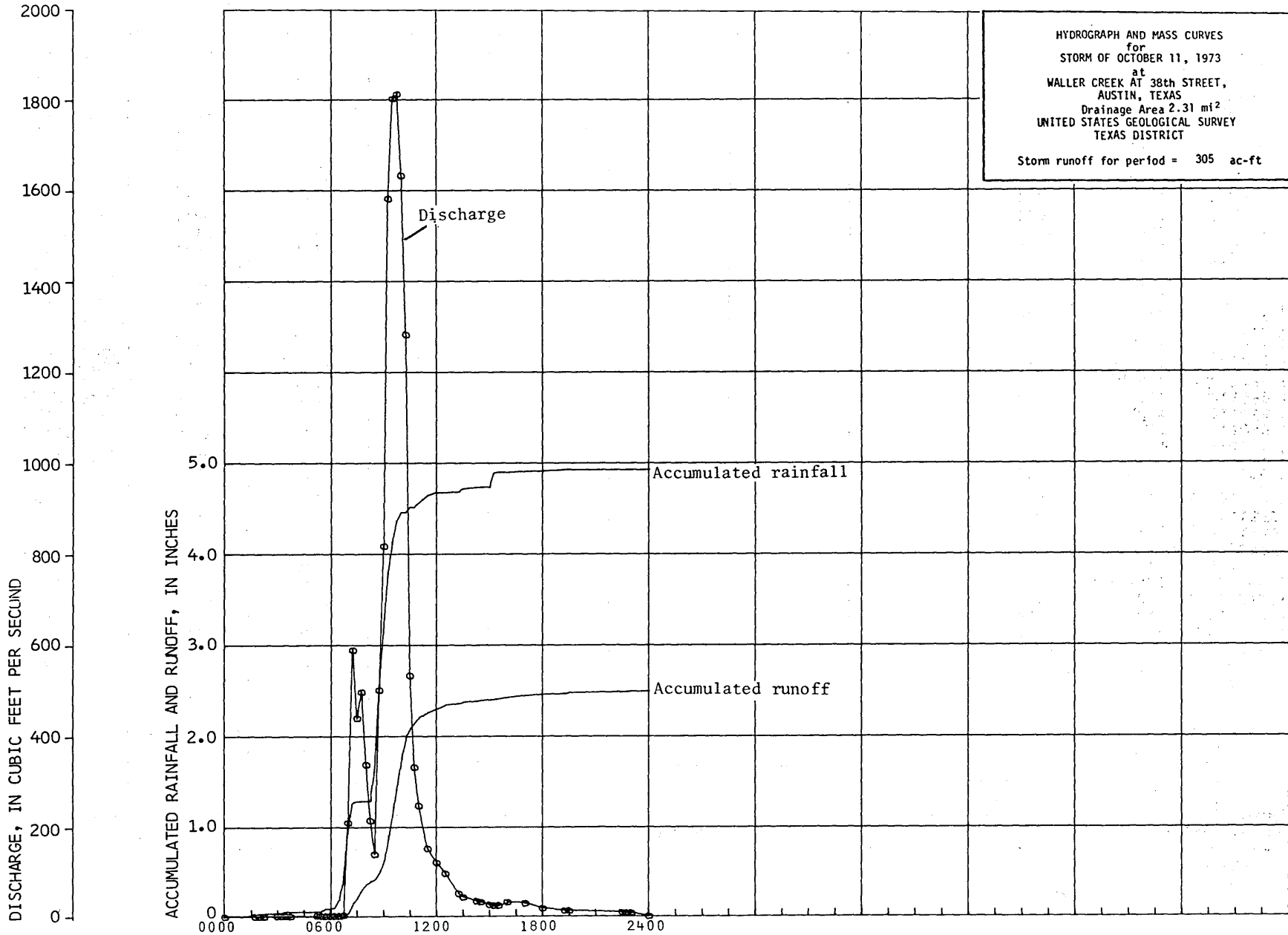
STORM OF OCT.11, 1973

DATE & TIME	G A G E N U M B E R				ACCUM. WEIGHTED PRECIP.	DISCHARGE IN	ACCUM. RUNOFF
	4-R	5-R			IN.	FT <sup>3</sup> /S	IN.
OCT. 11							
0000	0.0	0.0			0.0	0.3	0.0002
0145	0.04	0.0			0.03	0.3	0.0004
0200	0.04	0.06			0.04	0.3	0.0004
0215	0.04	0.06			0.04	0.3	0.0005
0300	0.04	0.10			0.05	1.8	0.0011
0315	0.04	0.10			0.05	1.6	0.0014
0330	0.06	0.10			0.07	1.3	0.0016
0345	0.06	0.10			0.07	1.2	0.0023
0515	0.06	0.10			0.07	1.9	0.0034
0530	0.06	0.10			0.07	1.8	0.0037
0545	0.09	0.13			0.10	1.7	0.0040
0600	0.09	0.13			0.10	1.7	0.0043
0615	0.10	0.14			0.11	1.7	0.0046
0630	0.19	0.19			0.19	1.7	0.0049
0645	0.41	0.31			0.39	3.9	0.0055
0700	0.98	0.69			0.93	208.0	0.0404
0715	1.25	1.28			1.26	587.0	0.1389
0730	1.25	1.44			1.29	437.0	0.2121
0745	1.25	1.44			1.29	495.0	0.2952
0800	1.25	1.44			1.29	335.0	0.3513
0815	1.25	1.44			1.29	212.0	0.3869
0830	1.66	1.44			1.62	138.0	0.4100
0845	2.59	2.24			2.52	499.0	0.4937
0900	3.17	3.09			3.15	815.0	0.6304
0915	3.70	4.04			3.76	1580.0	0.8954
0930	3.99	4.69			4.12	1800.0	1.1972
0945	4.17	5.18			4.36	1810.0	1.5008
1000	4.24	5.37			4.45	1630.0	1.7741
1015	4.24	5.37			4.45	1280.0	1.9888
1030	4.29	5.47			4.51	531.0	2.0779
1045	4.29	5.47			4.51	329.0	2.1330
1100	4.34	5.50			4.56	244.0	2.1944
1130	4.42	5.58			4.64	150.0	2.2447
1200	4.45	5.64			4.67	119.0	2.2846
1230	4.45	5.64			4.67	95.0	2.3245
1315	4.46	5.64			4.68	51.0	2.3416
1330	4.50	5.64			4.72	43.0	2.3560
1415	4.50	5.73			4.73	34.0	2.3674
1430	4.50	5.73			4.73	32.0	2.3754

-33-



STA. NO.08157000		STORM RAINFALL AND RUNOFF RECORD					1974 WATER YEAR		
WALLER CREEK AT 38TH STREET, AUSTIN, TEXAS					STORM OF OCT.11, 1973		ACCUM.	DISCHARGE	ACCUM.
DATE & TIME	G A G E N U M B E R					WEIGHTED	IN	RUNOFF	
	4-R	5-R				PRECIP.	FT <sup>3</sup> /S	IN.	
						IN.			
OCT. 11									
1500	4.50	5.75				4.74	26.0	2.3820	
1515	4.69	5.75				4.89	24.0	2.3860	
1530	4.70	5.75				4.90	24.0	2.3920	
1600	4.70	5.75				4.90	32.0	2.4081	
1700	4.70	5.80				4.91	29.0	2.4276	
1800	4.70	5.82				4.91	18.0	2.4412	
1915	4.70	5.89				4.92	12.0	2.4472	
1930	4.70	5.89				4.92	12.0	2.4603	
2230	4.70	5.89				4.92	8.7	2.4698	
2245	4.70	5.89				4.92	8.1	2.4711	
2300	4.70	5.89				4.92	7.6	2.4743	
2400	4.70	5.89				4.92	0.0	2.4743	



STA. NO. 08157000

STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 38TH ST. AUSTIN, TEX.

