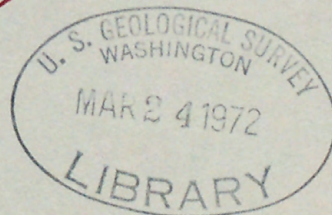
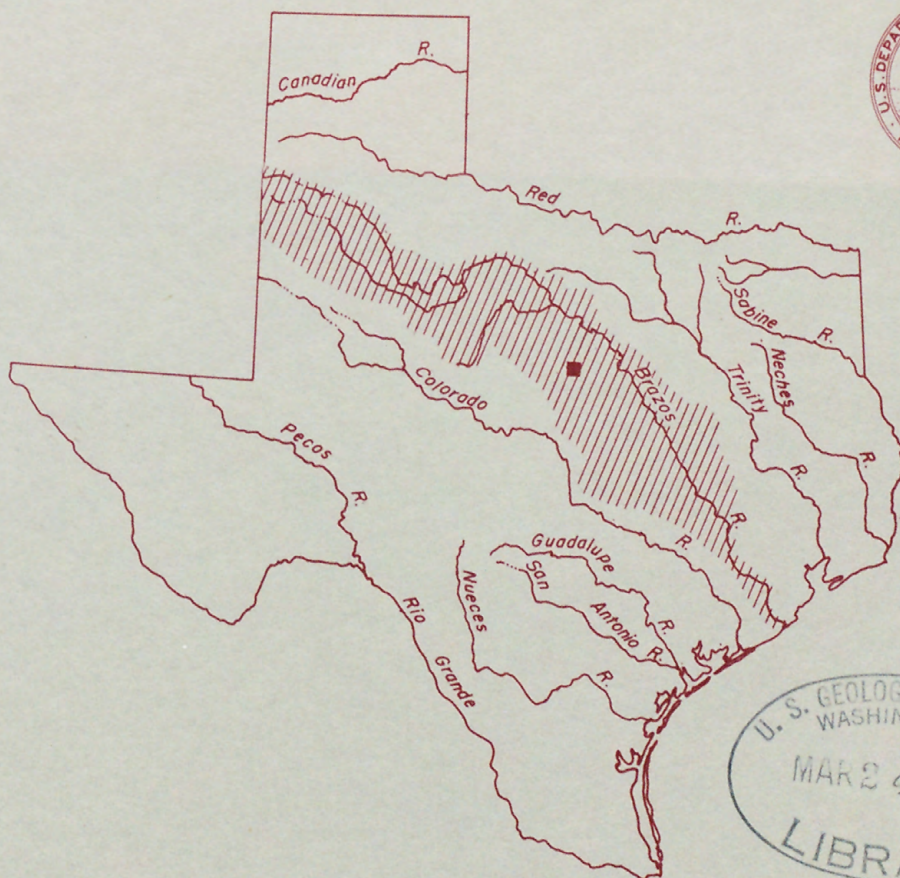


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Annual Compilation and Analysis of Hydrologic Data for Green Creek, Brazos River Basin Texas, 1970

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION



*Prepared in cooperation with the Texas Water Development
Board and the Soil Conservation Service*

Annual Compilation and Analysis of Hydrologic Data for Green Creek, Brazos River Basin Texas, 1970

By B.B. Hampton

U.S. GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
Texas District Open-File Report
I.D. Yost District Chief



*Prepared in cooperation with the Texas Water Development
Board and the Soil Conservation Service*

December 1971

CONTENTS

	Page
Introduction-----	1
History of small watershed projects in Texas-----	1
Objectives of the Texas small watershed project-----	4
Purpose and scope of this basic-data report-----	4
Description of the watershed-----	6
Floodwater-retarding structures-----	7
Hydrologic instruments-----	7
Summary of data for the 1970 water year-----	9
Compilation and analysis of data-----	11
<u>Brazos River basin</u>	
Green Creek subwatershed No. 1 near Dublin, Tex.-----	12
Monthly and yearly weighted-mean rainfall-----	13
Monthly and yearly net inflow-----	14
Monthly and yearly outflow-----	15
Water budget of pool, annual summary-----	16
Green Creek near Alexander, Tex.-----	17
Monthly and yearly weighted-mean rainfall-----	18
Monthly and yearly mean discharge-----	19
Rainfall data summary-----	20
Storm of December 28-29, 1969	
At site 1	
Inflow and outflow computations-----	24
Weighted-precipitation record-----	26
Hydrograph and mass curves-----	28
At stream-gaging station	
Runoff computations-----	29
Weighted-precipitation record-----	30
Hydrograph and mass curves-----	32
Storm of March 3, 1970	
At site 1	
Inflow and outflow computations-----	34
Weighted-precipitation record-----	35
Hydrograph and mass curves-----	36
At stream-gaging station	
Runoff computations-----	37
Weighted-precipitation record-----	38
Hydrograph and mass curves-----	39
Storm of May 30-31, 1970	
At stream-gaging station	
Runoff computations-----	40
Weighted-precipitation record-----	41
Hydrograph and mass curves-----	42

ILLUSTRATIONS

	Page
Figure 1. Map showing the location of the Green Creek study area-----	2
2. Map showing the locations of floodwater-retarding structures and hydrologic-instrument installations in the Green Creek study area-----	5

TABLES

Table 1. Small watershed study areas in Texas as of September 30, 1970-----	3
2. Floodwater-retarding structure data, Green Creek study area-----	8
3. Storm rainfall-runoff data, 1970 water year-----	10

ANNUAL COMPILATION AND ANALYSIS OF HYDROLOGIC DATA
FOR GREEN CREEK, BRAZOS RIVER BASIN, TEXAS
1970

By

B. B. Hampton

INTRODUCTION

History of Small Watershed Projects in Texas

The U.S. Soil Conservation Service is actively engaged in the installation of flood and soil erosion reducing measures in Texas under the authority of "The Flood Control Act of 1936 and 1944" and "Watershed Protection and Flood Prevention Act" (Public Law 566), as amended. The Soil Conservation Service has found a total of approximately 3,500 floodwater-retarding structures to be physically and economically feasible in Texas. As of September 30, 1970, 1,439 of these structures had been built.

This watershed-development program will have varying but important effects on the surface- and ground-water resources of river basins, especially where a large number of the floodwater-retarding structures are built. Basic hydrologic data under natural and developed conditions are needed to appraise the effects of the structures on the yield and mode of occurrence of runoff.

Hydrologic investigations of these small watersheds were begun by the U.S. Geological Survey in 1951 and are now being made in 12 study areas (fig. 1). These investigations are being made in cooperation with the Texas Water Development Board, the Soil Conservation Service, the San Antonio River Authority, the city of Dallas, and the Tarrant County Water Control and Improvement District No. 1. The 12 study areas were chosen to sample watersheds having different rainfall, topography, geology, and soils. In five of the study areas (North, Little Elm, Mukewater, North Elm-Little Pond, and Pin Oak Creeks), streamflow and rainfall records were collected prior to construction of the floodwater-retarding structures, thus affording the opportunity for analyses of the conditions "before and after" development. Structures have now been built in four of these study areas. A summary of the development of the floodwater-retarding structures in each study area as of September 30, 1970, is shown in table 1.

