Matsuoka

Fiscal year 1967

Water Resources Data for Hawaii and other Pacific Areas

Part 1. Surface Water Records

Part 2. Water Quality Records

UNITED STATES
DEPARTMENT OF THE INTERIOR
GEOLOGICAL SURVEY

Prepared in cooperation with the State of Hawaii, the Government of Guam, the Government of American Samoa, and with other State, county, and Federal agencies

United States Department of the Interior
Geological Survey - Water Resources Division

WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS 1967

Part 1: Surface Water Records

Prepared in cooperation with

Hawaii Department of Land and Natural Resources,
Division of Water and Land Development
Government of Guam
Government of American Samoa
City and county of Honolulu
Corps of Engineers, U.S. Army
Federal Water Pollution Control Administration,
U.S. Department of the Interior

Copies of this report may be obtained from
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U.S. Geological Survey
Room 330, First Insurance Bldg.
1100 Ward Avenue
Honolulu, Hawaii 96814

1968

CALENDAR FOR FISCAL YEAR 1967

JULY 1966

S	M	T	W	T	F	S
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3	4	5	6	7	8	9
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31						

AUGUST 1966

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SEPTEMBER 1966

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OCTOBER 1966

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NOVEMBER 1966

S	M	T	W	T	F	S
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DECEMBER 1966

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JANUARY 1967

S	M	T	W	T	F	S
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FEBRUARY 1967

S	M	T	W	T	F	S
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MARCH 1967

S	M	T	W	T	F	S
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APRIL 1967

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30						

MAY 1967

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

JUNE 1967

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1967

Part 1. Surface Water Records

INTRODUCTION

The surface-water records for the 1967 fiscal year for gaging stations, partial-record stations, and miscellaneous sites within the State of Hawaii and other Pacific areas are given in this report. The records were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of Mearle M. Miller, district chief.

Through June 30, 1960, the records of discharge and stage of streams and contents and stage of lakes or reservoirs were published in an annual series of U.S. Geological Survey water-supply papers entitled "Surface Water Supply of the United States." Since 1951 there have been 20 volumes in the series; each volume covered an area whose boundaries coincided with those of certain natural drainage areas. The records in Hawaii were contained in the above series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in a volume entitled "Surface Water Supply of Mariana, Caroline, and Samoa Islands."

Beginning with the 1961 fiscal year, streamflow records and related data have been released by the Geological Survey in annual reports on a State-boundary basis, except for Hawaii which includes other Pacific areas. The publishing of streamflow records on a fiscal-year basis (the 12-month period July 1 to June 30), and with discharges in million gallons a day, will be discontinued after this report. Future reports will contain surface-water records on a water-year basis (the 12-month period October 1 to September 30) and with discharges in cubic feet per second. To facilitate this conversion, a second report, "Part 1. Surface Water Records, Water Year 1967", containing the records for the period October 1966 to September 1967 will be published this year.

Distribution of these basic-data reports is limited and primarily for local needs. Records will be published in Geological Survey water-supply papers at 5-year intervals.

COOPERATION

Cooperative agreements between the U.S. Geological Survey and organizations of the State of Hawaii for the systematic collection of streamflow records began in 1909. Cooperative agreements with the Territory of Guam began in 1953, and with the Territory of American Samoa in 1957. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreements with the Survey are:

State of Hawaii, Department of Land and Natural Resources.
Government of Guam.
Government of American Samoa.
City and county of Honolulu, Division of Engineering.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army; Public Works Center, U.S. Navy, Guam; and Federal Water Pollution Control Administration, U.S. Department of the Interior.

The following organizations aided in collecting records:

Boards of Water Supply of the city and county of Honolulu and Maui County; Lihue Plantation Co., Ltd.; Grove Farm Co., Inc.; McBryde Sugar Co., Ltd.; Waiahole Water Co., Ltd.; East Maui Irrigation Co., Ltd.; B.P. Bishop Estate; Kohala Ditch Co., Ltd.; and Hawaiian Irrigation Co., Ltd.

DEFINITION OF TERMS AND ABBREVIATIONS

The terms of streamflow and other hydrologic data, as used in this report, are defined as follows:

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of gage height or discharge are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is obtained.

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

Cubic foot per second (cfs) is the rate of discharge of a stream whose channel is 1 square foot in cross-sectional area and whose average velocity is 1 foot per second.

Million gallons per day (mgd) is the rate of discharge of a stream measured in million gallons per day.

Acre-foot (ac-ft) is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet.

Cfs-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.983471 acre-feet, or 646,317 gallons, and represents a runoff of 0.0372 inch from 1 square mile.

Stage-discharge relation is the relation between gage height and the amount of water flowing in a channel, expressed as volume per unit of time.

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

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

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

DOWNSTREAM ORDER AND STATION NUMBERS

Stations are listed in the same downstream order used in the water-supply papers. Records are listed in a downstream direction along the main stem with all stations on a tributary entering above a main-stem station listed before that station. If a tributary enters between two main-stem stations, it is listed between them. A similar order is followed listing stations on first rank, second rank, and other ranks of tributaries. To indicate the rank of any tributary on which a gaging station is situated and the stream to which it is immediately tributary, each indention in the listing of gaging stations in the table of contents of this report represents one rank. This downstream order and system of indention shows which gaging stations are on tributaries between any two stations on a main stem and the rank of the tributary on which each gaging station is situated.

As an added means of identification, each gaging station and partial-record station has been assigned a station number. The numbers have been

assigned in the same downstream order used in the annual series of water-supply papers. In assigning station numbers, no distinction is made between partial-record stations and continuous-record gaging stations, so that the station number for a partial-record station indicates downstream order position in a list made up of both types of stations. Gaps are left in the numbers to allow for new stations that may be established; hence the numbers are not consecutive.

The complete 8-digit number for each station, such as 16-0958.00, includes the part number "16" plus a six-digit number. In this report, the nonessential zeros are not shown. For example, the complete number 16-0958.00 would appear as 16-0958, just to the left of the station name. Also, the records are listed in downstream order by islands.

EXPLANATION OF DATA

The base data collected at gaging stations consist of records of stage and measurements of discharge. In addition, observations of factors affecting the stage-discharge relation, weather records, and other information are used to supplement base data in determining the daily flow. Records of stage are obtained from a water-stage recorder that gives either a continuous chart of the fluctuations or, for a digital recorder, a tape punched at 15-minute intervals. Measurements of discharge are made with a current meter by the general methods adopted by the Geological Survey on the basis of experience in stream gaging since 1888. These methods are described in Water-Supply Paper 888 and are also outlined in standard textbooks on the measurement of stream discharge.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. If extensions to the rating curves are necessary to define the extremes of discharge, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, or computation of flow over dams or weirs), velocity-area studies, and logarithmic plotting. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and yearly mean discharge are computed. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes by engineers and observers are used in applying the gage heights to the rating tables. If the stage-discharge relation for a station is temporarily changed by the presence of aquatic growth or debris on the control, the daily mean discharge is computed by what is in effect the shifting-control method.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to compute the daily discharge. This happens when the recorder stops or otherwise fails to operate properly, intakes are plugged, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, adjoining good record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins.

The data in this report generally comprise a description of the station and a table showing the daily discharge and monthly and yearly discharge of the stream. Records are published for the fiscal year which begins on July 1 and ends on June 30. A calendar for the 1967 fiscal year is shown on page II to facilitate finding the day of the week for any date.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, and general remarks. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Records available" are given periods for which there are published records for the present station or for stations generally equivalent to the present one. Under "Gage" are given the type of gage currently in use and the datum of the gage above mean sea level, and a condensed history of the types, locations, and datums of previous gages used during the period of records available. The references to "datum of 1929" and adjustments of other years are to the datum and adjustments of the U.S. Coast and Geodetic Survey. Under "Average discharge" is given the average discharge for the number of years indicated. It is not given for stations having fewer than five complete years of record or for stations where changes in water development during the period of record cause the figure to have little significance. Under "Extremes" are given the maximum discharge and gage height or the maximum daily discharge, the minimum discharge if there is little or no regulation, and the minimum daily discharge if there is extensive regulation. In the first paragraph, the data given are for the complete current fiscal year unless otherwise specified. In the second paragraph, the data given are for the periods of record within the calendar year dates in the heading (not necessarily those for the complete years indicated by the heading dates). Reliable information concerning major floods that have occurred outside the period of record is given in the third or last paragraph under "Extremes." Unless otherwise qualified, the maximum discharge corresponds to the crest stage obtained by use of a water-stage recorder or crest-stage indicator. If the maximum gage height did not occur at the same time as the maximum discharge, it is given separately. Information pertaining to the accuracy of the records and to conditions which affect the natural flow at the gaging station is given under "Remarks."

The daily table gives the discharge corresponding to the daily mean gage height unless there are large or rapid changes in discharge during a day. For days having large or rapid changes, discharge for the day is computed by averaging the mean discharges for several parts of a day. For digital recorders, the daily mean discharge is always the average of the discharges at each punched reading.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily figures; it is the total cfs-days for the month for Guam and Okinawa and million gallons for Hawaii and Samoa. The line headed "Mean" gives the average flow in millions of gallons per day and cubic feet per second during the month. Discharge for the month is expressed in acre-feet (line headed "Ac-ft"). Maximum daily and minimum daily discharges for the month are listed in the last two lines.

In the yearly summary below the monthly summary, the figures of maximum are the maximum daily discharges, not the momentary discharges when the water was at crest stage. Likewise, the minimums in this summary are the minimum daily discharges.

Peak discharges and the times of their occurrence and corresponding gage heights for most stations are listed below the table of daily and monthly discharge. All independent peaks above the selected base are given. The base discharge, which is given in parentheses, is selected so that an average of about three peaks a year can be presented. Peak discharges are not published for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time, for example 12:30 a.m. is 0030, 1:30 p.m. is 1330.

In a general footnote, introduced by the word "Note," certain periods are indicated for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage-discharge relation, or of any other unusual condition at the gage are indicated only if they are a month or more in length and the accuracy of the records is affected. The methods used in computing discharge for various unusual conditions have been explained in preceding paragraphs.

ACCURACY OF FIELD DATA AND COMPUTED RESULTS

The accuracy of streamflow data depends primarily on (1) the stability of the stage-discharge relation or, if the control is unstable,

the frequency of discharge measurements, and (2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

The station description under "Remarks" states the degree of accuracy of the records. "Excellent" means that about 95 percent of the daily discharges are within 5 percent; "good," within 10 percent; and "fair," within 15 percent. "Poor" means that daily discharges have less than "fair" accuracy.

Discharge at some stations, as indicated by the monthly mean, may vary widely from natural runoff, owing to diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors.

OTHER DATA AVAILABLE

Data collected at partial-record stations and at miscellaneous sites are given at the end of this report. Data for partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements at miscellaneous sites are given in a third table. Data for crest-stage partial-record stations in the State of Hawaii are not included in this report. They are included in an annual progress report entitled "An Investigation of Floods in Hawaii," copies of which may be obtained from the district office.

Information of a more detailed nature than that published for most of the gaging stations is on file in the district office, such as discharge measurements and recorder charts or nonrecording-gage readings. Most gaging-station records in the State through fiscal year 1960 have been analyzed with an electronic computer to give: (1) the number of days in each year that the daily discharge was between selected limits (duration tables); (2) the lowest mean discharge for selected numbers of consecutive days in each year; and (3) the highest mean discharge for selected numbers of consecutive days in each year.

At or near some gaging stations, water-quality records also are collected. Data are obtained on the chemical quality of the stream water, on water temperature, on suspended-sediment concentration, and on the particle-size distribution of suspended sediment and bed material. These data are given in Part 2 of this report. Under the "Remarks" paragraph of the gaging-station description, reference is made to water-quality records collected on a regular basis.

ISLAND OF KAUAI

16-0100. Kawaikoi Stream near Waimea

Location.--Lat 22°08'09", long 159°37'22", on left bank at old trail crossing and 12.5 miles north of Waimea.

Drainage area.--4.1 sq mi, approximately.

Records available.--April 1909 to October 1912, December 1912 to March 1913, May 1913 to June 1915, August 1915 to May 1916, July to December 1916, July 1919 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,420 ft (by barometer). Prior to May 26, 1910, staff gage at site 300 ft downstream at different datum.

Average discharge.--51 years (1911-12, 1913-15, 1919-67), 22.3 mgd (34.5 cfs).

Extremes.--Maximum discharge during year, 7,000 mgd (10,800 cfs) Jan. 13 (gage height, 15.33 ft), from rating curve extended above 300 mgd on basis of slope-area measurements at gage heights 12.12 and 13.43 ft; minimum, 1.6 mgd (2.5 cfs) July 12, 15.
1909-16, 1919-67: Maximum discharge, that of Jan. 13, 1967; minimum, 0.74 mgd (1.15 cfs) Sept. 21, 22, 1953.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.9	37	8.7	2.9	48	5.0	28	7.6	11	16	7.0	7.6
2	15	17	4.8	2.4	8.5	4.4	29	6.9	8.3	16	8.3	7.6
3	5.6	5.6	4.0	2.1	8.9	4.2	178	6.5	7.4	16	12	7.2
4	3.0	8.4	3.7	2.0	286	47	93	6.1	6.9	11	7.8	6.7
5	2.4	14	3.3	2.0	56	19	74	5.8	6.3	11	6.5	5.9
6	2.1	16	3.1	44	42	8.3	65	5.6	24	12	5.8	5.6
7	1.9	19	2.9	24	19	7.8	50	5.4	16	12	5.4	5.1
8	1.8	7.4	2.8	8.9	12	6.1	94	5.1	8.5	53	5.4	4.8
9	2.0	7.4	2.6	4.5	8.5	5.0	27	5.4	6.9	78	7.4	4.7
10	2.1	4.4	2.6	7.0	6.9	4.5	17	89	5.9	132	5.8	4.5
11	1.8	3.6	2.5	93	6.3	4.2	18	46	5.6	318	5.1	4.8
12	1.6	3.5	2.4	6.9	10	4.0	170	45	14	155	4.8	9.1
13	1.8	3.3	2.5	4.2	9.4	4.1	660	12	17	50	4.5	5.1
14	1.7	17	3.7	3.5	5.8	5.1	123	17	8.5	91	4.4	4.5
15	1.6	6.5	4.1	32	5.1	4.1	31	16	6.3	104	4.7	4.1
16	1.9	4.1	3.1	104	5.3	3.7	23	33	5.6	28	5.4	4.0
17	8.6	3.5	4.1	18	4.5	20	20	11	9.2	21	4.5	3.9
18	14	3.5	3.4	7.0	4.1	80	17	8.5	7.2	16	16	3.7
19	3.6	4.4	3.9	5.3	4.0	11	15	8.3	5.6	14	8.5	3.6
20	7.5	4.1	5.0	4.2	4.8	7.0	13	18	32	13	50	3.5
21	4.0	9.6	11	3.7	6.3	78	11	11	56	11	301	3.4
22	2.5	22	11	3.5	41	42	9.6	7.2	220	10	560	3.4
23	2.0	20	4.4	3.1	125	21	8.9	6.7	408	9.2	118	3.3
24	1.9	59	3.4	2.9	14	10	44	5.9	98	8.7	25	3.1
25	149	17	2.8	2.7	16	14	20	5.6	109	8.3	24	3.3
26	57	29	2.4	2.6	19	277	12	52	64	7.8	26	3.6
27	12	15	2.3	2.5	15	46	9.6	99	42	7.4	19	3.5
28	5.6	7.8	2.1	2.4	7.8	206	8.7	18	45	8.3	12	4.5
29	3.9	5.1	6.0	2.3	5.9	275	8.3	----------	32	7.4	9.6	3.7
30	3.4	4.2	4.8	20	5.8	45	13	----------	20	6.9	8.9	3.4
31	5.1	22	----------	36	----------	39	9.4	----------	15	----------	8.1	----------
Total	333.3	400.4	123.4	459.6	810.9	1307.5	1899.5	563.6	1321.2	1252.0	1290.9	141.2
Mean												
Mgd	10.8	12.9	4.11	14.8	27.0	42.2	61.3	20.1	42.6	41.7	41.6	4.71
Cfs	16.7	20.0	6.36	22.9	41.8	65.3	94.8	31.1	65.9	64.5	64.4	7.29
Ac-ft	1020	1230	379	1410	2490	4010	5830	1730	4050	3840	3960	433
Max	149	59	11	104	286	277	660	99	408	318	560	9.1
Min	1.6	3.3	2.1	2.0	4.0	4.0	8.3	5.1	5.6	6.9	4.4	3.1

Calendar Year 1966: Max 315 Min 1.4 Mean (mgd) 15.8 Mean (cfs) 24.4 Ac-ft 17,700
Fiscal Year 1966-67: Max 660 Min 1.6 Mean (mgd) 27.1 Mean (cfs) 41.9 Ac-ft 30,390

Peak discharge (base, 1,300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	0100	9.53	2,190	3,390	5-21	1100	8.69	1,720	2,660
1-13	1600	15.33	7,000	10,800					

16-0130. Mohihi Stream at altitude 3,420 ft, near Waimea

Location.--Lat 22°07'13", long 159°36'14", on left bank at upper trail crossing, 3.8 miles northeast of confluence with Waiahulu and Poomau Streams, and 12 miles northeast of Waimea.

Drainage area.--1.6 sq mi, approximately.

Records available.--June 1920 to October 1926, October 1936 to June 1967. Published as "at altitude 3,500 ft, near Waimea" prior to July 1947 and July 1952 to June 1960, and as "near Waimea" July 1947 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 3,420 ft (from topographic map).

Average discharge.--36 years (1920-26, 1937-67), 5.41 mgd (8.37 cfs).

Extremes.--Maximum discharge during year, 608 mgd (941 cfs) May 22 (gage height, 5.51 ft), from rating curve extended above 110 mgd; minimum, 0.19 mgd (0.29 cfs) July 15, 16.
1920-26, 1936-67: Maximum discharge, 1,250 mgd (1,930 cfs) Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 50 mgd; minimum, 0.08 mgd (0.12 cfs) Sept. 21, 1953.

Remarks.--Records fair. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	1.5	1.4	1.0	5.7	1.5	15	3.6	3.9	4.8	1.9	2.3
2	3.3	2.2	1.2	.81	2.4	1.3	11	3.4	3.2	4.6	1.8	2.3
3	1.9	1.8	1.1	.66	2.7	1.2	45	3.2	2.9	4.2	2.1	2.2
4	1.0	1.5	1.1	.55	104	21	29	3.2	2.7	3.7	2.1	2.0
5	.66	2.0	.92	.49	27	12	23	3.0	2.6	11	1.9	1.8
6	.63	2.1	.81	4.5	25	3.9	19	2.9	3.7	5.6	1.8	1.8
7	.52	3.8	.74	7.5	9.0	2.6	11	2.8	4.8	3.9	1.7	1.6
8	.45	2.3	.69	3.2	5.3	2.1	21	2.7	3.2	8.4	1.8	1.6
9	.37	1.9	.66	1.8	3.0	1.8	8.6	2.7	2.8	29	2.3	1.5
10	.31	1.5	.63	2.0	2.3	1.6	5.3	13	2.4	80	1.8	1.4
11	.26	1.2	.66	18	2.0	1.4	5.8	28	2.3	124	2.2	1.5
12	.23	1.1	.71	2.3	4.2	1.3	22	21	5.0	49	1.5	1.6
13	.23	1.0	.81	1.2	3.1	1.2	67	6.9	5.8	20	1.4	1.4
14	.23	1.9	.92	1.0	1.9	1.2	39	11	3.2	25	1.3	1.4
15	.21	2.2	1.1	28	1.6	1.1	10	9.0	2.6	25	1.4	1.2
16	.21	1.6	1.1	50	2.0	1.0	5.4	17	2.3	9.2	1.4	1.2
17	.23	1.3	1.0	11	1.6	2.6	3.6	5.9	18	6.3	1.2	1.1
18	1.6	1.1	1.0	2.9	1.6	24	2.8	4.8	5.5	4.8	2.3	1.1
19	1.0	1.1	.96	1.8	1.4	3.0	2.8	4.6	3.6	4.2	2.1	1.1
20	.66	1.0	1.0	1.2	1.2	2.0	2.9	5.5	9.5	3.7	5.8	1.0
21	.60	1.1	1.6	1.0	1.1	13	2.8	4.6	22	3.3	48	1.0
22	.49	2.1	1.8	.88	24	9.8	2.3	3.4	80	3.1	223	1.0
23	.37	4.8	1.4	.77	54	5.9	2.2	3.0	78	2.8	29	.96
24	.35	7.2	1.0	.66	6.8	2.9	8.0	2.8	33	2.6	8.3	.88
25	33	8.2	.85	.60	4.4	8.6	7.0	2.6	25	2.5	5.3	.92
26	29	17	.71	.52	4.5	61	6.0	2.8	18	2.3	4.7	1.0
27	4.2	5.6	.71	.47	4.2	15	4.8	18	15	2.2	3.7	1.0
28	2.3	3.2	.81	.43	2.6	46	4.3	6.2	20	2.1	3.0	1.1
29	1.7	2.0	1.0	.41	2.0	81	4.0	----------	11	2.1	2.6	1.0
30	1.4	1.6	1.4	.43	1.8	25	4.9	----------	8.1	2.0	2.8	.85
31	1.4	1.3	----------	2.7	----------	28	4.3	----------	5.3	----------	2.6	----------
Total	89.91	88.2	29.79	148.78	312.4	384.0	399.8	197.6	405.4	451.4	372.8	40.81
Mean												
Mgd	2.90	2.85	0.993	4.80	10.4	12.4	12.9	7.06	13.1	15.0	12.0	1.36
Cfs	4.49	4.41	1.54	7.43	16.1	19.2	20.0	10.9	20.3	23.2	18.6	2.10
Ac-ft	276	271	91	457	959	1,180	1,230	606	1,240	1,390	1,140	125
Max	33	17	1.8	50	104	81	67	28	80	124	223	2.3
Min	0.21	1.0	0.63	0.41	1.1	1.0	2.2	2.6	2.3	2.0	1.2	0.85

Calendar Year 1966: Max 104 Min 0.14 Mean (mgd) 4.16 Mean (cfs) 6.44 Ac-ft 4,660
Fiscal Year 1966-67: Max 223 Min 0.21 Mean (mgd) 8.00 Mean (cfs) 12.4 Ac-ft 8,960

Peak discharge (base, 240 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-4	0100	5.10	480	743	5-22	0900	5.51	608	941

16-0140. Kokee ditch near Waimea

Location.--lat 22°06'25", long 159°40'45", on left bank 1,000 ft west of road and 10.5 miles north of Waimea.

Records available.--September 1926 to June 1967.

Gage.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (by barometer). Prior to July 1, 1962, at datum 0.07 ft higher.

Average discharge.--40 years (1927-67), 15.8 mgd (24.4 cfs).

Extremes.--1926-67: Maximum daily discharge, 68 mgd (105 cfs) Dec. 2, 1929, Mar. 4, 1933; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Kokee ditch diverts water at altitude 3,400 ft from all streams tributary to Waimea River west of Mohihi Stream for irrigation near Kekaha.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.7	13	12	3.6	40	8.7	5.4	5.0	20	14	18	16
2	19	26	5.5	2.6	13	7.7	18	18	16	12	19	16
3	8.9	8.5	4.0	2.4	14	7.4	22	17	15	20	24	16
4	5.1	9.8	3.5	2.4	40	26	32	16	14	25	18	15
5	4.0	15	3.2	2.4	48	30	23	15	13	24	16	13
6	3.6	16	3.0	18	42	16	17	14	15	25	15	13
7	3.3	22	3.0	24	35	15	19	14	38	23	14	12
8	3.1	10	3.0	9.0	18	12	26	13	17	26	15	12
9	3.1	9.5	2.4	5.5	15	11	22	13	15	21	16	11
10	3.3	6.0	2.4	28	12	9.3	27	38	13	31	14	11
11	3.0	4.9	2.4	30	11	8.5	31	45	12	37	13	11
12	2.9	4.6	2.4	8.2	14	7.9	39	28	14	30	12	15
13	2.9	4.2	2.4	5.2	15	7.7	52	14	36	34	12	11
14	2.9	16	3.1	4.4	9.9	8.7	8.6	28	18	33	12	10
15	2.8	9.1	4.0	23	8.7	7.7	19	26	14	23	13	9.5
16	2.8	5.6	3.6	46	8.7	7.2	16	36	13	16	14	9.3
17	5.2	4.6	2.6	28	8.1	13	13	16	13	31	12	8.9
18	19	4.2	2.4	12	7.4	45	29	18	16	36	26	8.5
19	6.2	5.1	2.6	8.3	7.0	22	37	17	14	32	17	8.3
20	8.8	4.5	5.0	6.5	7.7	13	28	21	15	29	20	8.1
21	6.2	10	7.0	5.6	7.8	32	25	21	52	26	51	8.1
22	3.9	18	16	4.9	17	45	23	16	44	25	53	7.9
23	3.3	26	5.5	4.3	51	25	22	14	20	23	46	7.6
24	3.1	30	3.2	4.0	26	8.7	45	13	10	24	34	7.6
25	37	21	2.6	3.8	22	16	40	13	16	23	33	7.6
26	42	35	2.4	3.5	27	37	24	12	14	22	36	7.7
27	21	16	2.4	3.3	24	13	25	51	12	21	30	7.6
28	9.3	12	2.4	3.2	14	12	23	32	14	22	22	8.5
29	6.4	6.5	3.2	3.1	11	15	21	----------	13	20	19	7.6
30	5.2	4.5	11	10	9.9	11	25	----------	12	18	18	7.2
31	6.2	4.0	----------	39	----------	8.1	5.0	----------	7.5	----------	16	----------
Total	260.2	381.6	128.2	354.2	584.2	506.6	762.0	584.0	555.5	746	678	312.0
Mean												
Mgd	8.39	12.3	4.27	11.4	19.5	16.3	24.6	20.9	17.9	24.9	21.9	10.4
Cfs	13.0	19.0	6.61	17.6	30.2	25.2	38.1	32.3	27.7	38.5	33.9	16.1
Ac-ft	799	1,170	393	1,090	1,790	1,550	2,340	1,790	1,700	2,290	2,080	957
Max	42	35	16	46	51	45	52	51	52	37	53	16
Min	2.8	4.0	2.4	2.4	7.0	7.2	5.0	5.0	7.5	12	12	7.2

Calendar Year 1966:	Max	51	Min	2.4	Mean (mgd)	11.6	Mean (cfs)	17.9	Ac-ft	13,020
Fiscal Year 1966-67:	Max	53	Min	2.4	Mean (mgd)	16.0	Mean (cfs)	24.8	Ac-ft	17,960

Note.--No gage-height record Aug. 26 to Oct. 14, Jan. 20 to Apr. 4.

16-0160. Waimea River at altitude 840 ft, near Waimea

Location.--Lat 22°04'55", long 159°39'15", on right bank in Waimea Canyon, 0.5 mile upstream from Koaie Stream, and 8.8 miles north of Waimea.

Drainage area.--20.0 sq mi.

Records available.--February to October 1916, October 1917 to June 1918, May 1925 to January 1949, September 1949 to July 1950, February 1951 to June 1967. Published as Waiahulu Stream near Waimea prior to July 1952 and as "at altitude 890 ft, near Waimea" July 1952 to June 1960.

Gage.--Water-stage recorder. Altitude of gage is 840 ft (from topographic map). Prior to May 25, 1925, at datum 1.55 ft lower.

Average discharge.--39 years (1925-48, 1951-67), 33.4 mgd (51.7 cfs).

Extremes.--Maximum discharge during year, 10,900 mgd (16,900 cfs) Jan. 13 (gage height, 13.18 ft), from rating curve extended above 130 mgd on basis of slope-area measurement at gage height 11.45 ft; minimum, 8.2 mgd (13 cfs) July 30 to Aug. 1.
1916-18, 1925-67: Maximum discharge, 18,100 mgd (28,000 cfs) Aug. 17, 1950 (gage height, 18.3 ft, from floodmarks), from rating curve extended above 320 mgd; minimum, 5.2 mgd (8.0 cfs) Nov. 4, 1927.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Kokee ditch (see sta. no. 140) diverts above station for irrigation near Kekaha.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12	14	12	11	36	13	42	14	15	16	11	11
2	13	19	9.8	11	17	13	41	13	13	15	12	11
3	13	9.1	9.8	11	21	13	253	13	12	14	12	11
4	11	8.4	9.6	11	692	121	161	12	11	13	12	11
5	11	8.6	9.6	11	165	68	106	12	15	15	12	11
6	10	9.1	9.4	28	135	30	109	12	20	15	12	11
7	10	11	9.4	22	60	22	46	12	17	12	12	11
8	10	11	9.4	15	32	17	137	11	14	27	12	11
9	10	9.6	9.4	12	23	15	38	11	12	77	12	9.6
10	10	9.4	9.6	15	22	14	23	110	11	204	12	9.6
11	10	9.4	9.6	96	17	13	20	80	11	481	12	9.8
12	10	9.4	9.6	15	18	12	202	70	13	231	12	10
13	10	9.4	9.8	11	16	12	1,020	15	18	65	12	10
14	10	9.4	10	10	15	12	254	20	13	80	12	10
15	10	10	10	32	14	12	72	28	11	106	12	9.6
16	10	9.6	10	147	13	12	48	38	11	26	12	9.6
17	10	9.4	10	45	18	12	45	18	19	19	12	9.6
18	11	9.4	10	16	15	108	35	11	16	17	14	9.4
19	12	9.4	10	12	14	19	28	16	12	16	13	9.4
20	11	9.4	10	11	24	14	23	22	19	14	35	9.1
21	11	9.1	11	10	18	55	20	18	80	13	251	9.1
22	11	9.7	12	10	38	58	15	15	242	13	699	8.8
23	10	14	11	10	262	22	14	13	503	12	109	8.6
24	10	38	11	10	40	16	99	11	179	12	25	8.6
25	194	20	11	10	24	20	36	20	118	11	26	8.6
26	71	34	10	9.8	21	376	21	55	74	11	16	8.6
27	17	15	10	9.8	20	82	15	120	42	11	13	8.6
28	9.6	13	11	9.8	17	240	12	30	80	11	12	8.6
29	8.6	11	12	9.8	15	538	15	----------	32	11	11	8.6
30	8.2	9.8	11	9.8	14	92	17	----------	23	11	11	8.6
31	8.2	14	----------	19	----------	80	15	----------	17	----------	11	----------
Total	572.6	391.6	307.0	660.0	1,836	2,131	2,982	820	1,673	1,579	1,449	290.4
Mean												
Mgd	18.5	12.6	10.2	21.3	61.2	68.7	96.2	29.3	54.0	52.6	46.7	9.68
Cfs	28.6	19.5	15.8	33.0	94.7	106	149	45.3	83.6	81.4	72.3	15.0
Ac-ft	1,760	1,200	942	2,030	5,630	6,540	9,150	2,520	5,130	4,850	4,450	891
Max	194	38	12	147	692	538	1,020	120	503	481	699	11
Min	8.2	8.4	9.4	9.8	13	12	12	11	11	11	11	8.6

Calendar Year 1966: Max 692 Min 8.2 Mean (mgd) 27.1 Mean (cfs) 41.9 Ac-ft 30,350
Fiscal Year 1966-67: Max 1,020 Min 8.2 Mean (mgd) 40.3 Mean (cfs) 62.4 Ac-ft 45,090

Note.--No gage-height record Jan. 18 to Mar. 11, May 24 to June 30.

Peak discharge (base, 1,400 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	0100	8.43	3,070	4,750	3-23	1730	6.50	1,410	2,180
1-13	1630	13.18	10,900	16,900	5-22	0800	7.03	1,790	2,770

16-0170. Koaie Stream at altitude 3,770 ft, near Waimea

Location.--lat 22°06'57", long 159°33'53", on left bank 3 miles upstream from Left Branch, 6.5 miles east of Kokee ranger station, and 12.7 miles northeast of Waimea.

Drainage area.--3.33 aq mi.

Records available.--July 1919 to July 1932, June 1954 to June 1967. Prior to July 1960, published as "at altitude 3,700 ft, near Waimea."

Gage.--Water-stage recorder. Altitude of gage is 3,770 ft (from topographic map).

Average discharge.--26 years, 18.1 mgd (28.0 cfs).

Extremes.--Maximum discharge during year, 2,220 mgd (3,430 cfs) July 26 (gage height, 4.22 ft), from rating curve extended above 700 mgd; minimum, 0.92 mgd (1.4 cfs) Feb. 8.
1919-32, 1954-67: Maximum discharge, 4,210 mgd (6,510 cfs) Oct. 23, 1956 (gage height, 5.88 ft), from rating curve extended above 350 mgd; minimum, 0.6 mgd (0.9 cfs) May 21, 22, 1929.

Remarks.--Records fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	26	3.3	3.3	1.4	25	2.1	62	2.3	9.5	15	2.3	5.1
2	26	3.7	2.8	1.4	8.4	1.8	32	1.9	7.3	10	3.3	4.7
3	6.8	4.4	2.8	1.4	18	1.8	125	1.6	4.7	25	36	5.1
4	3.7	6.8	3.0	1.4	158	94	52	1.4	4.0	88	15	10
5	3.7	5.5	2.3	1.4	68	26	47	1.3	2.8	161	5.5	12
6	4.0	5.9	2.3	20	60	5.1	36	1.1	7.9	19	4.0	6.4
7	4.4	10	2.1	22	17	3.3	18	1.1	10	8.9	2.8	4.7
8	3.0	8.4	1.9	7.8	7.8	2.3	36	1.0	6.8	22	3.0	4.0
9	2.6	5.9	1.9	4.0	5.5	1.9	13	1.0	5.1	129	4.4	3.0
10	2.1	3.3	1.9	5.7	4.4	1.6	6.4	78	3.3	151	2.3	3.0
11	1.6	3.0	2.3	83	5.5	1.4	8.4	121	2.6	284	1.8	3.7
12	1.4	4.4	6.8	6.4	51	1.3	45	51	23	80	1.6	5.5
13	1.1	3.7	5.5	5.1	11	1.3	184	48	9.5	65	1.4	4.0
14	1.3	9.5	5.9	8.4	5.1	1.3	78	78	4.7	51	1.3	3.0
15	4.0	5.9	6.8	347	25	1.1	14	85	3.3	34	2.1	2.6
16	4.4	4.0	8.4	354	13	1.0	6.4	64	2.6	13	3.4	2.3
17	26	3.0	5.9	53	5.5	2.6	4.7	8.9	29	7.8	5.1	2.1
18	23	3.0	4.7	9.5	4.0	53	5.1	16	9.5	6.4	8.9	1.9
19	4.4	4.7	5.5	6.8	3.0	5.1	5.1	10	5.1	4.7	6.8	1.8
20	12	4.7	8.4	4.7	3.0	3.3	4.7	11	28	4.7	130	1.8
21	10	4.0	9.5	3.7	2.8	31	4.0	6.8	51	4.4	160	1.6
22	7.8	5.5	7.8	3.0	106	36	3.0	4.4	19	3.3	1070	1.6
23	3.7	24	4.7	2.6	209	32	2.6	4.0	195	2.8	98	1.6
24	2.6	41	3.0	2.3	21	6.4	80	3.7	58	2.6	17	1.6
25	292	83	2.3	1.9	28	59	16	3.3	54	2.1	8.9	2.6
26	318	60	1.9	1.9	24	143	5.9	4.0	71	1.9	6.8	6.4
27	13	47	1.8	1.8	16	30	4.0	43	53	1.8	5.1	7.9
28	5.9	9.5	1.6	1.6	5.1	112	3.0	13	31	2.1	9.1	9.5
29	4.0	5.9	1.9	1.4	3.3	325	2.6	----------	16	2.1	7.3	4.3
30	3.3	4.7	1.8	2.3	2.8	165	4.0	----------	9.5	2.1	16	2.8
31	3.3	4.0	----------	7.3	----------	147	3.3	----------	13	----------	12	----------
Total	825.1	391.7	120.8	974.2	916.2	1297.7	911.2	665.8	749.2	1204.7	1651.2	126.3
Mean												
Mgd	26.6	12.6	4.03	31.4	30.5	41.9	29.4	23.8	24.2	40.2	53.3	4.21
Cfs	41.2	19.5	6.24	48.6	47.2	64.8	45.5	36.8	37.4	62.2	82.5	6.51
Ac-ft	2530	1200	371	2990	2810	3980	2800	2040	2300	3700	5070	388
Max	318	83	9.5	354	209	325	184	121	195	284	1070	12
Min	1.1	3.0	1.6	1.4	2.8	1.0	2.6	1.0	2.6	1.8	1.3	1.6

Calendar Year 1966: Max 354 Min 0.74 Mean (mgd) 16.2 Mean (cfs) 25.1 Ac-ft 18170
Fiscal Year 1966-67: Max 1070 Min 1.0 Mean (mgd) 26.9 Mean (cfs) 41.6 Ac-ft 30180

Peak discharge (base, 900 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-26	0030	4.22	2,220	3,430	12-29	0800	3.46	1,500	2,320
10-16	1430	3.02	1,140	1,760	5-22	1230	3.95	1,950	3,020
11-22	2330	2.72	900	1,390					

16-0190. Waialae Stream at altitude 3,820 ft, near Waimea

Location.--Lat 22°05'20", long 159°34'18", on left bank 5.0 miles northeast of mouth and 10.6 miles northeast of Waimea.

Drainage area.--2.5 sq mi, approximately.

Records available.--January 1920 to July 1932, June 1952 to June 1967. Prior to July 1954, published as Waialae River at altitude 3,700 ft, near Waimea.

Gage.--Water-stage recorder. Altitude of gage is 3,820 ft (from topographic map).

Average discharge.--27 years, 14.1 mgd (21.8 cfs).

Extremes.--Maximum discharge during year, 1,140 mgd (1,760 cfs) May 22 (gage height, 5.27 ft); minimum, 1.1 mgd (1.7 cfs) Oct. 5.
1920-32, 1952-67: Maximum discharge, 2,930 mgd (4,530 cfs) Jan. 16, 1921 (gage height, 8.44 ft), from rating curve extended above 720 mgd on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.64 mgd (0.99 cfs) May 17, 18, May 30 to June 2, 1966.

Remarks.--Records fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	21	2.3	2.3	1.4	7.7	3.4	60	4.0	5.2	8.9	1.7	5.5
2	11	2.4	2.0	1.3	7.0	3.0	35	3.4	4.5	5.2	1.8	5.2
3	4.0	2.3	2.3	1.2	9.8	3.4	100	3.0	4.0	9.4	13	5.7
4	2.4	3.0	2.2	1.2	165	109	45	2.8	3.4	57	5.5	11
5	2.3	3.0	1.8	1.1	64	35	35	2.7	2.8	141	2.7	7.3
6	2.3	3.0	1.7	6.2	74	6.8	25	2.6	4.7	11	2.2	4.7
7	3.0	4.5	1.6	8.1	16	5.0	12	2.4	5.7	5.7	1.8	3.6
8	2.0	4.0	1.6	4.1	7.7	4.0	17	2.3	5.7	8.1	2.0	3.0
9	1.9	3.4	1.5	2.6	5.5	3.4	9.4	2.4	4.5	147	2.2	2.7
10	1.7	2.3	1.4	2.3	4.3	3.0	6.5	64	3.4	123	1.8	2.7
11	1.4	2.0	1.6	37	6.9	2.7	7.0	110	2.7	190	1.7	2.8
12	1.3	2.0	4.0	4.1	40	2.6	24	66	31	42	1.6	2.8
13	1.2	1.9	3.8	4.7	6.5	2.4	92	56	9.4	55	1.6	2.6
14	1.2	3.0	3.6	6.5	4.5	2.4	61	73	4.3	30	1.5	2.3
15	1.7	2.8	4.1	239	15	2.2	12	72	3.6	14	1.9	2.2
16	2.2	2.0	2.6	259	8.1	2.0	6.8	58	2.8	7.0	9.2	2.0
17	16	1.7	2.8	40	4.5	3.1	5.7	8.9	36	5.2	5.0	1.9
18	15	1.6	2.7	8.1	4.1	20	5.5	14	8.9	4.5	4.7	1.9
19	3.8	1.9	3.6	5.7	4.1	5.0	5.0	7.7	5.2	4.1	3.8	1.8
20	8.5	2.2	4.1	4.3	3.2	4.0	4.7	7.0	32	3.8	61	1.6
21	6.8	1.9	4.3	3.6	2.8	25	4.1	5.2	42	3.2	36	1.6
22	8.1	2.2	4.1	3.0	42	32	3.8	4.1	150	2.8	418	1.6
23	3.4	11	2.8	2.7	120	25	3.6	4.0	146	2.7	49	1.5
24	2.2	27	2.0	2.3	14	7.0	102	3.6	38	2.4	8.9	1.5
25	138	69	1.7	2.2	29	50	17	3.2	28	2.3	6.0	2.4
26	111	44	1.6	2.0	18	130	7.3	3.6	34	2.2	5.0	3.4
27	7.7	36	1.5	1.9	11	30	5.2	16	34	2.0	4.3	5.3
28	4.3	6.0	1.4	1.8	6.0	100	4.7	6.0	20	2.0	5.2	5.2
29	3.0	3.8	1.8	1.7	4.7	300	4.1	----------	10	1.8	5.7	2.7
30	2.6	2.8	1.7	1.8	4.0	150	6.3	----------	6.3	1.7	11	1.9
31	2.4	2.4	----------	2.7	----------	130	4.7	----------	7.5	----------	6.8	----------
Total	393.4	257.4	74.2	663.6	709.4	1201.4	731.4	607.9	695.6	895.0	682.6	100.4
Mean												
Mgd	12.7	8.30	2.47	21.4	23.6	38.8	23.6	21.7	22.4	29.8	22.0	335
Cfs	19.6	12.8	3.82	33.1	36.5	60.0	36.5	33.6	34.7	46.1	34.0	5.18
Ac-ft	1210	790	228	2040	2180	3690	2240	1870	2130	2750	2090	308
Max	138	69	4.3	259	165	300	102	110	150	190	418	11
Min	1.2	1.6	1.4	1.1	2.8	2.0	3.6	2.3	2.7	1.7	1.5	1.5

Calendar Year 1966: Max 300 Min 0.64 Mean (mgd) 11.4 Mean (cfs) 17.6 Ac-ft 12,720
Fiscal Year 1966-67: Max 418 Min 1.1 Mean (mgd) 19.2 Mean (cfs) 29.7 Ac-ft 21,520

Peak discharge (base, 840 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
2-11	2200	4.51	845	1,310	5-22	0400	5.27	1,140	1,760

16-0220. Kekaha ditch at Camp 1, near Waimea

Location.--lat 22°02'35", long 159°38'30", on right bank 0.2 mile downstream from lower intake and 6.2 miles northeast of Waimea.

Records available.--May 1908 to February 1909, April, June, September, November 1909, January 1910 to June 1915, March 1916 to August 1917, October 1917 to June 1967. Prior to January 1910 and August 1932 to June 1933 monthly discharge only, published in WSP 1319; figures of daily discharge for latter period published in WSP 755 are unreliable. Published as "at intake, near Waimea" January 1910 to December 1911 and as "at Flume No. 4, near Waimea" March 1916 to June 1917.

Gage.--Water-stage recorder. Altitude of gage is 520 ft (by barometer). Prior to July 12, 1921, staff gage at several sites within 1 mile of present site at various datums.

Average discharge.--54 years (1910-15, 1916-17, 1918-24, 1925-67), 36.5 mgd (56.5 cfs).

Extremes.--1908-67: Maximum daily discharge, 67 mgd (104 cfs) Jan. 6, Mar. 3, 6, 7, 17, 18, 24-26, 29-31, 1921; no flow at times.

Remarks.--Records good. Ditch diverts from Waimea River 1 mile downstream from Waialae Stream for irrigation in vicinity of Kekaha.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	42	32	35	27	47	34	32	52	51	42	43	50
2	50	41	30	26	48	33	32	50	51	39	43	52
3	45	32	29	26	48	35	32	50	50	43	49	52
4	34	33	30	26	31	34	41	48	48	43	51	52
5	30	34	29	25	31	45	51	45	43	43	48	53
6	31	33	28	28	32	37	52	43	49	39	43	50
7	33	39	27	47	27	38	52	42	51	42	41	48
8	30	40	27	46	34	49	53	40	50	45	45	44
9	29	38	26	35	33	47	53	39	49	47	48	42
10	28	32	26	33	33	45	52	46	43	57	41	41
11	27	30	26	47	34	42	51	32	40	56	38	41
12	26	30	28	45	34	39	54	52	45	55	37	43
13	26	30	35	35	33	38	45	45	53	54	36	41
14	26	32	31	39	33	37	39	29	50	56	36	39
15	27	37	33	48	37	35	41	.04	46	56	41	37
16	28	32	31	47	35	34	53	.04	41	55	50	36
17	30	30	30	49	33	34	50	.04	49	55	50	36
18	46	28	31	49	33	34	49	.04	53	54	51	35
19	39	28	29	47	34	44	45	.04	51	52	52	34
20	39	30	34	41	35	42	42	26	52	50	48	33
21	47	30	33	37	35	47	44	52	36	51	48	33
22	43	30	37	34	34	52	42	51	33	50	39	33
23	36	44	33	33	30	52	39	50	33	51	53	32
24	30	50	29	31	31	49	53	49	31	51	54	32
25	37	50	28	30	34	48	54	47	33	50	53	32
26	48	50	27	29	33	50	54	47	34	50	53	36
27	50	50	26	28	31	43	52	51	36	49	52	36
28	44	48	26	28	32	31	52	51	40	48	52	46
29	37	39	29	28	32	28	52	----------	41	46	52	37
30	33	34	28	28	35	32	53	----------	39	44	49	33
31	31	34	----------	39	----------	32	53	----------	38	---------	48	--------
Total	1,102	1,120	891	1,111	1,032	1,240	1,467	1,037.20	1,359	1,473	1,444	1,209
Mean												
Mgd	35.5	36.1	29.7	35.8	34.4	40.0	47.3	37.0	43.8	49.1	46.6	40.3
Cfs	54.9	55.9	46.0	55.4	53.2	61.9	73.2	57.2	67.8	76.0	72.1	62.4
Ac-ft	3,380	3,440	2,730	3,410	3,170	3,810	4,500	3,180	4,170	4,520	4,430	3,710
Max	50	50	37	49	48	52	54	52	53	57	54	53
Min	26	28	26	25	27	28	32	0.04	31	39	36	32

Calendar Year 1966: Max 52 Min 25 Mean (mgd) 34.2 Mean (cfs) 52.9 Ac-ft 38,300
Fiscal Year 1966-67: Max 57 Min 0.04 Mean (mgd) 39.7 Mean (cfs) 61.4 Ac-ft 44,450

16-0291. Waimea ditch below wasteway, near Waimea

Location.--Iat 21°59'10", long 159°39'59", on left bank at tunnel No. 4 outlet and below wasteway, 1.3 miles downstream from intake, and 2 miles north of Waimea.

Records available.--February 1960 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 131.2 ft above mean sea level (by stadia survey).

Average discharge.--7 years, 2.80 mgd (4.33 cfs).

Extremes.--1960-67: Maximum daily discharge, 8.9 mgd (14 cfs) Mar. 11, 12, 1965; no flow at times.

Remarks.--Records good. Ditch diverts from Waimea River for irrigation of sugarcane in vicinity of Waimea.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.1	3.0	3.6	1.4	2.6	0.78	0.83	0.18	4.7	0.50	2.4	4.0
2	4.8	5.1	2.6	1.3	3.2	.65	.78	.16	4.1	.50	2.4	4.0
3	.73	3.3	2.5	1.3	3.3	.50	1.3	.12	3.7	.50	3.6	2.1
4	.05	3.0	2.3	1.3	3.2	1.0	3.0	.06	3.2	.50	6.2	.39
5	1.6	3.3	2.2	1.2	.14	1.7	5.1	.03	2.1	.50	4.2	2.0
6	2.3	3.2	2.2	1.2	0	1.4	3.4	0	.35	1.8	3.0	2.4
7	2.3	3.2	2.1	3.6	.05	1.1	.32	.02	3.8	3.8	2.5	1.6
8	2.4	4.1	2.0	4.1	.06	3.4	.32	.56	3.9	4.2	3.1	1.1
9	2.2	3.7	2.0	2.5	.02	4.5	1.1	2.5	3.4	5.5	3.7	.77
10	2.0	3.0	2.0	2.0	0	1.9	1.0	2.7	2.8	5.2	3.0	.61
11	2.1	2.5	1.9	4.3	0	.39	0	1.7	2.5	3.8	2.4	.53
12	2.0	2.4	1.9	4.6	.02	.73	0	.01	2.8	3.2	2.1	.50
13	2.2	2.3	2.3	2.8	0	.88	0	.01	3.1	4.2	2.0	.43
14	2.3	2.3	2.3	2.5	0	.38	0	0	3.2	4.0	1.9	.43
15	1.4	2.8	2.3	4.2	0	0	1.0	0	3.5	4.1	2.2	.57
16	.32	2.7	2.2	2.7	0	0	2.8	1.4	2.5	3.7	3.9	.53
17	.29	2.2	2.0	.84	0	0	5.2	1.7	3.0	3.4	1.8	.46
18	4.6	2.0	2.0	3.0	0	.09	4.8	1.3	5.8	3.2	2.6	.46
19	4.7	1.9	1.9	4.4	0	.16	2.6	1.3	1.5	3.2	2.9	.65
20	3.0	1.9	2.0	3.4	0	.05	1.2	1.3	2.8	3.7	3.1	1.0
21	5.0	1.8	2.0	2.6	0	.05	.98	1.2	1.2	4.1	2.4	1.2
22	4.0	1.7	2.0	2.4	0	.39	.98	.76	.80	4.0	2.3	1.5
23	3.7	2.4	1.9	2.2	0	.43	.73	1.7	.30	3.7	2.8	2.4
24	2.5	5.5	1.6	2.2	0	.24	1.6	2.6	.16	3.5	2.3	2.4
25	2.4	6.2	1.4	2.1	0	.08	1.7	2.4	.16	3.2	1.9	2.3
26	1.3	6.4	1.4	2.0	0	.46	1.5	2.2	.16	3.1	4.0	2.5
27	1.3	5.2	1.4	2.0	0	.39	.83	3.9	.20	2.8	4.9	3.1
28	3.4	2.5	1.6	1.9	0	.24	.50	5.1	.25	2.7	3.1	3.5
29	3.8	2.9	1.6	1.9	.44	.65	.46	----------	.50	2.7	3.4	4.2
30	3.2	2.8	1.6	1.9	.93	.93	.60	----------	.50	2.5	4.3	3.0
31	3.1	2.7	----------	2.1	----------	.83	.24	----------	.50	----------	4.6	----------
Total	78.09	98.0	60.8	75.94	13.96	24.30	44.87	34.91	67.48	91.80	95.0	50.63
Mean												
Mgd	2.52	3.16	2.03	2.45	0.465	0.784	1.45	1.25	2.18	3.06	3.06	1.69
Cfs	3.90	4.89	3.14	3.79	0.719	1.21	2.24	1.93	3.37	4.73	4.73	2.61
Ac-ft	240	301	187	233	43	75	138	107	207	282	292	155
Max	5.0	6.4	3.6	4.6	3.3	4.5	5.2	5.1	5.8	5.5	6.2	4.2
Min	0.05	1.7	1.4	0.84	0	0	0	0	0.16	0.50	1.8	0.39

Calendar Year 1966: Max 7.7 Min 0 Mean (mgd) 2.43 Mean (cfs) 3.76 Ac-ft 2.720
Fiscal Year 1966-67: Max 6.4 Min 0 Mean (mgd) 2.02 Mean (cfs) 3.13 Ac-ft 2.260

Note.--No gage-height record Mar. 14 to Apr. 13.

16-0310. Waimea River near Waimea

Location.--Lat 21°59'02", long 159°39'46", on right bank 1.2 miles upstream from Makaweli River and 1.8 miles north of Waimea.

Drainage area.--57.8 sq mi.

Records available.--July 1910 to June 1918, July to October 1919, November 1943 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (by hand levels from mouth of Makaweli River). Prior to Oct. 5, 1911, staff gage at site 1 mile downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, staff gage at present site at different datum.

Average discharge.--30 years (1911-18, 1944-67), 87.5 mgd (135 cfs).

Extremes.--Maximum discharge during year, 8,280 mgd (12,800 cfs) Jan. 13 (gage height, 12.19 ft), from rating curve extended above 3,400 mgd as explained below; minimum, 0.11 mgd (0.17 cfs) July 7.
1910-19, 1943-67: Maximum discharge, 24,000 mgd (37,100 cfs) Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 3,400 mgd on basis of slope-area measurements at gage heights 10.28 and 18.7 ft; practically no flow occasionally owing to upstream diversions.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Several upstream diversions for power and irrigation.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.58	0.48	2.1	1.2	27	19	68	51	23	87	5.3	27
2	37	4.0	.85	1.2	16	16	58	29	16	66	5.1	32
3	16	.70	.90	1.2	14	14	400	20	12	70	17	25
4	3.4	.55	.85	1.2	1,570	230	220	17	8.5	94	35	23
5	1.1	.58	.80	1.2	590	80	140	15	7.8	363	9.1	36
6	.38	.58	.75	5.0	401	40	150	14	11	122	4.2	19
7	.28	.60	.70	2.7	216	27	70	13	38	52	4.0	11
8	.33	1.1	.55	1.7	107	17	170	12	15	80	7.1	8.3
9	.40	.90	.55	1.3	62	14	70	7.8	12	398	11	7.4
10	.38	.70	.80	1.9	30	12	35	98	7.4	748	5.5	7.1
11	.34	.70	.90	140	19	11	30	253	5.7	1,460	4.0	6.9
12	.30	.80	.80	30	15	10	600	553	15	685	3.6	6.4
13	.71	.90	1.1	17	13	9.0	3,000	138	100	306	3.5	6.9
14	.65	.90	1.3	13	11	9.0	700	247	25	273	3.5	6.2
15	.80	1.2	.75	60	10	9.0	170	216	7.6	296	32	5.5
16	1.7	.95	1.1	250	12	9.0	120	282	4.9	119	20	5.1
17	1.9	.80	1.0	150	21	9.0	89	126	84	76	23	4.8
18	37	.80	1.0	42	14	150	54	107	82	59	15	5.1
19	2.3	.80	1.0	11	13	60	43	102	31	51	27	4.9
20	.32	.75	1.0	2.7	24	25	37	74	117	42	108	4.1
21	.90	.80	1.6	1.2	20	60	30	42	324	31	667	3.6
22	.48	.75	1.4	.85	18	64	26	26	869	25	2,760	4.9
23	.75	1.7	1.2	.70	874	35	24	16	1,360	21	567	3.4
24	.52	52	1.2	.65	160	27	532	13	637	17	132	3.4
25	554	86	1.0	.75	107	31	192	11	352	12	73	3.2
26	442	202	1.6	.75	102	800	94	11	304	11	51	2.9
27	56	72	1.2	.75	88	140	62	162	192	8.5	35	2.9
28	8.5	28	1.2	1.1	53	350	49	63	313	6.9	28	3.4
29	.60	3.2	1.2	1.2	31	1,400	42	----------	138	6.4	31	3.3
30	.55	.80	1.2	1.3	24	170	63	----------	124	5.7	37	2.1
31	.48	.80	----------	1.3	----------	100	66	----------	80	----------	45	----------
Total	1,170.65	466.84	31.60	744.85	4,662	3,947.0	7,404	2,718.8	5,315.9	5,591.5	4,768.9	284.8
Mean												
Mgd	37.8	15.1	1.05	24.0	155	127	239	97.1	171	186	154	9.49
Cfs	58.5	23.4	1.62	37.1	240	196	370	150	265	288	238	14.7
Ac-ft	3,590	1,430	97	2,290	14,310	12,110	22,720	8,340	16,310	17,160	14,640	874
Max	554	202	2.1	250	1,570	1,400	3,000	553	1,360	1,460	2,760	36
Min	0.28	0.48	0.55	0.65	10	9.0	24	7.8	4.9	5.7	3.5	2.1

Calendar Year 1966: Max 1,570 Min 0.28 Mean (mgd) 42.7 Mean (cfs) 66.1 Ac-ft 47,810
Fiscal Year 1966-67: Max 3,000 Min 0.28 Mean (mgd) 102 Mean (cfs) 158 Ac-ft 113,900

Note.--No gage-height record Sept. 18 to Oct. 17, Dec. 1 to Jan. 16.

Peak discharge (base, 5,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs
1-13	-	12.19	8,280	12,800

16-0360. Makaweli River near Waimea

Location.--Lat 21°58'31", long 159°38'55", on left bank 0.7 mile upstream from mouth and 1.9 miles northeast of Waimea.

Drainage area.--25 sq mi, approximately.

Records available.--July 1943 to June 1967. Records for October 1911 to June 1917 at site 0.2 mile downstream not equivalent owing to intervening diversion.

Gage.--Water-stage recorder. Datum of gage is 18.2 ft above mean sea level (by stadia survey). July 27, 1943, to June 15, 1959, at datum 1.00 ft higher.

Average discharge.--23 years (1944-67), 56.2 mgd (87.0 cfs).

Extremes.--Maximum discharge during year, 4,160 mgd (6,440 cfs) May 22 (gage height, 8.28 ft), from rating curve extended above 2,100 mgd as explained below; minimum, 7.3 mgd (11 cfs) Sept. 9.
1943-67: Maximum discharge, 10,300 mgd (15,900 cfs) Apr. 15, 1963 (gage height, 12.25 ft), from rating curve extended above 2,100 mgd on basis of slope-area measurement at gage height 10.65 ft; minimum, 2.05 mgd (3.15 cfs) July 19, 1951.

Remarks.--Records good. Olokele ditch diverts all low flow from Olokele River 9 miles above station for irrigation near Makaweli.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	43	12	11	8.5	18	18	385	19	27	64	16	26
2	42	12	9.8	7.9	20	16	154	18	23	39	28	27
3	17	14	9.5	8.2	26	16	153	17	18	95	89	29
4	12	13	9.1	8.2	224	292	131	17	18	99	37	34
5	13	11	8.5	7.9	332	202	64	16	16	504	17	32
6	19	10	8.2	27	206	59	50	15	19	102	19	23
7	15	11	8.2	13	108	37	32	15	18	42	18	20
8	12	37	7.9	11	60	26	27	15	21	34	21	19
9	11	14	7.6	9.5	38	21	23	14	19	188	21	18
10	10	11	7.6	9.1	28	19	20	270	16	230	16	18
11	9.8	14	26	72	31	17	19	402	15	305	15	18
12	9.8	12	43	14	215	16	27	604	72	147	15	18
13	11	10	14	12	56	15	122	273	58	97	14	16
14	28	12	11	23	25	15	165	361	21	131	15	16
15	14	11	12	600	57	14	47	409	18	95	19	15
16	10	10	9.1	1,080	60	14	29	420	17	60	38	15
17	35	9.8	9.5	307	22	13	23	87	79	47	31	15
18	63	9.8	8.8	53	18	27	24	113	56	35	18	14
19	13	11	11	30	18	15	19	58	28	32	17	13
20	34	9.8	15	21	16	13	18	44	94	28	186	13
21	17	9.1	10	17	21	19	17	33	152	24	205	13
22	17	8.8	10	15	19	33	16	27	441	22	1,260	13
23	14	20	9.5	14	352	91	16	26	496	21	377	12
24	11	33	8.5	13	159	32	208	25	204	23	81	12
25	322	211	8.2	12	95	37	82	23	110	22	45	24
26	358	141	8.2	12	104	180	40	23	262	21	35	20
27	53	190	7.9	11	69	68	29	30	211	18	39	26
28	20	27	8.8	11	34	122	24	21	183	18	55	36
29	15	14	9.5	10	24	843	22	----------	71	17	49	14
30	14	12	9.8	10	20	609	35	----------	55	17	71	13
31	13	11	----------	10	----------	634	23	----------	56	---------	30	---------
Total	1,275.6	931.3	337.2	2,457.3	2,475	3,533	2,044	3,395	2,894	2,577	2,897	582
Mean												
Mgd	41.1	30.0	11.2	79.3	82.5	114	65.9	121	93.4	85.9	93.5	19.4
Cfs	63.6	46.4	17.3	123	128	176	102	187	145	133	145	30.0
Ac-ft	3,910	2,860	1,030	7,540	7,600	10,840	6,270	10,420	8,880	7,910	8,890	1,790
Max	358	211	43	1,080	352	843	385	604	496	504	1,260	36
Min	9.8	8.8	7.6	7.9	16	13	16	14	15	17	14	12

Calendar Year 1966: Max 1,080 Min 7.6 Mean (mgd) 40.2 Mean (cfs) 62.2 Ac-ft 45,010
Fiscal Year 1966-67: Max 1,260 Min 7.6 Mean (mgd) 69.6 Mean (cfs) 108 Ac-ft 77,940

Peak discharge (base, 3,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-16	1700	7.82	3,630	5,620	5-22	1830	8.28	4,160	6,440
2-11	2330	7.91	3,730	5,770					

16-0490. Hanapepe River below Manuahi Stream, near Eleele

Location.--Lat 21°57'29", long 159°33'13", on left bank 200 ft downstream from Manuahi Stream and 4 miles northeast of Eleele.

Drainage area.--18.8 sq mi.

Records available.--July 1917 to January 1921, December 1926 to June 1967. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site half a mile upstream not equivalent owing to inflow.

Gage.--Water-stage recorder. Datum of gage is 222 ft above mean sea level (by stadia survey). July 1, 1917, to Jan. 22, 1921, staff gage and Dec. 16, 1926, to June 30, 1951, water-stage recorder, at same site at datum 1.00 ft higher.

Average discharge.--43 years (1917-20, 1927-67), 54.9 mgd (84.9 cfs).

Extremes.--Maximum discharge during year, 5,440 mgd (8,420 cfs) Feb. 10 (gage height, 8.41 ft), from rating curve extended above 840 mgd as explained below; minimum, 6.0 mgd (9.3 cfs) June 17-21.
1917-21, 1926-67: Maximum discharge, 25,200 mgd (39,000 cfs) Apr. 15, 1963 (gage height, 14.87 ft), from rating curve extended above 4,900 mgd on basis of slope-area measurement of peak flow; minimum, 3.3 mgd (5.1 cfs) May 21, 1954.

Remarks.--Records good. Hanapepe ditch diverts 3 miles above station for irrigation in vicinity of Makaweli.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	36	12	15	7.9	15	41	339	50	19	58	12	14
2	49	12	12	7.9	14	39	171	48	19	51	26	12
3	16	14	10	7.9	15	38	106	30	16	127	103	12
4	12	15	9.7	7.6	84	186	60	13	19	129	32	15
5	12	12	8.8	7.6	286	136	40	13	16	453	16	10
6	19	12	8.5	38	122	59	32	13	21	150	19	9.7
7	14	12	9.1	7.9	68	47	24	12	15	73	17	8.5
8	11	77	8.5	7.3	59	39	20	12	21	37	24	8.2
9	11	21	8.2	7.0	68	33	18	12	17	40	18	7.6
10	10	12	8.2	7.3	62	30	17	521	14	42	15	7.6
11	9.7	21	58	170	64	29	16	455	13	69	13	7.9
12	9.4	12	51	8.2	309	28	17	444	72	48	12	7.9
13	9.1	12	12	13	123	26	48	222	40	36	12	6.7
14	11	25	24	13	74	24	93	238	19	141	18	6.5
15	10	12	19	606	151	24	26	322	14	63	12	6.5
16	10	12	11	986	114	24	16	405	13	72	13	6.2
17	42	11	13	282	74	23	14	100	36	39	13	6.0
18	46	11	11	79	61	25	16	147	17	23	12	6.0
19	12	12	11	37	59	22	14	71	14	20	12	6.0
20	42	11	11	24	80	17	20	48	166	17	60	6.0
21	35	11	12	22	72	15	15	33	186	16	135	6.0
22	19	11	13	18	61	40	14	26	490	15	535	6.2
23	13	12	11	15	316	42	12	25	384	14	320	6.7
24	11	42	8.8	14	258	15	262	22	136	19	48	7.0
25	359	336	8.5	13	169	33	62	20	88	26	19	10
26	258	151	8.8	12	158	96	26	22	417	38	14	8.8
27	73	271	8.5	11	125	31	19	20	553	15	14	10
28	29	58	8.2	11	71	125	16	17	259	13	29	9.4
29	18	24	8.8	11	56	457	14	----------	87	12	16	6.5
30	16	37	8.2	11	50	390	38	----------	50	12	103	6.7
31	13	18	----------	11	----------	525	52	----------	64	----------	18	----------
Total	1235.2	1309	414.8	2473.6	3238	2659	1637	3361	3295	1868	1710	247.6
Mean												
Mgd	39.8	42.2	13.8	79.8	108	85.8	52.8	120	106	62.3	55.2	8.25
Cfs	61.6	65.3	21.4	123	167	133	81.7	186	164	96.4	85.4	12.8
Ac-ft	3,790	4,020	1,270	7,590	9,940	8,160	5,020	10,310	10,110	5,730	5,250	760
Max	359	336	58	986	316	525	339	521	553	453	535	15
Min	9.1	11	8.2	7.0	14	15	12	12	13	12	12	6.0

Calendar Year 1966: Max 986 Min 7.0 Mean (mgd) 39.1 Mean (cfs) 60.5 Ac-ft 43,850
Fiscal Year 1966-67: Max 986 Min 6.0 Mean (mgd) 64.2 Mean (cfs) 99.3 Ac-ft 71,960

Peak discharge (base, 2,300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-16	1630	7.30	3,810	5,890	2-10	1830	8.41	5,440	8,420
11- 5	0630	6.50	2,830	4,380					

16-0525. Lawai Stream near Koloa

Location.--Lat 21°54'03", long 159°30'19", on right bank at private road bridge, 0.9 mile upstream from mouth, and 2.6 miles southwest of Koloa.

Drainage area.--6.60 sq mi.

Records available.--Fiscal years 1962-63 (annual maximums), July 1963 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 37.0 ft above mean sea level (by stadia survey). Apr. 24, 1962, to June 30, 1963, crest-stage gage at same site and datum.

Extremes.--Maximum discharge during year, 780 mgd (1,210 cfs) Feb. 11 (gage height, 6.84 ft), from rating curve extended above 120 mgd as explained below; minimum, 0.04 mgd (0.06 cfs) Aug. 18.
1961-67: Maximum discharge, 2,290 mgd (3,540 cfs) Mar. 14, 1963 (gage height, 9.56 ft), from rating curve extended above 120 mgd on basis of slope-area measurements at gage heights 7.70 and 9.56 ft.
1963-67: Minimum discharge, that of Aug. 18, 1966.

Remarks.--Records fair. Several diversions above station for irrigation of sugarcane in vicinity of Lawai.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.84	1.1	11	0.41	0.20	0.96	18	5.9	3.5	14	2.8	2.4
2	.47	1.0	5.7	.30	.80	.88	14	2.4	3.6	13	3.2	2.2
3	.38	.80	5.0	.25	.51	.88	9.8	2.3	3.2	15	3.2	1.7
4	.38	.80	4.8	.25	2.9	3.5	3.9	2.0	2.9	8.7	3.0	1.4
5	.57	.98	4.3	.18	30	10	2.8	2.0	2.8	12	3.0	1.9
6	.65	.51	4.0	.30	8.4	2.6	2.6	2.8	7.1	8.0	2.7	1.6
7	.42	.62	4.0	.20	2.9	1.6	2.2	4.6	3.6	6.0	2.6	1.4
8	.42	.80	3.9	.36	1.6	1.3	1.8	2.6	3.8	5.4	4.0	1.4
9	.38	.56	3.6	.30	1.2	1.5	1.5	2.3	3.8	5.1	3.2	1.7
10	.33	.46	3.5	.41	1.2	1.0	1.4	8.5	3.4	5.6	2.7	1.4
11	.38	.80	14	7.3	.80	.88	1.5	33	2.9	5.5	2.6	1.4
12	.33	.30	5.0	1.6	.96	.80	1.9	52	4.1	5.3	2.7	1.6
13	.36	.18	4.4	1.2	.96	.80	4.8	18	3.6	5.0	2.4	8.2
14	.36	.36	3.9	.88	.67	.80	13	14	2.6	13	2.2	1.4
15	.38	.20	3.3	11	1.2	.72	4.0	20	2.4	6.7	2.3	1.4
16	.40	.12	2.7	17	.96	.62	2.8	34	2.3	4.9	2.7	1.1
17	.40	.12	2.5	7.3	.72	.51	2.3	17	2.8	4.3	2.7	1.0
18	.54	.10	2.3	2.7	.62	.51	2.3	16	2.3	4.1	2.5	1.0
19	.51	.10	2.2	1.6	.62	.46	2.3	13	2.8	4.1	2.4	.96
20	.69	.10	2.2	1.1	1.4	.36	2.3	11	39	4.4	2.3	1.0
21	.47	.12	2.3	.88	13	.51	2.0	7.9	37	4.1	7.9	1.4
22	.40	.20	2.2	.76	.88	.56	1.8	4.7	61	3.6	13	1.3
23	.36	.18	1.7	.67	22	.88	1.9	4.1	35	3.4	9.2	1.1
24	.36	.20	1.4	.46	14	.51	13	3.6	20	3.9	3.2	.72
25	8.7	27	1.1	.62	3.2	.65	3.6	3.5	17	3.4	2.6	.96
26	3.0	22	.96	.73	2.5	1.4	2.8	3.5	31	5.1	2.4	.96
27	2.0	5.7	.80	.51	2.0	.67	2.6	3.3	43	3.4	2.4	.88
28	2.0	5.1	.62	5.7	1.2	1.5	2.5	3.3	38	3.2	2.4	.88
29	1.8	4.8	.56	.25	2.2	6.6	2.3	----------	21	2.9	2.2	1.3
30	.62	4.6	.51	.15	1.2	4.9	4.7	----------	17	2.8	2.6	.96
31	.56	4.7	----------	.13	----------	12	5.7	----------	16	----------	2.9	----------
Total	29.46	84.61	104.45	65.50	109.10	60.86	138.1	297.3	438.5	185.9	106.0	46.62
Mean												
Mgd	0.950	2.73	3.48	2.11	3.64	1.96	4.45	10.6	14.1	6.20	3.42	1.55
Cfs	1.47	4.22	5.38	3.26	5.63	3.03	6.89	16.4	21.8	9.59	5.29	2.40
Ac-ft	90	260	321	201	335	187	424	912	1,350	571	325	143
Max	8.7	27	14	17	30	12	18	52	61	15	13	8.2
Min	0.33	0.10	0.51	0.13	0.20	0.36	1.4	2.0	2.3	2.8	2.2	0.72

Calendar Year 1966: Max 30 Min 0.10 Mean (mgd) 1.83 Mean (cfs) 2.83 Ac-ft 2,050
Fiscal Year 1966-67: Max 61 Min 0.10 Mean (mgd) 4.57 Mean (cfs) 7.07 Ac-ft 5,110

Peak discharge (base, 730 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
2-11	2300	6.84	780	1,210

16-0534. Upper Haiku ditch near Puhi

Location.--Lat 21°58'48", long 159°27'12", on right bank 20 ft upstream from flume crossing a tributary to Kamooloa Stream, 0.8 mile downstream from intake on Papuaa Stream, and 3.6 miles west of Puhi.

Records available.--October 1963 to June 1967.

Gage.--Graphic water-stage recorder. Altitude of gage is 470 ft (from topographic map). Prior to Dec. 13, 1966, digital water-stage recorder at same site and datum.

Extremes.--1963-67: Maximum daily discharge, 19 mgd (29 cfs) July 2, 8, 1964, Aug. 25, 1966; no flow at times.

Remarks.--Records fair except those for periods of no gage-height record, which are poor. Ditch diverts from Papuaa Stream at Papuaa Reservoir and from Kamooloa Stream at intake 300 ft above Puuana Road crossing for irrigation of sugarcane in vicinity of Puhi.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.1	10	14	3.8	2.0	2.5	1.8	0.05	8.2	0.02	10	6.6
2	6.3	11	12	3.8	2.0	2.5	2.5	.46	9.2	.02	10	4.4
3	6.4	9.7	13	10	2.0	1.8	2.5	2.0	6.7	.06	11	.78
4	3.1	11	13	10	2.0	1.7	2.5	2.0	.05	.03	11	.05
5	7.6	14	6.8	10	.05	2.5	2.5	1.9	0	.03	10	.05
6	9.3	14	12	10	.05	2.5	2.5	1.7	.75	0	2.0	.07
7	9.7	7.5	15	10	.05	2.5	2.0	2.6	.02	0	.50	.05
8	9.8	9.9	15	3.0	.05	2.5	1.8	3.9	.04	0	2.0	.05
9	6.6	10	10	2.8	.05	2.5	2.0	5.0	.01	0	4.0	.04
10	3.6	12	1.2	.50	.05	1.8	2.0	6.8	.01	7.2	4.0	.03
11	8.0	12	4.4	.50	.05	1.6	2.0	1.4	.03	10	4.0	.03
12	9.6	9.0	11	.50	.05	2.5	2.0	8.5	.13	13	4.0	4.0
13	8.7	.99	11	.50	.05	2.5	2.0	.08	.03	13	1.0	5.4
14	9.0	1.0	15	.50	2.0	2.5	1.8	.04	.03	9.7	1.0	7.0
15	7.2	11	12	.50	2.0	2.5	1.7	.05	.55	.04	1.0	7.9
16	.69	13	7.2	.50	2.0	2.5	2.2	.36	6.9	.04	1.0	7.2
17	4.2	13	1.2	.50	2.0	1.9	2.2	.03	10	8.4	1.0	1.6
18	11	14	3.2	.50	2.0	1.8	2.2	.04	0	10	1.0	1.5
19	10	9.6	14	.50	1.6	5.0	2.2	.03	0	9.0	1.0	7.0
20	9.1	.97	15	3.0	1.2	5.0	2.2	.03	.26	8.7	1.0	10
21	9.0	4.6	16	3.0	2.0	5.0	.20	0	.71	8.2	1.0	13
22	11	10	13	.50	2.0	5.0	.20	1.7	1.3	8.2	2.0	12
23	9.4	11	10	.50	2.0	5.0	.25	3.9	.53	8.2	3.0	13
24	7.8	14	3.8	.50	2.0	2.5	.25	2.7	.07	8.1	3.0	9.2
25	12	19	3.8	.20	2.0	2.2	.01	1.4	.06	8.1	.20	1.5
26	8.8	11	12	.20	1.8	5.0	0	1.2	.91	13	.20	9.9
27	6.6	15	14	.20	1.6	5.0	.03	5.0	.85	11	.20	14
28	11	12	9.0	.20	2.5	5.0	.03	6.2	2.2	13	.20	18
29	13	13	7.0	.20	2.5	5.0	.03	----------	.05	9.6	2.0	18
30	12	14	5.0	.20	2.5	5.0	.03	----------	.04	10	6.0	15
31	6.7	14	----------	2.0	----------	2.0	.04	----------	.04	----------	6.0	----------
Total	252.29	331.26	299.6	79.10	42.15	97.3	43.67	59.07	49.67	186.64	104.30	187.35
Mean												
Mgd	8.14	10.7	9.99	2.55	1.40	3.14	1.41	2.11	1.60	6.22	3.36	6.24
Cfs	12.6	16.6	15.5	3.95	2.17	4.86	2.18	3.26	2.48	9.62	5.20	9.65
Ac-ft	774	1020	919	243	129	299	134	181	152	573	320	575
Max	13	19	16	10	2.5	5.0	2.5	8.5	10	13	11	18
Min	0.69	0.97	1.2	0.20	0.05	1.6	0	0	0	0	0.20	0.03

Calendar Year 1966: Max 19 Min 0 Mean (mgd) 5.68 Mean (cfs) 8.79 Ac-ft 6370
Fiscal Year 1966-67: Max 19 Min 0 Mean (mgd) 4.75 Mean (cfs) 7.35 Ac-ft 5320

Note.--No gage-height record Sept. 28 to Jan. 23, Apr. 18 to June 7.

16-0536. Lower Haiku ditch near Puhi

Location.--Lat 21°58'19", long 159°27'12", on right bank 300 ft upstream from flume crossing a tributary to Kamooloa Stream, 0.5 mile downstream from intake on Kamooloa Stream, and 3.2 miles west of Puhi.

Records available.--October 1963 to June 1967.

Gage.--Graphic water-stage recorder. Altitude of gage is 400 ft (from topographic map). Prior to Mar. 18, 1964, digital water-stage recorder at same site and datum.

Extremes.--1963-67: Maximum daily discharge, 33 mgd (51 cfs) May 27, 1964, May 5, Nov. 19, 1965; no flow Feb. 3-5, 1967.

Remarks.--Records good. Ditch diverts from Kamooloa Stream 0.4 mile below Papuaa Stream for irrigation of sugarcane in vicinity of Puhi.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.2	1.3	3.7	0.94	1.6	10	16	6.9	2.4	16	1.0	7.6
2	1.2	1.3	2.2	86	2.1	10	15	3.3	2.2	14	1.3	14
3	1.1	1.3	1.8	86	1.6	11	16	0	2.2	18	2.2	10
4	86	1.4	1.6	1.0	4.9	16	16	0	4.8	17	1.1	19
5	.73	1.3	1.5	.94	20	17	15	0	6.1	16	.94	18
6	.73	1.3	1.3	1.0	18	13	14	1.1	11	6.3	.86	15
7	.86	1.2	1.3	.94	14	11	13	1.6	10	2.4	.80	13
8	.86	2.7	1.3	.94	13	9.1	12	1.6	11	2.2	.80	6.3
9	.73	1.9	1.1	.94	12	8.6	11	1.6	7.8	2.1	.80	4.6
10	.80	1.4	1.0	1.7	9.6	6.8	8.0	19	11	2.1	.73	4.3
11	.73	1.4	2.4	15	9.1	5.5	7.4	20	10	5.3	.73	6.4
12	.73	1.2	1.8	2.7	18	4.0	9.4	27	10	9.6	.66	4.8
13	.66	.94	1.5	2.6	15	2.5	11	17	5.6	7.4	.59	1.9
14	.73	1.4	1.5	2.2	10	3.0	20	16	3.7	14	.59	1.6
15	.73	1.0	1.4	9.7	15	1.8	13	16	3.0	15	.59	1.4
16	.66	1.0	1.3	12	14	1.6	11	18	2.2	12	.86	1.3
17	.73	1.3	1.3	5.9	13	1.6	9.9	14	6.6	8.1	.73	1.2
18	1.1	1.0	1.1	4.3	12	1.6	11	14	4.1	3.3	.66	1.1
19	.73	1.0	1.2	3.2	11	1.4	10	13	2.3	1.9	.59	1.0
20	.80	.86	1.1	2.9	11	1.3	11	12	17	1.6	16	.94
21	.80	.86	1.2	2.8	6.0	1.4	9.9	12	23	1.4	14	.86
22	.48	.94	1.4	2.8	3.0	2.9	9.1	11	31	1.3	17	.86
23	.37	.94	1.3	2.6	22	12	7.6	11	27	1.3	24	.80
24	.42	.94	1.1	2.0	22	6.5	21	8.7	20	1.2	12	.73
25	5.6	11	1.3	1.6	17	7.8	13	3.3	18	2.0	6.5	.80
26	2.3	14	1.1	1.6	16	14	11	6.1	28	7.1	10	.73
27	1.9	5.5	1.0	1.6	16	13	10	5.3	29	3.0	11	.73
28	1.4	3.2	1.0	1.7	13	12	9.6	2.5	30	1.3	10	.66
29	1.3	2.2	.94	1.6	13	14	8.7	----------	20	1.3	12	.66
30	1.3	1.7	.94	1.6	12	14	9.6	----------	17	1.0	26	.59
31	1.2	5.9	----------	1.5	---------	16	8.4	----------	16	---------	15	---------
Total	33.74	73.38	42.68	93.02	364.9	250.4	367.6	262.0	392.0	195.2	190.03	140.86
Mean												
Mgd	1.09	2.37	1.42	3.00	12.2	8.08	11.9	9.36	12.6	6.51	6.13	4.70
Cfs	1.69	3.67	2.20	4.64	18.9	12.5	18.4	14.5	19.5	10.1	9.48	7.27
Ac-ft	104	225	131	285	1,120	768	1,130	804	1,200	599	583	432
Max	5.6	14	3.7	15	22	17	21	27	31	18	26	19
Min	0.37	0.86	0.94	0.86	1.6	1.3	7.4	0	2.2	1.0	0.59	0.59

Calendar Year 1966: Max 22 Min 0.37 Mean (mgd) 4.23 Mean (cfs) 6.54 Ac-ft 4,740
Fiscal Year 1966-67: Max 31 Min 0 Mean (mgd) 6.59 Mean (cfs) 10.2 Ac-ft 7,380

16-0538. Kamooloa Stream near Puhi

Location.--lat 21°58'13", long 159°27'08", on right bank at head of falls, 0.4 mile upstream from confluence with Kuia Stream, and 3.5 miles west of Puhi.

Drainage area.--5.94 sq mi.

Records available.--November 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 390 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,870 mgd (2,890 cfs) Feb. 10 (gage height, 5.62 ft), from rating curve extended above 390 mgd as explained below; minimum, 0.03 mgd (0.05 cfs) on many days.
1963-67: Maximum discharge, 2,750 mgd (4,250 cfs) Dec. 16, 1964 (gage height, 6.66 ft), from rating curve extended above 390 mgd on basis of slope-area measurements at gage heights 4.86 and 6.66 ft; minimum, 0.02 mgd (0.03 cfs) June 20, 1966.

Remarks.--Records good. Kamooloa ditch diverts 4.3 miles above station into Kuia Stream. Upper Haiku ditch (see sta. no. 534) and Lower Haiku ditch (see sta. no. 536) divert 1.3 miles and 0.4 mile, respectively, above station for irrigation of sugarcane near Puhi. Since July 19, 1966, Koloa tunnel (see sta. no. 544) has diverted 0.6 mile above station for irrigation of sugarcane in vicinity of Koloa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.05	0.26	0.14	0.05	0.06	0.12	54	1.8	0.16	8.5	0.23	0.66
2	.05	.64	.10	.04	.06	.14	33	1.7	.14	6.6	.28	12
3	.04	1.5	.09	.04	.06	.14	16	.87	.14	25	.28	5.9
4	.03	.48	.07	.04	.12	33	8.2	.23	.95	18	.26	86
5	.03	.31	.06	.05	51	31	6.0	.21	.16	23	.23	30
6	.03	.31	.06	.07	33	4.9	5.8	.18	8.4	2.3	.23	3.1
7	.03	.18	.06	.05	5.2	2.1	3.6	.14	1.1	.39	.23	2.6
8	.03	1.3	.05	.05	1.5	.14	2.5	.12	5.5	.42	.23	.31
9	.03	.80	.05	.05	.21	.12	2.0	.12	2.3	.46	.23	.28
10	.03	.16	.05	.22	.12	.12	2.0	134	2.2	.31	.21	.33
11	.03	.39	.12	58	.10	.10	2.0	124	.82	.33	.21	.56
12	.03	.39	.10	.14	35	.10	1.3	272	11	4.1	.18	.26
13	.03	.07	.07	.10	5.8	.10	5.4	36	.54	.83	.16	.28
14	.03	.06	.07	.07	.75	.10	38	24	.14	.82	.16	.28
15	.03	.04	.06	.26	20	.09	4.7	28	.09	25	.16	.28
16	.03	.05	.06	.46	6.1	.09	.97	57	.09	15	.28	.26
17	.03	.10	.06	.31	1.1	.09	.21	14	4.3	2.3	.18	.18
18	.04	.04	.06	.16	.18	.07	.66	24	.27	.52	.18	.18
19	.03	.04	.06	.09	.10	.06	1.3	8.8	.23	.52	.16	.18
20	.61	.03	.05	.09	.12	.05	3.7	6.6	61	.52	.23	.21
21	.23	.03	.06	.09	.10	.06	2.0	4.3	61	.52	27	.21
22	.04	.05	.07	.07	.10	.40	1.8	2.2	127	.52	58	.21
23	.03	.05	.06	.07	81	3.2	1.5	1.5	69	.49	77	.18
24	.03	.05	.06	.07	42	.05	69	.99	27	.46	8.6	.12
25	1.5	5.4	.07	.05	19	7.9	8.8	.82	23	8.5	.31	.12
26	1.5	.60	.06	.05	13	18	4.1	5.4	89	11	.28	.14
27	.94	.16	.05	.05	12	6.9	2.6	.59	134	.42	.83	.16
28	.52	.12	.05	.04	3.2	4.2	2.2	.16	89	.31	1.5	.16
29	.28	.09	.05	.04	1.8	24	2.2	----------	27	.26	70	.21
30	.21	.07	.05	.04	.28	29	2.8	----------	11	.23	98	.26
31	.21	.19	----------	.04	----------	47	1.8	----------	8.8	----------	14	----------
Total	6.73	13.96	2.02	60.95	333.06	213.34	290.14	749.73	765.33	157.63	359.83	145.62
Mean												
Mgd	0.217	0.450	0.067	1.97	11.1	6.88	9.36	26.8	24.7	5.25	11.6	4.85
Cfs	0.336	0.696	0.104	3.05	17.2	10.6	14.5	41.5	38.2	8.12	17.9	7.50
Ac-ft	21	43	6.2	187	1,020	655	890	2,300	2,350	484	1,100	447
Max	1.5	5.4	0.14	58	81	47	69	272	134	25	98	86
Min	0.03	0.03	0.05	0.04	0.06	0.05	0.21	0.12	0.09	0.23	0.16	0.12

Calendar Year 1966: Max 81 Min 0.03 Mean (mgd) 2.39 Mean (cfs) 3.70 Ac-ft 2680
Fiscal Year 1966-67: Max 272 Min 0.03 Mean (mgd) 8.49 Mean (cfs) 13.1 Ac-ft 9,510

Peak discharge (base, 900 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
2-10	1830	5.62	1,870	2,890

16-0542. Koloa ditch near Koloa

Location.--Lat 21°57'07", long 159°28'11", on right bank at old county road bridge between Highways 50 and 52 at Knudsen Gap, 250 ft downstream from wasteway, and 3.0 miles north of Koloa.

Records available.--July 1964 to June 1967.

Gage.--Graphic water-stage recorder. Altitude of gage is 620 ft (from topographic map). Prior to Jan. 4, 1967, digital water-stage recorder at same site and datum.

Extremes.--1964-67: Maximum daily discharge, 104 mgd (161 cfs) Aug. 26, 1966; no flow Apr. 22-24, 1967.

Remarks.--Records fair. Ditch diverts from Kuia Stream just below the Waiahi-Kuia aqueduct for power generation and irrigation of sugarcane near Koloa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	28	71	0.24	9.5	8.6	2.7	7.4	8.0	0.60	7.8	0.81
2	28	21	55	.24	15	8.0	2.9	6.9	7.7	.60	13	2.6
3	12	16	45	.14	25	7.8	3.0	6.6	7.4	.60	16	.43
4	9.2	42	46	1.5	40	7.2	3.1	6.1	12	.60	7.3	.52
5	7.7	24	20	5.1	70	3.1	3.0	5.9	9.9	11	3.5	.57
6	3.9	8.3	16	6.6	30	2.8	3.0	6.1	20	14	7.5	.52
7	3.1	8.3	15	5.9	18	2.7	2.8	5.8	11	12	6.5	5.7
8	3.1	63	14	5.9	15	2.6	2.8	5.5	15	10	4.6	7.4
9	12	52	13	5.1	12	2.6	2.9	5.8	11	9.2	5.2	7.2
10	6.9	34	18	9.5	9.7	2.6	3.1	41	8.3	10	4.5	9.5
11	5.9	41	40	65	9.5	2.6	3.0	20	7.2	12	6.4	11
12	6.4	32	35	15	24	2.6	3.0	5.8	14	13	7.7	11
13	4.5	34	15	16	17	2.5	3.0	3.2	12	12	7.4	12
14	3.9	53	14	12	10	2.5	3.4	1.2	9.0	23	7.4	11
15	4.5	33	11	79	14	2.5	3.0	5.9	9.5	20	8.3	9.9
16	5.9	29	12	91	10	2.5	2.8	1.2	8.8	16	20	9.2
17	13	23	20	56	9.0	2.5	3.2	1.0	23	12	14	8.8
18	33	16	19	29	8.0	2.4	3.6	1.0	12	9.7	14	8.5
19	23	9.5	14	19	7.8	2.4	6.3	.90	7.8	8.5	12	8.0
20	55	5.1	8.0	16	8.0	2.4	12	.90	11	4.8	24	7.7
21	45	4.5	8.5	15	7.6	2.4	8.8	.81	1.3	.05	56	7.4
22	30	3.7	13	13	7.2	2.4	8.0	.76	1.2	0	42	7.2
23	18	3.9	8.8	11	6.6	2.4	7.5	.76	1.2	0	18	6.7
24	9.5	21	7.2	9.9	6.4	2.4	11	5.4	1.0	0	18	6.6
25	73	97	9.2	9.0	6.0	2.4	3.6	8.0	.95	7.3	15	6.9
26	79	104	7.8	8.3	5.8	2.5	7.5	10	.95	18	14	8.0
27	73	101	6.9	8.0	5.6	2.5	10	8.8	.95	12	12	6.9
28	50	80	6.1	7.7	5.4	2.5	9.0	7.8	.78	9.7	11	7.4
29	42	65	6.7	7.4	6.0	2.5	8.3	----------	.66	8.3	9.1	6.4
30	42	72	1.3	7.0	9.7	2.5	10	----------	.64	7.8	1.1	5.9
31	35	72	----------	6.9	----------	2.5	8.0	----------	.64	----------	.86	----------
Total	753.5	1,196.3	576.5	541.42	427.8	99.9	164.3	180.53	234.87	262.75	394.16	201.75
Mean												
Mgd	24.3	38.6	19.2	17.5	14.3	3.22	5.30	6.45	7.58	8.76	12.7	6.72
Cfs	37.6	59.7	29.7	27.1	22.1	4.98	8.20	9.98	11.7	13.6	19.6	10.4
Ac-ft	2,310	3,670	1,770	1,660	1,310	307	504	554	721	806	1,210	619
Max	79	104	71	91	70	8.6	12	41	23	23	56	12
Min	3.1	3.7	1.3	0.14	5.4	2.4	2.7	0.76	0.64	0	0.86	0.43

Calendar Year 1966: Max 104 Min 0.14 Mean (mgd) 14.2 Mean (cfs) 22.0 Ac-ft 15,950
Fiscal Year 1966-67: Max 104 Min 0 Mean (mgd) 13.8 Mean (cfs) 21.4 Ac-ft 15,450

16-0544. Koloa tunnel near Koloa

Location.--lat 21°56'05", long 159°27'39", on left bank 80 ft upstream from Wilcox ditch crossing, 0.7 mile upstream from Waita Reservoir, and 2.0 miles north of Koloa.

Records available.--February 1966 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 385.78 ft above mean sea level (Grove Farm Co. bench mark).

Extremes.--1966-67: Maximum daily discharge, 191 mgd (296 cfs) Feb. 10, 1967; minimum daily, 0.90 mgd (1.4 cfs) June 21-25, July 18, 1966.

Remarks.--Records good. Tunnel diverts from Kuia Stream to Waita Reservoir for irrigation of sugarcane in vicinity of Koloa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	1.4	20	7.8	7.8	8.4	15	6.9	10	3.6	8.0	25
2	1.1	3.1	13	7.8	7.2	7.8	15	7.2	9.3	3.6	13	25
3	1.1	14	8.1	7.8	12	7.5	10	12	10	3.8	17	25
4	1.1	2.1	7.2	6.5	35	9.7	5.9	8.7	12	3.6	11	40
5	1.1	2.1	7.2	3.2	96	5.2	5.7	8.1	13	17	12	15
6	1.1	2.1	6.8	3.6	5.7	4.9	9.7	9.8	17	26	7.9	6.0
7	1.2	2.1	6.5	2.9	4.4	5.2	14	8.1	13	19	9	6.0
8	1.2	3.2	4.9	2.5	3.6	5.4	13	6.2	8.3	15	17	25
9	1.2	2.5	4.6	2.5	3.4	8.8	11	6.8	6.2	15	12	23
10	1.2	2.1	4.1	5.0	7.6	13	11	191	6.0	12	9.0	19
11	1.1	2.1	14	84	10	13	10	84	8.6	13	8.9	13
12	1.1	2.1	7.5	6.8	16	13	10	8.4	8.9	9.8	6.5	13
13	1.1	2.5	5.4	5.7	14	13	10	5.7	6.2	5.2	5.5	13
14	1.0	3.2	5.4	4.9	13	14	4.4	5.5	8.0	5.2	5.2	8.9
15	1.0	2.9	4.9	42	11	13	4.1	5.5	8.9	5.0	5.5	7.4
16	1.0	2.1	4.4	124	10	10	3.9	5.7	6.8	4.7	11	7.4
17	1.0	1.8	4.1	45	9.1	11	3.6	5.2	9.9	4.7	5.5	6.8
18	.90	2.1	3.9	25	8.4	11	3.6	5.2	10	4.7	5.0	8.9
19	1.0	2.3	4.4	20	8.1	11	3.6	5.2	7.1	4.7	4.4	8.3
20	1.6	2.1	3.9	16	8.4	8.8	3.6	5.2	28	13	18	6.0
21	1.3	2.1	4.1	14	7.8	8.4	3.6	9.6	5.2	17	96	5.7
22	1.3	2.3	4.6	15	6.2	10	3.6	15	5.2	17	55	6.0
23	1.3	2.3	4.1	14	6.2	15	3.6	14	4.2	17	7.4	6.0
24	1.2	2.5	3.4	13	5.7	11	3.6	13	4.0	15	16	5.5
25	20	141	3.9	11	5.4	14	3.4	14	3.8	18	16	4.7
26	4.1	56	3.9	10	5.4	18	3.4	16	3.8	14	15	5.7
27	2.5	35	3.9	7.2	5.4	15	3.4	17	4.2	9.2	14	6.0
28	1.6	14	3.9	7.2	5.2	14	3.2	12	4.0	9.5	13	6.2
29	1.4	12	3.6	9.8	5.2	16	3.2	----------	3.6	9.2	12	6.0
30	1.4	11	5.9	9.1	7.8	16	3.2	----------	3.6	7.7	6.8	5.2
31	1.4	17	----------	6.2	----------	15	3.2	----------	3.6	----------	22	----------
Total	59.70	353.1	181.6	539.5	351.0	346.1	204.5	511.0	252.4	322.2	464.6	358.7
Mean												
Mgd	1.93	11.4	6.05	17.4	11.7	11.2	6.60	18.2	8.14	10.7	15.0	12.0
Cfs	2.99	17.6	9.36	26.9	18.1	17.3	10.2	28.2	12.6	16.6	23.2	18.6
Ac-ft	183	1,080	557	1,660	1,080	1,060	628	1,570	775	989	1,430	1,100
Max	20	141	20	124	96	18	15	191	28	26	96	40
Min	0.90	1.4	3.4	2.5	3.4	4.9	3.2	5.2	3.6	3.6	4.4	4.7

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Fiscal Year 1966-67: Max 191 Min 0.90 Mean (mgd) 10.8 Mean (cfs) 16.7 Ac-ft 12,100

16-0568. Waiahi-Kuia aqueduct near Puhi

Location.--Lat 21°58'36", long 159°28'28", on left bank 0.2 mile upstream from Kuia Stream, 4.8 miles west of Puhi, and 4.8 miles north of Koloa.

Records available.--July 1964 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 730 ft (from topographic map).

Extremes.--1964-67: Maximum daily discharge, 50 mgd (77 cfs) Aug. 27, 1966; no flow at times.

Remarks.--Records good. Ditch diverts from Waiahi Stream into Kuia Stream, from which Koloa ditch (see sta. no. 542) diverts a short distance downstream for power generation and irrigation of sugarcane near Koloa.

Cooperation.--Gage-height record furnished by Lihue Plantation Co.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14	18	43	1.0	2.2	1.2	3.4	0.86	1.4	3.0	1.6	2.4
2	19	19	36	1.0	1.9	1.2	2.7	.86	1.2	3.0	2.2	4.0
3	9.6	22	28	1.2	2.2	1.4	1.6	.86	1.2	3.4	2.4	3.0
4	8.1	23	24	1.4	2.2	2.2	1.4	.86	1.6	3.0	1.9	5.8
5	12	12	20	1.2	7.8	1.9	1.2	.86	1.2	3.0	1.9	3.7
6	4.2	2.2	10	1.2	6.2	1.2	1.0	.86	1.7	2.2	1.6	3.0
7	.75	1.6	2.4	1.4	2.4	1.0	1.0	.70	1.2	2.4	1.6	2.7
8	.16	26	1.9	1.4	1.9	.86	.86	.86	1.6	2.4	1.6	2.4
9	3.3	22	3.8	1.4	1.4	.86	.86	.70	1.2	2.4	1.6	2.2
10	6.0	14	8.1	2.6	1.4	.70	.86	13	1.0	2.4	1.6	1.6
11	3.8	19	9.2	6.1	1.2	.70	.86	10	.86	2.7	1.4	1.6
12	2.7	17	5.6	2.2	6.7	.70	.86	12	2.0	3.6	1.4	1.6
13	1.2	19	1.4	2.2	3.6	.70	1.0	3.4	1.2	2.7	1.2	1.6
14	.54	30	1.4	2.4	1.4	.70	3.9	2.4	1.0	11	1.0	1.6
15	1.2	17	1.4	6.5	2.2	.70	1.6	2.7	1.0	3.6	1.2	1.4
16	1.0	16	4.1	11	1.4	.54	1.4	3.3	1.0	3.2	5.0	1.4
17	7.0	12	7.8	5.2	1.2	.70	1.4	2.4	4.5	2.7	1.9	1.4
18	16	8.5	7.8	3.3	1.2	.70	1.4	2.4	1.4	2.4	1.9	1.2
19	14	4.7	4.1	2.7	1.2	.70	1.6	2.2	1.2	2.4	1.6	1.2
20	37	2.2	1.0	2.4	1.2	.70	1.2	2.2	4.8	2.2	4.5	1.2
21	34	1.4	1.0	2.2	1.2	.86	1.2	1.9	5.2	1.9	11	1.2
22	24	.80	1.2	2.2	1.2	.86	1.2	1.9	11	1.6	7.3	1.2
23	15	1.0	1.4	1.9	5.0	1.0	1.2	1.9	6.7	1.6	7.2	1.2
24	10	9.5	1.2	1.6	4.1	.40	5.6	1.9	4.1	1.6	3.8	1.2
25	34	31	1.2	1.6	1.9	.40	2.2	1.6	4.1	6.3	3.3	1.2
26	49	46	1.2	1.6	2.2	1.2	1.6	1.9	8.0	3.0	3.0	1.2
27	44	50	1.4	1.9	2.2	.86	1.4	1.6	14	2.2	2.4	1.4
28	33	44	1.2	1.9	1.2	.86	1.2	1.4	9.1	1.9	2.4	1.4
29	27	37	1.2	1.9	1.2	1.2	1.2	----------	5.4	1.9	5.9	1.4
30	26	43	1.2	1.6	1.0	1.6	1.2	----------	4.1	1.6	7.3	1.4
31	22	40	----------	1.6	----------	2.4	1.0	----------	3.8	----------	2.7	----------
Total	479.55	608.90	233.2	77.8	72.1	31.00	49.10	77.52	107.76	87.3	95.4	57.8
Mean												
Mgd	15.5	19.6	7.77	2.51	2.40	1.00	1.58	2.77	3.48	2.91	3.08	1.93
Cfs	24.0	30.3	12.0	3.88	3.71	1.55	2.44	4.29	5.38	4.50	4.77	2.99
Ac-ft	1470	1870	716	239	221	95	151	238	331	268	293	177
Max	49	50	43	11	7.8	2.4	5.6	13	14	11	11	5.8
Min	0.16	0.80	1.0	1.0	1.0	0.40	0.86	0.70	0.86	1.6	1.0	1.2

Calendar Year 1966: Max 50 Min 0 Mean (mgd) 5.01 Mean (cfs) 7.75 Ac-ft 5610
Fiscal Year 1966-67: Max 50 Min 0.16 Mean (mgd) 5.42 Mean (cfs) 8.39 Ac-ft 6070

16-0600. South Fork Wailua River near Lihue

Location.--Lat 22°02'24", long 159°22'58", on right bank 0.2 mile upstream from Wailua Falls and 4.3 miles north of Lihue.

Drainage area.--22.4 sq mi.

Records available.--December 1911 to April 1919, June 1919 to March 1921, May 1921 to June 1957, August, September 1957, November 1957 to February 1958, June 1958 to June 1967. Monthly discharge only for some periods, published in WSP 1319. Published as "above Waiehu Falls, near Lihue" 1912-13.

Gage.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map). Prior to Nov. 18, 1918, at site 0.3 mile upstream at different datum. Nov. 18, 1918, to June 30, 1957, at site 10 ft downstream from present site at datum 2.50 ft higher and July 1, 1957, to June 23, 1958, at present datum.

Average discharge.--51 years (1912-18, 1919-20, 1921-24, 1925-57, 1958-67), 76.9 mgd (119 cfs).

Extremes.--Maximum discharge during year, 11,400 mgd (17,600 cfs) May 21 (gage height, 17.42 ft); minimum, 1.7 mgd (2.6 cfs) July 14, 16, 17.
1911-67: Maximum discharge, 56,400 mgd (87,300 cfs) Apr. 15, 1963 (gage height, 22.90 ft), from rating curve extended above 8,400 mgd on basis of slope-area measurement of peak flow; minimum, 1.09 mgd (1.69 cfs) Sept. 21, 1953.

Remarks.--Records good. Lihue and Hanamaulu ditches divert upstream for irrigation of sugarcane in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.9	3.2	113	2.6	50	70	388	41	53	167	25	96
2	2.3	2.9	57	2.5	74	62	267	41	56	141	51	152
3	2.6	2.8	30	2.4	50	58	173	35	55	237	126	182
4	6.8	4.0	25	2.3	204	186	141	8.4	94	184	57	288
5	10	3.6	21	2.3	677	154	114	6.8	86	290	26	154
6	2.8	3.2	12	16	351	81	102	70	75	166	26	93
7	2.2	3.3	5.1	5.2	194	63	82	7.2	56	105	29	95
8	2.3	104	4.5	2.9	135	52	74	14	99	97	30	88
9	2.2	16	4.0	3.1	97	48	63	33	76	134	14	78
10	1.9	3.8	3.8	112	80	44	42	630	54	104	6.8	54
11	1.9	5.4	24	1,400	78	42	7.9	911	45	206	5.4	26
12	1.8	5.4	58	91	381	28	7.9	1,230	76	229	5.1	31
13	1.8	3.5	8.6	50	143	17	60	312	80	141	4.8	18
14	1.8	29	5.0	80	53	36	370	220	47	466	5.0	12
15	1.9	21	5.0	473	112	34	138	265	40	247	7.2	8.8
16	1.9	14	3.8	747	93	33	80	395	38	164	136	7.9
17	2.0	8.1	3.2	325	84	31	63	143	201	119	15	7.4
18	8.6	5.0	2.9	148	74	34	75	191	84	65	5.1	7.2
19	2.8	4.4	3.1	95	66	26	65	122	56	50	4.8	7.0
20	2.4	3.5	2.9	73	63	24	82	64	155	74	351	6.4
21	3.2	2.9	3.2	56	64	28	72	14	329	56	1,370	5.6
22	2.0	3.1	8.1	11	60	36	68	38	698	38	1,290	5.2
23	2.0	3.2	7.4	8.8	452	109	52	58	444	11	533	5.0
24	2.2	16	3.5	14	369	41	263	52	276	109	128	4.6
25	461	313	2.8	21	198	84	105	48	241	190	84	4.8
26	274	243	4.0	12	203	151	68	79	679	201	84	5.1
27	121	391	3.2	8.1	197	102	56	122	834	59	82	5.0
28	18	136	3.1	6.8	61	96	52	59	723	34	96	6.6
29	4.2	75	2.8	6.2	15	250	47	----------	244	35	280	4.6
30	3.5	58	2.8	7.0	37	282	56	----------	160	39	613	4.5
31	3.5	136	----------	6.6	----------	357	45	----------	161	----------	136	----------
Total	956.5	1,623.3	432.8	3,790.8	4,715	2659	3,278.8	5,146.4	6,315	4,158	5,626.2	1,462.7
Mean												
Mgd	30.9	52.4	14.4	122	157	85.8	106	184	204	139	181	48.8
Cfs	47.8	81.1	22.3	189	243	133	164	285	316	215	280	75.5
Ac-ft	2,940	4,980	1,330	11,630	14,470	8,160	10,060	15,790	19,380	12,760	17,270	4,490
Max	461	391	113	1,400	677	357	388	1,230	834	466	1,370	288
Min	1.8	2.8	2.8	2.3	15	17	7.9	6.8	38	11	4.8	4.5

Calendar Year 1966: Max 1,400 Min 1.8 Mean (mgd) 49.6 Mean (cfs) 76.7 Ac-ft 55,600
Fiscal Year 1966-67: Max 1,400 Min 1.8 Mean (mgd) 110 Mean (cfs) 170 Ac-ft 123,300

Peak discharge (base, 3,700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0130	16.57	8,220	12,700	2-11	2330	16.16	7,020	10,900
11- 5	0630	15.23	4,930	7,630	5-21	0730	17.42	11,400	17,600

16-0610. North Wailua ditch near Lihue

Location.--Lat 22°03'55", long 159°28'12", on left bank 300 ft downstream from intake, 8.3 miles west of Wailua, and 8.8 miles northwest of Lihue.

Records available.--July 1932 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,105.45 ft above mean sea level (levels by Lihue Plantation Co.).

Average discharge.--35 years, 12.1 mgd (18.7 cfs).

Extremes.--1932-67: Maximum daily discharge, 38 mgd (59 cfs) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

Remarks.--Records good. Ditch diverts from North Fork Wailua River for power and irrigation in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14	14	16	11	15	14	15	13	14	14	12	0
2	14	14	15	11	14	14	14	13	14	14	12	8.5
3	13	15	14	11	14	14	14	12	14	14	12	12
4	13	14	14	11	15	16	12	12	14	14	11	11
5	8.0	14	14	11	13	15	12	13	14	16	12	12
6	8.4	14	14	14	13	13	12	12	14	13	12	11
7	9.4	14	14	13	13	12	12	11	13	13	12	11
8	8.6	15	13	12	14	12	12	11	15	13	12	11
9	13	12	12	12	14	12	12	11	14	14	12	11
10	11	13	14	14	14	11	12	14	13	14	11	11
11	12	14	16	15	15	11	12	16	13	16	11	12
12	12	14	16	14	17	11	13	15	14	8.6	11	11
13	12	14	14	15	14	11	13	14	13	8.9	12	11
14	16	15	14	14	14	11	14	15	13	10	13	11
15	13	14	14	17	14	11	12	16	13	11	12	11
16	12	14	13	18	13	10	12	13	13	10	13	11
17	14	13	13	13	13	11	12	11	15	11	12	11
18	13	14	13	14	15	13	14	16	13	12	12	11
19	12	14	14	14	15	11	13	14	12	12	12	11
20	14	14	13	14	15	11	14	14	14	12	15	11
21	12	13	14	15	16	13	14	13	14	12	16	11
22	12	13	16	14	16	13	13	13	16	12	17	11
23	13	15	14	13	15	14	12	14	15	12	58	11
24	13	16	14	13	13	12	14	14	14	13	.17	11
25	16	18	14	13	13	13	11	14	15	15	.02	12
26	15	16	13	12	12	15	11	14	17	13	.03	11
27	13	17	13	12	12	13	12	15	17	12	.03	13
28	13	15	13	12	14	14	12	14	15	12	.08	12
29	15	13	12	11	14	15	11	----------	13	11	1.7	11
30	15	15	12	12	14	15	12	----------	13	11	.03	11
31	14	14	----------	13	----------	15	12	----------	14	----------	0	----------
Total	393.4	444	415	408	423	396	390	377	435	373.5	281.86	323.5
Mean												
Mgd	12.7	14.3	13.8	13.2	14.1	12.8	12.6	13.5	14.0	12.4	9.09	10.8
Cfs	19.6	22.1	21.4	20.4	21.8	19.8	19.5	20.9	21.7	19.2	14.1	16.7
Ac-ft	1,210	1,360	1,270	1,250	1,300	1,220	1,200	1,160	1,330	1,150	865	993
Max	16	18	16	18	17	16	15	16	17	16	17	13
Min	8.0	12	12	11	12	10	11	11	12	8.6	0	0

Calendar Year 1966: Max 25 Min 8.0 Mean (mgd) 13.4 Mean (cfs) 20.7 Ac-ft 14,970
Fiscal Year 1966-67: Max 18 Min 0 Mean (mgd) 12.8 Mean (cfs) 19.8 Ac-ft 14,300

16-0612. North Wailua ditch below Waikoko Stream, near Lihue

Location.--Lat 22°03'31", long 159°27'55", on left bank 380 ft downstream from Waikoko Stream, 8.1 miles west of Wailua, and 8.1 miles northwest of Lihue.

Records available.--January 1965 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,070 ft (from topographic map).

Extremes.--1965-67: Maximum daily discharge, 38 mgd (59 cfs) Oct. 11, 1966; no flow Jan. 1-18, 1965.

Remarks.--Records good. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17	19	24	15	22	18	25	16	19	18	16	0.54
2	17	19	22	15	20	18	21	16	19	19	18	13
3	15	20	21	15	19	18	20	15	19	20	21	19
4	15	20	20	21	24	22	19	15	21	20	19	20
5	4.2	19	20	14	34	20	18	15	20	23	17	18
6	.04	19	19	21	23	19	17	14	19	19	17	18
7	.04	19	19	19	21	18	17	14	18	17	17	17
8	5.9	25	18	18	21	17	17	14	21	17	17	17
9	15	20	17	17	20	16	16	14	19	20	17	16
10	13	19	18	22	19	16	15	23	18	18	16	16
11	13	20	22	38	20	15	15	29	18	22	16	17
12	13	20	23	20	26	15	16	27	20	16	15	17
13	12	20	21	21	21	15	18	24	19	16	16	16
14	17	21	21	21	20	14	22	24	18	18	16	15
15	14	19	20	28	23	14	19	26	17	17	16	15
16	14	19	19	28	21	14	18	26	17	16	19	14
17	18	18	19	23	19	15	18	20	22	17	17	14
18	18	19	19	21	19	17	19	24	18	17	17	14
19	16	20	19	20	19	14	19	20	17	17	17	14
20	19	19	19	20	19	14	19	19	19	17	23	13
21	17	17	20	21	19	17	19	18	23	16	25	13
22	16	16	23	20	19	19	18	18	26	16	27	13
23	15	19	20	19	26	21	18	18	24	16	20	13
24	15	22	19	18	24	18	25	17	22	19	8.1	13
25	25	27	21	17	21	19	19	17	23	21	3.8	15
26	27	24	20	17	21	20	18	18	28	20	4.3	14
27	22	27	20	17	20	18	18	21	30	17	5.4	15
28	20	24	18	16	20	19	17	18	23	16	9.8	15
29	21	21	17	15	19	24	16	----------	19	16	18	13
30	21	23	16	17	19	23	17	----------	18	16	11	13
31	20	23	----------	17	----------	24	15	----------	19	----------	.61	----------
Total	475.18	637	594	611	638	551	568	540	633	537	480.01	440.54
Mean												
Mgd	15.3	20.5	19.8	19.7	21.3	17.8	18.3	19.3	20.4	17.9	15.5	14.7
Cfs	23.7	31.7	30.6	30.5	33.0	27.5	28.3	29.9	31.6	27.7	24.0	22.7
Ac-ft	1460	1950	1820	1880	1960	1690	1740	1660	1940	1650	1470	1350
Max	27	27	24	38	34	24	25	29	30	23	27	20
Min	0.04	16	16	14	19	14	15	14	17	16	0.61	0.54

Calendar Year 1966: Max 38 Min 0.04 Mean (mgd) 17.5 Mean (cfs) 27.1 Ac-ft 19610
Fiscal Year 1966-67: Max 38 Min 0.04 Mean (mgd) 18.4 Mean (cfs) 28.5 Ac-ft 20580

16-0620. Stable storm ditch near Lihue

Location.--lat 22°04'09", long 159°26'46", on left bank 100 ft downstream from intake, 7.8 miles northwest of Lihue, and 8.2 miles west of Kapaa.

Records available.--December 1936 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 710 ft (by barometer).

Average discharge.--30 years (1937-67), 6.93 mgd (10.7 cfs).

Extremes.--1936-67: Maximum daily discharge, 46 mgd (71 cfs) Apr. 3, 1948; no flow at times each year.

Remarks.--Records good. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	24	18	0.12	20	0	0.07	0.12	0	0	0.34	0.07	0.12
2	25	28	.12	19	0	.07	.12	0	0	.34	.07	.12
3	22	30	.12	20	0	.12	.07	0	0	.43	.07	.12
4	21	29	.12	19	.07	.12	.07	0	0	.43	.07	.12
5	23	28	.12	19	.30	.12	.07	0	0	.34	.07	.12
6	7.1	28	.12	23	.19	.12	.07	0	0	.26	.07	.12
7	16	29	.12	17	.19	.07	.07	0	0	.26	.07	.07
8	23	22	.12	25	.12	.07	.07	0	0	.26	.07	.01
9	20	.62	.12	23	.12	.07	.07	0	0	.26	.07	0
10	19	16	.19	8.9	.12	.07	.07	.10	0	.34	.07	0
11	19	29	.19	.49	.12	.12	.02	.52	0	.43	.21	0
12	18	27	.19	.26	.12	.12	.07	.21	0	.43	.12	0
13	17	22	.19	.26	.12	.12	.06	.12	0	.43	.12	0
14	26	.62	.19	.19	.12	.12	.12	.12	0	.43	0	0
15	23	.62	.19	.26	.12	.19	.12	.12	0	.43	15	0
16	22	.52	.26	.40	.12	.12	.12	.12	0	.34	20	0
17	25	.52	.26	.26	.12	.19	.07	.12	.01	.26	12	0
18	24	17	.26	.26	.12	.19	.01	.12	0	.26	11	0
19	23	28	.26	.19	.12	.19	0	.07	0	.19	14	6.2
20	25	24	.26	.19	.12	.19	0	.12	0	.19	11	9.9
21	23	22	16	.19	.12	.26	0	.07	.02	.19	.59	9.9
22	21	23	29	.12	.07	.19	0	.01	.12	.12	1.8	9.1
23	20	28	17	.12	.13	.19	0	0	.12	.19	.07	8.9
24	21	32	.52	0	.12	.19	0	0	.27	.19	.02	8.7
25	18	16	.52	0	.12	.19	0	0	.73	.19	.12	18
26	4.8	.19	16	0	.12	.19	0	0	.73	.07	.12	24
27	4.6	.19	25	.03	.12	.19	0	0	.62	.07	.12	29
28	2.1	.19	22	.02	.12	.19	0	0	.62	.07	.12	26
29	.52	.19	22	0	.12	.12	0	----------	.43	.07	.19	21
30	.52	.19	21	0	.12	.12	0	----------	.43	.07	.12	26
31	.52	.22	----------	0	----------	.12	0	----------	.43	---------	.12	---------
Total	538.16	500.07	172.56	197.13	3.47	4.40	1.39	1.82	4.53	7.88	87.54	197.50
Mean												
Mgd	17.4	16.1	5.75	6.36	0.116	0.142	0.045	0.065	0.146	0.263	2.82	6.58
Cfs	26.9	24.9	8.90	9.84	0.179	0.220	0.070	0.101	0.226	0.407	4.36	10.2
Ac-ft	1650	1530	530	605	11	14	4.3	5.6	14	24	269	606
Max	26	32	29	25	0.30	0.26	0.12	0.52	0.73	0.43	20	29
Min	0.52	0.19	0.12	0	0	0.07	0	0	0	0.07	0	0

Calendar Year 1966: Max 32 Min 0 Mean (mgd) 9.66 Mean (cfs) 14.9 Ac-ft 10820
Fiscal Year 1966-67: Max 32 Min 0 Mean (mgd) 4.70 Mean (cfs) 7.27 Ac-ft 5270

16-0630. North Fork Wailua River at altitude 650 ft, near Lihue

Location.--lat 22°04'02", long 159°26'21", on right bank 0.5 mile downstream from intake of Stable storm ditch and 7.8 miles northwest of Lihue.

Drainage area.--6.6 sq mi, approximately.

Records available.--September 1914 to March 1915, May 1915 to October 1918, December 1918, March 1919, June 1919 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 650 ft (from topographic map). Prior to Sept. 9, 1944, at datum 2.0 ft higher.

Average discharge.--51 years (1915-18, 1919-67), 47.1 mgd (72.9 cfs).

Extremes.--Maximum discharge during year, 3,650 mgd (5,650 cfs) May 21 (gage height, 9.40 ft), from rating curve extended above 1,500 mgd; minimum, 0.26 mgd (0.40 cfs) Sept. 28 to Oct. 3.
1914-67: Maximum discharge, 8,550 mgd (13,200 cfs) Nov. 12, 1955 (gage height, 13.53 ft), from rating curve extended above 470 mgd on basis of slope-area measurement at gage height 10.65 ft; minimum, 0.22 mgd (0.34 cfs) Oct. 27, 1953.

Remarks.--Records fair. Since 1925 Manalei tunnel (see sta. no. 1000) has diverted from Manalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see sta. nos. 610, 620) divert water above station for power development and irrigation in vicinity of Lihue.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14	14	75	0.28	70	38	179	24	48	80	45	52
2	13	8.9	46	.26	46	36	99	20	44	85	75	63
3	3.5	17	37	.26	37	36	118	19	40	102	109	64
4	2.9	9.2	32	.28	106	78	87	18	58	121	54	79
5	13	6.2	29	.31	217	45	88	18	45	206	43	48
6	46	5.4	27	49	173	34	62	18	48	80	47	33
7	20	6.6	27	21	87	31	49	17	40	71	59	27
8	7.7	104	24	2.6	74	29	49	17	76	69	52	27
9	3.8	46	23	1.4	56	28	40	17	48	117	48	23
10	2.5	16	24	105	52	27	34	190	38	130	38	22
11	2.3	11	55	252	57	27	36	381	34	240	36	32
12	1.8	4.0	90	41	182	26	45	227	54	168	34	24
13	1.5	16	32	46	67	26	137	122	37	102	125	19
14	43	45	36	40	49	25	146	132	29	270	52	16
15	11	26	27	238	103	24	51	181	27	131	23	15
16	6.0	27	23	314	95	24	40	216	25	82	217	14
17	36	22	24	113	55	27	34	79	135	65	42	13
18	21	11	23	75	52	118	38	96	42	55	41	13
19	11	5.2	29	56	44	24	34	58	37	48	33	5.1
20	30	1.2	21	52	42	24	38	50	71	44	291	1.1
21	12	.98	12	64	50	40	33	42	126	40	627	1.0
22	7.4	1.0	16	40	40	54	29	38	217	37	1,330	1.0
23	3.1	5.8	10	35	216	80	25	40	202	36	261	1.0
24	5.2	24	22	32	158	34	69	37	135	101	104	1.0
25	279	253	27	30	85	56	39	34	144	207	75	4.0
26	225	129	9.1	28	87	93	30	43	277	123	62	1.4
27	91	195	.37	27	70	53	25	79	396	66	58	18
28	56	87	.28	26	54	71	22	44	215	55	89	3.6
29	46	57	.26	24	48	147	22	----------	98	45	214	1.1
30	46	73	.26	41	42	134	25	----------	75	41	136	2.0
31	34	109	----------	38	----------	191	21	----------	96	----------	62	----------
Total	1094.7	1336.48	801.27	1792.39	2.514	1.680	1.744	2.257	2.957	3.017	4.482	624.3
Mean												
Mgd	35.3	43.1	26.7	57.8	83.8	54.2	56.3	80.6	95.4	101	145	20.8
Cfs	54.6	66.7	41.3	89.4	130	83.9	87.1	125	148	156	224	32.2
Ac-ft	3,360	4,100	2,460	5,500	7,720	5,160	5,350	6,930	9,070	9,260	13,750	1,920
Max	279	253	90	314	217	191	179	381	396	270	1,330	79
Min	1.5	0.98	0.26	0.26	37	24	21	17	25	36	23	1.0

Calendar Year 1966: Max 314 Min 0.26 Mean (mgd) 31.1 Mean (cfs) 48.1 Ac-ft 34,810
Fiscal Year 1966-67: Max 1,330 Min 0.26 Mean (mgd) 66.6 Mean (cfs) 103 Ac-ft 74,570

Peak discharge (base, 1,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2330	7.50	1,960	3,030	2-11	2200	8.13	2,500	3,870
10-16	1500	7.92	2,310	3,570	5-13	1830	7.35	1,840	2,850
11- 5	0530	9.05	3,320	5,140	5-16	1430	8.13	2,500	3,870
11-23	0900	7.13	1,670	2,580	5-21	0700	9.40	3,650	5,650

16-0680. East Branch of North Fork Wailua River near Lihue

Location.--Lat 22°04'19", long 159°25'05", on right bank 1,200 ft upstream from mouth and 7.5 miles northwest of Lihue.