STORM OF OCT. 12-13, 1973

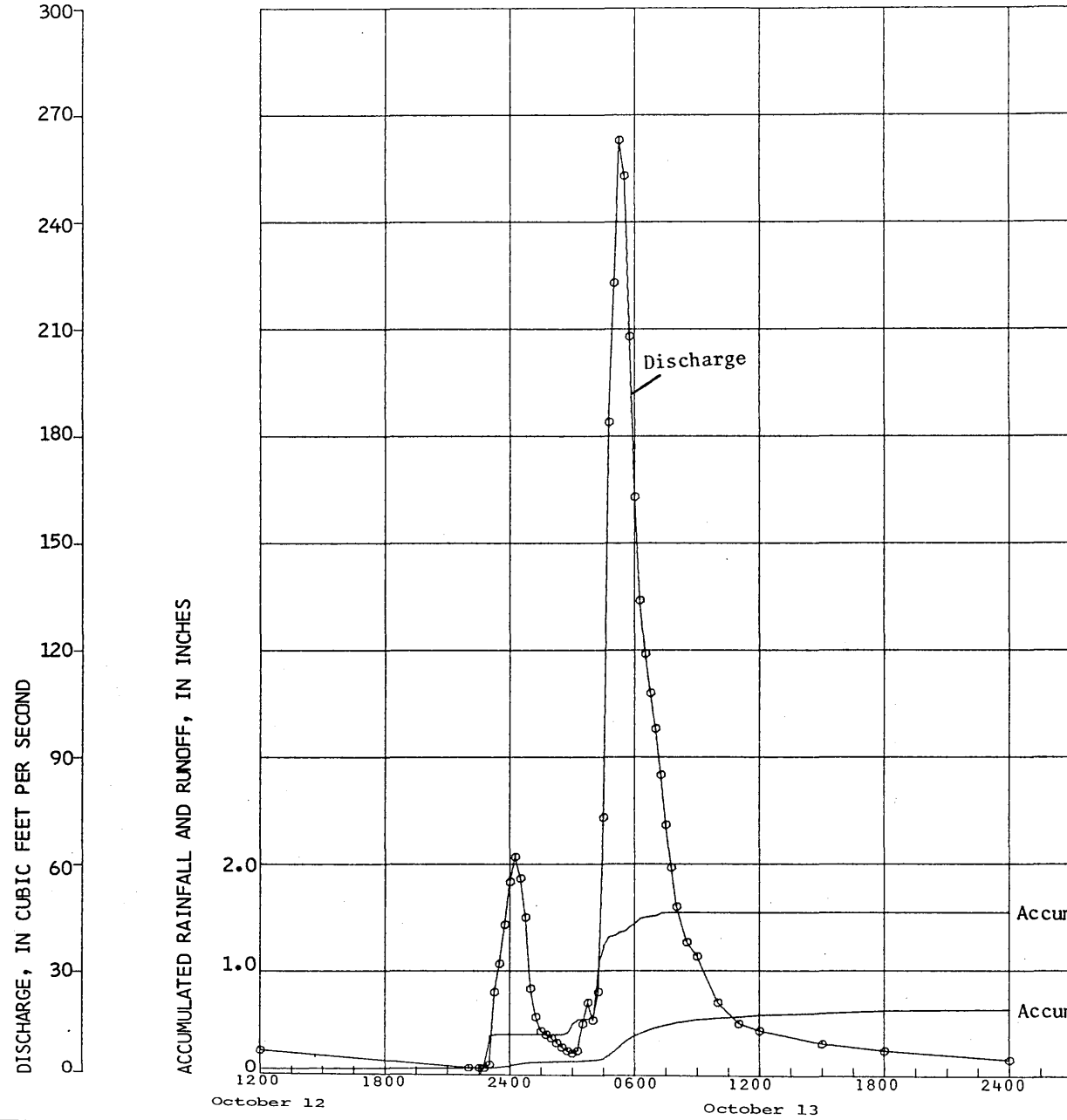
ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
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DATE & TIME	G A G E N U M B E R				ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	4-R	5-R					
OCT. 12							
0000	0.0	0.0			0.0	7.3	0.0539
2200	0.0	0.0			0.0	2.2	0.0705
2230	0.0	0.0			0.0	2.2	0.0710
2245	0.11	0.24			0.13	2.1	0.0714
2300	0.34	0.59			0.39	3.2	0.0719
2315	0.35	0.60			0.40	24.0	0.0759
2330	0.35	0.61			0.40	32.0	0.0813
2345	0.35	0.61			0.40	43.0	0.0885
2400	0.35	0.61			0.40	55.0	0.0931
OCT. 13							
0000	0.35	0.61			0.40	55.0	0.0977
0015	0.35	0.61			0.40	62.0	0.1081
0030	0.35	0.61			0.40	56.0	0.1175
0045	0.35	0.61			0.40	45.0	0.1251
0100	0.35	0.61			0.40	25.0	0.1293
0115	0.35	0.61			0.40	17.0	0.1321
0130	0.35	0.61			0.40	13.0	0.1343
0145	0.35	0.61			0.40	12.0	0.1363
0200	0.35	0.61			0.40	11.0	0.1382
0215	0.35	0.61			0.40	9.6	0.1398
0230	0.35	0.61			0.40	8.4	0.1412
0245	0.37	0.63			0.42	7.3	0.1424
0300	0.45	0.75			0.51	6.6	0.1435
0315	0.48	0.81			0.54	7.3	0.1447
0330	0.48	0.82			0.54	15.0	0.1472
0345	0.48	0.83			0.55	21.0	0.1508
0400	0.53	0.83			0.59	16.0	0.1534
0415	1.05	1.21			1.08	24.0	0.1575
0430	1.18	1.51			1.24	73.0	0.1697
0445	1.25	1.61			1.32	184.0	0.2006
0500	1.26	1.64			1.33	223.0	0.2380
0515	1.29	1.66			1.36	263.0	0.2821
0530	1.30	1.69			1.37	253.0	0.3245
0545	1.34	1.73			1.41	208.0	0.3594
0600	1.37	1.78			1.45	163.0	0.3867
0615	1.41	1.84			1.49	134.0	0.4092
0630	1.42	1.85			1.50	119.0	0.4292
0645	1.43	1.85			1.51	108.0	0.4473
0700	1.44	1.85			1.52	98.0	0.4637
0715	1.47	1.85			1.54	85.0	0.4780

STA. NO. 08157000		STORM RAINFALL AND RUNOFF RECORD					1974 WATER YEAR			
WALLER CREEK AT 38TH ST. AUSTIN, TEX.					STORM OF OCT. 12-13, 1973			ACCUM.	DISCHARGE	ACCUM.
DATE & TIME	G A G E N U M B E R					WEIGHTED	IN	ACCUM.		
	4-R	5-R				PRECIP.	FT <sup>3</sup> /S	RUNOFF		
						IN.		IN.		
OCT. 13										
0730	1.47	1.86				1.54	71.0	0.4899		
0745	1.47	1.87				1.55	59.0	0.4998		
0800	1.47	1.87				1.55	48.0	0.5118		
0830	1.47	1.87				1.55	38.0	0.5246		
0900	1.47	1.87				1.55	34.0	0.5417		
1000	1.47	1.87				1.55	21.0	0.5558		
1100	1.47	1.87				1.55	15.0	0.5658		
1200	1.47	1.87				1.55	13.0	0.5833		
1500	1.47	1.87				1.55	9.3	0.6020		
1800	1.47	1.87				1.55	7.3	0.6240		
2400	1.47	1.87				1.55	4.7	0.6335		

HYDROGRAPH AND MASS CURVES  
 for  
 STORM OF OCTOBER 12-13, 1973  
 at  
 WALLER CREEK AT 38th STREET,  
 AUSTIN, TEXAS  
 Drainage Area 2.31 mi<sup>2</sup>  
 UNITED STATES GEOLOGICAL SURVEY  
 TEXAS DISTRICT

Storm runoff for period = 78 ac-ft



STA. NO. 08157000

## STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 38TH ST. AUSTIN TEX.

STORM OF MAY 9 , 1974

ACCUM.  
WEIGHTED  
PRECIP.  
IN.DISCHARGE  
IN  
FT<sup>3</sup>/SACCUM.  
RUNOFF  
IN.

DATE &amp; TIME

4-R

5-R

G A G E N U M B E R

MAY 9

0000	0.0	0.0					0.0	0.3	0.0017
1700	0.03	0.0					0.02	0.3	0.0035
1815	0.03	0.0					0.02	0.3	0.0037
1830	0.04	0.01					0.03	0.3	0.0037
1845	0.10	0.03					0.09	0.3	0.0038
1900	0.75	0.08					0.62	0.3	0.0038
1915	0.96	0.59					0.89	0.4	0.0039
1930	0.97	0.81					0.94	27.0	0.0084
1945	0.98	0.83					0.95	147.0	0.0331
2000	1.22	0.83					1.15	212.0	0.0686
2015	1.72	0.97					1.58	290.0	0.1173
2030	2.18	1.65					2.08	253.0	0.1597
2045	2.25	2.14					2.23	388.0	0.2248
2100	2.28	2.21					2.27	571.0	0.3205
2115	2.35	2.24					2.33	644.0	0.4285
2130	2.40	2.31					2.38	600.0	0.5292
2145	2.43	2.36					2.42	384.0	0.5936
2200	2.44	2.39					2.43	263.0	0.6377
2215	2.46	2.41					2.45	190.0	0.6695
2230	2.47	2.44					2.46	152.0	0.6950
2245	2.48	2.45					2.47	120.0	0.7151
2300	2.49	2.45					2.48	96.0	0.7312
2315	2.49	2.45					2.48	75.0	0.7438
2330	2.49	2.45					2.48	60.0	0.7539
2345	2.49	2.45					2.48	49.0	0.7621
2400	2.49	2.45					2.48	44.0	0.7658