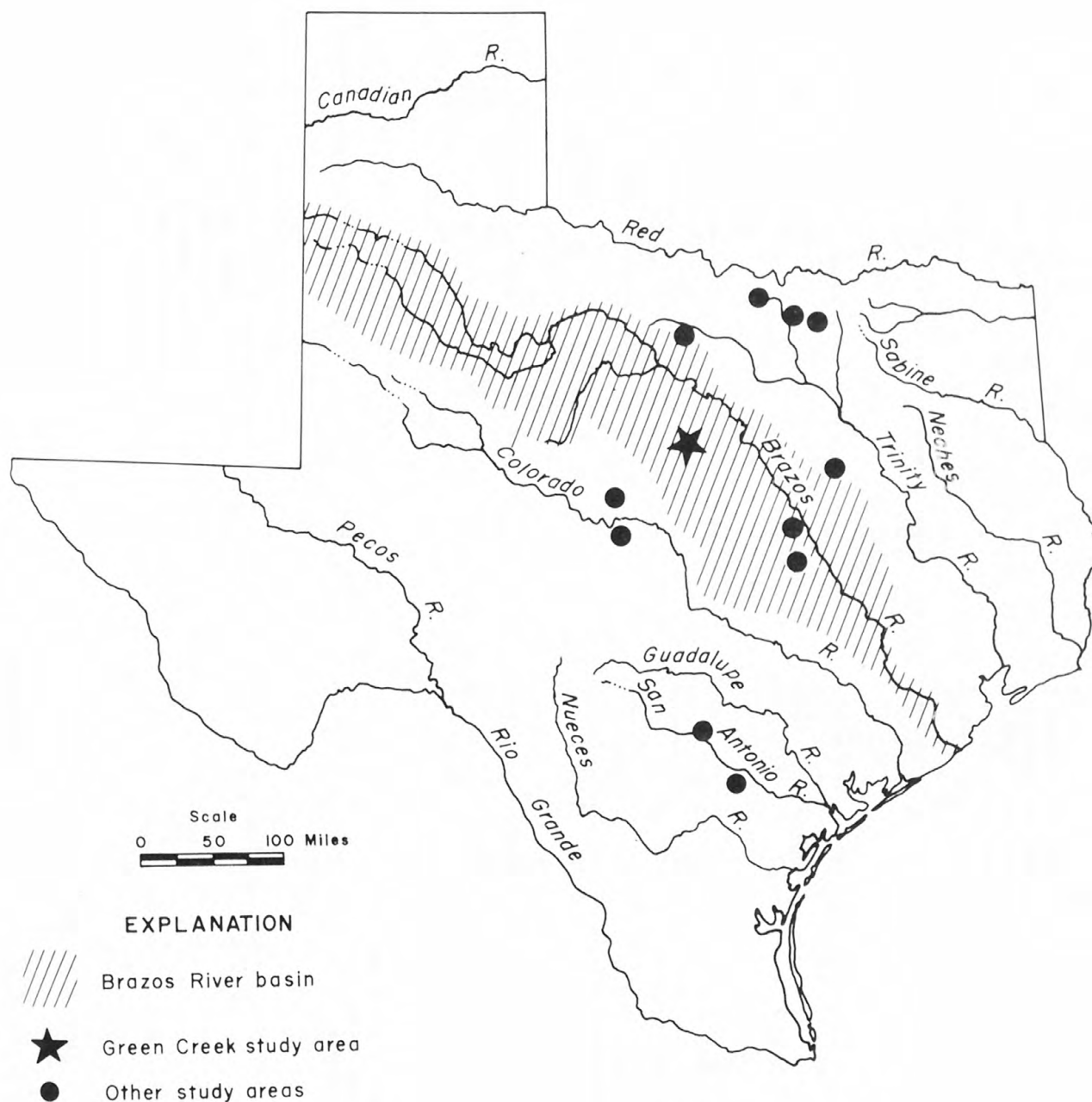


Figure 1.—Location of the Green Creek study area

Table 1.--Small watershed study areas in Texas as of September 30, 1970

Watershed	Drainage area above stream- gaging station (sq mi)	Hydrologic data collection began	Floodwater-retarding structures above stream-gaging station	Period the structures were built
<u>Trinity River basin:</u>				
North Creek near Jacksboro	21.6	Aug. 1956	1	1970
Elm Fork Trinity River near Muenster	46.0	July 1956	14	1954-57, 63
Little Elm Creek near Aubrey	75.5	June 1956	11	1966, 70
Honey Creek near McKinney	39.0	July 1951	13	1951-57, 69
Pin Oak Creek near Hubbard	17.6	Sept. 1956	6	1962-63, 65
<u>Brazos River basin:</u>				
Green Creek near Alexander	46.1	Oct. 1954	8	1954-56
Cow Bayou at Mooreville	85.0	Sept. 1954	26	1955-58, 64-65
<u>1</u> /Little Pond Creek at Burlington	22.2	Oct. 1962	None	-
<u>1</u> /North Elm Creek near Cameron	48.6	Oct. 1962	None	-
<u>Colorado River basin:</u>				
Mukewater Creek at Trickham	70.0	Aug. 1951	6	1961-62, 65
Deep Creek near Mercury	<u>a</u> /43.9	June 1951	5	1951-53
<u>San Antonio River basin:</u>				
Calaveras Creek near Elmendorf	77.2	Aug. 1954	<u>c</u> /7	1954-58
Escondido Creek at Kenedy	<u>b</u> /72.4	July 1954	10	1954-58

1/ Adjacent watersheds; considered as one study area.

a/ 8.31 sq mi above Dry Prong Deep Creek near Mercury not included in this total.

b/ 8.43 sq mi above Escondido Creek subwatershed No. 11 (Dry Escondido Creek) near Kenedy not included in this total.

c/ Six of the floodwater-retarding structures above Calaveras Creek near Elmendorf are in part of a 65.0 sq mi area controlled by Calaveras Creek Dam.

Objectives of the Texas Small Watersheds Project

The purpose of these investigations is to collect sufficient data to meet the following objectives:

1. To determine the net effect of floodwater-retarding structures on the regimen of streamflow at downstream points.
2. To determine the effectiveness of the structures as ground-water recharge facilities.
3. To determine the effect of the structures on the sediment yield at downstream points.
4. To develop relationships between maximum rates and/or volumes of runoff with rainfall in small natural watersheds.
5. To develop a stream-system model for basins with floodwater-retarding structures.
6. To determine the minimum instrumentation necessary for estimating the flood hydrographs below a system of structures, as needed for downstream water-management operation.

Purpose and Scope of this Basic-Data Report

This report, which is the eleventh in a series of basic-data reports published annually for the Green Creek study area, contains the rainfall, runoff, and storage data collected during the 1970 water year for the 46.1-square-mile area above the stream-gaging station Green Creek near Alexander, Texas. The locations of floodwater-retarding structures and hydrologic instrument installations in the area are shown as figure 2.

The investigation is scheduled to continue through a period of both above- and below-normal precipitation to define the various factors used in the analyses of rainfall-runoff relationships.

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

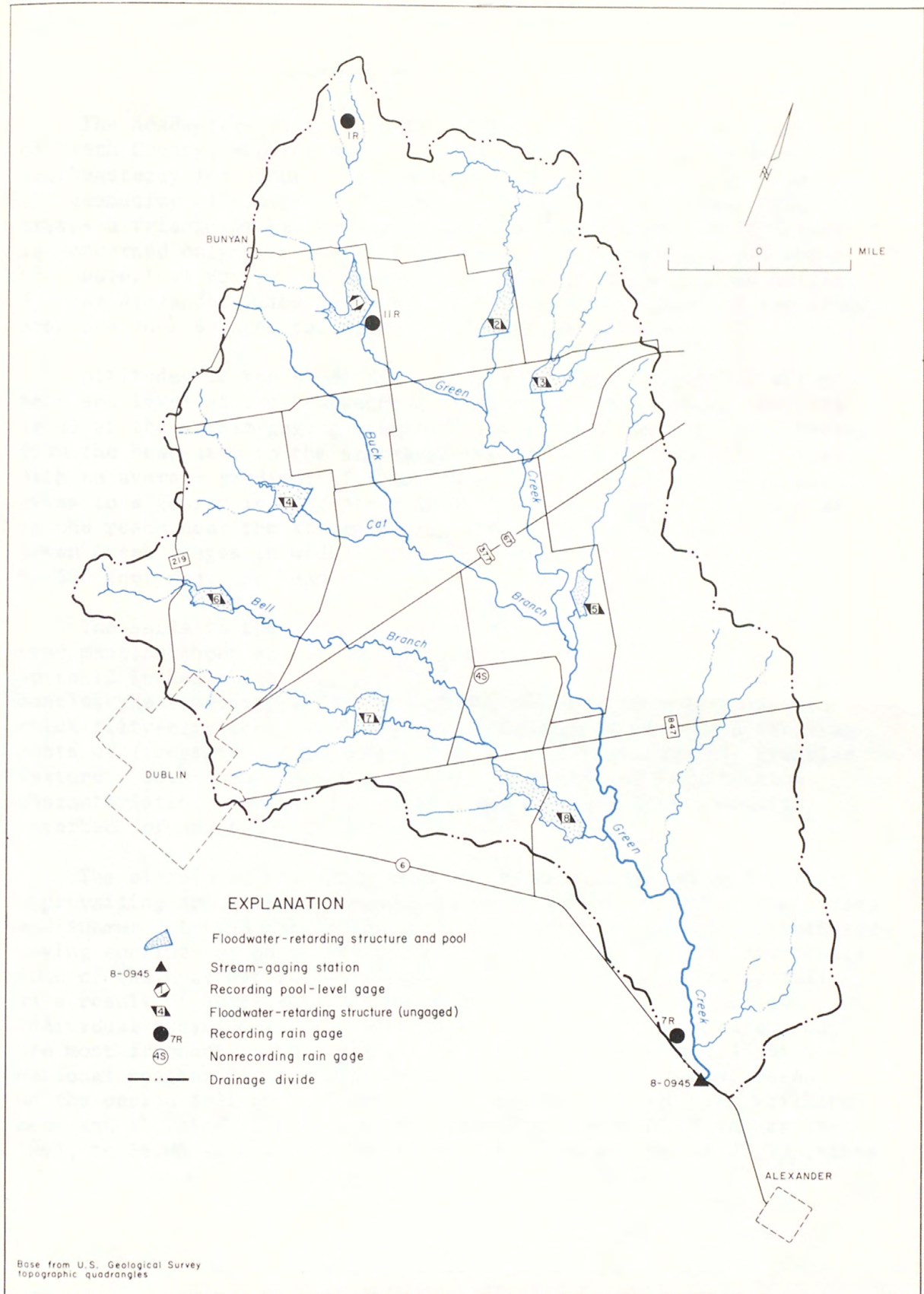


FIGURE 2.—Locations of floodwater-retarding structures and hydrologic-instrument installations in the Green Creek study area

DESCRIPTION OF THE WATERSHED

The headwaters of Green Creek originate in the western part of Erath County, about 2 miles north of Bunyon. The creek flows southeasterly for about 26 miles to the North Bosque River, near the community of Clairette in southern Erath County. Green Creek drains a triangular basin of 105 square miles; however, this report is concerned only with the 46.1 square miles of the watershed above the Geological Survey stream-gaging station at State Highway 6 (fig. 2) near Alexander. The major tributaries of Green Creek in the study area are Buck Branch, Cat Branch, and Bell Branch.

Altitudes in the study area range from about 1,500 feet above mean sea level at the headwater divide to 1,170 feet above mean sea level at the stream-gaging station. The total length of Green Creek, from the headwater to the stream-gaging station is about 13.5 miles, with an average gradient of about 20.6 feet per mile. An escarpment rises to a gently rolling plain about 100 feet above the flood plain in the reach near the stream-gaging station. The main valley of Green Creek ranges in width from 1,300 feet in the lower reaches to 300 feet near the headwaters.

The soils in the study area are of two basic types. The first type mantles about 80 percent of the area and is a fine sandy loam 10 to 12 inches thick overlying a firm sandy clay. The second type mantles the remaining 20 percent of the area and is a 4- to 8-inch thick silty-clay loam overlying a plastic clay containing a few fragments of limestone. This latter type of soil has a crumbly granular texture. Both types have a relatively high initial infiltration characteristic. The few outcrops in the area are limestone with interbeds of shale and sandstone.

The climate of the study area is temperate and subhumid with a prevailing south wind. Thunderstorms occur frequently in the spring and summer. Long-duration low-intensity storms triggered by southward-moving continental polar fronts are common during the fall and winter. Some of the heaviest rainfall occurs in late summer and early fall as a result of hurricanes moving inland from the Gulf of Mexico. Individual storms may cause serious flooding during any season, but are most frequent in the spring. The normal annual rainfall at the National Weather Service station at Dublin is 31.67 inches, based on the period 1931-60. During the water years 1958-70, the weighted-mean annual rainfall on the study area ranged from 19.28 inches in 1967, to 36.06 inches in 1968, with a weighted average of 29.23 inches.

FLOODWATER-RETARDING STRUCTURES

There are eight floodwater-retarding structures in the Green Creek study area (fig. 2). These structures have a total combined capacity of 7,500 acre-feet below the flood-spillway crests, and control 22.3 square miles, or approximately 50 percent of the drainage area above the stream-gaging station.