Drainage area.--6.2 sq mi, approximately.

Records available.--July 1912 to September 1914, December 1914 to March 1915, May 1915 to March 1919, June 1919 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 500 ft (from topographic map). Prior to Dec. 31, 1914, staff gage at site 725 ft downstream at different datum. Dec. 31, 1914, to May 10, 1934, water-stage recorder at site 75 ft upstream at present datum.

Average discharge.--52 years (1913-14, 1915-18, 1919-67), 31.4 mgd (48.6 cfs).

Extremes.--Maximum discharge during year, 2,330 mgd (3,610 cfs) May 22 (gage height, 7.30 ft); minimum, 7.4 mgd (11 cfs) Oct. 5. 1912-67: Maximum discharge, 11,900 mgd (18,400 cfs) Nov. 12, 1955 (gage height, 14.7 ft, from floodmarks), from rating curve extended above 1,700 mgd; minimum, 4.4 mgd (6.8 cfs) July 3, 13, 1926.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10	15	29	8.1	35	24	100	15	24	63	17	43
2	14	21	22	8.1	19	22	60	16	22	62	26	56
3	10	17	19	7.7	14	20	86	14	20	82	51	44
4	9.4	19	17	7.7	65	27	73	13	27	58	22	37
5	11	18	16	7.7	217	20	56	13	23	52	17	33
6	16	17	15	27	145	17	47	13	28	46	23	32
7	12	18	15	18	66	16	40	12	23	42	16	29
8	9.4	56	14	13	78	15	44	12	61	50	44	29
9	9.0	24	13	12	37	14	29	12	29	73	36	27
10	8.6	17	13	278	32	13	26	86	22	69	19	26
11	8.1	18	17	198	28	12	26	317	19	185	17	31
12	8.1	15	18	32	88	12	31	287	20	164	17	29
13	7.7	19	14	28	37	11	223	74	20	92	53	23
14	14	26	14	21	28	11	182	48	16	340	25	21
15	11	15	14	70	48	10	63	88	15	142	18	20
16	9.4	14	12	192	48	9.4	44	169	14	69	49	19
17	15	13	12	57	52	11	36	51	65	51	24	18
18	20	15	11	36	30	21	35	53	20	40	24	17
19	11	14	12	28	26	9.8	30	37	27	33	20	16
20	16	13	11	26	24	9.4	30	32	60	28	166	15
21	12	12	13	23	22	16	29	26	102	25	403	15
22	10	13	17	20	21	23	27	24	214	22	1,160	15
23	19	14	13	18	260	41	25	24	249	20	192	14
24	15	34	11	17	76	15	25	24	152	19	82	14
25	162	67	9.8	16	56	39	24	22	157	29	55	15
26	79	88	9.4	14	47	82	20	30	209	46	42	15
27	45	79	9.4	14	42	30	18	54	258	24	34	15
28	25	35	9.0	13	32	35	18	25	180	19	29	15
29	20	26	9.0	13	27	66	19	----------	92	16	82	13
30	23	26	8.6	14	25	47	19	----------	68	15	80	13
31	18	63	----------	16	----------	64	16	----------	73	----------	43	----------
Total	657.7	841	417.2	1,253.3	1,725	762.6	1,501	1,591	2,309	1,976	2,886	709
Mean												
Mgd	21.2	27.1	13.9	40.4	57.5	24.6	48.4	56.8	74.5	65.9	93.1	23.6
Cfs	32.8	41.9	21.5	62.5	89.0	38.1	74.9	87.9	115	102	144	36.5
Ac-ft	2,020	2,580	1,280	3,850	5,290	2,340	4,610	4,880	7,090	6,060	8,860	2,180
Max	162	88	29	278	260	82	223	317	258	340	1,160	56
Min	7.7	12	8.6	7.7	14	9.4	16	12	14	15	17	13

Calendar Year 1966: Max 278 Min 6.3 Mean (mgd) 24.0 Mean (cfs) 37.1 Ac-ft 26,890
Fiscal Year 1966-67: Max 1,160 Min 7.7 Mean (mgd) 45.6 Mean (cfs) 70.6 Ac-ft 51,030

Peak discharge (base, 1,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2300	5.35	1,080	1,670	1-13	1730	6.58	1,800	2,790
10-16	1430	5.78	1,310	2,030	2-11	2330	6.89	2,010	3,110
11- 5	0630	6.75	1,920	2,970	5-22	1200	7.30	2,330	3,610
11-23	0700	7.05	2,130	3,300					

16-0690. Wailua ditch near Kapaa

Location.--Lat 22°04'34", long 159°24'04", on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 miles west of Kapaa, and 7 miles north of Lihue.

Records available.--November 1936 to June 1967.

Gage.--Water-stage recorder and, since Feb. 4, 1965, sharp-crested weir. Datum of gage is 462.3 ft above mean sea level (by stadia survey).

Average discharge.--30 years (1937-67), 9.62 mgd (14.9 cfs).

Extremes.--1936-67: Maximum daily discharge, 41 mgd (63 cfs) June 4, 1937; no flow at times.

Remarks.--Records good. Ditch diverts water from North Fork Wailua River to reservoir 2,000 ft above station and thence to fields for irrigation of sugarcane near Kapaa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.6	13	10	5.6	6.2	0.13	0.06	0.02	0.48	0.32	9.3	3.0
2	4.4	17	7.0	5.6	4.9	.10	.06	.04	.48	.32	9.4	.60
3	4.6	17	1.5	14	4.8	.10	.06	.04	.48	.32	12	.54
4	4.6	17	1.5	18	2.6	.13	.06	.04	.42	.28	13	.48
5	14	10	.13	18	1.2	.13	.04	.04	.42	.28	9.7	.54
6	15	4.2	7.3	17	.88	.13	.04	1.5	.42	.28	5.2	.60
7	13	4.4	11	13	.60	.13	.04	2.9	.42	1.7	5.6	.68
8	8.6	13	11	8.5	.48	.13	.04	4.9	.42	3.4	5.6	1.7
9	4.7	18	7.0	8.6	.37	.10	.04	4.9	.37	2.8	5.7	3.9
10	4.8	17	4.2	5.0	.37	.10	.04	3.3	.37	2.8	5.7	4.0
11	14	17	4.4	1.7	.32	.13	.08	1.2	.37	2.6	5.7	4.0
12	18	11	9.1	1.5	.28	.10	1.6	1.1	.37	.68	5.8	9.1
13	18	4.4	16	1.9	.28	.10	3.9	.68	.42	.68	5.8	12
14	17	4.4	19	1.3	.28	.08	4.2	.60	.42	.68	5.8	12
15	15	13	19	1.1	.24	.08	4.0	.60	.37	.54	8.1	12
16	12	17	13	1.1	.24	.06	1.9	.60	.37	.54	13	13
17	12	17	5.6	.98	.24	.06	.04	.60	.37	.48	14	13
18	16	16	5.7	.88	.24	.08	.04	.60	.37	.48	14	13
19	18	10	15	.68	.20	.08	.04	.60	.37	1.7	14	13
20	17	4.0	19	.68	.20	.08	.04	.60	.37	2.8	6.0	13
21	17	3.9	18	.88	.20	.06	.02	.60	.37	2.7	.04	13
22	15	12	18	.98	.16	.06	.02	.54	.37	2.8	.04	13
23	12	16	12	1.1	.20	.06	.02	.60	.37	2.9	.04	13
24	12	16	4.9	5.7	.24	.06	.02	.54	.37	3.2	.04	13
25	9.1	13	5.1	8.3	.20	.06	.02	.54	.37	3.0	.86	13
26	1.4	5.9	15	8.6	.20	.06	.02	.54	.32	3.0	1.4	13
27	1.9	.54	19	9.3	.20	.06	.02	.54	.32	3.0	1.2	13
28	1.9	.60	18	7.5	.20	.06	.02	.48	.32	5.7	.88	13
29	3.4	11	18	5.2	.16	.08	.02	----------	.32	9.6	.88	13
30	3.9	16	12	5.2	.13	.06	.02	----------	.32	9.4	.54	7.4
31	3.9	14	---------	7.8	----------	.06	.02	----------	.32	---------	1.6	---------
Total	320.8	353.34	326.43	185.68	26.81	2.71	16.54	29.24	11.85	68.98	180.92	254.54
Mean												
Mgd	10.3	11.4	10.9	5.99	0.894	0.087	0.534	1.04	0.382	2.30	5.84	8.48
Cfs	15.9	17.6	16.9	9.27	1.38	0.135	0.826	1.61	0.591	3.56	9.04	13.1
Ac-ft	984	1,080	1,000	570	82	8.3	51	90	36	212	555	781
Max	18	18	19	18	6.2	0.13	4.2	4.9	0.48	9.6	14	13
Min	1.4	0.54	0.13	0.68	0.13	0.06	0.02	0.02	0.32	0.28	0.04	0.48

Calendar Year 1966: Max 19 Min 0.06 Mean (mgd) 6.87 Mean (cfs) 10.6 Ac-ft 7,690
Fiscal Year 1966-67: Max 19 Min 0.02 Mean (mgd) 4.87 Mean (cfs) 7.54 Ac-ft 5,460

16-0710. North Fork Wailua River near Kapaa

Location.--lat 22°03'08", long 159°22'22", on right bank 1.1 miles upstream from confluence with South Fork, 3.5 miles southwest of Kapaa, and 5.0 miles north of Lihue.

Drainage area.--18.7 sq mi.

Records available.--July 1952 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 18 ft (from topographic map).

Average discharge.--15 years, 84.6 mgd (131 cfs).

Extremes.--Maximum discharge during year, 4,310 mgd (6,670 cfs) May 22 (gage height, 8.47 ft); minimum, 4.8 mgd (7.4 cfs) July 1.
1952-67: Maximum discharge, 34,400 mgd (53,200 cfs) Nov. 12, 1955 (gage height, 19.88 ft in gage well, 20.8 ft from flood-marks), from rating curve extended above 2,400 mgd on basis of slope-area measurement of peak flow; minimum, 1.37 mgd (2.12 cfs) Oct. 28, 1953.

Remarks.--Records fair. Wailua ditch (see sta. no. 690) and Aahoaka ditch divert above station for irrigation of sugarcane in vicinity of Kapaa and Wailua, respectively.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.3	33	102	6.0	109	79	264	51	90	177	80	100
2	11	20	70	6.0	79	73	190	48	84	177	120	130
3	17	19	55	5.8	74	68	220	41	79	221	200	120
4	21	21	54	5.8	202	124	179	32	103	171	80	130
5	15	15	54	6.0	538	84	161	36	95	289	59	100
6	33	11	44	55	373	67	130	49	90	160	72	84
7	19	23	39	39	222	63	106	49	76	126	82	70
8	12	144	36	13	181	61	110	44	152	137	94	68
9	9.5	72	34	7.3	115	59	88	48	100	202	92	58
10	15	34	37	300	100	57	59	300	84	210	65	57
11	7.9	17	71	686	96	56	59	750	76	450	61	64
12	5.5	14	103	126	298	54	92	550	79	350	61	32
13	5.5	23	49	88	130	54	355	304	74	200	131	38
14	36	71	50	76	93	52	399	229	64	700	82	33
15	14	44	44	310	164	50	151	290	54	330	48	31
16	8.2	37	32	566	166	50	108	400	43	200	300	29
17	21	32	36	236	119	51	92	140	211	120	85	28
18	44	27	32	141	95	86	93	165	85	100	80	28
19	7.3	18	43	97	82	50	82	110	74	90	70	24
20	30	16	44	84	79	47	89	104	111	80	600	15
21	15	16	32	92	84	57	77	92	301	70	1,100	15
22	7.3	11	30	68	73	61	76	85	519	66	2,700	14
23	14	6.8	21	61	508	133	63	85	520	60	600	13
24	7.6	37	31	50	281	65	109	80	364	150	250	13
25	470	274	35	34	167	97	92	76	340	270	139	14
26	308	261	25	27	162	183	69	76	500	200	120	18
27	158	284	7.3	26	143	99	64	171	715	120	126	17
28	90	141	6.3	32	118	122	63	89	552	100	150	26
29	73	90	6.3	42	108	231	65	----------	249	80	330	11
30	72	93	6.0	50	89	214	70	----------	193	70	250	12
31	51	160	----------	63	----------	271	59	----------	200	----------	115	----------
Total	1,604.1	2,064.8	1,228.9	3,398.9	5,048	2,818	3,834	4,494	6,277	5,676	8,342	1,392
Mean												
Mgd	51.7	66.6	41.0	110	168	90.9	124	160	202	189	269	46.4
Cfs	80.0	103	63.4	170	260	141	192	248	313	292	416	71.8
Ac-ft	4,920	6,340	3,770	10,430	15,490	8,650	11,770	13,790	19,260	17,420	25,600	4,270
Max	470	284	103	686	538	271	399	750	715	700	2,700	130
Min	5.5	6.8	6.0	5.8	73	47	59	32	43	60	48	11

Calendar Year 1966: Max 686 Min 4.8 Mean (mgd) 60.9 Mean (cfs) 94.2 Ac-ft 68,180
Fiscal Year 1966-67: Max 2,700 Min 5.5 Mean (mgd) 127 Mean (cfs) 196 Ac-ft 141,700

Note.--No gage-height record May 16-24.

Peak discharge (base, 2,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2400	7.05	2,750	4,250	2-11	about 2400	7.96	3,660	5,660
10-16	1500	7.62	3,320	5,140					
11- 5	0630	8.26	4,040	6,250	5-22	about 1200	8.47	4,310	6,670
11-23	0800	6.97	2,670	4,130					
1-13	1730	6.90	2,600	4,020					

16-0715. Left Branch Opaekaa Stream near Kapaa

Location.--Lat 22°04'43", long 159°23'55", on left bank 0.4 mile upstream from mouth, 0.6 mile northeast of Wailua Reservoir, and 4.9 miles west of Kapaa.

Drainage area.--0.7 sq mi, approximately.

Records available.--May 1960 to June 1967. Prior to July 1960, published as Left Branch Opaikaa Stream near Kapaa.

Gage.--Water-stage recorder and concrete control. Datum of gage is 458.4 ft above mean sea level (by stadia survey).

Average discharge.--7 years, 2.09 mgd (3.23 cfs).

Extremes.--Maximum discharge during year, 99 mgd (153 cfs) Oct. 10 (gage height, 4.11 ft), from rating curve extended above 20 mgd; minimum, 0.23 mgd (0.36 cfs) July 5, 6.
1960-67: Maximum discharge, 236 mgd (365 cfs) Apr. 15, 1963 (gage height, 5.21 ft), from rating curve extended above 7.9 mgd; minimum, 0.20 mgd (0.31 cfs) Jan. 14, 15, 1963.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.27	0.31	1.3	0.35	1.2	1.8	1.5	1.2	1.5	4.0	1.7	2.4
2	.27	.31	.89	.35	.94	1.7	1.5	1.2	1.4	3.5	1.8	2.5
3	.27	.31	.79	.31	.94	1.6	1.4	1.1	1.4	3.9	2.1	2.4
4	.27	.35	.73	.31	3.5	1.8	1.5	1.1	1.6	3.3	1.7	2.3
5	.23	.35	.68	.31	14	1.6	1.4	1.1	1.4	2.9	1.6	5.1
6	.31	.31	.68	.48	5.9	1.5	1.5	1.0	1.5	2.7	1.5	2.2
7	.31	.31	.60	.43	4.0	1.4	1.3	.94	1.3	2.5	1.5	1.8
8	.27	.68	.60	.39	7.0	1.3	1.3	.89	1.9	2.6	1.5	1.8
9	.27	.48	.56	.60	3.4	1.3	1.2	.89	1.5	2.9	1.5	1.7
10	.27	.35	.56	22	2.7	1.2	1.2	3.1	1.5	3.1	1.3	1.7
11	.35	.39	.64	16	2.4	1.2	1.1	6.2	1.4	5.6	1.3	1.6
12	.27	.39	.68	2.7	3.1	1.1	1.1	16	1.3	6.4	1.3	1.5
13	.27	.39	.60	1.8	2.3	1.1	8.7	4.1	1.3	4.5	1.3	1.5
14	.27	.48	.64	1.6	2.1	1.1	7.4	3.0	1.2	8.9	1.3	1.4
15	.27	.39	.64	1.7	2.2	1.0	3.7	3.2	1.2	6.2	1.3	1.4
16	.27	.35	.56	8.4	1.9	.94	2.6	5.1	1.1	4.6	1.4	1.3
17	.31	.35	.52	3.1	1.8	.94	2.2	2.8	1.8	4.0	1.3	1.3
18	.31	.35	.48	2.2	1.8	1.0	2.1	2.5	1.3	3.6	1.3	1.2
19	.31	.35	.48	1.9	1.7	.89	2.0	2.3	1.3	3.3	1.2	1.2
20	.31	.31	.48	1.7	1.6	.84	1.8	2.2	2.0	3.0	3.0	1.1
21	.31	.31	.48	1.6	1.5	.84	1.8	2.0	4.7	2.8	7.9	1.1
22	.27	.27	.64	1.5	1.5	.94	1.7	1.9	6.2	2.6	8.3	1.1
23	.39	.31	.48	1.4	11	1.0	1.6	1.8	9.0	2.5	5.9	1.1
24	.31	.39	.43	1.3	3.2	.84	1.7	1.7	6.8	2.4	4.0	1.1
25	3.5	.56	.43	1.2	2.6	.79	1.5	1.7	5.4	2.2	3.3	1.1
26	.89	1.2	.39	1.2	2.4	1.3	1.4	1.7	7.0	2.3	3.0	1.0
27	.64	1.8	.43	1.1	2.4	1.0	1.3	1.7	7.9	2.4	2.8	1.0
28	.48	1.0	.43	1.1	2.2	1.0	1.3	1.5	9.5	2.1	2.5	1.0
29	.43	.73	.39	1.0	2.0	1.3	1.2	----------	6.2	1.9	2.8	.89
30	.43	.64	.35	1.0	1.9	1.3	1.3	----------	4.7	1.8	2.8	.89
31	.43	2.4	----------	1.0	----------	1.2	1.2	----------	4.7	----------	2.5	----------
Total	13.76	17.12	17.56	80.03	95.18	36.82	62.5	73.92	101.0	104.5	76.7	47.68
Mean												
Mgd	0.444	0.552	0.585	2.58	3.17	1.19	2.02	2.64	3.26	3.48	2.47	1.59
Cfs	0.687	0.854	0.905	3.99	4.90	1.84	3.13	4.08	5.04	5.38	3.82	2.46
Ac-ft	42	53	54	246	292	113	192	227	310	321	235	146
Max	3.5	2.4	1.3	22	14	1.8	8.7	16	9.5	8.9	8.3	5.1
Min	0.23	0.27	0.35	0.31	0.94	0.79	1.1	0.89	1.1	1.8	1.2	0.89

Calendar Year 1966: Max 22 Min 0.23 Mean (mgd) 1.18 Mean (cfs) 1.83 Ac-ft 1,320
Fiscal Year 1966-67: Max 22 Min 0.23 Mean (mgd) 1.99 Mean (cfs) 3.08 Ac-ft 2,230

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
10-10	2300	4.11	99	153

16-0770. Makaleha ditch near Kealia

Location.--lat 22°07'00", long 159°22'04", on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 miles northwest of Kealia, and 4.1 miles northwest of Kapaa.

Records available.--December 1936 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 518 ft above mean sea level (by stadia survey).

Average discharge.--30 years (1937-67), 4.34 mgd (6.71 cfs).

Extremes.--1936-67: Maximum daily discharge, 20 mgd (31 cfs) Aug. 1, 1961; no flow at times.

Remarks.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane near Kealia.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.5	3.3	7.8	4.6	11	2.9	0.29	0.07	0.53	0.29	2.7	2.0
2	5.3	9.6	4.6	4.6	.15	2.9	.34	.05	.11	.23	.02	.61
3	4.8	8.6	.93	5.4	.11	.07	.31	.04	.09	.32	.04	.45
4	4.8	9.5	.84	5.1	.89	.30	.34	.04	.29	.23	.04	.31
5	4.9	9.4	.75	5.3	4.9	.09	.34	.04	.23	.18	.02	3.7
6	4.9	9.9	3.6	14	2.5	1.8	.38	.02	.23	.15	.02	5.8
7	4.9	11	5.8	12	2.1	4.6	.34	1.0	.18	.11	.04	5.4
8	4.8	15	5.5	7.7	2.3	4.3	.41	3.6	.52	.11	.07	5.6
9	4.7	9.9	5.0	10	1.1	2.7	.29	3.8	.41	.13	4.9	5.4
10	4.6	6.3	5.4	12	.64	.04	.18	7.7	.31	.21	5.8	5.0
11	4.8	8.2	7.6	3.7	.38	.02	.15	1.4	.29	.80	5.9	6.3
12	5.6	7.2	8.5	1.2	.41	2.4	.18	7.2	.23	1.6	6.9	6.3
13	5.2	12	7.0	.64	.31	2.6	2.4	1.4	.21	1.3	6.3	4.3
14	6.0	12	8.5	.26	.26	.02	5.4	.64	.15	2.4	7.1	4.3
15	6.3	.26	6.6	.15	.23	.02	1.7	.41	.13	2.6	5.9	5.0
16	6.1	.18	5.4	.70	.18	.01	.67	1.2	.11	1.2	7.1	5.1
17	6.2	2.3	5.8	.49	.50	.01	.38	.49	.58	.60	5.8	3.5
18	6.5	9.3	5.8	.29	.26	.07	.26	.34	.21	.34	7.1	3.6
19	6.2	8.1	6.6	.21	.18	.01	.21	.23	.15	.23	6.6	3.9
20	8.3	6.4	6.3	.21	.15	0	.15	.18	.27	.15	7.2	4.0
21	7.5	5.6	8.8	4.2	.13	0	.13	.13	1.0	.13	6.5	4.1
22	6.7	6.2	10	7.2	.11	.02	.11	.11	1.9	.11	4.4	4.0
23	7.2	10	8.7	5.8	2.9	.04	.09	.09	5.1	.09	2.2	4.0
24	7.4	14	5.8	5.4	.89	.01	.07	.09	3.8	.07	1.0	3.8
25	7.1	13	6.2	5.0	.56	.08	.07	.07	1.8	.07	.56	4.0
26	.31	12	5.4	1.9	.31	.23	.05	.09	1.7	.05	.50	3.7
27	.31	2.3	5.8	.07	.26	.13	.04	.34	1.3	.09	.34	3.6
28	2.6	2.2	5.0	.07	.18	.13	.60	.18	1.8	1.6	.26	4.8
29	7.4	5.8	5.0	.07	.15	.22	.13	----------	1.0	5.0	.23	3.5
30	11	12	5.0	.15	.13	.21	.11	----------	.60	5.9	.41	3.4
31	6.8	10	----------	6.0	----------	.26	.09	----------	.38	---------	.29	---------
Total	174.72	251.54	174.02	124.41	34.17	26.19	16.21	30.95	25.61	26.29	96.24	119.47
Mean												
Mgd	5.64	8.11	5.80	4.01	1.14	0.845	0.523	1.11	0.826	0.876	3.10	3.98
Cfs	8.73	12.5	8.97	6.20	1.76	1.31	0.809	1.72	1.28	1.36	4.80	6.16
Ac-ft	536	772	534	382	105	80	50	95	79	81	295	367
Max	11	15	10	14	11	4.6	5.4	7.7	5.1	5.9	7.2	6.3
Min	0.31	0.18	0.75	0.07	0.11	0	0.04	0.02	0.09	0.05	0.02	0.31

Calendar Year 1966: Max 15 Min 0 Mean (mgd) 3.44 Mean (cfs) 5.32 Ac-ft 3,850
Fiscal Year 1966-67: Max 15 Min 0 Mean (mgd) 3.01 Mean (cfs) 4.66 Ac-ft 3,380

16-0790. Kapahi ditch near Kealia

Location.--Lat 22°06'09", long 159°22'28", on right bank 500 ft downstream from intake and 4.0 miles west of Kealia.

Records available.--April 1909 to February 1911, May 1911, July 1911 to May 1914, July 1915 to April 1917, June 1917 to June 1967. Published as "at Kapahi, near Kapaa" prior to January 1913 and as "at Kapahi, near Kealia" January to December 1913.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 377.1 ft above mean sea level (by stadia survey). Prior to Nov. 26, 1936, at site 61 ft upstream at datum 2.52 ft higher.

Average discharge.--49 years (1917-20, 1921-67), 4.44 mgd (6.87 cfs).

Extremes.--1909-67: Maximum daily discharge, 89.2 mgd (138 cfs) Feb. 6, 1913; no flow at times.

Remarks.--Records good. Ditch diverts from Kapaa Stream for irrigation of sugarcane in vicinity of Kapaa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.3	4.3	5.3	2.2	6.1	0.31	0.32	0.31	0.23	0.16	0.19	0.45
2	6.2	8.6	2.5	2.2	5.9	.35	.23	.40	.19	.16	.23	.56
3	4.9	3.9	.19	2.5	2.1	.27	.27	.45	1.2	.19	.16	.40
4	4.8	5.7	.16	2.2	.27	.27	.23	.45	1.8	.16	.19	.31
5	5.3	4.4	.13	2.0	.45	4.7	4.6	1.7	.35	.16	.23	3.3
6	7.8	3.9	2.1	13	.32	3.5	.56	6.7	.31	.16	.23	5.9
7	6.5	4.2	2.7	4.4	.29	2.8	.45	7.7	.23	.16	.23	6.2
8	3.2	11	2.6	2.8	.26	2.7	.35	4.9	.28	.19	.23	6.2
9	.27	6.2	1.6	4.3	.16	1.2	.31	4.8	.16	.16	.10	5.7
10	.23	4.2	.13	4.8	.13	.19	7.9	3.2	.23	.19	.23	5.7
11	2.1	4.9	.13	.19	.10	.16	3.8	.74	.23	.62	.27	7.0
12	2.7	2.4	3.0	.07	.13	3.2	.27	.93	.23	.50	.19	6.8
13	2.5	.23	3.3	.04	.10	2.6	.71	.19	.23	.23	.19	6.3
14	5.6	.16	3.4	.04	.07	.27	.56	.19	.19	1.1	.19	5.7
15	3.8	.16	2.8	.04	.10	.31	.19	.16	.19	.56	.19	4.6
16	3.0	6.7	2.4	.13	.10	.35	.31	.43	.19	.19	.31	4.0
17	4.7	7.2	2.4	.04	.16	.35	.56	.16	.27	.19	.35	5.9
18	6.1	4.2	2.5	.04	.07	.31	1.2	.16	.69	.13	.40	6.1
19	4.0	3.8	2.6	.04	.07	5.9	1.1	.16	3.0	.10	.35	5.3
20	7.3	3.2	2.6	.04	.07	6.5	.80	.51	.35	.07	.80	4.6
21	2.9	3.1	3.6	.04	.07	8.4	1.4	1.9	.35	.07	.93	4.6
22	2.5	3.6	4.6	.04	.07	6.7	.68	.35	.61	1.6	.86	4.5
23	3.5	4.3	4.2	.98	.34	2.6	.56	.31	1.3	.19	.19	4.4
24	3.5	5.1	2.8	4.2	.10	.23	.35	.31	.58	.19	.13	4.8
25	15	5.3	2.6	3.8	.07	.27	.35	.27	.45	.27	.13	6.2
26	.13	3.4	2.5	6.6	.07	.16	.31	.31	.74	.19	.10	6.2
27	.10	.31	2.5	8.0	.07	.35	.31	.27	.74	.19	.07	6.2
28	.10	.13	2.4	7.1	.07	.31	.31	.23	.45	.16	.07	6.5
29	.10	1.8	2.3	5.9	.07	.35	.31	----------	.16	.13	.24	5.7
30	.10	5.4	2.4	6.2	.14	.31	.31	----------	.16	.13	.35	5.4
31	.10	5.2	----------	5.9	----------	.33	.31	----------	.16	----------	.31	----------
Total	114.33	126.99	72.44	89.83	18.02	56.25	29.92	38.19	16.25	8.50	8.64	145.52
Mean												
Mgd	3.69	4.10	2.41	2.90	0.601	1.81	0.965	1.36	0.524	0.283	0.279	4.85
Cfs	5.71	6.34	3.73	4.49	0.930	2.80	1.49	2.10	0.811	0.438	0.432	7.50
Ac-ft	351	390	222	276	55	173	92	117	50	26	27	447
Max	15	11	5.3	13	6.1	8.4	7.9	7.7	3.0	1.6	0.93	7.0
Min	0.10	0.13	0.13	0.04	0.07	0.16	0.19	0.16	0.16	0.07	0.07	0.31

Calendar Year 1966: Max 16 Min 0.04 Mean (mgd) 2.68 Mean (cfs) 4.15 Ac-ft 3,010
Fiscal Year 1966-67: Max 15 Min 0.04 Mean (mgd) 1.99 Mean (cfs) 3.08 Ac-ft 2,220

16-0800. Kapaa Stream at Kapahi ditch intake, near Kapaa

Location.--lat 22°06'15", long 159°22'29", on right bank at Kapahi ditch intake, 4 miles northwest of Kapaa, and 4.5 miles northwest of Wailua.

Drainage area.--3.3 sq mi, approximately.

Records available.--July 1936 to June 1967. Prior to July 1959, published as Kapaa River at Kapahi ditch intake, near Kapaa.

Gage.--Water-stage recorder and concrete-masonry control. Datum of gage is 381.8 ft above mean sea level (by stadia survey). Prior to July 1, 1962, at datum 0.07 ft higher.

Average discharge.--31 years, 13.8 mgd (21.4 cfs).

Extremes.--Maximum discharge during year, 1,750 mgd (2,710 cfs) Nov. 23 (gage height, 3.50 ft); no flow for many days.
1936-67: Maximum discharge, 4,960 mgd (7,670 cfs) Jan. 25, 1956 (gage height, 5.41 ft, present datum), from rating curve extended above 1,800 mgd by logarithmic plotting; no flow at times.

Remarks.--Records good. Entire low flow is diverted above station at times for irrigation of sugarcane. Records do not include flow of Kapahi ditch (see sta. no. 790).

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.14	3.2	0.04	0	22	7.5	47	10	15	24	13	16
2	.16	.68	3.0	0	8.0	7.5	27	10	14	24	28	32
3	0	0	8.0	0	8.9	11	37	9.6	12	34	36	17
4	0	2.1	7.5	0	51	22	36	8.9	32	23	16	15
5	.31	0	7.5	.05	141	5.9	27	7.8	19	19	16	7.4
6	6.3	.71	2.6	4.4	86	5.0	27	3.4	25	18	15	1.3
7	0	.67	0	0	47	2.0	23	0	18	17	12	0
8	1.6	22	0	0	49	1.6	29	0	37	33	30	0
9	4.2	0	.98	8.2	20	5.0	14	0	20	28	11	0
10	3.2	0	2.6	286	17	8.4	3.2	59	17	28	7.0	0
11	.93	0	4.2	79	16	8.4	8.2	113	15	95	6.6	2.4
12	0	1.4	1.1	20	45	2.1	19	175	14	89	7.5	1.4
13	0	6.6	0	16	18	4.4	140	32	16	47	7.5	0
14	0	13	0	14	14	8.9	103	20	12	166	8.4	0
15	0	12	0	34	22	8.0	24	26	11	75	6.6	0
16	0	4.9	0	128	23	8.0	16	81	10	29	12	0
17	5.4	.11	0	30	61	12	14	19	34	21	7.5	0
18	3.0	0	.01	17	18	17	14	24	13	17	9.6	0
19	0	0	.02	14	14	2.5	12	18	13	16	9.3	0
20	0	0	0	14	15	1.4	15	16	32	14	147	0
21	0	0	0	8.4	12	6.9	12	12	59	14	232	0
22	0	0	0	7.5	12	17	12	12	109	10	247	0
23	0	.02	0	4.6	191	18	11	14	181	13	42	0
24	0	8.2	0	0	36	11	14	13	90	14	22	0
25	69	5.9	0	0	29	36	14	13	86	19	19	0
26	27	19	0	0	23	47	11	21	126	22	16	0
27	23	47	0	0	21	18	10	52	130	15	16	0
28	10	19	0	1.3	14	20	18	16	81	12	15	0
29	3.8	5.3	0	2.1	13	34	14	----------	30	7.5	39	0
30	6.1	.05	0	15	12	26	14	----------	22	7.5	38	.04
31	6.1	4.8	----------	7.5	----------	37	11	----------	24	----------	18	----------
Total	170.24	176.64	37.55	711.05	1058.9	419.5	776.4	785.7	1317	951.0	1110.0	92.54
Mean												
Mgd	5.49	5.70	1.25	22.9	35.3	13.5	25.0	28.1	42.5	31.7	35.8	3.08
Cfs	8.49	8.82	1.93	35.4	54.6	20.9	38.7	43.5	65.8	49.0	55.4	4.77
Ac-ft	522	542	115	2180	3250	1290	2380	2410	4040	2920	3410	284
Max	69	47	8.0	286	191	47	140	175	181	166	247	32
Min	0	0	0	0	8.0	1.4	3.2	0	10	7.5	6.6	0

Calendar Year 1966: Max 286 Min 0 Mean (mgd) 12.3 Mean (cfs) 19.0 Ac-ft 13,750
Fiscal Year 1966-67: Max 286 Min 0 Mean (mgd) 20.8 Mean (cfs) 32.2 Ac-ft 23,340

Peak discharge (base, 1,200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2130	3.22	1,420	2,200	1-13	1630	3.24	1,440	2,230
11- 5	0530	3.35	1,570	2,430	5-21	1300	3.14	1,330	2,060
11-23	0630	3.50	1,750	2,710					

16-0870. Anahola ditch wasteway near Kealia

Location.--Lat 22°00'16", long 159°22'28", on right bank 300 ft downstream from wasteway gates on Anahola ditch, 500 ft north of Kaneha Reservoir, 3.8 miles west of Anahola, and 4.9 miles northwest of Kealia.

Records available.--July 1936 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 825 ft above mean sea level (by stadia survey).

Average discharge.--31 years, 3.35 mgd (5.18 cfs).

Extremes.--1936-67: Maximum daily discharge, 54 mgd (84 cfs) Nov. 12, 1955; no flow at times.

Remarks.--Records good. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 miles below gaging station 890 on Anahola Stream.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.12	0.09	2.7	0.06	12	0.62	0.62	2.2	4.4	10	0.34	11
2	.12	.12	2.0	.06	3.6	.62	.62	2.5	3.8	11	.34	11
3	.12	.06	1.8	.06	2.5	.62	.84	2.2	3.2	9.6	.43	7.4
4	.12	.06	1.7	.06	13	.84	.84	2.0	7.2	9.8	2.5	5.6
5	.12	.18	1.6	.06	17	.72	.62	2.7	3.6	6.5	4.0	4.8
6	.12	.18	.56	.02	15	.84	.72	1.3	13	7.1	4.2	3.0
7	.18	.18	.12	.02	14	.84	.84	.18	7.5	8.2	3.5	.52
8	.18	4.9	.18	.02	12	.84	.96	.18	11	8.6	1.3	.52
9	.18	4.2	.06	.02	6.1	.84	.72	.26	5.9	9.3	.18	.52
10	.18	.43	.06	9.4	5.4	.84	.26	12	5.0	6.2	.18	.43
11	.18	.43	.06	15	5.4	.84	.28	20	4.0	14	.26	.52
12	.18	.34	.06	5.6	14	.84	1.6	20	3.5	15	.26	.34
13	.18	.52	.06	6.1	5.9	.84	13	10	11	12	.26	.34
14	.18	1.6	.06	3.8	4.0	.96	17	6.1	4.4	24	.26	.34
15	.18	4.4	.06	15	7.8	.84	8.1	9.8	3.5	1.8	.26	.12
16	.12	4.4	.06	15	9.0	.72	5.4	12	3.3	14	.18	.26
17	.18	3.5	.06	7.9	4.6	.84	4.6	6.3	7.6	10	.18	.26
18	.12	5.6	.06	5.0	3.3	.84	5.2	11	3.5	7.6	.26	.26
19	.12	5.4	.02	4.0	3.0	.62	3.8	5.9	5.8	6.5	.26	.34
20	.18	3.5	.06	3.6	3.8	.62	5.2	5.4	7.6	5.9	7.5	.34
21	.18	2.8	.02	4.6	3.0	.96	4.8	4.2	12	5.2	22	.34
22	.26	1.2	.06	3.3	5.9	.96	3.8	3.6	18	4.8	17	.34
23	.26	.43	.06	3.0	2.1	.84	3.0	3.3	26	4.4	17	.43
24	.52	.26	.06	2.7	.62	.72	3.3	3.3	17	2.5	11	.52
25	6.9	.18	.06	2.5	.52	.52	4.4	3.6	17	.52	9.2	.52
26	3.8	.52	.06	2.3	.52	1.4	2.8	8.3	16	.18	7.6	.52
27	.62	1.5	.06	2.2	.52	.43	2.5	13	17	.26	7.4	.34
28	.34	8.3	.06	1.6	.43	.43	2.3	4.8	16	.34	6.3	.34
29	.12	4.8	.06	.72	.43	.72	2.3	----------	11	.26	9.2	.34
30	.06	3.8	.06	1.7	.52	.62	3.0	----------	7.8	.34	13	.26
31	.06	5.0	----------	10	----------	.72	2.2	----------	9.7	----------	7.4	----------
Total	16.18	68.88	11.90	125.40	175.96	23.90	105.62	176.12	286.3	215.90	153.75	51.86
Mean												
Mgd	0.522	2.22	0.397	4.05	5.87	0.771	3.41	6.29	9.24	7.20	4.96	1.73
Cfs	0.808	3.43	0.614	6.27	9.08	1.19	5.28	9.73	14.3	11.1	7.67	2.68
Ac-ft	50	211	37	385	540	73	324	540	879	663	472	159
Max	6.9	8.3	2.7	15	17	1.4	17	20	26	24	22	11
Min	0.06	0.06	0.02	0.02	0.43	0.43	0.26	0.18	3.2	0.18	0.18	0.12

Calendar Year 1966: Max 17 Min 0.02 Mean (mgd) 2.18 Mean (cfs) 3.37 Ac-ft 2440
Fiscal Year 1966-67: Max 26 Min 0.02 Mean (mgd) 3.87 Mean (cfs) 5.99 Ac-ft 4330

16-0880. Anahola ditch above Kaneha Reservoir, near Kealia

Location.--Lat 22°08'10", long 159°22'28", on left bank at point of discharge into Kaneha Reservoir, 500 ft below wasteway gates, and 5 miles northwest of Kealia.

Records available.--December 1921 to June 1967. Records for May 1915 to December 1921 at site 520 ft upstream not equivalent owing to diversion.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 821.8 ft above mean sea level (Lihue Plantation bench mark). Dec. 9, 1921, to June 2, 1934, at site 480 ft upstream at different datum.

Average discharge.--43 years (1922-25, 1927-67), 2.89 mgd (4.47 cfs).

Extremes.--1921-67: Maximum daily discharge, 40 mgd (62 cfs) Nov. 12, 1947; no flow at times.

Remarks.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see sta. no. 870).

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.7	3.7	0.33	1.1	0.12	0.01	0	0.02	0.02	0.06	3.7	0.12
2	3.9	6.6	.28	1.0	0	.01	0	.04	.02	.06	8.5	.12
3	1.7	4.7	.24	1.0	0	0	.01	.04	.02	.06	12	.09
4	1.8	4.8	.24	1.0	.21	.01	.02	.04	.04	.06	2.2	.09
5	1.4	5.7	.20	1.1	.24	.01	.02	.04	.02	.06	.09	.06
6	4.3	5.0	1.2	7.7	.24	.01	.02	1.1	.09	.06	.06	1.0
7	1.8	4.6	1.7	4.2	.20	.01	.02	1.7	.04	.09	.04	3.2
8	1.5	8.2	1.6	2.2	.20	0	.02	1.6	.06	.09	5.0	3.1
9	1.4	2.6	1.6	5.1	.06	0	.02	2.3	.04	.09	4.2	2.9
10	1.2	3.3	1.6	7.3	.06	0	.29	3.6	.04	.09	2.8	3.0
11	1.1	6.4	2.6	.06	.06	0	.27	.20	.04	.12	2.4	4.3
12	1.1	3.3	2.2	0	.24	0	.02	.24	.04	.12	3.6	5.5
13	1.2	6.6	2.3	.01	.06	0	.14	.09	.09	.09	3.1	2.8
14	4.0	10	4.8	0	.04	0	.12	.06	.04	.12	6.7	2.4
15	1.7	.04	2.6	.09	.06	0	.06	.09	.04	.06	4.2	2.3
16	1.5	.04	1.6	.09	.09	0	.04	.12	.04	.04	4.2	2.2
17	4.2	.02	1.8	.02	.04	0	.04	.06	.06	.04	4.4	2.1
18	4.6	.02	1.9	0	.02	0	.04	.09	.04	.04	7.9	2.1
19	1.6	.02	3.0	0	.02	0	.04	.04	.04	.04	5.3	2.0
20	3.7	.01	2.0	0	.02	0	.04	.04	.06	.02	12	1.9
21	1.8	.01	3.4	0	.02	0	.04	.04	.09	.02	12	2.0
22	1.8	1.1	5.8	0	.06	0	.01	.04	.20	.02	4.6	1.9
23	2.0	8.4	2.2	0	.06	0	.01	.04	.71	.01	.33	1.7
24	3.4	11	1.6	0	.01	0	.01	.04	.16	1.2	.24	1.7
25	8.6	7.8	1.4	0	.01	0	.02	.04	.12	4.4	.20	1.8
26	6.2	11	1.3	0	.01	.01	.01	.06	.12	6.0	.16	1.8
27	8.3	13	1.3	0	.01	0	.01	.06	.12	3.8	.16	1.9
28	3.2	.71	1.2	.49	.01	0	.01	.02	.09	5.6	.12	2.2
29	2.8	.48	1.6	1.1	.01	0	.01	----------	.09	3.0	.16	1.6
30	5.8	.38	1.5	.84	.01	.01	.01	----------	.06	3.8	.16	1.6
31	3.9	.38	----------	.09	----------	0	.02	----------	.06	---------	.09	---------
Total	94.2	129.91	55.09	34.49	2.19	0.08	1.39	11.85	2.70	29.26	110.61	59.48
Mean												
Mgd	3.04	4.19	1.84	1.11	0.073	0.003	0.045	0.423	0.087	0.975	3.57	1.98
Cfs	4.70	6.48	2.85	1.72	0.113	0.005	0.070	0.654	0.135	1.51	5.52	3.06
Ac-ft	289	399	169	106	6.7	0.2	4.3	36	8.3	90	339	183
Max	8.6	13	5.8	7.7	0.24	0.01	0.29	3.6	0.71	6.0	12	5.5
Min	1.1	0.01	0.20	0	0	0	0	0.02	0.02	0.01	0.04	0.06

Calendar Year 1966: Max 13 Min 0 Mean (mgd) 1.78 Mean (cfs) 2.75 Ac-ft 2000
Fiscal Year 1966-67: Max 13 Min 0 Mean (mgd) 1.46 Mean (cfs) 2.26 Ac-ft 1630

16-0890. Anahola Stream near Kealia

Location.--lat 22°09'05", long 159°21'17", on right bank at intake of Lower Anahola ditch and 4.5 miles northwest of Kealia.

Drainage area.--5.5 sq mi, approximately.

Records available.--August to December 1910, January 1913 to November 1918, January 1919, March 1919 to June 1967. Monthly discharge only for some periods, published in WSP 1319. Published as Anahola River above dam at Kiokala, near Kealia prior to July 1913 and as Anahola River near Kealia July 1913 to June 1958.

Gage.--Water-stage recorder and concrete dam-orifice control. Datum of gage is 295.11 ft above mean sea level (Highway Department bench mark). Prior to May 4, 1934, at site 0.1 mile upstream at different datum.

Average discharge.--53 years (1913-18, 1919-67), 14.5 mgd (22.4 cfs).

Extremes.--Maximum discharge during year, 3,860 mgd (5,970 cfs) May 21 (gage height, 8.76 ft), from rating curve extended above 42 mgd on basis of slope-area measurement at gage height 10.6 ft; minimum, 2.2 mgd (3.4 cfs) July 16, 17.
1910, 1913-67: Maximum discharge, 12,700 mgd (19,600 cfs) Jan. 25, 1956 (gage height, 14.6 ft, from floodmarks), from rating curve extended above 380 mgd; minimum, 1.28 mgd (1.98 cfs) Oct. 27, 1953.

Remarks.--Records poor. Records include flow in Lower Anahola ditch (see sta. no. 910). Anahola ditch (see sta. no. 880) diverts 3 miles above station for irrigation in vicinity of Kealia.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.1	3.7	4.4	2.8	49	8.7	23	5.5	9.1	23	9.4	58
2	3.6	7.7	3.4	2.6	5.3	8.4	22	6.2	8.7	26	15	33
3	3.1	4.8	3.2	2.8	3.9	8.0	26	5.3	8.4	19	29	20
4	3.0	4.8	3.1	2.9	62	16	26	5.1	12	21	11	17
5	2.8	4.6	3.0	2.6	154	8.4	15	5.3	8.7	16	8.7	14
6	4.2	4.2	3.0	11	90	7.4	16	5.8	105	14	9.1	14
7	3.4	3.7	2.8	4.2	113	7.0	20	5.3	20	15	8.7	12
8	2.6	39	2.8	3.7	51	6.7	30	4.6	40	17	21	14
9	2.6	6.7	2.6	8.7	23	6.3	12	4.6	15	15	9.1	11
10	2.5	3.7	2.6	227	16	6.0	8.0	108	13	12	8.4	11
11	2.4	11	2.8	66	13	5.8	7.7	108	12	30	8.0	11
12	2.4	4.6	3.0	10	32	5.5	29	143	11	60	8.4	13
13	2.6	6.0	3.0	11	13	6.3	151	24	45	35	8.0	8.7
14	3.0	21	6.0	6.0	9.9	6.3	102	17	14	200	32	7.0
15	2.6	5.8	4.8	17	14	5.5	17	14	12	90	9.1	6.0
16	2.4	5.1	3.7	48	12	5.1	12	63	10	25	7.4	5.5
17	4.2	4.2	3.6	8.4	10	5.5	9.9	14	21	21	8.0	5.3
18	6.2	4.8	3.6	6.0	8.7	16	9.4	16	11	18	20	5.1
19	2.7	6.3	3.7	4.8	7.7	5.5	8.0	12	18	16	9.4	4.8
20	3.6	4.2	3.6	4.4	7.7	5.1	8.4	11	34	16	180	4.6
21	2.8	3.6	3.9	4.2	7.0	10	8.4	10	64	14	667	4.8
22	2.5	3.6	6.7	3.7	7.4	15	7.4	9.4	132	13	303	5.5
23	2.8	8.7	3.7	3.6	124	21	6.3	9.1	364	12	82	6.0
24	3.1	64	3.2	3.4	34	7.4	8.2	8.7	118	11	19	4.6
25	79	8.0	3.1	3.2	24	7.8	11	8.7	115	10	14	4.6
26	11	30	3.0	3.1	17	47	6.3	58	99	11	15	4.4
27	9.1	39	3.0	3.1	19	13	6.0	44	107	9.9	17	4.4
28	3.9	8.0	2.8	3.0	13	9.4	5.8	10	76	11	15	4.4
29	3.7	5.8	3.4	3.0	11	23	5.5	----------	29	9.9	75	4.6
30	5.5	5.1	3.2	3.1	9.9	17	6.0	----------	23	9.4	37	4.2
31	4.2	4.6	----------	15	----------	21	5.3	----------	23	----------	16	----------
Total	190.6	336.3	104.7	498.3	961.5	341.1	628.6	735.6	1577.9	800.2	1679.7	322.5
Mean												
Mgd	6.15	10.8	3.49	16.1	32.0	11.0	20.3	26.3	50.9	26.7	54.2	10.8
Cfs	9.52	16.7	5.40	24.9	49.5	17.0	31.4	40.7	78.8	41.3	83.9	16.7
Ac-ft	585	1030	321	1530	2950	1050	1930	2260	4840	2460	5150	990
Max	79	64	6.7	227	154	47	151	143	364	200	667	58
Min	2.4	3.6	2.6	2.6	3.9	5.1	5.3	4.6	8.4	9.4	7.4	4.2

Calendar Year 1966: Max 227 Min 2.4 Mean (mgd) 11.4 Mean (cfs) 17.6 Ac-ft 12750
Fiscal Year 1966-67: Max 667 Min 2.4 Mean (mgd) 22.4 Mean (cfs) 34.7 Ac-ft 25090

Peak discharge (base, 1,100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2130	5.50	1,360	2,100	3-23	1600	6.83	2,250	3,480
11- 5	0530	6.27	1,860	2,880	5-21	1330	8.76	3,860	5,970
1-13	1630	5.32	1,250	1,930					

16-0910. Lower Anahola ditch near Kealia

Location.--lat 22°08'13", long 159°19'31", on left bank 100 ft downstream from last wasteway, 1.3 miles southwest of mouth of Anahola Stream, and 2.5 miles northwest of Kealia.

Records available.--December 1936 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 276.11 ft above mean sea level (Highway Department bench mark).

Average discharge.--30 years (1937-67), 2.03 mgd (3.14 cfs).

Extremes.--1936-67: Maximum daily discharge, 12.0 mgd (18.6 cfs) June 1, 1938; no flow at times each year.

Remarks.--Records good. Ditch diverts from Anahola Stream for irrigation of sugarcane near Anahola.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.2	0.01	0	1.5	0	0			0	0	3.5	0
2	2.0	.01	0	1.4	0	0			0	0	2.7	0
3	1.9	0	0	1.4	0	0			0	0	.03	0
4	1.7	0	0	1.5	0	0			0	0	.04	0
5	1.9	0	0	1.4	.06	0			0	0	.03	0
6	2.2	0	0	2.2	0	0			0	0	0	0
7	2.3	0	.85	2.7	0	0			.01	0	0	0
8	2.0	.02	2.7	2.2	0	0			0	0	0	0
9	1.7	.05	2.9	2.2	0	0			0	0	2.3	0
10	1.6	0	1.7	1.3	0	0			.01	0	4.0	0
11	1.7	0	1.6	0	0	0			.01	0	4.2	0
12	1.7	0	2.5	0	0	0			0	0	4.3	0
13	1.6	0	3.0	0	0	0			0	0	3.3	0
14	1.5	0	3.5	0	0	0			0	0	3.3	0
15	1.4	.02	2.6	0	0	0			0	0	4.8	0
16	1.4	.01	3.1	0	0	0			0	0	4.4	1.8
17	1.3	0	1.8	0	0	0			0	0	2.2	7.1
18	1.8	.01	1.7	0	0	0			0	0	.04	7.0
19	2.1	.01	2.2	0	0	0			0	0	.04	7.3
20	1.9	.01	2.3	0	0	0			0	0	.04	4.8
21	2.0	0	2.2	0	0	0			0	0	.40	.06
22	1.5	0	2.2	0	0	0			0	0	0	.04
23	2.0	0	2.2	0	0	0			0	0	0	.03
24	1.7	0	1.8	0	0	0			0	0	0	.01
25	3.0	0	1.7	0	0	0			0	2.0	0	0
26	.04	0	1.7	0	0	.01			0	3.9	0	3.4
27	0	0	1.6	0	0	0			0	3.5	0	5.5
28	0	.01	1.6	0	0	.01			0	3.6	0	5.1
29	0	.01	1.6	0	0	.02		----------	0	3.4	0	5.0
30	0	0	1.6	0	0	.01		----------	0	3.4	0	4.9
31	0	0	----------	0	----------	.01		----------	0	---------	0	---------
Total	46.14	0.17	50.65	17.8	0.06	0.06	0	0	0.03	19.8	39.62	52.04
Mean												
Mgd	1.49	0.005	1.69	0.57	0.002	0.002	0	0	0.001	0.66	1.28	1.73
Cfs	2.31	0.008	2.61	0.88	0.003	0.003	0	0	0.002	1.02	1.98	2.68
Ac-ft	142	0.5	155	55	0.2	0.2	0	0	0.1	61	122	160
Max	3.0	0.05	3.5	2.7	0.06	0.02	0	0	0.01	3.9	4.8	7.3
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 5.7 Min 0 Mean (mgd) 0.855 Mean (cfs) 1.32 Ac-ft 958
Fiscal Year 1966-67: Max 7.3 Min 0 Mean (mgd) 0.620 Mean (cfs) 0.959 Ac-ft 695

16-0932. Anahola Stream at Anahola

Location.--lat 22°08'42", long 159°18'59", on downstream side of old highway bridge at Anahola, 0.1 mile upstream from Highway 56, and 0.9 mile upstream from mouth.

Drainage area.--9.89 sq mi.

Records available.--Fiscal years 1962-65 (annual maximums), November 1964 to June 1967.

Gage.--Water-stage recorder. Datum of gage is at mean sea level (by stadia survey). Apr. 12, 1962, to Nov. 19, 1964, crest-stage gage at same site and datum.

Extremes.--Maximum discharge during year, 5,530 mgd (8,560 cfs) May 21 (gage height, 14.52 ft), from rating curve extended above 1,400 mgd as explained below; minimum, 3.5 mgd (5.4 cfs) Sept. 27-29, Oct. 1-3.
1961-67: Maximum discharge, 8,400 mgd (13,000 cfs), revised, May 15, 1965 (gage height, 16.0 ft, revised), from rating curve extended above 1,400 mgd on basis of contracted-opening measurement of peak flow.
1964-67: Minimum discharge, 3.0 mgd (4.6 cfs) Oct. 11, 1965.

Remarks.--Records good. Anahola ditch (see sta. no. 880) and Lower Anahola ditch (aee sta. no. 910) divert above station for irrigation of sugarcane in vicinities of Kealia snd Anahola, respectively.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.4	7.8	13	3.8	75	15	29	14	20	41	13	73
2	4.7	11	10	3.5	14	15	30	16	20	50	18	57
3	4.6	8.6	8.8	3.8	10	14	34	14	18	38	36	36
4	4.1	8.8	8.1	43	82	23	36	13	28	40	15	28
5	4.3	8.4	7.8	3.7	247	15	24	13	20	31	19	25
6	5.1	8.1	8.4	9.5	125	14	26	14	111	29	18	24
7	5.3	8.1	6.0	5.3	136	13	27	12	46	32	17	19
8	4.3	36	4.6	4.4	92	12	44	11	75	35	27	18
9	4.1	21	4.4	7.3	40	12	22	10	36	31	14	18
10	4.0	8.6	4.4	262	30	12	16	96	30	26	10	16
11	4.0	14	4.4	102	26	11	15	147	25	59	10	16
12	4.1	10	5.1	24	51	11	34	215	24	90	10	19
13	4.4	8.8	5.3	22	28	11	138	62	71	49	9.7	16
14	4.3	22	5.6	14	20	12	136	35	29	252	34	16
15	4.7	14	5.3	32	28	10	42	29	23	167	12	16
16	4.9	13	4.1	66	26	9.7	34	92	21	63	10	13
17	5.1	13	4.0	30	28	10	26	30	39	44	11	6.6
18	5.9	15	4.0	15	20	21	24	35	24	35	27	6.6
19	4.3	16	4.1	13	17	10	21	28	27	32	16	6.6
20	4.3	12	4.3	12	17	9.4	21	24	49	28	181	8.1
21	4.4	11	4.4	12	16	12	20	21	106	27	772	13
22	3.8	11	5.8	11	20	17	19	20	148	25	256	11
23	4.4	13	4.4	10	139	28	17	18	470	24	119	9.1
24	4.3	60	3.8	9.4	41	13	17	18	150	22	55	7.1
25	66	13	3.8	8.8	31	12	25	18	140	17	41	6.2
26	22	28	4.1	8.6	24	50	16	49	130	18	36	5.5
27	14	41	3.8	8.6	26	24	15	90	150	14	32	4.9
28	8.4	22	3.5	8.6	19	17	15	25	124	14	28	4.9
29	7.4	16	4.0	7.6	17	33	15	----------	58	13	64	4.7
30	8.4	13	4.7	7.4	16	26	16	----------	43	13	57	4.7
31	7.8	13	----------	15	----------	31	14	----------	42	----------	31	----------
Total	244.8	505.2	164.0	744.6	1461	523.1	968	1169	2297	1359	1998.7	509.0
Mean												
Mgd	7.90	16.3	5.47	24.0	48.7	16.9	31.2	41.8	74.1	45.3	64.5	17.0
Cfs	12.2	25.2	8.46	37.1	75.4	26.1	48.3	64.7	115	70.1	99.8	26.3
Ac-ft	751	1550	503	2290	4480	1610	2970	3590	7050	4170	6130	1560
Max	66	60	13	262	247	50	138	215	470	252	772	73
Min	3.8	7.8	3.5	3.5	10	9.4	14	10	18	13	9.7	4.7

Calendar Year 1966: Max 262 Min 3.5 Mean (mgd) 17.5 Mean (cfs) 27.1 Ac-ft 19610
Fiscal Year 1966-67: Max 772 Min 3.5 Mean (mgd) 32.7 Mean (cfs) 50.6 Ac-ft 36650

Peak discharge (base, 1,400 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-5	0700	11.61	2,160	3,340	5-21	1300	14.52	5,530	8,560

16-0942. Ka Loko ditch near Kilauea

Location.--Lat 22°10'43", long 159°22'59", on left bank 35 ft downstream from Moloaa ditch, 400 ft upstream from Ka Loko Reservoir, and 3.5 miles southeast of Kilauea.

Records available.--August 1932 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 754 ft above mean sea level (by stadia survey).

Average discharge.--34 years (1933-67), 3.40 mgd (5.26 cfs).

Extremes.--1932-67: Maximum daily discharge, 63 mgd (98 cfs) Dec. 10, 1935; minimum daily, 0.05 mgd (0.08 cfs) Apr. 30, May 1, 3, 1965.

Remarks.--Records good. Ditch diverts from Moloaa and Puu Ka Ele Streams at points 0.5 mile southeast and 1.5 miles southwest of station, respectively, for irrigation in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.9	2.1	2.9	1.4	12	3.0	4.5	2.8	2.4	0.36	3.6	0.41
2	2.4	4.1	2.7	1.3	2.7	2.9	6.2	3.2	3.1	.36	6.4	.32
3	1.7	2.7	2.6	1.4	2.0	2.8	4.7	3.0	3.0	3.3	8.5	.32
4	1.7	2.3	2.5	1.4	14	4.0	5.0	2.6	3.9	4.2	4.6	.32
5	1.5	2.3	2.5	1.2	23	2.8	3.4	2.7	3.1	.36	3.6	2.5
6	2.6	2.1	2.4	3.1	15	2.5	3.6	2.8	3.6	2.7	3.4	4.2
7	1.6	2.0	2.4	2.0	13	2.4	4.5	2.6	.64	5.2	3.2	4.0
8	1.4	6.1	2.2	1.5	11	2.2	6.8	2.4	.58	4.6	5.1	3.8
9	1.4	3.0	2.0	2.4	5.9	2.1	3.4	2.3	2.0	4.2	3.8	3.6
10	1.3	2.0	2.0	21	5.0	2.0	2.7	5.0	3.4	3.4	3.2	3.6
11	1.2	4.4	2.4	14	4.5	2.0	2.6	.90	2.8	3.6	3.1	3.6
12	1.2	2.4	2.6	3.6	9.1	1.9	3.5	.90	2.7	.70	3.1	4.5
13	1.2	2.7	2.0	7.3	5.0	2.0	3.2	3.3	3.5	2.4	3.0	3.2
14	1.5	6.2	3.0	2.9	3.9	2.0	.47	4.0	3.9	2.0	4.1	3.1
15	1.2	2.6	2.4	6.5	5.5	1.8	.32	2.9	4.1	.53	3.4	2.9
16	1.1	2.6	1.9	9.2	4.5	1.7	2.4	4.0	3.6	.41	2.9	2.8
17	1.4	2.1	1.9	4.7	3.4	1.8	4.2	2.7	2.6	3.1	2.9	2.8
18	2.8	2.4	1.8	3.2	2.7	2.6	5.1	4.1	.41	5.2	6.9	2.8
19	1.4	2.7	2.0	2.7	2.6	1.7	4.2	3.1	.41	4.8	3.9	2.6
20	2.2	2.1	1.8	2.5	2.6	1.5	2.8	3.6	.41	4.5	27	2.5
21	1.4	1.9	2.2	2.4	2.4	2.0	1.9	3.8	.36	2.2	16	2.5
22	1.2	1.9	3.2	2.2	2.4	2.7	1.6	3.5	.41	.41	.32	2.4
23	1.4	4.6	2.0	2.2	18	5.6	2.7	3.5	.59	.41	2.5	2.3
24	2.2	11	1.7	2.1	7.7	2.2	4.7	3.2	.36	2.6	4.6	2.3
25	17	4.4	1.6	2.0	6.0	2.5	6.3	3.1	.36	4.1	5.1	2.3
26	4.9	8.7	1.5	2.0	4.8	7.1	3.6	4.0	.36	4.4	4.4	2.2
27	4.1	12	1.4	1.9	4.5	3.8	3.3	5.0	.36	3.9	2.1	2.2
28	2.3	5.2	1.4	1.8	3.8	2.9	3.1	1.4	.36	3.8	1.9	2.1
29	2.1	3.6	1.9	1.8	3.4	6.9	3.0	----------	2.2	3.5	3.9	2.1
30	3.1	3.3	1.8	1.7	3.3	5.3	3.3	----------	4.7	3.6	1.8	2.0
31	2.4	3.0	----------	2.9	----------	5.4	2.8	----------	4.2	---------	1.4	---------
Total	74.8	118.5	64.7	116.3	203.7	92.1	109.89	86.40	64.41	84.84	149.72	76.27
Mean												
Mgd	2.41	3.82	2.16	3.75	6.79	2.97	3.54	3.09	2.08	2.83	4.83	2.54
Cfs	3.73	5.91	3.34	5.80	10.5	4.60	5.48	4.78	3.22	4.38	7.47	3.93
Ac-ft	230	364	199	357	625	283	337	265	198	260	459	234
Max	17	12	3.2	21	23	7.1	6.8	5.0	4.7	5.2	27	4.5
Min	1.1	1.9	1.4	1.2	2.0	1.5	0.32	0.90	0.36	0.36	0.32	0.32

Calendar Year 1966: Max 23 Min 1.1 Mean (mgd) 3.21 Mean (cfs) 4.97 Ac-ft 3,590
Fiscal Year 1966-67: Max 27 Min 0.32 Mean (mgd) 3.40 Mean (cfs) 5.26 Ac-ft 3,810

16-0950. Puu Ka Ele ditch near Kilauea

Location.--Lat 22°11'10", long 159°24'17", on left bank 200 ft upstream from Puu Ka Ele Reservoir and 2 miles south of Kilauea.

Records available.--August 1932 to March 1967 (discontinued).

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 426 ft above mean sea level (by stadia survey).

Average discharge.--33 years (1933-66), 2.49 mgd (3.85 cfs).

Extremes.--1932-67: Maximum daily discharge, 21 mgd (32 cfs) Sept. 2, 1943; no flow at times each year.

Remarks.--Records good except those below 0.1 mgd, which are fair. Ditch diverts from Puu Ka Ele Stream 0.8 mile south of station for irrigation of sugarcane in vicinity of Kilauea.

Discharge, in million gallons a day, July 1966 to March 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.7	1.7	0	0.91	0.08	0	0	0	0			
2	1.7	2.3	0	.91	0	0	.17	0	0			
3	1.3	1.9	0	1.1	0	0	0	0	0			
4	1.1	1.8	0	1.1	.37	0	0	0	0			
5	1.1	1.6	0	1.2	.89	0	0	0	0			
6	1.2	1.7	0	2.1	.40	0	0	.91	.56			
7	1.1	1.6	0	1.3	.04	0	0	1.8	0			
8	.91	4.7	.46	1.1	0	0	.02	1.7	.14			
9	.91	2.1	1.2	1.3	0	0	0	1.7	-			
10	.84	1.6	1.3	11	0	0	0	1.4	-			
11	.77	3.1	1.3	9.6	0	0	0	1.4	-			
12	.77	1.8	1.8	.04	0	0	0	.94	-			
13	.77	1.8	1.3	.07	0	0	.01	0	-			
14	1.1	3.3	2.3	0	0	0	.23	0	-			
15	.77	2.1	1.6	0	0	0	0	0	-			
16	.77	2.0	1.1	.15	0	0	0	.55	-			
17	.98	1.7	1.1	0	0	0	0	0	-			
18	1.7	1.7	1.1	0	0	0	0	0	-			
19	.98	1.8	1.1	0	0	0	0	1.4	-			
20	2.5	1.5	.98	0	0	0	0	3.5	-			
21	1.3	1.3	1.3	0	0	0	0	3.1	-			
22	1.1	1.3	1.8	0	0	0	0	2.9	-			
23	.98	2.8	1.2	0	1.2	0	0	2.9	-			
24	1.1	7.5	.98	0	0	0	0	2.7	-			
25	13	3.3	.91	0	0	0	0	2.5	-			
26	5.0	8.6	.84	0	0	.33	0	1.2	-			
27	4.9	12	.84	0	0	0	0	.06	-			
28	2.4	5.1	.91	0	0	0	0	0	-			
29	2.0	3.5	1.2	0	0	.39	0	----------	-			
30	2.3	2.9	1.1	0	0	0	0	----------	-			
31	1.8	1.1	----------	0	----------	0	0	----------	-	----------		----------
Total	58.85	91.2	27.72	31.88	2.98	0.72	0.43	30.66	-			
Mean												
Mgd	1.90	2.94	0.924	1.03	0.099	0.023	0.014	1.10	-			
Cfs	2.94	4.55	1.43	1.59	0.153	0.036	0.022	1.70	-			
Ac-ft	181	280	85	98	9.1	2.2	1.3	94	-			
Max	13	12	2.3	11	1.2	0.39	0.23	3.5	-			
Min	0.77	1.1	0	0	0	0	0	0	-			

Calendar Year 1966: Max 13 Min 0 Mean (mgd) 1.41 Mean (cfs) 2.18 Ac-ft 1580
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

16-0952. Ross ditch near Kilauea

Location.--Lat 22°11'22", long 159°24'33", on left bank 1,000 ft downstream from intake and 1.7 miles south of Kilauea.

Records available.--October 1956 to March 1967 (discontinued).

Gage.--Digital water-stage recorder and Parshall flume. Datum of gage is 341 ft above mean sea level (by stadia survey). Prior to July 1, 1962, graphic water-stage recorder at same site at datum 0.03 ft higher and July 1, 1962, to Mar. 16, 1964, at same datum.

Average discharge.--9 years (1957-66), 2.48 mgd (3.84 cfs).

Extremes.--1956-67: Maximum daily discharge, 11 mgd (17 cfs) Apr. 15, 1963, Mar. 8, 1964, Mar. 31, Apr. 13, 1965; no flow at times.

Remarks.--Records fair. Ditch diverts from Puu Ka Ele Stream for irrigation in vicinity of Kilauea.

Discharge, in million gallons a day, July 1966 to March 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.4	2.4	4.6	1.5	4.6	0.70	1.6	3.6	3.2			
2	2.1	3.1	4.2	1.4	3.8	.63	2.0	3.8	3.7			
3	1.7	2.9	4.0	1.3	2.4	.49	2.4	2.7	3.9			
4	1.6	2.8	3.8	1.2	4.7	.70	2.2	1.1	4.0			
5	1.8	2.4	3.7	1.2	8.3	.49	2.0	1.2	3.8			
6	1.9	2.6	3.6	2.1	7.4	.39	1.8	1.0	6.4			
7	1.8	2.6	3.6	1.5	5.7	.39	1.7	.26	5.0			
8	1.7	4.4	3.0	1.3	4.6	.26	2.3	.23	6.1			
9	1.7	3.0	2.0	1.5	2.0	.21	1.5	.29	-			
10	1.6	2.4	2.0	5.2	1.5	.19	1.0	6.0	-			
11	1.6	3.4	2.1	5.8	1.4	.16	.80	10	-			
12	1.6	2.8	2.7	5.5	5.7	.14	.80	9.9	-			
13	1.6	2.8	2.1	6.4	2.6	.21	5.0	6.2	-			
14	1.9	3.4	2.9	5.5	1.4	.16	6.0	4.1	-			
15	1.7	2.6	2.2	6.7	3.2	.12	3.5	3.6	-			
16	1.6	.90	1.9	7.2	1.9	.08	2.5	7.9	-			
17	1.8	.12	1.9	6.7	1.4	.08	2.2	4.6	-			
18	2.1	1.6	1.8	6.1	1.2	.21	2.0	4.2	-			
19	1.7	2.6	2.0	5.6	1.0	.08	1.8	2.3	-			
20	4.2	2.2	1.9	5.2	.94	.07	1.7	.82	-			
21	2.5	2.1	2.2	4.7	.82	.14	1.6	1.4	-			
22	1.9	2.1	2.4	4.4	2.2	.23	1.6	2.2	-			
23	1.8	3.1	1.9	4.1	8.1	1.8	1.6	2.3	-			
24	1.9	5.0	1.8	3.8	5.5	.26	2.0	2.1	-			
25	7.8	3.2	1.6	3.6	2.4	.32	2.7	2.0	-			
26	6.1	4.8	1.6	3.5	2.2	2.8	1.7	4.0	-			
27	5.9	7.7	1.6	3.4	1.5	2.8	1.5	7.8	-			
28	3.2	4.4	1.6	3.3	1.2	2.3	1.4	4.1	-			
29	2.8	3.0	1.8	3.2	1.0	2.4	1.4	----------	-			
30	3.0	2.6	1.8	3.1	.86	2.1	1.6	----------	-			
31	2.6	3.8	----------	3.8	----------	2.0	2.2	----------	-	----------		----------
Total	77.6	92.82	74.3	119.8	91.52	22.91	64.10	99.70	-			
Mean												
Mgd	2.50	2.99	2.48	3.86	3.05	0.739	2.07	3.56	-			
Cfs	3.87	4.63	3.84	5.97	4.72	1.14	3.20	5.51	-			
Ac-ft	238	285	228	368	281	70	197	306	-			
Max	7.8	7.7	4.6	7.2	8.3	2.8	6.0	10	-			
Min	1.6	0.12	1.6	1.2	0.82	0.07	0.80	0.23	-			

Calendar Year 1966: Max 8.3 Min 0.01 Mean (mgd) 2.18 Mean (cfs) 3.37 Ac-ft 2440
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

16-0959. Kalihiwai ditch above wasteway, near Kilauea

Location.--Lat 22°10'42", long 159°25'43", on left bank 1,800 ft upstream from wasteway gate, 0.7 mile upstream from Kalihiwai Reservoir, and 2.5 miles southwest of Kilauea.

Records available.--April 1960 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 413.4 ft above mean sea level (by stadia survey).

Average discharge.--7 years, 4.04 mgd (6.25 cfs).

Extremes.--1960-67: Maximum daily discharge, 36 mgd (56 cfs) May 21, 1967; minimum daily, 0.87 mgd (1.4 cfs) Feb. 7, 1961.

Remarks.--Records good. Ditch diverts from Pohakuhonu Stream for domestic use and irrigation of sugarcane in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.6	3.1	3.1	1.8	9.4	2.4	4.6	1.6	3.0	7.3	3.6	4.4
2	3.2	4.9	2.8	1.7	3.6	2.3	5.2	1.5	2.8	7.0	6.3	4.3
3	2.2	3.5	2.6	1.7	3.0	2.3	4.8	1.5	2.5	8.6	7.9	4.0
4	2.0	3.5	2.5	1.7	13	2.2	4.3	1.5	2.4	6.7	4.9	3.8
5	1.8	3.3	2.4	1.6	14	2.0	3.4	1.5	2.4	6.2	3.6	3.6
6	2.0	3.3	2.4	3.4	9.3	2.0	3.3	1.5	12	6.3	2.6	3.5
7	1.9	3.2	2.4	2.2	6.1	2.0	3.6	1.4	5.0	5.4	2.4	3.4
8	1.6	7.0	2.4	1.8	4.3	1.8	5.1	1.4	5.1	4.9	2.4	3.3
9	1.5	4.2	2.3	1.7	3.2	1.7	3.0	1.9	3.8	4.3	2.3	3.3
10	1.5	3.2	2.3	12	2.8	1.7	2.4	18	3.4	4.2	2.2	3.3
11	1.4	5.7	2.3	7.5	2.8	1.6	2.3	23	3.1	7.5	2.2	3.3
12	1.4	3.7	3.2	3.5	6.9	1.6	3.9	16	3.0	8.1	2.1	3.2
13	1.4	3.7	2.4	6.7	3.5	1.7	13	7.0	9.9	6.7	2.1	3.0
14	1.8	5.5	2.8	3.8	2.8	1.6	15	4.6	3.8	26	2.8	2.8
15	1.7	3.5	2.4	13	3.8	1.5	4.8	6.7	3.3	16	3.1	2.8
16	1.5	3.3	2.2	15	5.5	1.5	3.5	10	3.0	7.3	2.6	2.6
17	1.5	3.0	2.1	7.3	3.1	1.5	3.0	4.5	2.5	5.6	2.5	2.6
18	2.8	3.1	2.1	5.3	2.6	1.8	3.0	4.4	3.4	4.9	4.6	2.5
19	1.9	3.2	2.3	4.4	2.4	1.5	2.5	3.6	3.9	4.3	3.1	2.4
20	6.9	2.8	2.1	3.7	2.4	1.5	2.1	3.4	6.3	3.9	13	2.2
21	2.8	2.5	2.4	3.5	2.3	1.7	2.2	3.0	14	3.7	36	2.2
22	2.3	2.6	3.1	3.1	3.7	2.1	2.0	2.8	19	3.4	18	2.2
23	2.2	4.2	2.4	3.0	17	3.9	1.8	2.6	27	3.2	10	2.1
24	2.2	8.8	2.1	2.8	7.3	1.9	1.9	2.5	15	3.1	6.6	2.1
25	21	8.6	2.0	2.5	4.8	1.7	2.4	2.4	14	3.8	5.6	2.2
26	15	15	2.0	2.4	4.6	4.9	1.9	6.8	28	4.5	5.1	2.1
27	12	13	1.9	2.4	3.8	2.8	1.8	7.1	19	3.7	5.9	2.4
28	4.9	5.5	1.8	2.3	3.2	2.6	1.7	3.3	12	3.7	4.6	2.4
29	3.8	4.3	2.1	2.2	2.8	7.3	1.7	----------	7.8	3.5	6.8	2.1
30	4.3	3.6	2.0	2.2	2.6	4.6	1.9	----------	6.2	3.5	6.3	2.0
31	3.5	3.5	----------	4.2	----------	5.1	1.7	----------	8.9	----------	4.8	----------
Total	116.6	148.3	70.9	130.4	156.6	74.8	113.8	145.5	255.5	187.3	186.0	86.1
Mean												
Mgd	3.76	4.78	2.36	4.21	5.22	2.41	3.67	5.20	8.24	6.24	6.00	2.87
Cfs	5.82	7.40	3.65	6.51	8.08	3.73	5.68	8.05	12.7	9.65	9.28	4.44
Ac-ft	358	455	218	400	481	230	349	447	784	575	571	264
Max	21	15	3.2	15	17	7.3	15	23	28	26	36	4.4
Min	1.4	2.5	1.8	1.6	2.3	1.5	1.7	1.4	2.4	3.1	2.1	2.0

Calendar Year 1966: Max 21 Min 1.3 Mean (mgd) 3.21 Mean (cfs) 4.97 Ac-ft 3600
Fiscal Year 1966-67: Max 36 Min 1.4 Mean (mgd) 4.58 Mean (cfs) 7.09 Ac-ft 5130

16-0960. Kalihiwai ditch near Kilauea

Location.--lat 22°11'07", long 159°25'58", on right bank 0.1 mile upstream from Kalihiwai Reservoir and 2.4 miles southwest of Kilauea.

Records available.--June 1934 to March 1967 (discontinued). Monthly discharge only for August 1943, published in WSP 1319.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 409.2 ft above mean sea level (by stadia survey).

Average discharge.--32 years (1934-66), 2.25 mgd (3.48 cfs).

Extremes.--1934-67: Maximum daily discharge, 29.5 mgd (45.6 cfs) July 16, 1937; no flow at times.

Remarks.--Records fair. Ditch diverts low flow of most branches of Pohakuhonu Stream at intakes about 1 mile south of station. Water discharges into Kalihiwai Reservoir, where it is stored for irrigation of sugarcane in vicinity of Kilauea.

Discharge, in million gallons a day, July 1966 to March 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.1	2.6	0.20	1.4	5.6	0.05	0.03	0.10	0.13			
2	2.5	4.6	1.5	1.3	.07	.05	.04	.07	.10			
3	1.5	3.2	1.0	1.2	.13	.05	.04	.07	.10			
4	1.3	3.2	.20	1.2	.29	.05	.04	.05	.10			
5	1.2	2.7	.20	1.2	.29	.05	.04	.05	.10			
6	1.5	2.8	.16	1.5	.16	.05	.05	.05	.13			
7	1.3	2.6	.16	1.5	.05	.05	.05	.04	.61			
8	1.2	6.4	.16	1.4	.05	.05	.05	.04	.49			
9	1.2	3.9	.16	1.2	.05	.05	.05	.04	.16			
10	1.1	2.6	.16	1.0	.05	.05	.04	.20	.16			
11	1.0	3.4	.16	2.8	.05	.05	.04	.24	-			
12	.95	2.5	.16	3.0	.05	.05	.05	.20	-			
13	.95	2.5	.16	3.2	.05	.05	.07	.13	-			
14	1.6	3.5	.16	2.8	.05	.05	.13	.49	-			
15	1.2	2.5	1.5	1.0	.05	.05	.07	.38	-			
16	1.2	2.3	1.5	.10	.05	.05	.07	.49	-			
17	1.5	2.1	1.5	.10	.05	.05	.05	.29	-			
18	2.3	1.7	1.5	.10	.05	.07	1.2	.29	-			
19	1.7	2.2	1.5	.10	.05	.05	2.3	.44	-			
20	7.2	2.0	1.5	.10	.05	.04	1.2	.67	-			
21	2.5	1.9	1.5	2.4	.05	.05	.20	.55	-			
22	2.0	1.7	1.5	2.2	.05	.05	.16	.49	-			
23	1.9	2.8	1.5	2.0	1.0	.07	.13	.44	-			
24	2.0	2.4	1.5	1.9	.50	.04	.13	.38	-			
25	23	2.8	1.4	1.9	.05	.04	.13	.33	-			
26	7.2	3.9	1.4	1.9	.05	.05	.10	.29	-			
27	2.8	.20	1.4	1.9	.05	.04	.07	.33	-			
28	4.6	.20	1.4	1.7	.05	.03	.07	.13	-			
29	3.6	.20	1.4	1.7	.05	.05	.05	----------	-			
30	3.9	.20	1.5	1.7	.05	.04	.05	----------	-			
31	3.2	.20	----------	1.7	----------	.05	.05	----------	-	----------	----------	----------
Total	91.20	75.80	28.04	47.20	9.14	1.52	6.75	7.27	-			
Mean												
Mgd	2.94	2.45	0.935	1.52	0.305	0.049	0.218	0.260	-			
Cfs	4.55	3.79	1.45	2.35	0.472	0.076	0.337	0.402	-			
Ac-ft	280	233	86	145	28	4.7	21	22	-			
Max	23	6.4	1.5	3.2	5.6	0.07	2.3	0.67	-			
Min	0.95	0.20	0.16	0.10	0.05	0.03	0.03	0.04	-			

Calendar Year 1966: Max 23 Min 0.03 Mean (mgd) 1.38 Mean (cfs) 2.14 Ac-ft 1,550
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Note.--No gage-height record Aug. 18 to Sept. 21, Sept. 23 to Nov. 2, Nov. 8 to Dec. 13.

16-0970. Pohakuhonu Stream near Kilauea

Location.--lat 22°10'52", long 159°25'40", on left bank 0.8 mile upstream from confluence with Halaulani Stream, 1.2 miles upstream from Stone Dam, and 2.5 miles southwest of Kilauea.

Drainage area.--1.8 sq mi, approximately.

Records available.--October 1957 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 401.7 ft above mean sea level (by stadia survey).

Average discharge.--9 years (1958-67), 5.47 mgd (8.46 cfs).

Extremes.--Maximum discharge during year, 1,280 mgd (1,980 cfs) May 21 (gage height, 6.08 ft), from rating curve extended above 420 mgd as explained below; minimum, 0.80 mgd (1.2 cfs) June 20-30.
1957-67: Maximum discharge, 1,750 mgd (2,710 cfs) Aug. 6, 1959 (gage height, 7.23 ft, from floodmark in well), from rating curve extended above 420 mgd on basis of slope-area measurement at gage height 11.0 ft; minimum, that of June 20-30, 1967.
Maximum stage known, 11.0 ft Jan. 24, 1956, from floodmark (discharge, 3,620 mgd or 5,600 cfs, from slope-area measurement of peak flow).

Remarks.--Records good. Kalihiwai ditch (sea sta. no. 959) diverts about 0.5 mile above station for domestic supply and irrigation of sugarcane. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.1	1.6	2.4	1.0	7.1	2.4	6.0	2.1	4.0	7.6	1.9	1.9
2	1.8	2.1	2.1	.95	1.5	2.2	6.5	1.9	3.6	6.5	4.9	1.9
3	1.4	1.9	1.9	1.0	1.3	2.1	6.0	1.9	3.2	9.9	6.8	1.7
4	1.3	1.9	1.7	.95	16	2.2	5.5	1.8	3.1	7.6	2.8	1.4
5	1.2	1.8	1.6	.95	21	2.1	4.7	2.1	2.9	6.2	2.4	1.3
6	1.3	1.9	1.5	1.9	10	1.9	4.5	1.8	22	5.9	2.9	1.2
7	1.2	1.8	1.6	1.1	5.1	1.9	4.9	1.8	5.3	4.9	2.6	1.1
8	1.1	4.2	1.5	1.0	4.9	1.8	7.0	1.8	5.3	4.0	2.6	1.1
9	1.0	2.2	1.4	1.0	3.6	1.7	3.8	2.2	3.8	3.6	2.5	1.0
10	.95	1.8	1.5	61	3.1	1.7	3.1	42	3.4	3.6	2.4	1.1
11	.95	3.1	1.6	6.5	3.4	1.6	2.8	72	3.1	8.0	2.2	1.0
12	.88	2.2	2.2	1.6	9.2	1.5	4.8	31	2.9	8.5	2.2	1.0
13	.88	2.2	1.7	5.4	4.2	1.7	32	8.5	14	6.2	2.2	.95
14	1.0	2.8	2.2	1.9	3.2	1.6	33	5.9	4.2	79	2.2	.95
15	.88	2.1	1.7	12	4.9	1.6	5.9	7.6	3.4	29	1.6	.95
16	.88	2.1	1.4	19	5.7	1.5	4.5	16	3.1	8.2	1.4	.95
17	1.1	1.8	1.4	4.5	3.4	1.5	3.8	5.6	3.1	6.2	1.3	.95
18	1.2	1.8	1.3	2.2	2.9	1.8	3.6	5.9	2.9	5.3	3.8	.95
19	1.1	2.1	1.5	1.8	2.6	1.5	3.2	4.7	5.8	4.7	1.7	.88
20	3.8	1.8	1.3	1.5	2.5	1.4	3.6	4.2	13	4.2	23	.88
21	1.7	1.7	1.5	1.4	2.2	1.7	3.1	3.8	68	3.8	230	.88
22	1.3	1.6	1.4	1.3	3.5	2.1	2.9	3.6	41	3.6	30	.88
23	1.1	2.2	1.1	1.2	84	4.0	2.8	3.4	131	3.4	11	.88
24	1.2	13	1.0	1.1	7.6	2.1	2.9	3.2	30	2.9	4.0	.80
25	25	7.4	1.0	1.1	5.1	1.8	3.2	3.1	21	2.4	3.2	.88
26	26	28	1.0	1.0	4.9	5.7	2.5	14	61	2.6	2.8	.80
27	4.9	27	1.0	1.0	3.8	2.9	2.4	13	36	1.9	3.6	.95
28	2.2	5.6	1.0	1.0	3.1	2.9	2.2	4.5	16	1.8	2.1	.95
29	1.9	3.8	1.1	1.0	2.8	9.6	2.2	----------	7.6	1.7	12	.88
30	2.2	2.9	1.0	1.0	2.5	5.9	2.5	----------	5.3	1.7	4.0	.88
31	1.9	2.6	----------	2.5	----------	6.2	2.1	----------	9.9	----------	2.4	----------
Total	95.42	139.0	44.6	140.85	235.1	80.6	178.0	269.4	538.9	244.9	378.5	31.94
Mean												
Mgd	3.08	4.48	1.49	4.54	7.84	2.60	5.74	9.62	17.4	8.16	12.2	1.06
Cfs	4.77	6.93	2.31	7.02	12.1	4.02	8.88	14.9	26.9	12.6	18.9	1.64
Ac-ft	293	427	137	432	721	247	546	827	1,650	752	1,160	98
Max	26	28	2.4	61	84	9.6	33	72	131	79	230	1.9
Min	0.88	1.6	1.0	0.95	1.3	1.4	2.1	1.8	2.9	1.7	1.3	0.80

Calendar Year 1966: Max 84 Min 0.88 Mean (mgd) 3.04 Mean (cfs) 4.70 Ac-ft 3,400
Fiscal Year 1966-67: Max 230 Min 0.80 Mean (mgd) 6.51 Mean (cfs) 10.1 Ac-ft 7,300

Peak discharge (base, 500 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2000	4.35	670	1,040	3-23	1530	4.92	862	1,330
11-23	0630	5.08	918	1,420	5-21	1330	6.08	1,280	1,980
2-11	0800	4.39	682	1,060					

16-0975. Kalaulani Stream at altitude 400 ft, near Kilauea

Location.--Lat 22°10'54", long 159°25'17", on left bank 0.5 mile upstream from confluence with Pohakuhonu Stream, 1 mile upstream from Stone Dam, and 2.5 miles south of Kilauea.

Drainage area.--1.1 sq mi, approximately.

Records available.--November 1957 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 391.8 ft above mean sea level (by stadia survey).

Average discharge.--9 years (1958-67), 7.98 mgd (12.3 cfs).

Extremes.--Maximum discharge during year, 1,110 mgd (1,720 cfs) May 21 (gage height, 7.54 ft), from rating curve extended above 130 mgd as explained below; minimum, 2.7 mgd (4.2 cfs) Oct. 5.
1957-67: Maximum discharge, 1,340 mgd (2,070 cfs) Aug. 6, 1959 (gage height, 8.30 ft), from rating curve extended above 130 mgd on basis of slope-area measurement of peak flow; minimum, 2.3 mgd (3.6 cfs) Feb. 20-23, 27, 28, Mar. 4, 1963.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.7	5.0	5.0	2.8	18	4.4	11	3.4	5.7	14	4.7	6.1
2	5.2	7.3	4.7	2.8	5.2	4.3	12	3.3	5.2	14	11	7.7
3	3.8	5.9	4.2	2.8	4.2	4.0	11	3.3	4.7	14	22	6.1
4	3.6	5.7	4.0	2.8	25	4.3	10	3.2	5.0	17	6.4	4.8
5	3.6	5.2	3.9	2.8	33	3.9	7.3	3.5	4.6	12	5.0	4.6
6	4.3	5.0	3.8	6.7	22	3.8	7.5	3.2	26	11	5.0	4.5
7	3.8	4.8	3.9	3.5	12	3.8	8.8	3.2	9.3	10	4.6	4.5
8	3.4	14	3.5	3.2	9.3	3.6	12	3.2	12	8.4	5.2	4.4
9	3.3	6.6	3.4	3.4	6.6	3.5	6.8	3.8	6.6	8.6	4.7	4.3
10	3.2	4.8	3.5	56	5.7	3.4	5.7	38	5.9	7.5	4.3	4.2
11	3.1	9.2	3.9	16	6.1	3.4	5.2	58	5.2	16	4.3	4.1
12	3.0	5.6	5.2	6.1	18	3.4	9.4	31	4.8	21	4.3	4.0
13	3.0	5.9	3.6	13	7.5	3.6	36	11	21	14	4.3	3.9
14	3.5	11	5.6	6.1	5.9	3.4	40	7.7	7.0	57	6.4	3.9
15	3.1	5.9	4.0	18	8.4	3.3	10	8.8	5.7	38	4.8	3.8
16	3.0	5.7	3.5	25	7.9	3.2	7.0	21	5.2	14	4.2	3.8
17	4.4	4.7	3.5	11	6.1	3.2	5.9	7.7	5.0	10	4.0	3.7
18	4.4	5.0	3.4	7.3	5.2	4.0	6.1	8.4	4.6	7.7	10	3.6
19	3.6	5.4	3.9	5.9	4.7	3.2	5.2	6.4	8.4	6.8	5.0	3.6
20	8.8	4.6	3.4	5.2	4.6	3.1	5.6	6.1	15	6.2	33	3.5
21	4.4	4.2	4.2	4.7	4.3	3.9	5.0	5.2	26	5.7	165	3.5
22	3.8	4.2	5.4	4.4	5.8	4.8	4.7	4.8	42	5.4	41	3.4
23	3.5	7.5	3.5	4.2	56	8.9	4.3	4.7	99	5.0	21	3.3
24	3.9	19	3.4	4.0	14	4.0	4.8	4.6	34	4.8	9.6	3.3
25	34	15	3.3	3.9	9.3	3.9	5.0	4.3	30	5.4	7.7	3.2
26	20	29	3.2	3.6	8.4	13	4.0	14	50	5.6	6.8	3.2
27	13	28	3.0	3.5	7.0	6.2	3.8	17	40	4.7	7.9	3.6
28	6.6	12	3.1	3.5	5.9	6.1	3.8	6.2	26	4.4	5.9	3.6
29	5.9	7.9	3.4	3.4	5.4	16	3.6	----------	14	4.4	18	3.3
30	6.8	6.6	3.1	3.4	4.7	11	4.0	----------	11	4.4	12	3.3
31	5.6	5.7	----------	7.2	----------	12	3.5	----------	14	----------	7.0	----------
Total	186.3	266.4	115.5	246.2	336.2	162.6	269.0	295.0	552.9	357.0	455.1	122.8
Mean												
Mgd	6.01	8.59	3.85	7.94	11.2	5.25	8.68	10.5	17.8	11.9	14.7	4.09
Cfs	9.30	13.3	5.96	12.3	17.3	8.12	13.4	16.2	27.5	18.4	22.7	6.33
Ac-ft	572	818	354	756	1030	499	826	905	1700	1100	1400	377
Max	34	29	5.6	56	56	16	40	58	99	57	165	7.7
Min	3.0	4.2	3.0	2.8	4.2	3.1	3.5	3.2	4.6	4.4	4.0	3.2

Calendar Year 1966: Max 56 Min 2.7 Mean (mgd) 5.97 Mean (cfs) 9.24 Ac-ft 6680
Fiscal Year 1966-67: Max 165 Min 2.8 Mean (mgd) 9.22 Mean (cfs) 14.3 Ac-ft 10330

Peak discharge (base, 370 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2030	5.04	478	740	3-23	1600	5.47	572	885
11-23	0630	5.61	608	941	5-21	1500	7.54	1,110	1,720
2-11	0700	4.51	372	576					

16-1000. Hanalei tunnel outlet near Lihue

Location.--Lat 22°04'57", long 159°27'52", on right bank at outlet of Hanalei tunnel, 2.2 miles downstream from intake on Kaapoko Stream, and 9.8 miles northwest of Lihue.

Records available.--July 1932 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 1,210 ft (from tunnel-profile).

Average discharge.--35 years, 17.7 mgd (27.4 cfs).

Extremes.--1932-67: Maximum daily discharge, 64 mgd (99 cfs) Apr. 11, 25, 26, 1942; no flow at times.

Remarks.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River into North Branch of North Fork Wailua River, from which it is later diverted for irrigation in vicinity of Lihue and Kapaa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	23	20	25	13	27	18	30	14	24	23	21	0.41
2	23	23	22	14	20	18	24	13	23	25	24	.71
3	18	26	21	14	18	18	27	13	21	26	30	.29
4	17	23	19	14	29	26	24	13	22	27	23	.29
5	21	22	18	14	33	21	24	13	21	34	20	.10
6	25	23	18	26	32	17	21	13	25	24	22	0
7	19	23	18	24	26	16	19	12	22	20	22	0
8	18	33	17	18	26	16	19	12	26	21	21	0
9	17	24	16	17	23	15	17	13	22	26	20	0
10	16	19	18	25	23	15	16	30	20	28	18	0
11	15	23	24	34	25	14	16	40	18	34	18	0
12	15	19	23	23	36	14	19	36	21	30	18	0
13	14	24	19	26	24	15	23	36	20	22	20	0
14	31	26	22	24	21	14	27	36	17	30	20	0
15	22	19	18	42	31	13	19	38	16	28	18	0
16	18	20	17	46	28	13	16	36	16	22	20	0
17	29	18	18	35	22	16	14	28	26	20	18	0
18	24	21	17	29	22	19	18	29	18	18	20	0
19	22	21	20	26	20	13	19	24	18	18	19	0
20	28	18	17	26	19	14	19	23	23	17	29	0
21	21	17	19	28	21	23	18	20	27	16	38	0
22	17	18	23	22	20	23	17	18	35	16	28	0
23	15	23	18	20	36	26	15	20	34	16	3.6	0
24	17	28	16	19	34	17	23	19	30	20	1.2	0
25	38	35	16	18	28	21	19	18	31	28	.68	6.4
26	40	32	16	18	27	30	16	23	35	26	.41	16
27	32	33	15	18	25	21	15	30	39	24	.19	22
28	26	30	14	16	22	24	14	23	32	23	.54	18
29	26	26	14	14	22	31	13	----------	24	21	4.2	13
30	25	26	14	23	20	30	15	----------	22	20	1.4	18
31	22	25	----------	23	----------	32	13	----------	24	---------	.41	---------
Total	694	738	552	709	760	603	589	643	752	703	499.63	95.20
Mean												
Mgd	22.4	23.8	18.4	22.9	25.3	19.5	19.0	23.0	24.3	23.4	16.1	3.17
Cfs	34.7	36.8	28.5	35.4	39.1	30.2	29.4	35.6	37.6	36.2	24.9	4.90
Ac-ft	2.130	2.260	1.690	2.180	2.330	1.850	1.810	1.970	2.310	2.160	1.530	292
Max	40	35	25	46	36	32	30	40	39	34	38	22
Min	14	17	14	13	18	13	13	12	16	16	0.19	0

Calendar Year 1966: Max 46 Min 1.2 Mean (mgd) 15.8 Mean (cfs) 24.4 Ac-ft 17,690
Fiscal Year 1966-67: Max 46 Min 0 Mean (mgd) 20.1 Mean (cfs) 31.1 Ac-ft 22,520

16-1030. Hanalei River near Hanalei

Location.--lat 22°11'31", long 159°27'57", on right bank 2.3 miles southeast of Hanalei and 4.9 miles upstream from mouth.

Drainage area.--19.1 sq mi.

Records available.--January 1912 to November 1919, fiscal years 1962-63 (annual maximums), December 1962 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 35.8 ft above mean sea level (by stadia survey). Jan. 1, 1912, to Nov. 20, 1919, staff gage at site 0.2 mile upstream at different datum. Jan. 26 to Dec. 26, 1962, crest-stage gage at present site and datum.

Extremes.--Maximum discharge during year, 26,500 mgd (41,000 cfs) May 21 (gage height, 13.81 ft), from rating curve extended above 1,800 mgd; minimum, 27 mgd (42 cfs) Oct. 5.
1912-19, 1961-67: Maximum discharge, 29,000 mgd (44,900 cfs) Nov. 13, 1965 (gage height, 14.23 ft), from rating curve extended above 1,800 mgd.
1912-19, 1962-67: Minimum discharge, 25 mgd (39 cfs) Mar. 4, 1963.

Remarks.--Records good except those for period of no gage-height record, which are poor. Since 1925, Hanalei tunnel (see sta. no. 1000) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	61	72	104	29	228	50	400	40	118	143	70	103
2	90	96	73	28	63	45	300	40	102	152	100	103
3	46	77	67	28	47	100	600	40	81	228	200	91
4	39	77	58	28	256	190	250	38	83	182	87	84
5	39	75	53	27	401	72	200	37	76	414	59	79
6	57	70	49	114	288	60	140	36	185	171	71	77
7	43	69	46	69	167	56	120	35	114	122	58	73
8	36	172	43	38	99	52	150	35	156	194	55	72
9	36	86	41	32	68	50	110	45	95	156	50	70
10	32	59	41	717	62	48	80	500	78	173	46	70
11	30	75	66	744	78	46	120	700	69	1,500	45	76
12	30	56	67	79	342	45	200	450	67	600	45	78
13	29	58	42	84	99	60	800	400	103	300	87	65
14	110	119	48	72	67	56	500	450	70	250	63	62
15	43	61	46	685	160	50	200	520	56	300	47	61
16	36	53	38	1,360	191	45	80	633	52	220	52	59
17	58	49	44	231	72	100	70	179	81	150	44	58
18	85	51	37	112	63	200	80	185	56	100	72	57
19	42	54	39	79	56	70	70	130	52	72	54	56
20	100	46	38	67	56	100	74	112	90	60	464	56
21	67	44	42	63	51	150	56	91	256	50	3,390	55
22	56	45	56	50	59	190	50	81	642	47	5,410	55
23	58	67	41	46	1,090	160	45	77	1,410	45	670	53
24	50	279	36	43	306	220	130	71	417	48	185	53
25	1,240	662	35	41	200	210	90	65	586	50	150	57
26	1,090	481	32	39	150	700	70	201	701	56	130	43
27	238	500	31	37	120	200	60	401	625	50	125	49
28	125	171	30	36	90	500	50	128	369	56	129	49
29	96	116	32	36	70	1,300	45	----------	156	52	263	43
30	79	99	30	66	60	700	50	----------	118	50	239	39
31	68	199	----------	82	----------	800	45	----------	144	---------	118	---------
Total	4,209	4,138	1,405	5,162	5,059	6,625	5,235	5,720	7,208	5,991	12,578	1,946
Mean												
Mgd	136	133	46.8	167	169	214	169	204	233	200	406	64.9
Cfs	210	206	72.4	258	261	331	261	316	361	309	628	100
Ac-ft	12,920	12,700	4,310	15,840	15,530	20,330	16,070	17,550	22,120	18,390	38,600	5,970
Max	1,240	662	104	1,360	1,090	1,300	800	700	1,410	1,500	5,410	103
Min	29	44	30	27	47	45	45	35	52	45	44	39

Calendar Year 1966: Max 1,360 Min 26 Mean (mgd) 114 Mean (cfs) 176 Ac-ft 128,000
Fiscal Year 1966-67: Max 5,410 Min 27 Mean (mgd) 179 Mean (cfs) 277 Ac-ft 200,300

Note.--No gage-height record Nov. 25 to Feb. 14.

Peak discharge (base, 3,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1130	8.33	5,560	8,600	12-29	about 0800	7.36	3,840	5,940
10-11	0130	8.07	5,050	7,810					
10-16	1430	9.28	7,700	11,900	1-13	-	11.08	12,900	20,000
11- 5	0530	8.41	5,720	8,850	2-10	-	10.71	11,600	17,900
11-23	0700	10.69	11,600	17,900	3-23	1700	9.26	7,650	11,800
					5-21	0730	13.81	26,500	41,000

16-1080. Wainiha River near Hanalei

Location.--Lat 22°08'10", long 159°33'40", on left bank at Puwainui Falls, 1.5 miles upstream from Wainiha powerplant intake, and 6.0 miles southwest of Hanalei.

Drainage area.--10.2 sq mi.

Records available.--August 1952 to February 1956, October 1957 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 960 ft (from topographic map).

Average discharge.--11 years (1953-55, 1958-67), 90.9 mgd (141 cfs).

Extremes.--Maximum discharge during year, 5,640 mgd (8,730 cfs) July 26 (gage height, 6.58 ft), from rating curve extended above 660 mgd as explained below; minimum, 26 mgd (40 cfs) Oct. 5, 29, Dec. 16.
1952-67: Maximum discharge recorded, 13,000 mgd (20,100 cfs) Aug. 6, 1959 (gage height, 8.19 ft), from rating curve extended above 660 mgd on basis of slope-area measurement at gage height 7.72 ft; minimum, 22.5 mgd (34.8 cfs) Feb. 12, 1954.
Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft from floodmarks (discharge, about 26,000 mgd or 40,000 cfs, from unit-discharge study).

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	88	36	37	27	103	32	283	33	81	80	43	51
2	83	53	34	27	55	30	137	33	63	89	73	48
3	43	66	32	27	51	33	413	33	46	148	149	46
4	38	53	31	27	265	160	187	32	43	271	50	51
5	56	49	32	27	169	68	148	31	39	584	39	48
6	67	54	32	108	152	38	116	30	66	92	43	46
7	46	62	33	86	71	34	81	28	52	68	36	43
8	40	98	31	41	57	31	105	28	52	100	38	45
9	39	49	29	34	45	30	67	31	39	264	36	45
10	33	34	35	59	47	29	50	315	36	392	34	46
11	31	53	72	322	71	28	55	544	34	948	36	55
12	33	39	71	52	260	27	135	228	64	313	35	48
13	29	51	36	65	59	31	539	234	49	198	33	41
14	137	74	57	61	40	29	320	359	36	279	39	39
15	54	39	41	909	125	27	77	442	35	171	35	39
16	46	42	34	1,020	76	26	57	343	34	82	44	38
17	139	33	50	179	39	42	46	78	86	62	36	38
18	80	41	37	72	37	118	58	104	43	48	48	38
19	57	55	58	53	33	46	49	62	40	43	41	37
20	87	39	37	53	33	43	51	61	76	40	344	37
21	60	36	50	56	41	114	40	46	148	39	697	37
22	52	39	51	34	77	137	38	41	713	37	1,760	37
23	38	84	35	31	493	112	34	49	697	36	453	36
24	43	177	30	31	174	198	105	45	214	40	85	36
25	749	480	29	30	116	170	53	37	294	41	74	61
26	1,130	252	29	29	108	509	42	61	574	44	70	47
27	105	363	28	28	83	119	39	175	414	36	76	70
28	57	85	28	27	46	205	36	84	150	41	116	48
29	52	52	29	26	41	782	34	----------	72	36	85	39
30	52	47	28	40	38	475	39	----------	62	36	123	37
31	42	45	----------	65	----------	567	34	----------	99	---------	57	----------
Totsl	3,606	2,680	1,156	3,646	3,005	4,290	3,468	3,587	4,451	4,658	4,828	1,327
Mean												
Mgd	116	86.5	38.5	118	100	138	112	128	144	155	156	44.2
Cfs	179	134	59.6	183	155	214	173	198	223	240	241	68.4
Ac-ft	11,070	8,220	3,550	11,190	9,220	13,170	10,640	11,010	13,660	14,290	14,820	4,070
Max	1,130	480	72	1,020	493	782	539	544	713	948	1,760	70
Min	29	33	28	26	33	26	34	28	34	36	33	36

Calendar Year 1966: Max 1,130 Min 26 Mean (mgd) 77.5 Mean (cfs) 120 Ac-ft 86,790
Fiscal Year 1966-67: Max 1,760 Min 26 Mean (mgd) 112 Mean (cfs) 173 Ac-ft 124,900

Peak discharge (base, 2,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-26	0030	6.58	5,640	8,730	1-13	1730	5.07	2,100	3,250
10-11	0130	5.05	2,080	3,220	4- 4	1630	5.09	2,140	3,310
10-15	0700	5.27	2,430	3,760	5-22	1330	5.87	3,670	5,680
12-29	0800	5.12	2,180	3,370					

16-1300. Nahomalu Valley near Mana
(Formerly published as Nahomalu Stream near Mana)

Location.--lat 22°02'41", long 159°45'17", on left bank 1.1 miles northeast of Mana and 5.3 miles northwest of Kekaha School.

Drainage area.--3.77 sq mi.

Records available.--Fiscal years 1962-63 (annual maximums), July 1963 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 236.8 ft above mean sea level (by stadia survey). Prior to July 1, 1963, crest-stage gage at same site and datum.

Extremes.--Maximum discharge during year, 108 mgd (167 cfs) Mar. 20 (gage height, 2.90 ft), from rating curve extended above 15 mgd as explained below; no flow most of the time.
1961-67: Maximum discharge, 629 mgd (973 cfa) Dec. 16, 1964 (gage height, 5.16 ft), from rating curve extended above 15 mgd on basis of slope-area measurement at gage height 5.13 ft.
1963-67: No flow most of the time each year.

Remarks.--Records fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1				0	0	0	0	0.34	0	0.31	0	0.10
2				0	.52	0	0	.28	0	.21	0	.18
3				0	.50	0	0	.21	0	.17	0	.14
4				0	20	.24	0	.15	0	.14	0	.10
5				0	7.3	.96	0	.14	0	.12	0	.04
6				0	2.1	.64	0	.11	0	.07	0	.02
7				0	1.2	.44	0	.07	0	.02	.14	0
8				0	.64	.28	0	0	0	0	.02	0
9				0	.38	.17	0	0	0	0	0	0
10				0	.25	.12	0	0	0	0	0	0
11				0	.15	.07	0	.05	0	0	0	0
12				0	.14	0	0	.41	0	0	0	0
13				0	.05	0	0	.28	0	.07	0	0
14				0	0	0	0	.21	0	.12	0	0
15				0	0	0	0	.17	0	.04	.03	0
16				.03	0	0	0	.34	0	0	0	0
17				.02	0	0	0	.21	0	0	0	0
18				0	0	0	0	.18	0	0	0	0
19				0	0	0	0	.17	0	0	0	0
20				0	0	0	0	.12	7.4	0	0	0
21				0	.54	0	0	.10	5.9	0	.03	0
22				0	.15	0	0	.07	3.5	0	.01	0
23				0	1.2	0	0	.01	2.6	0	0	0
24				0	.64	0	1.1	0	2.0	0	0	0
25				0	.41	0	.38	0	1.1	0	0	0
26				0	.25	0	.25	0	.70	0	0	0
27				0	.18	0	.17	0	.48	0	0	0
28				0	.14	0	.14	0	.77	0	0	0
29				0	.10	0	.15	----------	.44	0	.06	0
30				0	.02	0	2.2	----------	.38	0	0	0
31			----------	0	----------	0	.51	----------	.38	----------	0	----------
Total	0	0	0	0.05	36.86	2.92	4.90	3.62	25.65	1.27	0.29	0.58
Mean												
Mgd	0	0	0	0.002	1.23	0.094	0.158	0.129	0.827	0.042	0.009	0.019
Cfs	0	0	0	0.003	1.90	0.145	0.244	0.200	1.28	0.065	0.014	0.029
Ac-ft	0	0	0	0.2	113	9.0	15	11	79	3.9	0.9	1.8
Max	0	0	0	0.03	20	0.96	2.2	0.41	7.4	0.31	0.14	0.18
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 20 Min 0 Mean (mgd) 0.151 Mean (cfs) 0.234 Ac-ft 169
Fiscal Year 1966-67: Max 20 Min 0 Mean (mgd) 0.209 Mean (cfs) 0.323 Ac-ft 234

Peak discharge (base, 60 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-4	0030	2.86	102	158	3-20	2000	2.90	108	167

16-2000. North Fork Kaukonahua Stream above Right Branch, near Wahiawa

Location.--lat 21°31'09", long 157°56'53", on left bank 140 ft upstream from Mauka ditch intake and Right Branch, and 4.5 miles northeast of Wahiawa.

Drainage area.--1.38 sq mi.

Records available.--May 1913 to July 1953, April 1960 to June 1967. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1960, published as Left Branch of North Fork Kaukonahua Stream near Wahiawa.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,150 ft (from topographic map).

Average discharge.--45 years (1913-24, 1926-53, 1960-67), 10.7 mgd (16.6 cfs).

Extremes.--Maximum discharge during year, 1,330 mgd (2,060 cfs) Nov. 5 (gage height, 7.59 ft), from rating curve extended above 53 mgd on basis of slope-area measurement at gage height 12.46 ft; minimum, 0.64 mgd (0.99 cfs) Feb. 8, 9.
1913-53, 1960-67: Maximum discharge, 3,550 mgd (5,490 cfs) Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 44 mgd by test on model of station site; maximum gage height, 12.46 ft Apr. 15, 1963; minimum discharge, 0.08 mgd (0.12 cfs) Mar. 2, 13, 1941.

Remarks.--Records good except those for period of no gage-height record, which are fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	31	3.3	4.0	1.6	28	3.3	19	0.98	9.2	20	2.5	46
2	40	5.2	3.4	1.4	5.6	3.0	8.1	1.0	5.4	15	15	8.1
3	6.9	9.6	3.3	1.9	12	2.8	10	1.2	10	20	10	13
4	5.4	3.9	2.9	1.7	71	2.5	11	.88	14	30	4.0	4.6
5	4.8	3.3	2.7	1.3	83	3.7	4.8	1.1	14	60	3.0	3.9
6	21	2.7	2.7	6.7	58	4.6	5.2	.93	36	10	25	3.3
7	9.5	2.7	11	1.8	13	7.8	3.9	.73	6.9	10	4.0	3.0
8	4.8	26	3.3	1.3	9.2	2.5	3.6	.68	4.6	7.0	3.0	2.7
9	3.7	5.0	2.4	2.4	24	2.2	2.9	6.2	5.0	6.0	2.8	4.0
10	2.9	3.2	64	88	9.2	2.0	2.4	33	16	10	3.9	4.1
11	2.3	34	13	202	25	1.8	2.3	3.3	3.6	20	5.7	2.5
12	2.0	3.9	18	87	43	1.8	7.6	16	2.9	7.0	4.0	2.1
13	2.8	9.9	4.6	9.2	10	8.6	5.1	3.6	3.3	15	2.3	1.8
14	33	8.2	20	8.4	7.6	2.3	2.7	1.8	2.5	10	2.0	1.8
15	7.1	9.4	5.4	20	34	1.8	2.1	58	2.1	8.0	5.3	1.7
16	4.6	4.6	5.5	29	30	1.7	1.8	21	1.9	6.0	2.9	4.6
17	17	8.0	4.3	39	9.5	1.6	1.8	8.5	8.0	5.0	2.2	1.7
18	4.6	4.3	3.9	8.1	8.4	1.7	2.1	27	2.5	3.5	12	1.4
19	22	3.4	6.7	5.8	7.6	1.4	7.0	4.6	1.5	3.2	2.7	1.3
20	11	2.7	3.7	9.0	6.0	1.4	4.8	3.2	1.5	3.0	13	1.2
21	6	2.5	2.8	9.2	5.4	1.4	2.4	2.5	2.5	2.7	6.2	1.2
22	5.1	3.0	2.4	4.8	8.6	2.8	1.9	2.2	70	2.5	2.7	1.1
23	3.2	5.6	2.2	4.8	11	3.6	1.7	2.0	45	2.5	2.4	1.1
24	44	42	2.1	3.6	17	1.4	1.5	2.0	6.0	20	14	1.1
25	49	46	2.0	3.2	14	1.2	1.4	2.9	25	10	5.7	4.2
26	23	13	1.8	2.8	6.9	4.7	1.4	1.7	50	5.0	9.5	1.4
27	9.2	32	15	2.5	5.8	11	1.3	48	45	3.0	10	12
28	6.0	8.6	5.1	2.7	4.3	8.4	1.2	6.2	10	2.5	13	2.7
29	5.2	6.7	2.1	2.2	4.0	16	1.1	----------	7.0	2.2	26	30
30	4.2	6.2	1.8	2.1	3.6	48	1.1	----------	10	2.0	16	4.0
31	3.7	4.5	----------	59	----------	48	1.0	----------	45	----------	7.4	----------
Total	395.0	323.4	222.1	622.5	574.7	205.0	124.2	261.20	466.4	321.1	238.2	171.6
Mean												
Mgd	12.7	10.4	7.40	20.1	19.2	6.61	4.01	9.33	15.0	10.7	7.68	5.72
Cfs	19.6	16.1	11.4	31.1	29.7	10.2	6.20	14.4	23.2	16.6	11.9	8.85
Ac-ft	1,210	992	682	1,910	1,760	629	381	802	1,430	985	731	527
Max	49	46	64	202	83	48	19	58	70	60	26	46
Min	2.0	2.5	1.8	1.3	3.6	1.1	1.0	0.68	1.5	2.0	2.0	1.1

Calendar Year 1966: Max 202 Min 0.23 Mean (mgd) 8.84 Mean (cfs) 13.7 Ac-ft 9,900
Fiscal Year 1966-67: Max 202 Min 0.68 Mean (mgd) 10.8 Mean (cfs) 16.7 Ac-ft 12,050

Note.--No gage-height record Mar. 17 to May 8.

Peak discharge (base, 820 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2200	7.47	1,280	1,980	11- 4	1300	6.66	1,000	1,550
10-11	2300	7.16	1,180	1,830	11- 5	1700	7.59	1,330	2,060

16-2030. Mauka ditch near Wahiawa

Location.--Lat 21°30'45", long 157°59'20", on left bank 0.7 mile northwest of Ku Tree Reservoir and 2.9 miles east of Wahiawa Post Office.

Records available.--March 1947 to June 1967. Prior to July 1958, published as Kaukonahua ditch near Wahiawa.

Gage.--Digital water-stage recorder and Parshall flume. Altitude of gage is 1,140 ft (from topographic map). Prior to Apr. 9, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 2.81 mgd (4.35 cfs).

Extremes.--1947-67: Maximum daily discharge, 10.1 mgd (15.6 cfs) Jan. 27, 1948; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Ditch diverts from North Fork Kaukonahua Stream for domestic use in Wahiawa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.5	0.97	0.73	0.27	0.31	0.12	0.80	0.10	0.10	0.70	0.11	0.39
2	1.4	.94	.73	.25	.07	.11	.40	.10	.48	.50	.10	.32
3	1.1	.98	.73	.33	.37	.10	.45	.13	.23	.70	.14	.82
4	1.1	.94	.73	.58	1.4	.10	.50	.10	.33	1.0	.09	.28
5	1.0	.92	.73	.58	3.6	.11	.30	.12	.35	2.0	.09	.15
6	1.2	.88	.73	.73	2.5	.20	.25	.11	1.5	.50	.08	.13
7	1.1	.88	.80	.58	.92	.30	.23	.10	.50	.45	.25	.11
8	1.1	.95	.73	.46	.53	.20	.21	.10	.30	.35	.83	.10
9	1.1	.90	.73	.50	.61	.15	.19	.40	.20	.30	.92	.10
10	1.0	.88	.85	.68	.45	.10	.17	1.0	.60	.45	.99	.11
11	.99	.98	.82	3.2	.57	.09	.16	.20	.20	.90	1.1	.09
12	.94	1.3	.73	.73	.66	.08	.23	1.0	.15	.30	1.1	.08
13	.93	1.6	.65	.31	.36	.20	.24	.30	.15	.70	1.1	.08
14	1.1	1.2	.84	.58	.29	.15	.18	.15	.12	.45	.76	.09
15	1.1	.80	.70	1.1	1.1	.10	.17	2.0	.10	.30	.10	.09
16	1.1	.80	.70	1.1	.57	.09	.16	1.0	.09	.25	.09	.10
17	1.4	.85	.76	1.1	.34	.08	.15	.60	.35	.20	.08	.10
18	1.2	.83	.71	.42	.29	.08	.16	1.5	.10	.18	.33	.10
19	1.3	.85	.94	.29	.25	.07	.40	.35	.07	.17	.09	.10
20	1.3	.83	.85	.25	.25	.06	.39	.25	.07	.16	.08	.10
21	1.3	.83	.78	.21	.23	.06	.19	.20	.15	.15	.09	.10
22	1.4	.87	.75	.16	.62	.10	.16	.15	3.0	.14	.07	.10
23	1.1	.83	.76	.14	.72	.20	.14	.13	2.0	.14	.07	.10
24	1.7	1.2	.57	.12	.38	.15	.14	.11	.30	.17	.25	.10
25	1.9	.94	.42	.10	.60	.10	.15	.15	.90	.15	.13	.10
26	1.3	.83	.39	.10	.30	.30	.14	.15	2.0	.14	.12	.09
27	1.1	.88	.36	.10	.20	.50	.13	1.0	1.5	.14	.11	.11
28	1.1	.83	.42	.09	.16	.40	.12	.12	.45	.13	.13	.14
29	1.0	.78	.33	.07	.14	.50	.11	----------	.35	.09	.15	.21
30	1.0	.83	.33	.06	.13	.80	.11	----------	.45	.11	.17	.36
31	1.0	.74	----------	.19	----------	3.0	.10	----------	1.5	----------	.17	----------
Total	36.86	28.84	20.30	15.38	18.92	8.60	7.23	11.62	18.59	11.92	9.89	4.85
Mean												
Mgd	1.19	0.930	0.677	0.496	0.631	0.277	0.233	0.415	0.600	0.397	0.319	0.162
Cfs	1.84	1.44	1.05	0.767	0.976	0.429	0.361	0.642	0.928	0.614	0.494	0.251
Ac-ft	113	88	62	47	58	26	22	36	57	37	30	15
Max	1.9	1.6	0.94	3.2	3.6	3.0	0.80	2.0	3.0	2.0	1.1	0.82
Min	0.93	0.74	0.33	0.06	0.07	0.06	0.10	0.10	0.07	0.09	0.07	0.08

Calendar Year 1966: Max 3.6 Min 0.03 Mean (mgd) 0.448 Mean (cfs) 0.693 Ac-ft 501
Fiscal Year 1966-67: Max 3.6 Min 0.06 Mean (mgd) 0.529 Mean (cfs) 0.818 Ac-ft 592

Note.--No gage-height record Nov. 25 to Jan. 6, Jan. 26 to Feb. 27, Mar. 5 to Apr. 19.

16-2040. North Fork Kaukonahua Stream near Wahiawa

Location.--lat 21°30'54", long 157°59'19", on left bank 1.0 mile downstream from Poamoho tunnel inflow and 3.1 miles northeast of Wahiawa Post Office.

Drainage area.--4.86 sq mi.

Records available.--September 1946 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 930 ft (from topographic map).

Average discharge.--20 years (1947-67), 22.6 mgd (35.0 cfs).

Extremes.--Maximum discharge during year, 1,560 mgd (2,410 cfs) Nov. 5 (gage height, 11.20 ft), from rating curve extended above 190 mgd as explained below; minimum, 2.4 mgd (3.7 cfs) Oct. 9.
1946-67: Maximum discharge, 3,010 mgd (4,660 cfs) Apr. 15, 1963 (gage height, 20.95 ft), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 8.39 and 15.55 ft; no flow at times in 1953.

