# HYDROLOGIC DATA FOR URBAN STUDIES IN THE HOUSTON METROPOLITAN AREA, TEXAS, 1984

By Fred Liscum, J. P. Bruchmiller, D. W. Brown, and E. M. Paul

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## METRIC CONVERSIONS

For those readers interested in using the metric system, the inch-pound units of measurements used in this report may be converted to metric units by using the following conversion factors:

| From | | | To obtain | |
|---|---|---|---|---|
| Unit | Abbreviation | Multiply by | Unit | Abbreviation |
| inch | in. | 25.4 | millimeter | mm |
| foot | ft | 0.3048 | meter | m |
| mile | mi | 1.609 | kilometer | km |
| square mile | $mi^2$ | 2.590 | square kilometer | $km^2$ |
| cubic foot per second | $ft^3/s$ | 0.02832 | cubic meter per second | $m^3/s$ |
| foot per mile | ft/mi | 0.189 | meter per kilometer | m/km |
| acre-foot | -- | 1233 | cubic meter | $m^3$ |
| | | 0.001233 | cubic hectometer | $hm^3$ |

# HYDROLOGIC DATA FOR URBAN STUDIES IN THE HOUSTON METROPOLITAN AREA, TEXAS, 1984

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## INTRODUCTION

Hydrologic investigations of urban watersheds in Texas were begun by the U.S. Geological Survey in 1954. Studies are now in progress in the Austin and Houston areas, and have been completed in the Dallas-Fort Worth and San Antonio areas.

The U.S. Geological Survey, in cooperation with the city of Houston, began studies in the Houston metropolitan area in 1964. The program was expanded in 1968 to include collection of water-quality data. The objectives of the Houston urban-hydrology study are as follows:

1. To determine, on the basis of historical data and hydrologic analyses, the magnitude and frequency of flood peaks and flood volumes;
2. To determine the effect of urban development on flood peaks and volumes; and
3. To ascertain the variation in water quality for different flow conditions and different seasons.

This report, the twenty-first and last scheduled in a series of reports published annually, is primarily applicable to objective 2. The report presents hydrologic data collected in the Houston urban area for the 1984 water year (October 1, 1983 to September 30, 1984).

A report by Johnson and Sayre (1973) utilized records collected from 1965 to 1969 to study the effects of urbanization on floods in the Houston area. That report also summarized various basin parameters. A report by Waddell, Massey, and Jennings (1979) presented data on runoff from the Houston area and computed concentrations and loads of selected water-quality constituents discharged to Galveston Bay. The study utilized a variation of the "STORM" model developed by the Hydrologic Engineering Center of the U.S. Army Corps of Engineers. A report prepared by Liscum and Massey (1980) presented a technique for estimating the magnitude and frequency of floods in the Houston area from drainage areas, bank-full conveyance, and percentage of urban development.

A definition of terms related to streamflow, water quality, and other hydrologic data, as used in this report, are defined in "U.S. Geological Survey, Water-resources data for Texas, water year 1984, volume 2."

## LOCATION AND DESCRIPTION OF THE AREA

The Houston study area, which is located about 45 miles from the Gulf of Mexico, is on an almost level plain. The land surface in the area increases in altitude from 35 feet above the National Geodetic Vertical Datum of 1929 (NGVD) in the southeast to 135 feet in the northwest. Soils in the area are predominately clay, clay loams, and fine sandy loams of low permeability.

Records show that the entire Houston urban study area is being developed rapidly. Percent increases in urbanization in various drainage-basin areas in the Houston metropolitan area from 1969 to 1976 are given in table 1.

The major stream draining the area is Buffalo Bayou, a tributary of the San Jacinto River. Buffalo Bayou is regulated by the Barker and the Addicks flood-detention reservoirs near the western limits of the area. From these reservoirs, Buffalo Bayou meanders east and is fed by five major tributaries: Whiteoak, Brays, Sims, Hunting, and Greens Bayous. The drainage area of Buffalo Bayou, excluding the area above the flood-detention reservoirs, is about 810 square miles.

The climate of the Houston area is characterized by short mild winters, long hot summers, high relative humidity, and prevailing southeasterly winds. The mean annual temperature (1941-70) is 68.9°F (20.5°C); the lowest temperature recorded was 5°F (-15°C) in 1930; and the maximum recorded was 108°F (42°C) in 1909. The 30-year average (1941-70) annual rainfall for Houston is 48.19 inches, which is distributed uniformly throughout the year. The maximum annual rainfall was 72.86 inches in 1900; and the minimum was 17.66 inches in 1917.

## DATA-COLLECTION METHODS

The location of hydrologic-instrument installations and water-quality sampling sites in the Houston urban study area are shown in figure 1. The location of hydrologic instruments and data-collection sites in the individual basins are shown in figures 4-19.

### Precipitation Data

All precipitation data measured in the study area is rainfall. Data are collected at 39 recording and 11 nonrecording rain gages located in the study area (fig. 1). Thirty-one of the nonrecording gages are maintained by the U.S. Geological Survey, and the other eight are operated by the National Weather Service. The eleven nonrecording rain gages are also operated by the National Weather Service. The gages are distributed throughout the drainage basins to measure total precipitation and to define rainfall intensities. Rainfall data are given in the section "Compilation of Data." Locations of recording and nonrecording rain gages at sites other than stream-gaging stations are given later in table 19.

Precipitation at individual gages and weighted precipitation in each study basin is given in the section "Compilation of data." Daily and monthly rainfall amounts are also given in the section "Compilation of data."

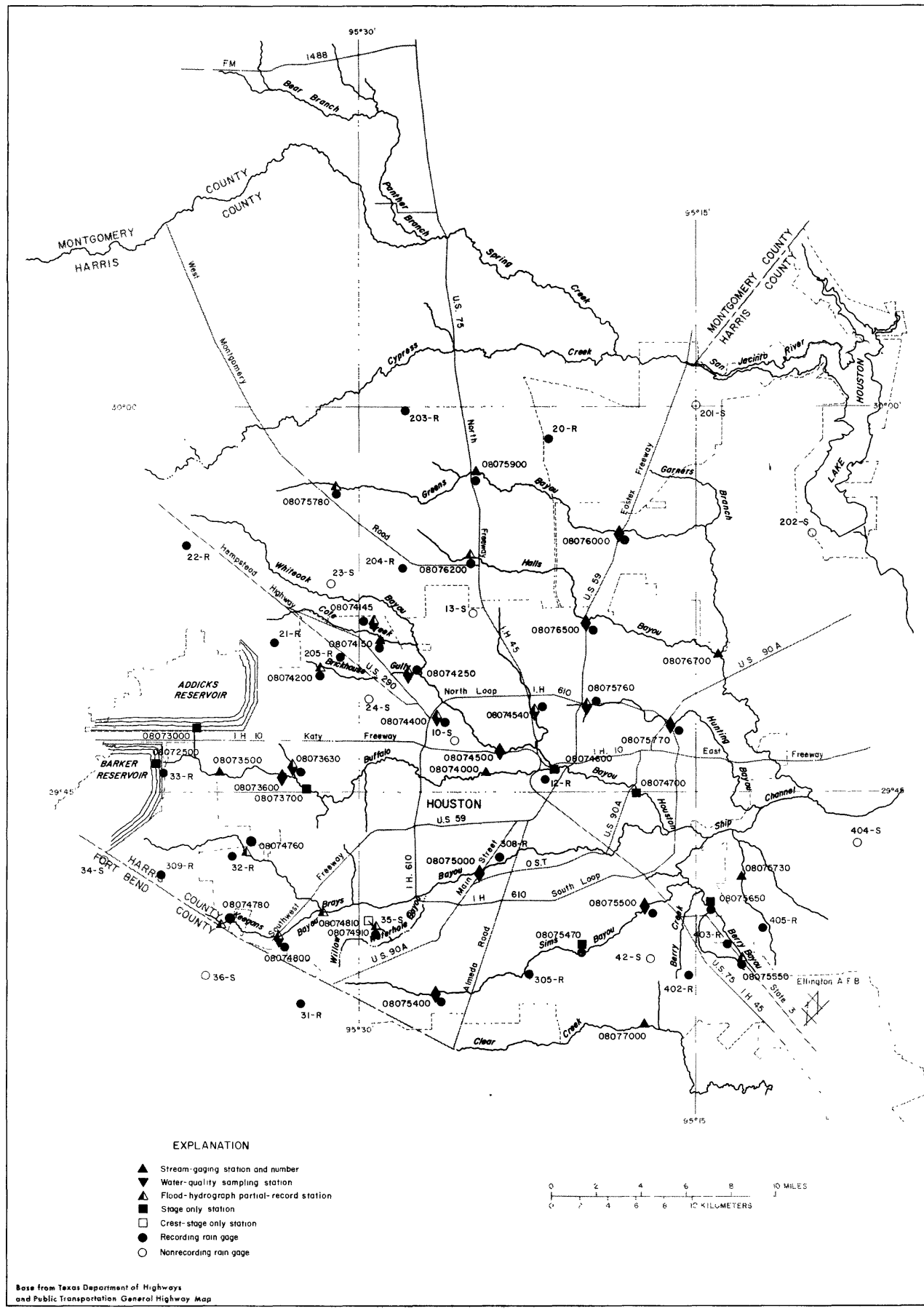


FIGURE 1.- Location of data-collection sites in the Houston urban study area

Table 1.--Percent increases in urbanization in various drainage areas above stream gaging stations in the Houston metropolitan area from 1969 to 1976

| Station no. | Station name | Percent of drainage area that is urbanized | | Percent increase |
|---|---|---|---|---|
| | | 1969 a/ | 1976 b/ | |
| 08074150 | Cole Creek at Diehl Road | 34.3 | 54.0 | 19.7 |
| 08074200 | Brickhouse Gully at Clarblak Street | 34.6 | 54.7 | 20.1 |
| 08074250 | Brickhouse Gully at Costa Rica Street | 61.0 | 77.5 | 16.5 |
| 08074500 | Whiteoak Bayou at Houston | 45.2 | 57.7 | 12.5 |
| 08074780 | Keegans Bayou at Keegan Road | 21.0 | 44.9 | 23.9 |
| 08074800 | Keegans Bayou at Roark Road | 26.3 | 55.7 | 29.4 |
| 08075000 | Brays Bayou at Houston | 44.6 | 64.4 | 19.8 |
| 08075400 | Sims Bayou at Hiram Clarke Street | 40.4 | 69.3 | 28.9 |
| 08075500 | Sims Bayou at Houston | 50.2 | 73.7 | 23.5 |
| 08075550 | Berry Bayou at Gilpin Street | 58.0 | 71.8 | 13.8 |
| 08075650 | Berry Bayou at Forest Oaks Street | 72.9 | 85.3 | 12.4 |
| 08075760 | Hunting Bayou at Falls Street | 95.9 | 98.9 | 3.0 |
| 08075770 | Hunting Bayou at Interstate Highway 610 | 83.3 | 95.0 | 11.7 |
| 08075780 | Greens Bayou at Cutten Road | 24.4 | 47.2 | 22.8 |
| 08076000 | Greens Bayou near Houston | 26.3 | 43.9 | 17.6 |
| 08076200 | Halls Bayou at Deertrail Street | 30.4 | 52.8 | 22.4 |
| 08076500 | Halls Bayou at Houston | 60.3 | 74.1 | 13.8 |

a/ Johnson and Sayre, 1973.
b/ Liscum and Massey, 1980.

Weighted-mean precipitation factors for drainage basins in the Houston area are given in table 2. Weighted-mean precipitation for a study area is determined by the Thiessen method as described by Linsley, Kohler, and Paulhus (1949). All of the rain gages, recording and nonrecording, are used to compute the monthly and annual rainfall amounts. Only the functioning recording gages are used to compute storm rainfall amounts. For example, the monthly and annual weighted-mean precipitation for the drainage basin upstream from the Cole Creek at the Deihl Road gaging station could be computed as follows: Multiply the recorded precipitation at the rain gage at station 08074150 by 0.10; to that value add the recorded precipitation at the rain gage at station 08074145 multiplied by 0.15; to that value add the recorded precipitation at the rain gage at station 205R multiplied by 0.15; to that value add the recorded precipitation at the rain gage at station 23S multiplied by 0.15; and to that value add the recorded precipitation at the rain gage at station 21R multiplied by 0.45.

Rainfall for the current year was unevenly distributed over the area. Individual station totals ranged from 22.62 inches at the U.S. Geological Survey streamflow station, Greens Bayou at U.S. Highway 59 (station 08076000) in northeast Houston to 44.16 inches at the U.S. Geological Survey rain gage at Lafferty Street in Pasadena (station 405R) which borders southeast Houston. Figure 2 shows the comparison of accumulated monthly rainfall for the 1984 water year for five widely separated drainage basins with the 30-year rainfall average (1941-70) of 48.19 inches for Houston. Rainfall in the months of October, and March through July was considerably less than the 30-year average for all basins. Rainfall greatly exceeded the 30-year average only in the month of August in the Vince Bayou and Upper Sims Bayou basins. As figure 2 illustrates, total rainfall for the 1984 water year approached that of the 30-year average only in the Vince Bayou basin. The deficiency in rainfall during the 1984 water year is further emphasized by noting that actual rainfall for these five basins ranged from 4.41 inches less to 18.63 inches less than the 30-year average of 48.19 inches.

Nineteen storms during the 1984 water year produced rainfall totals in excess of 2.0 inches. Thirteen of these storms were confined to only a few drainage basins and the remaining six produced significant rainfall over most of the metropolitan area. The most significant storms, in terms of total rainfall and areal coverage were on January 8-9, May 18-20, and June 6-8. The storms of July 18 and August 12 produced significant daily rainfalls over smaller areas.

The storm of January 8-9 produced rainfall ranging from about 2.9 inches in the Halls Bayou drainage basin in north Houston to about 0.2 inch in the upper part of the Sims Bayou drainage basin in south Houston. Most of the rainfall occurred on January 9.

The storm of May 18-20 produced rainfall ranging from about 3.2 inches in the vicinity of Barker Reservoir in west Houston to about 1.0 inch in the Hunting Bayou drainage basin of east Houston. Most of the rainfall occurred late on May 18 and early on May 19.

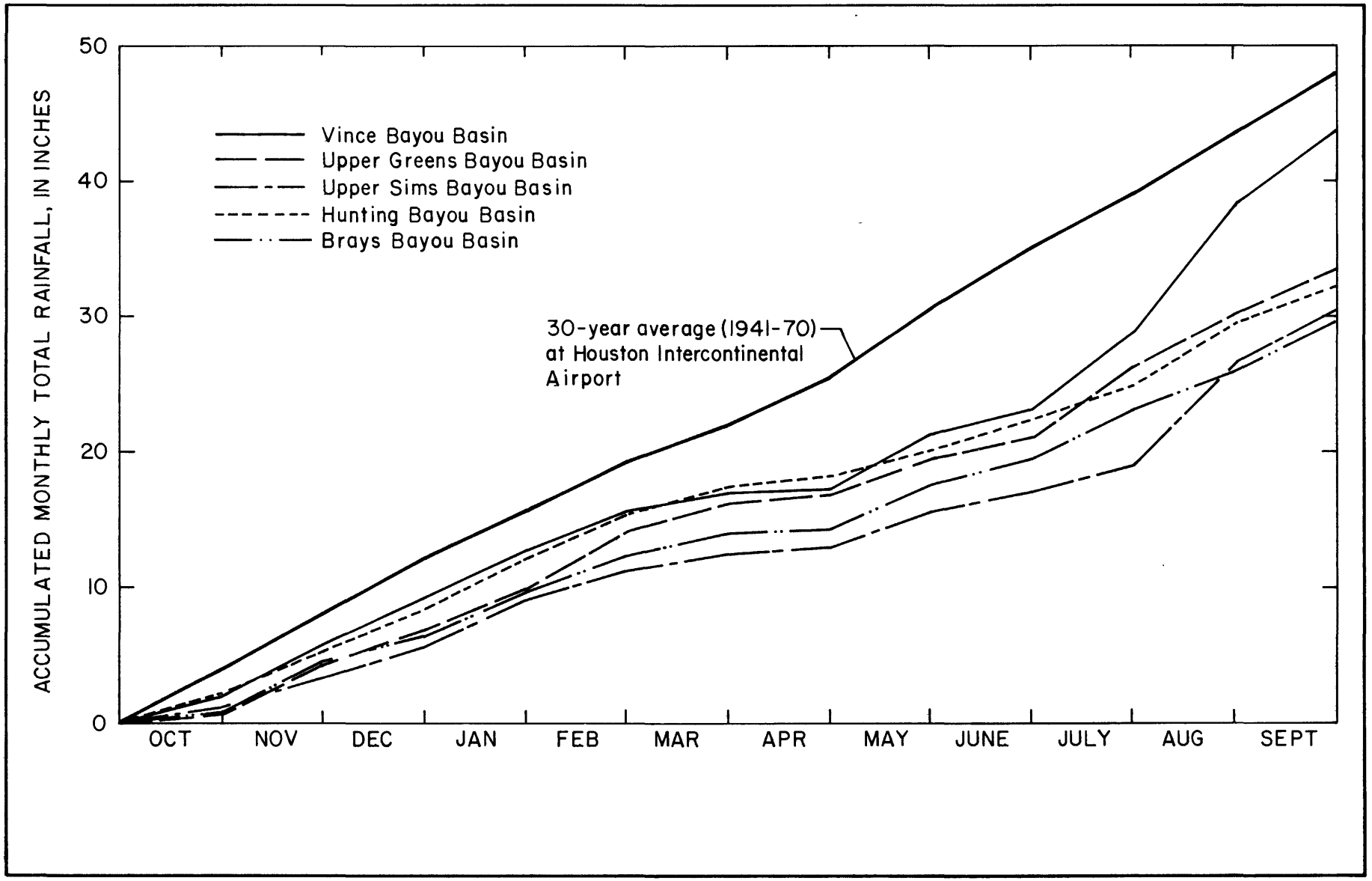


Figure 2.–Rainfall at five drainage basins in the Houston metropolitan area, 1984 water year

Table 2.--Weighted-mean precipitation factors for drainage basins above stations in the Houston metropolitan area

| Station number and name | Gages and factors used to compute monthly and yearly totals | | Date of storm | Gages and factors used to compute storm totals | |
|---|---|---|---|---|---|
| | Rain gage 1/ | Weighted-mean precipitation factors 2/ | | Rain gage 1/ | Weighted-mean precipitation factors 2/ |
| 08073630 Bettina Street Ditch at Houston | Not computed | -- | Mar. 23-24, 1984 | 08073630 | 1.00 |
| 08074145 Bingle Road Storm Sewer at Houston | Not computed | -- | July 5, 1984 | 08074145 | 1.00 |
| 08074150 Cole Creek at Deihl Road, Houston | 08074150<br>08074145<br>205R<br>23S<br>21R | .10<br>.15<br>.15<br>.15<br>.45 | July 18-20, 1984 | 08074150<br>08074145<br>205R<br>21R | .10<br>.20<br>.15<br>.55 |
| 08074200 Brickhouse Gully at Clarblak Street, Houston | Not computed | -- | July 18-19, 1984 | 08074200<br>21R | .30<br>.70 |
| 08074250 Brickhouse Gully at Costa Rica Street, Houston | 08074250<br>08074200<br>08074150<br>205R<br>24S<br>21R | .10<br>.30<br>.10<br>.25<br>.10<br>.15 | July 18-20, 1984 | 08074250<br>08074200<br>08074150<br>205R<br>21R | .15<br>.30<br>.10<br>.30<br>.15 |
| 08074400 Lazybrook Street Storm Sewer at Houston | Not computed | -- | Mar. 23, 1984<br>July 5, 1984<br>Aug. 5, 1984 | 08074400<br>08074400<br>08074400 | 1.00<br>1.00<br>1.00 |

See footnotes at end of table.

Table 2.--Weighted-mean precipitation factors for drainage basins above stations in the Houston metropolitan area--Continued

| Station number and name | Gages and factors used to compute monthly and yearly totals | | Date of storm | Gages and factors used to compute storm totals | |
|---|---|---|---|---|---|
| | Rain gage 1/ | Weighted-mean precipitation factors 2/ | | Rain gage 1/ | Weighted-mean precipitation factors 2/ |
| 08074500 Whiteoak Bayou at Houston | 08074400 | 0.05 | Mar. 23-25, 1984 | 08074400 | 0.15 |
| | 08074250 | .10 | | 08074250 | .10 |
| | 08074200 | .05 | | 08074200 | .05 |
| | 08074150 | .05 | | 08074150 | .05 |
| | 08074145 | .05 | | 08074145 | .05 |
| | 205R | .05 | | 205R | .05 |
| | 204R | .10 | | 204R | .20 |
| | 24S | .05 | | 22R | .20 |
| | 23S | .25 | | 21R | .15 |
| | 22R | .15 | | | |
| | 21R | .05 | | | |
| | 10S | .05 | | | |
| | | | June 6-8, 1984 | 08074400 | .15 |
| | | | | 08074250 | .10 |
| | | | | 08074200 | .05 |
| | | | | 08074150 | .05 |
| | | | | 08074145 | .05 |
| | | | | 205R | .05 |
| | | | | 204R | .20 |
| | | | | 22R | .20 |
| | | | | 21R | .15 |
| 08074540 Little Whiteoak Bayou at Trimble St., Houston | Not computed | -- | Jan. 9-10, 1984 | 08076500 | .20 |
| | | | | 08076200 | .25 |
| | | | | 08074540 | .35 |
| | | | | 08074400 | .20 |
| 08074760 Brays Bayou at Alief | Not computed | -- | June 6-8, 1984 | 08074760 | .55 |
| | | | | 33R | .45 |
| 08074780 Keegans Bayou at Keegan Road, Houston | Not computed | -- | July 18-21, 1984 | 08074780 | 1.00 |

See footnotes at end of table.

Table 2.--Weighted-mean precipitation factors for drainage basins above stations in the Houston metropolitan area--Continued

| Station number and name | Gages and factors used to compute monthly and yearly totals | | Date of storm | Gages and factors used to compute storm totals | |
|---|---|---|---|---|---|
| | Rain gage 1/ | Weighted-mean precipitation factors 2/ | | Rain gage 1/ | Weighted-mean precipitation factors 2/ |
| 08074800 Keegans Bayou at Roark Road, Houston | 08074800 | 0.10 | June 6-10, 1984 | 08074800 | 0.10 |
| | 08074780 | .65 | | 08074780 | .90 |
| | 34S | .25 | | | |
| 08074810 Brays Bayou at Gessner Drive, Houston | Not computed | -- | Nov. 30-Dec. 2, 1983 | 08074910 | .05 |
| | | | | 08074780 | .30 |
| | | | | 08074760 | .25 |
| | | | | 33R | .10 |
| | | | | 32R | .25 |
| | | | | 31R | .05 |
| 08074910 Hummingbird Street Ditch at Houston | Not computed | -- | Nov. 30, 1983 | 08074910 | 1.00 |
| 08075000 Brays Bayou at Houston | 08074910 | .10 | Jan. 8-11, 1984 | 08074800 | 0.25 |
| | 08074800 | .15 | | 08074780 | .10 |
| | 08074780 | .10 | | 08074760 | .15 |
| | 08074760 | .10 | | 308R | .20 |
| | 308R | .05 | | 32R | .25 |
| | 35S | .20 | | 31R | .05 |
| | 34S | .10 | | | |
| | 33R | .05 | Mar. 23-25, 1984 | 08074910 | .25 |
| | 32R | .10 | | 08074800 | .15 |
| | 31R | .05 | | 08074780 | .10 |
| | | | | 08074760 | .15 |
| | | | | 308R | .10 |
| | | | | 33R | .05 |
| | | | | 32R | .20 |
| 08075400 Sims Bayou at Hiram Clarke Street, Houston | 08075400 | .60 | Jan. 8-10, 1984 | 08075400 | .60 |
| | 31R | .40 | | 31R | .40 |
| | | | Aug. 12-13, 1984 | 08075400 | .60 |
| | | | | 31R | .40 |

See footnotes at end of table.

Table 2.--Weighted-mean precipitation factors for drainage basins above stations in the Houston metropolitan area--Continued

| Station number and name | Gages and factors used to compute monthly and yearly totals | | Date of storm | Gages and factors used to compute storm totals | |
|---|---|---|---|---|---|
| | Rain gage 1/ | Weighted-mean precipitation factors 2/ | | Rain gage 1/ | Weighted-mean precipitation factors 2/ |
| 08075470 Sims Bayou at Martin Luther King Blvd., Houston | Not computed | -- | Jan. 9-11, 1984 | 08075470<br>08075400<br>308R<br>31R | 0.25<br>.55<br>.05<br>.15 |
| 08075500 Sims Bayou at Houston | 08075500<br>08075470<br>08075400<br>305R<br>42S<br>31R | .05<br>.20<br>.35<br>.25<br>.05<br>.10 | Jan. 8-12, 1984 | 08075500<br>08075470<br>08075400<br>308R<br>31R | .05<br>.35<br>.40<br>.05<br>.15 |
| 08075550 Berry Bayou at Gilpin Street, Houston | Not computed | -- | Aug. 12-13, 1984 | 08075550 | 1.00 |
| 08075650 Berry Bayou at Forest Oaks Street, Houston | Not computed | -- | Aug. 12-13, 1984 | 08075550<br>08075725 | .85<br>.15 |
| 08075730 Vince Bayou at Pasadena | 08075650<br>405R | .10<br>.90 | Aug. 12-13, 1984 | 08075725 | 1.00 |
| 08075760 Hunting Bayou at Falls Street, Houston | Not computed | -- | Jan. 9-10, 1984 | 08075760 | 1.00 |
| 08075770 Hunting Bayou at Interstate Highway 610, Houston | 08075770<br>08075760 | .20<br>.80 | Jan. 9-12, 1984 | 08076500<br>08075760 | .10<br>.90 |

See footnotes at end of table.

Table 2.--Weighted-mean precipitation factors for drainage basins above stations in the Houston metropolitan area--Continued

| Station number and name | Gages and factors used to compute monthly and yearly totals | | Date of storm | Gages and factors used to compute storm totals | |
|---|---|---|---|---|---|
| | Rain gage 1/ | Weighted-mean precipitation factors 2/ | | Rain gage 1/ | Weighted-mean precipitation factors 2/ |
| 08075780 Greens Bayou at Cutten Road near Houston | Not computed | -- | Jan. 9-11, 1984 | 08075780 | 1.00 |
| 08075900 Greens Bayou at U.S. Highway 75, Houston | 08075900 | .40 | Jan. 9-11, 1984 | 08075900 | 0.40 |
| | 08075780 | .55 | | 08075780 | .60 |
| | 204R | .05 | | | |
| | | | Feb. 12-14, 1984 | 08075900 | .40 |
| | | | | 08075780 | .60 |
| 08076000 Greens Bayou near Houston | 08076000 | .15 | Jan. 9-12, 1984 | 08076200 | .10 |
| | 08075900 | .45 | | 08075900 | .40 |
| | 08075780 | .30 | | 08075780 | .30 |
| | 20R | .10 | | 20R | .20 |
| 08076200 Halls Bayou at Deertrail Street near Houston | Not computed | -- | Jan. 9-10, 1984 | 08076200 | .85 |
| | | | | 08075900 | .05 |
| | | | | 08075780 | .10 |
| | | | Feb. 12-13, 1984 | 08076200 | .85 |
| | | | | 08075900 | .05 |
| | | | | 08075780 | .10 |
| 08076500 Halls Bayou at Houston | 08076500 | .40 | No storms published | -- | -- |
| | 08076000 | .05 | | | |
| | 204R | .25 | | | |
| | 13S | .30 | | | |
| 08076700 Greens Bayou at Ley Road, Houston | Not computed | -- | Jan. 9-12, 1984 | 08076500 | .35 |
| | | | | 08076200 | .10 |
| | | | | 08075900 | .15 |
| | | | | 08075780 | .10 |
| | | | | 20R | .30 |

1/ See table 19 for locations of stations other than stream-gaging stations.
2/ See section on "Precipitation Data" for explanation of use of weighted-mean precipitation factors.

The storm of June 6-8 produced rainfall ranging from about 2.3 inches in the Whiteoak Bayou drainage basin of northwest Houston to about 0.2 inch in the Hunting Bayou drainage basin of east Houston. Most of the rainfall occurred on June 6.

The storm of July 18 produced rainfall totals in excess of 2.6 inches at several sites in both northwest and southeast Houston. The storm of August 12 produced rainfall ranging from 4.20 inches to 1.92 inches for south and southeast Houston. However, neither of these storms produced significant rainfall outside of these general areas.

The storms of January 8-9, June 6-8, July 18, and August 12 were analyzed for streamflow stations in the study area based on the total rainfall produced by the storm, the quality of the recorded data, and the significance of the runoff resulting from the storm. No analysis was made for the storm of May 18-20 because very little runoff resulted due to the extremely dry antecedent moisture conditions. Other storms were selected for analysis based on discharge, total rainfall, quality of recorded data, distribution of rainfall, and availability of water-quality data.

## Runoff Data

Runoff data are based on discharge measurements and stage records at 15 continuous-record stream-gaging stations, and 15 flood-hydrograph partial-record stations (fig. 1). Stage hydrograph data are available from seven stage-only stations.

Annual records of either daily discharge or maximum gage height at continuous-record stream-gaging stations, and maximum discharge at flood-hydrograph partial-record stations are given in the section "Compilation of data." Tables of storm runoff data, including accumulated rainfall totals, are also given for selected storms in the section "Compilation of data."

Figure 3 shows the accumulated monthly runoff from six basins for the 1984 water year and the average runoff for the period 1953-70. The average annual rainfall for the 1953-70 period was 46 inches or approximately equal to the 30-year (1941-70) rainfall average of 48.19 inches at Houston. Figure 3 shows that runoff for the 1984 water year for only two of the six drainage basins, Brays Bayou and Sims Bayou, is appreciably greater than the average runoff for the period 1953-70. Runoff for the 1984 water year is slightly less than the average runoff for the period 1953-70 at two drainage basins, Halls Bayou and Buffalo Bayou. Below normal runoff is attributed to low rainfall during the 1984 water year compared to the 46-inch average during 1953-70. Note that the high ratio of runoff to rainfall exhibited by comparison of the average period of 1953-70 with the 1984 water year is one of the effects of the continual urban development in the metropolitan area--not only increased storm runoff due to increased impervious area but also increased low flow sustained by sewage treatment plant releases.

The most significant runoff-producing storms of the 1984 water year were those of January 8-9, June 6-8, July 18, and August 12. These four storms produced the annual water year peak runoff at 26 of the 33 streamflow stations

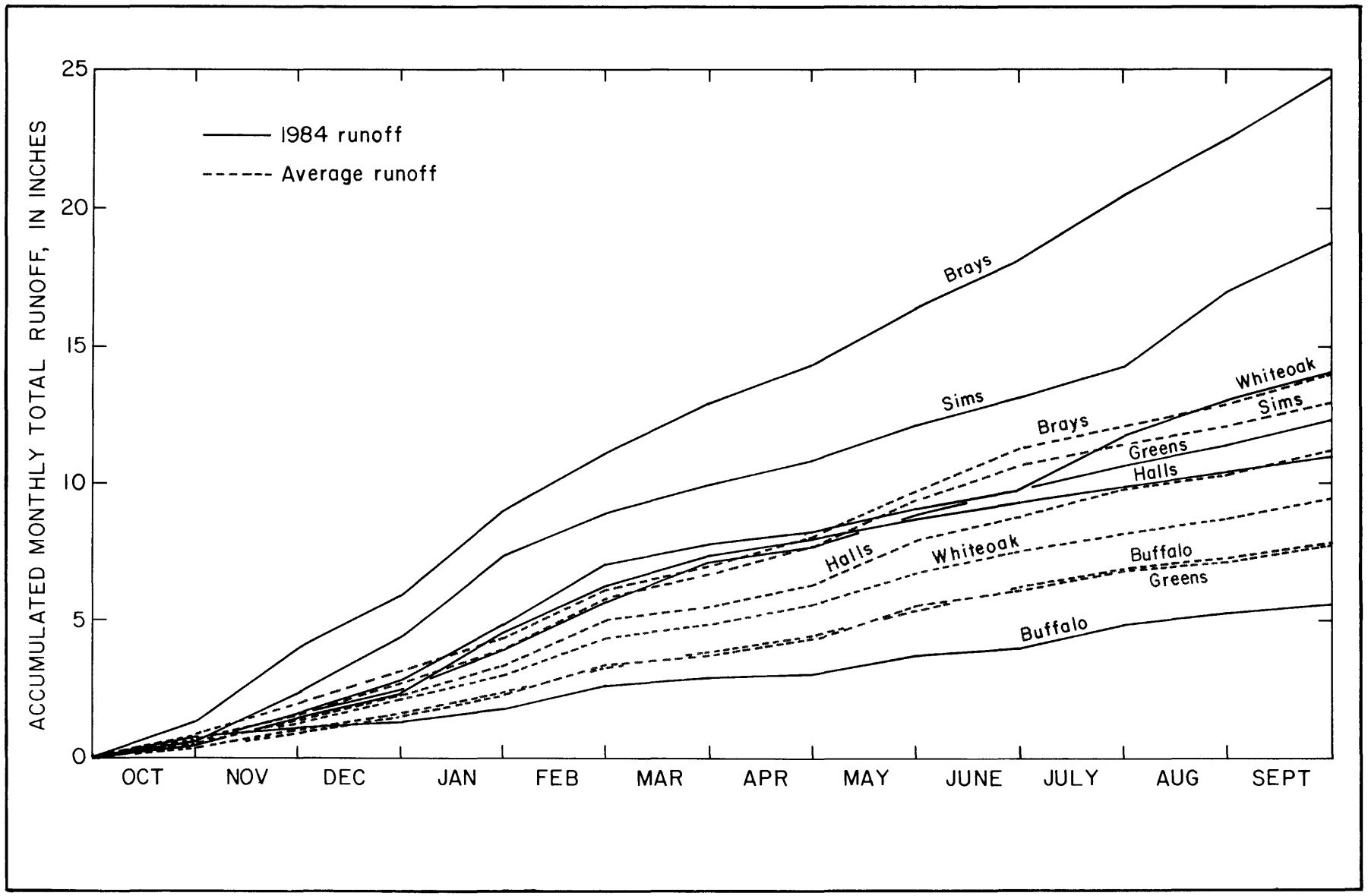


Figure 3.—Runoff from six drainage basins in the Houston metropolitan area, 1984 water year, and average runoff for the period 1953-70

included in this report. Data published in the section "Compilation of data" show that computed storm runoff for the storm of January 8-9 ranged from 0.5 to 1.6 inches. This storm was the most significant event of the water year as it produced the annual water year peak at 13 of the 33 streamflow stations. The storm of June 6-8 produced runoff from 0.4 to 0.6 inches. The annual water year peak at three stations resulted from this storm. The storm of July 18 produced runoff ranging from 0.5 to 0.9 inches. This storm produced the annual water year peak at seven stations. The storm of August 12 produced runoff room 0.6 to 1.6 inches. This storm produced the annual water year peak at three stations.

The ratio of runoff to rainfall was determined for all storms included in the section "Compilation of data." The ratio ranged from 0.30 to 0.72 for the storm of January 8-9. These values were distributed as follows: Less than 0.4, 3 sites; between 0.4 and 0.6, 4 sites; greater than 0.6, 4 sites. The ratio ranged from 0.28 to 0.39 for the storm of June 6 to 8; 0.29 to 0.44 for the storm of July 18; and 0.23 to 0.51 for the storm of August 12. A high ratio of runoff to rainfall may result from saturated soil moisture conditions, high-intensity rainfall, and long-duration rainfall in conjunction with highly developed drainage basins which include a large portion of impervious land cover and efficient storm drainage systems. However, caution is urged in the use of these computed values as the accuracies of the ratios may be adversely effected by inadequate rain-gage coverge, indeterminate drainage-area boundaries, basin exchange, and indefinite stage-discharge relationships.

Values for total storm runoff, storm peak discharge, ratio of runoff to rainfall, and other pertinent data for all storms analyzed in the 1984 water year are given in tables 3 to 18. A total of 9 storms have been analyzed for the 1984 water year resulting in a total of 34 separate storm-data listings. The storm rainfall dates and the number of stream-gaging stations, for which data are published, are in the section "Compilation of data."

| No. | Storm rainfall date | Number of stations for which data are published |
|---|---|---|
| 1 | November 30 | 2 |
| 2 | January 8-9 | 12 |
| 3 | February 12-13 | 2 |
| 4 | March 23-24 | 4 |
| 5 | June 6-8 | 3 |
| 6 | July 5 | 2 |
| 7 | July 18 | 4 |
| 8 | August 5 | 1 |
| 9 | August 12 | 4 |

## Water-Quality Data

Water-quality data were collected at 15 locations in the study area during the 1984 water year. The locations of the water-quality data collection sites are shown on figure 1. Water-quality data and streamflow data are presented in downstream order in the section "Compilation of data."

Water-quality data are collected from a wide range of discharge representing various flow and seasonal conditions, and include determinations for physical, chemical, and biological parameters. Physical analyses include measurements of temperature, pH, turbidity, suspended and volatile solids, and color. Chemical analyses include specific conductance, dissolved oxygen, standard inorganic chemical (major ions), and selected nutrients including total organic carbon, nitrogen, and phosphorus. Chemical analyses of trace substances include minor elements, and pesticides. Biological analyses include measurements of BOD (biochemical oxygen demand) and bacteriological analyses for total coliform, fecal coliform, and fecal streptococci.

Water samples were also collected during selected storms to determine the quality of storm runoff in the Houston metropolitan area. Storm dates and stations where at least three water-quality samples were collected during the storms are:

| Station no. | Station name | Date of storm |
|---|---|---|
| 08073630 | Bettina Street Ditch at Houston, Tex. | March 23-24, 1984 |
| 08074400 | Lazybrook Street Storm Sewer at Houston, Tex. | March 23, 1984<br>July 5, 1984<br>Aug. 5, 1984 |
| 08074500 | Whiteoak Bayou at Houston, Tex. | March 23-25, 1984 |
| 08075000 | Brays Bayou at Houston, Tex. | March 23-25, 1984 |
| 08075500 | Sims Bayou at Houston, Tex. | Aug. 12-13, 1984 |

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# COMPILATION OF DATA

SAN JACINTO RIVER BASIN

08073500 BUFFALO BAYOU NEAR ADDICKS, TX

LOCATION.--Lat 29°45'42", long 95°36'20", Harris County, Hydrologic Unit 12040104, near right bank at bridge on Dairy-Ashford Road over rectified channel, 1.8 mi downstream from South Mayde Creek, and 2.6 mi southeast of Addicks.

DRAINAGE AREA.--293 mi², unadjusted for basin boundary changes.

PERIOD OF RECORD.--August 1945 to current year.
Water-quality records.--Chemical, biochemical, and pesticide analyses: August 1970 to September 1982.

REVISED RECORDS.--WSP 1922: Drainage area.

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 1.40 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment; records unadjusted to land-surface subsidence. Prior to Feb. 2, 1948, water-stage recorder at bridge on natural channel 1,200 ft to right at same datum. Feb. 2 to May 21, 1948, nonrecording gage at present site and datum.

REMARKS.--Records fair. Floodflow regulated by Barker and Addicks Reservoirs (stations 08072500 and 08073000) 3.2 and 3.0 mi upstream, respectively (total capacity 315,900 acre-ft). Extreme low flow is sustained by drainage from irrigated lands.

AVERAGE DISCHARGE.--39 years, 212 ft³/s (153,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,200 ft³/s Aug. 29, 1945 (gage height, 81.23 ft), former site; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1896, 85.6 ft in December 1935, adjusted to former site from floodmark 0.5 mi downstream, on basis of slope of flood of Aug. 29, 1945, from information by local resident.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,400 ft³/s Oct. 1 at 0030 hours (gage height, 61.61 ft); minimum daily, 23 ft³/s May 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1390 | 35 | 35 | 37 | 45 | 63 | 28 | 50 | 41 | 295 | 185 | 52 |
| 2 | 1340 | 35 | 35 | 35 | 48 | 56 | 30 | 52 | 42 | 376 | 122 | 116 |
| 3 | 1270 | 30 | 63 | 33 | 53 | 53 | 35 | 57 | 43 | 417 | 212 | 113 |
| 4 | 1130 | 45 | 193 | 35 | 53 | 51 | 36 | 45 | 42 | 293 | 227 | 105 |
| 5 | 501 | 60 | 224 | 33 | 43 | 60 | 33 | 37 | 45 | 149 | 180 | 80 |
| 6 | 55 | 300 | 140 | 33 | 37 | 56 | 30 | 31 | 213 | 74 | 303 | 65 |
| 7 | 48 | 420 | 59 | 31 | 35 | 48 | 31 | 31 | 426 | 169 | 362 | 70 |
| 8 | 44 | 180 | 46 | 31 | 31 | 45 | 61 | 30 | 476 | 65 | 317 | 65 |
| 9 | 39 | 90 | 40 | 196 | 56 | 43 | 77 | 24 | 147 | 297 | 116 | 55 |
| 10 | 40 | 60 | 39 | 319 | 63 | 42 | 44 | 23 | 162 | 292 | 75 | 47 |
| 11 | 37 | 50 | 83 | 331 | 51 | 42 | 33 | 24 | 75 | 94 | 56 | 42 |
| 12 | 38 | 40 | 117 | 112 | 530 | 55 | 28 | 25 | 66 | 45 | 57 | 40 |
| 13 | 39 | 40 | 113 | 43 | 465 | 212 | 27 | 26 | 60 | 40 | 167 | 38 |
| 14 | 37 | 35 | 59 | 38 | 364 | 245 | 27 | 25 | 50 | 53 | 185 | 36 |
| 15 | 34 | 35 | 44 | 36 | 136 | 123 | 28 | 27 | 40 | 50 | 144 | 38 |
| 16 | 40 | 30 | 56 | 36 | 77 | 49 | 30 | 27 | 35 | 43 | 74 | 135 |
| 17 | 82 | 30 | 48 | 34 | 58 | 43 | 32 | 27 | 32 | 40 | 60 | 59 |
| 18 | 66 | 35 | 42 | 32 | 48 | 38 | 34 | 200 | 30 | 286 | 43 | 34 |
| 19 | 51 | 40 | 36 | 31 | 42 | 52 | 36 | 479 | 30 | 365 | 33 | 30 |
| 20 | 45 | 40 | 33 | 29 | 331 | 61 | 39 | 528 | 32 | 292 | 132 | 28 |
| 21 | 41 | 45 | 33 | 30 | 651 | 47 | 39 | 413 | 34 | 163 | 51 | 108 |
| 22 | 45 | 40 | 32 | 33 | 736 | 39 | 40 | 324 | 32 | 190 | 38 | 410 |
| 23 | 41 | 70 | 32 | 327 | 733 | 121 | 41 | 707 | 31 | 218 | 39 | 479 |
| 24 | 40 | 180 | 33 | 533 | 692 | 219 | 41 | 539 | 32 | 156 | 40 | 222 |
| 25 | 33 | 100 | 35 | 459 | 577 | 109 | 47 | 360 | 34 | 189 | 117 | 62 |
| 26 | 29 | 50 | 41 | 210 | 340 | 52 | 50 | 274 | 58 | 149 | 87 | 46 |
| 27 | 29 | 40 | 48 | 110 | 258 | 40 | 55 | 93 | 36 | 131 | 53 | 38 |
| 28 | 29 | 42 | 46 | 72 | 156 | 34 | 56 | 86 | 32 | 376 | 48 | 37 |
| 29 | 32 | 40 | 39 | 53 | 83 | 31 | 55 | 51 | 31 | 532 | 48 | 33 |
| 30 | 28 | 35 | 35 | 50 | --- | 30 | 46 | 44 | 46 | 430 | 46 | 32 |
| 31 | 29 | --- | 36 | 46 | --- | 30 | --- | 41 | --- | 320 | 47 | --- |
| TOTAL | 6702 | 2272 | 1915 | 3428 | 6792 | 2189 | 1189 | 4700 | 2453 | 6589 | 3664 | 2715 |
| MEAN | 216 | 75.7 | 61.8 | 111 | 234 | 70.6 | 39.6 | 152 | 81.8 | 213 | 118 | 90.5 |
| MAX | 1390 | 420 | 224 | 533 | 736 | 245 | 77 | 707 | 476 | 532 | 362 | 479 |
| MIN | 28 | 30 | 32 | 29 | 31 | 30 | 27 | 23 | 30 | 40 | 33 | 28 |
| AC-FT | 13290 | 4510 | 3800 | 6800 | 13470 | 4340 | 2360 | 9320 | 4870 | 13070 | 7270 | 5390 |

CAL YR 1983 TOTAL 133184 MEAN 365 MAX 1580 MIN 20 AC-FT 264200
WTR YR 1984 TOTAL 44608 MEAN 122 MAX 1390 MIN 23 AC-FT 88480

NOTE.--No gage-height record Nov. 1-30.