Table 2 is a summary of the physical data at each of the eight floodwater-retarding structures.

HYDROLOGIC INSTRUMENTS

Instruments to collect rainfall, runoff, and storage data in the Green Creek study area consist of a network of rain gages, a water-stage recorder at floodwater-retarding structure site 1, and a stream-gaging station on Green Creek downstream from all floodwater-retarding structures. Prior to October 1, 1966, staff gages were operated at seven floodwater-retarding structures, sites 2 through 8, at which weekly readings were obtained to provide data to determine the quantity of water retained or released from the structures. On September 30, 1966, staff gage readings at all miscellaneous sites were discontinued. The locations of instruments are shown on figure 2.

Four rain gages, three recording and one nonrecording, are located at points throughout the study area to define the total rainfall and rainfall intensities. A summary of rainfall data is included in the section "Compilation and Analysis of Data."

A continuous water-stage recording gage is operated at floodwater-retarding pool site 1, at which data are collected to compute contents, surface area, inflow, and outflow. Records at site 1 began May 12, 1955. Monthly and annual summary of the water budget for the 1970 water year at site 1 is shown in the section "Compilation and Analysis of Data."

A continuous water-stage recorder at the stream-gaging station on Green Creek near Alexander provides records of the stage, which together with measurements of streamflow are used to compute the runoff from the study area. Daily, monthly, and annual discharge records are presented in the section "Compilation and Analysis of Data." Streamflow records at this station began May 27, 1958.

Table 2.--Floodwater-retarding structure data, Green Creek study area.

Site Number	Drainage Area (sq mi)	Date Dam Completed	Date Gage Established	Datum of Gage above Mean Sea Level	Emergency Spillway			Drop Outlet		Portholes			Controlled Opening		Pipe through Dam (in.)	Range of Staff Gages
					Number and Width (ft)	Gage Height (ft)	Content (ac-ft)	Gage Height (ft)	Pool Content (ac-ft)	Number and Size (in.)	Gage Height at Bottom (ft)	Pool Content (ac-ft)	Gage Height at Bottom (ft)	Pool Content (ac-ft)		
1	3.34	4-25-55	5-12-55	1,408.0	1 (250)	21.8	1,097	11.0	223	-	-	-	3.76	34	14	3.4- 26.6
2	2.52	2-27-55	10-18-55	1,381.0	1 (200)	25.0	726	15.0	111	1 12"x24"	10.67 plugged	28	7.33	6.0	14	
3	1.58	9- 5-54	10-18-55	1,369.8	1 (150)	24.6	590	15.0	108	-	-	-	7.00	.4	14	
4	1.99	6- 5-55	10-18-55	1,401.5	1 (175)	26.5	642	15.0	48	-	-	-	8.00	0	a/22	
5	2.20	9-29-55	4-12-56	1,306.4	1 (200)	26.4	692	15.0	147	-	-	-	1.00	4	b/22	
6	1.20	10- 5-55	10-18-55	1,422.4	1 (100)	29.9	647	15.0	68	-	-	-	7.00	6.2	c/17	
7	3.20	3-28-56	4-12-56	1,347.0	1 (200)	28.3	1,166	15.0	148	-	-	-	5.00	16.6	d/17	
8	*10.66	9-24-56	12-10-56	1,256.0	2 (100) (300)	37.0	1,906	18.0	294	2 8"x8" 2 8"x10"	15.0	188	0	40	17	

* The 4.40 sq mi above sites 6 and 7 is included in this total.

a/ 10-inch baffle.

b/ 9-inch baffle.

c/ 11-inch baffle.

d/ 12-inch baffle.

SUMMARY OF DATA FOR THE 1970 WATER YEAR

The weighted-mean rainfall over the study area during the 1970 water year was 34.80 inches, or 110 percent of the 1931-60 long-term mean annual rainfall of 31.67 inches at Dublin, Texas. The monthly-rainfall totals ranged from 0.12 inch in July to 6.23 inches in October. The yearly mean discharge at the stream-gaging station Green Creek near Alexander was 9.78 cfs (cubic feet per second), compared with the 12-year (1959-70) average of 6.44 cfs. The annual runoff at the stream-gaging station was 7,080 acre-feet. This runoff represents an equivalent depth of 2.88 inches.

The weighted-mean rainfall above subwatershed No. 1 was 29.01 inches and the runoff was 455 acre-feet. This runoff represents an equivalent depth of 2.55 inches. The higher runoff (in inches) at the stream-gaging station as compared to the area above site 1 can be attributed to heavier rainfall during the year over the lower part of the study area.

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 at the stream-gaging station, and the assurance of good rainfall and runoff records for the storm periods selected.

Three storm periods were selected for detailed analysis and computation. These computations include a detailed time breakdown of rainfall and discharge. The storms selected occurred on December 28-29, 1969; March 3, 1970; and May 30-31, 1970.

No computations were made for the storm of May 30-31 at subwatershed No. 1 as the storm was centered in the lower portion of the study area.

A summary of rainfall-runoff data for the selected storms is shown in table 3. Computations, together with hydrographs and mass curves for the storms are shown in the section "Compilation and Analysis of Data."

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6/69

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 3.--Storm rainfall-runoff data, 1970 water year.

Date of Storm	Rainfall (inches)					Runoff (inches)	Ratio runoff to rainfall	Maximum discharge (cfs)
	Duration (hours)	Total	Maximum increment					
			15-minute	30-minute	60-minute			

Green Creek near Alexander, Tex.

(Drainage area 46.1 sq mi, of which 22.3 sq mi is above floodwater-retarding structures)

Dec 28-29, 1969	27.0	1.74	0.22	0.36	0.55	0.20	0.11	459
March 3, 1970	2.75	.66	.16	.26	.51	.12	.18	572
May 30, 1970	3.50	1.44	.51	.88	1.17	.15	.10	2,140

Green Creek subwatershed No. 1 near Dublin, Tex.

(Drainage area, 3.34 sq mi)

Dec 28-29, 1969	27.0	1.76	.18	.34	.58	.32	.18	83
March 3, 1970	3.00	1.00	.32	.58	.79	.29	.29	248
May 30, 1970	--	.25	--	--	--	(*)	(*)	(*)

* Storm analysis not made, no significant runoff occurred.

COMPI LATION AND ANALYSIS OF DATA

BRAZOS RIVER BASIN

08094000 Green Creek subwatershed No. 1 near Dublin, Tex.

LOCATION.--Lat 32°09'57", long 98°20'28", Erath County, near center of dam on main headwater channel of Green Creek, 0.9 mile downstream from county road, 1.3 miles east of Farm Road 219, and 5.5 miles north of Dublin.

DRAINAGE AREA.--3.34 sq mi.

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

GAGE.--Water-stage recorder and concrete drop inlet. Datum of gage is 1,408.00 ft above mean sea level (levels by Soil Conservation Service).

AVERAGE INFLOW.--15 years, 562 acre-ft per year.

AVERAGE OUTFLOW.--15 years, 403 acre-ft per year. Fourteen years, 399 acre-ft; figure published in Water Resources Data for Texas, 1969, in error.

EXTREMES.--Current year: Maximum outflow, 14 cfs Mar. 3 (gage height, 12.06 ft); no outflow most of time. Maximum inflow, 248 cfs (average for 5-minute interval) Mar. 3, computed from change in pool contents and adjusted for outflow and rainfall on pool surface during time of peak inflow; no inflow for many days.

Period of record: Maximum outflow, 709 cfs May 1, 1956 (gage height, 23.21 ft); no outflow for most of time each year. Maximum inflow, 11,500 cfs (average for 5-minute interval) Apr. 30, 1956, computed and adjusted as above; no inflow for many days each year.

REMARKS.--Records good. The pool is formed by a rolled earthfill dam 3,000 ft long. The dam was completed Apr. 25, 1955, and storage began shortly thereafter. The outlet structure consists of a 30-inch square concrete drop inlet that is connected to a 14-inch concrete outlet pipe. The gage height at top of the drop inlet is 11.0 ft. The emergency spillway is a 250-foot wide cut in natural ground at the right end of dam. The gage height at crest of emergency spillway is 21.8 ft. There is a clean-out gate valve at the end of an 8-inch pipe which connects to the lower end of the drop inlet box at a gage height of 3.76 ft. The pool capacity at the crest of emergency spillway is 1,097 acre-ft; at top of drop inlet, 223 acre-ft; and at controlled outlet pipe, 48.0 acre-ft. The dam was built by the Soil Conservation Service for flood control. A permit issued by the Texas Water Rights Commission grants 181 acre-ft per year for irrigation. During September about 5 acre-ft was released for irrigation purposes. Two recording rain gages are located in the watershed; one at station, and one above station. The surface area and capacity tables are based on a Soil Conservation Service sedimentation survey of June 1967.

REVISIONS (WATER YEARS).--WSP 1922: 1955-60(M).

POOL WATER BUDGET, IN ACRE-FEET, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.
Inflow 1/	25.4	2.7	73.4	11.3	74.3	233	37.7	89.8	4.3	0.1	0.2	3.4
Outflow	0	0	48.7	13.3	62.1	235	16.4	72.5	1.9	0	0	5.4
(††)	5.32	1.52	2.54	0.16	3.54	3.74	1.68	4.13	0.68	0.20	1.00	4.50
CAL YR 1969: Inflow	525											
WTR YR 1970: Inflow	556											
			Outflow	300		††	34.29					
			Outflow	455		††	29.01					

PEAK INFLOW (BASE, 100 CFS).--Mar. 3 (0450) *248 cfs; May 15 (0455) *180 cfs.

1/ Inflow adjusted for rainfall on pool and pool losses.

†† Weighted mean rainfall, in inches.

* 5-minute interval.