Remarks.--Records good. Mauka ditch (see sta. no. 2030) diverts 2.6 miles above station for domestic use in Wahiawa. Poamoho tunnel (see sta. no. 2109) diverts from Poamoho Stream into North Fork Kaukonahua Stream 1.0 mile above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	52	7.3	6.8	3.2	101	13	80	4.1	13	57	8.5	129
2	73	6.8	5.9	3.0	19	12	35	3.8	14	44	43	28
3	15	20	5.2	3.4	43	12	40	4.6	17	68	40	91
4	8.1	7.5	5.1	4.8	189	11	45	4.0	32	87	12	17
5	8.5	7.3	4.4	2.6	240	12	20	4.8	25	193	10	11
6	55	5.6	4.2	10	254	16	20	5.4	121	41	81	8.9
7	27	5.6	17	5.9	68	28	14	3.6	20	42	13	7.9
8	10	36	6.1	3.0	40	10	13	3.2	12	24	9.4	7.3
9	7.9	10	4.2	3.1	61	8.7	12	3.4	8.7	20	8.1	9.4
10	5.9	5.7	101	75	36	8.1	9.1	92	35	40	8.5	8.5
11	4.6	54	40	342	67	7.7	8.7	14	8.7	65	14	6.9
12	3.8	7.5	24	209	183	7.1	20	98	7.3	24	10	5.9
13	3.6	9.0	8.5	26	40	15	13	22	7.1	55	7.7	5.4
14	73	16	38	29	29	8.5	13	14	7.1	48	7.7	5.0
15	12	11	11	110	144	6.8	8.1	204	5.9	23	26	4.6
16	6.6	7.3	7.7	214	133	6.4	7.3	74	5.4	18	12	9.0
17	30	9.5	9.7	160	39	6.1	6.9	32	24	15	9.2	5.0
18	11	6.6	7.9	34	30	6.4	6.9	123	6.9	12	47	4.2
19	37	5.4	13	23	26	5.7	14	17	4.8	11	13	3.8
20	31	4.2	8.9	24	22	5.4	19	12	4.6	10	23	3.6
21	15	3.7	5.6	35	20	5.0	8.9	9.1	7.7	9.1	20	3.4
22	16	4.8	5.0	14	39	10	7.5	8.1	290	8.5	7.9	3.2
23	7.3	7.5	4.4	15	68	15	6.6	7.5	155	8.3	7.5	3.2
24	101	91	3.8	12	62	7.0	6.1	7.1	19	74	39	3.2
25	154	65	3.7	11	35	6.0	6.1	8.1	75	39	12	8.0
26	75	20	3.5	9.1	27	20	5.4	6.6	179	20	22	4.5
27	22	65	22	8.5	22	45	5.0	110	163	9.7	24	25
28	15	15	25	8.5	18	30	4.6	22	37	8.5	36	8.4
29	12	9.7	5.0	7.7	15	60	4.5	----------	22	7.7	45	89
30	9.7	11	4.0	7.3	14	150	4.4	----------	31	6.9	38	15
31	8.1	7.5	----------	130	----------	200	4.4	----------	143	----------	19	----------
Total	910.1	542.5	410.6	1543.1	2084	753.9	468.5	917.4	1501.2	1088.7	673.5	534.3
Mean												
Mgd	29.4	17.5	13.7	49.8	69.5	24.3	15.1	32.8	48.4	36.3	21.7	17.8
Cfs	45.5	27.1	21.2	77.1	108	37.6	23.4	50.7	74.9	56.2	33.6	27.5
Ac-ft	2,790	1,660	1,260	4,740	6,400	2,310	1,440	2,820	4,610	3,340	2,070	1,640
Max	154	91	101	342	254	200	80	204	290	193	81	129
Min	3.6	3.7	3.5	2.6	14	5.0	4.4	3.2	4.6	6.9	7.5	3.2

Calendar Year 1966:	Max	342	Min	0.41	Mean (mgd)	22.6	Mean (cfs)	35.0	Ac-ft	25,330
Fiscal Year 1966-67:	Max	342	Min	2.6	Mean (mgd)	31.3	Mean (cfs)	48.4	Ac-ft	35,070

16-2080. South Fork Kaukonahua Stream at East Pump Reservoir, near Wahiawa

Location.--Lat 21°29'32", long 157°59'55", on right bank on upstream side of dam at East Pump Reservoir, 2.3 miles east of Wahiawa Post Office, and 7.1 miles north of Waipahu.

Drainage area.--4.04 sq mi.

Records available.--July 1957 to June 1963, July 1964 to June 1967.

Gage.--Graphic water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level, datum of 1929. July 1, 1964, to July 7, 1966, digital water-stage recorder at same site and datum.

Average discharge.--9 years, 14.1 mgd (21.8 cfs).

Extremes.--Maximum discharge during year, 1,770 mgd (2,740 cfs) Oct. 11 (gage height, 7.81 ft), from rating curve extended above 700 mgd as explained below; minimum, 0.73 mgd (1.1 cfs) Sept. 6, 7.
1957-67: Maximum discharge, 3,530 mgd (5,460 cfs) Apr. 15, 1963 (gage height, 11.33 ft), from rating curve extended above 700 mgd on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Koolau ditch diverts water into Koolau Reservoir (capacity, 43,000,000 gal), and Ku Tree Reservoir (capacity, 293,000,000 gal) located on tributaries above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	35	3.8	2.6	2.5	68	6.5	45	2.1	4.6	35	3.8	24
2	43	3.3	1.9	2.2	8.3	6.0	20	2.0	6.0	20	24	24
3	14	3.9	1.5	2.2	18	5.5	25	2.0	8.0	30	11	38
4	6.8	4.1	1.2	3.0	115	5.0	25	2.0	13	45	5.8	13
5	5.4	4.8	1.0	1.8	112	6.0	11	2.0	10	90	3.9	7.4
6	13	3.3	.80	8.0	188	10	9.8	1.9	60	20	14	5.8
7	13	3.6	12	4.6	60	15	8.3	1.7	8.0	25	5.0	5.0
8	4.6	7.6	4.4	2.2	50	7.0	6.9	1.6	6.0	15	5.0	4.4
9	3.9	5.4	3.2	1.8	28	6.0	6.9	1.7	5.0	12	3.4	11
10	3.5	3.0	17	3.2	23	5.0	5.4	58	15	20	4.4	7.3
11	3.0	27	26	399	20	4.5	5.0	8.1	4.0	43	3.2	4.6
12	2.5	5.0	9.1	94	100	4.0	11	29	3.5	14	3.2	3.9
13	2.2	5.2	5.2	13	30	8.0	7.9	7.8	3.5	19	3.2	3.4
14	16	15	8.3	10	20	5.0	7.8	4.2	3.5	51	2.8	3.0
15	6.4	6.1	4.4	20	70	4.0	5.2	59	3.0	17	3.0	2.8
16	4.2	5.8	3.8	21	60	3.5	4.2	35	2.5	12	5.6	5.3
17	11	4.2	4.2	43	30	3.0	3.9	7.6	12	10	4.6	3.4
18	8.1	4.2	3.2	11	20	3.5	4.6	13	3.5	8.1	11	2.6
19	3.9	3.3	3.0	7.8	15	3.0	6.9	5.8	3.0	7.4	6.2	2.4
20	8.5	2.6	4.8	6.4	12	2.8	7.1	4.4	2.5	6.9	8.3	2.1
21	3.9	2.4	3.0	6.2	11	3.0	4.4	3.8	3.5	6.2	11	2.1
22	9.5	2.4	2.6	5.0	15	5.0	3.8	3.3	120	5.8	3.4	2.0
23	4.1	5.5	2.5	7.5	30	10	3.3	3.0	70	5.8	2.8	2.0
24	42	97	2.2	5.0	25	5.0	3.2	2.9	10	15	16	1.9
25	76	72	2.1	3.9	15	3.5	3.2	5.4	35	6.2	13	2.1
26	23	16	1.9	3.6	12	10	2.9	3.6	80	10	26	2.9
27	9.5	12	4.9	3.0	10	20	2.6	51	70	5.4	6.7	5.7
28	6.9	8.3	19	2.8	9.0	15	2.5	18	17	5.6	4.8	5.6
29	5.4	5.6	3.0	2.6	8.0	30	2.4	----------	10	4.2	40	23
30	4.6	4.2	3.0	2.4	7.0	40	2.2	----------	15	3.9	40	11
31	4.1	3.4	----------	62	----------	50	2.2	----------	70	----------	16	----------
Total	397.0	350.0	161.80	760.7	1189.3	304.8	259.6	339.9	677.1	568.5	311.1	231.7
Mean												
Mgd	12.8	11.3	5.39	24.5	39.6	9.83	8.37	12.1	21.8	19.0	10.0	7.72
Cfs	19.8	17.5	8.34	37.9	61.3	15.2	13.0	18.7	33.7	29.4	15.5	11.9
Ac-ft	1220	1070	497	2330	3650	935	797	1040	2080	1740	955	711
Max	76	97	26	399	188	50	45	59	120	90	40	38
Min	2.2	2.4	0.80	1.8	7.0	2.8	2.2	1.6	2.5	3.9	2.8	1.9

Calendar Year 1966: Max 399 Min 0.80 Mean (mgd) 11.8 Mean (cfs) 18.3 Ac-ft 13,160
Fiscal Year 1966-67: Max 399 Min 0.80 Mean (mgd) 15.2 Mean (cfs) 23.5 Ac-ft 17,040

Note.--No gage-height record Nov. 12 to Jan. 4, Mar. 5 to Apr. 10.

Peak discharge (base, 450 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0230	7.81	1,770	2,740	11- 6	2100	4.63	553	856
11- 4	1900	5.75	950	1,470	3-22	-	4.71	579	896
11- 5	2300	6.02	1,060	1,640					

16-2085. Right Branch of South Fork Kaukonahua Stream near Wahiawa

Location.--lat 21°29'58", long 157°59'07", on left bank 500 ft downstream from Ku Tree Reservoir spillway, 1 mile upstream from mouth, and 3.1 miles east of Wahiawa Post Office.

Drainage area.--0.86 sq mi.

Records available.--August 1957 to June 1967.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 980 ft (from topographic map).

Average discharge.--9 years (1958-67), 0.850 mgd (1.32 cfs).

Extremes.--Maximum discharge during year, 130 mgd (201 cfs) June 3 (gage height, 3.88 ft); no flow for many days.
1957-67: Maximum discharge, 880 mgd (1,360 cfs) Apr. 15, 1963 (gage height, 6.00 ft), from rating curve extended above 110 mgd; no flow at times.

Remarks.--Records fair. Diversion from South Fork Kaukonahua Stream into Ku Tree Reservoir (capacity, 293,000,000 gal) above station, then to Schofield Barracks for domestic use.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	0		0	0.02	0.07	5.0	0.05	0.49	4.9	0.75	2.8
2	0	0		0	.02	.08	3.0	.05	.39	3.3	1.3	8.0
3	0	0		0	.08	.08	4.0	.06	.31	3.1	1.6	16
4	0	0		0	.48	.09	5.0	.06	.42	1.9	.77	3.0
5	0	0		0	1.8	.06	2.5	.04	.34	2.4	.75	1.3
6	0	0		0	1.2	.03	1.7	.06	12	1.5	.86	.97
7	0	0		0	.28	.13	1.5	.07	2.2	1.3	.61	.84
8	0	0		0	.05	.07	1.5	.06	.81	1.1	.71	.74
9	0	0		0	.03	.08	1.3	.06	.61	1.1	.75	1.1
10	0	0		0	.06	.09	1.1	.06	.62	3.6	.75	.84
11	0	0		1.6	.05	.04	1.0	.05	.61	8.0	.62	.76
12	0	0		.08	.07	.02	2.2	.14	.55	2.5	.60	.58
13	0	0		.04	.04	.20	2.1	.08	.71	7.7	.61	.69
14	0	0		.08	.09	.04	1.5	.09	.44	13	.89	.68
15	0	0		.23	.18	0	1.2	.13	.28	3.5	1.8	.42
16	0	0		.52	.12	0	1.0	.15	.30	2.5	1.8	.65
17	.01	0		.30	.14	0	1.0	.12	1.6	2.1	.84	.56
18	0	0		.28	.16	0	1.8	.14	.67	1.5	4.2	.41
19	0	0		.35	.19	0	3.2	.13	.42	1.5	1.9	.39
20	0	0		.36	.24	0	2.3	.14	.61	1.4	1.7	.32
21	.05	0		.32	.05	0	.12	.16	1.6	1.2	1.6	.38
22	.04	0		.29	.23	0	.10	.16	28	1.2	.64	.41
23	0	0		.29	.07	.10	.07	.35	12	1.4	.75	.30
24	.12	.09		.29	.10	0	.06	.54	2.0	1.1	2.9	.56
25	.24	0		.17	.07	0	.05	.48	1.4	1.0	1.6	.76
26	.02	0		.05	.06	1.0	.04	.46	1.4	2.1	1.6	.61
27	0	0		0	.06	5.0	.03	1.5	1.9	1.4	.88	4.3
28	0	0		0	.06	3.0	.02	1.0	1.2	1.0	.71	1.5
29	0	0		0	.08	4.0	.04	----------	.89	1.0	.74	7.5
30	0	0		0	.06	6.0	.04	----------	1.6	.84	1.2	2.6
31	0	0	----------	.02	----------	10	.05	----------	15	----------	1.0	----------
Total	0.51	0.09	0	5.27	6.14	30.18	44.52	6.39	91.37	80.14	37.33	59.97
Mean												
Mgd	0.016	0.003	0	0.170	0.205	0.973	1.44	0.228	2.95	2.67	1.20	2.00
Cfs	0.025	0.005	0	0.263	0.317	1.51	2.23	0.353	4.56	4.13	1.86	3.09
Ac-ft	1.6	0.28	0	16	19	93	137	20	280	246	115	184
Max	0.24	0.09	0	1.6	1.8	10	5.0	1.5	28	13	4.2	16
Min	0	0	0	0	0.02	0	0.02	0.04	0.28	0.84	0.50	0.30

Calendar Year 1966: Max 10 Min 0 Mean (mgd) 0.153 Mean (cfs) 0.237 Ac-ft 171
Fiscal Year 1966-67: Max 28 Min 0 Mean (mgd) 0.992 Mean (cfs) 1.53 Ac-ft 1,110

16-2109. Poamoho tunnel near Wahiawa

Location.--lat 21°31'12", long 157°58'51", on left bank 5 ft downstream from tunnel outlet and 3.6 miles northeast of Wahiawa Post Office.

Records available.--July 1958 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (from topographic map).

Average discharge.--9 years, 3.57 mgd (5.52 cfs).

Extremes.--1958-67: Maximum daily discharge, 128 mgd (198 cfs) Apr. 15, 1963; no flow at times.

Remarks.--Records good. Tunnel diverts from Poamoho Stream to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.10	0.04	0.01	0.01	20	2.8	18	0.72	0.04	8.4	0.35	23
2	.22	.03	.01	.01	3.6	2.7	6.6	.68	1.0	4.7	5.9	2.7
3	.01	.03	.01	.01	10	2.5	5.4	.88	2.1	6.1	8.4	17
4	.01	.02	.01	.01	39	2.3	9.2	.68	3.7	30	1.9	1.3
5	.01	.02	.01	.01	43	2.5	4.2	1.2	1.2	38	1.5	.06
6	5.8	.01	.01	4.1	52	3.9	4.7	1.1	30	6.0	19	.01
7	1.1	.01	.02	.01	17	6.8	3.5	.64	2.3	7.3	2.5	.01
8	.01	.25	.01	.01	9.2	2.2	3.2	.53	.09	3.4	1.1	.01
9	.01	.02	.01	.05	9.7	1.9	2.8	.77	.01	2.4	.84	.06
10	.01	.01	7.0	2.0	7.5	1.7	2.2	19	4.3	8.7	.64	.01
11	.01	1.0	2.0	43	15	1.6	2.0	3.1	.07	15	1.2	.01
12	.01	.05	.01	27	43	1.5	4.3	25	.01	4.4	1.1	.01
13	.01	.03	.01	3.8	9.1	1.9	3.2	6.8	.01	15	1.3	.01
14	6.9	.02	.45	4.0	6.0	1.7	2.1	4.8	.02	7.4	1.3	.01
15	.01	.01	.01	30	43	1.3	2.0	57	.01	3.4	8.8	.01
16	.01	.01	.01	83	39	1.2	1.7	8.2	.01	2.2	3.1	.06
17	.01	.01	.01	31	9.7	1.1	1.5	5.8	7.7	1.7	1.3	.01
18	.01	.01	.05	7.7	7.1	1.2	1.5	28	.35	1.1	13	.01
19	.01	.01	.01	4.8	5.9	1.0	1.8	.35	.01	.84	2.0	.01
20	.01	.01	.01	4.2	4.9	.92	2.6	.01	.05	.64	4.0	.01
21	.01	.01	.01	6.4	4.5	.96	1.8	.01	.80	.42	2.6	.01
22	.01	.01	.01	3.0	12	1.4	1.5	.01	56	.33	.72	.01
23	.01	.01	.01	2.8	24	4.8	1.4	.01	23	.33	.64	.01
24	7.5	13	.01	2.2	20	1.5	1.2	.01	1.7	12	7.3	.01
25	27	1.5	.01	2.0	7.6	1.1	1.2	.01	13	7.5	1.9	.01
26	10	.29	.01	1.7	5.3	5.0	1.0	.01	22	2.3	3.1	.01
27	.12	4.9	.22	1.5	5.5	11	.92	23	24	1.0	4.3	.23
28	.09	.03	2.0	1.4	4.0	8.0	.88	2.6	4.8	.72	6.7	.01
29	.08	.02	.01	1.2	3.5	21	.80	----------	2.0	.56	5.7	19
30	.06	.01	.01	1.1	3.2	34	.76	----------	5.9	.40	6.3	.09
31	.05	.01	----------	32	----------	39	.80	----------	21	---------	2.4	----------
Total	59.20	21.39	11.97	300.02	483.3	170.48	94.76	190.92	227.18	192.24	120.89	63.70
Mean												
Mgd	1.91	0.690	0.399	9.68	16.1	5.50	3.06	6.82	7.33	6.41	3.90	2.12
Cfs	2.96	1.07	0.617	15.0	24.9	8.51	4.73	10.6	11.3	9.92	6.03	3.28
Ac-ft	182	66	37	921	1480	523	291	586	697	590	371	195
Max	27	13	7.0	83	52	39	18	57	56	38	19	23
Min	0.01	0.01	0.01	0.01	3.2	0.92	0.76	0.01	0.01	0.33	0.35	0.01

Calendar Year 1966: Max 83 Min 0.01 Mean (mgd) 3.84 Mean (cfs) 5.94 Ac-ft 4300
Fiscal Year 1966-67: Max 83 Min 0.01 Mean (mgd) 5.30 Mean (cfs) 8.20 Ac-ft 5,940

16-2110. Poamoho Stream near Wahiawa

Location.--Lat 21°31'24", long 157°58'55", on left bank 180 ft downstream from Poamoho tunnel intake and 3.7 miles northeast of Wahiawa Post Office.

Drainage area.--1.79 sq mi.

Records available.--January 1947 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,150 ft (from topographic map).

Average discharge.--20 years, 2.59 mgd (4.01 cfs).

Extremes.--Maximum discharge during year, 801 mgd (1,240 cfs) Nov. 5 (gage height, 5.00 ft), from rating curve extended above 49 mgd on basis of slope-area measurement at gage height 7.26 ft; minimum, 0.02 mgd (0.03 cfs) Oct. 20.
1947-67: Maximum discharge, 1,440 mgd (2,230 cfs) Apr. 15, 1963 (gage height, 8.24 ft), from rating curve extended above 49 mgd by test on model of station site; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Poamoho tunnel (see sta. no. 2109) diverts 180 ft above station to North Fork Kaukonahua Stream to augment storage in Wahiawa Reservoir.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.3	1.0	0.78	0.40	0.72	0.10	2.0	0.05	1.3	2.5	1.6	3.2
2	7.5	1.0	.63	.28	.03	.10	.50	.05	1.4	2.4	1.5	3.8
3	2.8	2.5	.60	.78	1.0	.10	1.0	.05	1.6	2.4	2.0	4.9
4	.83	1.2	.60	1.5	10	.10	.20	.05	3.0	2.6	1.5	4.0
5	.56	1.2	.52	.40	15	.10	.10	.05	2.0	3.4	1.4	3.3
6	7.7	.83	.48	2.2	20	.20	.05	.05	5.0	2.4	2.3	2.7
7	7.7	.88	3.0	1.5	3.0	1.0	.05	.05	2.0	2.4	1.5	2.4
8	2.0	3.6	1.1	.52	.10	.20	.05	.05	1.5	2.2	1.4	2.2
9	1.0	1.8	.52	1.3	1.0	.10	.05	.05	1.4	2.2	1.3	2.5
10	.68	.72	4.2	12	.10	.06	.05	1.0	3.0	2.2	1.2	2.2
11	.52	4.2	4.9	15	1.0	.06	.05	.20	2.0	2.4	1.2	1.9
12	.37	1.2	2.6	19	6.0	.06	.05	2.0	1.5	2.2	1.2	1.7
13	.37	1.1	1.2	.10	.20	.50	.05	.20	1.4	2.4	1.2	1.5
14	11	2.7	4.0	.09	.10	.10	.05	.10	1.3	2.2	1.2	1.4
15	2.1	1.1	1.8	.14	5.0	.06	.05	5.0	1.3	2.2	1.5	1.4
16	1.0	.88	.88	1.2	5.0	.06	.05	.20	1.3	2.1	1.2	2.2
17	2.6	.94	.83	.04	.50	.06	.05	.10	3.0	2.0	1.2	1.4
18	1.6	.83	2.2	.03	.20	.06	.05	2.0	2.0	2.0	1.3	1.2
19	2.2	.60	2.6	.03	.10	.06	.05	10	1.5	2.0	1.2	1.1
20	4.7	.44	1.8	.03	.10	.06	.05	3.9	1.4	2.0	1.3	1.0
21	2.7	.48	.72	.04	.10	.08	.05	2.0	1.3	2.1	1.3	1.0
22	2.1	.60	.60	.04	.20	.10	.05	1.5	3.0	2.1	1.3	1.0
23	.83	.78	.44	.05	1.0	1.0	.05	1.4	2.6	2.4	1.3	1.0
24	7.5	10	.40	.05	.50	.20	.05	1.3	2.5	2.6	1.4	.94
25	21	7.7	.34	.05	.10	.08	.05	1.3	2.6	2.5	1.4	1.2
26	14	2.7	.31	.06	.10	.50	.05	1.3	2.8	2.2	1.4	1.2
27	4.4	8.5	.48	.06	.10	2.0	.05	6.0	2.8	2.0	1.4	2.2
28	2.6	2.6	3.3	.08	.10	.50	.05	2.2	2.5	1.9	1.5	1.8
29	1.9	1.5	.78	.08	.10	1.0	.05	----------	2.4	1.8	1.5	6.6
30	1.5	1.2	.60	.06	.10	5.0	.05	----------	2.5	1.7	1.5	4.5
31	1.2	.88	----------	1.1	----------	10	.05	----------	2.6	----------	1.4	----------
Total	122.26	65.66	43.21	58.21	71.55	23.60	5.10	42.15	66.5	67.5	43.6	67.44
Mean												
Mgd	3.94	2.12	1.44	1.88	2.38	0.761	0.165	1.51	2.15	2.25	1.41	2.25
Cfs	6.10	3.28	2.23	2.91	3.68	1.18	0.255	2.34	3.33	3.48	2.18	3.48
Ac-ft	375	202	133	179	220	72	16	129	204	207	134	207
Max	21	10	4.9	19	20	10	2.0	10	5.0	3.4	2.3	6.6
Min	0.37	0.44	0.31	0.03	0.03	0.06	0.05	0.05	1.3	1.7	1.2	0.94

Calendar Year 1966: Max 35 Min 0 Mean (mgd) 1.48 Mean (cfs) 2.29 Ac-ft 1660
Fiscal Year 1966-67: Max 21 Min 0.03 Mean (mgd) 1.85 Mean (cfs) 2.86 Ac-ft 2080

Note.--No gage-height record Nov. 3 to Mar. 23.

16-2116. Makaha Stream near Makaha

Location.--lat 21°30'16", long 158°10'59", on right bank 1.5 miles northeast of Kaneaki Heiau and 3.4 miles northeast of Makaha.

Drainage area.--2.31 sq mi.

Records available.--July 1959 to June 1967.

Gage.--Water-stage recorder and concrete-masonry control. Datum of gage is 938.64 ft above mean sea level (Waianae Plantation bench mark).

Average discharge.--8 years, 1.36 mgd (2.10 cfs).

Extremes.--Maximum discharge during year, 228 mgd (353 cfs) Mar. 6 (gage height, 3.99 ft), from rating curve extended above 33 mgd as explained below; minimum, 0.01 mgd (0.02 cfs) Oct. 5, 8.
1959-67: Maximum discharge, 756 mgd (1,170 cfs) Mar. 13, 1962 (gage height, 6.50 ft, from floodmarks), from rating curve extended above 33 mgd on basis of slope-area measurement of peak flow; no flow at times.
Maximum stage known since at least 1953, about 7.8 ft Nov. 24, 1954, from information by local resident (discharge, about 1,100 mgd or 1,700 cfs).

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.13	0.09	0.07	0.02	4.4	0.29	1.2	0.45	1.9	2.6	0.69	2.0
2	.13	.07	.06	.02	7.0	.29	.80	.41	1.3	2.2	.69	2.0
3	.11	.07	.09	.02	7.6	.26	.98	.37	.99	2.0	.69	1.4
4	.11	.06	.20	.02	8.2	.42	2.0	.33	.74	1.6	.64	1.0
5	.11	.05	.17	.02	20	2.2	1.2	.29	.64	1.3	.59	.92
6	.11	.05	.13	.03	33	1.6	1.0	.48	33	1.2	.54	.80
7	.07	.05	.09	.02	11	2.7	1.2	.74	14	1.0	.54	.69
8	.07	.05	.07	.02	5.4	1.0	1.7	.37	5.0	2.2	.49	.59
9	.07	.05	.06	.02	3.6	.74	1.3	.29	3.3	2.5	.49	.54
10	.06	.05	.06	.22	2.6	.54	.74	.59	2.6	2.4	.41	.49
11	.06	.05	.06	.36	2.0	.45	.64	.59	2.2	5.7	.41	.45
12	.06	.05	.05	.30	2.2	.41	1.7	.74	1.8	5.5	.41	.45
13	.06	.09	.05	.15	1.5	.37	.80	.64	9.9	6.5	.41	.41
14	.06	.06	.05	.13	1.0	.33	.64	.45	3.8	10	.41	.37
15	.06	.09	.05	1.0	.92	.29	.49	.64	2.7	3.6	.41	.37
16	.06	.11	.04	3.2	.80	.29	.85	.86	2.0	2.7	.41	.33
17	.06	.07	.03	1.1	.74	.37	.86	.49	1.9	2.2	.41	.37
18	.04	.05	.02	.45	.69	.98	.69	.37	1.6	1.8	1.4	.33
19	.04	.05	.03	.29	.64	.54	.74	.33	3.8	1.5	1.3	.33
20	.03	.04	.02	.23	.59	.37	.74	.29	3.7	1.3	.99	.29
21	.04	.03	.03	.20	.49	.45	.59	.29	12	1.2	.64	.23
22	.04	.04	.03	.17	.49	.86	.49	.26	18	1.0	.49	.23
23	.04	.04	.03	.15	.45	.59	.45	.26	15	1.0	.41	.20
24	5.7	.29	.02	.13	.45	.41	.59	.23	13	.92	.49	.17
25	1.9	.41	.02	.11	.49	.29	1.5	.23	13	.86	.54	.20
26	.49	.29	.02	.09	.69	.39	.69	.26	8.5	.80	.69	.17
27	.29	.23	.02	.07	.49	.87	.49	11	4.9	.69	.49	.20
28	.23	.15	.02	.07	.41	.90	.45	3.2	3.9	1.6	.37	.17
29	.15	.13	.03	.07	.37	1.7	.37	----------	3.2	.92	.73	.17
30	.13	.11	.03	.12	.33	1.4	.33	----------	2.7	.74	4.7	.23
31	.11	.09	----------	13	----------	1.5	.41	----------	3.3	----------	2.6	----------
Total	10.62	3.06	1.65	21.80	118.54	23.80	26.63	25.45	194.37	69.53	24.48	16.10
Mean												
Mgd	0.343	0.099	0.055	0.703	3.95	0.768	0.859	0.909	6.27	2.32	0.790	0.537
Cfs	0.531	0.153	0.085	1.09	6.11	1.19	1.33	1.41	9.70	3.59	1.22	0.831
Ac-ft	33	9.4	5.1	67	364	73	82	78	596	213	75	49
Max	5.7	0.29	0.20	13	33	2.7	2.0	11	33	10	4.7	2.0
Min	0.03	0.03	0.02	0.02	0.33	0.26	0.33	0.23	0.64	0.69	0.37	0.17

Calendar Year 1966: Max 33 Min 0.02 Mean (mgd) 0.976 Mean (cfs) 1.51 Ac-ft 1090
Fiscal Year 1966-67: Max 33 Min 0.02 Mean (mgd) 1.47 Mean (cfs) 2.27 Ac-ft 1650

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1500	3.47	150	232	3-21	1530	3.69	184	285
11- 2	2100	3.22	114	176	3-22	2200	3.29	124	192
11- 6	1430	3.35	132	204	4-14	1330	3.16	105	162
3- 6	1600	3.99	228	353					

16-2118. Kaupuni Stream at altitude 374 ft, near Waianae

Location.--Lat 21°28'20", long 158°09'26", on right bank at diversion dam, 2.6 miles northeast of Waianae Cemetery, and 2.8 miles northeast of junction of Waianae Valley Road and Farrington Highway.

Drainage area.--3.58 sq mi.

Records available.--May 1960 to June 1967.

Gage.--Digital water-stage recorder and concrete-masonry control. Datum of gage is 374 ft above mean sea level (by stadia survey). Prior to July 23, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--7 years, 0.623 mgd (0.964 cfs).

Extremes.--Maximum discharge during year, 314 mgd (486 cfs) Nov. 6 (gage height, 3.74 ft), from rating curve extended above 98 mgd as explained below; no flow for several days.
1960-67: Maximum discharge, 865 mgd (1,340 cfs) Dec. 23, 1964 (gage height, 4.75 ft), from rating curve extended above 98 mgd on basis of slope-area measurement at gage height 4.06 ft; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Several water-development tunnels above station may affect flow.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.14	0.08	0.06	0.03	0.01	0.21	0.26	0.20	0.07	0.88	0.30	0.26
2	.14	.10	.05	.04	2.5	.21	.23	.22	.07	.52	.28	.27
3	.14	.08	.05	.04	3.0	.20	.27	.20	.08	.48	.27	.51
4	.14	.08	.04	.04	.56	.27	.38	.16	.07	.40	.26	.45
5	.14	.07	.04	.04	26	.72	.30	.12	.08	.36	.26	.35
6	.14	.10	.04	.06	44	.60	.28	.16	20	.31	.26	.40
7	.12	.12	.04	.04	7.4	.82	.30	.24	3.1	.29	.25	.33
8	.12	.10	.04	.04	1.8	.45	.32	.21	.21	.28	.26	.33
9	.12	.10	.04	.04	1.2	.36	.29	.18	.03	.36	.25	.33
10	.12	.10	.05	.10	.99	.30	.26	.20	.01	.42	.25	.33
11	.12	.10	.04	.23	.80	.27	.25	.22	.01	2.6	.24	.33
12	.10	.10	.04	.21	.84	.25	.30	.18	0	4.6	.24	.30
13	.10	.10	.04	.16	.60	.23	.27	.14	.73	2.1	.23	.30
14	.10	.10	.04	.12	.45	.21	.24	.12	.05	10	.23	.30
15	.10	.08	.04	.10	.42	.18	.22	.10	.03	3.3	.21	.30
16	.10	.08	.04	.45	.39	.14	.25	.08	.02	1.6	.21	.30
17	.10	.08	.03	.23	.36	.14	.24	.07	.03	1.2	.22	.30
18	.07	.10	.04	.10	.33	.23	.24	.07	.02	.98	.25	.30
19	.07	.08	.05	.04	.30	.16	.25	.07	.02	.84	.24	.27
20	.08	.08	.05	.02	.28	.10	.25	.07	.56	.71	.23	.27
21	.08	.08	.06	.02	.28	.12	.23	.07	1.8	.61	.23	.27
22	.07	.07	.05	.02	.28	.16	.21	.08	16	.52	.23	.27
23	.07	.07	.03	.02	.25	.10	.18	.08	15	.46	.23	.27
24	.73	.07	.04	0	.25	.08	.21	.08	3.1	.43	.23	.27
25	.12	.07	.06	0	.27	.06	.25	.08	2.3	.41	.24	.27
26	.10	.07	.04	.01	.35	.16	.23	.08	1.5	.37	.23	.27
27	.08	.07	.03	.01	.31	.23	.21	.08	1.1	.34	.23	.24
28	.08	.07	.03	0	.28	.26	.18	.08	1.0	.33	.22	.24
29	.08	.05	.04	0	.25	.30	.14	----------	.73	.31	.24	.27
30	.08	.05	.04	.01	.22	.27	.12	----------	.60	.31	.37	.27
31	.08	.05	----------	.02	----------	.28	.16	----------	.98	----------	.29	----------
Total	3.83	2.55	1.28	2.24	94.97	8.07	7.52	3.64	69.30	36.32	7.68	9.17
Mean												
Mgd	0.124	0.082	0.043	0.072	3.17	0.260	0.243	0.130	2.24	1.21	0.248	0.306
Cfs	0.192	0.127	0.066	0.111	4.90	0.402	0.376	0.201	3.47	1.87	0.384	0.473
Ac-ft	12	7.8	3.9	6.9	291	25	23	11	213	111	24	28
Max	0.73	0.12	0.06	0.45	44	0.82	0.38	0.24	20	10	0.37	0.51
Min	0.07	0.05	0.03	0	0.01	0.06	0.12	0.07	0	0.28	0.21	0.24

Calendar Year 1966: Max 44 Min 0 Mean (mgd) 0.516 Mean (cfs) 0.798 Ac-ft 578
Fiscal Year 1966-67: Max 44 Min 0 Mean (mgd) 0.676 Mean (cfs) 1.05 Ac-ft 757

Note.--No gage-height record Nov. 9 to Feb. 15.

Peak discharge (base, 20 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 2	2230	2.50	43	66	3-22	2200	3.19	148	229
11- 6	1415	3.74	314	486	4-14	1400	2.98	107	166
3- 6	1515	3.68	293	453					

16-2118.5. Puea mauka ditch near Waianae

Location.--Lat 21°28'12", long 158°09'43", on left bank 2.3 miles northeast f Waianae School and 2.8 miles north of Lualualei Naval Radio Station.

Records available.--June 1960 to June 1967 (discontinued).

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 360 ft (from topographic map).

Average discharge.--7 years, 0.373 mgd (0.577 cfs).

Extremes.--1960-67: Maximum daily discharge, 1.4 mgd (2.2 cfs) Oct. 22, 1960; minimum daily, 0.11 mgd (0.17 cfs) Aug. 21, 1961.

Remarks.--Records good. Water is used for irrigation of truck farms in Waianae Valley. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.55	0.51	0.59	0.76	0.55	0.63	0.59	0.51	0.51	0.59	0.36	0.51
2	.59	.55	.55	.76	.53	.59	.47	.55	.47	.51	.36	.47
3	.55	.59	.47	.81	.59	.59	.47	.47	.55	.43	.32	.39
4	.59	.59	.39	.81	.59	.72	.47	.36	.47	.36	.32	.47
5	.55	.63	.43	.76	.65	.67	.51	.39	.47	.32	.36	.43
6	.58	.59	.47	.81	.63	.59	.55	.55	.60	.32	.36	.47
7	.59	.63	.47	.76	.47	.51	.43	.55	.51	.32	.39	.43
8	.59	.63	.55	.72	.43	.55	.59	.55	.51	.29	.36	.39
9	.63	.59	.55	.91	.47	.59	.51	.59	.55	.36	.43	.43
10	.63	.63	.59	.76	.47	.55	.51	.67	.55	.36	.36	.36
11	.63	.72	.55	.67	.47	.51	.55	.63	.51	.51	.36	.43
12	.59	.59	.55	.67	.55	.55	.63	.59	.47	.51	.39	.36
13	.59	.59	.55	.63	.51	.59	.59	.59	.55	.51	.36	.47
14	.59	.55	.59	.59	.47	.55	.59	.59	.47	.51	.36	.51
15	.55	.55	.59	.55	.47	.51	.59	.51	.51	.43	.32	.51
16	.51	.55	.59	.51	.51	.47	.59	.47	.47	.43	.32	.51
17	.55	.59	.59	.47	.51	.51	.59	.47	.51	.47	.32	.51
18	.55	.67	.59	.43	.55	.55	.55	.43	.43	.47	.51	.55
19	.59	.67	.63	.43	.55	.51	.55	.47	.47	.39	.47	.47
20	.63	.72	.63	.47	.51	.55	.51	.47	.51	.47	.39	.55
21	.63	.63	.63	.55	.55	.59	.39	.51	.51	.47	.32	.51
22	.59	.63	.67	.55	.55	.55	.36	.51	.59	.39	.32	.51
23	.59	.59	.72	.55	.55	.51	.51	.51	.51	.36	.39	.47
24	.63	.59	.63	.55	.47	.51	.55	.51	.55	.39	.43	.47
25	.59	.47	.63	.59	.47	.59	.55	.51	.59	.47	.39	.47
26	.55	.39	.67	.59	.43	.59	.55	.59	.55	.43	.43	.43
27	.55	.36	.67	.63	.43	.59	.55	.51	.55	.43	.43	.43
28	.55	.32	.67	.63	.39	.59	.51	.51	.55	.43	.39	.39
29	.59	.43	.81	.63	.59	.59	.43	----------	.55	.39	.39	.43
30	.59	.47	.76	.72	.63	.55	.47	----------	.47	.36	.55	.55
31	.59	.55	----------	.59	----------	.51	.51	----------	.51	----------	.55	----------
Total	18.08	17.57	17.78	19.86	15.54	17.46	16.22	14.57	16.02	12.68	12.01	13.88
Mean												
Mgd	0.583	0.567	0.593	0.641	0.518	0.563	0.523	0.520	0.517	0.423	0.387	0.463
Cfs	0.902	0.877	0.918	0.992	0.801	0.871	0.809	0.805	0.800	0.654	0.599	0.716
Ac-ft	55	54	55	61	48	54	50	45	49	39	37	43
Max	0.63	0.72	0.81	0.91	0.65	0.72	0.63	0.67	0.60	0.59	0.55	0.55
Min	0.51	0.32	0.39	0.43	0.39	0.47	0.36	0.36	0.43	0.29	0.32	0.36

Calendar Year 1966: Max 0.91 Min 0.32 Mean (mgd) 0.557 Mean (cfs) 0.862 Ac-ft 624
Fiscal Year 1966-67: Max 0.91 Min 0.29 Mean (mgd) 0.525 Mean (cfs) 0.812 Ac-ft 588

16-2128. Kipapa Stream near Wahiawa

Location.--lat 21°28'15", long 157°57'50", on left bank 1,700 ft downstream from forest-reserve boundary, 4.9 miles southeast of Wahiawa Post Office, and 6.3 miles northeast of Waipahu.

Drainage area.--4.29 sq mi.

Records available.--January 1957 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 690 ft (from topographic map).

Average discharge.--10 years, 6.94 mgd (10.7 cfs).

Extremes.--Maximum discharge during year, 1,010 mgd (1,560 cfs) Oct. 11 (gage height, 8.22 ft), from rating curve extended above 190 mgd as explained below; minimum, 0.06 mgd (0.09 cfs) Sept. 27.
1957-67: Maximum discharge, 3,670 mgd (5,680 cfs) May 14, 1963 (gage height, 12.29 ft), from rating curve extended above 190 mgd on basis of slope-area measurements at gage heights 7.96 and 12.29 ft; no flow at times.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.1	0.52	0.59	0.41	34	1.5	23	0.46	3.1	20	1.1	3.0
2	15	.46	.59	.27	5.9	1.3	14	.41	3.1	12	4.0	14
3	6.0	.46	.46	.27	14	1.2	8.1	.82	4.6	11	9.9	6.8
4	1.2	.46	.37	.33	75	1.2	9.4	.46	14	50	2.6	4.0
5	.59	1.6	.33	.27	85	1.5	4.9	.46	3.2	23	8.7	2.4
6	3.1	.72	.27	8.2	88	6.0	4.5	.65	59	8.6	9.5	1.8
7	2.8	.41	.68	3.6	36	12	3.2	.33	12	16	1.8	1.3
8	.84	8.1	.84	.88	19	2.2	2.9	.30	4.9	7.3	1.3	1.1
9	.41	2.4	.41	.98	15	1.3	2.6	.30	3.0	5.2	3.6	1.3
10	.22	.72	13	25	7.6	1.0	1.2	37	9.6	9.8	3.4	1.8
11	.14	4.5	13	212	8.5	.91	1.1	7.3	2.4	43	1.1	.93
12	.10	11	3.4	74	40	.91	11	17	1.6	10	.87	.72
13	.07	.99	1.4	9.9	8.5	1.9	4.9	4.7	1.5	10	.82	.62
14	8.2	2.4	2.3	5.3	5.1	1.5	3.2	1.9	1.7	28	.77	.58
15	2.2	1.0	2.0	8.8	31	.84	1.6	48	1.3	11	2.4	.54
16	1.5	.52	.84	22	43	.72	1.1	20	1.1	5.4	8.7	5.5
17	.52	.94	.59	28	13	.65	.98	5.7	1.1	4.0	3.2	.93
18	.78	1.2	.41	6.7	6.0	.72	.91	12	1.2	3.0	30	.54
19	.30	.59	.41	3.8	4.5	.59	1.1	4.3	.87	2.6	6.2	.42
20	.66	.30	1.0	2.8	3.6	.52	1.2	2.4	.77	2.2	10	.39
21	.84	.18	.52	2.6	3.2	.52	1.0	1.6	1.3	2.0	12	.36
22	.37	.13	.37	1.7	15	1.1	.91	1.2	96	1.8	2.2	.33
23	.16	.14	.27	1.4	17	3.6	.84	1.0	56	1.6	1.3	.30
24	6.9	29	.20	1.2	8.5	1.0	.72	.91	8.6	4.8	29	.30
25	54	18	.16	1.0	9.3	.65	.72	11	43	2.4	16	.35
26	13	4.2	.13	.91	5.9	.84	.59	1.4	62	2.0	26	.46
27	4.3	12	3.6	.84	4.5	5.3	.59	48	70	15	8.0	.42
28	1.9	4.1	8.0	.84	3.0	6.6	.52	11	18	4.3	4.8	.93
29	1.2	13	2.1	.72	2.2	17	.46	----------	8.6	1.8	3.2	14
30	.84	.98	.65	.65	1.8	39	.46	----------	6.4	1.3	18	4.3
31	.72	.84	----------	38	----------	40	.46	----------	43	---------	7.4	---------
Total	130.96	110.16	58.89	463.37	613.1	154.07	108.16	240.60	542.94	319.1	237.86	70.42
Mean												
Mgd	4.22	3.55	1.96	14.9	20.4	4.97	3.49	8.59	17.5	10.6	7.67	2.35
Cfs	6.53	5.49	3.03	23.1	31.6	7.69	5.40	13.3	27.1	16.4	11.9	3.64
Ac-ft	402	338	181	1420	1880	473	332	738	1670	979	730	216
Max	54	29	13	212	88	40	23	48	96	50	30	14
Min	0.07	0.13	0.13	0.27	1.8	0.52	0.46	0.30	0.77	1.3	0.77	0.30

Calendar Year 1966: Max 212 Min 0 Mean (mgd) 5.51 Mean (cfs) 8.53 Ac-ft 6170
Fiscal Year 1966-67: Max 212 Min 0.07 Mean (mgd) 8.36 Mean (cfs) 12.9 Ac-ft 9360

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0500	8.22	1,010	1,560	11- 5	1700	6.92	610	944
10-12	0100	6.95	618	956	3- 6	1700	7.10	655	1,010
11- 4	1300	7.57	796	1,230					

16-2129. Kipapa Stream near Waipahu

Location.--Lat 21°24'33", long 158°01'14", on left bank 350 ft upstream from mouth and 1.5 miles northwest of Waipahu Post Office.

Drainage area.--13.8 sq mi.

Records available.--December 1966 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during period, 704 mgd (1,090 cfs) Mar. 6 (gage height, 9.08 ft), from rating curve extended above 200 mgd by logarithmic plotting; no flow June 24-26.

Remarks.--Records good. Several diversions above station for irrigation of truck farms and sugarcane.

Discharge, in million gallons a day, December 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1						-	42	0.41	5.2	29	0.79	5.1
2						-	20	.16	4.0	22	.18	31
3						-	13	.08	2.7	14	1.3	17
4						-	14	.05	14	19	.90	9.6
5						-	9.3	.02	5.0	20	.10	6.4
6						-	7.0	.01	74	10	10	6.2
7						-	6.8	.03	27	11	2.0	4.4
8						-	4.3	.02	9.1	12	1.0	4.0
9						-	5.0	.01	5.8	6.8	2.9	3.5
10						-	3.0	40	9.4	3.0	3.5	2.8
11						-	2.3	10	4.6	45	2.1	2.6
12						-	10	15	3.0	17	1.5	1.4
13						-	5.5	5.0	3.4	10	.62	.99
14						2.1	7.8	2.0	2.9	58	1.9	.57
15						1.1	3.5	50	2.2	24	1.5	.41
16						.48	3.4	20	1.3	9.8	6.4	3.0
17						.92	1.9	9.0	2.2	3.5	7.0	1.8
18						1.1	1.6	13	1.9	.57	28	.67
19						.79	1.1	7.8	1.3	.41	13	.31
20						.79	.72	4.4	1.2	.31	10	.23
21						.57	.62	2.8	4.0	.23	12	.10
22						.72	.67	1.8	96	.18	3.5	.06
23						2.7	.48	1.3	122	7.2	2.1	.01
24						3.4	.28	1.1	19	.85	23	0
25						1.8	.26	9.2	38	.52	12	0
26						1.5	.28	3.3	69	.26	35	0
27						4.3	.26	41	81	7.0	9.1	.06
28						15	.18	21	26	6.4	5.5	.05
29						24	.12	----------	12	3.2	4.6	8.1
30						46	.26	----------	8.7	1.9	12	4.4
31			----------		----------	54	3.1	----------	32	----------	16	----------
Total						-	168.73	258.49	687.9	343.13	229.49	114.76
Mean												
Mgd						-	5.44	9.23	22.2	11.4	7.40	3.83
Cfs						-	8.42	14.3	34.3	17.6	11.4	5.93
Ac-ft						-	518	793	2110	1050	704	352
Max						-	42	50	122	58	35	31
Min						-	0.12	0.01	1.2	0.18	0.10	0

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Peak discharge (base, 650 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
3-6	1830	9.08	704	1,090

16-2130. Waikele Stream at Waipahu

Location.--Lat 21°23'09", long 158°00'48", on left bank 300 ft upstream from bridge on Farrington Highway, 0.3 mile south of Waipahu, and 2.5 miles west of Pearl City.
Drainage area.--45.7 sq mi.
Records available.--June to October 1951, December 1951 to October 1959, July 1960 to June 1967.
Gage.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft above mean sea level, datum of 1929. Prior to July 1, 1960, at site 300 ft downstream at datum 1.30 ft higher.
Average discharge.--14 years (1952-59, 1960-67), 26.8 mgd (41.5 cfs).
Extremes.--Maximum discharge during year, 3,250 mgd (5,030 cfs) Nov. 5 (gage height, 8.10 ft), from rating curve extended above 1,500 mgd on basis of slope-area measurement at gage height 9.65 ft; minimum, 7.9 mgd (12 cfs) Oct. 4.
1951-67: Maximum discharge (corrected), 8,790 mgd (13,600 cfs) Nov. 28, 1954 (gage height, 14.82 ft, site and datum then in use), from rating curve extended above 470 mgd on basis of slope-area measurement of peak flow; minimum, 2.4 mgd (3.7 cfs) Sept. 28, 29, 1962.
Revisions.--The maximum discharge for the fiscal year 1966 has been revised to 4,140 mgd (6,410 cfs) Nov. 14, 1965 (gage height, 9.10 ft), superseding figure published in Water Resources Data for Hawaii and other Pacific Areas (1966).
Remarks.--Records good. Diversions above station for irrigation of sugarcane in vicinity of Waipahu. Sediment samples are collected intermittently. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.
Revisions.--Revised figures of discharge, in million gallons a day, for high-water periods in the fiscal year 1966, superseding those published in Water Resources Data for Hawaii and other Pacific Areas (1966) are given herewith:

1965		1965-Con.	
July 22	277	Dec. 14	784
Nov. 12	378	15	534
14	945		

Month	Million gallons	Maximum	Minimum	Mean Mgd	Mean Cfs	Runoff in acre-feet
July 1965	1,062	277	12	34.3	53.1	3,260
November	3,836	945	22	128	198	11,770
December	2,930	784	28	94.5	146	8,990
Calendar year 1965	-	945	9.2	45.7	70.7	51,200
Fiscal year 1965-66	-	945	9.2	39.1	60.5	43,750

Revised peak discharge.--1965-66: July 22 (0100) 1,920 mgd (2,970 cfs), 6.46 ft; Oct. 13 (1800) 966 mgd (1,490 cfs), 4.96 ft; Nov. 12 (2400) 1,920 mgd (2,970 cfs), 6.46 ft; Nov. 14 (1530) 4,140 mgd (6,410 cfs), 9.10 ft; Dec. 10 (1200) 727 mgd (1,120 cfs), 4.53 ft; Dec. 14 (1430) 3,480 mgd (5,380 cfs), 8.38 ft; Feb. 7 (1200) 753 mgd (1,170 cfs), 4.58 ft.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	12	11	9.0	11	97	23	76	20	28	64	19	21
2	14	10	9.2	11	28	22	48	18	23	56	17	65
3	21	10	14	10	38	21	39	18	19	43	17	143
4	16	10	16	8.3	217	21	43	18	32	43	19	44
5	12	10	15	8.7	573	22	35	18	25	47	19	28
6	12	12	17	8.5	478	26	32	18	165	35	34	26
7	13	13	13	10	216	39	31	18	71	32	22	24
8	13	12	9.2	14	98	24	28	17	32	38	18	20
9	11	10	11	14	60	20	27	18	27	30	22	20
10	14	10	11	10	48	21	24	58	28	25	20	25
11	12	10	21	567	44	21	23	42	29	76	16	24
12	11	9.8	10	162	81	16	32	43	24	54	14	19
13	11	9.8	9.0	37	45	15	32	39	26	45	17	14
14	11	9.8	8.7	25	35	16	44	24	23	139	18	13
15	11	9.8	8.7	32	69	18	34	61	23	58	17	16
16	12	10	8.5	48	88	14	32	82	21	36	21	16
17	13	10	9.8	68	56	15	23	33	23	27	25	17
18	12	10	11	33	37	16	22	34	20	22	56	18
19	11	11	9.2	23	32	15	21	32	20	19	40	16
20	10	11	8.3	19	30	14	20	25	20	18	32	16
21	10	12	8.3	18	29	14	20	22	31	18	38	14
22	10	10	8.3	21	31	14	20	21	207	22	21	11
23	12	9.5	8.7	20	57	19	20	20	306	46	15	10
24	21	26	11	14	35	25	20	20	57	23	38	10
25	70	30	13	14	34	25	21	28	68	22	29	11
26	44	23	11	13	32	26	19	26	120	17	58	13
27	17	15	10	13	28	30	19	65	123	21	33	12
28	14	19	9.8	13	27	44	19	52	62	27	25	15
29	13	13	9.0	14	25	67	19	----------	39	24	21	20
30	13	9.8	10	14	23	75	20	----------	36	23	32	15
31	13	9.2	----------	42	----------	84	25	----------	59	---------	46	----------
Total	489	385.7	327.7	1315.5	2691	822	888	890	1.787	1.150	819	716
Mean												
Mgd	15.8	12.4	10.9	42.4	89.7	26.5	28.6	31.8	57.6	38.3	26.4	23.9
Cfs	24.4	19.2	16.9	65.6	139	41.0	44.3	49.2	89.1	59.3	40.8	37.0
Ac-ft	1.500	1.180	1.010	4.040	8.260	2.520	2.730	2.730	5.480	3.530	2.510	2.200
Max	70	30	21	567	573	84	76	82	306	139	58	143
Min	10	9.2	8.3	8.3	23	14	19	17	19	17	14	10

Calendar Year 1966: Max 573 Min 8.3 Mean (mgd) 28.9 Mean (cfs) 44.7 Ac-ft 32.360
Fiscal Year 1966-67: Max 573 Min 8.3 Mean (mgd) 33.6 Mean (cfs) 52.0 Ac-ft 37.690

Peak discharge (base, 700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0700	6.62	2,030	3,140	11- 7	1600	4.68	804	1,240
11- 4	1530	5.40	1,230	1,900	3- 6	1900	4.95	960	1,490
11- 5	1900	8.10	3,250	5,030	3-22	2400	4.74	838	1,300
11- 6	1630	5.92	1,560	2,410	6- 3	1700	4.98	977	1,510

16-2160. Waiawa Stream near Pearl City

Location.--Lat 21°23'55", long 157°58'50", on left bank 100 ft upstream from lower bridge on Farrington Highway, 0.6 mile northwest of Pearl City, and 2.0 miles northeast of Waipahu.

Drainage area.--26.4 sq mi.

Records available.--June 1952 to June 1967.

Gage.--Graphic water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level, datum of 1929. Prior to July 24, 1964, graphic and July 24, 1964, to Aug. 8, 1966, digital water-stage recorders at same site and datum.

Average discharge.--15 years, 18.0 mgd (27.9 cfs).

Extremes.--Maximum discharge during year, 7,200 mgd (11,100 cfs) Oct. 11 (gage height, 15.82 ft), from rating curve extended above 680 mgd as explained below; minimum, 2.4 mgd (3.7 cfs) June 27.
1952-67: Maximum discharge, 10,900 mgd (16,900 cfs) Nov. 28, 1954 (gage height, 19.27 ft), from rating curve extended above 680 mgd on basis of slope-area measurement at gage height 17.1 ft; minimum, 1.3 mgd (2.0 cfs) June 11, 12, 1965.

Remarks.--Records good. Occasional small diversions for irrigation above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.0	5.0	6.0	4.9	87	6.0	56	4.5	11	54	3.9	9.8
2	5.0	5.6	5.7	4.6	22	5.5	30	3.4	8.0	40	4.1	28
3	4.3	5.8	5.8	4.5	38	5.2	23	3.4	17	26	5.7	21
4	4.1	6.5	5.2	5.2	419	5.1	34	3.4	23	35	6.4	8.7
5	4.0	6.7	4.6	5.8	706	5.1	18	3.4	8.7	39	4.8	8.9
6	3.9	5.4	4.6	5.5	755	14	14	3.4	83	24	8.0	7.8
7	4.4	4.6	5.1	5.7	283	19	12	3.4	37	17	5.5	7.0
8	5.0	4.4	5.4	5.2	85	9.8	8.7	3.4	14	14	5.8	6.0
9	4.5	4.4	5.7	4.9	43	6.7	8.2	3.4	8.9	9.8	7.2	5.2
10	3.9	4.5	5.7	268	28	5.5	6.2	76	15	10	5.5	3.9
11	4.5	5.2	26	1620	21	4.9	5.4	19	10	83	4.6	3.9
12	4.9	5.7	6.4	296	68	4.5	8.2	24	8.0	36	3.9	3.8
13	5.8	5.2	4.2	36	29	4.4	7.2	16	7.8	37	3.7	3.6
14	6.3	4.8	4.4	20	17	4.4	5.7	8.4	9.1	104	5.7	3.6
15	6.4	4.5	6.2	41	59	4.2	5.1	53	6.2	47	4.1	3.4
16	5.6	5.2	5.8	71	143	3.9	5.1	48	6.0	18	11	4.6
17	5.0	6.4	4.6	101	60	3.9	4.8	16	7.0	12	13	4.6
18	4.6	6.2	4.2	29	28	4.4	4.2	18	6.0	9.3	84	3.7
19	4.4	5.8	4.1	16	16	5.1	4.5	13	5.4	7.4	29	3.4
20	5.0	5.1	4.9	11	12	4.2	4.5	8.0	5.5	6.2	17	3.3
21	5.7	4.4	5.4	9.8	9.5	4.1	4.1	6.0	7.8	5.5	19	3.2
22	6.1	4.1	5.7	8.2	14	4.4	3.9	5.1	349	5.2	7.2	3.3
23	4.8	4.1	5.4	6.4	41	4.2	4.2	4.5	345	8.8	4.9	3.2
24	4.5	21	5.1	5.5	20	4.5	4.2	3.9	34	4.8	22	3.1
25	64	30	4.9	5.4	23	4.2	4.4	5.1	65	5.1	9.8	3.2
26	32	14	4.9	5.4	16	4.5	3.9	5.7	109	4.6	19	3.3
27	12	11	4.9	4.5	12	7.8	3.8	105	131	4.6	8.9	3.4
28	7.7	11	6.0	5.5	9.8	19	3.7	32	46	4.2	6.7	3.3
29	7.2	6.0	6.0	4.6	7.8	50	3.8	----------	25	4.1	8.8	3.3
30	6.1	5.1	6.0	4.2	6.9	78	3.7	----------	18	3.8	79	12
31	5.3	5.2	----------	13	----------	69	7.2	----------	101	----------	28	----------
Total	253.0	222.9	178.9	2627.8	3079.0	375.5	311.7	498.4	1427.4	679.4	446.2	185.5
Mean												
Mgd	8.16	7.19	5.96	84.8	103	12.1	10.1	17.8	46.0	22.6	14.4	6.18
Cfs	12.6	11.1	9.22	131	159	18.7	15.6	27.5	71.2	35.0	22.3	9.56
Ac-ft	776	684	549	8060	9450	1150	957	1530	4380	2080	1370	569
Max	64	30	26	1620	755	78	56	105	349	104	84	28
Min	3.9	4.1	4.1	4.2	6.9	3.9	3.7	3.4	5.4	3.8	3.7	3.1

Calendar Year 1966: Max 1620 Min 3.9 Mean (mgd) 22.3 Mean (cfs) 34.5 Ac-ft 24,980
Fiscal Year 1966-67: Max 1620 Min 3.1 Mean (mgd) 28.2 Mean (cfs) 43.6 Ac-ft 31,570

Peak discharge (base, 1,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0500	15.82	7,200	11,100	11- 6	1300	10.96	2,960	4,580
10-12	0130	10.32	2,570	3,980	11- 7	1600	10.58	2,730	4,220
11- 4	1430	11.77	3,500	5,420	11-16	1000	7.87	1,350	2,090
11- 5	1830	11.59	3,370	5,210	3-22	2400	7.84	1,340	2,070

16-2190. Hawaiian Electric Co. tunnel at Waiau, near Pearl City

Location.--lat 21°23'30", long 157°57'55", on right bank of ditch at Hawaiian Electric Co. Waiau powerplant, 20 ft downstream from tunnel portal, and 0.6 mile east of Pearl City.

Records available.--October 1939 to April 1942, July 1942 to December 1945, July 1952 to June 1967 (discontinued).

Gage.--Digital water-stage recorder and Parshall flume. Datum of gage is 2.91 ft above mean sea level, datum of 1929. Graphic water-stage recorder at aite 120 ft downstream at datum 2.27 ft lower prior to July 1, 1952, and July 1, 1952, to Apr. 8, 1964, at present site and datum.

Average discharge.--17 years (1940-41, 1944-45, 1952-67), 10.6 mgd (16.4 cfs).

Extremes.--1939-45, 1952-67: Maximum daily discharge, 17.3 mgd (26.8 cfs) Mar. 26, 27, 1940; minimum daily, 6.0 mgd (9.3 cfs) Aug. 3, 1941.

Remarks.--Records good. Water is used for cooling condensers in powerplant and afterwards for irrigation of sugarcane.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	11	10	10	9.9	11	11	11	11	11	11	11
2	11	11	10	10	9.9	11	11	11	11	11	11	11
3	11	11	10	10	9.9	11	11	11	11	11	11	11
4	11	11	10	10	10	11	11	11	11	10	11	11
5	11	11	11	10	10	11	11	11	11	10	11	11
6	11	11	11	10	10	11	11	11	11	10	11	11
7	11	11	11	10	10	11	11	11	11	10	11	11
8	11	11	10	10	10	11	11	11	11	10	11	11
9	11	11	10	10	10	10	11	11	11	10	11	11
10	11	11	10	10	10	10	11	11	11	10	11	11
11	11	11	10	10	10	11	11	11	11	10	11	11
12	11	11	10	10	11	10	11	11	11	10	11	11
13	10	11	10	10	10	10	11	11	11	12	11	11
14	10	11	10	10	11	10	11	11	11	12	11	11
15	10	11	10	10	11	10	11	11	11	12	11	11
16	10	11	10	10	11	10	11	11	11	12	11	11
17	11	11	10	10	11	10	11	11	11	12	11	11
18	10	11	10	10	11	10	11	11	11	12	10	11
19	10	11	10	10	11	10	11	11	11	11	11	11
20	10	11	10	10	11	11	11	11	11	11	11	11
21	10	11	10	10	11	11	11	11	11	11	11	11
22	10	11	10	10	11	11	11	11	11	11	11	11
23	11	11	10	10	11	11	11	11	11	12	11	11
24	11	11	10	10	11	11	11	11	11	11	11	11
25	11	10	10	10	11	11	11	11	11	11	11	11
26	11	10	10	10	11	11	11	11	11	11	11	11
27	11	10	10	10	11	11	11	11	11	11	11	11
28	11	10	10	10	11	11	11	11	11	11	11	11
29	11	10	10	10	11	11	11	----------	11	11	11	11
30	11	10	10	10	11	11	11	----------	11	11	11	11
31	11	10	----------	10	----------	11	11	----------	11	---------	11	---------
Total	332	334	303	310	317.7	331	341	308	341	328	340	330
Mean												
Mgd	10.7	10.8	10.1	10.0	10.6	10.7	11.0	11.0	11.0	10.9	11.0	11.0
Cfs	16.6	16.7	15.6	15.5	16.4	16.6	17.0	17.0	17.0	16.9	17.0	17.0
Ac-ft	1020	1020	930	951	975	1020	1050	945	1050	1010	1040	1010
Max	11	11	11	10	11	11	11	11	11	12	11	11
Min	10	10	10	10	9.9	10	11	11	11	10	10	11

Calendar Year 1966: Max 13 Min 9.9 Mean (mgd) 11.1 Mean (cfs) 17.2 Ac-ft 12450
Fiscal Year 1966-67: Max 12 Min 9.9 Mean (mgd) 10.7 Mean (cfs) 16.6 Ac-ft 12020

16-2230. Waimalu Stream near Aiea

Location.--Lat 21°23'34", long 157°57'03", on right bank 350 ft downstream from bridge on Moanalua Road and 1.3 miles northwest of Aiea Post Office.

Drainage area.--6.07 sq mi.

Records available.--January 1952 to June 1962, July 1963 to June 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 1.97 ft above mean sea level. Graphic water-stage recorder at site 350 ft upstream at different datums prior to Feb. 21, 1961, and Feb. 21, 1961, to June 30, 1962, at present site at datum 0.13 ft lower than present datum.

Average discharge.--14 years (1952-62, 1963-67), 4.70 mgd (7.27 cfs).

Extremes.--Maximum discharge during year, 951 mgd (1,470 cfs) Oct. 11 (gage height, 3.38 ft); minimum, 0.06 mgd (0.09 cfs) July 20, 23.
1952-67: Maximum discharge, 4,480 mgd (6,930 cfs) May 2, 1965 (gage height, 6.30 ft), from rating curve extended above 750 mgd on basis of slope-area measurement of peak flow; no flow Sept. 25, Sept. 28 to Oct. 1, 1958.
Maximum discharge of flood of May 14, 1963, was 3,440 mgd (5,320 cfs), from slope-area measurement of peak flow.

Remarks.--Records good. Occasional small diversions for irrigation of truck farms above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.14	0.21	0.71	0.41	44	0.46	13	0.16	4.8	24	0.30	3.8
2	.13	.27	.41	.30	7.1	.38	5.5	.16	3.0	14	.27	8.2
3	.12	.27	.23	.25	14.8	.30	8.4	.16	1.7	9.7	.30	3.6
4	.12	.21	.21	.23	51	.27	13	.14	4.6	9.7	.34	1.9
5	.12	.19	.21	.27	81	.27	6.2	.14	1.8	10	.27	1.2
6	.12	.25	.19	.30	126	9.7	8.4	.17	27	5.9	.25	1.0
7	.10	.27	.19	.41	42	4.8	5.2	.14	15	3.5	.25	.99
8	.10	.30	.17	.27	20	2.0	2.6	.14	4.1	2.5	.27	1.2
9	.10	.34	.17	.25	9.0	1.2	1.8	.14	2.1	1.8	.81	1.2
10	.10	.41	4.0	3.8	5.9	.56	.99	35	8.4	1.6	1.3	1.0
11	.10	.71	12	123	4.6	.41	.61	7.5	2.6	14	.76	.81
12	.10	.66	1.8	52	18	.25	2.2	7.7	1.4	6.6	1.1	.76
13	.10	.71	1.2	8.4	7.1	.23	1.5	4.3	3.1	9.4	1.1	.61
14	.10	.71	1.8	3.6	3.8	.23	.76	1.8	3.8	21	1.4	.56
15	.10	.71	2.6	10	16	.21	.46	26	1.4	17	1.4	.61
16	.10	.61	.61	26	34	.19	.46	16	1.1	4.5	1.4	.56
17	.09	.41	.23	41	9.4	.23	.25	4.3	1.0	3.0	3.6	.41
18	.09	.41	.21	8.4	6.6	.27	.23	3.5	.50	2.2	18	.34
19	.09	.71	.21	3.6	3.5	.17	.21	2.6	.30	1.4	7.5	.38
20	.09	.61	.19	1.9	2.2	.17	.21	1.5	.71	1.1	4.8	.41
21	.09	.56	.19	1.5	1.6	.17	.19	1.1	1.5	.71	3.1	.71
22	.09	.76	.19	1.1	2.4	.19	.19	.99	56	.50	1.5	.87
23	.09	.93	.50	.71	13	.16	.19	.81	56	1.2	.87	.93
24	.14	3.9	.66	.41	5.5	.16	.19	.61	10	.38	.71	.93
25	36	16	.66	.30	4.3	.16	.19	.50	37	.38	.87	.71
26	11	4.1	.76	.27	3.0	.19	.17	.38	51	.61	5.2	.56
27	2.3	5.5	7.1	.25	2.3	.25	.16	71	59	.50	2.3	1.1
28	.76	4.1	6.4	.25	1.8	1.2	.16	19	19	.34	2.2	.99
29	.25	1.6	1.0	.23	1.1	15	.16	----------	7.5	.46	1.2	1.1
30	.21	.81	.46	.21	.76	20	.14	----------	5.0	.41	29	2.4
31	.19	.71	----------	13	----------	20	.17	----------	24	---------	9.7	----------
Total	53.23	47.94	45.26	302.62	541.76	79.78	73.89	205.94	414.41	168.39	102.07	39.84
Mean												
Mgd	1.72	1.55	1.51	9.76	18.1	2.57	2.38	7.36	13.4	5.61	3.29	1.33
Cfs	2.66	2.40	2.34	15.1	28.0	3.98	3.68	11.4	20.7	8.68	5.09	2.06
Ac-ft	163	147	139	927	1,660	245	227	632	1,270	517	313	122
Max	36	16	12	123	126	20	13	71	59	24	29	8.2
Min	0.09	0.19	0.17	0.21	0.76	0.16	0.14	.14	0.30	0.34	0.25	0.34

Calendar Year 1966: Max 126 Min 0.09 Mean (mgd) 3.82 Mean (cfs) 5.91 Ac-ft 4,280
Fiscal Year 1966-67: Max 126 Min 0.09 Mean (mgd) 5.69 Mean (cfs) 8.80 Ac-ft 6,370

Peak discharge (base, 350 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0415	3.38	951	1,470	2-10	0845	2.61	355	549
11- 4	1400	3.31	888	1,370	3-22	2145	2.62	361	559
11- 5	1800	3.20	789	1,220	5-30	1745	2.75	440	681
11- 6	1245	2.67	390	603					

16-2245. Kalauao Stream at Moanalua Road, at Aiea

Location.--lat 21°23'07", long 157°56'22", on left bank at downstream side of Moanalua Road bridge, 0.4 mile northwest of Aiea Post Office, and 2.3 miles southeast of Pearl City Post Office.

Drainage area.--2.59 sq mi.

Records available.--July 1957 to June 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 12.75 ft above mean sea level, datum of 1929. Prior to Apr. 28, 1964, graphic water-stage recorder at same site and datum. Apr. 28, 1964, to Nov. 14, 1965, digital water-stage recorder at same site and datum and Nov. 15, 1965, to June 16, 1966, at datum 1.00 ft lower.

Average discharge.--10 years, 1.73 mgd (2.68 cfs).

Extremes.--Maximum discharge during year, 316 mgd (489 cfs) Oct. 11 (gage height, 2.93 ft); minimum, 0.01 mgd (0.02 cfs) Sept. 13.
1957-67: Maximum discharge, 1,670 mgd (2,580 cfs) May 14, 1963 (gage height, 6.63 ft), from rating curve extended above 50 mgd on basis of slope-area measurements at gage heights 6.29 and 6.63 ft; minimum, that of Sept. 13, 1966.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Some return of irrigation water above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.31	0.12	0.10	0.06	17	0.30	4.3	0.10	1.4	7.5	0.11	2.0
2	.16	.18	.06	.06	3.0	.25	1.6	.10	.84	3.3	.12	4.0
3	.18	.08	.06	.05	7.2	.22	4.3	.08	.36	1.9	.12	1.8
4	.19	.10	.05	.05	28	.20	6.4	.08	.45	1.5	.11	1.0
5	.23	.08	.05	.06	28	.20	2.4	.12	.28	2.6	.11	.60
6	.34	.08	.04	.06	61	5.0	2.0	.07	8.6	1.5	.11	.50
7	.16	.07	.04	.06	15	2.0	1.4	.08	4.8	.67	.20	.50
8	.15	.07	.04	.06	6.7	1.0	.67	.08	1.2	.42	.12	.60
9	.15	.06	.04	.08	2.5	.60	.45	.10	.48	.23	.18	.60
10	.15	.08	.04	12	1.6	.40	.23	9.1	1.7	.21	.52	.50
11	.15	.14	1.0	54	1.5	.25	.19	1.4	1.3	6.4	.78	.40
12	.18	.16	.10	18	8.6	.20	.90	2.3	.52	2.4	.39	.35
13	.18	.16	.01	1.8	2.2	.16	.48	1.2	1.3	2.9	.19	.30
14	.23	.08	.02	.57	1.0	.12	.23	.61	2.1	7.7	.12	.25
15	.34	.07	.03	3.0	8.0	.10	.16	10	1.9	4.6	.05	.30
16	.18	.06	.03	11	15	.08	.45	5.6	.90	.96	.50	.25
17	.15	.06	.04	14	5.0	.14	.15	1.2	.19	.39	2.0	.22
18	.15	.06	.04	2.5	3.0	.20	.14	1.1	.16	.21	7.0	.20
19	.14	.06	.03	.78	1.0	.06	.15	.90	.16	.19	3.0	.21
20	.14	.06	.03	.28	.70	.06	.16	.34	.67	.18	1.5	.22
21	.14	.06	.03	.19	.50	.06	.20	.16	.96	.16	1.0	.35
22	.14	.06	.04	.15	1.0	.06	.26	.14	24	.15	.50	.40
23	.14	.06	.05	.12	6.0	.06	.20	.12	20	.36	.40	.45
24	.16	.08	.06	.10	3.0	.06	.08	.12	3.2	.16	.30	.45
25	6.1	2.4	.04	.08	2.0	.06	.11	.12	14	.15	.40	.30
26	2.1	.31	.03	.08	1.5	.08	.08	.11	16	.14	2.0	.25
27	.18	1.4	1.4	.07	1.0	.12	.08	28	20	.14	1.2	.50
28	.06	.45	1.3	.07	.70	.61	.08	6.4	5.0	.12	1.0	.40
29	.06	.11	.08	.07	.50	4.6	.08	----------	2.0	.12	.60	.50
30	.07	.06	.05	.07	.40	7.2	.08	----------	1.3	.11	10	1.0
31	.08	.08	----------	1.7	----------	6.1	.08	----------	8.3	----------	5.0	----------
Total	13.09	6.90	4.93	121.17	232.60	30.55	28.09	69.73	144.07	47.37	39.62	19.40
Mean												
Mgd	0.422	0.223	0.164	3.91	7.75	0.985	0.906	2.49	4.65	1.58	1.28	0.647
Cfs	0.653	0.345	0.254	6.05	12.0	1.52	1.40	3.85	7.19	2.44	1.98	1.00
Ac-ft	40	21	15	372	714	94	86	214	442	145	122	60
Max	6.1	2.4	1.4	54	61	7.2	6.4	28	24	7.7	10	4.0
Min	0.06	0.06	0.01	0.05	0.40	0.06	0.08	0.07	0.16	0.11	0.05	0.20

Calendar Year 1966: Max 61 Min 0.01 Mean (mgd) 1.84 Mean (cfs) 2.85 Ac-ft 2060
Fiscal Year 1966-67: Max 61 Min 0.01 Mean (mgd) 2.08 Mean (cfs) 3.22 Ac-ft 2320

Note.--No gage-height record Nov. 14 to Dec. 20, May 16 to June 30.

Peak discharge (base, 150 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0430	2.93	316	489	11- 6	1215	2.52	197	305
11- 4	1730	2.69	246	381	3-22	1730	2.35	154	238
11- 5	2130	2.82	284	439					

16-2260. North Halawa Stream near Aiea

Location.--Lat 21°23'45", long 157°53'37", on left bank 2.7 miles upstream from confluence with South Halawa Stream and 2.7 miles northeast of Aiea Post Office.

Drainage area.--3.45 sq mi.

Records available.--August 1929 to June 1933, July 1953 to June 1967. Monthly discharge only May, June 1931, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 320 ft (from topographic map).

Average discharge.--17 years (1930-33, 1953-67), 4.11 mgd (6.36 cfs).

Extremes.--Maximum discharge during year, 607 mgd (939 cfs) Nov. 4 (gage height, 9.76 ft), from rating curve extended above 36 mgd on basis of slope-area measurements at gage heights 10.3, 13.04 and 13.46 ft; no flow for many days.
1929-33, 1953-67: Maximum discharge, 4,300 mgd (6,650 cfs) Feb. 28, 1932 (gage height, 13.36 ft), from rating curve extended above 270 mgd; maximum gage height, 13.46 ft May 14, 1963; no flow at times each year.

Remarks.--Records good. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	0.10	0	34	0.48	8.0	0	4.8	12	0.10	1.9
2	0	0	.01	0	7.4	.44	3.6	0	2.8	7.2	.12	3.0
3	0	0	0	0	18	.38	10	0	1.8	4.6	.16	1.1
4	0	0	0	0	61	.32	14	0	1.7	4.2	.12	.48
5	0	0	0	0	80	.29	5.3	0	1.2	6.6	.08	.32
6	0	0	0	0	88	6.1	4.0	0	15	3.7	.04	.16
7	0	0	0	0	22	2.4	2.7	0	7.9	2.2	.05	.06
8	0	0	0	0	8.7	1.1	1.8	0	2.8	1.7	.64	.03
9	0	0	0	0	4.6	.64	1.4	0	2.1	1.3	1.6	.02
10	0	0	.98	24	2.8	.48	.77	23	5.7	1.9	1.3	.01
11	0	0	1.7	86	3.3	.41	.60	3.6	1.7	9.8	.44	.01
12	0	0	.20	41	25	.26	.77	8.7	1.2	14	.32	0
13	0	0	.14	4.5	5.9	.20	.64	3.0	4.9	12	.72	0
14	0	0	.11	1.6	2.8	.12	.56	1.8	2.2	15	.26	0
15	0	0	.03	5.6	17	.10	.44	33	.87	5.5	.11	0
16	0	0	.01	15	36	.05	.38	15	.56	2.0	.10	0
17	0	0	.01	28	16	.03	.26	3.8	1.3	1.4	.22	0
18	0	0	.01	5.1	3.6	.03	.18	4.3	.72	.92	13	0
19	0	0	.01	1.7	2.4	.02	.11	2.6	.44	.77	2.7	0
20	0	0	0	.87	1.5	.01	.07	1.4	.38	.60	3.1	0
21	0	0	0	.60	1.2	0	.04	.82	1.4	.52	1.4	0
22	0	0	0	.48	4.1	0	.03	.56	45	.44	.44	0
23	0	0	0	.38	8.7	0	.02	.44	38	.41	.26	0
24	0	0	0	.24	4.8	0	.02	.38	8.6	.38	.14	0
25	8.8	6.8	0	.12	3.1	0	.01	.26	44	.32	.06	0
26	2.0	1.2	0	.06	2.1	0	.01	.22	35	.32	.03	0
27	.26	4.7	3.7	.03	1.6	0	0	80	42	.29	.28	0
28	0	.87	.75	.02	1.2	.01	0	17	12	.24	.22	0
29	0	.29	0	.01	.82	4.8	0	----------	5.3	.18	.11	0
30	0	.16	0	.01	.60	17	0	----------	3.2	.11	12	9.2
31	0	.04	----------	9.0	----------	14	0	----------	18	----------	2.5	----------
Total	11.06	14.06	7.76	224.32	468.22	49.67	55.71	199.88	312.57	110.60	42.62	16.29
Mean												
Mgd	0.357	0.454	0.259	7.24	15.6	1.60	1.80	7.14	10.1	3.69	1.37	0.543
Cfs	0.552	0.702	0.401	11.2	24.1	2.48	2.79	11.0	15.6	5.71	2.12	0.840
Ac-ft	34	43	24	688	1440	152	171	613	959	339	131	50
Max	8.8	6.8	3.7	86	88	17	14	80	45	15	13	9.2
Min	0	0	0	0	0.60	0	0	0	0.38	0.11	0.03	0

Calendar Year 1966: Max 88 Min 0 Mean (mgd) 2.64 Mean (cfs) 4.08 Ac-ft 2,950
Fiscal Year 1966-67: Max 88 Min 0 Mean (mgd) 4.14 Mean (cfs) 6.41 Ac-ft 4,640

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0200	8.48	339	525	11- 5	1730	9.63	575	890
11- 4	1330	9.76	607	939	2-10	about 0700	9.40	520	805

16-2280. Moanalua Stream near Honolulu

Location.--Lat 21°22'53", long 157°52'22", on left bank 1.8 miles northeast of Tripler Hospital and 5.0 miles north of Honolulu Post Office.

Drainage area.--2.73 sq mi.

Records available.--June 1926 to June 1967.

Gage.--Water-stage recorder and concrete weir. Datum of gage is 338.12 ft above mean sea level (city and county of Honolulu bench mark). Prior to July 1, 1960, at datum 1.00 ft higher.

Average discharge.--41 years, 2.03 mgd (3.14 cfs).

Extremes.--Maximum discharge during year, 615 mgd (952 cfs) Mar. 22 (gage height, 7.16 ft), from rating curve extended above 77 mgd on basis of slope-area measurement at gage height 11.82 ft; no flow for many days.
1926-67: Maximum discharge, 2,960 mgd (4,580 cfs) Nov. 18, 1930 (gage height, 12.58 ft, present datum), from rating curve extended above 72 mgd by test on model of station site; no flow at times each year.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0			0	8.2	0.20	6.8	0	3.3	7.3	0	0.04
2	0			0	2.8	.10	3.1	0	1.7	4.3	0	.93
3	0			0	7.8	.10	6.5	0	1.0	2.9	0	.17
4	0			0	44	.10	5.1	0	.72	2.3	0	.04
5	0			0	28	.25	2.5	0	.42	4.9	0	.02
6	0			0	61	2.5	1.6	0	6.9	2.8	0	.01
7	0			0	16	2.0	1.2	0	4.5	1.8	0	0
8	0			0	6.6	1.0	.67	0	1.6	1.1	0	0
9	0			0	3.3	.50	.35	0	.97	.67	0	0
10	0			11	2.0	.35	.16	5.4	4.8	.50	0	0
11	0			72	1.8	.25	.08	.82	1.6	3.3	0	0
12	0			26	6.8	.20	.08	2.0	.82	3.4	0	0
13	0			3.3	3.3	.11	.04	1.4	.62	5.6	0	0
14	0			.77	1.7	.06	.03	.58	.67	19	0	0
15	0			2.8	10	0	.03	17	.24	4.9	0	0
16	0			7.0	35	0	.02	10	.08	2.0	0	0
17	0			9.8	15	0	.01	2.7	.04	1.1	0	0
18	0			3.1	4.0	0	.01	4.6	.03	.54	.66	0
19	0			.88	2.0	0	.01	2.4	.03	.29	.16	0
20	0			.29	.90	0	0	1.1	.02	.14	.78	0
21	0			.14	.70	0	0	.46	.14	.08	.48	0
22	0			.06	1.5	0	0	.21	50	.04	.04	0
23	0			.04	5.0	0	0	.09	31	.03	.03	0
24	0			.02	2.0	0	0	.05	5.6	.03	.01	0
25	.28			.02	1.0	0	0	.04	22	.02	0	0
26	.01			.01	.60	0	0	.03	16	.01	0	0
27	0			.01	.40	0	0	30	26	.01	0	0
28	0			0	.30	0	0	9.4	8.3	.01	0	0
29	0			0	.25	0	0	----------	4.2	0	0	0
30	0			0	.20	6.0	0	----------	2.6	0	1.4	2.1
31	0		----------	0	----------	7.5	0	----------	8.6	---------	.78	---------
Total	0.29	0	0	137.24	272.15	21.22	28.29	88.28	204.50	69.07	4.34	3.31
Mean												
Mgd	0.009	0	0	4.43	9.07	0.685	0.913	3.15	6.60	2.30	0.140	0.110
Cfs	0.014	0	0	6.85	14.0	1.06	1.41	4.87	10.2	3.56	0.217	0.170
Ac-ft	0.9	0	0	421	835	65	87	271	628	212	13	10
Max	0.28	0	0	72	61	7.5	6.8	30	50	19	1.4	2.1
Min	0	0	0	0	0.20	0	0	0	0.02	0	0	0

Calendar Year 1966: Max 72 Min 0 Mean (mgd) 1.27 Mean (cfs) 1.96 Ac-ft 1420
Fiscal Year 1966-67: Max 72 Min 0 Mean (mgd) 2.27 Mean (cfs) 3.51 Ac-ft 2540

Note.--No gage-height record Nov. 15 to Dec. 27.

Peak discharge (base, 150 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0300	5.94	374	579	3-22	2000	7.16	615	952
11- 4	1430	6.62	495	766	4-14	1430	4.49	174	269
11- 5	1900	5.72	338	523					

16-2289. Kalihi Stream near Kaneohe

Location.--Lat 21°22'35", long 157°49'32", on right bank 800 ft downstream from Likelike Highway and 2.8 miles southwest of Castle High School in Kaneohe.

Drainage area.--0.60 sq mi.

Records available.--November 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 840 ft (from topographic map).

Extremes.--Maximum discharge during period, 142 mgd (220 cfs) May 18 (gage height, 2.72 ft), from rating curve extended above 32 mgd on basis of slope-area measurements at gage heights 3.88 and 4.96 ft; minimum, 0.16 mgd (0.25 cfs) Jan. 30, 31.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, November 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1					-	0.39	0.39	0.17	0.32	1.7	0.38	0.31
2					-	.36	.32	.18	.26	1.5	.43	2.1
3					-	.34	.30	.19	.43	1.2	.34	.43
4					-	.32	.51	.18	.32	1.2	.30	.30
5					-	.34	.30	.19	.26	1.2	.30	.26
6					-	.66	.40	.17	3.9	.88	.28	.25
7					-	.49	.35	.17	1.0	.86	.34	.25
8					-	.39	.30	.17	.81	.70	.28	.25
9					-	.36	.27	.22	.73	.68	.26	.26
10					-	.34	.25	4.8	.94	.70	.25	.23
11					-	.32	.24	.78	.70	.96	.25	.25
12					-	.30	.50	.76	.58	.73	.26	.20
13					-	.47	.30	.58	.76	.70	.22	.21
14					-	.30	.25	.47	.68	7.4	.22	.21
15					-	.28	.50	2.5	.51	1.5	.21	.21
16					5.8	.26	.30	1.4	.43	.94	.60	.21
17					1.8	.26	.25	.94	.43	.78	.28	.21
18					1.3	.30	.23	.86	.38	.68	3.4	.21
19					1.1	.26	.22	.70	.34	.60	.83	.21
20					.91	.25	.21	.70	.82	.56	1.1	.21
21					.83	.25	.21	.53	.89	.51	.78	.19
22					1.0	.25	.21	.56	14	.47	.51	.21
23					.86	.30	.21	.56	6.8	.45	.36	.18
24					.86	.25	.20	.60	1.7	.47	.23	.18
25					.73	.23	.30	.49	4.4	.41	.23	.19
26					.61	.25	.25	.43	3.3	.40	.19	.17
27					.58	.25	.22	1.6	6.5	.40	.28	.22
28					.56	.43	.21	.43	2.6	.40	.23	.21
29					.47	.28	.20	----------	1.7	.36	.28	.51
30					.43	.33	.19	----------	1.5	.34	.47	1.6
31			----------		----------	.43	.17	----------	2.3	----------	.34	----------
Total					-	10.24	8.76	21.33	60.29	29.68	14.43	10.43
Mean												
Mgd					-	0.330	0.283	0.762	1.94	0.983	0.465	0.348
Cfs					-	0.511	0.438	1.18	3.00	1.52	0.719	0.538
Ac-ft					-	31	27	65	185	91	44	32
Max					-	0.66	0.51	4.8	14	7.4	3.4	2.1
Min					-	0.23	0.17	0.17	0.26	0.34	0.19	0.17

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Peak discharge (base, 97 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
3-22	2000	2.56	121	187	5-18	1600	2.72	142	220
4-14	1300	2.66	134	207					

16-2290. Kalihi Stream near Honolulu

Location.--lat 21°21'59", long 157°50'49", on right bank 1.9 miles upstream from Kamanaiki Stream and 4.1 miles north of Honolulu Post Office.

Drainage area.--2.61 sq mi.

Records available.--September 1913 to April 1914, July 1914 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 464.40 ft above mean sea level, datum of 1929. Prior to Oct. 12, 1923, at datum 2.00 ft lower.

Average discharge.--53 years (1914-67), 4.55 mgd (7.04 cfs).

Extremes.--Maximum discharge during year, 593 mgd (918 cfs) Oct. 11 (gage height, 7.91 ft), from rating curve extended above 180 mgd on basis of indirect measurements at gage heights 8.9, 10.96, and 11.27 ft; minimum, 0.06 mgd (0.09 cfs) July 29.
1913-67: Maximum discharge, about 8,000 mgd (about 12,400 cfs) Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 180 mgd on basis of indirect measurements at gage heights 8.9 and 11.27 ft; minimum, 0.06 mgd (0.09 cfs) Oct. 22, 1933, July 29, 1966.

Remarks.--Records poor. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.64	0.14	0.34	0.20	16	2.3	7.0	0.83	5.6	10	1.6	2.0
2	1.5	.14	.26	.20	5.2	2.2	4.2	.76	3.6	8.3	2.2	5.8
3	.70	.14	.34	.20	10	2.0	11	.76	3.3	8.0	2.0	2.3
4	.43	.10	.23	.17	37	1.9	6.0	.76	3.0	7.0	1.8	1.6
5	.30	.10	.20	.14	71	2.0	5.0	.90	2.4	12	1.6	1.3
6	.38	.10	.20	.53	60	3.6	5.6	.83	12	8.0	1.6	1.2
7	.38	.10	.30	.30	21	2.4	4.0	.83	7.6	7.0	2.0	1.2
8	.26	.64	.23	.17	10	1.8	2.5	.83	5.2	6.0	2.0	1.2
9	.26	.20	.20	.20	7.6	1.7	2.0	.97	3.8	5.0	1.8	2.0
10	.26	.14	.64	44	7.6	1.5	1.8	20	5.8	8.0	1.6	1.5
11	.26	.43	.76	90	8.6	1.4	1.8	3.1	6.8	13	1.5	1.5
12	.26	.17	.90	30	12	1.3	3.5	15	3.4	8.0	1.5	1.5
13	.23	.48	.48	5.2	7.6	2.2	1.6	2.7	3.9	6.0	1.4	1.5
14	.23	.43	.90	4.0	5.2	1.4	1.5	2.0	3.2	16	1.3	1.4
15	.26	.23	.53	15	18	1.3	2.5	20	2.8	7.0	1.2	1.3
16	.26	.17	.34	20	31	1.2	1.8	10	2.4	5.0	3.0	1.2
17	.23	.26	.30	12	8.1	1.0	1.6	7.0	2.6	4.0	1.6	1.1
18	.17	.23	.26	5.4	5.4	2.3	1.5	9.0	2.1	3.5	17	1.1
19	.17	.17	.30	3.4	4.4	1.4	1.4	5.0	2.0	3.0	4.6	1.1
20	.17	.17	.30	2.7	4.2	1.2	1.3	4.0	7.4	2.7	5.6	1.0
21	.17	.14	.38	2.3	3.6	1.2	1.2	3.1	11	2.5	4.6	.97
22	.17	.14	.38	1.8	6.1	1.3	1.2	2.7	60	2.3	2.7	.97
23	.12	.12	.34	2.3	5.2	1.9	1.2	2.7	33	2.5	2.3	.97
24	.70	1.5	.48	1.8	7.8	1.6	1.1	2.4	11	3.0	2.2	.90
25	8.0	1.2	.48	1.6	4.4	1.5	1.1	3.6	14	2.5	2.0	.90
26	1.8	.70	.53	1.4	3.8	2.3	1.0	3.1	13	2.2	1.8	.90
27	.64	.97	.76	1.3	3.4	7.4	.97	20	26	2.0	1.7	.90
28	.17	.83	1.1	1.2	3.3	8.6	.97	10	12	1.7	1.7	.90
29	.07	.64	.26	1.2	3.1	1.8	1.0	----------	9.6	1.7	1.5	1.5
30	.08	.48	.20	.70	2.3	1.8	.90	----------	8.9	1.7	8.0	11
31	.17	.38	----------	5.2	----------	1.8	.90	----------	15	----------	4.0	----------
Total	19.44	11.64	12.92	254.61	392.9	67.3	79.14	152.87	302.4	169.6	89.4	52.71
Mean												
Mgd	0.627	0.375	0.431	8.21	13.1	2.17	2.55	5.46	9.75	5.65	2.88	1.76
Cfs	0.971	0.581	0.666	12.7	20.3	3.36	3.95	8.45	15.1	8.74	4.46	2.72
Ac-ft	60	36	40	781	1,210	207	243	469	928	521	274	162
Max	8.0	1.5	1.1	90	71	8.6	11	20	60	16	17	11
Min	0.07	0.10	0.20	0.14	2.3	1.0	0.90	0.76	2.0	1.7	1.2	0.90

Calendar Year 1966: Max 90 Min 0.07 Mean (mgd) 3.05 Mean (cfs) 4.72 Ac-ft 3,420
Fiscal Year 1966-67: Max 90 Min 0.07 Mean (mgd) 4.40 Mean (cfs) 6.81 Ac-ft 4,930

Note.--No gage-height record Feb. 10 to Mar. 30.

Peak discharge (base, 250 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	0900	6.72	309	478	11- 6	1100	6.99	354	548
10-11	0130	7.91	593	918	3-22	2000	7.12	380	588
11- 4	1330	6.76	316	489	4-14	about 1400	6.99	354	548
11- 5	1800	7.08	372	576					

16-2293. Kalihi Stream at Kalihi

Location.--Lat 21°20'29", long 157°52'36", on right bank at Kalihi, 0.4 mile northwest of Bishop Museum, and 2.4 miles northwest of Honolulu Post Office.

Drainage area.--5.18 sq mi.

Records available.--Fiscal year 1962 (annual maximum), July 1962 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 70 ft (from topographic map). Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft downstream at different datum.

Average discharge.--5 years, 8.54 mgd (13.2 cfs).

Extremes.--Maximum discharge during year, 1,110 mgd (1,720 cfs) Nov. 5 (gage height, 4.97 ft), from rating curve extended above 510 mgd on basis of slope-area measurements at gage heights 8.0 and 8.24 ft; minimum, 0.12 mgd (0.19 cfs) July 13, 16.
1961-67: Maximum discharge, about 4,500 mgd (about 7,000 cfs) Nov. 14, 1965.
1962-67: Minimum discharge, 0.10 mgd (0.16 cfs) June 24, 1966.
Flood of May 14, 1960, reached a stage of 8.0 ft, from floodmarks, present site and datum (discharge, 4,100 mgd or 6,350 cfs, from slope-area measurement of peak flow).

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.84	0.52	0.45	0.84	25	2.7	9.3	0.97	6.5	19	2.3	2.0
2	2.2	.52	.40	.58	8.5	2.7	6.8	.97	4.7	14	3.4	8.7
3	1.1	.58	.36	.66	24	2.3	15	.84	4.2	10	2.7	3.1
4	.40	.84	.31	1.1	100	2.3	9.3	.84	3.4	9.3	2.3	2.2
5	.31	1.5	.26	1.1	188	2.5	5.3	1.1	2.9	17	2.3	2.0
6	.84	1.1	.40	2.3	156	6.4	5.9	.84	29	10	2.2	1.8
7	.66	1.2	.66	1.7	34	3.1	4.2	.66	12	9.8	4.0	1.8
8	.58	2.3	.36	.84	18	2.3	3.4	.66	6.2	7.2	4.4	2.0
9	.52	1.5	.36	.97	12	2.2	2.3	.84	5.0	6.2	2.7	2.3
10	.45	.97	.36	52	9.8	2.0	1.8	21	6.8	11	2.3	1.7
11	.45	1.8	1.5	169	11	1.8	1.8	4.2	9.6	18	2.2	1.7
12	.40	1.1	.84	37	23	1.8	4.7	18	4.5	9.8	2.0	1.7
13	.26	1.7	.58	8.9	11	2.9	1.7	5.9	5.3	8.5	2.0	1.5
14	.31	1.7	.84	6.8	7.8	1.8	1.5	4.5	4.2	26	1.8	1.4
15	.40	.75	.84	32	12	1.7	3.7	20	3.4	8.9	2.5	1.2
16	.26	.52	.40	55	21	1.5	1.5	11	2.9	6.5	6.2	1.1
17	.18	.52	.31	28	11	1.5	1.4	7.5	3.4	5.3	4.7	1.1
18	.31	.66	.31	8.5	7.5	4.0	1.2	9.3	2.5	4.7	35	.97
19	.31	.58	1.1	4.5	6.2	1.5	1.2	5.6	2.3	4.2	8.5	.84
20	.40	.45	.58	3.4	5.3	1.5	.97	3.9	12	3.9	6.8	.75
21	.45	.58	.75	2.7	5.0	1.5	.84	2.9	15	3.6	4.7	.75
22	.52	.75	.75	2.0	5.9	2.0	.75	2.7	186	3.1	2.9	.84
23	.31	1.0	.66	2.0	5.6	2.2	.75	2.3	75	3.4	2.3	.84
24	2.3	5.8	.97	1.5	6.5	1.5	.66	2.2	16	3.6	2.3	.84
25	10	2.5	.97	1.4	6.2	1.2	.84	2.5	28	2.7	2.9	1.4
26	4.5	1.2	1.1	1.2	4.7	2.2	.66	1.8	26	2.7	2.2	1.1
27	1.8	1.2	1.7	1.2	5.3	9.1	.66	38	48	2.7	2.2	2.0
28	1.1	1.4	2.3	1.2	4.2	13	.66	14	20	2.7	2.0	1.1
29	.97	.75	.66	1.1	3.6	7.8	.84	----------	13	2.3	1.8	2.3
30	.58	.58	.75	1.1	2.9	11	.91	----------	12	2.2	11	30
31	.45	.45	----------	8.0	----------	16	1.1	----------	23	----------	3.1	----------
Total	34.16	37.02	21.83	438.59	741.0	116.0	91.64	185.02	592.8	238.3	137.7	81.03
Mean												
Mgd	1.10	1.19	0.728	14.1	24.7	3.74	2.96	6.61	19.1	7.94	4.44	2.70
Cfs	1.70	1.84	1.13	21.8	38.2	5.79	4.58	10.2	29.6	12.3	6.87	4.18
Ac-ft	105	114	67	1350	2270	356	281	568	1820	731	423	249
Max	10	5.8	2.3	169	188	16	15	38	186	26	35	30
Min	0.18	0.45	0.26	0.58	2.9	1.2	0.66	0.66	2.3	2.2	1.8	0.75

Calendar Year 1966: Max 188 Min 0.15 Mean (mgd) 5.37 Mean (cfs) 8.31 Ac-ft 6010
Fiscal Year 1966-67: Max 188 Min 0.18 Mean (mgd) 7.44 Mean (cfs) 11.5 Ac-ft 8330

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0200	4.89	1,060	1,640	11- 6	1000	4.64	922	1,430
11- 4	1300	4.62	910	1,410	3-22	2030	4.80	1,010	1,560
11- 5	1800	4.97	1,110	1,720					

16-2320. Nuuanu Stream below reservoir 2 wasteway, near Honolulu

Location.--lat 21°20'55", long 157°49'40", on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mile downstream from reservoir 2 wasteway, and 3.5 miles northeast of Honolulu Post Office.

Drainage area.--3.35 sq mi.

Records available.--October 1913 to January 1921, September 1921 to June 1967.

Gage.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level, datum of 1929. Prior to Sept. 7, 1915, staff gage at same site at datum 0.03 ft lower and Sept. 7, 1915, to Mar. 31, 1918, at same datum.

Average discharge.--50 years (1914-16, 1917-20, 1922-67), 4.84 mgd (7.49 cfs).

Extremes.--Maximum discharge during year, 278 mgd (430 cfs) Oct. 11, Mar. 22 (gage height, 4.35 ft), from rating curve extended above 270 mgd on basis of slope-area measurement at gage height 6.69 ft; minimum, 0.30 mgd (0.46 cfs) Sept. 16.
1913-67: Maximum discharge, 4,520 mgd (6,990 cfs) Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 270 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) Sept. 10, 11, 1925.

Remarks.--Records fair. Low-flow regulation by reservoirs 2, 3, and 4 (capacities, 21, 34, and 1,630 acre-ft, respectively). Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.3	0.80	0.72	0.46	10	3.9	4.0	1.8	3.4	15	3.4	2.7
2	1.6	.80	.68	.52	3.8	3.8	3.5	1.8	3.0	11	3.4	3.0
3	1.2	.80	.72	.48	7.9	3.7	4.8	1.8	2.7	9.3	3.4	2.8
4	1.1	.80	.68	.36	14	3.6	4.2	1.7	2.6	9.3	3.3	2.7
5	.95	.80	.65	.36	28	3.6	3.5	1.8	2.6	14	3.2	2.6
6	1.2	.83	.68	.43	31	4.6	3.6	1.7	13	9.9	3.0	2.6
7	1.1	.80	.87	.52	16	4.4	3.2	1.6	4.0	8.7	3.4	2.6
8	.95	.87	.87	.72	9.9	3.6	3.1	1.8	3.2	8.7	3.7	2.6
9	.91	.76	.83	.76	8.2	3.4	2.8	1.8	3.4	7.6	3.4	2.7
10	.87	.76	.87	16	7.4	3.3	2.8	7.2	3.4	7.6	3.0	2.6
11	.83	1.0	.87	49	8.7	3.2	2.6	2.3	3.2	12	3.0	2.6
12	.87	.80	.83	4.6	13	3.2	2.8	4.6	2.8	8.2	2.9	2.5
13	.87	.87	.83	1.9	7.9	3.4	2.6	2.8	3.1	9.1	2.8	2.4
14	.91	.83	.91	1.5	6.4	3.2	2.6	2.4	2.7	12	2.8	2.4
15	.87	.76	.65	2.4	6.8	3.0	2.5	10	2.7	4.0	2.8	2.4
16	.83	.76	.51	5.2	11	3.0	2.5	4.7	2.5	3.8	3.1	2.3
17	.91	.80	.36	3.3	6.4	3.0	2.4	3.4	2.6	3.6	2.8	2.2
18	.87	.80	.36	2.6	5.5	3.1	2.3	6.0	2.4	3.6	15	2.2
19	.80	.76	.41	2.4	5.1	2.8	2.3	3.4	2.3	3.6	6.4	2.1
20	.80	.72	.41	2.3	4.9	2.8	2.2	2.9	2.3	3.6	7.0	2.1
21	.83	.72	.43	2.1	4.7	2.8	2.2	2.6	7.5	3.6	6.6	2.1
22	.80	.80	.46	1.7	5.5	2.8	2.1	2.6	28	3.5	5.5	2.0
23	.76	.87	.46	1.6	4.8	2.7	2.1	2.5	22	3.5	5.5	2.0
24	1.6	1.7	.46	1.5	6.2	2.6	2.0	2.4	6.6	3.6	5.5	2.0
25	3.9	1.1	.46	1.6	5.3	2.6	2.1	2.4	12	3.5	5.5	2.2
26	1.9	.87	.46	1.8	4.8	2.6	2.0	2.2	12	3.5	5.5	2.0
27	1.1	.87	1.3	1.7	4.6	2.7	2.0	13	19	3.5	5.5	2.1
28	.87	.83	.88	1.6	4.4	3.0	1.9	4.6	9.3	3.4	5.1	2.0
29	.83	.80	.46	1.6	4.1	3.0	1.9	----------	7.6	3.4	4.9	2.1
30	.80	.76	.46	1.6	4.0	4.4	1.9	----------	7.6	3.3	6.0	2.6
31	.76	.76	----------	4.7	----------	6.4	1.8	----------	9.0	----------	2.8	----------
Total	33.89	26.20	19.54	117.31	260.3	104.2	82.3	97.8	208.5	199.4	140.2	71.2
Mean												
Mgd	1.09	0.845	0.651	3.78	8.68	3.36	2.65	3.49	6.73	6.65	4.52	2.37
Cfs	1.69	1.31	1.01	5.85	13.4	5.20	4.10	5.40	10.4	10.3	6.99	3.67
Ac-ft	104	80	60	360	799	320	253	300	640	612	430	218
Max	3.9	1.7	1.3	49	31	6.4	4.8	13	28	15	15	3.0
Min	0.76	0.72	0.36	0.36	3.8	2.6	1.8	1.6	2.3	3.3	2.8	2.0

Calendar Year 1966: Max 49 Min 0.36 Mean (mgd) 2.70 Mean (cfs) 4.18 Ac-ft 3020
Fiscal Year 1966-67: Max 49 Min 0.36 Mean (mgd) 3.73 Mean (cfs) 5.78 Ac-ft 4180

Peak discharge (base, 150 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0200	4.35	278	430	3-22	2030	4.35	278	430
10-11	2200	3.91	195	302					

16-2385. Waihi Stream at Honolulu
(Formerly published as 40-2400. West Branch Manoa Stream near Honolulu)

Location.--Lat 21°19'54", long 157°48'13", on left bank 100 ft upstream from bridge on Waaloa Road, 1.0 mile northeast of Manoa School, and 4.2 miles northeast of Honolulu Post Office.

Drainage area.--1.14 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1967. Prior to July 1960, published as West Branch Manoa Stream near Honolulu.

Gage.--Digital water-stage recorder and combination Parshall flume and V-notch weir. Datum of gage is 290.84 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, staff gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, graphic water-stage recorder at site 150 ft upstream at different datum. Aug. 4, 1925, to Mar. 15, 1928, graphic water-stage recorder at present site at datum 3.35 ft lower and Mar. 16, 1928, to July 2, 1963, at present site and datum.

Average discharge.--48 years (1913-20, 1926-67), 2.42 mgd (3.74 cfs).

Extremes.--Maximum discharge during year, 248 mgd (384 cfs) Mar. 22 (gage height, 3.40 ft), from rating curve extended above 73 mgd by test on model of station site; minimum, 0.10 mgd (0.16 cfs) Sept. 25.
1913-21, 1925-67: Maximum discharge, 2,100 mgd (3,250 cfs) Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 40 mgd; minimum, 0.05 mgd (0.08 cfs) Dec. 16, 18, 1913, Jan. 16-18, Feb. 4, 6, 1915, Mar. 16, 22, 1926.

Remarks.--Records fair. Occasional small diversion for irrigation above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.41	0.28	0.36	0.17	5.0	0.82	2.5	0.19	2.2	7.7	1.0	1.0
2	1.8	.23	.32	.15	3.0	.76	2.3	.41	1.7	4.8	3.0	1.4
3	.87	.28	.32	.14	7.0	.71	5.4	.36	2.3	3.6	1.5	.87
4	.55	.28	.28	.13	9.0	.66	3.5	.23	2.6	3.2	1.0	.71
5	.46	.28	.23	.12	15	.76	2.1	.46	1.9	7.2	.90	.60
6	.71	.32	.32	.50	20	1.5	2.0	.28	12	3.1	.80	.55
7	3.0	.32	.46	.15	7.0	.87	1.6	.23	3.3	3.2	3.5	.50
8	4.7	1.2	.32	.11	5.0	.66	1.2	.19	2.5	2.6	1.5	.55
9	.41	.50	.28	.15	3.8	.55	1.0	.36	3.0	2.0	1.0	.66
10	.32	.28	1.6	20	3.6	.50	.87	5.4	3.5	2.0	.71	.60
11	.28	.76	1.3	50	6.2	.46	.82	1.0	2.5	4.7	.60	.46
12	.23	.36	2.0	6.0	9.1	.46	1.2	3.6	1.5	2.3	.55	.41
13	.23	1.2	.76	2.5	4.1	1.6	.82	1.7	2.0	4.7	.60	.41
14	.28	1.0	1.4	2.0	3.1	.71	.76	1.2	1.2	3.0	.46	.36
15	.36	.71	.76	1.8	4.0	.50	.66	4.4	1.1	2.5	.41	.32
16	.32	.50	.60	4.0	7.3	.46	.60	2.5	1.0	2.1	.46	.32
17	.28	.71	.50	4.5	2.6	.36	.55	1.8	2.2	1.8	.46	.23
18	.23	.50	.36	2.5	1.9	.60	.60	4.5	1.1	1.6	6.0	.28
19	.36	.36	.41	2.0	1.7	.32	.66	2.2	.99	1.5	1.3	.41
20	.23	.28	.36	2.5	1.5	.28	.55	1.6	2.7	1.4	2.5	.36
21	.16	.23	.28	1.5	1.4	.28	.50	1.1	2.6	1.3	1.3	.32
22	.13	.50	.23	1.2	1.8	.55	.45	.87	38	1.2	.66	.32
23	.13	.71	.19	2.0	1.3	.76	.40	.76	20	1.2	.55	.32
24	1.5	4.8	.16	1.2	2.6	.41	.35	.71	5.2	2.0	.66	.32
25	3.6	2.0	.13	1.0	1.6	.32	.70	.87	8.8	1.6	.82	.32
26	1.6	1.1	.16	.90	1.2	.55	.60	.60	9.4	1.4	1.2	.28
27	.87	1.5	1.5	.71	1.4	.76	.40	11	15	1.3	1.4	.71
28	.60	.87	.50	.66	1.3	1.7	.32	3.5	5.9	1.2	.66	.46
29	.41	.66	.30	.60	.99	1.8	.28	----------	3.9	1.1	.50	1.0
30	.36	.55	.20	.55	.87	2.5	.23	----------	4.0	1.0	6.8	.76
31	.28	.46	----------	7.0	----------	4.8	.23	----------	7.3	----------	1.8	----------
Total	25.67	23.73	16.59	116.74	134.36	27.97	34.15	52.02	171.39	78.3	44.60	15.81
Mean												
Mgd	0.828	0.765	0.553	3.77	4.48	0.902	1.10	1.86	5.53	2.61	1.44	0.527
Cfs	1.28	1.18	0.856	5.83	6.93	1.40	1.70	2.88	8.56	4.04	2.23	0.815
Ac-ft	79	73	51	358	412	86	105	160	526	240	137	49
Max	4.7	4.8	2.0	50	20	4.8	5.4	11	38	7.7	6.8	1.4
Min	0.13	0.23	0.13	0.11	0.87	0.28	0.23	0.19	0.99	1.0	0.41	0.23

Calendar Year 1966: Max 50 Min 0.11 Mean (mgd) 1.41 Mean (cfs) 2.18 Ac-ft 1580
Fiscal Year 1966-67: Max 50 Min 0.11 Mean (mgd) 2.03 Mean (cfs) 3.14 Ac-ft 2280

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
3-22	1645	3.40	248	384

16-2405. Waiakeakua Stream at Honolulu
(Formerly published as 40-2390. East Branch Manoa Stream near Honolulu)

Location.--lat 21°19'50", long 157°48'10", on right bank 5 ft downstream from highway bridge, 400 ft upstream from confluence with West Branch, and 4.2 miles northeast of Honolulu Post Office.

Drainage area.--1.06 sq mi.

Records available.--May 1913 to Jnuary 1921, August 1925 to June 1967. Prior to July 1960, published as East Branch Manoa Stream near Honolulu.

Gage.--Water-stage recorder and combination Parshall flume and concrete weir. Datum of gage is 294.50 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, staff gage at site 200 ft upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 2.99 ft lower, and Mar. 16, 1928, to Oct. 18, 1933, at datum 0.41 ft higher than present datum.

Average discharge.--48 years (1913-20, 1926-67), 3.21 mgd (4.97 cfs).

Extremes.--Maximum discharge during year, 579 mgd (896 cfs) Oct. 11 (gage height, 4.42 ft), from rating curve extended above 68 mgd on basis of slope-area measurement at gage height 5.28 ft; minimum, 1.2 mgd (1.9 cfs) Oct. 8.
1913-21, 1925-67: Maximum discharge, 2,000 mgd (3,090 cfs) Jan. 16, 1921 (gage height, 10.4 ft, from floodmarks, site and datum then in use), from rating curve extended above 37 mgd; minimum, 0.4 mgd (0.6 cfs) June 7, 8, 1926.

Remarks.--Records good. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.9	1.6	1.6	1.4	13	2.1	2.9	1.6	2.6	9.0	2.3	2.5
2	3.5	1.6	1.6	1.3	4.2	2.1	3.5	2.2	2.3	6.1	3.8	3.1
3	2.5	1.6	1.5	1.3	7.7	2.1	7.6	1.7	2.9	4.7	2.6	2.5
4	1.9	1.8	1.5	1.3	8.9	2.1	5.0	1.6	3.6	4.3	2.4	2.3
5	1.8	1.8	1.4	1.3	19	2.3	3.1	2.0	2.4	5.7	2.3	2.1
6	2.5	1.8	1.6	1.6	21	3.4	3.0	1.6	15	3.9	2.4	2.1
7	2.2	1.8	1.7	1.3	6.5	2.6	2.7	1.5	4.6	4.8	4.0	2.1
8	1.6	3.1	1.6	1.2	4.6	2.2	2.5	1.5	3.0	3.7	3.0	2.1
9	1.6	1.8	1.5	1.3	4.1	2.1	2.2	1.8	3.1	3.3	2.6	2.3
10	1.5	1.7	4.0	28	4.1	2.1	2.1	7.9	3.5	3.4	2.4	2.2
11	1.4	2.5	2.6	53	6.7	2.0	2.1	2.6	2.7	6.7	2.3	2.1
12	1.6	1.8	3.7	6.4	9.8	2.0	3.0	4.4	2.5	4.1	2.3	2.0
13	1.7	3.6	2.0	2.8	4.4	3.5	2.3	2.4	3.0	5.8	2.3	2.0
14	1.7	2.7	2.3	2.4	4.2	2.3	2.1	2.2	2.3	4.9	2.2	2.0
15	1.8	2.2	1.7	2.4	5.4	2.0	2.1	4.2	2.1	3.5	2.1	2.0
16	1.6	2.2	1.6	4.5	7.0	1.9	2.0	2.4	2.1	3.2	2.2	2.0
17	1.6	2.5	1.5	4.6	4.1	1.9	2.0	2.2	3.7	3.0	2.1	1.9
18	1.6	2.1	1.6	2.7	3.2	2.1	2.1	4.2	2.1	2.9	8.7	1.9
19	1.9	1.9	1.7	2.3	3.0	1.9	2.1	2.5	2.0	2.8	3.5	1.9
20	1.6	1.7	1.6	2.4	2.8	1.9	2.0	2.1	3.7	2.7	6.0	2.0
21	1.5	1.6	1.6	2.1	2.6	1.9	1.9	1.9	3.6	2.6	3.6	2.0
22	1.4	1.9	1.6	2.0	2.7	2.2	1.8	1.8	34	2.6	2.5	1.9
23	1.4	2.1	1.6	2.2	2.5	2.2	1.8	1.7	20	2.6	2.3	1.9
24	3.4	7.0	1.6	1.9	3.4	1.9	1.7	1.8	5.3	3.0	2.4	1.9
25	5.7	3.3	1.5	1.8	2.7	1.8	1.8	2.1	14	2.7	2.9	2.0
26	2.4	2.1	1.5	1.8	2.5	2.2	1.7	1.7	13	2.6	3.4	1.9
27	1.9	3.0	1.9	1.8	2.6	2.3	1.7	13	15	2.6	3.4	2.3
28	1.8	2.1	1.6	1.7	2.6	3.2	1.7	3.7	6.7	2.5	2.5	2.1
29	1.7	1.8	1.5	1.7	2.3	3.2	1.6	----------	4.8	2.4	2.3	2.7
30	1.7	1.7	1.5	1.7	2.2	3.2	1.6	----------	5.1	2.3	6.7	2.7
31	1.7	1.6	----------	17	----------	5.2	1.6	----------	5.7	----------	3.2	----------
Total	62.1	70.0	54.2	159.2	169.8	73.9	75.3	80.3	196.4	114.4	96.7	64.5
Mean												
Mgd	2.00	2.26	1.81	5.14	5.66	2.38	2.43	2.87	6.34	3.81	3.12	2.15
Cfs	3.09	3.50	2.80	7.95	8.76	3.68	3.76	4.44	9.81	5.89	4.83	3.33
Ac-ft	191	215	166	489	521	227	231	246	603	351	297	198
Max	5.7	7.0	4.0	53	21	5.2	7.6	13	34	9.0	8.7	3.1
Min	1.4	1.6	1.4	1.2	2.2	1.8	1.6	1.5	2.0	2.3	2.1	1.9

Calendar Year 1966: Max 53 Min 1.2 Mean (mgd) 3.09 Mean (cfs) 4.78 Ac-ft 3470
Fiscal Year 1966-67: Max 53 Min 1.2 Mean (mgd) 3.33 Mean (cfs) 5.15 Ac-ft 3730

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	0600	3.25	204	316	10-11	2200	3.68	299	463
10-11	0030	4.42	579	896	3-22	1600	3.54	264	408

16-2440. Pukele Stream near Honolulu

Location.--Lat 21°18'35", long 157°47'30", on right bank 200 ft upstream from bridge on Palolo Avenue, 0.6 mile upstream from confluence with Waiomao Stream, and 4.8 miles east of Honolulu Post Office.

Drainage area.--1.18 sq mi.

Records available.--June 1926 to June 1967.

Gage.--Digital water-stage recorder and V-notch weir. Datum of gage is 344.78 ft above mean sea level (Honolulu Board of Water Supply bench mark). Prior to July 3, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--41 years, 1.30 mgd (2.01 cfs).

Extremes.--Maximum discharge during year, 326 mgd (504 cfs) Oct. 11 (gage height, 4.86 ft), from rating curve extended above 62 mgd on basis of slope-area measurement at gage height 6.13 ft; minimum, 0.13 mgd (0.20 cfs) on many days.
1926-67: Maximum discharge, 1,680 mgd (2,600 cfs) Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 46 mgd by test on model of station site; minimum, 0.05 mgd (0.08 cfs) Oct. 31, 1929.

Remarks.--Records fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.21	0.19	0.21	0.14	10	0.45	0.49	0.34	1.4	5.6	0.63	0.57
2	.21	.19	.21	.14	1.8	.42	.89	.34	1.0	5.4	.57	.63
3	.19	.19	.21	.14	3.1	.42	4.1	.28	.97	3.2	.57	.57
4	.17	.19	.19	.14	6.8	.42	5.1	.31	.97	2.8	.57	.57
5	.14	.19	.19	.14	15	.42	1.4	.31	.97	4.6	.57	.57
6	.14	.21	.19	.14	23	.74	1.2	.28	14	2.8	.57	.57
7	.14	.23	.19	.14	5.8	.39	.97	.28	4.8	2.8	1.1	.53
8	.13	.23	.19	.13	2.5	.39	.89	.28	1.8	2.2	.49	.53
9	.13	.23	.17	.13	1.8	.39	.74	.28	1.6	2.1	.49	.53
10	.13	.23	.19	8.0	1.8	.39	.81	3.1	1.8	2.2	.45	.49
11	.13	.23	.19	79	2.9	.39	.74	3.0	2.1	7.3	.49	.49
12	.14	.19	.19	11	11	.39	1.8	2.4	1.8	5.0	.45	.45
13	.14	.19	.21	3.5	3.4	.42	.89	.81	1.8	4.3	.45	.45
14	.14	.19	.19	1.4	2.2	.42	.81	.57	1.0	3.0	.42	.45
15	.13	.19	.21	1.8	2.4	.39	.81	.63	.97	1.8	.42	.45
16	.13	.19	.17	1.9	3.2	.39	.68	.57	.97	1.6	.42	.42
17	.13	.19	.19	6.4	1.8	.39	.63	.89	1.2	1.5	.42	.42
18	.13	.19	.39	3.5	1.4	.39	.63	1.9	.89	1.4	4.6	.39
19	.13	.19	.49	3.2	1.4	.36	.63	1.0	.74	1.4	.57	.42
20	.13	.19	.49	3.9	1.4	.39	.57	.81	.97	1.4	2.2	.39
21	.13	.19	.17	4.1	1.2	.36	.57	.74	1.6	1.2	1.1	.39
22	.13	.19	.17	1.5	1.1	.36	.57	.74	20	1.1	.53	.39
23	.13	.19	.17	.57	.97	.34	.53	.74	25	1.0	.53	.39
24	.14	.45	.17	.49	.81	.34	.53	.63	2.0	.97	.57	.39
25	.28	.23	.17	.45	.74	.34	.53	.68	3.0	.89	.63	.39
26	.25	.21	.17	.42	.68	.36	.45	.53	5.0	.74	.57	.39
27	.21	.21	.17	.42	.68	.36	.42	14	10	.68	.53	.39
28	.21	.21	.16	.39	.57	.42	.39	4.0	2.5	.68	.53	.39
29	.19	.21	.16	.36	.53	.36	.39	----------	2.0	.63	.53	.39
30	.19	.19	.16	.34	.53	.39	.34	----------	1.8	.57	1.9	.39
31	.19	.21	---------	8.6	---------	1.2	.34	----------	1.9	---------	.74	---------
Total	4.97	6.51	6.33	142.48	110.51	13.19	29.84	40.44	116.55	70.86	24.61	13.79
Mean												
Mgd	0.160	0.210	0.211	4.60	3.68	0.425	0.963	1.44	3.76	2.36	0.794	0.460
Cfs	0.248	0.325	0.326	7.12	5.69	0.658	1.49	2.23	5.82	3.65	1.23	0.712
Ac-ft	15	20	19	437	339	40	92	124	358	217	76	42
Max	0.28	0.45	0.49	79	23	1.2	5.1	14	25	7.3	4.6	0.63
Min	0.13	0.19	0.16	0.13	0.53	0.34	0.34	0.28	0.74	0.57	0.42	0.39

Calendar Year 1966: Max 79 Min 0.10 Mean (mgd) 1.16 Mean (cfs) 1.79 Ac-ft 1,290
Fiscal Year 1966-67: Max 79 Min 0.13 Mean (mgd) 1.59 Mean (cfs) 2.46 Ac-ft 1,780

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0100	4.86	326	504	3-23	0030	4.17	202	313
3- 6	1800	3.70	129	200					

16-2460. Waiomao Stream near Honolulu

Location.--Lat 21°18'35", long 157°47'10", on left bank 300 ft west of road, 0.8 mile upstream from confluence with Pukele Stream, and 5 miles east of Honolulu Post Office.

Drainage area.--1.04 sq mi.

Records available.--April to December 1911, May to December 1912, June 1926 to June 1967. Prior to July 1960, published as "above Pukele Stream, near Honolulu."

Gage.--Water-stage recorder and V-notch weir. Datum of gage is 373.66 ft above mean sea level (Honolulu Board of Water Supply bench mark). Apr. 12, 1911, to Dec. 31, 1912, staff gage at site 0.5 mile downstream at different datum.

Average discharge.--41 years (1926-67), 1.19 mgd (1.84 cfs).

Extremes.--Maximum discharge during year, 211 mgd (326 cfs) Mar. 23 (gage height, 4.28 ft), from rating curve extended above 90 mgd on basis of slope-area measurement at gage height 4.74 ft; no flow Oct. 4, 5, 9, June 23, 26.
1911-12, 1926-67: Maximum discharge, 1,000 mgd (1,550 cfs) Apr. 11, 1930 (gage height, 6.27 ft), from rating curve extended above 65 mgd by test on model of station site; no flow at times.