## SAN JACINTO RIVER BASIN

### 08073600 BUFFALO BAYOU AT WEST BELT DRIVE, HOUSTON, TX

LOCATION.--Lat 29°45'43", long 95°33'27", Harris County, Hydrologic Unit 12040104, at downstream side of bridge on West Belt Drive in west Houston, 100 ft downstream from Rummel Creek, 3.5 mi downstream from station 08073500, and 3.7 mi upstream from station 08073700.

DRAINAGE AREA.--307 $mi^2$, unadjusted for basin boundary changes.

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorders and crest-stage gage. Datum of gage is 0.67 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment. Telemetry located at station.

REMARKS.--Water-discharge records fair. Floodflow regulated by Barker and Addicks Reservoirs (stations 08072500 and 08073000) 10.1 and 10.3 mi upstream, respectively. Low flow is sustained by sewage effluent from Houston suburbs.

AVERAGE DISCHARGE.--13 years, 315 $ft^3/s$ (228,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,350 $ft^3/s$ Aug. 31, 1981 (gage height, 64.58 ft); minimum daily, 25 $ft^3/s$ Nov. 21, 1971.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,940 $ft^3/s$ July 18 at 2030 hours (gage height, 53.12 ft); minimum daily, 49 $ft^3/s$ May 10, 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1400 | 73 | 59 | 61 | 86 | 90 | 68 | 65 | 64 | 309 | 213 | 78 |
| 2 | 1360 | 67 | 58 | 60 | 94 | 84 | 71 | 64 | 65 | 414 | 137 | 231 |
| 3 | 1310 | 63 | 98 | 56 | 104 | 84 | 74 | 66 | 64 | 463 | 297 | 141 |
| 4 | 1190 | 79 | 199 | 60 | 95 | 83 | 74 | 65 | 63 | 346 | 485 | 125 |
| 5 | 692 | 91 | 241 | 59 | 86 | 109 | 71 | 63 | 66 | 233 | 299 | 91 |
| 6 | 118 | 370 | 174 | 62 | 79 | 86 | 69 | 59 | 335 | 126 | 352 | 85 |
| 7 | 97 | 487 | 81 | 61 | 77 | 80 | 69 | 63 | 430 | 229 | 404 | 88 |
| 8 | 92 | 270 | 67 | 60 | 74 | 77 | 92 | 122 | 467 | 111 | 373 | 85 |
| 9 | 79 | 147 | 64 | 535 | 157 | 76 | 119 | 53 | 163 | 330 | 254 | 80 |
| 10 | 81 | 95 | 70 | 343 | 106 | 75 | 79 | 49 | 174 | 358 | 149 | 80 |
| 11 | 76 | 80 | 109 | 442 | 92 | 75 | 62 | 49 | 83 | 199 | 114 | 79 |
| 12 | 77 | 72 | 153 | 203 | 654 | 105 | 58 | 50 | 77 | 89 | 124 | 78 |
| 13 | 81 | 69 | 154 | 91 | 501 | 284 | 55 | 51 | 69 | 76 | 241 | 76 |
| 14 | 74 | 68 | 84 | 84 | 422 | 296 | 54 | 50 | 70 | 99 | 270 | 78 |
| 15 | 68 | 65 | 65 | 84 | 195 | 187 | 52 | 50 | 71 | 88 | 236 | 112 |
| 16 | 88 | 61 | 132 | 83 | 121 | 89 | 53 | 51 | 69 | 78 | 140 | 184 |
| 17 | 199 | 61 | 74 | 79 | 97 | 85 | 53 | 52 | 65 | 76 | 115 | 113 |
| 18 | 128 | 66 | 66 | 78 | 87 | 80 | 56 | 307 | 69 | 471 | 96 | 81 |
| 19 | 102 | 66 | 59 | 78 | 81 | 106 | 57 | 633 | 71 | 580 | 86 | 75 |
| 20 | 90 | 68 | 57 | 77 | 492 | 98 | 59 | 535 | 74 | 313 | 173 | 74 |
| 21 | 93 | 74 | 62 | 77 | 649 | 84 | 56 | 438 | 68 | 186 | 107 | 247 |
| 22 | 94 | 64 | 54 | 80 | 700 | 79 | 54 | 252 | 64 | 199 | 78 | 496 |
| 23 | 80 | 127 | 53 | 490 | 701 | 194 | 56 | 636 | 61 | 234 | 78 | 540 |
| 24 | 74 | 238 | 53 | 603 | 670 | 352 | 56 | 519 | 63 | 510 | 83 | 334 |
| 25 | 64 | 160 | 53 | 541 | 594 | 161 | 61 | 368 | 66 | 426 | 159 | 116 |
| 26 | 59 | 73 | 61 | 302 | 402 | 98 | 66 | 293 | 88 | 206 | 140 | 94 |
| 27 | 58 | 69 | 69 | 172 | 314 | 83 | 70 | 108 | 67 | 154 | 92 | 86 |
| 28 | 61 | 71 | 69 | 121 | 208 | 76 | 69 | 105 | 64 | 394 | 84 | 84 |
| 29 | 66 | 67 | 64 | 95 | 116 | 70 | 70 | 77 | 64 | 538 | 81 | 78 |
| 30 | 62 | 67 | 61 | 93 | --- | 69 | 63 | 69 | 80 | 452 | 78 | 76 |
| 31 | 74 | --- | 62 | 87 | --- | 71 | --- | 60 | --- | 342 | 76 | --- |
| TOTAL | 8187 | 3428 | 2725 | 5317 | 8054 | 3586 | 1966 | 5422 | 3294 | 8629 | 5614 | 4185 |
| MEAN | 264 | 114 | 87.9 | 172 | 278 | 116 | 65.5 | 175 | 110 | 278 | 181 | 140 |
| MAX | 1400 | 487 | 241 | 603 | 701 | 352 | 119 | 636 | 467 | 580 | 485 | 540 |
| MIN | 58 | 61 | 53 | 56 | 74 | 69 | 52 | 49 | 61 | 76 | 76 | 74 |
| AC-FT | 16240 | 6800 | 5410 | 10550 | 15980 | 7110 | 3900 | 10750 | 6530 | 17120 | 11140 | 8300 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CAL YR 1983 | TOTAL | 154724 | MEAN 424 | MAX 2410 | MIN 43 | AC-FT | 306900 | |
| WTR YR 1984 | TOTAL | 60407 | MEAN 165 | MAX 1400 | MIN 49 | AC-FT | 119800 | |

08073600 BUFFALO BAYOU AT WEST BELT DRIVE, HOUSTON, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical and biochemical analyes: December 1978 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June 1979 to September 1981.
WATER TEMPERATURES: June 1979 to September 1981.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum daily, 922 micromhos June 25, 1979; minimum daily, 78 micromhos Aug. 31, 1981.
WATER TEMPERATURES (1979-80): Maximum daily, 30.5°C July 1, 1978; minimum daily, 8.5°C Jan. 23, 1981.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) | HARD-NESS (MG/L AS CACO3) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | | | |
| 21... | 1115 | 77 | 840 | 8.0 | 21.0 | 29 | 8.0 | 90 | 4.7 | K18 | 320 | 140 |
| MAR | | | | | | | | | | | | |
| 06... | 0834 | 85 | 760 | 7.6 | 15.5 | 56 | 8.5 | 85 | 1.2 | K14 | 130 | 150 |
| MAY | | | | | | | | | | | | |
| 09... | 0935 | 48 | 831 | 7.6 | 24.0 | 18 | 6.2 | 73 | 6.8 | K8 | K1 | 140 |
| AUG | | | | | | | | | | | | |
| 15... | 1000 | 239 | 384 | 7.2 | 26.5 | 170 | 7.0 | 86 | 1.7 | K4 | K1 | 83 |

| DATE | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | | |
| 21... | 0 | 45 | 7.7 | 120 | 5 | 7.2 | 194 | 33 | 120 | .40 | 19 |
| MAR | | | | | | | | | | | |
| 06... | 0 | 45 | 8.9 | 96 | 4 | 7.1 | 190 | 27 | 110 | .40 | 18 |
| MAY | | | | | | | | | | | |
| 09... | 0 | 42 | 7.9 | 110 | 4 | 8.0 | 193 | 34 | 110 | .40 | 19 |
| AUG | | | | | | | | | | | |
| 15... | 0 | 26 | 4.3 | 42 | 2 | 8.5 | 98 | 16 | 50 | .30 | 12 |

| DATE | SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) | NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) | NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | PHOS-PHORUS, DIS-SOLVED (MG/L AS P) | PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P) | SEDI-MENT, SUS-PENDED (MG/L) | SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY) | SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | | |
| 21... | 476 | 480 | 3.5 | 1.40 | 4.7 | 2.50 | 2.40 | 2.00 | 43 | 8.9 | 98 |
| MAR | | | | | | | | | | | |
| 06... | 433 | 430 | 2.0 | <.010 | 6.0 | 3.50 | 3.30 | .170 | 78 | 18 | 89 |
| MAY | | | | | | | | | | | |
| 09... | 471 | 470 | 2.6 | 4.30 | 5.0 | 4.00 | 4.00 | 5.10 | 17 | 2.2 | 98 |
| AUG | | | | | | | | | | | |
| 15... | 219 | 220 | 1.3 | .860 | 2.2 | 1.60 | .900 | 1.00 | 93 | 60 | 98 |

| DATE | TIME | ARSENIC DIS-SOLVED (UG/L AS AS) | BARIUM, DIS-SOLVED (UG/L AS BA) | BERYL-LIUM, DIS-SOLVED (UG/L AS BE) | CADMIUM DIS-SOLVED (UG/L AS CD) | CHRO-MIUM, DIS-SOLVED (UG/L AS CR) | COBALT, DIS-SOLVED (UG/L AS CO) | COPPER, DIS-SOLVED (UG/L AS CU) | IRON, DIS-SOLVED (UG/L AS FE) | LEAD, DIS-SOLVED (UG/L AS PB) |
|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | |
| 21... | 1115 | 3 | 180 | .5 | <1 | <1 | <3 | 3 | 12 | 2 |
| MAR | | | | | | | | | | |
| 06... | 0834 | 3 | 180 | <.5 | <1 | <1 | <3 | 5 | 48 | 4 |
| MAY | | | | | | | | | | |
| 09... | 0935 | 4 | 160 | <.5 | <1 | 1 | <3 | 8 | 17 | <1 |
| AUG | | | | | | | | | | |
| 15... | 1000 | 3 | 140 | 1 | <1 | <1 | <3 | 5 | 68 | 1 |

08073600 BUFFALO BAYOU AT WEST BELT DRIVE, HOUSTON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | LITHIUM DIS-SOLVED (UG/L AS LI) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) | MERCURY DIS-SOLVED (UG/L AS HG) | MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) | NICKEL, DIS-SOLVED (UG/L AS NI) | SELE-NIUM, DIS-SOLVED (UG/L AS SE) | SILVER, DIS-SOLVED (UG/L AS AG) | STRON-TIUM, DIS-SOLVED (UG/L AS SR) | VANA-DIUM, DIS-SOLVED (UG/L AS V) | ZINC, DIS-SOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|---|---|---|---|
| NOV 21... | 22 | 32 | <.1 | <10 | <1 | 1 | <1 | 560 | <6 | 10 |
| MAR 06... | 20 | 98 | <.1 | <10 | 2 | <1 | <1 | 450 | <6 | 17 |
| MAY 09... | 30 | 45 | <.1 | <10 | 5 | <1 | <1 | 470 | <6 | 24 |
| AUG 15... | 10 | 3 | <.1 | <10 | 2 | <1 | <1 | 210 | <6 | 17 |

## BETTINA STREET DITCH DRAINAGE BASIN

The locations of data-collection sites in the Bettina Street Ditch drainage basin are shown in figure 4.

Weighted-mean rainfall for the 1984 water year was not determined.

The storm of March 23-24 was selected for analysis at station 08073630, Bettina Street Ditch at Houston.

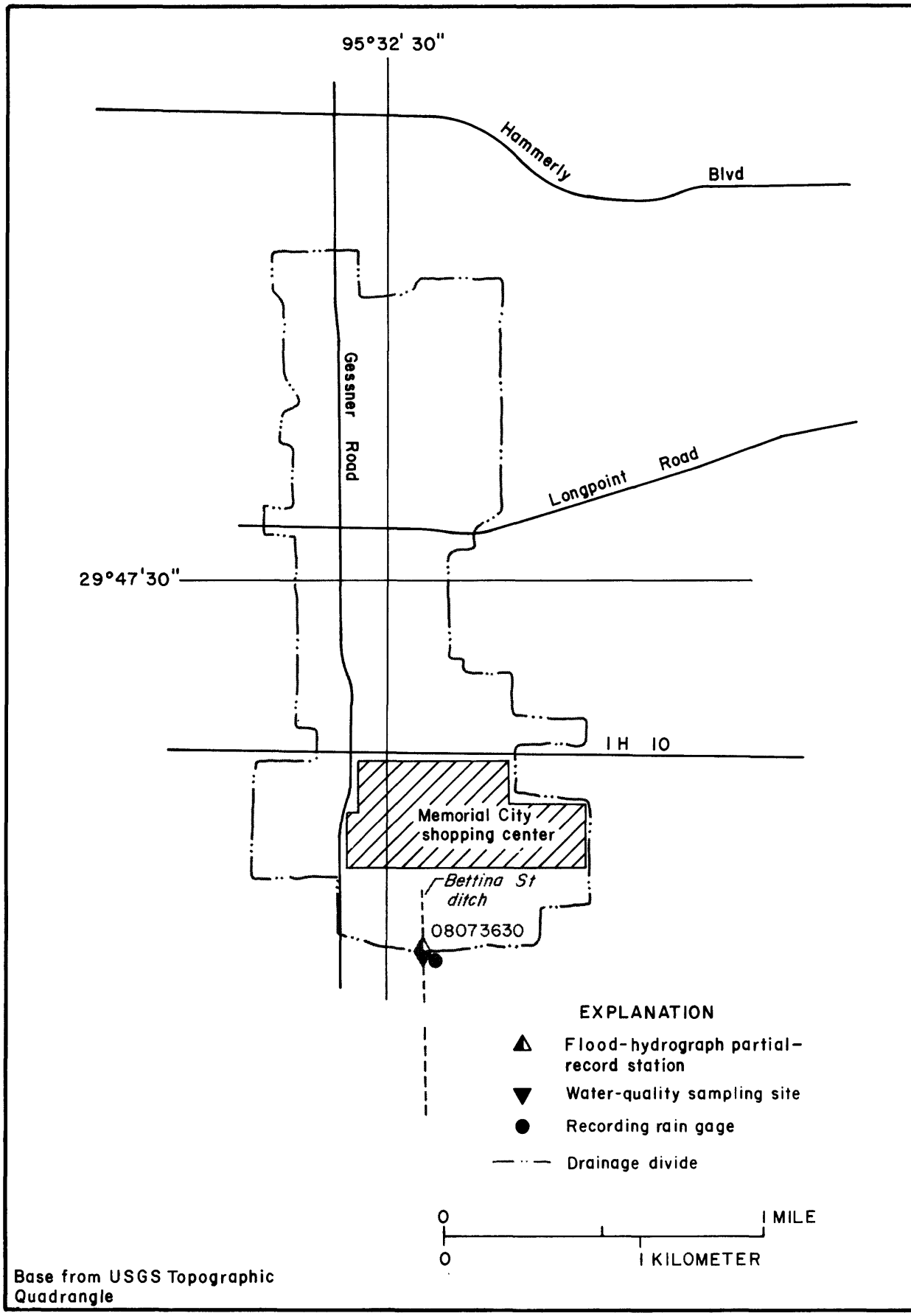


Figure 4.-Locations of data-collection sites in and near Bettina Street Ditch drainage basin

TX-35
Rev. 5/80

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 3.--Storm rainfall-runoff data, 1984 Water Year, Bettina Street Ditch

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Bettina Street Ditch at Houston, TX. (Drainage Area -- 1.37 $mi.^2$)** | | | | | | | | |
| Mar. 23-24, 1984 | 0.8 | 1.75 | 0.60 | 1.14 | 1.54 | 0.54 | 0.31 | 210 |
| | | | | | | | | |
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*08073630* BETTINA STREET DITCH AT KIMBERLY STREET AT HOUSTON, TX
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°46'32", long 95°32'23", Harris County, Hydrologic Unit 12040104, at intersection of Bettina Street ditch and Kimberly Street in west Houston.

DRAINAGE AREA.--1.37 mi². (Flow leaves basin above IH 10 during some large runoff events).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1978 to current year.

GAGE.--Flood-hydrograph and rainfall recorder, automatic water-quality sampler, and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929.

REMARKS.--Records fair. Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urbsn Studies in the Houston, Texas Metropolitan Area, 1984."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 562 ft³/s Aug. 31, 1981 (elevation, 81.69 ft).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 300 ft³/s and maximum (*):

| Date | Time | Discharge (ft³/s) | Elevation (ft) |
|---|---|---|---|
| July 18 | 1835 | 310 | 79.59 |
| July 24 | 1420 | *341 | 79.96 |
| Aug. 3 | 1855 | 330 | 79.83 |

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) |
|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | |
| 16-16 | 0650 | 16 | 264 | 30 | 22 | 22 | 58 | 0 | 19 | 2.5 |
| FEB | | | | | | | | | | |
| 11-12 | 2330 | 35 | 180 | 70 | 25 | -- | 52 | 0 | 18 | 1.8 |
| 20-20 | 0740 | 44 | 65 | 70 | 24 | 5.6 | -- | -- | -- | -- |
| MAR | | | | | | | | | | |
| 19-19 | 0325 | 16 | 184 | 70 | 28 | -- | -- | -- | -- | -- |
| 23... | 1920 | 5.8 | 261 | -- | -- | -- | -- | -- | -- | -- |
| 23... | 1950 | 166 | 96 | 5 | 17 | -- | -- | -- | -- | -- |
| 23... | 2020 | 196 | -- | <1 | 34 | -- | -- | -- | -- | -- |
| 23... | 2050 | 162 | 90 | -- | -- | -- | -- | -- | -- | -- |
| 23... | 2120 | 116 | 70 | -- | -- | -- | -- | -- | -- | -- |
| 23... | 2150 | 71 | 87 | 5 | 25 | -- | -- | -- | -- | -- |

| DATE | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | |
| 16-16 | 31 | 2 | 4.0 | 59 | 18 | 31 | .10 | 6.6 | 150 | 105 |
| FEB | | | | | | | | | | |
| 11-12 | 15 | .9 | 2.6 | 54 | 12 | 14 | <.10 | 5.8 | 100 | 84 |
| 20-20 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 58 |
| MAR | | | | | | | | | | |
| 19-19 | -- | -- | -- | -- | -- | -- | -- | -- | -- | 153 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 111 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 257 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 88 |

08073630 BETTINA STREET DITCH AT KIMBERLY STREET AT HOUSTON TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | SOLIDS, VOLATILE, SUSPENDED (MG/L) | NITROGEN, NITRATE TOTAL (MG/L AS N) | NITROGEN, NITRITE TOTAL (MG/L AS N) | NITROGEN, NO2+NO3 TOTAL (MG/L AS N) | NITROGEN, AMMONIA TOTAL (MG/L AS N) | NITROGEN, ORGANIC TOTAL (MG/L AS N) | NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) | PHOSPHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | |
| 16-16 | 24 | .51 | .090 | .60 | .240 | 1.8 | 2.0 | 1.40 | 24 |
| FEB | | | | | | | | | |
| 11-12 | 33 | .18 | .020 | .20 | .090 | 1.5 | 1.6 | .540 | 20 |
| 20-20 | 13 | .38 | .020 | .40 | .080 | .62 | .70 | .240 | 10 |
| MAR | | | | | | | | | |
| 19-19 | 56 | -- | <.010 | <.10 | .040 | 3.2 | 3.2 | .740 | 33 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | 57 | .29 | .010 | .30 | .140 | 2.1 | 2.2 | 1.50 | 13 |
| 23... | 69 | .39 | .010 | .40 | .360 | 1.9 | 2.3 | .510 | 12 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | 34 | .38 | .020 | .40 | .190 | 1.2 | 1.4 | .390 | 14 |

STORM RAINFALL AND RUNOFF
08073630 BETTINA STREET DITCH AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 3630 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF MAR. 23-24, 1984 | | | | |
| MAR. 23 | | | | |
| 0000 | 0.0 | 0.0 | 1.0 | 0.0102 |
| 1800 | 0.0 | 0.0 | 1.0 | 0.0209 |
| 1900 | 0.0 | 0.0 | 1.0 | 0.0215 |
| 1905 | 0.04 | 0.04 | 1.0 | 0.0216 |
| 1910 | 0.08 | 0.08 | 1.0 | 0.0217 |
| 1915 | 0.13 | 0.13 | 1.0 | 0.0218 |
| 1920 | 0.31 | 0.31 | 5.8 | 0.0224 |
| 1925 | 0.49 | 0.49 | 38.0 | 0.0259 |
| 1930 | 0.67 | 0.67 | 81.0 | 0.0336 |
| 1935 | 0.87 | 0.87 | 106.0 | 0.0436 |
| 1940 | 1.07 | 1.07 | 125.0 | 0.0554 |
| 1945 | 1.27 | 1.27 | 142.0 | 0.0687 |
| 1950 | 1.36 | 1.36 | 166.0 | 0.0844 |
| 1955 | 1.45 | 1.45 | 196.0 | 0.1029 |
| 2000 | 1.54 | 1.54 | 209.0 | 0.1226 |
| 2005 | 1.55 | 1.55 | 210.0 | 0.1424 |
| 2010 | 1.56 | 1.56 | 207.0 | 0.1619 |
| 2015 | 1.58 | 1.58 | 203.0 | 0.1810 |
| 2020 | 1.61 | 1.61 | 196.0 | 0.1995 |
| 2025 | 1.64 | 1.64 | 189.0 | 0.2173 |
| 2030 | 1.68 | 1.68 | 184.0 | 0.2346 |
| 2035 | 1.69 | 1.69 | 180.0 | 0.2516 |
| 2040 | 1.70 | 1.70 | 176.0 | 0.2682 |
| 2045 | 1.72 | 1.72 | 170.0 | 0.2922 |
| 2055 | 1.72 | 1.72 | 155.0 | 0.3141 |
| 2100 | 1.73 | 1.73 | 148.0 | 0.3490 |
| 2120 | 1.73 | 1.73 | 116.0 | 0.3873 |
| 2135 | 1.73 | 1.73 | 93.0 | 0.4136 |
| 2150 | 1.73 | 1.73 | 71.0 | 0.4303 |
| 2200 | 1.73 | 1.73 | 57.0 | 0.4411 |
| 2210 | 1.73 | 1.73 | 46.0 | 0.4497 |
| 2220 | 1.73 | 1.73 | 37.0 | 0.4567 |
| 2230 | 1.73 | 1.73 | 30.0 | 0.4624 |
| 2240 | 1.73 | 1.73 | 24.0 | 0.4827 |
| 2400 | 1.73 | 1.73 | 7.4 | 0.5134 |
| MAR. 24 | | | | |
| 0000 | 1.73 | 1.73 | 7.4 | 0.5134 |
| 0600 | 1.74 | 1.74 | 1.2 | 0.5216 |
| 1200 | 1.75 | 1.75 | 1.1 | 0.5328 |
| 2400 | 1.75 | 1.75 | 1.0 | 0.5395 |

## 08073700 BUFFALO BAYOU AT PINEY POINT, TX

LOCATION.--Lat 29°44'48", long 95°31'24", Harris County, Hydrologic Unit 12040104, on downstream side of bridge on Piney Point Road, village of Piney Point, 3.7 mi downstream from Rummel Creek, 7.2 mi downstream from gage near Addicks (station 08073500), and 12.5 mi upstream from gage at Houston (station 08074000).

DRAINAGE AREA.--317 $mi^2$.

PERIOD OF RECORD.--October 1963 to September 1976, October 1976 to September 30, 1984 (gage heights only).

GAGE.--Water-stage recorder. Datum of gage is 1.35 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment. Telemetry located at station.

REMARKS.--Station is operated for the purpose of gate regulations at Barker and Addicks Reservoirs (stations 08072500 and 08073000), located 14.0 and 13.8 mi upstream, respectively. Low flow is partly sustained by sewage effluent from Houston suburbs.

AVERAGE DISCHARGE.--13 years (water years 1963-76), 265 $ft^3/s$ (192,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge estimated, 5,700 $ft^3/s$ Aug. 31, 1981 (gage height, 57.20 ft, from floodmark); minimum daily, 6.0 $ft^3/s$ Dec. 6, 7, 1964.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 45.20 ft July 18 at 2000 hours; minimum, 33.00 ft June 28, 30.

GAGE HEIGHT. IN FEET, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MAXIMUM VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 44.15 | 34.03 | 34.29 | 33.91 | 33.87 | 34.33 | 33.67 | 33.58 | 33.75 | 36.95 | 36.60 | 33.82 |
| 2 | 44.00 | 34.00 | 33.82 | 33.90 | 34.90 | 33.98 | 33.78 | 33.57 | 33.86 | 38.55 | 35.20 | 37.33 |
| 3 | 43.80 | 33.69 | 35.77 | 33.88 | 34.94 | 33.88 | 33.69 | 33.57 | 33.60 | 38.25 | 41.25 | 35.15 |
| 4 | 43.40 | 34.90 | 36.27 | 33.98 | 34.17 | 33.81 | 33.61 | 33.54 | 33.56 | 37.20 | 42.70 | 35.10 |
| 5 | 42.50 | 34.95 | 36.29 | 33.94 | 34.03 | 35.22 | 33.51 | 33.50 | 33.81 | 37.57 | 39.33 | 34.08 |
| 6 | 35.40 | 42.35 | 36.05 | 33.94 | 33.80 | 33.97 | 33.54 | 33.40 | 40.85 | 35.40 | 37.45 | 33.84 |
| 7 | 34.42 | 39.23 | 34.88 | 33.94 | 33.70 | 33.84 | 33.65 | 35.80 | 38.00 | 36.50 | 37.17 | 34.69 |
| 8 | 34.25 | 37.65 | 34.12 | 34.17 | 33.57 | 33.62 | 34.75 | 38.10 | 37.95 | 35.22 | 37.10 | 34.21 |
| 9 | 34.08 | 35.17 | 34.02 | 42.50 | 37.25 | 33.56 | 34.83 | 33.47 | 37.25 | 37.62 | 38.00 | 33.75 |
| 10 | 34.05 | 34.30 | 34.45 | 38.50 | 34.45 | 33.52 | 34.35 | 33.32 | 37.25 | 37.42 | 35.35 | 33.70 |
| 11 | 33.98 | 33.90 | 35.22 | 38.46 | 34.35 | 33.55 | 33.81 | 33.25 | 34.34 | 38.00 | 34.75 | 33.62 |
| 12 | 33.86 | 33.60 | 35.23 | 36.63 | 39.99 | 35.21 | 33.44 | 33.30 | 34.00 | 35.26 | 35.07 | 34.18 |
| 13 | 33.88 | 33.50 | 35.22 | 34.15 | 38.50 | 36.64 | 33.38 | 33.32 | 33.75 | 33.97 | 35.87 | 33.68 |
| 14 | 33.75 | 33.52 | 35.02 | 33.98 | 37.90 | 36.35 | 33.31 | 33.32 | 33.75 | 35.14 | 36.02 | 33.59 |
| 15 | 33.66 | 33.54 | 34.14 | 34.00 | 36.52 | 36.25 | 33.30 | 33.31 | 33.68 | 34.46 | 35.97 | 36.48 |
| 16 | 35.75 | 33.32 | 36.56 | 33.72 | 35.00 | 34.35 | 33.30 | 33.38 | 33.67 | 33.84 | 35.47 | 35.50 |
| 17 | 36.58 | 33.34 | 34.38 | 33.68 | 34.50 | 33.99 | 33.29 | 33.42 | 33.60 | 33.68 | 34.57 | 35.15 |
| 18 | 34.67 | 33.39 | 34.18 | 33.61 | 34.25 | 33.97 | 33.36 | 41.59 | 34.00 | 45.20 | 34.40 | 33.92 |
| 19 | 34.19 | 33.57 | 33.88 | 33.55 | 34.02 | 35.36 | 33.39 | 41.34 | 33.90 | 44.00 | 33.98 | 33.54 |
| 20 | 34.00 | 33.89 | 33.66 | 33.51 | 40.86 | 34.34 | 33.45 | 39.50 | 33.80 | --- | 35.95 | 33.48 |
| 21 | 34.01 | 33.91 | 34.29 | 33.55 | 39.92 | 34.12 | 33.45 | 39.25 | 33.55 | --- | 35.93 | 37.03 |
| 22 | 34.05 | 33.77 | 33.61 | 33.80 | 39.70 | 33.85 | 33.37 | 39.30 | 33.45 | --- | 33.65 | 37.83 |
| 23 | 33.90 | 36.08 | 33.54 | 38.57 | 39.76 | 41.54 | 33.34 | 39.35 | 33.39 | --- | 33.61 | 38.02 |
| 24 | 33.80 | 36.27 | 33.60 | 38.55 | 39.72 | 41.32 | 33.36 | 39.20 | 33.43 | --- | 34.38 | 37.90 |
| 25 | 33.62 | 35.95 | 33.60 | 38.35 | 39.43 | 36.09 | 33.60 | 37.47 | 33.63 | --- | 35.40 | 35.02 |
| 26 | 33.50 | 34.47 | 33.80 | 37.35 | 38.45 | 34.63 | 33.62 | 36.70 | 34.35 | --- | 35.38 | 34.27 |
| 27 | 33.55 | 34.32 | 34.00 | 35.29 | 37.15 | 34.21 | 33.75 | 35.95 | 33.62 | --- | 34.24 | 33.92 |
| 28 | 33.57 | 34.20 | 34.00 | 34.72 | 36.03 | 33.84 | 33.75 | 34.91 | 33.41 | --- | 33.79 | 33.81 |
| 29 | 33.62 | 34.21 | 33.95 | 34.35 | 35.10 | 33.60 | 33.75 | 34.30 | 33.45 | --- | 33.74 | 33.76 |
| 30 | 33.61 | 36.80 | 33.80 | 34.20 | --- | 33.49 | 33.70 | 33.77 | 34.74 | 38.50 | 33.62 | 33.70 |
| 31 | 34.21 | --- | 33.85 | 33.93 | --- | 33.71 | --- | 33.61 | --- | 37.10 | 33.58 | --- |
| MAX | 44.15 | 42.35 | 36.56 | 42.50 | 40.86 | 41.54 | 34.83 | 41.59 | 40.85 | --- | 42.70 | 38.02 |
| MIN | 33.50 | 33.32 | 33.54 | 33.51 | 33.57 | 33.49 | 33.29 | 33.25 | 33.39 | --- | 33.58 | 33.48 |

## 08074000 BUFFALO BAYOU AT HOUSTON, TX

LOCATION.--Lat 29°45'36", long 95°24'30", Harris County, Hydrologic Unit 12040104, at bridge on Shepherd Drive in Houston and 0.8 mi upstream from Waugh Drive.

DRAINAGE AREA.--358 mi², unadjusted for basin boundary changes.

PERIOD OF RECORD.--May 1936 to September 1957, October 1957 to December 1961 (high-water records and discharge measurements), January 1962 to September 1975, October 1975 to current year (high-water records and discharge measurements) Water-quality records.--Chemical, biochemical, and pesticide analysis: October 1968 to September 1981.

REVISED RECORDS.--WSP 1732: Drainage area (former site).

GAGE.--Water-stage recorder and crest-stage gages. Datum of gage is 1.36 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment; records unadjusted for land-surface subsidence. Prior to June 19, 1936, nonrecording gage, and June 19, 1936, to Jan. 16, 1962, water-stage recorder at site 0.8 mi downstream at 4.08-foot lower datum. Jan. 17, 1962, to Sept. 30, 1973, auxiliary water-stage recorder 0.8 mi downstream. Water-stage recorder at Main Street (station 08074600) used as auxiliary gage after Sept. 30, 1973. Telemetry located at station.

REMARKS.--Records poor. Although floodflows are regulated by Barker and Addicks Reservoirs (stations 08072500 and (08073000) located 26.3 and 26.8 mi upstream, respectively, flood peaks from the urbanized areas below these reservoirs are often independent of the regulation. Discharge is computed uaing a stage-fall-discharge relationship for all storms that produce peak discharges above 1,500 ft³/s. Discharges below 1,000 ft³/s are computed or estimated following designated storm periods only. Low flow is mostly sustained by sewage effluent from Houston suburbs. Gage heights are affected by tides, backwater from Whiteoak Bayou, and other streams.

AVERAGE DISCHARGE.--8 years (water years 1936-44) unregulated, 272 ft³/s (197,100 acre-ft/yr); 26 years (water years 1944-57, 1962-75) regulated, 274 ft³/s (198,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 10,900 ft³/s Aug. 30, 1945 (gage height, 28.82 ft), at site 0.8 mi downstream at present datum; minimum daily, 1.3 ft³/s May 24, 1939, Nov. 5, 1950.

EXTREMES OUTSIDE PERIOD OF RECORD.--All flood data at site 0.8 mi downstream at present datum. Maximum gage height since at least 1835, 49.0 ft Dec. 9, 1935 (discharge, 40,000 ft³/s); furnished by engineer for Harris County. Flood of May 31, 1929, reached a gage height of 43.5 ft (discharge, 19,000 ft³/s) at bridge on Capitol Avenue, affected by bridge; furnished by city of Houston.

EXTREMES FOR CURRENT YEAR.--Maxmum discharge, 2,090 ft³/s Jan. 9 at about 0800 hours (gage height, 13.81 ft); minimum discharge not determined (affected by tides).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1400 | | | --- | | --- | | | | --- | | |
| 2 | 1400 | | | --- | | --- | | | | --- | | |
| 3 | 1400 | | | --- | | --- | | | | --- | | |
| 4 | 1400 | | | --- | | --- | | | | --- | | |
| 5 | 1060 | | | --- | | --- | | | | --- | | |
| 6 | 367 | | | --- | | --- | | | | --- | | |
| 7 | --- | | | --- | | --- | | | | --- | | |
| 8 | --- | | | --- | | --- | | | | --- | | |
| 9 | --- | | | 1500 | | --- | | | | --- | | |
| 10 | --- | | | 500 | | --- | | | | --- | | |
| 11 | --- | | | --- | | --- | | | | --- | | |
| 12 | --- | | | --- | | --- | | | | --- | | |
| 13 | --- | | | --- | | --- | | | | --- | | |
| 14 | --- | | | --- | | --- | | | | --- | | |
| 15 | --- | | | --- | | --- | | | | --- | | |
| 16 | --- | | | --- | | --- | | | | --- | | |
| 17 | --- | | | --- | | --- | | | | --- | | |
| 18 | --- | | | --- | | --- | | | | 152 | | |
| 19 | --- | | | --- | | --- | | | | 1130 | | |
| 20 | --- | | | --- | | --- | | | | 360 | | |
| 21 | --- | | | --- | | --- | | | | --- | | |
| 22 | --- | | | --- | | --- | | | | --- | | |
| 23 | --- | | | --- | | 228 | | | | --- | | |
| 24 | --- | | | --- | | 859 | | | | 495 | | |
| 25 | --- | | | --- | | --- | | | | 881 | | |
| 26 | --- | | | --- | | --- | | | | 599 | | |
| 27 | --- | | | --- | | --- | | | | --- | | |
| 28 | --- | | | --- | | --- | | | | --- | | |
| 29 | --- | | | --- | | --- | | | | --- | | |
| 30 | --- | | | --- | | --- | | | | --- | | |
| 31 | --- | | | --- | | --- | | | | --- | | |
| TOTAL | --- | | | --- | | --- | | | | --- | | |
| MEAN | --- | | | --- | | --- | | | | --- | | |
| MAX | --- | | | --- | | --- | | | | --- | | |
| MIN | --- | | | --- | | --- | | | | --- | | |
| AC-FT | --- | | | --- | | --- | | | | --- | | |

## WHITEOAK BAYOU DRAINAGE BASIN

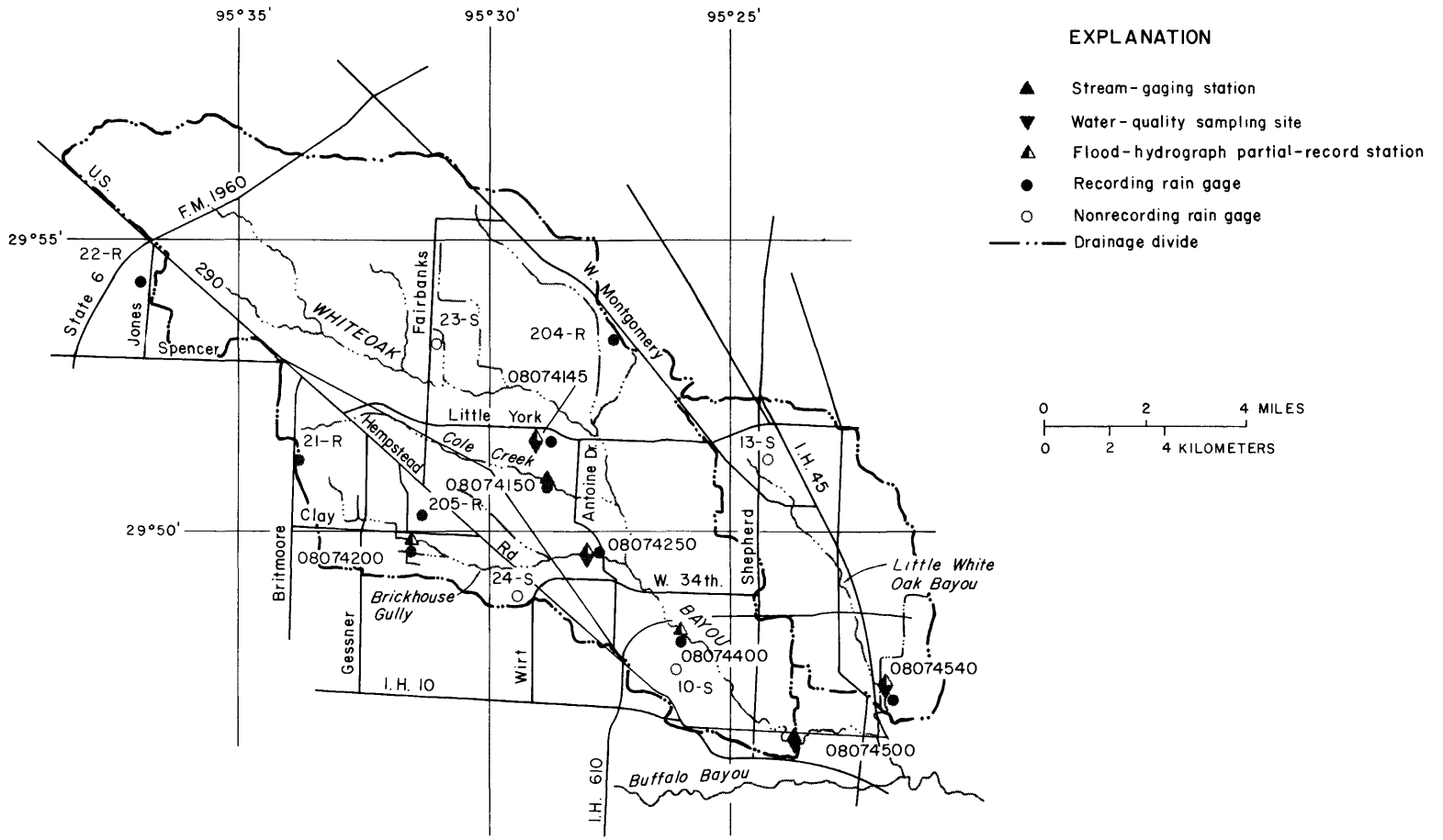
The locations of data-collection sites in and near the Whiteoak Bayou drainage basin are shown in figure 5.

Cole Creek (including Bingle Road Storm Sewer), Brickhouse Gully, Lazybrook Street Storm Sewer, and Little Whiteoak Bayou are shown as separate drainage basins within the Whiteoak Bayou section.

Weighted-mean rainfall in the drainage basin, based on twelve rain gages for the 1984 water year was 32.17 inches or 16.02 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals in inches for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.80 | 3.32 | 1.60 | 3.04 | 3.50 | 2.47 | 0.39 | 2.81 | 2.71 | 6.49 | 2.79 | 2.25 | 32.17 |

The storms of Mar. 23-25 and June 6-8 were selected for analysis at the Whiteoak Bayou at Houston (08074500) gaging station.




Base from Texas Department of Highways and Public Transportation General Highway Map

Figure 5.– Locations of data-collection sites in and near the Whiteoak Bayou drainage basin

## COLE CREEK DRAINAGE BASIN

The locations of data-collection sites in and near the Cole Creek drainage basin are shown in figure 6.

Bingle Road Storm Sewer is shown as a separate drainage basin within the Cole Creek section.

Weighted-mean rainfall in the drainage basin, based on five rain gages, for the 1984 water year was 29.47 inches, or 18.72 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.75 | 3.01 | 1.44 | 2.94 | 3.90 | 2.39 | 0.19 | 2.47 | 1.46 | 6.44 | 1.97 | 2.51 | 29.47 |

The storm of July 18-20 was selected for analysis at station 08074150, Cole Creek at Deihl Road.

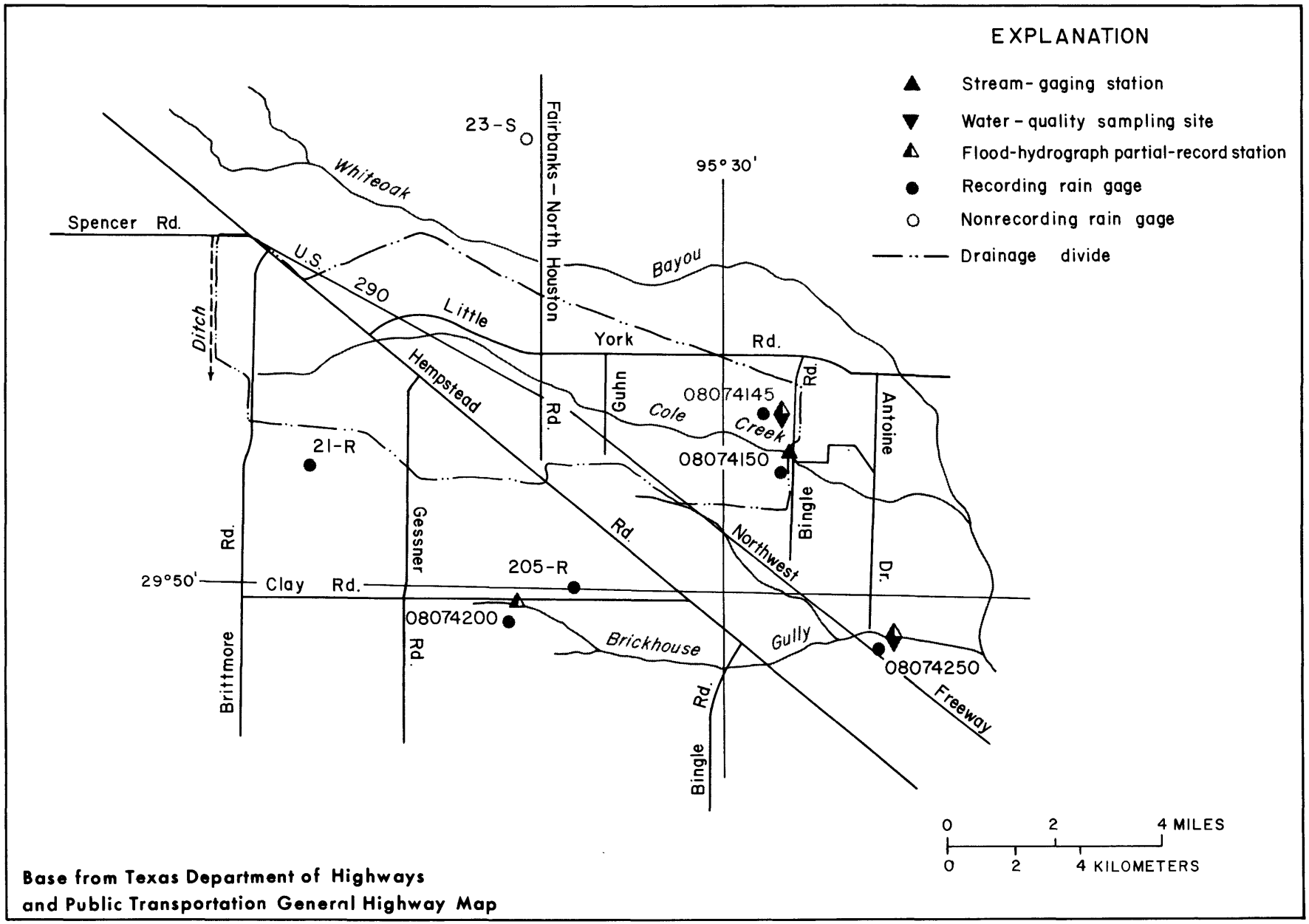



Figure 6.- Locations of data-collection sites in and near the Cole Creek drainage basin

## BINGLE ROAD STORM SEWER DRAINAGE BASIN

The location of data-collection sites in and near the Bingle Road Storm Sewer drainage basin are shown in figure 7.