UNITED STATES
 DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY
 WATER RESOURCES DIVISION
Sheet 1 of Sheets

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yearly weighted-mean rainfall
 Monthly and ~~annual discharge~~, in inches, of Green Creek Subwatershed No. 1 River ^{at} _{near} Dublin, Tex.
 [Drainage area, 3.34 square miles]

16-70459-5 U. S. GOVERNMENT PRINTING OFFICE

YEAR	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.	APR.	MAY	JUNE	JULY	AUG.	SEPT.	ANNUAL	
1955	-	-	-	-	-	-	-	-	3.88	0.50	0.73	2.96	-	
1956	1.17	0.51	0	1.11	1.46	0	14.28	2.87	.50	.16	.75	0	22.81	
1957	1.82	1.26	3.01	.71	.96	2.78	7.92	9.52	1.06	1.64	.36	3.00	34.04	
1958	4.82	5.65	1.64	2.09	1.47	2.56	5.41	1.93	2.23	5.34	1.09	4.17	38.40	
1959	2.03	1.34	.96	0	.81	.33	2.04	2.01	8.26	4.58	2.43	3.49	28.28	
1960	10.34	1.39	2.84	2.12	1.40	1.17	1.57	2.94	2.55	2.79	1.82	1.92	32.85	
1961	1.43	.20	3.34	5.40	3.53	1.60	.68	2.96	4.35	5.69	.10	3.33	32.61	
1962	4.48	2.02	.98	.16	1.12	.67	2.75	.83	3.23	2.99	1.43	6.44	27.10	
1963	4.64	1.38	.64	.26	.06	.12	3.97	4.36	2.00	1.39	1.59	2.50	22.91	
1964	1.57	6.01	.63	3.03	1.56	1.75	3.47	.45	.93	.96	4.83	10.95	36.14	
1965	1.90	3.35	.55	1.75	2.85	.39	1.40	7.72	.81	1.32	1.67	1.43	25.14	
1966	3.01	1.96	1.74	.96	1.25	.04	6.24	.82	3.82	.85	4.00	5.35	30.04	
1967	.52	.34	.11	.08	.44	1.88	2.04	3.10	2.16	3.06	.50	6.42	20.63	
1968	1.96	1.91	.94	8.01	1.59	4.20	2.12	5.39	2.66	2.51	2.20	1.51	35.00	
1969	0	4.36	.04	0	1.45	3.08	4.10	3.37	3.11	6.05	2.72	1.03	29.31	
1970	5.32	1.52	2.54	.16	3.54	3.74	1.68	4.13	.68	.20	1.00	4.50	29.01	

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

[illegible]

8-0940.00

WATER RESOURCES DIVISION
Green Creek
yearly outflow
Monthly and ~~annual discharge~~, in acre-feet, of Subwatershed No. 1 River ^{at} near Dublin, Tex.
[Drainage area, 3.34 square miles]

16-26489-6 U.S. GOVERNMENT PRINTING OFFICE

[illegible]

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - TEXAS DISTRICT

WATER BUDGET OF POOL

ANNUAL SUMMARY

1970 WATER YEAR

8-0940 Green Creek subwatershed No. 1 near Dublin, Tex. Drainage Area 3.34 sq. mi.

Continuous water-stage recorder: ratio 10:12. Date of last sediment survey June 1967.

Maxima: gage height, 12.06 ft; outflow, 13.7 c.f.s.; surface area, 45.5 acres; contents, 268 acre-feet; on March 3, 1970.

Minima: gage height, 8.06 ft; surface area, 25.2 acres; contents, 128 acre-feet; on Sept. 25, 1970.

Maximum inflow, 248 c.f.s. (averaged for 5-min. interval and adjusted for rainfall on pool surface) on March 3, 1970.

Averages: 15 water years, (1955-70); inflow, 562 acre-feet/year; outflow, 403 acre-feet/year; rainfall, 29.61 inches/year.

Pool water budget, in acre-feet, water year October 1969 to September 1970.

	Oct.	Nov.	Dec.	Calendar year <u>1969</u>	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sept.	Water year <u>1970</u>
Total Inflow <u>1/</u>	25.4	2.7	73.4	525	11.3	74.3	233	37.7	89.8	4.3	0.1	0.2	3.4	556
Total Outflow	0	0	48.7	300	13.3	62.1	235	16.4	72.5	1.9	0	0	5.4	455
Total Consumption	20.1	11.6	6.4	400	7.1	12.6	17.4	22.0	30.5	31.3	33.4	31.6	15.0	239
†	+21.4	-4.9	+25.6	+84.5	-8.8	+10.8	-7.6	+3.2	-0.4	-27.2	-32.7	-29.0	-7.8	-57.4
‡	37.2	37.3	37.7	-	39.6	39.5	40.6	39.3	39.6	38.2	34.1	29.0	25.9	-
††	5.32	1.52	2.54	34.29	0.16	3.54	3.74	1.68	4.13	0.68	0.20	1.00	4.50	29.01

1/ Inflow adjusted for rainfall on pool and pool losses.

† Change in contents, in acre-feet.

‡ Mean surface area, in acres.

†† Weighted mean rainfall, in inches.

Peak inflow - (base, 100 cfs)

Date	Time	Discharge	Date	Time	Discharge
3-3-70	0450	*248			
5-15-70	0455	*180			

* Based on a 5-minute increment.

BRAZOS RIVER BASIN

08094500 Green Creek near Alexander, Tex.

LOCATION.--Lat 32°04'26", long 98°13'46", Erath County, at downstream side of bridge on State Highway 6, 0.5 mile upstream from Cottonwood Creek, and 1.7 miles northwest of Alexander.

DRAINAGE AREA.--46.1 sq mi.

PERIOD OF RECORD.--October 1954 to April 1958 (annual maximums only), May 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,172.00 ft above mean sea level. Prior to May 27, 1958, nonrecording gage and crest-stage gage at same site and datum.

AVERAGE DISCHARGE.--12 years, 6.44 cfs (4,670 acre-ft per year).

EXTREMES.--Current year: Maximum discharge, 2,140 cfs May 30 (gage height, 11.44 ft), no flow at times.

Period of record: Maximum discharge, 23,900 cfs Apr. 30, 1956 (gage height, 23.95 ft), from rating curve extended above 2,400 cfs on basis of contracted-opening measurement of 23,900 cfs; no flow at times each year.

Maximum discharge since at least 1910, 55,800 cfs May 23, 1952 (gage height, 28.0 ft), on basis of contracted-opening measurement of peak flow.

REMARKS.--Records good. At end of year, flow from 22.3 sq mi above this station was partly controlled by eight floodwater-retarding structures with a total combined capacity of 7,470 acre-ft below flood-spillway crests, of which 6,510 acre-ft is floodwater-retarding capacity and 960 acre-ft is sediment-pool capacity. The capacity in these pools allocated to sediment storage will be used for conservation storage until eliminated by sedimentation. Four rain gages (1 standard and 3 recording) are operated in the basin.

REVISIONS.--WRD Tex. 1967: Drainage area.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	0	1.6	1.5	18	4.2	31	13	8.6	19	.13	0	0
2	0	2.0	1.4	14	4.4	25	12	6.7	14	.13	0	4.7
3	0	2.2	1.2	11	3.8	150	12	5.6	10	.11	0	.15
4	.04	2.2	1.2	9.4	3.4	52	11	5.2	6.4	.11	0	0
5	36	1.8	1.2	10	3.0	34	11	4.4	4.6	.09	0	0
6	4.2	1.6	5.9	9.0	3.2	75	11	3.8	4.0	.07	0	0
7	.60	1.5	14	7.8	3.4	155	11	3.2	3.4	.06	0	0
8	.13	1.4	6.2	7.0	3.4	69	10	3.0	2.9	.05	0	0
9	.03	1.4	4.4	6.4	3.2	41	23	2.9	2.8	.04	0	0
10	0	1.2	3.6	6.4	2.9	34	15	2.8	2.2	.04	0	0
11	0	1.2	3.0	6.2	3.0	40	9.8	2.4	2.2	.03	0	0
12	107	1.2	2.8	5.6	2.9	29	8.2	2.2	2.0	.03	0	0
13	33	1.2	2.8	5.2	2.9	25	7.4	2.2	1.6	.03	0	0
14	14	1.2	2.6	4.9	2.9	21	7.4	2.4	1.5	.03	0	0
15	5.4	1.2	2.6	4.9	4.9	19	7.8	34	1.0	.02	0	0
16	3.0	1.0	2.4	4.9	4.6	25	8.2	23	.80	.02	0	0
17	1.8	1.0	2.2	4.6	4.0	104	8.2	15	.70	.02	0	0
18	1.4	1.0	2.4	4.4	3.6	37	9.4	10	.52	.01	0	0
19	.90	1.0	2.4	4.0	3.0	30	11	5.6	.45	.01	0	0
20	.80	1.0	2.4	3.8	2.9	65	8.6	3.8	.38	.01	0	0
21	.60	1.0	2.4	3.6	2.9	127	7.8	2.9	.38	.02	0	0
22	.45	1.0	2.2	3.6	4.2	45	7.4	2.4	.38	.02	0	4.3
23	.45	1.0	2.2	3.6	11	38	6.7	2.4	.45	.01	0	4.9
24	.38	1.8	2.0	3.4	162	31	6.4	2.8	.38	.01	0	.04
25	.32	2.2	2.0	3.4	112	27	6.7	2.6	.32	.01	0	10
26	.32	1.6	2.0	3.2	48	23	9.0	2.0	.27	.01	0	24
27	.60	3.2	2.0	3.2	37	21	11	4.4	.23	.01	0	.38
28	1.5	3.4	2.2	3.2	47	18	9.0	56	.20	0	0	.05
29	2.8	2.6	169	3.0	-----	17	7.4	21	.17	0	0	.02
30	3.2	2.0	48	2.8	-----	15	11	137	.15	0	0	.01
31	2.2	-----	29	2.8	-----	14	-----	47	-----	0	.02	-----
TOTAL	221.12	47.7	329.2	183.3	493.7	1,437	297.4	427.3	83.38	1.13	.02	48.55
MEAN	7.13	1.59	10.6	5.91	17.6	46.4	9.91	13.8	2.78	.037	.0006	1.62
MAX	107	3.4	169	18	162	155	23	137	19	.13	.02	24
MIN	0	1.0	1.2	2.8	2.9	14	6.4	2.0	.15	0	0	0
AC-FT	439	95	653	364	979	2,850	590	848	165	2.2	.04	96
CAL YR 1969	TOTAL 5,225.08	MEAN 14.3	MAX 1,730	MIN 0	ACFT 10,360							
WAT YR 1970	TOTAL 3,569.80	MEAN 9.78	MAX 169	MIN 0	ACFT 7,080							