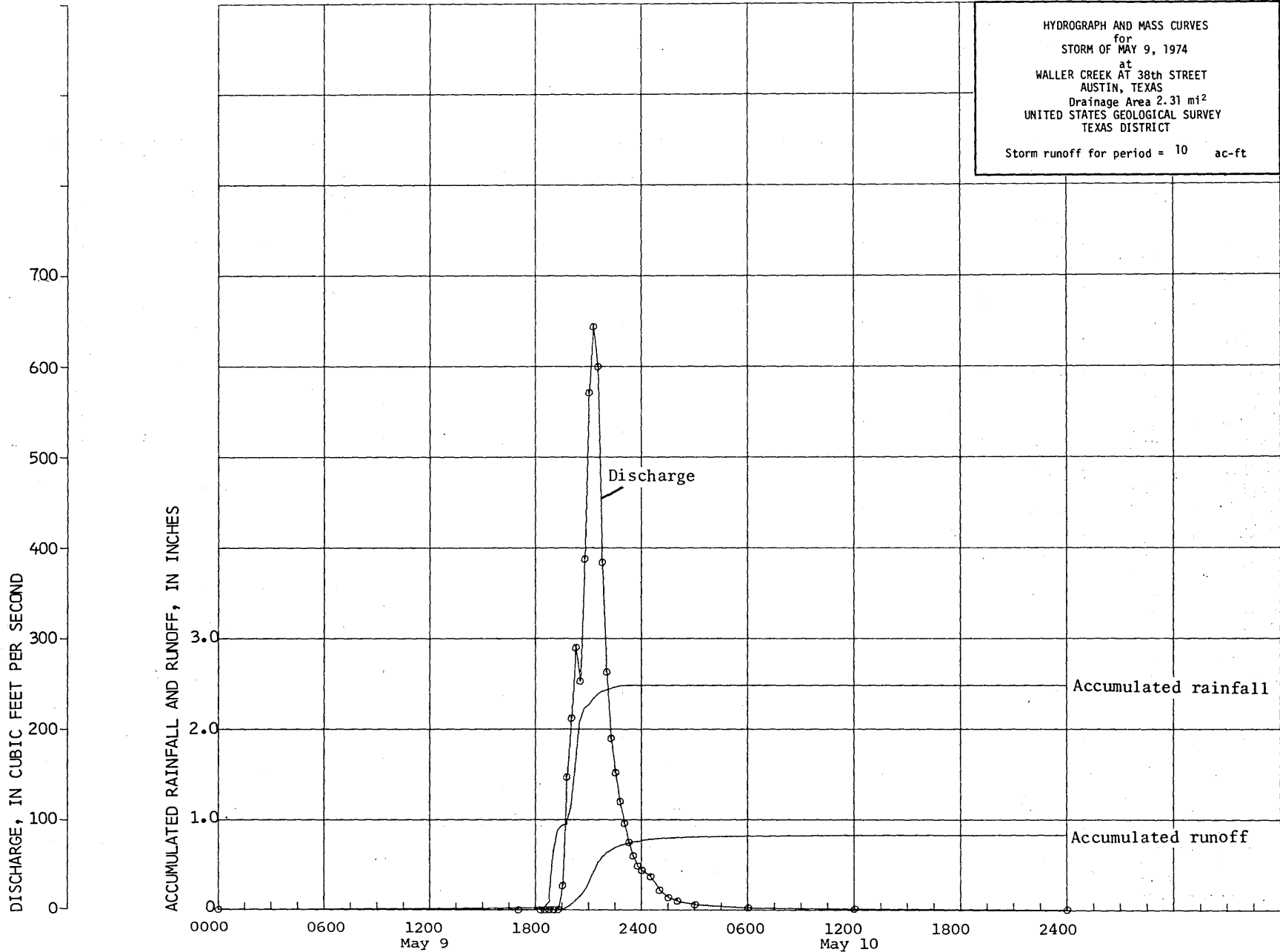
MAY 10

0000	2.49	2.45					2.48	44.0	0.7732
0030	2.49	2.45					2.48	37.0	0.7856
0100	2.49	2.45					2.48	22.0	0.7930
0130	2.49	2.45					2.48	14.0	0.7977
0200	2.49	2.45					2.48	10.0	0.8027
0300	2.49	2.45					2.48	6.2	0.8110
0600	2.49	2.45					2.48	2.6	0.8189
1200	2.49	2.45					2.48	1.4	0.8273
2400	2.49	2.45					2.48	0.8	0.8305

HYDROGRAPH AND MASS CURVES  
 for  
 STORM OF MAY 9, 1974  
 at  
 WALLER CREEK AT 38th STREET  
 AUSTIN, TEXAS  
 Drainage Area 2.31 mi<sup>2</sup>  
 UNITED STATES GEOLOGICAL SURVEY  
 TEXAS DISTRICT

Storm runoff for period = 10 ac-ft

-40-



STA. NO. 08157000

## STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 38TH ST. AUSTIN TEX.

STORM OF AUG. 28-29, 1974

DATE & TIME	G A G E N U M B E R						ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	4-R	5-R							
AUG. 28									
0000	0.0	0.0					0.0	0.2	0.0011
1645	0.0	0.0					0.0	0.1	0.0017
1700	0.74	0.64					0.72	0.2	0.0017
1715	1.45	0.92					1.35	0.4	0.0018
1730	1.78	1.21					1.67	82.0	0.0155
1745	2.02	1.48					1.92	152.0	0.0410
1800	2.19	1.66					2.09	426.0	0.1125
1815	2.21	1.69					2.11	551.0	0.2049
1830	2.33	1.80					2.23	318.0	0.2582
1845	2.34	1.81					2.24	281.0	0.3053
1900	2.35	1.82					2.25	223.0	0.3427
1915	2.35	1.82					2.25	157.0	0.3691
1930	2.36	1.85					2.26	114.0	0.3882
1945	2.37	1.86					2.27	91.0	0.4034
2000	2.38	1.87					2.28	62.0	0.4138
2015	2.40	1.89					2.30	43.0	0.4211
2030	2.41	1.91					2.32	35.0	0.4269
2045	2.41	1.91					2.32	28.0	0.4316
2100	2.41	1.91					2.32	24.0	0.4377
2130	2.42	1.93					2.33	18.0	0.4437
2200	2.48	2.00					2.39	14.0	0.4484
2230	2.52	2.05					2.43	15.0	0.4534
2300	2.57	2.11					2.48	15.0	0.4585
2330	2.64	2.18					2.55	22.0	0.4658
2400	2.68	2.22					2.59	28.0	0.4705
AUG. 29									
0000	2.68	2.22					2.59	28.0	0.4752
0030	2.72	2.26					2.63	32.0	0.4860
0100	2.73	2.28					2.64	30.0	0.4960
0130	2.74	2.28					2.65	26.0	0.5047
0200	2.75	2.32					2.67	20.0	0.5114
0230	2.77	2.33					2.69	15.0	0.5165
0300	2.77	2.33					2.69	12.0	0.5205
0330	2.77	2.33					2.69	9.3	0.5236
0400	2.77	2.33					2.69	7.3	0.5273
0500	2.77	2.33					2.69	4.9	0.5306
0600	2.79	2.35					2.71	3.1	0.5327
0700	2.79	2.38					2.71	2.5	0.5343
0800	2.79	2.38					2.71	1.7	0.5355
0900	2.79	2.38					2.71	1.5	0.5365



STA. NO. 08157000

## STORM RAINFALL AND RUNOFF RECORD

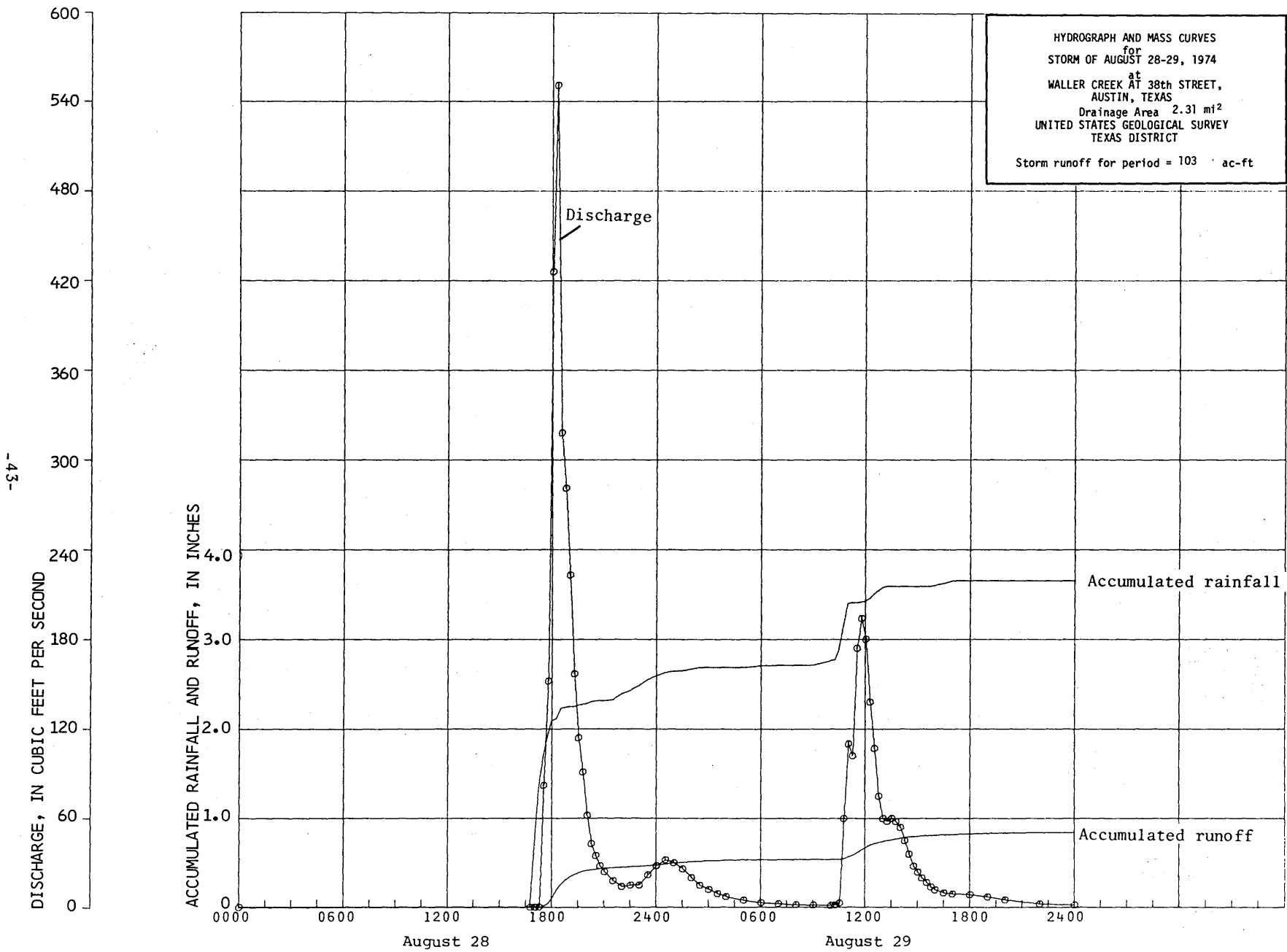
1974 WATER YEAR

WALLER CREEK AT 34TH ST. AUSTIN TEX.