Weighted-mean rainfall for the 1984 water year was not determined.

The storm of July 5 was selected for analysis at station 08074145, Bingle Road Storm Sewer at Houston, Tex.

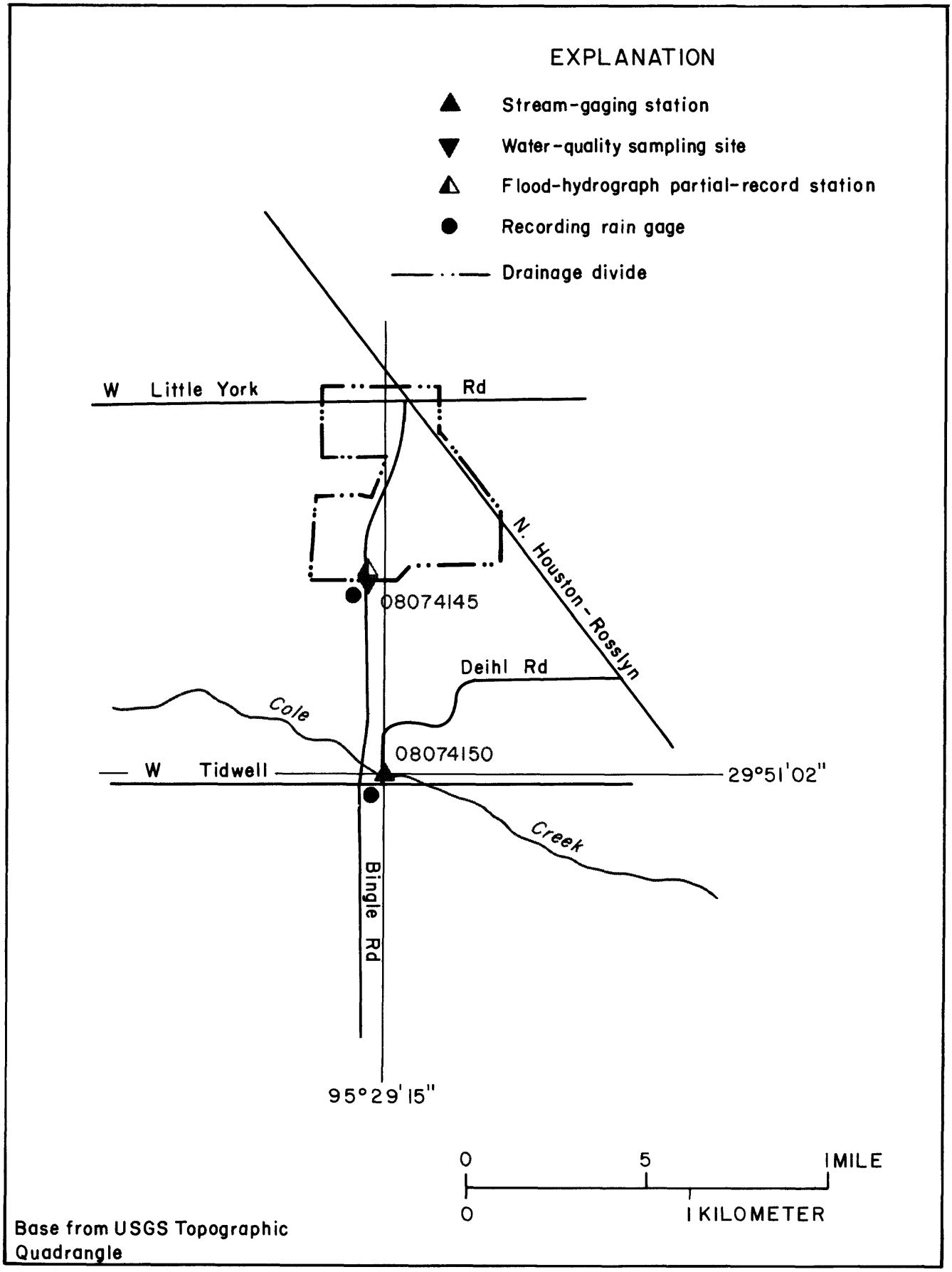



Figure 7.–Locations of data-collection sites in and near the Bingle Road storm sewer drainage basin

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 4.--Storm rainfall-runoff data, 1984 Water Year, Bingle Road Storm Sewer

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Bingle Road Storm Sewer at Houston, TX. (Drainage area -- 0.21 $mi.^2$)** | | | | | | | | |
| July 5, 1984 | 0.4 | 1.13 | 0.57 | 1.00 | 1.11 | 0.41 | 0.36 | 88 |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
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| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

SAN JACINTO RIVER BASIN

08074145 BINGLE ROAD STORM SEWER AT HOUSTON, TX
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°51'31", long 95°29'09", Harris County, Hydrologic Unit 12040104, over a 60-inch storm sewer in the center median at Bingle Road and 3,000 ft north of the station Cole Creek at Deihl Road, Houston (08074150).

DRAINAGE AREA.--0.21 mi².

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1980 to current year.

GAGE.--Flood-hydrograph and rainfall recorder and crest-stage gage. Datum of gage is arbitrary.

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the reports "Hydrologic Data for Urban Studies in the Houston, Texas Metropolitan Area."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge not determined, rating definition pending; maximum gage height, 13.97 ft Aug. 31, 1981, is a recorded pressure head in the access pipe and exceeds gage height for full pipe flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base gage height of 11.00 ft and maximum (*):

| Date | Time | Discharge ($ft^3/s$) | Gage height (ft) |
|---|---|---|---|
| June 6 | unknown | (a) | b11.55 |
| July 18 | 1858 | (a) | *b12.87 |

a Discharge not determined; rating definition pending.
b Recorded pressure head; gage height for full pipe flow exceeded.

Minimum daily discharge not determined.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: May 1980 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | | | |
| 16-16 | 0600 | 3.0 | 187 | -- | -- | 35 | 20 | -- | -- | 8.1 | -- | -- |
| FEB | | | | | | | | | | | | |
| 07... | 0940 | .19 | 858 | 7.5 | 16.0 | <1 | 1.5 | 7.5 | 75 | 1.4 | K2 | 1800 |
| 20... | 0530 | 2.0 | 61 | -- | -- | 70 | 27 | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | | |
| 02... | 1315 | .43 | 588 | 8.1 | 27.0 | 3 | 1.1 | 7.2 | 90 | 1.0 | K1 | K1 |

| DATE | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | | | |
| 16-16 | 49 | 20 | 17 | 1.7 | 16 | 1 | 2.0 | 30 | 12 | 30 | <.10 | 2.7 |
| FEB | | | | | | | | | | | | |
| 07... | 220 | 0 | 68 | 13 | 100 | 3 | 2.4 | 290 | 16 | 88 | .50 | 21 |
| 20... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | | |
| 02... | 130 | 0 | 39 | 7.0 | 78 | 3 | 2.6 | 180 | 12 | 62 | .40 | 20 |

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) | SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) | NITRO-GEN, NITRATE TOTAL (MG/L AS N) | NITRO-GEN, NITRITE TOTAL (MG/L AS N) | NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA TOTAL (MG/L AS N) | NITRO-GEN, ORGANIC TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | | |
| 16-16 | 99 | 47 | 14 | .64 | .060 | .70 | .170 | .73 | .90 | .370 | 7.3 |
| FEB | | | | | | | | | | | |
| 07... | 480 | <2 | <2 | -- | <.010 | <.10 | .020 | -- | <.20 | .070 | 1.5 |
| 20... | -- | 75 | 12 | .19 | .010 | .20 | .050 | .45 | .50 | .410 | 9.5 |
| JUL | | | | | | | | | | | |
| 02... | 330 | <2 | <2 | -- | <.010 | <.10 | .080 | -- | <.20 | .050 | .6 |

08074145 BINGLE ROAD STORM SEWER AT HOUSTON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | ARSENIC DISSOLVED (UG/L AS AS) | BARIUM, DISSOLVED (UG/L AS BA) | CADMIUM DISSOLVED (UG/L AS CD) | CHROMIUM, DISSOLVED (UG/L AS CR) | COPPER, DISSOLVED (UG/L AS CU) | IRON, DISSOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL 02... | 1315 | 2 | 240 | <1 | <10 | 23 | 8 |

| DATE | LEAD, DISSOLVED (UG/L AS PB) | MANGANESE, DISSOLVED (UG/L AS MN) | MERCURY DISSOLVED (UG/L AS HG) | SELENIUM, DISSOLVED (UG/L AS SE) | SILVER, DISSOLVED (UG/L AS AG) | ZINC, DISSOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL 02... | 11 | 2 | <.1 | <1 | <1 | 8 |

| DATE | TIME | AMETRYNE TOTAL | ATRAZINE, TOTAL (UG/L) | CYANAZINE TOTAL (UG/L) | METHOMYL TOTAL (UG/L) | PROMETONE TOTAL (UG/L) | PROMETRYNE TOTAL (UG/L) | PROPAZINE TOTAL (UG/L) | PROPHAM TOTAL (UG/L) | SEVIN, TOTAL (UG/L) | SIMAZINE TOTAL (UG/L) | SIMETRYNE TOTAL (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL 02... | 1315 | <.10 | <.10 | <.10 | <2.0 | <.1 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |

STORM RAINFALL AND RUNOFF
08074145 BINGLE ROAD STORM SEWER AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4145 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF JULY 5 , 1984 | | | | |
| JULY5 | | | | |
| 0000 | 0.0 | 0.0 | 0.2 | 0.0044 |
| 0600 | 0.0 | 0.0 | 0.2 | 0.0133 |
| 1200 | 0.0 | 0.0 | 0.2 | 0.0208 |
| 1615 | 0.0 | 0.0 | 0.2 | 0.0240 |
| 1620 | 0.02 | 0.02 | 0.2 | 0.0242 |
| 1625 | 0.04 | 0.04 | 0.2 | 0.0243 |
| 1630 | 0.07 | 0.07 | 0.2 | 0.0244 |
| 1635 | 0.26 | 0.26 | 0.2 | 0.0245 |
| 1640 | 0.45 | 0.45 | 0.3 | 0.0247 |
| 1645 | 0.64 | 0.64 | 1.9 | 0.0259 |
| 1650 | 0.78 | 0.78 | 3.0 | 0.0277 |
| 1655 | 0.92 | 0.92 | 33.0 | 0.0480 |
| 1700 | 1.07 | 1.07 | 69.0 | 0.0905 |
| 1705 | 1.08 | 1.08 | 88.0 | 0.1446 |
| 1710 | 1.09 | 1.09 | 85.0 | 0.1968 |
| 1715 | 1.11 | 1.11 | 77.0 | 0.2442 |
| 1720 | 1.11 | 1.11 | 62.0 | 0.2823 |
| 1725 | 1.11 | 1.11 | 46.0 | 0.3106 |
| 1730 | 1.12 | 1.12 | 32.0 | 0.3303 |
| 1735 | 1.12 | 1.12 | 23.0 | 0.3444 |
| 1740 | 1.12 | 1.12 | 18.0 | 0.3555 |
| 1745 | 1.12 | 1.12 | 14.0 | 0.3641 |
| 1750 | 1.12 | 1.12 | 10.0 | 0.3702 |
| 1755 | 1.12 | 1.12 | 7.3 | 0.3747 |
| 1800 | 1.13 | 1.13 | 5.8 | 0.3872 |
| 1830 | 1.13 | 1.13 | 2.1 | 0.3950 |
| 1900 | 1.13 | 1.13 | 1.1 | 0.4051 |
| 2100 | 1.13 | 1.13 | 0.2 | 0.4088 |
| 2400 | 1.13 | 1.13 | 0.1 | 0.4099 |

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 5.--Storm rainfall-runoff data, 1984 Water Year, Cole Creek

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Cole Creek at Deihl Road, Houston, TX. (Drainage Area -- 7.50 $mi.^2$)** | | | | | | | | |
| July 18-20, 1984 | 2.0 | 2.22 | 0.44 | 0.87 | 1.67 | 0.86 | 0.39 | 787* |
| | | | | | | | | |
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| | | | | | | | | |

* - Peak Discharge for 1984 Water Year

## 08074150 COLE CREEK AT DEIHL ROAD, HOUSTON, TX

LOCATION.--Lat 29°51'04", long 95°29'16", Harris County, Hydrologic Unit 12040104, on downstream side of bridge at Deihl Road in northwest Houston and 1.8 mi upstream from mouth.

DRAINAGE AREA.--7.50 mi². Prior to Oct. 1, 1976, 8.05 mi². Prior to Oct. 1, 1979, 7.33 mi². Drainage area changes are the result of drainage ditch relocations and extensions.

PERIOD OF RECORD.--April 1964 to current year. Gage at temporary location 1.0 mi downstream at Antoine Drive May 18, 1965, to Sept. 1, 1966, due to bridge construction and channel rectification.

REVISED RECORDS.--WRD TX-74-1: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1957 adjustment; unadjusted for land-surface subsidence.

REMARKS.--Records fair. No diversion above station. Low flow is partly sustained by sewage effluent from Houston suburbs. Recording rain gage at station. Several observations of water temperature were made during the year.

AVERAGE DISCHARGE.--20 years, 7.79 ft³/s, 5,640 acre-ft/yr.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,020 ft³/s Mar. 20, 1972 (elevation, 78.60 ft); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 787 ft³/s July 18 at 1930 hours (elevation, 75.95 ft); no other peaks above base of 400 ft³/s; minimum daily, 0.08 ft³/s Aug. 16.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 1.70 | 10.0 | 2.0 | 1.6 | 1.6 | 2.9 | 2.0 | 1.70 | 1.60 | 2.70 | .32 | 1.30 |
| 2 | 1.50 | 4.0 | 2.5 | 1.7 | 4.7 | 3.0 | 3.5 | 1.50 | 1.50 | 2.00 | 3.10 | 23.00 |
| 3 | 1.50 | 2.7 | 12.0 | 1.6 | 3.7 | 2.8 | 4.7 | 1.30 | 1.50 | 4.40 | 6.60 | 1.60 |
| 4 | 1.20 | 2.9 | 2.3 | 1.7 | 1.8 | 2.6 | 2.3 | 1.10 | 1.30 | .80 | 14.00 | .64 |
| 5 | 1.40 | 20.0 | 1.4 | 1.7 | 1.7 | 6.9 | 2.0 | .83 | 2.10 | 19.00 | 4.50 | 1.20 |
| 6 | 1.10 | 76.0 | 1.2 | 1.6 | 1.8 | 2.9 | 2.1 | .67 | 61.00 | 1.80 | 2.00 | .89 |
| 7 | .95 | 6.3 | 1.2 | 1.6 | 1.5 | 2.8 | 2.6 | 1.70 | 4.70 | 1.50 | 1.00 | 1.60 |
| 8 | 1.20 | 3.1 | 1.2 | 1.7 | 1.6 | 2.6 | 3.2 | 1.90 | 2.20 | 3.20 | .51 | .94 |
| 9 | 1.10 | 8.5 | 1.1 | 91.0 | 21.0 | 2.4 | 2.1 | .60 | 1.80 | 6.10 | .32 | .56 |
| 10 | 1.10 | 2.7 | 6.6 | 5.5 | 2.9 | 2.4 | 2.0 | .84 | 1.40 | 5.30 | 1.10 | .58 |
| 11 | 1.10 | 1.6 | 3.7 | 2.6 | 2.3 | 2.3 | 2.3 | .64 | 2.30 | 5.70 | .51 | .27 |
| 12 | 1.70 | 1.8 | 1.5 | 2.4 | 187.0 | 17.0 | 1.8 | .79 | 1.60 | 8.40 | 1.30 | .95 |
| 13 | 1.20 | 1.6 | 1.5 | 2.0 | 13.0 | 76.0 | 1.7 | .61 | 1.80 | 3.90 | .51 | .84 |
| 14 | 1.30 | 1.5 | 1.4 | 2.2 | 6.1 | 6.6 | 1.8 | .72 | 1.40 | 2.50 | .58 | .26 |
| 15 | 1.20 | 1.6 | 1.2 | 3.2 | 4.6 | 4.3 | 1.6 | .97 | 1.00 | 1.80 | .96 | 1.40 |
| 16 | 1.80 | 1.7 | 9.3 | 3.8 | 3.6 | 3.2 | 1.7 | .90 | 1.00 | .96 | .08 | 1.70 |
| 17 | 4.60 | 1.8 | 2.5 | 2.7 | 6.9 | 2.8 | 1.7 | 1.00 | .96 | .80 | .21 | .57 |
| 18 | 3.00 | 1.7 | 1.4 | 2.3 | 3.5 | 2.5 | 1.8 | 5.70 | 1.60 | 114.00 | .88 | .51 |
| 19 | 1.40 | 1.6 | 1.4 | 1.9 | 2.9 | 8.5 | 1.9 | 59.00 | 1.00 | 53.00 | .65 | .42 |
| 20 | 1.30 | 1.5 | 1.7 | 2.0 | 106.0 | 7.6 | 1.7 | 14.00 | .80 | 4.50 | .64 | 2.10 |
| 21 | 1.60 | 1.5 | 2.9 | 2.1 | 35.0 | 2.7 | 1.7 | 12.00 | .65 | .96 | .47 | 12.00 |
| 22 | 1.40 | 1.9 | 1.4 | 2.3 | 6.1 | 2.2 | 1.8 | 3.50 | .96 | .80 | .61 | 9.00 |
| 23 | 1.30 | 5.7 | 1.4 | 43.0 | 4.3 | 16.0 | 1.8 | 2.20 | .65 | .72 | .13 | .84 |
| 24 | 1.60 | 1.6 | 1.5 | 9.9 | 3.6 | 14.0 | 2.2 | 1.80 | .51 | 22.00 | 4.20 | .46 |
| 25 | 1.80 | 1.4 | 1.6 | 4.2 | 3.1 | 2.9 | 2.5 | 1.80 | .38 | 20.00 | 2.80 | 1.00 |
| 26 | 1.30 | 1.6 | 1.8 | 3.4 | 6.4 | 2.4 | 2.5 | 1.70 | .38 | 2.30 | .72 | .52 |
| 27 | 1.70 | 3.1 | 2.1 | 2.6 | 4.0 | 2.5 | 1.4 | 1.70 | .38 | 1.60 | .55 | .40 |
| 28 | 5.50 | 1.7 | 1.5 | 2.4 | 3.1 | 2.2 | 1.2 | 1.60 | .51 | 57.00 | .31 | .40 |
| 29 | 5.80 | 1.6 | 1.4 | 2.3 | 2.9 | 2.1 | 1.0 | 1.90 | .51 | 9.60 | .88 | .34 |
| 30 | 2.10 | 1.8 | 1.5 | 2.6 | --- | 2.1 | 1.3 | 1.60 | 1.10 | .88 | .80 | .34 |
| 31 | 2.70 | --- | 1.5 | 2.3 | --- | 2.0 | --- | 1.60 | --- | .44 | 1.40 | --- |
| TOTAL | 58.15 | 174.5 | 75.7 | 211.9 | 446.7 | 213.2 | 61.9 | 127.87 | 98.59 | 358.66 | 52.64 | 66.63 |
| MEAN | 1.88 | 5.82 | 2.44 | 6.84 | 15.4 | 6.88 | 2.06 | 4.12 | 3.29 | 11.6 | 1.70 | 2.22 |
| MAX | 5.8 | 76 | 12 | 91 | 187 | 76 | 4.7 | 59 | 61 | 114 | 14 | 23 |
| MIN | .95 | 1.4 | 1.1 | 1.6 | 1.5 | 2.0 | 1.0 | .60 | .38 | .44 | .08 | .26 |
| AC-FT | 115 | 346 | 150 | 420 | 886 | 423 | 123 | 254 | 196 | 711 | 104 | 132 |

CAL YR 1983 TOTAL 4538.24 MEAN 12.4 MAX 591 MIN .77 AC-FT 9000
WTR YR 1984 TOTAL 1946.44 MEAN 5.32 MAX 187 MIN .08 AC-FT 3860

STORM RAINFALL AND RUNOFF
08074150 COLE CREEK AT DEIHL ROAD, HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4150 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4145 (INCHES) | ACCUMULATED RAINFALL AT GAGE 205R (INCHES) | ACCUMULATED RAINFALL AT GAGE 21R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|
| | | | STORM OF JULY 18-20, 1984 | | | | |
| JULY18 | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.3 | 0.0002 |
| 0600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.1 | 0.0003 |
| 1200 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0005 |
| 1630 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.2 | 0.0006 |
| 1700 | 0.07 | 0.47 | 0.0 | 0.30 | 0.27 | 0.2 | 0.0007 |
| 1730 | 0.20 | 0.53 | 0.12 | 0.52 | 0.43 | 26.0 | 0.0033 |
| 1800 | 0.23 | 0.65 | 0.16 | 0.93 | 0.69 | 51.0 | 0.0086 |
| 1830 | 1.07 | 1.52 | 1.07 | 1.67 | 1.48 | 268.0 | 0.0363 |
| 1900 | 1.90 | 2.25 | 1.71 | 2.22 | 2.12 | 484.0 | 0.0863 |
| 1930 | 1.92 | 2.28 | 1.73 | 2.25 | 2.14 | 787.0 | 0.1676 |
| 2000 | 1.93 | 2.28 | 1.74 | 2.26 | 2.15 | 694.0 | 0.2493 |
| 2030 | 1.94 | 2.30 | 1.75 | 2.30 | 2.18 | 598.0 | 0.3011 |
| 2100 | 1.95 | 2.32 | 1.76 | 2.30 | 2.19 | 502.0 | 0.3629 |
| 2130 | 1.96 | 2.33 | 1.78 | 2.30 | 2.19 | 463.0 | 0.4008 |
| 2200 | 1.96 | 2.34 | 1.80 | 2.30 | 2.20 | 424.0 | 0.4446 |
| 2230 | 1.96 | 2.35 | 1.80 | 2.30 | 2.20 | 385.0 | 0.4843 |
| 2300 | 1.96 | 2.38 | 1.81 | 2.30 | 2.21 | 355.0 | 0.5210 |
| 2330 | 1.96 | 2.39 | 1.82 | 2.30 | 2.21 | 326.0 | 0.5547 |
| 2400 | 1.96 | 2.39 | 1.82 | 2.30 | 2.21 | 296.0 | 0.6005 |
| JULY19 | | | | | | | |
| 0000 | 1.96 | 2.39 | 1.82 | 2.30 | 2.21 | 296.0 | 0.6005 |
| 0100 | 1.96 | 2.40 | 1.82 | 2.30 | 2.21 | 221.0 | 0.6462 |
| 0200 | 1.96 | 2.41 | 1.82 | 2.30 | 2.22 | 180.0 | 0.6834 |
| 0300 | 1.96 | 2.41 | 1.82 | 2.30 | 2.22 | 138.0 | 0.7262 |
| 0500 | 1.96 | 2.41 | 1.82 | 2.30 | 2.22 | 90.0 | 0.7541 |
| 0600 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 66.0 | 0.8018 |
| 1200 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 15.0 | 0.8704 |
| 1800 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 3.2 | 0.8730 |
| 2000 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 1.8 | 0.8738 |
| 2200 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 15.0 | 0.8800 |
| 2400 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 22.0 | 0.8891 |
| JULY20 | | | | | | | |
| 0000 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 22.0 | 0.8891 |
| 0200 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 16.0 | 0.8957 |
| 0400 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 6.9 | 0.8985 |
| 0600 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 4.6 | 0.9023 |
| 1200 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 2.5 | 0.9054 |
| 1800 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 1.0 | 0.9067 |
| 2400 | 1.96 | 2.42 | 1.82 | 2.30 | 2.22 | 0.4 | 0.9069 |

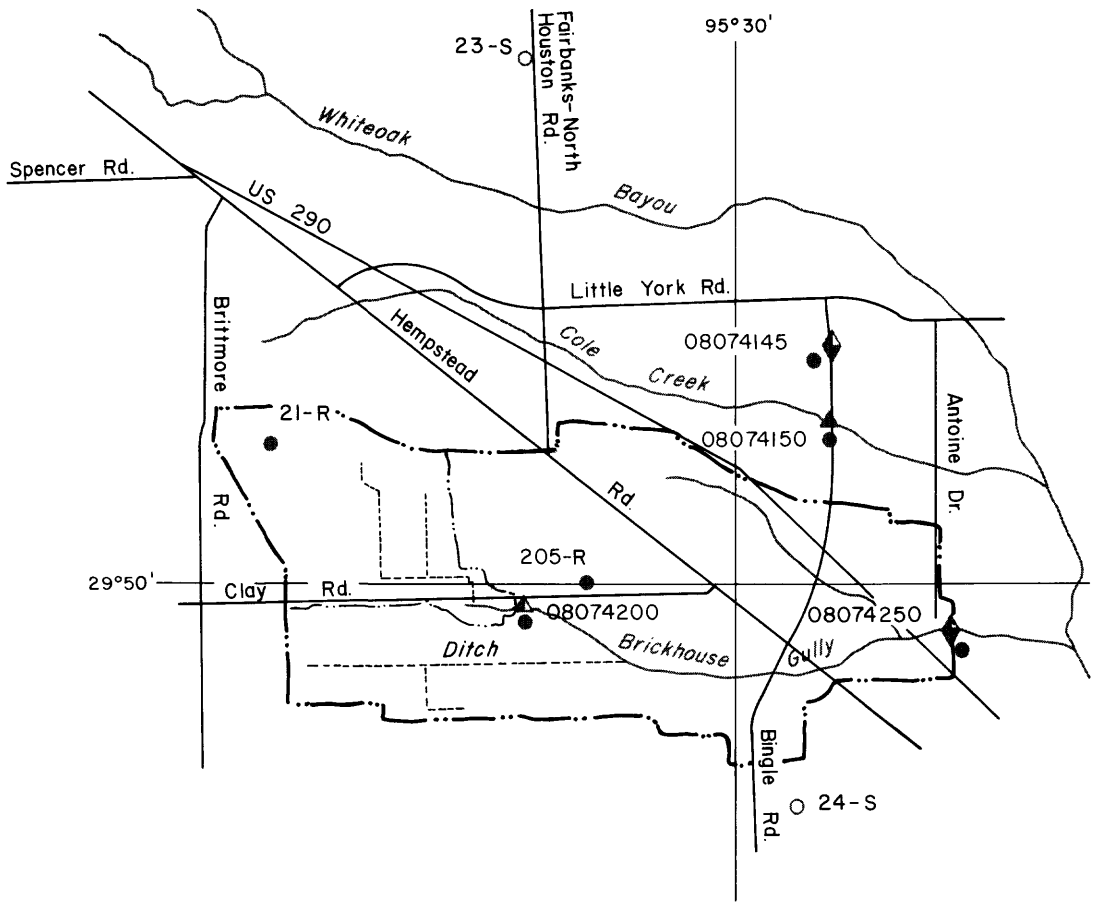
## BRICKHOUSE GULLY DRAINAGE BASIN

The location of data-collection sites in and near the Brickhouse Gully drainage basin are shown in figure 8.

Weighted-mean rainfall in the drainage basin based on six rain gages for the 1984 water year was 29.12 inches or 19.07 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.72 | 2.60 | 1.25 | 2.95 | 3.18 | 2.50 | 0.13 | 2.58 | 1.34 | 6.68 | 3.12 | 2.07 | 29.12 |

The storm of July 18-19 was selected for analysis at station 08074200, Brickhouse Gully at Clarblak Street. The storm of July 18-20 was selected for analysis at station 08074250, Brickhouse Gully at Costa Rica Street.




EXPLANATION

- ▲ Stream-gaging station
- ▼ Water-quality sampling site
- ◮ Flood-hydrograph partial-record station
- ● Recording rain gage
- ○ Nonrecording rain gage
- —·— Drainage divide
- —··— Drainage subdivide

0 2 MILES
0 1 2 KILOMETERS

**Base from Texas Department of Highways and Public Transportation General Highway Map**

Figure 8.-Locations of data-collection sites in and near the Brickhouse Gully drainage basin

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GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 6 .--Storm rainfall-runoff data, 1984 Water Year, Brickhouse Gully

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Brickhouse Gully at Clarblak St., Houston, TX. (Drainage Area -- 2.56 $mi.^2$)** | | | | | | | | |
| July 18-19, 1984 | 1.8 | 2.40 | 0.72 | 1.20 | 1.68 | 0.71 | 0.30 | 307* |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **Brickhouse Gully at Costa Rica St., Houston, TX. (Drainage Area -- 11.4 $mi.^2$)** | | | | | | | | |
| July 18-20, 1984 | 1.8 | 2.06 | 0.72 | 1.22 | 1.68 | 0.90 | 0.44 | 2610* |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

* - Peak Discharge for 1984 Water Year

08074200 Brickhouse Gully at Clarblak Street, Houston, Tex.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°49'53", long 95°31'42", Harris County, Hydrologic Unit 12040104 at bridge on Clarblak Street, in northwest Houston, and 4.0 miles upstream from station at Costa Rica Street.

DRAINAGE AREA.--2.56 $mi^2$. Drainage area, effective for period, April 1964 to current year. The boundary of the basin is poorly defined due to flat ground slopes.

PERIOD OF RECORD--April 1964 to July 6, 1976, Jan. 26, 1977 to current year.

GAGE.--Digital flood-hydrograph and rainfall recorders and crest-stage gage. Prior to April 7, 1978, a flood-hydrograph rainfall recorder (type SR) and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1957 adjustment, unadjusted for land-surface subsidence.

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 409 $ft^3/s$, Oct. 15, 1980 (elevation 89.57 ft) after concrete lining of channel. Maximum elevation 94.28 ft, March 20, 1972 prior to concrete lining of channel. Minimum discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 200 $ft^3/s$ and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| July 9 | 1545 | 268 | 88.11 |
| July 18 | 1915 | *307 | 88.58 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08074200 BRICKHOUSE GULLY AT CLARBLAK ST., HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 21R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|
| | | STORM OF JULY 18-19, 1984 | | | |
| JULY18 | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0018 |
| 0600 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0054 |
| 1200 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0087 |
| 1645 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0102 |
| 1700 | 0.0 | 0.30 | 0.21 | 1.0 | 0.0104 |
| 1715 | 0.36 | 0.52 | 0.47 | 10.0 | 0.0119 |
| 1730 | 0.84 | 0.52 | 0.62 | 33.0 | 0.0169 |
| 1745 | 0.84 | 0.53 | 0.62 | 63.0 | 0.0264 |
| 1800 | 0.84 | 0.93 | 0.90 | 85.0 | 0.0393 |
| 1815 | 1.08 | 1.32 | 1.25 | 98.0 | 0.0541 |
| 1830 | 1.56 | 1.67 | 1.64 | 153.0 | 0.0773 |
| 1845 | 2.28 | 2.02 | 2.10 | 259.0 | 0.1164 |
| 1900 | 2.52 | 2.22 | 2.31 | 305.0 | 0.1626 |
| 1915 | 2.52 | 2.24 | 2.32 | 307.0 | 0.2091 |
| 1930 | 2.52 | 2.25 | 2.33 | 290.0 | 0.2529 |
| 1945 | 2.52 | 2.25 | 2.33 | 263.0 | 0.2927 |
| 2000 | 2.52 | 2.26 | 2.34 | 239.0 | 0.3289 |
| 2015 | 2.52 | 2.28 | 2.35 | 213.0 | 0.3611 |
| 2030 | 2.64 | 2.30 | 2.40 | 187.0 | 0.4036 |
| 2100 | 2.64 | 2.30 | 2.40 | 147.0 | 0.4592 |
| 2145 | 2.64 | 2.30 | 2.40 | 113.0 | 0.5105 |
| 2230 | 2.64 | 2.30 | 2.40 | 86.0 | 0.5430 |
| 2300 | 2.64 | 2.30 | 2.40 | 64.0 | 0.5624 |
| 2330 | 2.64 | 2.30 | 2.40 | 48.0 | 0.5769 |
| 2400 | 2.64 | 2.30 | 2.40 | 40.0 | 0.6193 |
| JULY19 | | | | | |
| 0000 | 2.64 | 2.30 | 2.40 | 40.0 | 0.6193 |
| 0300 | 2.64 | 2.30 | 2.40 | 20.0 | 0.6556 |
| 0600 | 2.64 | 2.30 | 2.40 | 10.0 | 0.6829 |
| 1200 | 2.64 | 2.30 | 2.40 | 4.5 | 0.6992 |
| 1800 | 2.64 | 2.30 | 2.40 | 3.0 | 0.7101 |
| 2400 | 2.64 | 2.30 | 2.40 | 2.0 | 0.7137 |

08074250 Brickhouse Gully at Costa Rica Street, Houston, Tex.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°49'40", long 95°28'09", Harris County, Hydrologic Unit 12040104, at downstream side of bridge at Costa Rica Street in northwest Houston and 1.0 mile upstream from Whiteoak Bayou.

DRAINAGE AREA.--11.4 $mi^2$. Prior to Oct. 1, 1973, 11.6 $mi^2$.

PERIOD OF RECORD.--August 1964 to current year (operated as a continuous-recording station prior to Oct. 1, 1981).

GAGE.--Water-stage recorder and crest-stage gage. Low-water concrete control since Dec. 9, 1970. Datum of gage is National Geodetic Vertical Datum of 1929, 1957 adjustment; unadjusted for land-surface subsidence.

REMARKS.--Water-discharge records good. Low flow is partially sustained by sewage affluent. No known diversion above station. Recording rain gage at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,800 $ft^3/s$ Mar. 20, 1972 (elevation, 69.20 ft); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 $ft^3/s$ (revised) and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| July 18 | 1930 | *2,610 | 63.91 |
| July 25 | 1500 | 1,740 | 61.86 |
| Aug. ? | 2030 | 1,700 | 61.77 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08074250 BRICKHOUSE GULLY AT COSTA RICA ST., HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4250 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4150 (INCHES) | ACCUMULATED RAINFALL AT GAGE 205R (INCHES) | ACCUMULATED RAINFALL AT GAGE 21R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|
| | | | | STORM OF JULY 18-20, 1984 | | | | |
| JULY18 | | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.8 | 0.0007 |
| 1200 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.3 | 0.0021 |
| 1645 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 1.0 | 0.0025 |
| 1700 | 0.0 | 0.0 | 0.07 | 0.0 | 0.30 | 0.05 | 1.0 | 0.0025 |
| 1715 | 0.0 | 0.36 | 0.16 | 0.08 | 0.52 | 0.23 | 0.9 | 0.0025 |
| 1730 | 0.0 | 0.84 | 0.20 | 0.12 | 0.52 | 0.39 | 0.9 | 0.0026 |
| 1745 | 0.0 | 0.84 | 0.22 | 0.14 | 0.53 | 0.40 | 0.9 | 0.0026 |
| 1800 | 0.0 | 0.84 | 0.23 | 0.16 | 0.93 | 0.46 | 0.9 | 0.0026 |
| 1815 | 0.23 | 1.08 | 0.57 | 0.42 | 1.32 | 0.74 | 234.0 | 0.0106 |
| 1830 | 0.64 | 1.56 | 1.07 | 1.02 | 1.67 | 1.23 | 513.0 | 0.0280 |
| 1845 | 0.92 | 2.28 | 1.65 | 1.64 | 2.02 | 1.78 | 902.0 | 0.0587 |
| 1900 | 1.14 | 2.52 | 1.90 | 1.71 | 2.22 | 1.96 | 1650.0 | 0.1147 |
| 1915 | 1.15 | 2.52 | 1.90 | 1.72 | 2.24 | 1.97 | 2430.0 | 0.1973 |
| 1930 | 1.16 | 2.52 | 1.92 | 1.73 | 2.25 | 1.98 | 2610.0 | 0.2860 |
| 1945 | 1.17 | 2.52 | 1.92 | 1.74 | 2.25 | 1.98 | 2510.0 | 0.3713 |
| 2000 | 1.18 | 2.52 | 1.93 | 1.74 | 2.26 | 1.99 | 2270.0 | 0.4484 |
| 2015 | 1.18 | 2.52 | 1.93 | 1.75 | 2.28 | 1.99 | 1750.0 | 0.5147 |
| 2030 | 1.18 | 2.64 | 1.94 | 1.75 | 2.30 | 2.03 | 1610.0 | 0.5694 |
| 2045 | 1.19 | 2.64 | 1.94 | 1.76 | 2.30 | 2.04 | 1310.0 | 0.6139 |
| 2100 | 1.20 | 2.64 | 1.95 | 1.76 | 2.30 | 2.04 | 1050.0 | 0.6496 |
| 2115 | 1.20 | 2.64 | 1.95 | 1.77 | 2.30 | 2.04 | 835.0 | 0.6780 |
| 2130 | 1.20 | 2.64 | 1.96 | 1.78 | 2.30 | 2.05 | 677.0 | 0.7010 |
| 2145 | 1.20 | 2.64 | 1.96 | 1.79 | 2.30 | 2.05 | 524.0 | 0.7188 |
| 2200 | 1.20 | 2.64 | 1.96 | 1.80 | 2.30 | 2.05 | 393.0 | 0.7388 |
| 2230 | 1.20 | 2.64 | 1.96 | 1.80 | 2.30 | 2.05 | 268.0 | 0.7570 |
| 2300 | 1.20 | 2.64 | 1.96 | 1.81 | 2.30 | 2.06 | 199.0 | 0.7706 |
| 2330 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 155.0 | 0.7811 |
| 2400 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 125.0 | 0.8108 |
| JULY19 | | | | | | | | |
| 0000 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 125.0 | 0.8108 |
| 0300 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 62.0 | 0.8361 |
| 0600 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 37.0 | 0.8600 |
| 1200 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 20.0 | 0.8763 |
| 1800 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 10.0 | 0.8844 |
| 2400 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 6.4 | 0.8897 |
| JULY20 | | | | | | | | |
| 0000 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 6.4 | 0.8897 |
| 0600 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 4.5 | 0.8933 |
| 1200 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 3.7 | 0.8964 |
| 1800 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 3.0 | 0.8988 |
| 2400 | 1.20 | 2.64 | 1.96 | 1.82 | 2.30 | 2.06 | 2.4 | 0.8998 |

## LAZYBROOK STREET STORM SEWER DRAINAGE BASIN

The locations of data-collection sites in the Lazybrook Street Storm Sewer drainage basin are shown in figure 9.

Weighted-mean rainfall for the 1984 water year was not determined.

The storms of Mar. 23, July 5, and Aug. 5 were selected for analysis at station 08074400, Lazybrook Street Storm Sewer at Houston.

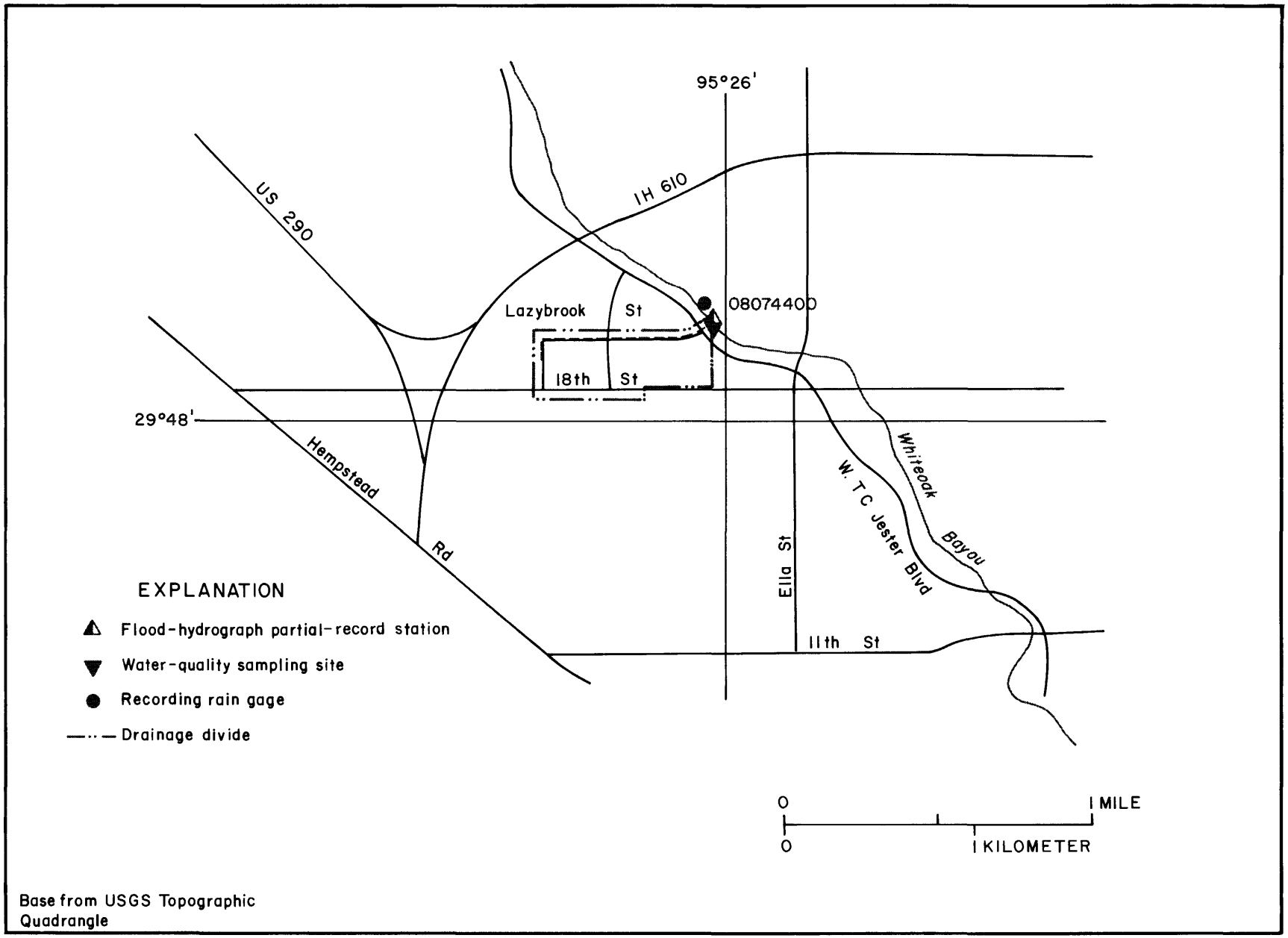


Figure 9.-Locations of data-collection sites in and near the Lazybrook Street Storm Sewer drainage basin

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 7.--Storm rainfall-runoff data, 1984 Water Year, Lazybrook Street Storm Sewer

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Lazybrook Street Storm Sewer at Houston, TX. (Drainage Area -- 0.13 $mi.^2$)** | | | | | | | | |
| Mar. 23, 1984 | 0.9 | 1.62 | 0.54 | 0.88 | 1.43 | 0.85 | 0.52 | 79 |
| July 5, 1984 | 0.6 | 1.88 | 0.82 | 1.35 | 1.87 | 0.69 | 0.37 | 94 |
| Aug. 5, 1984 | 1.4 | 1.39 | 0.28 | 0.52 | 0.90 | 0.82 | 0.59 | 105* |

* - Peak Discharge for 1984 Water Year

## SAN JACINTO RIVER BASIN

### 08074400 LAZYBROOK STREET STORM SEWER AT HOUSTON, TX
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°48'15", long 95°26'04", Harris County, Hydrologic Unit 12040104, over a 54-inch storm sewer 30 ft north of the intersection of Lazybrook Street and West T. C. Jester Boulevard, Houston.