Remarks.--Records fair. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.20	0.09	0.19	0.02	13	0.13	0.60	0.04	1.4	6.0	0.28	0.50
2	.20	.06	.15	.03	2.1	.12	1.2	.03	.93	4.0	.47	.40
3	.18	.10	.12	.01	2.0	.10	3.1	.05	.53	1.5	.21	.30
4	.17	.09	.10	0	4.4	.09	4.9	.03	.50	.90	.17	.30
5	.16	.12	.07	0	15	.12	1.2	.09	.38	2.5	.15	.20
6	.16	.15	.09	.03	25	1.5	1.1	.06	20	.87	.13	.15
7	.16	.19	.13	.03	5.0	.60	.97	.03	3.8	1.3	1.5	.15
8	.16	1.4	.09	.01	2.1	.28	.68	.03	1.6	.92	.25	.12
9	.16	.64	.06	0	1.2	.17	.53	.03	1.4	.75	.12	.13
10	.16	.21	.84	6.0	1.1	.13	.33	2.9	2.1	1.1	.12	.12
11	.16	.88	1.3	30	2.2	.12	.28	4.9	1.5	3.9	.12	.10
12	.17	.25	2.7	7.0	8.4	.10	1.8	2.5	.83	2.2	.12	.09
13	.17	1.0	.60	1.5	1.7	.86	.57	1.2	1.9	3.6	.12	.06
14	.17	1.3	.50	.80	1.5	.64	.35	.53	1.1	2.7	.12	.05
15	.16	.57	.35	.60	1.8	.28	.28	.53	.53	1.2	.12	.04
16	.16	.31	.28	.50	1.6	.17	.25	.72	.38	.75	.12	.03
17	.16	.79	.31	2.0	1.4	.13	.19	.64	2.7	.57	.12	.03
18	.16	.38	.17	.68	.64	.17	.21	1.9	.83	.41	3.7	.03
19	.16	.25	.10	.38	.53	.09	.35	.79	.44	.35	.50	.02
20	.16	.19	.09	.53	.35	.10	.19	.41	.85	.28	2.0	.01
21	.17	.15	.07	.44	.28	.09	.17	.25	2.7	.23	.90	.01
22	.18	.15	.06	.31	.28	.15	.15	.21	15	.21	.50	.01
23	.19	.15	.04	.25	.25	.13	.12	.19	25	.23	.50	0
24	.50	3.4	.03	.21	.25	.09	.10	.15	2.0	.28	.50	.01
25	.90	1.5	.03	.17	.33	.06	.12	.64	3.0	.33	.50	.01
26	1.0	.60	.01	.13	.25	.09	.10	.25	3.0	.23	.40	0
27	.41	1.0	.01	.12	.28	.15	.10	20	10	.19	.40	.12
28	.25	.68	.05	.10	.41	.47	.10	3.2	4.0	.17	.40	.05
29	.19	.41	.02	.09	.41	.64	.07	----------	2.0	.17	.40	.26
30	.13	.33	.01	.07	.17	.64	.06	----------	1.5	.13	.80	.54
31	.12	.23	---------	6.7	---------	1.5	.05	---------	1.5	---------	.70	---------
Total	7.38	17.57	8.57	58.71	93.93	9.91	20.22	42.30	113.40	37.97	16.44	3.84
Mean												
Mgd	0.238	0.567	0.286	1.89	3.13	0.320	0.652	1.51	3.66	1.27	0.530	0.128
Cfs	0.369	0.877	0.443	2.92	4.85	0.495	1.01	2.34	5.67	1.97	0.820	0.198
Ac-ft	23	54	26	180	288	30	62	130	348	117	50	12
Max	1.0	3.4	2.7	30	25	1.5	4.9	20	25	6.0	3.7	0.54
Min	0.12	0.06	0.01	0	0.17	0.06	0.05	0.03	0.38	0.13	0.12	0

Calendar Year 1966: Max 30 Min 0 Mean (mgd) 0.882 Mean (cfs) 1.36 Ac-ft 987
Fiscal Year 1966-67: Max 30 Min 0 Mean (mgd) 1.18 Mean (cfs) 1.83 Ac-ft 1,320

Peak discharge (base, 70 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0500	3.28	80	124	3- 6	1730	4.05	173	268
11- 5	2300	3.56	108	167	3-23	0030	4.28	211	326

16-2470. Palolo Stream near Honolulu

Location.--Lat 21°17'35", long 157°48'25", on left bank 250 ft downstream from bridge on Palolo Avenue and 3.9 miles east of Honolulu Post Office.

Drainage area.--3.63 sq mi.

Records available.--April 1952 to June 1967.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 95 ft (from topographic map). Prior to Apr. 28, 1954, graphic water-stage recorder at same site and datum.

Average discharge.--15 years, 3.71 mgd (5.74 cfs).

Extremes.--Maximum discharge during year, 836 mgd (1,290 cfs) Mar. 23 (gage height, 3.76 ft), from rating curve extended above 86 mgd as explained below; minimum, 0.24 mgd (0.37 cfs) July 11, 12.
1952-67: Maximum discharge, 2,460 mgd (3,810 cfs) Nov. 14, 1965 (gage height, 5.69 ft), from rating curve extended above 86 mgd on basis of slope-conveyance study and slope-area measurements at gage heights 3.92 and 4.13 ft; minimum, 0.01 mgd (0.02 cfs) June 25, 1958.

Remarks.--Records fair. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.69	0.50	0.55	0.85	38	0.93	1.8	0.81	4.8	19	0.93	1.6
2	.67	.50	.50	.45	5.6	.85	3.6	.84	2.4	13	1.1	2.3
3	.61	.72	.55	.50	16	.93	16	.91	1.8	5.6	.85	1.2
4	.44	.50	.50	.55	36	.93	13	.92	1.6	4.4	1.5	1.3
5	.32	.55	.50	.55	91	1.5	2.6	1.2	1.4	9.3	.85	1.3
6	.35	.55	.72	.78	112	6.0	2.4	1.1	50	4.4	.81	1.3
7	.33	.55	.72	.45	21	1.1	1.8	1.0	13	5.2	8.6	1.3
8	.30	1.2	.60	.41	7.9	.66	2.0	1.0	4.6	3.2	2.2	1.3
9	.31	.85	.60	.38	3.3	.55	1.4	1.2	2.8	2.3	1.3	1.9
10	.30	.66	1.9	33	4.5	.55	1.2	16	2.3	3.2	1.2	1.5
11	.27	.78	2.3	124	7.8	.55	1.4	15	9.8	24	1.3	1.3
12	.34	.72	3.2	24	28	.55	11	25	2.4	11	1.3	1.3
13	.35	1.8	1.3	2.8	2.8	1.3	1.9	4.5	4.3	13	1.5	1.2
14	.30	2.1	1.3	1.9	3.2	1.1	1.4	1.7	2.7	9.3	1.6	1.2
15	.30	1.2	1.2	1.8	4.4	.66	1.2	2.5	1.6	4.0	1.5	1.1
16	.32	.93	1.0	1.8	4.4	.55	1.1	2.1	1.3	1.9	1.5	1.1
17	.33	1.6	.93	4.0	4.4	.60	.95	3.4	9.0	1.8	1.8	1.1
18	.32	1.0	.85	1.2	2.5	1.1	1.2	7.6	2.2	1.6	16	1.1
19	.36	.78	.93	1.0	2.3	.55	1.2	2.8	1.4	1.6	1.9	1.1
20	.33	.72	.85	1.3	2.1	.78	.95	1.7	6.5	1.5	6.5	1.0
21	.33	.72	.93	1.1	1.8	.72	.94	1.3	8.6	1.5	3.6	1.1
22	.33	.93	.85	1.0	1.6	.78	.94	1.2	75	1.5	1.6	1.2
23	.37	.93	.85	1.0	1.5	.60	.92	1.2	88	1.6	1.8	1.2
24	2.1	5.2	.85	.85	1.3	.60	.92	1.0	5.6	1.3	2.3	1.2
25	2.7	2.1	.93	.78	1.5	.66	1.2	1.9	13	1.3	3.2	1.1
26	1.5	1.0	.66	.78	1.1	2.1	.87	1.0	14	1.3	2.3	.85
27	1.1	.85	.72	.72	1.6	2.3	1.1	55	22	1.3	1.6	1.3
28	.66	.78	.72	.72	1.3	2.5	.84	14	7.5	1.1	1.3	.93
29	.55	.60	.66	.72	1.1	1.6	.78	----------	4.0	.93	1.3	1.6
30	.55	.55	.66	.85	.93	1.8	.80	----------	4.0	.72	6.5	1.6
31	.50	.55	----------	25	----------	2.8	.80	----------	4.0	----------	3.2	----------
Total	18.23	32.42	28.83	235.24	410.93	38.20	78.21	167.88	371.6	151.85	82.94	38.58
Mean												
Mgd	0.588	1.05	0.961	7.59	13.7	1.23	2.52	6.00	12.0	5.06	2.68	1.29
Cfs	0.910	1.62	1.49	11.7	21.2	1.90	3.90	9.28	18.6	7.83	4.15	2.00
Ac-ft	56	99	88	722	1,260	117	240	515	1,140	466	255	118
Max	2.7	5.2	3.2	124	112	6.0	16	55	88	24	16	2.3
Min	0.27	0.50	0.50	0.38	0.93	0.55	0.78	0.81	1.3	0.72	0.81	0.85

Calendar Year 1966: Max 124 Min 0.27 Mean (mgd) 3.36 Mean (cfs) 5.20 Ac-ft 3,760
Fiscal Year 1966-67: Max 124 Min 0.27 Mean (mgd) 4.53 Mean (cfs) 7.01 Ac-ft 5,080

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0130	3.57	722	1,120	3- 6	1730	2.89	365	565
11- 6	1500	3.06	450	696	3-23	0030	3.76	836	1,290
1-12	0245	2.59	226	350					

16-2500. Maunawili ditch near Waimanalo

Location.--lat 21°20'45", long 157°45'10", on left bank 80 ft downstream from Aniani Nui Ridge tunnel and 3.5 miles west of Waimanalo Post Office.

Records available.--March 1954 to June 1967.

Gage.--Digital water-stage recorder and sharp-crested weir. Altitude of gage is 390 ft (from topographic map). Prior to Aug. 11, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--13 years, 1.72 mgd (2.66 cfs).

Extremes.--1954-67: Maximum daily discharge, 7.0 mgd (10.8 cfs) Mar. 5, 1958; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are poor. Ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.9	1.8	1.9	1.7	2.5	0.37	0.37	1.1	1.0	2.5	1.7	2.2
2	2.0	1.8	2.2	1.7	2.1	.37	.37	1.3	1.0	2.0	1.6	2.2
3	2.0	1.7	1.9	1.7	2.3	.37	.43	.80	1.0	2.0	1.6	2.1
4	1.9	1.6	1.8	1.7	2.5	.37	.37	.60	1.0	2.0	1.5	2.0
5	1.9	1.5	1.8	1.7	2.8	.37	.37	.50	1.0	2.0	1.5	2.0
6	2.0	1.5	1.8	1.7	2.5	.37	.37	.50	2.0	2.0	1.5	2.0
7	1.9	1.6	1.8	1.7	1.6	.37	.37	.50	1.1	2.0	1.3	1.9
8	1.9	1.8	1.8	1.7	1.3	.37	.40	.50	1.0	2.0	1.1	1.9
9	2.0	1.7	1.8	1.7	1.0	.37	.40	.50	1.0	2.0	.95	1.9
10	2.2	1.7	1.9	2.9	1.6	.37	.40	1.5	1.0	2.0	1.2	1.9
11	2.2	1.8	1.8	2.3	2.8	.37	.40	1.5	1.0	2.0	1.2	1.9
12	2.2	1.7	1.9	1.8	2.8	.37	.40	1.1	1.0	2.0	1.0	1.8
13	2.1	1.8	1.8	1.6	2.7	.37	.37	1.0	1.0	2.5	.89	1.9
14	1.9	1.8	1.9	1.5	1.7	.37	.37	1.0	1.0	3.0	.72	1.8
15	1.9	1.8	1.8	1.5	.65	.37	.37	1.0	1.0	2.1	.22	1.8
16	1.9	1.8	1.8	1.4	.50	.37	.34	1.0	2.0	2.0	1.0	1.8
17	1.9	1.8	1.8	1.7	.43	.37	.34	1.0	1.5	2.0	1.8	1.7
18	1.9	1.7	1.8	2.1	.40	.37	.34	1.0	1.5	2.0	3.1	1.7
19	1.9	1.8	1.8	2.0	.40	.37	.34	1.0	1.5	2.0	2.6	1.7
20	1.9	1.7	1.8	2.0	.37	.40	.34	1.0	1.5	1.9	3.5	1.7
21	2.0	1.7	1.8	2.0	.37	.37	.34	1.0	1.5	1.7	3.1	1.7
22	1.9	1.8	1.8	2.0	.40	.37	.34	1.0	1.5	1.7	2.5	1.5
23	1.8	1.9	1.8	2.0	.37	.37	.34	1.0	3.0	1.7	2.3	1.3
24	2.0	2.0	1.8	2.0	.37	.37	.34	1.0	2.5	1.8	2.2	1.9
25	2.2	1.8	1.8	1.9	.37	.34	.34	1.0	2.0	1.8	2.2	1.9
26	1.9	1.8	1.8	1.9	.37	.34	.34	1.0	2.0	1.8	2.1	2.0
27	1.9	1.8	1.8	1.9	.37	.34	.34	1.5	2.0	1.8	2.1	1.9
28	1.9	1.8	1.7	1.9	.37	.34	.60	1.1	2.0	1.8	1.9	1.9
29	1.9	1.7	1.7	1.9	.37	.34	1.0	----------	2.0	1.7	1.9	2.0
30	1.8	1.7	1.7	1.9	.37	.37	1.0	----------	2.0	1.7	2.2	2.1
31	1.8	1.7	----------	2.2	----------	.37	1.0	----------	2.0	---------	2.3	---------
Total	60.6	54.1	54.6	57.7	36.68	11.35	13.44	27.00	46.6	59.5	54.78	56.1
Mean												
Mgd	1.95	1.75	1.82	1.86	1.22	0.366	0.434	0.964	1.50	1.98	1.77	1.87
Cfs	3.02	2.71	2.82	2.88	1.89	0.566	0.671	1.49	2.32	3.06	2.74	2.89
Ac-ft	186	166	168	177	113	35	41	83	143	183	168	172
Max	2.2	2.0	2.2	2.9	2.8	0.40	1.0	1.5	3.0	3.0	3.5	2.2
Min	1.8	1.5	1.7	1.4	0.37	0.34	0.34	0.50	1.0	1.7	0.22	1.3

Calendar Year 1966: Max 4.0 Min 0 Mean (mgd) 1.62 Mean (cfs) 2.51 Ac-ft 1820
Fiscal Year 1966-67: Max 3.5 Min 0.22 Mean (mgd) 1.46 Mean (cfs) 2.26 Ac-ft 1630

Note.--No gage-height record Jan. 18 to Apr. 18.

16-2540. Makawao Stream near Kailua

Location.--Lat 21°21'49", long 157°46'02", on left bank 650 ft upstream from mouth, 2.7 miles southwest of Kailua, and 4.3 miles southeast of Kaneohe Courthouse.

Drainage area.--2.04 sq mi.

Records available.--November 1912 to June 1916, January 1958 to June 1967.

Gage.--Graphic water-stage recorder and concrete control. Altitude of gage is 80 ft (from topographic map). Prior to Jan. 1, 1958, staff gage at sites about 200 ft upstream at different datums. Jan. 1, 1958, to Feb. 3, 1964, graphic and Feb. 4, 1964, to Aug. 28, 1966, digital water-stage recorders at present site and datum.

Average discharge.--12 years (1913-16, 1958-67), 3.72 mgd (5.76 cfs).

Extremes.--Maximum discharge during year, 333 mgd (515 cfs) Oct. 10 (gage height, 5.40 ft), from rating curve extended above 310 mgd as explained below; minimum, 1.2 mgd (1.9 cfs) Oct. 8.
1912-16, 1958-67: Maximum discharge, 3,880 mgd (6,000 cfs) Feb. 4, 1965 (gage height, 12.41 ft), from rating curve extended above 310 mgd on basis of slope-area measurement of peak flow; minimum, 0.28 mgd (0.43 cfs) Sept. 8-12, 14, 16-20, 22, 23, 1964.

Remarks.--Records good except those for period of no gage-height record, which are poor. Maunawili ditch (see sta. no. 2500) diverts 1.5 miles above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.6	1.5	1.4	1.3	1.3	3.9	3.8	3.1	2.4	8.3	3.4	2.8
2	1.6	1.5	3.2	1.3	2.5	4.6	3.8	4.7	2.3	6.2	3.5	3.3
3	1.6	1.4	2.1	1.3	2.5	4.3	4.6	3.8	2.2	5.4	3.3	2.8
4	1.6	1.6	1.5	1.3	10	4.2	4.5	3.3	2.2	5.0	3.3	2.7
5	1.6	1.6	1.4	1.3	15	4.5	3.9	3.4	2.1	4.6	3.3	2.6
6	1.6	1.6	1.4	1.3	25	6.1	3.9	3.1	25	4.5	3.3	2.6
7	1.6	1.6	1.4	1.3	16	5.4	3.9	3.1	8.9	4.5	3.4	2.5
8	1.5	2.0	1.3	1.2	6.0	4.7	3.8	3.1	6.2	4.2	3.5	2.5
9	1.5	1.6	1.3	1.3	5.0	4.6	3.6	3.1	6.0	4.0	3.6	2.5
10	1.5	1.5	1.4	35	4.5	4.5	3.5	11	6.0	4.2	3.4	2.5
11	1.5	1.7	1.4	10	4.4	4.3	3.5	11	5.2	4.9	3.3	2.4
12	1.4	1.5	1.5	4.0	4.4	4.3	3.8	5.2	4.6	7.8	3.6	2.4
13	1.5	1.6	1.4	2.5	4.4	4.7	3.5	4.5	4.6	7.9	3.9	2.3
14	1.5	1.5	1.4	2.6	4.4	4.3	4.5	4.0	3.9	10	3.6	2.3
15	1.5	1.5	1.4	2.5	4.4	4.2	3.8	4.6	3.6	5.4	3.5	2.2
16	1.5	1.5	1.3	2.5	15	4.0	3.6	3.9	3.4	4.6	3.6	2.2
17	1.4	1.6	1.3	2.5	8.0	4.0	3.6	3.1	10	4.3	2.8	2.1
18	1.9	1.5	1.3	2.2	6.0	4.0	3.5	2.4	4.2	4.0	10	2.0
19	2.8	1.5	1.3	2.2	5.4	3.9	3.5	2.2	3.8	3.9	5.2	2.0
20	1.6	1.5	1.3	2.0	5.0	3.9	3.4	2.2	5.8	3.9	8.8	2.0
21	1.5	1.5	1.3	2.0	4.7	3.9	3.4	2.1	5.5	3.9	5.2	2.0
22	1.5	1.5	1.4	1.9	4.7	3.9	3.4	2.0	13	4.0	3.6	2.0
23	1.5	1.5	1.3	1.9	4.3	3.9	3.4	2.0	27	3.9	3.3	2.0
24	1.8	2.0	1.3	1.8	3.9	3.9	3.3	2.0	14	3.6	3.3	2.0
25	5.0	2.4	1.3	1.7	3.8	3.8	3.4	2.0	10	3.8	3.4	2.0
26	3.2	1.7	1.3	1.6	3.6	3.9	3.3	2.2	8.9	3.5	3.1	1.9
27	2.2	1.8	1.3	1.5	3.5	3.9	3.3	5.7	7.5	3.5	3.0	2.0
28	1.6	1.6	1.3	1.4	3.5	4.2	3.0	2.8	7.1	3.6	3.0	2.0
29	1.5	1.4	1.3	1.4	3.4	3.9	2.5	----------	6.4	3.4	2.8	2.7
30	1.5	1.4	1.3	1.3	3.3	3.8	2.5	----------	5.9	3.4	3.0	3.1
31	1.5	1.4	----------	1.3	----------	3.8	2.6	----------	5.7	---------	2.8	---------
Total	55.1	49.5	43.1	97.4	187.9	131.3	110.1	105.6	223.4	144.2	118.8	70.4
Mean												
Mgd	1.78	1.60	1.44	3.14	6.26	4.24	3.55	3.77	7.21	4.81	3.83	2.35
Cfs	2.75	2.48	2.23	4.86	9.69	6.56	5.49	5.83	11.2	7.44	5.93	3.64
Ac-ft	169	152	132	299	577	403	338	324	686	443	364	216
Max	5.0	2.4	3.2	35	25	6.1	4.6	11	27	10	10	3.3
Min	1.4	1.4	1.3	1.2	1.3	3.8	2.5	2.0	2.1	3.4	2.8	1.9

Calendar Year 1966: Max 35 Min 1.2 Mean (mgd) 3.87 Mean (cfs) 5.99 Ac-ft 4,340
Fiscal Year 1966-67: Max 35 Min 1.2 Mean (mgd) 3.66 Mean (cfs) 5.66 Ac-ft 4,100

Note.--No gage-height record July 20 to Aug. 29.

Peak discharge (base, 250 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
10-10	about 0600	5.40	333	515

16-2739. Kamooalii Stream at Kaneohe

Location.--lat 21°24'51", long 157°48'12", on right bank 500 ft upstream from Kamehameha Highway and 0.2 mile south of Parker School in Kaneohe.

Drainage area.--4.38 sq mi.

Records available.--January 1959 to October 1963, October 1965 to June 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 38.75 ft above mean sea level (levels by city and county of Honolulu). Prior to Oct. 5, 1963, at site 50 ft downstream at datum 0.93 ft lower.

Average discharge.--5 years (1959-63, 1966-67), 9.11 mgd (14.1 cfs).

Extremes.--Maximum discharge during year, 550 mgd (851 cfs) Oct. 10 (gage height, 3.52 ft), from rating curve extended above 250 mgd as explained below; minimum, 4.4 mgd (6.8 cfs) July 4, 20, Sept. 7.

1959-63, 1965-67: Maximum discharge, 3,350 mgd (5,180 cfs) Nov. 14, 1965 (gage height, 7.14 ft), from rating curve extended above 250 mgd on basis of slope-area measurements at gage heights 7.14 and 7.47 ft; minimum, 2.2 mgd (3.4 cfs) Aug. 28, 1962.

Flood of Oct. 23, 1958, reached a stage of 8.3 ft, from floodmarks, former site and datum (discharge, 4,270 mgd or 6,610 cfs, from rating curve extended above 72 mgd on basis of slope-area measurement at gage height 5.69 ft). Discharge for peak of Feb. 4, 1965, 4,010 mgd (6,200 cfs), result of slope-area measurement of peak flow.

Remarks.--Records fair. Many diversions for irrigation above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.7	5.2	5.2	5.2	5.6	11	8.6	7.4	6.4	13	9.7	12
2	8.0	5.0	8.5	4.8	5.5	11	8.6	9.6	6.0	13	9.7	17
3	6.8	5.0	6.2	4.8	5.4	10	9.7	7.7	5.6	13	9.3	12
4	7.1	5.6	5.6	4.8	30	10	8.6	7.1	5.4	13	9.3	10
5	6.8	5.6	5.4	4.8	70	11	8.9	7.1	5.2	13	8.9	10
6	7.1	5.6	5.4	5.2	60	16	9.3	6.8	30	12	8.9	10
7	6.8	5.6	5.4	4.8	15	11	8.9	6.5	15	12	8.9	9.7
8	6.5	6.8	5.4	4.8	10	11	8.9	6.5	12	12	8.9	9.7
9	6.8	5.9	5.4	5.8	9.0	10	8.3	6.8	10	10	8.9	9.7
10	6.8	5.6	6.5	76	8.6	10	8.3	40	9.5	12	8.9	9.7
11	6.8	6.2	5.9	37	8.2	9.7	8.6	9.7	9.0	13	8.9	9.7
12	6.8	5.4	6.8	27	7.8	9.3	9.7	10	8.5	18	10	9.7
13	6.8	5.9	5.9	9.7	7.6	10	9.4	8.0	10	18	14	9.3
14	6.2	5.6	6.2	10	7.4	9.7	12	7.4	7.6	41	8.9	9.3
15	6.2	5.4	5.9	9.7	7.2	9.3	10	9.1	7.2	13	9.3	9.3
16	5.9	5.4	5.6	9.7	50	8.9	9.3	7.7	7.0	11	19	8.9
17	6.2	5.6	5.6	9.7	25	8.6	9.3	7.1	12	10	10	8.9
18	5.6	5.4	5.6	8.9	16	9.3	9.7	6.6	8.3	9.6	50	8.9
19	5.6	5.2	5.4	8.9	14	8.3	9.3	6.2	7.7	9.2	17	8.9
20	5.4	5.2	5.4	8.6	15	8.0	9.3	6.0	12	9.0	28	8.9
21	5.4	5.2	5.4	8.6	13	7.7	8.9	5.8	14	8.8	16	8.9
22	5.4	5.2	5.2	8.3	17	7.7	8.6	5.6	42	8.8	13	8.6
23	5.4	5.2	5.2	8.3	13	7.7	8.3	5.4	26	8.8	12	8.6
24	6.6	8.4	5.0	8.0	13	7.1	8.0	5.2	24	8.8	11	8.6
25	15	6.9	4.8	7.7	12	7.1	8.6	5.1	18	14	11	8.9
26	6.8	5.6	4.8	7.1	12	8.0	8.3	5.0	14	12	11	8.6
27	5.6	6.2	5.2	6.7	12	8.3	8.0	15	14	11	11	9.3
28	5.4	5.6	6.0	6.4	12	10	7.7	8.0	13	15	10	9.9
29	5.2	5.4	5.2	6.2	11	8.6	7.4	----------	12	10	10	18
30	5.2	5.2	5.0	6.0	11	11	7.4	----------	12	9.7	24	19
31	5.2	5.2	----------	5.8	----------	8.9	7.4	----------	14	----------	12	----------
Total	203.1	175.3	169.1	339.3	503.3	294.2	273.3	238.4	397.4	381.7	407.5	310.0
Mean												
Mgd	6.55	5.65	5.64	10.9	16.8	9.49	8.82	8.51	12.8	12.7	13.1	10.3
Cfs	10.1	8.74	8.73	16.9	26.0	14.7	13.6	13.2	19.8	19.6	20.3	15.9
Ac-ft	623	538	519	1040	1540	903	839	732	1220	1170	1250	951
Max	15	8.4	8.5	76	70	16	12	40	42	41	50	19
Min	5.2	5.0	4.8	4.8	5.4	7.1	7.4	5.0	5.2	8.8	8.9	8.6

Calendar Year 1966: Max 76 Min 4.8 Mean (mgd) 10.7 Mean (cfs) 16.6 Ac-ft 11950

Fiscal Year 1966-67: Max 76 Min 4.8 Mean (mgd) 10.1 Mean (cfs) 15.6 Ac-ft 11330

Peak discharge (base, 500 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
10-10	0900	3.52	550	851

16-2750. Haiku Stream near Heeia

Location.--lat 21°24'45", long 157°49'35", on left bank 1.7 miles west of Kaneohe Post Office and 1.8 miles southwest of Heeia.

Drainage area.--0.97 sq mi.

Records available.--January 1914 to October 1919, July 1939 to June 1967.

Gage.--Digital water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by city and county of Honolulu). Prior to Apr. 28, 1914, staff gage and Apr. 28, 1914, to Oct. 25, 1919, graphic water-stage recorder, at same site at different datums. July 1, 1939, to July 7, 1963, graphic water-stage recorder at same site and datum.

Average discharge.--24 years (1943-67), 1.41 mgd (2.18 cfs).

Extremes.--Maximum discharge during year, 701 mgd (1,080 cfs) Oct. 10 (gage height, 3.79 ft, from floodmark in well), from rating curve extended above 37 mgd as explained below; minimum, 0.78 mgd (1.2 cfs) Oct. 22-31 and sometime during period Nov. 6 to Dec. 5. 1914-19, 1939-67: Maximum discharge, 3,710 mgd (5,740 cfs) May 2, 1965 (gage height, 7.94 ft), from rating curve extended above 37 mgd on basis of slope-area measurements at gage heights 3.87, 3.88, and 7.94 ft; minimum, 0.13 mgd (0.20 cfs) July 20, 1957, Sept. 17, 1961.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	0.96	0.91	0.90	1.5	1.0	1.0	0.87	1.4	2.0	1.1	1.3
2	1.1	.96	1.0	.90	1.0	1.0	.96	.87	1.3	1.6	1.1	1.2
3	1.1	.96	.91	.90	1.8	1.0	.96	.87	1.3	1.4	1.1	1.1
4	1.1	.96	.90	.90	16	.90	1.0	.87	1.3	1.4	1.1	1.1
5	1.1	.96	.90	.90	18	.90	.96	.87	1.3	1.3	1.1	1.1
6	1.1	.96	.80	1.0	5.0	1.3	.96	.87	2.6	1.3	1.0	1.1
7	1.1	.96	.80	1.0	2.0	1.2	1.0	.87	1.9	1.3	1.0	1.1
8	1.1	1.0	.80	1.0	1.5	1.1	.96	.87	1.5	1.2	1.0	1.1
9	1.1	.96	.80	1.5	1.3	1.1	.96	.87	1.6	1.2	1.0	1.1
10	1.1	.96	1.0	25	1.1	1.1	.91	9.7	1.9	1.3	1.0	1.1
11	1.1	.96	.90	8.0	1.0	1.1	.91	1.9	1.5	1.3	1.0	1.0
12	1.1	.96	.80	4.0	1.0	1.0	.91	3.2	1.4	2.0	1.2	1.0
13	1.1	.96	.80	1.1	1.0	1.1	.96	2.0	2.2	3.3	1.1	1.0
14	1.1	.96	.80	1.0	1.0	1.0	.96	1.4	1.8	5.6	1.0	.96
15	1.1	.96	.80	1.0	2.0	1.0	.96	1.7	1.4	2.9	1.0	.96
16	1.1	.96	.80	.90	10	1.0	.91	1.8	1.3	1.7	1.3	.96
17	1.1	.96	.80	.90	4.0	.96	.91	1.4	1.4	1.4	1.1	.96
18	1.1	.96	.80	.90	2.0	.96	.91	1.3	1.3	1.4	5.8	.96
19	1.1	.96	.80	.90	1.5	.96	.91	1.3	1.3	1.3	1.6	.91
20	1.1	.96	.80	.82	1.4	.96	.87	1.3	1.3	1.3	2.4	.91
21	1.1	.96	.80	.82	1.4	.96	.87	1.2	1.4	1.3	1.6	.91
22	1.1	1.0	.80	.78	1.6	.91	.87	1.2	11	1.2	1.2	.91
23	1.1	1.0	1.2	.78	1.2	.96	.87	1.2	4.8	1.2	1.2	.91
24	1.2	1.2	1.0	.78	1.1	.91	.87	1.3	2.0	1.2	1.2	.91
25	1.9	1.3	.90	.78	1.1	.91	.87	1.3	4.3	1.2	1.1	.91
26	1.3	1.2	.90	.78	1.0	.91	.87	1.2	3.5	1.2	1.1	.87
27	1.1	1.3	.90	.78	1.0	.91	.87	3.3	3.9	1.2	1.1	.87
28	1.0	1.1	.90	.78	1.0	.91	.87	1.8	2.4	1.2	1.1	.91
29	.96	.96	.90	.78	1.0	.96	.87	----------	1.8	1.2	1.1	1.1
30	.96	.91	.90	.78	1.0	.96	.87	----------	1.5	1.1	4.1	2.1
31	.96	.91	----------	.87	----------	1.0	.87	----------	2.3	----------	1.8	----------
Total	34.68	31.08	26.12	62.23	85.5	30.94	28.45	47.33	69.9	48.2	44.6	31.32
Mean												
Mgd	1.12	1.00	0.871	2.01	2.85	0.998	0.918	1.69	2.25	1.61	1.44	1.04
Cfs	1.73	1.55	1.35	3.11	4.41	1.54	1.42	2.62	3.48	2.49	2.23	1.61
Ac-ft	106	95	80	191	262	95	87	145	215	148	137	96
Max	1.9	1.3	1.2	25	18	1.3	1.0	9.7	11	5.6	5.8	2.1
Min	0.96	0.91	0.80	0.78	1.0	0.90	0.87	0.87	1.3	1.1	1.0	0.87

Calendar Year 1966: Max 25 Min 0.78 Mean (mgd) 1.46 Mean (cfs) 2.26 Ac-ft 1640
Fiscal Year 1966-67: Max 25 Min 0.78 Mean (mgd) 1.48 Mean (cfs) 2.29 Ac-ft 1660

Note.--No gage-height record Sept. 4 to Oct. 19, Nov. 6 to Dec. 5.

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	-	3.79	701	1,080	11-4	1315	3.24	305	472

16-2780. Iolekaa Stream mauka near Heeia

Location.--Lat 21°25'15", long 157°49'50", on left bank 0.7 mile upstream from confluence with Haiku Stream, 1.5 miles southwest of Heeia, and 1.8 miles west of Kaneohe Post Office.

Drainage area.--0.29 sq mi.

Records available.--March 1940 to June 1967.

Gage.--Digital water-stage recorder and concrete control. Datum of gage is 320 ft above mean sea level (transit levels by U.S. Navy). Prior to Apr. 30, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--26 years (1940-42, 1943-67), 0.441 mgd (0.682 cfs).

Extremes.--Maximum discharge during year, 38 mgd (59 cfs) Nov. 5 (gage height, 2.00 ft), from rating curve extended above 2.1 mgd as explained below; minimum, 0.04 mgd (0.06 cfs) Feb. 12.
1940-67: Maximum discharge, 212 mgd (328 cfs) May 2, 1965 (gage height, 3.74 ft), from rating curve extended above 2.1 mgd by test on model of station site; minimum, that of Feb. 12, 1967.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Diversion 400 ft above station for domestic use since July 1966.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.41	0.22	0.19	0.23	0.35	0.35	0.21	0.28	0.28	0.35	0.31	0.50
2	.33	.22	.19	.22	.21	.35	.21	.28	.26	.25	.31	.40
3	.31	.22	.19	.22	.60	.35	.25	.28	.27	.23	.31	.35
4	.26	.22	.19	.22	3.6	.30	.25	.28	.26	.22	.27	.31
5	.21	.23	.20	.22	5.6	.27	.22	.30	.27	.22	.28	.31
6	.21	.23	.20	.24	3.6	.35	.22	.28	.23	.22	.27	.31
7	.21	.23	.20	.22	1.0	.23	.22	.26	.54	.20	.27	.31
8	.20	.23	.20	.22	.57	.22	.22	.22	.30	.18	.25	.31
9	.20	.22	.20	.40	.45	.21	.22	.23	.32	.18	.25	.31
10	.21	.22	.26	11	.41	.20	.21	.22	.45	.19	.25	.31
11	.20	.23	.20	2.5	.39	.20	.21	.06	.35	.19	.25	.29
12	.20	.23	.19	1.0	.46	.20	.21	.49	.32	.21	.27	.29
13	.20	.23	.19	.70	.39	.20	.23	.49	.52	.60	.25	.28
14	.20	.22	.20	.56	.37	.20	.22	.41	.35	3.5	.25	.28
15	.20	.22	.20	.45	1.3	.20	.22	.46	.33	1.2	.25	.28
16	.20	.23	.20	.40	5.2	.20	.22	.39	.31	.80	.57	.28
17	.20	.23	.21	.35	2.5	.20	.22	.35	.34	.58	.30	.28
18	.20	.23	.21	.32	.73	.20	.22	.35	.30	.45	1.4	.28
19	.20	.23	.21	.30	.54	.20	.22	.35	.30	.39	.77	.27
20	.20	.22	.21	.28	.46	.20	.22	.33	.30	.37	1.1	.27
21	.20	.21	.21	.26	.45	.20	.21	.33	.32	.35	.67	.27
22	.20	.21	.21	.24	.54	.20	.23	.30	2.0	.35	.46	.27
23	.19	.21	.37	.23	.45	.20	.23	.27	10	.35	.41	.27
24	.19	.39	.27	.22	.43	.20	.26	.27	1.5	.34	.27	.27
25	.54	.35	.25	.21	.39	.20	.28	.27	1.2	.33	.26	.27
26	.17	.27	.22	.20	.39	.20	.28	.27	1.0	.33	.25	.26
27	.16	.39	.23	.20	.39	.20	.28	.57	1.1	.33	.25	.26
28	.19	.27	.23	.20	.39	.21	.28	.33	.50	.33	.25	.27
29	.21	.26	.23	.20	.35	.21	.28	----------	.40	.31	.25	.31
30	.21	.25	.22	.20	.35	.23	.28	----------	.30	.31	1.6	.40
31	.22	.19	----------	.25	----------	.21	.28	----------	.50	----------	.70	----------
Total	7.03	7.51	6.48	22.46	32.86	7.09	7.31	8.92	25.42	13.86	13.55	9.07
Mean												
Mgd	0.227	0.242	0.216	0.725	1.10	0.229	0.236	0.319	0.820	0.462	0.437	0.302
Cfs	0.351	0.374	0.334	1.12	1.70	0.354	0.365	0.494	1.27	0.715	0.676	0.467
Ac-ft	22	23	20	69	101	22	22	27	78	43	42	28
Max	0.54	0.39	0.37	11	5.6	0.35	0.28	0.57	10	3.5	1.6	0.50
Min	0.16	0.19	0.19	0.20	0.21	0.20	0.21	0.06	0.23	0.18	0.25	0.26

Calendar Year 1966: Max 11 Min 0.16 Mean (mgd) 0.579 Mean (cfs) 0.896 Ac-ft 648
Fiscal Year 1966-67: Max 11 Min 0.06 Mean (mgd) 0.443 Mean (cfs) 0.685 Ac-ft 496

Note.--No gage-height record Oct. 1-31, Mar. 6 to Apr. 18, May 27 to June 30.

Peak discharge (base, 15 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	-	1.63	18	28	3-22	about 2000	1.85	29	45
11- 5	1715	2.00	38	59					
11-16	2100	1.88	31	48	5-16	1800	1.55	15	23

16-2830. Kahaluu Stream near Heeia

Location.--Lat 21°26'20", long 157°51'20", on left bank 40 ft upstream from intake of Libby ditch, 0.5 mile upstream from forest-reserve boundary, and 3.0 miles northwest of Heeia.

Drainage area.--0.28 sq mi.

Records available.--October 1935 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 357.52 ft above mean sea level (levels by Wright, Harvey & Wright).

Average discharge.--20 years (1947-67), 0.532 mgd (0.823 cfs).

Extremes.--Maximum discharge during year, 57 mgd (88 cfs) Oct. 10 (gage height, 2.90 ft), from rating curve extended above 9.9 mgd as explained below; minimum, 0.08 mgd (0.12 cfs) May 6-8.
1935-67: Maximum discharge, 1,120 mgd (1,730 cfs) Feb. 4, 1965 (gage height, 8.46 ft, from floodmarks), from rating curve extended above 9.9 mgd by test on modal of station site; minimum, 0.03 mgd (0.05 cfs) June 25, 1958, Dec. 5-9, 1962, Feb. 22-24, 26-28, Mar. 14-18, 1963.

Remarks.--Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.21	0.17	0.17	0.17	0.65	0.11	0.25	0.17	0.14	0.39	0.11	0.17
2	.25	.17	.17	.17	.34	.14	.21	.25	.11	.21	.11	.14
3	.34	.17	.17	.17	.72	.14	.29	.21	.11	.21	.11	.14
4	.29	.25	.25	.21	2.8	.14	.25	.17	.11	.34	.11	.14
5	.25	.29	.21	.21	4.6	.21	.25	.17	.11	.21	.14	.11
6	.25	.29	.17	.25	3.9	.75	.25	.21	1.1	.14	.11	.14
7	.25	.34	.21	.14	.78	.34	.25	.17	.45	.14	.08	.14
8	.25	.34	.21	.14	.34	.29	.25	.17	.21	.11	.11	.17
9	.25	.29	.17	.17	.25	.25	.25	.17	.17	.11	.11	.21
10	.25	.25	.63	5.0	.21	.25	.21	1.8	.29	.17	.11	.21
11	.25	.29	.50	3.9	.21	.25	.17	.45	.21	.21	.11	.21
12	.25	.29	.29	1.8	.25	.25	.21	.72	.17	.21	.14	.17
13	.25	.34	.25	.34	.21	.25	.17	.29	.17	.17	.14	.17
14	.25	.39	.29	.25	.17	.25	.17	.21	.17	2.0	.14	.21
15	.25	.39	.25	.25	.89	.25	.17	.25	.11	.67	.11	.25
16	.29	.39	.25	.29	1.6	.25	.17	.21	.11	.21	.34	.17
17	.29	.39	.21	.39	.72	.25	.17	.17	.11	.14	.29	.14
18	.29	.39	.21	.21	.29	.25	.17	.14	.11	.14	1.9	.14
19	.25	.34	.21	.21	.25	.25	.17	.11	.11	.11	.50	.14
20	.25	.29	.21	.21	.21	.25	.17	.11	.11	.11	.67	.14
21	.21	.29	.21	.21	.21	.25	.17	.11	.14	.14	.39	.17
22	.17	.29	.25	.21	.39	.25	.17	.11	2.2	.14	.25	.17
23	.17	.34	.25	.21	.21	.25	.17	.11	2.0	.14	.21	.14
24	.25	.64	.21	.21	.17	.25	.17	.11	.39	.17	.21	.14
25	1.7	.86	.17	.21	.14	.25	.17	.11	1.5	.17	.21	.17
26	.39	.29	.14	.17	.14	.25	.17	.11	2.0	.14	.21	.17
27	.17	.59	.22	.17	.11	.25	.17	1.0	1.3	.17	.17	.17
28	.17	.29	.21	.17	.11	.29	.17	.39	.50	.14	.14	.17
29	.14	.21	.14	.17	.11	.29	.17	----------	.29	.14	.14	.21
30	.14	.17	.14	.17	.11	.29	.17	----------	.21	.14	2.7	.50
31	.14	.17	----------	.40	----------	.25	.17	----------	.57	----------	.39	----------
Total	8.86	10.20	6.97	16.78	21.09	7.99	6.07	8.20	15.28	7.49	10.46	5.32
Mean												
Mgd	0.286	0.329	0.232	0.541	0.703	0.258	0.196	0.293	0.493	0.250	0.337	0.177
Cfs	0.443	0.509	0.359	0.837	1.09	0.399	0.303	0.453	0.763	0.387	0.521	0.274
Ac-ft	27	31	21	51	65	25	19	25	47	23	32	16
Max	1.7	0.86	0.63	5.0	4.6	0.75	0.29	1.8	2.2	2.0	2.7	0.50
Min	0.14	0.17	0.14	0.14	0.11	0.11	0.17	0.11	0.11	0.11	0.08	0.11

Calendar Year 1966: Max 5.0 Min 0.11 Mean (mgd) 0.765 Mean (cfs) 1.18 Ac-ft 857
Fiscal Year 1966-67: Max 5.0 Min 0.08 Mean (mgd) 0.342 Mean (cfs) 0.529 Ac-ft 383

Peak discharge (base, 30 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	1630	2.90	57	88	5-18	1430	2.59	45	70
10-11	2330	2.25	34	53	5-30	1630	2.82	54	84
3-22	1930	2.25	34	53					

Note.--No gage-height record Feb. 10 to Mar. 19.

16-2836. South Fork Waihee Stream near Heeia

Location.--Lat 21°26'42", long 157°52'10", on left bank 0.6 mile upstream from confluence with North Fork, 3.0 miles southwest of Waiahole School, and 4.0 miles northwest of Heeia.

Drainage area.--0.03 sq mi.

Records available.--September 1962 to June 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft above mean sea level (levels by Honolulu Board of Water Supply).

Extremes.--Maximum discharge during year, 52 mgd (80 cfs) Nov. 4 (gage height, 2.55 ft), from rating curve extended above 2.6 mgd as explained below; minimum, 1.2 mgd (1.9 cfs) on many days.
1962-67: Maximum discharge, 180 mgd (279 cfs) May 2, 1965 (gage height, 3.96 ft), from rating curve extended above 2.6 mgd by logarithmic plotting; minimum, 0.92 mgd (1.4 cfs) on many days in 1963.

Remarks.--Records fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.4	1.4	1.4	1.4	1.4	1.2	1.2	1.3	1.3	1.3	1.3	1.3
2	1.4	1.4	1.4	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.3
3	1.4	1.3	1.4	1.4	1.4	1.2	1.2	1.3	1.3	1.3	1.3	1.3
4	1.4	1.3	1.4	1.3	2.6	1.2	1.2	1.3	1.3	1.3	1.3	1.3
5	1.4	1.3	1.4	1.3	3.1	1.3	1.2	1.3	1.3	1.3	1.3	1.3
6	1.4	1.4	1.4	1.4	2.0	1.4	1.3	1.3	1.9	1.3	1.3	1.3
7	1.4	1.4	1.4	1.3	1.5	1.3	1.2	1.3	1.3	1.3	1.3	1.3
8	1.4	1.4	1.4	1.3	1.3	1.2	1.2	1.3	1.3	1.3	1.4	1.3
9	1.4	1.3	1.4	1.3	1.3	1.2	1.2	1.3	1.4	1.3	1.3	1.3
10	1.4	1.3	1.4	2.0	1.3	1.2	1.3	2.3	1.3	1.3	1.3	1.3
11	1.4	1.3	1.4	2.4	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3
12	1.4	1.3	1.4	1.5	1.4	1.2	1.3	1.5	1.3	1.3	1.3	1.3
13	1.4	1.3	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3
14	1.4	1.3	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.6	1.3	1.3
15	1.4	1.3	1.4	1.3	1.4	1.2	1.3	1.4	1.3	1.3	1.3	1.4
16	1.4	1.3	1.4	1.4	1.8	1.2	1.3	1.3	1.3	1.3	1.3	1.3
17	1.4	1.3	1.4	1.4	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3
18	1.4	1.3	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.8	1.3
19	1.4	1.3	1.4	1.3	1.3	1.2	1.3	1.3	1.3	1.3	1.3	1.3
20	1.4	1.3	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.5	1.3
21	1.4	1.3	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.4	1.3
22	1.4	1.3	1.4	1.3	1.2	1.2	1.3	1.3	2.3	1.3	1.3	1.3
23	1.4	1.3	1.4	1.3	1.2	1.2	1.3	1.3	1.7	1.3	1.3	1.3
24	1.4	1.7	1.4	1.3	1.2	1.2	1.3	1.3	1.3	1.3	1.3	1.3
25	1.8	1.5	1.4	1.3	1.2	1.2	1.3	1.3	1.7	1.3	1.3	1.3
26	1.4	1.4	1.4	1.3	1.2	1.2	1.3	1.3	1.6	1.3	1.3	1.3
27	1.4	1.4	1.4	1.3	1.2	1.2	1.3	2.0	1.6	1.3	1.3	1.3
28	1.4	1.4	1.4	1.3	1.2	1.3	1.3	1.3	1.4	1.3	1.3	1.3
29	1.4	1.3	1.4	1.3	1.2	1.3	1.3	----------	1.3	1.3	1.3	1.8
30	1.4	1.3	1.4	1.3	1.2	1.3	1.3	----------	1.3	1.3	2.3	1.3
31	1.4	1.4	----------	1.4	----------	1.3	1.3	----------	1.4	----------	1.3	----------
Total	43.8	41.8	42.0	43.0	42.8	38.0	39.5	38.4	43.6	39.3	42.2	39.6
Mean												
Mgd	1.41	1.35	1.40	1.39	1.43	1.23	1.27	1.37	1.41	1.31	1.36	1.32
Cfs	2.18	2.09	2.17	2.15	2.21	1.90	1.96	2.12	2.18	2.03	2.10	2.04
Ac-ft	134	128	129	132	131	117	121	118	134	121	130	122
Max	1.8	1.7	1.4	2.4	3.1	1.4	1.3	2.3	2.3	1.6	2.3	1.8
Min	1.4	1.3	1.4	1.3	1.2	1.2	1.2	1.3	1.3	1.3	1.3	1.3

Calendar Year 1966: Max 3.1 Min 1.2 Mean (mgd) 1.39 Mean (cfs) 2.15 Ac-ft 1550
Fiscal Year 1966-67: Max 3.1 Min 1.2 Mean (mgd) 1.35 Mean (cfs) 2.09 Ac-ft 1520

Peak discharge (base, 20 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	2230	1.88	21	32	2-10	0600	2.45	46	71
11- 4	1330	2.55	52	80	5-18	1430	1.83	20	31
11- 5	1730	2.30	39	60	5-30	1630	2.23	36	56

16-2037. North Fork Waihee Stream near Heeia

Location.--lat 21°26'46", long 157°52'18", on left bank 0.6 mile upstream from confluence with South Fork, 2.8 miles southwest of Waiahole School, and 4.3 miles northwest of Heeia.

Drainage area.--0.03 sq mi.

Records available.--September 1962 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 639.00 ft above mean sea level (levels by Honolulu Board of Water Supply).

Extremes.--Maximum discharge during year, 40 mgd (62 cfs) Feb. 10 (gage height, 1.92 ft), from rating curve extended above 12 mgd as explained below; minimum, 1.0 mgd (1.6 cfs) on many days.
1962-67: Maximum discharge, 243 mgd (376 cfs) Feb. 4, 1965 (gage height, 3.38 ft), from rating curve extended above 12 mgd by logarithmic plotting; minimum, 0.86 mgd (1.3 cfs) on many days in 1963.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.4	1.3	1.3	1.1	1.2	1.0	1.0	1.1	1.1	1.2	1.1	1.3
2	1.4	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.3
3	1.4	1.3	1.2	1.1	1.3	1.0	1.0	1.1	1.1	1.1	1.1	1.3
4	1.4	1.3	1.2	1.1	2.0	1.0	1.0	1.1	1.1	1.2	1.1	1.3
5	1.4	1.3	1.2	1.1	2.4	1.0	1.0	1.1	1.1	1.1	1.1	1.3
6	1.4	1.3	1.2	1.2	1.7	1.2	1.1	1.1	1.6	1.1	1.1	1.3
7	1.4	1.3	1.2	1.1	1.3	1.1	1.0	1.1	1.1	1.1	1.1	1.3
8	1.4	1.3	1.2	1.1	1.2	1.0	1.0	1.1	1.1	1.1	1.3	1.3
9	1.4	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.3
10	1.4	1.3	1.3	1.5	1.1	1.0	1.0	1.9	1.1	1.2	1.1	1.3
11	1.4	1.3	1.2	2.0	1.2	1.0	1.0	1.1	1.1	1.2	1.1	1.3
12	1.4	1.3	1.2	1.3	1.2	1.0	1.0	1.3	1.1	1.2	1.1	1.3
13	1.4	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.3
14	1.4	1.3	1.2	1.1	1.1	1.0	1.0	1.1	1.1	1.5	1.1	1.3
15	1.4	1.3	1.2	1.1	1.1	1.0	1.0	1.2	1.1	1.2	1.1	1.3
16	1.4	1.3	1.2	1.1	1.6	1.0	1.0	1.1	1.1	1.1	1.2	1.3
17	1.4	1.3	1.1	1.2	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.3
18	1.4	1.3	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.5	1.3
19	1.3	1.3	1.1	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.2	1.3
20	1.3	1.3	1.1	1.1	1.1	1.0	1.0	1.0	1.1	1.1	1.3	1.3
21	1.3	1.3	1.1	1.1	1.1	1.0	1.1	1.0	1.0	1.1	1.2	1.3
22	1.3	1.3	1.1	1.1	1.1	1.0	1.1	1.0	1.6	1.1	1.1	1.3
23	1.3	1.3	1.1	1.1	1.0	1.0	1.1	1.0	1.4	1.1	1.1	1.3
24	1.4	1.6	1.1	1.1	1.0	1.0	1.1	1.1	1.1	1.1	1.1	1.3
25	1.9	1.4	1.1	1.1	1.0	1.0	1.1	1.1	1.5	1.1	1.1	1.3
26	1.4	1.3	1.1	1.1	1.0	1.0	1.1	1.1	1.4	1.1	1.1	1.3
27	1.4	1.4	1.1	1.1	1.0	1.0	1.1	1.7	1.4	1.1	1.1	1.3
28	1.3	1.3	1.1	1.1	1.0	1.1	1.1	1.1	1.2	1.1	1.2	1.3
29	1.3	1.3	1.1	1.1	1.0	1.1	1.1	----------	1.1	1.1	1.2	1.6
30	1.3	1.3	1.1	1.1	1.0	1.1	1.1	----------	1.1	1.1	1.7	1.3
31	1.3	1.3	----------	1.3	----------	1.0	1.1	----------	1.3	----------	1.2	----------
Total	43.0	40.8	34.8	36.0	36.3	31.6	32.2	32.1	36.6	34.0	36.1	39.3
Mean												
Mgd	1.39	1.32	1.16	1.16	1.21	1.02	1.04	1.15	1.18	1.13	1.16	1.31
Cfs	2.15	2.04	1.79	1.79	1.87	1.58	1.61	1.78	1.83	1.75	1.79	2.03
Ac-ft	132	125	107	110	111	97	99	99	112	104	111	121
Max	1.9	1.6	1.3	2.0	2.4	1.2	1.1	1.9	1.6	1.5	1.7	1.6
Min	1.3	1.3	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.3

Calendar Year 1966: Max 2.6 Min 1.0 Mean (mgd) 1.33 Mean (cfs) 2.06 Ac-ft 1,500
Fiscal Year 1966-67: Max 2.4 Min 1.0 Mean (mgd) 1.19 Mean (cfs) 1.84 Ac-ft 1,330

Peak discharge (base, 20 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	2230	1.53	20	31	2-10	0600	1.92	40	62
11- 4	1200	1.86	37	57	5-30	1530	1.54	20	31
11- 5	1530	1.71	28	43					

16-2840. Waihee Stream near Heeia

Location.--Lat 21°27'00", long 157°51'40", on left bank 70 ft upstream from intake of Kihe ditch, 120 ft downstream from forest-reserve boundary, 3.5 miles northwest of Heeia, and 4.4 miles northwest of Kaneohe.

Drainage area.--0.93 sq mi.

Records available.--December 1935 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 193.44 ft above mean sea level (levels by Honolulu Board of Water Supply).

Average discharge.--31 years (1936-67), 6.03 mgd (9.33 cfs).

Extremes.--Maximum discharge during year, 101 mgd (156 cfs) May 30 (gage height, 3.43 ft), from rating curve extended above 50 mgd as explained below; minimum, 2.3 mgd (3.6 cfs) Oct. 30.
1935-67: Maximum discharge, 3,300 mgd (5,110 cfs) Feb. 4, 1965 (gage height, 8.72 ft, from floodmarks), from rating curve extended above 50 mgd on basis of slope-area measurements at gage heights 6.06 and 8.72 ft; minimum, 2.2 mgd (3.4 cfs) Oct. 15, 16, 1962.

Remarks.--Records fair. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.7	3.1	2.9	2.5	3.1	3.0	3.1	3.3	3.5	5.3	3.6	4.1
2	3.7	3.0	2.9	2.5	2.7	3.0	3.0	3.7	3.4	4.8	3.7	3.9
3	3.6	2.9	2.9	2.6	3.4	2.9	3.0	3.4	3.6	4.5	3.7	3.8
4	3.6	2.9	2.8	2.5	9.5	2.9	3.0	3.4	3.4	4.9	3.4	3.7
5	3.4	2.9	2.8	2.5	16	3.1	3.0	3.7	3.3	4.5	3.9	3.6
6	3.4	2.9	2.8	2.8	16	4.2	3.2	3.4	7.0	4.2	3.7	3.6
7	3.4	3.0	2.8	2.6	7.4	3.6	3.1	3.4	4.0	4.1	3.6	3.6
8	3.3	3.2	2.8	2.5	4.8	3.2	2.9	3.4	3.6	4.0	4.2	3.6
9	3.3	2.9	2.8	2.7	3.9	3.2	2.7	3.6	3.5	4.0	3.9	3.6
10	3.3	2.9	3.1	6.4	3.4	3.2	2.7	10	3.5	4.1	3.6	3.4
11	3.2	3.0	2.9	10	3.3	3.1	2.7	5.3	3.6	4.4	3.3	3.4
12	3.2	3.0	2.8	7.9	3.4	3.1	2.9	5.4	3.4	4.2	3.2	3.4
13	3.2	3.0	2.7	3.8	3.1	3.2	2.9	4.2	3.5	4.0	3.2	3.4
14	3.2	2.9	2.9	3.0	2.9	3.1	3.0	3.9	3.4	5.8	3.2	3.3
15	3.2	2.8	2.8	2.9	3.3	3.1	3.1	4.4	3.4	5.2	3.2	3.6
16	3.2	2.8	2.7	2.8	5.4	3.1	3.2	3.9	3.4	4.4	3.3	3.6
17	3.2	2.8	2.7	2.8	4.9	3.2	3.2	3.6	3.4	4.1	3.3	3.2
18	3.1	2.8	2.7	2.7	3.7	3.3	3.2	3.6	3.4	4.0	7.4	3.2
19	3.1	2.7	2.7	2.5	3.2	3.1	3.2	3.4	3.4	3.9	4.9	3.2
20	3.1	2.7	2.7	2.5	3.0	3.0	3.2	3.3	3.3	3.8	5.5	3.1
21	3.1	2.6	2.7	2.5	2.9	3.0	3.2	3.2	3.3	3.8	4.8	3.1
22	3.1	2.6	2.7	2.5	3.0	3.0	3.3	3.3	7.3	3.9	4.2	3.0
23	3.1	2.7	2.7	2.5	2.9	3.0	3.3	3.4	10	3.8	4.0	3.0
24	3.2	4.2	2.6	2.4	2.8	2.9	3.3	3.6	5.0	3.8	4.1	2.9
25	5.9	3.4	2.6	2.4	2.8	2.9	3.3	3.4	7.4	3.8	4.0	2.9
26	3.8	3.0	2.5	2.4	2.8	2.9	3.3	3.4	8.1	3.8	3.9	2.9
27	3.4	3.3	2.6	2.4	2.8	2.9	3.4	5.0	8.2	3.8	3.8	2.9
28	3.3	3.1	2.6	2.4	2.9	3.0	3.4	4.0	6.0	3.8	3.8	2.9
29	3.3	3.0	2.5	2.4	3.0	3.6	3.3	----------	4.8	3.7	3.8	6.1
30	3.2	2.9	2.5	2.4	3.0	3.7	3.3	----------	4.5	3.7	9.4	4.5
31	3.1	3.0	----------	2.9	----------	3.2	3.3	----------	5.9	----------	4.9	----------
Total	104.9	92.0	82.2	97.7	135.3	97.7	96.7	111.6	143.5	126.1	128.5	104.5
Mean												
Mgd	3.38	2.97	2.74	3.15	4.51	3.15	3.12	3.99	4.63	4.20	4.15	3.48
Cfs	5.23	4.60	4.24	4.88	6.98	4.88	4.83	6.18	7.17	6.50	6.42	5.39
Ac-ft	322	282	252	300	415	300	297	342	440	387	394	321
Max	5.9	4.2	3.1	10	16	4.2	3.4	10	10	5.8	9.4	6.1
Min	3.1	2.6	2.5	2.4	2.7	2.9	2.7	3.2	3.3	3.7	3.2	2.9

Calendar Year 1966: Max 18 Min 2.4 Mean (mgd) 4.26 Mean (cfs) 6.59 Ac-ft 4,780
Fiscal Year 1966-67: Max 16 Min 2.4 Mean (mgd) 3.62 Mean (cfs) 5.60 Ac-ft 4,050

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
5-30	1630	3.43	101	156

16-2845. Waihee Stream at Kahaluu

Location.--Lat 21°27'31", long 157°50'26", on left bank 20 ft upstream from Ahaolelo Road, 300 ft upstream from mouth, and 0.3 mile southwest of Kahaluu.

Drainage area.--2.26 sq mi.

Records available.--October 1966 to June 1967.

Gage.--Water-stage recorder. Datum of gage is at mean sea level.

Extremes.--Maximum discharge during period, 578 mgd (894 cfs) Nov. 5 (gage height, 7.05 ft), from rating curve extended above 170 mgd; minimum, 6.8 mgd (10 cfs) June 25, 26.

Remarks.--Records fair. Diversions above station for irrigation of taro and other crops. Honolulu Board of Water Supply diverts ground water from tunnel in drainage area.

Discharge, in million gallons a day, October 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1				-	8.8	11	13	8.0	8.3	12	7.5	8.3
2				-	8.3	11	13	9.2	8.0	10	7.6	7.9
3				-	9.8	11	13	8.3	8.0	9.6	7.7	8.6
4				-	67	11	13	8.1	8.0	11	7.3	9.2
5				-	105	11	13	8.3	7.9	9.8	8.2	8.8
6				-	60	16	14	8.3	23	9.0	7.9	9.2
7				-	21	12	13	8.1	12	8.8	7.6	8.8
8				-	14	11	13	8.0	9.8	8.5	8.0	8.8
9				-	12	11	12	8.1	9.0	8.1	7.9	8.6
10				-	11	10	12	39	9.3	8.5	7.3	8.5
11				-	11	10	12	12	9.2	9.3	7.2	8.3
12				-	12	10	10	19	8.5	9.0	8.9	8.3
13				-	10	10	9.2	10	8.8	8.6	8.1	8.1
14				-	9.6	10	9.3	8.6	8.3	12	7.5	8.0
15				-	13	9.8	9.2	9.5	8.0	11	7.3	8.3
16				-	52	9.8	8.8	8.8	8.0	8.6	12	8.3
17				-	45	9.8	8.6	8.3	8.8	8.0	7.5	7.9
18				-	18	11	8.6	8.1	8.0	7.7	33	7.6
19				-	15	12	8.5	7.9	8.0	7.5	11	7.5
20				-	16	13	8.3	7.7	8.1	7.5	16	7.5
21				-	14	13	8.5	7.6	8.3	7.3	11	7.5
22				-	17	13	8.5	7.6	20	7.7	8.8	7.3
23				-	14	13	8.3	7.4	25	7.7	8.1	7.2
24				-	13	13	8.0	7.5	14	7.5	9.0	7.1
25				-	13	13	8.1	7.5	17	9.4	8.6	7.1
26				-	12	13	8.0	7.5	17	7.5	8.5	7.1
27				-	12	13	8.0	14	16	7.7	8.0	7.2
28				7.6	12	14	8.0	9.3	14	7.5	7.7	7.1
29				7.5	11	15	8.0	----------	11	7.3	7.6	21
30				7.5	11	15	8.0	----------	10	7.3	17	14
31			----------	8.3	----------	14	8.0	----------	14	----------	9.3	----------
Total				-	647.5	369.4	310.9	281.7	353.3	261.4	299.1	259.1
Mean												
Mgd				-	21.6	11.9	10.0	10.1	11.4	8.71	9.65	8.64
Cfs				-	33.4	18.4	15.5	15.6	17.6	13.5	14.9	13.4
Ac-ft				-	1,990	1,130	954	865	1,080	802	918	795
Max				-	105	16	14	39	25	12	33	21
Min				-	8.3	9.8	8.0	7.4	7.9	7.3	7.2	7.1

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	1330	7.04	576	891	2-10	0800	5.14	270	418
11- 5	1730	7.05	578	894	5-18	1530	5.66	348	538
11- 6	1100	4.76	215	333	5-30	1700	4.39	168	260
11-17	0030	5.60	339	525					

16-2850. Waiahole tunnel at Waianu, near Waiahole

Location.--Lat 21°29'05", long 157°53'15", on left bank in Waiahole tunnel at Waianu Stream intake and 2.1 miles west of Waiahole School.

Records available.--December 1950 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 785.5 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--16 years (1951-67), 25.4 mgd (39.3 cfs).

Extremes.--1950-67: Maximum daily discharge, 74.0 mgd (114 cfs) July 28, 1954; minimum daily, 16.0 mgd (24.8 cfs) Jan. 24-29, 1952.

Remarks.--Records excellent. Tunnel diverts from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Occasional releases at various intakes above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	27	23	23	22	32	24	25	23	25	34	29	36
2	31	24	23	22	25	24	24	23	24	28	29	30
3	25	24	23	22	26	24	24	23	32	27	28	28
4	25	24	23	22	38	24	24	23	31	30	27	28
5	24	24	23	22	41	24	24	23	26	31	30	28
6	26	24	23	23	41	25	24	23	41	27	28	28
7	25	24	23	22	31	27	24	23	27	30	28	28
8	24	30	23	22	26	24	24	23	25	27	27	27
9	24	24	22	22	25	24	23	26	25	27	30	27
10	24	24	37	38	24	24	23	36	26	28	27	27
11	24	30	26	49	27	24	24	25	24	32	27	27
12	24	24	25	33	32	24	24	30	24	30	28	27
13	24	26	23	24	25	25	26	25	24	30	27	27
14	29	25	23	23	24	24	24	24	24	37	27	26
15	25	24	23	23	32	24	23	33	24	30	27	29
16	24	24	22	23	36	23	23	25	23	28	32	28
17	25	25	22	24	31	23	23	24	23	27	27	27
18	24	24	22	23	25	23	23	26	23	27	35	26
19	25	23	22	22	25	23	23	24	23	27	28	26
20	24	23	22	22	24	23	23	23	23	27	45	26
21	24	23	22	22	26	23	23	23	23	27	33	26
22	24	22	22	22	34	23	23	23	54	27	28	26
23	24	23	22	22	25	23	23	23	39	26	28	26
24	27	33	22	22	26	23	23	24	27	28	31	26
25	36	33	22	22	25	23	23	26	38	28	28	26
26	27	25	22	22	24	23	23	23	48	27	32	26
27	24	32	28	22	24	24	23	57	47	27	28	26
28	24	24	24	22	24	23	23	27	31	26	29	26
29	24	24	22	22	24	24	23	----	27	26	34	47
30	23	23	22	22	24	28	23	----	26	26	38	28
31	23	23	----	42	----	28	23	----	37	----	30	----
Total	783	778	701	765	846	745	728	731	914	852	925	839
Mean												
Mgd	25.3	25.1	23.4	24.7	28.2	24.0	23.5	26.1	29.5	28.4	29.8	28.0
Cfs	39.1	38.8	36.2	38.2	43.6	37.1	36.4	40.4	45.6	43.9	46.1	43.3
Ac-ft	2,400	2,390	2,150	2,350	2,600	2,290	2,230	2,240	2,800	2,610	2,840	2,570
Max	36	33	37	49	41	28	26	57	54	37	45	47
Min	23	22	22	22	24	23	23	23	23	26	27	26

Calendar Year 1966: Max 61 Min 22 Mean (mgd) 27.9 Mean (cfs) 43.2 Ac-ft 31,250
Fiscal Year 1966-67: Max 57 Min 22 Mean (mgd) 26.3 Mean (cfs) 40.7 Ac-ft 29,480

16-2860. Waiahole tunnel wasteway at intake 31, near Waiahole

Location.--Lat 21°28'30", long 157°53'15", on left bank 150 ft downstream from wasteway gates at Waiahole tunnel intake No. 31 and 2.2 miles west of Waiahole School.

Records available.--January 1951 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 742.7 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--16 years, 1.16 mgd (1.79 cfs).

Extremes.--1951-67: Maximum daily discharge, 64 mgd (99 cfs) Nov. 12, 1965; no flow most of the time.

Remarks.--Records good. Station measures releases from Waiahole tunnel to Waiahole Stream.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1				0	0	0	25		0		0	
2				0	0	0	24		0		0	
3				0	0	0	5.0		0		0	
4				0	16	0	0		0		0	
5				0	30	0	0		0		0	
6				0	30	0	0		5.8		0	
7				0	22	0	0		0		0	
8				0	18	0	0		0		0	
9				0	17	0	0		0		0	
10				.02	17	0	0		0		0	
11				25	18	0	0		0		0	
12				28	23	0	0		0		0	
13				21	17	0	0		0		0	
14				14	17	0	0		0		0	
15				12	23	0	0		0		0	
16				12	10	0	0		0		0	
17				13	2.7	0	0		0		0	
18				12	0	0	0		0		.19	
19				12	0	0	0		0		0	
20				12	0	0	0		0		8.1	
21				12	.53	0	0		0		2.5	
22				12	4.4	0	0		12		.06	
23				12	10	0	0		6.4		0	
24				8.3	25	0	0		.21		0	
25				.75	24	0	0		4.8		0	
26				.03	24	0	0		11		0	
27				.03	13	0	0		8.8		0	
28				.03	0	0	0		6.0		0	
29				.03	0	9.4	0	----------	6.1		0	
30				.03	0	28	0	----------	3.1		0	
31			----------	2.2	----------	28	0	----------	0	----------	0	----------
Total	0	0	0	208.42	361.63	65.4	54.0	0	64.21	0	10.85	0
Mean												
Mgd	0	0	0	6.72	12.1	2.11	1.74	0	2.07	0	0.350	0
Cfs	0	0	0	10.4	18.7	3.26	2.69	0	3.20	0	0.542	0
Ac-ft	0	0	0	640	1,110	201	166	0	197	0	33	0
Max	0	0	0	28	30	28	25	0	12	0	8.1	0
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 30 Min 0 Mean (mgd) 3.13 Mean (cfs) 4.84 Ac-ft 3,510
Fiscal Year 1966-67: Max 30 Min 0 Mean (mgd) 2.09 Mean (cfs) 3.23 Ac-ft 2350

16-2870. Waiahole tunnel at north portal, near Waiahole

Location.--lat 21°28'15", long 157°53'30", on right bank in Waiahole tunnel directly below crest of Koolau Range and 2.6 miles southwest of Waiahole School.

Records available.--January 1951 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Datum of gage is 752.5 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--16 years, 26.9 mgd (41.6 cfs).

Extremes.--1951-67: Maximum daily discharge, 81.0 mgd (125 cfs) July 28, 1954; minimum daily, 1.48 mgd (2.29 cfs) Dec. 9, 1956.

Remarks.--Records excellent. Tunnel diverts from headwaters of nearly all streams from Kahana Valley to Waiahole Valley for irrigation in central Oahu. Occasional releases at numerous intakes above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	30	26	25	24	36	26	2.2	25	26	36	31	39
2	34	26	25	24	27	27	2.0	25	26	30	33	33
3	28	26	25	24	28	27	19	26	35	29	31	31
4	27	26	25	24	25	27	25	26	34	32	30	30
5	26	26	25	23	14	27	25	26	29	33	34	31
6	29	26	25	25	14	28	25	25	38	29	32	31
7	28	26	25	24	12	29	25	25	29	30	32	31
8	28	33	25	23	10	27	25	25	26	29	31	31
9	28	27	25	24	9.7	27	26	28	26	28	33	30
10	28	26	40	39	9.5	27	26	40	28	30	31	30
11	28	32	29	28	9.8	27	26	28	25	36	30	30
12	28	26	27	5.8	12	26	28	33	25	32	32	29
13	27	28	25	5.2	9.7	27	28	28	26	32	30	30
14	32	28	25	9.4	9.3	27	25	26	25	40	30	31
15	28	27	25	11	12	27	25	33	25	33	30	35
16	27	26	25	12	26	26	25	28	26	31	36	32
17	28	27	25	12	29	26	26	25	27	30	31	31
18	27	26	25	11	26	26	26	27	26	30	40	31
19	28	26	24	11	26	26	26	25	26	30	32	30
20	27	25	24	11	25	26	26	25	26	29	41	30
21	27	25	24	11	27	26	26	24	26	29	33	30
22	27	25	24	11	31	26	26	24	46	29	31	30
23	26	26	24	11	17	26	26	24	35	29	31	30
24	30	37	24	14	2.2	26	25	24	28	30	36	30
25	40	36	24	21	2.2	26	25	28	37	30	32	30
26	31	28	24	22	2.0	26	26	24	40	30	37	30
27	28	35	30	22	11	26	26	62	39	30	32	31
28	27	27	27	22	25	25	26	29	27	29	33	30
29	26	26	24	22	25	18	26	----------	23	29	38	52
30	26	26	24	22	26	3.6	26	----------	25	29	43	33
31	26	26	----------	39	----------	2.9	26	----------	39	----------	34	----------
Total	880	856	768	587.4	538.4	767.5	745.2	788	919	923	1030	952
Mean												
Mgd	28.4	27.6	25.6	18.9	17.9	24.8	24.0	28.1	29.6	30.8	33.2	31.7
Cfs	43.9	42.7	39.6	29.2	27.7	38.4	37.1	43.5	45.8	47.7	51.4	49.0
Ac-ft	2700	2630	2360	1800	1650	2360	2290	2420	2820	2830	3160	2920
Max	40	37	40	39	36	29	28	62	46	40	43	52
Min	26	25	24	5.2	2.0	2.9	2.0	24	23	28	30	29

Calendar Year 1966: Max 43 Min 2.0 Mean (mgd) 26.9 Mean (cfs) 41.6 Ac-ft 30,100
Fiscal Year 1966-67: Max 62 Min 2.0 Mean (mgd) 26.7 Mean (cfs) 41.3 Ac-ft 29,940

16-2872. Waiahole tunnel at adit 8, near Waipahu

Location.--Lat 21°27'00", long 157°57'30", on left bank at adit 8, 2,700 ft downstream from Ewa Forest Reserve, and 5.2 miles northeast of Waipahu Post Office.

Records available.--August 1956 to June 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 709.0 ft above mean sea level (levels by Waiahole Water Co.).

Average discharge.--10 years (1957-67), 32.3 mgd (50.0 cfs).

Extremes.--1956-67: Maximum daily discharge, 97.4 mgd (151 cfs) Oct. 23, 1958; minimum daily, 6.0 mgd (9.3 cfs) Dec. 9, 1956.

Remarks.--Records good. Records represent entire flow of Waiahole water-development tunnel; water is used for irrigation of sugarcane in vicinity of Waipahu.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	34	30	29	28	39	29	9.2	30	31	39	34	43
2	38	30	29	28	30	30	9.0	30	31	35	37	39
3	32	30	29	28	32	30	21	30	37	33	36	36
4	31	29	29	27	29	30	29	30	38	36	34	36
5	31	30	28	27	18	30	29	30	33	36	37	36
6	34	30	28	28	20	31	29	30	40	33	37	36
7	33	30	29	27	16	32	29	30	32	34	36	36
8	32	36	28	27	15	31	29	30	31	33	35	36
9	32	31	28	27	15	30	30	31	30	32	37	36
10	32	30	38	39	14	30	30	42	32	34	36	35
11	32	36	35	37	15	30	30	33	30	40	35	35
12	32	31	31	12	16	30	32	36	30	36	36	35
13	31	31	29	10	14	31	32	32	30	36	36	36
14	35	32	29	14	14	30	30	30	30	45	35	36
15	32	31	29	16	16	30	29	36	29	37	35	38
16	31	30	28	16	27	30	30	34	30	35	41	38
17	32	31	28	16	33	30	30	30	30	34	36	36
18	31	30	28	16	29	30	30	32	30	34	44	36
19	32	30	28	16	29	30	30	29	30	34	37	36
20	31	29	28	16	29	30	30	29	30	34	44	36
21	31	29	28	16	30	30	30	29	30	33	38	36
22	30	29	28	16	34	30	30	29	48	33	36	36
23	30	29	28	16	23	30	30	28	40	33	36	35
24	33	38	28	18	8.7	30	30	28	32	35	40	35
25	42	38	28	25	8.0	30	30	31	40	34	37	36
26	34	32	28	26	7.8	30	30	28	43	34	41	35
27	32	38	32	26	15	31	30	60	42	34	38	35
28	31	31	32	26	28	30	30	34	32	33	38	35
29	31	30	28	26	28	24	30	----------	28	33	42	54
30	30	30	28	26	29	10	30	----------	29	33	46	39
31	30	29	----------	39	----------	9.4	30	----------	41	----------	40	----------
Total	1002	970	876	715	661.5	888.4	877.2	901	1039	1045	1170	1107
Mean												
Mgd	32.3	31.3	29.2	23.1	22.0	28.7	28.3	32.2	33.5	34.8	37.7	36.9
Cfs	50.0	48.4	45.2	35.7	34.0	44.4	43.8	49.8	51.8	53.8	58.3	57.1
Ac-ft	3080	2980	2690	2190	2030	2730	2690	2770	3190	3210	3590	3400
Max	42	38	38	39	39	32	32	60	48	45	46	54
Min	30	29	28	10	7.8	9.4	9.0	28	28	32	34	35

Calendar Year 1966: Max 47 Min 7.8 Mean (mgd) 31.4 Mean (cfs) 48.6 Ac-ft 35130
Fiscal Year 1966-67: Max 60 Min 7.8 Mean (mgd) 30.8 Mean (cfs) 47.7 Ac-ft 34530

16-2910. Waiahole Stream at altitude 250 ft, near Waiahole

Location.--Lat 21°28'35", long 157°52'30", on left bank 1.5 miles southwest of Waiahole School and 2.7 miles northwest of Kahaluu.

Drainage area.--0.99 sq mi.

Records available.--July 1955 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 250 ft (from topographic map).

Average discharge.--12 years, 5.47 mgd (8.46 cfs).

Extremes.--Maximum discharge during year, 347 mgd (537 cfs) Oct. 11 (gage height, 3.48 ft), from rating curve extended above 19 mgd on basis of field estimate at gage height 4.23 ft and slope-area measurement at gage height 4.80 ft; minimum, 1.7 mgd (2.6 cfs) on many days.

1955-67: Maximum discharge, 1,440 mgd (2,230 cfs) Apr. 15, 1963, May 2, 1965 (gage height, 4.80 ft), from rating curve extended above 72 mgd on basis of field estimate at gage height 4.23 ft and slope-area measurement of peak flow; minimum, 1.5 mgd (2.3 cfs) Oct. 7-13, 1962.

Remarks.--Records fair. Water was released from Waiahole tunnel at times throughout the year which increased flow at this station and augmented some of the peaks. During the fiscal year, an average of 1.09 million gallons a day was diverted above station by pumping into Waiahole tunnel for irrigation in central Oahu. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.2	1.9	1.9	1.7	3.6	3.0	36	2.3	4.8	9.1	2.8	3.6
2	3.3	1.9	1.8	1.7	3.0	3.0	33	2.7	3.0	7.5	3.0	4.3
3	3.9	2.7	1.8	1.8	5.7	2.8	13	2.2	3.1	6.7	3.4	5.7
4	4.2	3.0	1.8	1.8	35	2.8	4.5	2.2	2.8	7.8	3.0	5.4
5	3.6	1.9	1.8	1.8	50	3.0	4.3	2.3	2.7	6.7	5.0	4.1
6	3.2	1.9	1.7	1.9	53	4.3	4.3	2.2	19	6.2	4.1	3.6
7	3.1	1.9	1.7	1.9	32	4.5	4.1	2.2	8.1	6.2	3.2	3.0
8	3.0	2.0	1.7	1.8	25	3.2	4.1	2.2	5.7	6.2	3.2	3.0
9	2.9	1.9	1.7	1.9	23	3.0	2.8	2.3	5.4	6.0	3.0	4.5
10	2.9	1.9	4.0	7.1	22	2.8	2.2	14	5.2	5.3	2.8	5.2
11	2.9	2.0	3.6	45	24	2.8	2.2	4.5	5.0	5.7	2.8	5.2
12	2.9	1.9	2.0	40	30	2.8	2.7	4.8	4.8	4.5	3.2	5.0
13	3.3	1.9	1.9	25	23	2.8	3.0	3.4	5.0	4.1	3.0	3.4
14	3.1	1.9	1.9	18	23	2.8	4.1	3.6	4.8	10	2.8	2.8
15	3.0	1.9	1.8	17	32	2.7	4.1	5.2	4.8	6.7	2.8	7.5
16	3.0	1.9	1.7	17	20	2.7	3.4	5.0	3.2	4.5	3.6	5.4
17	3.0	1.9	1.7	17	12	2.7	2.3	4.5	2.7	3.8	3.6	3.4
18	2.9	1.9	1.7	17	6.7	2.7	2.3	4.5	2.5	3.4	14	3.0
19	2.9	1.8	1.7	16	6.0	2.5	2.2	4.3	2.3	3.2	5.0	2.8
20	2.9	1.8	1.7	16	6.0	2.8	2.2	4.1	2.5	3.2	24	2.8
21	2.9	1.8	1.8	16	7.5	2.5	2.2	4.1	2.5	3.0	13	2.8
22	2.9	1.9	1.7	16	13	2.5	2.2	4.1	38	3.6	4.8	2.7
23	2.9	1.9	1.7	16	17	2.5	2.3	4.1	28	3.0	3.8	2.7
24	3.2	3.4	1.7	13	34	2.5	2.5	4.3	7.5	2.8	9.7	2.7
25	7.6	3.2	1.7	5.0	32	2.5	2.7	4.1	18	3.0	4.5	2.8
26	3.8	2.7	1.7	3.8	32	2.7	2.2	4.1	28	2.8	4.5	2.8
27	2.5	2.8	1.7	3.8	21	2.8	2.2	11	23	3.6	3.6	2.8
28	2.2	2.3	1.9	3.8	5.2	3.8	2.2	5.7	17	3.0	3.4	4.1
29	2.0	2.0	1.8	3.8	5.0	14	2.2	----------	15	2.8	3.2	6.2
30	2.7	1.9	1.7	3.8	3.6	40	2.3	----------	11	2.8	3.6	6.5
31	1.9	1.9	----------	5.5	----------	39	2.3	----------	12	----------	3.2	----------
Total	97.8	65.7	57.0	341.9	605.3	174.5	162.1	120.0	297.4	147.2	155.6	119.8
Mean												
Mgd	3.15	2.12	1.90	11.0	20.2	5.63	5.23	4.28	9.59	4.91	5.02	3.99
Cfs	4.87	3.28	2.94	17.0	31.3	8.71	8.09	6.62	14.8	7.60	7.77	6.17
Ac-ft	300	202	175	1050	1860	536	497	368	913	452	478	368
Max	7.6	3.4	4.0	45	53	40	36	14	38	10	24	7.5
Min	1.9	1.8	1.7	1.7	3.0	2.5	2.2	2.2	2.3	2.8	2.8	2.7

Calendar Year 1966: Max 53 Min 1.7 Mean (mgd) 7.87 Mean (cfs) 12.2 Ac-ft 4810
Fiscal Year 1966-67: Max 53 Min 1.7 Mean (mgd) 6.42 Mean (cfs) 9.93 Ac-ft 7,190

Peak discharge (base, 120 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	2230	3.48	347	537	2-10	0630	2.38	133	206
11- 4	1230	3.10	259	401	3-22	2230	2.43	140	217
11- 5	1600	2.58	162	251	5-18	1430	2.71	183	283
11- 6	1000	2.42	139	215					

16-2949. Waikane Stream at altitude 75 ft, at Waikane

Location.--Lat 21°30'00", long 157°51'54", on right bank 0.3 mile downstream from Waikeekee Stream, 0.7 mile west of Waikane, and 1.2 miles northwest of Waiahole School.

Drainage area.--2.22 sq mi.

Records available.--December 1959 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (from topographic map).

Average discharge.--7 years (1960-67), 6.05 mgd (9.36 cfs).

Extremes.--Maximum discharge during year, 776 mgd (1,200 cfs) Nov. 4 (gage height, 5.84 ft), from rating curve extended above 74 mgd as explained below; minimum, 1.5 mgd (2.3 cfs) Aug. 20.
1959-67: Maximum discharge, 5,690 mgd (8,800 cfs) Feb. 4, 1965 (gage height, 10.76 ft), from rating curve extended above 74 mgd on basis of slope-area measurements at gage heights 4.88, 9.46, and 10.76 ft; minimum, 0.77 mgd (1.2 cfs) Oct. 10, 11, 1962.

Remarks.--Records good. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.8	1.6	2.2	1.7	16	4.6	3.2	2.2	6.0	13	4.6	16
2	3.0	1.6	2.3	1.6	5.7	4.6	3.0	2.6	5.1	10	5.3	9.6
3	2.2	1.6	2.2	1.7	7.3	4.2	3.6	2.3	4.9	8.2	5.1	7.0
4	1.9	1.9	1.9	1.7	63	4.0	3.4	2.2	4.9	8.5	4.2	6.0
5	1.8	1.8	1.9	1.6	68	4.0	3.0	2.0	4.2	7.3	4.4	5.5
6	1.9	1.7	1.8	2.2	70	4.9	3.4	2.2	35	6.2	4.0	5.3
7	1.9	1.7	2.0	1.9	29	6.8	3.0	2.2	10	7.0	4.9	5.1
8	1.8	3.7	1.8	1.6	16	4.2	3.4	2.0	6.7	6.2	4.8	4.9
9	1.7	2.0	1.8	2.0	12	3.8	2.9	2.3	5.7	6.0	7.0	4.9
10	1.7	1.7	6.2	50	9.4	3.8	2.6	11	5.7	6.2	4.0	4.6
11	1.7	4.0	4.2	23	8.5	3.6	2.6	5.3	5.3	12	3.4	4.6
12	1.7	2.0	2.6	26	8.8	3.4	4.4	36	4.9	11	8.9	4.4
13	1.8	2.2	2.0	7.6	8.5	3.8	4.1	7.0	5.5	9.3	5.3	4.2
14	2.2	2.2	2.2	5.3	6.2	3.4	3.6	4.9	5.1	22	4.6	4.2
15	1.9	1.8	2.0	4.6	8.6	3.2	3.6	5.1	4.4	14	4.2	7.0
16	1.7	1.7	1.9	4.4	57	3.2	3.0	4.6	4.2	9.1	17	5.3
17	1.9	2.2	1.8	3.8	36	3.0	2.9	4.0	4.6	7.6	7.3	4.0
18	1.8	1.9	1.7	3.6	13	3.0	2.7	3.8	4.0	6.7	30	3.8
19	1.8	1.8	1.8	3.4	10	3.0	2.6	3.6	4.0	6.2	10	3.8
20	1.8	1.7	1.7	3.2	8.8	3.2	2.6	3.4	4.0	5.7	88	3.8
21	1.7	1.7	1.8	3.0	8.8	3.2	2.4	3.2	3.8	5.5	30	3.6
22	1.7	1.7	1.8	2.9	14	3.2	2.4	3.0	43	5.3	14	3.6
23	1.6	1.8	1.7	3.0	8.5	3.2	2.3	3.0	53	5.1	13	3.6
24	2.9	4.8	1.7	2.9	7.0	3.0	2.3	3.0	16	5.1	14	3.4
25	5.9	5.2	1.7	2.7	6.2	3.0	2.4	4.5	27	5.3	10	3.4
26	2.7	3.0	1.7	2.7	5.6	3.4	2.3	3.0	38	4.6	14	2.9
27	2.0	5.0	1.9	2.6	5.3	3.6	2.3	37	24	6.5	9.1	2.9
28	1.7	3.0	2.2	2.4	5.1	3.2	2.3	8.8	16	5.1	7.9	2.9
29	1.7	2.4	1.7	2.4	4.6	3.2	2.2	----------	12	4.6	7.6	32
30	1.6	2.2	1.7	2.4	4.5	4.6	2.2	----------	10	4.4	11	8.8
31	1.6	2.2	----------	14	----------	3.0	2.2	----------	13	----------	7.0	----------
Total	65.1	73.8	63.9	191.9	531.4	114.3	88.9	174.2	390.0	233.7	364.6	181.1
Mean												
Mgd	2.10	2.38	2.13	6.19	17.7	3.69	2.87	6.22	12.6	7.79	11.8	6.04
Cfs	3.25	3.68	3.30	9.58	27.4	5.71	4.44	9.62	19.5	12.1	18.3	9.35
Ac-ft	200	226	196	589	1,630	351	273	535	1,200	717	1,120	556
Max	5.9	5.2	6.2	50	70	6.8	4.4	37	53	22	88	32
Min	1.6	1.6	1.7	1.6	4.5	3.0	2.2	2.0	3.8	4.4	3.4	2.9

Calendar Year 1966: Max 70 Min 1.6 Mean (mgd) 4.99 Mean (cfs) 7.72 Ac-ft 5,590
Fiscal Year 1966-67: Max 88 Min 1.6 Mean (mgd) 6.78 Mean (cfs) 10.5 Ac-ft 7,590

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	0500	5.23	569	880	3- 6	1630	5.18	554	857
11- 4	1400	5.84	776	1,200	3-23	0230	5.69	722	1,120
11- 5	1700	4.71	426	659	5-18	1430	4.62	404	625
11-16	2130	5.71	728	1,130	5-20	1830	5.68	718	1,110
2-12	0300	4.28	322	498					

16-2965. Kahana Stream at altitude 30 ft, near Kahana

Location.--Lat 21°32'38", long 157°53'07", on right bank 600 ft upstream from Kawa Stream, 1.1 miles southwest of Kahana, and 2.2 miles southwest of Swanzy Beach Park in Kaaawa.

Drainage area.--3.74 sq mi.

Records available.--December 1958 to June 1967.

Gage.--Water-stage recorder and concrete-masonry control. Altitude of gage is 30 ft (from topographic map).

Average discharge.--8 years (1959-67), 23.6 mgd (36.5 cfs).

Extremes.--Maximum discharge during year, 1,920 mgd (2,970 cfs) Oct. 11 (gage height, 6.22 ft), from rating curve extended above 350 mgd as explained below; minimum, 10 mgd (16 cfs) Sept. 25-27.
1958-67: Maximum discharge, 3,510 mgd (5,430 cfs) Apr. 15, 1963 (gage height, 8.10 ft), from rating curve extended above 350 mgd on basis of computation of peak flow over submerged weir; minimum, 6.5 mgd (10 cfs) Sept. 17, 18, 20, 1961.

Remarks.--Records good. Approximately 6 mgd is diverted by Waiahole Water Co. at 800-ft elevation, 2.3 miles above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15	12	13	12	47	16	19	11	17	45	16	70
2	30	12	13	12	18	18	16	12	16	29	22	27
3	15	13	15	13	24	16	15	12	87	26	20	23
4	12	12	12	12	138	16	15	11	49	40	16	20
5	12	12	12	12	156	16	14	12	24	38	29	19
6	17	12	12	13	151	18	14	12	84	25	23	18
7	16	11	13	12	52	22	14	11	30	26	25	17
8	13	28	11	11	31	16	13	11	23	22	20	17
9	12	15	11	12	26	15	13	13	25	20	25	17
10	12	12	48	133	22	14	12	54	28	22	18	16
11	12	36	22	196	23	14	12	19	19	26	18	15
12	11	14	18	121	40	14	15	96	18	24	23	15
13	11	15	14	26	22	16	26	21	20	26	18	15
14	38	15	14	20	19	14	15	17	17	60	17	15
15	15	13	13	19	39	14	14	70	16	27	16	20
16	13	13	12	19	83	13	20	31	15	22	23	19
17	15	16	12	21	45	13	13	20	17	20	17	15
18	13	13	12	16	26	13	12	26	15	19	41	14
19	14	12	12	15	24	13	12	18	15	18	19	14
20	13	12	12	15	25	13	12	16	14	17	142	13
21	12	12	11	15	29	13	12	15	15	17	44	13
22	12	12	11	14	63	13	12	15	149	17	25	13
23	11	12	11	14	25	13	12	15	130	16	22	13
24	21	30	11	13	26	12	12	15	30	23	29	13
25	46	32	11	13	22	12	12	17	49	22	20	13
26	26	18	10	12	19	13	12	14	185	19	23	13
27	17	38	66	12	19	14	11	53	180	17	21	13
28	15	18	32	12	19	13	11	19	59	17	27	13
29	14	16	15	12	18	15	11	----	35	16	36	150
30	13	15	13	12	17	28	11	----	29	15	79	26
31	13	14	----	56	----	28	11	----	63	----	25	----
Total	509	515	492	895	1,268	478	423	656	1,473	731	899	679
Mean												
Mgd	16.4	16.6	16.4	28.9	42.3	15.4	13.6	23.4	47.5	24.4	29.0	22.6
Cfs	25.4	25.7	25.4	44.7	65.4	23.8	21.0	36.2	73.5	37.8	44.7	35.0
Ac-ft	1,560	1,580	1,510	2,750	3,890	1,470	1,300	2,010	4,520	2,240	2,760	2,080
Max	46	38	66	196	156	28	26	96	185	60	142	150
Min	11	11	10	11	17	12	11	11	14	15	16	13

Calendar Year 1966: Max 196 Min 10 Mean (mgd) 21.0 Mean (cfs) 32.5 Ac-ft 23,520
Fiscal Year 1966-67: Max 196 Min 10 Mean (mgd) 24.7 Mean (cfs) 38.2 Ac-ft 27,670

Peak discharge (base, 1,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	2300	6.22	1,920	2,970	11-16	2200	4.75	1,010	1,560
11- 4	1230	5.71	1,590	2,460	5-20	1930	5.47	1,430	2,210
11- 5	1630	5.12	1,230	1,900					

16-3020. Punaluu ditch near Punaluu

Location.--Lat 21°33'41", long 157°54'11", on right bank 1,000 ft downstream from intake, 1.5 miles west of Kahana, and 1.7 miles southwest of Punaluu.

Records available.--May 1953 to June 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 200 ft (from topographic map). Prior to Apr. 30, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--14 years, 7.25 mgd (11.2 cfs).

Extremes.--1953-67: Maximum daily discharge, 35 mgd (54 cfs) Oct. 31, 1954; no flow Dec. 7-11, 1963, Jan. 20-22, 25, 1966.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts from Punaluu Stream for irrigation of sugarcane in vicinity of Punaluu.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	10	10	10	1.8	8.0	7.7	5.5	4.2	2.5	2.4	7.3
2	12	10	9.7	10	1.8	8.1	7.3	5.5	4.2	2.5	8.7	6.5
3	11	10	9.7	10	1.8	8.1	7.1	5.5	4.2	2.5	12	7.1
4	11	10	9.7	10	4.0	7.3	7.1	5.4	4.2	2.5	11	7.3
5	10	10	9.4	9.8	6.0	7.5	7.0	5.4	4.0	2.5	10	7.4
6	10	9.8	8.5	9.7	4.0	7.5	7.0	5.4	5.0	2.5	9.4	7.4
7	11	9.7	8.7	9.7	1.7	7.7	7.0	5.4	3.0	2.5	8.8	7.6
8	10	10	8.4	9.7	1.7	7.4	7.0	5.4	2.5	2.5	9.1	7.6
9	10	9.7	8.5	9.7	1.7	7.4	6.9	5.3	2.5	2.5	9.1	7.4
10	10	10	9.7	15	1.7	7.4	6.7	5.6	2.5	2.5	9.4	7.4
11	9.7	10	10	5.0	5.1	8.1	6.6	5.3	2.5	2.5	9.5	7.5
12	9.7	9.7	10	2.0	3.8	8.0	6.6	5.2	2.5	2.5	10	7.5
13	10	9.7	9.7	1.9	3.4	8.0	6.9	4.6	2.5	2.8	10	8.0
14	12	9.7	9.8	1.8	3.5	7.8	6.7	4.6	2.5	2.8	9.7	7.7
15	10	9.4	10	1.8	4.9	7.8	6.7	4.8	2.5	2.7	9.7	7.7
16	10	9.5	9.8	1.8	7.3	7.8	4.0	4.4	2.5	2.6	10	7.8
17	10	9.7	9.7	1.8	5.8	7.8	.50	4.2	2.5	2.6	9.8	7.7
18	9.8	9.4	9.7	1.8	5.8	7.7	4.1	4.2	2.5	2.6	9.4	8.1
19	10	9.7	9.4	1.8	6.0	7.3	5.8	4.0	2.5	2.6	8.4	8.7
20	11	9.7	9.4	1.8	6.5	7.3	5.6	3.6	2.5	2.6	9.1	8.5
21	10	9.7	9.7	1.8	7.4	7.3	5.6	3.8	2.5	2.6	6.6	8.4
22	9.8	9.7	9.5	1.8	11	7.3	5.6	3.8	2.5	2.6	6.9	8.3
23	9.5	9.7	9.5	1.8	9.1	7.3	5.6	3.8	2.5	2.5	6.9	8.3
24	9.3	12	9.5	1.8	9.3	7.1	5.6	4.0	2.5	2.6	6.7	8.8
25	14	11	9.4	1.8	9.3	7.3	5.5	4.0	2.5	2.6	6.9	9.7
26	13	10	9.4	1.8	9.0	7.4	5.6	4.0	2.5	2.5	7.0	9.4
27	12	11	11	1.8	8.7	8.0	5.6	4.4	2.5	2.5	7.1	10
28	11	10	13	1.8	8.3	7.5	5.5	4.2	2.5	2.4	7.3	11
29	11	10	11	1.8	8.0	7.4	5.4	----------	2.5	2.4	6.6	7.3
30	11	10	10	1.8	7.7	8.1	5.4	----------	2.5	2.4	6.9	6.2
31	10	10	----------	3.0	----------	8.3	5.5	----------	2.5	---------	7.8	---------
Total	328.8	308.8	291.8	146.1	166.1	237.0	185.20	131.3	88.8	76.4	262.2	239.6
Mean												
Mgd	10.6	9.96	9.73	4.71	5.54	7.65	5.97	4.69	2.86	2.55	8.46	7.99
Cfs	16.4	15.4	15.1	7.29	8.57	11.8	9.24	7.25	4.43	3.95	13.1	12.4
Ac-ft	1,010	948	896	448	510	727	568	403	273	234	805	735
Max	14	12	13	15	11	8.3	7.7	5.6	5.0	2.8	12	11
Min	9.3	9.4	8.4	1.8	1.7	7.1	0.50	3.6	2.5	2.4	2.4	6.2

Calendar Year 1966: Max 15 Min 0 Mean (mgd) 6.91 Mean (cfs) 10.7 Ac-ft 7,740
Fiscal Year 1966-67: Max 15 Min 0.50 Mean (mgd) 6.75 Mean (cfs) 10.4 Ac-ft 7,560

Note.--No gage-height record Oct. 7 to Nov. 8, Mar. 8 to Apr. 11.

16-3030. Punaluu Stream near Punaluu

Location.--Lat 21°33'33", long 157°54'06", on left bank at Punaluu ditch diversion dam, 1.4 miles west of Kahana, and 1.8 miles southwest of Punaluu.

Drainage area.--2.78 sq mi.

Records available.--May 1953 to June 1967.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 212 ft (from topographic map).

Average discharge.--14 years, 9.71 mgd (15.0 cfs).

Extremes.--Maximum discharge during year, 1,140 mgd (1,760 cfs) Oct. 11 (gage height, 4.36 ft), from rating curve extended above 110 mgd as explained below; minimum, 0.59 mgd (0.91 cfs) sometime during period Oct. 3 to Nov. 8.
1953-67: Maximum discharge, 1,920 mgd (2,970 cfs) Nov. 1, 1951, and Feb. 4, 1965 (gage height, 6.06 ft), from rating curve extended above 110 mgd on basis of slope-area measurement at gage height 5.77 ft; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Records do not include flow of Punaluu ditch (see sta. no. 3020).

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.1	1.6	1.2	1.2	15	6.1	7.5	5.4	10	22	14	25
2	4.8	1.6	1.2	.82	10	6.1	6.1	5.9	9.7	19	7.5	8.8
3	3.3	1.6	1.5	.80	15	5.9	5.9	5.6	20	18	3.3	9.3
4	2.8	1.6	1.2	.90	40	6.4	6.1	5.1	13	22	2.8	6.9
5	2.6	1.5	1.1	.80	50	6.7	5.6	5.1	11	21	12	6.1
6	3.3	1.4	1.1	.90	40	7.2	5.6	5.1	41	18	7.7	5.9
7	4.3	1.4	1.2	.80	25	8.2	5.6	5.1	19	18	6.7	5.4
8	3.1	2.3	1.1	.80	22	6.7	5.4	4.8	16	16	5.1	5.1
9	2.5	1.5	1.0	.80	19	6.4	5.1	6.1	14	15	4.6	5.4
10	1.8	1.4	5.0	50	18	5.6	5.1	21	15	16	4.3	5.4
11	1.5	2.7	1.5	60	14	6.1	5.1	9.7	13	17	4.1	5.4
12	1.4	1.5	1.1	40	20	6.1	6.1	60	12	21	4.8	5.1
13	1.5	1.6	1.0	20	9.7	5.1	8.3	14	13	20	4.5	4.8
14	7.8	1.5	1.1	12	8.5	4.6	6.7	10	12	33	3.9	5.1
15	2.5	1.4	1.0	10	14	4.5	6.1	33	12	21	3.8	5.9
16	1.6	1.3	.88	9.0	34	4.5	8.5	16	12	18	7.6	6.7
17	1.7	1.4	.82	11	14	4.5	12	12	19	16	4.6	5.4
18	1.4	1.3	.88	9.0	13	4.5	7.8	13	13	16	15	3.8
19	1.4	.95	.88	8.0	9.7	4.3	6.1	10	12	15	6.9	2.6
20	1.4	.88	.82	7.2	9.4	4.5	5.9	9.4	12	14	52	2.6
21	1.2	.88	.88	6.8	11	4.5	5.9	9.1	12	14	16	2.6
22	1.1	.88	.82	6.4	45	4.5	5.6	8.8	42	14	10	2.8
23	1.1	.95	.82	6.0	14	4.8	5.6	8.5	32	13	8.8	2.8
24	5.4	4.6	.76	5.6	12	4.5	5.4	8.5	24	25	14	2.9
25	18	3.1	.76	5.4	9.7	4.6	5.6	8.5	23	15	8.2	3.4
26	7.5	1.9	.82	5.2	8.8	5.1	5.4	8.2	45	14	7.8	3.4
27	3.1	3.9	6.6	5.0	7.5	6.3	5.4	30	51	13	8.2	2.6
28	2.3	2.1	5.2	5.0	7.5	5.6	5.4	12	29	14	8.2	2.3
29	1.9	1.5	1.8	5.0	6.9	5.6	5.4	----------	23	13	22	66
30	1.8	1.4	1.5	5.0	6.4	8.0	5.6	----------	20	13	9.7	16
31	1.6	1.3	----------	20	----------	8.8	5.4	----------	25	----------	5.6	----------
Total	99.8	52.94	45.54	319.42	529.1	176.3	191.3	349.9	624.7	524	293.7	235.5
Mean												
Mgd	3.22	1.71	1.52	10.3	17.6	5.69	6.17	12.5	20.2	17.5	9.47	7.85
Cfs	4.98	2.65	2.35	15.9	27.2	8.80	9.55	19.3	31.3	27.1	14.7	12.1
Ac-ft	306	162	140	980	1620	541	587	1070	1920	1610	901	723
Max	18	4.6	6.6	60	50	8.8	12	60	51	33	52	66
Min	1.1	0.88	0.76	0.80	6.4	4.3	5.1	4.8	9.7	13	2.8	2.3

Calendar Year 1966: Max 74 Min 0.76 Mean (mgd) 9.59 Mean (cfs) 15.1 Ac-ft 10740
Fiscal Year 1966-67: Max 66 Min 0.76 Mean (mgd) 9.43 Mean (cfs) 14.9 Ac-ft 10560

Note.--No gage-height record Oct. 3 to Nov. 8.

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	about 2300	4.36	1,140	1,760	2-12	0300	3.88	922	1,430
11-4	about 1200	3.80	885	1,370	5-20	1830	3.20	620	959

16-3089.9. Kalaekahana Stream near Laie

Location.--Lat 21°38'09", long 157°57'54", on left bank 2.3 miles southwest of Laie Temple and 3.0 miles south of Kahuku School.

Drainage area.--0.64 sq mi.

Records available.--July 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 450 ft (from topographic map).

Extremes.--Maximum discharge during year, 268 mgd (415 cfs) Mar. 22 (gage height, 5.25 ft), from rating curve extended above 4.3 mgd as explained below; no flow July 13-15, Sept. 25, 26.
1963-67: Maximum discharge, 323 mgd (500 cfs) Jan. 6, 1964 (gage height, 5.54 ft), from rating curve extended above 4.3 mgd on basis of slope-area measurement at gage height 4.89 ft; no flow in 1963, 1964 and 1966.

Remarks.--Records fair. No diversion above stetion.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	0.03	0.06	0.12	3.8	0.23	1.4	0.04	0.14	2.0	0.08	2.0
2	.38	.03	.05	.06	.33	.23	.55	.04	.11	.88	1.0	.48
3	.28	.03	.04	.05	1.6	.21	.92	.04	.11	.64	.50	.23
4	.11	.02	.03	.04	22	.19	.43	.03	.53	.94	.20	.25
5	.05	.01	.03	.04	25	.18	.23	.03	.18	.66	.10	.15
6	.03	.01	.02	.62	19	.18	.32	.03	19	.46	.90	.14
7	.03	.01	.03	.26	2.9	.32	.26	.03	4.7	.43	.80	.11
8	.03	.40	.03	.08	.96	.28	.18	.03	.90	.48	.70	.10
9	.06	.21	.03	.06	.55	.18	.12	.04	.38	.43	.60	.10
10	.03	.07	4.8	1.4	.43	.15	.10	3.2	.94	3.0	.10	.11
11	.02	4.2	1.7	.26	.41	.14	.07	11	.90	3.1	.12	.14
12	.01	.25	.26	10	3.6	.12	.16	3.9	.41	4.1	.28	.14
13	0	.11	.18	1.0	.48	.16	.56	.63	6.5	1.4	.19	.12
14	0	.58	.11	.12	.28	.26	.40	.25	.71	4.0	.14	.12
15	0	.18	.10	.48	3.6	.16	.48	8.5	.33	.62	.14	.19
16	.10	.19	.07	.38	6.3	.14	.28	1.3	.23	.21	.19	.31
17	.20	.40	.06	.73	1.4	.10	.16	.25	.96	.16	.15	.18
18	.50	.16	.05	.16	.52	.10	.12	1.3	.30	.13	.16	.10
19	.10	.08	.04	.07	.83	.09	.42	.26	.19	.13	.18	.05
20	.40	.06	.03	.06	.41	.11	.62	.15	.18	.11	10	.05
21	.20	.04	.03	.05	.76	.11	.19	.11	.33	.11	1.0	.03
22	.10	.03	.02	.04	17	.11	.19	.10	22	.11	.30	.03
23	.05	.18	.01	.04	8.0	1.1	.12	.07	6.5	.09	.21	.03
24	.02	4.4	.01	.04	1.3	.21	.10	.07	3.9	.09	.16	.03
25	10	1.4	0	.03	.71	.14	.12	.33	2.7	.09	.15	.03
26	2.4	.26	0	.03	.52	.11	.10	.14	11	.08	.15	.03
27	.38	2.2	2.6	.03	.87	.11	.06	3.4	14	.08	.68	.04
28	.19	.33	1.3	.03	.46	.48	.06	.28	2.0	.08	.80	.06
29	.11	.16	.18	.02	.33	.83	.05	----------	.80	.20	1.7	18
30	.07	.12	.18	.01	.26	1.9	.04	----------	.67	.10	2.1	1.7
31	.06	.07	----------	11	----------	2.2	.04	----------	4.5	----------	.41	----------
Total	17.01	16.22	12.05	27.31	124.61	10.83	8.85	35.55	106.10	24.91	24.19	25.05
Mean												
Mgd	0.549	0.523	0.402	0.881	4.15	0.349	0.285	1.27	3.42	0.830	0.780	0.835
Cfs	0.849	0.809	0.622	1.36	6.42	0.540	0.441	1.96	5.29	1.28	1.21	1.29
Ac-ft	52	50	37	84	382	33	27	109	326	76	74	77
Max	10	4.4	4.8	10	25	2.2	1.4	11	22	4.1	10	18
Min	0	0.01	0	0.01	0.26	0.09	0.04	0.03	0.11	0.08	0.08	0.03

Calendar Year 1966: Max 25 Min 0 Mean (mgd) 0.860 Mean (cfs) 1.33 Ac-ft 963
Fiscal Year 1966-67: Max 25 Min 0 Mean (mgd) 1.19 Mean (cfs) 1.84 Ac-ft 1330

Peak discharge (base, 120 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	about 1300	4.45	148	229	2-11	0100	4.93	215	333
11-4	1300	4.70	181	280	3-22	1900	5.25	268	415
11-5	1700	5.14	249	385	6-29	0400	4.47	151	234
11-22	0600	4.68	178	275					

16-3250. Kamananui Stream at Pupukea Military Road, near Maunawai

Location.--lat 21°37'25", long 158°01'04", on right bank 75 ft upstream from Pupukea Military Road and 3.5 miles southeast of Maunawai.

Drainage area.--3.13 sq mi.

Records available.--Occasional low-flow measurements, fiscal years 1961-63; June 1963 to June 1967.

Gage.--Water-stage recorder and culvert control. Altitude of gage is 590 ft (from topographic map).

Extremes.--Maximum discharge during year, 844 mgd (1,310 cfs) Mar. 22 (gage height, 8.23 ft), from rating curve extended above 28 mgd as explained below; minimum, 0.05 mgd (0.08 cfs) July 14, 15.
1963-67: Maximum discharge, 844 mgd (1,310 cfs) Feb. 4, 1965, Mar. 22, 1967 (gage height, 8.23 ft), from rating curve extended above 28 mgd on basis of slope-area measurement at gage height 8.12 ft; minimum, 0.01 mgd (0.02 cfs) May 26-28, 1966.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.6	1.0	0.95	0.58	27	3.7	15	0.89	3.0	16	2.5	11
2	21	.90	.79	.26	5.2	3.5	6.0	1.0	3.6	11	9.2	8.6
3	2.9	.80	.74	.19	9.1	3.3	7.0	.89	2.3	11	6.4	2.7
4	.84	.76	.68	.19	96	3.2	5.7	.79	3.1	8.7	3.6	2.6
5	.36	.74	.63	.18	113	3.1	3.0	.84	2.2	11	2.4	1.6
6	.29	.72	.63	2.7	106	4.0	3.9	1.0	93	7.6	2.2	1.2
7	.48	.70	.89	2.5	20	3.5	3.1	.89	18	5.3	1.9	1.2
8	1.1	1.5	.89	.58	10	3.0	2.4	.74	7.0	6.3	1.9	1.1
9	.43	2.5	.74	.26	7.3	2.5	1.9	.68	4.5	4.9	1.8	1.1
10	.36	1.0	14	.24	6.4	2.2	1.6	12	7.9	11	1.7	1.4
11	.16	10	16	30	5.8	2.1	1.4	11	5.4	19	1.7	1.1
12	.10	30	2.4	123	15	2.0	2.0	8.6	3.8	30	1.6	.89
13	.07	1.2	1.7	5.0	5.4	2.1	2.4	4.3	11	14	1.6	.84
14	.06	2.5	1.2	2.9	4.0	3.0	2.7	4.9	5.4	10	2.2	.79
15	.06	2.3	1.2	4.5	16	2.5	2.3	39	3.3	12	1.9	.74
16	.26	1.2	.89	6.4	27	2.2	2.1	12	2.8	6.6	2.6	.74
17	1.2	1.0	.68	11	7.0	2.0	1.6	4.3	3.3	5.2	1.6	.74
18	2.0	1.3	.63	3.2	4.6	1.8	1.6	5.9	2.9	5.3	1.6	.63
19	.63	1.0	.58	2.2	4.4	1.7	2.6	3.3	2.4	4.3	1.8	.58
20	1.8	.90	.58	1.9	3.6	1.6	4.1	2.3	2.3	3.8	7.7	.53
21	1.2	.80	.48	1.9	3.4	1.6	2.0	1.9	3.3	3.7	4.6	.53
22	.58	.70	.39	1.7	32	1.8	1.9	1.8	82	3.4	1.9	.53
23	.26	.80	.32	1.6	120	7.0	1.6	1.6	67	3.3	1.8	.53
24	64	15	.29	1.6	14	3.5	1.3	1.5	16	3.2	1.9	.53
25	127	8.0	.24	1.5	8.5	2.0	1.4	1.9	23	3.2	1.9	.58
26	21	2.5	.24	1.4	6.9	1.7	1.2	1.6	139	2.9	1.3	.74
27	5.0	2.8	.24	1.2	8.0	1.7	1.1	58	136	2.7	3.5	1.1
28	2.7	3.0	.89	1.3	5.4	2.5	1.0	7.6	20	2.7	4.2	2.0
29	1.9	1.5	.84	1.4	4.5	7.0	1.0	----------	11	3.4	3.8	91
30	1.5	1.3	.39	1.2	4.0	10	.89	----------	8.8	2.5	4.5	11
31	1.2	1.1	----------	80	----------	19	.89	----------	33	----------	5.0	----------
Total	263.04	99.52	51.12	292.58	699.5	110.8	86.68	191.22	726.3	234.0	92.3	148.62
Mean												
Mgd	8.48	3.21	1.70	9.44	23.3	3.57	2.80	6.83	23.4	7.80	2.98	4.95
Cfs	13.1	4.97	2.63	14.6	36.1	5.52	4.33	10.6	36.2	12.1	4.61	7.66
Ac-ft	807	305	157	898	2150	340	266	587	2230	718	283	456
Max	127	30	16	123	120	19	15	58	139	30	9.2	91
Min	0.06	0.70	0.24	0.18	3.4	1.6	0.89	0.68	2.2	2.5	1.3	0.53

Calendar Year 1966: Max 127 Min 0.01 Mean (mgd) 5.71 Mean (cfs) 8.83 Ac-ft 6390
Fiscal Year 1966-67: Max 139 Min 0.06 Mean (mgd) 8.21 Mean (cfs) 12.7 Ac-ft 9190

Peak discharge (base, 420 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1430	7.50	666	1,030	11-23	0030	7.86	746	1,150
10-11	2330	7.50	666	1,030	3- 6	1700	6.43	464	718
11- 4	1230	7.12	592	916	3-22	2230	8.23	844	1,310
11- 5	1530	8.20	834	1,290	6-29	0430	6.23	432	668

16-3300. Kamananui Stream at Maunawai

Location.--Lat 21°38'20", long 158°03'27", on right bank at Maunawai, 25 ft upstream from Elehaha Stream, 4.9 miles northeast of Waialua School, and 7.3 miles southwest of Kahuku School.

Drainage area.--9.79 sq mi.

Records available.--February 1958 to June 1967.

Gage.--Graphic water-stage recorder. Altitude of gage is 20 ft (from topographic map). Prior to May 13, 1964, graphic and May 13, 1964, to May 12, 1965, digital water-stage recorders at same site at datum 2.00 ft higher. May 13, 1965, to May 17, 1966, graphic water-stage recorder at same site at datum 1.00 ft higher than present datum.

Average discharge.--9 years, 10.6 mgd (16.4 cfs).

Extremes.--Maximum discharge during year, 1,490 mgd (2,310 cfs) Nov. 5 (gage height, 8.13 ft), from rating curve extended above 96 mgd on basis of slope-area measurements at gage heights 6.25 and 8.13 ft; minimum, 0.02 mgd (0.03 cfs) July 14, 15.
1958-67: Maximum discharge, 2,230 mgd (3,450 cfs) Apr. 15, 1963 (gage height, 7.92 ft, datum and control then in use), from rating curve extended above 210 mgd on basis of slope-area measurement at gage height 7.72 ft; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.0	0.34	0.26	0.60	56	5.2	22	0.70	5.7	22	2.6	4.7
2	7.9	.26	.17	.25	9.8	4.8	8.2	.80	5.2	15	6.8	18
3	6.6	.17	.13	.10	18	4.3	7.9	.75	3.4	13	5.3	3.8
4	2.8	.13	.11	.10	152	4.0	9.2	.70	3.6	11	4.2	3.6
5	1.2	.11	.07	.10	211	3.6	6.1	.66	3.5	13	2.4	2.1
6	.57	.09	.05	4.0	226	3.6	4.4	.80	118	11	2.3	1.3
7	.34	.07	.07	3.0	71	4.3	6.1	.85	44	7.7	2.0	1.1
8	.70	2.1	.12	.80	28	3.9	3.6	.66	15	8.2	1.8	.95
9	1.0	2.8	.08	.25	18	3.0	2.7	.53	7.9	7.2	1.7	.90
10	.38	.57	2.3	.23	15	2.6	2.0	9.5	11	14	1.6	1.2
11	.14	14	26	15	13	2.4	1.7	32	10	33	1.5	1.1
12	.07	4.6	4.0	186	29	2.3	2.1	12	8.7	32	1.4	.90
13	.04	.85	2.0	9.0	15	2.5	3.0	9.7	18	27	1.5	.80
14	.03	2.9	1.0	3.1	9.5	3.2	4.8	5.3	10	12	2.0	.66
15	.03	2.8	1.0	2.6	28	2.5	3.2	87	5.3	18	1.9	.56
16	.03	1.2	.70	9.0	48	2.0	4.8	34	4.2	10	2.5	.49
17	.03	.70	.60	16	19	1.9	2.6	8.5	4.4	7.0	1.4	.46
18	3.3	1.1	.50	4.3	11	1.9	2.0	9.7	5.5	6.1	2.0	.46
19	2.3	.42	.40	1.8	9.2	1.8	2.6	7.0	3.4	5.3	2.0	.41
20	1.8	.16	.40	.85	8.2	1.4	5.5	3.9	3.0	5.0	8.4	.37
21	2.9	.07	.30	.63	7.2	1.4	3.2	2.9	4.3	4.6	7.4	.33
22	1.2	.05	.20	.46	40	1.7	2.5	2.4	56	4.2	2.8	.30
23	.46	.49	.10	.42	247	8.2	2.1	2.3	155	3.9	2.0	.28
24	83	22	.06	.34	29	4.0	1.6	2.0	25	3.6	1.6	.28
25	142	15	.04	.28	17	2.0	1.8	2.4	22	3.6	2.1	.26
26	46	4.3	.04	.23	13	1.6	1.4	2.7	88	3.5	1.4	.26
27	9.0	5.2	.40	.17	12	1.6	1.3	69	104	3.2	2.6	.39
28	3.5	5.3	1.5	.14	9.7	3.5	1.1	16	24	3.0	4.7	1.3
29	1.8	1.5	1.0	.17	7.0	8.2	.95	----------	15	3.5	4.1	81
30	.93	.70	.40	.16	6.1	14	.85	----------	11	2.9	3.8	21
31	.46	.38	----------	89	----------	28	.80	----------	25	----------	8.1	----------
Total	321.51	90.36	44.00	349.08	1382.7	135.4	122.10	324.75	819.1	313.5	95.9	149.26
Mean												
Mgd	10.4	2.91	1.47	11.3	46.1	4.37	3.94	11.6	26.4	10.4	3.09	4.98
Cfs	16.1	4.50	2.27	17.5	71.3	6.76	6.10	17.9	40.8	16.1	4.78	7.71
Ac-ft	987	277	135	1,070	4,240	416	375	997	2,510	962	294	458
Max	142	22	26	186	247	28	22	87	155	33	8.4	81
Min	0.03	0.05	0.04	0.10	6.1	1.4	0.80	0.53	3.0	2.9	1.4	0.26

Calendar Year 1966: Max 247 Min 0 Mean (mgd) 8.82 Mean (cfs) 13.9 Ac-ft 9,870
Fiscal Year 1966-67: Max 247 Min 0.03 Mean (mgd) 11.4 Mean (cfs) 17.6 Ac-ft 12,730

Peak discharge (base, 650 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1600	6.25	835	1,290	11- 5	1800	8.13	1,490	2,310
7-25	1700	5.72	676	1,050	11-23	0300	7.42	1,230	1,900
10-12	0030	6.08	784	1,210	3-22	2400	7.17	1,130	1,750
11- 4	1430	6.46	898	1,390					

Note.--No gage-height record Sept. 12 to Oct. 11.

16-3450. Opaeula Stream near Wahiawa

Location.--Lat 21°33'55", long 158°00'10", on left bank 4.3 miles northeast of Leilehua High School in Wahiawa and 8.1 miles east of Waialua School.

Drainage area.--2.98 sq mi.

Records available.--August 1959 to June 1967.

Gage.--Graphic water-stage recorder and concrete control. Altitude of gage is 1,120 ft (from topographic map). Prior to May 13, 1964, graphic and May 13, 1964, to July 12, 1966, digital water-stage recorders at same site and datum.

Average discharge.--7 years (1960-67), 9.49 mgd (14.7 cfs).

Extremes.--Maximum discharge during year, 1,380 mgd (2,140 cfs) Oct. 12 (gage height, 7.94 ft), from rating curve extended above 69 mgd as explained below; minimum, 0.23 mgd (0.36 cfs) Oct. 5.
1959-67: Maximum discharge, 1,810 mgd (2,800 cfs) Dec. 15, 1964 (gage height, 8.82 ft), from rating curve extended above 69 mgd on basis of slope-area measurement at gage height 6.74 ft; minimum, 0.07 mgd (0.11 cfs) June 2-4, 1966.