WATER RESOURCES DIVISION

yearly weighted-mean rainfall
Monthly and ~~annual~~ discharge, in _____ inches, of _____ Green Creek _____ River at near _____ Alexander, Tex.
[Drainage area, 46.1 square miles]

16-2846

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

[illegible]

8-0945.00

WATER RESOURCES DIVISION

yearly mean
Monthly and ~~annual~~ discharge, in cfs, of Green Creek River ^{at} near Alexander, Tex.
[Drainage area, 45.5 square miles]

16-70480

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

[illegible]

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

RAINFALL DATA SUMMARY

STUDY AREA <u>GREEN CREEK</u>		RAIN GAGES				<u>1970</u>	WATER YEAR
Date of Storm	1-R	4-S	7-R	11-R	Average (1-R & 11-R)	Weighted*	
Oct. 4- 5, 1969	2.74	2.63	3.30	2.64	2.69	2.88	
11	.07	0	0	.06	.07	.02	
12	1.37	1.93	2.90	1.41	1.39	2.07	
27	.50	.52	.40	.46	.48	.47	
28-29	.68	.86	.82	.70	.69	.79	
October Totals	5.36	5.94	7.42	5.27	5.32	6.23	
Nov. 2, 1969	.40	.40	.33	.35	.38	.37	
9	.02	.04	0	0	.01	.02	
16	.10	.05	0	.01	.06	.04	
17	.13	0	0	0	.07	.02	
24	.42	.50	.65	.33	.37	.50	
26-27	.67	.78	.90	.60	.63	.77	
November Totals	1.74	1.77	1.88	1.29	1.52	1.72	
Dec. 5, 1969	.12	.10	.10	.10	.11	.10	
6	.71	.89	.89	.45	.58	.79	
28-29	1.88	1.86	1.58	1.65	1.76	1.73	
30	.10	.07	.04	.08	.09	.07	
December Totals	2.81	2.92	2.61	2.28	2.54	2.69	
Jan. 2, 1970	.05	.12	.16	0	.03	.10	
5	.05	.04	.02	.04	.05	.04	
7	.10	.16	.23	.07	.08	.16	
January Totals	.20	.32	.41	.11	.16	.30	

Form TX-88
Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

RAINFALL DATA SUMMARY

STUDY AREA <u>GREEN CREEK</u>		RAIN GAGES				<u>1970</u>	WATER YEAR
Date of Storm	1-R	4-S	7-R	11-R	Average (1-R & 11-R)	Weighted*	
Feb. 1, 1970	0.50	0.48	0.38	0.42	0.46	0.44	
8	0	.14	0	0	0	.05	
15	.25	.51	.50	.21	.23	.41	
22-23	.85	.80	.95	.76	.81	.85	
23-24	1.60	1.47	1.75	1.59	1.59	1.60	
27	.50	.33	.35	.40	.45	.38	
February Totals	3.70	3.73	3.93	3.38	3.54	3.73	
Mar. 2	.07	.02	0	0	.03	.02	
3	1.00	.53	.45	.81	.90	.63	
6	.93	.84	.90	.95	.94	.89	
7	.20	.18	.20	.25	.22	.20	
10	.32	.36	.45	.22	.27	.36	
12	.06	.08	.10	.05	.06	.08	
16	.61	.74	.78	.47	.54	.68	
19	.05	.05	.05	.04	.04	.05	
20	.60	.62	.65	.43	.52	.59	
21	.25	.19	.15	.18	.22	.19	
March Totals	4.09	3.61	3.73	3.40	3.74	3.69	
Apr. 9	.15	.36	2.05	.10	.12	.84	
18	.48	.59	.10	.27	.38	.36	
25	.77	.37	.15	.32	.55	.36	
26	.09	.18	.20	.11	.10	.16	
30	.65	.48	.35	.41	.53	.45	
April Totals	2.14	1.98	2.85	1.21	1.68	2.17	

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Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

RAINFALL DATA SUMMARY

STUDY AREA	RAIN GAGES				1970	WATER YEAR
GREEN CREEK						
Date of Storm	1-R	4-S	7-R	11-R	Average (1-R & 11-R)	Weighted*
May 13, 1970	0.09	0.04	0.11	0	0.04	0.04
14-15	2.25	1.90	2.25	1.94	2.10	2.09
22	.15	.25	.23	.18	.16	.21
23	.20	.30	.25	.10	.15	.23
24	.15	.29	.30	.20	.18	.26
27-28	1.30	1.09	1.85	1.20	1.25	1.40
30	.23	.74	3.34	.27	.25	1.44
May Totals	4.37	4.61	8.33	3.89	4.13	5.69
June 1, 1970	.22	.17	.22	.16	.19	.20
21	.35	.03	0	.03	.19	.07
22	.22	.03	0	.37	.30	.11
June Totals	.79	.23	.22	.56	.68	.38
July 21, 1970	.20	.14	.03	.20	.20	.12
July Totals	.20	.14	.03	.20	.20	.12
Aug. 21, 1970	.60	1.07	1.44	.47	.53	1.01
29	.10	.58	.05	.25	.18	.27
31	.28	1.29	1.80	.30	.29	1.13
August Totals	.98	2.94	3.29	1.02	1.00	2.41

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Rev. 10-69

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION

RAINFALL DATA SUMMARY

STUDY AREA	RAIN GAGES				1970	WATER YEAR
<u>GREEN CREEK</u>						
Date of Storm	1-R	4-S	7-R	11-R	Average (1-R & 11-R)	Weighted*
Sept. 1, 1970	0.72	0.43	0.45	0.66	0.69	0.52
1-2	.71	.70	1.30	.77	.74	.91
13	.90	.48	.90	.79	.84	.74
16	.75	.70	.50	.76	.75	.65
21-22	.07	.34	1.68	.08	.08	.70
22-23	.31	.29	1.05	.21	.26	.53
25-26	1.32	1.65	2.05	.96	1.14	1.62
September Totals	4.78	4.59	7.93	4.23	4.50	5.67
1970 Water Year Totals	31.16	32.78	42.63	26.84	29.01	34.80

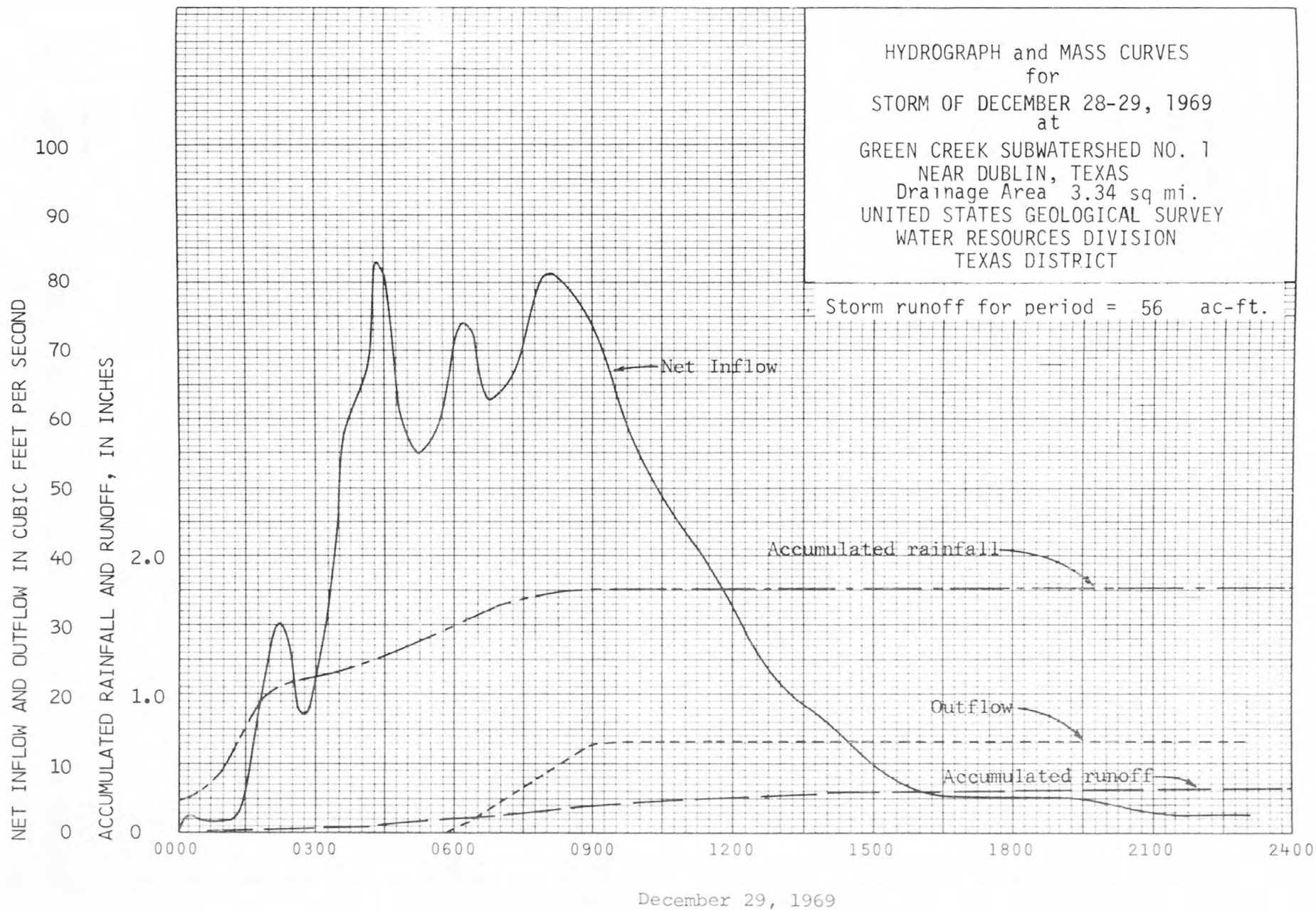
*Average of 4-S, 7-R, $\frac{1-R + 11-R}{2}$

INFLOW AND OUTFLOW COMPUTATIONSStorm period Dec. 28-29, 19698-940 Green Creek subwatershed No. 1 near Dublin, Tex. D.A. 3.34 sq mi