DRAINAGE AREA.--0.13 $mi^2$.

### WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to current year.

GAGE.--Flood-hydrograph and rainfall recorder. Datum of gage is -0.10 ft National Geodetic Vertical Datum of 1929, 1973 adjustment.

REMARKS.--Records good. Additional storm rainfall-runoff data for this site can be obtained from the reports "Hydrologic Data for Urban Studies in the Houston, Texas Metropolitan Area."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 119 $ft^3/s$ represents full storm sewer discharge and usually occurs many times annually, gage height, 58.09 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 85 $ft^3/s$ and maximum (*):

| Date | Time | Discharge ($ft^3/s$) | Gage height (ft) |
|---|---|---|---|
| July 5 | 1640 | 94 | 57.67 |
| Aug. 5 | 1430 | *105 | 57.85 |

### WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: March 1980 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) |
|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | |
| 16-16 | 0645 | .97 | 156 | 40 | 6.6 | 7.2 | 42 | 0 | 14 | 1.7 |
| FEB | | | | | | | | | | |
| 20... | 0830 | 3.3 | 130 | 140 | 64 | -- | 37 | 6 | 13 | 1.1 |
| 20... | 0945 | 7.5 | 65 | 80 | 23 | -- | 20 | 3 | 6.8 | .70 |
| MAR | | | | | | | | | | |
| 23... | 1930 | 32 | 162 | <1 | 26 | -- | -- | -- | -- | -- |
| 23... | 1945 | 26 | 108 | 10 | 17 | -- | -- | -- | -- | -- |
| 23... | 2000 | 60 | 60 | 10 | 20 | -- | -- | -- | -- | -- |
| 23... | 2015 | 72 | 75 | 30 | 10 | -- | -- | -- | -- | -- |
| 23... | 2030 | 30 | 163 | -- | -- | -- | -- | -- | -- | -- |
| 23... | 2045 | 17 | 98 | 40 | 10 | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | |
| 05-05 | 1605 | 11 | 84 | 55 | 15 | -- | 20 | 0 | 7.0 | .70 |
| 06-06 | 0645 | .74 | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-10 | 1515 | .90 | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 05-05 | 1400 | 12 | 86 | 50 | 12 | -- | 20 | 0 | 6.4 | .90 |

08074400 LAZYBROOK STREET STORM SEWER AT HOUSTON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | SODIUM, DISSOLVED (MG/L AS NA) | SODIUM ADSORPTION RATIO | POTASSIUM, DISSOLVED (MG/L AS K) | ALKALINITY FIELD (MG/L AS CACO3) | SULFATE DISSOLVED (MG/L AS SO4) | CHLORIDE, DISSOLVED (MG/L AS CL) | FLUORIDE, DISSOLVED (MG/L AS F) | SILICA, DISSOLVED (MG/L AS SIO2) | SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L) |
|---|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | | |
| 16-16 | 14 | 1 | 2.6 | 43 | 12 | 15 | .10 | 3.9 | 89 | 45 |
| FEB | | | | | | | | | | |
| 20... | 11 | .8 | 2.1 | 31 | 9.3 | 17 | <.10 | 2.3 | 74 | 306 |
| 20... | 3.9 | .4 | 2.4 | 17 | 9.0 | 4.4 | <.10 | 2.4 | 40 | 114 |
| MAR | | | | | | | | | | |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 328 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 123 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 138 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 76 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | 44 |
| JUL | | | | | | | | | | |
| 05-05 | 8.7 | .9 | 2.4 | 24 | 8.1 | 6.9 | .10 | 2.6 | 51 | 62 |
| 06-06 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-10 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | | |
| 05-05 | 9.8 | 1 | 2.1 | 28 | 7.5 | 7.1 | <.10 | 3.0 | 54 | 35 |

| DATE | SOLIDS, VOLATILE, SUSPENDED (MG/L) | NITROGEN, NITRATE TOTAL (MG/L AS N) | NITROGEN, NITRITE TOTAL (MG/L AS N) | NITROGEN, NO2+NO3 TOTAL (MG/L AS N) | NITROGEN, AMMONIA TOTAL (MG/L AS N) | NITROGEN, ORGANIC TOTAL (MG/L AS N) | NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) | PHOSPHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|
| DEC | | | | | | | | | |
| 16-16 | 12 | .20 | .200 | .40 | .430 | 1.1 | 1.5 | .540 | 12 |
| FEB | | | | | | | | | |
| 20... | 114 | -- | <.010 | .40 | .040 | 3.1 | 3.1 | .680 | 28 |
| 20... | 33 | .59 | .010 | .60 | .540 | 1.6 | 2.1 | .640 | 15 |
| MAR | | | | | | | | | |
| 23... | 132 | .31 | .190 | .50 | 1.10 | 6.9 | 8.0 | 2.40 | 34 |
| 23... | 55 | .57 | .030 | .60 | .650 | 2.5 | 3.1 | .770 | 16 |
| 23... | 43 | -- | <.010 | .80 | .870 | 1.4 | 2.3 | .700 | 12 |
| 23... | 41 | .49 | .010 | .50 | .510 | 1.4 | 1.9 | .640 | 9.8 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | 30 | .88 | .020 | .90 | .560 | 1.0 | 1.6 | .840 | 11 |
| JUL | | | | | | | | | |
| 05-05 | 23 | .67 | .030 | .70 | .470 | 1.0 | 1.5 | .650 | 12 |
| 06-06 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 10-10 | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| AUG | | | | | | | | | |
| 05-05 | 12 | .47 | .030 | .50 | .130 | 1.3 | 1.4 | .510 | 9.4 |

| DATE | TIME | ARSENIC DISSOLVED (UG/L AS AS) | BARIUM, DISSOLVED (UG/L AS BA) | CADMIUM DISSOLVED (UG/L AS CD) | CHROMIUM, DISSOLVED (UG/L AS CR) | COPPER, DISSOLVED (UG/L AS CU) | IRON, DISSOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL | | | | | | | |
| 05-05 | 1605 | <1 | 19 | <1 | 20 | 4 | 100 |
| 06-06 | 0645 | <1 | <100 | <1 | <10 | 3 | 20 |
| 10-10 | 1515 | <1 | <100 | <1 | <10 | 3 | 40 |
| AUG | | | | | | | |
| 05-05 | 1400 | 1 | 25 | <1 | <10 | 3 | 79 |

| DATE | LEAD, DISSOLVED (UG/L AS PB) | MANGANESE, DISSOLVED (UG/L AS MN) | MERCURY DISSOLVED (UG/L AS HG) | SELENIUM, DISSOLVED (UG/L AS SE) | SILVER, DISSOLVED (UG/L AS AG) | ZINC, DISSOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL | | | | | | |
| 05-05 | 5 | 16 | <.1 | <1 | <1 | 210 |
| 06-06 | 5 | <10 | .1 | <1 | <1 | 220 |
| 10-10 | 3 | <10 | .1 | <1 | <1 | 180 |
| AUG | | | | | | |
| 05-05 | 6 | 2 | <.1 | <1 | <1 | 140 |

STORM RAINFALL AND RUNOFF
08074400 LAZYBROOK STREET STORM SEWER AT HOUSTON, TEX

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF MAR. 23, 1984 | | | | |
| MAR. 23 | | | | |
| 0000 | 0.0 | 0.0 | 0.1 | 0.0036 |
| 0600 | 0.0 | 0.0 | 0.1 | 0.0107 |
| 1200 | 0.0 | 0.0 | 0.2 | 0.0250 |
| 1800 | 0.0 | 0.0 | 0.1 | 0.0294 |
| 1915 | 0.0 | 0.0 | 0.1 | 0.0301 |
| 1920 | 0.10 | 0.10 | 0.1 | 0.0302 |
| 1925 | 0.20 | 0.20 | 2.9 | 0.0331 |
| 1930 | 0.30 | 0.30 | 32.0 | 0.0649 |
| 1935 | 0.38 | 0.38 | 33.0 | 0.0977 |
| 1940 | 0.46 | 0.46 | 29.0 | 0.1265 |
| 1945 | 0.55 | 0.55 | 26.0 | 0.1523 |
| 1950 | 0.66 | 0.66 | 33.0 | 0.1851 |
| 1955 | 0.77 | 0.77 | 46.0 | 0.2308 |
| 2000 | 0.89 | 0.89 | 60.0 | 0.2904 |
| 2005 | 1.07 | 1.07 | 79.0 | 0.3689 |
| 2010 | 1.25 | 1.25 | 79.0 | 0.4473 |
| 2015 | 1.43 | 1.43 | 72.0 | 0.5189 |
| 2020 | 1.43 | 1.43 | 54.0 | 0.5725 |
| 2025 | 1.44 | 1.44 | 40.0 | 0.6122 |
| 2030 | 1.45 | 1.45 | 30.0 | 0.6420 |
| 2035 | 1.47 | 1.47 | 22.0 | 0.6639 |
| 2040 | 1.49 | 1.49 | 18.0 | 0.6818 |
| 2045 | 1.51 | 1.51 | 17.0 | 0.6987 |
| 2050 | 1.53 | 1.53 | 16.0 | 0.7145 |
| 2055 | 1.56 | 1.56 | 15.0 | 0.7294 |
| 2100 | 1.59 | 1.59 | 14.0 | 0.7434 |
| 2105 | 1.60 | 1.60 | 13.0 | 0.7563 |
| 2110 | 1.61 | 1.61 | 11.0 | 0.7672 |
| 2115 | 1.62 | 1.62 | 9.3 | 0.7857 |
| 2130 | 1.62 | 1.62 | 5.4 | 0.8098 |
| 2200 | 1.62 | 1.62 | 2.5 | 0.8322 |
| 2300 | 1.62 | 1.62 | 1.0 | 0.8441 |
| 2400 | 1.62 | 1.62 | 0.5 | 0.8471 |

STORM RAINFALL AND RUNOFF

08074400 LAZYBROOK STREET STORM SEWER AT HOUSTON, TEX.

--CONTINUED

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF JULY 5 , 1984 | | | | |
| JULY5 | | | | |
| 0000 | 0.0 | 0.0 | 0.1 | 0.0036 |
| 0600 | 0.0 | 0.0 | 0.1 | 0.0107 |
| 1200 | 0.0 | 0.0 | 0.1 | 0.0167 |
| 1600 | 0.0 | 0.0 | 0.1 | 0.0191 |
| 1605 | 0.14 | 0.14 | 0.1 | 0.0192 |
| 1610 | 0.28 | 0.28 | 0.1 | 0.0193 |
| 1615 | 0.43 | 0.43 | 1.9 | 0.0212 |
| 1620 | 0.70 | 0.70 | 24.0 | 0.0450 |
| 1625 | 0.97 | 0.97 | 40.0 | 0.0848 |
| 1630 | 1.25 | 1.25 | 56.0 | 0.1404 |
| 1635 | 1.42 | 1.42 | 81.0 | 0.2209 |
| 1640 | 1.60 | 1.60 | 94.0 | 0.3142 |
| 1645 | 1.78 | 1.78 | 92.0 | 0.4056 |
| 1650 | 1.81 | 1.81 | 77.0 | 0.4821 |
| 1655 | 1.84 | 1.84 | 56.0 | 0.5377 |
| 1700 | 1.87 | 1.87 | 38.0 | 0.5755 |
| 1705 | 1.87 | 1.87 | 25.0 | 0.6003 |
| 1710 | 1.87 | 1.87 | 17.0 | 0.6172 |
| 1715 | 1.88 | 1.88 | 12.0 | 0.6410 |
| 1730 | 1.88 | 1.88 | 4.7 | 0.6621 |
| 1800 | 1.88 | 1.88 | 1.4 | 0.6787 |
| 1930 | 1.88 | 1.88 | 0.3 | 0.6841 |
| 2100 | 1.88 | 1.88 | 0.2 | 0.6895 |
| 2400 | 1.88 | 1.88 | 0.1 | 0.6913 |

STORM RAINFALL AND RUNOFF

08074400 LAZYBROOK STREET STORM SEWER AT HOUSTON, TEX

--CONTINUED

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF AUG. 5 , 1984 | | | | |
| AUG. 5 | | | | |
| 0000 | 0.0 | 0.0 | 0.2 | 0.0072 |
| 0600 | 0.0 | 0.0 | 0.2 | 0.0215 |
| 1200 | 0.0 | 0.0 | 0.8 | 0.0548 |
| 1300 | 0.0 | 0.0 | 0.2 | 0.0572 |
| 1400 | 0.0 | 0.0 | 0.1 | 0.0580 |
| 1415 | 0.0 | 0.0 | 0.1 | 0.0582 |
| 1420 | 0.06 | 0.06 | 0.4 | 0.0586 |
| 1425 | 0.13 | 0.13 | 48.0 | 0.1062 |
| 1430 | 0.20 | 0.20 | 105.0 | 0.2105 |
| 1435 | 0.29 | 0.29 | 102.0 | 0.3119 |
| 1440 | 0.38 | 0.38 | 99.0 | 0.4102 |
| 1445 | 0.48 | 0.48 | 93.0 | 0.5026 |
| 1450 | 0.56 | 0.56 | 81.0 | 0.5830 |
| 1455 | 0.64 | 0.64 | 61.0 | 0.6436 |
| 1500 | 0.72 | 0.72 | 41.0 | 0.6844 |
| 1505 | 0.78 | 0.78 | 28.0 | 0.7122 |
| 1510 | 0.84 | 0.84 | 20.0 | 0.7320 |
| 1515 | 0.90 | 0.90 | 15.0 | 0.7469 |
| 1520 | 0.95 | 0.95 | 11.0 | 0.7579 |
| 1525 | 1.01 | 1.01 | 8.0 | 0.7658 |
| 1530 | 1.07 | 1.07 | 6.3 | 0.7721 |
| 1535 | 1.11 | 1.11 | 4.9 | 0.7769 |
| 1540 | 1.15 | 1.15 | 4.0 | 0.7809 |
| 1545 | 1.20 | 1.20 | 3.1 | 0.7840 |
| 1550 | 1.24 | 1.24 | 2.7 | 0.7867 |
| 1555 | 1.28 | 1.28 | 2.2 | 0.7888 |
| 1600 | 1.32 | 1.32 | 1.9 | 0.7907 |
| 1605 | 1.34 | 1.34 | 1.6 | 0.7923 |
| 1610 | 1.36 | 1.36 | 1.4 | 0.7937 |
| 1615 | 1.39 | 1.39 | 1.2 | 0.8068 |
| 1800 | 1.39 | 1.39 | 0.3 | 0.8207 |
| 2400 | 1.39 | 1.39 | 0.1 | 0.8243 |

TX-35
Rev. 5/80

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 8.--Storm rainfall-runoff data, 1984 Water Year, Whiteoak Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Whiteoak Bayou at Houston, TX. (Drainage Area -- 86.3 $mi.^2$)** | | | | | | | | |
| Mar. 23-25, 1984 | 1.5 | 0.73 | 0.30 | 0.59 | 1.15 | 0.34 | 0.47 | 2830 |
| June 6-8, 1984 | 2.0 | 1.53 | 0.71 | 1.41 | 1.66 | 0.42 | 0.28 | 3830* |

* - Peak Discharge for 1984 Water Year

## 08074500 WHITEOAK BAYOU AT HOUSTON, TX

LOCATION.--Lat 29°46'30", long 95°23'49", Harris County, Hydrologic Unit 12040104, at downstream side of downstream bridge on Heights Boulevard in Houston, 560 ft downstream from Texas and New Orleans Railroad Co. bridge, 2.4 mi upstream from Little Whiteoak Bsyou, and 4.0 mi upstream from mouth.

DRAINAGE AREA.--86.3 $mi^2$. Prior to Oct. 1, 1976, 84.7 $mi^2$.

### WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1936 to current year (October 1965 to September 1966, monthly discharge only).

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 7.35 ft below National Geodetic Vertical Datum of 1929; unadjusted for land-surface subsidence. Prior to June 17, 1936, nonrecording gage, and June 17, 1936, to Apr. 28, 1965, water-stage recorder at site 480 ft upstream at same datum.

REMARKS.--Water-discharge records fair. Low flow is partly sustained by industrial waste. No diversion above station.

AVERAGE DISCHARGE.--48 years, 83.9 $ft^3/s$ (60,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 17,300 $ft^3/s$ Mar. 20, 1972 (gage height, 43.50 ft); maximum gage height, 43.60 ft Nov. 13, 1961; no flow for many days during 1965 water year (result of construction dams).

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since at least 1919, 51.5 ft Dec. 9, 1935, prior to channel rectification, present site and datum (discharge, 14,750 $ft^3/s$), furnished by the engineer for Harris County. The flood of May 31, 1929, reached a stage of 47.0 + 0.5 ft, prior to channel rectification, present site and datum (discharge, 9,360 $ft^3/s$), computed on basis of current-meter measurement at stage 1.0 ft below crest, furnished by city of Houston.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,830 $ft^3/s$ June 6 at 1400 hours (gage height, 26.31 ft), no peak above base of 4,000 $ft^3/s$; minimum daily, 28 $ft^3/s$ Sept. 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 44 | 210 | 38 | 38 | 39 | 47 | 41 | 39 | 32 | 124 | 29 | 50 |
| 2 | 43 | 69 | 41 | 40 | 52 | 42 | 68 | 38 | 32 | 62 | 243 | 461 |
| 3 | 44 | 35 | 289 | 37 | 83 | 42 | 76 | 37 | 31 | 109 | 230 | 93 |
| 4 | 41 | 48 | 97 | 40 | 43 | 43 | 52 | 35 | 33 | 42 | 145 | 43 |
| 5 | 39 | 179 | 41 | 39 | 37 | 130 | 42 | 36 | 70 | 378 | 418 | 38 |
| 6 | 38 | 662 | 38 | 38 | 36 | 46 | 45 | 34 | 724 | 116 | 163 | 38 |
| 7 | 37 | 156 | 32 | 38 | 34 | 41 | 52 | 84 | 180 | 83 | 145 | 133 |
| 8 | 37 | 52 | 32 | 40 | 35 | 39 | 127 | 158 | 80 | 89 | 43 | 45 |
| 9 | 38 | 67 | 37 | 1000 | 213 | 38 | 55 | 32 | 50 | 201 | 40 | 37 |
| 10 | 38 | 44 | 98 | 250 | 65 | 39 | 42 | 33 | 40 | 92 | 218 | 36 |
| 11 | 38 | 40 | 182 | 71 | 47 | 38 | 41 | 36 | 45 | 173 | 116 | 34 |
| 12 | 52 | 38 | 45 | 50 | 918 | 150 | 40 | 36 | 45 | 192 | 150 | 35 |
| 13 | 38 | 35 | 37 | 49 | 211 | 771 | 42 | 36 | 40 | 111 | 58 | 35 |
| 14 | 35 | 35 | 36 | 48 | 110 | 142 | 47 | 35 | 35 | 72 | 72 | 35 |
| 15 | 34 | 35 | 34 | 66 | 69 | 84 | 38 | 34 | 32 | 71 | 106 | 98 |
| 16 | 58 | 33 | 178 | 44 | 56 | 60 | 44 | 36 | 32 | 36 | 38 | 144 |
| 17 | 159 | 33 | 59 | 42 | 50 | 50 | 45 | 296 | 32 | 30 | 33 | 40 |
| 18 | 48 | 34 | 37 | 41 | 48 | 46 | 43 | 143 | 40 | 547 | 35 | 30 |
| 19 | 35 | 59 | 34 | 40 | 42 | 148 | 42 | 745 | 35 | 502 | 32 | 29 |
| 20 | 36 | 44 | 36 | 50 | 816 | 71 | 44 | 392 | 32 | 55 | 33 | 31 |
| 21 | 51 | 34 | 80 | 41 | 363 | 44 | 42 | 123 | 32 | 61 | 34 | 240 |
| 22 | 36 | 54 | 37 | 38 | 139 | 41 | 39 | 65 | 35 | 43 | 49 | 222 |
| 23 | 35 | 147 | 37 | 576 | 92 | 350 | 37 | 39 | 32 | 31 | 34 | 57 |
| 24 | 35 | 48 | 37 | 226 | 58 | 361 | 40 | 37 | 35 | 217 | 253 | 71 |
| 25 | 35 | 33 | 40 | 103 | 50 | 79 | 41 | 34 | 32 | 436 | 75 | 51 |
| 26 | 34 | 33 | 45 | 65 | 138 | 57 | 42 | 32 | 31 | 73 | 39 | 34 |
| 27 | 34 | 62 | 65 | 52 | 122 | 55 | 40 | 31 | 30 | 167 | 38 | 30 |
| 28 | 37 | 39 | 45 | 46 | 63 | 46 | 37 | 33 | 32 | 393 | 62 | 28 |
| 29 | 45 | 35 | 40 | 43 | 50 | 43 | 37 | 37 | 31 | 132 | 38 | 28 |
| 30 | 36 | 55 | 38 | 44 | --- | 44 | 38 | 31 | 66 | 36 | 34 | 29 |
| 31 | 76 | --- | 40 | 39 | --- | 41 | --- | 32 | --- | 30 | 43 | --- |
| TOTAL | 1386 | 2448 | 1925 | 3334 | 4079 | 3228 | 1419 | 2809 | 1996 | 4704 | 3046 | 2275 |
| MEAN | 44.7 | 81.6 | 62.1 | 108 | 141 | 104 | 47.3 | 90.6 | 66.5 | 152 | 98.3 | 75.8 |
| MAX | 159 | 662 | 289 | 1000 | 918 | 771 | 127 | 745 | 724 | 547 | 418 | 461 |
| MIN | 34 | 33 | 32 | 37 | 34 | 38 | 37 | 31 | 30 | 30 | 29 | 28 |
| AC-FT | 2750 | 4860 | 3820 | 6610 | 8090 | 6400 | 2810 | 5570 | 3960 | 9330 | 6040 | 4510 |

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| CAL YR 1983 | TOTAL | 68482 | MEAN | 188 | MAX | 7600 | MIN 31 | AC-FT 135800 |
| WTR YR 1984 | TOTAL | 32649 | MEAN | 89.2 | MAX | 1000 | MIN 28 | AC-FT 64760 |

08074500 WHITEOAK BAYOU AT HOUSTON, TX--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 07... | 1145 | 31 | 911 | 7.8 | 13.5 | <1 | 7.8 | 13.0 | 123 | 4.3 | 48 | K14 |
| MAR | | | | | | | | | | | | |
| 23... | 2005 | 173 | 270 | 8.6 | 23.0 | 1100 | 180 | 7.7 | 90 | 19 | 70000 | 150000 |
| 23... | 2035 | 2070 | 225 | 8.3 | 20.0 | 560 | 200 | 8.3 | 91 | 17 | 31000 | 160000 |
| 23... | 2205 | 2310 | 180 | 7.8 | 19.5 | 560 | 78 | 8.4 | 92 | 17 | 41000 | 260000 |
| 24... | 1305 | 233 | 350 | 8.0 | 20.0 | 560 | 180 | 8.2 | 90 | 8.7 | 25000 | 65000 |
| JUL | | | | | | | | | | | | |
| 02... | 1130 | 77 | 630 | 8.3 | 28.5 | 25 | 6.9 | 11.2 | 144 | 4.4 | 7700 | 6700 |
| AUG | | | | | | | | | | | | |
| 06... | 1050 | 125 | 344 | 7.8 | 28.5 | 70 | 130 | 8.4 | 108 | 4.8 | 13000 | 1400 |

| DATE | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 07... | 220 | 0 | 66 | 13 | 110 | 3 | 5.5 | 260 | 30 | 110 | .50 | 19 |
| MAR | | | | | | | | | | | | |
| 23... | 72 | 0 | 23 | 3.5 | 26 | 1 | 2.6 | 77 | 17 | 25 | .20 | 6.2 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 23... | 52 | 0 | 17 | 2.4 | 15 | .9 | 3.4 | 54 | 13 | 14 | .20 | 4.8 |
| 24... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | | |
| 02... | 150 | 0 | 47 | 7.5 | 75 | 3 | 6.4 | 170 | 24 | 75 | .30 | 20 |
| AUG | | | | | | | | | | | | |
| 06... | 96 | 0 | 31 | 4.5 | 33 | 2 | 4.4 | 100 | 19 | 28 | .30 | 12 |

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) | SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) | NITRO-GEN, NITRATE TOTAL (MG/L AS N) | NITRO-GEN, NITRITE TOTAL (MG/L AS N) | NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA TOTAL (MG/L AS N) | NITRO-GEN, ORGANIC TOTAL (MG/L AS N) | NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | |
| 07... | 510 | 3 | <2 | 3.8 | .230 | 4.0 | .710 | 1.7 | 2.4 | 4.40 | 6.8 |
| MAR | | | | | | | | | | | |
| 23... | 150 | 766 | 140 | .74 | .060 | .80 | .950 | 1.9 | 2.8 | 1.40 | 30 |
| 23... | -- | 710 | 118 | .54 | .060 | .60 | .580 | 1.0 | 1.6 | .830 | 26 |
| 23... | 100 | 270 | 66 | 1.2 | .090 | 1.3 | .250 | 2.4 | 2.6 | 3.00 | 26 |
| 24... | -- | 256 | 68 | .95 | .150 | 1.1 | .670 | 1.7 | 2.4 | 1.80 | 17 |
| JUL | | | | | | | | | | | |
| 02... | 360 | 6 | 6 | 2.2 | .180 | 2.4 | .400 | 1.2 | 1.6 | 2.90 | 8.7 |
| AUG | | | | | | | | | | | |
| 06... | 190 | 120 | 22 | 1.4 | .160 | 1.6 | .190 | 1.6 | 1.8 | 2.20 | 10 |

| DATE | TIME | ARSENIC DIS-SOLVED (UG/L AS AS) | BARIUM, DIS-SOLVED (UG/L AS BA) | CADMIUM DIS-SOLVED (UG/L AS CD) | CHRO-MIUM, DIS-SOLVED (UG/L AS CR) | COPPER, DIS-SOLVED (UG/L AS CU) | IRON, DIS-SOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL | | | | | | | |
| 02... | 1130 | 11 | 180 | <1 | <10 | 7 | 22 |
| AUG | | | | | | | |
| 06... | 1050 | 9 | 140 | <1 | <10 | 4 | 43 |

| DATE | LEAD, DIS-SOLVED (UG/L AS PB) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) | MERCURY DIS-SOLVED (UG/L AS HG) | SELE-NIUM, DIS-SOLVED (UG/L AS SE) | SILVER, DIS-SOLVED (UG/L AS AG) | ZINC, DIS-SOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL | | | | | | |
| 02... | <1 | 21 | <.1 | <1 | 1 | 26 |
| AUG | | | | | | |
| 06... | 1 | 2 | <.1 | <1 | <1 | 10 |

08074500 WHITEOAK BAYOU AT HOUSTON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | AME-TRYNE TOTAL | ATRA-ZINE, TOTAL (UG/L) | CYAN-AZINE TOTAL (UG/L) | METHO-MYL TOTAL (UG/L) | PROME-TONE TOTAL (UG/L) | PROME-TRYNE TOTAL (UG/L) | PRO-PAZINE TOTAL (UG/L) | PROPHAM TOTAL (UG/L) | SEVIN, TOTAL (UG/L) | SIMA-ZINE TOTAL (UG/L) | SIME-TRYNE TOTAL (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL | | | | | | | | | | | | |
| 02... | 1130 | <.10 | .20 | <.10 | <2.0 | .2 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |
| AUG | | | | | | | | | | | | |
| 06... | 1050 | <.10 | 1.7 | <.10 | <2.0 | .6 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |

STORM RAINFALL AND RUNOFF
08074500 WHITEOAK BAYOU AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4250 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4150 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4145 (INCHES) | ACCUMULATED RAINFALL AT GAGE 205R (INCHES) | ACCUMULATED RAINFALL AT GAGE 204R (INCHES) | ACCUMULATED RAINFALL AT GAGE 22R (INCHES) | ACCUMULATED RAINFALL AT GAGE 21R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STORM OF MAR. 23-25, 1984 | | | | | | | | | | | | |
| MAR. 23 | | | | | | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 45.0 | 0.0024 |
| 0600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 42.0 | 0.0069 |
| 1200 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 43.0 | 0.0114 |
| 1730 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 40.0 | 0.0135 |
| 1800 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.27 | 0.0 | 0.05 | 40.0 | 0.0139 |
| 1830 | 0.0 | 0.0 | 0.0 | 0.0 | 0.02 | 0.0 | 0.0 | 0.27 | 0.0 | 0.05 | 40.0 | 0.0143 |
| 1900 | 0.0 | 0.08 | 0.24 | 0.17 | 0.35 | 0.28 | 0.44 | 0.42 | 0.0 | 0.23 | 40.0 | 0.0146 |
| 1930 | 0.30 | 0.20 | 0.72 | 0.30 | 0.57 | 0.52 | 0.52 | 0.42 | 0.26 | 0.40 | 40.0 | 0.0150 |
| 2000 | 0.89 | 0.61 | 0.96 | 0.58 | 0.70 | 0.77 | 0.52 | 0.42 | 0.46 | 0.60 | 58.0 | 0.0155 |
| 2030 | 1.45 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.71 | 1750.0 | 0.0312 |
| 2100 | 1.59 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 2780.0 | 0.0562 |
| 2130 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 2830.0 | 0.0816 |
| 2200 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 2400.0 | 0.1031 |
| 2230 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 1980.0 | 0.1209 |
| 2300 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 1480.0 | 0.1408 |
| 2400 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 1120.0 | 0.1710 |
| MAR. 24 | | | | | | | | | | | | |
| 0000 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 1120.0 | 0.1710 |
| 0200 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 909.0 | 0.1996 |
| 0330 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 714.0 | 0.2188 |
| 0500 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 542.0 | 0.2310 |
| 0600 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 457.0 | 0.2412 |
| 0730 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 371.0 | 0.2529 |
| 0930 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 270.0 | 0.2589 |
| 1000 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 236.0 | 0.2642 |
| 1200 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 236.0 | 0.2780 |
| 1630 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 192.0 | 0.2883 |
| 1800 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 177.0 | 0.2987 |
| 2300 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 145.0 | 0.3065 |
| 2400 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 140.0 | 0.3115 |
| MAR. 25 | | | | | | | | | | | | |
| 0000 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 140.0 | 0.3115 |
| 0300 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 108.0 | 0.3173 |
| 0600 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 87.0 | 0.3220 |
| 0900 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 70.0 | 0.3258 |
| 1200 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 65.0 | 0.3310 |
| 1800 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 68.0 | 0.3384 |
| 2400 | 1.62 | 0.65 | 0.96 | 0.60 | 0.70 | 0.77 | 0.52 | 0.42 | 0.56 | 0.73 | 67.0 | 0.3420 |

STORM RAINFALL AND RUNOFF

08074500 WHITEOAK BAYOU AT HOUSTON, TEX. --CONTINUED

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4250 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4150 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4145 (INCHES) | ACCUMULATED RAINFALL AT GAGE 205R (INCHES) | ACCUMULATED RAINFALL AT GAGE 204R (INCHES) | ACCUMULATED RAINFALL AT GAGE 22R (INCHES) | ACCUMULATED RAINFALL AT GAGE 21R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| STORM OF JUNE 6 -8 , 1984 | | | | | | | | | | | | |
| JUNE6 | | | | | | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 45.0 | 0.0024 |
| 0600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 37.0 | 0.0061 |
| 1100 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 32.0 | 0.0077 |
| 1130 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.17 | 0.36 | 0.0 | 0.11 | 33.0 | 0.0080 |
| 1200 | 0.0 | 0.05 | 0.12 | 0.16 | 0.43 | 0.21 | 0.72 | 0.72 | 0.04 | 0.34 | 34.0 | 0.0083 |
| 1230 | 0.95 | 0.32 | 0.36 | 1.57 | 1.66 | 0.30 | 1.64 | 0.90 | 0.47 | 0.95 | 722.0 | 0.0147 |
| 1300 | 1.57 | 1.10 | 0.72 | 1.68 | 1.79 | 0.34 | 1.70 | 1.13 | 0.61 | 1.23 | 1410.0 | 0.0274 |
| 1330 | 1.96 | 1.31 | 0.84 | 1.79 | 1.87 | 0.37 | 1.74 | 1.15 | 0.64 | 1.34 | 2620.0 | 0.0509 |
| 1400 | 1.96 | 1.48 | 0.84 | 1.80 | 1.88 | 0.41 | 1.76 | 1.21 | 0.64 | 1.38 | 3830.0 | 0.0853 |
| 1430 | 2.01 | 1.49 | 0.84 | 1.88 | 1.95 | 0.44 | 1.82 | 1.21 | 0.68 | 1.41 | 3490.0 | 0.1166 |
| 1500 | 2.04 | 1.51 | 0.84 | 1.91 | 1.99 | 0.47 | 1.85 | 1.27 | 0.74 | 1.45 | 3150.0 | 0.1449 |
| 1530 | 2.05 | 1.56 | 0.84 | 1.93 | 2.01 | 0.49 | 1.87 | 1.27 | 0.77 | 1.47 | 2650.0 | 0.1687 |
| 1600 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.49 | 1.87 | 1.28 | 0.77 | 1.49 | 2140.0 | 0.1879 |
| 1630 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.52 | 1.87 | 1.28 | 0.77 | 1.49 | 1850.0 | 0.2045 |
| 1700 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.52 | 1.87 | 1.28 | 0.77 | 1.49 | 1550.0 | 0.2185 |
| 1730 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.53 | 1.87 | 1.28 | 0.77 | 1.49 | 1380.0 | 0.2308 |
| 1800 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.53 | 1.87 | 1.28 | 0.77 | 1.49 | 1200.0 | 0.2416 |
| 1830 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.55 | 1.87 | 1.28 | 0.77 | 1.49 | 1080.0 | 0.2513 |
| 1900 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.57 | 1.87 | 1.28 | 0.77 | 1.49 | 953.0 | 0.2599 |
| 1930 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.58 | 1.87 | 1.28 | 0.77 | 1.49 | 863.0 | 0.2676 |
| 2000 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.59 | 1.87 | 1.28 | 0.77 | 1.49 | 772.0 | 0.2745 |
| 2030 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.60 | 1.87 | 1.28 | 0.77 | 1.49 | 704.0 | 0.2809 |
| 2100 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.60 | 1.87 | 1.28 | 0.77 | 1.49 | 636.0 | 0.2866 |
| 2130 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.60 | 1.87 | 1.28 | 0.77 | 1.49 | 589.0 | 0.2919 |
| 2200 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.60 | 1.87 | 1.28 | 0.77 | 1.49 | 542.0 | 0.2967 |
| 2230 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.60 | 1.87 | 1.28 | 0.77 | 1.49 | 503.0 | 0.3012 |
| 2300 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.61 | 1.87 | 1.28 | 0.77 | 1.49 | 463.0 | 0.3054 |
| 2330 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 425.0 | 0.3092 |
| 2400 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 386.0 | 0.3179 |
| JUNE7 | | | | | | | | | | | | |
| 0000 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 386.0 | 0.3179 |
| 0200 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 288.0 | 0.3308 |
| 0500 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 227.0 | 0.3390 |
| 0600 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 209.0 | 0.3465 |
| 0900 | 2.07 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.49 | 182.0 | 0.3530 |
| 1000 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.51 | 172.0 | 0.3576 |
| 1200 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.51 | 154.0 | 0.3645 |
| 1500 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.62 | 1.87 | 1.28 | 0.77 | 1.51 | 140.0 | 0.3696 |
| 1600 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.63 | 1.87 | 1.28 | 0.77 | 1.51 | 135.0 | 0.3720 |
| 1700 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.64 | 1.87 | 1.28 | 0.77 | 1.51 | 130.0 | 0.3743 |

STORM RAINFALL AND RUNOFF

08074500 WHITEOAK BAYOU AT HOUSTON, TEX. --CONTINUED

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4250 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4150 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4145 (INCHES) | ACCUMULATED RAINFALL AT GAGE 205R (INCHES) | ACCUMULATED RAINFALL AT GAGE 204R (INCHES) | ACCUMULATED RAINFALL AT GAGE 22R (INCHES) | ACCUMULATED RAINFALL AT GAGE 21R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | STORM OF JUNE 6 -8 , 1984 | | | --CONTINUED | | | | |
| JUNE7 | | | | | | | | | | | | |
| 1800 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.67 | 1.87 | 1.28 | 0.77 | 1.51 | 125.0 | 0.3822 |
| 2400 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.67 | 1.87 | 1.28 | 0.77 | 1.51 | 105.0 | 0.3935 |
| JUNE8 | | | | | | | | | | | | |
| 0000 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.67 | 1.87 | 1.28 | 0.77 | 1.51 | 105.0 | 0.3935 |
| 0600 | 2.17 | 1.60 | 0.96 | 1.95 | 2.02 | 0.67 | 1.87 | 1.28 | 0.77 | 1.51 | 91.0 | 0.4033 |
| 1200 | 2.20 | 1.60 | 0.96 | 1.95 | 2.04 | 0.67 | 1.87 | 1.28 | 0.77 | 1.52 | 78.0 | 0.4096 |
| 1500 | 2.27 | 1.60 | 0.96 | 1.95 | 2.04 | 0.74 | 1.87 | 1.28 | 0.77 | 1.53 | 72.0 | 0.4135 |
| 1800 | 2.27 | 1.60 | 0.96 | 1.95 | 2.04 | 0.74 | 1.87 | 1.28 | 0.77 | 1.53 | 65.0 | 0.4187 |
| 2400 | 2.27 | 1.60 | 0.96 | 1.95 | 2.04 | 0.74 | 1.87 | 1.28 | 0.77 | 1.53 | 59.0 | 0.4219 |

## LITTLE WHITEOAK BAYOU DRAINAGE BASIN

The locations of data-collection sites in and near the Little Whiteoak Bayou drainage basin are shown in figure 10.

Weighted-mean rainfall for the 1984 water year was not determined.

The storm of Jan 9-10 was selected for analysis at station 08074540, Little Whiteoak Bayou at Houston.

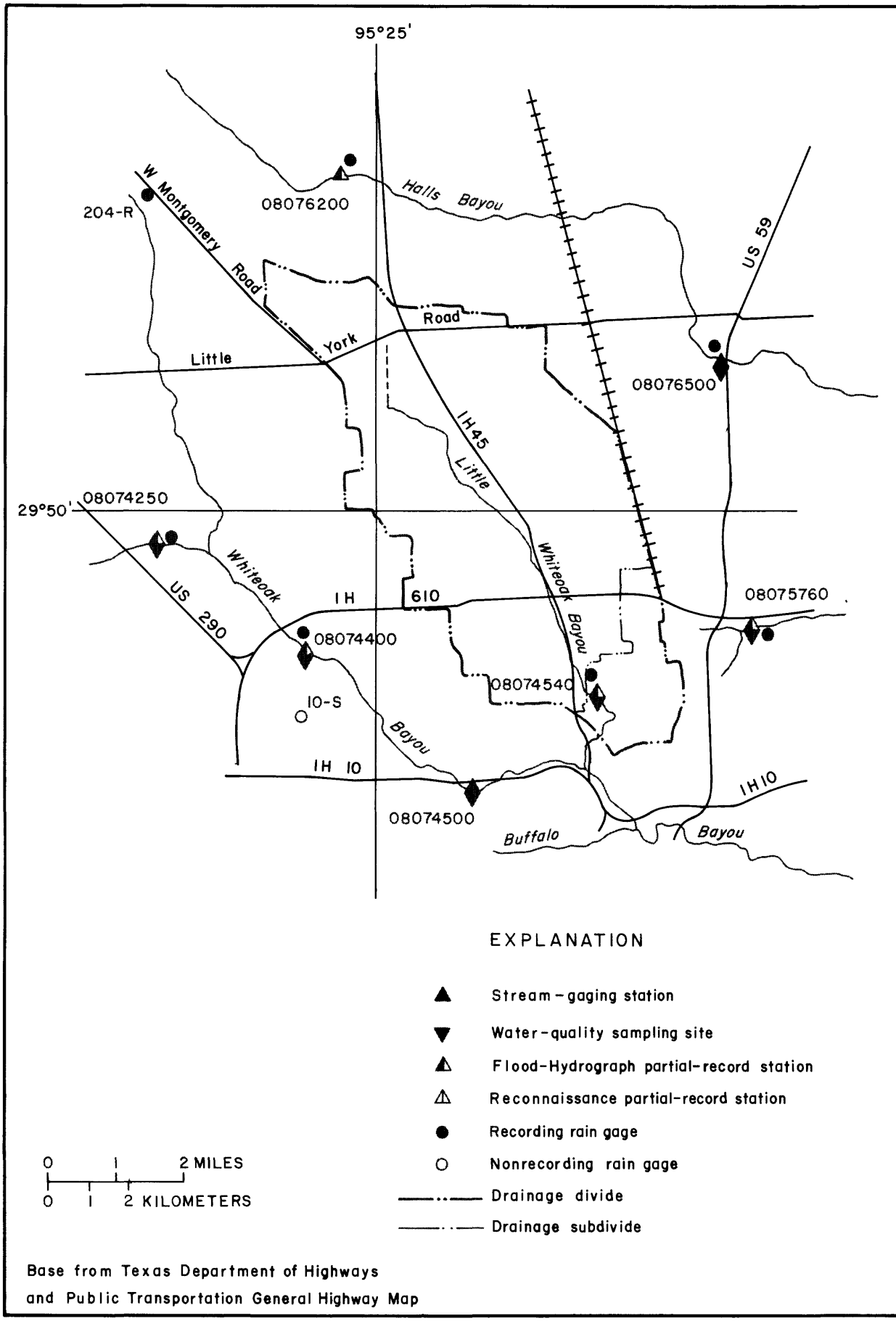


Figure 10.-Locations of data-collection sites in and near the Little Whiteoak Bayou drainage basin

TX-35
Rev. 5/80

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 9 .--Storm rainfall-runoff data, 1984 Water Year, Little Whiteoak Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Little Whiteoak Bayou (Drainage Area -- 18.0 $mi^2$)** | | | | | | | | |
| Jan. 9-10, 1984 | 4.3 | 2.37 | 0.69 | 0.87 | 1.32 | 1.53 | 0.65 | 2610* |
| | | | | | | | | |
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| | | | | | | | | |

* - Peak Discharge for 1984 Water Year

SAN JACINTO RIVER BASIN

08074540 LITTLE WHITEOAK BAYOU AT TRIMBLE STREET AT HOUSTON, TX
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°47'33", long 95°22'06", Harris County, Hydrologic Unit 12040104, at downstream side of bridge at Trimble Street, Houston.

DRAINAGE AREA.--18.0 $mi^2$.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June 1979 to current year. June to September 1979 published as Little Whiteoak Bayou at Houston (08074550).

GAGE.--Flood-hydrograph and rainfall recorder and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1973 adjustment. Prior to June 1979 occasional discharge measurements to arbitrary datum and water-quality samples were obtained at site 6,200 ft downstream at North Main Street bridge (station 08074550, Little Whiteoak Bayou at Houston).