Remarks.--Records good except those for period of no gage-height record, which are poor. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.0	1.1	1.2	0.72	46	2.5	19	0.75	3.6	21	1.7	14
2	18	.94	1.0	.48	6.3	2.2	7.4	.69	4.0	16	16	9.9
3	7.8	.78	.90	.39	14	2.1	12	.66	4.7	27	7.8	29
4	2.1	1.3	.75	.31	94	2.0	12	1.1	8.2	35	4.5	7.2
5	1.2	1.8	.66	.35	75	1.9	6.0	.98	6.6	105	2.0	2.9
6	.98	1.7	.60	6.6	107	3.9	11	.82	88	12	3.3	2.0
7	4.7	1.3	1.4	5.5	18	9.9	6.6	.78	6.8	14	3.4	1.7
8	3.6	8.8	3.3	1.8	7.8	3.4	5.5	.66	3.5	12	2.6	1.4
9	1.3	5.4	1.2	.90	5.8	1.8	4.7	.57	2.9	7.4	2.4	1.6
10	.78	1.7	2.1	19	6.1	1.4	2.6	50	9.2	12	1.8	2.5
11	.69	8.8	32	73	6.5	1.2	2.1	7.8	2.9	28	1.2	1.6
12	.60	3.7	4.5	157	43	1.1	6.6	78	2.3	13	1.0	1.3
13	.48	1.4	3.8	6.0	8.0	1.2	3.8	8.6	2.1	17	8.5	1.2
14	23	8.1	1.4	3.7	3.8	3.5	5.0	6.0	2.2	28	7.3	1.0
15	5.2	3.5	2.3	10	15	2.0	2.3	112	1.4	11	4.1	.82
16	2.6	1.9	2.2	15	81	1.4	1.8	25	1.1	5.0	3.7	1.2
17	3.7	2.8	1.1	18	8.7	1.1	1.6	10	6.8	3.8	3.3	2.0
18	4.9	2.7	.75	4.5	4.7	1.2	1.7	8.4	2.1	3.0	14	1.0
19	2.0	1.5	.69	2.5	3.4	1.2	3.3	7.0	1.0	2.7	6.0	.69
20	3.8	1.4	.82	1.8	2.8	1.1	5.5	5.4	.84	2.4	2.6	.57
21	3.2	.98	1.1	2.3	2.8	1.0	3.3	3.5	2.3	2.2	8.2	.48
22	1.6	.78	1.5	2.4	70	2.4	2.1	3.1	135	2.0	2.7	.44
23	1.2	1.1	1.0	1.5	89	13	2.1	2.6	92	2.1	2.7	.44
24	32	23	.60	1.5	21	4.5	1.4	1.9	5.8	2.7	8.2	.48
25	83	15	.46	1.3	10	1.6	1.2	3.0	36	3.4	5.0	.51
26	29	5.5	.37	1.1	7.8	12	1.2	1.6	100	3.6	3.2	.95
27	5.3	11	.31	.86	8.1	12	1.1	70	90	2.3	5.1	1.2
28	2.9	5.1	11	.75	5.4	15	.98	6.2	11	1.5	6.4	2.4
29	2.1	2.3	2.2	.78	3.8	11	.86	----------	6.5	1.5	15	86
30	1.5	1.8	1.2	.82	3.3	21	.78	----------	9.2	1.6	4.8	12
31	1.3	1.5	----------	100	----------	20	.75	----------	87	----------	6.2	----------
Total	257.53	128.68	82.41	440.86	778.1	159.6	136.27	417.11	735.04	398.2	164.7	188.48
Mean												
Mgd	8.31	4.15	2.75	14.2	25.9	5.15	4.40	14.9	23.7	13.3	5.31	6.28
Cfs	12.9	6.42	4.25	22.0	40.1	7.97	6.81	23.1	36.7	20.6	8.22	9.72
Ac-ft	790	395	253	1,350	2,390	490	418	1,280	2,260	1,220	505	578
Max	83	23	32	157	107	21	19	112	135	105	16	86
Min	0.48	0.78	0.31	0.31	2.8	1.0	0.75	0.57	0.84	1.5	1.0	0.44

Calendar Year 1966: Max 157 Min 0.07 Mean (mgd) 6.98 Mean (cfs) 10.8 Ac-ft 7,820
Fiscal Year 1966-67: Max 157 Min 0.31 Mean (mgd) 10.6 Mean (cfs) 16.4 Ac-ft 11,930

Note.--No gage-height record Feb. 14 to Apr. 7.

Peak discharge (base, 750 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	2330	6.80	930	1,440	11-5	1700	7.02	1,010	1,560
10-12	0100	7.94	1,380	2,140					

16-4000. Halawa Stream near Halawa

Location.--Lat 21°09'31", long 156°45'53", on right bank 600 ft downstream from Hipuapua Stream and 1.5 miles west of Halawa.

Drainage area.--4.62 sq mi.

Records available.--July 1917 to July 1932, November 1937 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 210 ft (from topographic map). Prior to June 25, 1923, at site 350 ft upstream at different datum.

Average discharge.--44 years (1917-32, 1938-67), 19.7 mgd (30.5 cfs).

Extremes.--Maximum discharge during year, 1,990 mgd (3,080 cfs) Nov. 4 (gage height, 9.90 ft), from rating curve extended above 33 mgd as explained below; minimum, 1.4 mgd (2.2 cfs) June 24, 25.
1917-32, 1937-67: Maximum discharge, 17,400 mgd (26,900 cfs) Feb. 4, 1965 (gage height, 19.91 ft, from floodmarks), from rating curve extended above 33 mgd on basis of slope-area measurement of peak flow; minimum, 0.49 mgd (0.76 cfs) Nov. 23, 1962.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Small diversion above station by Maui County Board of Water Supply for domestic use at Halawa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10	3.2	4.8	3.8	13	6.3	15	4.0	10	57	8.6	4.7
2	15	4.0	4.6	3.2	106	5.3	24	3.5	6.0	28	10	5.4
3	20	5.5	5.9	2.9	37	5.0	23	6.0	4.0	14	11	3.3
4	9.0	7.2	4.3	2.7	267	4.4	20	5.0	6.0	61	6.7	3.0
5	5.0	5.2	3.8	2.9	34	4.0	12	7.0	9.0	19	5.6	2.7
6	6.0	6.5	7.5	24	163	48	6.4	10	5.0	10	5.5	2.5
7	14	4.3	7.9	6.7	48	34	5.2	5.0	60	92	5.2	2.4
8	5.4	27	4.2	5.1	16	7.6	5.0	4.5	15	39	6.8	2.2
9	5.1	6.1	4.5	103	46	5.4	5.3	4.0	10	16	5.2	2.4
10	4.7	3.9	51	120	45	4.7	3.4	4.0	33	19	4.8	2.7
11	4.5	11	11	200	59	4.4	4.2	5.0	14	29	5.7	2.3
12	4.3	6.1	24	50	44	4.2	28	15	9.2	17	65	2.1
13	7.2	30	6.4	15	17	12	4.0	8.0	37	59	13	1.9
14	26	7.0	24	46	13	6.2	3.2	5.0	18	54	9.5	1.8
15	7.1	15	11	74	34	5.5	3.1	10	8.4	16	11	2.2
16	5.5	37	6.0	65	77	4.6	3.3	7.0	7.0	10	5.5	2.7
17	5.2	48	5.1	30	31	4.0	2.7	5.0	36	8.4	15	3.8
18	9.5	12	4.4	11	11	3.9	15	4.0	11	7.1	29	3.2
19	8.0	7.3	9.6	9.0	9.2	4.4	5.0	4.5	6.8	6.3	47	2.2
20	9.8	6.0	5.1	12	7.6	3.6	10	7.0	6.2	5.8	53	1.7
21	4.7	6.4	4.2	8.9	22	3.8	7.0	6.0	23	5.3	7.1	1.6
22	4.0	12	4.2	8.2	15	12	5.0	5.0	231	22	5.2	1.8
23	3.6	8.6	3.8	8.4	8.1	11	4.5	4.5	47	124	4.5	1.8
24	32	35	3.6	7.0	8.1	13	4.0	8.0	69	14	4.1	1.4
25	55	50	3.2	7.0	7.4	4.4	80	4.0	119	9.2	6.4	2.9
26	11	30	3.1	6.5	7.9	4.6	15	7.0	81	7.3	5.0	2.5
27	5.8	13	14	6.3	30	13	20	30	59	6.7	11	12
28	4.6	7.9	46	6.3	11	47	10	20	18	13	6.1	15
29	4.0	14	4.7	5.6	8.9	28	6.0	----------	12	16	4.1	14
30	3.7	7.6	4.8	5.3	6.2	11	5.0	----------	16	6.7	4.1	22
31	3.3	5.6	----------	17	----------	8.0	4.5	----------	42	----------	3.8	----------
Total	313.0	442.4	296.7	872.8	1202.4	333.3	358.8	208.0	1028.6	791.8	384.5	130.2
Mean												
Mgd	10.1	14.3	9.89	28.2	40.1	10.8	11.6	7.43	33.2	26.4	12.4	4.34
Cfs	15.6	22.1	15.3	43.6	62.0	16.7	17.9	11.5	51.4	40.8	19.2	6.71
Ac-ft	961	1360	910	2680	3690	1020	1100	638	3160	2430	1180	400
Max	55	50	51	200	267	48	80	30	231	124	65	22
Min	3.3	3.2	3.1	2.7	6.2	3.6	2.7	3.5	4.0	5.3	3.8	1.4

Calendar Year 1966: Max 267 Min 2.0 Mean (mgd) 16.2 Mean (cfs) 25.1 Ac-ft 18100
Fiscal Year 1966-67: Max 267 Min 1.4 Mean (mgd) 17.4 Mean (cfs) 26.9 Ac-ft 19530

Note.--No gage-height record Jan. 18 to Mar. 9.

Peak discharge (base, 1,200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-10	0530	9.18	1,560	2,410	11- 6	2000	8.90	1,420	2,200
11- 4	1530	9.90	1,990	3,080	4-23	0630	8.89	1,420	2,200

16-4051. Molokai tunnel at east portal

Location.--lat 21°08'38", long 156°55'16", on left bank 100 ft downstream from the east portal, 5.3 miles southeast of Kalaupapa, and 7.5 miles northeast of Kaunakakai.

Records available.--July 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 989 ft (from tunnel plans).

Extremes.--1966-67: Maximum daily discharge, 5.3 mgd (8.2 cfs) Oct. 15; no flow for many days March to June.

Remarks.--Records good. Tunnel diverts from Waikolu Stream and a tributary; diversion is augmented by water pumped from two wells in Waikolu Valley near the east portal and one well in the tunnel slightly below the station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.4	0.83	0.76	1.1	2.6	0.83	0.64	0.08	0.01	0	0.01	0
2	3.0	.78	.70	.80	1.9	.83	.64	.08	.01	0	.01	0
3	1.9	.76	.70	.70	2.6	.76	.64	.08	.01	0	0	0
4	1.1	1.0	.70	.70	3.6	.70	.58	.06	.01	0	.01	0
5	.90	1.4	.70	.70	2.5	.76	.53	.06	.01	0	.01	0
6	1.2	2.5	1.0	2.3	2.7	3.1	.48	.09	.01	0	.01	0
7	1.9	1.5	1.5	1.8	2.1	3.1	.48	.08	.01	0	.01	0
8	1.1	1.9	.94	1.1	1.5	2.6	.48	.06	.01	0	.02	0
9	1.0	1.3	.76	.90	1.9	1.5	.48	.15	.01	0	0	0
10	.97	.97	2.5	.70	2.6	1.1	.43	.48	.01	0	.01	.40
11	.89	1.0	2.1	1.1	3.9	.97	.39	.43	.01	0	.01	.66
12	.89	.97	1.5	1.1	3.6	.89	.30	.43	.01	0	.01	.66
13	.97	1.1	1.1	.80	2.1	2.3	.25	.39	.01	0	0	.76
14	2.5	1.1	1.9	1.3	1.3	2.3	.20	.59	.01	0	0	.76
15	1.8	1.7	1.7	5.3	1.1	1.5	.20	.48	.01	0	.02	.76
16	1.5	1.1	.97	5.1	1.7	1.0	.20	.39	.01	0	.02	.76
17	2.0	3.0	.83	3.7	1.4	.89	.20	.35	.01	0	.01	.76
18	2.8	2.0	.76	1.7	1.0	1.8	.20	.35	.01	0	0	.76
19	1.5	1.0	.83	1.3	.80	2.6	.48	.27	.01	0	0	.76
20	1.2	.89	1.1	2.7	.76	1.8	.43	.23	.01	0	0	.76
21	1.1	.83	.83	2.5	.76	2.7	.35	.18	.01	0	0	.70
22	1.0	1.1	.76	1.4	1.0	3.2	.20	.11	.01	0	0	.70
23	.97	1.2	.70	1.0	3.0	2.7	.13	.26	.01	0	0	.87
24	2.1	3.5	.70	.97	3.0	1.5	.18	.11	.01	0	0	.76
25	3.9	4.3	.70	.89	3.0	1.0	.43	.01	.01	0	.60	.97
26	2.3	2.2	.70	.89	2.0	1.4	.31	.01	.01	0	0	1.1
27	1.2	1.9	.70	.83	2.8	3.2	.31	1.0	.01	0	0	2.6
28	1.0	1.3	3.0	.76	1.5	3.2	.20	.10	.01	.01	0	2.9
29	.89	1.0	1.0	.76	1.1	3.4	.13	----------	.01	.01	0	3.8
30	.89	.89	1.4	.70	.97	1.3	.11	----------	0	0	0	3.4
31	.83	.76	----------	2.9	----------	.64	.09	----------	0	----------	0	----------
Total	46.70	45.78	33.54	48.50	60.79	55.57	10.67	6.91	0.29	0.02	0.76	25.60
Mean												
Mgd	1.51	1.48	1.12	1.56	2.03	1.79	0.344	0.247	0.009	0.001	0.025	0.853
Cfs	2.34	2.29	1.73	2.41	3.14	2.77	0.532	0.382	0.014	0.002	0.039	1.32
Ac-ft	143	140	103	149	187	171	33	21	0.9	0.06	2.3	79
Max	3.9	4.3	3.0	5.3	3.9	3.4	0.64	1.0	0.01	0.01	0.60	3.8
Min	0.83	0.76	0.70	0.70	0.76	0.64	0.09	0.01	0	0	0	0

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max 5.3 Min 0 Mean (mgd) 0.918 Mean (cfs) 1.42 Ac-ft 1030

16-4053. Molokai tunnel at west portal

Location.--lat 21°07'27", long 156°59'50", on left bank 50 ft upstream from west portal, 2.5 miles northeast of Kaunakakai, and 4.7 miles south of Kalaupapa.

Records available.--July 1965 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from tunnel plans).

Extremes.--1965-67: Maximum daily discharge, 7.2 mgd (11 cfs) Oct. 15, 1966; minimum daily, 1.6 mgd (2.5 cfs) Sept. 19-27, 1965, Mar. 1-18, 1967.

Remarks.--Records excellent except those for periods of no gage-height record, which are fair. Tunnel diverts from Waikolu Stream and a tributary, and diversion is augmented by water pumped from two wells in Waikolu Valley near east portal and one well in the tunnel below east portal. Water is used for irrigation in west-central Molokai.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.4	2.8	2.8	3.1	4.6	2.4	2.0	1.9	1.6	1.8	1.9	1.9
2	5.0	2.8	2.8	2.6	3.9	2.4	2.0	1.9	1.6	1.8	1.9	1.9
3	3.9	2.8	2.8	2.5	4.6	2.4	2.0	1.9	1.6	1.8	1.9	1.9
4	3.1	3.0	2.6	2.5	5.6	2.3	2.0	1.9	1.6	1.8	1.9	1.9
5	2.9	3.4	2.6	2.5	4.5	2.4	2.0	1.9	1.6	1.8	1.9	1.9
6	3.3	5.5	2.8	4.3	4.8	5.0	2.0	1.9	1.6	1.8	1.9	1.9
7	3.9	3.5	3.4	3.8	4.1	5.0	2.0	1.9	1.6	1.8	1.9	1.9
8	3.3	3.9	2.9	3.1	3.5	4.6	2.0	1.9	1.6	1.8	1.9	1.9
9	3.1	3.3	2.8	2.8	3.9	3.5	2.0	2.0	1.6	1.8	1.9	1.9
10	3.1	3.0	4.1	2.6	4.6	3.1	2.0	2.3	1.6	1.8	1.9	2.3
11	2.9	3.0	4.4	3.1	5.9	2.7	2.0	2.2	1.6	1.8	1.9	2.6
12	2.9	3.0	3.4	3.1	5.6	2.5	2.0	2.2	1.6	1.8	1.9	2.6
13	2.9	3.1	3.3	2.8	4.1	4.0	2.0	2.2	1.6	1.8	1.9	2.5
14	4.4	3.1	3.6	3.3	3.3	4.0	2.0	2.4	1.6	1.8	1.9	2.5
15	4.3	3.7	3.9	7.2	3.1	3.1	2.0	2.3	1.6	1.8	1.9	2.5
16	3.8	3.1	2.8	7.0	3.7	2.7	2.0	2.2	1.6	1.8	1.9	2.5
17	3.9	5.0	2.6	6.3	3.4	2.5	2.1	2.2	1.6	1.8	1.9	2.6
18	5.3	4.0	2.5	3.8	3.0	3.5	1.8	2.2	1.6	1.8	1.9	2.6
19	3.8	3.0	2.6	3.3	2.8	4.6	2.0	2.0	1.7	1.8	1.9	2.6
20	3.6	2.9	2.9	4.1	2.7	3.5	2.0	2.0	1.7	1.8	1.9	2.5
21	3.3	2.8	2.6	4.6	2.7	4.7	2.0	2.0	1.7	1.8	1.9	2.5
22	3.1	3.1	2.5	4.5	3.5	5.2	1.9	1.9	1.7	1.8	1.9	2.6
23	3.0	3.2	2.5	3.0	5.0	4.7	1.8	2.0	1.7	1.8	1.9	2.6
24	4.1	5.5	2.4	3.0	5.0	3.2	1.9	1.9	1.7	1.8	1.9	2.6
25	5.9	6.3	2.4	2.9	5.0	2.6	2.2	1.9	1.7	1.8	2.5	2.8
26	4.3	4.3	2.4	2.9	4.0	3.1	2.0	1.9	1.8	1.8	1.9	2.9
27	3.2	4.1	2.4	2.8	4.8	5.2	2.0	2.7	1.8	1.8	1.9	4.6
28	3.0	3.4	5.0	2.8	3.5	5.2	2.0	1.8	1.8	1.8	1.9	5.1
29	2.9	3.1	2.9	2.8	2.7	5.4	1.9	----------	1.8	1.8	1.9	5.9
30	2.9	2.9	3.6	2.7	2.5	3.3	1.9	----------	1.8	1.8	1.9	5.1
31	2.8	2.8	----------	5.0	----------	2.1	1.9	----------	1.8	----------	1.9	----------
Total	111.3	109.4	90.3	110.8	120.4	110.9	61.4	57.5	51.5	54.0	59.5	81.6
Mean												
Mgd	3.59	3.53	3.01	3.57	4.01	3.58	1.98	2.05	1.66	1.80	1.92	2.72
Cfs	5.55	5.46	4.66	5.52	6.20	5.54	3.06	3.17	2.57	2.79	2.97	4.21
Ac-ft	342	336	277	340	369	340	188	176	158	166	183	250
Max	5.9	6.3	5.0	7.2	5.9	5.4	2.2	2.7	1.8	1.8	2.5	5.9
Min	2.8	2.8	2.4	2.5	2.5	2.1	1.8	1.8	1.6	1.8	1.9	1.9

Calendar Year 1966: Max 7.2 Min 1.7 Mean (mgd) 2.76 Mean (cfs) 4.27 Ac-ft 3090
Fiscal Year 1966-67: Max 7.2 Min 1.6 Mean (mgd) 2.79 Mean (cfs) 4.32 Ac-ft 3130

Note.--No gage-height record July 21 to Aug. 24, Oct. 22 to Jan. 18.

16-4055. Waikolu Stream at altitude 900 ft, near Kalaupapa

Location.--lat 21°08'43", long 156°55'18", on right bank 1.8 miles southwest of Haupu Bay, 2.3 miles upstream from mouth, and 5.2 miles southeast of Kalaupapa.

Drainage area.--1.99 sq mi.

Records available.--May 1956 to October 1961, July 1962 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 900 ft (from topographic map). Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

Average discharge.--10 years, 6.58 mgd (10.2 cfs).

Extremes.--Maximum discharge during year, 1,890 mgd (2,920 cfs) Nov. 4 (gage height, 6.03 ft), from rating curve extended above 14 mgd as explained below; minimum, 0.45 mgd (0.70 cfs) Oct. 8-14.
1956-61, 1962-67: Maximum discharge, 1.960 mgd (3,030 cfs) Apr. 13, 1965 (gage height, 6.12 ft), from rating curve extended above 14 mgd on basis of approximate gage height for flood of Oct. 31, 1961; minimum, 0.32 mgd (0.50 cfs) Jan. 15, 16, 1963.
Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum (discharge, 4,020 mgd or 6,220 cfs, by slope-area measurement of peak flow).

Remarks.--Records good except those above 30 mgd, which are poor. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.5	0.63	0.63	0.54	2.1	0.54	8.5	1.3	4.3	22	2.1	5.0
2	5.8	.75	.63	.54	3.7	.54	20	1.3	3.4	11	2.1	3.2
3	1.9	.63	.63	.54	15	.63	21	1.2	2.1	5.4	2.5	2.3
4	.87	.75	.63	.54	205	.63	66	1.2	1.9	5.7	2.3	2.1
5	.75	.87	.63	.54	17	.75	21	1.3	1.7	13	2.1	1.9
6	1.2	1.2	.75	11	21	48	4.3	1.3	13	3.7	2.3	1.9
7	1.5	.87	.63	.87	.87	7.3	2.5	1.2	67	25	2.5	1.7
8	.54	1.0	.63	.54	.54	1.3	7.7	1.2	4.3	46	2.3	1.7
9	.54	.75	.54	.45	1.2	.63	8.0	1.5	2.1	7.7	2.1	1.7
10	.54	.63	2.8	.45	2.1	.63	1.9	40	3.2	10	2.1	1.2
11	.54	.63	.87	.75	9.9	.63	50	5.6	2.9	54	1.9	.87
12	.54	.63	.63	.45	8.2	.63	54	8.7	2.1	4.3	3.9	.87
13	.54	.75	.63	.45	.75	1.3	2.5	3.4	2.1	3.4	8.9	.75
14	1.6	.75	.63	3.5	.63	.87	1.9	2.1	2.7	18	3.8	.75
15	1.0	1.0	.63	66	.63	.63	1.7	33	1.9	5.8	2.3	.75
16	.75	1.0	.63	67	.63	.63	1.5	8.0	1.3	2.9	2.1	.75
17	1.2	2.3	.63	10	.63	.63	1.5	2.1	34	2.3	15	.75
18	2.1	1.2	.63	1.0	.63	8.0	2.1	2.5	4.6	2.1	69	.75
19	.75	.75	.63	.63	.63	2.2	3.4	1.7	2.1	2.1	12	.75
20	.63	.63	.63	1.3	.63	1.0	3.4	1.5	1.9	1.9	6.5	.75
21	.63	.63	.63	.63	.63	6.5	1.7	1.3	2.3	1.9	3.2	.75
22	.54	.75	.63	.54	1.0	7.3	1.5	1.2	101	1.9	2.3	.63
23	.54	.63	.63	.54	1.8	2.0	1.3	1.2	15	1.9	2.1	.63
24	22	1.2	.63	.54	1.8	.54	4.5	1.2	53	1.9	1.9	.63
25	21	2.9	.63	.54	1.8	.54	89	1.2	35	1.9	1.3	.63
26	3.5	.54	.63	.54	1.1	.75	3.4	1.2	13	1.9	1.9	.63
27	1.2	.54	.63	.54	1.7	15	2.1	154	11	2.1	2.9	2.1
28	.75	.54	4.9	.54	.54	39	1.7	24	4.0	4.5	2.3	.63
29	.63	.54	.54	.54	.54	13	1.5	----------	2.7	4.4	2.1	1.3
30	.63	.54	.54	.54	.54	12	1.3	----------	2.5	2.3	1.9	4.1
31	.63	.54	----------	38	----------	14	1.3	----------	9.6	----------	1.9	----------
Total	76.84	27.07	25.43	210.58	303.22	188.10	392.2	305.4	407.7	271.0	171.6	42.47
Mean												
Mgd	2.48	0.873	0.848	6.79	10.1	6.07	12.7	10.9	13.2	9.03	5.54	1.42
Cfs	3.84	1.35	1.31	10.5	15.6	9.39	19.6	16.9	20.4	14.0	8.57	2.20
Ac-ft	236	83	78	646	931	577	1,200	937	1,250	832	527	130
Max	22	2.9	4.9	67	205	48	89	154	101	54	69	5.0
Min	0.54	0.54	0.54	0.45	0.54	0.54	1.3	1.2	1.3	1.9	1.3	0.63

Calendar Year 1966: Max 205 Min 0.45 Mean (mgd) 5.48 Mean (cfs) 8.48 Ac-ft 6,140
Fiscal Year 1966-67: Max 205 Min 0.45 Mean (mgd) 6.63 Mean (cfs) 10.3 Ac-ft 7,430

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	1030	3.42	362	560	2-27	0800	3.42	362	560
11- 4	1630	6.03	1,890	2,920	3- 7	0800	3.56	411	636
12-28	2230	3.73	477	738	3-17	1530	3.82	512	792
1-12	0100	3.85	524	811	3-22	1900	4.10	627	970
1-25	0600	3.39	352	545					

16-4080. Waikolu Stream below pipeline crossing, near Kalaupapa

Location.--Lat 21°09'45", long 156°55'54", on left bank 0.7 mile upstream from mouth and 4.4 miles southeast of Kalaupapa Lighthouse.

Drainage area.--3.68 sq mi.

Records available.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to June 1967. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

Gage.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Aug. 14, 1931, at site 500 ft upstream at different datums. Sept. 20, 1937, to Jan. 25, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher, than present datum.

Average discharge.--38 years (1919-30, 1938-47, 1949-67), 12.0 mgd (18.6 cfs).

Extremes.--Maximum discharge during year, 837 mgd (1,300 cfs) Nov. 4 (gage height, 5.99 ft), from rating curve extended above 23 mgd as explained below; minimum, 3.9 mgd (6.0 cfs) Oct. 14, Nov. 29 to Dec. 1.
1919-32, 1937-67: Maximum discharge (corrected), 4,270 mgd (6,600 cfs) Oct. 31, 1961 (gage height, 13.75 ft, present datum, from floodmarks), from rating curve extended above 23 mgd on basis of slope-area measurement of peak flow; minimum, 1.3 mgd (2.0 cfs) Nov. 1, 2, 1925, June 5, 1926.

Remarks.--Records fair. Diversion above station for domestic use in Kalaupapa and, since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.5	4.6	4.3	4.1	7.6	3.9	10	6.0	11	22	6.6	8.3
2	8.2	4.6	4.3	4.1	6.7	4.1	19	5.9	9.6	14	6.6	7.2
3	6.1	4.6	4.3	4.1	14	4.1	19	5.9	7.8	9.7	6.8	6.3
4	5.0	4.7	4.3	4.1	113	4.1	67	5.9	7.5	9.5	6.7	6.2
5	4.8	4.8	4.3	4.1	25	4.1	23	5.9	7.3	15	6.4	6.0
6	5.0	4.9	4.6	11	21	41	7.2	6.0	13	8.0	6.6	6.0
7	5.5	4.8	4.4	4.6	6.0	12	5.5	5.9	61	30	6.6	6.0
8	4.8	4.6	4.3	4.2	5.7	5.0	8.8	5.9	10	44	6.4	6.0
9	4.8	4.6	4.3	4.1	6.5	4.3	11	6.7	7.7	12	6.3	5.9
10	4.8	4.6	7.1	4.1	7.2	4.2	4.7	37	8.3	13	6.2	5.6
11	4.7	4.6	4.8	4.3	15	4.2	30	11	8.2	52	6.2	5.3
12	4.7	4.6	4.4	4.1	12	4.3	42	12	7.3	9.4	7.7	5.2
13	4.7	4.6	4.3	4.1	5.0	4.9	6.3	8.0	7.5	8.3	11	5.0
14	5.5	4.6	4.3	5.6	4.5	4.6	5.6	6.6	8.0	24	7.9	5.0
15	5.2	4.8	4.3	50	4.5	4.2	4.5	27	7.0	11	6.4	5.2
16	4.9	4.9	4.2	53	4.5	4.1	4.5	12	6.6	8.0	6.3	5.2
17	5.0	5.7	4.2	13	4.5	4.1	4.5	6.4	30	7.5	15	5.0
18	6.1	4.9	4.2	4.8	4.5	9.8	5.0	6.8	9.6	7.0	61	5.0
19	4.9	4.6	4.2	4.6	4.5	5.7	6.1	6.2	7.2	6.8	15	4.9
20	4.8	4.6	4.1	5.0	4.5	4.3	6.6	6.0	6.8	6.8	10	4.9
21	4.7	4.4	4.1	4.6	4.5	7.5	5.2	5.9	7.9	6.7	7.5	4.9
22	4.7	4.7	4.1	4.3	5.0	11	4.9	5.9	84	6.7	6.7	4.9
23	4.6	4.4	4.1	4.2	6.0	5.7	4.8	5.6	19	6.6	6.4	4.9
24	19	4.8	4.1	4.2	6.0	4.2	6.9	5.8	50	6.6	6.3	4.9
25	19	6.9	4.1	4.3	6.0	4.1	69	5.8	51	6.4	6.0	5.0
26	6.9	4.9	4.1	4.2	5.0	4.2	9.3	5.8	23	6.4	6.2	4.9
27	5.0	4.6	4.2	4.2	6.0	16	7.2	137	15	6.4	6.8	6.5
28	4.7	4.4	6.4	4.2	4.0	38	6.6	40	9.2	8.6	6.4	5.0
29	4.6	4.3	4.1	4.2	4.0	21	6.4	----------	7.7	9.4	6.3	5.7
30	4.6	4.3	4.1	4.1	3.9	13	6.3	----------	7.2	6.8	6.2	9.1
31	4.6	4.3	----------	37	----------	15	6.2	----------	12	----------	6.2	----------
Total	187.4	146.7	132.6	276.5	326.6	276.7	423.1	404.9	527.4	388.6	282.7	170.0
Mean											9.12	5.67
Mgd	6.05	4.73	4.42	8.92	10.9	8.93	13.6	14.5	17.0	13.0	14.1	8.77
Cfs	9.36	7.32	6.84	13.8	16.9	13.8	21.0	22.4	26.3	20.1	868	522
Ac-ft	575	450	407	849	1,000	849	1,300	1,240	1,620	1,190	61	9.1
Max	19	6.9	7.1	53	113	41	69	137	84	52	6.0	4.9
Min	4.6	4.3	4.1	4.1	3.9	3.9	4.5	5.6	6.6	6.4		

Calendar Year 1966: Max 113 Min 3.9 Mean (mgd) 8.75 Mean (cfs) 13.5 Ac-ft 9800
Fiscal Year 1966-67: Max 113 Min 3.9 Mean (mgd) 9.71 Mean (cfs) 15.0 Ac-ft 10870

Peak discharge (base, 450 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
11-4	1630	5.99	837	1,300

16-4114. Kakaako Gulch near Mauna Loa

Location.--Lat 21°10'39", long 157°12'31", on left bank 1.0 mile downstream from Karakahi Gulch and 3.0 miles north of Mauna Loa School.

Drainage area.--5.34 sq mi.

Records available.--July 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 300 ft (from topographic map).

Extremes.--Maximum discharge during year, 495 mgd (766 cfs) May 13 (gage height, 3.34 ft), from rating curve based on slope-area measurements at gage heights 0.72, 1.43 and 6.28 ft; no flow most of the time.
1963-67: Maximum discharge, 1,140 mgd (1,760 cfs) Nov. 12, 1965 (gage height, 6.28 ft), from rating curve based on slope-area measurements at gage heights 0.72, 1.43 and 6.28 ft; no flow most of the time each year.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1					0	0	0	0	0	0	0	
2					0	0	0	0	0	0	0	
3					0	0	0	0	0	0	0	
4					48	0	0	0	0	0	0	
5					27	.44	0	0	0	0	0	
6					0	6.7	0	0	0	0	0	
7					0	0	0	0	23	0	4.0	
8					0	0	0	0	0	0	1.9	
9					0	0	0	0	0	0	0	
10					0	0	0	.32	0	0	0	
11					0	0	0	1.2	0	0	0	
12					0	0	1.9	0	0	2.4	1.9	
13					0	0	2.8	0	0	20	29	
14					0	0	3.0	0	0	7.2	0	
15					0	0	0	0	0	0	0	
16					0	0	0	0	0	0	0	
17					0	0	0	0	15.3	0	0	
18					0	0	0	0	0	0	0	
19					0	0	0	0	0	0	0	
20					0	0	0	0	0	0	0	
21					0	0	0	0	0	0	0	
22					0	0	0	0	0	0	0	
23					0	0	0	0	3.1	0	0	
24					0	0	0	0	.06	0	0	
25					0	0	.56	0	0	0	0	
26					0	0	0	0	0	0	0	
27					0	0	0	0	0	0	0	
28					0	0	0	0	0	0	0	
29					0	.84	0	---	0	0	0	
30					0	0	0	---	0	0	0	
31			---		---	0	1.6	---	0	---	0	---
Total	0	0	0	0	75	7.98	9.86	1.52	41.46	29.6	36.8	0
Mean												
Mgd	0	0	0	0	2.5	0.257	0.318	0.054	1.34	0.99	1.19	0
Cfs	0	0	0	0	3.9	0.398	0.492	0.084	2.07	1.53	1.84	0
Ac-ft	0	0	0	0	230	24	30	4.7	127	91	113	0
Max	0	0	0	0	48	6.7	3.0	1.2	23	20	29	0
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 48 Min 0 Mean (mgd) 0.442 Mean (cfs) 0.684 Ac-ft 495
Fiscal Year 1966-67: Max 48 Min 0 Mean (mgd) 0.554 Mean (cfs) 0.857 Ac-ft 620

Peak discharge (base, 190 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	1700	2.70	357	552	4-13	1230	3.26	477	738
11- 5	2000	2.84	386	597	4-14	1700	2.07	231	357
3- 7	0400	2.74	365	565	5-13	1230	3.34	495	766
3-24	0030	1.93	205	317					

16-4140. Kaunakakai Gulch at Kaunakakai

Location.--lat 21°06'21", long 157°00'34", on left bank 0.6 mile upstream from Molokai Ranch pipeline crossing, 1.3 miles northeast of Kaunakakai Post Office, and 1.7 miles upstream from mouth.

Drainage area.--6.57 sq mi.

Records available.--December 1949 to June 1967. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

Gage.--Water-stage recorder. Altitude of gage is 240 ft (from topographic map).

Average discharge.--15 years (1950-65), 1.01 mgd (1.56 cfs).

Extremes.--Maximum discharge during year, 915 mgd (1,420 cfs) Nov. 4 (gage height, 7.18 ft), from rating curve extended above 49 mgd on basis of slope-area measurement at gage height 9.30 ft; no flow for many days.
1949-67: Maximum discharge, 1,980 mgd (3,060 cfs) Oct. 31, 1961 (gage height, 9.30 ft), from rating curve extended above 400 mgd on basis of slope-area measurement of peak flow; no flow at times each year.

Remarks.--Records fair. Since May 20, 1965, records include diversion from Molokai tunnel. No other diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.39	0.78	0	0.68	2.8	0.36	0	0	0.10	0	0	0
2	1.3	.60	.08	.60	.87	.08	0	0	0	0	0	0
3	.57	.51	.21	.70	1.6	.56	.14	0	0	0	0	0
4	0	.05	.79	.33	98	.53	13	0	0	0	0	0
5	.16	.53	1.3	.21	8.4	.61	2.2	0	0	0	0	0
6	.64	1.3	.67	1.4	12	15	.24	0	0	0	0	0
7	1.0	1.2	.61	1.3	1.7	6.3	0	0	27	0	0	0
8	.73	1.3	.34	.66	1.1	1.6	0	0	1.2	1.4	0	0
9	.91	.76	.30	.58	1.0	.95	0	0	0	.05	0	0
10	.79	.61	1.0	1.4	1.4	.72	0	3.4	0	0	0	0
11	.93	.68	2.0	.99	2.2	.61	5.5	.29	0	15	0	0
12	.69	.39	1.2	1.0	2.4	.56	52	0	0	.22	0	0
13	.66	.22	.68	.59	1.5	.83	.90	0	0	0	0	0
14	1.5	.49	.77	.53	.99	1.2	0	0	0	.27	0	0
15	1.4	.74	1.0	3.9	.76	.80	0	0	0	.98	0	0
16	1.0	.40	.18	11	.95	.61	0	0	0	0	0	0
17	.99	.94	.22	5.1	1.0	.56	0	0	2.0	0	0	0
18	2.2	1.6	.84	1.1	.80	.72	0	0	.72	0	29	0
19	1.3	.64	.29	.69	.69	.82	0	0	0	0	3.8	0
20	.87	.61	.56	1.4	.66	0	0	0	0	0	.12	0
21	.43	.71	.39	1.8	.63	0	0	0	0	0	0	0
22	.41	.79	.50	.66	.63	0	0	0	23	0	0	0
23	.28	.72	.15	1.2	1.9	0	0	0	7.5	0	0	0
24	.54	2.1	.35	1.2	1.7	0	0	0	14	0	0	0
25	3.0	2.8	.45	.91	1.8	0	38	0	2.7	0	0	0
26	2.0	.88	.66	.84	1.8	0	.94	0	1.3	0	0	0
27	.80	.49	.16	1.2	1.7	0	0	18	0	0	0	0
28	.31	.61	2.1	.65	1.3	0	0	4.6	0	0	0	0
29	.70	.59	.81	.24	.87	4.1	0	----------	0	0	0	.05
30	.65	.76	1.3	.38	.64	.37	0	----------	0	----------	0	----------
31	.81	.18	----------	1.8	----------	.17	0	----------	0			
Total	27.96	24.98	19.91	45.04	153.79	38.06	112.92	26.29	79.52	17.92	32.92	0.05
Mean Mgd	0.902	0.806	0.664	1.45	5.13	1.23	3.64	0.939	2.57	0.597	1.06	0.002
Cfs	1.40	1.25	1.03	2.24	7.94	1.90	5.63	1.45	3.98	0.924	1.64	0.003
Ac-ft	86	77	61	138	472	117	347	81	244	55	101	0.2
Max	3.0	2.8	2.1	11	98	15	52	18	27	15	29	0.05
Min	0	0.05	0	0.21	0.63	0	0	0	0	0	0	0

Calendar Year 1966: Max 98 Min 0 Mean (mgd) 1.35 Mean (cfs) 2.09 Ac-ft 1510
Fiscal Year 1966-67: Max 98 Min 0 Mean (mgd) 1.59 Mean (cfs) 2.46 Ac-ft 1780

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	1830	7.18	915	1,420	3- 7	1000	4.78	182	282
1-12	0200	5.36	304	470	3-22	2100	4.87	198	306
1-25	0800	4.87	198	306	3-24	0430	4.45	132	204

16-4150. East Fork Kawela Gulch near Kamalo

Location.--Lat 21°06'46", long 156°54'23", on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo, and 7.6 miles northeast of Kaunakakai.

Drainage area.--0.45 sq mi.

Records available.--September 1946 to June 1967. Published as Right Branch of East Fork Kawela Stream near Kamalo prior to July 1958 and as Right Branch of East Fork Kawela Gulch near Kamalo July 1958 to June 1960.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey bench mark).

Average discharge.--20 years (1947-67), 1.53 mgd (2.37 cfs).

Extremes.--Maximum discharge during year, 569 mgd (880 cfs) Nov. 4 (gage height, 6.13 ft), from rating curve extended above 4.3 mgd as explained below; no flow for many days.
1946-67: Maximum discharge, 1,460 mgd (2,260 cfs) Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended above 4.3 mgd on basis of slope-area measurement at gage height 6.50 ft; no flow at times each year.

Remarks.--Records fair. Molokai Ranch diverts from gage pool.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.30	0	0	0.05	1.1	0	4.3	0.09	1.2	5.1	0	1.7
2	1.0	0	0	0	.01	0	6.1	.07	1.1	4.3	0	.74
3	.30	.01	0	0	2.6	0	9.5	.04	.40	1.6	.42	.08
4	.20	.46	0	0	36	0	15	.02	.29	1.4	.06	.01
5	.10	.51	0	0	7.2	0	3.0	.22	.26	4.0	0	0
6	.20	1.1	.03	1.9	4.5	10	1.0	.29	7.4	.49	.34	0
7	.30	.35	.48	.49	.52	3.0	.64	.08	16	4.7	.22	0
8	0	1.2	0	.08	.04	.72	2.9	.02	1.3	5.3	.21	0
9	0	.05	0	0	1.0	.06	2.0	.21	.64	1.6	0	0
10	0	0	.93	.05	1.9	0	.40	12	.88	3.7	0	0
11	0	.24	.46	.55	4.3	0	13	1.8	1.2	12	0	0
12	0	.13	.70	.08	3.6	0	12	3.1	.40	.56	.20	0
13	.37	.85	.05	0	.37	1.3	.43	1.4	.23	1.6	3.8	0
14	2.7	.37	.88	2.8	.02	.49	.20	.80	.56	1.3	1.1	0
15	1.3	.80	.34	13	0	.01	.02	11	.03	.76	.26	0
16	.64	.26	0	15	1.4	0	0	2.6	0	.18	.31	0
17	1.9	2.6	0	3.7	.84	0	0	.37	5.7	0	5.9	0
18	2.2	.64	0	.37	.15	4.5	1.2	1.3	1.1	0	19	0
19	.49	.14	.60	.08	0	1.2	1.9	.22	.31	0	3.9	0
20	.34	.03	.22	1.5	0	.07	1.3	.16	.18	0	1.8	0
21	.20	.11	0	.68	0	1.0	.17	.07	.29	0	.64	0
22	.09	.84	0	.11	.27	3.3	0	0	22	0	.17	0
23	0	.40	0	.03	1.3	1.2	0	.14	4.1	0	0	0
24	6.5	1.7	0	.01	2.3	.11	1.9	.24	11	0	0	0
25	4.8	1.7	0	.03	2.0	0	22	.14	6.3	0	.75	.26
26	1.3	.76	0	.16	1.4	1.5	1.2	0	2.1	0	.29	.37
27	.18	.49	1.2	.07	1.4	8.7	.56	18	3.2	0	.42	3.9
28	0	.05	2.4	.02	.34	7.8	.37	4.6	.60	0	.11	.49
29	0	0	.04	.01	0	4.1	.22	----------	.11	.29	0	.93
30	0	0	.64	.01	0	5.5	.16	----------	0	0	0	.26
31	0	0	----------	2.3	----------	5.1	.13	----------	4.8	----------	.16	----------
Total	25.41	15.79	8.97	43.08	74.56	59.66	101.60	58.98	93.68	48.88	40.06	8.74
Mean												
Mgd	0.820	0.509	0.299	1.39	2.49	1.92	3.28	2.11	3.02	1.63	1.29	0.291
Cfs	1.27	0.788	0.463	2.15	3.85	2.97	5.07	3.26	4.67	2.52	2.00	0.450
Ac-ft	78	48	28	132	229	183	312	181	287	150	123	26
Max	6.5	2.6	2.4	15	36	10	22	18	22	12	19	3.9
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 36 Min 0 Mean (mgd) 1.11 Mean (cfs) 1.72 Ac-ft 1,240
Fiscal Year 1966-67: Max 36 Min 0 Mean (mgd) 1.59 Mean (cfs) 2.46 Ac-ft 1,780

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-4	1600	6.13	569	880	3-22	1830	4.26	109	169

16-4160. Punaula Gulch near Pukoo

Location.--lat 21°05'50", long 156°48'48", on right bank 1.8 miles northwest of Pukoo and 5.2 miles northeast of Kamalo.

Drainage area.--0.24 sq mi.

Records available.--March 1947 to June 1967. Prior to July 1958, published as Punaula Stream near Pukoo.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--20 years, 0.820 mgd (1.27 cfs).

Extremes.--Maximum discharge during year, 261 mgd (404 cfs) Nov. 4 (gage height, 5.26 ft), from rating curve extended above 9.0 mgd as explained below; minimum, 0.03 mgd (0.05 cfs) on several days.
1947-67: Maximum discharge, 368 mgd (569 cfs) Feb. 4, 1965 (gage height, 7.17 ft), from rating curve extended above 9.0 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) Mar. 13, 1947, Feb. 19, 1954.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.23	0.06	0.09	0.09	0.37	0.11	1.6	0.06	0.49	3.6	0.08	0.64
2	1.5	.05	.08	.07	.48	.10	1.9	.52	.34	1.6	.17	.17
3	.50	.07	.10	.06	.28	.13	1.9	.53	.21	.53	.47	.06
4	.30	.26	.07	.05	34	.07	3.8	.13	1.1	4.0	.13	.10
5	.20	.17	.07	.05	2.3	.07	1.4	.31	.49	.69	.07	.05
6	.30	.26	.26	2.2	6.0	5.4	.49	.26	3.9	.31	.07	.04
7	.35	.10	.16	.49	.92	1.0	.26	.08	4.1	7.1	.06	.05
8	.10	1.2	.07	.19	.69	.23	.69	.07	.74	1.3	.09	.04
9	.07	.21	.09	2.2	1.0	.13	.49	.07	.26	.49	.06	.05
10	.07	.09	3.4	5.0	1.3	.07	.17	4.8	.86	.81	.05	.09
11	.07	.40	.43	5.0	3.2	.07	.69	.81	.31	2.1	.05	.04
12	.07	.19	.98	.40	3.0	.06	4.2	.23	.21	.34	5.3	.04
13	.37	2.0	.21	.17	.57	.46	.28	.21	.53	.37	.69	.03
14	.92	.31	1.1	2.4	.34	.17	.19	.13	.61	.31	.17	.03
15	.49	.81	.34	6.4	2.0	.07	.16	.74	.19	.23	.09	.03
16	.19	1.4	.16	5.6	9.3	.06	.13	.23	.14	.16	.07	.03
17	.31	3.1	.11	1.3	1.1	.05	.11	.13	2.7	.13	3.1	.04
18	.28	.43	.11	.34	.34	.10	.31	.69	.31	.10	3.6	.04
19	.16	.17	.49	.21	.23	.09	.31	.16	.11	.09	2.6	.03
20	.13	.11	.16	.53	.17	.05	.26	.13	.10	.08	1.4	.03
21	.09	.09	.11	.34	.21	.07	.14	.08	1.0	.07	.19	.03
22	.07	.61	.10	.23	.31	.43	.09	.07	17	.08	.09	.04
23	.07	.28	.07	.34	.19	.37	.08	.07	2.4	3.9	.07	.03
24	3.9	2.1	.07	.19	.19	.31	.09	.08	5.0	.21	.06	.03
25	3.9	1.7	.07	.14	.16	.07	15	.40	4.6	.11	.23	.08
26	.43	.81	.06	.13	.21	.19	.37	.09	5.0	.08	.37	.05
27	.16	.43	1.4	.10	1.3	1.8	.34	13	2.9	.07	.32	.31
28	.10	.17	1.2	.09	1.0	2.2	.21	1.8	.57	.22	.11	.23
29	.07	.40	.14	.08	.37	.65	.09	----------	.34	.30	.07	.58
30	.07	.21	.19	.07	.19	1.3	.07	----------	.49	.08	.07	.88
31	.06	.11	----------	.31	----------	1.2	.07	----------	2.1	----------	.05	----------
Total	15.53	18.30	11.89	34.77	71.72	17.08	35.89	25.88	59.10	29.46	19.95	3.89
Mean												
Mgd	0.501	0.590	0.396	1.12	2.39	0.551	1.16	0.924	1.91	0.982	0.644	0.130
Cfs	0.775	0.913	0.613	1.73	3.70	0.853	1.79	1.43	2.96	1.52	0.996	0.201
Ac-ft	48	56	36	107	220	52	110	79	181	90	61	12
Max	3.9	3.1	3.4	6.4	34	5.4	15	13	17	7.1	5.3	0.88
Min	0.06	0.05	0.06	0.05	0.16	0.05	0.07	0.06	0.10	0.07	0.05	0.03

Calendar Year 1966: Max 34 Min 0.03 Mean (mgd) 0.781 Mean (cfs) 1.21 Ac-ft 875
Fiscal Year 1966-67: Max 34 Min 0.03 Mean (mgd) 0.941 Mean (cfs) 1.46 Ac-ft 1,050

Peak discharge (base, 85 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	1730	5.26	261	404	1-12	0200	3.95	150	232
11- 6	2000	4.30	184	285	3-22	1100	3.72	128	198
11-16	1930	4.00	155	240	5-12	1730	4.72	220	340

16-4195. Papio Gulch at Halawa

Location.--Lat 21°08'55", long 156°44'16", on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mile south of Halawa.

Drainage area.--0.94 sq mi.

Records available.--July 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 640 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,100 mgd (1,700 cfs) Nov. 4 (gage height, 8.53 ft), from rating curve extended above 11 mgd as explained below; no flow Sept. 26 to Oct. 1, Oct. 5-8.
1963-67: Maximum discharge, 1,760 mgd (2,720 cfs) Apr. 13, 1965 (gage height, 11.25 ft), from rating curve extended above 11 mgd on basis of slope-area measurements at gage heights 4.60, 7.15, and 11.25 ft; no flow at times each year.

Remarks.--Records good. Diversion above station for domestic use at Puu O Hoku Ranch.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.24	0.06	0.13	0	0.12	0.18	0.16	0.20	0.20	1.3	0.44	0.26
2	.39	.06	.13	.01	2.7	.20	.16	.20	.16	1.2	.41	.22
3	.50	.05	.12	.02	.70	.17	.20	.22	.14	.78	.41	.20
4	.22	.05	.10	.01	51	.16	.17	.22	.18	1.3	.39	.18
5	.16	.05	.06	0	2.5	.16	.16	.28	.24	.75	.38	.18
6	.18	.05	.08	0	2.7	.80	.16	.34	.22	.65	.38	.17
7	.36	.04	.09	0	1.9	2.1	.16	.18	2.7	1.6	.38	.17
8	.28	.05	.06	0	.54	.30	.14	.16	.75	.92	.36	.16
9	.24	.05	.05	2.6	.64	.22	.13	.16	.48	.72	.36	.16
10	.16	.09	.35	2.8	1.4	.18	.10	1.2	.44	.72	.20	.16
11	.12	.12	.30	7.3	2.2	.18	.12	1.3	.48	.78	.17	.17
12	.13	.10	.13	.70	.85	.17	.47	.39	.48	.60	.22	.22
13	.14	.42	.09	.30	.52	.18	.20	.24	1.1	1.0	.20	.22
14	.16	.24	.06	.18	.39	.17	.16	.18	.75	3.3	.14	.22
15	.14	.12	.06	3.2	.28	.16	.14	.17	.39	1.0	.17	.24
16	.12	.14	.05	1.6	.48	.14	.14	.17	.34	.65	.17	.22
17	.10	.81	.04	1.1	.39	.14	.13	.16	1.5	.57	.22	.22
18	.10	.30	.03	.48	.22	.13	.12	.14	.72	.54	1.1	.20
19	.10	.14	.03	.30	.20	.12	.12	.13	.39	.46	1.4	.17
20	.12	.08	.05	.22	.18	.10	.10	.13	.36	.44	2.1	.16
21	.08	.06	.04	.28	.18	.12	.10	.10	.57	.38	.38	.16
22	.05	.08	.04	.28	.18	.12	.09	.08	19	.41	.24	.14
23	.05	.08	.04	.24	.17	.12	.09	.09	7.1	1.8	.2	.13
24	.06	.35	.03	.22	.17	.10	.09	.10	7.5	.54	.17	.12
25	1.4	1.5	.01	.17	.16	.09	3.5	.10	5.4	.46	.22	.13
26	.24	.50	0	.13	.16	.10	.80	.13	2.6	.46	.18	.12
27	.24	.48	0	.13	.18	.13	.95	.93	2.2	.44	.18	.16
28	.17	.26	0	.12	.17	.32	.36	.50	1.2	.48	.18	.17
29	.12	.20	0	.09	.16	1.3	.28	----------	1.0	.57	.20	.24
30	.12	.18	0	.06	.16	.22	.24	----------	.88	.46	.20	.34
31	.13	.16	----------	.06	----------	.17	.22	----------	.88	----------	.25	----------
Total	6.62	6.87	2.17	22.60	71.60	8.75	9.96	8.20	60.35	25.28	12.00	5.61
Mean												
Mgd	0.214	0.222	0.072	0.729	2.39	0.282	0.321	0.293	1.95	0.843	0.387	0.187
Cfs	0.331	0.343	0.111	1.13	3.70	0.436	0.497	0.453	3.02	1.30	0.599	0.289
Ac-ft	20	21	6.7	69	220	27	31	25	185	78	37	17
Max	1.4	1.5	0.35	7.3	51	2.1	3.5	1.3	19	3.3	2.1	0.34
Min	0.05	0.04	0	0	0.12	0.09	0.09	0.08	0.14	0.38	0.14	0.12

Calendar Year 1966: Max 51 Min 0 Mean (mgd) 0.875 Mean (cfs) 1.35 Ac-ft 980
Fiscal Year 1966-67: Max 51 Min 0 Mean (mgd) 0.658 Mean (cfs) 1.02 Ac-ft 737

Peak discharge (base, 130 mgd)

Date	Time	Gage height	Discharge		Date	Time	Gage height	Discharge	
			Mgd	Cfs				Mgd	Cfs
11-4	1800	8.53	1,100	1,700	3-22	2000	4.42	171	265

16-5001. Kepuni Gulch near Kahikinui House

Location.--Lat 20°37'21", long 156°15'16", on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 miles east of Kahikinui House, and 8.5 miles west of Kaupo.

Drainage area.--1.91 sq mi.

Records available.--May 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 750 ft (from topographic map). Prior to Feb. 13, 1964, at site 50 ft downstream at different datum.

Extremes.--Maximum discharge during year, 83 mgd (128 cfs) Mar. 24 (gage height, 3.94 ft), from rating curve defined as explained below; no flow most of the time.
1963-67: Maximum discharge, 327 mgd (506 cfs) Sept. 17, 1963 (gage height, 6.38 ft), from rating curve defined only by computations of peak flow over dam at gage heights 4.80, 6.38, and 7.95 ft; no flow most of the time each year.
Maximum stage known, 7.95 ft, from floodmarks, present site and datum, sometime prior to July 1962 (discharge, 576 mgd or 891 cfs, result of indirect measurement).

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1									0			
2									0			
3									0			
4									0			
5												
6									0			
7									0			
8									0			
9									0			
10												
11									0			
12									0			
13									0			
14									0			
15												
16									0			
17									0			
18									0			
19									0			
20												
21									0			
22									0			
23									0			
24									14			
25									0			
26									0			
27									0			
28									0			
29								----------	0			
30								----------	0			
31			----------		----------			----------	0	----------		----------
Total	0	0	0	0	0	0	0	0	14	0	0	0
Mean												
Mgd	0	0	0	0	0	0	0	0	0.5	0	0	0
Cfs	0	0	0	0	0	0	0	0	0.8	0	0	0
Ac-ft	0	0	0	0	0	0	0	0	43	0	0	0
Max	0	0	0	0	0	0	0	0	14	0	0	0
Min									0			

Calendar Year 1966: Max 1.3 Min 0 Mean (mgd) 0.004 Mean (cfs) 0.006 Ac-ft 4.0
Fiscal Year 1966-67: Max 14 Min 0 Mean (mgd) 0.04 Mean (cfs) 0.06 Ac-ft 43

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
3-24	0800	3.94	83	128

16-5010. Palikea Stream below diversion dam, near Kipahulu

Location.--Lat 20°41'05", long 156°04'10", on left bank 50 ft downstream from old diversion dam, 2 miles northwest of Kipahulu, and 2.1 miles upstream from mouth.

Drainage area.--6.29 sq mi.

Records available.--February 1927 to September 1929, December 1931 to September 1935, December 1935 to February 1938, May to October, December 1938, January 1939, August 1939 to June 1967. Published as Oheo Stream at elevation 1,550 ft, near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56.

Gage.--Water-stage recorder. Datum of gage is 1,546 ft above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft upstream at different datum.

Average discharge.--32 years (1927-29, 1932-35, 1940-67), 37.1 mgd (57.4 cfs).

Extremes.--Maximum discharge during year, 2,960 mgd (4,580 cfs) Dec. 30 (gage height, 9.61 ft), from rating curve extended above 2,200 mgd as explained below; minimum, 0.01 mgd (0.02 cfs) on several days.
1927-29, 1931-67: Maximum discharge, 10,400 mgd (16,100 cfs) Jan. 23, 1965 (gage height, 18.3 ft, from floodmarks), from ratiag curve extended above 2,200 mgd on basis of computations of peak flow over dam at gage heights 12.68 and 17.5 ft; no flow at times.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	142	0.05	0.02	0.40	52	20	211	0.01	51	215	0.50	0.36
2	134	.22	.02	.29	44	7.3	98	.01	22	154	.55	.40
3	15	4.0	.02	.16	3.6	3.3	72	1.0	5.4	58	46	.58
4	10	.64	.02	.08	131	1.0	151	.13	57	143	1.6	3.7
5	12	.06	.02	.05	156	.55	17	.05	33	499	7.5	.36
6	29	.04	.02	2.3	467	.40	2.1	.02	152	39	54	.32
7	24	.03	.04	2.2	169	.32	.71	.02	13	76	62	.29
8	1.2	3.0	.02	.05	12	.19	.45	.01	2.9	15	128	.36
9	.50	.10	.02	1.7	57	.10	.32	6.1	4.7	4.0	34	3.2
10	.25	.04	50	18	17	.08	.19	166	154	170	35	3.4
11	.13	10	6.6	36	34	.05	172	211	26	53	43	.36
12	.06	.06	28	8.4	41	.02	73	341	5.0	7.9	293	.36
13	5.8	.02	26	5.1	3.7	.67	.89	88	2.0	1.2	57	1.5
14	140	.01	13	175	5.5	.16	.32	21	2.4	1.8	196	.16
15	28	.01	2.0	630	29	.05	.19	382	.55	1.9	187	.19
16	2.4	.02	.08	521	384	.02	.06	67	1.1	1.5	29	.63
17	9.5	7.6	.08	145	128	.01	.05	4.9	110	.50	15	.45
18	43	.13	6.3	72	6.1	12	2.5	58	11	.25	58	.25
19	23	.03	32	38	2.0	7.2	4.5	1.2	.60	.13	21	.06
20	20	.53	1.8	201	2.9	.05	1.0	.25	.32	.06	13	.03
21	20	.19	.05	34	90	5.0	.08	.10	.22	.04	1.2	.04
22	16	.04	.02	8.0	186	31	.04	.04	152	218	.60	.05
23	.89	.02	.02	6.2	147	116	.06	.06	78	127	.40	.03
24	19	.02	.02	1.8	168	107	.04	.03	413	169	.32	.14
25	172	20	.03	4.3	131	4.2	.02	.32	10	46	.32	14
26	39	20	.02	1.7	28	64	.02	.22	26	8.6	19	16
27	4.9	14	.16	3.0	30	39	.02	70	83	6.2	54	53
28	1.1	2.7	15	1.5	29	137	.01	31	35	1.1	45	262
29	.25	3.4	9.3	.25	20	335	.01	----------	8.8	.83	14	507
30	.19	.28	1.9	.13	32	789	.01	----------	87	.45	8.6	37
31	.19	.03	----------	.13	----------	318	.01	----------	247	----------	.91	----------
Total	913.36	87.27	192.58	1917.74	2605.8	1998.67	807.60	1449.47	1793.99	2018.46	1425.50	906.22
Mean												
Mgd	29.5	2.82	6.42	61.9	86.9	64.5	26.1	51.8	57.9	67.3	46.0	30.2
Cfs	45.6	4.36	9.93	95.8	134	99.8	40.4	80.1	89.6	104	71.2	46.7
Ac-ft	2800	268	591	5890	8000	6130	2480	4450	5510	6190	4370	2780
Max	172	20	50	630	467	789	211	382	413	499	293	507
Min	0.06	0.01	0.02	0.05	2.0	0.01	0.01	0.01	0.22	0.04	0.32	0.03

Calendar Year 1966: Max 789 Min 0.01 Mean (mgd) 29.8 Mean (cfs) 46.1 Ac-ft 33,410
Fiscal Year 1966-67: Max 789 Min 0.01 Mean (mgd) 44.2 Mean (cfs) 68.4 Ac-ft 49,460

Peak discharge (base, 1,800 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 6	2000	9.60	2,900	4,490	5-12	1930	9.58	2,820	4,360
12-30	1100	9.61	2,950	4,580	5-14	2200	9.57	2,780	4,300
3-24	0800	9.46	2,420	3,740	6-29	0530	9.57	2,780	4,300
4-22	1900	9.26	2,150	3,330					

16-5020. Hahalawe Gulch near Kipahulu

Location.--Lat 20°40'54", long 156°02'50", on left bank at old ditch intake, 0.7 mile upstream from mouth, and 1.8 miles northeast of Kipahulu Church.

Drainage area.--0.43 sq mi.

Records available.--February 1927 to March 1935, May 1935 to April 1937, May 1938 to June 1967. Monthly discharge only May, June 1938, published in WSP 1319. Published as Right Branch Kahalawe Stream near Kipahulu 1927-56 and as Right Branch Hahalawe Stream near Kipahulu 1956-60.

Gage.--Water-stage recorder and concrete control. Datum of gage is 885 ft above mean sea level (by vertical angles). Prior to May 1, 1938, at datum 8.0 ft lower.

Average discharge.--37 years (1927-34, 1935-36, 1938-67), 3.52 mgd (5.45 cfs).

Extremes.--Maximum discharge during year, 735 mgd (1,140 cfs) Apr. 22 (gage height, 4.39 ft), from rating curve extended above 26 mgd as explained below; minimum, 0.58 mgd (0.90 cfs) Feb. 8.
1927-67: Maximum discharge, 2,300 mgd (3,560 cfs) Apr. 29, 1937 (gage height, 15.74 ft, datum then in use), from rating curve extended above 54 mgd on basis of slope-area measurement at gage height 4.80 ft and by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Dec. 18, 1929.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.4	1.2	1.1	1.2	9.0	15	6.3	0.64	3.2	24	2.0	1.5
2	8.5	2.0	1.1	.98	3.9	4.9	5.5	.95	2.9	8.7	1.5	2.7
3	2.5	1.8	1.2	.86	1.6	2.6	5.8	6.2	3.3	3.6	2.8	1.4
4	3.1	2.7	1.1	.82	12	1.9	8.1	.98	13	4.3	1.3	5.0
5	2.7	1.6	1.2	.74	15	1.6	4.5	1.0	9.0	9.2	1.6	1.2
6	4.0	1.5	1.5	2.1	16	1.4	2.3	.78	20	4.4	3.1	1.1
7	3.2	1.7	1.8	1.8	4.5	1.3	1.8	.70	2.6	12	5.6	1.0
8	1.6	4.0	1.2	1.8	3.2	1.2	1.4	.64	1.8	3.2	4.6	1.4
9	1.2	1.9	1.2	3.9	5.2	1.1	1.2	2.1	1.8	2.5	2.2	1.9
10	1.1	1.6	5.6	5.5	2.3	1.0	1.1	3.6	29	7.3	2.0	1.6
11	1.1	2.8	2.2	17	2.3	.98	7.7	3.4	5.3	3.9	5.9	1.2
12	1.0	1.8	6.0	2.9	4.4	.98	4.5	5.7	2.3	2.3	14	1.3
13	3.6	1.5	1.4	2.8	1.8	2.5	1.5	2.5	2.2	1.8	3.7	2.8
14	5.6	1.4	4.3	14	11	1.2	1.2	1.5	1.6	2.3	4.2	1.1
15	2.6	3.0	2.3	24	7.1	1.0	1.1	4.9	1.4	1.5	6.2	4.5
16	1.6	3.5	1.5	17	43	.90	.94	1.8	3.5	1.4	8.6	4.8
17	1.3	9.2	1.3	6.2	8.7	.86	.94	1.4	5.6	1.3	2.2	2.2
18	2.5	2.3	2.5	3.1	4.4	1.8	1.6	2.4	2.0	1.2	16	2.3
19	2.2	1.9	4.0	2.6	2.7	1.2	1.6	1.2	1.4	1.1	2.7	1.2
20	2.0	2.6	1.5	6.1	3.3	.98	1.2	.94	1.1	1.0	2.9	.98
21	1.5	1.8	1.2	2.8	4.3	1.3	1.0	.74	1.1	.94	1.8	.98
22	1.4	1.7	.98	3.6	2.8	3.3	1.2	.74	12	22	1.5	1.0
23	1.2	1.4	.90	2.5	4.3	4.9	7.1	.78	6.9	18	1.4	.86
24	2.2	1.5	1.4	2.0	5.1	12	1.1	.67	23	4.8	1.4	1.6
25	4.9	3.4	.98	2.6	3.6	1.6	.98	1.7	2.8	2.9	1.3	3.7
26	4.4	2.8	1.0	1.8	2.3	3.9	1.1	1.6	8.7	1.7	2.4	1.2
27	1.9	3.0	2.3	2.6	2.8	1.8	.94	11	14	4.4	5.4	2.2
28	1.6	1.9	8.6	1.8	5.1	5.6	.86	4.7	7.1	1.4	3.7	32
29	1.2	4.6	3.8	1.4	2.7	6.7	.90	----------	2.9	1.8	1.9	23
30	1.2	1.6	1.6	1.2	25	14	.74	----------	7.4	1.2	1.5	4.1
31	1.5	1.3	----------	1.5	----------	5.7	.67	----------	19	----------	1.3	----------
Total	80.8	75.0	66.76	139.20	219.4	105.20	76.87	65.26	217.9	156.14	116.7	111.82
Mean												
Mgd	2.61	2.42	2.23	4.49	7.31	3.39	2.48	2.33	7.03	5.20	3.76	3.73
Cfs	4.04	3.74	3.45	6.95	11.3	5.25	3.84	3.61	10.9	8.00	5.82	5.77
Ac-ft	248	230	205	427	673	323	236	200	669	479	358	343
Max	8.5	9.2	8.6	24	43	15	8.1	11	29	24	16	32
Min	1.0	1.2	0.90	0.74	1.6	0.86	0.67	0.64	1.1	0.94	1.3	0.86

Calendar Year 1966: Max 43 Min 0.38 Mean (mgd) 3.33 Mean (cfs) 5.15 Ac-ft 3,730
Fiscal Year 1966-67: Max 43 Min 0.64 Mean (mgd) 3.92 Mean (cfs) 6.07 Ac-ft 4,390

Peak discharge (base, 230 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-11	0100	3.78	462	715	12-30	1030	3.45	338	523
10-15	1700	3.38	314	486	4- 1	0030	3.25	275	425
11- 4	1830	3.12	236	365	4-22	1600	4.39	735	1,140
11-16	0100	3.44	334	517	5-18	1100	3.23	269	416
11-30	0930	3.30	290	449					

16-5080. Hanawi Stream near Nahiku

Location.--lat 20°48'35", long 156°07'00", on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 miles southwest of Nahiku, and 4.5 miles southeast of Keanae.

Drainage area.--3.49 sq mi.

Records available.--January 1914 to January 1916, November 1921 to June 1967. Monthly discharge only April to June 1915, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical anglea). Prior to Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

Average discharge.--46 years (1914-15, 1922-67), 14.4 mgd (22.3 cfs).

Extremes.--Maximum discharge during year, 1,190 mgd (1,840 cfs) Nov. 4 (gage height, 6.70 ft), from rating curve extended above 270 mgd as explained below; minimum, 1.6 mgd (2.5 cfs) June 23, 24.
1914-16, 1921-67: Maximum discharge, about 3,600 mgd (about 5,570 cfs) Jan. 18, 1916 (gage height, 11.6 ft, present site and datum), from rating curve extended above 270 mgd by test on model of station site; minimum, 1.0 mgd (1.6 cfs) Nov. 14, 19, 20, 1962, Feb. 10, 11, 16, 17, 1963.

Remarks.--Records good except those above 500 mgd, which are fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15	3.1	2.8	2.0	3.3	3.2	36	3.1	18	120	9.0	2.4
2	18	2.5	2.7	1.8	3.0	3.0	59	3.0	9.1	46	6.3	2.3
3	6.9	2.8	2.6	1.8	2.9	2.8	86	2.9	5.2	22	5.4	2.2
4	4.8	5.8	2.4	1.7	84	2.7	165	2.9	5.2	13	4.3	2.2
5	3.6	3.1	2.3	1.7	45	2.6	57	8.0	4.8	125	3.8	2.1
6	3.4	3.4	2.3	50	5.9	2.6	12	3.8	4.0	20	3.7	2.0
7	3.3	3.7	2.2	14	4.3	2.7	7.6	3.0	3.6	23	3.4	2.0
8	2.6	5.4	2.1	4.2	3.4	2.7	6.3	2.8	3.4	20	3.6	2.1
9	2.4	3.3	3.0	4.7	5.5	2.6	9.2	30	3.4	12	3.0	2.1
10	2.2	3.4	22	5.3	3.9	2.5	6.2	44	3.4	102	2.9	2.9
11	2.0	8.6	3.4	9.1	3.7	2.4	138	15	3.3	31	3.1	2.0
12	2.0	3.9	3.4	3.3	4.0	2.4	48	18	3.3	9.9	42	2.0
13	2.0	3.4	2.7	3.3	3.4	2.7	8.6	14	6.1	9.6	14	1.9
14	3.8	3.0	5.2	51	3.2	3.3	7.0	7.0	6.6	10	20	1.8
15	3.3	3.9	3.6	248	4.6	2.7	6.4	88	3.5	6.5	13	1.8
16	2.4	5.9	2.7	173	21	2.4	5.9	13	3.1	5.9	3.3	1.8
17	3.9	23	2.5	64	4.0	2.4	5.7	6.3	19	7.4	2.8	1.8
18	5.7	5.8	3.0	36	3.5	20	7.2	5.9	6.1	5.3	2.7	1.7
19	4.2	4.9	7.5	13	3.2	12	6.6	4.3	3.3	4.8	26	1.7
20	3.4	5.1	3.4	25	3.0	12	5.3	4.0	3.0	4.5	5.3	1.7
21	7.3	5.0	2.7	7.3	4.4	31	4.9	3.5	3.0	4.3	2.8	1.7
22	7.5	5.2	2.4	4.8	200	19	4.6	3.3	29	49	2.6	1.7
23	3.4	3.6	2.3	4.0	65	7.7	4.3	3.6	12	7.6	2.4	1.6
24	22	5.8	2.2	3.7	16	3.4	4.1	3.2	139	5.8	2.4	1.9
25	14	11	2.1	4.9	22	2.9	5.4	3.0	44	5.6	2.9	2.3
26	6.1	16	2.0	4.0	12	43	6.6	3.4	95	4.3	21	5.8
27	3.7	6.6	2.0	3.6	14	22	4.8	147	37	4.0	12	17
28	3.0	4.3	2.0	3.3	5.2	89	4.1	79	8.1	9.2	5.1	43
29	2.7	3.6	1.9	3.2	4.0	105	3.7	---	5.4	20	3.4	13
30	2.6	3.3	2.2	3.0	3.5	209	3.5	---	5.6	7.0	2.8	11
31	4.9	3.0	---	3.7	---	38	3.4	---	55	---	2.6	---
Total	172.1	171.4	103.6	758.4	560.9	659.7	732.4	525.0	550.5	714.7	237.6	139.5
Mean												
Mgd	5.55	5.53	3.45	24.5	18.7	21.3	23.6	18.8	17.8	23.8	7.66	4.65
Cfs	8.59	8.56	5.34	37.9	28.9	33.0	36.5	29.1	27.5	36.8	11.9	7.19
Ac-ft	528	526	318	2,330	1,720	2,020	2,250	1,610	1,690	2,190	729	428
Max	22	23	22	248	200	209	165	147	139	125	42	43
Min	2.0	2.5	1.9	1.7	2.9	2.4	3.4	2.8	3.0	4.0	2.4	1.6

Calendar Year 1966: Max 248 Min 1.1 Mean (mgd) 110 Mean (cfs) 17.0 Ac-ft 12,370
Fiscal Year 1966-67: Max 248 Min 1.6 Mean (mgd) 14.6 Mean (cfs) 22.6 Ac-ft 16,340

Peak discharge (base, 1,000 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	0130	6.38	1,090	1,690	11-4	1800	6.70	1,190	1,840

16-5120. Koolau ditch at Nahiku weir, near Nahiku

Location.--Lat 20°48'55", long 156°07'15", on right bank between Kapaula and Waiohue Gulches, 1.8 miles southwest of Nahiku, and 3.8 miles southeast of Keanae.

Records available.--February 1919 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft above mean sea level, datum of 1929. Prior to Apr. 28, 1922, staff gage at same site and datum.

Average discharge.--48 years, 22.1 mgd (34.2 cfs).

Extremes.--1919-67: Maximum daily discharge, 64 mgd (99 cfs) Apr. 27, May 11, 1963, May 25, 1964; no flow at times.

Remarks.--Records excellent. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	47	16	14	9.0	15	18	56	13	54	58	38	13
2	50	14	13	8.5	13	16	57	12	42	57	28	12
3	32	15	13	7.9	13	15	58	12	28	54	25	12
4	24	22	12	7.6	24	14	39	12	29	49	21	11
5	20	15	12	7.6	50	14	41	26	25	56	19	10
6	20	16	11	35	24	13	53	17	21	54	19	10
7	19	17	10	42	20	13	40	13	19	55	17	9.9
8	15	26	9.3	20	16	13	32	12	18	54	19	9.9
9	14	17	11	19	20	12	36	44	17	46	16	10
10	13	18	44	27	19	12	26	56	17	48	15	12
11	12	31	18	34	19	11	41	55	16	54	15	9.3
12	11	19	17	18	20	11	50	54	15	40	27	8.8
13	12	17	13	17	17	12	31	46	24	34	40	8.5
14	18	15	20	50	16	13	26	33	26	35	21	8.2
15	16	18	15	57	19	12	24	57	17	27	31	8.2
16	13	26	12	57	39	10	23	50	15	25	16	7.9
17	16	52	11	56	22	10	22	33	28	27	14	7.6
18	21	27	12	54	19	23	27	32	23	22	14	7.4
19	19	23	24	50	16	30	25	24	15	20	30	7.4
20	18	23	15	56	15	26	21	21	14	19	22	7.1
21	28	22	12	40	20	48	20	18	14	18	13	6.8
22	27	22	12	30	54	40	19	16	52	32	13	6.6
23	18	17	10	24	54	26	18	17	34	33	12	6.6
24	38	24	10	22	52	15	16	15	44	25	12	7.4
25	46	41	10	24	54	13	21	14	44	24	12	8.5
26	32	42	9.9	20	46	39	24	15	60	20	43	16
27	22	32	9.3	18	48	42	20	38	58	18	38	40
28	19	22	9.6	16	28	54	17	58	44	27	24	57
29	16	19	9.0	15	22	56	15	----------	31	46	16	46
30	15	17	10	14	20	58	14	----------	29	31	14	40
31	20	16	----------	17	----------	57	13	----------	53	----------	13	----------
Total	691	701	408.1	872.6	814	746	925	813	926	1,108	657	425.1
Mean												
Mgd	22.3	22.6	13.6	28.1	27.1	24.1	29.8	29.0	29.9	36.9	21.2	14.2
Cfs	34.5	35.0	21.0	43.5	41.9	37.3	46.1	44.9	46.3	57.1	32.8	22.0
Ac-ft	2,120	2,150	1,250	2,680	2,500	2,290	2,840	2,500	2,840	3,400	2,020	1,300
Max	50	52	44	57	54	58	58	58	60	58	43	57
Min	11	14	9.0	7.6	13	10	13	12	14	18	12	6.6

Calendar Year 1966: Max 60 Min 4.6 Mean (mgd) 21.8 Mean (cfs) 33.7 Ac-ft 24,450
Fiscal Year 1966-67: Max 60 Min 6.6 Mean (mgd) 24.9 Mean (cfs) 38.5 Ac-ft 27,890

16-5180. West Wailuaiki Stream near Keanae

Location.--Lat 20°49'15", long 156°08'37", on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 miles south of Keanae Post Office.

Drainage area.--3.66 sq mi.

Records available.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder. Datum of gage is 1,343.6 ft above mean sea level (by vertical angles).

Average discharge.--47 years (1914-15, 1916-17, 1922-67), 23.4 mgd (36.2 cfs).

Extremes.--Maximum discharge during year, 1,580 mgd (2,440 cfs) Jan. 11 (gage height, 7.99 ft), from rating curve extended above 420 mgd as explained below; minimum, 1.4 mgd (2.2 cfs) June 23, 24.
1914-17, 1921-67: Maximum discharge, about 4,500 mgd (about 6,960 cfs) Jan. 14, 1923 (gage height, 13.5 ft, from floodmarks), from rating curve extended above 420 mgd by logarithmic plotting; minimum, 0.3 mgd (0.5 cfs) July 26, 1922.

Remarks.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft below station, for domestic supply and irrigation of sugarcane in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19	4.6	3.7	6.0	4.2	4.7	33	3.4	24	174	12	4.0
2	26	3.4	5.3	3.2	3.3	4.3	77	3.2	12	49	8.3	3.5
3	10	4.9	4.6	3.0	3.2	4.0	119	3.1	7.8	28	6.5	2.9
4	7.7	8.8	3.4	2.4	123	3.6	257	4.3	8.6	13	5.2	2.7
5	5.8	4.1	3.2	2.3	59	3.3	81	22	8.0	110	4.6	2.6
6	5.2	5.1	4.4	104	15	3.2	18	6.3	6.8	27	4.3	2.4
7	4.7	5.2	3.5	33	9.2	3.5	12	4.0	5.9	29	4.0	2.3
8	3.6	8.0	3.0	9.2	6.2	5.1	9.5	3.4	5.3	28	4.1	2.6
9	3.5	4.1	9.2	18	7.6	3.4	14	64	4.6	16	3.5	3.8
10	3.1	4.7	52	11	5.8	3.2	7.8	50	5.2	179	3.3	6.4
11	2.8	21	6.2	9.2	5.1	3.2	276	9.8	8.8	56	3.6	2.6
12	2.7	5.9	5.9	5.2	5.1	3.0	83	9.0	6.2	16	20	2.3
13	2.8	4.6	4.1	5.5	4.3	4.1	12	8.8	13	11	46	2.3
14	5.2	3.8	11	80	4.1	7.1	8.8	6.7	12	15	8.1	2.1
15	4.6	5.4	5.4	308	5.0	3.6	8.9	42	5.4	9.2	7.6	9.9
16	3.6	9.6	4.1	210	9.8	3.0	7.2	9.7	6.7	10	4.6	5.8
17	6.4	43	3.4	82	7.1	3.2	6.7	7.2	19	10	3.9	3.9
18	8.3	8.3	5.2	44	5.6	42	9.7	6.3	10	7.1	4.8	2.3
19	6.5	6.8	13	19	4.1	27	7.8	5.1	5.3	5.9	42	1.9
20	4.6	8.6	4.7	27	3.7	20	6.0	4.5	4.4	5.3	9.6	1.8
21	9.9	7.8	3.8	10	5.1	50	5.5	4.0	4.6	4.7	5.2	1.7
22	10	11	3.3	7.8	90	33	5.2	3.7	51	34	4.0	1.6
23	4.7	5.9	3.0	6.7	29	11	5.0	5.0	12	9.0	3.7	1.5
24	39	15	2.8	6.2	12	6.5	4.3	3.6	121	6.5	3.3	4.4
25	13	24	2.6	8.0	19	5.2	11	3.3	65	5.5	3.3	7.1
26	8.1	31	2.5	5.8	14	67	14	3.5	154	4.4	28	16
27	5.1	11	2.4	5.0	18	49	7.3	206	51	4.1	16	27
28	4.1	6.7	22	4.2	7.8	104	5.5	115	13	21	8.0	49
29	3.4	5.3	4.0	3.9	6.5	47	4.5	----------	8.6	30	5.0	22
30	4.3	4.6	6.6	3.5	5.8	140	4.2	----------	8.3	11	4.1	34
31	9.7	4.1	----------	4.8	----------	24	3.7	----------	70	----------	3.6	----------
Total	247.4	296.3	208.3	1047.9	497.6	691.2	1124.6	616.9	737.5	928.7	290.2	232.4
Mean												
Mgd	7.98	9.56	6.94	33.8	16.6	22.3	36.3	22.0	23.8	31.0	9.36	7.75
Cfs	12.3	14.8	10.7	52.3	25.7	34.5	56.2	34.0	36.8	48.0	14.5	12.0
Ac-ft	759	909	639	3220	1530	2120	3450	1890	2260	2850	891	713
Max	39	43	52	308	123	140	276	206	154	179	46	49
Min	2.7	3.4	2.4	2.3	3.2	3.0	3.7	3.1	4.4	4.1	3.3	1.5

Calendar Year 1966: Max 308 Min 1.3 Mean (mgd) 14.5 Mean (cfs) 22.4 Ac-ft 16250
Fiscal Year 1966-67: Max 308 Min 1.5 Mean (mgd) 19.0 Mean (cfs) 29.4 Ac-ft 21230

Peak discharge (base, 1,200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	0200	7.18	1,260	1,950	1-11	1930	7.99	1,580	2,440
11- 4	1730	7.55	1,400	2,170					

16-5220. Taro patch feeder ditch at Keanae

Location.--Lat 20°51'40", long 156°09'00", on left bank at Keanae, 80 ft downstream from intake on Palauhulu Stream, 500 ft downstream from highway bridge, 4.2 miles northwest of Nahiku, and 4.8 miles southeast of Kailua.

Records available.--September 1934 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 51 ft (from topographic map).

Average discharge.--32 years (1935-67), 2.30 mgd (3.56 cfs).

Extremes.--1934-67: Maximum daily discharge, 7.9 mgd (12.2 cfs) June 30, 1941, Feb. 10, 1955; no flow Nov. 15 to Dec. 12, 1965.

Remarks.--Records excellent. Ditch diverts from Palauhulu Stream for irrigation of taro at Keanae.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.9	1.8	1.8	1.7	2.0	1.7	2.6	1.7	2.7	2.8	2.3	1.7
2	2.3	1.8	1.8	1.7	1.9	1.7	3.2	1.7	2.3	1.6	2.3	1.7
3	1.9	1.8	1.8	1.7	1.8	1.7	3.6	1.7	2.1	1.4	2.2	1.7
4	1.8	1.8	1.8	1.7	2.4	1.7	5.1	1.7	2.1	1.3	2.1	1.7
5	1.8	1.8	1.8	1.7	2.4	1.7	3.6	2.2	2.1	2.8	2.0	1.7
6	1.8	1.8	1.8	2.8	2.1	1.7	2.5	1.9	2.0	2.3	2.0	1.7
7	1.8	1.8	1.8	2.6	1.9	1.8	2.4	1.8	2.0	3.2	1.9	1.7
8	1.8	1.9	1.8	1.7	1.9	1.9	2.5	1.7	1.9	3.0	1.9	1.7
9	1.8	1.8	1.8	2.1	1.8	1.9	2.5	3.0	1.9	2.7	1.9	1.7
10	1.8	1.9	3.4	2.6	1.8	1.9	2.4	3.2	1.9	3.7	1.9	1.7
11	1.8	2.3	1.9	2.3	1.8	1.9	3.3	2.4	1.8	3.5	1.8	1.7
12	1.8	1.8	1.9	1.9	1.8	1.9	1.9	2.2	1.8	2.7	2.1	1.7
13	1.9	1.8	1.8	1.8	1.8	1.9	2.2	2.1	1.9	2.6	2.3	1.7
14	1.9	1.8	1.9	3.4	1.7	1.9	2.1	2.0	1.8	2.6	2.0	1.7
15	1.8	1.7	1.8	4.3	1.7	1.9	2.1	2.7	1.8	2.5	1.9	1.8
16	1.8	1.8	1.8	3.2	2.0	1.9	2.1	2.3	1.8	2.4	1.8	1.7
17	1.8	3.2	1.8	2.0	1.8	1.9	2.1	2.1	1.9	2.4	1.8	1.7
18	1.8	1.9	1.8	2.3	1.7	2.0	2.1	2.1	2.1	2.3	1.8	1.7
19	1.8	1.9	1.8	1.7	1.7	1.9	2.0	2.0	1.9	2.3	2.6	1.6
20	1.8	1.8	1.8	2.2	1.7	1.8	2.0	1.9	1.8	2.3	2.1	1.6
21	1.8	1.8	1.8	1.5	1.7	2.4	2.0	1.9	2.0	2.3	1.9	1.6
22	1.8	1.8	1.8	1.4	2.6	2.0	2.0	1.8	3.6	3.0	1.9	1.6
23	1.8	1.8	1.8	1.3	2.4	1.8	1.9	1.8	2.3	2.5	1.9	1.6
24	2.3	2.0	1.7	1.6	2.0	1.8	1.9	1.7	3.0	2.3	1.8	1.7
25	1.9	2.2	1.7	2.0	2.1	1.8	2.0	1.7	3.3	2.3	1.8	1.7
26	1.8	3.3	1.7	2.0	2.0	2.5	2.1	1.7	4.8	2.2	2.3	1.7
27	1.8	2.4	1.7	2.0	2.1	2.2	1.9	4.0	3.6	2.1	2.4	2.1
28	1.8	1.9	2.2	1.9	2.1	3.3	1.8	4.4	2.3	2.3	2.1	2.7
29	1.8	1.9	1.7	1.9	1.8	2.6	1.8	----------	2.1	2.9	1.9	2.7
30	1.8	1.8	1.7	1.9	1.7	3.9	1.8	----------	2.1	2.3	1.8	3.2
31	1.9	1.8	----------	2.0	----------	2.6	1.7	----------	3.0	----------	1.8	----------
Total	57.4	60.9	55.7	64.9	58.2	63.6	73.2	61.4	71.7	74.6	62.3	54.5
Mean												
Mgd	1.85	1.96	1.86	2.09	1.94	2.05	2.36	2.19	2.31	2.49	2.01	1.82
Cfs	2.86	3.03	2.88	3.23	3.00	3.17	3.65	3.39	3.57	3.85	3.11	2.82
Ac-ft	176	187	171	199	179	195	225	188	220	229	191	167
Max	2.3	3.3	3.4	4.3	2.6	3.9	5.1	4.4	4.8	3.7	2.6	3.2
Min	1.8	1.7	1.7	1.3	1.7	1.7	1.7	1.7	1.8	1.3	1.8	1.6

Calendar Year 1966: Max 5.9 Min 1.3 Mean (mgd) 2.15 Mean (cfs) 3.33 Ac-ft 2410
Fiscal Year 1966-67: Max 5.1 Min 1.3 Mean (mgd) 2.08 Mean (cfs) 3.22 Ac-ft 2330

16-5230. Koolau ditch near Keanae

Location.--lat 20°49'53", long 156°10'30", on right bank on west side of Keanae Valley, 2.6 miles southwest of Keanae Post Office, and 5.1 miles southeast of Kailua.

Records available.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 1,237.7 ft above mean sea level (by plane-table traverse). Jan. 1, 1910, to Dec. 31, 1912, staff gage at same site and datum.

Average discharge.--51 years (1910-12, 1918-67), 66.4 mgd (103 cfs).

Extremes.--1910-12, 1917-67: Maximum daily discharge, 172 mgd (266 cfs) Apr. 19, 1935; no flow at times.

Remarks.--Records excellent. Ditch diverts at altitude 1,260 ft from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	139	50	43	42	51	50	145	36	146	138	120	36
2	138	42	46	29	39	45	146	34	119	147	83	35
3	104	54	41	27	37	42	147	33	77	146	77	32
4	77	85	36	25	64	39	136	35	90	131	54	30
5	60	46	35	24	143	37	145	74	78	147	49	28
6	56	53	41	118	105	36	144	61	60	146	48	27
7	55	62	36	139	75	37	116	37	53	147	44	27
8	42	98	31	77	51	41	89	34	49	146	48	28
9	41	51	44	71	69	33	110	121	45	134	41	35
10	37	56	131	107	55	32	73	147	51	136	38	55
11	34	98	58	104	52	31	123	127	59	146	42	28
12	32	62	58	55	56	30	146	124	50	138	78	27
13	33	53	41	55	46	38	106	113	66	106	121	25
14	64	46	87	138	43	52	78	84	98	111	60	23
15	51	62	51	147	56	33	74	141	49	87	83	36
16	41	83	39	147	98	29	62	120	50	86	46	32
17	62	139	35	143	61	30	58	81	79	88	41	26
18	79	85	43	142	51	87	88	85	82	64	44	22
19	66	74	104	137	43	120	74	58	46	56	89	20
20	58	81	47	141	39	95	55	52	40	52	77	19
21	109	74	38	112	58	144	51	47	44	48	44	19
22	97	85	34	82	133	136	48	43	139	89	38	18
23	52	54	32	66	133	94	46	50	108	94	36	18
24	101	94	30	61	128	51	42	41	117	64	34	31
25	125	135	29	76	138	42	73	39	96	59	33	49
26	93	101	27	59	126	114	85	39	134	50	126	88
27	58	113	27	51	133	145	64	88	145	46	124	131
28	48	69	60	46	46	147	50	138	128	68	83	140
29	43	57	35	43	62	144	43	----------	86	142	48	123
30	48	51	43	41	55	147	42	----------	87	98	41	112
31	85	47	----------	57	----------	145	39	----------	144	----------	37	----------
Total	2.128	2.260	1.402	2.562	2.246	2.246	2.698	2.082	2.615	3.110	1.927	1.320
Mean												
Mgd	68.6	72.9	46.7	82.6	74.9	72.5	87.0	74.4	84.4	104	62.2	44.0
Cfs	106	113	72.3	128	116	112	135	115	131	161	96.2	68.1
Ac-ft	6.530	6.940	4.300	7.860	6.890	6.890	8.280	6.390	8.030	9.540	5.910	4.050
Max	139	139	131	147	143	147	147	147	146	147	126	140
Min	32	42	27	24	37	29	39	33	40	46	33	18

Calendar Year 1966:	Max	147	Min	15	Mean (mgd)	65.8	Mean (cfs)	102	Ac-ft	73.710
Fiscal Year 1966-67:	Max	147	Min	18	Mean (mgd)	72.9	Mean (cfs)	113	Ac-ft	81.620

16-5240. Honomanu Stream at Haiku-uka boundary, near Kailiili

Location.--Lat 20°49'19", long 156°12'15", on left bank at Haiku-uka trail crossing, 4.5 miles southwest of Keanae, 4.8 miles southeast of Kailiili, and 5 miles south of Kailua.

Drainage area.--2.54 sq mi.

Records available.--October 1919 to February 1927, July 1932 to December 1934, June 1962 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 2,900 ft (from topographic map).

Average discharge.--13 years (1920-26, 1932-34, 1962-67), 8.24 mgd (12.7 cfs).

Extremes.--Maximum discharge during year, 521 mgd (806 cfs) Jan. 11 (gage height, 5.94 ft), from rating curve extended above 75 mgd; minimum, 0.20 mgd (0.31 cfs) June 7, 8, 23.
1919-27, 1932-34, 1962-67: Maximum discharge, 1,290 mgd (2,000 cfs) Jan. 14, 1923 (gage height, 9.93 ft), from rating curve extended above 75 mgd; minimum, 0.06 mgd (0.09 cfs) Nov. 20, 1962.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.2	3.5	1.2	0.64	1.5	0.60	8.1	0.42	3.8	92	2.0	1.0
2	9.4	1.8	8.6	.57	1.3	.51	35	.36	1.4	18	1.0	.67
3	2.8	1.8	1.8	.51	1.0	.48	56	4.3	1.2	5.4	.57	.36
4	1.6	3.0	1.0	.48	19	.42	130	1.6	2.3	1.5	.39	.29
5	1.4	1.6	1.0	.45	11	.39	37	13	3.7	25	.32	.25
6	1.0	1.5	1.6	30	1.9	.36	5.9	2.0	.89	3.0	.30	.21
7	1.5	1.1	1.0	6.6	1.2	.92	2.0	.80	.60	5.1	.28	.20
8	.90	2.0	.85	2.0	.85	1.5	1.6	.60	.48	7.0	.26	.21
9	.76	1.0	3.5	1.6	1.0	.68	2.9	29	.42	2.1	.24	.51
10	.68	.90	43	1.6	1.0	.78	1.3	15	.72	56	.30	1.4
11	.57	9.6	2.1	4.2	.76	.68	111	2.4	2.6	29	.32	.81
12	.54	2.0	2.5	1.3	.80	.48	45	1.5	.78	3.0	1.8	2.4
13	.54	1.3	1.3	1.0	.76	.60	3.7	1.2	.54	1.3	.71	.90
14	1.0	1.1	6.5	37	.64	1.6	1.7	.85	.68	2.3	4.1	.38
15	1.5	2.0	2.2	160	.68	.68	1.2	3.5	.45	1.2	.96	3.6
16	.90	3.4	1.2	86	1.2	.51	1.2	1.4	.64	1.5	.39	3.8
17	1.0	15	1.0	43	.72	.74	1.0	.85	8.7	1.0	.30	1.2
18	1.8	2.4	1.7	10	.54	37	2.5	.72	1.4	.72	.30	.50
19	1.1	1.6	5.9	4.2	.48	15	1.4	.60	.69	.60	14	.36
20	.80	2.7	1.5	7.1	.42	5.7	.90	.60	.54	.54	1.3	.29
21	1.0	5.4	1.0	2.2	.39	22	.76	.51	.73	.48	.57	.27
22	1.0	4.4	.85	1.5	1.1	11	1.1	.45	15	.77	.38	.23
23	.72	1.5	.85	1.1	1.0	2.2	.76	.51	1.2	.69	.31	.23
24	19	15	1.2	1.0	1.1	1.2	.60	.26	43	.48	.27	1.2
25	3.6	9.3	.76	1.2	3.4	.85	1.3	.24	13	.42	.32	3.5
26	1.6	6.7	11	1.0	3.2	39	3.7	.22	67	.34	6.1	6.8
27	1.0	2.7	5.2	1.3	5.0	29	1.6	92	24	.28	1.8	8.5
28	.76	1.5	1.8	1.2	1.7	31	.80	50	2.8	2.3	.90	11
29	.68	2.0	.90	.76	.85	5.4	.60	----------	1.2	6.8	.60	4.1
30	1.3	1.8	.72	.64	.72	37	.51	----------	1.1	1.5	.47	6.8
31	4.0	1.3	----------	1.4	----------	4.7	.48	----------	33	----------	.38	----------
Total	69.65	110.90	113.73	411.55	65.21	252.98	461.61	224.89	234.56	270.32	41.94	61.97
Mean												
Mgd	2.25	3.58	3.79	13.3	2.17	8.16	14.9	8.03	7.57	9.01	1.35	2.07
Cfs	3.48	5.54	5.86	20.6	3.36	12.6	23.1	12.4	11.7	13.9	2.09	3.20
Ac-ft	214	340	349	1,260	200	776	1,420	690	720	830	129	190
Max	19	15	43	160	19	39	130	92	67	92	14	11
Min	0.54	0.90	0.72	0.45	0.39	0.36	0.48	0.22	0.42	0.28	0.24	0.20

Calendar Year 1966: Max 160 Min 0.22 Mean (mgd) 4.88 Mean (cfs) 7.55 Ac-ft 5,470
Fiscal Year 1966-67: Max 160 Min 0.20 Mean (mgd) 6.35 Mean (cfs) 9.82 Ac-ft 7,120

Peak discharge (base, 450 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
1-11	2100	5.94	521	806

16-5310. Kula diversion from Haipuaena Stream near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank of Haipuaena Stream, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

Records available.--July 1945 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,320 ft (from topographic map).

Average discharge.--21 years (1946-67), 0.436 mgd (0.675 cfs).

Extremes.--1945-67: Maximum daily discharge, 2.05 mgd (3.17 cfs) Mar. 20, 1948; no flow Nov. 4, 1964.

Remarks.--Records excellent. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.92	0.48	0.13	0.10	0.14	0.09	1.2	0.07	0.78	0.32	0.59	0.16
2	1.3	.42	.55	.07	.12	.07	1.4	.05	.76	.14	.54	.23
3	.69	.30	.53	.06	.12	.05	1.5	.15	.43	.13	.26	.11
4	.34	.38	.24	.04	.54	.04	1.4	.37	.54	.39	.16	.07
5	.50	.33	.16	.04	1.1	.03	1.0	.63	.68	1.1	.11	.04
6	.26	.27	.21	.92	.78	.03	.84	.56	.40	.80	.12	.04
7	.27	.20	.18	1.2	.52	.05	.50	.21	.27	1.0	.12	.03
8	.18	.26	.13	.68	.30	.24	.36	.13	.20	1.4	.09	.02
9	.11	.15	.44	.30	.30	.12	.56	.93	.15	.80	.11	.02
10	.08	.10	1.4	.21	.38	.08	.33	1.1	.18	.81	.27	.04
11	.07	1.0	.64	.88	.26	.06	1.5	.75	.26	.16	.21	.04
12	.05	.38	.43	.52	.27	.04	.82	.41	.33	.14	.37	.07
13	.04	.23	.27	.26	.27	.04	.66	.30	.19	.14	.46	.18
14	.30	.18	.93	1.3	.18	.09	.43	.20	.14	.46	.65	.08
15	.30	.24	.58	.84	.13	.08	.34	.37	.10	.61	.57	.16
16	.18	.55	.27	.36	.20	.05	.34	.30	.07	.33	.28	.26
17	.12	1.5	.21	.86	.15	.04	.27	.16	.41	.26	.16	.19
18	.12	.59	.32	1.1	.10	1.1	.41	.12	.68	.20	.12	.10
19	.10	.27	1.2	.66	.07	1.1	.31	.10	.30	.15	.65	.05
20	.14	.29	.39	.84	.06	.82	.21	.09	.23	.12	.71	.04
21	.11	.62	.20	.43	.05	1.1	.16	.07	.23	.10	.28	.03
22	.09	.98	.14	.30	.06	1.3	.13	.05	1.1	.09	.16	.02
23	.07	.33	.18	.23	.07	.62	.11	.04	.78	.12	.11	.02
24	.78	.96	.26	.18	.08	.33	.09	.04	.92	.11	.09	.05
25	1.2	.22	.13	.14	.26	.20	.11	.03	.66	.34	.08	.37
26	.52	1.0	.70	.12	.50	1.2	.47	.03	.80	.38	.43	.56
27	.26	.78	.85	.12	.99	1.6	.49	.54	.68	.18	.42	.86
28	.16	.36	.31	.12	.48	1.8	.21	.56	.56	.17	.26	.64
29	.11	.33	.24	.09	.21	1.1	.14	----	.45	.98	.20	.60
30	.10	.30	.14	.07	.13	1.4	.10	----	.41	.41	.14	.97
31	.20	.20	----	.06	----	1.1	.07	----	.76	----	.09	----
Total	9.67	14.20	12.36	13.10	8.82	15.97	16.46	8.36	14.45	12.34	8.81	6.05
Mean												
Mgd	0.312	0.458	0.412	0.423	0.294	0.515	0.531	0.299	0.466	0.411	0.284	0.202
Cfs	0.483	0.709	0.637	0.654	0.455	0.797	0.822	0.463	0.721	0.636	0.439	0.313
Ac-ft	30	44	38	40	27	49	51	26	44	38	27	19
Max	1.3	1.5	1.4	1.3	1.1	1.8	1.5	1.1	1.1	1.4	0.71	0.97
Min	0.04	0.10	0.13	0.04	0.05	0.03	0.07	0.03	0.07	0.09	0.08	0.02

Calendar Year 1966: Max 1.8 Min 0.02 Mean (mgd) 0.381 Mean (cfs) 0.589 Ac-ft 427
Fiscal Year 1966-67: Max 1.8 Min 0.02 Mean (mgd) 0.385 Mean (cfs) 0.596 Ac-ft 431

16-5311. Haipuaena Stream at Kula pipeline intake, near Olinda

Location.--Lat 20°48'24", long 156°13'27", on left bank at Kula pipeline intake, 3.4 miles east of Olinda, and 6.2 miles south of Kailua.

Drainage area.--0.27 sq mi.

Records available.--January to April 1946 (fragmentary), May 1946 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,320 ft (from topographic map).

Average discharge.--21 years, 0.535 mgd (0.828 cfs).

Extremes.--Maximum discharge during year, 48 mgd (74 cfs) Apr. 1 (gage height, 3.02 ft), from rating curve extended above 1.3 mgd as explained below; no flow for many days.
1946-67: Maximum discharge, 91 mgd (141 cfs) Nov. 14, 1965 (gage height, 3.76 ft), from rating curve extended above 1.3 mgd by differential-curve method; no flow at times each year.

Remarks.--Records good. Kula pipeline (see sta. no. 5310) diverts all water from Haipuaena Stream at low flow.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.17	0	0	0	0	0	0.98	0	0.50	13	0.09	0
2	.93	0	1.4	0	0	0	6.0	0	.03	3.2	.01	0
3	.02	0	.04	0	0	0	9.4	0	0	1.2	0	0
4	0	0	0	0	2.9	0	17	0	.01	.21	0	0
5	0	0	0	0	2.1	0	2.2	.61	.01	2.3	0	0
6	0	0	0	3.7	.12	0	.24	.03	0	.24	0	0
7	0	0	0	.49	.01	0	0	0	0	.19	0	0
8	0	0	0	.02	0	0	0	0	0	.95	0	0
9	0	0	.06	0	0	0	0	3.4	0	.04	0	0
10	0	0	2.4	0	0	0	0	1.1	0	10	0	0
11	0	.64	.05	.31	0	0	16	.02	0	4.7	0	0
12	0	0	0	0	0	0	2.2	0	0	.84	0	0
13	0	0	0	0	0	0	0	0	0	.52	0	0
14	0	0	.21	4.9	0	0	0	0	0	.25	.36	0
15	0	0	0	18	0	0	0	0	0	0	.02	0
16	0	.13	0	9.3	0	0	0	0	0	0	0	0
17	0	.92	0	5.1	0	0	0	0	1.6	0	0	0
18	0	.01	0	.15	0	7.5	0	0	.24	0	0	0
19	0	0	.20	0	0	2.5	0	0	0	0	1.8	0
20	0	0	0	.03	0	.53	0	0	0	0	.06	0
21	0	.23	0	0	0	2.8	0	0	0	0	0	0
22	0	.24	0	0	0	2.8	0	0	3.8	0	0	0
23	0	0	0	0	0	0	0	0	.29	0	0	0
24	2.8	.90	0	0	0	0	0	0	9.7	0	0	0
25	.50	.82	0	0	0	0	0	0	1.6	0	0	.01
26	0	.97	.55	0	0	7.2	.04	0	8.8	0	0	.05
27	0	.06	.05	0	.11	4.7	0	15	3.6	0	0	.16
28	0	0	0	0	0	2.9	0	7.2	.57	0	0	2.4
29	0	0	0	0	0	.25	0	----------	.08	.32	0	.38
30	0	0	0	0	0	5.0	0	----------	.08	0	0	1.1
31	0	0	----------	0	----------	.40	0	----------	7.0	----------	0	----------
Total	4.42	4.92	4.96	42.00	5.24	36.58	54.06	27.36	37.91	37.96	2.34	4.10
Mean												
Mgd	0.142	0.159	0.166	1.35	0.175	1.18	1.74	0.977	1.22	1.27	0.075	0.137
Cfs	0.220	0.246	0.257	2.09	0.271	1.83	2.69	1.51	1.89	1.96	0.116	0.212
Ac-ft	14	15	15	129	16	112	166	84	116	116	7.2	13
Max	2.8	0.97	2.4	18	2.9	7.5	17	15	9.7	13	1.8	2.4
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 18 Min 0 Mean (mgd) 0.436 Mean (cfs) 0.675 Ac-ft 488
Fiscal Year 1966-67: Max 18 Min 0 Mean (mgd) 0.717 Mean (cfs) 1.11 Ac-ft 804

Peak discharge (base, 42 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	0800	2.97	46	71	4-1	1100	3.02	48	74
1-11	2300	2.97	46	71					

16-5360. Haipuaena Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'04", long 156°11'28", on left bank 200 ft upstream from Spreckels ditch, 2.8 miles west of Keanae, 3.3 miles southeast of Kailua, and 4.7 miles southeast of Huelo.

Drainage area.--1.16 sq mi.

Records available.--October 1913 to January 1967 (discontinued). Monthly discharge only July 1915, published in WSP 1319. Prior to July 1954, published as "near Huelo." Records for December 1910 to September 1913 at site 600 ft downstream not equivalent owing to inflow from Spreckels ditch.

Gage.--Water-stage recorder and, since Feb. 8, 1951, concrete control. Datum of gage is 1,512.22 ft above mean sea level (East Maui Irrigation Co. bench mark).

Average discharge.--52 years (1914-66), 9.73 mgd (15.1 cfs).

Extremes.--Maximum discharge during period, 362 mgd (560 cfs) Oct. 15 (gage height, 4.72 ft), from rating curve extended above 150 mgd; minimum, 1.4 mgd (2.2 cfs) Oct. 3-5, Dec. 12.
1913-67: Maximum discharge, 1,750 mgd (2,710 cfs) Aug. 12, 1940 (gage height, 6.91 ft), from rating curve extended above 150 mgd; minimum, slightly less than 0.1 mgd (about 0.2 cfs) on several days in January, February, May, June 1945, October 1953.

Remarks.--Records excellent. Kula pipeline (see sta. no. 5310) diverts above station.

Discharge, in million gallons a day, July 1966 to January 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	3.8	3.0	1.5	4.3	2.2	14					
2	17	3.2	5.6	1.5	2.9	2.0	28					
3	7.4	3.6	3.2	1.4	2.5	1.8	46					
4	6.4	6.4	2.1	1.4	13	1.8	88					
5	4.8	3.2	2.0	1.4	11	1.6	34					
6	4.3	3.7	2.9	27	4.3	1.5	8.8					
7	4.2	4.5	2.2	8.4	3.2	2.1	5.6					
8	3.1	7.3	1.8	3.8	2.5	3.1	4.8					
9	2.6	3.5	5.2	9.7	3.4	1.7	6.6					
10	2.4	6.1	40	7.6	2.9	1.5	3.8					
11	2.1	21	5.2	7.7	2.9	1.7	49					
12	1.9	5.3	5.1	3.7	2.9	1.4	16					
13	2.0	3.8	3.4	3.2	2.4	2.1	4.5					
14	4.4	3.3	10	47	2.1	4.1	3.8					
15	4.1	4.8	4.4	114	2.4	1.9	3.4					
16	2.6	11	3.3	78	3.7	1.5	3.2					
17	4.4	31	2.9	33	2.4	1.7	3.1					
18	5.4	6.4	3.7	19	2.0	22	4.5					
19	4.6	5.1	11	9.9	1.9	12	3.7					
20	3.8	6.4	3.8	15	1.8	8.0	2.6					
21	7.2	5.5	3.1	6.6	1.7	20	2.4					
22	5.7	7.8	2.6	4.8	6.9	12	2.4					
23	3.4	3.8	2.4	3.9	4.1	5.2	1.8					
24	15	12	2.4	3.7	5.1	3.4	2.0					
25	7.4	17	2.0	4.3	8.6	3.0	2.7					
26	5.0	26	4.6	3.7	7.1	28	4.9					
27	3.2	7.9	3.7	3.2	8.7	21	3.1					
28	2.5	4.5	2.9	3.1	4.0	32	2.5					
29	2.1	4.3	1.9	2.4	3.1	8.8	1.8	----------				
30	4.2	3.8	1.7	2.2	2.5	36	1.7	----------				
31	6.1	3.3	----------	6.3	----------	9.3	1.5	----------		----------		----------
Total	165.3	239.3	148.1	438.4	126.3	254.4	360.2					
Mean												
Mgd	5.33	7.72	4.94	14.1	4.20	8.21	11.6					
Cfs	8.25	11.9	7.64	21.8	6.50	12.7	17.9					
Ac-ft	507	734	454	1,350	388	781	1,110					
Max	17	31	40	114	13	36	88					
Min	1.9	3.2	1.7	1.4	1.7	1.4	1.5					

Calendar Year 1966: Max 114 Min 0.68 Mean (mgd) 7.09 Mean (cfs) 11.0 Ac-ft 7,940
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Peak discharge (base, 350 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
10-15	0200	4.72	362	560

16-5380. Spreckels ditch at Haipuaena weir, near Huelo

Location.--lat 20°51'15", long 156°11'25", on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 miles west of Keanae, and 4.5 miles southeast of Huelo.

Records available.--April 1922 to June 1967. Published as "at Haipuaena, near Huelo" 1930-35.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft upstream at different datum.

Average discharge.--44 years (1922-29, 1930-67), 14.1 mgd (21.8 cfs).

Extremes.--1922-67: Maximum daily discharge, 97 mgd (150 cfs) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

Remarks.--Records good. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 4 mgd was diverted above station to East Maui Irrigation Co. powerplant at Kolea Gulch prior to June 30, 1961, when the plant was abandoned. Water used for domestic supply and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	57	16	11	5.1	17	8.7	48	5.5	43	77	37	7.7
2	56	12	19	4.7	12	7.7	63	5.1	22	70	19	7.7
3	29	16	11	4.4	9.6	7.2	74	13	15	54	12	5.7
4	25	26	8.4	4.2	23	6.4	79	9.5	25	25	9.9	5.3
5	18	12	8.0	4.0	43	6.0	69	33	30	64	8.4	4.9
6	16	14	12	46	19	6.0	32	14	14	50	8.0	4.5
7	16	20	9.6	35	12	9.2	20	7.4	11	60	7.2	4.4
8	10	35	7.2	12	9.6	13	17	6.2	9.3	58	7.2	5.3
9	9.3	13	15	26	14	7.0	26	60	8.2	27	6.2	9.5
10	8.2	16	65	31	11	6.2	14	61	11	47	6.2	20
11	7.2	43	19	33	11	6.7	46	23	29	60	8.5	5.7
12	6.7	21	20	12	12	5.7	43	16	13	26	21	12
13	7.0	15	11	11	9.0	9.9	17	17	9.9	19	11	7.4
14	19	12	35	70	7.7	18	13	12	14	24	18	4.9
15	16	20	14	76	10	7.4	12	42	9.0	15	12	14
16	10	34	10	72	16	5.7	11	17	9.3	20	7.0	17
17	20	68	8.7	55	9.6	6.4	10	12	29	14	5.7	8.2
18	22	20	12	48	8.2	50	18	16	18	11	6.2	5.3
19	20	19	39	32	7.7	35	13	9.3	9.9	10	28	4.5
20	14	24	12	53	6.7	30	9.6	8.7	9.6	9.3	12	4.0
21	33	21	9.3	24	7.0	54	8.4	7.4	14	8.4	7.7	4.0
22	22	27	8.2	17	27	44	8.7	6.7	63	17	6.2	3.7
23	12	13	7.4	13	19	21	8.2	9.0	18	12	5.5	3.5
24	38	39	7.7	13	26	12	7.2	6.4	69	8.4	5.3	10
25	26	44	6.4	17	35	9.6	12	6.7	52	7.7	5.5	20
26	20	57	16	13	28	52	23	5.5	77	7.2	46	36
27	11	32	14	11	34	54	12	43	68	6.7	49	55
28	9.3	17	11	11	16	65	8.0	73	30	24	22	69
29	8.2	16	6.4	8.4	11	35	7.0	----------	18	53	11	33
30	17	14	5.5	7.7	10	60	6.4	----------	23	22	8.4	40
31	27	12	----------	22	----------	35	6.2	----------	56	----------	7.2	----------
Total	609.9	748	438.8	791.5	481.1	693.8	741.7	545.4	827.2	906.7	424.3	432.2
Mean												
Mgd	19.7	24.1	14.6	25.5	16.0	22.4	23.9	19.5	26.7	30.2	13.7	14.4
Cfs	30.5	37.3	22.6	39.5	24.8	34.7	37.0	30.2	41.3	46.7	21.2	22.3
Ac-ft	1870	2300	1350	2430	1480	2130	2280	1670	2540	2780	1300	1330
Max	57	68	65	76	43	65	79	73	77	77	49	69
Min	6.7	12	5.5	4.0	6.7	5.7	6.2	5.1	8.2	6.7	5.3	3.5

Calendar Year 1966:	Max	77	Min	2.5	Mean (mgd)	20.2	Mean (cfs)	31.3	Ac-ft	22640
Fiscal Year 1966-67:	Max	79	Min	3.5	Mean (mgd)	20.9	Mean (cfs)	32.3	Ac-ft	23450

16-5410. Koolau ditch at Haipuaena, near Huelo

Location.--lat 20°51'17", long 156°11'19", on right bank at Haipuaena Stream, 1,000 ft upstream from intake at Puohokamoa Stream, 3.3 miles southeast of Kailua, and 4.5 miles southeast of Huelo.

Records available.--April 1932 to June 1967.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (from topographic map). Prior to Mar. 21, 1933, at datum 1.94 ft lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower, than present datum.

Average discharge.--35 years, 77.5 mgd (120 cfs).

Extremes.--1932-67: Maximum daily discharge, 194 mgd (300 cfs) July 1, 17, 1963; no flow at times.

Remarks.--Records excellent. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water is used for power, domestic supply, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	153	50	42	41	48	50	153	34	155	181	121	34
2	147	42	47	29	38	44	158	32	122	168	82	33
3	101	52	41	27	36	42	154	32	76	158	67	30
4	75	97	35	25	66	39	183	33	88	128	55	29
5	58	46	34	24	156	36	165	83	78	171	49	27
6	57	52	39	128	105	35	151	60	61	155	48	26
7	54	59	35	143	75	36	110	36	53	158	43	26
8	41	98	31	75	51	41	87	32	48	144	48	27
9	40	51	45	80	67	33	110	149	43	131	40	33
10	36	51	157	109	55	31	72	178	50	144	37	54
11	32	113	58	108	52	30	133	126	59	160	41	26
12	31	62	59	55	55	29	154	122	49	140	78	27
13	32	53	41	57	45	37	102	110	60	102	121	24
14	60	45	86	174	42	50	76	80	96	108	62	22
15	52	61	49	185	55	32	72	153	48	86	81	35
16	40	91	39	186	98	28	61	118	48	84	45	35
17	57	166	35	163	61	30	58	77	79	89	39	26
18	76	83	43	162	51	98	85	84	86	64	42	21
19	64	73	104	106	42	119	74	57	45	56	93	20
20	56	79	45	142	39	95	56	52	40	52	80	19
21	108	74	36	105	57	142	51	45	45	49	42	19
22	93	82	34	77	143	134	48	42	160	90	36	18
23	51	54	32	63	132	90	44	50	106	94	34	18
24	106	97	30	59	128	51	41	40	139	65	32	30
25	120	145	29	74	142	41	70	37	123	59	32	45
26	92	116	30	58	126	120	85	36	192	50	131	86
27	57	115	29	51	132	157	63	115	146	46	139	140
28	48	70	59	46	43	161	49	183	122	75	80	165
29	42	58	34	42	61	150	42	----------	80	158	48	126
30	47	52	41	40	55	165	41	----------	81	97	40	133
31	84	46	----------	62	----------	150	37	----------	151	----------	36	----------
Total	2110	2333	1419	2696	2256	2296	2785	2196	2729	3262	1922	1354
Mean												
Mgd	68.1	75.3	47.3	87.0	75.2	74.1	89.8	78.4	88.0	109	62.0	45.1
Cfs	105	117	73.2	135	116	115	139	121	136	169	95.9	69.8
Ac-ft	6480	7160	4350	8270	6920	7050	8550	6740	8370	10010	5900	4160
Max	153	166	157	186	156	165	183	183	192	181	139	165
Min	31	42	29	24	36	28	37	32	40	46	32	18

Calendar Year 1966: Max 186 Min 14 Mean (mgd) 68.1 Mean (cfs) 105 Ac-ft 76240
Fiscal Year 1966-67: Max 192 Min 18 Mean (mgd) 75.0 Mean (cfs) 116 Ac-ft 83960

16-5415. Manuel Luis ditch at Puohokamoa Gulch, near Huelo

Location.--lat 20°51'48", long 156°11'00", on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 miles west of Keanae, and 4.4 miles southeast of Huelo.

Records available.--December 1917 to November 1924, January 1925 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (from topographic map).

Average discharge.--48 years (1918-24, 1925-67), 5.64 mgd (8.73 cfs).

Extremes.--1917-67: Maximum daily discharge, 92 mgd (142 cfs) Jan. 3, 1927; no flow at times.

Remarks.--Records excellent. Ditch is extension of Center ditch and picks up water from streams between Kolea and Waikamoi Streams for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.6	0.60	0.93	0.32	2.3	0.85	5.1	0.32	4.7	47	2.3	0.42
2	3.7	.60	.85	.28	.93	.78	10	.32	2.8	11	1.2	.37
3	1.0	.54	.85	.28	.78	.72	16	.28	1.9	10	.85	.37
4	.54	1.0	.66	.28	6.5	.66	54	.28	2.8	5.4	.78	.37
5	.42	.48	.60	.28	2.8	.60	24	9.7	1.8	34	.66	.32
6	.60	.66	.66	15	1.2	.66	4.1	.81	1.3	9.3	.60	.32
7	.48	.85	.60	2.0	1.0	.72	2.4	.32	1.2	12	.54	.32
8	.32	2.5	.54	.72	.78	.72	1.9	.28	.93	8.3	.60	.32
9	.28	.72	1.4	9.8	1.2	.54	1.6	21	.85	4.1	.54	.37
10	.28	.66	27	8.1	.85	.48	1.2	19	1.0	17	.48	1.1
11	.23	15	1.6	8.9	1.2	.48	22	3.9	1.4	9.4	.54	.37
12	.23	1.2	1.4	2.5	1.4	.48	3.8	3.0	.94	2.1	1.8	.32
13	.28	.85	1.0	1.7	.85	.72	1.0	2.4	.93	1.7	.85	.28
14	.66	.72	2.3	32	.72	1.3	.85	1.5	1.2	1.5	.54	.28
15	.54	1.2	1.4	67	.93	.60	.72	10	.85	1.2	.48	.32
16	.28	5.7	.93	55	3.2	.48	.66	3.5	.72	1.2	.42	.37
17	.28	26	.78	26	1.0	.48	.66	2.1	4.0	1.0	.37	.28
18	.48	2.8	.78	13	.85	3.2	.85	2.6	1.3	.85	.37	.28
19	.48	1.9	2.6	17	.78	1.4	.72	1.4	.66	.78	8.6	.28
20	.48	1.9	.93	12	.72	.71	.66	1.2	.60	.72	.75	.23
21	1.7	1.6	.72	8.7	.66	1.1	.60	1.0	4.7	.66	.48	.11
22	.54	1.4	.60	7.3	9.1	1.3	.54	.85	32	5.2	.54	.08
23	.32	1.0	.54	6.4	3.5	.72	.48	.93	4.4	1.4	.54	.08
24	4.2	2.8	.54	3.4	2.7	.48	.48	.78	24.0	.78	.54	.18
25	1.7	4.4	.48	1.5	3.3	.42	.72	.78	30	.66	.54	.28
26	1.5	18	.48	1.2	2.2	10	1.0	.66	61	.60	1.6	.54
27	.54	6.2	.48	1.0	2.4	7.4	.60	40	38	.54	5.9	28
28	.42	2.4	.48	.85	1.4	13	.48	36	11	8.6	1.1	15
29	.37	1.8	.42	.78	1.2	2.3	.42	----------	8.1	9.4	.60	2.7
30	.37	1.4	.37	.72	1.0	20	.42	----------	7.3	1.2	.48	3.2
31	.72	1.2	----------	5.1	----------	3.2	.37	----------	26	----------	.42	----------
Total	28.54	108.08	52.92	309.11	57.45	76.50	158.33	164.91	278.38	207.59	36.01	32.26
Mean												
Mgd	0.921	3.49	1.76	9.97	1.92	2.47	5.11	5.89	8.98	6.92	1.16	1.08
Cfs	1.42	5.40	2.72	15.4	2.97	3.82	7.91	9.11	13.9	10.7	1.79	1.67
Ac-ft	88	332	162	949	176	235	486	506	854	637	111	99
Max	4.6	26	27	67	9.1	20	54	40	61	47	8.6	15
Min	0.23	0.48	0.37	0.28	0.66	0.42	0.37	0.28	0.60	0.54	0.37	0.08

Calendar Year 1966: Max 67 Min 0.05 Mean (mgd) 3.50 Mean (cfs) 5.42 Ac-ft 3,920
Fiscal Year 1966-67: Max 67 Min 0.08 Mean (mgd) 4.14 Mean (cfs) 6.41 Ac-ft 4,630

16-5430. Middle Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili

Location.--Lat 20°49'42", long 156°12'50", on left bank 200 ft downstream from Haiku-uka trail crossing, 4.0 miles east of Kailiili, and 4.5 miles south of Kailua.