Date and time	Gage height ft	Storage ac-ft	Time int. hrs	Change in storage		Mean G. Ht. ft	Outflow cfs	Total inflow cfs	Rainfall on Pool				Net Inflow			
				ac-ft	cfs				in	ac	Storage ac-ft	cfs	Rate cfs	in/hr	in	Acc in
		<u>Dec. 28</u>														
0000	10.48	202.60														
1230	10.48	202.60	12.5	0	0	10.48	0	0	0				0	0.0000	0.0000	0.0000
45	10.48	202.60	.25	0	0	10.48	0	0	0				0	0.0000	0.0000	0.0000
1300	10.48	202.60	.25	0	0	10.48	0	0	.09	37.16	.28	13.6	0	0.0000	0.0000	0.0000
1400	10.49	202.97	1	.37	4.48	10.48	0	4.48	0				4.5	0.021	0.021	0.021
1600	10.49	202.97	2	0		10.49	0	0	0				0			
15	10.49	202.97	.25	0		10.49			.03	37.20	.09	4.4				
30	10.49	202.97	.25			10.49			0							
2145	10.49	202.97	5.25			10.49			.03	37.20	.09	.2				
2200	10.49	202.97	.25			10.49										
2315	10.49	202.97	1.25			10.49										
30	10.49	202.97	.25			10.49			.03	37.20	.09	4.4				
2400	10.49	202.97	.5			10.49										
			24													
		<u>Dec. 29</u>											0			
0000	10.49	202.97														
30	10.50	203.34	.5	.37	8.95	10.50		8.95	.08	37.25	.25	6.05	2.9	.0013	.0006	.0027
0100	10.51	203.72	.5	.38	9.20	10.50		9.20	.10	37.25	.31	7.50	1.7	.0008	.0004	.0031
30	10.54	204.84	.5	1.12	27.10	10.52		27.10	.33	37.34	1.04	25.2	1.9	.0009	.0004	.0035
0200	10.58	206.34	.5	1.50	36.30	10.56		36.30	.27	37.53	.83	20.1	14.2	.0075	.0038	.0073
30	10.62	207.85	.5	1.51	36.54	10.60		36.54	.08	37.72	.25	6.05	30.5	.0142	.0071	.0144
0300	10.64	208.61	.5	.76	18.39	10.63		18.39	.02	37.86	.06	1.95	16.9	.0078	.0039	.0183
30	10.68	210.13	.5	1.52	36.78	10.66		36.78	.04	38.01	.13	3.15	33.6	.0156	.0078	.0216
0400	10.75	212.81	.5	2.68	64.86	10.72		64.86	.05	38.30	.16	3.87	61.0	.0283	.0142	.0403
15	10.79	214.35	.25	1.54	74.54	10.77		74.54	.04	38.54	.13	6.29	68.2	.0316	.0079	.0482
30	10.84	216.29	.25	1.94	93.90	10.82		93.90	.07	38.78	.23	11.13	82.8	.0384	.0096	.0578
0500	10.91	219.01	.5	2.72	65.82	10.87		65.82	.03	39.02	.10	2.42	63.4	.0294	.0147	.0725
30	10.97	221.38	.5	2.37	57.35	10.94		57.35	.03	39.36	.10	2.42	54.9	.0255	.0128	.0853
0600	11.04	224.16	.5	2.78	67.28	11.00		67.28	.08	39.65	.26	6.29	61.0	.0283	.0142	.0995

Storm period Dec. 28-29, 1969

Comp. by BBH
Check by FAP



UNITED STATES DEPARTMENT OF THE INTERIOR
 GEOLOGICAL SURVEY - TEXAS DISTRICT

RUNOFF COMPUTATIONS

Station Green Creek near Alexander, Tex.Period of Record December 28-31, 1969Drainage Area 46.1 sq mi

Time	G. Ht. Feet	Sh. Adj.	Discharge			Runoff	
			C. f. s.	Inc.	In/Hr.	Inches	Acc. In
			December 28				
0000	2.88	7.01	2.0	6	.0001	.0006	.0006
1200	2.89		2.2	12	.0001	.0012	.0018
2400	2.90	7.01	2.4	6	.0001	.0006	.0024
			52.8	24			
			2.2				
			December 29				
0000	2.90	7.01	2.4	1.5	.0001	.0002	.0026
0300	3.00		4.2	1.75	.0001	.0002	.0028
30	3.06	7.01	5.6	.5	.0002	.0001	.0029
0400	3.34	0	17	.5	.0006	.0003	.0030
30	3.65		30	.5	.0010	.0005	.0037
0500	3.91		45	.5	.0015	.0008	.0045
30	4.20		65	.5	.0022	.0011	.0056
0600	4.92		135	.75	.0045	.0034	.0090
0700	4.93		137	1	.0046	.0046	.0136
0800	5.45		207	1	.0070	.0070	.0206
0900	6.28		359	1	.0121	.0121	.0327
1000	6.72		459	1	.0154	.0154	.0481
1100	6.60		430	1	.0145	.0145	.0626
1200	6.42		389	1.5	.0131	.0196	.0822
1400	5.88		280	2	.0094	.0188	.1010
1600	5.38		196	2	.0066	.0132	.1142
1800	4.94		138	2	.0046	.0092	.1234
2000	4.63	0	104	2	.0035	.0070	.1304

Time	G. Ht. Feet	Sh. Adj.	Discharge			Runoff	
			C. f. s.	Inc.	In/Hr.	Inches	Acc. In
			December 29, 1969 cont.				
2200	4.43	0	85	2	.0029	.0058	.1362
2400	4.29	0	72	1	.0024	.0024	.1386
			4,047.2	24			
			169				
			December 30, 1969				
0000	4.29	0	72	1.5	.0024	.0036	.1422
0300	4.19		64	3	.0022	.0066	.1488
0600	4.04		54	4.5	.0018	.0081	.1569
1200	3.92		45	6	.0015	.0090	.1659
1800	3.82		39	6	.0013	.0078	.1737
2400	3.74	0	34	3	.0011	.0033	.1770
			1,149	24			
			48				
			December 31, 1969				
0000	3.74	0	34	6	.0011	.0066	.1836
1200	3.65		30	9	.0010	.0090	.1926
1800	3.60		27	4	.0009	.0036	.1962
2000	3.57		26	3	.0009	.0027	.1989
2400	3.50	0	23	2	.0008	.0016	.2005
			706	24			
			29				

 Computed by EEL RBH Date 11/10/70 Checked by D.L.T. J.O.B. Date 12/17/70

UNITED STATES DEPARTMENT OF INTERIOR
GEOLOGICAL SURVEY - WATER RESOURCES DIVISION
TEXAS DISTRICT

WEIGHTED-PRECIPIATION RECORD

Sheet 1 of 2
Comp. by: LBH
Date: 2-22-71
Check by: LDH
Date: 5-3-71

Study Area <u>Green Creek near Alexander, Tex</u>										Date of storm										Accumulated										
Accumulated Precipitation in Inches for Recording Rain Gauges										Recording gauges (See Gauges x K)										All Gauges										
Weight Factor	Gauge Aug 1-11-8	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor	Gauge	Recorded	x Factor
Date & Time	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor	Recorded	x Factor
<u>Dec. 28, 1868</u>																														
<u>00.00</u>																														
<u>06.00</u>																														
<u>09.00</u>																														
<u>12.00</u>																														
<u>13.15</u>																														
<u>30</u>																														
<u>14.00</u>																														
<u>18.00</u>																														
<u>21.00</u>																														
<u>30</u>																														
<u>22.00</u>																														
<u>15</u>																														
<u>23.00</u>																														
<u>24.00</u>																														
<u>Dec. 29</u>																														
<u>00.15</u>																														
<u>30</u>																														
<u>01.00</u>																														
<u>15</u>																														
<u>30</u>																														
<u>45</u>																														
<u>02.00</u>																														
<u>15</u>																														
<u>30</u>																														
<u>03.00</u>																														

Sheet 2 of 2
Comp. by: B B H
Date 4-27-71
Check by JDB
Date 5-3-71

WEIGHTED PRECIPITATION RECORD

Date of storm

[illegible]