REMARKS.--Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the Houston, Texas Metropolitan Area." The record for June to September 1979 was published in the 1979 edition of this publication as station Little Whiteoak Bayou at Houston (08074550).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,860 $ft^3/s$ Aug. 18, 1983 (elevation, 39.42 ft).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 $ft^3/s$ and maximum (*):

| Date | Time | Discharge ($ft^3/s$) | Elevation (ft) |
|---|---|---|---|
| Jan. 9 | 0615 | *2,610 | 33.07 |
| Aug. 24 | 1730 | 2,330 | 33.29 |

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: June 1979 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | | | |
| 01-02 | 1130 | 406 | -- | -- | -- | -- | -- | -- | -- | 7.9 | -- | -- |
| FEB | | | | | | | | | | | | |
| 07... | 1330 | 6.0 | 928 | 7.7 | 14.0 | <1 | 3.1 | 11.2 | 107 | 4.8 | 56000 | 3000 |
| JUL | | | | | | | | | | | | |
| 03... | 1110 | 3.6 | 354 | 7.6 | 28.0 | 27 | 3.2 | 2.6 | 33 | 4.5 | 120000 | 620 |
| AUG | | | | | | | | | | | | |
| 08... | 1215 | 3.6 | 460 | 7.6 | 29.5 | 27 | 1.2 | 5.5 | 72 | 4.4 | 280000 | 6700 |

| DATE | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | | | |
| 01-02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB | | | | | | | | | | | | |
| 07... | 240 | 0 | 68 | 17 | 110 | 3 | 2.9 | 310 | 34 | 87 | .60 | 15 |
| JUL | | | | | | | | | | | | |
| 03... | 89 | 0 | 28 | 4.5 | 39 | 2 | 3.3 | 110 | 16 | 27 | .30 | 9.2 |
| AUG | | | | | | | | | | | | |
| 08... | 140 | 0 | 45 | 6.8 | 45 | 2 | 3.7 | 160 | 20 | 38 | .30 | 12 |

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) | SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) | NITRO-GEN, NITRATE TOTAL (MG/L AS N) | NITRO-GEN, NITRITE TOTAL (MG/L AS N) | NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA TOTAL (MG/L AS N) | NITRO-GEN, ORGANIC TOTAL (MG/L AS N) | NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NOV | | | | | | | | | | | |
| 01-02 | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| FEB | | | | | | | | | | | |
| 07... | 520 | <2 | <2 | .22 | .080 | .30 | 1.20 | 1.2 | 2.4 | 1.30 | 6.8 |
| JUL | | | | | | | | | | | |
| 03... | 190 | 8 | 4 | .17 | .030 | .20 | .440 | .66 | 1.1 | .570 | 9.3 |
| AUG | | | | | | | | | | | |
| 08... | 270 | 9 | 6 | .07 | .030 | .10 | .790 | .91 | 1.7 | 7.00 | 11 |

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | ARSENIC DIS-SOLVED (UG/L AS AS) | BARIUM, DIS-SOLVED (UG/L AS BA) | CADMIUM DIS-SOLVED (UG/L AS CD) | CHRO-MIUM, DIS-SOLVED (UG/L AS CR) | COPPER, DIS-SOLVED (UG/L AS CU) | IRON, DIS-SOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL 03... | 1110 | 7 | 110 | <1 | <10 | 3 | 47 |
| AUG 08... | 1215 | 7 | 130 | <1 | <10 | 4 | 51 |

| DATE | LEAD, DIS-SOLVED (UG/L AS PB) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) | MERCURY DIS-SOLVED (UG/L AS HG) | SELE-NIUM, DIS-SOLVED (UG/L AS SE) | SILVER, DIS-SOLVED (UG/L AS AG) | ZINC, DIS-SOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL 03... | <1 | 55 | <.1 | <1 | <1 | 26 |
| AUG 08... | <1 | 5 | <.1 | <1 | <1 | 10 |

| DATE | TIME | AME-TRYNE TOTAL | ATRA-ZINE, TOTAL (UG/L) | CYAN-AZINE TOTAL (UG/L) | METHO-MYL TOTAL (UG/L) | PROME-TONE TOTAL (UG/L) | PROME-TRYNE TOTAL (UG/L) | PRO-PAZINE TOTAL (UG/L) | PROPHAM TOTAL (UG/L) | SEVIN, TOTAL (UG/L) | SIMA-ZINE TOTAL (UG/L) | SIME-TRYNE TOTAL (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL 03... | 1110 | <.10 | .20 | <.10 | <2.0 | .1 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |
| AUG 08... | 1215 | <.10 | .30 | <.10 | <2.0 | .4 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |

STORM RAINFALL AND RUNOFF

08074540 LITTLE WHITEOAK BAYOU AT TRIMBLE ST, HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 6500 (INCHES) | ACCUMULATED RAINFALL AT GAGE 6200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4540 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|
| | | | STORM OF JAN. 9 -10, 1984 | | | | |
| JAN. 9 | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0002 |
| 0045 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 5.0 | 0.0004 |
| 0100 | 0.0 | 0.0 | 0.02 | 0.0 | 0.01 | 5.0 | 0.0005 |
| 0115 | 0.0 | 0.0 | 0.03 | 0.04 | 0.02 | 6.0 | 0.0006 |
| 0130 | 0.12 | 0.0 | 0.04 | 0.05 | 0.05 | 7.0 | 0.0008 |
| 0145 | 0.12 | 0.0 | 0.08 | 0.07 | 0.07 | 8.0 | 0.0009 |
| 0200 | 0.12 | 0.0 | 0.11 | 0.07 | 0.08 | 9.0 | 0.0011 |
| 0215 | 0.12 | 0.0 | 0.11 | 0.08 | 0.08 | 10.0 | 0.0013 |
| 0230 | 0.12 | 0.12 | 0.25 | 0.31 | 0.20 | 20.0 | 0.0018 |
| 0245 | 0.12 | 0.24 | 0.26 | 0.32 | 0.24 | 68.0 | 0.0032 |
| 0300 | 0.12 | 0.24 | 0.27 | 0.38 | 0.25 | 103.0 | 0.0055 |
| 0315 | 0.24 | 0.36 | 0.33 | 0.55 | 0.36 | 126.0 | 0.0082 |
| 0330 | 0.36 | 0.48 | 0.60 | 0.89 | 0.58 | 159.0 | 0.0116 |
| 0345 | 0.96 | 0.72 | 0.60 | 1.10 | 0.80 | 365.0 | 0.0194 |
| 0400 | 1.08 | 0.84 | 0.67 | 1.44 | 0.95 | 741.0 | 0.0354 |
| 0415 | 1.56 | 0.96 | 0.70 | 1.48 | 1.09 | 1070.0 | 0.0584 |
| 0430 | 1.68 | 0.96 | 0.75 | 1.53 | 1.14 | 1400.0 | 0.0886 |
| 0445 | 1.80 | 1.08 | 0.83 | 1.58 | 1.24 | 1650.0 | 0.1241 |
| 0500 | 1.80 | 1.20 | 0.88 | 1.75 | 1.32 | 1850.0 | 0.1639 |
| 0515 | 2.04 | 1.32 | 1.57 | 1.88 | 1.66 | 2020.0 | 0.2074 |
| 0530 | 2.28 | 1.44 | 1.75 | 1.97 | 1.82 | 2290.0 | 0.2566 |
| 0545 | 2.40 | 1.44 | 1.86 | 1.98 | 1.89 | 2490.0 | 0.3102 |
| 0600 | 2.40 | 1.56 | 1.95 | 2.03 | 1.96 | 2600.0 | 0.3662 |
| 0615 | 2.52 | 1.56 | 2.03 | 2.08 | 2.02 | 2610.0 | 0.4224 |
| 0630 | 2.52 | 1.68 | 2.06 | 2.13 | 2.07 | 2560.0 | 0.4775 |
| 0645 | 2.52 | 1.68 | 2.13 | 2.16 | 2.10 | 2470.0 | 0.5306 |
| 0700 | 2.64 | 1.68 | 2.18 | 2.18 | 2.15 | 2380.0 | 0.5818 |
| 0715 | 2.64 | 1.68 | 2.19 | 2.18 | 2.15 | 2270.0 | 0.6307 |
| 0730 | 2.64 | 1.68 | 2.20 | 2.18 | 2.15 | 2160.0 | 0.6772 |
| 0745 | 2.64 | 1.68 | 2.21 | 2.18 | 2.16 | 2040.0 | 0.7211 |
| 0800 | 2.64 | 1.68 | 2.21 | 2.20 | 2.16 | 1900.0 | 0.7620 |
| 0815 | 2.64 | 1.68 | 2.22 | 2.21 | 2.17 | 1780.0 | 0.8003 |
| 0830 | 2.64 | 1.68 | 2.22 | 2.22 | 2.17 | 1660.0 | 0.8717 |
| 0915 | 2.64 | 1.68 | 2.22 | 2.22 | 2.17 | 1290.0 | 0.9273 |
| 0930 | 2.64 | 1.68 | 2.23 | 2.22 | 2.17 | 1200.0 | 0.9789 |
| 1015 | 2.64 | 1.68 | 2.23 | 2.22 | 2.17 | 944.0 | 1.0399 |
| 1100 | 2.64 | 1.68 | 2.23 | 2.22 | 2.17 | 760.0 | 1.0971 |
| 1200 | 2.64 | 1.68 | 2.23 | 2.22 | 2.17 | 600.0 | 1.1552 |
| 1315 | 2.64 | 1.68 | 2.23 | 2.22 | 2.17 | 464.0 | 1.1902 |

STORM RAINFALL AND RUNOFF
08074540 LITTLE WHITEOAK BAYOU AT TRIMBLE ST, HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 6500 (INCHES) | ACCUMULATED RAINFALL AT GAGE 6200 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4540 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4400 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|
| | | STORM OF JAN. 9 -10, 1984 | | | --CONTINUED | | |
| JAN. 9 | | | | | | | |
| 1345 | 2.64 | 1.68 | 2.23 | 2.22 | 2.17 | 427.0 | 1.2040 |
| 1400 | 2.64 | 1.80 | 2.24 | 2.28 | 2.22 | 406.0 | 1.2127 |
| 1415 | 2.64 | 1.80 | 2.29 | 2.33 | 2.25 | 389.0 | 1.2211 |
| 1430 | 2.76 | 1.92 | 2.32 | 2.36 | 2.32 | 381.0 | 1.2293 |
| 1445 | 2.76 | 1.92 | 2.34 | 2.36 | 2.32 | 379.0 | 1.2374 |
| 1500 | 2.76 | 1.92 | 2.37 | 2.36 | 2.33 | 383.0 | 1.2457 |
| 1515 | 2.76 | 1.92 | 2.40 | 2.36 | 2.34 | 388.0 | 1.2540 |
| 1530 | 2.88 | 1.92 | 2.41 | 2.36 | 2.37 | 401.0 | 1.2670 |
| 1600 | 2.88 | 1.92 | 2.41 | 2.36 | 2.37 | 415.0 | 1.3027 |
| 1730 | 2.88 | 1.92 | 2.41 | 2.36 | 2.37 | 345.0 | 1.3324 |
| 1800 | 2.88 | 1.92 | 2.41 | 2.36 | 2.37 | 316.0 | 1.4072 |
| 2300 | 2.88 | 1.92 | 2.41 | 2.36 | 2.37 | 149.0 | 1.4409 |
| 2315 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 142.0 | 1.4470 |
| 2400 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 127.0 | 1.4620 |
| JAN. 10 | | | | | | | |
| 0000 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 127.0 | 1.4620 |
| 0200 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 92.0 | 1.4779 |
| 0400 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 70.0 | 1.4899 |
| 0600 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 54.0 | 1.5015 |
| 0900 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 40.0 | 1.5101 |
| 1100 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 31.0 | 1.5141 |
| 1200 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 27.0 | 1.5188 |
| 1500 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 20.0 | 1.5231 |
| 1700 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 16.0 | 1.5252 |
| 1800 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 15.0 | 1.5297 |
| 2400 | 2.88 | 1.92 | 2.42 | 2.36 | 2.37 | 9.0 | 1.5320 |

## BRAYS BAYOU DRAINAGE BASIN

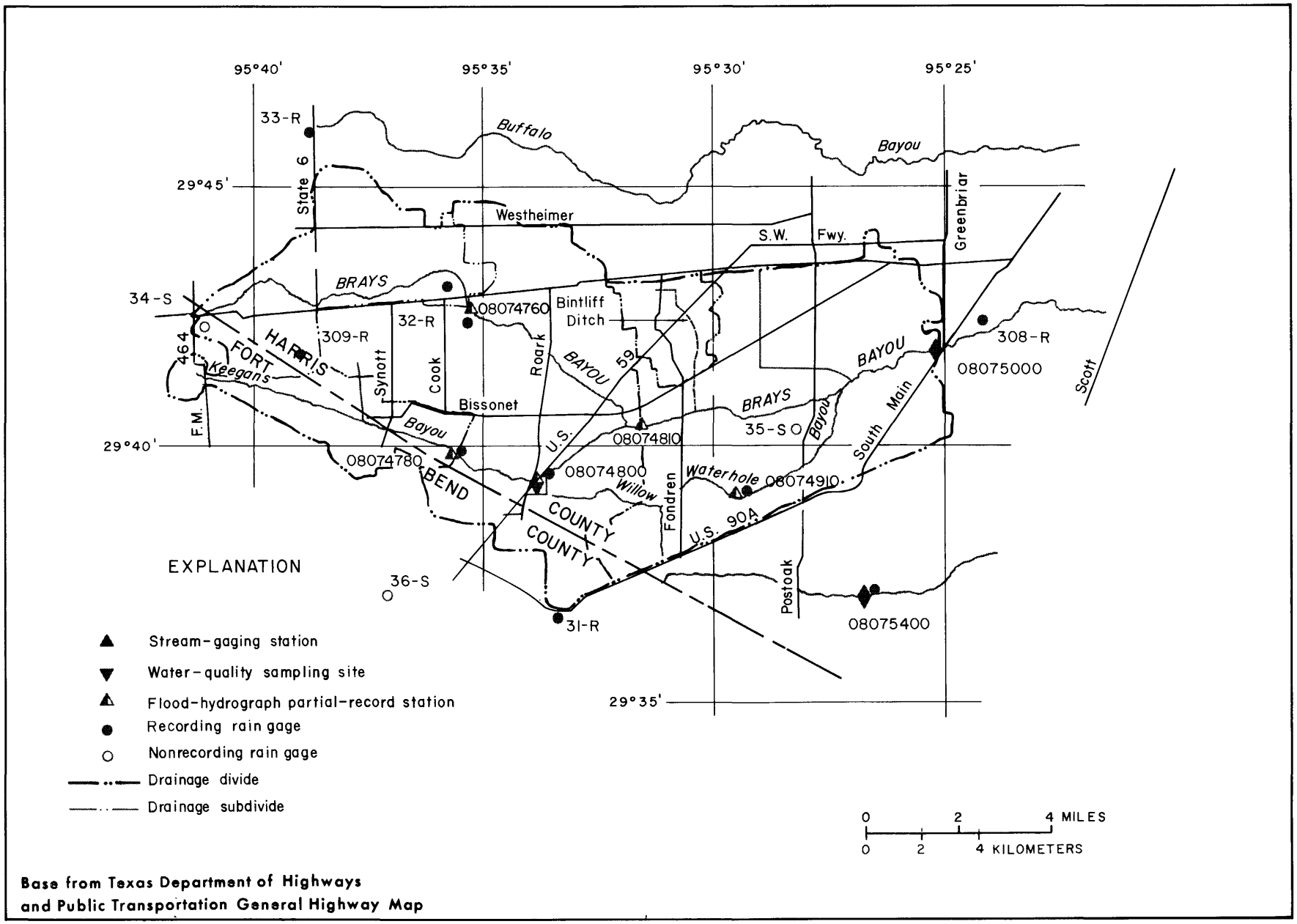
The locations of data-collection sites in and near the Brays Bayou drainage basin are shown in figure 11.

Keegans Bayou, Bintliff Ditch, and Hummingbird Street Ditch are shown as separate drainage basins within the Brays Bayou section.

Weighted-mean rainfall in the drainage basin for the 1984 water year based on ten rain gages was 28.98 inches or 19.21 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.85 | 3.45 | 1.91 | 3.11 | 2.66 | 1.69 | 0.35 | 3.09 | 1.94 | 3.43 | 2.92 | 3.58 | 28.98 |

The storm of June 6-8 was selected for analysis at station 08074760, Brays Bayou at Alief. The storm of Nov. 30-Dec. 2 was selected for analysis at station 08074810, Brays Bayou at Gessner Drive, Houston. The storms of Jan. 8-11, and Mar. 23-25 were selected for analysis at station 08075000, Brays Bayou at Houston.




**Base from Texas Department of Highways and Public Transportation General Highway Map**

Figure II.- Locations of data-collection sites in and near the Brays Bayou drainage basin

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 10.--Storm rainfall-runoff data, 1984 Water Year, Brays Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Brays Bayou at Alief, TX. (Drainage Area -- 14.1 $mi.^2$)** | | | | | | | | |
| June 6-8, 1984 | 1.0 | 1.65 | 0.45 | 0.90 | 1.27 | 0.65 | 0.39 | 597* |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **Brays Bayou at Gessner Dr., Houston, TX (Drainage Area -- 53.2 $mi.^2$)** | | | | | | | | |
| Nov.30-Dec.2,1983 | 2.3 | 1.33 | 1.12 | 1.13 | 1.27 | 0.52 | 0.39 | 2960* |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

* - Peak Discharge for 1984 Water Year

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ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 10.--Storm rainfall-runoff data, 1984 Water Year, Brays Bayou--Continued

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Brays Bayou at Houston, TX. (Drainage Area -- 94.9 $mi^2$)** | | | | | | | | |
| Jan. 8-11, 1984 | 9.5 | 1.88 | 0.84 | 0.84 | 0.84 | 1.30 | 0.69 | 8540 |
| Mar. 23-25, 1984 | 2.0 | 0.42 | 0.71 | 0.71 | 0.71 | 0.32 | 0.77 | 1800 |

08074760 BRAYS BAYOU AT ALIEF, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°42'39", long 95°35'13", Harris County, Hydrologic unit 12040104, near center of channel on downstream side of bridge on High Star Street in Alief, Tex.

DRAINAGE AREA.--14.1 $mi^2$. Prior to Jan. 1, 1978, 12.9 $mi^2$.

PERIOD OF RECORD.--Feb. 3, 1977 to present.

GAGE.--Digital flood-hydrograph recorder and crest-stage gage. Datum of gage is 55.88 ft National Geodetic Vertical Datum of 1929, 1957 adjustment; unadjusted for land-surface subsidence.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 5,090 $ft^3/s$, Sept. 19, 1983. (Gage-height 19.23 ft); maximum gage height, 19.59 ft, Aug. 31, 1981. Minimum discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 1,000 $ft^3/s$ (revised) or maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| June 6 | 1630 | *597 | 10.60 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF

08074760 BRAYS BAYOU AT ALIEF, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4760 (INCHES) | ACCUMULATED RAINFALL AT GAGE 33R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|
| STORM OF JUNE 6 -8 , 1984 | | | | | |
| JUNE6 | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0033 |
| 0600 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0085 |
| 0930 | 0.0 | 0.0 | 0.0 | 10.0 | 0.0107 |
| 1000 | 0.0 | 0.02 | 0.01 | 10.0 | 0.0113 |
| 1030 | 0.0 | 0.02 | 0.01 | 10.0 | 0.0118 |
| 1100 | 0.0 | 0.10 | 0.05 | 10.0 | 0.0124 |
| 1130 | 0.02 | 0.10 | 0.06 | 10.0 | 0.0129 |
| 1200 | 0.53 | 0.78 | 0.64 | 25.0 | 0.0143 |
| 1230 | 1.29 | 0.78 | 1.06 | 35.0 | 0.0162 |
| 1300 | 1.36 | 1.68 | 1.50 | 50.0 | 0.0190 |
| 1330 | 1.37 | 1.68 | 1.51 | 65.0 | 0.0225 |
| 1400 | 1.41 | 1.76 | 1.57 | 87.0 | 0.0273 |
| 1430 | 1.47 | 1.76 | 1.60 | 130.0 | 0.0345 |
| 1500 | 1.50 | 1.84 | 1.65 | 286.0 | 0.0502 |
| 1530 | 1.50 | 1.84 | 1.65 | 484.0 | 0.0768 |
| 1600 | 1.50 | 1.84 | 1.65 | 573.0 | 0.1083 |
| 1630 | 1.50 | 1.84 | 1.65 | 597.0 | 0.1411 |
| 1700 | 1.50 | 1.84 | 1.65 | 597.0 | 0.1903 |
| 1800 | 1.50 | 1.84 | 1.65 | 547.0 | 0.2504 |
| 1900 | 1.50 | 1.84 | 1.65 | 473.0 | 0.3024 |
| 2000 | 1.50 | 1.84 | 1.65 | 409.0 | 0.3473 |
| 2100 | 1.50 | 1.84 | 1.65 | 341.0 | 0.3848 |
| 2200 | 1.50 | 1.84 | 1.65 | 281.0 | 0.4157 |
| 2300 | 1.50 | 1.84 | 1.65 | 238.0 | 0.4418 |
| 2400 | 1.50 | 1.84 | 1.65 | 205.0 | 0.4756 |
| JUNE7 | | | | | |
| 0000 | 1.50 | 1.84 | 1.65 | 205.0 | 0.4756 |
| 0200 | 1.50 | 1.84 | 1.65 | 147.0 | 0.5079 |
| 0400 | 1.50 | 1.84 | 1.65 | 108.0 | 0.5317 |
| 0600 | 1.50 | 1.84 | 1.65 | 83.0 | 0.5499 |
| 0800 | 1.50 | 1.84 | 1.65 | 67.0 | 0.5720 |
| 1200 | 1.50 | 1.84 | 1.65 | 42.0 | 0.5951 |
| 1800 | 1.50 | 1.84 | 1.65 | 24.0 | 0.6109 |
| 2400 | 1.50 | 1.84 | 1.65 | 17.0 | 0.6221 |
| JUNE8 | | | | | |
| 0000 | 1.50 | 1.84 | 1.65 | 17.0 | 0.6221 |
| 0600 | 1.50 | 1.84 | 1.65 | 14.0 | 0.6313 |
| 1200 | 1.50 | 1.84 | 1.65 | 12.0 | 0.6393 |
| 1800 | 1.50 | 1.84 | 1.65 | 11.0 | 0.6465 |
| 2400 | 1.50 | 1.84 | 1.65 | 10.0 | 0.6498 |

## KEEGANS BAYOU DRAINAGE BASIN

The locations of data-collection sites in and near the Keegans Bayou drainage basin are shown in figure 12.

Weighted-mean rainfall in the drainage basin, based on three rain gages for the 1984 water year was 27.73 inches or 20.46 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 0.93 | 2.71 | 1.70 | 2.91 | 2.41 | 1.52 | 0.13 | 2.91 | 2.21 | 4.37 | 2.36 | 3.57 | 27.73 |

The storm of July 18-21 was analyzed at station 08074780, Keegans Bayou at Keegan Road near Houston. The storm of June 6-10 was selected for analysis at station 08074800, Keegans Bayou at Roark Road near Houston.

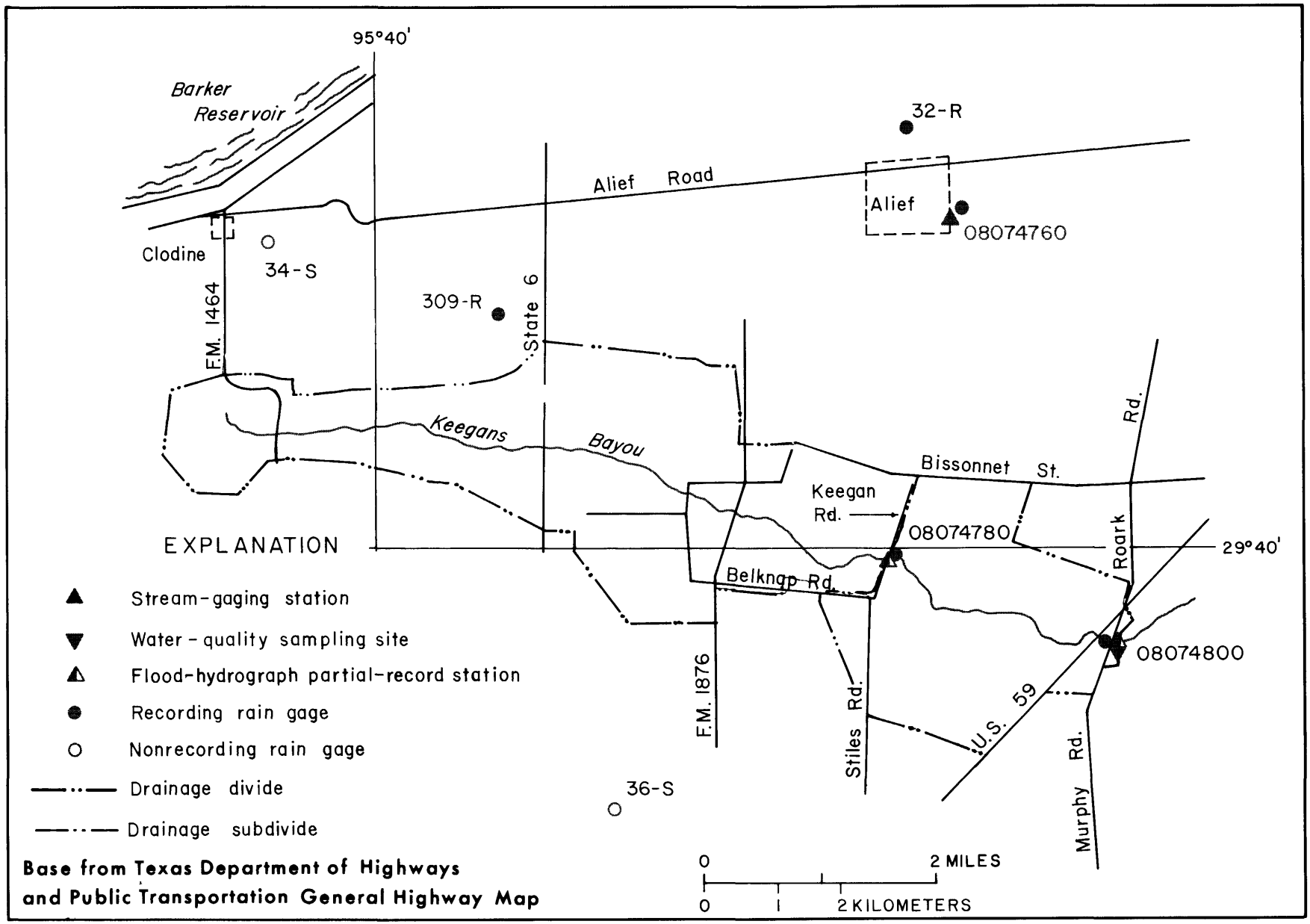


Figure 12.- Locations of data-collection sites in and near the Keegans Bayou drainage basin

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 11.--Storm rainfall-runoff data, 1984 Water Year, Keegans Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Keegans Bayou at Keegan Rd. near Houston, TX. (Drainage Area -- 7.47 $mi.^2$)** | | | | | | | | |
| July 18-21, 1984 | 0.5 | 1.79 | 0.82 | 1.40 | 1.79 | 0.51 | 0.29 | 216* |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| **Keegans Bayou at Roark Rd. near Houston, TX. (Drainage Area -- 11.5 $mi.^2$)** | | | | | | | | Maximum Gage Height (ft.) |
| June 6-10, 1984 | 1.5 | 1.65 | 0.46 | 0.92 | 1.26 | -- | -- | 69.00* |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |
| | | | | | | | | |

* - Peak Discharge/Gage Height for 1984 Water Year

08074780 KEEGANS BAYOU AT KEEGAN ROAD NEAR HOUSTON, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°39'55", long 95°35'42", Harris County, Hydrologic Unit 12040104 on downstream side of bridge on Keegan Road, 2.35 miles upstream from station, Keegans Bayou at Roark Road, and about 16 miles southwest of Houston.

DRAINAGE AREA.--7.47 $mi^2$. Prior to Jan. 1, 1978, 7.87 $mi^2$.
Prior to Oct. 1, 1973, 6.93 $mi^2$.

PERIOD OF RECORD.--August 1964 to September 1971; August 5, 1974 to current year.

GAGE.--Digital flood-hydrograph and rainfall recorders and crest-stage gage. Prior to April 25, 1978 a flood-hydrograph and rainfall recorder (type SR) and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1973 adjustment, unadjusted for land-surface subsidence.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 2,760 $ft^3/s$, Sept. 19, 1983. (Gage height 81.93 ft).
Maximum elevation 83.55 ft April 14, 1966, (prior to channel improvement).
Minimum discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 350 $ft^3/s$ (revised) and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| July 18 | 1845 | *216 | 74.15 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08074780 KEEGANS BAYOU AT KEEGAN ROAD NEAR HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF JULY 18-21, 1984 | | | | |
| JULY18 | | | | |
| 0000 | 0.0 | 0.0 | 3.0 | 0.0019 |
| 0600 | 0.0 | 0.0 | 3.0 | 0.0056 |
| 1200 | 0.0 | 0.0 | 3.0 | 0.0093 |
| 1800 | 0.0 | 0.0 | 3.0 | 0.0113 |
| 1815 | 0.0 | 0.0 | 143.0 | 0.0187 |
| 1830 | 0.58 | 0.58 | 199.0 | 0.0290 |
| 1845 | 1.40 | 1.40 | 216.0 | 0.0402 |
| 1900 | 1.65 | 1.65 | 199.0 | 0.0505 |
| 1915 | 1.79 | 1.79 | 179.0 | 0.0598 |
| 1930 | 1.79 | 1.79 | 165.0 | 0.0727 |
| 2000 | 1.79 | 1.79 | 142.0 | 0.0874 |
| 2030 | 1.79 | 1.79 | 125.0 | 0.1036 |
| 2115 | 1.79 | 1.79 | 109.0 | 0.1205 |
| 2200 | 1.79 | 1.79 | 96.0 | 0.1355 |
| 2245 | 1.79 | 1.79 | 88.0 | 0.1446 |
| 2300 | 1.79 | 1.79 | 85.0 | 0.1556 |
| 2400 | 1.79 | 1.79 | 76.0 | 0.1793 |
| JULY19 | | | | |
| 0000 | 1.79 | 1.79 | 76.0 | 0.1793 |
| 0200 | 1.79 | 1.79 | 62.0 | 0.2114 |
| 0500 | 1.79 | 1.79 | 50.0 | 0.2322 |
| 0600 | 1.79 | 1.79 | 46.0 | 0.2536 |
| 0930 | 1.79 | 1.79 | 37.0 | 0.2767 |
| 1200 | 1.79 | 1.79 | 33.0 | 0.3058 |
| 1800 | 1.79 | 1.79 | 28.0 | 0.3406 |
| 2400 | 1.79 | 1.79 | 24.0 | 0.3580 |
| JULY20 | | | | |
| 0000 | 1.79 | 1.79 | 24.0 | 0.3580 |
| 0100 | 1.79 | 1.79 | 24.0 | 0.3730 |
| 0600 | 1.79 | 1.79 | 21.0 | 0.3969 |
| 1200 | 1.79 | 1.79 | 19.0 | 0.4206 |
| 1800 | 1.79 | 1.79 | 17.0 | 0.4417 |
| 2400 | 1.79 | 1.79 | 15.0 | 0.4526 |
| JULY21 | | | | |
| 0000 | 1.79 | 1.79 | 15.0 | 0.4526 |
| 0100 | 1.79 | 1.79 | 15.0 | 0.4557 |
| 0200 | 1.79 | 1.79 | 15.0 | 0.4635 |
| 0600 | 1.79 | 1.79 | 14.0 | 0.4780 |
| 1200 | 1.79 | 1.79 | 12.0 | 0.4930 |
| 1800 | 1.79 | 1.79 | 11.0 | 0.5067 |
| 2400 | 1.79 | 1.79 | 9.0 | 0.5123 |

08074800 KEEGANS BAYOU AT ROARK ROAD NEAR HOUSTON, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°39'23", long 95°33'43", Harris County, Hydrologic unit 12040104 on left bank on downstream side of bridge on Roark Road in southwest Houston.

DRAINAGE AREA.--11.5 $mi^2$. Oct. 1, 1976, to Dec. 31, 1977, 12.0 $mi^2$; August 1964 to Sept. 30, 1976, 11.6 $mi^2$. Drainage area changes were the result of ditch relocations or extensions.

PERIOD OF RECORD.--August 1964 to current year (operated as a continuous-record station prior to Oct. 1, 1981).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1957 adjustment; unadjusted for land-surface subsidence.

REMARKS.--Water-discharge records poor. Channel was rectified during latter part of 1981 water year. Recording rain gage at station. Additional storm rainfall-runoff data for this site can be obtained from the report "Hydrologic Data for Urban Studies in the Houston, Texas Metropolitan Area, 1984."

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,250 $ft^3/s$ Sept. 19, 1983 (elevation, 75.00 ft).

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 1,000 $ft^3/s$ (revised) and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| June 6 | 1430 | *[a]320 | 69.00 |

[a] Estimate.
Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08074800 KEEGANS BAYOU AT ROARK ROAD NEAR HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4800 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | STAGE (FEET) |
|---|---|---|---|---|
| STORM OF JUNE 6 -10, 1984 | | | | |
| JUNE6 | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 65.51 |
| 0600 | 0.0 | 0.0 | 0.0 | 64.88 |
| 1130 | 0.0 | 0.0 | 0.0 | 64.26 |
| 1200 | 0.07 | 0.06 | 0.06 | 64.20 |
| 1230 | 0.81 | 0.40 | 0.44 | 66.45 |
| 1300 | 0.99 | 1.32 | 1.29 | 68.70 |
| 1330 | 1.00 | 1.47 | 1.42 | 68.84 |
| 1400 | 1.13 | 1.48 | 1.44 | 68.98 |
| 1430 | 1.16 | 1.69 | 1.64 | 69.00 |
| 1500 | 1.16 | 1.70 | 1.65 | 68.90 |
| 1630 | 1.16 | 1.70 | 1.65 | 68.69 |
| 1800 | 1.16 | 1.70 | 1.65 | 68.51 |
| 1830 | 1.16 | 1.70 | 1.65 | 68.46 |
| 1900 | 1.16 | 1.71 | 1.65 | 68.41 |
| 2030 | 1.16 | 1.71 | 1.65 | 68.27 |
| 2230 | 1.16 | 1.71 | 1.65 | 68.10 |
| 2400 | 1.16 | 1.71 | 1.65 | 67.97 |
| JUNE7 | | | | |
| 0000 | 1.16 | 1.71 | 1.65 | 67.97 |
| 0600 | 1.16 | 1.71 | 1.65 | 67.63 |
| 1200 | 1.16 | 1.71 | 1.65 | 67.42 |
| 1800 | 1.16 | 1.71 | 1.65 | 67.24 |
| 2400 | 1.16 | 1.71 | 1.65 | 67.08 |
| JUNE8 | | | | |
| 0000 | 1.16 | 1.71 | 1.65 | 67.08 |
| 0600 | 1.16 | 1.71 | 1.65 | 66.85 |
| 1200 | 1.16 | 1.71 | 1.65 | 66.76 |
| 1800 | 1.16 | 1.71 | 1.65 | 66.55 |
| 2400 | 1.16 | 1.71 | 1.65 | 66.33 |
| JUNE9 | | | | |
| 0000 | 1.16 | 1.71 | 1.65 | 66.33 |
| 0600 | 1.16 | 1.71 | 1.65 | 65.96 |
| 1200 | 1.16 | 1.71 | 1.65 | 65.79 |
| 1800 | 1.16 | 1.71 | 1.65 | 65.74 |
| 2400 | 1.16 | 1.71 | 1.65 | 65.69 |
| JUNE10 | | | | |
| 0000 | 1.16 | 1.71 | 1.65 | 65.69 |
| 0600 | 1.16 | 1.71 | 1.65 | 65.56 |
| 1200 | 1.16 | 1.71 | 1.65 | 65.50 |
| 1800 | 1.16 | 1.71 | 1.65 | 65.40 |
| 2400 | 1.16 | 1.71 | 1.65 | 65.30 |

STAGE RECORDS ARE RELATIVE TO GAGE DATUM.
DISCHARGE RECORDS ARE NOT CURRENTLY AVAILABLE FOR THIS STORM.

08074810 BRAYS BAYOU AT GESSNER DRIVE, HOUSTON, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°40'21", long 95°31'41", Harris County, Hydrologic unit 12040104 on right bank on downstream side of bridge at Gessner Drive in southwest Houston.

DRAINAGE AREA.--53.2 $mi^2$. Prior to Jan. 1, 1978, 51.7 $mi^2$.

PERIOD OF RECORD.--Feb. 1, 1977 to current year.

GAGE.--Digital flood-hydrograph recorder and crest-stage gage. Datum of gages is National Geodetic Vertical Datum of 1929, 1964 adjustment, unadjusted for land-surface subsidence.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 16,800 $ft^3/s$, Sept. 19, 1983 (elevation 65.33 ft); minimum discharge not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 3,000 $ft^3/s$ (revised) and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| Nov. 30 | 1600 | *2,960 | 51.41 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08074810 BRAYS BAYOU AT GESSNER DRIVE HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4910 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4760 (INCHES) | ACCUMULATED RAINFALL AT GAGE 33R (INCHES) | ACCUMULATED RAINFALL AT GAGE 32R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|
| STORM OF NOV. 30 TO DEC. 2, 1983 | | | | | | | | | |
| NOV. 30 | | | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 26.0 | 0.0012 |
| 0315 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 28.0 | 0.0027 |
| 0330 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.03 | 0.00 | 28.0 | 0.0029 |
| 0345 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.05 | 0.00 | 28.0 | 0.0031 |
| 0400 | 0.02 | 0.0 | 0.0 | 0.0 | 0.0 | 0.05 | 0.00 | 28.0 | 0.0033 |
| 0415 | 0.03 | 0.0 | 0.0 | 0.0 | 0.0 | 0.05 | 0.00 | 28.0 | 0.0036 |
| 0445 | 0.03 | 0.0 | 0.0 | 0.0 | 0.0 | 0.05 | 0.00 | 28.0 | 0.0039 |
| 0500 | 0.03 | 0.0 | 0.0 | 0.0 | 0.04 | 0.05 | 0.01 | 28.0 | 0.0041 |
| 0515 | 0.03 | 0.01 | 0.05 | 0.0 | 0.04 | 0.05 | 0.03 | 28.0 | 0.0043 |
| 0530 | 0.03 | 0.01 | 0.05 | 0.0 | 0.04 | 0.05 | 0.03 | 28.0 | 0.0045 |
| 0545 | 0.03 | 0.02 | 0.05 | 0.0 | 0.04 | 0.05 | 0.03 | 27.0 | 0.0047 |
| 0600 | 0.03 | 0.02 | 0.05 | 0.0 | 0.04 | 0.05 | 0.03 | 27.0 | 0.0051 |
| 0645 | 0.03 | 0.02 | 0.05 | 0.0 | 0.04 | 0.05 | 0.03 | 26.0 | 0.0055 |
| 0700 | 0.03 | 0.02 | 0.06 | 0.0 | 0.04 | 0.05 | 0.03 | 25.0 | 0.0073 |
| 1145 | 0.03 | 0.02 | 0.06 | 0.0 | 0.04 | 0.05 | 0.03 | 27.0 | 0.0092 |
| 1200 | 0.03 | 0.02 | 0.06 | 0.0 | 0.05 | 0.05 | 0.04 | 28.0 | 0.0095 |
| 1215 | 0.03 | 0.02 | 0.06 | 0.0 | 0.05 | 0.05 | 0.04 | 28.0 | 0.0097 |
| 1230 | 0.03 | 0.02 | 0.20 | 0.0 | 0.05 | 0.05 | 0.07 | 29.0 | 0.0099 |
| 1245 | 0.03 | 0.02 | 0.62 | 0.0 | 0.05 | 0.05 | 0.18 | 29.0 | 0.0101 |
| 1300 | 0.03 | 0.10 | 1.33 | 0.0 | 1.17 | 0.05 | 0.66 | 30.0 | 0.0103 |
| 1315 | 0.03 | 0.10 | 1.33 | 0.0 | 1.17 | 0.05 | 0.66 | 52.0 | 0.0107 |
| 1330 | 0.19 | 0.10 | 1.33 | 0.0 | 1.17 | 0.05 | 0.67 | 76.0 | 0.0112 |
| 1345 | 0.19 | 0.10 | 1.33 | 0.0 | 1.17 | 0.05 | 0.67 | 146.0 | 0.0123 |
| 1400 | 0.22 | 0.16 | 1.33 | 0.0 | 1.26 | 0.05 | 0.71 | 355.0 | 0.0149 |
| 1415 | 0.37 | 0.20 | 1.78 | 0.0 | 1.26 | 0.05 | 0.84 | 642.0 | 0.0196 |
| 1430 | 0.39 | 0.21 | 2.34 | 0.0 | 1.26 | 0.05 | 0.99 | 868.0 | 0.0259 |
| 1445 | 0.39 | 0.38 | 2.38 | 0.0 | 1.26 | 0.05 | 1.05 | 1050.0 | 0.0335 |
| 1500 | 0.41 | 0.52 | 2.47 | 0.0 | 1.72 | 0.37 | 1.24 | 1590.0 | 0.0451 |
| 1515 | 1.15 | 0.58 | 2.49 | 0.0 | 1.72 | 0.42 | 1.30 | 2230.0 | 0.0613 |
| 1530 | 1.27 | 0.58 | 2.49 | 0.0 | 1.72 | 0.43 | 1.31 | 2700.0 | 0.0810 |
| 1545 | 1.27 | 0.58 | 2.49 | 0.0 | 1.72 | 0.43 | 1.31 | 2900.0 | 0.1021 |
| 1600 | 1.27 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 2960.0 | 0.1237 |
| 1615 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 2880.0 | 0.1446 |
| 1630 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 2690.0 | 0.1740 |
| 1700 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 2330.0 | 0.2080 |
| 1730 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 1940.0 | 0.2362 |
| 1800 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 1600.0 | 0.2595 |
| 1830 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 1330.0 | 0.2789 |
| 1900 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 1110.0 | 0.2950 |

STORM RAINFALL AND RUNOFF
08074810 BRAYS BAYOU AT GESSNER DRIVE HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4910 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4760 (INCHES) | ACCUMULATED RAINFALL AT GAGE 33R (INCHES) | ACCUMULATED RAINFALL AT GAGE 32R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|
| | | | STORM OF NOV 30 TO DEC. 2 ,1983 --CONTINUED | | | | | | |
| NOV. 30 | | | | | | | | | |
| 1930 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 957.0 | 0.3090 |
| 2000 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 837.0 | 0.3212 |
| 2030 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 756.0 | 0.3322 |
| 2100 | 1.28 | 0.58 | 2.49 | 0.0 | 1.73 | 0.43 | 1.31 | 692.0 | 0.3423 |
| 2130 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 645.0 | 0.3517 |
| 2200 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 601.0 | 0.3648 |
| 2300 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 519.0 | 0.3799 |
| 2400 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 455.0 | 0.3998 |
| DEC 1 | | | | | | | | | |
| 0000 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 455.0 | 0.3998 |
| 0200 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 346.0 | 0.4199 |
| 0400 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 267.0 | 0.4355 |
| 0600 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 205.0 | 0.4474 |
| 0800 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 152.0 | 0.4563 |
| 1000 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 124.0 | 0.4635 |
| 1200 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 102.0 | 0.4709 |
| 1500 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 80.0 | 0.4779 |
| 1800 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 68.0 | 0.4868 |
| 2400 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 56.0 | 0.4966 |
| DEC 2 | | | | | | | | | |
| 0000 | 1.28 | 0.59 | 2.49 | 0.0 | 1.73 | 0.43 | 1.32 | 56.0 | 0.4966 |
| 0600 | 1.29 | 0.59 | 2.50 | 0.0 | 1.73 | 0.43 | 1.32 | 46.0 | 0.5047 |
| 1200 | 1.36 | 0.59 | 2.50 | 0.0 | 1.73 | 0.45 | 1.32 | 43.0 | 0.5122 |
| 1800 | 1.39 | 0.61 | 2.51 | 0.0 | 1.73 | 0.45 | 1.33 | 45.0 | 0.5200 |
| 2400 | 1.39 | 0.61 | 2.51 | 0.0 | 1.73 | 0.45 | 1.33 | 40.0 | 0.5235 |

## HUMMINGBIRD STREET DITCH DRAINAGE BASIN

The location of data-collection sites in the Hummingbird Street Ditch drainage basin are shown in figure 13.