STORM OF AUG. 28-29, 1974

DATE & TIME	G A G E N U M B E R		ACCUM. WEIGHTED PRECIP.	DISCHARGE IN	ACCUM. RUNOFF
	4-R	5-R	IN.	FT <sup>3</sup> /S	IN.
AUG. 29					
1000	2.85	2.39	2.76	1.4	0.5371
1015	2.86	2.40	2.77	1.6	0.5373
1030	2.96	2.63	2.90	2.9	0.5378
1045	3.25	2.71	3.15	60.0	0.5479
1100	3.52	2.89	3.40	110.0	0.5663
1115	3.53	2.89	3.41	102.0	0.5834
1130	3.53	2.89	3.41	174.0	0.6126
1145	3.54	2.89	3.42	194.0	0.6452
1200	3.55	2.89	3.43	180.0	0.6753
1215	3.58	2.91	3.45	138.0	0.6985
1230	3.63	2.96	3.50	107.0	0.7164
1245	3.67	2.99	3.54	75.0	0.7290
1300	3.71	3.02	3.58	60.0	0.7391
1315	3.72	3.04	3.59	58.0	0.7488
1330	3.72	3.04	3.59	60.0	0.7589
1345	3.72	3.04	3.59	58.0	0.7686
1400	3.72	3.04	3.59	54.0	0.7776
1415	3.72	3.04	3.59	45.0	0.7852
1430	3.72	3.04	3.59	36.0	0.7912
1445	3.72	3.04	3.59	28.0	0.7959
1500	3.72	3.04	3.59	24.0	0.7999
1515	3.72	3.04	3.59	20.0	0.8033
1530	3.72	3.04	3.59	17.0	0.8062
1545	3.72	3.05	3.59	14.0	0.8085
1600	3.73	3.06	3.60	12.0	0.8115
1630	3.75	3.08	3.62	9.9	0.8148
1700	3.78	3.11	3.65	9.3	0.8195
1800	3.78	3.11	3.65	8.7	0.8254
1900	3.78	3.11	3.65	7.3	0.8303
2000	3.78	3.11	3.65	5.2	0.8355
2200	3.78	3.11	3.65	2.5	0.8388
2400	3.78	3.11	3.65	1.7	0.8400

HYDROGRAPH AND MASS CURVES  
 for  
 STORM OF AUGUST 28-29, 1974  
 at  
 WALLER CREEK AT 38th STREET,  
 AUSTIN, TEXAS  
 Drainage Area 2.31 mi<sup>2</sup>  
 UNITED STATES GEOLOGICAL SURVEY  
 TEXAS DISTRICT  
 Storm runoff for period = 103 ac-ft



STA. NO.08157500

STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 23RD STREET, AUSTIN, TEXAS

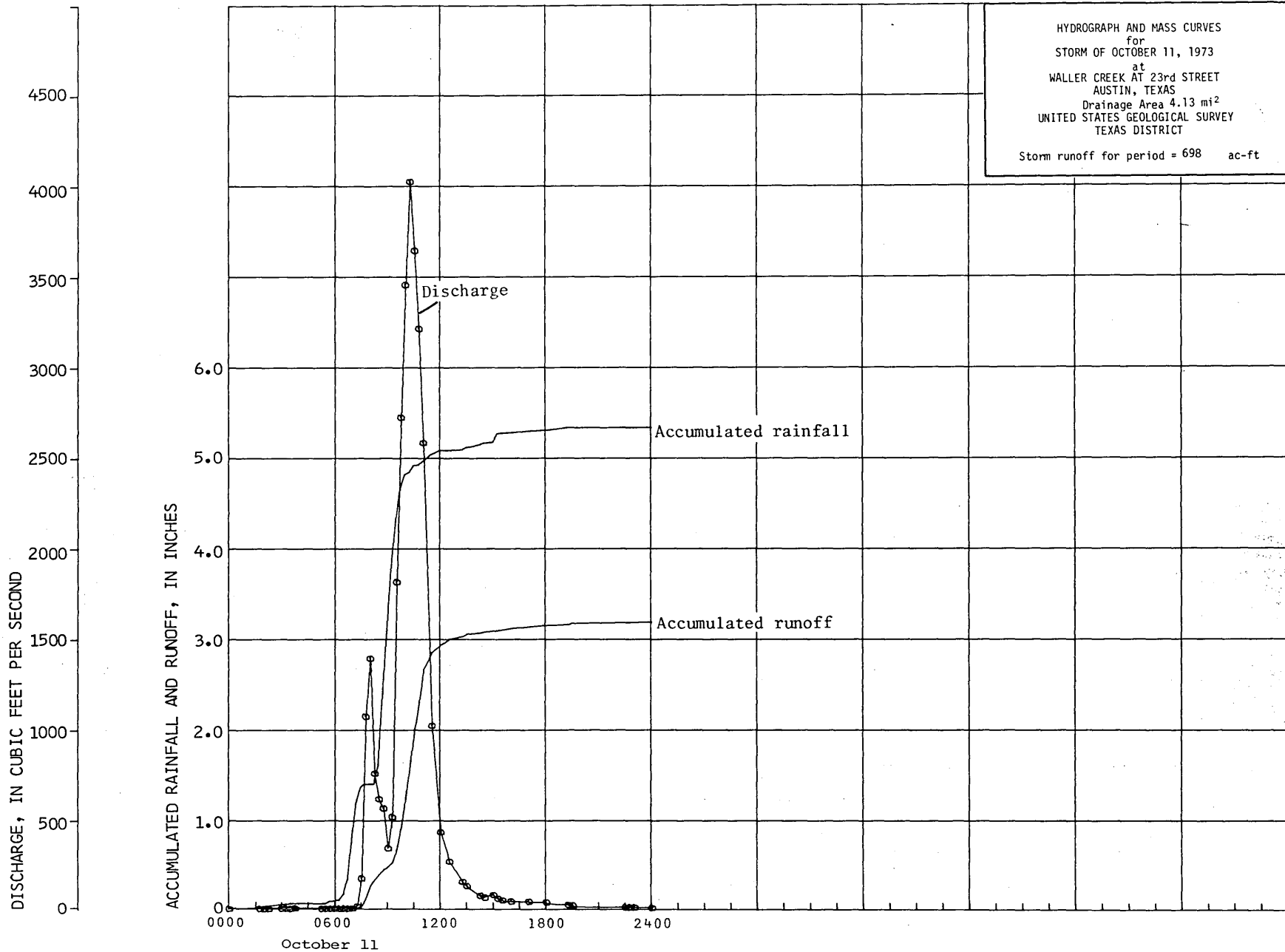
STORM OF OCT.11, 1973

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	4-R	5-R	6-R			
OCT. 11						
0000	0.0	0.0	0.0	0.0	1.1	0.0004
0145	0.04	0.0	0.0	0.02	0.9	0.0007
0200	0.04	0.06	0.0	0.04	0.9	0.0008
0215	0.04	0.06	0.02	0.05	0.9	0.0010
0300	0.04	0.10	0.02	0.06	3.2	0.0016
0315	0.04	0.10	0.04	0.06	3.5	0.0019
0330	0.06	0.10	0.06	0.08	3.5	0.0022
0345	0.06	0.10	0.06	0.08	5.4	0.0040
0515	0.06	0.10	0.06	0.08	3.6	0.0052
0530	0.06	0.10	0.06	0.08	3.4	0.0055
0545	0.09	0.13	0.06	0.10	3.1	0.0058
0600	0.09	0.13	0.06	0.10	2.8	0.0060
0615	0.10	0.14	0.08	0.11	2.8	0.0063
0630	0.19	0.19	0.08	0.18	4.2	0.0067
0645	0.41	0.31	0.10	0.34	4.5	0.0071
0700	0.98	0.69	0.20	0.79	4.7	0.0076
0715	1.25	1.28	0.60	1.20	16.0	0.0091
0730	1.25	1.44	1.68	1.37	173.0	0.0253
0745	1.25	1.44	2.04	1.40	1070.0	0.1257
0800	1.25	1.44	2.04	1.40	1390.0	0.2560
0815	1.25	1.44	2.04	1.40	755.0	0.3269
0830	1.66	1.44	2.04	1.61	614.0	0.3844
0845	2.59	2.24	2.04	2.40	562.0	0.4372
0900	3.17	3.09	2.70	3.09	340.0	0.4691
0915	3.70	4.04	3.38	3.80	514.0	0.5173
0930	3.99	4.69	4.40	4.31	1810.0	0.6870
0945	4.17	5.18	5.18	4.67	2720.0	0.9422
1000	4.24	5.37	5.58	4.82	3450.0	1.2658
1015	4.24	5.37	5.84	4.84	4020.0	1.6429
1030	4.29	5.47	5.94	4.92	3640.0	1.9843
1045	4.29	5.47	6.02	4.92	3210.0	2.2854
1100	4.34	5.50	6.02	4.96	2580.0	2.6484
1130	4.42	5.58	6.06	5.04	1020.0	2.8398
1200	4.45	5.64	6.14	5.08	430.0	2.9204
1230	4.45	5.64	6.17	5.09	268.0	2.9833
1315	4.46	5.64	6.17	5.09	155.0	3.0124
1330	4.50	5.64	6.17	5.11	131.0	3.0369
1415	4.50	5.73	6.17	5.15	79.0	3.0518
1430	4.50	5.73	6.35	5.16	69.0	3.0615

STA. NO.08157500				STORM RAINFALL AND RUNOFF RECORD				1974 WATER YEAR		
WALLER CREEK AT 23 RD STREET, AUSTIN, TEXAS				STORM OF OCT.11, 1973				ACCUM.	DISCHARGE	ACCUM.
DATE & TIME	G A G E N U M B E R			PRECIP.	IN.	FT <sup>3</sup> /S	IN.			
	4-R	5-R	6-R							
OCT. 11										
1500	4.50	5.75	6.36		5.17	82.0	3.0730			
1515	4.69	5.75	6.36		5.27	63.0	3.0789			
1530	4.70	5.75	6.36		5.28	53.0	3.0864			
1600	4.70	5.75	6.40		5.28	46.0	3.0993			
1700	4.70	5.80	6.40		5.30	46.0	3.1166			
1800	4.70	5.82	6.40		5.31	42.0	3.1343			
1915	4.70	5.89	6.40		5.33	26.0	3.1416			
1930	4.70	5.89	6.40		5.33	23.0	3.1556			
2230	4.70	5.89	6.40		5.33	13.0	3.1636			
2245	4.70	5.89	6.40		5.33	12.0	3.1647			
2300	4.70	5.89	6.40		5.33	12.0	3.1675			
2400	4.70	5.89	6.40		5.33	10.0	3.1694			