Drainage area.--0.48 sq mi.

Records available.--March 1919 to February 1927, July 1932 to June 1934, June 1962 to June 1967.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 2,900 ft (from topographic map). Prior to June 12, 1962, at site 200 ft upstream at different datum.

Average discharge.--5 years (1962-67), 2.08 mgd (3.22 cfs).

Extremes.--Maximum discharge during year, 152 mgd (235 cfs) Oct. 16 (gage height, 3.80 ft), from rating curve extended above 9.0 mgd as explained below; minimum, 0.10 mgd (0.16 cfs), Dec. 12.
1962-67: Maximum discharge, 303 mgd (469 cfs) Nov. 14, 1965 (gage height, 5.09 ft), from rating curve extended above 9.0 mgd on basis of slope-conveyance study; minimum, 0.04 mgd (0.06 cfs) Nov. 12, 16-20, 1962, Jan. 20, 1965.

Remarks.--Records good. Kula pipeline (see sta. no. 5310) diverts above station at altitudes 4,300 ft (since 1934) and 3,200 ft (since 1944) for domestic use. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.3	0.83	0.44	0.15	0.54	0.15	3.4	0.17	3.4	17	1.0	0.49
2	3.9	.49	1.1	.15	.35	.15	7.9	.15	2.2	6.3	.78	.44
3	1.3	.49	.59	.15	.31	.15	12	.99	1.6	3.0	.65	.31
4	.78	.92	.31	.15	3.3	.13	22	.49	2.1	1.6	.54	.28
5	.65	.49	.31	.13	2.6	.13	9.2	3.4	2.5	9.7	.35	.25
6	.44	.39	.44	6.6	.65	.12	2.5	.65	1.4	2.5	.35	.19
7	.59	.31	.28	2.1	.44	.19	1.4	.31	.92	2.9	.28	.17
8	.31	.59	.24	.71	.31	.39	1.1	.19	.78	4.2	.31	.17
9	.25	.28	1.7	.44	.39	.15	1.3	9.4	.78	1.9	.31	.31
10	.22	.31	8.5	.49	.35	.15	.78	5.8	.85	12	.39	.71
11	.19	4.1	.92	.70	.28	.15	15	1.1	1.3	6.4	.35	.31
12	.19	.65	.85	.39	.28	.12	3.7	.71	.92	2.1	1.5	.76
13	.19	.49	.54	.35	.25	.15	1.1	.59	.71	1.6	.71	.54
14	.31	.39	2.6	10	.19	.39	.85	.44	.71	1.8	2.9	.25
15	.44	.59	.92	34	.19	.17	.71	1.2	.59	1.3	1.0	.83
16	.28	1.8	.49	22	.31	.12	.59	.59	.71	1.1	.54	1.2
17	.35	6.3	.39	10	.19	.15	.54	.39	3.5	.92	.49	.49
18	.59	1.1	.65	4.1	.15	7.0	.92	.35	1.2	.78	.44	.15
19	.35	.71	2.5	2.1	.15	2.9	.54	.28	.78	.65	3.9	.15
20	.22	.85	.59	3.0	.15	1.8	.39	.25	.65	.59	1.1	.15
21	.31	1.5	.39	1.3	.15	7.1	.35	.19	.65	.54	.71	.17
22	.31	1.9	.28	.92	.28	3.2	.39	.19	5.7	.59	.54	.15
23	.22	.59	.25	.71	.19	.92	.35	.22	1.3	.54	.49	.15
24	4.4	4.2	.31	.65	.28	.49	.28	.17	9.4	.49	.44	.39
25	1.5	3.8	.22	.65	1.0	.35	.35	.19	5.2	.35	.39	1.2
26	.54	3.2	1.6	.54	1.0	7.8	.59	.15	18	.28	2.5	3.1
27	.25	1.3	1.3	.49	2.1	5.0	.59	19	8.6	.22	1.0	4.5
28	.22	.71	.59	.44	.65	8.2	.28	13	2.8	.84	.54	3.8
29	.19	.78	.28	.31	.25	1.7	.22	----------	1.6	3.3	.44	1.6
30	.44	.65	.19	.28	.19	9.6	.19	----------	1.5	.92	.35	3.0
31	.88	.49	----------	.54	----------	2.2	.17	----------	9.8	----------	.31	----------
Total	23.11	41.20	29.77	104.54	17.47	61.22	89.68	60.56	92.15	86.41	25.60	26.21
Mean												
Mgd	0.745	1.33	0.992	3.37	0.582	1.97	2.89	2.16	2.97	2.88	0.826	0.874
Cfs	1.15	2.06	1.53	5.21	0.900	3.05	4.47	3.34	4.60	4.46	1.28	1.35
Ac-ft	71	126	91	321	54	188	275	186	283	265	79	80
Max	4.4	6.3	8.5	34	3.3	9.6	22	19	18	17	3.9	4.5
Min	0.19	0.28	0.19	0.13	0.15	0.12	0.17	0.15	0.59	0.22	0.28	0.15

Calendar Year 1966: Max 34 Min 0.09 Mean (mgd) 1.49 Mean (cfs) 2.31 Ac-ft 1,660
Fiscal Year 1966-67: Max 34 Min 0.12 Mean (mgd) 1.80 Mean (cfs) 2.79 Ac-ft 2,020

Peak discharge (base, 87 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-16	1230	3.80	152	235	4-1	0200	3.13	96	149

16-5450. Puohokamoa Stream above Spreckels ditch, near Huelo

Location.--Lat 20°51'21", long 156°11'29", on right bank 150 ft upstream from Spreckels ditch inflow and trail crossing, 3.2 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Drainage area.--2.35 sq mi.

Records available.--June 1913 to June 1967. Monthly discharge only for some periods, published in WSP 1319. Prior to July 1954, published as "near Huelo." Records for December 1910 to May 1913 at site 700 ft downstream not equivalent owing to inflow of Spreckels ditch.

Gage.--Water-stage recorder and masonry control. Datum of gage is 1,322.04 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to May 31, 1934, at site 130 ft downstream at different datum.

Average discharge.--54 years, 21.1 mgd (32.6 cfs).

Extremes.--Maximum discharge during year, 795 mgd (1,230 cfs) Oct. 15 (gage height, 4.85 ft); minimum, 1.3 mgd (2.0 cfs) June 22, 23.
1913-67: Maximum discharge, 2,360 mgd (3,650 cfs) Apr. 16, 1960 (gage height, 9.31 ft), from rating curve extended above 410 mgd by logarithmic plotting; minimum, 0.4 mgd (0.6 cfs) Oct. 26, 1917.

Remarks.--Records good. Kula pipeline (see sta. no. 5310) diverts above station at altitudes 4,300 ft (since (1934) and 3,200 ft (since 1944) for domestic use.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	36	6.6	5.6	2.1	9.8	3.7	30	2.6	29	139	16	4.3
2	34	6.1	6.5	2.0	5.3	3.3	51	2.6	18	48	10	4.3
3	16	7.2	5.8	1.8	4.8	3.1	69	4.7	12	34	6.9	3.1
4	13	14	4.3	1.7	22	2.8	179	5.1	16	16	5.6	2.8
5	10	6.3	3.9	1.7	19	2.8	73	34	20	121	4.6	2.6
6	8.4	6.9	5.6	46	8.4	2.6	21	8.4	12	33	4.1	2.2
7	9.1	8.8	4.8	16	5.8	3.1	14	4.1	8.1	38	3.7	2.1
8	5.8	16	3.5	6.2	4.6	5.0	13	3.3	6.9	36	3.5	2.2
9	5.3	6.6	14	18	6.3	2.8	17	86	6.1	19	3.3	3.7
10	4.6	8.8	95	14	5.0	2.4	9.1	69	6.6	56	3.1	11
11	3.9	51	11	14	5.3	2.4	104	15	11	42	4.1	3.1
12	3.7	12	11	5.6	5.0	2.2	28	9.8	8.4	17	12	4.4
13	3.9	8.1	6.6	4.8	4.3	3.7	11	9.5	5.6	14	6.8	3.9
14	10	6.6	20	97	3.7	8.4	8.4	6.9	7.5	17	13	2.2
15	8.4	10	8.4	265	4.4	3.1	7.5	24	5.0	11	7.8	4.5
16	5.3	22	5.8	183	6.5	2.2	6.6	9.5	5.3	9.1	3.7	7.1
17	10	66	4.8	75	4.3	2.4	6.1	7.2	22	8.4	3.1	4.1
18	12	14	6.1	47	3.3	33	8.8	8.7	11	6.9	3.1	2.2
19	9.5	12	23	23	3.1	16	7.2	5.6	5.6	6.1	25	1.8
20	7.2	14	6.9	36	2.8	17	5.3	4.8	5.3	5.6	7.6	1.7
21	15	12	5.0	15	2.8	38	4.3	4.1	7.6	5.0	4.1	1.6
22	11	14	4.3	11	12	23	4.6	3.9	48	8.3	3.3	1.4
23	6.3	7.5	3.7	8.8	7.2	10	4.3	4.6	12	5.8	2.9	1.3
24	26	24	3.5	8.1	9.9	5.8	3.5	3.5	62	4.6	2.6	4.0
25	14	32	3.1	9.5	32	4.6	4.1	3.9	62	4.1	2.6	11
26	9.9	67	4.5	7.8	14	48	7.2	3.1	163	3.9	33	21
27	6.3	19	5.6	6.1	20	38	5.6	217	76	3.3	33	38
28	5.3	10	4.6	5.6	8.1	69	3.7	127	20	20	11	47
29	4.3	8.8	3.1	4.8	5.3	19	3.1	----------	13	34	6.1	16
30	8.6	8.1	2.4	4.3	4.3	77	2.9	----------	13	11	4.6	25
31	11	6.6	----------	13	----------	20	2.8	----------	73	----------	3.9	----------
Total	333.8	512.0	292.4	953.9	249.3	474.4	715.1	687.9	771.0	777.1	254.1	239.6
Mean												
Mgd	10.8	16.5	9.75	30.8	8.31	15.3	23.1	24.6	24.9	25.9	8.20	7.99
Cfs	16.7	25.5	15.1	47.7	12.9	23.7	35.7	38.1	38.5	40.1	12.7	12.4
Ac-ft	1,020	1,570	897	2,930	765	1,460	2,190	2,110	2,370	2,380	780	735
Max	36	67	95	265	32	77	179	217	163	139	33	47
Min	3.7	6.1	2.4	1.7	2.8	2.2	2.8	2.6	5.0	3.3	2.6	1.3

Calendar Year 1966: Max 265 Min 0.90 Mean (mgd) 14.7 Mean (cfs) 22.7 Ac-ft 16,470
Fiscal Year 1966-67: Max 265 Min 1.3 Mean (mgd) 17.2 Mean (cfs) 26.6 Ac-ft 19,210

Peak discharge (base, 700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	0100	4.85	795	1,230	4-1	0200	4.77	771	1,190
1-11	1900	4.59	717	1,110					

16-5528. Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda

Location.--Lat 20°48'27", long 156°14'02", on left bank 1,000 ft upstream from Kula pipeline intake and 3.3 miles east of Olinda Prison Camp.

Drainage area.--2.50 sq mi.

Records available.--July 1953 to June 1967. Prior to July 1956, published as Waikamoi Stream above reservoir at Kula pipeline intake, near Olinda.

Gage.--Water-stage recorder and concrete control. Datum of gage is 4,487 ft above mean sea level (levels by Maui County Waterworks).

Average discharge.--13 years (1954-67), 1.41 mgd (2.18 cfs).

Extremes.--Maximum discharge during year, 912 mgd (1,410 cfs) Jan. 11 (gage height, 6.20 ft), from rating curve extended above 6.4 mgd as explained below; minimum, 0.01 mgd (0.02 cfs) on several days.
1953-67: Maximum discharge, 1,680 mgd (2,600 cfs) Dec. 10, 1954 (gage height, 8.16 ft), from rating curve extended above 6.4 mgd on basis of computation of peak flow over dam; no flow at times.

Remarks.--Records good. Diversion above station for livestock.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.28	0.07	0.04	0.03	0.04	0.02	1.2	0.02	0.89	17	0.07	0.09
2	.59	.08	.53	.02	.03	.02	5.1	.02	.38	2.4	.09	.08
3	.22	.05	.26	.02	.03	.01	8.3	.04	.12	.97	.04	.03
4	.09	.08	.07	.02	1.6	.01	26	.08	.10	.37	.03	.02
5	.08	.08	.05	.02	4.4	.01	4.2	.19	.12	1.7	.03	.01
6	.05	.07	.07	1.4	.51	.02	.83	.13	.08	.63	.03	.01
7	.05	.04	.05	.60	.16	.04	.31	.05	.07	.41	.02	.01
8	.04	.05	.04	.24	.08	.07	.12	.04	.05	1.2	.02	.01
9	.02	.03	.13	.08	.10	.04	.16	2.2	.03	.48	.03	.02
10	.02	.02	1.4	.05	.07	.03	.08	1.1	.04	16	.04	.02
11	.02	.40	.33	.06	.05	.02	98	.35	.06	8.8	.04	.02
12	.01	.09	.12	.05	.05	.03	19	.15	.08	.92	.06	.02
13	.02	.06	.08	.04	.05	.03	.89	.08	.04	.43	.08	.02
14	.04	.04	.30	3.3	.04	.03	.33	.05	.04	.48	.44	.02
15	.05	.05	.15	28	.03	.03	.28	.12	.03	.48	.18	.03
16	.04	.11	.08	1.0	.04	.02	.31	.08	.02	.16	.07	.05
17	.02	.56	.05	6.3	.03	.02	.14	.05	.52	.08	.04	.05
18	.02	.16	.09	.80	.02	3.8	.16	.04	.41	.05	.03	.02
19	.02	.08	.36	.39	.02	2.8	.10	.03	.10	.04	.60	.01
20	.03	.08	.11	.33	.02	.38	.05	.03	.07	.03	.30	.01
21	.02	.29	.06	.16	.01	2.0	.04	.02	.06	.03	.07	.01
22	.02	.38	.04	.08	.02	2.5	.04	.02	2.2	.03	.04	.02
23	.02	.11	.04	.05	.02	.28	.03	.02	.65	.03	.03	.02
24	.68	.54	.05	.04	.02	.10	.04	.02	19	.04	.03	.03
25	.56	.98	.03	.04	.05	.06	.04	.01	2.3	.04	.03	.10
26	.16	.79	.12	.03	.09	5.2	.06	.01	6.9	.04	.16	.18
27	.07	.47	.16	.03	.25	4.7	.08	11	2.7	.02	.14	.28
28	.04	.11	.12	.03	.11	3.2	.04	6.3	.69	.04	.10	.49
29	.03	.08	.08	.02	.05	.98	.03	----------	.23	.25	.08	.28
30	.03	.07	.04	.02	.03	4.7	.02	----------	.14	.08	.05	.83
31	.04	.05	----------	.03	----------	.97	.02	----------	5.1	----------	.02	----------
Total	3.38	6.07	5.05	52.28	8.02	32.12	166.00	22.25	43.22	53.23	2.99	2.79
Mean												
Mgd	0.109	0.196	0.168	1.69	0.267	1.04	5.35	0.794	1.39	1.77	0.096	0.090
Cfs	0.169	0.303	0.260	2.61	0.413	1.61	8.28	1.23	2.15	2.74	0.149	0.139
Ac-ft	10	19	15	160	25	99	509	68	133	163	9.2	8.6
Max	0.68	0.98	1.4	28	4.4	5.2	98	11	19	17	0.60	0.83
Min	0.01	0.02	0.03	0.02	0.01	0.01	0.02	0.01	0.02	0.02	0.02	0.01

Calendar Year 1966: Max 28 Min 0.01 Mean (mgd) 0.456 Mean (cfs) 0.706 Ac-ft 511
Fiscal Year 1966-67: Max 98 Min 0.01 Mean (mgd) 1.09 Mean (cfs) 1.69 Ac-ft 1,220

Peak discharge (base, 130 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	1200	2.77	131	203	4-10	2300	2.78	133	206
1-11	2000	6.20	912	1,410					

16-5700. Naililihaele Stream near Huelo

Location.--Lat 20°52'28", long 156°13'06", on left bank 200 ft upstream from Wailoa ditch intake, 1,000 ft upstream from New Hamakua ditch trail, 1.5 miles south of Kailua, and 2.4 miles southeast of Huelo Church.

Drainage area.--3.58 sq mi.

Records available.--December 1910 to December 1911, October 1913 to June 1918, August to October 1919, December 1919 to June 1924, January 1925 to June 1967. Gage-height records for July to December 1912 at site 700 ft downstream not equivalent owing to diversion. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Datum of gage is 1,205 ft above mean sea level (by vertical angles). Dec. 9, 1910, to Dec. 31, 1911, staff gage at site 300 ft downstream at different datum. Oct. 8, 1913, to Mar. 20, 1922, water-stage recorder at present site at datum 0.50 ft higher.

Average discharge.--50 years (1914-18, 1920-24, 1925-67), 24.4 mgd (37.8 cfs).

Extremes.--Maximum discharge during year, 1,020 mgd (1,580 cfs) Apr. 1 (gage height, 6.67 ft), from rating curve extended above 390 mgd as explained below; minimum, 2.4 mgd (3.7 cfs) June 23.
1910-11, 1913-67: Maximum discharge, 4,140 mgd (6,410 cfs) Nov. 18, 1930 (gage height, 10.74 ft), from rating curve extended above 390 mgd by logarithmic plotting; minimum, 0.45 mgd (0.70 cfs) July 14, 1920.

Remarks.--Records good. No diversion above station since 1922. All low flow diverted into Wailoa ditch (see sta. no. 5880) 200 ft below station for domestic supply, power, and irrigation.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	60	8.3	8.0	4.0	14	6.4	42	4.6	35	146	17	7.5
2	48	7.7	7.5	3.8	7.5	5.9	54	4.4	19	60	10	5.9
3	22	8.4	7.2	3.6	6.7	5.4	155	4.6	13	46	7.5	4.8
4	20	16	6.2	3.4	15	5.0	176	5.0	16	20	6.2	4.4
5	15	8.3	5.9	3.4	19	4.8	93	48	16	164	5.7	4.2
6	15	10	6.7	53	9.0	4.8	25	10	12	44	5.4	4.0
7	13	14	6.4	17	7.2	5.7	17	5.9	10	49	5.0	3.8
8	9.4	26	5.2	7.2	6.2	7.0	14	5.0	8.7	44	4.8	4.0
9	8.7	10	11	40	11	4.8	22	110	8.0	22	4.6	4.0
10	8.0	19	112	16	7.2	4.4	11	92	9.4	27	4.4	13
11	7.0	68	13	12	9.0	4.2	70	23	13	49	5.7	4.4
12	6.7	15	14	7.2	8.3	4.0	36	15	9.4	18	12	4.0
13	6.4	11	8.7	6.4	6.2	6.2	12	15	7.7	16	7.5	4.2
14	18	9.7	23	124	5.7	11	11	11	11	16	25	3.4
15	14	14	11	253	6.2	5.2	18	41	7.0	12	8.0	3.6
16	8.3	32	8.0	200	11	4.2	11	13	7.0	11	5.0	4.0
17	15	91	7.2	82	6.4	4.4	9.4	10	30	10	4.6	3.8
18	17	17	8.7	58	5.7	22	13	18	12	9.0	4.4	3.2
19	14	17	32	28	5.2	12	11	9.0	7.5	8.3	30	2.8
20	12	20	9.7	51	4.8	15	8.7	8.0	7.0	7.5	8.0	2.7
21	30	16	7.5	20	4.8	27	7.7	7.2	15	7.0	5.2	2.7
22	17	15	6.7	14	22	22	7.5	6.7	77	7.0	4.6	2.7
23	11	10	6.2	11	10	13	7.2	7.7	14	6.4	4.4	2.6
24	24	20	5.7	11	17	8.7	6.2	6.2	75	5.9	4.0	5.2
25	16	27	5.2	13	23	7.2	7.0	7.2	94	5.4	4.2	9.8
26	16	108	5.0	10	18	40	7.5	5.7	179	5.2	32	19
27	10	28	4.8	8.7	24	36	7.0	288	100	5.0	61	46
28	8.7	14	4.6	7.5	11	82	5.9	137	23	23	16	68
29	7.5	12	4.4	6.7	8.3	19	5.4	----------	16	46	8.3	14
30	8.3	11	4.2	6.2	7.2	86	5.0	----------	19	11	6.4	28
31	12	9.0	----------	27	----------	25	4.8	----------	75	----------	6.2	----------
Total	498.0	692.4	365.7	1108.1	316.6	508.3	880.3	918.2	945.7	900.7	333.1	289.7
Mean												
Mgd	16.1	22.3	12.2	35.7	10.6	16.4	28.4	32.8	30.5	30.0	10.7	9.66
Cfs	24.9	34.5	18.9	55.2	16.4	25.4	43.9	50.7	47.2	46.4	16.6	14.9
Ac-ft	1530	2120	1120	3400	972	1560	2700	2820	2900	2760	1020	889
Max	60	108	112	253	24	86	176	288	179	164	61	68
Min	6.4	7.7	4.2	3.4	4.8	4.0	4.8	4.4	7.0	5.0	4.0	2.6

Calendar Year 1966: Max 253 Min 2.1 Mean (mgd) 18.9 Mean (cfs) 29.2 Ac-ft 21,210
Fiscal Year 1966-67: Max 288 Min 2.6 Mean (mgd) 21.3 Mean (cfs) 33.0 Ac-ft 23,800

Peak discharge (base, 750 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-16	1700	6.02	758	1,170	4-1	0200	6.67	1,020	1,580
2-27	1430	6.63	1,000	1,550					

16-5745. Kailua Stream near Kailiili

Location.--lat 20°50'28", long 156°14'24", on right bank 0.4 mile downstream from Haiku-uka boundary trail, 2.1 miles east of Kailiili, and 3.9 miles south of Kailua.

Drainage area.--1.01 sq mi.

Records available.--June 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 2,840 ft (from topographic map).

Extremes.--Maximum discharge during year, 380 mgd (588 cfs) Oct. 16 (gage height, 7.20 ft), from rating curve extended above 18 mgd as explained below; minimum, 0.04 mgd (0.06 cfs) Oct. 4-6.
1963-67: Maximum discharge, 1,150 mgd (1,780 cfs) Feb. 3, 1965 (gage height, 10.51 ft), from rating curve extended above 18 mgd by logarithmic plotting; minimum, 0.02 mgd (0.03 cfs) June 17, 18, 1966.

Remarks.--Records good. Diversion above atation at altitude 4,250 ft by Maui County Board of Water Supply for irrigation and domestic use.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.0	0.22	0.27	0.16	0.46	0.11	3.5	0.14	3.9	46	0.53	0.71
2	4.5	.18	.20	.11	.33	.10	13	.13	1.8	6.8	.46	.37
3	1.7	.18	.35	.07	.29	.09	25	.16	1.0	3.1	.31	.18
4	.92	.64	.22	.05	1.7	.07	66	.33	.89	1.6	.20	.16
5	.67	.31	.18	.04	2.8	.05	17	1.6	1.1	12	.16	.13
6	.44	.25	.17	5.6	.78	.05	3.5	1.3	.72	2.5	.14	.11
7	.50	.23	.17	2.1	.50	.05	1.8	.39	.61	1.9	.13	.09
8	.31	.37	.14	.84	.42	.09	1.4	.25	.46	5.4	.12	.08
9	.23	.20	.20	.46	.37	.12	2.2	15	.37	2.3	.11	.08
10	.22	.20	11	.42	.33	.10	1.2	11	.33	36	.09	.22
11	.18	4.5	1.1	.27	.29	.10	62	1.7	.76	15	.09	.17
12	.16	.70	.78	.20	.27	.09	15	1.0	.95	2.8	.51	.13
13	.13	.39	.48	.13	.27	.08	1.7	.67	.44	1.6	.68	.12
14	.14	.25	1.9	13	.25	.09	1.2	.46	.56	3.1	9.9	.09
15	.29	.37	.94	101	.23	.10	1.3	1.0	.39	2.1	2.1	.08
16	.22	.63	.44	54	.23	.09	1.2	.59	.29	1.3	.70	.11
17	.25	4.4	.31	26	.23	.08	.78	.39	3.4	1.1	.37	.16
18	.48	1.1	.33	3.2	.22	8.3	1.1	.33	2.3	.80	.25	.14
19	.31	.61	1.7	.99	.20	7.0	.83	.25	.64	.67	2.9	.12
20	.20	.66	.74	2.1	.18	2.2	.61	.20	.44	.53	1.6	.08
21	.18	.86	.37	.81	.17	10	.48	.16	.37	.46	.50	.06
22	.22	1.6	.27	.67	.17	5.9	.42	.31	4.5	.39	.29	.05
23	.18	.64	.22	.59	.17	1.5	.37	.29	2.2	.35	.18	.05
24	1.7	2.5	.17	.50	.18	.78	.29	.29	36	.29	.16	.07
25	1.5	4.0	.13	.48	.42	.50	.31	.29	6.5	.25	.13	.75
26	.71	3.4	.11	.46	.69	15	.39	.27	32	.22	1.2	2.2
27	.33	2.0	.37	.39	1.1	12	.37	47	11	.18	1.1	5.2
28	.20	.83	.50	.35	.59	16	.29	28	2.4	.37	.37	2.7
29	.17	.61	.29	.31	.23	3.4	.20	----------	1.4	2.7	.22	1.7
30	.18	.50	.22	.29	.14	21	.17	----------	1.2	.87	.16	3.7
31	.29	.37	----------	.37	----------	2.9	.14	----------	16	----------	.14	----------
Total	20.51	33.70	24.27	215.96	14.21	107.94	223.75	113.50	134.92	152.68	25.80	19.81
Mean												
Mgd	0.662	1.09	0.809	6.97	0.474	3.48	7.22	4.05	4.35	5.09	0.832	0.660
Cfs	1.02	1.69	1.25	10.8	0.733	5.38	11.2	6.27	6.73	7.88	1.29	1.02
Ac-ft	63	103	74	663	44	331	687	348	414	469	79	61
Max	4.5	4.5	11	101	2.8	21	66	47	36	46	9.9	5.2
Min	0.13	0.18	0.11	0.04	0.14	0.05	0.14	0.13	0.29	0.18	0.09	0.05

Calendar Year 1966: Max 101 Min 0.03 Mean (mgd) 1.77 Mean (cfs) 2.74 Ac-ft 1,980
Fiscal Year 1966-67: Max 101 Min 0.04 Mean (mgd) 2.98 Mean (cfs) 4.61 Ac-ft 3,340

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-16	1230	7.20	380	588	4-1	1130	6.23	247	382
1-11	1930	6.80	320	495					

16-5850. Hoolawanui Stream near Huelo

Location.--Lat 20°53'15", long 156°14'55", on right bank 250 ft upstream from Wailoa ditch intake, 2 miles west of Kailua, and 2 miles southwest of Huelo.

Drainage area.--1.34 sq mi.

Records available.--December 1910 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,219.42 ft above mean sea level (East Maui Irrigation Co. bench mark). Prior to June 20, 1914, staff gage at site 180 ft downstream at different datum. June 20, 1914, to Oct. 24, 1933, water-stage recorder at site 80 ft downstream at datum 4.43 ft lower.

Average discharge.--56 years (1911-67), 7.72 mgd (11.9 cfs).

Extremes.--Maximum discharge during year, 420 mgd (650 cfs) Feb. 27 (gage height, 2.95 ft), from rating curve extended above 92 mgd as explained below; minimum, 0.69 mgd (1.1 cfs) June 20, 23.
1910-67: Maximum discharge, 3,240 mgd (5,010 cfs) Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 92 mgd by logarithmic plotting; minimum, 0.15 mgd (0.23 cfs) Oct. 25, 1917.

Remarks.--Records good. No diversion above station. All low flow diverted into Wailoa ditch (see sta. no. 5880) 250 ft below station for domestic supply, power, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	2.0	2.8	1.3	3.6	1.6	8.7	1.8	12	53	3.1	1.5
2	7.8	1.8	2.7	1.2	2.5	1.5	13	1.8	7.5	17	2.7	1.4
3	4.4	1.8	2.5	1.2	2.4	1.5	21	1.8	5.7	12	2.3	1.3
4	3.6	2.7	2.3	1.1	3.4	1.4	64	1.8	5.3	7.8	2.0	1.2
5	3.2	1.8	2.3	1.1	4.1	1.3	30	11	4.7	46	2.0	1.2
6	3.2	2.0	2.3	5.6	3.0	1.4	12	3.0	3.9	12	1.8	1.2
7	3.0	2.5	2.0	2.7	2.4	1.9	7.8	2.0	3.7	13	1.8	1.1
8	2.3	4.1	2.0	1.6	2.2	1.6	6.4	1.8	3.2	14	1.6	1.2
9	2.2	2.0	2.2	3.8	3.0	1.3	7.4	19	3.1	7.8	1.6	1.1
10	2.0	2.9	18	3.1	2.3	1.2	4.9	30	3.4	7.8	1.6	1.6
11	2.0	13	3.2	2.0	2.4	1.2	17	6.5	4.6	14	1.8	1.1
12	1.8	3.1	3.0	1.6	2.4	1.2	13	4.3	3.2	7.8	2.2	.99
13	1.8	2.5	2.4	1.5	2.0	1.4	6.4	4.3	3.1	6.7	2.0	.93
14	3.2	2.3	3.6	17	1.8	2.0	5.1	3.6	3.9	6.0	5.1	.88
15	2.7	2.5	2.5	78	2.0	1.2	7.3	8.7	2.7	5.1	2.4	.88
16	2.0	4.9	2.2	67	2.0	1.1	4.3	4.1	2.5	4.5	1.6	.88
17	2.7	13	2.0	34	1.8	1.1	3.7	3.8	6.7	4.3	1.4	.73
18	3.2	3.7	2.2	17	1.6	3.4	4.3	4.8	3.6	3.6	1.3	.83
19	2.8	3.9	4.6	9.6	1.6	2.2	3.7	3.2	2.7	3.2	9.2	.78
20	2.5	4.0	2.4	13	1.5	2.0	3.2	3.0	2.4	3.1	2.3	.73
21	6.0	3.4	2.0	7.2	1.5	3.4	3.0	2.7	2.7	3.0	1.6	.73
22	3.2	3.4	2.0	6.0	2.6	4.3	2.8	2.5	12	2.7	1.4	.73
23	2.4	2.8	1.8	5.1	2.0	2.5	2.7	2.7	3.9	2.5	1.2	.73
24	4.2	3.9	1.8	4.5	2.4	1.8	2.4	2.4	34	2.4	1.2	1.1
25	3.4	4.5	1.6	4.5	3.1	1.6	3.0	2.7	22	2.3	1.2	1.2
26	3.1	20	1.6	3.9	3.1	5.9	2.7	2.2	46	2.2	3.4	1.6
27	2.4	6.4	1.6	3.4	3.7	5.7	2.4	101	33	2.0	7.4	5.1
28	2.2	4.1	1.5	3.1	2.0	15	2.2	45	11	4.2	2.7	6.6
29	2.0	3.7	1.4	2.8	1.8	4.7	2.0	----------	7.8	8.2	1.8	2.7
30	2.0	3.2	1.3	2.7	1.6	20	2.0	----------	7.5	3.0	1.6	4.5
31	2.5	3.1	----------	5.6	----------	7.2	1.8	----------	17	----------	1.5	----------
Total	100.8	135.0	83.8	312.2	71.8	103.6	270.2	281.5	284.8	281.2	74.8	46.62
Mean												
Mgd	3.25	4.35	2.79	10.1	2.39	3.34	8.72	10.1	9.19	9.37	2.41	1.55
Cfs	5.03	6.73	4.32	15.6	3.70	5.17	13.5	15.6	14.2	14.5	3.73	2.40
Ac-ft	309	414	257	958	220	318	829	864	874	863	230	143
Max	11	20	18	78	4.1	20	64	101	46	53	9.2	6.6
Min	1.8	1.8	1.3	1.1	1.5	1.1	1.8	1.8	2.4	2.0	1.2	0.73

Calendar Year 1966: Max 78 Min 0.51 Mean (mgd) 4.91 Mean (cfs) 7.60 Ac-ft 5,500
Fiscal Year 1966-67: Max 101 Min 0.73 Mean (mgd) 5.61 Mean (cfs) 8.68 Ac-ft 6,280

Peak discharge (base, 400 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
2-27	1500	2.95	420	650

16-5870. Honopou Stream near Huelo

Location.--Lat 20°53'20", long 156°15'20", on left bank 75 ft upstream from Wailoa ditch intake, 2.2 miles southwest of Huelo, and 2.5 miles west of Kailua.

Drainage area.--0.64 sq mi.

Records available.--December 1910 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, staff gage at same site and datum.

Average discharge.--56 years (1911-67), 3.07 mgd (4.75 cfs).

Extremes.--Maximum discharge during year, 111 mgd (172 cfs) Feb. 27 (gage height, 2.80 ft); minimum, 0.25 mgd (0.39 cfs) June 23. 1910-67: Maximum discharge, 3,690 mgd (5,710 cfs) Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 70 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) on several days in 1933, 1934.

Remarks.--Records excellent. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.1	0.92	1.9	0.68	2.1	0.76	3.3	0.92	6.6	14	1.3	0.60
2	2.8	.92	1.8	.68	1.6	.76	5.1	.84	4.8	6.3	1.1	.60
3	1.9	.92	1.7	.68	1.5	.76	7.2	.84	3.9	5.9	1.0	.60
4	1.8	1.1	1.6	.60	1.7	.68	18	.84	3.5	4.6	.92	.54
5	1.6	.92	1.5	.60	1.9	.68	11	4.8	3.1	16	.84	.54
6	1.7	1.1	1.5	1.6	1.5	.68	6.1	1.4	2.6	6.1	.84	.48
7	1.5	1.3	1.4	1.3	1.3	1.1	4.9	1.0	2.4	5.7	.76	.48
8	1.2	1.7	1.3	.76	1.2	.92	4.2	.92	2.1	7.0	.68	.48
9	1.2	.92	1.5	2.0	1.6	.68	3.8	5.8	2.1	4.5	.68	.54
10	1.1	1.2	4.4	1.4	1.2	.60	3.1	7.6	2.0	4.2	.60	.60
11	1.0	3.4	1.6	.92	1.3	.60	5.4	3.5	2.2	5.4	.76	.48
12	.92	1.3	1.6	.76	1.4	.60	3.9	2.6	1.7	3.5	.92	.48
13	.92	1.1	1.4	.68	1.1	.68	2.6	2.5	1.8	3.1	.76	.42
14	1.3	1.0	1.8	5.9	1.0	1.0	2.4	2.2	1.9	2.9	1.1	.42
15	1.1	1.2	1.4	17	1.0	.60	2.8	4.6	1.5	2.5	.76	.42
16	.92	2.2	1.2	21	1.1	.60	2.2	2.3	1.4	2.4	.60	.42
17	1.0	5.7	1.1	11	.92	.60	2.1	2.2	3.2	2.3	.54	.36
18	1.3	1.9	1.1	8.0	.84	1.1	2.2	2.8	1.6	2.1	.54	.36
19	1.3	2.1	1.9	5.4	.84	.92	2.0	2.0	1.3	1.9	2.6	.36
20	1.0	2.0	1.2	5.7	.76	.76	1.8	1.9	1.2	1.8	1.0	.36
21	2.7	1.9	1.0	4.4	.76	.92	1.7	1.7	1.3	1.7	.68	.36
22	1.4	1.9	1.0	3.6	1.4	1.4	1.6	1.7	6.3	1.6	.60	.30
23	1.1	1.6	.92	3.3	1.1	1.1	1.5	1.7	1.9	1.5	.54	.30
24	1.9	2.1	.92	2.9	1.2	.84	1.4	1.6	15	1.4	.54	.48
25	1.5	2.1	.84	2.8	1.4	.76	1.8	1.6	8.2	1.3	.54	.54
26	1.5	5.5	.84	2.4	1.5	1.6	1.5	1.4	16	1.2	.84	.60
27	1.2	3.3	.84	2.2	1.4	2.0	1.3	40	12	1.1	2.5	1.1
28	1.1	2.3	.84	2.1	.92	5.4	1.2	17	6.1	1.8	1.1	2.1
29	1.0	2.2	.76	1.9	.84	2.0	1.1	----------	4.9	2.7	.84	1.6
30	1.0	2.1	.76	1.8	.84	7.0	1.0	----------	4.5	1.3	.76	1.5
31	1.1	2.0	----------	3.2	----------	3.1	.92	----------	6.4	----------	.68	----------
Total	44.16	59.90	41.62	117.26	37.22	41.20	109.12	118.26	133.5	117.8	27.92	18.42
Mean												
Mgd	1.42	1.93	1.39	3.78	1.24	1.33	3.52	4.22	4.31	3.93	0.901	0.614
Cfs	2.20	2.99	2.15	5.85	1.92	2.06	5.45	6.53	6.67	6.08	1.39	0.950
Ac-ft	136	184	128	360	114	126	335	363	410	362	86	57
Max	3.1	5.7	4.4	21	2.1	7.0	18	40	16	16	2.6	2.1
Min	0.92	0.92	0.76	0.60	0.76	0.60	0.92	0.84	1.2	1.1	0.54	0.30

Calendar Year 1966: Max 27 Min 0.30 Mean (mgd) 2.16 Mean (cfs) 3.34 Ac-ft 2410
Fiscal Year 1966-67: Max 40 Min 0.30 Mean (mgd) 2.37 Mean (cfs) 3.67 Ac-ft 2660

Peak discharge (base, 110 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
2-27	1530	2.80	111	172

16-5880. Wailoa ditch at Honopou, near Huelo

Location.--Lat 20°53'20", long 156°15'19", on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, and 2.2 miles southwest of Huelo.

Records available.--November 1922 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 1,208 ft above mean sea level (by vertical angles).

Average discharge.--44 years (1923-67), 113 mgd (175 cfs).

Extremes.--1922-67: Maximum daily discharge, 211 mgd (326 cfs) Apr. 1, 1967; no flow Jan. 24-27, 1923.

Remarks.--Records excellent. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft. Water is used for domestic supply, power, and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	192	103	92	68	132	84	195	61	190	211	180	72
2	192	91	102	52	84	77	196	58	185	209	154	69
3	188	99	95	50	77	71	198	66	162	203	118	58
4	172	164	76	47	99	67	202	70	178	191	97	54
5	141	94	71	45	197	62	179	121	178	192	86	52
6	133	110	86	157	172	63	160	123	138	190	82	50
7	128	134	79	194	122	74	161	70	113	190	76	48
8	91	178	65	129	89	84	164	63	99	190	78	51
9	85	106	90	111	128	62	187	173	91	190	69	56
10	78	106	194	177	98	57	142	201	106	189	66	123
11	70	182	144	169	103	57	185	196	131	191	74	53
12	66	152	148	102	108	54	200	192	115	189	127	58
13	68	120	93	90	83	75	143	186	107	185	163	53
14	131	99	169	196	75	113	107	147	154	184	127	44
15	125	142	123	204	86	64	138	193	90	164	136	62
16	85	151	87	204	152	53	122	188	89	156	78	77
17	132	195	78	202	99	55	108	140	123	152	67	56
18	167	178	94	203	83	147	157	160	147	116	67	43
19	146	162	182	183	74	187	137	109	91	103	117	39
20	122	157	107	202	67	152	102	99	80	97	134	37
21	179	162	81	198	78	193	91	86	87	91	78	37
22	172	178	73	166	170	193	88	80	189	122	65	34
23	104	118	68	134	182	162	82	94	180	140	61	33
24	148	169	65	124	181	96	76	77	190	101	57	62
25	188	192	61	147	194	78	106	78	192	93	57	105
26	164	189	70	121	192	156	135	69	201	81	165	139
27	114	192	74	102	194	193	113	140	198	77	186	185
28	95	157	97	92	111	196	81	203	143	104	154	187
29	83	134	66	82	105	193	71	----------	60	190	95	182
30	100	117	61	77	94	196	69	----------	50	167	76	187
31	141	103	----------	121	----------	195	65	----------	119	---------	69	----------
Total	4.000	4.434	2.891	4.149	3.629	3.509	4.160	3.443	4.176	4.658	3.159	2.306
Mean												
Mgd	129	143	96.4	134	121	113	134	123	135	155	102	76.9
Cfs	200	221	149	207	187	175	207	190	209	240	158	119
Ac-ft	12.280	13.610	8.870	12.730	11.140	10.770	12.770	10.570	12.820	14.290	9.690	7.080
Max	192	195	194	204	197	196	202	203	201	211	186	187
Min	66	91	61	45	67	53	65	58	50	77	57	33

Calendar Year 1966: Max 204 Min 26 Mean (mgd) 117 Mean (cfs) 181 Ac-ft 130,600
Fiscal Year 1966-67: Max 211 Min 33 Mean (mgd) 122 Mean (cfs) 189 Ac-ft 136,600

16-5890. New Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'28", long 156°15'22", on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, and 2.1 miles southwest of Huelo.

Records available.--January 1918 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 1,170 ft above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft upstream at different datum. May 14, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft higher.

Average discharge.--49 years, 24.4 mgd (37.8 cfs).

Extremes.--1918-67: Maximum daily discharge, 116 mgd (179 cfs) Feb. 13, 14, 27, 1932; no flow at times.

Remarks.--Records excellent. Ditch diverts from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	91	1.1	1.7	0.47	23	1.2	19	0.59	100	42	35	0.26
2	98	.79	1.4	.43	1.6	1.1	19	.55	66	41	5.0	.23
3	42	.74	1.5	.39	1.3	1.0	19	.55	4.3	41	1.0	.20
4	4.7	21	1.2	.35	12	.96	19	.55	27	56	.85	.18
5	2.6	.90	1.0	.32	84	.90	29	17	21	70	.74	.15
6	1.2	1.0	1.0	43	10	.85	9.4	11	3.8	72	.69	.15
7	.85	1.4	.96	70	1.7	1.1	9.2	.69	2.4	72	.64	.15
8	.64	53	.85	8.5	1.1	1.1	7.5	.55	1.8	72	.59	.15
9	.59	1.2	.85	21	1.9	.79	9.8	29	1.7	70	.55	.15
10	.55	1.1	93	52	1.2	.74	2.8	64	1.8	64	.51	8.1
11	.51	61	15	40	1.3	.69	45	52	18	72	.51	.23
12	.47	2.3	2.6	1.7	2.3	.64	94	36	5.4	67	7.3	.18
13	.51	1.3	1.2	1.3	1.4	.69	43	20	2.5	21	16	.15
14	9.6	1.1	41	84	1.1	3.0	36	2.0	10	33	20	.13
15	1.6	4.6	3.6	100	1.0	.59	12	57	1.4	13	14	.13
16	.59	30	1.2	101	18	.51	1.7	33	1.2	6.5	.43	.15
17	.69	100	1.1	102	1.3	.47	1.4	3.3	23	6.2	.35	.11
18	3.1	33	1.1	110	1.1	32	4.0	25	35	4.5	.23	.10
19	.96	10	55	68	1.0	49	1.4	2.4	1.4	4.1	2.5	.10
20	.74	25	1.9	109	.96	18	1.2	2.0	1.2	2.6	2.3	.08
21	48	14	1.0	46	.90	78	1.1	1.7	2.2	1.4	.59	.10
22	18	14	.90	5.5	25	75	.96	1.5	101	7.7	.23	.08
23	.96	1.8	.79	3.5	31	17	.90	1.5	36	11	.23	.05
24	32	41	.74	3.4	25	.64	.85	1.3	48	1.2	.20	.08
25	42	93	.69	3.2	54	.51	2.2	1.4	38	1.0	.20	2.0
26	24	78	.64	2.6	32	52	6.6	1.1	37	.90	34	35
27	1.1	77	.59	2.0	62	98	5.3	53	37	.85	82	88
28	.85	4.6	.64	1.8	3.5	107	.79	102	37	11	16	84
29	.74	2.6	.59	1.5	1.5	76	.69	----------	59	66	.59	47
30	.69	2.2	.47	1.3	1.3	37	.64	----------	42	14	.39	87
31	20	1.9	----------	18	----------	19	.59	----------	42	----------	.29	----------
Total	449.24	680.63	234.21	1002.26	403.46	675.48	404.02	520.68	808.1	944.95	243.91	354.39
Mean												
Mgd	14.5	22.0	7.81	32.3	13.4	21.8	13.0	18.6	26.1	31.5	7.87	11.8
Cfs	22.4	34.0	12.1	50.0	20.7	33.7	20.1	28.8	40.4	48.7	12.2	18.3
Ac-ft	1,380	2,090	719	3,080	1,240	2,070	1,240	1,600	2,480	2,900	749	1,090
Max	98	100	93	110	84	107	94	102	101	72	82	88
Min	0.47	0.74	0.47	0.32	0.90	0.47	0.59	0.55	1.2	0.85	0.20	0.05

Calendar Year 1966: Max 110 Min 0.13 Mean (mgd) 15.3 Mean (cfs) 23.7 Ac-ft 17,170
Fiscal Year 1966-67: Max 110 Min 0.05 Mean (mgd) 18.4 Mean (cfs) 28.5 Ac-ft 20,630

16-5920. Lowrie ditch at Honopou Gulch, near Huelo

Location.--Lat 20°54'57", long 156°15'07", on left bank 0.2 mile downstream from siphon across Honopou Stream, 1.6 miles west of Huelo, and 2.7 miles northwest of Kailua.

Records available.--January 1910 to March 1927, February 1930 to June 1967. Published as "at Opana weir, near Huelo" 1910-27.

Gage.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

Average discharge.--53 years (1910-26, 1930-67), 26.1 mgd (40.4 cfs).

Extremes.--1910-27, 1930-67: Maximum daily discharge, 75 mgd (116 cfs) Oct. 31, 1921; no flow at times.

Remarks.--Records excellent. Lowrie ditch received water from Center ditch at Nailiilihaele Stream and diverts from additional streams westward to Maliko Gulch for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	55	7.3	11	5.9	30	11	1.6	5.1	32	1.7	29	12
2	53	5.9	11	5.5	13	10	1.4	2.2	22	1.0	18	11
3	28	7.2	11	5.1	12	9.8	1.2	.74	17	.93	19	10
4	9.2	6.8	9.4	4.8	15	9.2	1.3	.86	23	.93	14	4.4
5	17	5.1	8.0	4.6	42	8.3	1.2	8.1	17	.93	13	7.6
6	14	5.7	12	25	15	9.2	1.3	1.6	19	.72	10	6.0
7	10	6.0	12	26	12	12	1.0	.93	26	.72	7.2	4.3
8	6.8	22	12	15	10	10	.93	.74	22	1.1	11	4.6
9	4.3	7.7	12	22	13	8.3	.66	4.1	12	.72	8.3	4.4
10	4.7	5.5	55	40	11	7.7	0	8.9	13	.72	6.8	5.7
11	7.8	41	24	35	12	7.2	0	20	30	.72	7.0	3.8
12	5.1	9.2	16	25	18	6.9	2.3	22	12	.55	8.8	3.4
13	4.6	6.8	13	16	13	8.5	14	6.4	14	.60	16	3.6
14	8.0	6.0	27	55	11	8.1	13	.79	14	.60	16	3.1
15	10	11	13	59	11	7.0	15	.79	10	8.0	16	3.0
16	4.4	16	14	51	28	6.2	4.8	10	10	17	7.7	3.2
17	4.3	68	12	50	13	6.2	1.0	17	22	15	6.8	2.8
18	5.8	31	12	49	12	16	1.0	19	26	13	6.6	2.8
19	5.0	16	28	48	11	29	.72	14	9.4	13	22	2.7
20	6.2	14	13	48	10	7.6	1.0	11	8.5	14	25	2.7
21	18	15	14	45	9.8	38	6.9	1.8	23	13	7.9	2.6
22	8.9	18	14	36	26	44	11	1.1	53	12	7.0	2.5
23	6.0	14	11	29	38	10	3.3	3.6	22	14	8.5	2.4
24	15	24	9.6	17	21	7.2	.60	11	40	9.4	11	3.6
25	30	50	9.6	14	29	6.2	.86	9.6	36	8.9	9.4	3.6
26	13	52	6.8	18	25	23	.72	8.3	36	13	24	8.4
27	10	48	7.4	18	33	45	3.8	35	35	14	47	45
28	9.3	18	9.4	12	16	49	5.5	42	27	10	9.9	49
29	8.2	3.3	6.6	11	16	46	5.5	----------	1.9	57	11	31
30	5.0	2.7	7.5	11	14	22	5.3	----------	1.6	13	9.8	40
31	5.9	4.3	----------	19	----------	1.6	5.3	----------	1.6	----------	9.0	----------
Total	392.5	547.5	421.3	819.9	539.8	490.2	112.19	266.65	636.0	256.24	422.7	289.2
Mean												
Mgd	12.7	17.7	14.0	26.4	18.0	15.8	3.62	9.52	20.5	8.54	13.6	9.64
Cfs	19.6	27.4	21.7	40.8	27.9	24.4	5.60	14.7	31.7	13.2	21.0	14.9
Ac-ft	1200	1680	1290	2520	1660	1500	344	818	1950	786	1300	888
Max	55	68	55	59	42	49	15	42	53	57	47	49
Min	4.3	2.7	6.6	4.6	9.8	1.6	0	0.74	1.6	0.55	6.6	2.4

Calendar Year 1966: Max 68 Min 1.2 Mean (mgd) 15.2 Mean (cfs) 23.5 Ac-ft 16990
Fiscal Year 1966-67: Max 68 Min 0 Mean (mgd) 14.2 Mean (cfs) 22.0 Ac-ft 15940

16-5940. Haiku ditch at Honopou Gulch, near Kailua

Location.--Lat 20°55'05", long 156°14'55", on right bank on west side of Honopou Gulch, 160 ft below new Government Road, 2.5 miles northwest of Kailua, and 5 miles east of Haiku.

Records available.--January 1910 to June 1912, January 1913 to December 1928, February 1930 to June 1967. Published as "at Peahi weir, near Huelo" January 1910 to June 1919, as "at Manawai Gulch, near Peahi" July 1919 to December 1928, and as "at Kapalalaea Gulch, near Huelo" February 1930 to January 1940. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft above mean sea level, datum of 1929. Jan. 1, 1910, to Oct. 6, 1914, at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, at site 2.9 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mile downstream at different datum.

Average discharge.--53 years (1910-12, 1913-14, 1915-28, 1930-67), 18.0 mgd (27.9 cfs).

Extremes.--1910-28, 1930-67: Maximum daily discharge, 135 mgd (209 cfs) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

Remarks.--Records excellent. Ditch diverts water from all streams between Nailiilihaele Stream and Maliko Gulch for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	25	0.44	1.0	0.62	17	1.4	27	0.70	45	63	2.2	0.85
2	36	.44	.85	.62	1.6	1.3	50	1.9	18	59	1.8	.80
3	11	.51	.90	.58	1.4	1.2	49	5.9	2.6	65	1.6	.80
4	1.0	.54	.75	.54	3.8	1.2	26	5.7	3.5	60	1.4	.75
5	.75	.51	.70	.51	20	1.2	.80	13	2.5	62	1.4	.75
6	.70	.48	1.0	27	1.7	1.2	9.7	18	2.4	61	1.4	.70
7	.62	.48	.80	5.2	1.4	1.4	1.0	6.6	2.4	62	1.3	.70
8	.51	1.6	.75	.80	1.4	1.2	.90	5.9	1.8	63	1.2	.70
9	.51	.51	.80	9.1	1.7	1.1	35	43	1.6	44	1.2	.70
10	.48	.51	60	17	1.4	1.1	32	57	1.6	42	1.1	.65
11	.48	30	4.0	7.6	1.6	1.0	36	29	1.5	61	1.1	.62
12	.44	.80	1.2	.95	1.8	1.0	6.7	18	1.5	42	1.3	.62
13	.51	.65	.90	.85	1.6	1.0	.80	1.8	1.6	26	13	.62
14	.75	.54	3.1	52	1.5	1.0	.75	12	1.6	31	8.1	.62
15	.58	.54	1.2	55	1.5	.95	.70	37	1.4	18	3.8	.62
16	.51	7.3	.85	45	6.0	.90	7.6	23	1.4	7.0	1.0	.58
17	.51	64	.75	44	1.5	.90	11	3.2	10	4.5	1.0	.58
18	.54	8.7	.90	52	1.4	9.3	20	9.1	12	3.9	1.0	.54
19	.48	.95	14	26	1.4	20	25	2.9	1.5	3.7	21	.54
20	.48	.80	1.3	52	1.4	1.0	21	3.6	1.4	3.5	13	.51
21	8.4	.70	.85	13	1.3	26	9.1	12	5.2	3.3	1.2	.51
22	.80	.75	.75	4.2	14	30	2.6	12	29	3.0	1.1	.51
23	.44	.65	.70	5.6	17	1.2	6.5	12	34	3.4	1.0	.51
24	11	1.7	.65	25	1.8	.95	9.0	1.8	49	3.0	.95	.65
25	13	32	.62	9.4	5.3	.85	11	1.8	51	2.7	1.0	.70
26	.98	38	.62	2.9	4.7	26	10	1.6	61	2.5	13	.58
27	.54	36	.58	2.7	15	15	5.5	23	60	1.9	51	34
28	.48	2.0	.70	2.5	1.6	7.4	2.2	5.4	18	2.8	1.4	51
29	.44	14	.65	1.9	1.4	1.2	1.7	----------	.58	32	1.0	13
30	.40	12	.62	1.6	1.5	3.6	1.1	----------	.44	2.0	.90	18
31	.44	8.5	----------	7.1	----------	16	.70	----------	26	----------	.90	----------
Total	118.77	266.60	102.49	473.27	134.7	177.55	420.35	366.90	449.52	838.2	140.65	132.71
Mean												
Mgd	3.83	8.60	3.42	15.3	4.49	5.73	13.6	13.1	14.5	27.9	4.54	4.42
Cfs	5.93	13.3	5.29	23.7	6.95	8.87	21.0	20.3	22.4	43.2	7.02	6.84
Ac-ft	364	818	315	1,450	413	545	1,290	1,130	1,380	2,570	432	407
Max	36	64	60	55	20	30	50	57	61	65	51	51
Min	0.40	0.44	0.58	0.51	1.3	0.85	0.70	0.70	0.44	1.9	0.90	0.51

Calendar Year 1966: Max 66 Min 0.14 Mean (mgd) 8.48 Mean (cfs) 13.1 Ac-ft 9,510
Fiscal Year 1966-67: Max 65 Min 0.40 Mean (mgd) 9.92 Mean (cfs) 15.3 Ac-ft 11,110

16-5962. Halehaku Gulch near Kailiili

Location.--Lat 20°50'53", long 156°15'13", on left bank 1.2 miles east of Kailiili, 3.1 miles northeast of Olinda Prison Camp, and 3.9 miles east of Makawao.

Drainage area.--0.13 sq mi.

Records available.--March 1965 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,610 ft (from topographic map).

Extremes.--Maximum discharge during year, 9.4 mgd (14 cfs) Oct. 15 (gage height, 1.63 ft), from rating curve extended above 1.5 mgd as explained below; minimum, 0.04 mgd (0.06 cfs) Aug. 2-5.
1965-67: Maximum discharge, 23 mgd (36 cfs) Apr. 5 and May 2, 1965 (gage heights, 2.30 and 2.31 ft, respectively), from rating curve extended above 1.5 mgd by logarithmic plotting; minimum, 0.04 mgd (0.06 cfs) Oct. 6-8, 1965, Aug. 2-5, 1966.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.47	0.05	0.21	0.08	0.24	0.09	0.94	0.21	1.2	3.0	0.27	0.15
2	.51	.05	.21	.08	.21	.09	1.2	.19	.89	1.8	.27	.15
3	.39	.04	.19	.08	.21	.09	2.1	.19	.69	1.3	.24	.15
4	.27	.04	.19	.07	.27	.09	4.8	.19	.59	1.0	.21	.15
5	.24	.04	.17	.07	.30	.08	3.0	.27	.55	1.7	.21	.13
6	.21	.05	.17	.17	.27	.08	1.6	.21	.51	1.3	.21	.11
7	.21	.06	.15	.15	.24	.08	1.1	.19	.47	1.0	.19	.11
8	.19	.06	.15	.11	.21	.08	.89	.17	.43	1.2	.19	.09
9	.17	.06	.15	.11	.21	.08	.79	.86	.39	1.1	.17	.09
10	.17	.06	.81	.11	.21	.07	.69	1.6	.36	1.3	.17	.11
11	.15	.32	.33	.11	.19	.07	1.9	.69	.44	2.3	.15	.09
12	.15	.13	.27	.11	.19	.07	2.4	.47	.36	1.6	.17	.08
13	.13	.11	.21	.11	.19	.07	1.2	.43	.36	1.2	.17	.08
14	.13	.09	.24	.82	.17	.07	.89	.36	.36	.99	.21	.08
15	.13	.09	.21	5.5	.17	.07	.82	.36	.33	.94	.21	.07
16	.11	.11	.19	4.4	.17	.06	.74	.33	.30	.84	.17	.08
17	.11	.27	.17	3.2	.15	.06	.69	.30	.39	.74	.17	.07
18	.11	.21	.17	1.4	.15	.17	.59	.30	.39	.64	.17	.07
19	.09	.19	.17	.99	.15	.24	.55	.27	.36	.59	.36	.07
20	.08	.17	.17	.89	.13	.24	.47	.24	.33	.55	.27	.07
21	.08	.17	.15	.74	.13	.64	.43	.28	.30	.51	.21	.07
22	.07	.19	.15	.64	.11	.69	.43	.21	.43	.47	.19	.06
23	.07	.17	.13	.55	.11	.39	.36	.21	.43	.43	.19	.06
24	.08	.21	.13	.47	.11	.30	.36	.21	2.1	.39	.17	.06
25	.11	.36	.11	.43	.13	.27	.33	.21	1.4	.36	.17	.08
26	.09	.47	.11	.36	.15	.65	.30	.19	2.8	.33	.19	.15
27	.08	.47	.11	.33	.15	1.1	.30	2.2	2.3	.33	.19	.30
28	.07	.33	.11	.30	.13	1.7	.27	2.9	1.4	.33	.17	.24
29	.06	.27	.09	.30	.11	.99	.27	----------	.99	.39	.17	.24
30	.06	.24	.09	.27	.11	1.9	.24	----------	.84	.30	.15	.36
31	.06	.21	----------	.27	----------	1.2	.21	----------	1.1	----------	.15	----------
Total	4.85	5.29	5.71	23.22	5.27	11.78	30.86	14.24	23.79	28.93	6.13	3.62
Mean												
Mgd	0.156	0.171	0.190	0.749	0.176	0.380	0.995	0.509	0.767	0.964	0.198	0.121
Cfs	0.241	0.265	0.294	1.16	0.272	0.588	1.54	0.788	1.19	1.49	0.306	0.187
Ac-ft	15	16	18	71	16	36	95	44	73	89	19	11
Max	0.51	0.47	0.81	5.5	0.30	1.9	4.8	2.9	2.8	3.0	0.36	0.36
Min	0.06	0.04	0.09	0.07	0.11	0.06	0.21	0.17	0.30	0.30	0.15	0.06

Calendar Year 1966: Max 5.5 Min 0.04 Mean (mgd) 0.379 Mean (cfs) 0.586 Ac-ft 424
Fiscal Year 1966-67: Max 5.5 Min 0.04 Mean (mgd) 0.448 Mean (cfs) 0.693 Ac-ft 502

Peak discharge (base, 8.0 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
10-15	1200	1.63	9.4	14

16-5995. Opana tunnel at Kailiili

Location.--Lat 20°51'04", long 156°16'17", on left bank at tunnel outlet, 0.3 mile north of Kailiili, and 2.7 miles east of Makawao.

Records available.--May 1965 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,340 ft (from topographic map).

Extremes.--1965-67: Maximum daily discharge, 7.4 mgd (11 cfs) Jan. 4, 1967; minimum daily, 0.15 mgd (0.23 cfs) Oct. 5, 6, 1965.

Remarks.--Records good. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.8	0.24	0.38	0.27	0.91	0.42	3.9	1.4	5.0	7.0	1.8	0.97
2	3.0	.21	.38	.24	.81	.38	5.3	1.3	3.6	5.7	1.6	.76
3	2.1	.24	.46	.24	.81	.38	6.3	1.5	3.0	5.0	1.5	.66
4	1.3	.30	1.1	.21	.93	.34	7.4	1.4	2.7	4.1	1.3	.61
5	.87	.24	.61	.21	1.2	.34	6.2	2.1	2.6	5.0	1.3	.56
6	.66	.24	.56	1.8	1.0	.34	5.1	1.8	2.4	4.7	1.3	.51
7	.61	.24	.46	1.8	.93	.46	4.4	1.4	2.3	4.0	1.2	.46
8	.46	.21	.38	.81	.81	.71	3.9	1.2	2.2	5.0	1.1	.42
9	.38	.18	.46	.71	.81	.46	3.9	4.4	2.0	4.6	1.1	.42
10	.34	.25	3.9	.56	.81	.38	3.4	5.2	1.9	5.7	1.1	.56
11	.30	1.6	1.8	.42	.71	.34	5.6	3.2	2.4	6.5	1.0	.51
12	.27	.56	1.1	.34	.71	.30	6.2	2.5	2.6	5.3	1.7	.46
13	.27	.34	.76	.30	.71	.27	4.7	2.2	2.1	4.6	1.9	.42
14	.38	.27	1.1	1.5	.61	.38	4.0	1.9	2.2	5.0	2.5	.38
15	.42	.27	1.1	7.0	.61	.34	4.0	2.1	1.9	4.7	3.6	.38
16	.34	.30	.71	6.0	.61	.27	3.8	1.8	1.7	3.9	1.8	.61
17	.42	1.1	.56	5.0	.51	.27	3.4	1.7	2.7	3.5	1.3	.81
18	.42	.76	.61	4.5	.51	2.0	3.3	1.6	3.4	3.1	1.1	.56
19	.34	.56	.93	4.0	.51	4.3	3.0	1.5	2.1	2.8	1.2	.42
20	.27	.51	.81	3.5	.46	2.2	2.8	1.4	1.8	2.6	3.4	.38
21	.27	.56	.56	3.0	.42	4.0	2.6	1.3	1.7	2.6	1.8	.42
22	.27	1.1	.46	2.4	.42	4.5	2.4	1.3	3.7	2.6	1.3	.38
23	.24	.66	.42	2.0	.42	2.2	2.2	1.3	3.8	2.4	1.1	.38
24	.50	.82	.38	1.8	.42	1.5	2.1	1.2	6.3	2.2	1.0	.90
25	.93	2.2	.34	1.6	.46	1.1	2.2	1.3	5.7	2.0	.87	1.5
26	.66	2.1	.34	1.5	.51	4.1	2.2	1.1	6.2	1.8	1.3	2.4
27	.38	2.5	.46	1.4	.51	5.6	1.9	3.9	5.9	1.8	1.3	3.0
28	.27	1.2	.42	1.2	.46	5.7	1.8	6.8	4.9	2.0	.93	2.0
29	.24	.81	.34	1.2	.46	4.1	1.6	----------	4.0	3.1	.81	2.3
30	.24	.61	.30	1.0	.42	5.7	1.5	----------	3.5	2.0	.76	4.0
31	.24	.46	----------	1.0	----------	4.4	1.5	----------	4.6	----------	.71	----------
Total	20.19	21.64	22.19	57.51	19.47	57.78	112.6	59.8	100.9	115.3	44.68	28.14
Mean												
Mgd	0.651	0.698	0.740	1.86	0.649	1.86	3.63	2.14	3.25	3.84	1.44	0.938
Cfs	1.01	1.08	1.14	2.88	1.00	2.88	5.62	3.31	5.03	5.94	2.23	1.45
Ac-ft	62	66	68	176	60	177	346	184	310	354	137	86
Max	3.0	2.5	3.9	7.0	1.2	5.7	7.4	6.8	6.3	7.0	3.6	4.0
Min	0.24	0.18	0.30	0.21	0.42	0.27	1.5	1.1	1.7	1.8	0.71	0.38

Calendar Year 1966: Max 7.0 Min 0.18 Mean (mgd) 1.58 Mean (cfs) 2.44 Ac-ft 1,770
Fiscal Year 1966-67: Max 7.4 Min 0.18 Mean (mgd) 1.81 Mean (cfs) 2.80 Ac-ft 2,030

Note.--No gage-height record Oct. 14 to Nov. 30.

16-6180. Kahakuloa Stream near Honokohau

Location.--Lat 20°58'54", long 156°33'26", on right bank 0.5 mile downstream from Kapuna Stream, 1.3 miles south of Kahakuloa, 2 miles west of Puu Makawana, and 4.3 miles southeast of Honokohau.

Drainage area.--3.47 sq mi.

Records available.--July 1939 to August 1943, September 1947 to June 1967. Records for January 1913 to December 1914 (fragmentary) at site 1 mile upstream not equivalent owing to difference in drainage areas.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 330 ft (from topographic map).

Average discharge.--22 years (1940-43, 1948-67), 10.9 mgd (16.9 cfs).

Extremes.--Maximum discharge during year, 786 mgd (1,220 cfs) Mar. 22 (gage height, 6.17 ft), from rating curve extended above 110 mgd on basis of slope-area measurements at gage heights 6.70 and 8.48 ft; minimum, 3.4 mgd (5.3 cfs) July 9, 30.
1939-43, 1947-67: Maximum discharge, 1,990 mgd (3,080 cfs) Dec. 14, 1942 (gage height, 7.02 ft, control then in use), from rating curve extended above 55 mgd by test on model of station site; minimum, 1.95 mgd (3.02 cfs) Feb. 9-11, 1954.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.5	4.8	4.4	4.8	16	4.1	5.6	4.3	8.2	55	14	5.4
2	7.0	5.4	4.8	4.7	11	4.0	9.0	5.6	6.5	11	7.8	4.8
3	4.6	4.4	4.3	4.6	6.9	4.0	21	5.1	6.2	13	5.6	4.4
4	3.9	7.4	3.9	4.4	64	3.9	60	5.3	10	8.0	5.1	4.3
5	3.8	4.8	3.8	4.4	16	3.9	21	8.6	7.2	8.3	5.0	4.3
6	4.9	5.3	6.3	17	9.4	7.5	8.2	7.5	6.3	13	4.8	4.1
7	4.0	11	4.7	9.0	6.3	17	6.6	4.7	7.5	40	4.8	4.1
8	3.5	24	3.8	5.3	5.6	7.0	7.4	4.4	5.7	28	4.7	4.0
9	3.4	5.6	6.2	17	6.1	4.6	8.5	19	7.0	10	4.8	4.1
10	3.9	4.8	69	17	5.4	4.3	5.3	62	7.1	9.1	4.8	4.4
11	3.5	10	10	20	5.0	4.1	13	45	5.1	24	4.7	4.0
12	4.3	6.0	26	6.1	5.1	4.6	25	15	5.0	8.5	9.8	4.0
13	5.2	7.1	7.0	5.1	5.1	8.3	6.1	6.8	4.8	13	5.9	3.9
14	5.1	4.6	15	9.7	5.3	6.3	5.6	5.6	6.6	10	6.0	3.9
15	3.9	9.9	8.2	38	4.8	4.6	6.1	5.3	4.7	8.2	5.3	4.0
16	3.8	26	5.9	29	5.1	4.1	5.3	5.4	4.4	6.5	4.4	4.6
17	3.6	36	5.3	14	4.8	4.1	5.1	4.6	35	6.1	4.4	4.0
18	3.6	8.1	5.9	9.0	4.6	13	5.4	5.3	8.1	5.6	16	4.0
19	3.5	5.8	9.4	7.0	5.0	6.6	5.3	4.8	5.1	5.4	52	3.9
20	3.5	4.8	5.9	9.6	4.6	4.6	5.0	4.6	4.7	5.3	25	3.9
21	10	4.3	5.1	6.6	4.4	4.8	4.7	4.3	7.5	5.1	6.8	3.9
22	4.1	4.1	4.8	5.7	4.3	6.5	4.8	4.3	133	6.2	5.7	3.9
23	3.9	3.9	8.2	5.3	4.1	6.7	4.8	6.0	28	5.3	5.3	3.8
24	11	8.8	6.4	5.3	4.4	4.6	4.4	4.4	45	5.6	5.0	3.9
25	6.6	10	4.8	5.3	4.4	4.1	18	5.7	60	5.1	5.1	4.1
26	7.5	16	6.7	5.0	4.3	5.5	8.3	4.4	77	5.1	5.1	4.0
27	4.1	27	40	5.0	4.7	10	6.8	83	46	4.8	9.0	4.7
28	3.6	6.3	9.0	5.0	5.0	24	5.1	29	12	5.0	5.3	17
29	3.5	7.2	5.6	4.6	4.3	8.2	4.7	---	9.4	21	5.1	5.6
30	3.4	5.2	5.1	4.4	4.1	15	4.4	---	9.1	6.1	6.1	5.9
31	4.0	4.3	---	16	---	7.0	4.6	---	18	---	6.6	---
Total	147.2	292.9	305.5	303.9	240.1	217.0	305.1	370.0	600.2	357.3	260.0	140.9
Mean												
Mgd	4.75	9.45	10.2	9.80	8.00	7.00	9.84	13.2	19.4	11.9	8.39	4.70
Cfs	7.35	14.6	15.8	15.2	12.4	10.8	15.2	20.4	30.0	18.4	13.0	7.27
Ac-ft	452	899	938	933	737	666	936	1140	1840	1100	798	432
Max	11	36	69	38	64	24	60	83	133	55	52	17
Min	3.4	3.9	3.8	4.4	4.1	3.9	4.4	4.3	4.4	4.8	4.4	3.8

Calendar Year 1966: Max 90 Min 3.4 Mean (mgd) 9.23 Mean (cfs) 14.3 Ac-ft 10340
Fiscal Year 1966-67: Max 133 Min 3.4 Mean (mgd) 9.70 Mean (cfs) 15.0 Ac-ft 10860

Peak discharge (base, 320 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 4	1700	5.87	624	965	3-22	1830	6.17	786	1,220
2-10	1600	5.87	624	965	4- 1	1130	5.75	562	870
3-17	1630	5.64	507	784					

16-6200. Honokohau Stream near Honokohau

Location.--Lat 20°57'48", long 156°35'22", on right bank 1,000 ft upstream from intake of Honokohau ditch and 4.1 miles southeast of Honokohau.

Drainage area.--4.11 sq mi.

Records available.--September, November and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to June 1967. Monthly discharge only for some periods, published in WSP 1319.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 870 ft (from topographic map). Prior to Mar. 7, 1913, staff gage at site just below Honokohau ditch intake at different datum.

Average discharge.--52 years (1913-20, 1922-67), 25.8 mgd (39.9 cfs).

Extremes.--Maximum discharge during year, 1,630 mgd (2,520 cfs) Feb. 10 (gage height, 7.25 ft), from rating curve extended above 120 mgd as explained below; minimum, 7.7 mgd (12 cfs) Feb. 8.
1911, 1913-20, 1922-67: Maximum discharge, 2,420 mgd (3,740 cfs) Dec. 14, 1942, Aug. 30, 1957 (gage height, 8.40 ft), from rating curve extended above 120 mgd by logarithmic plotting; minimum, 5.4 mgd (8.4 cfs) May 1, 1945, Jan. 5, 1946.

Remarks.--Records good. No diversion above station. All medium and low flow, together with the inflow from 2 development tunnels below station, is diverted into Honokohau ditch.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	40	10	9.0	8.7	16	8.4	17	8.2	28	111	24	13
2	37	15	9.0	8.7	19	8.4	24	8.2	16	26	15	11
3	13	13	8.7	8.7	12	8.4	47	8.2	12	46	13	11
4	14	24	8.4	8.4	81	8.4	125	8.0	12	15	13	11
5	12	11	8.6	8.4	17	8.2	46	8.7	12	78	12	11
6	23	15	22	43	16	19	14	8.7	10	44	19	10
7	16	18	12	22	10	25	11	8.0	15	71	14	10
8	9.5	39	8.7	10	9.8	12	14	7.7	10	47	12	10
9	9.2	11	10	21	21	9.0	15	52	13	19	17	10
10	9.8	26	117	24	11	8.4	9.5	111	18	28	13	11
11	9.0	35	19	17	33	8.4	58	22	9.8	52	17	10
12	11	15	48	9.8	20	8.4	49	14	9.2	16	15	10
13	14	23	11	9.2	11	24	11	12	9.0	16	14	9.8
14	19	10	32	20	9.5	14	9.8	10	10	16	15	9.8
15	12	24	14	108	11	9.2	9.2	27	8.7	15	12	9.8
16	10	29	10	82	18	8.4	8.7	15	8.4	13	11	9.8
17	11	50	9.5	42	9.8	8.4	9.0	19	73	13	12	9.8
18	10	13	13	41	9.5	51	12	27	13	13	47	9.8
19	24	17	27	25	9.5	12	16	10	9.5	12	44	9.5
20	12	11	11	50	9.0	10	11	12	9.0	12	48	9.5
21	18	9.8	9.2	14	8.7	16	9.0	8.7	20	12	13	9.5
22	10	11	9.0	11	13	24	9.0	8.7	139	12	12	9.5
23	14	9.2	19	10	13	15	8.4	18	51	12	11	9.5
24	34	22	10	11	23	8.7	8.4	8.7	118	51	11	11
25	27	30	9.0	12	12	8.2	36	9.5	50	17	11	16
26	42	65	12	10	11	21	11	8.2	120	14	31	13
27	11	50	67	9.5	17	29	9.5	196	97	12	68	25
28	9.2	13	15	9.2	9.8	31	8.4	89	19	13	26	34
29	9.2	12	9.8	9.0	8.7	19	8.2	----------	15	23	15	12
30	9.8	10	9.2	8.7	8.7	57	8.4	----------	58	13	14	15
31	14	9.2	----------	23	----------	26	8.4	----------	72	----------	16	----------
Total	513.7	650.2	577.1	694.3	478.0	523.9	640.9	743.5	1064.6	842	615	360.3
Mean												
Mgd	16.6	21.0	19.2	22.4	15.9	16.9	20.7	26.6	34.3	28.1	19.8	12.0
Cfs	25.7	32.5	29.7	34.7	24.6	26.1	32.0	41.2	53.1	43.5	30.6	18.6
Ac-ft	1580	2000	1770	2130	1470	1610	1970	2280	3270	2580	1890	1110
Max	42	65	117	108	81	57	125	196	139	111	68	34
Min	9.0	9.2	8.4	8.4	8.7	8.2	8.2	7.7	8.4	12	11	9.5

Calendar Year 1966: Max 118 Min 8.2 Mean (mgd) 19.0 Mean (cfs) 29.4 Ac-ft 21240
Fiscal Year 1966-67: Max 196 Min 7.7 Mean (mgd) 21.1 Mean (cfs) 32.6 Ac-ft 23640

Peak discharge (base, 700 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
2-10	1530	7.25	1,630	2,520	3-24	0130	5.62	808	1,250
3-17	1700	6.31	1,120	1,730	4-1	1200	5.57	788	1,220

16-6290. Honokowai ditch near Lahaina

Location.--lat 20°55'57", long 156°37'31", on left bank 20 ft downstream from intake on Kapaloa Stream and 5.4 miles northeast of Lahaina lighthouse.

Records available.--July 1912 to December 1917, November 1918 to January 1958, June 1958 to June 1967. Monthly discharge only January 1916, published in WSP 1319.

Gage.--Water-stage recorder. Altitude of gage is 1,600 ft (from topographic map). Prior to Jan. 1, 1918, staff gage at site 0.5 mile downstream, Nov. 14, 1918, to May 27, 1921, water-stage recorder at site 1.5 miles downstream, and May 28, 1921, to Apr. 21, 1951, water-stage recorder in tunnel section now abandoned 75 ft downstream from Kapaloa Stream intake, all at different datums.

Average discharge.--51 years (1912-16, 1919-57, 1958-67), 5.78 mgd (8.94 cfs).

Extremes.--1912-67: Maximum daily discharge, 43 mgd (66 cfs) June 30, 1930; no flow at times.

Remarks.--Records fair. Ditch diverts from Amalu and Kapaloa Streams just above station for irrigation of sugarcane and domestic use.

Cooperation.--Records of daily discharge since July 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	3.3	2.9	2.9	4.5	2.6	5.0	2.5	9.3	20	3.6	4.2
2	16	4.3	2.9	2.7	5.9	2.6	4.6	2.4	4.9	8.7	4.4	3.3
3	5.3	4.5	2.9	2.6	3.3	2.4	5.0	2.4	3.1	9.6	3.9	2.9
4	4.2	6.7	2.9	2.6	15	2.4	5.0	2.4	2.7	3.6	3.8	2.9
5	5.1	3.8	2.8	2.6	5.4	2.3	4.0	2.4	2.8	17	3.8	2.9
6	9.3	5.3	5.7	8.9	3.5	5.8	3.7	2.2	2.5	7.6	4.6	2.9
7	8.1	4.3	4.3	5.6	3.2	8.8	3.2	2.0	3.6	9.5	4.0	2.9
8	4.1	6.4	3.2	3.3	3.2	3.4	3.1	2.0	2.8	8.5	2.6	2.9
9	3.9	3.5	2.9	2.6	7.3	2.6	3.6	14	2.4	4.1	3.0	2.9
10	3.9	7.3	20	3.4	3.6	2.5	2.7	10	3.5	8.7	3.0	2.9
11	3.4	10	5.3	3.9	12	2.4	3.6	1.9	2.6	11	4.1	2.9
12	3.3	3.8	7.8	2.8	7.4	2.1	4.2	2.7	2.5	4.1	3.1	2.8
13	4.0	6.3	3.2	2.8	3.2	6.3	3.6	3.0	2.4	3.5	2.8	2.8
14	7.3	3.5	7.0	5.5	2.8	4.3	3.6	2.0	2.4	3.8	2.7	2.8
15	4.7	5.0	3.9	24	2.8	2.7	3.1	7.2	2.4	3.7	2.8	2.8
16	3.5	4.6	3.0	19	2.6	2.4	2.7	5.1	2.4	3.4	2.7	2.8
17	4.0	7.8	2.9	12	2.5	2.2	3.6	6.2	6.5	3.2	2.8	2.8
18	3.8	3.9	3.7	14	2.4	13	6.2	9.4	3.8	3.2	16	2.8
19	6.8	5.7	8.1	8.8	2.4	3.8	3.8	3.3	2.7	3.2	7.3	2.9
20	4.9	4.0	3.5	18	2.4	2.6	2.6	2.9	2.1	3.2	8.5	2.9
21	5.8	3.6	3.1	5.4	2.3	4.6	2.6	2.2	2.1	3.2	3.4	3.0
22	3.9	3.3	2.9	3.2	3.4	7.4	2.6	2.0	22	3.2	2.9	3.2
23	3.3	2.6	2.8	2.8	4.5	4.2	2.4	4.8	13	3.2	2.9	3.2
24	8.0	5.5	2.7	2.8	7.1	2.6	2.2	2.2	18	8.8	2.4	3.2
25	5.7	8.7	2.7	3.5	4.0	2.3	10	2.2	6.6	4.6	2.0	4.7
26	10	12	2.5	3.3	3.4	6.1	3.5	2.2	16	3.8	6.7	4.0
27	3.6	7.9	6.4	2.9	5.6	10	2.5	19	14	3.4	16	9.3
28	3.2	3.8	4.1	2.8	2.9	9.5	2.4	17	3.0	3.4	7.2	6.7
29	3.0	3.2	2.8	2.8	2.7	7.0	2.4	----------	3.1	3.4	4.7	3.6
30	3.0	3.0	2.9	2.8	2.6	8.5	2.8	----------	12	3.5	3.5	4.4
31	3.5	2.9	----------	4.3	----------	5.0	2.8	----------	14	----------	4.5	----------
Total	174.6	160.5	131.8	184.6	133.9	144.4	113.1	137.6	191.2	180.1	145.7	104.3
Mean												
Mgd	5.63	5.18	4.39	5.95	4.46	4.66	3.65	4.91	6.17	6.00	4.70	3.48
Cfs	8.71	8.01	6.79	9.21	6.90	7.21	5.65	7.60	9.55	9.28	7.27	5.38
Ac-ft	536	493	404	567	411	443	347	422	587	553	447	320
Max	16	12	20	24	15	13	10	19	22	20	16	9.3
Min	3.0	2.6	2.5	2.6	2.2	2.1	2.2	1.9	2.1	3.2	2.0	2.8

Calendar Year 1966: Max 24 Min 2.1 Mean (mgd) 5.04 Mean (cfs) 7.80 Ac-ft 5,650
Fiscal Year 1966-67: Max 24 Min 1.9 Mean (mgd) 4.94 Mean (cfs) 7.64 Ac-ft 5,530

16-6385. Kahoma Stream at Lahaina

Location.--Lat 20°53'10", long 156°40'36", on right bank 0.2 mile west of Kelawea, 0.6 mile northeast of Lahaina, 0.6 mile downstream from Kanaha Stream, and 0.9 mile upstream from mouth.

Drainage area.--5.22 sq mi.

Records available.--October 1962 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 90 ft (from topographic map).

Extremes.--Maximum discharge during year, 991 mgd (1,530 cfs) Mar. 17 (gage height, 7.87 ft), from rating curve extended above 3.1 mgd as explained below; no flow most of the time.
1962-67: Maximum discharge, 1,610 mgd (2,490 cfs) July 11, 1965 (gage height, 11.03 ft), from rating curve extended above 3.1 mgd on basis of slope-area measurements at gage heights 5.90 and 11.03 ft; no flow most of the time each year.
Maximum discharge known, 5,010 mgd (7,750 cfs) May 13, 1960, by slope-area measurement of peak flow at site 0.5 mile upstream.

Remarks.--Records fair. Diversion above station by Pioneer Mill Co. for irrigation of sugarcane. Diversion from Kanaha Stream above station by Maui County Board of Water Supply for domestic use. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	27	0		0	0	0	5.1	0	0	20	0	1.4
2	.94	0		0	0	0	19	0	0	10	0	.77
3	.04	0		0	0	0	12	0	0	2.6	0	.11
4	0	0		0	24	0	18	0	0	.04	0	0
5	0	0		0	.95	0	.06	0	0	44	0	.08
6	0	0		0	.11	0	0	0	0	.74	0	0
7	.01	0		0	.05	2.2	0	0	0	.55	0	0
8	0	0		0	0	0	0	0	0	.12	0	0
9	0	0		0	.18	0	0	15	0	0	0	0
10	0	0		0	2.8	0	0	63	0	.33	0	0
11	0	.90		0	1.1	0	41	.93	.01	5.2	0	0
12	0	0		0	.17	0	30	0	0	.12	0	0
13	0	0		0	0	0	.01	0	0	0	0	0
14	0	0		0	0	0	0	0	0	0	0	.17
15	0	0		29	0	0	0	0	0	0	0	.04
16	0	0		41	0	0	0	0	0	0	0	.12
17	0	0		28	0	0	0	0	30	0	0	1.2
18	0	0		.39	0	22	0	0	2.7	0	11	.02
19	0	0		.16	0	.30	0	0	.01	0	.40	.17
20	0	0		6.0	0	0	.05	0	0	0	0	.50
21	0	0		.50	0	.50	0	0	0	0	0	.19
22	0	0		.03	0	1.4	0	0	24	0	0	.77
23	0	0		0	0	0	0	0	30	0	0	.11
24	0	0		0	0	0	0	0	87	24	0	0
25	0	0		0	0	0	18	.40	2.1	.52	0	.13
26	0	0		0	0	6.0	.16	0	4.4	1.2	0	0
27	0	0		0	0	4.7	0	10	8.4	0	3.3	5.2
28	0	0		0	0	.02	0	7.8	.10	0	1.1	.17
29	0	0		0	0	0	0	----------	0	0	.22	0
30	0	0		0	0	4.5	0	----------	24	0	.08	0
31	0	0	----------	0	----------	.14	0	----------	30	----------	1.6	----------
Total	27.99	0.90	0	105.08	29.36	41.76	143.38	97.13	242.72	109.42	17.70	11.15
Mean												
Mgd	0.903	0.029	0	3.39	0.979	1.35	4.63	3.47	7.83	3.65	0.571	0.372
Cfs	1.40	0.045	0	5.25	1.51	2.09	7.16	5.37	12.1	5.65	0.883	0.576
Ac-ft	86	2.8	0	322	90	128	440	298	745	336	54	34
Max	27	0.90	0	41	24	22	41	63	87	44	11	5.2
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 41 Min 0 Mean (mgd) 0.708 Mean (cfs) 1.10 Ac-ft 793
Fiscal Year 1966-67: Max 87 Min 0 Mean (mgd) 2.26 Mean (cfs) 3.50 Ac-ft 2,540

Peak discharge (base, 250 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-16	1400	5.90	315	487	3-17	1630	7.87	991	1,530
11- 4	1700	5.85	298	461	3-24	0130	6.77	618	956
1-12	0100	6.12	387	599	4- 5	1030	6.00	345	534
2-10	1430	6.69	586	907	4-24	1700	6.17	404	625

16-6450. Olowalu ditch near Olowalu

Location.--Lat 20°49'33", long 156°36'47", on left bank 1.2 miles northeast of Olowalu and 5.5 miles southeast of Lahaina.

Records available.--August 1911 to January 1916, April 1916 to September 1920, November 1920 to January 1958, June 1958 to June 1967. Prior to July 1913, published as Olowalu ditch 1 near Olowalu. Monthly discharge only for June 1932, published in WSP 1319.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 480 ft (from topographic map). Prior to June 30, 1916, staff gage in tailrace of powerhouse 1,000 ft downstream at different datum. July 28, 1916, to June 8, 1919, staff gage and June 9, 1919, to June 30, 1932, water-stage recorder, at site 300 ft upstream at different datum. July 1, 1932, to Oct. 7, 1933, records obtained by combining flows at three stations about 1,000 ft downstream.

Average discharge.--51 years (1912-15, 1917-20, 1921-57, 1958-67), 4.83 mgd (7.47 cfs).

Extremes.--1911-67: Maximum daily discharge, 13.7 mgd (21.2 cfs) Apr. 17, 1935; no flow at times.

Remarks.--Records good. Ditch diverts from Olowalu Stream at altitude 520 ft for irrigation of sugarcane and domestic use in the Olowalu area.

Cooperation.--Records of daily discharge since July 1932 furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.0	2.4	3.4	2.8	3.1	2.6	6.3	3.3	9.6	6.9	3.5	6.1
2	4.5	2.6	3.1	2.6	4.4	2.6	7.8	5.1	9.0	5.3	3.5	5.8
3	3.5	2.7	2.9	2.5	4.8	2.6	8.7	4.8	7.3	3.8	3.4	5.4
4	2.9	3.4	2.7	2.4	6.0	2.5	8.7	4.5	6.3	1.8	3.3	5.2
5	2.7	2.9	2.6	2.3	5.3	2.5	8.7	4.4	5.7	2.1	3.3	4.7
6	3.1	3.3	3.1	5.5	9.0	6.0	8.5	4.2	6.8	1.8	3.3	4.9
7	3.4	3.7	2.9	5.1	8.6	8.0	7.5	3.9	10	2.7	3.3	4.9
8	2.6	7.6	2.5	3.5	7.5	5.1	7.1	3.7	9.5	3.3	3.2	4.8
9	2.5	4.1	2.6	3.4	6.6	4.0	6.7	7.9	8.7	3.2	3.3	4.8
10	2.4	4.3	9.0	3.5	5.4	3.5	5.1	9.8	7.7	3.4	3.2	4.8
11	2.3	7.1	7.8	3.0	6.2	3.2	6.0	8.8	6.8	4.1	3.2	4.6
12	2.6	4.5	6.8	2.7	6.7	3.0	5.0	6.5	6.0	3.9	3.2	4.4
13	2.4	5.5	4.6	2.6	5.2	3.8	5.9	5.8	5.6	4.1	1.7	4.5
14	2.8	3.9	5.0	3.0	4.4	3.5	7.6	5.3	5.2	3.8	3.9	4.4
15	2.9	4.8	4.3	7.7	4.2	3.0	6.9	5.1	5.0	3.7	5.8	4.4
16	2.4	5.4	3.5	9.4	4.1	2.8	6.0	4.8	4.7	3.5	5.6	4.4
17	2.4	9.5	3.2	9.2	3.8	2.8	5.4	4.6	4.6	3.4	5.5	4.3
18	2.3	6.7	3.0	8.2	3.5	6.8	4.9	4.9	4.9	3.3	5.2	4.2
19	2.3	5.8	3.9	6.7	3.4	6.0	4.6	4.4	8.3	3.3	2.8	4.2
20	2.5	4.4	3.2	8.8	3.3	4.3	4.3	5.1	7.8	3.3	2.3	4.1
21	2.7	3.7	2.8	7.4	3.2	4.4	4.0	4.3	7.0	3.3	2.0	4.1
22	2.5	3.8	2.7	5.0	3.1	5.2	3.8	4.1	8.4	3.3	3.8	4.0
23	2.3	3.2	2.6	4.1	3.0	3.9	4.1	4.8	7.0	3.3	5.3	3.9
24	3.2	3.6	2.6	3.7	3.3	3.4	3.6	4.1	5.8	3.4	5.1	4.2
25	2.8	4.4	2.5	3.4	2.9	3.2	2.8	4.1	4.4	3.4	4.0	4.1
26	5.3	8.1	2.6	3.2	2.9	5.3	4.9	3.8	5.3	3.3	4.3	4.1
27	3.0	9.4	2.9	3.0	3.1	8.0	8.0	7.3	10	3.3	6.9	4.5
28	2.6	6.8	2.7	2.9	2.9	6.7	7.1	10	8.7	3.3	6.7	4.6
29	2.4	5.0	3.2	2.8	2.8	5.1	6.9	----------	8.2	3.4	6.4	4.5
30	2.4	4.0	3.9	2.7	2.7	8.7	5.0	----------	9.0	3.5	5.8	5.5
31	2.4	3.6	----------	3.1	----------	8.4	3.6	----------	9.5	----------	6.6	----------
Total	88.1	150.2	108.6	136.2	135.4	140.9	185.5	149.4	222.8	104.2	129.4	138.4
Mean												
Mgd	2.84	4.85	3.62	4.39	4.51	4.55	5.98	5.34	7.19	3.47	4.17	4.61
Cfs	4.39	7.50	5.60	6.79	6.98	7.04	9.25	8.26	11.1	5.37	6.45	7.13
Ac-ft	270	461	333	418	416	432	569	458	684	320	397	425
Max	5.3	9.5	9.0	9.4	9.0	8.7	8.7	10	10	6.9	6.9	6.1
Min	2.3	2.4	2.5	2.3	2.7	2.5	2.8	3.3	4.4	1.8	1.7	3.9

Calendar Year 1966: Max 9.5 Min 1.7 Mean (mgd) 4.15 Mean (cfs) 6.42 Ac-ft 4640
Fiscal Year 1966-67: Max 10 Min 1.7 Mean (mgd) 4.63 Mean (cfs) 7.16 Ac-ft 5180

16-6462. Olowalu Stream at Olowalu

Location.--Lat 20°49'23", long 156°37'15", on downstream side of center pier of plantation road bridge, 0.6 mile northeast of Olowalu, and 5.5 miles southeast of Lahaina.

Drainage area.--4.08 sq mi.

Records available.--May 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during year, 840 mgd (1,300 cfs) Mar. 24 (gage height, 5.40 ft), from rating curve extended above 43 mgd on basis of slope-area measurements at gage heights 3.39, 3.72, 5.31 and 5.40 ft; no flow most of the time.
1963-67: Maximum discharge, that of Mar. 24, 1967; no flow most of the time each year.
Discharge for flood of Nov. 2, 1961, was 480 mgd (743 cfs), from slope-area measurement of peak flow.

Remarks.--Records fair. All low flow diverted 1.5 miles above station by Olowalu ditch (see sta. no. 6450) for domestic use and irrigation of sugarcane in vicinity of Olowalu. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.23	0	0	0	0	0	0	0.61	0.05	38	0	3.6
2	.12	0	0	0	.05	0	.45	0	0	23	0	0
3	0	0	0	0	0	0	7.5	0	0	17	0	0
4	0	0	0	0	61	0	28	0	0	12	0	0
5	0	0	0	0	30	0	8.2	0	0	12	0	0
6	0	0	0	0	22	6.1	.54	0	2.2	10	0	0
7	0	0	0	0	.14	2.0	0	0	20	12	0	0
8	0	0	0	0	3.2	0	0	0	.48	4.6	0	0
9	0	0	0	0	3.2	0	0	.32	0	2.4	0	0
10	0	0	3.0	0	3.2	0	0	6.0	0	3.4	0	0
11	0	1.5	.72	0	2.8	0	17	.07	0	12	0	0
12	0	.01	.08	0	2.3	0	38	0	0	3.1	0	0
13	0	.05	0	0	1.6	0	1.8	0	0	2.0	13	0
14	0	0	0	0	.86	0	.02	0	0	.45	3.3	0
15	0	.01	0	11	.17	0	0	0	0	.15	.36	0
16	0	.50	0	25	0	0	0	0	0	0	.01	0
17	0	1.8	0	6.0	0	0	0	0	45	0	4.9	0
18	0	.65	0	1.1	0	2.8	0	0	13	0	68	0
19	0	.48	0	.45	0	.14	0	0	.68	0	24	0
20	0	0	0	2.2	0	0	0	0	.01	0	16	0
21	0	0	0	.25	0	0	0	0	.01	0	9.2	0
22	0	0	0	0	0	0	0	0	14	0	2.3	0
23	0	0	0	0	0	0	0	0	48	0	0	0
24	0	0	0	0	0	0	0	0	160	0	0	0
25	0	0	0	0	0	0	82	0	32	0	0	0
26	0	.62	0	0	0	0	21	0	32	0	0	0
27	0	2.4	0	0	0	.78	2.0	10	45	0	2.4	0
28	0	.20	0	0	0	0	.11	15	21	0	.34	0
29	0	0	0	0	0	0	0	----------	14	0	0	0
30	0	0	0	0	0	.88	.49	----------	18	0	0	0
31	0	0	----------	0	----------	.14	1.1	----------	34	----------	8.5	----------
Total	0.35	8.22	3.80	46.00	130.52	12.84	208.21	32.00	499.43	152.10	152.31	3.6
Mean												
Mgd	0.011	0265	0.127	1.48	4.35	0.414	6.72	1.14	16.1	5.07	4.91	0.12
Cfs	0.017	0.410	0.196	2.29	6.73	0.641	10.4	1.76	24.9	7.84	7.60	0.19
Ac-ft	1.1	25	12	141	401	39	639	98	1,530	467	467	11
Max	0.23	2.4	3.0	25	61	6.1	82	15	160	38	68	3.6
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 61 Min 0 Mean (mgd) 1.14 Mean (cfs) 1.76 Ac-ft 1,280
Fiscal Year 1966-67: Max 160 Min 0 Mean (mgd) 3.42 Mean (cfs) 5.29 Ac-ft 3,830

Note.--No gage-height record Aug. 11 to Sept. 14, Sept. 18 to Oct. 24.

Peak discharge (base, 220 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-4	1730	3.72	280	433	3-17	1700	5.21	754	1,170
1-12	0030	3.57	248	384	3-24	0430	5.40	840	1,300
1-25	1100	3.81	308	477					

16-6600. Kulanihakoi Gulch near Kibei

Location.--lat 20°46'06", long 156°27'03", on right bank 0.5 mile northeast of Libue Cemetery, 0.8 mile upstream from mouth, and 1.3 miles southeast of Kibei.

Drainage area.--14.4 sq mi.

Records available.--October 1962 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 35 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,780 mgd (2,750 cfs) Mar. 24 (gage height, 6.39 ft), from rating curve extended above 96 mgd on basis of slope-area measurement of peak flow; no flow most of the time.
1962-67: Maximum discharge, that of Mar. 24, 1967; no flow most of the time each year.

Remarks.--Records fair. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0				0		0		0			
2	0				0		0		0			
3	0				3.0		0		0			
4	0				6.7		0		0			
5	0				72		0		0			
6	0				0		0		0			
7	0				0		0		0			
8	0				0		0		0			
9	0				0		0		0			
10	0				0		0		0			
11	0				0		2.2		0			
12	0				0		23		0			
13	0				0		0		0			
14	0				0		0		0			
15	0				0		0		0			
16	0				0		0		0			
17	0				0		0		26			
18	0				0		0		0			
19	0				0		0		0			
20	0				0		0		0			
21	0				0		0		0			
22	0				0		0		0			
23	0				0		0		14			
24	2.0				0		0		264			
25	2.5				0		5.1		5.0			
26	0				0		0		1.0			
27	0				0		0		0			
28	0				0		0		0			
29	0				0		0	----------	0			
30	0				0		0	----------	0			
31	0		----------		----------		0	----------	0	----------		----------
Total	4.5	0	0	0	81.7	0	30.3	0	310.0	0	0	0
Mean												
Mgd	0.15	0	0	0	2.72	0	0.98	0	10.0	0	0	0
Cfs	0.23	0	0	0	4.21	0	1.52	0	15.5	0	0	0
Ac-ft	14	0	0	0	251	0	93	0	951	0	0	0
Max	2.5	0	0	0	72	0	23	0	264	0	0	0
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 72 Min 0 Mean (mgd) 0.248 Mean (cfs) 0.384 Ac-ft 277
Fiscal Year 1966-67: Max 264 Min 0 Mean (mgd) 1.17 Mean (cfs) 1.81 Ac-ft 1,310

Peak discharge (base, 40 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11- 5	0100	1.70	200	309	3-17	1800	2.12	308	477
1-11	2400	1.88	246	381	3-24	0530	6.39	1,780	2,750
1-25	1600	1.32	111	172					

16-7000. Waiakea Stream near Mountain View

Location (revised).--Lat 19°38'30", long 155°10'28", on left bank 200 ft upstream from Olaa Flume Road, 7.3 miles northwest of Mountain View, and 8.0 miles southwest of Hilo Post Office.

Drainage area.--17.4 sq mi.

Records available.--September 1930 to June 1967. Prior to July 1960, published as "at middle flume house, near Mountain View."

Gage.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft lower.

Average discharge.--36 years (1931-67), 7.58 mgd (11.7 cfs).

Extremes.--Maximum discharge during year, 82 mgd (127 cfs) Nov. 16 (gage height, 3.57 ft); minimum, 2.0 mgd (3.1 cfs) Feb. 9.
1930-67: Maximum discharge, 365 mgd (565 cfs), Mar. 14, 1942 (gage height, 4.43 ft), from rating curve extended above 110 mgd by logarithmic plotting; no flow at times.

Remarks.--Records good. No diversion above station. Large part of flow comes from 3 tunnels.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	12	7.9	7.4	8.3	14	35	3.0	8.9	16	11	6.7
2	11	11	7.2	7.0	7.5	13	32	2.9	10	17	10	6.4
3	12	11	7.2	6.4	7.0	12	29	2.7	9.9	20	9.3	6.0
4	11	10	6.7	6.0	14	11	29	2.6	10	19	8.5	5.6
5	11	9.1	6.4	5.6	12	10	24	2.5	10	29	8.2	5.2
6	10	8.4	5.9	5.3	12	9.3	20	2.4	9.9	27	9.0	4.8
7	10	7.6	5.5	5.2	12	8.5	18	2.2	9.3	26	8.3	4.6
8	9.3	7.3	5.2	8.0	11	7.6	16	2.1	8.5	22	8.2	4.6
9	8.6	6.7	7.3	10	11	6.9	14	3.9	7.8	19	7.6	4.1
10	8.1	6.4	9.0	9.6	10	6.7	13	2.8	9.9	18	7.4	4.0
11	7.4	6.4	7.6	8.6	9.3	6.1	13	2.8	9.0	16	8.3	3.8
12	7.0	5.6	7.4	7.9	8.6	5.6	12	7.5	8.9	14	9.8	5.8
13	6.9	5.2	6.7	7.2	8.0	5.1	11	8.9	8.8	13	10	4.6
14	9.5	5.0	8.7	7.1	7.4	4.8	11	7.8	8.5	12	11	3.9
15	8.4	4.8	9.7	14	7.3	4.4	9.8	11	8.0	11	11	3.8
16	8.0	8.1	9.6	19	11	4.1	9.0	11	8.4	10	11	3.8
17	8.1	13	9.6	23	8.3	3.9	8.4	11	7.8	11	11	4.1
18	9.2	11	10	21	7.3	3.9	7.7	11	7.3	10	10	4.1
19	10	10	11	21	6.7	6.0	6.9	9.9	6.9	9.9	9.7	3.6
20	11	9.9	10	21	6.2	7.4	6.3	9.2	6.5	9.6	9.0	3.4
21	13	9.1	10	21	8.3	9.9	5.8	8.2	6.2	10	8.3	3.3
22	12	8.2	9.6	19	19	8.6	5.2	7.5	6.2	10	7.6	3.2
23	12	7.6	12	17	16	8.8	4.8	6.9	5.8	10	7.1	3.1
24	12	7.6	11	16	21	8.3	4.6	6.3	5.4	12	6.5	3.4
25	21	9.7	10	14	20	7.6	4.2	5.9	5.7	12	6.2	3.3
26	20	11	10	13	20	7.8	4.0	5.5	9.1	12	8.9	3.6
27	21	11	9.8	12	20	15	3.9	5.1	14	12	8.8	11
28	20	10	9.2	11	18	12	3.6	11	12	11	8.9	11
29	18	9.8	8.6	10	17	15	3.4	----------	12	12	8.0	11
30	16	9.0	8.1	9.6	15	30	3.2	----------	12	11	7.4	11
31	14	8.5	----------	8.9	----------	28	3.1	----------	12	----------	7.0	----------
Total	366.5	270.0	256.9	371.8	359.2	301.3	370.9	173.6	274.7	441.5	273.0	156.8
Mean												
Mgd	11.8	8.71	8.56	12.0	12.0	9.72	12.0	6.20	8.86	14.7	8.81	5.23
Cfs	18.3	13.5	13.2	18.6	18.6	15.0	18.6	9.59	13.7	22.7	13.6	8.09
Ac-ft	1,120	829	788	1,140	1,100	925	1,140	533	843	1,350	838	481
Max	21	13	12	23	21	30	35	11	14	29	11	11
Min	6.9	4.8	5.2	5.2	6.2	3.9	3.1	2.1	5.4	9.6	6.2	3.1

Calendar Year 1966: Max 30 Min 2.4 Mean (mgd) 8.06 Mean (cfs) 12.5 Ac-ft 9,020
Fiscal Year 1966-67: Max 35 Min 2.1 Mean (mgd) 9.91 Mean (cfs) 15.3 Ac-ft 11,100

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1930	3.53	76	118	11-16	1800	3.57	82	127
10-15	2330	3.27	52	80	11-22	2300	3.29	53	82

16-7012. Waiakea Stream near Hilo

Location.--Lat 19°41'35", long 155°05'55", on right bank 2.5 miles south of Hilo Post Office and 3.0 miles southeast of Piihonua.

Drainage area.--33.6 sq mi.

Records available.--May 1957 to June 1967 (discontinued).

Gage.--Water-stage recorder and, since June 19, 1964, concrete control. Datum of gage is 369 ft above mean sea level (by stadia survey).

Average discharge.--10 years, 3.78 mgd (5.85 cfs).

Extremes.--Maximum discharge during year, 696 mgd (1,080 cfs) July 25 (gage height, 6.04 ft), from rating curve extended above 190 mgd as explained below; no flow most of the time.
1957-67: Maximum discharge, 736 mgd (1,140 cfs) May 5, 1965 (gage height, 6.14 ft), from rating curve extended above 190 mgd by logarithmic plotting; no flow most of the time each year.

Remarks.--Records good. Board of Water Supply, County of Hawaii, diverts about 25,000,000 gal per year above station at 1,500-ft elevation.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0	0	0	0	0.42	73	0	0	17	0	
2	0	0	0	0	0	0	47	0	0	13	0	
3	0	0	0	0	0	0	34	0	0	29	0	
4	0	0	0	0	2.0	0	64	0	0	14	0	
5	0	0	0	0	.50	0	32	0	0	162	0	
6	0	0	0	0	0	0	19	0	0	36	0	
7	0	0	0	0	0	0	11	0	0	30	0	
8	0	0	0	4.2	0	0	5.2	0	0	21	0	
9	0	0	0	1.2	0	0	2.0	0	0	15	0	
10	0	0	.28	.41	0	0	.24	0	.19	8.6	0	
11	0	0	0	0	0	0	15	0	0	3.6	0	
12	0	0	0	0	0	0	3.2	0	0	1.5	13	
13	0	0	0	0	0	0	.12	0	0	.20	1.2	
14	0	0	0	0	0	0	0	0	0	0	8.0	
15	0	0	.60	24	0	0	0	3.7	0	0	2.9	
16	0	0	0	85	1.0	0	0	.62	0	0	.01	
17	0	19	0	78	0	0	0	0	0	4.1	0	
18	0	.16	0	14	0	0	0	0	0	1.1	0	
19	0	0	0	20	0	0	0	0	0	0	0	
20	0	0	0	28	0	0	0	0	0	0	0	
21	1.3	0	0	18	10	0	0	0	0	5.0	0	
22	.23	0	0	9.8	30	0	0	0	0	10	0	
23	0	0	6.4	3.3	5.0	0	0	0	0	.56	0	
24	0	.09	1.0	.77	21	0	0	0	0	16	0	
25	185	0	0	.02	13	0	0	0	0	2.3	0	
26	19	0	0	0	11	.08	0	0	0	.01	.07	
27	4.4	1.0	0	0	10	23	0	0	19	0	.38	
28	2.8	0	0	0	4.9	3.1	0	1.6	.25	0	0	
29	1.1	0	0	0	1.8	26	0	----------	0	11	0	
30	.05	0	0	0	.25	105	0	----------	0	.90	0	
31	0	0	----------	0	----------	33	0	----------	.10	----------	0	----------
Total	213.88	20.25	8.28	286.70	110.45	190.60	305.76	5.92	19.54	401.87	25.56	0
Mean												
Mgd	6.90	0.653	0.276	9.25	3.68	6.15	9.86	0.211	0.630	13.4	0.825	0
Cfs	10.7	1.01	0.427	14.3	5.69	9.52	15.3	0.326	0.975	20.7	1.28	0
Ac-ft	656	62	25	880	339	585	938	18	60	1,230	78	0
Max	185	19	6.4	85	30	105	73	3.7	19	162	13	0
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 185 Min 0 Mean (mgd) 2.27 Mean (cfs) 3.51 Ac-ft 2,550
Fiscal Year 1966-67: Max 185 Min 0 Mean (mgd) 4.35 Mean (cfs) 6.73 Ac-ft 4,880

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	2000	6.04	696	1,080	12-30	1130	4.82	295	456
10-17	0130	5.13	379	586	4- 5	1330	5.20	400	619
11-22	-	5.20	400	619					

16-7017.5. Wailuku River near Humuula

Location.--lat 19°42'55", long 155°18'36", on right bank 300 ft upstream from trail terminus, 10 miles east of Humuula, and 14 miles west of Hilo.

Drainage area.--34.8 sq mi.

Records available.--February 1965 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 4,250 ft (from topographic map).

Extremes.--Maximum discharge during year, 768 mgd (1,190 cfs) Dec. 30 (gage height, 8.06 ft), from rating durve extended above 12 mgd by logarithmic plotting; minimum, 0.02 mgd (0.03 cfs) July 8-13.
1965-67: Maximum discharge, that of Dec. 30, 1966; no flow Oct. 4-6, Nov. 2, 1965.

Remarks.--Records good except those above 30 mgd, which are poor. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.54	0.15	0.12	0.15	0.32	0.54	19	0.10	0.35	19	0.30	0.68
2	.25	.18	.15	.15	.28	.38	8.5	.10	.28	6.1	.25	.61
3	.07	.15	.08	.12	.25	.35	4.4	.10	.25	8.3	.22	.30
4	.04	.12	.08	.12	.38	.32	3.3	.18	.18	3.8	.20	.40
5	.03	.10	.07	.12	2.4	.30	2.0	.12	.15	28	.25	.22
6	.03	.08	.05	.18	1.3	.28	1.4	.08	.15	7.6	.72	.20
7	.03	.08	.05	.15	2.0	.28	.98	.07	.15	4.6	.64	.18
8	.02	.08	.05	.25	.38	.28	.72	.05	.12	3.2	.50	.20
9	.02	.07	.10	.30	.32	.28	.54	2.1	.10	2.0	.38	.18
10	.02	.07	1.4	.20	.28	.35	.44	.68	1.7	1.3	.47	.15
11	.02	.15	.35	.51	.28	.28	2.5	.35	1.9	.93	.50	.12
12	.02	.07	.15	.44	.28	.22	3.4	3.1	1.8	.80	16	.20
13	.08	.05	.10	.18	.25	.22	1.2	5.5	.90	.54	4.8	.20
14	.44	.05	.15	.12	.25	.22	.75	.61	.30	.50	1.9	.12
15	.12	.05	.35	.28	.25	.20	.61	5.7	.22	.44	3.8	.10
16	.05	.33	.22	3.2	.50	.18	.38	2.8	.25	.44	1.0	.10
17	.05	10	.20	24	.35	.15	.35	.58	.22	.40	.84	.08
18	.08	.54	.40	5.3	.38	.15	.35	.35	.20	.40	.44	.08
19	.15	.22	.44	2.0	.25	.20	.25	.25	.18	.38	.38	.10
20	.12	.15	.25	1.9	.20	.22	.22	.20	.18	.30	.35	.10
21	.12	.12	.15	1.2	.28	.20	.22	.18	.87	.28	.32	.10
22	.84	.10	.12	.80	7.8	.18	.20	.15	.75	4.3	.32	.12
23	.12	.07	3.0	.64	9.1	.15	.20	.15	3.3	5.6	.30	.12
24	.24	.08	.68	.47	10	.12	.18	.15	1.2	2.6	.28	.15
25	8.5	.50	.28	.40	8.5	.10	.18	.15	.64	2.4	.28	.20
26	16	.84	.22	.40	2.0	.12	.15	.15	.61	.80	.38	.20
27	.64	.44	.28	.38	.93	.15	.15	.15	2.9	.40	.50	.40
28	.30	.22	.92	.35	.68	.40	.15	1.2	1.1	.35	.72	5.1
29	.22	.12	.44	.32	.54	9.0	.15	----------	.64	.32	.32	2.6
30	.18	.12	.22	.32	.50	227	.12	----------	.44	.32	.84	.72
31	.18	.10	----------	.30	----------	36	.10	----------	6.7	----------	1.0	----------
Total	29.52	15.40	11.07	45.25	51.23	278.82	53.09	25.30	28.73	106.40	39.20	14.03
Mean												
Mgd	0.952	0.497	0.369	1.46	1.71	8.99	1.71	0.904	0.927	3.55	1.26	0.468
Cfs	1.47	0.769	0.571	2.26	2.65	13.9	2.65	1.40	1.43	5.49	1.95	0.724
Ac-ft	91	47	34	139	157	856	163	78	88	327	120	43
Max	16	10	3.0	24	10	227	19	5.7	6.7	28	16	5.1
Min	0.02	0.05	0.05	0.12	0.20	0.10	0.10	0.05	0.10	0.28	0.20	0.08

Calendar Year 1966: Max 227 Min 0.01 Mean (mgd) 1.26 Mean (cfs) 1.95 Ac-ft 1410
Fiscal Year 1966-67: Max 227 Min 0.02 Mean (mgd) 1.91 Mean (cfs) 2.96 Ac-ft 2140

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
12-30	1100	8.06	768	1,190

16-7040. Wailuku River at Piihonua

Location.--Lat 19°42'58", long 155°09'13", on left bank 0.2 mile downstream from Hookelekele Stream, 0.9 mile west of Piihonua, and 4.1 miles west of Hilo Post Office.

Drainage area.--125 sq mi.

Records available.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to June 1967. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

Gage.--Digital water-atage recorder. Altitude of gage is 1,070 ft (from topographic map). Prior to Apr. 28, 1964, graphic water-stage recorder at same site and datun.

Average discharge.--37 years (1928-40, 1941-47, 1948-67), 178 mgd (275 cfs).

Extremes.--Maximum discharge during year, 12,900 mgd (20,000 cfs) Dec. 30 (gage height, 18.55 ft); minimum, 8.9 mgd (14 cfs) Feb. 8, 9. 1928-67: Maximum discharge, 41,000 mgd (63,400 cfs) Aug. 11, 1940 (gage height, 28.6 ft, from floodmarks), from rating curve extended above 6,600 mgd; minimum, 0.16 mgd (0.25 cfs) Mar. 9, 1941.

Remarks.--Records good. Hawaii County Board of Water Supply diverts about 4 mgd above station for domestic eupply. Kapehu ditch diverted from Kapehu Stream into Wailnku River above station 1938-63.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	324	80	58	37	55	116	1.490	15	96	1.070	71	123
2	321	71	47	31	42	82	646	14	150	767	65	106
3	190	79	41	28	35	68	350	16	96	1.060	50	68
4	126	62	37	25	179	56	465	13	70	468	41	95
5	109	50	36	23	425	49	297	16	85	2.220	40	57
6	77	42	30	33	293	42	196	15	80	649	210	44
7	100	37	26	35	229	37	145	12	66	462	130	40
8	66	43	24	43	96	33	114	9.7	48	332	107	47
9	53	57	45	316	137	32	94	389	40	211	81	35
10	45	34	218	164	85	56	64	150	268	190	86	30
11	39	117	66	68	68	90	216	57	233	147	93	25
12	33	43	62	53	67	39	229	559	226	139	1.030	145
13	36	34	42	41	48	32	90	613	147	97	399	83
14	403	31	134	46	44	30	116	218	98	77	368	39
15	153	27	206	408	115	30	104	899	76	67	462	34
16	98	287	91	908	204	26	60	583	124	61	168	43
17	129	999	91	1.610	98	25	65	221	105	146	120	37
18	167	195	176	735	89	23	86	140	64	132	86	48
19	201	120	208	655	60	69	52	96	49	95	69	29
20	124	88	132	673	46	118	42	71	41	65	56	24
21	271	72	88	428	132	171	37	54	39	129	46	25
22	200	54	68	276	600	93	32	43	64	616	39	22
23	111	44	301	180	1.000	98	25	38	56	367	44	19
24	526	74	231	142	800	94	26	34	64	407	40	36
25	2.310	300	101	111	600	61	24	30	102	331	35	33
26	624	263	80	97	400	64	21	27	234	212	308	51
27	337	383	69	92	300	269	19	25	750	124	243	391
28	210	139	74	79	210	184	19	314	353	116	261	762
29	152	100	63	61	153	849	22	----------	226	110	149	359
30	121	79	45	53	122	5.510	17	----------	142	81	94	205
31	103	64	----------	46	----------	1.280	16	----------	485	---------	106	---------
Total	7.759	4.068	2.890	7.497	6.732	9.726	5.179	4.671.7	4.677	10.948	5.097	3,055
Mean	250	131	96.3	242	224	314	167	167	151	365	164	102
Mgd	387	203	149	374	347	486	258	258	234	565	254	158
Cfs	23,810	12.480	8.870	23,010	20.660	29.850	15.890	14.340	14.350	33,600	15.640	9.380
Ac-ft	2.310	999	301	1.610	1.000	5.510	1.490	899	750	2.220	1.030	762
Max	33	27	24	23	35	23	16	9.7	39	61	35	19.
Min												

Calendar Year 1966: Max 5,510 Min 9.8 Mean (mgd) 144 Mean (cfs) 223 Ac-ft 161,500
Fiscal Year 1966-67: Max 5,510 Min 9.7 Mean (mgd) 198 Mean (cfs) 306 Ac-ft 221,900

Peak discharge (base, 5,600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1800	15.79	7,140	11,000	12-30	1200	18.55	12,900	20,000
10-17	0330	15.13	5,950	9,210	4- 5	1145	15.10	5,900	9,130
11-23	-	14.98	5,710	8,830					

16-7176. Alia Stream near Hilo

Location.--Lat 19°50'38", long 155°06'21", on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo, 2.0 miles south of Honomu, and 8 miles north of Hilo.

Drainage area.--0.58 sq mi.

Records available.--April 1962 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 489 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 7.57 mgd (11.7 cfs).

Extremes.--Maximum discharge during year, 248 mgd (384 cfs) July 25 (gage height, 4.09 ft); minimum, 2.8 mgd (4.3 cfs) Dec. 1.
1962-67: Maximum discharge, 254 mgd (393 cfs) Nov. 8, 1964 (gage height, 4.12 ft); minimum, 0.70 mgd (1.1 cfs) sometime during period Jan. 24 to Feb. 12, 1963.

Remarks.--Records good. No diversion above station. Spring water not used by sugar mills enters stream above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10	9.6	8.3	7.1	7.4	3.9	14	5.1	12	21	9.7	11
2	9.9	9.2	10	6.4	7.4	5.8	12	5.3	12	18	8.8	9.6
3	10	9.2	8.6	5.8	6.8	5.4	11	5.7	11	20	7.4	8.3
4	9.7	9.0	8.6	5.6	16	4.9	19	5.3	11	16	6.4	10
5	9.4	8.6	8.4	5.4	10	4.6	16	5.3	12	34	6.2	7.4
6	9.0	8.4	8.3	8.1	8.4	4.4	14	5.0	12	18	9.0	6.6
7	9.0	7.9	7.6	8.4	7.9	4.1	12	4.8	9.2	16	8.3	6.2
8	8.8	8.1	7.2	8.1	7.9	3.9	11	4.5	7.4	14	8.4	8.4
9	7.9	8.1	9.3	8.8	7.8	4.0	11	10	7.2	13	7.2	7.4
10	7.6	7.8	10	9.6	6.6	7.4	10	10	15	16	8.6	6.8
11	7.4	8.6	8.3	7.4	6.3	8.0	13	11	13	13	9.9	6.0
12	6.6	7.9	9.0	6.9	6.2	6.5	12	14	13	12	12	5.8
13	6.3	7.6	8.1	6.6	5.8	5.5	11	12	12	11	11	9.0
14	9.4	7.6	15	7.8	5.6	5.0	11	10	11	9.9	26	5.7
15	8.8	7.6	12	21	6.4	5.5	10	14	8.8	9.7	10	6.2
16	8.3	11	9.0	17	12	5.0	11	14	8.8	8.8	7.2	6.3
17	7.9	16	9.7	15	7.8	4.5	9.7	12	11	9.0	7.6	5.4
18	9.7	9.2	9.0	28	6.6	4.2	11	11	8.6	8.3	7.2	8.1
19	9.7	8.6	9.9	16	6.0	9.0	9.6	9.4	7.2	8.3	6.8	5.3
20	9.0	8.4	8.6	12	5.6	7.0	8.4	8.4	7.1	7.2	6.2	4.8
21	9.9	8.3	8.3	10	6.8	6.9	7.8	7.4	7.4	9.0	5.8	5.1
22	9.2	8.8	8.1	9.4	42	6.4	7.2	6.9	10	11	6.0	5.1
23	8.8	7.9	10	8.8	9.5	6.3	6.9	7.2	9.4	10	7.8	5.1
24	11	7.6	8.4	9.4	9.2	6.0	6.4	8.1	7.1	11	7.2	8.1
25	41	9.6	8.1	8.8	6.6	5.0	6.2	7.1	7.4	11	9.0	9.6
26	14	24	8.1	8.4	6.0	8.5	6.3	7.4	9.6	10	14	9.9
27	11	14	7.9	8.3	5.6	11	6.4	6.2	19	8.3	14	11
28	10	9.6	7.9	7.9	5.1	10	6.2	13	13	7.2	12	16
29	9.9	9.2	7.4	7.6	4.9	17	5.3	----------	12	13	12	10
30	11	8.3	7.6	7.2	4.0	26	5.7	----------	12	10	10	9.6
31	10	8.3	----------	6.9	----------	15	5.4	----------	15	----------	9.0	----------
Total	320.2	294.0	266.7	303.7	254.2	226.7	306.5	240.1	331.2	383.7	290.7	233.8
Mean												
Mgd	10.3	9.48	8.89	9.80	8.47	7.31	9.89	8.58	10.7	12.8	9.38	7.79
Cfs	15.9	14.7	13.8	15.2	13.1	11.3	15.3	13.3	16.6	19.8	14.5	12.1
Ac-ft	983	902	818	932	780	696	941	737	1020	1180	892	718
Max	41	24	15	28	42	26	19	14	19	34	26	16
Min	6.3	7.6	7.2	5.4	4.0	3.9	5.3	4.5	7.1	7.2	5.8	4.8

Calendar Year 1966: Max 42 Min 3.0 Mean (mgd) 8.84 Mean (cfs) 13.7 Ac-ft 9,900
Fiscal Year 1966-67: Max 42 Min 3.9 Mean (mgd) 9.46 Mean (cfs) 14.6 Ac-ft 10,590

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1445	4.09	248	384	11-22	1600	3.72	174	269
8-26	2300	3.73	176	272	4- 5	1500	3.38	122	189
10-15	2245	3.57	150	232	5-14	1700	3.88	206	319
11- 4	1500	3.22	102	158					

16-7178. Pohakupuka Stream near Papaaloa

Location.--Lat 19°57'20", long 155°11'20", on right bank 200 ft downstream from Mamalahoa Highway, 2.8 miles northwest of Honohina, and 3.0 miles southwest of Papaaloa.