Weighted-mean rainfall for the 1984 water year was not determined.

The storm of Nov. 30 was selected for analysis at station 08074910, Hummingbird Street Ditch at Houston, Tex.

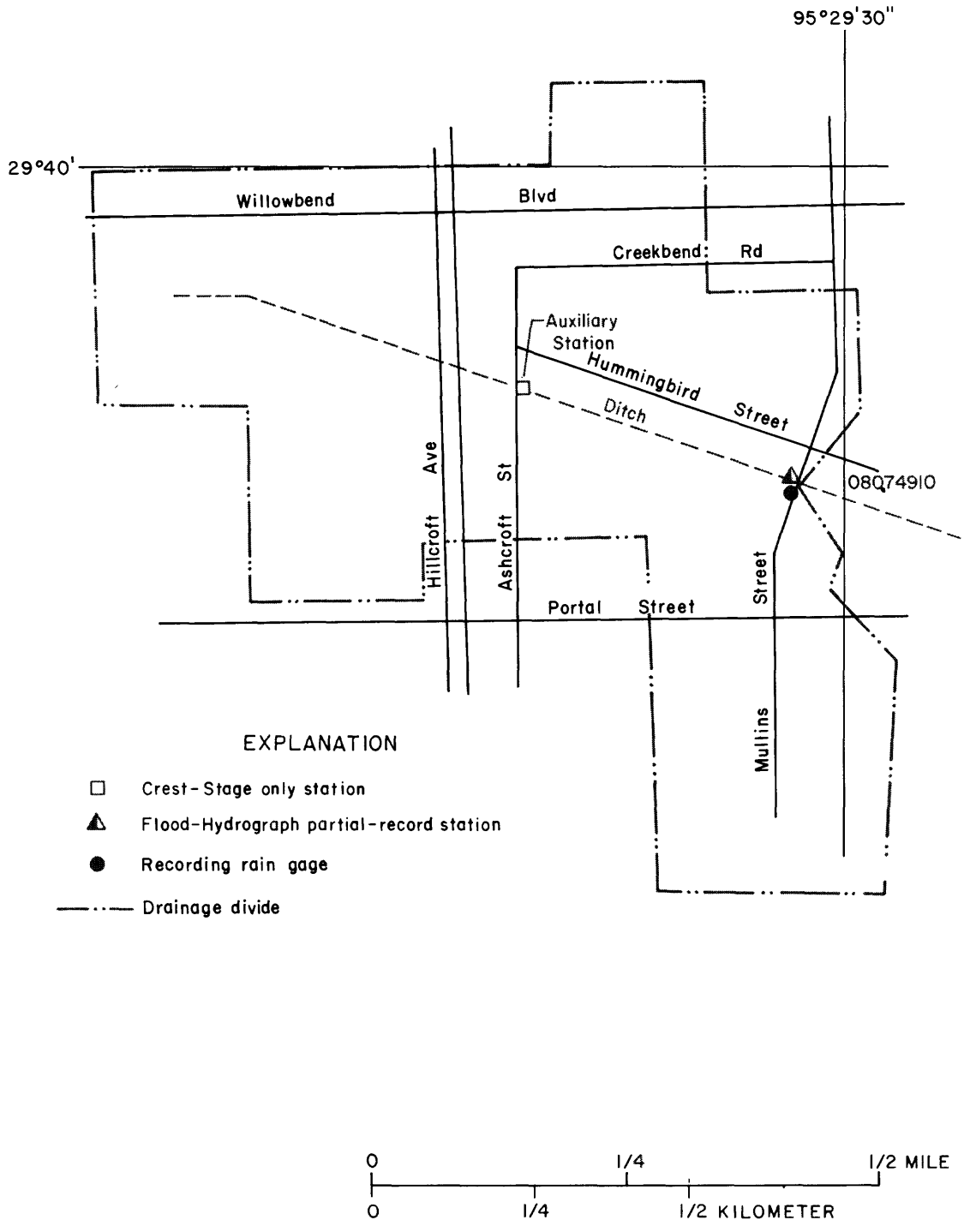


Figure 13 .-Locations of data-collection sites in and near the Hummingbird Street Ditch drainage basin

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 12.--Storm rainfall-runoff data, 1984 Water Year, Hummingbird Street Ditch

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Hummingbird Street Ditch at Houston, TX. (Drainage Area -- 0.32 $mi^2$)** | | | | | | | | |
| Nov. 30, 1983 | 1.9 | 1.28 | 0.74 | 0.86 | 0.88 | 0.55 | 0.43 | 82 |
| | | | | | | | | |
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## 08074910 HUMMINGBIRD STREET DITCH AT HOUSTON, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°39'44", long 95°29'11", Harris County, Hydrologic Unit 12040104, at downstream side of bridge at intersection of Hummingbird Street Ditch and Mullins Street in southwest Houston.

DRAINAGE AREA.--0.32 $mi^2$.

PERIOD OF RECORD.--Nov. 3, 1978 to current year.

GAGE.--Digital flood-hydrograph and rainfall recorders and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1924, 1973 adjustment, unadjusted for land-surface subsidence.

REMARKS.--Records poor. Heavy vegetal growth makes a stage-discharge relationship difficult to define.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 227 $ft^3/s$, May 3, 1981, (gage-height, 59.46 ft); no flow for many days.

EXTREMES FOR CURRENT YEAR.--Peak discharge above base of 75 $ft^3/s$ and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| Nov. 30 | 1515 | 82 | 56.90 |
| Jan. 9 | 0400 | *121 | 57.76 |

No flow for many days.

STORM RAINFALL AND RUNOFF
08074910 HUMMINGBIRD STREET DITCH AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4910 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF NOV. 30, 1983 | | | | |
| NOV. 30 | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 |
| 0400 | 0.02 | 0.02 | 0.0 | 0.0 |
| 1200 | 0.03 | 0.03 | 0.0 | 0.0 |
| 1300 | 0.03 | 0.03 | 0.0 | 0.0 |
| 1315 | 0.03 | 0.03 | 0.3 | 0.0002 |
| 1320 | 0.08 | 0.08 | 0.5 | 0.0004 |
| 1325 | 0.13 | 0.13 | 0.7 | 0.0007 |
| 1330 | 0.19 | 0.19 | 0.9 | 0.0015 |
| 1345 | 0.19 | 0.19 | 0.8 | 0.0021 |
| 1350 | 0.20 | 0.20 | 0.8 | 0.0024 |
| 1355 | 0.21 | 0.21 | 1.1 | 0.0029 |
| 1400 | 0.22 | 0.22 | 1.4 | 0.0034 |
| 1405 | 0.27 | 0.27 | 2.0 | 0.0042 |
| 1410 | 0.32 | 0.32 | 2.5 | 0.0052 |
| 1415 | 0.37 | 0.37 | 3.1 | 0.0065 |
| 1420 | 0.37 | 0.37 | 4.7 | 0.0084 |
| 1425 | 0.38 | 0.38 | 6.2 | 0.0109 |
| 1430 | 0.39 | 0.39 | 7.8 | 0.0172 |
| 1445 | 0.39 | 0.39 | 10.0 | 0.0253 |
| 1450 | 0.39 | 0.39 | 25.0 | 0.0353 |
| 1455 | 0.40 | 0.40 | 39.0 | 0.0511 |
| 1500 | 0.41 | 0.41 | 54.0 | 0.0729 |
| 1505 | 0.65 | 0.65 | 74.0 | 0.1027 |
| 1510 | 0.90 | 0.90 | 81.0 | 0.1354 |
| 1515 | 1.15 | 1.15 | 82.0 | 0.1685 |
| 1520 | 1.19 | 1.19 | 79.0 | 0.2004 |
| 1525 | 1.23 | 1.23 | 74.0 | 0.2303 |
| 1530 | 1.27 | 1.27 | 68.0 | 0.2851 |
| 1545 | 1.27 | 1.27 | 52.0 | 0.3481 |
| 1600 | 1.27 | 1.27 | 41.0 | 0.3895 |
| 1610 | 1.27 | 1.27 | 34.0 | 0.4100 |
| 1615 | 1.28 | 1.28 | 30.0 | 0.4342 |
| 1630 | 1.28 | 1.28 | 23.0 | 0.4574 |
| 1640 | 1.28 | 1.28 | 18.0 | 0.4720 |
| 1650 | 1.28 | 1.28 | 14.0 | 0.4805 |
| 1655 | 1.28 | 1.28 | 11.0 | 0.4849 |
| 1700 | 1.28 | 1.28 | 8.9 | 0.5082 |
| 1800 | 1.28 | 1.28 | 2.5 | 0.5506 |
| 2400 | 1.28 | 1.28 | 0.3 | 0.5550 |

## SAN JACINTO RIVER BASIN

### 08075000 BRAYS BAYOU AT HOUSTON, TX

LOCATION.--Lat 29°41'49", long 95°24'43", Harris County, Hydrologic Unit 12040104, near right bank at downstream side of Main Street Bridge in southwest Houston, 1.6 mi upstream from Harris Gully, and 11.6 mi upstream from Buffalo Bayou.

DRAINAGE AREA.--94.9 mi². Prior to October 1976, 88.4 mi². Changes due to drainage ditch relocations.

### WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--May 1936 to current year.

REVISED RECORDS.--WSP 1732: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 7.16 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment; unadjusted for land-surface subsidence. Prior to June 20, 1936, nonrecording gage, and June 20, 1936, to Nov. 25, 1959, water-stage recorder at site 0.8 mi downstream at same datum.

REMARKS.--Water-discharge records fair except those for period of no gage-height record and those below 200 ft³/s, which are poor. No diversion above station. Low flow is mostly sewage effluent from Houston suburbs.

AVERAGE DISCHARGE.--48 years, 126 ft³/s (91,290 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 29,000 ft³/s June 15, 1976, and Sept. 19, 1983 (gage height, 52.13 ft); minimum daily, 0.1 ft³/s Oct. 11, 12, 1937, Mar. 14, Apr. 1, 1958.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage since 1911, 56.0 ft in June 1919 before channel rectification, former site, from information by engineer for city of Houston.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 6,000 ft³/s and maximum (*):

| Date | Time | Discharge (ft³/s) | Gage height (ft) |
|---|---|---|---|
| Nov. 30 | unknown | *8,640 | a38.31 |
| Jan. 9 | 0545 | 8,540 | 38.21 |

a From peak mark.

Minimum daily discharge, 94 ft³/s Nov. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 119 | 180 | 400 | 125 | 120 | 115 | 95 | 110 | 110 | 160 | 114 | 161 |
| 2 | 118 | 118 | 150 | 125 | 160 | 118 | 220 | 110 | 110 | 166 | 162 | 702 |
| 3 | 123 | 115 | 350 | 120 | 200 | 110 | 120 | 105 | 105 | 173 | 224 | 203 |
| 4 | 121 | 114 | 150 | 110 | 120 | 110 | 100 | 105 | 105 | 127 | 281 | 167 |
| 5 | 120 | 209 | 120 | 100 | 110 | 170 | 95 | 110 | 120 | 123 | 427 | 154 |
| 6 | 114 | 817 | 110 | 100 | 130 | 120 | 95 | 110 | 1050 | 179 | 172 | 130 |
| 7 | 114 | 219 | 105 | 105 | 110 | 100 | 100 | 160 | 334 | 118 | 142 | 225 |
| 8 | 113 | 121 | 105 | 117 | 100 | 110 | 200 | 130 | 135 | 110 | 126 | 120 |
| 9 | 114 | 162 | 100 | 2670 | 600 | 100 | 150 | 110 | 99 | 147 | 202 | 112 |
| 10 | 119 | 129 | 135 | 352 | 200 | 110 | 110 | 100 | 103 | 138 | 186 | 117 |
| 11 | 119 | 108 | 150 | 172 | 150 | 120 | 100 | 100 | 106 | 128 | 350 | 114 |
| 12 | 117 | 112 | 120 | 139 | 500 | 240 | 105 | 100 | 120 | 126 | 240 | 130 |
| 13 | 111 | 104 | 100 | 124 | 200 | 326 | 110 | 100 | 110 | 114 | 190 | 126 |
| 14 | 112 | 111 | 100 | 119 | 150 | 120 | 110 | 100 | 105 | 110 | 190 | 116 |
| 15 | 108 | 104 | 95 | 139 | 140 | 110 | 130 | 100 | 100 | 179 | 140 | 229 |
| 16 | 143 | 97 | 600 | 127 | 130 | 105 | 120 | 100 | 100 | 132 | 120 | 224 |
| 17 | 331 | 100 | 200 | 116 | 130 | 100 | 115 | 140 | 100 | 120 | 115 | 135 |
| 18 | 127 | 98 | 130 | 117 | 125 | 100 | 110 | 520 | 95 | 473 | 120 | 120 |
| 19 | 120 | 139 | 125 | 115 | 130 | 532 | 105 | 1330 | 100 | 489 | 110 | 116 |
| 20 | 109 | 109 | 120 | 113 | 530 | 148 | 105 | 460 | 95 | 148 | 115 | 121 |
| 21 | 116 | 101 | 170 | 110 | 350 | 116 | 105 | 200 | 99 | 124 | 110 | 703 |
| 22 | 113 | 115 | 120 | 110 | 200 | 111 | 100 | 130 | 103 | 120 | 110 | 462 |
| 23 | 111 | 246 | 100 | 900 | 150 | 234 | 105 | 110 | 95 | 245 | 115 | 164 |
| 24 | 114 | 111 | 95 | 400 | 130 | 400 | 110 | 105 | 96 | 688 | 180 | 146 |
| 25 | 108 | 95 | 95 | 200 | 130 | 180 | 100 | 105 | 99 | 372 | 180 | 149 |
| 26 | 102 | 94 | 110 | 150 | 370 | 140 | 105 | 100 | 108 | 172 | 150 | 121 |
| 27 | 98 | 157 | 150 | 140 | 150 | 120 | 105 | 100 | 105 | 145 | 130 | 118 |
| 28 | 107 | 115 | 135 | 130 | 118 | 110 | 100 | 105 | 105 | 251 | 119 | 108 |
| 29 | 101 | 100 | 120 | 130 | 115 | 105 | 100 | 120 | 106 | 168 | 115 | 107 |
| 30 | 102 | 2000 | 110 | 200 | --- | 100 | 120 | 110 | 121 | 119 | 113 | 106 |
| 31 | 177 | --- | 110 | 140 | --- | 95 | --- | 110 | --- | 112 | 116 | --- |
| TOTAL | 3821 | 6400 | 4780 | 7815 | 5748 | 4775 | 3445 | 5495 | 4339 | 5976 | 5164 | 5706 |
| MEAN | 123 | 213 | 154 | 252 | 198 | 154 | 115 | 177 | 145 | 193 | 167 | 190 |
| MAX | 331 | 2000 | 600 | 2670 | 600 | 532 | 220 | 1330 | 1050 | 688 | 427 | 703 |
| MIN | 98 | 94 | 95 | 100 | 100 | 95 | 95 | 100 | 95 | 110 | 110 | 106 |
| AC-FT | 7580 | 12690 | 9480 | 15500 | 11400 | 9470 | 6830 | 10900 | 8610 | 11850 | 10240 | 11320 |

CAL YR 1983 TOTAL 122001 MEAN 334 MAX 12900 MIN 94 AC-FT 242000
WTR YR 1984 TOTAL 63464 MEAN 173 MAX 2670 MIN 94 AC-FT 125900

NOTE.--No gage-height record Nov. 30 to jan. 5 and many other shorter periods.

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 07... | 1430 | 113 | 832 | 7.8 | 19.0 | 5 | 6.7 | 13.8 | 147 | 6.5 | 80 | K2 |
| MAR | | | | | | | | | | | | |
| 23... | 2147 | 444 | 513 | 7.4 | 20.5 | 280 | 40 | 4.4 | 49 | 17 | 96000 | 46000 |
| 23... | 2320 | 1700 | 211 | 7.2 | 20.5 | 560 | 52 | 4.5 | 50 | 15 | 74000 | 210000 |
| 24... | 0105 | 1110 | 222 | 7.2 | 17.5 | 280 | 100 | 5.8 | 61 | 14 | 44000 | 160000 |
| 24... | 1150 | 291 | 450 | 7.7 | 19.5 | 280 | 72 | 7.8 | 85 | 6.9 | 14000 | K100000 |
| JUL | | | | | | | | | | | | |
| 02... | 1010 | 170 | 601 | 8.0 | 28.0 | 50 | 33 | 7.9 | 99 | 6.5 | K5 | K18 |
| AUG | | | | | | | | | | | | |
| 06... | 0930 | 103 | 595 | 7.6 | 27.5 | 40 | 15 | 9.4 | 117 | 5.1 | 36 | 30 |

| DATE | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 07... | 170 | 0 | 50 | 11 | 110 | 4 | 6.4 | 230 | 43 | 86 | .50 | 22 |
| MAR | | | | | | | | | | | | |
| 23... | 110 | 0 | 32 | 6.7 | 61 | 3 | 5.1 | 130 | 32 | 53 | .40 | 12 |
| 23... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 24... | 54 | 0 | 17 | 2.8 | 20 | 1 | 3.6 | 59 | 17 | 16 | .20 | 5.5 |
| 24... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| JUL | | | | | | | | | | | | |
| 02... | 120 | 0 | 38 | 7.1 | 77 | 3 | 5.9 | 130 | 36 | 65 | .40 | 18 |
| AUG | | | | | | | | | | | | |
| 06... | 140 | 0 | 43 | 8.2 | 69 | 3 | 5.6 | 160 | 32 | 58 | .40 | 18 |

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) | SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) | NITRO-GEN, NITRATE TOTAL (MG/L AS N) | NITRO-GEN, NITRITE TOTAL (MG/L AS N) | NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA TOTAL (MG/L AS N) | NITRO-GEN, ORGANIC TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | |
| 07... | 470 | <2 | <2 | 3.2 | .820 | 4.0 | 2.90 | 2.1 | 5.0 | 4.10 | 8.7 |
| MAR | | | | | | | | | | | |
| 23... | 280 | 149 | 45 | 1.6 | .360 | 2.0 | .360 | 4.6 | 5.0 | 3.00 | 18 |
| 23... | -- | 206 | 46 | .91 | .090 | 1.0 | 1.10 | 1.6 | 2.7 | 1.00 | 21 |
| 24... | 120 | 208 | 49 | 1.2 | .210 | 1.4 | 1.40 | 1.8 | 3.2 | 2.70 | 17 |
| 24... | -- | 86 | 27 | 2.0 | .160 | 2.2 | 1.10 | 1.5 | 2.6 | 2.10 | 14 |
| JUL | | | | | | | | | | | |
| 02... | 330 | 64 | 19 | 2.7 | .260 | 3.0 | .760 | 1.3 | 2.1 | 2.20 | 10 |
| AUG | | | | | | | | | | | |
| 06... | 330 | 25 | 7 | 3.0 | .340 | 3.3 | .730 | 1.1 | 1.8 | 3.30 | 7.7 |

| DATE | TIME | ARSENIC DIS-SOLVED (UG/L AS AS) | BARIUM, DIS-SOLVED (UG/L AS BA) | CADMIUM DIS-SOLVED (UG/L AS CD) | CHRO-MIUM, DIS-SOLVED (UG/L AS CR) | COPPER, DIS-SOLVED (UG/L AS CU) | IRON, DIS-SOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL | | | | | | | |
| 02... | 1010 | 8 | 130 | <1 | <10 | 5 | 11 |
| AUG | | | | | | | |
| 06... | 0930 | 20 | 120 | <1 | <10 | 5 | 12 |

| DATE | LEAD, DIS-SOLVED (UG/L AS PB) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) | MERCURY DIS-SOLVED (UG/L AS HG) | SELE-NIUM, DIS-SOLVED (UG/L AS SE) | SILVER, DIS-SOLVED (UG/L AS AG) | ZINC, DIS-SOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL | | | | | | |
| 02... | <1 | 9 | <.1 | <1 | <1 | 20 |
| AUG | | | | | | |
| 06... | <1 | 2 | <.1 | <1 | <1 | 7 |

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | AME-TRYNE TOTAL | ATRA-ZINE, TOTAL (UG/L) | CYAN-AZINE TOTAL (UG/L) | METHO-MYL TOTAL (UG/L) | PROME-TONE TOTAL (UG/L) | PROME-TRYNE TOTAL (UG/L) | PRO-PAZINE TOTAL (UG/L) | PROPHAM TOTAL (UG/L) | SEVIN, TOTAL (UG/L) | SIMA-ZINE TOTAL (UG/L) | SIME-TRYNE TOTAL (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL 02... | 1010 | <.10 | <.10 | <.10 | <2.0 | .1 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |
| AUG 06... | 0930 | <.10 | .50 | <.10 | <2.0 | .4 | <.1 | <.10 | <2.0 | <2.0 | .20 | <.1 |

STORM RAINFALL AND RUNOFF

08075000 BRAYS BAYOU AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4800 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4760 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 32R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|
| | | | | STORM OF JAN. 8 -11, 1984 | | | | | |
| JAN 8 | | | | | | | | | |
| 0000 | 0 0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 104.0 | 0.0102 |
| 1200 | 0 0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 103.0 | 0.0220 |
| 1400 | 0.0 | 0 0 | 0.0 | 0.0 | 0.0 | 0.09 | 0.00 | 101.0 | 0.0253 |
| 1600 | 0.0 | 0 0 | 0 0 | 0.01 | 0.0 | 0.20 | 0.01 | 103.0 | 0.0286 |
| 1800 | 0.0 | 0 0 | 0.0 | 0.01 | 0.0 | 0.20 | 0.01 | 106.0 | 0.0312 |
| 1900 | 0 0 | 0.01 | 0.0 | 0.03 | 0.0 | 0.20 | 0.02 | 108.0 | 0.0330 |
| 2000 | 0.0 | 0 01 | 0.0 | 0.08 | 0.01 | 0.20 | 0.03 | 110.0 | 0.0343 |
| 2030 | 0.02 | 0 03 | 0.01 | 0.08 | 0.01 | 0.20 | 0.04 | 135.0 | 0.0354 |
| 2100 | 0.04 | 0 08 | 0.04 | 0.14 | 0.04 | 0.20 | 0.07 | 159.0 | 0.0367 |
| 2130 | 0 05 | 0.12 | 0 06 | 0.14 | 0.04 | 0.20 | 0.08 | 175.0 | 0.0382 |
| 2200 | 0.08 | 0.21 | 0.18 | 0.17 | 0.18 | 0.20 | 0.16 | 190.0 | 0.0397 |
| 2230 | 0.08 | 0.22 | 0.19 | 0.17 | 0.18 | 0.20 | 0.16 | 204.0 | 0.0414 |
| 2300 | 0.08 | 0.22 | 0.19 | 0.19 | 0.18 | 0.20 | 0.16 | 217.0 | 0.0431 |
| 2330 | 0.08 | 0.22 | 0.19 | 0.19 | 0.18 | 0.20 | 0.16 | 224.0 | 0.0450 |
| 2400 | 0.08 | 0.22 | 0.19 | 0.19 | 0 19 | 0.20 | 0.17 | 228.0 | 0.0478 |
| JAN. 9 | | | | | | | | | |
| 0000 | 0.08 | 0.22 | 0.19 | 0.19 | 0.19 | 0.20 | 0.17 | 228.0 | 0.0478 |
| 0100 | 0.08 | 0.22 | 0.19 | 0.24 | 0.19 | 0.20 | 0.18 | 236.0 | 0.0502 |
| 0115 | 0.08 | 0.22 | 0.20 | 0.24 | 0.19 | 0.20 | 0.18 | 242.0 | 0.0512 |
| 0130 | 0.08 | 0.23 | 0 20 | 0.24 | 0.19 | 0.20 | 0 18 | 247.0 | 0.0522 |
| 0145 | 0 18 | 0.23 | 0.20 | 0 24 | 0.19 | 0.20 | 0.20 | 253.0 | 0.0532 |
| 0200 | 0 27 | 0.25 | 0.20 | 0.27 | 0.24 | 0.25 | 0.25 | 258.0 | 0.0543 |
| 0215 | 0 27 | 0.27 | 0.25 | 0.27 | 0.24 | 0.31 | 0 26 | 275.0 | 0.0554 |
| 0230 | 0.27 | 0.28 | 0.26 | 0 27 | 0.24 | 0.32 | 0.26 | 293.0 | 0.0566 |
| 0245 | 0.28 | 0.28 | 0 26 | 0 27 | 0.24 | 0.33 | 0.27 | 310.0 | 0.0578 |
| 0300 | 0 59 | 0.28 | 0.26 | 0.37 | 0.28 | 0.34 | 0.38 | 327.0 | 0.0592 |
| 0315 | 0.60 | 0.66 | 0.36 | 0 37 | 0.28 | 0.59 | 0.44 | 566.0 | 0.0615 |
| 0330 | 0 70 | 0 68 | 0 64 | 0.37 | 0.28 | 0.70 | 0.52 | 1430 0 | 0.0673 |
| 0345 | 0.80 | 0.82 | 0 68 | 0 37 | 0.28 | 0.93 | 0.57 | 2430.0 | 0.0772 |
| 0400 | 0 99 | 0 90 | 0.77 | 1.21 | 0.72 | 1.11 | 0.93 | 4010.0 | 0.0936 |
| 0415 | 1.08 | 1 06 | 0.83 | 1.21 | 0.72 | 1.27 | 0.99 | 5190.0 | 0.1148 |
| 0430 | 1 22 | 1 17 | 0 94 | 1.21 | 0.72 | 1.40 | 1.05 | 5980.0 | 0.1392 |
| 0445 | 1.28 | 1.37 | 1.18 | 1.21 | 0.72 | 1.49 | 1.13 | 6500.0 | 0.1657 |
| 0500 | 1.30 | 1.41 | 1.27 | 1.43 | 1.31 | 1.68 | 1.35 | 6900.0 | 0.1939 |
| 0515 | 1.34 | 1.44 | 1.31 | 1.43 | 1.31 | 1.71 | 1.37 | 7930.0 | 0.2263 |
| 0530 | 1.38 | 1.47 | 1.34 | 1.43 | 1.31 | 1.73 | 1.39 | 8460.0 | 0.2608 |
| 0545 | 1.40 | 1.50 | 1.38 | 1.43 | 1.31 | 1.77 | 1.41 | 8540.0 | 0.2957 |
| 0600 | 1.47 | 1.52 | 1.41 | 1.98 | 1.43 | 1.82 | 1.58 | 8510.0 | 0.3304 |
| 0615 | 1.48 | 1.59 | 1.46 | 1.98 | 1.43 | 1.85 | 1.59 | 8410.0 | 0.3648 |
| 0630 | 1.50 | 1 62 | 1.52 | 1.98 | 1.43 | 1.89 | 1.61 | 8240.0 | 0.3984 |

STORM RAINFALL AND RUNOFF

08075000 BRAYS BAYOU AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4800 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4760 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 32R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|
| | | | STORM OF JAN. 8-11, 1984 | | | --CONTINUED | | | |
| JAN 9 | | | | | | | | | |
| 0645 | 1.50 | 1.64 | 1.53 | 1.98 | 1.43 | 1.94 | 1.62 | 8020.0 | 0.4311 |
| 0700 | 1.53 | 1.64 | 1.54 | 2.11 | 1.54 | 1.95 | 1.68 | 7790.0 | 0.4629 |
| 0715 | 1.53 | 1.64 | 1.54 | 2.11 | 1.54 | 1.96 | 1.68 | 7460.0 | 0.4934 |
| 0730 | 1.53 | 1.65 | 1.55 | 2.11 | 1.54 | 1.96 | 1.68 | 7120.0 | 0.5224 |
| 0745 | 1.53 | 1.65 | 1.55 | 2.11 | 1.54 | 1.96 | 1.68 | 6730.0 | 0.5499 |
| 0800 | 1.53 | 1.65 | 1.55 | 2.12 | 1.54 | 1.96 | 1.69 | 6330.0 | 0.5628 |
| 0800 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 5570.0 | 0.6083 |
| 0900 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 4820.0 | 0.6772 |
| 0945 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 3820.0 | 0.7240 |
| 1030 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 3010.0 | 0.7670 |
| 1130 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 2300.0 | 0.7951 |
| 1200 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 2050.0 | 0.8202 |
| 1300 | 1.53 | 1.66 | 1.56 | 2.12 | 1.54 | 1.97 | 1.69 | 1700.0 | 0.8480 |
| 1400 | 1.78 | 1.84 | 1.61 | 2.16 | 1.54 | 2.04 | 1.79 | 1480.0 | 0.8631 |
| 1415 | 1.79 | 1.85 | 1.66 | 2.16 | 1.54 | 2.08 | 1.81 | 1490.0 | 0.8692 |
| 1430 | 1.80 | 1.90 | 1.68 | 2.16 | 1.54 | 2.14 | 1.82 | 1490.0 | 0.8753 |
| 1445 | 1.83 | 1.90 | 1.69 | 2.16 | 1.54 | 2.16 | 1.83 | 1660.0 | 0.8820 |
| 1500 | 1.83 | 1.90 | 1.69 | 2.28 | 1.62 | 2.16 | 1.87 | 1820.0 | 0.8895 |
| 1515 | 1.83 | 1.91 | 1.70 | 2.28 | 1.62 | 2.16 | 1.87 | 1980.0 | 0.9016 |
| 1545 | 1.83 | 1.91 | 1.70 | 2.28 | 1.62 | 2.16 | 1.87 | 2070.0 | 0.9143 |
| 1600 | 1.83 | 1.91 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 2060.0 | 0.9521 |
| 1800 | 1.83 | 1.91 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 1650.0 | 0.9993 |
| 1930 | 1.83 | 1.91 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 1320.0 | 1.0181 |
| 1945 | 1.83 | 1.91 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 1270.0 | 1.0233 |
| 2000 | 1.83 | 1.92 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 1220.0 | 1.0283 |
| 2015 | 1.83 | 1.92 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 1180.0 | 1.0331 |
| 2030 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 1140.0 | 1.0494 |
| 2200 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 934.0 | 1.0761 |
| 2400 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 737.0 | 1.1242 |
| JAN. 10 | | | | | | | | | |
| 0000 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 737.0 | 1.1242 |
| 0600 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 426.0 | 1.1659 |
| 1200 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 304.0 | 1.1957 |
| 1800 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 250.0 | 1.2202 |
| 2400 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 212.0 | 1.2410 |
| JAN. 11 | | | | | | | | | |
| 0000 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 212.0 | 1.2410 |
| 0600 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 186.0 | 1.2592 |
| 1200 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 163.0 | 1.2752 |
| 1800 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 159.0 | 1.2908 |
| 2400 | 1.83 | 1.93 | 1.70 | 2.32 | 1.63 | 2.16 | 1.88 | 155.0 | 1.2984 |

STORM RAINFALL AND RUNOFF

08075000 BRAYS BAYOU AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 4910 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4800 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4780 (INCHES) | ACCUMULATED RAINFALL AT GAGE 4760 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 33R (INCHES) | ACCUMULATED RAINFALL AT GAGE [illegible] (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|---|---|
| STORM OF MAR. 23-25, 1984 | | | | | | | | | | |
| MAR. 23 | | | | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 110.0 | 0.0054 |
| 0600 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 109.0 | 0.0125 |
| 0800 | 0.0 | 0.0 | 0.01 | 0.01 | 0.10 | 0.0 | 0.0 | 0.01 | 109.0 | 0.0161 |
| 1000 | 0.0 | 0.0 | 0.01 | 0.01 | 0.10 | 0.0 | 0.0 | 0.01 | 108.0 | 0.0196 |
| 1200 | 0.0 | 0.0 | 0.02 | 0.01 | 0.10 | 0.0 | 0.0 | 0.01 | 108.0 | 0.0266 |
| 1800 | 0.0 | 0.0 | 0.02 | 0.01 | 0.10 | 0.0 | 0.0 | 0.01 | 110.0 | 0.0329 |
| 1900 | 0.0 | 0.0 | 0.02 | 0.01 | 0.10 | 0.33 | 0.0 | 0.03 | 110.0 | 0.0343 |
| 1930 | 0.0 | 0.0 | 0.02 | 0.01 | 0.10 | 0.33 | 0.0 | 0.03 | 110.0 | 0.0350 |
| 1945 | 0.0 | 0.0 | 0.02 | 0.02 | 0.10 | 0.33 | 0.0 | 0.03 | 110.0 | 0.0354 |
| 2000 | 0.0 | 0.0 | 0.02 | 0.14 | 0.10 | 1.04 | 0.26 | 0.13 | 110.0 | 0.0359 |
| 2015 | 0.0 | 0.0 | 0.04 | 0.22 | 0.10 | 1.04 | 0.26 | 0.14 | 110.0 | 0.0363 |
| 2030 | 0.0 | 0.01 | 0.08 | 0.29 | 0.10 | 1.04 | 0.26 | 0.16 | 110.0 | 0.0368 |
| 2045 | 0.23 | 0.04 | 0.15 | 0.29 | 0.10 | 1.04 | 0.26 | 0.23 | 110.0 | 0.0372 |
| 2100 | 0.42 | 0.28 | 0.18 | 0.29 | 0.22 | 1.04 | 0.26 | 0.33 | 110.0 | 0.0376 |
| 2115 | 0.59 | 0.30 | 0.18 | 0.29 | 0.22 | 1.04 | 0.26 | 0.38 | 110.0 | 0.0381 |
| 2130 | 0.61 | 0.30 | 0.18 | 0.29 | 0.22 | 1.04 | 0.26 | 0.38 | 111.0 | 0.0386 |
| 2145 | 0.61 | 0.30 | 0.18 | 0.29 | 0.22 | 1.04 | 0.26 | 0.38 | 220.0 | 0.0394 |
| 2200 | 0.61 | 0.30 | 0.18 | 0.29 | 0.51 | 1.04 | 0.26 | 0.41 | 579.0 | 0.0418 |
| 2215 | 0.61 | 0.30 | 0.18 | 0.29 | 0.51 | 1.04 | 0.26 | 0.41 | 1160.0 | 0.0465 |
| 2230 | 0.61 | 0.30 | 0.18 | 0.29 | 0.51 | 1.04 | 0.26 | 0.41 | 1630.0 | 0.0532 |
| 2245 | 0.61 | 0.30 | 0.18 | 0.29 | 0.51 | 1.04 | 0.26 | 0.41 | 1800.0 | 0.0606 |
| 2300 | 0.61 | 0.30 | 0.18 | 0.29 | 0.52 | 1.04 | 0.26 | 0.41 | 1800.0 | 0.0716 |
| 2330 | 0.61 | 0.30 | 0.18 | 0.29 | 0.52 | 1.04 | 0.26 | 0.41 | 1670.0 | 0.0818 |
| 2345 | 0.61 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 1580.0 | 0.0882 |
| 2400 | 0.61 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 1490.0 | 0.0974 |
| MAR. 24 | | | | | | | | | | |
| 0000 | 0.61 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 1490.0 | 0.0974 |
| 0030 | 0.61 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 1310.0 | 0.1081 |
| 0100 | 0.62 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 1130.0 | 0.1219 |
| 0200 | 0.62 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 846.0 | 0.1357 |
| 0300 | 0.62 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 664.0 | 0.1493 |
| 0430 | 0.62 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 516.0 | 0.1619 |
| 0600 | 0.62 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 430.0 | 0.1777 |
| 0900 | 0.62 | 0.30 | 0.18 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 345.0 | 0.1946 |
| 1200 | 0.62 | 0.30 | 0.19 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 290.0 | 0.2159 |
| 1800 | 0.62 | 0.30 | 0.19 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 240.0 | 0.2394 |
| 2400 | 0.62 | 0.30 | 0.19 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 215.0 | 0.2710 |
| MAR. 25 | | | | | | | | | | |
| 0000 | 0.62 | 0.30 | 0.19 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 215.0 | 0.2710 |
| 1200 | 0.62 | 0.30 | 0.19 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 180.0 | 0.3063 |
| 2400 | 0.62 | 0.30 | 0.19 | 0.30 | 0.52 | 1.04 | 0.26 | 0.42 | 160.0 | 0.3220 |

## SIMS BAYOU DRAINAGE BASIN

The locations of data-collection sites in and near the Sims Bayou drainage basin are shown in figure 14.

Berry Bayou is shown as a separate drainage basin within the Sims Bayou section.

Weighted-mean rainfall for the upper portion of the drainage basin above the Hiram Clarke Street station, based on two rain gages, for the 1984 water year was 29.70 inches, or 18.49 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.21 | 2.37 | 2.21 | 2.66 | 2.17 | 1.20 | 0.47 | 2.54 | 1.56 | 1.82 | 7.49 | 4.00 | 29.70 |

Weighted-mean rainfall in the drainage basin above the Telephone Road station (station 08075500), based on six rain gages, for the 1984 water year was 34.31 inches or 13.88 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water-year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.73 | 3.73 | 2.68 | 3.55 | 2.30 | 1.31 | 0.47 | 2.67 | 1.94 | 1.86 | 7.47 | 4.60 | 34.31 |

The storms of Jan. 8-10, and Aug. 12-13 were selected for analysis at station 08075400, Sims Bayou at Hiram Clarke Street. The storm of Jan. 9-11 was selected for analysis at station 08075470, Sims Bayou at Martin Luther King Blvd. The storm of Jan. 8-12 was selected for analysis at station 08075500, Sims Bayou at Houston.

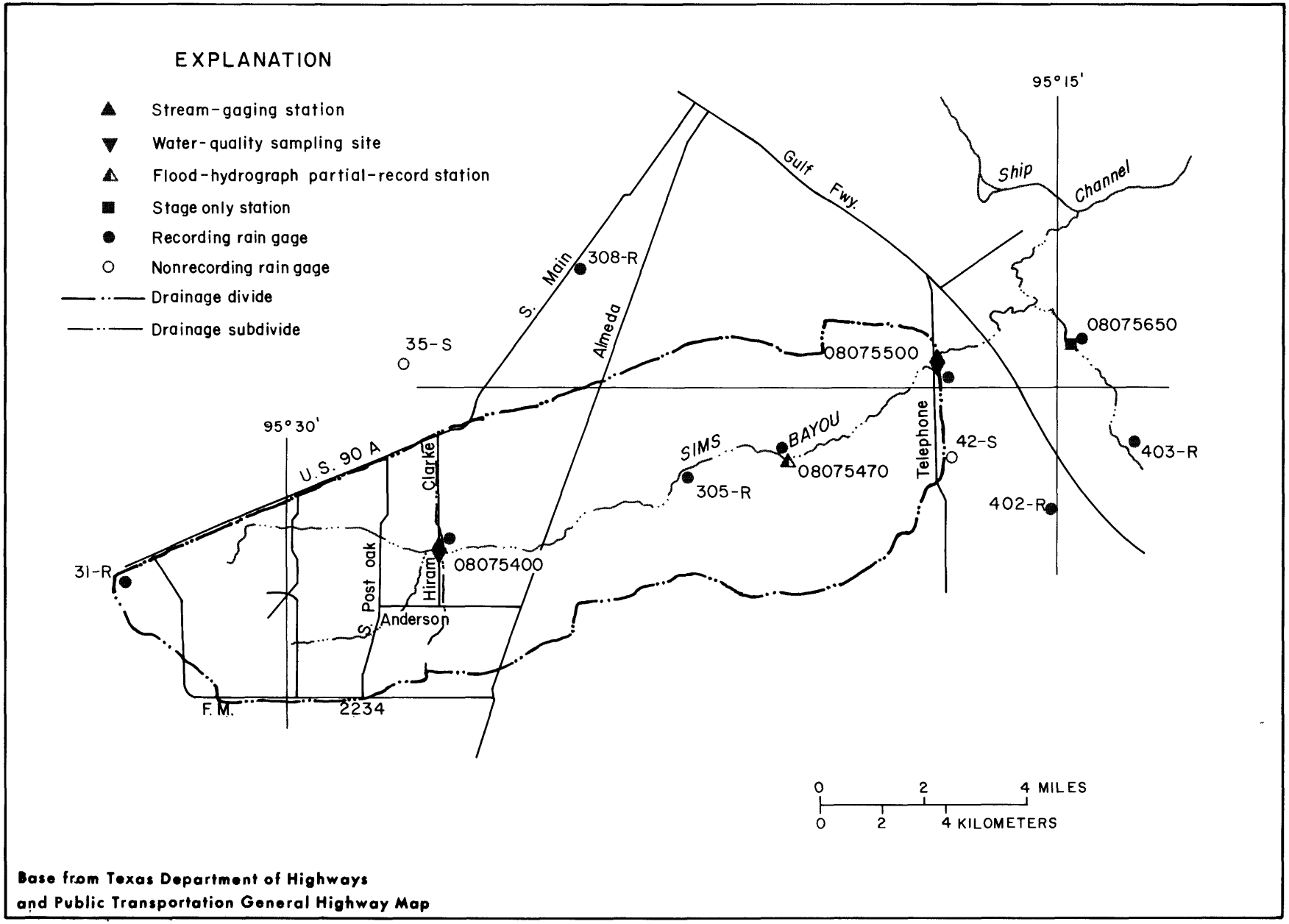


Figure 14 - Locations of data-collection sites in and near the Sims Bayou drainage basin

TX-35
Rev. 5/80

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table13.--Storm rainfall-runoff data, 1984 Water Year, Sims Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Sims Bayou at Hiram Clarke St., Houston, TX. (Drainage Area -- 20.2 $mi.^2$)** | | | | | | | | |
| Jan. 8-10, 1984 | 5.5 | 2.23 | 0.30 | 0.60 | 0.96 | 1.60 | 0.72 | 1500* |
| Aug. 12-13, 1984 | 1.0 | 2.83 | 0.80 | 1.59 | 3.04 | 0.65 | 0.23 | 1010 |
| **Sims Bayou at Martin Luther King Blvd., Houston, TX (Drainage Area -- 48.4 $mi.^2$)** | | | | | | | | |
| Jan. 9-10, 1984 | 5.5 | 2.16 | 0.42 | 0.84 | 0.96 | -- | -- | 25.90* |

* - Peak Discharge/Gage Height for 1984 Water Year

UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 13.--Storm rainfall-runoff data, 1984 Water Year, Sims Bayou--Continued

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Sims Bayou at Houston, TX, (Drainage Area -- 63.0 $mi.^2$)** | | | | | | | | |
| Jan. 8-12, 1984 | 12.5 | 2.24 | 0.42 | 0.84 | 0.96 | 1.45 | 0.65 | 2540* |
| | | | | | | | | |
| | | | | | | | | |
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* - Peak Discharge for 1984 Water Year

## 08075400 SIMS BAYOU AT HIRAM CLARKE STREET, HOUSTON, TX

LOCATION.--Lat 29°37'07", long 95°26'45", Harris County, Hydrologic Unit 12040104, on right bank at downstream side of bridge on Hiram Clarke Street in southwest Houston, 12.7 mi upstream from gage Sims Bayou at Houston, and 19.7 mi upstream from mouth.

DRAINAGE AREA.--20.2 mi².

### WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--August 1964 to current year (discharge measurements and supplemental peak discharges only Dec. 6, 1978, to Aug. 31, 1979).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1959 adjustment; unadjusted for land-surface subsidence. Telemetry located at station.

REMARKS.--Water-discharge records fair. Channel bed was lowered 5 to 6 ft during rectification of 1978. No known diversion above station. Low flow is partly sustained by sewage effluent from Houston suburbs. Records furnished by Houston Lighting and Power Co. show that during the current year about 428 acre-ft of ground water was used for cooling purposes then released to the bayou about 200 ft upstream from gage.