HYDROGRAPH AND MASS CURVES  
 for  
 STORM OF OCTOBER 11, 1973  
 at  
 WALLER CREEK AT 23rd STREET  
 AUSTIN, TEXAS  
 Drainage Area 4.13 mi<sup>2</sup>  
 UNITED STATES GEOLOGICAL SURVEY  
 TEXAS DISTRICT

Storm runoff for period = 698 ac-ft



STA. NO. 08157500

## STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 23RD ST. AUSTIN TEX.

STORM OF OCT. 12-13, 1973

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP.	DISCHARGE IN	ACCUM. RUNOFF
	4-R	5-R	6-R	IN.	FT <sup>3</sup> /S	IN.
OCT. 12						
0000	0.0	0.0	0.0	0.0	10.0	0.0422
2230	0.0	0.0	0.0	0.0	3.9	0.0589
2245	0.11	0.24	0.0	0.15	3.9	0.0592
2300	0.34	0.59	0.0	0.41	3.9	0.0596
2315	0.35	0.60	0.04	0.42	3.9	0.0600
2330	0.35	0.61	0.38	0.46	3.8	0.0603
2345	0.35	0.61	0.39	0.46	18.0	0.0620
2400	0.35	0.61	0.39	0.46	381.0	0.0799
OCT. 13						
0000	0.35	0.61	0.39	0.46	381.0	0.0977
0015	0.35	0.61	0.39	0.46	203.0	0.1168
0030	0.35	0.61	0.39	0.46	133.0	0.1293
0045	0.35	0.61	0.39	0.46	88.0	0.1375
0100	0.35	0.61	0.39	0.46	79.0	0.1449
0115	0.35	0.61	0.39	0.46	85.0	0.1529
0130	0.35	0.61	0.39	0.46	82.0	0.1606
0145	0.35	0.61	0.39	0.46	70.0	0.1671
0200	0.35	0.61	0.40	0.46	58.0	0.1726
0215	0.35	0.61	0.40	0.46	41.0	0.1764
0230	0.35	0.61	0.40	0.46	29.0	0.1792
0245	0.37	0.63	0.40	0.48	24.0	0.1814
0300	0.45	0.75	0.40	0.56	20.0	0.1833
0315	0.48	0.81	0.41	0.60	18.0	0.1850
0330	0.48	0.82	0.45	0.61	16.0	0.1865
0345	0.48	0.83	0.59	0.63	15.0	0.1879
0400	0.53	0.83	0.63	0.66	24.0	0.1901
0415	1.05	1.21	0.64	1.07	68.0	0.1965
0430	1.18	1.51	0.64	1.26	88.0	0.2048
0445	1.25	1.61	0.81	1.35	50.0	0.2095
0500	1.26	1.64	1.19	1.40	40.0	0.2132
0515	1.29	1.66	1.37	1.44	161.0	0.2283
0530	1.30	1.69	1.43	1.47	806.0	0.3039
0545	1.34	1.73	1.46	1.51	725.0	0.3719
0600	1.37	1.78	1.49	1.54	586.0	0.4269
0615	1.41	1.84	1.51	1.59	530.0	0.4766
0630	1.42	1.85	1.57	1.60	487.0	0.5223
0645	1.43	1.85	1.61	1.61	388.0	0.5587
0700	1.44	1.85	1.64	1.62	300.0	0.5868
0715	1.47	1.85	1.65	1.64	251.0	0.6104
0730	1.47	1.86	1.65	1.64	210.0	0.6301

STA. NO. 08157500

STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 23RD ST. AUSTIN TEX.

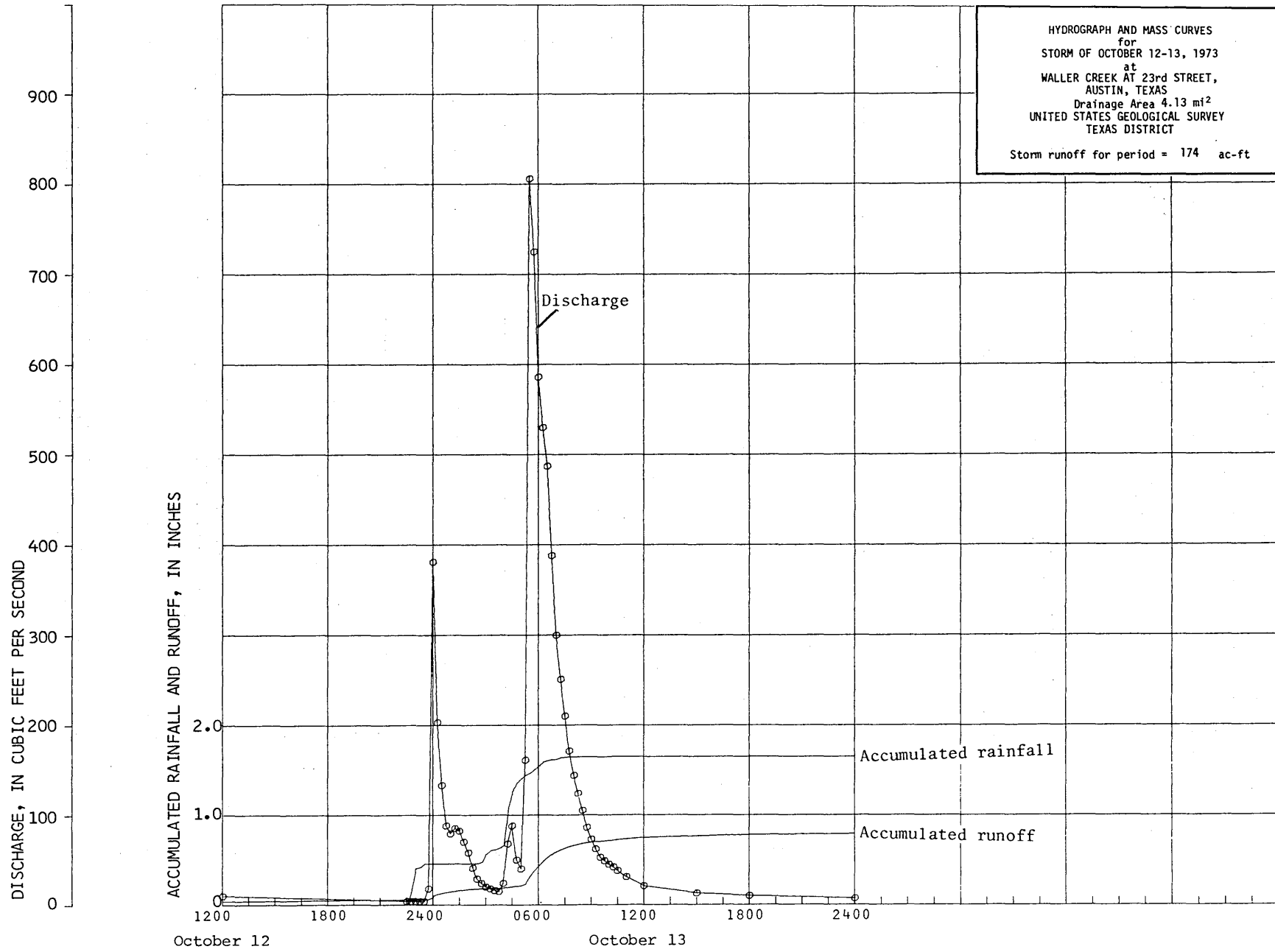
STORM OF OCT. 12-13, 1973

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	4-R	5-R	6-R			
OCT. 13						
0745	1.47	1.87	1.65	1.65	171.0	0.6461
0800	1.47	1.87	1.66	1.65	144.0	0.6596
0815	1.47	1.87	1.66	1.65	124.0	0.6712
0830	1.47	1.87	1.66	1.65	105.0	0.6811
0845	1.47	1.87	1.66	1.65	86.0	0.6891
0900	1.47	1.87	1.66	1.65	73.0	0.6960
0915	1.47	1.87	1.66	1.65	62.0	0.7018
0930	1.47	1.87	1.66	1.65	53.0	0.7068
0945	1.47	1.87	1.66	1.65	49.0	0.7114
1000	1.47	1.87	1.67	1.65	45.0	0.7156
1015	1.47	1.87	1.69	1.65	42.0	0.7195
1030	1.47	1.87	1.69	1.65	38.0	0.7249
1100	1.47	1.87	1.69	1.65	31.0	0.7336
1200	1.47	1.87	1.69	1.65	21.0	0.7494
1500	1.47	1.87	1.69	1.65	13.0	0.7640
1800	1.47	1.87	1.69	1.65	10.0	0.7809
2400	1.47	1.87	1.69	1.65	7.1	0.7889

HYDROGRAPH AND MASS CURVES  
 for  
 STORM OF OCTOBER 12-13, 1973  
 at  
 WALLER CREEK AT 23rd STREET,  
 AUSTIN, TEXAS  
 Drainage Area 4.13 mi<sup>2</sup>  
 UNITED STATES GEOLOGICAL SURVEY  
 TEXAS DISTRICT