Drainage area.--2.76 sq mi.

Records available.--April 1962 to June 1967.

Gage.--Water-stage recorder (digital since Feb. 10). Datum of gage is 250 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 14.7 mgd (22.7 cfs).

Extremes.--Maximum discharge during year, 929 mgd (1,440 cfs) Nov. 22 (gage height, 7.73 ft); minimum, 1.4 mgd (2.2 cfs) June 23, 24. 1962-67: Maximum discharge, 3,280 mgd (5,070 cfs) Nov. 7, 1964 (gage height, 13.06 ft), from rating curve extended above 670 mgd by logarithmic plotting; minimum, 0.18 mgd (0.28 cfs) Nov. 9, 1962.

Remarks.--Records good. No diversion above station. Irrigation ditches in basin occasionally overflow, but amount reaching stream is small.

Discharge, in million gallons a day, fiscal year July 1966 to July 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	6.2	4.8	4.5	5.3	5.7	50	4.1	16	129	8.6	8.6
2	12	5.4	4.7	4.5	4.7	5.1	17	4.0	25	87	6.4	4.1
3	13	5.7	4.7	5.8	4.4	4.7	14	4.0	7.7	82	5.5	3.3
4	6.7	7.3	4.4	4.4	4.5	4.5	143	4.0	5.8	14	4.9	3.1
5	5.7	5.1	4.7	4.0	6.6	4.2	40	4.2	8.4	200	4.6	2.9
6	3.7	4.3	4.5	54	6.6	4.0	16	4.0	6.4	28	5.0	2.5
7	5.4	4.0	4.1	22	7.8	4.3	10	3.9	4.2	16	4.9	2.4
8	3.4	4.5	4.0	9.0	4.5	6.4	8.8	3.9	3.5	16	4.3	2.9
9	2.7	6.7	20	15	12	21	20	12	3.2	11	4.0	2.9
10	2.6	4.2	23	9.6	5.3	82	7.7	5.5	6.5	37	3.9	2.5
11	2.4	18	6.0	5.4	4.5	20	122	4.5	10	13	6.4	2.3
12	2.2	5.0	5.2	5.0	4.1	6.8	29	6.0	25	9.9	14	2.1
13	2.0	4.1	4.5	5.1	3.7	5.8	9.5	18	9.0	8.4	7.4	2.2
14	6.7	4.7	47	5.6	3.5	5.1	11	5.8	13	8.1	6.6	2.0
15	4.8	4.4	38	39	24	5.3	9.0	40	5.6	8.4	12	2.0
16	6.0	59	8.0	55	15	4.8	10	17	4.9	7.6	4.6	1.8
17	13	70	18	106	7.6	4.6	9.5	5.8	6.0	9.3	3.9	1.7
18	25	11	35	69	4.6	4.8	9.9	4.6	6.5	8.2	8.4	1.7
19	16	6.6	36	76	4.4	73	6.8	4.4	4.2	7.0	6.5	1.9
20	5.6	7.3	10	34	3.7	100	6.0	4.4	3.9	6.1	4.1	1.6
21	16	7.8	6.7	13	3.6	66	5.6	4.3	6.6	9.1	3.6	1.5
22	7.7	8.0	5.7	10	186	12	5.4	4.3	14	12	3.3	1.5
23	3.7	4.7	13	8.0	65	7.0	5.2	4.3	11	9.7	3.7	1.4
24	11	31	10	7.6	63	5.3	5.0	4.3	6.1	9.5	4.1	7.4
25	190	70	5.6	7.5	40	4.5	4.8	4.3	6.6	12	4.9	3.7
26	26	20	5.0	7.6	25	32	4.6	4.3	79	6.4	129	9.9
27	13	17	4.5	7.2	36	107	4.5	4.3	124	6.6	122	48
28	7.5	7.8	18	6.2	8.3	12	4.4	146	20	18	6.5	62
29	5.7	6.8	8.0	5.3	6.7	35	4.3	----------	9.0	96	5.0	10
30	6.2	6.2	5.4	5.2	6.0	326	4.3	----------	9.3	14	3.7	5.6
31	10	5.2	----------	4.8	----------	28	4.2	----------	26	---------	4.3	----------
Total	446.7	428.0	368.5	615.3	576.4	1006.9	601.5	336.2	486.4	899.3	316.1	205.5
Mean												
Mgd	14.4	13.8	12.3	19.8	19.2	32.5	19.4	12.0	15.7	30.0	10.2	6.85
Cfs	22.3	21.4	19.0	30.6	29.7	50.3	30.0	18.6	24.3	46.4	15.8	10.6
Ac-ft	1370	1310	1130	1890	1770	3090	1850	1030	1490	2760	970	631
Max	190	70	47	106	186	326	143	146	124	200	129	62
Min	2.0	4.0	4.0	4.0	3.5	4.0	4.2	3.9	3.2	6.1	3.3	1.4

Calendar Year 1966: Max 326 Min 1.7 Mean (mgd) 14.4 Mean (cfs) 22.3 Ac-ft 16,170
Fiscal Year 1966-67: Max 326 Min 1.4 Mean (mgd) 17.2 Mean (cfs) 26.6 Ac-ft 19,290

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1500	7.33	809	1,250	12-30	0630	7.61	893	1,380
11-22	1600	7.73	929	1,440	1-11	1645	7.24	782	1,210
12-27	0600	7.04	723	1,120	4- 5	1510	6.87	677	1,050

16-7178.2. Manowaiopae Stream near Laupahoehoe

Location.--Lat 19°58'35", long 155°14'45", on left bank 1.0 mile upstream from mouth, 1.2 miles south of Laupahoehoe, and 1.5 miles west of Papaaloa.

Drainage area.--1.04 sq mi.

Records available.--August 1965 to June 1967.

Gage.--Water-stage recorder (digital since Feb. 21). Altitude of gage is 900 ft (from topographic map).

Extremes.--Maximum discharge during year, 680 mgd (1,050 cfs) Aug. 25 (gage height, 4.40 ft), from rating curve extended above 92 mgd by logarithmic plotting; minimum, 0.92 mgd (1.4 cfs), June 24-27, 30.
1965-67: Maximum discharge, that of Aug. 25, 1966; minimum, 0.07 mgd (0.11 cfs) Oct. 13, 15, 16, 1965.

Remarks.--Records good except those above 200 mgd, which are fair. Board of Water Supply, County of Hawaii, diverts from 20,000 to 100,000 gallons a day by pipeline from 5 springs along the stream above station for domestic use in the Laupahoehoe area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.6	2.7	3.4	2.7	2.5	1.9	11	3.0	2.2	15	3.1	1.6
2	1.6	2.7	3.3	2.6	2.5	1.9	5.2	2.8	2.7	10	2.8	1.5
3	2.5	2.7	3.3	2.4	2.4	1.9	4.6	2.7	1.6	12	2.7	1.5
4	1.9	2.7	3.2	2.2	2.3	1.9	32	2.6	1.6	5.0	2.6	1.4
5	1.9	2.6	3.0	1.8	2.2	1.8	13	2.5	1.5	47	2.6	1.4
6	1.9	2.5	2.9	10	2.1	1.8	7.3	2.4	1.5	6.9	2.6	1.4
7	1.9	2.4	2.8	4.5	2.0	2.8	6.4	2.3	1.5	5.6	2.6	1.4
8	1.9	2.3	2.7	2.5	2.0	2.1	6.2	2.3	1.4	6.2	2.6	1.3
9	1.9	2.3	4.3	3.0	1.7	16	6.9	2.2	1.4	5.8	2.6	1.3
10	2.0	2.6	3.7	2.5	1.6	18	5.9	2.0	1.6	7.6	2.6	1.3
11	2.0	2.9	2.4	2.2	1.6	3.1	27	1.9	1.4	5.8	2.7	1.2
12	2.1	2.3	2.3	2.0	1.6	2.4	8.7	1.9	1.4	5.2	2.4	1.2
13	2.1	2.3	2.5	2.0	1.5	2.3	6.4	1.8	1.6	5.0	2.3	1.2
14	2.1	2.3	7.2	2.2	1.5	2.3	6.0	1.7	4.0	4.8	2.3	1.2
15	2.1	2.2	6.5	5.0	2.2	2.3	5.9	1.9	1.6	4.7	2.2	1.2
16	2.1	9.3	2.5	10	1.5	2.3	5.8	1.8	1.6	8.4	2.1	1.1
17	2.2	9.6	3.0	20	1.5	2.3	5.4	1.6	1.6	5.0	2.1	1.1
18	3.0	3.0	6.4	12	1.5	5.9	5.2	1.6	1.5	4.5	2.0	1.1
19	2.8	2.8	5.2	14	1.6	13	4.8	1.5	1.5	4.2	1.9	1.1
20	2.1	2.9	3.1	3.6	1.5	20	4.7	1.5	1.5	4.0	1.9	1.0
21	2.1	2.8	2.9	3.4	1.4	11	4.5	1.5	1.6	4.0	1.8	1.0
22	2.1	2.7	2.9	3.3	4.2	3.3	4.3	1.5	1.7	3.7	1.8	1.0
23	1.9	2.5	3.1	3.3	17	3.0	4.2	1.5	1.7	3.6	1.7	1.0
24	2.0	6.7	2.9	3.2	5.3	2.9	4.0	1.4	1.9	3.5	1.7	1.0
25	22	58	2.9	3.1	2.9	2.8	3.9	1.4	1.7	3.4	1.6	1.0
26	4.6	4.5	2.9	3.0	3.5	5.4	3.6	1.4	25	3.2	28	1.0
27	3.0	3.9	2.9	2.8	2.5	8.5	3.5	2.0	26	3.2	3.1	2.5
28	2.7	3.5	3.7	2.7	1.9	3.4	3.4	33	4.1	8.0	1.6	3.4
29	2.7	3.5	2.9	2.7	1.9	3.2	3.3	----------	3.2	45	1.6	1.0
30	2.7	3.4	2.8	2.6	1.9	43	3.2	----------	3.3	4.2	1.6	.92
31	2.7	3.4	----------	2.6	----------	8.8	3.1	----------	8.4	----------	1.5	----------
Total	90.2	160.0	103.6	139.9	79.8	201.3	219.4	85.7	113.3	254.5	94.7	39.32
Mean												
Mgd	2.91	5.16	3.45	4.51	2.66	6.49	7.08	3.06	3.65	8.48	3.05	1.31
Cfs	4.50	7.98	5.34	6.98	4.12	10.0	11.0	4.73	5.65	13.1	4.72	2.03
Ac-ft	277	491	318	429	245	618	673	263	348	781	291	121
Max	22	58	7.2	20	17	43	32	33	26	47	28	3.4
Min	1.6	2.2	2.3	1.8	1.4	1.8	3.1	1.4	1.4	3.2	1.5	0.92

Calendar Year 1966: Max 58 Min 0.96 Mean (mgd) 3.55 Mean (cfs) 5.49 Ac-ft 3,980
Fiscal Year 1966-67: Max 58 Min 0.92 Mean (mgd) 4.33 Mean (cfs) 6.70 Ac-ft 4,850

Peak discharge (base, 300 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-25	1800	3.54	337	521	12-30	about 1200	3.63	366	566
8-25	1730	4.40	680	1,050	4-29	0145	3.75	408	631

16-7200. Kawainui Stream near Kamuela
(Formerly published as Kawainui Stream above Upper Hamakua ditch, near Kamuela)

Location.--Lat 20°05'18", long 155°40'58", on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 miles north of Kamuela.

Drainage area.--1.58 sq mi.

Records available.--January 1964 to June 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 4,060 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,560 mgd (2,410 cfs) Jan. 11 (gage height, 9.15 ft), from rating curve extended above 34 mgd on basis of computation of peak flow over dam; minimum, 0.11 mgd (0.17 cfs) June 14, 15, 17.
1964-67: Maximum discharge, that of Jan. 11, 1967; minimum, 0.02 mgd (0.03 cfs) Oct. 5, 6, 1965.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	21	2.7	0.91	0.36	1.7	0.57	26	0.20	22	31	8.1	0.91
2	21	3.1	.61	.27	.91	.48	11	.20	18	40	3.4	.66
3	23	8.0	.53	.22	.66	.40	31	.18	2.8	24	1.3	.48
4	27	19	1.4	.20	.57	.31	113	.18	2.1	3.4	.91	.36
5	17	6.2	2.9	.16	5.2	.27	34	.18	5.4	22	.70	.27
6	18	16	8.7	15	3.3	.22	8.7	.16	1.6	16	.70	.22
7	25	18	1.9	14	1.5	.25	3.0	.13	.84	8.1	.98	.25
8	3.8	22	.98	4.1	.98	.53	8.5	.16	.53	7.5	.66	.27
9	8.5	3.8	14	1.3	6.0	7.0	26	17	.98	4.4	.48	.22
10	8.7	19	19	2.3	3.3	26	4.8	3.8	3.4	12	.61	.25
11	5.7	18	9.2	1.2	3.8	18	158	1.8	20	9.9	1.9	.22
12	2.1	6.7	20	.70	3.3	12	15	6.1	5.4	1.7	3.3	.20
13	2.2	21	3.6	.53	1.3	9.2	2.8	6.0	1.3	.84	4.4	.16
14	6.4	11	38	.77	.91	21	1.7	1.8	.70	.57	2.7	.11
15	6.9	8.2	19	7.7	.91	6.7	1.1	1.1	.48	.44	1.3	.16
16	16	39	6.5	11	3.6	5.2	4.8	1.6	.36	.27	.77	.13
17	38	42	4.4	31	1.5	5.3	16	.98	1.9	34	.57	.16
18	32	7.5	16	11	.91	38	14	.61	4.1	2.0	.48	1.1
19	11	7.3	42	57	.77	98	12	.53	7.3	.98	.36	.48
20	4.7	15	7.3	20	.61	69	6.9	1.2	3.8	.57	.31	.44
21	16	7.6	1.8	4.4	.53	56	3.1	1.4	9.0	.44	.25	2.7
22	6.5	4.4	.91	2.1	.61	7.9	2.0	.91	14	.31	.22	1.0
23	3.0	1.8	.70	1.3	.48	4.2	1.3	5.8	5.1	.44	.27	.57
24	26	128	.57	1.2	26	2.0	.84	4.7	1.6	.53	.27	2.2
25	6.4	27	.48	21	12	1.3	.61	1.4	2.1	.44	.25	1.8
26	4.6	9.9	.40	16	11	11	.44	.77	23	.44	30	22
27	9.2	20	.31	7.7	17	41	.36	17	40	.53	20	12
28	2.8	8.5	.91	2.1	2.7	5.8	.31	74	12	.70	8.7	28
29	1.4	6.9	.98	1.3	1.3	2.5	.27	----------	2.7	5.8	3.6	5.8
30	1.9	3.0	.48	.84	.84	4.0	.25	----------	9.9	3.6	2.3	1.8
31	5.0	1.4	----------	1.1	----------	3.1	.22	----------	36	----------	1.6	----------
Total	380.8	512.0	224.47	237.85	114.19	457.23	508.00	149.89	258.39	232.90	101.39	84.92
Mean												
Mgd	12.3	16.5	7.48	7.67	3.81	14.7	16.4	5.35	8.34	7.76	3.27	2.83
Cfs	19.0	25.5	11.6	11.9	5.89	22.7	25.4	8.28	12.9	12.0	5.06	4.38
Ac-ft	1,170	1,570	689	730	350	1,400	1,560	460	793	715	311	261
Max	38	128	42	57	26	98	158	74	40	40	30	28
Min	1.4	1.4	0.31	0.16	0.48	0.22	0.22	0.13	0.36	0.27	0.22	0.11

Calendar Year 1966: Max 128 Min 0.13 Mean (mgd) 8.80 Mean (cfs) 13.6 Ac-ft 9,860
Fiscal Year 1966-67: Max 158 Min 0.11 Mean (mgd) 8.94 Mean (cfs) 13.8 Ac-ft 10,010

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
8-24	1730	7.31	853	1,320	1-11	1830	9.15	1,560	2,410
12-19	0200	5.28	346	535	4-17	0200	4.89	274	424
1- 4	0930	4.82	263	407					

16-7205. Upper Hamakua ditch below Kawaiki Stream, near Kamuela

Location.--Lat 20°05'15", long 155°40'42", on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 miles north of Kamuela.

Records available.--January 1964 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 4,020 ft (from topographic map).

Extremes.--1964-67: Maximum daily discharge, 30 mgd (46 cfs) Aug. 25, 1966; minimum daily, 0.03 mgd (0.05 cfs) Oct. 4-6, 1965.

Remarks.--Records fair. Ditch diverts from Kawainui and Kawaiki Streams for irrigation near Kamuela. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17	3.1	1.1	0.56	2.2	0.70	18	0.40	23	23	13	1.1
2	19	3.7	.80	.40	1.1	.56	13	.36	21	28	4.6	.76
3	17	9.5	.65	.33	.81	.44	23	.36	4.4	23	1.7	.52
4	21	17	2.0	.30	.70	.36	28	.33	3.4	5.0	1.2	.40
5	18	7.5	4.0	.27	6.2	.30	21	.30	9.7	16	.98	.33
6	13	16	11	16	4.6	.24	9.4	.30	2.8	23	1.1	.27
7	17	16	2.5	17	2.1	.36	3.6	.24	1.6	13	1.6	.27
8	4.9	16	1.3	4.8	1.3	.65	7.7	.24	1.1	12	.98	.30
9	11	4.9	17	1.8	8.2	8.2	15	15	1.9	6.1	.70	.24
10	11	10	20	3.6	3.7	24	5.3	5.0	5.9	12	.98	.27
11	6.9	14	12	1.5	5.3	18	20	2.4	15	12	3.0	.24
12	3.0	8.8	21	.90	3.7	15	9.1	7.5	9.0	2.7	5.5	.21
13	3.0	20	5.0	.70	1.7	11	3.8	9.3	2.4	1.7	7.5	.15
14	8.5	13	25	1.6	1.1	16	2.4	2.6	1.6	1.2	5.1	.13
15	8.9	10	20	12	1.4	8.6	1.7	1.7	1.1	1.0	2.4	.18
16	18	18	9.0	15	4.6	5.9	4.5	2.4	.76	.81	1.5	.18
17	22	22	6.0	22	1.8	6.0	11	1.5	2.8	17	.92	.27
18	23	9.5	18	16	1.1	18	11	.98	5.9	2.7	.65	2.0
19	13	9.5	25	29	.92	28	8.7	.81	8.1	1.4	.48	.76
20	6.4	13	10	17	.76	27	7.0	2.4	6.2	.98	.40	.65
21	14	9.2	2.5	4.8	.60	26	4.4	2.5	12	.70	.30	4.1
22	8.4	6.2	1.1	2.8	.81	9.6	2.9	1.6	20	.60	.24	1.4
23	4.4	2.6	.90	1.8	.56	4.8	1.8	11	7.1	.76	.33	.81
24	19	25	.70	1.8	14	2.4	1.4	6.4	2.5	.92	.30	3.3
25	7.9	30	.60	18	12	1.6	1.0	2.1	3.6	.86	.27	2.4
26	6.0	12	.50	18	12	12	.81	1.2	21	.76	20	27
27	12	20	.40	8.2	13	23	.65	5.1	27	1.2	18	18
28	3.7	11	1.7	2.8	2.7	6.8	.56	29	17	1.6	12	25
29	2.1	9.0	1.5	1.6	1.4	3.0	.52	----------	4.3	10	4.6	9.7
30	3.2	4.0	.81	1.1	.92	4.9	.48	----------	12	5.9	3.3	2.5
31	6.8	2.5	----------	1.5	----------	3.8	.44	----------	25	----------	2.0	----------
Total	349.1	373.0	222.06	223.16	111.28	287.21	238.16	113.02	279.16	225.89	115.63	103.44
Mean												
Mgd	11.3	12.0	7.40	7.20	3.71	9.26	7.68	4.04	9.01	7.53	3.73	3.45
Cfs	17.5	18.6	11.4	11.1	5.74	14.3	11.9	6.25	13.9	11.7	5.77	5.34
Ac-ft	1070	1140	681	685	342	881	731	347	857	693	355	317
Max	23	30	25	29	14	28	28	29	27	28	20	27
Min	2.1	2.5	0.40	0.27	0.56	0.24	0.44	0.24	0.76	0.60	0.24	0.13

Calendar Year 1966: Max 30 Min 0.15 Mean (mgd) 7.29 Mean (cfs) 11.3 Ac-ft 8170
Fiscal Year 1966-67: Max 30 Min 0.13 Mean (mgd) 7.24 Mean (cfs) 11.2 Ac-ft 8110

16-7250. Alakahi Stream near Kamuela
(Formerly published as Alakahi Stream above Upper Hamakua ditch, near Kamuela)

Location.--lat 20°04'27", long 155°40'25", on right bank 25 ft upstream from Upper Hamakua ditch intake and 3.5 miles north of Kamuela.

Drainage area.--0.87 sq mi.

Records available.--January 1964 to June 1967.

Gage.--Digital water-stage recorder. Altitude of gage is 3,900 ft (from topographic map).

Extremes.--Maximum discharge during year, 940 mgd (1,450 cfs) Jan. 11 (gage height, 8.65 ft), from rating curve extended above 23 mgd on basis of computation of peak flow over dam; minimum, 0.18 mgd (0.28 cfs) June 14, 15.
1964-67: Maximum discharge, that of Jan. 11, 1967; minimum, 0.02 mgd (0.03 cfs) on several days in 1965.

Remarks.--Records fair. Parker Ranch pipeline diverts from tributary 0.4 mile above station for ranch use in Kamuela area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.1	1.4	1.0	0.35	1.1	0.45	10	0.35	9.3	18	6.3	0.86
2	10	1.1	.77	.30	.65	.38	7.1	.32	12	21	2.6	.57
3	12	3.6	.74	.25	.50	.35	16	.32	2.6	11	1.1	.41
4	16	12	1.8	.24	.48	.28	37	.30	2.4	3.0	.78	.36
5	8.6	3.4	3.0	.24	1.9	.25	18	.28	5.1	9.5	.67	.31
6	7.8	11	5.3	13	1.9	.25	7.4	.28	2.0	11	.60	.27
7	13	11	1.5	7.0	1.3	.30	4.2	.25	1.2	5.8	.82	.34
8	2.2	12	.95	2.0	.68	.45	5.8	.25	.82	4.4	.57	.31
9	4.4	2.5	8.2	1.0	1.9	2.7	13	4.6	.74	2.6	.44	.29
10	5.2	8.9	11	1.4	1.4	16	5.0	2.0	2.2	8.7	.41	.27
11	3.2	8.9	5.9	1.1	1.6	9.5	73	1.3	9.8	6.5	.94	.27
12	1.2	4.0	9.6	.74	1.7	6.9	10	3.8	3.9	1.8	3.3	.25
13	1.1	13	2.7	.59	.74	4.3	4.8	3.6	1.5	1.2	4.0	.25
14	2.1	6.9	22	.71	.56	9.8	4.2	1.5	.94	.90	2.3	.20
15	2.5	5.0	10	4.4	.62	3.1	3.8	.94	.70	.74	1.6	.25
16	5.9	19	4.4	5.4	1.6	2.4	3.1	.86	.57	.64	1.2	.31
17	18	21	2.7	11	.80	2.1	6.4	.70	1.0	14	.74	.41
18	13	4.0	8.2	6.2	.53	11	6.4	.54	3.7	1.8	.54	1.8
19	4.4	3.9	19	23	.59	36	5.1	.48	5.6	1.0	.38	.67
20	2.2	9.8	3.2	6.9	.56	31	3.0	1.6	3.8	.70	.34	.60
21	7.9	3.2	1.6	1.8	.42	24	2.1	2.7	8.4	.57	.27	2.3
22	3.1	2.5	1.0	1.2	.40	4.3	1.5	1.3	7.7	.48	.25	.90
23	1.8	1.2	.80	.77	.35	2.3	1.0	3.4	2.6	.48	.31	.48
24	15	44	.71	.68	9.2	1.5	.80	2.8	1.4	.54	.29	.90
25	3.6	16	.59	11	4.4	1.2	.71	1.2	1.2	.48	.27	.86
26	2.8	6.8	.48	6.6	3.9	5.9	.62	.67	14	.44	18	9.5
27	6.4	12	.42	3.1	7.0	21	.53	5.7	24	.90	9.9	5.7
28	1.8	6.5	.53	1.3	1.5	5.4	.48	31	9.5	1.7	6.3	16
29	1.0	7.5	.59	.80	.77	3.0	.45	----------	2.8	5.2	2.4	5.4
30	1.2	4.2	.42	.59	.59	3.2	.42	----------	12	3.4	1.5	2.5
31	3.2	2.9	----------	.71	----------	3.0	.38	----------	20	---------	1.6	----------
Total	189.7	269.2	129.10	114.37	49.64	212.31	252.29	73.04	173.47	138.47	70.72	53.54
Mean												
Mgd	6.12	8.68	4.30	3.69	1.65	6.85	8.14	2.61	5.60	4.62	2.28	1.78
Cfs	9.47	13.4	6.65	5.71	2.55	10.6	12.6	4.04	8.66	7.15	3.53	2.75
Ac-ft	582	826	396	351	152	652	774	224	532	425	217	164
Max	18	44	22	23	9.2	36	73	31	24	21	18	16
Min	1.0	1.1	0.42	0.24	0.35	0.25	0.38	0.25	0.57	0.44	0.25	0.20

Calendar Year 1966: Max 44 Min 0.11 Mean (mgd) 4.48 Mean (cfs) 6.93 Ac-ft 5020
Fiscal Year 1966-67: Max 73 Min 0.20 Mean (mgd) 4.73 Mean (cfs) 7.32 Ac-ft 5300

Peak discharge (base, 60 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1615	4.40	82	127	1- 4	0900	4.16	68	105
8-24	1700	6.28	300	464	1-11	1900	8.65	940	1,450
12-19	0030	4.46	86	133	4-17	0345	4.07	64	99
12-27	1100	5.58	196	303					

16-7322. Wailoa Stream near Waipio

Location.--Lat 20°05'28", long 155°37'01", on right bank 1.0 mile downstream from confluence of Waipio and Waima Streams, 1.8 miles southwest of Waipio, and 3.3 miles southwest of Kukuihaele.

Drainage area.--14.3 sq mi.

Records available.--August 1901 to January 1902 (prior to any upstream diversions), July 1911 to December 1912 (gage heights only), February 1964 to June 1967. Published as Waipio River at elevation 360 ft, near Waipio 1901-2 and as Waipio River below Waima Stream, near Waipio 1911-12.

Gage.--Digital water-stage recorder. Altitude of gage is 150 ft (from topographic map). Aug. 15, 1901, to Jan. 22, 1902, and July 20, 1911, to Dec. 31, 1912, staff gage at site 1.0 mile upstream (400 ft below Waima Stream) at different datums. Feb. 19, 1964, to June 2, 1965, graphic water-stage recorder at present site and datum.

Extremes.--Maximum discharge during year, 5,490 mgd (8,490 cfs) Jan. 11 (gage height, 7.8 ft, from floodmarks), from rating curve extended above 260 mgd on basis of slope-area measurement of peak flow; minimum, 26 mgd (40 cfs) Aug. 3, June 22, 23, 25.
1901-2, 1964-67: Maximum discharge, that of Jan. 11, 1967; minimum, 25 mgd (39 cfs) at times in 1964-66.

Remarks.--Records fair. Upper and Lower Hamakua ditches divert water out of basin from upstream tributaries for irrigation in vicinity of Kamuela and for mill and domestic use, power generation, and irrigation on Hamakua coast. Parker Ranch pipeline diverts from Alakahi Stream for ranch use in Kamuela area.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	62	28	33	32	30	31	60	32	72	173	61	32
2	52	27	33	32	30	31	50	33	89	167	40	31
3	85	28	33	31	30	30	100	34	34	104	33	30
4	88	59	44	31	30	30	200	34	35	45	33	30
5	57	29	41	31	32	30	80	34	41	74	32	30
6	69	50	55	112	53	29	50	33	33	84	33	30
7	97	74	35	72	35	31	40	32	33	57	32	30
8	32	118	34	33	30	32	40	32	32	66	32	30
9	34	35	105	47	30	36	60	52	33	41	33	29
10	38	99	127	37	30	155	33	35	36	64	32	30
11	34	78	84	32	32	118	575	34	82	82	33	30
12	30	37	110	31	31	55	116	37	47	38	34	31
13	31	82	45	30	30	53	37	39	33	37	36	31
14	31	52	180	30	30	74	32	34	33	36	41	31
15	31	42	126	34	30	34	35	34	33	36	33	32
16	41	178	53	38	30	35	43	34	32	36	32	32
17	111	247	45	99	30	30	68	33	32	119	32	33
18	102	54	66	38	29	100	47	33	37	35	32	34
19	41	40	178	195	29	250	48	33	98	33	32	31
20	31	65	62	81	29	200	38	33	45	33	32	31
21	55	40	39	32	29	150	34	33	59	33	32	33
22	37	36	35	31	29	50	33	32	56	33	31	30
23	30	29	36	30	29	40	33	32	36	33	32	27
24	124	328	35	30	85	35	33	33	30	33	32	28
25	42	233	34	72	44	35	33	31	34	33	32	27
26	33	80	34	52	32	40	32	31	162	33	168	51
27	45	114	34	36	62	150	32	51	260	34	105	53
28	30	74	34	31	33	50	32	374	84	35	65	135
29	29	65	33	31	32	35	32	----------	38	76	37	50
30	28	44	32	30	32	30	33	----------	103	47	31	32
31	29	34	----------	30	----------	30	33	----------	194	----------	32	----------
Total	1579	2499	1835	1471	1037	2029	2112	1312	1966	1750	1295	1084
Mean												
Mgd	50.9	80.6	61.2	47.5	34.6	65.5	68.1	46.9	63.4	58.3	41.8	36.1
Cfs	78.8	125	94.7	73.5	53.5	101	105	72.5	98.1	90.2	64.7	55.9
Ac-ft	4850	7670	5630	4510	3180	6230	6480	4030	6030	5370	3970	3330
Max	124	328	180	195	85	250	575	374	260	173	168	135
Min	28	27	32	30	29	29	32	31	30	33	31	27

Calendar Year 1966: Max 328 Min 25 Mean (mgd) 48.9 Mean (cfs) 75.7 Ac-ft 54820
Fiscal Year 1966-67: Max 575 Min 27 Mean (mgd) 54.7 Mean (cfs) 84.6 Ac-ft 61280

Peak discharge (base, 600 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
8-24	1845	6.04	1,460	2,260	2-28	0500	4.34	838	1,300
12-27	-	5.31	1,100	1,700	4-17	0300	4.12	692	1,070
1-11	1900	7.8	5,490	8,490	6-28	1530	4.13	698	1,080

16-7330. Lower Hamakua ditch wasteway near Kukuihaele

Location.--Lat 20°07'07", long 155°35'09", on left bank 50 ft downstream from Lower Hamakua ditch, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

Records available.--February 1964 to June 1967.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 980 ft (from topographic map). Prior to Apr. 22, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-67: Maximum daily discharge, 12 mgd (19 cfs) Dec. 30, 1965, Jan. 2, 1966; no flow most of the time.

Remarks.--Records good. The wasteway diverts excess water from Lower Hamakua ditch (see sta. no. 7331).

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.7	0.60	0	0	0	0	4.7	0	3.7	6.7	6.4	0
2	5.6	0	0	0	0	0	4.6	0	5.2	6.7	3.1	0
3	6.0	0	0	0	0	0	5.2	0	1.4	5.8	0	0
4	4.8	5.3	0	0	0	0	4.5	0	0	1.2	0	0
5	7.0	.65	4.9	0	0	0	2.0	0	0	6.4	0	0
6	3.0	3.6	6.1	2.8	0	0	7.5	0	0	8.4	0	0
7	7.2	5.2	3.8	5.6	.73	0	3.5	0	0	10	0	0
8	1.3	7.0	0	.39	0	0	3.0	0	0	10	0	0
9	0	4.1	1.2	0	0	0	7.7	1.3	0	7.2	0	0
10	3.6	2.3	4.4	1.2	0	5.9	3.5	1.4	0	8.4	0	0
11	3.3	6.6	5.0	0	0	8.7	2.8	0	0	7.4	0	0
12	0	3.4	5.8	0	0	6.5	2.6	0	2.3	0	2.1	0
13	0	6.9	1.7	0	0	4.4	8.7	0	0	0	0	0
14	0	7.3	5.1	0	0	5.3	6.5	0	0	0	0	0
15	0	6.0	6.2	0	0	4.6	1.6	0	0	0	0	0
16	0	6.2	4.9	.97	0	1.6	0	0	0	0	0	0
17	5.2	8.0	4.4	3.5	0	.21	5.6	0	0	4.0	0	0
18	7.5	3.6	4.6	1.7	0	1.1	6.4	0	0	0	0	0
19	5.6	.69	6.2	3.7	0	2.0	4.3	0	0	0	0	0
20	.54	1.7	5.8	5.4	0	5.2	3.0	0	1.6	0	0	0
21	.61	2.4	2.1	0	0	11	1.1	0	0	0	0	1.2
22	3.5	0	.47	0	0	8.7	0	0	2.6	0	0	0
23	.94	0	0	0	0	3.6	0	0	1.5	0	0	0
24	4.9	0	0	0	1.6	1.0	0	0	0	0	0	0
25	5.0	0	0	.66	3.9	0	0	0	0	0	0	0
26	.48	0	0	4.6	0	0	0	0	3.2	0	3.6	1.3
27	5.0	5.6	0	2.1	0	3.5	0	0	10	0	4.1	1.3
28	1.7	6.4	0	0	0	0	0	5.0	6.8	0	0	.37
29	0	4.4	0	0	0	0	0	----------	.89	5.9	0	.56
30	0	1.2	0	0	0	0	0	----------	0	8.6	0	0
31	1.6	1.6	----------	0	----------	0	0	----------	4.7	----------	0	----------
Total	90.07	100.74	72.67	32.62	6.23	73.31	88.8	7.7	43.89	96.7	19.3	4.73
Mean												
Mgd	2.91	3.25	2.42	1.05	0.208	2.36	2.86	0.28	1.42	3.22	0.62	0.158
Cfs	4.50	5.03	3.74	1.62	0.322	3.65	4.43	0.43	2.20	4.98	0.96	0.244
Ac-ft	276	309	223	100	19	225	272	24	135	297	59	15
Max	7.5	8.0	6.2	5.6	3.9	11	8.7	5.0	10	10	6.4	1.3
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 12 Min 0 Mean (mgd) 1.77 Mean (cfs) 2.74 Ac-ft 1980
Fiscal Year 1966-67: Max 11 Min 0 Mean (mgd) 1.74 Mean (cfs) 2.69 Ac-ft 1950

16-7331. Lower Hamakua ditch below main weir, near Kukuihaele

Location.--Lat 20°07'07", long 155°35'09", on left bank 30 ft upstream from main weir, 0.8 mile west of Kukuihaele School, and 1.0 mile northeast of Waipio.

Records available.--February 1964 to June 1967.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 990 ft (from topographic map). Prior to Apr. 22, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-67: Maximum daily discharge, 44 mgd (68 cfs) Mar. 2, 1964; minimum daily, 0.05 mgd (0.08 cfs) Dec. 6, 1965.

Remarks.--Records good. At high flow, water can be diverted from the ditch 0.1 mile upstream and at the gage (see sta. no. 7330) to prevent flume damage downstream.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	36	30	36	30	33	25	33	28	30	33	32	28
2	38	31	34	30	30	25	30	28	34	31	32	27
3	37	32	34	30	28	24	34	28	30	30	29	26
4	38	37	37	30	27	24	30	28	31	31	28	25
5	36	36	36	30	34	24	28	27	36	27	27	25
6	36	37	36	36	34	23	33	27	30	29	28	25
7	36	37	33	37	34	25	34	27	27	27	29	25
8	36	36	32	38	28	27	34	27	25	27	27	27
9	37	34	34	34	30	31	33	33	27	27	27	28
10	37	34	1.5	38	29	35	32	30	32	25	27	27
11	35	34	20	35	30	30	31	27	36	28	30	27
12	32	35	30	34	32	30	18	27	32	30	34	27
13	33	36	30	32	26	30	34	34	27	30	34	25
14	35	34	32	31	25	32	34	27	27	30	35	25
15	35	34	32	37	26	28	35	26	25	20	32	25
16	38	36	33	40	30	31	35	26	25	5.4	28	25
17	37	35	34	40	26	30	35	25	25	31	27	25
18	37	35	34	40	25	34	33	25	30	30	27	34
19	34	37	34	40	26	31	34	25	30	27	26	27
20	34	37	33	39	26	30	33	27	33	27	26	27
21	38	35	34	38	25	31	31	28	34	27	26	31
22	35	36	34	34	25	28	30	26	36	27	25	27
23	33	34	34	32	25	33	28	29	31	27	27	29
24	36	35	34	32	28	33	27	33	27	27	25	30
25	33	24	33	38	34	32	26	27	27	27	25	30
26	34	38	32	37	31	37	28	25	33	27	34	37
27	35	38	31	36	39	30	28	26	30	28	30	35
28	32	36	34	33	29	28	28	31	32	30	34	36
29	30	38	35	30	26	33	27	----------	34	34	33	34
30	31	37	31	29	25	33	27	----------	34	30	29	31
31	36	38	----------	30	----------	32	27	----------	37	----------	29	----------
Total	1090	1086	957.5	1070	866	919	950	777	947	829.4	902	850
Mean												
Mgd	35.2	35.0	31.9	34.5	28.9	29.6	30.6	27.8	30.5	27.6	29.1	28.3
Cfs	54.5	54.2	49.4	53.4	44.7	45.8	47.3	43.0	47.2	42.7	45.0	43.8
Ac-ft	3,350	3,330	2,940	3,280	2,660	2,820	2,920	2,380	2,910	2,550	2,770	2,610
Max	38	38	37	40	39	37	35	34	37	34	35	37
Min	30	24	1.5	29	25	23	18	25	25	5.4	25	25

Calendar Year 1966: Max 40 Min 1.1 Mean (mgd) 30.6 Mean (cfs) 47.3 Ac-ft 34,240
Fiscal Year 1966-67: Max 40 Min 1.5 Mean (mgd) 30.8 Mean (cfs) 47.7 Ac-ft 34,500

16-7332. Honokaa diversion at Honokaa

Location.--lat 20°05'12", long 155°28'36", on left bank 50 ft downstream from Lower Hamakua ditch and 0.5 mile northwest of Honokaa Hospital.

Records available.--March 1964 to June 1967.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 950 ft (from topographic map). Prior to Apr. 17, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-67: Maximum daily discharge, 15 mgd (23 cfs) Apr. 25, May 22, 1964; no flow Dec. 8, 1965.

Remarks.--Records good. The diversion is from Lower Hamakua ditch (see sta. no. 7333) for use in Honokaa Sugar Co. mill.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	8.0	13	12	11	10	12	10	12	12	10	8.6
2	11	9.0	13	11	11	9.6	12	10	13	12	12	8.2
3	11	8.8	13	11	10	9.6	12	11	13	12	12	8.2
4	11	10	14	11	10	9.4	12	11	11	12	11	7.9
5	11	11	14	10	12	9.4	12	11	11	12	10	8.0
6	11	11	14	11	12	9.4	12	10	11	12	11	8.2
7	11	11	14	12	12	9.4	12	10	10	12	9.4	8.2
8	11	11	14	13	11	10	12	10	10	12	10	9.3
9	10	11	14	12	11	11	12	11	10	12	10	9.8
10	10	10	3.5	11	11	13	12	12	12	12	11	8.6
11	10	10	5.2	11	11	13	12	12	13	12	11	8.6
12	10	9.8	12	11	11	12	7.2	12	13	12	13	8.8
13	9.4	11	11	11	10	12	10	13	12	12	14	8.6
14	10	11	11	9.8	10	12	11	11	13	12	14	8.6
15	11	11	12	9.6	10	12	11	10	12	12	13	8.8
16	11	11	13	9.8	12	11	11	10	11	.44	12	8.6
17	11	12	13	12	11	10	10	10	11	8.2	11	8.6
18	11	13	13	13	11	11	10	10	12	11	11	9.1
19	11	13	13	12	12	12	10	10	12	11	10	8.6
20	11	13	13	13	13	12	10	10	13	11	10	8.5
21	11	13	13	13	13	12	10	10	13	11	10	8.8
22	12	12	13	12	13	9.0	10	10	13	11	9.4	8.5
23	10	12	13	12	12	11	10	10	13	12	9.1	8.8
24	11	11	13	12	13	12	9.6	12	11	11	9.0	8.6
25	10	9.1	13	12	12	12	9.1	12	11	11	9.0	8.6
26	10	12	13	12	11	12	9.1	12	13	11	10	10
27	11	12	12	13	11	12	9.3	11	13	11	9.7	10
28	9.0	12	12	12	10	12	9.1	12	13	12	11	9.4
29	8.0	12	13	11	10	12	9.0	----------	13	12	10	8.4
30	7.9	12	13	12	10	12	9.8	----------	12	10	9.6	8.5
31	8.4	12	----------	11	----------	12	10	----------	12	----------	9.4	----------
Total	321.7	344.7	370.7	358.2	337	345.8	327.2	303	372	333.64	331.6	261.4
Mean												
Mgd	10.4	11.1	12.4	11.6	11.2	11.2	10.6	10.8	12.0	11.1	10.7	8.71
Cfs	16.1	17.2	19.2	17.9	17.3	17.3	16.4	16.7	18.6	17.2	16.6	13.5
Ac-ft	987	1060	1140	1100	1030	1060	1000	930	1140	1020	1020	802
Max	12	13	14	13	13	13	12	13	13	12	14	10
Min	7.9	8.0	3.5	9.6	10	9.0	7.2	10	10	0.44	9.0	7.9

Calendar Year 1966: Max 14 Min 2.7 Mean (mgd) 10.6 Mean (cfs) 16.4 Ac-ft 11820
Fiscal Year 1966-67: Max 14 Min 0.44 Mean (mgd) 11.0 Mean (cfs) 17.0 Ac-ft 12300

16-7333. Lower Hamakua ditch below Honokaa diversion, at Honokaa

Location.--Lat 20°05'12", long 155°28'34", on right bank 50 ft downstream from tunnel, 100 ft downstream from Honokaa diversion, and 0.5 mile northwest of Honokaa Hospital.

Records available.--February 1964 to June 1967.

Gage.--Graphic water-stage recorder and Parshall flume. Altitude of gage is 950 ft (from topographic map). Prior to Apr. 17, 1964, digital water-stage recorder at same site and datum.

Extremes.--1964-67: Maximum daily discharge, 25 mgd (39 cfs) Jan. 23, 1965; no flow Dec. 7, 8, 1965, Apr. 16, 1967.

Remarks.--Records good. Excess water is spilled at wasteway 8½ miles above station (see sta. no. 7330) and water for Honokaa Sugar Co. mill is diverted 100 ft above station (see sta. no. 7332).

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	14	18	14	15	12	15	13	14	16	17	14
2	18	14	16	14	13	11	14	13	16	16	16	13
3	19	14	16	14	13	11	15	13	14	15	14	12
4	19	16	17	14	12	11	15	13	14	16	13	12
5	18	15	18	14	14	11	11	13	19	12	13	11
6	16	16	18	16	13	11	15	13	15	13	13	11
7	17	15	17	18	17	11	15	12	13	12	15	11
8	16	16	17	18	14	12	15	12	12	13	13	11
9	16	14	18	16	14	12	16	14	11	13	12	12
10	18	14	3.3	19	15	18	14	15	15	11	12	13
11	16	15	2.6	16	13	14	18	13	15	12	13	13
12	14	16	17	16	16	13	5.0	12	16	14	16	13
13	13	17	18	15	13	14	16	16	13	14	14	13
14	16	17	19	15	12	14	16	13	12	14	15	13
15	15	16	17	16	12	12	17	13	12	11	15	13
16	15	16	17	19	14	15	17	12	12	0	12	12
17	15	18	18	19	12	14	16	12	11	14	12	12
18	16	16	18	17	11	16	15	12	13	15	13	17
19	14	17	18	19	10	14	16	12	11	13	12	14
20	14	17	17	18	9.7	14	15	12	16	12	11	13
21	15	16	17	17	8.8	16	15	13	14	12	11	16
22	15	17	17	15	8.8	15	14	12	17	12	12	13
23	13	17	17	14	8.4	16	13	12	15	11	13	14
24	16	18	17	13	9.9	14	12	16	13	12	12	14
25	15	11	16	16	17	14	12	11	12	12	12	15
26	14	18	15	17	15	15	14	10	14	12	16	16
27	16	19	15	16	21	14	14	11	15	12	14	16
28	14	17	15	15	15	11	14	16	14	13	18	16
29	14	18	16	13	12	15	13	----------	16	15	17	18
30	14	18	14	12	11	15	13	----------	16	13	14	17
31	18	18	----------	12	----------	15	12	----------	20	----------	14	----------
Total	485	500	478.9	487	389.6	420	442.0	359	440	380	424	408
Mean												
Mgd	15.6	16.1	16.0	15.7	13.0	13.5	14.3	12.8	14.2	12.7	13.7	13.6
Cfs	24.1	24.9	24.8	24.3	20.1	20.9	22.1	19.8	22.0	19.6	21.2	21.0
Ac-ft	1,490	1,530	1,470	1,490	1,200	1,290	1,360	1,100	1,350	1,170	1,300	1,250
Max	19	19	19	19	21	18	18	16	20	16	18	18
Min	13	11	2.6	12	8.4	11	5.0	10	11	0	11	11

Calendar Year 1966: Max 21 Min 2.6 Mean (mgd) 14.0 Mean (cfs) 21.7 Ac-ft 15,650
Fiscal Year 1966-67: Max 21 Min 0 Mean (mgd) 14.3 Mean (cfs) 22.1 Ac-ft 16,000

16-7420. Kukui Stream near Waimanu

Location.--Lat 20°09'14", long 155°40'15", on left bank 300 ft upstream from Waimanu trail crossing, 0.4 mile east of head of Awini ditch, and 2.2 miles west of Waimanu.

Drainage area.--0.21 sq mi.

Records available.--February 1939 to July 1952, September 1959 to October 1966 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 1,940 ft (by barometer).

Average discharge.--19 years (1939-52, 1960-66), 1.24 mgd (1.92 cfs).

Extremes.--Maximum discharge during period, 47 mgd (73 cfs) Aug. 24 (gage height, 2.77 ft), from rating curve extended above 9.0 mgd by test on model of station site; minimum, 0.36 mgd (0.56 cfs) Oct. 8.
1939-52, 1959-66: Maximum discharge, 195 mgd (302 cfs) Feb. 25, 1962 (gage height, 4.45 ft), from rating curve extended above 2.4 mgd by test on model of station site; minimum, 0.08 mgd (0.12 cfs) Sept. 19-23, 1965.

Remarks.--Records good except those above 20 mgd, which are poor. No diversion above station.

Discharge, in million gallons a day, July to October 1966

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.3	0.66	1.8	0.76								
2	2.3	.58	.92	.58								
3	1.5	.62	.76	.50								
4	4.7	2.1	2.1	.50								
5	1.5	.62	.98	.46								
6	3.5	1.2	1.2	.46								
7	2.6	2.9	.71	.42								
8	.98	1.9	.62	.39								
9	.81	.98	4.4	1.9								
10	.76	3.1	3.6	2.2								
11	.71	2.2	1.8	.98								
12	.54	1.5	3.2	.50								
13	.76	2.4	.98	2.6								
14	.58	1.7	6.3	1.2								
15	.62	1.5	4.1	.71								
16	1.8	13	1.2	.50								
17	1.6	11	1.1	.46								
18	1.8	2.1	1.6	.76								
19	1.0	1.5	3.5	.71								
20	.62	1.9	3.7	-								
21	1.1	1.0	1.2	-								
22	.71	.92	.92	-								
23	.62	.76	.76	-								
24	2.9	5.1	.71	-								
25	.76	3.9	.66	-								
26	.71	3.0	.62	-								
27	1.6	5.0	.58	-								
28	.66	1.4	.54	-								
29	.54	2.3	1.4	-				----------				
30	.58	1.0	3.4	-				----------				
31	.76	.87	----------	-	----------			----------		----------		----------
Total	42.92	78.71	55.36	-								
Mean												
Mgd	1.38	2.54	1.85	-								
Cfs	2.14	3.93	2.86	-								
Ac-ft	132	242	170	-								
Max	4.7	13	6.3	-								
Min	0.54	0.58	0.54	-								

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -

Peak discharge (base, 50 mgd).--No peak above base.

16-7430. Awini ditch at East Honokane Iki Gulch, near Niulii

Location.--lat 20°09'55", long 155°43'10", at upper end of flume across East Honokane Iki Gulch and 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1938, September 1938 to June 1949, July 1950 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--37 years (1928-38, 1939-49, 1950-67), 11.6 mgd (17.9 cfs).

Extremes.--1927-67: Maximum daily discharge, 35 mgd (54 cfs) Jan. 29, 1966, Jan. 4, 1967; no flow at times.

Remarks.--Records good. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	20	10	8.1	6.3	11	5.1	25	5.4	20	22	18	6.2
2	21	9.9	7.4	5.4	6.8	4.5	19	5.4	21	21	14	4.3
3	22	9.9	7.0	5.0	6.2	4.0	22	5.3	11	19	8.8	3.1
4	27	21	8.8	4.6	6.5	3.6	35	7.0	9.5	8.3	6.8	2.6
5	20	13	11	4.3	15	3.3	31	6.1	11	19	5.7	2.3
6	19	18	14	18	11	3.1	17	5.3	7.7	20	5.1	2.0
7	24	24	8.0	19	7.3	6.4	11	4.3	5.4	12	5.9	2.0
8	13	24	6.3	13	5.7	22	15	4.0	4.3	23	5.3	1.9
9	12	16	15	9.1	14	17	17	14	7.2	17	4.4	1.8
10	13	19	27	17	10	32	10	16	15	14	3.9	1.6
11	11	23	22	9.4	10	24	16	9.8	11	18	4.7	1.4
12	8.8	18	25	6.7	14	22	9.0	7.4	9.1	13	13	1.4
13	9.4	23	15	6.6	7.3	17	6.0	14	5.5	9.9	8.8	1.2
14	10	20	32	10	5.4	22	5.2	8.1	13	8.7	5.4	1.1
15	11	18	24	17	4.9	16	4.5	5.8	6.4	7.8	4.0	1.6
16	20	27	16	18	9.5	14	11	5.4	4.8	7.0	3.3	1.4
17	24	34	15	25	7.2	13	13	5.0	7.4	13	3.2	1.4
18	26	21	22	19	5.0	15	5.9	4.2	15	4.7	3.8	7.8
19	17	21	32	32	4.2	31	4.1	3.9	8.5	4.3	2.7	3.5
20	11	22	19	24	3.7	29	4.0	5.4	12	3.9	2.9	2.0
21	20	18	13	16	12	28	3.5	5.8	8.7	3.5	2.2	7.8
22	16	16	11	12	15	16	3.3	4.2	18	3.3	2.0	4.1
23	12	12	9.5	9.1	7.5	13	2.8	6.9	12	3.1	4.5	2.4
24	22	16	8.7	7.8	20	11	4.4	11	7.6	3.0	4.3	4.0
25	16	26	7.8	21	21	8.6	7.5	6.2	10	3.8	2.8	4.7
26	12	19	7.3	20	17	14	7.3	4.2	27	5.3	21	15
27	17	28	7.9	18	21	24	6.9	7.3	32	5.2	19	15
28	12	14	9.5	12	11	13	6.7	32	21	5.6	11	17
29	9.1	14	10	8.5	7.6	9.6	6.4	----------	20	27	9.4	13
30	8.5	11	7.4	6.8	6.2	17	5.7	----------	13	18	6.7	7.4
31	13	8.6	----------	9.4	----------	12	5.4	----------	23	---------	7.0	----------
Total	496.8	574.4	426.7	410.0	303.0	470.2	340.6	219.4	397.1	343.4	219.6	141.0
Mean												
Mgd	16.0	18.5	14.2	13.2	10.1	15.2	11.0	7.84	12.8	11.4	7.08	4.70
Cfs	24.8	28.6	22.0	20.4	15.6	23.5	17.0	12.1	19.8	17.6	11.0	7.27
Ac-ft	1,520	1,760	1,310	1,260	930	1,440	1,050	673	1,220	1,050	674	433
Max	27	34	32	32	21	32	35	32	32	27	21	17
Min	8.5	8.6	6.3	4.3	3.7	3.1	2.8	3.9	4.3	3.0	2.0	1.1

Calendar Year 1966: Max 35 Min 0 Mean (mgd) 13.9 Mean (cfs) 21.5 Ac-ft 15,630
Fiscal Year 1966-67: Max 35 Min 1.1 Mean (mgd) 11.9 Mean (cfs) 18.4 Ac-ft 13,330

16-7440. East Honokane Iki intake to Awini ditch near Niulii

Location.--lat 20°09'55", long 155°43'15", on intake tunnel delivering water from East Honokane Iki Gulch to Awini ditch, on west side of gulch, and 4.5 miles southeast of Niulii.

Records available.--October 1927 to May 1928, July 1928 to December 1936, July 1937 to June 1938, July 1939 to July 1940, September 1940 to June 1949, July 1951 to June 1967. Prior to July 1960, published as "at East Honokane Iki Gulch, near Niulii."

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--34 years (1928-36, 1937-38, 1939-40, 1941-49, 1951-67), 1.17 mgd (1.81 cfs).

Extremes.--1927-49, 1951-67: Maximum daily discharge, 8.4 mgd (13.0 cfs) Aug. 6, 1957; no flow at times.

Remarks.--Records good. Records are of diversion from East Honokane Iki Gulch to Awini ditch (see sta. no. 7430) for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	0.35	0.48	0.20	0.71	0.23	4.6	0.20	0.97	3.6	1.4	0.38
2	1.1	.29	.41	.17	.32	.20	1.6	.17	.97	3.4	.75	.20
3	1.2	.29	.38	.17	.35	.17	4.2	.17	.79	2.8	.35	.10
4	1.2	2.8	.38	.14	.78	.14	4.9	.26	.71	1.5	.26	.08
5	1.6	.60	.68	.12	2.2	.14	1.0	.12	.68	2.8	.20	.06
6	4.9	2.1	1.4	4.1	.75	.12	.64	.10	.41	2.7	.17	.04
7	5.2	4.1	.41	1.9	.35	.64	.56	.08	.32	1.8	.23	.03
8	1.4	4.0	.29	.64	.26	2.5	.68	.06	.26	3.0	.23	.03
9	1.3	1.0	2.7	.51	.90	1.6	.75	3.1	1.8	2.2	.17	.03
10	1.4	4.0	4.5	1.2	.38	3.6	.56	.87	1.9	2.1	.14	.03
11	.87	3.0	3.2	.38	.90	2.5	.92	.41	1.4	.83	.17	.02
12	.60	1.3	4.5	.23	.64	2.2	.41	.62	.64	.97	1.5	.02
13	.71	3.4	1.2	.17	.26	1.6	.97	.75	.35	.97	1.1	.01
14	.79	2.3	7.5	.63	.17	2.2	1.0	.23	1.6	.75	.32	0
15	.97	1.6	4.0	2.6	.14	1.4	2.4	.12	.48	.60	.20	0
16	3.6	4.9	1.1	2.4	.26	1.0	2.2	.12	.29	.52	.14	0
17	5.3	5.5	1.0	4.7	.20	.87	3.1	.10	1.0	.92	.12	0
18	5.6	2.4	3.5	1.9	.12	1.9	2.1	.06	1.8	.87	.08	0
19	2.5	2.9	7.1	6.9	.08	3.2	1.6	.04	.64	.60	.10	0
20	.92	3.6	2.1	3.3	.06	2.8	1.4	.10	.71	.44	.06	0
21	3.8	1.4	.92	1.1	1.5	2.6	1.1	.20	.35	.38	.06	0
22	1.4	1.2	.64	.68	1.1	1.7	.87	.08	2.2	.32	.04	0
23	.71	.64	.48	.48	.32	1.2	.60	.23	.71	.35	.06	0
24	3.4	1.9	.41	.41	2.4	.83	.44	.52	.35	.29	.10	0
25	1.3	.44	.35	3.4	1.8	.64	.35	.14	.60	.23	.06	.03
26	.71	2.0	.32	2.3	1.5	2.2	.29	.06	5.5	.20	4.7	1.6
27	1.1	5.7	.32	1.8	1.8	4.2	.26	.72	4.8	.20	2.0	1.4
28	.56	2.0	.38	.64	.60	1.0	.26	1.5	2.3	.80	.60	2.3
29	.38	1.4	.32	.41	.35	.64	.23	----------	1.0	2.7	.38	.97
30	.32	.97	.26	.32	.26	3.2	.20	----------	2.0	1.5	.78	.35
31	.56	.64	----------	.60	----------	1.0	.17	----------	4.1	----------	.48	----------
Total	56.50	68.72	51.23	44.50	21.46	48.22	40.36	11.13	41.63	40.34	16.95	7.68
Mean												
Mgd	1.82	2.22	1.71	1.44	0.715	1.56	1.30	0.398	1.34	1.34	0.547	0.256
Cfs	2.82	3.43	2.65	2.23	1.11	2.41	2.01	0.616	2.07	2.07	0.846	0.396
Ac-ft	173	211	157	137	66	148	124	34	128	124	52	24
Max	5.6	5.7	7.5	6.9	2.4	4.2	4.9	3.1	5.5	3.6	4.7	2.3
Min	0.32	0.29	0.26	0.12	0.06	0.12	0.17	0.04	0.26	0.20	0.04	0

Calendar Year 1966: Max 7.5 Min 0.01 Mean (mgd) 1.42 Mean (cfs) 2.20 Ac-ft 1590
Fiscal Year 1966-67: Max 7.5 Min 0 Mean (mgd) 1.23 Mean (cfs) 1.90 Ac-ft 1380

16-7455. Awini ditch at Awini weir, near Kohala

Location.--Lat 20°08'20", long 155°43'55", on right bank at Awini weir, 6 miles south of Niulii, and 8 miles southeast of Kohala.

Records available.--July 1907 to June 1917 (published as Kohala ditch at Awini weir, near Kohala), May 1963 to June 1967.

Gage.--Graphic water-stage recorder and sharp-crested weir. Altitude of gage is 1,840 ft (from topographic map). July 1, 1907, to June 30, 1917, staff gage at same site at different datum and May 16, 1963, to Jan. 12, 1965, digital water-stage recorder at same site and datum.

Average discharge.--14 years,.12.7 mgd (19.6 cfs).

Extremes.--1907-17, 1963-67: Maximum daily discharge, 36 mgd (56 cfs) May 20, 24, 1964; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts at altitude 2,000 ft from all streams between the Waikaloa and the Honokane and empties into Kohala ditch (see sta. no. 7509) for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15	12	8.3	6.2	14	5.3	26	6.2	24	28	21	7.0
2	24	11	7.8	5.5	7.0	5.1	20	6.5	25	28	17	4.5
3	26	9.8	7.8	4.6	6.0	4.8	26	5.5	14	25	11	3.5
4	28	24	9.8	4.2	7.0	4.4	34	8.3	12	12	8.0	3.0
5	25	16	12	3.7	18	3.5	32	6.5	14	22	6.5	2.5
6	28	22	16	20	14	3.0	21	5.8	9.8	26	6.0	1.5
7	30	26	8.6	22	9.0	5.2	15	4.2	6.8	18	7.0	1.5
8	18	28	6.5	15	6.0	24	18	3.7	4.8	28	6.0	1.3
9	16	19	14	10	17	18	21	21	6.4	23	4.5	1.4
10	17	21	30	19	13	27	13	20	20	20	4.0	1.8
11	14	27	25	10	13	23	19	12	16	23	5.0	1.5
12	11	22	28	6.8	16	21	12	8.6	12	17	16	1.1
13	11	28	18	6.5	9.0	17	7.2	18	6.8	14	11	.60
14	14	25	32	11	6.0	22	5.3	9.5	16	12	6.2	.30
15	14	23	28	20	5.0	19	4.7	6.2	8.3	10	4.2	.61
16	24	27	19	22	11	17	14	6.2	5.1	8.9	3.5	.50
17	27	34	19	27	8.0	15	17	5.8	7.2	16	3.0	.61
18	31	27	26	23	5.0	19	10	4.8	19	6.5	3.8	7.5
19	23	26	32	32	5.0	32	6.5	4.0	11	6.0	3.0	3.0
20	13	26	25	27	4.5	30	6.2	5.1	16	5.1	3.0	1.3
21	24	23	17	19	15	31	5.3	6.8	10	4.6	2.5	6.8
22	21	20	13	15	18	21	4.8	4.6	22	4.2	2.2	3.3
23	15	15	11	11	9.0	18	3.7	6.0	17	4.2	5.0	1.5
24	24	17	11	9.0	24	14	5.3	14	9.8	4.0	5.0	2.4
25	21	29	9.2	25	25	12	8.9	7.2	13	4.6	3.0	4.0
26	14	22	7.8	24	20	19	8.6	4.6	30	6.0	24	16
27	20	31	7.8	22	25	28	8.0	4.8	33	6.0	22	18
28	14	19	9.8	15	14	18	7.8	32	26	7.2	14	19
29	10	17	11	10	9.0	13	7.5	----------	18	30	12	16
30	8.9	13	7.8	7.0	7.0	21	6.8	----------	17	21	8.0	8.0
31	16	9.2	----------	11	----------	16	6.2	----------	28	----------	8.5	----------
Total	596.9	669.0	478.2	463.5	359.5	526.3	400.8	247.9	478.0	440.3	255.9	140.02
Mean												
Mgd	19.2	21.6	15.9	15.0	12.0	17.0	12.9	8.85	15.4	14.7	8.25	4.67
Cfs	29.7	33.4	24.6	23.2	18.6	26.3	20.0	13.7	23.8	22.7	12.8	7.23
Ac-ft	1830	2050	1470	1420	1100	1620	1230	760	1470	1350	785	430
Max	31	34	32	32	25	32	34	32	33	30	24	19
Min	8.9	9.2	6.5	3.7	4.5	3.0	3.7	3.7	4.8	4.0	2.2	0.30

Calendar Year 1966: Max 34 Min 0.25 Mean (mgd) 15.8 Mean (cfs) 24.4 Ac-ft 17,710
Fiscal Year 1966-67: Max 34 Min 0.30 Mean (mgd) 13.9 Mean (cfs) 21.5 Ac-ft 15,520

Note.--No gage-height record Oct. 19 to Nov. 30, Apr. 29 to June 13.

16-7475. East Branch Honokane Nui Stream near Niulii

Location.--Lat 20°08'18", long 155°44'00", on left bank 500 ft upstream from Awini falls, 1.2 miles upstream from confluence with West Branch, and 6.0 miles south of Niulii.

Drainage area.--4.96 sq mi.

Records available.--May 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 1,080 ft (from topographic map). Prior to Dec. 13, 1964, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, not determined; maximum daily, 100 mgd (155 cfs) Jan. 11; minimum, not determined; minimum daily, 10 mgd (16 cfs) for several days.
1963-67: Maximum discharge, not determined; maximum daily, that of Jan. 11, 1967; minimum, not determined; minimum daily, 9.4 mgd (15 cfs) Sept. 14-23, 1965.

Remarks.--Records poor. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	35	12	11	11	14	11	17	12	30	20	20	12
2	30	12	11	11	12	11	14	12	30	20	15	12
3	35	12	10	11	12	10	20	12	15	18	13	11
4	25	20	11	11	12	10	70	13	13	15	13	11
5	25	12	12	11	20	10	30	12	12	17	13	11
6	20	20	14	15	12	11	20	12	12	20	13	11
7	25	20	12	30	10	10	15	11	12	16	13	11
8	15	35	11	15	10	15	15	11	12	20	13	11
9	12	15	13	10	13	14	25	20	12	17	13	11
10	15	15	30	13	10	40	18	15	15	16	13	11
11	12	35	15	11	10	30	100	14	17	17	12	11
12	11	15	30	11	12	20	50	13	15	15	20	11
13	11	25	12	11	11	18	19	15	13	14	18	11
14	11	20	35	11	10	25	15	14	12	13	15	11
15	14	15	45	12	11	16	16	13	13	13	14	11
16	14	30	15	16	13	14	17	13	12	13	14	11
17	25	60	15	35	11	13	20	13	11	16	14	11
18	45	25	15	17	10	20	17	12	15	15	14	15
19	20	20	50	50	11	40	16	12	13	14	13	12
20	14	25	25	35	10	25	15	12	12	14	13	12
21	13	20	15	16	11	25	14	12	12	14	12	15
22	15	15	15	13	14	20	14	12	20	14	12	13
23	12	12	13	11	13	16	14	12	20	14	12	12
24	15	30	12	11	30	14	14	14	14	14	13	13
25	20	20	11	17	25	12	14	13	13	14	13	12
26	14	15	11	25	20	18	14	12	25	14	25	25
27	15	20	11	18	25	18	13	15	35	14	25	30
28	13	15	12	13	15	16	13	50	20	13	15	30
29	12	14	13	12	11	14	13	----------	15	25	15	25
30	12	13	11	11	10	13	12	----------	20	20	14	20
31	13	12	----------	12	----------	13	12	----------	25	---------	14	----------
Total	568	629	516	506	408	542	676	401	515	479	456	423
Mean												
Mgd	18.3	20.3	17.2	16.3	13.6	17.5	21.8	14.3	16.6	16.0	14.7	14.1
Cfs	28.3	31.4	26.6	25.2	21.0	27.1	33.7	22.1	25.7	24.8	22.7	21.8
Ac-ft	1,740	1,930	1,580	1,550	1,250	1,660	2,070	1,230	1,580	1,470	1,400	1,300
Max	45	60	50	50	30	40	100	50	35	25	25	30
Min	11	12	10	10	10	10	12	11	11	13	12	11

Calendar Year 1966: Max 60 Min 10 Mean (mgd) 16.1 Mean (cfs) 24.9 Ac-ft 18010
Fiscal Year 1966-67: Max 100 Min 10 Mean (mgd) 16.8 Mean (cfs) 26.0 Ac-ft 18780

Note.--No gage-height record for entire year.

16-7509. Kohala ditch at Honokane, near Niulii

Location.--Lat 20°09'50", long 155°43'50", on land of Honokane, on Honokane trail at tunnel adit, 28 ft from right side of tunnel, and 4.4 miles south of Niulii.

Records available.--May 1963 to June 1967.

Gage.--Graphic water-stage recorder. Altitude of gage is 960 ft (from topographic map). Prior to Apr. 20, 1965, digital water-stage recorder at same site and datum.

Extremes.--1963-67: Maximum daily discharge, 62 mgd (96 cfs) May 24, 1964, Jan. 4, 1967; no flow at times each year.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream. Water is used for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	39	21	20	18	24	17	37	17	12	38	26	20
2	41	22	19	17	18	16	27	16	17	38	25	17
3	44	22	18	17	19	15	34	16	23	34	22	15
4	41	37	18	16	20	14	62	18	22	20	19	14
5	40	26	22	16	33	14	38	17	23	29	18	14
6	37	34	27	31	25	15	25	16	20	30	17	14
7	42	36	21	39	19	15	19	15	16	22	18	14
8	30	44	19	28	16	32	21	15	16	29	17	14
9	26	30	24	20	25	26	30	28	18	25	17	13
10	29	32	43	29	22	47	23	22	28	25	17	12
11	25	45	34	22	21	44	30	18	29	28	17	12
12	21	32	42	19	26	35	13	16	25	19	26	13
13	22	40	28	18	18	34	18	21	17	17	24	13
14	24	37	46	21	16	38	16	19	24	16	18	13
15	26	33	44	29	16	31	20	18	19	16	16	13
16	34	43	30	33	20	29	21	16	17	15	16	13
17	40	58	30	44	19	26	10	15	18	18	16	12
18	50	39	39	34	16	33	0	14	31	17	17	17
19	35	37	52	53	14	47	10	14	21	17	14	15
20	27	39	40	45	14	38	20	15	25	16	15	14
21	33	35	29	31	20	38	17	16	22	16	14	19
22	32	30	24	26	27	20	15	14	34	16	13	16
23	25	26	22	21	18	23	14	16	30	16	16	14
24	34	39	21	20	32	20	14	23	21	15	17	15
25	34	38	19	35	38	19	16	16	22	16	15	16
26	26	33	20	39	30	24	16	14	35	17	33	30
27	32	40	20	34	38	24	16	18	46	17	34	34
28	26	30	23	25	25	24	16	38	31	17	21	34
29	22	25	24	20	19	21	16	----------	24	32	19	30
30	21	24	20	18	18	26	16	----------	24	27	18	20
31	25	22	----------	20	----------	23	16	----------	39	---------	20	---------
Total	983	1049	838	838	666	828	646	501	749	658	595	510
Mean												
Mgd	31.7	33.8	27.9	27.0	22.2	26.7	20.8	17.9	24.2	21.9	19.2	17.0
Cfs	49.0	52.3	43.2	41.8	34.3	41.3	32.2	27.7	37.4	33.9	29.7	26.3
Ac-ft	3020	3220	2570	2570	2040	2540	1980	1540	2300	2020	1830	1570
Max	50	58	52	53	38	47	62	38	46	38	34	34
Min	21	21	18	16	14	14	0	14	12	15	13	12

Calendar Year 1966: Max 58 Min 0 Mean (mgd) 26.3 Mean (cfs) 40.7 Ac-ft 29,450
Fiscal Year 1966-67: Max 62 Min 0 Mean (mgd) 24.3 Mean (cfs) 37.6 Ac-ft 27,190

Note.--No gage-height record Oct. 30 to Nov. 29, Feb. 10 to Mar. 13.

16-7510. Kohala ditch at Pololu, near Niulii

Location.--Lat 20°10'19", long 155°44'20", on right bank of open section of ditch, on land of Pololu, 0.5 mile upstream from Pololu Stream, and 3.7 miles south of Niulii.

Records available.--Auguet 1927 to June 1938, September 1938 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 960 ft (from topographic map).

Average discharge.--38 years (1928-38, 1939-67), 26.7 mgd (41.3 cfs).

Extremes.--1927-67: Maximum daily discharge, 66 mgd (102 cfs) May 24, Oct. 19, 1964; no flow at times.

Remarks.--Records good. Kohala ditch receives flow of Awini ditch at Honokane Gulch and diverts water at altitude of about 1,000 ft from East and West Branches Honokane Nui Stream and all streams west. Water is used for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	40	23	22	20	26	18	36	18	14	42	28	22
2	42	24	21	19	20	17	28	18	19	42	27	19
3	42	24	19	19	21	16	34	17	25	36	23	17
4	41	39	20	18	22	16	48	19	24	21	21	15
5	41	28	24	18	35	16	42	18	25	33	19	15
6	39	36	30	33	27	16	28	18	22	33	18	16
7	44	38	23	41	21	17	21	16	18	24	19	16
8	32	46	20	30	18	34	22	17	18	34	18	15
9	28	32	25	22	27	28	32	30	20	27	18	14
10	31	33	45	31	24	49	24	24	30	28	18	14
11	27	47	37	24	23	46	32	20	31	32	19	14
12	23	34	45	21	28	37	15	18	27	21	28	14
13	24	42	30	20	20	36	20	23	19	19	26	14
14	26	40	46	23	18	40	18	21	25	18	20	14
15	28	35	46	31	18	33	22	20	20	17	18	15
16	36	42	32	35	22	31	22	18	18	16	17	15
17	41	58	32	47	21	28	11	17	19	19	17	14
18	46	42	40	36	18	35	.50	16	33	19	18	19
19	38	40	52	52	16	49	12	16	22	18	16	16
20	29	41	41	47	16	40	22	17	26	18	16	16
21	36	38	30	33	22	40	19	18	23	17	15	21
22	34	33	26	27	29	22	17	16	35	17	15	18
23	26	28	24	23	20	25	16	18	31	17	18	16
24	36	36	22	21	34	22	5.8	25	22	17	19	17
25	36	41	21	37	40	21	0	18	23	17	17	18
26	28	35	21	41	32	26	0	16	39	18	35	32
27	34	42	22	36	40	26	10	20	50	18	37	37
28	28	32	24	27	27	26	18	40	33	19	23	37
29	24	27	26	22	21	22	18	----------	26	35	21	32
30	23	26	22	20	20	26	17	----------	25	29	20	22
31	27	24	----------	22	----------	24	18	----------	42	----------	22	----------
Total	1030	1106	888	896	726	882	628.30	552	804	721	646	564
Mean												
Mgd	33.2	35.7	29.6	28.9	24.2	28.4	20.3	19.7	25.9	24.0	20.8	18.8
Cfs	51.4	55.2	45.8	44.7	37.4	43.9	31.4	30.5	40.1	37.1	32.2	29.1
Ac-ft	3160	3390	2720	2750	2230	2710	1930	1690	2470	2210	1980	1730
Max	46	58	52	52	40	49	48	40	50	42	37	37
Min	23	23	19	18	16	16	0	16	14	16	15	14

Calendar Year 1966:	Max	58	Min	0.50	Mean (mgd)	27.8	Mean (cfs)	43.0	Ac-ft	31150
Fiscal Year 1966-67:	Max	58	Min	0	Mean (mgd)	25.9	Mean (cfs)	40.1	Ac-ft	28980

16-7560. Kohakohau Stream near Kamuela

Location (revised).--Lat 20°02'38", long 155°41'10", on left bank 0.6 mile upatream from Oolamakapehu Gulch and 1.7 miles northwest of Kamuela.

Drainage area.--2.51 sq mi (revised).

Records available.--March 1956 to June 1967.

Gage.--Digital water-stage recorder. Datum of gage is 3,273 ft above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Oct. 28, 1966, graphic water-stage recorder and Oct. 28, 1966, to Jan. 10, 1967, digital water-stage recorder at site 0.5 mile upstream at different datums.

Average discharge.--11 years, 5.88 mgd (9.10 cfs).

Extremes.--Maximum discharge during year, 1,420 mgd (2,200 cfs) Jan. 11 (gage height, 6.20 ft, from floodmarks), from rating curve extended above 23 mgd on basis of computation of peak flow over dam; minimum, 0.02 mgd (0.03 cfs) May 11.
1956-67: Maximum discharge, 2,510 mgd (3,880 cfs) Aug. 7, 1958 (gage height, 10.76 ft, site and datum then in use), from rating curve extended above 45 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) Oct. 6, 7, 1965.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Parker Ranch pipeline diverts above station at altitude 4,250 ft.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11	1.4	1.4	0.45	1.0	0.60	10	0.20	15	36	2.9	0.70
2	8.4	.96	1.2	.45	.80	.50	5.0	.10	25	40	1.6	.60
3	17	1.4	1.1	.40	.75	.40	20	.10	4.0	20	1.0	.50
4	19	9.5	1.4	.36	.70	.40	150	.05	1.0	3.1	.85	.40
5	11	3.1	2.1	.32	1.8	.36	50	.05	2.0	13	.76	.35
6	6.0	10	3.6	5.1	1.3	.10	10	.05	1.0	13	.59	.30
7	21	10	1.6	5.7	.96	.10	4.0	.05	.80	4.5	.34	.22
8	2.7	20	1.2	2.2	.80	.40	4.0	.05	.50	2.1	.19	.19
9	2.7	3.1	6.7	1.3	.88	.40	20	.10	.20	1.5	.10	.14
10	4.2	11	12	1.0	.80	5.0	4.0	1.0	1.0	4.5	.06	.14
11	3.3	12	4.7	.88	.80	20	400	3.0	13	8.2	.03	.12
12	1.7	4.0	12	.80	.88	3.0	50	2.0	5.1	1.5	.34	.10
13	1.3	14	2.7	.60	.75	7.0	6.0	3.0	1.3	1.1	1.4	.08
14	1.3	7.8	30	.55	.70	10	4.0	1.5	.96	.94	.58	.06
15	1.8	5.5	19	.96	.65	3.0	2.5	1.0	.82	.82	.54	.06
16	3.1	28	3.6	2.8	.80	2.0	2.0	1.0	.71	.75	.40	.10
17	25	43	3.1	16	.65	1.5	4.0	.50	.67	37	.34	.06
18	20	5.7	6.2	5.2	.60	25	8.0	.20	1.6	1.9	.28	.37
19	4.5	3.6	21	31	.55	150	9.0	.10	1.5	1.1	.25	.28
20	2.4	8.9	6.7	13	.50	75	6.0	1.0	5.2	.88	.22	.16
21	4.9	3.8	2.1	2.1	.50	60	4.0	2.0	6.8	.77	.14	.62
22	3.3	2.4	1.4	1.3	.45	10	2.0	1.0	9.7	.69	.12	.34
23	1.7	1.6	1.2	.88	.40	4.0	1.5	1.0	5.0	.63	.14	.19
24	33	158	1.0	.80	4.7	2.0	1.2	2.0	1.4	.53	.12	.16
25	5.5	27	.96	8.9	4.3	1.5	1.0	1.0	1.1	.40	.10	.16
26	2.8	6.7	.80	6.4	1.8	4.0	.80	.50	18	.31	6.0	1.7
27	5.2	12	.75	3.3	7.8	40	.70	.50	61	.90	15	4.6
28	2.1	6.4	.70	1.7	1.7	7.0	.60	100	16	1.2	2.0	13
29	1.4	5.2	.65	1.3	.96	3.0	.50	----------	2.5	1.6	1.5	4.3
30	1.4	3.1	.55	1.0	.75	2.0	.40	----------	7.0	1.6	1.0	1.9
31	2.2	2.0	----------	.96	----------	1.5	.30	----------	33	----------	1.0	----------
Total	230.9	431.16	151.41	117.71	40.03	439.76	781.50	123.05	242.86	200.52	39.89	31.90
Mean												
Mgd	7.45	13.9	5.05	3.80	1.33	14.2	25.2	4.39	7.83	6.68	1.29	1.06
Cfs	11.5	21.5	7.81	5.88	2.06	22.0	39.0	6.79	12.1	10.3	2.00	1.64
Ac-ft	709	1320	465	361	123	1350	2400	378	745	615	122	98
Max	33	158	30	31	7.8	150	400	100	61	40	15	13
Min	1.3	0.96	0.55	0.32	0.40	0.10	0.30	0.05	0.20	0.31	0.03	0.06

Calendar Year 1966: Max 158 Min 0.09 Mean (mgd) 5.43 Mean (cfs) 8.40 Ac-ft 6080
Fiscal Year 1966-67: Max 400 Min 0.03 Mean (mgd) 7.76 Mean (cfs) 12.0 Ac-ft 8690

Peak discharge (base, 200 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1730	5.05	352	545	1- 4	about 1000	-	about 210	about 320
8-24	1800	8.40	1,300	2,010					
12-19	about 0100	-	about 350	about 540	1-11	about 1800	6.20	1,420	2,200
					4-17	0415	4.11	218	337

Note.--No gage-height record Dec. 6 to Mar. 10.

16-7565. Keanuiomano Stream near Kamuela

Location.--Lat 20°01'48", long 155°42'05", on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 miles west of Kamuela.

Drainage area.--4.30 sq mi.

Records available.--November 1963 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,410 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,780 mgd (2,750 cfs) Jan. 11 (gage height, 8.26 ft), from rating curve extended above 110 mgd on basis of contracted-opening measurement of peak flow; no flow Feb. 3-9, May 10, 11.
1963-67: Maximum discharge, that of Jan. 11, 1967; no flow at times in 1965-67.

Remarks.--Records good. Two Parker Ranch pipeline diversions above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.9	0.80	0.74	0.16	0.50	0.39	7.6	0.07	9.3	36	2.3	0.59
2	11	.52	.57	.15	.44	.31	3.7	.01	18	34	1.7	.49
3	19	.54	.50	.13	.37	.25	15	0	2.7	20	.61	.36
4	14	8.3	.46	.10	.32	.20	138	0	.84	3.8	.37	.28
5	15	2.1	1.0	.09	.74	.15	35	0	1.3	8.3	.31	.21
6	3.7	9.5	2.5	2.6	.82	.02	8.7	0	.84	13	.09	.15
7	25	5.6	.78	5.4	.52	.05	2.4	0	.46	5.2	.02	.10
8	3.3	25	.37	1.8	.41	.28	2.0	0	.26	2.2	.01	.10
9	1.6	3.0	2.4	.64	.37	.25	16	0	.11	1.1	.01	.07
10	3.5	5.4	12	.54	.37	2.7	2.5	.61	.33	1.6	0	.05
11	3.7	15	4.2	.40	.33	13	508	2.0	5.2	9.9	0	.04
12	1.4	2.7	11	.40	.39	2.3	32	.88	5.3	1.4	.03	.03
13	.68	13	2.1	.28	.36	5.1	4.4	2.7	.74	.72	.62	.02
14	.44	8.1	23	.20	.32	8.1	2.2	.84	.36	.47	.14	.01
15	.50	4.8	24	.22	.25	2.0	1.6	.50	.16	.36	.04	.01
16	1.2	29	2.8	1.7	.29	1.2	1.3	.50	.04	.25	.02	.01
17	18	59	2.9	14	.29	.78	2.6	.34	.02	39	.01	.01
18	23	7.5	4.3	4.9	.23	10	6.4	.19	.78	2.1	.06	.01
19	4.4	3.2	28	32	.20	144	7.2	.11	.11	.68	.04	.05
20	1.4	6.2	9.4	18	.17	79	4.8	.48	4.9	.43	.02	.04
21	2.0	4.7	1.8	2.3	.16	68	2.4	1.7	6.5	.29	.01	.09
22	2.7	1.6	.87	1.0	.17	6.1	1.3	.62	8.3	.16	.03	.15
23	.70	.94	.70	.70	.13	2.3	.97	.74	4.7	.08	.05	.07
24	9.8	144	.61	.54	1.2	1.2	.82	1.8	.84	.03	.01	.03
25	7.7	33	.43	6.2	5.0	.87	.70	.48	.54	.02	.03	.02
26	1.9	7.7	.28	8.8	.94	2.3	.59	.03	9.7	.04	4.5	.35
27	4.6	10	.26	3.7	6.5	42	.52	.02	54	.35	15	3.4
28	1.7	6.5	.27	1.2	1.0	5.6	.46	88	14	1.4	2.0	8.1
29	.82	4.0	.28	.78	.47	1.8	.41	----------	2.8	.97	1.7	4.0
30	.62	2.8	.19	.52	.39	1.2	.31	----------	3.6	1.1	.72	1.5
31	1.4	1.1	----------	.46	----------	.94	.11	----------	27	----------	.94	----------
Total	282.86	425.60	138.71	109.91	23.65	402.39	809.99	102.62	183.73	184.95	31.39	20.34
Mean												
Mgd	9.12	13.7	4.62	3.55	0.788	13.0	26.1	3.66	5.93	6.16	1.01	0.678
Cfs	14.1	21.2	7.15	5.49	1.22	20.1	40.4	5.66	9.18	9.53	1.56	1.09
Ac-ft	868	1310	426	337	73	1230	2490	315	564	568	96	62
Max	98	144	28	32	6.5	144	508	88	54	39	15	8.1
Min	0.44	0.52	0.19	0.09	0.13	0.02	0.11	0	0.02	0.02	0	0.01

Calendar Year 1966: Max 144 Min 0 Mean (mgd) 5.30 Mean (cfs) 8.20 Ac-ft 5,940
Fiscal Year 1966-67: Max 508 Min 0 Mean (mgd) 7.44 Mean (cfs) 11.5 Ac-ft 8,340

Peak discharge (base, 350 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1730	5.11	413	639	1-11	1900	8.26	1,780	2,750
8-24	1700	6.34	826	1,280	4-17	0445	4.92	356	551
12-19	0200	5.16	428	662					

16-7570. Waikoloa Stream near Kamuela

Location.--lat 20°03'17", long 155°40'01", on left bank 0.2 mile south of Puu Iki and 2.2 miles north of Kamuela.

Drainage area.--0.78 sq mi.

Records available.--May 1947 to June 1967. See also Note below.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,570 ft (from topographic map).

Average discharge.--20 years, 4.64 mgd (7.18 cfs).

Extremes.--Maximum discharge during year, 790 mgd (1,220 cfs) Jan. 11 (gage height, 5.65 ft), from rating curve extended above 62 mgd as explained below; minimum, 0.98 mgd (1.5 cfs) June 13, 14.
1947-67: Maximum discharge, 1,250 mgd (1,930 cfs), revised, Oct. 23, 1957 (gage height, 6.55 ft), from rating curve extended above 62 mgd by logarithmic plotting; minimum, 0.48 mgd (0.74 cfs) Sept. 28 to Oct. 7, 1965.
Revisions.--The maximum discharge for the fiscal year 1966 has been revised to 343 mgd (531 cfs) Oct. 7, 1965 (gage height, 4.41 ft), superseding figure published in Water Resources Data for Hawaii and other Pacific Areas, Part I (1966).

Remarks.--Records good except those above 150 mgd, which are fair. No diversion above station.

Note.--Published records for high-water periods in fiscal years 1948-51, 1954-60, and water years 1960-61, 1963 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.7	2.4	2.5	1.7	1.9	1.4	4.6	1.4	5.7	12	5.8	1.6
2	5.5	2.0	2.3	1.6	1.6	1.2	3.0	1.4	8.8	12	3.0	1.6
3	9.6	2.6	2.2	1.6	1.6	1.2	13	1.3	2.6	6.9	1.9	1.2
4	13	7.8	3.9	1.6	1.6	1.2	45	1.3	2.1	3.1	1.8	1.2
5	6.9	3.6	4.8	1.6	2.5	1.2	16	1.3	2.9	3.9	1.7	1.2
6	7.8	6.7	5.3	12	2.5	1.1	5.0	1.3	2.2	7.8	1.6	1.1
7	12	11	2.8	6.7	2.4	1.1	3.0	1.2	1.6	4.3	1.6	1.2
8	3.0	13	2.3	2.9	1.9	1.4	3.5	1.2	1.4	4.5	1.6	1.2
9	3.1	4.3	11	2.1	2.0	2.8	10	1.6	1.6	2.9	1.6	1.1
10	4.5	10	9.6	2.3	1.8	14	3.0	1.6	2.2	6.9	1.5	1.1
11	3.8	6.9	5.8	2.2	2.0	7.3	73	1.7	4.0	5.0	1.7	1.1
12	2.4	5.5	8.0	2.1	2.0	4.6	11	2.1	3.0	2.4	2.4	1.0
13	2.3	12	3.5	1.7	1.6	3.8	3.5	2.5	1.7	1.8	3.4	1.0
14	2.4	8.2	15	1.7	1.5	5.5	2.8	1.8	1.5	1.7	1.9	1.0
15	2.6	7.1	12	2.6	1.6	2.8	2.5	1.7	1.3	1.6	1.6	1.0
16	3.3	20	5.0	3.8	2.0	2.3	2.5	1.7	1.2	1.6	1.4	1.1
17	15	29	4.0	7.3	1.6	1.9	3.5	1.5	1.6	6.7	1.4	1.2
18	11	6.2	5.2	4.2	1.5	13	4.3	1.3	2.1	2.2	1.3	2.6
19	4.6	4.8	14	15	1.5	35	4.2	1.4	4.2	1.7	1.3	1.6
20	2.7	8.8	5.7	5.7	1.5	27	3.4	2.7	4.2	1.6	1.3	1.6
21	4.8	4.8	3.0	2.5	1.4	16	2.8	3.0	5.3	1.6	1.2	2.7
22	3.8	3.4	2.5	2.0	1.4	4.0	2.3	1.9	5.3	1.5	1.2	1.6
23	2.4	2.7	2.4	1.7	1.4	2.5	1.9	2.5	2.5	1.5	1.4	1.2
24	17	37	2.3	1.8	4.2	1.9	1.7	2.4	1.6	1.4	1.3	1.3
25	4.5	17	2.0	6.7	3.4	1.8	1.6	1.6	1.7	1.4	1.3	1.3
26	3.9	6.9	2.0	4.6	2.6	3.3	1.6	1.3	13	1.3	13	3.3
27	7.3	11	1.9	3.5	4.0	15	1.6	6.2	23	1.7	7.4	3.3
28	2.9	8.0	1.9	2.2	2.0	3.1	1.6	30	8.2	2.0	4.5	9.1
29	2.2	7.8	1.8	1.8	1.6	2.1	1.5	----------	2.9	5.5	2.5	3.6
30	2.6	4.3	1.8	1.6	1.4	2.0	1.5	----------	8.3	4.8	1.8	2.4
31	3.9	2.9	----------	1.8	----------	1.8	1.4	----------	17	---------	1.7	---------
Total	177.5	277.7	146.5	110.6	60.0	183.3	236.3	80.9	144.7	113.3	77.1	55.5
Mean												
Mgd	5.73	8.96	4.88	3.57	2.00	5.91	7.62	2.89	4.67	3.78	2.49	1.85
Cfs	8.87	13.9	7.55	5.52	3.09	9.14	11.8	4.47	7.23	5.85	3.85	2.86
Ac-ft	545	852	450	339	184	563	725	248	444	348	237	170
Max	17	37	15	15	4.2	35	73	30	23	12	13	9.1
Min	2.2	2.0	1.8	1.6	1.4	1.1	1.4	1.2	1.2	1.3	1.2	1.0

Calendar Year 1966: Max 37 Min 0.88 Mean (mgd) 4.34 Mean (cfs) 6.71 Ac-ft 4,860
Fiscal Year 1966-67: Max 73 Min 1.0 Mean (mgd) 4.56 Mean (cfs) 7.06 Ac-ft 5,100

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1730	3.30	125	193	12-19	0030	3.37	136	210
8-24	1730	4.61	403	624	1-11	about 1900	5.65	790	1,220

16-7580. Waikoloa Stream at Marine Dam, near Kamuela

Location.--Lat 20°02'48", long 155°39'58", on right bank 160 ft upstream from Marine Dam, 0.4 mile east of Puu Ohu, and 1.6 miles north of Kamuela.

Drainage area.--1.18 sq mi.

Records available.--May 1947 to June 1967. See also Note below.

Gage.--Digital water-stage recorder and concrete control. Altitude of gage is 3,460 ft (from topographic map). Prior to Apr. 20, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--20 years, 5.70 mgd (8.82 cfs).

Extremes.--Maximum discharge during year, 906 mgd (1,400 cfs) Jan. 11 (gage height, 5.46 ft), from rating curve extended above 76 mgd as explained below; minimum, 0.96 mgd (1.5 cfs) June 13-15.
1947-67: Maximum discharge, 2,190 mgd (3,390 cfs), revised, Oct. 23, 1957 (gage height, 6.99 ft), from rating curve extended above 76 mgd on basis of computation of flow over dam at gage height 5.46 ft; minimum, 0.38 mgd (0.59 cfs) Oct. 3-6, 1965.
Revisions.--The maximum discharge for the fiscal year 1966 has been revised to 300 mgd (464 cfs) Oct. 7, 1965 (gage height, 4.14 ft), superseding figure published in Water Resources Data for Hawaii and other Pacific Areas, Part I (1966).

Remarks.--Records good. Diversion above station for livestock and domestic use.

Note.--Published records for high-water periods in fiscal years 1948-52, 1954-60, and water years 1960-63 have been found to be in error; revised records are on file in the district office and will be published in the next water-supply paper.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.8	2.8	2.8	1.7	2.0	1.4	6.5	1.4	7.7	19	7.5	1.8
2	7.7	2.3	2.3	1.7	1.7	1.4	4.1	1.4	12	17	3.3	1.7
3	12	2.9	2.2	1.7	1.6	1.3	9.0	1.4	3.3	9.8	2.1	1.4
4	15	9.9	4.2	1.6	1.6	1.2	58	1.4	2.5	4.3	1.7	1.3
5	10	4.5	5.0	1.6	2.8	1.2	27	1.4	3.4	5.2	1.7	1.2
6	7.7	9.0	5.6	10	2.5	1.2	8.6	1.4	2.5	10	1.5	1.2
7	17	13	2.7	8.2	2.4	1.3	4.0	1.3	1.8	6.0	1.5	1.2
8	4.3	16	2.4	2.9	1.8	1.8	4.7	1.3	1.6	5.8	1.4	1.2
9	3.9	5.7	7.7	2.2	2.0	2.9	13	1.7	1.7	3.7	1.4	1.1
10	5.8	13	12	2.7	1.8	18	3.9	1.6	2.5	7.1	1.3	1.1
11	5.8	11	6.2	2.2	1.8	9.1	86	2.2	4.5	9.1	1.5	1.1
12	2.8	6.9	7.9	2.1	2.0	4.5	14	2.3	3.9	3.0	2.4	1.1
13	2.6	16	3.9	1.7	1.7	5.1	4.6	3.0	1.8	2.3	4.0	1.0
14	2.7	11	22	1.7	1.5	7.6	3.3	2.0	1.6	2.0	2.0	1.0
15	2.9	8.8	14	2.6	1.6	3.3	2.8	1.7	1.4	1.8	1.5	1.1
16	3.5	27	5.4	3.9	2.0	2.7	2.8	1.8	1.4	1.7	1.4	1.1
17	19	36	4.7	8.6	1.6	2.2	4.7	1.5	1.4	11	1.3	1.1
18	15	8.7	5.0	5.0	1.5	5.6	5.0	1.4	2.6	2.7	1.3	2.8
19	5.8	5.9	18	16	1.5	53	4.9	1.4	5.4	1.8	1.3	1.6
20	3.4	10	6.8	8.2	1.5	38	3.8	2.7	6.0	1.7	1.2	1.4
21	6.3	6.3	3.4	2.9	1.4	28	3.1	3.6	7.7	1.6	1.1	3.0
22	4.9	4.0	2.8	2.1	1.4	6.0	2.6	1.8	7.9	1.5	1.1	1.7
23	2.9	3.1	2.6	1.8	1.4	3.2	2.2	2.5	3.9	1.5	1.2	1.2
24	20	58	2.3	1.8	4.0	2.4	2.0	2.7	2.3	1.4	1.1	1.3
25	6.1	24	2.2	7.1	3.7	2.1	1.8	1.7	2.1	1.4	1.1	1.2
26	5.0	9.3	2.1	4.9	2.6	3.6	1.7	1.4	16	1.4	14	3.4
27	9.6	14	2.0	4.3	4.0	19	1.7	4.2	32	1.8	9.8	4.0
28	3.7	10	1.8	2.2	2.2	4.8	1.7	43	12	2.3	5.0	11
29	2.5	9.9	1.8	1.8	1.7	2.7	1.6	----------	3.9	7.1	3.0	5.6
30	3.0	5.5	1.8	1.7	1.4	2.4	1.6	----------	9.8	6.2	2.0	3.2
31	5.0	3.3	----------	1.7	----------	2.3	1.5	----------	23	----------	2.0	----------
Total	224.7	367.8	163.6	118.6	60.7	239.3	292.2	95.2	189.6	151.2	82.7	62.1
Mean												
Mgd	7.25	11.9	5.45	3.83	2.02	7.72	9.43	3.40	6.12	5.04	2.67	2.07
Cfs	11.2	18.4	8.43	5.93	3.13	11.9	14.6	5.26	9.47	7.80	4.13	3.20
Ac-ft	690	1,130	502	364	186	734	897	292	582	464	254	191
Max	20	58	22	16	4.0	53	86	43	32	19	14	11
Min	2.5	2.3	1.8	1.6	1.4	1.2	1.5	1.3	1.4	1.4	1.1	1.0

Calendar Year 1966: Max 58 Min 0.96 Mean (mgd) 5.25 Mean (cfs) 8.12 Ac-ft 5,880
Fiscal Year 1966-67: Max 86 Min 1.0 Mean (mgd) 5.61 Mean (cfs) 8.68 Ac-ft 6,280

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-24	1730	3.35	124	192	1- 4	1200	3.21	102	158
8-24	1730	4.87	585	905	1-11	1915	5.46	906	1,400
12-19	0100	3.44	139	215					

16-7590. Hauani Gulch near Kamuela

Location.--Lat 20°02'28", long 155°39'05", on left bank 800 ft downstream from small tributary and 1.8 miles northeast of Kamuela.

Drainage area.--0.47 sq mi.

Records available.--March 1956 to June 1967. Prior to July 1960, published as Hauani Stream near Kamuela.

Gage.--Digital water-stage recorder and since Feb. 27, 1963, concrete control. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Board of Water Supply bench mark). Prior to Apr. 21, 1964, graphic water-stage recorder at same site and datum.

Average discharge.--11 years, 0.987 mgd (1.53 cfs).

Extremes.--Maximum discharge during year, 294 mgd (455 cfs) Aug. 24 (gage height, 3.98 ft), from rating curve extended above 24 mgd by logarithmic plotting; minimum, 0.03 mgd (0.05 cfs) Dec. 6.
1956-67: Maximum discharge, 325 mgd (503 cfs) Oct. 23, 1957 (gage height, 4.65 ft), from rating curve extended above 7.0 mgd by slope-conveyance study; no flow at times.

Remarks.--Records good. Diversion above station for livestock and domestic use.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.8	0.27	0.46	0.18	0.18	0.07	1.6	0.20	1.3	5.2	0.84	0.41
2	1.1	.22	.42	.16	.15	.07	.73	.20	1.8	4.2	.24	.24
3	1.7	.28	.38	.14	.13	.06	1.4	.18	.44	1.6	.21	.15
4	2.8	1.3	.79	.14	.13	.06	14	.18	.32	.68	.17	.12
5	1.4	.55	.63	.13	.40	.04	5.4	.16	.42	.67	.18	.11
6	2.3	1.1	.69	1.1	.23	.04	1.2	.17	.28	1.2	.15	.10
7	2.8	3.0	.36	.94	.22	.09	.61	.16	.19	.68	.15	.10
8	.78	3.8	.29	.31	.15	.17	.84	.16	.15	.66	.13	.09
9	.86	.71	2.6	1.3	.16	.24	2.1	.20	.30	.41	.12	.09
10	1.3	2.5	2.2	.79	.14	4.9	.60	.16	.43	.76	.11	.08
11	.82	1.5	1.6	.40	.15	2.7	24	.63	.50	.89	.13	.07
12	.49	1.2	2.2	.26	.18	1.2	2.7	.28	.38	.34	.20	.07
13	.43	3.0	.64	.20	.13	.99	.68	.24	.19	.27	.21	.06
14	.41	2.0	3.7	.18	.11	1.1	.50	.14	.16	.24	.16	.06
15	.36	1.5	2.6	.22	.12	.42	.41	.11	.13	.21	.12	.07
16	.45	5.0	.94	.31	.15	.30	.36	.11	.12	.20	.10	.09
17	5.3	8.5	.68	1.3	.12	.23	.35	.09	.13	3.7	.10	.07
18	2.6	1.3	.71	.71	.09	1.4	.42	.08	.22	.28	.09	.28
19	.82	.80	3.1	3.1	.11	15	.45	.08	1.4	.22	.09	.11
20	.53	2.0	1.0	1.2	.11	12	.40	.11	.79	.20	.09	.12
21	1.2	.79	.54	.34	.11	7.4	.32	.22	1.0	.18	.08	.44
22	.72	.48	.40	.24	.08	1.1	.28	.13	1.7	.16	.08	.13
23	.45	.37	.37	.20	.08	.57	.25	.16	.88	.16	.09	.08
24	3.4	27	.34	.20	.71	.40	.24	.27	.34	.16	.07	.07
25	.81	6.8	.28	.51	.41	.33	.23	.11	.29	.16	.07	.07
26	.73	1.7	.26	.59	.21	.59	.22	.08	4.6	.14	1.8	.33
27	1.4	2.8	.24	.43	.56	2.4	.22	1.1	8.8	.18	.84	.41
28	.53	1.6	.24	.24	.17	.59	.20	12	2.3	.20	2.1	.97
29	.33	1.7	.22	.18	.10	.37	.20	----------	.62	.79	.44	1.7
30	.41	.83	.20	.15	.08	.33	.20	----------	2.0	.59	.26	.51
31	.51	.58	----------	.18	----------	.32	.20	----------	7.6	----------	.53	----------
Total	39.54	85.18	29.08	16.33	5.67	55.48	61.31	17.71	39.78	25.33	9.95	7.20
Mean												
Mgd	1.28	2.77	0.969	0.527	0.189	1.79	1.98	0.632	1.28	0.844	0.321	0.240
Cfs	1.98	4.29	1.50	0.815	0.292	2.77	3.06	0.978	1.98	1.31	0.497	0.371
Ac-ft	121	261	89	50	17	170	188	54	122	78	31	22
Max	5.3	27	3.7	3.1	0.71	15	24	12	8.8	5.2	2.1	1.7
Min	0.33	0.22	0.20	0.13	0.08	0.04	0.20	0.08	0.12	0.14	0.07	0.06

Calendar Year 1966: Max 27 Min 0.01 Mean (mgd) 0.938 Mean (cfs) 1.45 Ac-ft 1,050
Fiscal Year 1966-67: Max 27 Min 0.04 Mean (mgd) 1.08 Mean (cfs) 1.67 Ac-ft 1,200

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
8-24	1630	3.98	294	455	1-11	1845	3.86	260	402
12-19	0230	2.57	52	80	4-17	0345	2.68	62	96

16-7592. Right Branch Waisha Stream near Holualoa

Location.--Lat 19°38'41", long 155°54'55", on right bank 1,000 ft upstream from reservoir, 1.0 mile northeast of Holualoa Makai Camp, and 2.9 miles northeast of Holualoa School.

Drainage area.--1.89 sq mi.

Records available.--April 1960 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (from topographic map).

Average discharge.--7 years, 0.260 mgd (0.402 cfs).

Extremes.--Maximum discharge during year, 219 mgd (339 cfs) Apr. 25 (gage height, 4.86 ft), from rating curve extended above 0.80 mgd as explained below; no flow for several days.
1960-67: Maximum discharge, 269 mgd (416 cfs) Aug. 14, 1965 (gage height, 5.16 ft), from rating curve extended above 0.80 mgd on basis of slope-area measurement at gage height 4.07 ft; no flow at times each year.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.13	0.06	0.08	0.12	0.01	0.05	0.05	0.01	0.01	10	0.13	0.54
2	.09	.07	.04	.08	.01	.03	.03	.01	.01	.60	.11	.35
3	.16	.08	.03	.06	.01	.03	.02	0	.01	.20	.05	.29
4	.12	.11	.03	.05	1.4	.02	.02	0	.01	.09	.09	.12
5	.13	.16	.03	.05	.54	.02	.02	0	.03	.66	.11	.09
6	.12	.13	.05	.52	.11	.02	.01	0	.05	.62	.62	.10
7	.11	.08	.03	5.2	.11	.06	.01	0	.01	.20	1.5	.20
8	.12	.06	.03	.40	.35	.03	.01	0	.01	.10	.48	.18
9	.18	.16	.02	.15	.16	.02	.01	0	.01	.04	.18	.11
10	.15	.11	3.0	.21	.08	.01	.01	.02	.92	.02	.11	.15
11	.25	.05	.38	2.7	.05	.01	.01	3.4	.98	.02	.12	.11
12	.15	.05	.48	.40	.03	.01	.05	.23	.20	.02	.63	.05
13	.07	.04	.25	1.7	.03	.01	.02	.20	.08	.03	.27	.04
14	.04	.04	.11	.33	.02	.01	.05	.62	.03	.06	.12	.05
15	.08	.04	.09	.15	.02	.01	.06	.29	.02	.02	.06	.03
16	.08	.03	.08	.10	.02	.01	.05	.18	.01	.02	.73	.03
17	.09	.03	.08	5.8	.01	.01	.03	.25	.03	.02	.99	.16
18	.18	.12	.07	1.7	.01	.01	.02	.10	.09	.01	.40	.09
19	.19	.09	.06	.23	.01	.01	.01	.09	.03	.01	.16	.04
20	.13	.03	.06	.23	2.1	.01	.01	.07	.03	.01	.11	.03
21	.11	.03	.05	.20	.16	0	.01	.05	.03	0	.06	.02
22	.58	.02	.04	.21	.06	0	.01	.03	.06	0	.04	.03
23	.20	.01	.04	.23	.03	0	.01	.02	.06	.16	.03	.04
24	.09	.01	.03	.10	.04	0	.01	.02	.08	.73	.13	1.1
25	.07	.01	.03	.08	.12	0	.01	.02	.06	10	.67	.27
26	.05	.79	1.3	.05	.27	0	.01	.01	.03	.51	.18	.18
27	.05	.11	1.1	.04	1.2	.02	.01	.01	.02	.29	.20	.20
28	.09	.05	.18	.03	.31	.01	.01	.01	16	.11	.11	1.1
29	.13	.07	.27	.03	.12	.01	.01	----------	.27	.06	.21	.53
30	.10	.06	.16	.02	.07	.01	.01	----------	.13	.13	.11	.18
31	.07	.06	----------	.02	----------	.03	.01	----------	.10	----------	.10	----------
Total	4.11	2.76	8.20	21.19	7.46	0.47	0.61	5.64	19.41	24.74	8.81	6.41
Mean												
Mgd	0.133	0.089	0.273	0.684	0.249	0.015	0.020	0.201	0.626	0.825	0.284	0.214
Cfs	0.206	0.138	0.422	1.06	0.385	0.023	0.031	0.311	0.969	1.28	0.439	0.331
Ac-ft	13	8.5	25	65	23	1.4	1.9	17	60	76	27	20
Max	0.58	0.79	3.0	5.8	2.1	0.06	0.06	3.4	16	10	1.5	1.1
Min	0.04	0.01	0.02	0.02	0.01	0	0.01	0	0.01	0	0.03	0.02

Calendar Year 1966: Max 5.8 Min 0 Mean (mgd) 0.164 Mean (cfs) 0.254 Ac-ft 183
Fiscal Year 1966-67: Max 16 Min 0 Mean (mgd) 0.301 Mean (cfs) 0.466 Ac-ft 337

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-17	2200	4.19	131	203	4-1	1845	4.50	170	263
3-28	0315	4.37	153	237	4-25	1700	4.86	219	339

16-7593. Waiaha Stream at Luawai, near Holualoa

Location.--Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 miles northeast of Holualoa School, and 4.2 miles southeast of Honokohau School.

Drainage area.--8.74 sq mi.

Records available.--April 1960 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 2,580 ft (from topographic map).

Average discharge.--7 years, 0.533 mgd (0.825 cfs).

Extremes.--Maximum discharge during year, 418 mgd (647 cfs) Oct. 17 (gage height, 4.96 ft), from rating curve extended above 20 mgd as explained below; no flow for many days.
1960-67: Maximum discharge, 1,100 mgd (1,700 cfs) Aug. 14, 1965 (gage height, 6.37 ft), from rating curve extended above 20 mgd on basis of slope-area measurements at gage heights 4.34 and 4.51 ft; no flow at times each year.

Remarks.--Records good. Huehue Ranch diverts entire low flow of a tributary above station for domestic use.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	0.02	0.01	0.06	0	0.03	0.03	0	0	14	0.23	0.86
2	.02	.02	.01	.02	.22	.02	.03	0	0	1.4	.16	.45
3	.15	.02	.01	.01	.06	.01	.02	0	0	.22	.08	.66
4	.06	.03	.01	.01	2.4	.01	.01	0	0	.12	.22	.20
5	.03	.06	.02	.01	.98	.01	.01	0	0	2.5	.24	.13
6	.03	.08	.02	.04	.16	.01	.01	0	0	2.4	1.1	.13
7	.03	.03	.02	6.2	.18	.06	.01	.01	0	.42	1.9	.40
8	.03	.03	.01	.30	.25	.02	0	.01	0	.18	.64	.28
9	.15	.19	.01	.06	.16	.01	0	0	0	.07	.25	.14
10	.16	.08	3.6	1.1	.07	.01	.01	.01	4.2	.03	.08	.08
11	.28	.02	.28	6.6	.04	.01	.01	7.9	.32	.02	.97	.08
12	.16	.02	.63	.85	.02	.01	.01	.38	.08	.01	.38	.03
13	.03	.01	.25	1.8	.01	.01	.02	.28	.02	.42	.20	.03
14	.02	.01	.09	.22	.01	0	.02	2.4	.01	.16	.09	.07
15	.10	.01	.13	.08	.01	.01	.03	.38	.01	.03	.03	.02
16	.05	.01	.12	.03	.01	0	.02	.30	.01	.02	1.9	.06
17	.05	.01	.05	28	.01	0	.02	.38	.14	.02	2.3	.76
18	.14	.01	.18	4.9	0	0	.01	.10	.06	.01	.58	.20
19	.08	.01	.07	.24	0	0	.01	.04	.01	.01	.20	.07
20	.06	.01	.04	.83	2.0	0	.01	.02	.01	0	.10	.03
21	.08	.01	.04	.35	.22	0	.01	.02	.01	0	.05	.02
22	.93	0	.02	.43	.07	0	0	.01	.01	0	.02	.26
23	.35	0	.01	.25	.03	0	0	.01	.01	.02	.02	.08
24	.10	0	.01	.09	.10	0	0	.01	.01	.03	.56	2.3
25	.04	0	.01	.06	.36	0	0	.01	.01	25	.86	.38
26	.02	0	2.7	.03	.48	0	0	.01	.01	2.3	.28	.22
27	.03	0	1.6	.02	1.5	0	0	.01	.01	.66	.10	1.3
28	.03	0	.38	.02	.35	0	0	0	28	.22	.06	6.5
29	.07	.01	.25	.01	.14	0	0	---	.40	.12	.97	.50
30	.05	.01	.13	0	.06	0	0	---	.18	.14	.18	.20
31	.02	.01	---	0	---	.01	0	---	.10	---	.12	---
Total	3.38	0.72	10.71	52.62	9.90	0.24	0.30	12.29	33.62	50.53	14.87	16.44
Mean												
Mgd	0.109	0.023	0.357	1.70	0.033	0.007	0.010	0.439	1.08	1.68	0.480	0.548
Cfs	0.169	0.036	0.552	2.63	0.051	0.011	0.016	0.679	1.67	2.60	0.743	0.848
Ac-ft	10	2.2	33	161	30	0.7	0.9	38	103	155	46	50
Max	0.93	0.19	3.6	28	2.4	0.06	0.03	7.9	28	25	2.3	6.5
Min	0.02	0	0.01	0	0	0	0	0	0	0	0.02	0.02

Calendar Year 1966: Max 28 Min 0 Mean (mgd) 0.244 Mean (cfs) 0.378 Ac-ft 273
Fiscal Year 1966-67: Max 28 Min 0 Mean (mgd) 0.563 Mean (cfs) 0.871 Ac-ft 631

Peak discharge (base, 90 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-17	2200	4.96	418	647	4- 1	1900	4.06	182	282
2-11	1315	4.15	200	309	4-25	1700	4.68	334	517
3-28	0330	4.67	331	512	6-28	1430	3.62	108	167

16-7595. Waiaha Stream near Holualoa

Location.--Lat 19°38'12", long 155°56'40", on left bank 0.5 mile upstream from Highway 18, 1.2 miles north of Holualoa School, and 3.2 miles east of Kailua.

Drainage area.--9.35 sq mi.

Records available.--December 1957 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,910 ft (from topographic map).

Average discharge.--9 years (1958-67), 0.683 mgd (1.06 cfs).

Extremes.--Maximum discharge during year, 755 mgd (1,170 cfs) Oct. 17 (gage height, 3.85 ft), from rating curve extended above 160 mgd as explained below; no flow for many days.
1957-67: Maximum discharge, 1,560 mgd (2,410 cfs) Jan. 18, 1959 (gage height, 4.76 ft), from rating curve extended above 160 mgd on basis of 2 slope-area measurements at gage height 3.80 ft; no flow for many days each year.

Remarks.--Records good. Diversions by Huehue Ranch from Right Branch Waiaha Stream for domestic use and from Waiaha Stream 1 mile above station to off-stream reservoir for stock water. Diversion by Hawaii County Board of Water Supply from pool about 1/3 mile above station for domestic use in Kailua and Holualoa.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.01	0	0.02	0.04	0	0	0.02	0	0	16	0.01	0.70
2	.01	0	.03	.03	2.2	0	.01	0	0	.86	.01	.29
3	.10	0	.02	.02	.04	0	.01	0	0	.03	.02	.55
4	.02	0	.02	.01	4.5	0	.01	0	0	.01	.03	.06
5	.01	0	.02	.01	1.6	0	.01	0	0	1.9	.02	.02
6	.01	0	.03	.01	.03	0	.01	0	0	2.1	.25	.03
7	.01	0	.03	6.5	.07	.01	0	0	0	.06	.83	.20
8	.01	0	.02	.07	.07	0	0	0	0	.02	.18	.09
9	.05	.10	.01	.02	.03	0	0	0	0	.01	.03	.03
10	.05	.01	2.4	4.0	.02	0	0	0	11	0	.01	.02
11	.10	0	.06	11	.01	0	0	8.0	.07	0	3.2	.02
12	.05	0	.26	13	.01	0	0	.20	.02	0	.34	.01
13	.01	0	.03	1.0	.01	0	0	.10	.01	.63	.06	.18
14	.01	0	.02	.09	0	0	0	5.5	.01	.09	.02	.04
15	.01	0	1.7	.02	0	0	.01	.13	.01	.02	.01	.01
16	.01	0	.23	.02	0	0	.01	.23	0	.01	3.1	.01
17	.01	0	.03	51	0	0	.02	.10	.01	.01	3.8	.36
18	.01	0	.02	7.2	0	0	.01	.02	.02	0	.33	.05
19	.01	0	.01	.04	0	0	.01	.02	.01	0	.03	.02
20	.01	0	.01	1.1	3.4	0	.01	.01	0	0	.02	.01
21	.01	0	.01	.04	.41	0	0	.01	0	0	.01	.01
22	.01	0	.01	.03	.02	0	0	0	0	0	.01	.38
23	.01	0	.01	.04	.01	0	0	0	0	0	.01	.05
24	.01	0	.01	.02	.02	0	0	0	0	0	.58	5.2
25	0	0	.01	.01	.09	0	0	0	0	32	1.1	.15
26	0	0	5.0	.01	.29	0	0	0	0	1.9	.07	.03
27	0	0	1.8	.01	1.4	0	0	0	.07	.13	.02	6.0
28	0	0	.06	.01	.09	0	0	0	35	.01	.01	9.6
29	0	.01	1.3	.01	.01	0	0	----------	.06	.01	3.2	.20
30	0	.03	.15	0	.01	0	0	----------	.02	.01	.07	.02
31	0	.02	----------	0	----------	.15	0	----------	.01	----------	.03	----------
Total	0.55	0.17	13.33	95.36	14.34	0.16	0.14	14.32	46.32	55.81	17.41	24.34
Mean												
Mgd	0.018	0.005	0.444	3.08	0.478	0.005	0.005	0.511	1.49	1.86	0.562	0.811
Cfs	0.028	0.008	0.687	4.77	0.740	0.008	0.008	0.791	2.31	2.88	0.870	1.25
Ac-ft	1.7	0.5	41	293	44	0.5	0.4	44	142	171	53	75
Max	0.10	0.10	5.0	51	4.5	0.15	0.02	8.0	35	32	3.8	9.6
Min	0	0	0.01	0	0	0	0	0	0	0	0.01	0.01

Calendar Year 1966: Max 51 Min 0 Mean (mgd) 0.358 Mean (cfs) 0.554 Ac-ft 401
Fiscal Year 1966-67: Max 51 Min 0 Mean (mgd) 0.773 Mean (cfs) 1.20 Ac-ft 866

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-12	1830	2.93	297	460	4-1	1800	2.54	175	271
10-17	2200	3.85	755	1,170	4-25	1730	3.40	520	805
3-10	1530	2.64	202	313	6-28	1430	2.53	172	266
3-28	0345	3.26	450	696					

16-7598. Kiilae Stream near Honaunau

Location.--Lat 19°24'52", long 155°50'56", on right bank 2.4 miles northeast of Kealia and 3.0 miles southeast of Honaunau Post Office.

Drainage area.--0.67 sq mi.

Records available.--April 1958 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 2,898 ft above mean sea level (by stadia traverse).

Average discharge.--9 years, 0.164 mgd (0.254 cfs).

Extremes.--Maximum discharge during year, 22 mgd (34 cfs) June 28 (gage height, 1.69 ft); no flow for many days.
1958-67: Maximum discharge, 67 mgd (104 cfs) Jan. 13, 1959 (gage height, 2.32 ft), from rating curve extended above 3.7 mgd by logarithmic plotting; no flow at times each year.

Remarks.--Records good. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.05	0.09	0.34	0.07	0.06	0.02	2.1	0	0	0.94	0.10	0.40
2	.10	.06	.07	.03	.04	.01	.29	0	.03	2.0	.10	.14
3	.04	.06	.04	.02	.04	.01	.12	0	.18	.47	.05	.44
4	.28	.04	.14	.01	.10	0	.21	.01	.15	.12	.10	.12
5	.14	.03	.10	.02	.09	0	1.1	0	.30	1.3	.20	.11
6	.04	.09	.07	.08	.59	0	.16	0	.08	1.8	.50	.07
7	.40	.17	.06	.81	.14	0	.07	.06	.02	.31	1.0	.58
8	.11	.04	.03	.28	.40	.01	.03	.05	.01	.12	.20	.14
9	.04	.05	.03	.06	.53	0	.01	.02	.08	.04	.93	.08
10	.05	.04	.93	1.4	.18	.04	.01	.03	1.4	.02	.69	.11
11	.18	.02	.26	1.8	.08	.05	.04	.04	.18	.01	.16	.07
12	.09	.02	.38	.37	.05	.01	.05	.09	.05	.02	.11	.02
13	.02	.02	.09	.74	.02	0	.63	.52	.75	.01	.09	.84
14	.08	.02	.07	.12	.02	0	.37	.61	.09	.55	1.1	.09
15	.11	.02	3.1	.05	.01	.02	.23	.36	.04	.11	.13	.04
16	.05	.02	.21	.03	0	0	.09	1.1	.01	.04	.14	.05
17	.17	.16	.09	.58	.02	0	.04	.47	0	.03	.18	.15
18	.52	.40	.04	.09	.02	0	.02	.07	.03	.02	.10	.08
19	.08	.14	.04	.06	0	0	.02	.03	.61	.01	.10	.05
20	.06	.19	.13	1.2	0	0	.03	.03	.09	.01	.07	.02
21	.26	.71	.45	1.1	0	0	.03	.04	.10	0	.03	.43
22	.69	.13	.09	.34	0	0	.02	.02	.18	0	.28	1.0
23	.06	.07	.27	.35	0	0	.01	.01	.05	.10	.06	.09
24	.40	.04	.08	.13	1.3	0	0	.01	.44	.10	.07	2.0
25	.07	.29	.05	.07	.68	0	0	.01	.09	2.0	.30	.40
26	.03	1.3	.59	.08	.60	0	0	.02	.03	.50	.07	.43
27	.05	.12	.21	.07	.83	0	0	.01	.12	.30	.03	.24
28	.72	.04	.07	.06	1.1	0	0	.01	1.9	.20	.02	2.2
29	.07	.87	.12	.06	.13	0	0	----------	.29	.10	.01	.18
30	.04	.25	.25	.03	.04	0	0	----------	.12	.10	.57	.06
31	.07	.55	----------	.11	----------	.02	0	----------	.13	----------	.09	----------
Total	5.07	6.05	8.40	10.22	7.07	0.19	5.68	3.62	7.55	11.33	7.58	10.63
Mean												
Mgd	0.164	0.195	0.280	0.330	0.236	0.006	0.183	0.129	0.244	0.378	0.245	0.354
Cfs	0.254	0.302	0.433	0.511	0.365	0.009	0.283	0.200	0.378	0.585	0.379	0.548
Ac-ft	16	19	26	31	22	0.6	17	11	23	35	23	33
Max	0.72	1.3	3.1	1.8	1.3	0.05	2.1	1.1	1.9	2.0	1.1	2.2
Min	0.02	0.02	0.03	0.01	0	0	0	0	0	0	0.01	.02

Calendar Year 1966: Max 3.1 Min 0 Mean (mgd) 0.159 Mean (cfs) 0.246 Ac-ft 178
Fiscal Year 1966-67: Max 3.1 Min 0 Mean (mgd) 0.228 Mean (cfs) 0.353 Ac-ft 256

Peak discharge (base, 16 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9-15	1730	1.58	16	25	4- 2	2000	1.66	21	32
10-11	1645	1.63	19	29	6-28	1500	1.69	22	34
11-24	1630	1.64	19	29					

16-7640. Hilea Gulch tributary near Honuapo

Location (revised).--Lat 19°10'27", long 155°35'58", on right bank 0.5 mile upstream from mouth, 6.6 miles northwest of Honuapo, and 6.7 miles west of Punaluu.