AVERAGE DISCHARGE.--19 years (water years 1965-78, 1980-84), 28.7 ft³/s (20,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,660 ft³/s Sept 19, 1983 (elevation, 54.50 ft); maximum elevation, 57.12 ft June 15, 1976, occurred prior to 1978 channel rectification; minimum daily discharge, 1.5 ft³/s July 26, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s and maximum (*):

| Date | Time | Discharge (ft³/s) | Elevation (ft) |
|---|---|---|---|
| Jan. 9 | 0700 | *1,500 | 45.92 |
| Aug. 12 | 1800 | 1,010 | 44.62 |

Minimum daily discharge, 11 ft³/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 14 | 16 | 18 | 16 | 19 | 18 | 12 | 16 | 15 | 20 | 16 | 36 |
| 2 | 13 | 14 | 17 | 16 | 31 | 17 | 19 | 15 | 15 | 20 | 17 | 132 |
| 3 | 13 | 13 | 55 | 14 | 34 | 17 | 14 | 16 | 13 | 16 | 18 | 54 |
| 4 | 13 | 14 | 20 | 14 | 21 | 18 | 12 | 14 | 13 | 15 | 41 | 19 |
| 5 | 13 | 19 | 16 | 14 | 19 | 20 | 11 | 13 | 15 | 15 | 37 | 16 |
| 6 | 16 | 71 | 14 | 14 | 18 | 18 | 11 | 14 | 114 | 15 | 40 | 12 |
| 7 | 13 | 16 | 13 | 15 | 17 | 17 | 13 | 14 | 51 | 16 | 45 | 11 |
| 8 | 14 | 16 | 13 | 15 | 18 | 16 | 13 | 13 | 14 | 18 | 20 | 13 |
| 9 | 14 | 22 | 13 | 760 | 102 | 16 | 12 | 13 | 12 | 17 | 45 | 13 |
| 10 | 13 | 19 | 26 | 400 | 41 | 17 | 13 | 13 | 11 | 17 | 27 | 12 |
| 11 | 13 | 15 | 47 | 150 | 26 | 17 | 12 | 14 | 11 | 17 | 21 | 13 |
| 12 | 11 | 16 | 16 | 40 | 48 | 21 | 13 | 14 | 14 | 17 | 245 | 13 |
| 13 | 12 | 16 | 13 | 25 | 30 | 18 | 13 | 15 | 12 | 18 | 105 | 13 |
| 14 | 11 | 16 | 12 | 20 | 24 | 16 | 13 | 14 | 12 | 19 | 75 | 12 |
| 15 | 11 | 15 | 13 | 18 | 20 | 15 | 13 | 14 | 12 | 20 | 225 | 34 |
| 16 | 13 | 15 | 66 | 17 | 21 | 16 | 13 | 14 | 12 | 21 | 56 | 27 |
| 17 | 18 | 16 | 24 | 18 | 20 | 17 | 13 | 15 | 13 | 20 | 17 | 12 |
| 18 | 14 | 16 | 16 | 19 | 19 | 17 | 13 | 28 | 12 | 26 | 15 | 11 |
| 19 | 17 | 17 | 14 | 20 | 19 | 45 | 13 | 204 | 13 | 45 | 14 | 11 |
| 20 | 12 | 17 | 14 | 19 | 27 | 16 | 13 | 80 | 15 | 23 | 13 | 11 |
| 21 | 12 | 17 | 37 | 20 | 25 | 16 | 15 | 21 | 12 | 23 | 12 | 73 |
| 22 | 13 | 18 | 19 | 20 | 22 | 15 | 14 | 15 | 12 | 24 | 12 | 54 |
| 23 | 12 | 24 | 19 | 192 | 23 | 16 | 14 | 14 | 12 | 24 | 13 | 16 |
| 24 | 11 | 19 | 20 | 55 | 19 | 23 | 13 | 15 | 13 | 25 | 94 | 14 |
| 25 | 11 | 17 | 20 | 25 | 19 | 15 | 15 | 15 | 13 | 26 | 90 | 14 |
| 26 | 12 | 17 | 21 | 24 | 54 | 15 | 15 | 14 | 13 | 20 | 22 | 12 |
| 27 | 11 | 18 | 22 | 24 | 30 | 14 | 16 | 14 | 13 | 19 | 19 | 11 |
| 28 | 12 | 12 | 19 | 25 | 20 | 13 | 17 | 15 | 12 | 75 | 13 | 12 |
| 29 | 13 | 12 | 19 | 25 | 19 | 12 | 17 | 16 | 17 | 37 | 12 | 11 |
| 30 | 12 | 33 | 19 | 30 | --- | 12 | 18 | 15 | 14 | 19 | 11 | 12 |
| 31 | 14 | --- | 18 | 21 | --- | 12 | --- | 16 | --- | 16 | 12 | --- |
| TOTAL | 401 | 566 | 673 | 2085 | 805 | 535 | 413 | 723 | 530 | 703 | 1402 | 704 |
| MEAN | 12.9 | 18.9 | 21.7 | 67.3 | 27.8 | 17.3 | 13.8 | 23.3 | 17.7 | 22.7 | 45.2 | 23.5 |
| MAX | 18 | 71 | 66 | 760 | 102 | 45 | 19 | 204 | 114 | 75 | 245 | 132 |
| MIN | 11 | 12 | 12 | 14 | 17 | 12 | 11 | 13 | 11 | 15 | 11 | 11 |
| AC-FT | 795 | 1120 | 1330 | 4140 | 1600 | 1060 | 819 | 1430 | 1050 | 1390 | 2780 | 1400 |

CAL YR 1983 TOTAL 17671 MEAN 48.4 MAX 2130 MIN 11 AC-FT 35050
WTR YR 1984 TOTAL 9540 MEAN 26.1 MAX 760 MIN 11 AC-FT 18920

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1970 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 06... | 1415 | 17 | 865 | 8.2 | 16.0 | 20 | 12 | 15.8 | 158 | 3.8 | K12 | K10 |
| JUL | | | | | | | | | | | | |
| 02... | 1320 | 21 | 905 | 7.8 | 28.0 | 40 | 12 | 4.0 | 51 | 7.4 | 190 | 190 |
| AUG | | | | | | | | | | | | |
| 07... | 1340 | 36 | 533 | 7.6 | 30.0 | 70 | 60 | 5.1 | 67 | 7.3 | 880 | 230 |
| 12... | 1500 | 97 | 314 | -- | -- | 140 | 390 | -- | -- | -- | -- | -- |
| 12... | 1900 | 928 | 157 | -- | -- | 300 | 400 | -- | -- | -- | -- | -- |
| 12... | 2300 | 362 | 209 | -- | -- | 190 | 250 | -- | -- | -- | -- | -- |
| 13... | 1000 | 94 | 241 | -- | -- | 230 | 140 | -- | -- | -- | -- | -- |

| DATE | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 06... | 180 | 0 | 51 | 13 | 120 | 4 | 5.1 | 260 | 46 | 84 | .50 | 20 |
| JUL | | | | | | | | | | | | |
| 02... | 150 | 0 | 44 | 9.1 | 130 | 5 | 5.0 | 210 | 61 | 110 | .60 | 21 |
| AUG | | | | | | | | | | | | |
| 07... | 110 | 0 | 34 | 6.0 | 67 | 3 | 6.6 | 150 | 28 | 51 | .40 | 16 |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 12... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |
| 13... | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- | -- |

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) | SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) | NITRO-GEN, NITRATE TOTAL (MG/L AS N) | NITRO-GEN, NITRITE TOTAL (MG/L AS N) | NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA TOTAL (MG/L AS N) | NITRO-GEN, ORGANIC TOTAL (MG/L AS N) | NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | |
| 06... | 500 | <2 | <2 | 3.6 | .250 | 3.8 | 1.50 | 2.5 | 4.0 | 4.70 | 6.9 |
| JUL | | | | | | | | | | | |
| 02... | 510 | 22 | 12 | 1.9 | .640 | 2.5 | .680 | 1.3 | 2.0 | 4.90 | 9.4 |
| AUG | | | | | | | | | | | |
| 07... | 300 | 65 | 14 | 1.7 | .520 | 2.2 | .830 | 1.2 | 2.0 | 2.60 | 10 |
| 12... | -- | 168 | 24 | .60 | .500 | 1.1 | .690 | 3.7 | 4.4 | 2.00 | 21 |
| 12... | -- | 191 | 25 | .14 | .460 | .60 | .450 | 2.4 | 2.8 | 1.20 | 19 |
| 12... | -- | 155 | 20 | .50 | .200 | .70 | .570 | 1.2 | 1.8 | 1.50 | 15 |
| 13... | -- | 28 | 18 | .50 | .300 | .80 | .450 | 1.5 | 1.9 | .790 | 11 |

| DATE | TIME | ARSENIC DIS-SOLVED (UG/L AS AS) | BARIUM, DIS-SOLVED (UG/L AS BA) | CADMIUM DIS-SOLVED (UG/L AS CD) | CHRO-MIUM, DIS-SOLVED (UG/L AS CR) | COPPER, DIS-SOLVED (UG/L AS CU) | IRON, DIS-SOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL | | | | | | | |
| 02... | 1320 | 60 | 130 | 1 | <10 | 5 | 16 |
| AUG | | | | | | | |
| 07... | 1340 | 23 | 110 | <1 | <10 | 3 | 62 |

| DATE | LEAD, DIS-SOLVED (UG/L AS PB) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) | MERCURY DIS-SOLVED (UG/L AS HG) | SELE-NIUM, DIS-SOLVED (UG/L AS SE) | SILVER, DIS-SOLVED (UG/L AS AG) | ZINC, DIS-SOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL | | | | | | |
| 02... | <1 | 28 | <.1 | <1 | <1 | 53 |
| AUG | | | | | | |
| 07... | <1 | 7 | <.1 | <1 | <1 | <3 |

08075400 SIMS BAYOU AT HIRAM CLARKE STREET, HOUSTON, TX--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | AME-TRYNE TOTAL | ATRA-ZINE, TOTAL (UG/L) | CYAN-AZINE TOTAL (UG/L) | METHO-MYL TOTAL (UG/L) | PROME-TONE TOTAL (UG/L) | PROME-TRYNE TOTAL (UG/L) | PRO-PAZINE TOTAL (UG/L) | PROPHAM TOTAL (UG/L) | SEVIN, TOTAL (UG/L) | SIMA-ZINE TOTAL (UG/L) | SIME-TRYNE TOTAL (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL | | | | | | | | | | | | |
| 02... | 1320 | <.10 | .10 | <.10 | <2.0 | .1 | <.1 | <.10 | <2.0 | <2.0 | .10 | <.1 |
| AUG | | | | | | | | | | | | |
| 07... | 1340 | <.10 | .30 | <.10 | -- | .5 | <.1 | <.10 | -- | -- | <.10 | <.1 |

STORM RAINFALL AND RUNOFF
08075400 SIMS BAYOU AT HIRAM CLARKE STREET, HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|
| | | STORM OF JAN. 8 -10, 1984 | | | |
| JAN. 8 | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 16.0 | 0.0074 |
| 1200 | 0.0 | 0.0 | 0.0 | 13.0 | 0.0148 |
| 1500 | 0.0 | 0.20 | 0.08 | 14.0 | 0.0181 |
| 1800 | 0.0 | 0.20 | 0.08 | 16.0 | 0.0236 |
| 2400 | 0.0 | 0.20 | 0.08 | 24.0 | 0.0305 |
| JAN. 9 | | | | | |
| 0000 | 0.0 | 0.20 | 0.08 | 24.0 | 0.0305 |
| 0130 | 0.12 | 0.20 | 0.15 | 25.0 | 0.0324 |
| 0200 | 0.12 | 0.25 | 0.17 | 26.0 | 0.0334 |
| 0230 | 0.24 | 0.32 | 0.27 | 26.0 | 0.0344 |
| 0300 | 0.24 | 0.34 | 0.28 | 27.0 | 0.0354 |
| 0330 | 0.84 | 0.70 | 0.78 | 120.0 | 0.0400 |
| 0400 | 1.20 | 1.11 | 1.16 | 214.0 | 0.0483 |
| 0430 | 1.32 | 1.40 | 1.35 | 464.0 | 0.0660 |
| 0500 | 1.44 | 1.68 | 1.54 | 714.0 | 0.0934 |
| 0530 | 1.68 | 1.73 | 1.70 | 1030.0 | 0.1329 |
| 0600 | 1.80 | 1.82 | 1.81 | 1350.0 | 0.1847 |
| 0630 | 1.92 | 1.89 | 1.91 | 1430.0 | 0.2396 |
| 0700 | 2.04 | 1.95 | 2.00 | 1500.0 | 0.2971 |
| 0730 | 2.04 | 1.96 | 2.01 | 1460.0 | 0.3531 |
| 0800 | 2.04 | 1.96 | 2.01 | 1410.0 | 0.4072 |
| 0830 | 2.04 | 1.97 | 2.01 | 1310.0 | 0.4574 |
| 0900 | 2.04 | 1.97 | 2.01 | 1200.0 | 0.5265 |
| 1000 | 2.04 | 1.97 | 2.01 | 979.0 | 0.6016 |
| 1100 | 2.04 | 1.97 | 2.01 | 809.0 | 0.6636 |
| 1200 | 2.04 | 1.97 | 2.01 | 623.0 | 0.6995 |
| 1230 | 2.04 | 1.97 | 2.01 | 530.0 | 0.7198 |
| 1300 | 2.04 | 1.97 | 2.01 | 591.0 | 0.7538 |
| 1400 | 2.04 | 2.04 | 2.04 | 714.0 | 0.8086 |
| 1500 | 2.28 | 2.16 | 2.23 | 788.0 | 0.8993 |
| 1700 | 2.28 | 2.16 | 2.23 | 877.0 | 1.0002 |
| 1800 | 2.28 | 2.16 | 2.23 | 871.0 | 1.1672 |
| 2200 | 2.28 | 2.16 | 2.23 | 625.0 | 1.3110 |
| 2400 | 2.28 | 2.16 | 2.23 | 447.0 | 1.4139 |
| JAN. 10 | | | | | |
| 0000 | 2.28 | 2.16 | 2.23 | 447.0 | 1.4139 |
| 0400 | 2.28 | 2.16 | 2.23 | 238.0 | 1.4869 |
| 0800 | 2.28 | 2.16 | 2.23 | 142.0 | 1.5305 |
| 1200 | 2.28 | 2.16 | 2.23 | 92.0 | 1.5658 |
| 1800 | 2.28 | 2.16 | 2.23 | 53.0 | 1.5902 |
| 2400 | 2.28 | 2.16 | 2.23 | 31.0 | 1.5973 |

STORM RAINFALL AND RUNOFF

08075400 SIMS BAYOU AT HIRAM CLARKE STREET, HOUSTON, TEX.

--CONTINUED

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|
| | | STORM OF AUG. 12-13, 1984 | | | |
| AUG. 12 | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 40.0 | 0.0092 |
| 0600 | 0.0 | 0.0 | 0.0 | 19.0 | 0.0180 |
| 1200 | 0.0 | 0.0 | 0.0 | 17.0 | 0.0228 |
| 1330 | 0.0 | 0.0 | 0.0 | 19.0 | 0.0243 |
| 1400 | 0.0 | 0.18 | 0.07 | 20.0 | 0.0251 |
| 1430 | 0.24 | 1.77 | 0.85 | 59.0 | 0.0273 |
| 1500 | 1.32 | 3.22 | 2.08 | 97.0 | 0.0310 |
| 1530 | 1.80 | 3.78 | 2.59 | 262.0 | 0.0411 |
| 1600 | 1.80 | 4.07 | 2.71 | 426.0 | 0.0574 |
| 1630 | 1.80 | 4.16 | 2.74 | 599.0 | 0.0804 |
| 1700 | 1.80 | 4.18 | 2.75 | 772.0 | 0.1100 |
| 1730 | 1.92 | 4.18 | 2.82 | 891.0 | 0.1442 |
| 1800 | 1.92 | 4.18 | 2.82 | 1010.0 | 0.1829 |
| 1830 | 1.92 | 4.20 | 2.83 | 969.0 | 0.2201 |
| 1900 | 1.92 | 4.20 | 2.83 | 928.0 | 0.2557 |
| 1930 | 1.92 | 4.20 | 2.83 | 844.0 | 0.2881 |
| 2000 | 1.92 | 4.20 | 2.83 | 760.0 | 0.3172 |
| 2030 | 1.92 | 4.20 | 2.83 | 677.0 | 0.3432 |
| 2100 | 1.92 | 4.20 | 2.83 | 593.0 | 0.3659 |
| 2130 | 1.92 | 4.20 | 2.83 | 527.0 | 0.3861 |
| 2200 | 1.92 | 4.20 | 2.83 | 460.0 | 0.4126 |
| 2300 | 1.92 | 4.20 | 2.83 | 362.0 | 0.4404 |
| 2400 | 1.92 | 4.20 | 2.83 | 290.0 | 0.4738 |
| AUG. 13 | | | | | |
| 0000 | 1.92 | 4.20 | 2.83 | 290.0 | 0.4738 |
| 0200 | 1.92 | 4.20 | 2.83 | 211.0 | 0.5061 |
| 0400 | 1.92 | 4.20 | 2.83 | 166.0 | 0.5316 |
| 0600 | 1.92 | 4.20 | 2.83 | 139.0 | 0.5529 |
| 0800 | 1.92 | 4.20 | 2.83 | 115.0 | 0.5706 |
| 1000 | 1.92 | 4.20 | 2.83 | 94.0 | 0.5850 |
| 1200 | 1.92 | 4.20 | 2.83 | 83.0 | 0.6041 |
| 1600 | 1.92 | 4.20 | 2.83 | 65.0 | 0.6190 |
| 1800 | 1.92 | 4.20 | 2.83 | 57.0 | 0.6322 |
| 2200 | 1.92 | 4.20 | 2.83 | 45.0 | 0.6425 |
| 2400 | 1.92 | 4.20 | 2.83 | 39.0 | 0.6455 |

08075470 SIMS BAYOU AT MARTIN LUTHER KING BLVD., HOUSTON, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°38'42", long 95°20'13", Harris County, Hydrologic Unit 12040104, at downstream side of upstream bridge on Martin Luther King Boulevard (formerly South Park Boulevard), 1.6 miles upstream from Atchison, Topeka, and Santa Fe Railway Co. bridge in south Houston.

DRAINAGE.--48.4 mi$^2$.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Digital flood-hydrograph and rainfall recorders and crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1973 adjustment, unadjusted for land-surface subsidence.

REMARKS.--Gage-height records good. Peak discharges were not computed at this time because an adequate stage-discharge relationship has not been determined.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge (est.) 1,500 ft$^3$/s Jan. 19, 1978 (elevation unknown); maximum elevation, 37.82 ft Aug. 18, 1983. Minimum not determined.

EXTREMES OUTSIDE PERIOD OF RECORD.--Peak stage of 38.28 ft (discharge unknown) on June 15, 1976. This same storm produced the largest peak for the period of record (1952-81) at the gaging station Sims Bayou at Houston (08075500).

EXTREMES FOR CURRENT YEAR.--Peak stages above elevation of 25.0 ft and maximum (*):

| DATE | TIME | DISCHARGE (ft$^3$/s) | ELEVATION (ft) |
|---|---|---|---|
| Jan. 9 | 0945 | unknown | *25.90 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08075470 SIMS BAYOU AT M. L. KING BLVD., HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5470 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | STAGE (FEET) |
|---|---|---|---|---|---|---|
| | | STORM OF JAN. 9 -11, 1984 | | | | |
| JAN. 9 | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 12.25 |
| 0100 | 0.0 | 0.0 | 0.05 | 0.0 | 0.00 | 12.25 |
| 0115 | 0.0 | 0.0 | 0.05 | 0.0 | 0.00 | 12.25 |
| 0130 | 0.0 | 0.12 | 0.05 | 0.0 | 0.07 | 12.25 |
| 0145 | 0.0 | 0.12 | 0.05 | 0.0 | 0.07 | 12.25 |
| 0200 | 0.0 | 0.12 | 0.08 | 0.05 | 0.08 | 12.25 |
| 0215 | 0.12 | 0.24 | 0.08 | 0.11 | 0.18 | 12.26 |
| 0230 | 0.12 | 0.24 | 0.08 | 0.12 | 0.18 | 12.28 |
| 0245 | 0.12 | 0.24 | 0.08 | 0.13 | 0.19 | 12.29 |
| 0300 | 0.12 | 0.24 | 0.18 | 0.14 | 0.19 | 12.30 |
| 0315 | 0.12 | 0.72 | 0.18 | 0.39 | 0.49 | 12.50 |
| 0330 | 0.36 | 0.84 | 0.18 | 0.50 | 0.64 | 13.25 |
| 0345 | 0.48 | 1.08 | 0.18 | 0.73 | 0.83 | 13.00 |
| 0400 | 0.60 | 1.20 | 1.02 | 0.91 | 1.00 | 13.50 |
| 0415 | 0.72 | 1.20 | 1.02 | 1.07 | 1.05 | 13.90 |
| 0430 | 0.84 | 1.32 | 1.02 | 1.20 | 1.17 | 14.40 |
| 0445 | 0.84 | 1.32 | 1.02 | 1.29 | 1.18 | 15.03 |
| 0500 | 0.96 | 1.44 | 1.24 | 1.48 | 1.32 | 15.60 |
| 0515 | 0.96 | 1.68 | 1.24 | 1.51 | 1.45 | 16.17 |
| 0530 | 1.32 | 1.68 | 1.24 | 1.53 | 1.55 | 16.91 |
| 0545 | 1.32 | 1.80 | 1.24 | 1.57 | 1.62 | 17.77 |
| 0600 | 1.32 | 1.80 | 1.79 | 1.62 | 1.65 | 18.59 |
| 0615 | 1.44 | 1.92 | 1.79 | 1.65 | 1.75 | 19.42 |
| 0630 | 1.44 | 1.92 | 1.79 | 1.69 | 1.76 | 20.26 |
| 0645 | 1.56 | 1.92 | 1.79 | 1.74 | 1.80 | 21.13 |
| 0700 | 1.56 | 2.04 | 1.92 | 1.75 | 1.87 | 22.03 |
| 0715 | 1.56 | 2.04 | 1.92 | 1.76 | 1.87 | 22.85 |
| 0730 | 1.56 | 2.04 | 1.92 | 1.76 | 1.87 | 23.56 |
| 0745 | 1.56 | 2.04 | 1.92 | 1.76 | 1.87 | 24.14 |
| 0800 | 1.56 | 2.04 | 1.93 | 1.76 | 1.87 | 24.64 |
| 0815 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 24.99 |
| 0845 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 25.51 |
| 0945 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 25.90 |
| 1000 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 25.90 |
| 1015 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 25.90 |
| 1145 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 25.32 |
| 1200 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 25.17 |
| 1315 | 1.56 | 2.04 | 1.93 | 1.77 | 1.87 | 24.15 |
| 1330 | 1.68 | 2.04 | 1.93 | 1.78 | 1.91 | 24.00 |

STAGE RECORDS ARE RELATIVE TO GAGE DATUM.
DISCHARGE RECORDS ARE NOT CURRENTLY AVAILABLE FOR THIS STORM.

STORM RAINFALL AND RUNOFF

08075470 SIMS BAYOU AT M. L. KING BLVD., HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5470 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | STAGE (FEET) |
|---|---|---|---|---|---|---|
| | STORM OF JAN. 9 -11, 1984 | | | --CONTINUED | | |
| JAN. 9 | | | | | | |
| 1345 | 1.68 | 2.04 | 1.93 | 1.82 | 1.91 | 23.73 |
| 1400 | 1.68 | 2.04 | 1.97 | 1.84 | 1.92 | 23.54 |
| 1415 | 1.68 | 2.04 | 1.97 | 1.88 | 1.92 | 23.44 |
| 1430 | 1.68 | 2.16 | 1.97 | 1.94 | 2.00 | 23.24 |
| 1445 | 1.80 | 2.16 | 1.97 | 1.96 | 2.03 | 23.14 |
| 1500 | 1.92 | 2.28 | 2.09 | 1.96 | 2.13 | 23.11 |
| 1545 | 1.92 | 2.28 | 2.09 | 1.96 | 2.13 | 23.10 |
| 1600 | 1.92 | 2.28 | 2.13 | 1.96 | 2.13 | 23.10 |
| 1745 | 1.92 | 2.28 | 2.13 | 1.96 | 2.13 | 22.62 |
| 1800 | 1.92 | 2.28 | 2.13 | 1.96 | 2.13 | 22.54 |
| 1845 | 1.92 | 2.28 | 2.13 | 1.96 | 2.13 | 22.31 |
| 1900 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 22.20 |
| 2000 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 21.82 |
| 2100 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 21.42 |
| 2145 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 20.99 |
| 2245 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 20.52 |
| 2330 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 20.06 |
| 2400 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 19.83 |
| JAN. 10 | | | | | | |
| 0000 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 19.83 |
| 0100 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 19.33 |
| 0200 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 18.93 |
| 0300 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 18.53 |
| 0400 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 18.09 |
| 0500 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 17.71 |
| 0600 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 17.37 |
| 0800 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 16.82 |
| 0900 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 16.45 |
| 1000 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 16.16 |
| 1200 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 15.71 |
| 1400 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 15.35 |
| 1600 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 14.96 |
| 1800 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 14.70 |
| 2000 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 14.43 |
| 2400 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 14.00 |
| JAN. 11 | | | | | | |
| 0000 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 14.00 |
| 0600 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 13.50 |
| 1200 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 13.25 |
| 1800 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 13.10 |
| 2400 | 2.04 | 2.28 | 2.13 | 1.96 | 2.16 | 13.00 |

STAGE RECORDS ARE RELATIVE TO GAGE DATUM.

DISCHARGE RECORDS ARE NOT CURRENTLY AVAILABLE FOR THIS STORM.

SAN JACINTO RIVER BASIN

08075500 SIMS BAYOU AT HOUSTON, TX

LOCATION.--Lat 29°40'27", long 95°17'21", Harris County, Hydrologic Unit 12040104, on left bank at downstream side of bridge on State Highway 35 in southeast Houston and 7.0 mi upstream from mouth.

DRAINAGE AREA.--63.0 mi². Prior to Oct. 1, 1976, 64.0 mi².

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.--WSP 1922: 1960. WDR TX-76-2: 1975(M).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 3.09 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment; unadjusted for land-surface subsidence. Telemetry located at station.

REMARKS.--Water-discharge records fair. Low flow is largely sustained by sewage effluent from Houston suburbs and industrial wastes.

AVERAGE DISCHARGE.--32 years, 84.0 ft³/s (60,860 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft³/s Aug. 18, 1983, Hurricane Alica (gage height, 33.23 ft); minimum daily, 0.9 ft³/s Aug. 7, 1955.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,540 ft³/s Jan. 9 at 1230 hours (gage height, 21.34 ft), no other peak above base of 2,200 ft³/s; minimum daily, 15 ft³/s Oct. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | 23 | 210 | 282 | 54 | 50 | 44 | 47 | 47 | 38 | 69 | 42 | 97 |
| 2 | 23 | 76 | 78 | 51 | 70 | 46 | 80 | 43 | 41 | 49 | 45 | 424 |
| 3 | 15 | 39 | 423 | 53 | 165 | 39 | 69 | 41 | 38 | 45 | 54 | 254 |
| 4 | 24 | 37 | 194 | 46 | 76 | 52 | 46 | 46 | 39 | 38 | 55 | 89 |
| 5 | 22 | 53 | 76 | 46 | 58 | 79 | 49 | 44 | 47 | 42 | 114 | 68 |
| 6 | 28 | 405 | 51 | 45 | 52 | 54 | 48 | 50 | 262 | 49 | 209 | 58 |
| 7 | 25 | 121 | 39 | 43 | 48 | 46 | 46 | 31 | 221 | 39 | 185 | 112 |
| 8 | 31 | 50 | 43 | 47 | 48 | 48 | 57 | 50 | 55 | 35 | 74 | 121 |
| 9 | 31 | 79 | 38 | 1420 | 293 | 46 | 53 | 48 | 44 | 40 | 54 | 58 |
| 10 | 29 | 107 | 56 | 659 | 195 | 49 | 48 | 55 | 39 | 43 | 89 | 54 |
| 11 | 28 | 45 | 237 | 177 | 93 | 48 | 49 | 64 | 45 | 41 | 59 | 58 |
| 12 | 28 | 42 | 69 | 101 | 319 | 95 | 49 | 63 | 49 | 43 | 482 | 56 |
| 13 | 25 | 40 | 46 | 65 | 180 | 175 | 48 | 61 | 43 | 33 | 706 | 59 |
| 14 | 22 | 42 | 37 | 67 | 94 | 66 | 48 | 59 | 46 | 44 | 209 | 54 |
| 15 | 22 | 41 | 34 | 72 | 86 | 54 | 44 | 58 | 45 | 53 | 752 | 67 |
| 16 | 28 | 45 | 276 | 61 | 71 | 51 | 45 | 58 | 39 | 51 | 251 | 187 |
| 17 | 130 | 48 | 196 | 43 | 56 | 49 | 44 | 65 | 35 | 51 | 87 | 58 |
| 18 | 42 | 47 | 66 | 54 | 59 | 49 | 44 | 86 | 136 | 144 | 62 | 52 |
| 19 | 32 | 82 | 45 | 54 | 52 | 148 | 45 | 353 | 60 | 149 | 58 | 51 |
| 20 | 36 | 51 | 41 | 51 | 72 | 76 | 43 | 343 | 43 | 61 | 52 | 51 |
| 21 | 46 | 47 | 305 | 50 | 74 | 47 | 43 | 77 | 36 | 48 | 57 | 290 |
| 22 | 46 | 51 | 125 | 50 | 41 | 44 | 50 | 53 | 32 | 44 | 56 | 245 |
| 23 | 47 | 97 | 67 | 646 | 57 | 63 | 43 | 45 | 34 | 45 | 56 | 77 |
| 24 | 44 | 51 | 54 | 462 | 56 | 102 | 47 | 40 | 30 | 65 | 98 | 68 |
| 25 | 40 | 43 | 50 | 192 | 46 | 55 | 46 | 36 | 33 | 144 | 406 | 63 |
| 26 | 40 | 43 | 52 | 107 | 104 | 54 | 41 | 25 | 35 | 70 | 102 | 61 |
| 27 | 39 | 110 | 49 | 78 | 113 | 49 | 45 | 32 | 34 | 66 | 65 | 45 |
| 28 | 39 | 58 | 58 | 62 | 55 | 49 | 43 | 66 | 38 | 95 | 60 | 52 |
| 29 | 38 | 45 | 52 | 61 | 47 | 46 | 44 | 77 | 40 | 114 | 56 | 52 |
| 30 | 42 | 640 | 52 | 70 | --- | 43 | 49 | 39 | 42 | 48 | 54 | 49 |
| 31 | 158 | --- | 57 | 63 | --- | 43 | --- | 42 | --- | 44 | 53 | --- |
| TOTAL | 1223 | 2845 | 3248 | 5050 | 2730 | 1909 | 1453 | 2197 | 1719 | 1902 | 4702 | 3030 |
| MEAN | 39.5 | 94.8 | 105 | 163 | 94.1 | 61.6 | 48.4 | 70.9 | 57.3 | 61.4 | 152 | 101 |
| MAX | 158 | 640 | 423 | 1420 | 319 | 175 | 80 | 353 | 262 | 149 | 752 | 424 |
| MIN | 15 | 37 | 34 | 43 | 41 | 39 | 41 | 25 | 30 | 33 | 42 | 45 |
| AC-FT | 2430 | 5640 | 6440 | 10020 | 5410 | 3790 | 2880 | 4360 | 3410 | 3770 | 9330 | 6010 |

CAL YR 1983 TOTAL 58732 MEAN 161 MAX 6630 MIN 15 AC-FT 116500
WTR YR 1984 TOTAL 32008 MEAN 87.5 MAX 1420 MIN 15 AC-FT 63490

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Chemical, biochemical, and pesticide analyses: October 1968 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DATE | TIME | STREAM-FLOW, INSTAN-TANEOUS (CFS) | SPE-CIFIC CON-DUCT-ANCE (UMHOS) | PH (STAND-ARD UNITS) | TEMPER-ATURE (DEG C) | COLOR (PLAT-INUM-COBALT UNITS) | TUR-BID-ITY (NTU) | OXYGEN, DIS-SOLVED (MG/L) | OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) | OXYGEN DEMAND, BIO-CHEM-ICAL, 5 DAY (MG/L) | COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML) | STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 06... | 1315 | 46 | 1120 | 7.8 | 12.5 | 5 | 12 | 11.4 | 106 | 4.9 | 2900 | 880 |
| JUL | | | | | | | | | | | | |
| 02... | 1130 | 41 | 814 | 7.6 | 27.0 | 45 | 25 | 4.1 | 51 | 6.3 | 10000 | 150 |
| AUG | | | | | | | | | | | | |
| 07... | 1440 | 119 | 662 | 7.5 | 30.0 | 50 | 38 | 4.8 | 63 | 6.6 | 55000 | 1000 |

| DATE | HARD-NESS (MG/L AS CACO3) | HARD-NESS, NONCAR-BONATE (MG/L CACO3) | CALCIUM DIS-SOLVED (MG/L AS CA) | MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) | SODIUM, DIS-SOLVED (MG/L AS NA) | SODIUM AD-SORP-TION RATIO | POTAS-SIUM, DIS-SOLVED (MG/L AS K) | ALKA-LINITY FIELD (MG/L AS CACO3) | SULFATE DIS-SOLVED (MG/L AS SO4) | CHLO-RIDE, DIS-SOLVED (MG/L AS CL) | FLUO-RIDE, DIS-SOLVED (MG/L AS F) | SILICA, DIS-SOLVED (MG/L AS SIO2) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | | |
| 06... | 190 | 0 | 53 | 14 | 170 | 6 | 6.3 | 220 | 160 | 120 | .60 | 17 |
| JUL | | | | | | | | | | | | |
| 02... | 140 | 0 | 44 | 8.5 | 110 | 4 | 8.9 | 170 | 49 | 100 | .90 | 17 |
| AUG | | | | | | | | | | | | |
| 07... | 120 | 0 | 37 | 6.6 | 88 | 4 | 5.8 | 140 | 39 | 85 | .70 | 14 |

| DATE | SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L) | SOLIDS, RESIDUE AT 105 DEG. C, SUS-PENDED (MG/L) | SOLIDS, VOLA-TILE, SUS-PENDED (MG/L) | NITRO-GEN, NITRATE TOTAL (MG/L AS N) | NITRO-GEN, NITRITE TOTAL (MG/L AS N) | NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N) | NITRO-GEN, AMMONIA TOTAL (MG/L AS N) | NITRO-GEN, ORGANIC TOTAL (MG/L AS N) | NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) | PHOS-PHORUS, TOTAL (MG/L AS P) | CARBON, ORGANIC TOTAL (MG/L AS C) |
|---|---|---|---|---|---|---|---|---|---|---|---|
| FEB | | | | | | | | | | | |
| 06... | 670 | <2 | <2 | 4.3 | .370 | 4.7 | .660 | 2.0 | 2.7 | 2.00 | 7.2 |
| JUL | | | | | | | | | | | |
| 02... | 440 | 43 | 8 | 5.0 | .620 | 5.6 | .760 | 1.2 | 2.0 | 2.00 | 7.0 |
| AUG | | | | | | | | | | | |
| 07... | 360 | 36 | 14 | 1.2 | .360 | 1.6 | 1.90 | 1.1 | 3.0 | 1.90 | 11 |

| DATE | TIME | ARSENIC DIS-SOLVED (UG/L AS AS) | BARIUM, DIS-SOLVED (UG/L AS BA) | CADMIUM DIS-SOLVED (UG/L AS CD) | CHRO-MIUM, DIS-SOLVED (UG/L AS CR) | COPPER, DIS-SOLVED (UG/L AS CU) | IRON, DIS-SOLVED (UG/L AS FE) |
|---|---|---|---|---|---|---|---|
| JUL | | | | | | | |
| 02... | 1130 | 17 | 95 | <1 | <10 | 4 | 5 |
| AUG | | | | | | | |
| 07... | 1440 | 17 | 96 | <1 | 40 | 5 | 35 |

| DATE | LEAD, DIS-SOLVED (UG/L AS PB) | MANGA-NESE, DIS-SOLVED (UG/L AS MN) | MERCURY DIS-SOLVED (UG/L AS HG) | SELE-NIUM, DIS-SOLVED (UG/L AS SE) | SILVER, DIS-SOLVED (UG/L AS AG) | ZINC, DIS-SOLVED (UG/L AS ZN) |
|---|---|---|---|---|---|---|
| JUL | | | | | | |
| 02... | <1 | 110 | <.1 | <1 | <1 | 25 |
| AUG | | | | | | |
| 07... | 3 | 2x | u61 | <1 | <1 | 12 |

| DATE | TIME | AME-TRYNE TOTAL | ATRA-ZINE, TOTAL (UG/L) | CYAN-AZINE TOTAL (UG/L) | METHO-MYL TOTAL (UG/L) | PROME-TONE TOTAL (UG/L) | PROME-TRYNE TOTAL (UG/L) | PRO-PAZINE TOTAL (UG/L) | PROPHAM TOTAL (UG/L) | SEVIN, TOTAL (UG/L) | SIMA-ZINE TOTAL (UG/L) | SIME-TRYNE TOTAL (UG/L) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| JUL | | | | | | | | | | | | |
| 02... | 1130 | <.10 | .40 | <.10 | <2.0 | .5 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |
| AUG | | | | | | | | | | | | |
| 07... | 1440 | <.10 | .20 | <.10 | <2.0 | .4 | <.1 | <.10 | <2.0 | <2.0 | <.10 | <.1 |

STORM RAINFALL AND RUNOFF

08075500 SIMS BAYOU AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5500 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5470 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|
| | | | | STORM OF JAN. 8 -12, 1984 | | | | |
| JAN. 8 | | | | | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 0.0074 |
| 1200 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 50.0 | 0.0157 |
| 1330 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 0.0 | 47.0 | 0.0168 |
| 1400 | 0.0 | 0.0 | 0.0 | 0.0 | 0.09 | 0.01 | 45.0 | 0.0174 |
| 1430 | 0.0 | 0.0 | 0.0 | 0.0 | 0.20 | 0.03 | 44.0 | 0.0179 |
| 1500 | 0.0 | 0.0 | 0.0 | 0.0 | 0.20 | 0.03 | 43.0 | 0.0185 |
| 1530 | 0.0 | 0.0 | 0.0 | 0.0 | 0.20 | 0.03 | 44.0 | 0.0190 |
| 1600 | 0.0 | 0.0 | 0.0 | 0.01 | 0.20 | 0.03 | 45.0 | 0.0198 |
| 1700 | 0.0 | 0.0 | 0.0 | 0.01 | 0.20 | 0.03 | 46.0 | 0.0210 |
| 1800 | 0.0 | 0.0 | 0.0 | 0.01 | 0.20 | 0.03 | 43.0 | 0.0218 |
| 1830 | 0.0 | 0.0 | 0.0 | 0.01 | 0.20 | 0.03 | 42.0 | 0.0223 |
| 1900 | 0.0 | 0.0 | 0.0 | 0.03 | 0.20 | 0.03 | 41.0 | 0.0228 |
| 1930 | 0.0 | 0.0 | 0.0 | 0.03 | 0.20 | 0.03 | 41.0 | 0.0233 |
| 2000 | 0.0 | 0.0 | 0.0 | 0.08 | 0.20 | 0.03 | 40.0 | 0.0238 |
| 2030 | 0.0 | 0.12 | 0.0 | 0.08 | 0.20 | 0.08 | 43.0 | 0.0243 |
| 2100 | 0.0 | 0.12 | 0.0 | 0.14 | 0.20 | 0.08 | 46.0 | 0.0249 |
| 2130 | 0.0 | 0.12 | 0.0 | 0.14 | 0.20 | 0.08 | 48.0 | 0.0255 |
| 2200 | 0.0 | 0.12 | 0.0 | 0.17 | 0.20 | 0.08 | 50.0 | 0.0261 |
| 2230 | 0.12 | 0.24 | 0.0 | 0.17 | 0.20 | 0.13 | 53.0 | 0.0267 |
| 2300 | 0.12 | 0.24 | 0.0 | 0.19 | 0.20 | 0.13 | 55.0 | 0.0277 |
| 2400 | 0.12 | 0.24 | 0.0 | 0.19 | 0.20 | 0.13 | 77.0 | 0.0292 |
| JAN. 9 | | | | | | | | |
| 0000 | 0.12 | 0.24 | 0.0 | 0.19 | 0.20 | 0.13 | 77.0 | 0.0292 |
| 0030 | 0.12 | 0.24 | 0.0 | 0.19 | 0.20 | 0.13 | 86.0 | 0.0302 |
| 0100 | 0.24 | 0.24 | 0.0 | 0.24 | 0.20 | 0.14 | 95.0 | 0.0314 |
| 0130 | 0.24 | 0.24 | 0.12 | 0.24 | 0.20 | 0.19 | 98.0 | 0.0326 |
| 0200 | 0.24 | 0.24 | 0.12 | 0.27 | 0.25 | 0.19 | 101.0 | 0.0338 |
| 0230 | 0.24 | 0.36 | 0.24 | 0.27 | 0.32 | 0.30 | 101.0 | 0.0351 |
| 0300 | 0.36 | 0.36 | 0.24 | 0.37 | 0.34 | 0.31 | 102.0 | 0.0363 |
| 0330 | 0.36 | 0.60 | 0.84 | 0.37 | 0.70 | 0.69 | 102.0 | 0.0376 |
| 0400 | 0.72 | 0.84 | 1.20 | 1.21 | 1.11 | 1.04 | 102.0 | 0.0388 |
| 0430 | 0.96 | 1.08 | 1.32 | 1.21 | 1.40 | 1.22 | 143.0 | 0.0406 |
| 0500 | 1.08 | 1.20 | 1.44 | 1.43 | 1.68 | 1.37 | 183.0 | 0.0428 |
| 0530 | 1.32 | 1.56 | 1.68 | 1.43 | 1.73 | 1.61 | 291.0 | 0.0464 |
| 0600 | 1.32 | 1.56 | 1.80 | 1.98 | 1.82 | 1.70 | 397.0 | 0.0513 |
| 0630 | 1.44 | 1.68 | 1.92 | 1.98 | 1.89 | 1.81 | 595.0 | 0.0587 |
| 0700 | 1.56 | 1.80 | 2.04 | 2.11 | 1.95 | 1.92 | 791.0 | 0.0684 |
| 0730 | 1.56 | 1.80 | 2.04 | 2.11 | 1.96 | 1.92 | 996.0 | 0.0806 |
| 0800 | 1.56 | 1.80 | 2.04 | 2.12 | 1.96 | 1.92 | 1200.0 | 0.0954 |
| 0830 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 1660.0 | 0.1158 |

STORM RAINFALL AND RUNOFF

08075500 SIMS BAYOU AT HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5500 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5470 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5400 (INCHES) | ACCUMULATED RAINFALL AT GAGE 308R (INCHES) | ACCUMULATED RAINFALL AT GAGE 31R (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|---|---|---|---|
| | | STORM OF JAN. 8 -12, 1984 | | | --CONTINUED | | | |
| JAN. 9 | | | | | | | | |
| 0900 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 2110.0 | 0.1547 |
| 1000 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 2140.0 | 0.2074 |
| 1100 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 2390.0 | 0.2661 |
| 1200 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 2520.0 | 0.3126 |
| 1230 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 2540.0 | 0.3439 |
| 1300 | 1.56 | 1.80 | 2.04 | 2.12 | 1.97 | 1.93 | 2530.0 | 0.3750 |
| 1330 | 1.56 | 1.92 | 2.04 | 2.12 | 1.98 | 1.97 | 2480.0 | 0.4055 |
| 1400 | 1.56 | 1.92 | 2.04 | 2.16 | 2.04 | 1.98 | 2420.0 | 0.4352 |
| 1430 | 1.56 | 1.92 | 2.16 | 2.16 | 2.14 | 2.04 | 2340.0 | 0.4640 |
| 1500 | 1.68 | 2.16 | 2.28 | 2.28 | 2.16 | 2.19 | 2250.0 | 0.4917 |
| 1530 | 1.68 | 2.16 | 2.28 | 2.28 | 2.16 | 2.19 | 2170.0 | 0.5184 |
| 1600 | 1.80 | 2.16 | 2.28 | 2.32 | 2.16 | 2.20 | 2080.0 | 0.5823 |
| 1800 | 1.80 | 2.16 | 2.28 | 2.32 | 2.16 | 2.20 | 1960.0 | 0.6547 |
| 1900 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 1860.0 | 0.7004 |
| 2000 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 1780.0 | 0.7661 |
| 2200 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 1590.0 | 0.8443 |
| 2400 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 1390.0 | 0.9298 |
| JAN. 10 | | | | | | | | |
| 0000 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 1390.0 | 0.9298 |
| 0300 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 1090.0 | 1.0102 |
| 0600 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 845.0 | 1.0725 |
| 0900 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 677.0 | 1.1225 |
| 1200 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 558.0 | 1.1843 |
| 1800 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 410.0 | 1.2448 |
| 2400 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 319.0 | 1.2918 |
| JAN. 11 | | | | | | | | |
| 0000 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 319.0 | 1.2918 |
| 0600 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 228.0 | 1.3255 |
| 1200 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 177.0 | 1.3516 |
| 1800 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 159.0 | 1.3751 |
| 2400 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 141.0 | 1.3959 |
| JAN. 12 | | | | | | | | |
| 0000 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 141.0 | 1.3959 |
| 0600 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 123.0 | 1.4140 |
| 1200 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 97.0 | 1.4284 |
| 1800 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 86.0 | 1.4410 |
| 2400 | 1.80 | 2.28 | 2.28 | 2.32 | 2.16 | 2.24 | 75.0 | 1.4466 |

## BERRY BAYOU DRAINAGE BASIN

The locations of data-collection sites in and near the Berry Bayou drainage basin are shown in figure 15.