Storm runoff for period = 174 ac-ft

-49-





STA. NO. 08157500

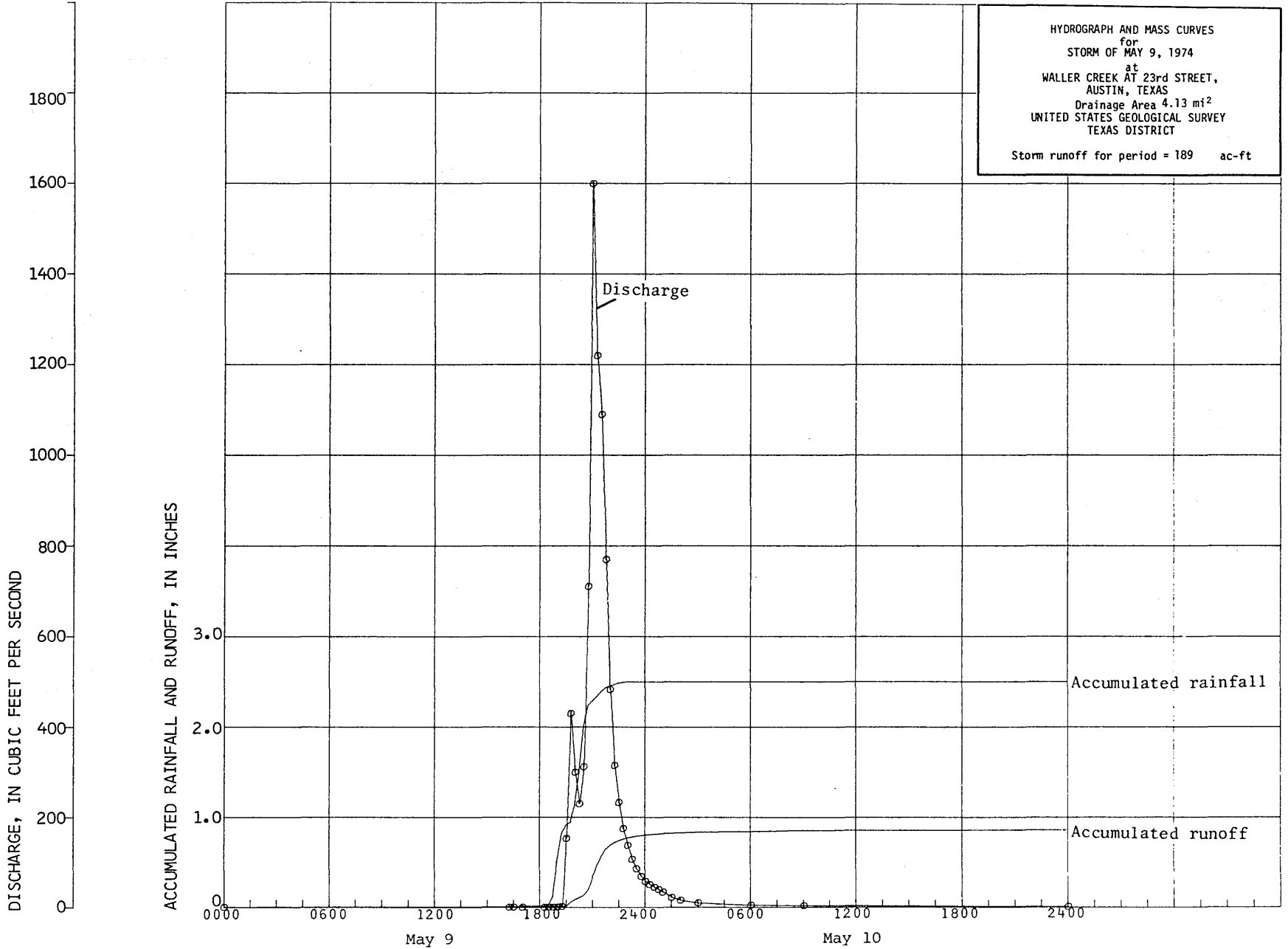
STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 23RD ST. AUSTIN, TEX.

STORM OF MAY 9 , 1974

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	4-R	5-R	6-R			
MAY 9						
0000	0.0	0.0	0.0	0.0	0.7	0.0021
1615	0.0	0.0	0.0	0.0	1.0	0.0052
1630	0.0	0.0	0.0	0.0	1.0	0.0054
1700	0.03	0.0	0.0	0.02	0.9	0.0057
1815	0.03	0.0	0.0	0.02	0.9	0.0059
1830	0.04	0.0	0.08	0.03	0.9	0.0060
1845	0.10	0.03	0.66	0.13	0.9	0.0061
1900	0.75	0.08	1.02	0.51	0.9	0.0062
1915	0.96	0.59	1.03	0.82	1.6	0.0063
1930	0.97	0.81	1.03	0.91	153.0	0.0207
1945	0.98	0.83	1.21	0.94	430.0	0.0610
2000	1.22	0.83	1.95	1.14	300.0	0.0891
2015	1.72	0.97	2.44	1.49	230.0	0.1107
2030	2.18	1.65	2.54	2.00	312.0	0.1400
2045	2.25	2.14	2.57	2.24	711.0	0.2067
2100	2.28	2.21	2.64	2.29	1600.0	0.3568
2115	2.35	2.24	2.67	2.34	1220.0	0.4712
2130	2.40	2.31	2.70	2.39	1090.0	0.5734
2145	2.43	2.36	2.73	2.43	770.0	0.6457
2200	2.44	2.39	2.74	2.45	483.0	0.6910
2215	2.46	2.41	2.75	2.47	315.0	0.7205
2230	2.47	2.44	2.75	2.48	233.0	0.7424
2245	2.48	2.45	2.75	2.49	175.0	0.7588
2300	2.49	2.45	2.76	2.50	138.0	0.7717
2315	2.49	2.45	2.76	2.50	107.0	0.7818
2330	2.49	2.45	2.76	2.50	86.0	0.7898
2345	2.49	2.45	2.76	2.50	69.0	0.7963
2400	2.49	2.45	2.76	2.50	58.0	0.7990
MAY 10						
0000	2.49	2.45	2.76	2.50	58.0	0.8018
0015	2.49	2.45	2.76	2.50	51.0	0.8065
0030	2.49	2.45	2.76	2.50	45.0	0.8108
0045	2.49	2.45	2.76	2.50	40.0	0.8145
0100	2.49	2.45	2.76	2.50	34.0	0.8193
0130	2.49	2.45	2.76	2.50	22.0	0.8234
0200	2.49	2.45	2.76	2.50	16.0	0.8279
0300	2.49	2.45	2.76	2.50	10.0	0.8354
0600	2.49	2.45	2.76	2.50	5.2	0.8413
0900	2.49	2.45	2.76	2.50	3.6	0.8534
2400	2.49	2.45	2.76	2.50	1.5	0.8577



STA. NO. 08157500

STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 23RD ST. AUSTIN TEX.

STORM OF AUG. 28-29, 1974

DATE & TIME	G A G E N U M B E R			WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	4-R	5-R	6-R			
AUG. 28						
0000	0.0	0.0	0.0	0.0	0.8	0.0025
1645	0.0	0.0	0.0	0.0	0.7	0.0047
1700	0.74	0.64	0.02	0.63	38.0	0.0083
1715	1.45	0.92	0.17	1.12	286.0	0.0351
1730	1.78	1.21	0.35	1.42	291.0	0.0624
1745	2.02	1.48	0.49	1.66	337.0	0.0940
1800	2.19	1.66	0.82	1.85	702.0	0.1599
1815	2.21	1.69	0.96	1.88	844.0	0.2391
1830	2.33	1.80	0.98	1.99	526.0	0.2884
1845	2.34	1.81	0.99	2.00	398.0	0.3257
1900	2.35	1.82	0.99	2.01	291.0	0.3530
1915	2.35	1.82	1.00	2.01	203.0	0.3721
1930	2.36	1.85	1.00	2.03	147.0	0.3859
1945	2.37	1.86	1.04	2.04	124.0	0.3975
2000	2.38	1.87	1.05	2.05	97.0	0.4066
2015	2.40	1.89	1.08	2.07	73.0	0.4134
2030	2.41	1.91	1.10	2.09	58.0	0.4189
2045	2.41	1.91	1.12	2.09	49.0	0.4235
2100	2.41	1.91	1.12	2.09	40.0	0.4272
2115	2.41	1.92	1.12	2.09	33.0	0.4303
2130	2.42	1.93	1.12	2.10	27.0	0.4329
2145	2.44	1.95	1.12	2.12	26.0	0.4353
2200	2.48	2.00	1.14	2.16	28.0	0.4379
2215	2.50	2.02	1.21	2.19	37.0	0.4414
2230	2.52	2.05	1.23	2.21	41.0	0.4452
2245	2.54	2.08	1.24	2.23	41.0	0.4491
2300	2.57	2.11	1.28	2.26	43.0	0.4531
2315	2.61	2.15	1.32	2.30	46.0	0.4574
2330	2.64	2.18	1.35	2.33	53.0	0.4624
2345	2.66	2.20	1.38	2.35	56.0	0.4677
2400	2.68	2.22	1.40	2.37	53.0	0.4701
AUG. 29						
0000	2.68	2.22	1.40	2.37	53.0	0.4751
0030	2.72	2.26	1.44	2.41	55.0	0.4854
0100	2.73	2.28	1.47	2.43	51.0	0.4950
0130	2.74	2.28	1.49	2.44	39.0	0.5023
0200	2.75	2.32	1.51	2.46	29.0	0.5078
0230	2.77	2.33	1.52	2.48	26.0	0.5126
0300	2.77	2.33	1.53	2.48	21.0	0.5185
0400	2.77	2.33	1.53	2.48	12.0	0.5230

STA. NO. 08157500

## STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WALLER CREEK AT 23RD ST. AUSTIN TEX.

STORM OF AUG. 28-29, 1974

ACCUM.  
WEIGHTED  
PRECIP.  
IN.DISCHARGE  
IN  
FT<sup>3</sup>/SACCUM.  
RUNOFF  
IN.

DATE &amp; TIME

G A G E N U M B E R

4-R

5-R

6-R

IN.

FT<sup>3</sup>/S

IN.