-32-

DISCHARGE IN CUBIC FEET PER SECOND

ACCUMULATED RAINFALL AND RUNOFF, IN INCHES

500
450
400
350
300
250
200
150
100
50
0

2.0
1.0
0

0600 0900 1200 1500 1800 2100 2400 0300 0600

December 28, 1969

December 29, 1969

HYDROGRAPH and MASS CURVES
for
STORM OF DECEMBER 28-29, 1969
at

GREEN CREEK NEAR ALEXANDER, TEXAS

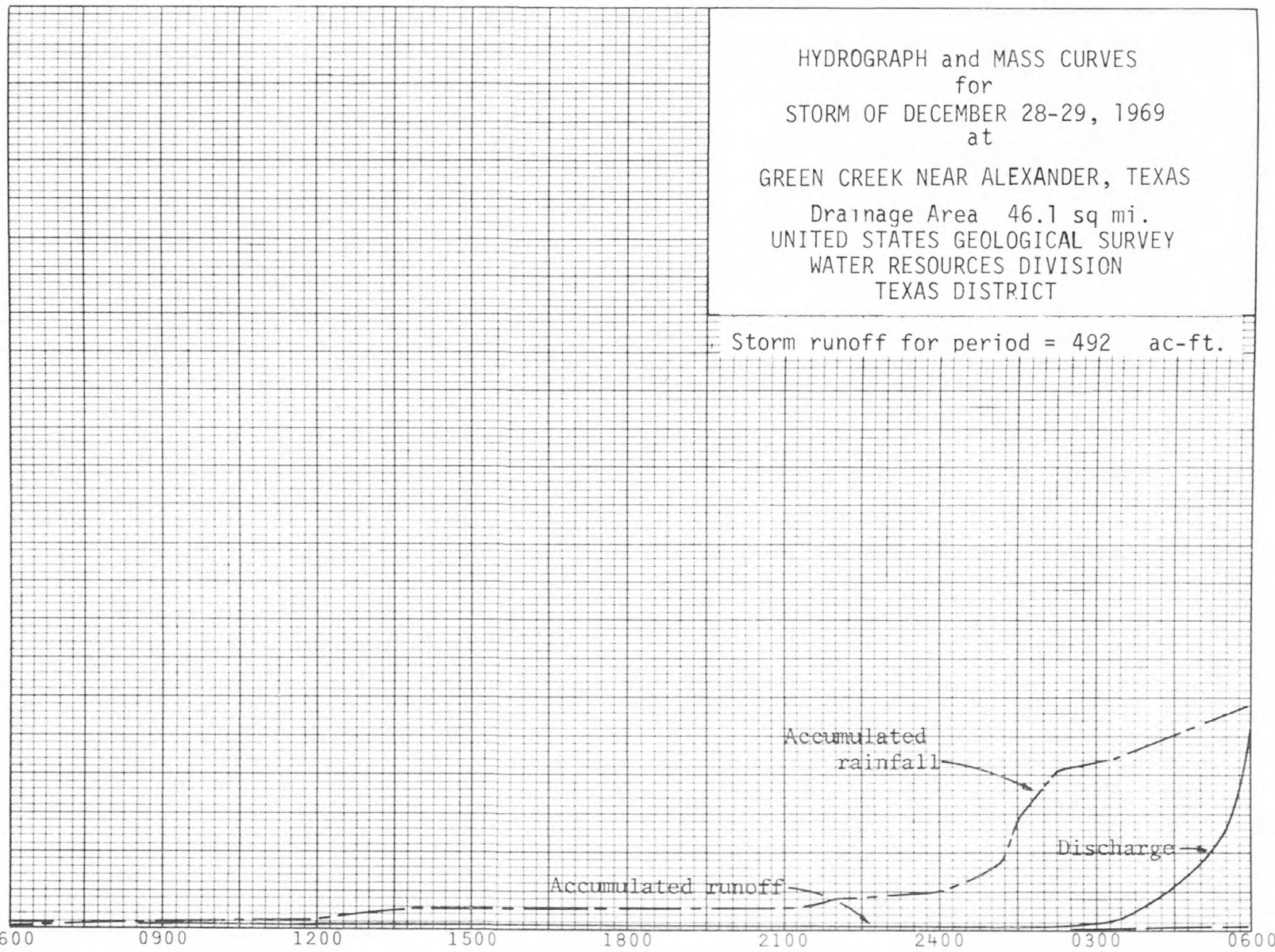
Drainage Area 46.1 sq mi.
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT

Storm runoff for period = 492 ac-ft.

Accumulated
rainfall

Discharge

Accumulated runoff



-33-

DISCHARGE IN CUBIC FEET PER SECOND

ACCUMULATED RAINFALL AND RUNOFF, IN INCHES

500
450
400
350
300
250
200
150
100
50
0

2.0
1.0
0

0600 0900 1200 1500 1800 2100 2400 0300 0600

December 29, 1969

HYDROGRAPH and MASS CURVES
for
STORM OF DECEMBER 28-29, 1969
at

GREEN CREEK NEAR ALEXANDER, TEXAS

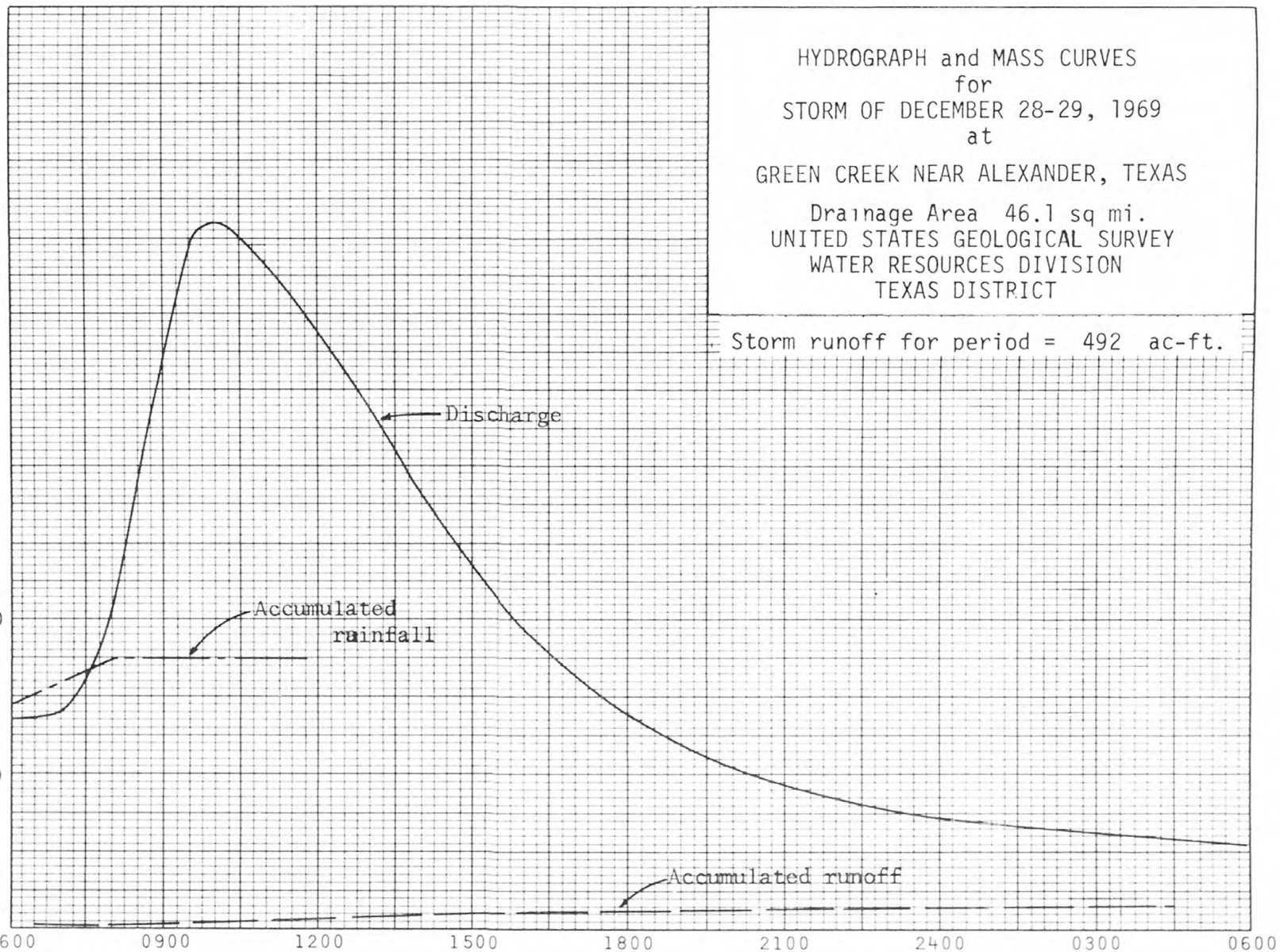
Drainage Area 46.1 sq mi.
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT

Storm runoff for period = 492 ac-ft.