Weighted-mean rainfall over the drainage basin for the 1984 water year was not determined.

The storm of Aug. 12-13 was selected for analysis at both gaging station 08075550, Berry Bayou at Gilpin Street and station 08075650, Berry Bayou at Forest Oaks Street.

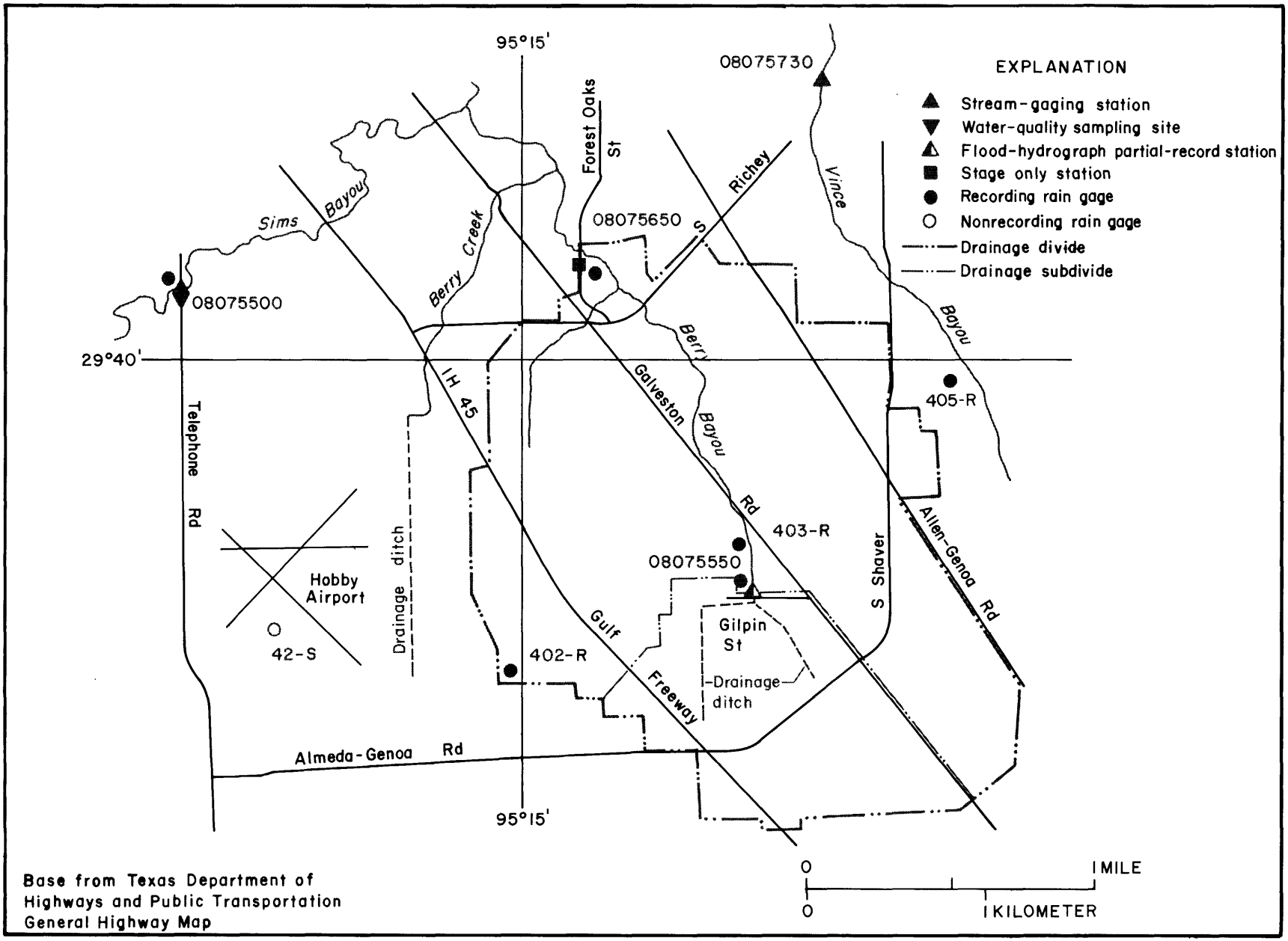


Figure 15.-Locations of data-collection sites in and near the Berry Bayou drainage basin

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 14.--Storm rainfall-runoff data, 1984 Water Year, Berry Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Berry Bayou at Gilpin St., Houston, TX. (Drainaage Area -- 2.56 $mi.^2$)** | | | | | | | | |
| Aug. 12-13, 1984 | 1.3 | 3.12 | 0.96 | 1.56 | 2.40 | 1.58 | 0.51 | 378* |
| **Berry Bayou at Forest Oaks St., Houston, TX. (Drainage Area -- 10.7 $mi.^2$)** | | | | | | | | Maximum Gage Height (ft.) |
| Aug. 12-13, 1984 | 1.0 | 3.12 | 0.90 | 1.80 | 2.52 | -- | -- | 12.59* |

* - Peak Discharge & Gage Height for 1984 Water Year

08075550 BERRY BAYOU AT GILPIN STREET, HOUSTON, TEX.
(Flood-hydrograph partial-record station)

LOCATION.--Lat 29°38'32", long 95°13'22", Harris County, Hydrologic Unit 12040104, at bridge on Gilpin Street in southeast Houston.

DRAINAGE AREA.--2.56 $mi^2$. Oct. 1, 1973 to Oct. 1, 1978, 2.87 $mi^2$. Prior to Oct. 1, 1973, 3.26 $mi^2$.

PERIOD OF RECORD.--April 1964 to current year.

GAGE.--Digital flood-hydrograph and rainfall recorders and crest-stage gage. Prior to April 26, 1978 a flood hydrograph and rainfall recorder (type SR) and a crest-stage gage. Datum of gage is National Geodetic Vertical Datum of 1929, 1959 adjustment, unadjusted for land surface subsidence.

REMARKS.--Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 738 $ft^3/s$ May 10, 1968; maximum elevation, 37.07 ft, July 26, 1979. Minimum not determined.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 $ft^3/s$ and maximum (*):

| DATE | TIME | DISCHARGE ($ft^3/s$) | GAGE HEIGHT (ft) |
|---|---|---|---|
| Aug. 12 | 1615 | *378 | 33.52 |

Minimum discharge not determined.

STORM RAINFALL AND RUNOFF
08075550 BERRY BAYOU AT GILPIN STREET, HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5550 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF AUG. 12-13, 1984 | | | | |
| AUG. 12 | | | | |
| 0000 | 0.0 | 0.0 | 0.3 | 0.0005 |
| 0600 | 0.0 | 0.0 | 0.3 | 0.0016 |
| 1200 | 0.0 | 0.0 | 0.3 | 0.0024 |
| 1415 | 0.0 | 0.0 | 0.3 | 0.0026 |
| 1430 | 0.24 | 0.24 | 10.0 | 0.0041 |
| 1445 | 0.72 | 0.72 | 70.0 | 0.0147 |
| 1500 | 1.68 | 1.68 | 136.0 | 0.0353 |
| 1515 | 2.28 | 2.28 | 253.0 | 0.0736 |
| 1530 | 2.64 | 2.64 | 319.0 | 0.1219 |
| 1545 | 2.88 | 2.88 | 359.0 | 0.1762 |
| 1600 | 2.88 | 2.88 | 375.0 | 0.2329 |
| 1615 | 2.88 | 2.88 | 378.0 | 0.2901 |
| 1630 | 3.00 | 3.00 | 375.0 | 0.3469 |
| 1645 | 3.00 | 3.00 | 371.0 | 0.4030 |
| 1700 | 3.00 | 3.00 | 366.0 | 0.4861 |
| 1730 | 3.00 | 3.00 | 349.0 | 0.5917 |
| 1800 | 3.00 | 3.00 | 327.0 | 0.6907 |
| 1830 | 3.00 | 3.00 | 299.0 | 0.7812 |
| 1900 | 3.00 | 3.00 | 270.0 | 0.9038 |
| 2000 | 3.00 | 3.00 | 204.0 | 1.0272 |
| 2100 | 3.00 | 3.00 | 150.0 | 1.1180 |
| 2200 | 3.00 | 3.00 | 118.0 | 1.1895 |
| 2300 | 3.00 | 3.00 | 95.0 | 1.2470 |
| 2400 | 3.00 | 3.00 | 80.0 | 1.3196 |
| AUG. 13 | | | | |
| 0000 | 3.00 | 3.00 | 80.0 | 1.3196 |
| 0200 | 3.00 | 3.00 | 60.0 | 1.3922 |
| 0400 | 3.00 | 3.00 | 43.0 | 1.4443 |
| 0600 | 3.00 | 3.00 | 30.0 | 1.5169 |
| 1200 | 3.00 | 3.00 | 11.0 | 1.5502 |
| 1600 | 3.00 | 3.00 | 7.0 | 1.5608 |
| 1700 | 3.12 | 3.12 | 6.0 | 1.5645 |
| 1800 | 3.12 | 3.12 | 5.0 | 1.5750 |
| 2400 | 3.12 | 3.12 | 2.0 | 1.5787 |

## 08075650 BERRY BAYOU AT FOREST OAKS STREET, HOUSTON, TX

LOCATION.--Lat 29°40'35", long 95°14'37", Harris County, Hydrologic Unit 12040104, at gaging station at Forest Oaks Street Bridge in southeast Houston, 0.8 mi upstream from mouth of Berry Creek, and 1.7 mi upstream from Sims Bayou.

DRAINAGE AREA.--10.7 mi². Prior to Oct. 1, 1973, 11.1 mi². Oct. 1, 1976, to Dec. 31, 1977, 10.1 mi². Drainage ditch relocations resulted in drainage area changes.

PERIOD OF RECORD.--October 1967 to current year (stage only beginning October 1982). October 1966 to September 1982 operated as partial discharge or flood-hydrograph partial-record station. April 1964 to September 1966 operated as a daily discharge station.
Water-quality records.--Chemical, biochemical, and pesticide analyses: October 1968 to September 1981. Water temperatures: April 1964 to September 1981.

REVISED RECORDS.--WRD TX-80-2: 1979(P).

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2.72 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment prior to Oct. 1, 1982, auxiliary water-stage recorder 0.8 mi downstream at same datum. June 25, 1964, to Jan. 11, 1965, auxiliary nonrecording gage 0.8 mi downstream at same datum. Rain gage also located at station.

REMARKS.--Low stages affected by tidal surge. Rises sometimes affected by backwater from Sims Bayou. The reports "Hydrologic Data for Urban Studies in the Houston, Texas Metropolitan area," for the water years 1965-82 contain additional storm runoff data for this station. Stage and rainfall radio-telemeter located at station.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,080 ft³/s, June 9, 1975; maximum gage height, 23.85 ft Sept. 20, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 12.60 ft Aug. 12 at 1715 hours; minimum gage height, 2.69 ft Apr. 17.

GAGE HEIGHT, IN FEET, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984

| DAY | OCT | | NOV | | DEC | | JAN | | FEB | | MAR | | APR | | MAY | | JUNE | | JULY | | AUG | | SEPT | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. | max. | min. |
| 1 | 5.78 | 3.88 | 6.16 | 4.75 | 6.02 | 3.83 | - | - | 4.58 | 3.06 | 4.22 | 3.07 | 4.83 | 3.87 | 5.28 | 3.45 | 5.90 | 3.87 | - | - | 5.75 | 4.35 | 6.05 | 4.33 |
| 2 | 5.61 | 3.88 | 6.05 | 4.79 | 5.94 | 4.34 | - | - | 4.77 | 3.37 | 4.35 | 3.14 | 6.18 | 4.80 | 5.60 | 3.95 | 5.53 | 3.74 | - | - | 5.95 | 4.75 | 7.97 | 4.67 |
| 3 | 5.58 | 4.02 | 6.02 | 4.72 | 8.27 | 5.27 | - | - | 4.77 | 3.13 | 4.34 | 3.51 | 5.16 | 3.82 | 5.35 | 3.65 | 5.40 | 3.32 | - | - | 5.65 | 4.75 | 9.72 | 4.60 |
| 4 | 5.87 | 4.11 | 5.67 | 4.03 | 5.73 | 3.73 | - | 3.20 | 4.45 | 3.05 | 5.37 | 4.27 | 3.98 | 2.77 | 5.32 | 3.02 | 5.67 | 3.35 | - | - | 6.83 | 4.35 | 5.20 | 3.87 |
| 5 | 5.62 | 4.26 | 6.13 | 3.87 | 5.61 | 3.95 | 4.59 | 2.88 | 4.42 | 2.97 | 5.14 | 3.16 | 4.08 | 2.73 | 5.99 | 3.92 | 6.24 | - | - | - | 6.04 | 4.20 | 5.04 | 3.80 |
| 6 | 6.12 | 4.20 | 7.09 | 4.93 | 5.17 | 2.88 | 4.56 | 3.22 | 4.10 | 2.88 | 3.75 | 2.94 | 4.82 | 2.82 | 6.12 | 4.23 | 7.56 | - | - | - | 6.05 | 4.05 | 6.10 | 4.38 |
| 7 | 6.01 | 4.59 | 6.06 | 3.76 | 4.92 | 3.26 | 4.59 | 3.43 | 4.60 | 3.30 | 4.55 | 3.12 | 6.34 | 3.18 | 5.97 | 4.07 | 6.30 | 4.96 | - | - | 5.85 | 4.12 | 7.14 | 4.93 |
| 8 | 5.98 | 4.28 | 5.77 | 4.18 | 5.20 | 3.58 | 5.14 | 4.07 | 5.10 | 3.72 | 4.45 | 3.27 | 5.66 | 3.97 | 5.25 | 2.74 | 6.32 | 5.38 | - | - | 5.22 | 3.95 | 7.14 | 5.67 |
| 9 | 5.76 | 3.90 | 6.12 | 4.08 | 5.36 | 3.80 | 10.83 | 5.14 | 5.87 | 4.15 | 4.82 | 3.16 | 5.08 | 2.98 | 5.05 | 2.97 | 6.24 | 5.13 | - | - | 5.62 | 3.85 | 5.72 | 4.89 |
| 10 | 5.43 | 3.86 | 4.26 | 2.90 | 6.02 | 4.57 | 7.23 | 3.55 | 5.10 | 3.74 | 4.96 | 3.39 | 5.54 | 3.52 | 5.02 | 3.57 | 6.37 | 4.88 | - | - | 5.55 | 3.73 | 5.75 | 4.97 |
| 11 | 5.59 | 4.21 | 4.00 | 3.02 | 5.85 | 3.27 | 4.90 | 3.33 | 5.50 | 3.72 | 5.35 | 3.34 | 5.55 | 3.56 | 5.20 | 4.18 | 6.41 | 4.70 | - | - | 5.27 | 3.65 | 5.75 | 4.86 |
| 12 | 5.69 | 3.18 | 5.06 | 3.78 | 4.74 | 3.06 | 5.09 | 4.21 | 5.79 | 4.94 | 5.68 | 4.28 | 5.60 | 4.00 | 5.21 | 4.08 | 6.20 | 4.42 | - | - | 12.60 | 3.68 | 5.75 | 4.80 |
| 13 | 4.59 | 3.35 | 5.24 | 3.82 | 5.47 | 3.08 | 4.68 | 3.33 | 5.34 | 3.62 | 6.65 | 3.84 | 5.28 | 3.82 | 4.93 | 3.53 | 5.92 | 4.08 | - | - | 7.65 | 5.12 | 5.43 | 4.41 |
| 14 | 5.50 | 3.65 | 5.13 | 3.90 | 4.38 | 2.88 | 4.83 | 3.46 | 5.64 | 3.65 | 5.37 | 3.49 | 5.02 | 3.49 | 4.67 | 3.00 | 5.66 | 3.65 | - | - | 6.88 | 4.02 | 5.21 | 3.98 |
| 15 | 6.73 | 4.43 | 4.73 | 3.11 | 4.61 | 3.24 | 4.90 | 3.54 | 5.77 | 4.00 | 5.48 | 3.90 | - | 2.92 | 4.75 | 3.03 | 5.70 | 3.65 | - | - | 6.00 | 4.45 | 5.15 | 4.18 |
| 16 | 6.15 | 4.82 | 4.36 | 3.03 | 6.03 | 4.36 | 4.95 | 3.32 | 5.55 | 3.50 | 5.35 | 3.89 | - | 2.73 | 5.27 | 2.98 | 5.70 | 3.67 | 5.05 | - | 4.93 | 4.10 | 6.25 | 4.80 |
| 17 | 6.87 | 4.87 | 5.26 | 4.03 | 4.82 | 3.37 | 5.42 | 3.54 | 5.40 | 3.77 | 5.42 | 3.94 | 3.93 | 2.69 | 5.90 | 3.45 | 5.98 | 4.01 | 4.83 | 3.50 | 4.85 | 3.78 | 5.83 | 4.82 |
| 18 | 5.98 | 4.81 | 5.67 | 4.57 | 5.14 | 3.78 | 5.37 | 3.17 | 5.78 | 4.35 | - | - | 4.90 | 2.83 | 6.72 | 4.12 | 6.02 | 4.00 | 7.95 | 3.60 | 4.61 | 3.48 | 6.39 | 4.95 |
| 19 | 6.59 | 4.92 | 6.72 | 4.77 | 4.46 | 2.92 | 4.28 | 3.08 | 5.24 | 3.19 | 4.95 | 3.68 | 5.39 | 3.32 | 7.40 | 4.55 | 5.77 | 4.10 | 6.20 | 4.55 | 4.55 | 3.32 | 6.22 | 4.95 |
| 20 | 6.53 | 5.64 | 5.70 | 3.28 | 5.35 | 3.18 | 4.98 | 3.36 | 4.57 | 3.66 | 3.80 | 2.81 | 6.38 | 3.75 | 5.82 | 4.54 | 5.30 | 4.00 | 5.00 | 4.35 | 4.85 | 3.42 | 6.80 | 5.08 |
| 21 | 6.10 | 4.84 | 6.22 | 4.09 | 7.34 | 4.41 | 4.70 | 3.40 | 4.75 | 3.30 | 4.80 | 2.83 | 6.22 | 4.51 | 5.98 | 3.90 | - | 3.90 | 5.60 | 4.30 | 5.22 | 3.42 | 8.96 | 5.92 |
| 22 | 5.42 | 3.64 | 6.66 | 4.72 | 4.83 | 3.08 | 5.62 | 4.70 | 4.83 | 3.57 | 5.40 | 3.38 | 4.87 | 2.91 | 6.90 | 4.42 | - | - | 5.33 | 3.80 | 5.15 | 3.35 | 8.35 | 6.45 |
| 23 | 5.00 | 3.40 | 6.84 | 3.82 | - | 3.05 | 7.57 | 5.65 | 4.95 | 3.15 | 6.07 | 4.22 | 4.60 | 2.88 | 6.95 | 4.50 | - | - | 5.19 | 3.67 | 4.93 | 3.27 | 6.48 | 5.75 |
| 24 | - | - | 5.08 | 3.17 | - | - | 6.11 | 4.43 | 4.13 | 3.09 | 5.10 | 3.30 | 4.69 | 3.16 | 5.65 | 4.22 | - | - | 5.61 | 3.65 | 7.85 | 3.20 | 6.92 | 5.45 |
| 25 | - | 3.17 | 5.67 | 4.24 | - | - | 4.94 | 3.79 | 5.37 | 3.22 | 5.08 | 3.26 | 5.81 | 4.25 | 5.78 | 4.74 | - | - | 6.05 | 3.72 | 5.90 | 4.43 | 6.80 | 5.80 |
| 26 | 4.94 | 3.30 | 6.68 | 4.87 | - | - | 5.22 | 3.76 | 6.50 | 4.62 | 5.32 | 3.75 | 5.82 | 4.32 | 5.60 | 4.60 | - | - | 5.58 | 3.45 | 5.40 | 3.98 | 6.50 | 5.20 |
| 27 | 5.18 | 3.67 | 5.98 | - | - | - | 5.12 | 3.54 | 5.53 | 3.06 | 5.70 | 3.93 | 5.92 | 4.39 | 5.53 | 4.38 | - | - | 5.78 | 3.45 | 5.65 | 3.65 | 6.29 | 4.59 |
| 28 | 5.45 | 3.78 | 3.52 | 3.15 | - | - | 4.58 | 3.04 | 3.52 | 2.95 | 5.32 | 2.83 | 5.50 | 4.30 | 5.40 | 4.10 | - | - | 5.78 | 3.65 | 5.10 | 3.93 | 5.84 | 4.10 |
| 29 | 5.38 | 3.75 | 5.26 | 3.40 | - | - | 4.50 | 3.02 | 3.40 | 2.95 | - | 2.73 | 6.42 | 4.73 | 4.52 | 3.55 | - | - | 5.55 | 3.75 | 5.07 | 3.84 | 5.28 | 3.84 |
| 30 | 5.48 | 3.85 | 10.38 | 4.66 | - | - | 4.45 | 2.94 | ----x---- | | 4.40 | 3.00 | 5.37 | 3.94 | 5.40 | 3.05 | - | - | 5.80 | 3.65 | 5.10 | 4.05 | 4.87 | 3.75 |
| 31 | 6.68 | 3.94 | ----x---- | | - | - | 4.58 | 2.98 | | | 4.45 | 3.75 | ----x---- | | 5.68 | 3.80 | ----x---- | | 5.75 | 4.10 | 5.32 | 3.95 | ----x---- | |

STORM RAINFALL AND RUNOFF

08075650 BERRY BAYOU AT FOREST OAKS ST., HOUSTON, TEX.

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5550 (INCHES) | ACCUMULATED RAINFALL AT GAGE 5725 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | STAGE (FEET) |
|---|---|---|---|---|
| STORM OF AUG. 12-13, 1984 | | | | |
| AUG. 12 | | | | |
| 0000 | 0.0 | 0.0 | 0.0 | 4.48 |
| 0600 | 0.0 | 0.0 | 0.0 | 3.99 |
| 1200 | 0.0 | 0.0 | 0.0 | 5.24 |
| 1400 | 0.0 | 0.0 | 0.0 | 5.24 |
| 1430 | 0.24 | 0.0 | 0.20 | 5.18 |
| 1500 | 1.68 | 0.72 | 1.54 | 5.35 |
| 1530 | 2.64 | 2.52 | 2.62 | 7.75 |
| 1600 | 2.88 | 2.88 | 2.88 | 10.10 |
| 1630 | 3.00 | 2.88 | 2.98 | 12.22 |
| 1700 | 3.00 | 3.00 | 3.00 | 12.59 |
| 1730 | 3.00 | 3.00 | 3.00 | 12.58 |
| 1800 | 3.00 | 3.00 | 3.00 | 12.39 |
| 1830 | 3.00 | 3.00 | 3.00 | 12.04 |
| 1900 | 3.00 | 3.00 | 3.00 | 11.68 |
| 1930 | 3.00 | 3.00 | 3.00 | 11.27 |
| 2000 | 3.00 | 3.00 | 3.00 | 10.85 |
| 2030 | 3.00 | 3.00 | 3.00 | 10.43 |
| 2100 | 3.00 | 3.00 | 3.00 | 10.00 |
| 2130 | 3.00 | 3.00 | 3.00 | 9.53 |
| 2200 | 3.00 | 3.00 | 3.00 | 9.06 |
| 2230 | 3.00 | 3.00 | 3.00 | 8.63 |
| 2300 | 3.00 | 3.00 | 3.00 | 8.20 |
| 2330 | 3.00 | 3.00 | 3.00 | 7.92 |
| 2400 | 3.00 | 3.00 | 3.00 | 7.65 |
| AUG. 13 | | | | |
| 0000 | 3.00 | 3.00 | 3.00 | 7.65 |
| 0200 | 3.00 | 3.00 | 3.00 | 6.92 |
| 0400 | 3.00 | 3.00 | 3.00 | 6.28 |
| 0600 | 3.00 | 3.00 | 3.00 | 5.69 |
| 0800 | 3.00 | 3.00 | 3.00 | 5.27 |
| 1000 | 3.00 | 3.00 | 3.00 | 5.17 |
| 1200 | 3.00 | 3.00 | 3.00 | 5.31 |
| 1400 | 3.00 | 3.00 | 3.00 | 5.27 |
| 1600 | 3.00 | 3.12 | 3.02 | 5.12 |
| 1800 | 3.12 | 3.12 | 3.12 | 5.21 |
| 2000 | 3.12 | 3.12 | 3.12 | 5.34 |
| 2200 | 3.12 | 3.12 | 3.12 | 5.47 |
| 2400 | 3.12 | 3.12 | 3.12 | 4.97 |

STAGE RECORDS ARE RELATIVE TO GAGE DATUM.
DISCHARGE RECORDS ARE NOT CURRENTLY AVAILABLE FOR THIS STORM.

## VINCE BAYOU DRAINAGE BASIN

The locations of data-collection sites in and near the drainage basin are shown in figure 16.

Weighted-mean rainfall in the drainage basin based on two rain gages for the 1984 water year was 43.89 inches or 4.30 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sept. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.13 | 3.64 | 3.37 | 3.60 | 2.85 | 1.36 | 0.37 | 3.88 | 1.88 | 5.68 | 9.66 | 5.47 | 43.89 |

The storm of Aug. 12-13 was selected for analysis at station 08075730, Vince Bayou at Pasadena, Tex.

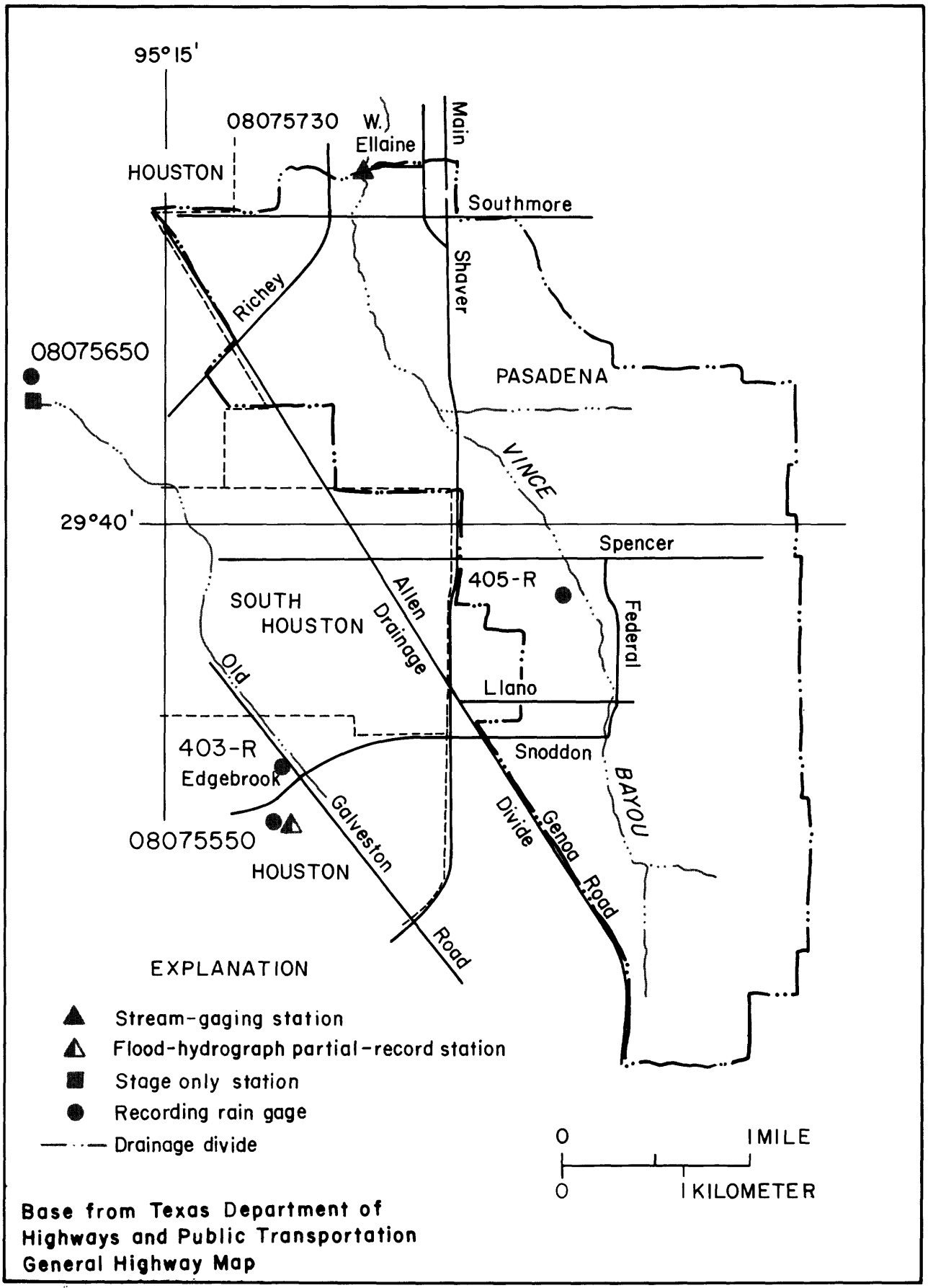


Figure 16.- Locations of data-collection sites in and near the Vince Bayou drainage basin

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UNITED STATES DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY-TEXAS DISTRICT

ANNUAL STORM RAINFALL-RUNOFF SUMMARY DATA

Table 15--Storm rainfall-runoff data, 1984 Water Year, Vince Bayou

| Date of Storm | 85% Duration (hours) | Rainfall (inches) | | | | Runoff (inches) | Ratio runoff to rainfall | Maximum discharge ($ft^3/s$) |
|---|---|---|---|---|---|---|---|---|
| | | Weighted Total | Maximum Increment Recorded in Basin | | | | | |
| | | | 15-minute | 30-minute | 60-minute | | | |
| **Vince Bayou at Pasadena, TX. (Drainage Area -- 7.32 $mi.^2$)** | | | | | | | | |
| Aug. 12-13, 1984 | 0.8 | 3.12 | 0.96 | 1.80 | 2.88 | 1.22 | 0.39 | 1800* |
| | | | | | | | | |
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| | | | | | | | | |
| | | | | | | | | |

* - Peak Discharge for 1984 Water Year

## 08075730 VINCE BAYOU AT PASADENA, TX

LOCATION.--Lat 29°41'40", long 95°12'58", Harris County, Hydrologic Unit 12040104, on right bank of concrete lined channel at end of West Ellaine Avenue in Pasadena and 2.4 mi upstream from mouth.

DRAINAGE AREA.--7.32 mi². Prior to Jan. 1, 1978, 8.21 mi². Jan. 1 to Sept. 30, 1978, 7.61 mi². Drainage area revisions due to drainage ditch changes.

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

GAGE.--Water-stage recorder and crest-stage gage. Datum of gage is 2.54 ft below National Geodetic Vertical Datum of 1929, 1973 adjustment; unadjusted for land-surface subsidence (levels by Corps of Engineers). Telemeter located at station.

REMARKS.--Records fair. Low flow is sustained by sewage effluent.

AVERAGE DISCHARGE.--13 years, 16.9 ft³/s (12,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,720 ft³/s May 3, 1981 (gage height, 18.30 ft); no flow Aug. 5, 6, 18, 1972.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,400 ft³/s and maximum (*):

| Date | Time | Discharge (ft³/s) | Gage height (ft) |
|---|---|---|---|
| Nov. 30 | 1545 | 1,440 | 13.29 |
| Aug. 12 | 1545 | *1,800 | 14.00 |

Minimum daily discharge, 0.16 ft³/s Apr. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
MEAN VALUES

| DAY | OCT | NOV | DEC | JAN | FEB | MAR | APR | MAY | JUN | JUL | AUG | SEP |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .30 | 15.00 | 6.10 | 1.70 | 1.4 | 1.20 | .47 | .6 | 3.0 | 113.00 | 1.2 | 5.1 |
| 2 | .30 | 3.90 | 4.10 | 2.00 | 3.2 | 1.10 | 8.80 | 2.1 | 3.3 | 6.40 | 1.1 | 241.0 |
| 3 | .30 | .81 | 128.00 | .74 | 2.2 | 1.00 | 1.40 | 1.3 | 3.9 | 1.20 | 36.0 | 153.0 |
| 4 | .30 | .57 | 4.30 | 1.60 | 2.0 | 1.40 | .80 | 1.1 | 3.4 | 1.20 | 18.0 | 16.0 |
| 5 | .39 | 1.10 | 4.40 | 2.10 | 1.6 | 22.00 | .92 | 1.9 | 3.7 | 1.20 | 2.4 | 2.6 |
| 6 | .35 | 54.00 | 1.20 | 2.90 | 1.1 | 1.90 | .35 | 1.4 | 93.0 | 1.20 | 7.0 | 1.8 |
| 7 | .65 | 2.60 | .57 | 1.10 | 1.4 | 1.30 | 1.30 | 1.1 | 12.0 | 1.10 | 2.8 | 15.0 |
| 8 | .46 | .84 | .51 | 5.40 | 1.3 | 1.10 | 3.10 | 1.8 | 4.5 | 1.00 | 1.4 | 8.0 |
| 9 | .35 | 16.00 | .66 | 263.00 | 93.0 | 1.40 | .34 | 1.5 | 5.2 | 1.20 | 1.4 | 3.1 |
| 10 | .35 | 4.00 | 68.00 | 18.00 | 5.5 | 1.30 | .49 | 1.5 | 5.3 | .91 | 2.7 | 2.8 |
| 11 | .35 | .84 | 18.00 | 3.40 | 2.3 | 1.60 | .30 | 2.0 | 13.0 | 1.00 | 1.5 | 3.1 |
| 12 | .67 | .56 | 2.70 | 1.90 | 70.0 | 12.00 | .30 | 2.7 | 4.6 | .98 | 231.0 | 3.0 |
| 13 | .35 | .47 | 1.50 | 1.60 | 5.2 | 93.00 | .30 | 2.8 | 2.4 | 1.00 | 17.0 | 3.0 |
| 14 | .31 | .60 | 1.20 | 5.80 | 2.3 | 2.10 | .28 | 3.6 | 2.2 | .83 | 71.0 | 3.2 |
| 15 | .30 | .98 | .88 | 4.00 | 8.0 | 1.20 | .25 | 2.1 | 2.1 | .68 | 31.0 | 4.8 |
| 16 | 4.80 | .56 | 81.00 | 1.60 | 4.5 | .92 | .21 | 2.7 | 2.2 | .56 | 2.8 | 2.7 |
| 17 | 32.00 | .53 | 9.00 | 2.10 | 2.5 | .69 | .17 | 3.8 | 2.1 | .56 | 1.7 | 3.9 |
| 18 | 1.70 | .56 | 2.50 | 1.40 | 2.2 | .61 | .16 | 11.0 | 5.4 | 49.00 | 1.8 | 4.7 |
| 19 | .49 | 35.00 | 2.40 | 1.20 | 2.4 | 17.00 | .23 | 134.0 | 1.7 | 21.00 | 1.9 | 4.9 |
| 20 | 3.40 | 4.00 | 1.00 | 1.00 | 24.0 | 1.10 | .18 | 27.0 | 1.5 | 1.90 | 1.8 | 3.8 |
| 21 | 1.90 | .80 | 67.00 | .75 | 7.4 | .79 | .32 | 4.6 | 7.2 | .79 | 1.9 | 79.0 |
| 22 | .57 | 3.90 | 4.40 | .68 | 2.5 | .69 | .42 | 3.2 | 1.4 | .69 | 2.0 | 28.0 |
| 23 | .44 | 31.00 | 1.80 | 161.00 | 1.9 | 1.80 | .25 | 8.0 | 1.4 | .87 | 2.2 | 5.3 |
| 24 | .43 | 1.80 | 1.80 | 26.00 | 2.2 | 4.10 | .19 | 20.0 | 1.3 | 4.10 | 207.0 | 1.8 |
| 25 | .40 | .92 | 1.50 | 5.80 | 1.4 | .87 | .35 | 11.0 | 1.3 | 40.00 | 29.0 | 1.4 |
| 26 | .44 | 1.90 | 1.50 | 2.50 | 66.0 | .87 | .98 | 7.0 | 1.5 | 22.00 | 7.6 | 2.3 |
| 27 | .44 | 15.00 | 1.50 | 1.80 | 4.9 | 1.00 | 1.70 | 5.5 | 1.6 | 12.00 | 43.0 | 1.7 |
| 28 | .62 | 2.00 | 1.50 | 1.40 | 1.6 | 4.00 | 1.20 | 38.0 | 2.6 | 11.00 | 13.0 | 1.3 |
| 29 | .58 | 1.50 | 1.50 | 1.30 | 1.0 | .65 | .83 | 33.0 | 1.5 | 6.80 | 3.3 | 1.3 |
| 30 | .56 | 146.00 | 1.60 | 1.80 | --- | .43 | 1.10 | 6.5 | 2.3 | 2.00 | 2.3 | 1.4 |
| 31 | 61.00 | --- | 1.30 | 1.40 | --- | .44 | --- | 5.0 | --- | 1.30 | 4.1 | --- |
| TOTAL | 115.50 | 347.74 | 423.42 | 526.97 | 325.0 | 179.56 | 27.69 | 347.8 | 196.6 | 307.47 | 750.9 | 609.0 |
| MEAN | 3.73 | 11.6 | 13.7 | 17.0 | 11.2 | 5.79 | .92 | 11.2 | 6.55 | 9.92 | 24.2 | 20.3 |
| MAX | 61 | 146 | 128 | 263 | 93 | 93 | 8.8 | 134 | 93 | 113 | 231 | 241 |
| MIN | .30 | .47 | .51 | .68 | 1.0 | .43 | .16 | .60 | 1.3 | .56 | 1.1 | 1.3 |
| AC-FT | 229 | 690 | 840 | 1050 | 645 | 356 | 55 | 690 | 390 | 610 | 1490 | 1210 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| CAL YR 1983 | TOTAL | 7825.84 | MEAN | 21.4 | MAX | 1600 | MIN | .13 | AC-FT 15520 |
| WTR YR 1984 | TOTAL | 4157.65 | MEAN | 11.4 | MAX | 263 | MIN | .16 | AC-FT 8250 |

STORM RAINFALL AND RUNOFF

08075730 VINCE BAYOU AT PASADENA, TEX.

--CONTINUED

| DATE AND TIME | ACCUMULATED RAINFALL AT GAGE 5725 (INCHES) | ACCUMULATED WEIGHTED RAINFALL (INCHES) | DISCHARGE (CUBIC FEET PER SECOND) | ACCUMULATED RUNOFF (INCHES) |
|---|---|---|---|---|
| STORM OF AUG. 12-13, 1984 | | | | |
| AUG. 12 | | | | |
| 0000 | 0.0 | 0.0 | 1.3 | 0.0017 |
| 1200 | 0.0 | 0.0 | 1.3 | 0.0037 |
| 1445 | 0.0 | 0.0 | 104.0 | 0.0367 |
| 1500 | 0.72 | 0.72 | 200.0 | 0.0473 |
| 1515 | 1.68 | 1.68 | 336.0 | 0.0651 |
| 1530 | 2.52 | 2.52 | 1310.0 | 0.1344 |
| 1545 | 2.88 | 2.88 | 1800.0 | 0.2297 |
| 1600 | 2.88 | 2.88 | 1740.0 | 0.3217 |
| 1615 | 2.88 | 2.88 | 1620.0 | 0.4075 |
| 1630 | 2.88 | 2.88 | 1500.0 | 0.4869 |
| 1645 | 3.00 | 3.00 | 1400.0 | 0.5610 |
| 1700 | 2.88 | 2.88 | 1300.0 | 0.6642 |
| 1730 | 3.00 | 3.00 | 1020.0 | 0.7721 |
| 1800 | 3.00 | 3.00 | 780.0 | 0.8547 |
| 1830 | 3.00 | 3.00 | 605.0 | 0.9187 |
| 1900 | 3.00 | 3.00 | 429.0 | 0.9641 |
| 1930 | 3.00 | 3.00 | 340.0 | 1.0001 |
| 2000 | 3.00 | 3.00 | 250.0 | 1.0398 |
| 2100 | 3.00 | 3.00 | 172.0 | 1.0762 |
| 2200 | 3.00 | 3.00 | 124.0 | 1.1025 |
| 2300 | 3.00 | 3.00 | 92.0 | 1.1219 |
| 2400 | 3.00 | 3.00 | 73.0 | 1.1374 |
| AUG. 13 | | | | |
| 0000 | 3.00 | 3.00 | 73.0 | 1.1374 |
| 0100 | 3.00 | 3.00 | 58.0 | 1.1497 |
| 0200 | 3.00 | 3.00 | 46.0 | 1.1594 |
| 0300 | 3.00 | 3.00 | 36.0 | 1.1708 |
| 0500 | 3.00 | 3.00 | 24.0 | 1.1785 |
| 0600 | 3.00 | 3.00 | 20.0 | 1.1848 |
| 0800 | 3.00 | 3.00 | 16.0 | 1.1916 |
| 1000 | 3.00 | 3.00 | 12.0 | 1.1967 |
| 1200 | 3.00 | 3.00 | 9.3 | 1.2016 |
| 1500 | 3.00 | 3.00 | 7.6 | 1.2048 |
| 1600 | 3.12 | 3.12 | 7.4 | 1.2064 |
| 1700 | 3.12 | 3.12 | 7.1 | 1.2079 |
| 1800 | 3.12 | 3.12 | 16.0 | 1.2113 |
| 1900 | 3.12 | 3.12 | 9.9 | 1.2134 |
| 2000 | 3.12 | 3.12 | 7.6 | 1.2174 |
| 2400 | 3.12 | 3.12 | 4.4 | 1.2192 |

## HUNTING BAYOU DRAINAGE BASIN

The locations of data-collection sites in and near the Hunting Bayou drainage basin are shown in figure 17.

Weighted-mean rainfall in the drainage basin based on two rain gages for the 1984 water year was 32.21 inches, or 15.98 inches less than the 30-year (1941-70) average of 48.19 inches for Houston. The monthly totals, in inches, for the 1984 water year weighted-mean rainfall are as follows:

| Oct. | Nov. | Dec. | Jan. | Feb. | Mar. | Apr. | May | June | July | Aug. | Sep. | Total |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.26 | 3.06 | 3.02 | 3.72 | 3.32 | 2.06 | 0.83 | 1.73 | 2.30 | 2.07 | 5.04 | 2.80 | 32.21 |

The storm of Jan. 9-10 was selected for analysis at station 08075760, Hunting Bayou at Falls Street. The storm of Jan. 9-12 was selected for analysis at station 08075770, Hunting Bayou at Interstate Highway 610.