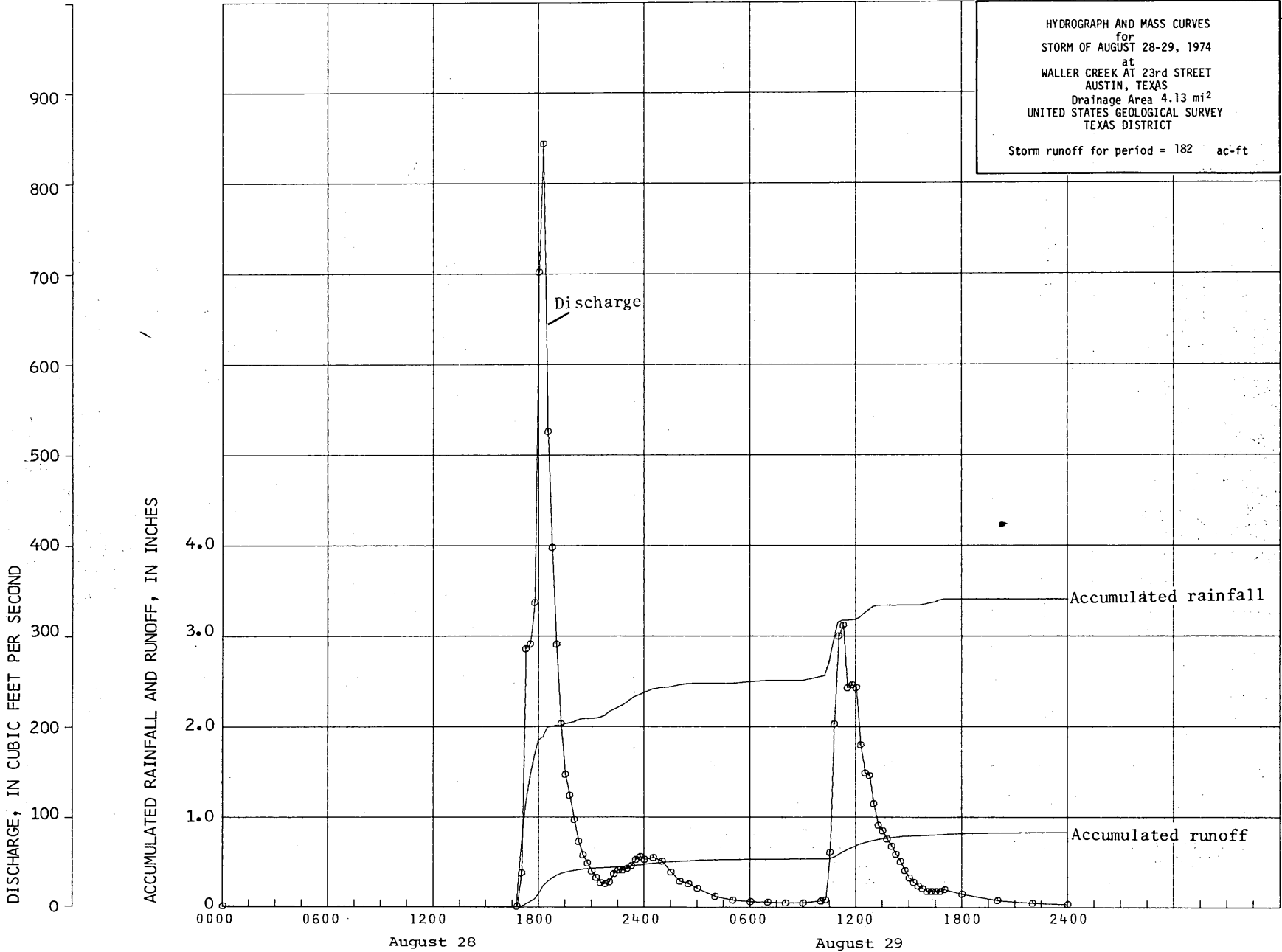
AUG. 29

0500	2.77	2.33	1.53				2.48	7.9	0.5260
0600	2.79	2.35	1.54				2.50	6.2	0.5283
0700	2.79	2.38	1.55				2.51	5.6	0.5304
0800	2.79	2.38	1.55				2.51	4.7	0.5322
0900	2.79	2.38	1.55				2.51	4.7	0.5340
1000	2.85	2.39	1.62				2.55	7.1	0.5356
1015	2.86	2.40	1.63				2.56	8.2	0.5364
1030	2.96	2.63	1.63				2.70	61.0	0.5421
1045	3.25	2.71	2.23				2.94	203.0	0.5612
1100	3.52	2.89	2.28				3.15	300.0	0.5893
1115	3.53	2.89	2.44				3.17	312.0	0.6186
1130	3.53	2.89	2.45				3.17	243.0	0.6414
1145	3.54	2.89	2.46				3.18	246.0	0.6644
1200	3.55	2.89	2.46				3.18	243.0	0.6872
1215	3.58	2.91	2.47				3.21	180.0	0.7041
1230	3.63	2.96	2.48				3.25	149.0	0.7181
1245	3.67	2.99	2.51				3.29	146.0	0.7318
1300	3.71	3.02	2.55				3.33	115.0	0.7426
1315	3.72	3.04	2.56				3.34	91.0	0.7511
1330	3.72	3.04	2.56				3.34	85.0	0.7591
1345	3.72	3.04	2.57				3.34	76.0	0.7662
1400	3.72	3.04	2.57				3.34	68.0	0.7726
1415	3.72	3.04	2.57				3.34	59.0	0.7781
1430	3.72	3.04	2.59				3.34	51.0	0.7829
1445	3.72	3.04	2.59				3.34	41.0	0.7867
1500	3.72	3.04	2.59				3.34	33.0	0.7898
1515	3.72	3.04	2.59				3.34	28.0	0.7925
1530	3.72	3.04	2.59				3.34	24.0	0.7947
1545	3.72	3.05	2.59				3.35	21.0	0.7967
1600	3.73	3.06	2.60				3.36	18.0	0.7984
1615	3.74	3.07	2.62				3.37	18.0	0.8001
1630	3.75	3.08	2.63				3.38	18.0	0.8018
1645	3.77	3.10	2.66				3.40	18.0	0.8034
1700	3.78	3.11	2.67				3.41	20.0	0.8081
1800	3.78	3.11	2.68				3.41	15.0	0.8166
2000	3.78	3.11	2.68				3.41	7.9	0.8225
2200	3.78	3.11	2.68				3.41	5.0	0.8263
2400	3.78	3.11	2.68				3.41	3.5	0.8276

HYDROGRAPH AND MASS CURVES  
for  
STORM OF AUGUST 28-29, 1974  
at  
WALLER CREEK AT 23rd STREET  
AUSTIN, TEXAS  
Drainage Area 4.13 mi<sup>2</sup>  
UNITED STATES GEOLOGICAL SURVEY  
TEXAS DISTRICT

Storm runoff for period = 182 ac-ft

-54-



STA. NO. 08159150

STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WILBARGER CREEK NEAR PFLUGERVILLE TEX.

STORM OF OCT. 11, 1973

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	1-R	2-R	3-R			
OCT. 11						
0000	0.0	0.0	0.0	0.0	0.5	0.0003
0315	0.0	0.0	0.0	0.0	0.5	0.0008
0600	0.02	0.02	0.0	0.01	0.5	0.0011
0645	0.03	0.03	0.0	0.02	0.5	0.0012
0700	0.21	0.24	0.0	0.16	0.5	0.0012
0715	0.47	0.55	0.0	0.37	1.0	0.0013
0730	0.88	1.02	0.10	0.71	2.7	0.0015
0745	1.01	1.18	0.20	0.84	6.7	0.0021
0800	1.04	1.21	0.34	0.90	21.0	0.0038
0815	1.06	1.23	0.48	0.96	34.0	0.0067
0830	1.30	1.51	0.60	1.18	44.0	0.0104
0845	1.58	1.84	0.71	1.43	93.0	0.0182
0900	1.79	2.08	0.87	1.63	298.0	0.0432
0915	1.89	2.20	1.04	1.76	496.0	0.0849
0930	1.98	2.30	1.23	1.88	648.0	0.1394
0945	1.99	2.32	1.48	1.95	806.0	0.2071
1000	2.03	2.36	1.64	2.02	908.0	0.2834
1015	2.05	2.34	1.79	2.07	882.0	0.3575
1030	2.07	2.41	1.95	2.14	848.0	0.4288
1045	2.09	2.43	2.11	2.20	811.0	0.4969
1100	2.11	2.46	2.26	2.26	745.0	0.5596
1115	2.12	2.47	2.40	2.30	682.0	0.6169
1130	2.16	2.51	2.51	2.36	611.0	0.6682
1145	2.20	2.56	2.61	2.42	519.0	0.7118
1200	2.23	2.60	2.69	2.46	444.0	0.7491
1215	2.24	2.61	2.74	2.49	378.0	0.7809
1230	2.24	2.61	2.82	2.51	319.0	0.8077
1245	2.24	2.61	2.82	2.51	273.0	0.8306
1300	2.24	2.61	2.82	2.51	233.0	0.8502
1315	2.24	2.61	2.82	2.51	208.0	0.8677
1330	2.24	2.61	2.82	2.51	173.0	0.8822
1345	2.24	2.61	2.82	2.51	154.0	0.8952
1400	2.25	2.62	2.84	2.52	137.0	0.9067
1415	2.25	2.62	2.84	2.52	123.0	0.9170
1430	2.25	2.62	2.84	2.52	109.0	0.9262
1445	2.25	2.62	2.84	2.52	103.0	0.9348
1500	2.25	2.62	2.85	2.52	93.0	0.9427
1515	2.25	2.62	2.85	2.52	85.0	0.9498
1530	2.31	2.69	2.85	2.57	78.0	0.9564