Discharge

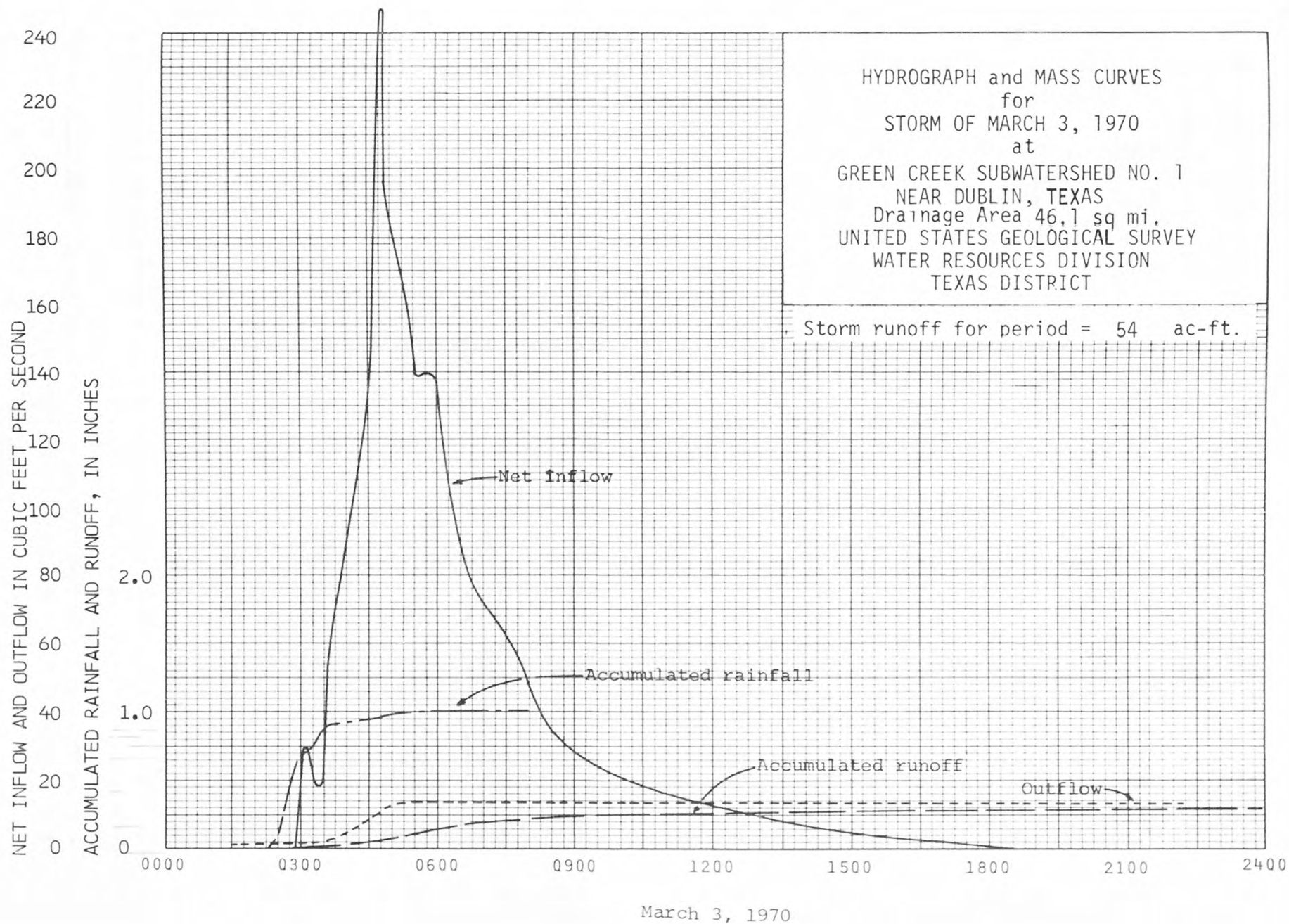
Accumulated
rainfall

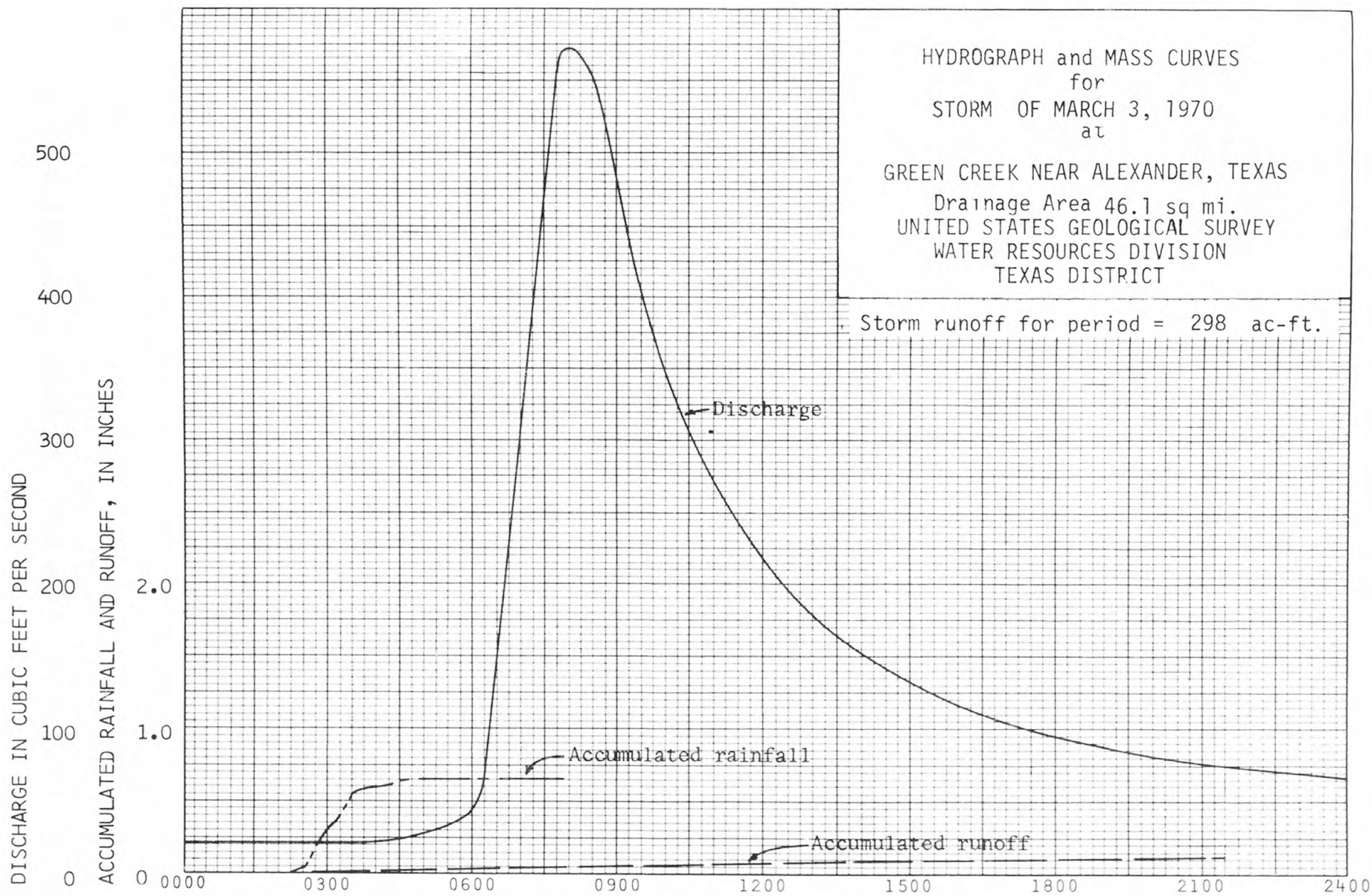
Accumulated runoff



INFLOW AND OUTFLOW COMPUTATIONSStorm period March 3, 19708-940 Green Creek subwatershed No. 1 near Dublin, Tex. D.A. 3.34 sq mi

Date and time	Gage height ft	Storage ac-ft	Time int. hrs	Change in storage		Mean G. Ht. ft	Outflow cfs	Total inflow cfs	Rainfall on Pool				Net Inflow			
				ac-ft	cfs				in	ac	ac-ft	cfs	cfs	in/hr	in	Acc in
		March 3														
0000	11.10	226.55														
0230	11.09	226.15	.25	- .40	- 1.94	11.10	189	0	.10	40.2	.39	1.65	0	0.0000	0.0000	0.0000
45	11.09	226.15	.25	0	0	11.09	166	166	.32	40.1	1.08	52.27	0	0.0000	0.0000	0.0000
0300	11.10	226.55	.25	.40	- 1.94	11.10	189	0	.26	40.2	.88	42.59	0	0.0000	0.0000	0.0000
15	11.12	227.36	.25	.81	39.20	11.11	218	41.34	.07	40.2	.23	11.12	30.2	.0140	.0035	.0035
30	11.14	228.17	.25	.81	39.20	11.13	265	41.85	.14	40.3	.48	23.23	18.6	.0086	.0022	.0057
45	11.17	229.38	.25	1.21	58.56	11.16	345	62.01	.02	40.5	.07	3.39	58.6	.0272	.0068	.0125
0400	11.21	231.00	.25	1.62	78.81	11.19	430	82.71	.01	40.6	.04	1.94	80.8	.0375	.0094	.0219
15	11.26	233.04	.25	2.04	98.74	11.24	580	104.54	.02	40.9	.07	3.39	101	.0469	.0117	.0336
30	11.32	235.51	.25	2.47	119.55	11.29	738	126.93	.01	41.1	.04	1.94	125	.0580	.0145	.0481
45	11.39	238.41	.25	2.90	140.36	11.36	980	150.16	.01	41.5	.04	1.94	148	.0687	.0172	.0653
50	11.43	240.08	.083	1.67	292.48	11.41	1155	254.03	.01	41.8	.04	5.81	248	.1151	.0096	.0749
55	11.46	241.34	.083	1.26	182.95	11.44	1250	195.45	0				195	.0905	.0075	.0824
0500	11.49	242.60	.083	1.26	182.95	11.48	1295	195.90	.02	42.1	.07	10.16	186	.0863	.0072	.0896
15	11.57	246.00	.25	3.40	164.56	11.53	1303	177.59	.01	42.4	.04	1.94	176	.0817	.0204	.1100
30	11.64	248.99	.25	2.99	144.72	11.60	1310	157.82					158	.0733	.0183	.1283
45	11.70	251.58	.25	2.59	125.36	11.67	1317	138.53					139	.0645	.0161	.1444
0600	11.76	254.20	.25	2.62	126.81	11.73	1323	140.04					140	.0650	.0162	.1606
15	11.81	256.38	.25	2.18	105.51	11.78	1328	118.79					119	.0552	.0138	.1744
30	11.85	258.15	.25	1.77	85.67	11.83	1336	99.03					99.0	.0459	.0115	.1859
0700	11.91	260.81	.5	2.66	64.37	11.88	1346	77.83					77.8	.0361	.0180	.2039
30	11.96	263.05	.5	2.24	54.21	11.94	1354	67.75					67.8	.0315	.0158	.2197
0800	12.00	264.84	.5	1.79	43.32	11.98	1358	56.90					56.9	.0264	.0132	.2329
0900	12.04	266.66	1	1.82	22.02	12.02	1362	35.64					35.6	.0165	.0165	.2494
1000	12.06	267.56	1	.90	10.89	12.05	1365	24.54					24.5	.0114	.0114	.2608
1300	12.06	267.56	3	0	0	12.06	1366	13.66					13.7	.0064	.0192	.2790
1400	12.05	267.11	1	- .45	- 5.44	12.06	1366	8.22					8.2	.0038	.0038	.2828
1600	12.02	265.75	2	- 1.36	- 8.23	12.03	1363	5.40					5.4	.0025	.0050	.2878
1800	11.98	263.94	2	- 1.81	- 10.95	12.00	1360	2.65					2.7	.0013	.0026	.2904
2000	11.93	261.70	2	- 2.24	- 13.55	11.96	1356	0					0	.0000	.0000	.2904
2400	11.84	257.71	4	- 3.99	- 12.05	11.88	1346	1.41					1.4	.0006	.0024	.2928
							274.9760									
							11.46									





March 3, 1970

Station Green Creek near Alexander, Tex.
Period of Record May 30-31, 1970 Drainage Area 46.1 sq mi

Computed by BBH Date 11-25-70 Checked by DLT JDB Date 12-1-70
4-30-71

WEIGHTED-PRECIPITATION RECORD

Comp. by: BBH

Date 4-27-71

Check by JDB

Date 5-3-71

[illegible]

WMR = Sum of Precipitation x Weight Factor

$$K = \frac{WMR}{\text{Total Recording Gages Weighted Precipitation}} = \frac{1.44}{1.09}$$

WMB: 0.804

-42-
DISCHARGE IN CUBIC FEET PER SECOND

ACCUMULATED RAINFALL AND RUNOFF, IN INCHES

2,200
2,000
1,800
1,600
1,400
1,200
1,000
800
600
400
200
0

2.0
1.0
0

1800

May 30, 1970

2100

2400

0300

0600

0900

1200

1500

1800

HYDROGRAPH and MASS CURVES
for
STORM OF MAY 30, 1970
at

GREEN CREEK NEAR ALEXANDER, TEXAS

Drainage Area 46.1 sq mi.
UNITED STATES GEOLOGICAL SURVEY
WATER RESOURCES DIVISION
TEXAS DISTRICT

Storm runoff for period = 365 ac-ft.

Discharge

Accumulated rainfall

Accumulated runoff