STA. NO. 08159150

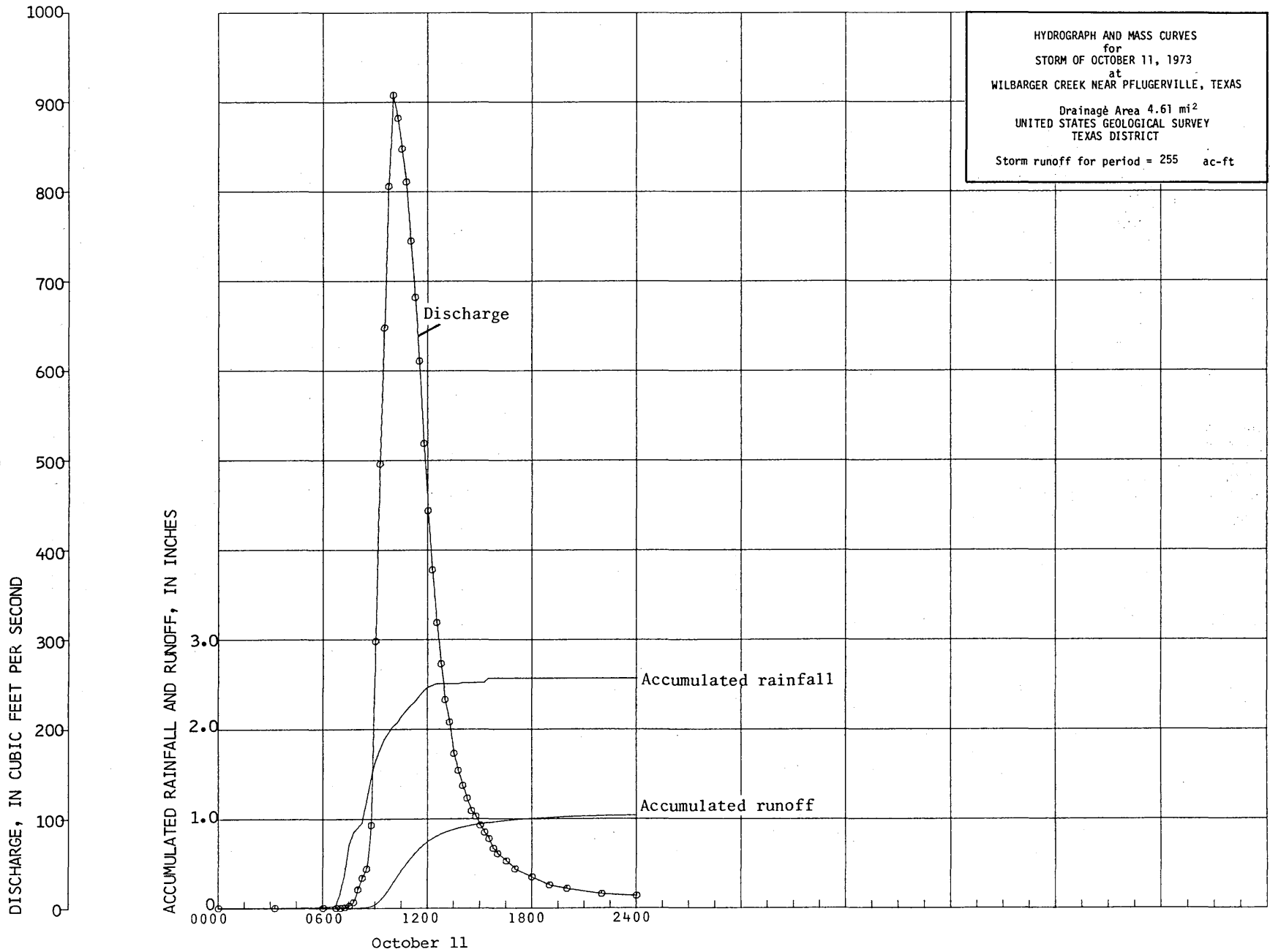
STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WILBARGER CREEK NEAR PFLUGERVILLE TEX.

STORM OF OCT. 11, 1973

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	1-R	2-R	3-R			
OCT. 11						
1545	2.31	2.69	2.85	2.57	67.0	0.9620
1600	2.31	2.69	2.85	2.57	61.0	0.9697
1630	2.31	2.69	2.85	2.57	53.0	0.9786
1700	2.31	2.69	2.85	2.57	44.0	0.9897
1800	2.31	2.69	2.85	2.57	35.0	1.0014
1900	2.31	2.69	2.85	2.57	26.0	1.0102
2000	2.31	2.69	2.85	2.57	22.0	1.0213
2200	2.31	2.69	2.85	2.57	16.0	1.0320
2400	2.31	2.69	2.85	2.57	14.0	1.0367





STA. NO. 08159150

## STORM RAINFALL AND RUNOFF RECORD

1974 WATER YEAR

WILBARGER CREEK NEAR PFLUGERVILLE TEX.

STORM OF OCT. 13, 1973

DATE & TIME	G A G E N U M B E R			ACCUM. WEIGHTED PRECIP. IN.	DISCHARGE IN FT <sup>3</sup> /S	ACCUM. RUNOFF IN.
	1-R	2-R	3-R			
OCT. 13						
0000	0.0	0.0	0.0	0.0	6.7	0.0006
0030	0.0	0.0	0.0	0.0	7.9	0.0019
0100	0.01	0.01	0.01	0.01	9.1	0.0034
0130	0.01	0.01	0.02	0.01	10.0	0.0051
0200	0.02	0.02	0.09	0.04	12.0	0.0066
0215	0.03	0.03	0.09	0.05	15.0	0.0079
0230	0.14	0.13	0.09	0.12	19.0	0.0095
0245	0.18	0.17	0.09	0.15	24.0	0.0115
0300	0.20	0.19	0.14	0.18	25.0	0.0136
0315	0.22	0.21	0.15	0.20	26.0	0.0158
0330	0.29	0.28	0.15	0.25	29.0	0.0182
0345	0.33	0.32	0.16	0.28	30.0	0.0207
0400	0.35	0.34	0.20	0.31	32.0	0.0234
0415	0.35	0.34	0.21	0.31	34.0	0.0263
0430	0.37	0.36	0.22	0.33	38.0	0.0295
0445	0.56	0.54	0.23	0.47	55.0	0.0341
0500	0.76	0.73	0.26	0.62	79.0	0.0407
0515	0.84	0.81	0.27	0.68	115.0	0.0504
0530	0.88	0.85	0.31	0.72	160.0	0.0638
0545	0.92	0.89	0.36	0.76	203.0	0.0809
0600	0.94	0.90	0.37	0.78	277.0	0.1042
0615	1.00	0.96	0.40	0.83	416.0	0.1391
0630	1.02	0.98	0.45	0.86	502.0	0.1813
0645	1.04	1.00	0.50	0.88	522.0	0.2252
0700	1.04	1.00	0.54	0.89	513.0	0.2683
0715	1.04	1.00	0.58	0.90	499.0	0.3102
0730	1.04	1.00	0.61	0.91	467.0	0.3495
0745	1.04	1.00	0.65	0.92	433.0	0.3859
0800	1.04	1.00	0.67	0.93	396.0	0.4191
0815	1.04	1.00	0.69	0.93	356.0	0.4491
0830	1.04	1.00	0.73	0.94	314.0	0.4754
0845	1.04	1.00	0.74	0.95	277.0	0.4987
0900	1.04	1.00	0.77	0.96	244.0	0.5192
0915	1.04	1.00	0.82	0.97	212.0	0.5370
0930	1.04	1.00	0.82	0.97	179.0	0.5521
0945	1.04	1.00	0.84	0.97	154.0	0.5650
1000	1.04	1.00	0.86	0.98	137.0	0.5765
1015	1.04	1.00	0.90	0.99	125.0	0.5870
1030	1.04	1.00	0.91	0.99	108.0	0.5961

STA. NO. 08159150		STORM RAINFALL AND RUNOFF RECORD						1974 WATER YEAR			
WILBARGER CREEK NEAR PFLUGERVILLE TEX.						STORM OF OCT. 13, 1973			ACCUM.	DISCHARGE	ACCUM.
DATE & TIME		G A G E N U M B E R				WEIGHTED	IN	PRECIP.	IN	PRECIP.	IN.
		1-R	2-R	3-R				IN.	FT <sup>3</sup> /S	IN.	
OCT. 13											
1045		1.04	1.00	0.93				1.00	96.0	0.6042	
1100		1.04	1.00	0.94				1.00	90.0	0.6117	
1115		1.04	1.00	0.95				1.00	88.0	0.6191	
1130		1.04	1.00	0.96				1.01	76.0	0.6255	
1145		1.04	1.00	0.96				1.01	72.0	0.6316	
1200		1.04	1.00	0.96				1.01	64.0	0.6396	
1230		1.04	1.00	0.96				1.01	56.0	0.6491	
1300		1.04	1.00	0.96				1.01	49.0	0.6573	
1330		1.04	1.00	0.96				1.01	43.0	0.6645	
1400		1.04	1.00	0.96				1.01	37.0	0.6707	
1430		1.04	1.00	0.96				1.01	34.0	0.6764	
1500		1.04	1.00	0.96				1.01	32.0	0.6845	
1600		1.04	1.00	0.96				1.01	29.0	0.6991	
1800		1.04	1.00	0.96				1.01	21.0	0.7133	
2000		1.04	1.00	0.96				1.01	17.0	0.7247	
2200		1.04	1.00	0.96				1.01	15.0	0.7348	
2400		1.04	1.00	0.96				1.01	13.0	0.7391	

HYDROGRAPH AND MASS CURVES  
 for  
 STORM OF OCTOBER 13, 1973  
 at  
 WILBARGER CREEK NEAR PFLUGERVILLE, TEXAS  
 Drainage Area 4.61 mi<sup>2</sup>  
 UNITED STATES GEOLOGICAL SURVEY  
 TEXAS DISTRICT  
 Storm runoff for period = 182 ac-ft