Drainage area.--11.7 sq mi.

Records available.--February 1966 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 2,940 ft (revised, from topographic map).

Extremes.--Maximum discharge during year, 788 mgd (1,220 cfs) Dec. 30 (gage height, 6.35 ft), from rating curve extended above 49 mgd by logarithmic plotting; no flow Dec. 21, 22, Jan. 29-31.
1966-67: Maximum discharge, that of Dec. 30, 1966; no flow at times each year.

Remarks.--Records good except those above 100 mgd, which are fair. No diversion above station. Continuous records of rainfall have been obtained at station since Oct. 25, 1966.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	34	20	2.0	0.40	15	1.3	16	0.07	0.03	31	15	0.49
2	14	6.7	.46	.28	1.8	.46	3.1	.83	.94	13	2.5	.82
3	7.3	1.5	.43	.20	.91	.25	.96	.46	.55	17	.31	4.2
4	32	.64	2.4	.19	87	.20	7.6	.24	6.3	2.8	.16	2.8
5	6.3	.46	.55	10	54	.16	2.8	.13	1.3	31	17	19
6	7.8	.49	.24	24	12	.14	1.2	.13	.64	6.6	45	21
7	13	1.4	.19	17	6.2	.13	.28	.06	.22	10	9.4	45
8	1.9	70	13	1.5	11	.10	.18	.03	.08	2.9	4.7	39
9	.78	8.7	37	3.0	7.5	.19	.10	45	2.5	.86	2.8	18
10	3.0	1.3	36	17	7.1	.49	.08	8.1	6.0	8.2	8.1	1.7
11	3.5	.91	5.8	25	14	.25	2.4	2.3	2.0	1.5	13	.46
12	6.2	1.4	27	37	3.0	.10	.52	42	.14	.60	63	6.2
13	1.8	1.0	3.0	8.0	14	.09	.10	7.2	.09	.43	21	1.7
14	41	.73	32	1.8	11	.07	.09	.55	.14	.34	22	.55
15	2.3	.37	16	46	5.6	.06	.09	3.2	.34	.24	53	.28
16	.49	61	30	8.7	4.4	.05	.04	7.5	.16	.25	4.8	3.7
17	17	36	33	6.2	1.1	.04	.03	.49	.14	.25	1.4	12
18	14	2.3	23	1.6	28	.03	.02	6.2	.13	.13	.55	5.2
19	32	.60	19	2.2	2.0	.02	.03	7.8	10	.09	.43	.52
20	3.0	20	9.7	13	.49	.01	.05	.91	.95	.06	.37	8.4
21	31	1.9	1.9	15	24	0	.02	.16	2.3	.05	.20	3.1
22	29	9.1	.55	2.3	32	0	.03	.09	17	.31	.16	2.4
23	2.0	.96	40	.78	9.3	.12	.41	.06	8.3	.85	1.2	8.2
24	43	17	14	.28	38	.14	.60	.06	18	29	19	14
25	54	18	13	3.1	2.8	.09	.04	.05	1.6	24	6.5	2.0
26	14	5.7	7.7	2.6	.91	.04	.03	.06	7.7	9.1	21	.68
27	9.7	10	4.8	4.4	6.8	.04	.02	.06	12	2.9	21	13
28	9.6	1.5	2.5	.91	2.3	.08	.01	.05	9.8	5.5	5.0	20
29	3.3	6.2	.64	.22	.68	.10	0	----------	3.2	24	1.9	4.9
30	8.2	12	.46	1.3	10	149	0	----------	14	9.3	.55	3.6
31	6.3	3.5	----------	28	----------	34	0	----------	27	----------	.24	----------
Total	451.47	321.36	376.32	281.96	412.89	187.75	36.83	133.79	153.55	232.26	361.27	262.90
Mean												
Mgd	14.6	10.4	12.5	9.10	13.8	6.06	1.19	4.78	4.95	7.74	11.7	8.76
Cfs	22.6	16.1	19.3	14.1	21.4	9.38	1.84	7.40	7.66	12.0	17.9	13.5
Ac-ft	1,390	986	1,150	865	1,270	576	113	411	471	713	1,110	807
Max	54	70	40	46	87	149	16	45	27	31	63	45
Min	0.49	0.37	0.19	0.19	0.49	0	0	0.03	0.03	0.05	0.16	0.28

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max 149 Min 0 Mean (mgd) 8.80 Mean (cfs) 13.6 Ac-ft 9,860

Peak discharge (base, 300 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
9- 9	1830	4.66	322	498	12-30	2200	6.35	788	1,220
10-12	1800	5.20	445	689	4- 1	1830	4.70	330	511
10-15	1730	5.52	526	814	5-12	1600	5.45	508	786
11- 5	1600	5.15	432	668	5-15	0315	5.55	535	828

16-7650. Hilea Gulch tributary No. 2 near Honuapo

Location (revised).--lat 19°10'17", long 155°36'05", on right bank 0.5 mile upstream from mouth, 6.3 miles northwest of Honuapo, and 6.6 miles west of Punaluu.

Drainage area.--4.53 sq mi.

Records available.--February 1966 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 2,880 ft (revised, from topographic map).

Extremes.--Maximum discharge during year, 338 mgd (523 cfs) Dec. 30 (gage height, 7.16 ft), from rating curve extended above 27 mgd by logarithmic plotting; no flow for many days.
1966-67: Maximum discharge, that of Dec. 30, 1966; no flow for many days each year.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17	7.8	0.15	0	7.0	0.80	6.1	0	0	13	5.3	0
2	7.0	2.7	0	0	.90	.10	.93	0	.30	7.0	.82	0
3	3.0	.14	0	0	.40	0	.06	0	.15	6.8	0	.48
4	16	0	.12	0	40	0	2.3	0	3.0	.67	0	.26
5	2.0	0	.03	2.5	25	0	.12	0	.40	17	7.1	4.9
6	3.2	0	0	15	6.0	0	.01	0	.20	3.0	25	6.5
7	6.0	.16	0	6.3	3.0	0	0	0	.01	5.0	3.8	20
8	.39	39	2.5	.08	5.0	0	0	0	0	1.5	1.2	17
9	.04	6.9	21	.25	4.0	0	0	22	1.0	.30	.60	16
10	1.0	.01	23	14	3.5	.10	0	4.0	3.0	4.0	2.4	.53
11	1.0	.02	3.2	13	7.0	.01	.67	1.0	1.0	.80	5.4	.01
12	1.7	.11	10	19	1.5	0	0	20	0	.15	38	.80
13	.35	.04	1.8	5.4	7.0	0	0	3.5	0	.10	9.8	.10
14	22	0	12	.54	5.0	0	0	.15	0	.05	8.0	.01
15	.72	0	7.1	22	3.0	0	0	1.5	.05	.01	24	0
16	.01	44	12	5.0	2.0	0	0	4.0	0	.01	1.4	.36
17	9.2	24	19	2.8	.50	0	0	.10	0	.01	.12	3.0
18	7.8	.72	12	.10	14	0	0	3.0	0	0	0	1.7
19	16	0	8.4	.65	1.0	0	0	4.0	5.0	0	0	0
20	.89	7.6	4.0	6.9	.20	0	0	.30	.40	0	0	2.2
21	32	.36	.30	4.5	12	0	0	0	1.2	0	0	.56
22	19	2.9	0	.30	15	0	0	0	8.5	.05	0	.31
23	.45	.09	21	.01	4.5	0	0	0	4.0	.30	0	3.2
24	26	7.7	4.5	0	20	0	0	0	9.0	14	6.4	5.9
25	32	8.3	3.0	.67	1.5	0	0	0	.40	12	2.3	.69
26	6.3	.62	3.1	.42	.40	0	0	0	3.0	4.5	5.1	.17
27	2.2	2.3	.77	.67	3.0	.25	0	0	6.0	1.5	7.4	8.7
28	2.4	.09	1.7	.05	1.0	.82	0	0	4.0	2.2	1.4	8.4
29	.56	.85	0	0	.30	.01	0	----------	.50	11	.23	2.0
30	2.6	1.3	0	.70	5.0	87	0	----------	6.6	3.4	.02	.60
31	1.6	2.0	----------	15	----------	16	0	----------	13	----------	0	----------
Total	240.41	159.71	170.67	135.84	198.70	105.09	10.19	63.55	70.71	108.35	155.79	104.38
Mean												
Mgd	7.76	5.15	5.69	4.38	6.62	3.39	0.329	2.27	2.28	3.61	5.03	3.48
Cfs	12.0	7.97	8.80	6.78	10.2	5.25	0.509	3.51	3.53	5.59	7.78	5.38
Ac-ft	738	490	524	417	610	323	31	195	217	333	478	320
Max	32	44	23	22	40	87	6.1	22	13	17	38	20
Min	0.01	0	0	0	0.20	0	0	0	0	0	0	0

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max 87 Min 0 Mean (mgd) 4.17 Mean (cfs) 6.45 Ac-ft 4,680

Note.--No gage-height record Oct. 30 to Dec. 15, Feb. 4 to Mar. 28.

Peak discharge (base, 200 mgd, revised)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10-15	1800	6.24	230	356	4-24	about 1800	6.00	206	319
11- 5	about 1600	6.02	208	322	5-12	1630	5.97	203	314
12-30	2030	7.16	338	523	5-15	0400	6.05	211	326
2- 9	-	6.07	213	330					

ISLAND OF HAWAII

16-7670. Ninole Gulch near Punaluu

Location (revised).--Lat 19°10'44", long 155°33'46", on right bank 300 ft downstream from forest-reserve boundary, 4.6 miles northwest of Punaluu, and 6.0 miles north of Honuapo.

Drainage area.--14.0 sq mi.

Records available.--February 1966 to June 1967.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (revised, from topographic map).

Extremes.--Maximum discharge during year, 807 mgd (1,250 cfs) Nov. 4 (gage height, 5.81 ft), from rating curve extended above 19 mgd; no flow for many days.
1966-67: Maximum discharge, that of Nov. 4, 1966; no flow for many days each year.

Remarks.--Records good except those above 40 mgd, which are fair. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.2	10	0.04	0.90	13	0.09	5.1	0	0	20	3.3	0
2	2.5	2.5	0	.22	.14	0	.24	0	0	5.7	.36	.01
3	.04	.07	0	.07	.01	0	0	0	.01	4.9	0	.06
4	17	0	.15	.04	130	0	1.1	0	3.4	.24	0	.02
5	.71	0	.02	3.5	65	0	.10	0	.27	11	1.4	3.5
6	.70	0	0	23	5.0	0	0	0	0	1.4	19	5.5
7	2.0	0	0	13	3.2	0	0	0	0	3.9	3.0	55
8	.08	97	.08	.46	1.7	0	0	0	0	.60	.38	36
9	0	14	23	3.1	.82	0	0	40	0	.06	.10	26
10	0	0	20	10	4.3	0	0	5.6	.01	.67	.51	.29
11	0	0	.77	11	17	0	0	.07	.01	.09	3.6	0
12	0	0	18	88	1.6	0	0	17	0	0	88	5.0
13	0	0	1.4	5.9	9.4	0	0	2.1	0	0	14	.19
14	2.5	0	17	.34	10	0	.02	0	0	0	30	.02
15	.16	0	6.8	40	1.7	0	0	0	0	0	67	0
16	0	38	19	3.4	4.3	0	0	0	0	0	.05	.27
17	.97	46	29	.38	.48	0	0	0	0	0	.01	2.2
18	3.5	1.9	13	.04	38	0	0	1.7	0	0	0	2.2
19	17	0	7.3	.02	1.5	0	0	3.0	6.0	0	0	0
20	1.1	5.5	3.2	4.1	0	0	0	.11	.97	0	0	.88
21	53	.54	.22	9.8	58	0	0	0	.03	0	0	.40
22	21	3.0	0	.73	27	0	0	0	5.5	.06	0	.10
23	.52	.04	56	.03	5.0	0	0	0	.69	1.1	0	1.5
24	26	5.9	7.8	0	24	0	0	0	8.9	19	11	5.8
25	37	4.3	5.8	0	1.3	0	0	0	.58	10	4.0	.08
26	7.3	.52	3.2	0	0	0	0	0	1.4	3.2	17	0
27	3.7	.38	.78	.15	5.3	0	0	0	.70	.46	13	11
28	3.7	.06	.30	.05	.46	0	0	0	.60	1.9	.88	13
29	.88	1.2	.14	0	0	0	0	---	.06	13	.05	1.2
30	3.5	3.9	12	0	5.2	58	0	---	8.6	3.9	.01	.50
31	1.9	1.1	---	13	---	33	0	---	13	---	0	---
Total	212.96	235.91	245.00	231.23	433.41	91.09	6.56	69.58	50.73	101.18	276.65	170.72
Mean												
Mgd	6.87	7.61	8.17	7.46	14.4	2.94	0.212	2.48	1.64	3.37	8.92	5.69
Cfs	10.6	11.8	12.6	11.5	22.3	4.55	0.328	3.84	2.54	5.21	13.8	8.80
Ac-ft	654	724	752	710	1330	280	20	214	156	311	849	524
Max	53	97	56	88	130	58	5.1	40	13	20	88	55
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max 130 Min 0 Mean (mgd) 5.82 Mean (cfs) 9.00 Ac-ft 6520

Peak discharge (base, 650 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
8- 8	1630	5.77	782	1,210	12-30	2230	5.64	704	1,090
10-12	1745	5.78	788	1,220	5-12	1500	5.75	770	1,190
11- 4	1500	5.81	807	1,250	5-15	0300	5.56	656	1,010

16-7705. Paauau Gulch at Pahala

Location (revised).--Lat 19°12'39", long 155°28'48", on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mile north of Pahala.

Drainage area.--1.42 sq mi.

Records available.--May 1962 to June 1967.

Gage.--Water-stage recorder. Datum of gage is 972 ft above mean sea level (by stadia survey).

Average discharge.--5 years, 0.309 mgd (0.478 cfs).

Extremes.--Maximum discharge during year, 990 mgd (1,530 cfs) Nov. 5 (gage height, 5.05 ft), from rating curve extended above 230 mgd on basis of slope-area measurement at gage height 4.40 ft; no flow most of the time.
1962-67: Maximum discharge, that of Nov. 5, 1966; no flow most of the time each year.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0	0	0	0	0.46		0	0	0	0	0
2		0	0	.01	0	.94		0	0	0	0	.14
3		0	0	.03	0	.46		0	0	0	0	0
4		0	.08	0	76	0		0	0	0	0	0
5		0	0	0	78	0		0	0	.60	0	0
6		0	0	0	3.8	0		0	0	.03	0	0
7		0	0	0	.69	0		0	0	0	0	.02
8		0	0	0	0	0		0	0	0	0	.04
9		0	0	5.9	0	0		3.4	0	.01	0	0
10		0	0	.82	0	0		.63	0	0	0	0
11		0	.18	.01	0	0		0	0	.16	0	0
12		0	0	.82	0	0		0	.01	.02	.08	3.0
13		0	0	.04	0	0		0	0	0	2.0	.02
14		0	0	0	5.1	0		0	0	0	20	0
15		0	0	0	.63	0		0	0	0	15	0
16		0	0	.17	.01	0		0	0	0	.07	0
17		.19	0	.08	.10	0		0	0	0	0	.14
18		0	0	0	.23	0		0	0	0	0	.62
19		0	0	0	.01	0		0	.08	0	0	0
20		0	0	0	0	0		0	.19	0	0	0
21		0	0	.07	0	0		0	0	0	0	0
22		0	0	0	3.9	0		0	.01	.34	0	0
23		0	5.2	0	2.5	0		0	3.9	.82	0	0
24		0	.07	.03	2.3	0		0	1.9	1.8	0	0
25		0	.14	0	.36	0		0	.01	.16	0	0
26		0	.06	0	.26	0		0	0	.06	0	0
27		0	0	0	1.6	0		0	0	0	0	0
28		0	0	0	.99	0		0	0	0	.04	0
29		0	0	0	.70	0		----------	0	.67	0	0
30		0	.10	0	.58	0		----------	0	.03	0	0
31		0	----------	0	----------	4.7		----------	0	----------	0	----------
Total	0	0.19	5.83	7.98	177.76	6.56	0	4.03	6.10	4.70	37.19	3.98
Mean												
Mgd	0	0.006	0.194	0.257	5.93	0.212	0	0.144	0.197	0.157	1.20	0.128
Cfs	0	0.009	0.300	0.398	9.18	0.328	0	0.223	0.305	0.243	1.86	0.198
Ac-ft	0	0.6	18	24	546	20	0	12	19	14	114	12
Max	0	0.19	5.2	5.9	78	4.7	0	3.4	3.9	1.8	20	3.0
Min	0	0	0	0	0	0	0	0	0	0	0	0

Calendar Year 1966: Max 78 Min 0 Mean (mgd) 0.600 Mean (cfs) 0.928 Ac-ft 672
Fiscal Year 1966-67: Max 78 Min 0 Mean (mgd) 0.697 Mean (cfs) 1.08 Ac-ft 780

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10- 9	1730	3.67	128	198	5-15	0400	4.03	272	421
11- 5	1500	5.05	990	1,530					

16-8083. Finile River at Agat

Location.--Lat 13°22'41" N., long 144°39'26" E., on right bank 0.4 mile upstream from estuary and 0.4 mile southeast of Agat School.

Drainage area.--0.26 sq mi.

Records available.--April 1960 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Average discharge.--7 years, 1.49 cfs.

Extremes.--Maximum discharge during year, 231 cfs Aug. 23 (gage height, 3.18 ft), from rating curve extended above 30 cfs as explained below; minimum, 0.09 cfs July 6.
1960-67: Maximum discharge, 314 cfs June 6, 1963 (gage height, 3.77 ft), from rating curve extended above 30 cfs on basis of slope-area measurement at gage height 3.66 ft; minimum, 0.09 cfs June 1, 3, July 6, 1966.

Remarks.--Records good. No diversion above station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.13	0.34	1.4	2.0	2.0	1.2	0.86	0.78	0.78	0.70	1.0	0.62
2	.13	18	2.0	2.0	1.9	1.0	.78	.78	.62	.70	1.0	.62
3	.13	5.0	1.4	3.0	1.9	4.6	.70	.70	.62	4.2	1.2	.62
4	.13	1.5	1.8	2.0	2.0	1.2	.62	.70	.56	2.8	.95	.80
5	.13	1.0	1.5	3.9	1.9	1.0	.62	.62	.50	1.8	.95	.86
6	.13	.70	1.5	2.9	1.8	.95	.62	.62	.56	1.4	.86	.70
7	.13	.50	1.2	2.4	1.6	1.0	.62	.62	.50	1.2	.86	.62
8	.16	.40	23	2.0	1.4	.95	.70	.62	.50	1.2	2.9	.56
9	.13	.40	6.1	1.9	1.2	.95	.70	.62	.50	1.0	1.0	.50
10	.16	.70	5.6	1.8	1.2	.86	1.2	.62	.50	1.0	1.0	.50
11	.20	4.0	5.0	1.8	1.2	.86	2.6	.95	.44	.95	.95	.50
12	.30	1.5	3.8	1.8	1.6	.78	1.4	.62	.50	.95	.95	.50
13	.40	.80	2.9	1.6	1.6	.78	1.0	.56	.44	.95	.95	.50
14	.30	3.0	2.7	1.6	1.6	.78	.95	.56	.44	3.8	.95	.56
15	.20	1.0	2.4	6.3	1.2	.70	6.2	.56	.44	1.5	.86	.56
16	.20	.44	3.6	2.4	1.8	2.5	1.2	.50	.62	1.2	.86	.50
17	.20	.39	3.8	2.0	4.0	.95	1.0	.50	1.0	1.0	.86	.50
18	.15	.39	2.7	2.0	2.2	2.7	1.2	.50	2.4	1.0	.78	.56
19	.15	.34	2.6	1.9	1.6	1.4	1.2	.50	17	.95	.78	.50
20	.22	.39	2.4	1.9	1.6	1.0	1.2	.60	2.8	.95	.78	.70
21	.26	.56	5.0	2.0	1.5	.95	1.0	.50	1.5	.86	.86	.62
22	.19	.56	2.7	13	1.5	.95	1.0	.60	1.2	2.9	.78	2.2
23	.19	13	2.4	4.5	1.5	.95	1.2	.60	1.0	1.2	.86	2.5
24	.22	6.0	2.2	3.1	2.4	.95	1.0	.70	1.2	.95	.78	3.0
25	.26	2.0	2.0	2.7	1.5	.95	1.0	.70	1.0	.95	.70	2.3
26	.26	1.5	2.0	2.4	1.6	.95	.95	.62	.95	3.4	.62	1.0
27	.22	1.4	2.0	2.2	1.4	.86	.86	.62	.86	1.4	.70	1.2
28	.22	1.4	1.9	2.0	1.9	.86	.86	.70	.95	1.2	.86	.95
29	.26	1.4	1.9	2.0	1.2	.86	.86	----------	.86	1.0	1.0	.86
30	7.3	1.5	2.0	2.0	1.4	.78	.86	----------	.78	1.2	.78	.86
31	.56	1.5	----------	2.0	---------	.70	.78	----------	.78	---------	.62	---------
Total	13.62	71.61	101.5	85.1	51.2	35.92	35.74	17.57	42.80	44.31	29.00	27.27
Mean	0.439	2.31	3.38	2.75	1.71	1.16	1.15	0.628	1.38	1.48	0.935	0.909
Ac-ft	27	142	201	169	102	71	71	35	85	88	58	54
Max	7.3	18	23	13	4.0	4.6	6.2	0.95	17	4.2	2.9	3.0
Min	0.13	0.34	1.2	1.6	1.2	0.70	0.62	0.50	0.44	0.70	0.62	0.50

Calendar year 1966: Max 23 Min 0.13 Mean 1.12 Ac-ft 810
Fiscal year 1966-67: Max 23 Min 0.13 Mean 1.52 Ac-ft 1,100

Peak discharge (base, 170 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-23	2000	3.18	231	9-8	0600	2.88	192

16-8094. Cetti River near Umatac

Location.--Lat 13°18'58" N., long 144°39'21" E., on right bank 0.1 mile upstream from estuary and 1.3 miles northeast of Umatac School.

Drainage area.--0.72 sq mi.

Records available.--February 1960 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

Average discharge.--7 years, 4.23 cfs.

Extremes.--Maximum discharge during year, 1,210 cfs Sept. 8 (gage height, 5.50 ft), from rating curve extended above 66 cfs as explained below; minimum, 0.01 cfs July 19.
1960-67: Maximum discharge, 1,420 cfs Oct. 19, 1960 (gage height, 6.19 ft), from rating curve extended above 66 cfs by slope-area measurements at gage heights 1.78 and 6.19 ft; minimum, that of July 19, 1966.

Remarks.--Records fair. No diversion above station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.09	8.8	3.0	6.0	3.4	1.5	2.9	0.54	2.2	1.8	2.6	1.0
2	.07	162	10	4.2	1.6	1.0	1.6	.54	1.6	2.2	2.4	.80
3	.07	11	3.9	15	1.8	14	1.0	.54	1.2	47	2.4	.80
4	.11	6.4	4.6	8.0	1.3	3.0	.54	.54	1.1	8.1	2.0	.70
5	.09	4.2	8.5	42	1.3	2.2	.70	.54	1.0	6.7	1.8	.70
6	.07	3.0	5.2	22	1.0	2.2	1.0	.46	1.8	4.6	1.8	.80
7	.07	2.4	3.3	8.9	.90	1.8	.70	.54	1.0	4.2	27	.70
8	.09	1.4	124	6.4	1.0	1.6	.54	.70	1.0	3.6	16	.62
9	.18	1.4	46	5.2	1.0	1.6	.80	1.0	.90	3.0	3.3	.54
10	.09	2.6	35	4.2	.90	1.4	4.6	.62	.80	2.8	2.6	.54
11	.07	21	15	3.6	.90	1.2	8.1	5.8	.70	2.6	2.2	.54
12	.60	5.2	13	3.0	1.0	1.2	5.6	1.2	.90	5.1	2.0	.62
13	.26	3.6	7.6	2.6	1.0	1.1	2.6	.70	1.4	2.6	2.0	.90
14	.14	15	4.6	2.8	1.0	1.0	1.8	.70	2.6	49	1.6	.70
15	.09	4.6	3.9	3.0	.90	1.0	32	1.0	1.1	4.6	1.4	.62
16	.14	6.7	8.7	6.0	1.5	6.2	4.6	.62	4.3	3.3	1.4	.54
17	.05	4.9	6.5	2.4	3.4	1.8	3.0	.54	7.7	5.0	1.2	.46
18	.05	2.4	4.6	3.0	2.8	43	2.4	.46	13	3.0	1.0	.38
19	.03	2.0	3.6	2.2	1.8	6.0	1.8	.31	36	2.6	1.0	.80
20	.26	1.8	3.0	2.0	3.0	4.2	3.0	.46	9.0	4.4	1.0	2.5
21	.26	11	9.0	2.2	2.0	3.0	2.0	.46	6.0	2.6	1.0	.90
22	1.9	6.9	5.0	24	1.0	2.5	2.0	.38	4.2	14	1.0	1.4
23	1.0	59	4.0	19	.90	2.2	2.6	1.1	3.6	4.2	.90	3.3
24	.70	21	3.0	14	4.7	.90	1.1	1.4	3.0	3.0	.90	4.1
25	.54	6.8	2.5	5.6	2.0	.90	.70	1.0	3.0	15	1.0	25
26	.46	4.2	2.5	4.2	6.1	.54	.54	.62	2.8	24	.90	3.0
27	.46	3.0	2.0	3.3	2.4	.54	.31	.54	2.4	5.6	2.0	3.6
28	.70	2.2	2.0	2.8	1.6	1.8	.38	1.8	2.4	4.2	3.4	2.2
29	3.6	1.8	3.0	2.6	1.5	.90	.54	----------	1.8	3.3	1.8	1.8
30	7.1	2.6	3.6	2.0	2.2	1.0	.46	----------	1.6	2.8	1.1	1.6
31	2.8	3.0	----------	1.6	----------	1.4	.38	----------	3.2	----------	1.0	----------
Total	22.14	391.9	350.6	233.8	55.90	112.68	90.29	25.11	123.30	244.9	91.70	62.16
Mean	0.714	12.6	11.7	7.54	1.86	3.63	2.91	0.897	3.98	8.16	2.96	2.07
Ac-ft	44	777	695	464	111	223	179	50	245	486	182	123
Max	7.1	162	124	42	6.1	43	32	5.8	36	49	27	25
Min	0.03	1.4	2.0	1.6	0.90	0.54	0.31	0.31	0.70	1.8	0.90	0.38

Calendar year 1966: Max 162 Min 0.03 Mean 3.38 Ac-ft 2,450
Fiscal year 1966-67: Max 162 Min 0.03 Mean 4.94 Ac-ft 3,580

Peak discharge (base, 800 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-23	2100	4.25	840	9- 9	2300	4.26	843
9- 8	0630	5.50	1,210	12-18	1430	4.25	840

Note.--No gage-height record Nov. 3 to Dec. 3.

16-8160. Umatac River at Umatac

Location.--Lat 13°17'45" N., long 144°39'50" E., on left bank 0.2 mile upstream from mouth, 0.3 mile southeast of Umatac, and 5.7 miles northwest of Inarajan.

Drainage area.--2.04 sq mi.

Records available.--September 1952 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 8 ft (from topographic map). Prior to Oct. 16, 1953, at datum 0.62 ft higher.

Average discharge.--14 years (1953-67), 8.70 cfs.

Extremes.--Maximum discharge during year, 2,540 cfs Sept. 8 (gage height, 4.33 ft), from rating curve extended above 320 cfs as explained below; minimum, 0.94 cfs July 3, 6.
1952-67: Maximum discharge, 7,460 cfs Oct. 19, 1960 (gage height, 7.04 ft), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 3.51 and 7.04 ft; minimum, 0.20 cfs June 23, 1960.

Remarks.--Records good except those for period of no gage-height record, which are fair. Upstream diversion at Piga Spring for domestic use at Umatac. Continuous records of rainfall are obtained at station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.2	5.6	12	17	21	5.6	4.6	3.0	12	4.3	5.3	2.2
2	1.2	220	60	10	9.0	4.6	4.0	3.0	4.3	4.6	4.6	2.2
3	1.1	22	16	12	7.2	25	3.8	3.0	3.8	110	4.6	2.0
4	1.2	10	15	19	6.0	7.6	3.5	3.0	3.8	29	4.3	2.2
5	1.2	6.0	25	71	6.4	6.0	3.5	2.5	3.0	19	4.0	2.4
6	1.2	4.6	15	64	5.6	5.6	3.8	2.5	6.5	11	3.8	2.8
7	1.2	3.8	11	27	6.8	4.6	3.2	2.5	3.5	8.0	10	2.4
8	1.2	3.2	363	18	5.0	4.6	3.0	2.5	3.0	7.2	21	2.2
9	1.5	2.8	118	14	4.6	4.3	3.2	3.0	2.8	6.0	5.3	2.0
10	1.5	2.6	134	12	4.3	4.0	6.5	3.0	2.6	5.6	4.3	2.0
11	1.5	28	60	10	4.3	3.8	11	12	2.6	5.0	3.8	2.0
12	3.0	10	48	9.0	8.0	3.8	12	5.0	3.5	11	3.8	2.0
13	2.6	10	34	8.0	4.6	3.5	6.0	3.0	3.2	5.3	3.8	5.2
14	2.2	17	23	7.2	6.8	3.5	4.6	3.5	4.3	73	3.2	2.6
15	2.2	9.5	18	6.8	4.6	3.5	54	3.0	3.0	10	3.0	3.0
16	2.0	68	30	8.0	4.3	29	9.5	2.5	12	7.2	3.0	2.4
17	2.0	12	27	6.4	9.5	6.8	6.8	3.0	13	8.8	3.0	2.4
18	2.2	7.6	20	5.6	7.2	64	5.6	3.0	24	7.6	3.0	3.5
19	2.2	5.6	15	5.6	4.6	18	4.6	3.0	72	6.0	2.8	3.8
20	3.5	5.6	13	5.3	8.5	10	7.5	2.5	18	7.7	2.6	14
21	3.0	16	39	5.3	5.6	7.2	4.3	2.5	11	6.0	2.8	7.2
22	3.2	9.5	21	13	5.3	6.0	4.0	3.0	8.0	12	2.6	9.8
23	3.2	50	16	29	5.6	9.7	9.3	3.0	7.2	8.5	2.4	19
24	3.0	58	12	27	5.6	7.2	4.3	4.5	6.0	6.0	2.6	12
25	3.0	20	11	15	4.6	7.6	4.0	4.0	5.6	20	2.4	80
26	3.0	12	9.5	10	10	6.0	4.0	3.5	5.0	45	2.2	14
27	3.0	9.5	9.0	8.0	8.5	5.3	4.0	3.0	6.0	12	5.0	26
28	3.0	7.6	8.0	7.2	5.6	7.2	3.8	10	6.0	8.0	4.6	11
29	3.5	7.2	19	6.4	4.6	5.0	4.0	----------	4.6	6.4	3.5	8.0
30	5.3	12	11	6.0	10	4.3	3.8	----------	4.0	6.0	2.6	9.6
31	5.0	13	----------	5.6	---------	4.0	3.5	----------	8.6	---------	2.4	----------
Total	74.1	668.7	1212.5	468.4	203.7	287.3	209.7	102.0	272.9	476.2	132.3	259.9
Mean	2.39	21.6	40.4	15.1	6.79	9.27	6.76	3.64	8.80	15.9	4.27	8.66
Ac-ft	147	1330	2400	929	404	570	416	202	541	945	262	516
Max	5.3	220	363	71	21	64	54	12	72	110	21	80
Min	1.1	2.6	8.0	5.3	4.3	3.5	3.0	2.5	2.6	4.3	2.2	2.0

Calendar year 1966: Max 363 Min 0.25 Mean 8.43 Ac-ft 6100
Fiscal year 1966-67: Max 363 Min 1.1 Mean 12.0 Ac-ft 8660

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-8	0600	4.33	2,540	4-3	1630	3.33	1,290
9-9	2300	3.46	1,420				

Note.--No gage-height record Feb. 1 to Mar. 1.

16-8210. Geus River near Merizo

Location.--Lat 13°16'15" N., long 144°40'40" E., on left bank 0.7 mile northeast of Merizo, 2.2 miles southeast of Umatac, and 4.7 miles west of Inarajan.

Drainage area.--0.95 sq mi.

Records available.--April 1953 to June 1967.

Gage.--Water-stage recorder and broad-crested weir. Altitude of gage is 60 ft (from topographic map).

Average discharge.--14 years, 3.22 cfs.

Extremes.--Maximum discharge during year, 1,410 cfs Sept. 8 (gage height, 3.63 ft), from rating curve extended above 66 cfs as explained below; no flow July 6-8.
1953-67: Maximum discharge, 2,940 cfs Oct. 19, 1960 (gage height, 4.16 ft), from rating curve extended above 66 cfs on basis of slope-area measurements at gage heights 4.00 and 4.16 ft; no flow for many days in 1966.

Remarks.--Records good. Water is diverted half a mile upstream for domestic use and at station for irrigation.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.06	0.89	2.0	2.5	3.4	1.1	0.93	0.55	3.4	0.98	0.98	0.43
2	.05	169	17	1.8	2.1	.87	.77	.55	1.2	.93	.93	.37
3	.03	9.4	3.5	1.9	1.6	3.4	.72	.55	.87	25	.93	.34
4	.02	3.1	2.1	4.7	1.2	1.7	.63	.55	.82	8.7	.77	.43
5	.01	1.9	11	33	1.2	1.3	.59	.51	.68	4.5	.72	.40
6	0	.98	7.3	8.4	.98	1.0	.72	.51	1.7	3.2	.72	.40
7	0	.72	3.6	7.9	.87	.87	.63	.47	.98	1.9	1.1	.34
8	0	.55	146	3.8	.98	.77	.63	.51	.68	1.4	2.6	.28
9	.01	.47	11	2.2	.98	.72	.68	.63	.59	1.2	1.0	.31
10	.05	.40	4.6	1.2	.87	.63	1.1	.59	.55	1.2	.82	.25
11	.09	1.8	12	.93	.82	.59	3.1	2.5	.51	1.4	.72	.34
12	.37	1.6	6.8	.93	.97	.59	4.7	.93	.72	2.7	.77	.34
13	.43	1.8	4.3	1.6	.93	.55	1.7	.63	.77	1.4	.72	.82
14	.20	3.8	3.5	1.6	1.0	.55	1.2	.72	.98	24	.63	.47
15	.10	2.5	2.8	1.5	.87	.51	19	.59	.77	3.8	.63	.93
16	.10	25	2.4	2.3	.98	8.4	2.9	.55	4.3	3.1	.59	1.2
17	.08	3.3	3.2	1.4	2.1	2.2	1.3	.59	6.4	2.5	.55	.59
18	.08	1.6	3.6	1.3	1.9	16	.93	.68	8.7	2.2	.55	1.3
19	.08	.98	3.5	1.2	1.1	6.6	.87	.59	26	1.6	.51	.82
20	.12	1.3	2.8	1.0	2.0	2.7	1.1	.51	6.2	1.5	.47	3.4
21	.14	1.7	3.2	1.1	1.6	1.6	.93	.55	3.1	1.3	.59	2.9
22	.14	1.9	3.2	1.6	1.5	1.2	.82	.63	2.1	3.7	.51	3.6
23	.23	8.9	2.5	2.2	1.4	2.8	.98	.63	1.4	3.3	.47	8.1
24	.12	21	2.0	11	1.6	2.3	.82	.98	1.2	1.6	.47	3.4
25	1.0	4.6	1.7	7.6	1.3	2.2	.77	.77	1.0	2.0	.43	35
26	.31	2.0	1.6	2.5	3.0	1.5	.87	.63	.87	14	.40	4.8
27	.18	1.3	1.6	1.6	3.0	1.2	.72	.55	.82	3.4	1.0	5.0
28	.12	.98	1.6	1.6	1.6	1.1	.68	2.9	.98	1.9	.68	2.7
29	.12	.77	1.9	1.2	1.1	.93	.68	---	.77	1.3	.72	1.7
30	.18	2.3	2.6	1.0	1.4	.87	.68	---	.68	1.1	.51	1.7
31	.55	3.4	---	1.0	---	.82	.59	---	1.5	---	.47	---
Total	4.97	279.94	274.9	113.56	44.35	67.57	52.74	21.35	81.24	126.81	22.96	82.66
Mean	0.160	9.03	9.16	3.66	1.48	2.18	1.70	0.762	2.62	4.23	0.741	2.76
Ac-ft	9.9	555	545	225	88	134	105	42	161	252	46	164
Max	1.0	169	146	33	3.4	16	19	2.9	26	25	2.6	35
Min	0	0.40	1.6	0.93	0.82	0.51	0.59	0.47	0.51	0.93	0.40	0.25

Calendar year 1966: Max 169 Min 0 Mean 2.20 Ac-ft 1,600
Fiscal year 1966-67: Max 169 Min 0 Mean 3.21 Ac-ft 2,330

Peak discharge (base, 350 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8- 2	0800	3.01	578	9- 8	0630	3.63	1,410

16-8350. Inarajan River near Inarajan

Location.--Lat 13°16'40" N., long 144°44'15" E., on right bank 0.6 mile northwest of Inarajan and 4.9 miles east of Merizo.

Drainage area.--4.49 sq mi.

Records available.--September 1952 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Average discharge.--14 years (1953-67), 17.0 cfs.

Extremes.--Maximum gage height during year, 12.62 ft Sept. 8 (discharge not determined); minimum discharge, 1.2 cfs July 19.
1952-67: Maximum gage height, 12.90 ft Oct. 11, 1963 (discharge not determined); minimum discharge, 0.99 cfs July 14, 1959.

Remarks.--Records good. Stage-discharge relation not determined above gage height 11.0 ft owing to ungaged overbank flow. Village of Inarajan diverts about 40,000 gallons a day above station for domestic use.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.6	10	12	26	16	7.8	7.5	4.8	10	6.0	7.8	6.0
2	1.6	532	53	19	14	7.5	7.2	4.8	5.5	6.3	7.5	5.0
3	1.6	50	20	21	10	20	6.3	4.6	5.5	141	7.5	4.6
4	1.6	12	20	33	9.4	8.4	5.8	4.6	4.8	50	7.2	5.8
5	2.0	9.0	48	109	9.7	6.9	5.8	4.4	4.4	22	7.2	5.0
6	1.6	6.6	26	59	9.4	6.9	6.3	4.0	6.4	13	6.9	5.5
7	1.6	5.0	16	28	9.4	6.6	6.0	4.0	4.6	9.7	9.7	5.0
8	1.7	4.5	530	22	9.1	6.6	5.8	4.2	4.2	9.4	28	4.4
9	1.9	4.0	163	19	8.1	6.3	6.3	5.2	4.0	8.8	9.1	4.2
10	1.7	3.6	254	16	8.4	6.0	8.8	4.6	3.8	8.4	8.4	4.0
11	2.2	3.4	100	18	7.8	5.2	20	17	3.8	7.2	8.1	5.2
12	4.0	3.3	70	15	8.8	4.8	15	6.3	5.5	32	7.5	4.4
13	4.7	5.2	50	14	8.1	4.8	9.1	5.2	5.2	9.7	7.5	9.8
14	1.8	7.0	40	14	8.4	4.6	8.1	5.8	5.0	180	7.2	4.8
15	1.7	5.4	35	13	7.5	4.4	85	5.2	4.2	13	6.9	7.5
16	1.7	15	50	16	8.1	30	11	4.6	13	10	6.9	7.2
17	1.6	5.5	45	12	11	9.1	8.4	5.0	13	13	6.0	6.0
18	1.6	3.0	40	11	9.4	151	7.5	5.8	28	12	6.0	9.0
19	1.4	4.7	30	11	7.5	20	6.6	4.4	63	9.7	5.8	13
20	2.6	5.7	30	10	13	13	7.8	4.0	15	12	5.8	26
21	1.9	3.2	70	10	8.4	10	6.0	4.2	12	9.7	6.0	14
22	2.2	2.8	45	14	8.8	9.1	5.8	5.0	9.1	19	5.5	17
23	2.0	76	35	26	10	16	7.5	4.6	7.5	12	5.2	30
24	1.7	65	30	87	9.1	12	5.5	6.0	7.2	9.4	5.0	16
25	1.6	22	25	30	7.8	11	5.2	4.6	7.8	12	5.0	180
26	1.4	15	20	15	18	9.1	7.2	4.2	6.3	69	5.0	17
27	1.4	11	20	13	11	7.8	5.5	4.0	6.3	14	12	49
28	1.4	11	20	14	8.4	9.4	5.2	12	7.2	9.7	5.8	14
29	1.4	8.8	50	11	7.5	7.5	5.8	----------	6.0	9.1	6.6	11
30	4.1	16	30	10	12	6.9	5.5	----------	5.5	8.4	5.0	12
31	4.8	16	----------	10	---------	6.9	5.0	----------	8.8	---------	4.8	----------
Total	64.1	941.7	1,977	726	294.1	435.6	308.5	153.1	292.6	745.5	232.9	502.4
Mean	2.07	30.4	65.9	23.4	9.80	14.1	9.95	5.47	9.44	24.8	7.51	16.7
Ac-ft	127	1,870	3,920	1,440	583	864	612	304	580	1,480	462	996
Max	4.8	532	530	109	18	151	85	17	63	180	28	180
Min	1.4	2.8	12	10	7.5	4.4	5.0	4.0	3.8	6.0	4.8	4.0

Calendar year 1966: Max 532 Min 1.2 Mean 13.1 Ac-ft 9,510
Fiscal year 1966-67: Max 532 Min 1.4 Mean 18.3 Ac-ft 13,240

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge
9-8	0700	12.62	-

16-8400. Paululuc River near Inarajan

Location.--lat 13°17'05" N., long 144°45'00" E., on right bank 0.3 mile upstream from mouth, 0.9 mile northeast of Inarajan, and 3.8 miles south of Talofofo.

Drainage area.--1.86 sq mi.

Records available.--October 1952 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Average discharge.--14 years (1953-67), 5.80 cfs.

Extremes.--Maximum discharge during year, 958 cfs Sept. 8 (gage height, 7.12 ft), from rating curve extended above 210 cfs as indicated below; minimum, 0.29 cfs July 4, 19.
1952-67: Maximum discharge, 2,980 cfs Oct. 15, 1953 (gage height, 13.11 ft), from rating curve extended above 210 cfs by logarithmic plotting; minimum, 0.15 cfs May 16, 21-23, 29, 1966.

Remarks.--Records fair. No diversion above station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.41	2.3	3.5	12	5.0	2.6	2.0	1.9	3.0	2.0	2.8	2.6
2	.38	122	26	7.3	4.5	2.6	2.1	1.7	2.0	2.0	2.5	2.2
3	.44	13	6.1	10	3.5	10	2.0	1.5	1.7	20	2.4	2.0
4	.44	4.9	7.3	12	3.0	3.0	1.8	1.4	1.5	10	2.4	2.2
5	.38	3.4	13	51	3.0	2.5	1.7	1.3	1.4	7.0	2.2	2.0
6	.35	2.5	7.7	19	3.0	2.5	1.6	1.2	2.0	4.0	2.1	2.2
7	.35	2.0	4.9	11	3.0	2.5	1.5	1.2	1.5	3.0	2.6	2.2
8	.35	1.7	171	8.5	3.0	2.0	1.6	1.2	1.3	3.0	8.0	2.1
9	.50	1.5	31	7.0	2.6	2.0	1.7	1.2	1.3	2.5	2.9	2.0
10	.54	1.3	63	6.1	2.6	2.0	2.1	1.2	1.2	2.5	2.6	1.7
11	.66	1.2	24	5.8	2.5	1.5	5.9	7.3	1.5	2.5	2.5	1.6
12	1.3	1.2	20	5.5	3.2	1.5	9.7	2.8	1.7	10	2.4	1.6
13	1.2	2.3	13	4.7	2.8	1.5	3.2	1.8	1.7	3.0	2.4	1.6
14	.83	2.9	8.9	4.4	2.9	1.5	2.8	1.7	1.5	35	2.0	1.6
15	.70	1.5	7.3	4.0	2.9	2.0	12	1.7	1.5	4.0	2.1	1.7
16	.58	1.3	27	5.0	3.0	10	3.9	1.6	4.0	3.0	2.0	1.7
17	.50	1.2	14	4.0	3.5	3.4	3.0	1.5	6.0	3.5	1.8	2.0
18	.47	1.2	9.7	3.5	3.0	19	2.8	1.4	10	4.1	1.7	3.7
19	.32	5.0	8.1	3.5	2.5	6.4	2.5	1.3	15	3.2	1.5	2.5
20	.38	8.0	8.9	3.5	4.0	3.7	2.5	1.2	5.0	4.3	1.5	4.3
21	.35	4.1	49	3.5	2.5	3.0	2.4	1.4	4.0	3.5	1.5	3.2
22	.50	2.1	14	5.0	3.0	2.8	2.2	1.5	3.0	3.4	1.5	4.5
23	.41	25	8.9	10	3.5	3.7	2.2	1.5	2.5	3.2	1.4	6.4
24	.44	32	7.3	30	3.0	3.7	2.2	2.0	2.5	2.9	1.4	5.5
25	.44	7.7	6.1	10	2.5	3.0	2.1	1.5	2.5	4.5	1.3	37
26	.44	4.5	5.5	5.0	6.0	2.9	2.2	1.5	2.0	21	1.4	6.1
27	.44	3.4	4.9	4.5	3.5	2.8	2.1	1.5	2.0	4.5	5.3	9.1
28	.47	3.2	4.5	4.5	3.0	3.0	2.1	4.1	2.5	3.5	2.8	3.9
29	.38	2.8	16	4.0	2.5	2.8	2.1	----------	2.0	3.2	4.5	3.2
30	.47	4.5	16	3.5	4.0	2.6	2.1	----------	2.0	3.0	2.9	3.0
31	.58	6.1	----------	3.5	----------	2.1	2.1	----------	3.0	----------	2.2	----------
Total	16.00	275.8	606.6	271.3	97.0	114.6	90.2	51.1	92.8	181.3	76.6	125.4
Mean	0.516	8.90	20.2	8.75	3.23	3.70	2.91	1.82	2.99	6.04	2.47	4.18
Ac-ft	32	547	1,200	538	192	227	179	101	184	360	152	249
Max	1.3	122	171	51	6.0	19	12	7.3	15	35	8.0	37
Min	0.32	1.2	3.5	3.5	2.5	1.5	1.5	1.2	1.2	2.0	1.3	1.6

Calendar year 1966: Max 171 Min 0.16 Mean 4.07 Ac-ft 2,950
Fiscal year 1966-67: Max 171 Min 0.32 Mean 5.48 Ac-ft 3,960

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge
9-8	0600	7.12	958

Note.--No gage-height record Nov. 16 to Dec. 15, Mar. 6 to Apr. 17.

16-8470. Imong River near Agat

Location.--Lat 13°20'14" N., long 144°41'55" E., on left bank 500 ft upstream from Fena Valley Reservoir, 1.4 miles southwest of Fena Dam spillway, and 4.3 miles southeast of Agat School.

Drainage area.--1.93 sq mi.

Records available.--March 1960 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 120 ft (from topographic map).

Average discharge.--7 years, 10.4 cfs.

Extremes.--Maximum discharge during year, 1,630 cfs Aug. 23 (gage height, 6.47 ft), from rating curve extended above 110 cfs as explained below; minimum, 0.74 cfs July 3, 11.
1960-67: Maximum discharge, 3,370 cfs Oct. 19, 1960 (gage height, 10.06 ft), from rating curve extended above 110 cfs on basis of slope-area measurements at gage heights 7.46 and 10.06 ft; minimum, 0.37 cfs May 21, 22, 26, 1966.

Remarks.--Records good. No diversion above station. Continuous records of rainfall are obtained at station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.1	5.2	15	12	11	5.9	7.1	4.3	5.9	4.3	4.9	4.0
2	1.0	217	106	9.5	8.0	4.9	5.2	4.3	4.3	5.2	4.6	3.8
3	.94	25	18	44	8.5	25	4.6	4.0	4.3	81	4.6	3.8
4	1.0	10	17	15	6.7	9.0	4.6	4.0	4.0	16	4.3	3.5
5	1.1	5.9	29	257	6.7	6.3	4.3	4.0	4.0	12	4.0	3.8
6	.94	4.0	22	49	6.3	6.7	4.9	4.0	4.3	7.5	4.0	4.6
7	1.0	3.2	14	20	7.1	5.6	4.3	4.0	3.5	6.3	18	3.8
8	1.0	2.8	210	14	6.3	5.2	4.3	4.3	3.2	6.3	31	3.5
9	1.2	2.6	40	11	5.9	5.2	5.2	4.6	3.2	5.6	5.2	3.2
10	1.1	2.2	60	10	5.6	4.9	16	4.3	3.2	5.2	4.3	3.0
11	.94	43	45	11	5.6	4.6	25	14	3.5	5.2	3.8	3.2
12	1.8	15	37	9.5	30	4.6	15	5.2	4.6	10	3.8	3.2
13	2.4	10	23	8.5	10	4.3	7.5	4.6	6.0	5.6	3.8	5.3
14	1.2	16	16	8.5	15	4.3	5.6	4.6	7.5	78	3.2	3.5
15	1.0	10	13	9.0	7.1	4.3	56	4.3	4.6	8.0	3.2	3.8
16	1.4	8.0	21	10	5.9	16	9.0	4.0	10	5.9	3.8	3.8
17	1.0	5.9	20	7.5	13	6.3	6.7	3.8	19	11	4.3	3.5
18	.94	4.6	16	9.0	9.0	20	5.6	4.0	28	5.9	4.3	3.5
19	.94	4.3	12	8.0	6.3	13	5.2	3.8	67	4.9	4.0	3.8
20	1.5	5.6	11	8.5	8.9	9.5	7.5	3.8	14	9.0	4.0	5.2
21	1.2	11	27	7.5	5.9	6.7	4.9	4.0	11	5.2	4.0	4.3
22	2.2	9.8	16	99	5.9	5.9	4.9	4.0	8.0	18	4.0	6.7
23	2.4	110	12	88	7.5	8.2	7.5	7.0	6.3	7.1	3.8	8.5
24	1.5	50	10	89	13	5.9	4.9	7.8	6.3	6.3	4.0	10
25	1.4	25	9.5	32	7.1	6.3	4.9	4.9	5.6	23	3.8	43
26	1.2	15	8.5	25	9.3	5.6	4.6	4.3	5.2	39	3.8	9.5
27	1.4	10	8.0	20	7.1	5.2	4.6	4.0	4.9	9.5	5.9	9.0
28	1.4	7.0	8.0	16	5.9	6.7	4.6	6.3	5.2	6.7	4.9	5.6
29	2.2	5.0	15	11	5.2	5.6	4.6	----------	4.6	5.6	4.6	4.6
30	8.6	15	11	9.5	8.5	5.2	4.6	----------	4.0	5.6	3.8	4.3
31	5.9	25	----------	7.5	----------	4.9	4.3	----------	8.1	----------	3.8	----------
Total	52.90	683.1	870.0	935.5	258.3	231.8	258.0	136.2	273.3	418.9	169.5	181.3
Mean	1.71	22.0	29.0	30.2	8.61	7.48	8.32	4.86	8.82	14.0	5.47	6.04
Ac-ft	105	1,350	1,730	1,860	512	460	512	270	542	831	336	360
Max	8.6	217	210	257	30	25	56	14	67	81	31	43
Min	0.94	2.2	8.0	7.5	5.2	4.3	4.3	3.8	3.2	4.3	3.2	3.0

Calendar year 1966: Max 257 Min 0.42 Mean 8.97 Ac-ft 6,490
Fiscal year 1966-67: Max 257 Min 0.94 Mean 12.2 Ac-ft 8,860

Peak discharge (base, 1,400 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-23	2100	6.47	1,630	10- 5	0200	6.24	1,540
9- 8	0730	6.37	1,590	4- 3	1700	6.31	1,560

16-8480. Almagosa Springs near Agat

Location.--lat 13°20'45" N., long 144°40'45" E., on left bank 3.5 miles southeast of Agat and 3.5 miles northeast of Umatac.

Drainage area.--0.74 sq mi, hydrologic drainage boundary uncertain owing to ground-water exchange.

Records available.--September 1951 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 640 ft (from topographic map).

Average discharge.--15 years (1952-67), 3.68 cfs.

Extremes.--Maximum discharge during year, 218 cfs Aug. 2 (gage height, 3.65 ft); minimum, 0.01 cfs on several days.
1951-67: Maximum discharge, 770 cfs Oct. 15, 1953 (gage height, 5.02 ft), from rating curve extended above 53 cfs by test on model of station site; no flow at times.

Remarks.--Records good. Up to 3.9 cfs diverted above station for municipal use.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.02	1.6	6.2	4.0	1.5	1.5	0.20	0.03	0.44	0.92	1.6	0.20
2	.02	117	17	4.0	1.0	1.1	.06	.05	.29	.73	1.2	.16
3	.02	36	12	13	.40	4.2	.02	.18	.08	19	.99	.16
4	.02	14	8.8	11	.35	2.9	.01	.32	.07	18	.67	.12
5	.02	8.5	9.4	45	.37	2.3	.02	.32	.02	11	.44	.14
6	.02	4.0	11	20	.26	1.8	.02	.32	.02	7.6	.26	.18
7	.02	2.5	7.6	17	.18	1.4	.05	.29	.09	4.6	.46	.18
8	.02	1.4	87	12	.16	1.1	.16	.29	.16	3.4	7.4	.12
9	.06	.62	33	9.4	.16	.85	.05	.36	.18	2.3	2.0	.07
10	.04	.16	48	7.3	.14	.57	2.7	.26	.16	2.0	1.2	.05
11	.02	6.9	33	5.3	.12	.36	3.9	1.5	.14	1.3	.85	.03
12	.22	6.5	26	4.0	1.5	.18	9.9	.04	.16	1.4	.57	.08
13	.50	2.2	21	3.1	.73	.05	4.4	.23	.18	.85	.44	.13
14	.16	7.4	14	2.7	1.5	.02	2.7	.29	.25	26	.23	.18
15	.08	5.9	11	3.5	1.3	.04	25	.29	.03	9.1	.09	.10
16	.14	3.5	9.6	4.0	.99	3.0	11	.23	1.1	5.0	.02	.12
17	.08	2.8	10	3.0	4.6	.99	5.6	.23	6.5	4.6	.01	.06
18	.04	1.6	11	3.3	5.6	15	3.1	.20	10	2.8	.02	.05
19	.02	.79	8.8	3.1	3.1	14	2.2	.16	32	2.4	.04	.03
20	.16	.29	6.4	3.2	2.8	6.7	2.0	.12	20	2.3	.09	.14
21	.10	2.3	13	3.0	2.0	3.5	1.2	.12	11	1.8	.16	.10
22	.20	3.5	12	20	1.6	2.4	.99	.14	7.6	3.4	.20	.56
23	.22	21	9.6	18	1.8	1.8	1.4	1.7	4.6	2.9	.23	2.3
24	.18	64	7.0	16	4.5	1.4	.67	1.1	3.7	2.3	.36	5.3
25	.02	22	4.8	6.5	3.8	1.2	.52	.73	3.4	4.9	.36	15
26	.02	12	3.7	4.9	3.2	.99	.48	.20	2.7	13	.32	8.8
27	.02	7.9	2.8	4.3	2.9	.79	.36	.03	2.0	9.1	.36	4.2
28	.02	4.8	2.4	3.7	2.5	.62	.16	.07	1.8	4.8	.36	2.2
29	2.5	3.4	3.7	2.8	1.8	.44	.10	----------	1.4	3.2	.12	1.4
30	3.8	3.5	4.0	1.8	2.0	.26	.04	----------	1.1	2.5	.29	.79
31	3.5	5.6	----------	1.3	---------	.12	.03	----------	1.4	---------	.26	---------
Total	12.26	373.66	453.8	260.2	52.86	71.58	79.04	9.80	112.57	173.20	21.60	42.95
Mean	0.395	12.1	15.1	8.39	1.76	2.31	2.55	0.350	3.63	5.77	0.697	1.43
Ac-ft	24	741	900	516	105	142	157	19	223	344	43	85
Max	3.8	117	87	45	5.6	15	25	1.7	32	26	7.4	15
Min	0.02	0.16	2.4	1.3	0.12	0.02	0.01	0.03	0.02	0.73	0.01	0.03

Calendar year 1966: Max 117 Min 0 Mean 3.39 Ac-ft 2450
Fiscal year 1966-67: Max 117 Min 0.01 Mean 4.56 Ac-ft 3300

Peak discharge (base, 80 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8- 2	0800	3.65	218	3-19	1630	2.18	86
8-23	2300	3.39	184	4- 3	1800	2.26	91
9- 8	0900	3.51	199	4-14	0500	2.58	107
10- 5	0300	3.26	169				

16-8490. Fena Dam spillway near Agat

Location.--Lat 13°21'30" N., long 144°42'10" E., on left bank 4.0 miles southeast of Agat and 5.5 miles southwest of Yona.

Drainage area.--5.81 sq mi.

Records available.--September 1951 to July 1952, November 1952 to June 1967.

Gage.--Water-stage recorder and concrete-dam control. Datum of gage is 111.35 ft above mean sea level (from U.S. Navy construction plans).

Average discharge.--14 years (1953-67), 18.2 cfs.

Extremes.--Maximum discharge during year, 1,050 cfs Oct. 5 (gage height, 1.57 ft), from rating curve extended above 130 cfs on basis of broad-crested weir formula; no flow for many days.
1951-67: Maximum discharge, not determined, occurred Oct. 15, 1953 (gage height, at least 4.5 ft); no flow for many days each year.

Remarks.--Records fair. About 10 cfs is diverted from Fena Valley Reservoir and tributary springs for military and civilian use. Records represent only flow over spillway. Continuous records of rainfall are obtained at station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1			0	22	14	17	7.9	0	4.3	6.0	6.0	0
2			0	22	14	9.9	7.9	0	1.5	4.3	4.3	0
3			0	100	14	58	2.8	0	.54	153	4.3	0
4			14	41	7.9	25	.54	0	1.5	91	2.8	0
5			31	291	7.9	17	0	0	0	41	.54	0
6			28	98	7.9	12	0	0	0	17	0	0
7			12	59	7.9	12	.54	0	0	12	1.5	0
8			398	41	7.9	6.0	0	0	0	9.9	67	0
9			136	31	4.3	6.0	.54	0	0	6.0	14	0
10			201	22	6.0	6.0	28	0	0	6.0	6.0	0
11			147	22	7.9	4.3	62	0	0	2.8	4.3	0
12			117	22	28	1.5	89	1.5	0	9.9	2.8	0
13			67	17	17	1.5	22	0	0	6.0	2.8	0
14			38	17	22	.54	14	0	0	213	1.5	0
15			34	31	12	0	209	0	0	31	0	0
16			55	31	7.9	43	41	0	0	17	0	0
17			63	17	46	20	22	0	52	20	0	0
18			41	20	41	110	14	0	64	20	0	0
19			34	20	17	63	12	0	209	7.9	0	0
20			22	17	20	28	17	0	75	9.9	0	0
21			75	20	17	14	9.9	0	34	12	0	0
22			44	128	12	12	7.9	0	20	52	0	0
23			31	179	17	12	14	0	17	34	0	3.7
24			22	108	44	14	9.9	14	14	14	0	34
25			20	38	25	12	6.0	7.9	17	38	0	102
26			17	22	22	12	2.8	1.5	14	116	0	41
27			12	17	25	9.9	2.8	0	7.9	38	0	25
28			12	20	14	7.9	2.8	2.8	6.0	20	0	14
29			28	14	12	6.0	2.8	----------	6.0	14	0	7.9
30			31	14	17	2.8	.54	----------	4.3	12	0	6.0
31			----------	12	----------	1.5	0	----------	7.9	----------	0	----------
Total	0	0	1730	1513	515.6	544.84	609.66	27.7	555.94	1033.7	117.84	233.6
Mean	0	0	57.7	48.8	17.2	17.6	19.7	0.99	17.9	34.5	3.80	7.79
Ac-ft	0	0	3430	3000	1020	1080	1210	55	1100	2050	234	463
Max	0	0	398	291	46	110	209	14	209	213	67	102
Min	0	0	0	12	4.3	0	0	0	0	2.8	0	0

Calendar year 1966: Max 398 Min 0 Mean 11.8 Ac-ft 8540
Fiscal year 1966-67: Max 398 Min 0 Mean 18.9 Ac-ft 13650

16-8550. Ugum River near Talofofo

Location.--Lat 13°20'00" N., long 144°44'55" E., on left bank 0.3 mile upstream from confluence with Talofofo River, 1.3 miles south of Talofofo, and 4.2 miles north of Inarajan.

Drainage area.--6.96 sq mi.

Records available.--June 1952 to June 1967.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3.23 ft above mean sea level.

Average discharge.--15 years, 28.9 cfs.

Extremes.--Maximum discharge during year, 2,100 cfs Sept. 8 (gage height, 11.40 ft), from rating curve extended above 910 cfs as explained below; minimum, 3.4 cfs July 11, 12.
1952-67: Maximum discharge, 7,660 cfs Dec. 4, 1963 (gage height, 12.06 ft), from rating curve extended above 910 cfs on basis of slope-area measurements at gage heights 11.30, 11.36, 11.87 and 11.90 ft; minimum, 1.1 cfs July 18, 1965.

Remarks.--Records good. No diversion above station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.1	5.9	26	42	40	23	18	13	27	15	20	15
2	4.1	464	91	34	31	19	17	13	16	15	19	14
3	3.8	70	34	62	29	70	17	13	13	139	20	13
4	3.8	28	34	49	23	30	14	13	13	51	19	14
5	3.8	19	48	248	24	23	14	12	12	33	18	13
6	3.8	13	42	97	23	22	16	12	15	25	18	13
7	3.8	10	28	62	24	19	16	12	13	20	18	13
8	3.6	9.2	409	49	23	17	14	12	12	18	96	12
9	3.6	8.0	116	40	22	17	15	14	11	17	24	12
10	3.6	7.6	235	38	22	17	24	12	11	18	21	12
11	3.4	24	115	39	21	17	41	38	10	16	19	11
12	3.6	24	91	34	44	16	59	19	14	30	18	11
13	8.0	26	66	32	23	16	24	14	14	15	18	19
14	4.5	25	53	32	25	15	19	14	18	125	18	15
15	4.3	17	46	31	21	14	107	15	13	26	17	14
16	4.1	19	75	32	21	55	32	12	18	19	16	14
17	4.1	16	63	29	28	25	23	12	38	25	16	13
18	3.8	13	51	27	30	114	20	12	57	21	15	21
19	3.8	40	43	26	23	51	18	12	117	18	15	17
20	3.6	24	41	26	25	30	24	11	41	25	15	30
21	4.8	17	101	27	24	23	18	11	28	20	15	25
22	4.3	14	58	43	23	20	18	12	22	38	14	26
23	5.3	159	45	59	25	24	23	13	18	25	14	45
24	4.5	140	39	86	30	21	18	18	19	18	14	35
25	4.3	46	34	58	23	23	17	14	17	41	14	150
26	3.8	27	31	35	27	21	18	12	16	101	13	35
27	3.6	23	30	31	27	19	17	12	16	36	24	50
28	3.6	21	29	31	23	24	16	19	15	26	16	30
29	4.1	18	68	29	19	19	17	----------	15	23	20	23
30	4.3	21	45	26	30	18	16	----------	14	21	14	19
31	9.6	32	----------	25	---------	17	15	----------	20	---------	13	---------
Total	133.4	1380.7	2187	1479	773	839	725	396	683	1020	611	734
Mean	4.30	44.5	72.9	47.7	25.8	27.1	23.4	14.1	22.0	34.0	19.7	24.5
Ac-ft	265	2740	4340	2930	1530	1660	1440	785	1350	2020	1210	1460
Max	9.6	464	409	248	44	114	107	38	117	139	96	150
Min	3.4	5.9	26	25	19	14	14	11	10	15	13	11

Calendar year 1966: Max 464 Min 2.6 Mean 21.1 Ac-ft 15,280
Fiscal year 1966-67: Max 464 Min 3.4 Mean 30.0 Ac-ft 21,740

Peak discharge (base, 1,100 cfs)

Date	Time	Gage height	Discharge
9-8	0830	11.40	2,100

16-8580. Ylig River near Yona

Location.--Lat 13°23'20" N., long 144°45'00" E., on right bank 2 miles upstream from mouth, 2.1 miles southwest of Yona, and 5.8 miles south of Agana.

Drainage area.--6.58 sq mi.

Records available.--June 1952 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 20 ft (from topographic map).

Average discharge.--15 years, 27.1 cfs.

Extremes.--Maximum discharge during year, 3,270 cfs Aug. 2 (gage height, 15.30 ft), from rating curve extended above 620 cfs as explained below; minimum, 0.36 cfs July 1, 3, 4.
1952-67: Maximum discharge, 4,500 cfs Sept. 9, 1963 (gage height, 18.77 ft, from floodmarks), from rating curve extended above 620 cfs on basis of slope-area measurements at gage heights 11.24 and 15.87 ft; minimum, not determined; minimum daily, 0.10 cfs May 15 to June 14, June 16-20, 1966.

Remarks.--Records good except those for periods of no gage-height record, which are poor. No diversion above station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.36	6.2	26	24	30	12	15	8.0	12	10	15	14
2	.40	763	119	18	25	17	10	7.2	5.8	10	14	15
3	.36	134	34	31	25	50	8.0	6.8	5.5	75	17	9.0
4	.40	37	48	33	20	25	8.0	6.5	5.5	45	12	7.5
5	.73	23	38	26	20	20	8.0	6.0	4.7	25	11	120
6	.87	16	38	32	20	15	8.0	5.8	6.5	20	11	41
7	.55	13	29	33	20	15	8.0	5.5	4.9	15	10	24
8	.73	12	532	28	20	14	8.0	6.0	4.5	13	61	18
9	1.0	9.9	206	23	18	13	8.0	6.5	4.3	12	31	16
10	.94	8.6	194	21	16	12	15	5.8	4.3	10	15	14
11	1.7	9.0	124	19	16	12	15	7.5	4.1	10	13	13
12	1.2	17	86	18	35	10	15	5.8	5.3	11	12	13
13	4.3	12	65	17	17	10	11	5.3	5.1	11	11	39
14	2.1	11	45	17	20	10	10	6.2	5.3	68	11	15
15	1.3	9.3	34	74	15	9.0	150	5.5	4.7	15	9.9	14
16	1.1	9.6	44	29	15	40	24	5.1	8.0	13	9.3	14
17	.87	12	87	21	20	20	19	5.1	26	14	8.6	13
18	.73	14	45	21	25	80	15	5.3	56	12	8.0	15
19	.73	14	32	18	18	45	15	4.7	150	11	7.5	12
20	.73	22	28	15	20	25	15	4.5	100	13	7.2	15
21	.87	17	81	17	20	20	12	5.1	60	12	6.8	16
22	.94	14	42	141	18	15	10	5.8	35	21	6.8	23
23	.73	15	31	74	20	15	12	5.5	25	15	6.5	166
24	.60	23	26	78	25	15	10	6.8	20	10	6.2	45
25	.55	23	21	41	18	15	10	7.0	20	15	6.0	63
26	1.8	23	20	33	20	15	10	5.1	15	145	5.8	32
27	1.2	20	18	29	20	15	9.0	4.7	15	30	6.0	52
28	.94	16	16	25	20	15	9.0	5.5	15	22	6.5	28
29	1.0	15	25	25	15	10	10	----------	13	19	15	24
30	22	15	31	20	17	10	9.0	----------	12	17	8.0	21
31	25	17	----------	20	---------	9.0	9.0	----------	11	---------	6.5	----------
Total	76.73	1350.6	2165	1021	608	608.0	495.0	164.6	663.5	719	374.6	911.5
Mean	2.48	43.6	72.2	32.9	20.3	19.6	16.0	5.88	21.4	24.0	12.1	30.4
Ac-ft	152	2680	4290	2030	1210	1210	982	326	1320	1430	743	1810
Max	25	763	532	141	35	80	150	8.0	150	145	61	166
Min	0.36	6.2	16	15	15	9.0	8.0	4.5	4.1	10	5.8	7.5

Calendar year 1966: Max 763 Min 0.10 Mean 16.4 Ac-ft 11910
Fiscal year 1966-67: Max 763 Min 0.36 Mean 25.1 Ac-ft 18160

Peak discharge (base, 2,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-2	0900	15.30	3,270	9-8	1300	12.32	2,340

Note.--No gage-height record Oct. 28 to Jan. 12, Mar. 19 to Apr. 25.

16-8650. Pago River near Ordot

Location.--Lat 13°26'10" N., long 144°45'15" E., on left bank 0.8 mile south of Ordot, 2.5 miles south of Agana, and 3.6 miles southeast of Asan.

Drainage area.--6.17 sq mi.

Records available.--September 1951 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 25 ft (from topographic map).

Average discharge.--15 years (1952-67), 24.9 cfs.

Extremes.--Maximum discharge during year, 3,220 cfs Sept. 8 (gage height, 11.96 ft), from rating curve extended above 320 cfs as explained below; no flow July 4.
1951-67: Maximum discharge, 9,470 cfs Aug. 2, 1962 (gage height, 18.87 ft, from floodmarks), from rating curve extended above 320 cfs on basis of slope-area measurements at gage heights 13.22, 15.07 and 18.87 ft; no flow June 5-7, 10-23, 1959, Apr. 29 to June 13, June 17-19, July 4, 1966.

Remarks.--Records good except those for period of no gage-height record, which are fair. No diversion above station.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.07	1.5	26	19	20	10	12	7.0	6.1	7.9	10	46
2	.04	613	64	15	15	16	8.4	6.1	4.3	7.9	8.9	17
3	.02	98	28	28	15	51	7.0	6.1	4.0	19	14	10
4	0	23	55	19	12	20	7.0	6.6	4.0	33	8.9	10
5	.02	13	40	100	12	17	7.0	5.3	3.6	19	7.9	165
6	.02	8.9	41	60	12	15	7.0	4.6	5.3	14	7.4	65
7	.01	7.9	28	35	12	14	7.0	4.9	4.3	11	7.4	28
8	.07	6.1	504	25	12	12	6.6	4.6	4.0	10	38	18
9	.42	4.6	131	20	10	11	6.6	6.1	4.0	8.4	29	14
10	.23	4.3	409	20	10	10	14	4.9	4.0	8.4	12	10
11	.10	4.0	100	20	10	10	13	7.0	3.6	7.9	10	9.4
12	.35	4.9	69	17	20	9.4	10	5.3	3.6	8.4	8.9	8.4
13	2.3	5.3	55	15	12	8.9	9.4	4.9	4.0	7.9	8.4	7.4
14	.68	7.4	40	15	13	7.9	8.4	5.3	4.3	16	7.4	7.0
15	.68	5.3	30	15	10	7.4	67	5.7	4.0	10	7.0	7.0
16	.78	4.9	40	16	10	59	20	4.9	4.3	7.9	7.0	7.4
17	.49	12	78	15	15	18	14	4.6	16	7.9	6.1	7.4
18	.35	27	50	13	15	34	13	4.3	90	7.9	6.1	7.4
19	.18	14	34	13	12	40	10	3.6	132	7.4	6.1	7.9
20	.14	30	28	13	13	22	9.4	3.1	63	6.6	5.7	10
21	.42	29	83	15	12	17	8.4	3.3	41	7.4	6.1	12
22	.68	18	41	20	12	14	7.9	4.3	25	26	5.7	14
23	.29	37	30	30	12	13	10	4.0	18	16	5.3	69
24	.18	147	26	40	15	12	8.4	4.6	16	10	5.3	36
25	.35	42	20	30	12	12	7.9	4.9	16	9.4	5.3	49
26	2.1	25	19	20	15	11	7.9	4.0	13	68	4.9	26
27	.68	20	18	15	15	10	7.4	3.6	11	23	7.9	37
28	.42	16	16	15	12	11	7.4	4.3	13	15	14	20
29	.35	15	21	15	10	9.4	8.9	----------	10	13	22	16
30	1.9	14	26	12	15	8.4	7.4	----------	9.4	11	8.4	15
31	3.6	18	----------	15	---------	7.9	7.4	----------	8.4	---------	7.0	---------
Total	17.92	1,276.1	2,150	720	390	518.3	345.8	137.9	549.2	425.3	308.1	756.3
Mean	0.578	41.2	71.7	23.2	13.0	16.7	11.2	4.92	17.7	14.2	9.94	25.2
Ac-ft	36	2,530	4,260	1,430	774	1,030	686	274	1,090	844	611	1,500
Max	3.6	613	504	100	20	59	67	7.0	132	68	38	165
Min	0	1.5	16	12	10	7.4	6.6	3.1	3.6	6.6	4.9	7.0

Calendar year 1966: Max 613 Min 0 Mean 14.1 Ac-ft 10,230
Fiscal year 1966-67: Max 613 Min 0 Mean 20.8 Ac-ft 15,060

Peak discharge (base, 2,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-2	0830	11.14	2,930	9-8	1300	11.96	3,220

Note.--No gage-height record Oct. 5 to Dec. 2.

16-8752. Benoki-gawa at Benoki

Location.--Iat 26°47'06" N., long 128°14'59" E., on left bank 0.9 mile southeast of Benoki and 1.6 miles east of Sate.

Drainage area.--3.8 sq mi, approximately.

Records available.--December 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 220 ft (from topographic map).

Extremes.--Maximum discharge during year, 3,680 cfs Aug. 22 (gage height, 8.70 ft); minimum, 3.8 cfs May 18-20.
1963-67: Maximum discharge, 6,700 cfs May 12, 1966 (gage height, 10.45 ft), from rating curve extended above 2,400 cfs by logarithmic plotting; minimum, 3.5 cfs Jan. 14-16, 1966.
Minimum discharge known, 3.20 cfs Oct. 30, 1963, result of discharge measurement.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	16	8.0	12	16	10	7.9	174	8.0	6.5	4.5	5.6	20
2	44	7.7	34	16	7.2	8.1	33	72	6.3	4.4	5.1	14
3	28	7.2	13	15	5.7	7.9	26	37	6.2	4.3	5.1	16
4	160	7.0	12	14	5.6	7.4	23	13	6.2	4.6	5.1	64
5	28	6.8	11	13	9.8	37	21	11	19	4.4	4.6	432
6	64	6.6	11	13	71	28	19	9.9	12	5.7	4.8	293
7	41	6.4	10	12	23	16	20	9.5	8.2	6.2	5.0	241
8	26	7.4	9.5	12	8.2	24	17	9.2	7.5	7.4	4.8	158
9	22	6.8	41	11	7.0	18	16	8.9	7.0	15	4.6	91
10	20	6.2	39	11	8.3	16	16	8.6	6.9	6.8	4.4	47
11	18	6.6	16	10	6.9	14	16	13	6.8	5.8	4.2	35
12	17	9.9	14	9.7	6.2	64	24	9.0	6.3	6.4	4.1	48
13	16	10	13	9.3	6.2	20	16	8.4	6.2	6.4	4.6	297
14	15	11	12	9.0	8.1	17	15	15	6.0	5.4	8.7	51
15	14	8.8	12	9.2	6.2	15	14	15	5.9	5.0	6.6	35
16	14	7.0	11	8.6	5.7	16	14	10	5.7	4.6	4.9	108
17	13	26	11	8.1	5.8	14	13	9.2	5.7	4.4	4.2	48
18	13	14	10	7.9	5.7	13	12	8.8	6.5	4.3	4.0	34
19	12	76	9.2	7.6	5.4	13	12	8.2	5.6	5.8	3.9	28
20	11	38	10	7.5	22	12	11	8.0	5.3	20	9.0	25
21	11	69	9.8	7.1	13	17	11	7.7	6.7	7.4	149	22
22	10	362	284	6.9	8.0	14	11	7.5	5.6	5.8	27	21
23	10	27	356	6.8	6.9	29	10	7.7	5.1	5.4	13	20
24	9.6	25	103	6.6	6.5	19	9.9	7.6	5.0	6.0	11	18
25	9.3	18	40	6.4	67	185	9.6	9.1	4.8	6.8	63	17
26	8.9	16	28	6.3	17	82	9.3	7.4	4.8	5.3	19	16
27	9.2	15	24	6.2	12	34	9.0	6.9	4.8	5.0	15	15
28	10	14	21	7.1	9.5	27	8.8	6.6	4.9	5.0	13	15
29	8.8	12	19	6.0	8.6	23	9.5	----------	5.3	15	11	14
30	8.4	12	18	5.7	9.9	21	8.4	----------	4.6	6.4	10	13
31	8.4	11	----------	5.7	----------	19	8.1	----------	4.5	----------	34	----------
Total	695.6	858.4	1,213.5	290.7	392.4	838.3	616.6	352.2	201.9	199.5	468.3	2,256
Mean	22.4	27.7	40.4	9.38	13.1	27.0	19.9	12.6	6.51	6.65	15.1	75.2
Ac-ft	1,380	1,700	2,410	577	778	1,660	1,220	699	400	396	929	4,470
Max	160	362	356	16	71	185	174	72	19	20	149	432
Min	8.4	6.2	9.2	5.7	5.4	7.4	8.1	6.6	4.5	4.3	3.9	13

Calendar year 1966 Max 720 Min 3.6 Mean 30.6 Ac-ft 22170
Fiscal year 1966-67: Max 432 Min 3.9 Mean 23.0 Ac-ft 16630

Peak discharge (base, 1,300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-22	0100	8.70	3,680	6- 5	0030	7.67	2,470
9-22	2100	6.70	1,580	6-13	1030	8.10	2,940
9-23	1730	6.38	1,350				

16-8755. Yona-gawa at Yona

Location.--Lat 26°45'10" N., long 128°13'18" E., on left bank 0.9 mile southeast of Yona and 2.7 miles east of Nentona School.

Drainage area.--1.7 sq mi, approximately.

Records available.--December 1963 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 150 ft (from topographic map).

Extremes.--Maximum discharge during year, 1,350 cfs June 13 (gage height, 4.96 ft), from rating curve extended above 350 cfs; minimum, 2.1 cfs Apr. 3-6.
1963-67: Maximum discharge, 1,550 cfs May 12, 1966 (gage height, 5.27 ft), from rating curve extended above 350 cfs; minimum, 2.0 cfs on several days in 1964.

Remarks.--Records good except those above 700 cfs, which are fair. No diversion above station. Daily sediment samples and continuous records of rainfall are obtained at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.5	3.6	6.1	8.3	4.3	3.4	56	3.2	2.8	2.2	3.6	11
2	16	3.4	31	7.6	3.4	3.2	16	23	2.8	2.2	3.2	8.3
3	14	3.4	9.5	6.8	2.8	3.2	12	11	2.6	2.1	3.4	10
4	20	3.2	7.9	6.5	2.8	3.0	10	5.1	2.6	2.4	3.4	49
5	10	3.2	7.2	6.2	5.0	13	9.1	4.4	12	2.2	2.8	117
6	26	3.2	6.8	6.2	25	10	7.9	4.1	6.5	2.4	2.8	112
7	19	3.0	6.2	5.6	9.3	7.2	7.9	3.8	4.4	2.4	2.8	85
8	12	3.0	5.9	5.4	4.1	13	6.8	4.1	3.8	4.4	3.8	52
9	10	2.8	5.9	5.4	3.6	9.1	6.2	3.6	3.6	6.2	3.4	36
10	9.1	2.8	6.5	5.1	4.8	7.6	5.9	3.6	3.4	3.0	2.8	22
11	8.3	3.0	5.6	4.8	3.6	6.2	6.4	4.4	3.4	2.6	2.6	17
12	7.9	5.4	9.5	4.6	3.4	18	10	3.6	3.2	2.4	2.4	20
13	7.2	6.2	6.5	4.4	3.2	8.7	6.2	3.4	3.2	2.8	2.4	126
14	6.5	7.9	5.6	4.4	3.6	7.2	5.6	6.4	3.0	2.6	3.4	30
15	6.2	4.8	5.4	4.6	3.0	6.2	5.4	4.8	3.0	2.4	10	21
16	5.9	3.6	5.1	4.1	3.0	8.3	5.1	3.8	2.8	2.4	3.8	50
17	5.6	16	5.6	3.8	3.4	5.9	4.8	3.6	2.8	2.2	3.0	27
18	5.4	7.9	4.8	3.6	3.0	5.9	4.6	3.4	3.4	2.2	2.6	20
19	5.1	50	4.4	3.6	3.0	5.6	4.6	3.4	2.8	3.2	2.6	16
20	4.8	24	5.1	3.6	3.6	5.4	4.4	3.2	2.8	13	5.6	14
21	4.8	25	6.0	3.4	3.2	5.6	4.4	3.2	3.3	4.1	39	12
22	4.6	103	138	3.4	2.8	4.8	4.1	3.2	2.8	3.2	12	11
23	4.6	20	170	3.2	2.6	5.4	4.1	3.4	2.6	3.0	7.9	10
24	4.4	14	54	3.2	2.6	5.4	3.8	3.4	2.4	3.2	6.8	9.1
25	4.1	11	26	3.2	24	42	3.8	4.4	2.4	3.6	15	8.3
26	4.1	9.1	18	3.0	7.6	21	3.6	3.4	2.4	2.8	10	7.6
27	4.1	7.9	14	3.0	4.6	13	3.6	3.2	2.4	2.6	8.3	7.2
28	6.2	8.7	12	3.0	4.1	10	3.4	3.0	2.6	2.8	6.8	6.8
29	4.4	6.8	10	3.0	3.6	9.1	3.8	----------	2.6	12	6.2	6.5
30	3.8	6.2	9.1	3.0	4.1	7.9	3.4	----------	2.4	4.1	5.6	6.2
31	3.6	5.9	---------	2.8	---------	7.9	3.2	----------	2.2	---------	16	---------
Total	256.2	378.0	607.7	138.8	157.1	282.2	236.1	133.1	103.0	106.7	204.0	928.0
Mean	8.26	12.2	20.3	4.48	5.24	9.10	7.62	4.75	3.32	3.56	6.58	30.9
Ac-ft	508	750	1,210	275	312	560	468	264	204	212	405	1,840
Max	26	103	170	8.3	25	42	56	23	12	13	39	126
Min	3.6	2.8	4.4	2.8	2.6	3.0	3.2	3.0	2.2	2.1	2.4	6.2

Calendar year 1966: Max 221 Min 2.2 Mean 13.3 Ac-ft 9,640
Fiscal year 1966-67: Max 170 Min 2.1 Mean 9.67 Ac-ft 7,000

Peak discharge (base, 700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-22	0100	4.46	1,050	6-13	0900	4.96	1,350
9-22	2200	4.01	805				

16-8762. Takazato-gawa near Hama

Location.--Lat 26°41'10" N., long 128°10'48" E., on right bank 2.3 miles southeast of Hama and 3.0 miles south of Okuma.

Drainage area.--0.9 sq mi, approximately.

Records available.--December 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 400 ft (from topographic map).

Extremes.--Maximum discharge during year, 998 cfs June 13 (gage height, 5.77 ft), from rating curve extended above 40 cfs as explained below; minimum, 1.0 cfs Apr. 16-19.
1963-67: Maximum discharge, 1,150 cfs June 16, 1964 (gage height, 6.10 ft), from rating curve extended above 44 cfs on basis of slope-area measurement at gage height 5.45 ft; minimum, 0.76 cfs Dec. 2, 4-8, 1964.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.0	2.1	3.6	4.2	2.3	2.1	14	1.6	1.4	1.2	1.9	3.7
2	7.7	2.1	9.7	3.9	1.8	1.8	6.7	6.5	1.4	1.2	1.6	3.0
3	7.1	2.1	4.8	3.6	1.6	1.6	5.5	4.2	1.4	1.4	2.8	5.2
4	7.7	2.1	4.5	3.3	1.4	1.6	5.0	2.5	1.4	1.9	2.5	15
5	6.3	1.8	4.2	3.0	1.8	4.1	4.2	2.1	5.5	1.4	2.1	21
6	13	1.8	3.9	3.0	18	3.9	4.0	1.9	3.4	1.4	1.9	26
7	8.1	1.8	3.3	2.8	3.3	3.3	3.7	1.9	2.5	1.4	1.9	20
8	6.0	1.8	3.0	2.8	1.8	6.2	3.4	2.1	2.1	2.3	2.6	13
9	4.9	1.6	3.0	2.6	1.6	4.8	3.2	1.9	2.1	2.5	2.5	10
10	4.3	2.2	2.8	2.3	3.0	3.9	3.0	1.9	2.1	1.6	2.1	7.6
11	3.7	1.6	2.8	2.3	2.1	3.3	3.4	2.5	1.9	1.4	1.9	6.4
12	3.4	3.1	3.0	2.3	1.8	4.2	4.4	1.9	1.9	1.2	1.6	6.1
13	3.4	3.7	2.8	2.1	1.6	3.3	3.2	1.9	1.6	1.2	2.1	49
14	3.4	4.6	4.0	2.1	1.8	2.8	3.0	3.3	1.6	1.2	2.1	23
15	3.2	2.9	2.8	2.3	1.6	2.6	2.8	2.8	1.6	1.2	2.6	18
16	3.2	1.8	2.6	2.3	1.4	4.2	2.5	2.1	1.6	1.0	2.1	31
17	2.9	18	2.8	2.1	1.6	2.8	2.5	1.9	1.4	1.0	1.9	16
18	2.9	4.8	2.6	2.1	1.6	2.6	2.5	1.9	1.9	1.0	1.6	11
19	2.6	12	2.3	1.8	1.4	2.3	2.5	1.9	1.6	1.5	1.4	9.1
20	2.6	12	2.3	1.8	1.6	2.3	2.3	1.6	1.4	4.2	2.8	7.6
21	2.6	18	2.8	1.8	1.4	2.3	2.3	1.6	1.9	1.9	12	6.8
22	2.4	30	30	1.6	1.4	2.1	2.3	1.6	1.6	1.4	5.5	6.0
23	2.4	10	37	1.6	1.2	2.1	2.1	1.9	1.4	1.2	3.7	5.6
24	2.4	7.3	19	1.8	1.2	2.1	2.1	1.6	1.2	1.4	3.2	4.8
25	2.1	6.2	11	1.6	6.0	8.4	2.1	2.1	1.2	1.6	4.0	4.8
26	2.1	4.8	8.1	1.4	3.6	6.2	2.1	1.6	1.2	1.2	3.7	4.0
27	2.1	4.5	6.9	1.4	2.6	4.8	1.9	1.6	1.4	1.2	3.0	3.7
28	2.6	3.9	5.8	1.4	2.3	4.2	1.9	1.4	1.6	2.0	2.8	3.7
29	2.4	3.6	5.2	1.4	2.1	3.6	2.1	----------	1.4	5.3	2.5	3.4
30	2.1	3.0	4.5	1.4	2.6	3.3	1.9	----------	1.2	2.3	2.5	3.4
31	2.4	3.0	----------	1.4	----------	3.3	1.6	----------	1.2	---------	4.5	----------
Total	128.0	178.2	201.1	69.5	77.5	106.1	104.2	61.8	55.1	50.7	89.4	347.9
Mean	4.13	5.75	6.70	2.24	2.58	3.42	3.36	2.21	1.78	1.69	2.88	11.6
Ac-ft	254	353	399	138	154	210	207	123	109	101	177	690
Max	13	30	37	4.2	18	8.4	14	6.5	5.5	5.3	12	49
Min	2.1	1.6	2.3	1.4	1.2	1.6	1.6	1.4	1.2	1.0	1.4	3.0

Calendar year 1966: Max 96 Min 0.97 Mean 5.99 Ac-ft 4,340
Fiscal year 1966-67: Max 49 Min 1.0 Mean 4.03 Ac-ft 2,910

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-17	0630	3.82	335	6-16	1800	3.82	335
6-13	0930	5.77	998				

16-8770. Right Branch of South Fork Henan-gawa near Tsuha

Location.--Lat 26°37'42" N., long 128°05'52" E., on right bank 1.6 miles upstream from Henan-gawa bridge at Highway 1 and 1.6 miles south of Tsuha.

Drainage area.--0.7 sq mi, approximately.

Records available.--November 1963 to June 1967.

Gage.--Water-stage recorder and since May 14, 1965, concrete control. Altitude of gage is 50 ft (from topographic map).

Extremes.--Maximum discharge during year, 821 cfs June 13 (gage height, 4.32 ft), from rating curve extended above 150 cfs on basis of slope-area measurement of gage height 5.46 ft; minimum, 0.60 cfs Apr. 16-19.
1963-67: Maximum discharge, 1,600 cfs June 16, 1964 (gage height, 6.47 ft), from rating curve extended above 38 cfs; minimum, 0.35 cfs Dec. 1, 1963.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.4	1.2	1.7	2.3	2.7	0.88	37	1.1	0.83	0.78	0.83	3.0
2	3.2	1.2	10	2.2	1.8	.88	4.8	4.5	.83	.78	.73	1.9
3	2.8	1.1	2.5	1.9	1.6	.88	3.5	2.3	.83	.83	1.1	2.0
4	5.6	1.1	2.2	1.8	1.7	.88	2.9	1.2	.83	.88	.93	30
5	2.5	1.0	2.0	1.7	2.8	1.7	2.6	1.1	2.0	.69	.73	39
6	16	1.0	1.8	1.6	19	2.1	2.4	1.0	1.3	.73	.69	46
7	6.0	1.0	1.7	1.6	3.7	1.6	2.3	.99	.99	.69	.69	26
8	3.4	1.0	1.6	1.5	1.5	7.2	2.0	1.0	.88	.78	2.0	8.8
9	2.9	1.0	1.7	1.6	1.2	2.5	1.9	.99	.88	.88	.99	6.2
10	2.6	1.0	1.7	1.5	3.0	1.8	1.8	.99	.83	.69	.73	4.6
11	2.5	1.2	1.6	1.5	1.5	1.6	1.9	1.0	.83	.83	.69	3.8
12	2.4	2.5	1.5	1.4	1.2	1.6	2.2	.93	.78	.83	.65	3.8
13	2.3	1.9	3.2	1.4	1.2	1.4	1.6	.88	.78	.78	2.8	39
14	2.3	4.7	2.3	1.3	1.2	1.3	1.6	1.7	.78	.73	8.8	6.2
15	2.2	2.2	2.5	1.4	1.0	1.2	1.5	1.2	.78	.69	2.2	4.4
16	2.0	1.3	2.3	1.3	.99	2.0	1.4	.93	.78	.65	1.2	25
17	1.9	6.0	1.8	1.2	.99	1.4	1.4	.93	.78	.60	.99	8.5
18	1.9	2.7	1.7	1.2	.99	1.3	1.4	.93	.88	.60	.88	5.3
19	1.8	9.3	1.6	1.1	.93	1.3	1.3	.88	.78	.88	.83	4.2
20	1.7	9.0	1.5	1.1	.99	1.4	1.3	.88	.78	3.2	3.2	3.5
21	1.7	6.5	1.6	1.1	.93	1.6	1.3	.88	.88	.88	27	3.0
22	1.7	12	20	1.0	.88	1.3	1.2	.88	.78	.73	4.6	2.8
23	1.7	3.4	29	1.0	.88	1.4	1.2	.93	.73	.69	2.8	2.5
24	1.6	2.6	8.8	1.7	.88	1.3	1.2	.93	.73	.83	2.2	2.4
25	1.5	2.6	4.6	1.1	5.0	20	1.2	1.1	.69	.99	2.0	2.2
26	1.5	2.0	3.7	1.0	1.5	4.8	1.2	.93	.69	.73	2.5	2.0
27	1.4	2.7	3.0	.99	1.0	3.0	1.2	.88	.73	.69	1.7	1.9
28	1.4	2.2	2.8	.99	.99	2.4	1.1	.83	.78	2.1	1.6	1.9
29	1.3	1.8	2.5	.99	.93	2.2	1.3	----------	.83	2.9	1.5	1.8
30	1.3	1.7	2.4	1.2	1.1	1.9	1.1	----------	.78	.93	1.4	1.8
31	1.2	1.7	----------	1.6	----------	2.0	1.1	----------	.73	----------	8.4	----------
Total	84.7	90.6	125.3	43.27	64.08	76.82	89.9	32.79	26.50	28.99	87.36	293.5
Mean	2.73	2.92	4.18	1.40	2.14	2.48	2.90	1.17	0.855	0.966	2.82	9.78
Ac-ft	168	180	249	86	127	152	178	65	53	58	173	582
Max	16	12	29	2.3	19	20	37	4.5	2.0	3.2	27	46
Min	1.2	1.0	1.5	0.99	0.83	0.88	1.1	0.83	0.69	0.60	0.65	1.8

Calendar year 1966: Max 97 Min 0.60 Mean 4.05 Ac-ft 2930
Fiscal year 1966-67: Max 46 Min 0.60 Mean 2.86 Ac-ft 2070

Peak discharge (base, 300 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7- 6	1930	3.22	327	6-13	0900	4.32	821
5-21	1530	3.70	515	6-16	1800	3.14	302
6- 4	1530	4.11	706				

16-8782. Hanechi-okawa at Kawakami

Location.--Lat 26°36'28" N., long 128°01'16" E., on left bank 0.4 mile south of Kawakami, 0.7 mile southeast of Taira School, and 1.0 mile southwest of Nakaoshi.

Drainage area.--4.4 sq mi, approximately.

Records available.--November 1963 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 50 ft (from topographic map). Prior to May 3, 1965, at datum 1.00 ft lower.

Extremes.--Maximum discharge during year, 2,850 cfs June 4 (gage height, 4.15 ft), from rating curve extended above 950 cfs by logarithmic plotting; minimum, 2.6 cfs Apr. 18, 19.
1963-67: Maximum discharge, 7,840 cfs June 16, 1964 (gage height, 6.03 ft, present datum), from rating curve extended above 190 cfs; minimum, not determined; minimum daily, 1.8 cfs Nov. 30, Dec. 1, 1963.
Minimum discharge known, 0.40 cfs Oct. 21, 1963, result of discharge measurement.

Remarks.--Records fair. No diversion above station. Records include small diversion from gage pool for irrigation below station. Daily sediment samples and continuous records of rainfall are obtained at station. Records of chemical analyses, water temperatures, and suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	18	5.6	13	12	9.3	7.1	97	5.4	4.6	3.1	5.8	39
2	27	4.8	119	11	7.2	6.9	44	18	4.4	3.0	5.1	24
3	24	4.6	40	10	5.0	6.5	31	21	4.3	2.9	7.5	18
4	48	4.4	27	9.7	4.3	6.2	24	8.2	4.2	4.1	9.0	298
5	22	4.1	24	9.4	6.1	16	20	6.9	12	3.3	5.8	271
6	70	4.0	18	9.2	64	25	18	6.0	9.2	3.2	5.1	311
7	69	4.0	15	9.0	38	14	15	5.8	6.0	3.0	4.7	270
8	27	4.5	14	8.7	12	54	14	5.8	5.1	3.4	4.8	100
9	18	4.0	17	8.7	9.0	35	12	5.6	4.6	4.7	4.6	73
10	15	17	18	8.4	19	25	12	5.4	4.3	3.5	4.1	55
11	14	6.0	13	8.2	12	16	12	7.6	4.2	4.2	4.0	46
12	12	8.2	12	8.2	9.7	14	15	5.6	4.1	7.7	3.7	44
13	12	20	11	8.0	8.4	12	12	5.2	3.8	5.7	28	261
14	12	12	11	7.6	9.2	12	10	7.6	3.7	4.0	48	79
15	11	12	12	8.7	7.6	11	9.4	8.0	3.7	3.4	24	55
16	10	7.4	10	7.2	7.1	16	9.2	5.8	3.6	3.0	10	180
17	10	51	9.2	6.9	7.6	12	8.7	5.4	3.6	2.7	10	98
18	9.7	22	8.4	6.7	7.1	11	8.4	5.7	4.0	2.7	8.2	58
19	9.0	88	7.6	6.3	6.5	10	8.0	5.2	3.6	4.6	7.2	46
20	8.7	96	7.4	6.2	10	10	7.6	5.0	3.5	29	22	37
21	8.0	79	8.0	5.8	9.8	11	7.4	5.0	4.9	6.2	227	31
22	7.6	52	79	5.6	7.1	10	7.2	4.8	4.2	4.7	74	27
23	7.4	35	206	5.4	6.5	10	7.1	5.1	3.5	4.1	35	24
24	6.9	26	90	6.8	6.2	9.7	6.9	5.2	3.2	5.3	25	20
25	6.5	35	46	5.7	52	65	6.7	6.8	3.2	7.8	22	18
26	6.3	24	33	5.1	16	46	6.3	5.4	3.2	4.7	28	15
27	6.0	19	25	4.8	11	24	6.0	4.8	3.2	4.1	20	14
28	5.8	16	18	4.7	9.0	16	5.8	4.6	3.5	4.4	14	12
29	5.6	15	14	4.4	8.0	14	6.9	----------	4.1	30	12	12
30	5.1	14	13	4.2	8.7	12	5.7	----------	3.2	7.8	12	11
31	6.4	15	----------	4.2	---------	12	5.4	----------	3.1	---------	42	----------
Total	518.0	709.6	938.6	226.8	393.4	549.4	458.7	190.9	135.8	180.3	732.6	2547
Mean	16.7	22.9	31.3	7.32	13.1	17.7	14.8	6.82	4.38	6.01	23.6	84.9
Ac-ft	1030	1410	1860	450	780	1090	910	379	269	358	1450	5050
Max	70	96	206	12	64	65	97	21	12	30	227	311
Min	5.1	4.0	7.4	4.2	4.3	6.2	5.4	4.6	3.1	2.7	3.7	11

Calendar year 1966: Max 713 Min 3.2 Mean 29.8 Ac-ft 21,580
Fiscal year 1966-67: Max 311 Min 2.7 Mean 20.8 Ac-ft 15,040

Peak discharge (base, 900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-21	1700	3.00	1,030	6-13	1030	3.65	1,960
6-4	1700	4.15	2,850	6-16	1930	3.10	1,150

16-8785. Oi-kawa at Jingusuku

Location.--Lat 26°39'07" N., long 127°57'24" E., on left bank 0.1 mile west of Jingusuku, 0.8 mile west of Gogayama, and 2.5 miles east of Manna.

Drainage area.--3.1 sq mi, approximately.

Records available.--March 1964 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,240 cfs June 13 (gage height, 9.13 ft), from rating curve extended above 160 cfs as explained below; no flow Apr. 16-18.
1964-67: Maximum discharge, 2,480 cfs May 7, 1966 (gage height, 10.30 ft), from rating curve extended above 160 cfs on basis of slope-area measurements at gage heights 7.40 and 8.50 ft; no flow at times each year.

Remarks.--Records fair. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.3	2.1	3.8	5.2	1.3	1.6	45	1.2	0.69	0.06	0.44	7.8
2	14	2.0	30	4.4	.92	1.3	12	4.1	.62	.10	.30	4.9
3	7.5	1.9	7.9	4.2	.76	1.2	8.6	3.1	.56	.10	1.3	5.2
4	16	1.7	5.5	3.8	.69	1.2	7.5	1.6	.56	.06	.56	11
5	7.9	1.6	4.4	3.6	.92	1.5	6.5	1.4	6.7	.04	.34	80
6	29	1.6	3.8	3.2	10	6.0	5.5	1.2	3.3	.04	.22	136
7	18	1.6	3.4	3.0	7.0	4.0	6.1	1.2	1.9	.04	.18	63
8	9.0	1.5	3.2	2.8	2.1	40	4.7	1.1	1.4	.03	.10	30
9	7.9	1.5	3.7	2.6	1.6	12	4.0	1.0	1.2	.03	.08	26
10	6.8	1.6	3.2	2.4	6.0	8.3	3.8	1.0	1.0	.01	.04	16
11	6.1	1.6	3.0	2.1	2.6	6.5	4.3	1.0	.92	.58	.04	12
12	5.2	2.3	3.6	1.9	1.9	5.8	5.2	.92	.76	.74	.02	11
13	4.9	6.1	3.0	1.7	1.6	4.7	3.8	.92	.69	.18	.87	228
14	4.7	2.3	2.6	1.7	1.6	3.8	3.8	2.7	.62	.06	1.1	27
15	4.4	2.0	2.8	1.7	1.2	3.6	3.6	2.1	.62	.01	.30	18
16	4.2	1.7	2.4	1.6	1.1	11	3.4	1.4	.56	0	.15	157
17	4.2	3.7	2.4	1.5	1.1	5.2	3.0	1.2	.50	0	.10	35
18	3.8	2.3	2.1	1.4	1.0	4.2	2.8	1.1	.56	0	.03	19
19	3.6	26	2.0	1.3	1.0	3.6	2.6	.92	.44	1.6	.03	14
20	3.4	24	2.0	1.3	4.5	3.6	2.4	.84	.39	6.9	1.9	12
21	3.6	18	1.9	1.2	2.1	4.7	2.3	.76	.55	1.1	129	10
22	3.4	13	29	1.1	1.6	3.6	2.1	.69	.44	.44	16	9.0
23	3.4	9.0	297	1.1	1.5	4.4	2.0	1.5	.30	.30	7.2	8.0
24	3.4	20	44	1.1	1.3	4.4	2.0	.84	.26	.31	4.7	7.0
25	3.2	8.6	17	1.0	14	52	1.9	1.3	.26	.34	3.6	6.0
26	3.2	6.5	11	1.0	5.0	20	1.7	1.0	.22	.18	3.2	5.2
27	3.0	5.2	9.0	1.0	3.0	11	1.5	.84	.18	.12	2.0	4.7
28	2.8	4.4	7.5	.92	2.2	9.0	1.5	.76	.18	.73	1.6	4.2
29	2.6	4.0	6.5	.84	1.7	7.2	1.5	----------	.22	2.7	1.3	3.8
30	2.4	4.0	5.8	.84	2.1	6.1	1.4	----------	.18	.69	1.2	3.6
31	2.3	3.8	----------	.84	---------	5.8	1.3	----------	.12	---------	19	---------
Total	200.2	185.6	523.5	62.34	83.39	257.3	157.8	37.69	26.90	17.49	196.90	974.4
Mean	6.46	5.99	17.4	2.01	2.78	8.30	5.09	1.35	0.868	0.583	6.35	32.5
Ac-ft	397	368	1040	124	165	510	313	75	53	35	391	1930
Max	29	26	297	5.2	14	52	45	4.1	6.7	6.9	129	228
Min	2.3	1.5	1.9	0.84	0.69	1.2	1.3	0.69	0.12	0	0.02	3.6

Calendar year 1966: Max 358 Min 0 Mean 10.5 Ac-ft 7,580
Fiscal year 1966-67: Max 297 Min 0 Mean 7.46 Ac-ft 5400

Peak discharge (base, 750 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-23	1530	6.93	1,680	6-13	0930	9.13	2,240
5-21	1500	6.50	1,550	6-16	1800	7.05	1,720

16-8799. Yonabaru-gawa below Zukeyama Dam

Location.--Lat 26°23'00" N., long 127°48'25" E., on right bank 0.2 mile downstream from Zukeyama Dam, 1.5 miles northwest of Noborikawa, and 3.5 miles northeast of Kadena Circle.

Drainage area.--1.9 sq mi, approximately.

Records available.--October 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 150 ft (from topographic map).

Extremes.--Maximum discharge during period, 588 cfs June 16 (gage height, 6.40 ft), from rating curve extended above 38 cfs; minimum, 0.29 cfs May 15-17.

Remarks.--Records good except those above 80 cfs, which are fair. Flow regulated by Zukeyama Reservoir (capacity, 2,070 acre-ft). No diversion above station.

Discharge, in cubic feet per second, October 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1				-	1.9	2.7	140	1.4	0.68	5.5	6.5	0.43
2				-	2.2	1.0	16	4.6	.72	5.5	7.2	.43
3				-	1.5	.97	8.8	10	3.2	6.2	6.2	.40
4				-	1.3	.97	6.5	2.5	5.8	4.1	.40	.73
5				-	1.9	2.4	4.6	2.6	6.6	3.3	1.8	80
6				-	25	6.0	4.4	1.4	5.0	6.2	6.2	140
7				-	6.0	4.2	6.0	1.2	2.7	6.2	6.2	81
8				-	4.4	29	5.3	1.5	.64	4.6	6.2	50
9				-	2.6	14	3.6	1.8	.76	3.3	6.7	14
10				-	24	7.2	3.9	2.5	1.6	6.7	6.7	7.9
11				-	6.2	4.4	4.6	3.9	1.4	7.2	7.0	6.2
12				-	3.2	7.5	6.0	2.0	1.1	7.9	8.2	6.2
13				-	3.8	5.0	3.9	.52	2.8	7.9	9.2	25
14				-	4.1	2.4	2.9	3.0	2.8	7.9	1.6	10
15				-	2.3	2.3	4.9	3.6	2.8	7.2	.34	9.3
16				-	1.3	10	4.0	.81	2.8	7.0	.34	130
17				-	2.2	5.8	2.1	.86	2.8	6.7	6.4	62
18				-	2.3	3.9	.91	1.5	2.4	7.5	7.5	14
19				-	2.2	3.8	1.7	1.8	2.5	8.0	7.0	9.2
20				-	3.8	5.8	2.3	.97	3.0	.56	6.2	6.7
21				-	3.8	16	2.4	1.1	3.6	.34	3.9	5.8
22				-	1.2	6.2	2.5	1.3	.37	5.1	.68	4.8
23				-	1.0	5.0	2.8	2.3	1.2	7.9	.43	4.4
24				2.3	.97	4.4	2.2	1.8	3.9	5.5	.40	4.1
25				2.5	9.9	56	2.4	2.9	3.9	.46	.40	3.6
26				2.2	6.6	23	2.2	1.6	3.9	1.3	.40	3.2
27				2.3	2.5	8.8	2.1	1.9	4.1	7.9	2.6	2.9
28				3.6	1.9	5.5	2.2	.91	4.4	6.7	7.0	2.5
29				1.0	1.8	4.8	4.9	----------	4.8	6.7	7.2	2.2
30				.86	5.7	4.4	3.4	----------	5.0	7.0	7.4	2.0
31			----------	.86	----------	5.6	1.0	----------	5.3	----------	1.0	----------
Total				-	137.57	259.04	260.51	62.27	92.57	168.36	139.29	688.99
Mean				-	4.59	8.36	8.40	2.22	2.99	5.61	4.49	23.0
Ac-ft				-	273	514	517	124	184	334	276	1370
Max				-	25	56	140	10	6.6	8.0	9.2	140
Min				-	0.97	0.97	0.91	0.52	0.37	0.34	0.34	0.40

Calendar year 1966: Max - Min - Mean - Ac-ft -
Fiscal year 1966-67: Max - Min - Mean - Ac-ft -

16-8803. Bishi-gawa at Kadena

Location.--Lat 26°21'54" N., long 127°45'59" E., on left bank at Bishi-gawa Pumping Station, 0.6 mile northeast of Kadena Circle, and 3.1 miles west of Chibana.

Drainage area.--14 sq mi, approximately.

Records available.--July 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during year, 2,280 cfs Sept. 23 (gage height, 8.10 ft), from rating curve extended above 44 cfs on basis of theoretical rating for the artificial control; no flow Apr. 9.

Remarks.--Records fair. Slight regulation by Zukeyama Reservoir on Yonabaru-gawa (capacity, 2,070 acre-ft). Pumping station diverts water from the gage pool for domestic use.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	60	52	21	31	17	17	1030	8.2	2.9	0.14	1.1	24
2	160	15	536	29	16	9.8	111	49	.56	.29	.38	14
3	200	11	88	26	13	9.8	46	70	.01	.26	33	9.0
4	140	12	39	22	9.0	9.8	39	21	1.6	.54	36	65
5	180	8.4	34	23	16	15	29	8.2	79	.12	7.4	566
6	350	9.0	24	180	130	29	26	6.6	35	.07	5.9	762
7	75	5.9	22	50	139	23	34	6.6	14	2.8	5.9	659
8	60	6.6	20	30	36	213	27	3.9	5.2	.04	3.9	302
9	54	5.2	56	29	22	95	22	3.9	1.2	0	.65	84
10	50	7.2	40	26	281	43	18	7.4	1.1	.01	.54	35
11	46	31	34	21	50	29	20	9.0	.90	.32	.34	26
12	44	33	24	17	22	42	30	9.8	.83	.70	.28	26
13	43	267	19	18	22	30	24	10	.70	.90	45	44
14	42	161	17	17	18	19	18	7.1	.90	.54	172	43
15	38	243	208	64	15	17	19	18	.40	1.5	15	57
16	35	54	64	36	14	83	22	9.0	.31	.16	1.6	708
17	36	141	34	24	14	43	17	3.3	.85	.01	.15	577
18	30	60	28	17	15	26	13	5.9	.54	.01	2.8	83
19	30	48	22	14	14	18	11	5.9	1.7	11	.90	43
20	30	43	19	15	13	15	12	2.2	1.3	77	27	30
21	28	43	19	15	16	46	13	.30	22	7.4	472	23
22	29	436	283	16	11	31	14	2.8	13	.06	191	20
23	30	108	1780	15	5.9	28	13	2.8	.96	1.5	26	17
24	24	35	464	18	5.9	26	11	4.5	.14	55	9.0	20
25	20	58	90	14	37	370	13	7.4	.30	72	2.8	17
26	23	31	59	14	31	158	11	7.4	.24	9.8	1.6	16
27	22	28	50	14	15	47	8.2	3.3	.30	3.3	.41	14
28	23	27	38	14	11	34	8.2	2.7	.20	2.8	2.3	13
29	21	24	33	14	12	26	18	----------	.50	3.9	3.9	7.4
30	24	22	33	13	18	19	14	----------	.12	1.2	6.8	7.4
31	35	30	----------	11	---------	30	7.4	----------	.11	---------	49	---------
Total	1982	2055.3	4198	847	1038.8	1601.4	1698.8	296.20	186.87	253.37	1124.65	4311.8
Mean	63.9	66.3	140	27.3	34.6	51.7	54.8	10.6	6.03	8.45	36.3	144
Ac-ft	3930	4080	8330	1680	2060	3180	3370	588	371	503	2230	8550
Max	350	436	1780	180	281	370	1030	70	79	77	472	762
Min	20	5.2	17	11	5.9	9.8	7.4	0.30	0.01	0	0.15	7.4

Calendar year 1966: Max - Min - Mean - Ac-ft -
Fiscal year 1966-67: Max 1780 Min 0 Mean 53.7 Ac-ft 38860

Peak discharge (base, 1,900 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-23	1900	8.10	2,280	1-1	0930	7.25	1,940

16-8805. Nagata-gawa at Kadena

Location.--Lat 26°22'23" N., long 127°45'50" E., on left bank 1.0 mile northeast of Kadena Circle and 3.4 miles northwest of Chibana.

Drainage area.--4.0 sq mi, approximately.

Records available.--September 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during period, 1,600 cfs Sept. 23 (gage height, 11.50 ft), from rating curve extended above 54 cfs; minimum, 1.8 cfs Apr. 18, 19.

Remarks.--Records good except those above 150 cfs, which are fair. No diversion above station.

Discharge, in cubic feet per second, September 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1			-	12	6.0	5.2	326	5.9	3.5	2.4	2.3	7.7
2			-	12	6.0	5.2	17	12	3.4	2.3	2.1	6.4
3			-	11	5.8	5.4	11	12	3.4	2.3	6.7	5.2
4			-	11	5.7	5.0	10	6.1	3.4	2.4	6.6	12
5			-	11	6.9	9.8	9.4	5.2	16	2.4	3.1	283
6			-	21	57	12	8.8	4.8	6.9	2.4	2.5	377
7			-	12	21	8.5	11	4.8	4.3	2.3	2.4	131
8			-	11	8.0	59	8.8	4.5	3.7	2.4	2.3	48
9			-	10	6.9	16	8.3	4.5	3.4	2.4	2.1	17
10			-	10	47	11	7.7	4.3	3.2	2.3	2.1	11
11			-	9.7	9.4	7.7	8.1	4.3	3.4	2.3	2.0	10
12			-	9.4	7.4	15	12	4.1	3.1	2.3	2.0	10
13			8.0	9.1	7.2	8.3	8.0	4.1	3.1	2.3	26	60
14			7.6	8.8	7.2	6.4	7.7	5.7	3.1	2.1	23	14
15			50	22	6.1	6.1	7.4	5.9	2.9	2.1	4.5	19
16			13	10	5.7	19	7.4	4.5	2.9	2.0	3.4	372
17			8.0	8.8	6.4	8.0	7.2	4.3	2.9	1.9	2.6	74
18			7.0	8.3	6.1	6.9	6.9	4.3	3.2	1.9	2.3	18
19			6.6	8.0	5.7	6.6	6.6	4.1	3.1	6.0	2.1	15
20			7.4	7.7	6.1	9.6	6.6	4.1	2.9	20	4.6	13
21			7.4	7.4	5.9	21	6.4	4.5	6.0	3.9	281	12
22			190	7.2	5.2	8.8	6.4	4.1	4.1	2.8	32	11
23			830	7.0	4.8	8.0	6.1	3.9	3.1	2.7	7.2	10
24			80	8.0	4.8	7.2	6.1	3.9	2.8	11	4.8	10
25			19	7.0	20	138	5.9	4.8	2.8	12	3.9	9.4
26			15	6.5	8.3	24	5.7	4.1	2.6	3.7	4.4	8.8
27			14	6.2	5.7	11	5.4	3.9	2.6	2.9	3.5	8.6
28			14	6.0	5.0	9.1	5.5	3.7	2.6	2.6	3.2	8.3
29			13	5.8	5.0	8.0	7.2	----------	2.6	2.5	3.1	8.0
30			13	5.7	6.4	7.4	5.7	----------	2.5	2.4	3.5	7.7
31			----------	5.7	---------	10	5.7	----------	2.4	---------	19	---------
Total			-	295.3	308.7	483.2	562.0	142.4	115.9	113.0	470.3	1597.1
Mean			-	9.53	10.3	15.6	18.1	5.09	3.74	3.77	15.2	53.2
Ac-ft			-	586	612	958	1,110	282	230	224	933	3,170
Max			-	22	57	138	326	12	16	20	281	377
Min			-	5.7	4.8	5.0	5.4	3.7	2.4	1.9	2.0	5.2

Calendar year 1966: Max - Min - Mean - Ac-ft -
Fiscal year 1966-67: Max - Min - Mean - Ac-ft -

Peak discharge (base, 1,200 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-23	0030	11.50	1,600	6-16	2000	11.30	1,560

16-8806. Hiza-gawa at Kadena

Location.--Lat 26°21'49" N., long 127°45'23" E., on left bank 600 ft downstream from Highway 1, 0.3 mile northwest of Kadena Circle, and 3.7 miles west of Chibana.

Drainage area.--19 sq mi, approximately.

Records available.--July 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 12 ft (from topographic map).

Extremes.--Maximum discharge during period, 3,980 cfs Sept. 23 (gage height, 6.02 ft), from rating curve extended above 240 cfs on basis of theoretical rating for the artificial control; no flow on Apr. 18.

Remarks.--Records fair. Slight regulation by Zukeyama Reservoir on Yonabaru-gawa (capacity, 2,070 acre-ft). Upstream pumping stations on both Bishi-gawa and Nagata-gawa divert water for domestic use.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	-	49	36	56	32	22	1.520	26	15	0.55	3.1	36
2	-	26	743	54	30	16	145	66	11	.87	.55	26
3	-	22	133	49	22	18	65	101	8.3	.55	45	20
4	-	22	54	46	20	16	54	36	11	3.1	48	85
5	-	18	49	46	30	28	44	20	105	5.9	11	837
6	-	22	41	222	179	44	36	20	49	1.3	9.8	1.220
7	-	16	36	76	177	35	51	18	24	4.7	9.8	895
8	-	15	34	46	49	269	39	18	13	.87	7.0	366
9	-	13	74	44	34	132	34	24	9.8	1.3	3.1	117
10	-	24	74	41	349	59	32	20	9.8	.55	2.4	59
11	-	49	46	36	74	41	32	22	15	.87	.87	46
12	-	44	36	36	41	69	51	22	11	3.1	.07	44
13	-	348	32	34	36	49	36	22	16	7.0	53	102
14	-	230	30	34	34	32	30	18	18	4.8	213	68
15	-	356	257	98	26	28	30	28	15	3.9	26	79
16	-	79	94	51	24	113	30	18	15	.87	8.3	1.110
17	-	208	46	36	26	56	28	15	11	.02	1.8	746
18	-	81	39	28	28	36	26	18	9.8	0	3.9	110
19	36	76	32	26	26	30	24	16	15	12	2.4	71
20	36	76	30	28	26	31	24	13	15	105	39	54
21	34	68	30	28	26	86	26	15	38	9.8	768	46
22	34	616	399	28	22	46	28	20	18	1.3	250	39
23	36	137	2.970	30	15	36	26	18	7.0	3.1	39	36
24	32	62	638	30	16	34	28	16	2.4	68	18	34
25	30	113	126	28	65	490	30	26	3.9	96	8.3	32
26	32	65	91	24	49	207	28	26	7.0	16	8.3	28
27	32	46	79	26	30	65	24	16	3.9	8.3	3.9	26
28	30	44	62	26	22	49	24	15	3.9	9.8	4.8	26
29	26	41	56	26	18	34	34	----------	3.9	9.8	13	24
30	28	39	56	24	26	32	30	----------	.87	5.9	17	22
31	42	46	----------	22	---------	40	22	----------	.55	---------	84	---------
Total	-	3,051	6423	1379	1552	2243	2631	693	486.12	385.25	1.702.39	6404
Mean	-	98.4	214	44.5	51.7	72.4	84.9	24.8	15.7	12.8	54.9	213
Ac-ft	-	6050	12.740	2740	3080	4450	5220	1370	964	764	3380	12.700
Max	-	616	2.970	222	349	490	1.520	101	105	105	768	1.220
Min	-	13	30	22	15	16	22	13	0.55	0	0.07	20

Calendar year 1966: Max - Min - Mean - Ac-ft -
Fiscal year 1966-67: Max - Min - Mean - Ac-ft -

Peak discharge (base, 3,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-23	1800	6.02	3,980	6-16	2100	5.74	3,630
1-1	0930	5.55	3,420				

16-8809. Machinato-gawa near Ojana

Location.--Lat 26°14'43" N., long 127°44'16" E., on right bank on upstream side of bridge on dirt road, 1.4 miles south of Ojana, and 2.4 miles northeast of Shuri.

Drainage area.--1.7 sq mi, approximately.

Records available.--April 1965 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 180 ft (from topographic map).

Extremes.--Maximum discharge during year, 882 cfs Sept. 23 (gage height, 7.80 ft); no flow for many days.
1965-67: Maximum discharge, 2,040 cfs Aug. 5, 1965 (gage height, 12.90 ft), from rating curve extended above 500 cfs by logarithmic plotting; no flow for many days each year.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1957 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.08	0.18	0.30	0.45	0.06	0.75	132	0.24	0.24	0.14	1.6	6.8
2	20	.05	69	.50	.09	.50	93	.25	.18	.10	1.3	5.0
3	39	.01	7.8	.50	.08	.45	4.5	2.0	.16	.08	26	4.2
4	22	0	3.2	.45	.05	.41	3.0	.83	.21	.10	39	14
5	34	0	2.0	.41	.06	.50	2.3	.50	39	.12	7.1	84
6	64	0	1.4	.30	13	1.8	1.8	.37	12	.10	3.8	228
7	25	0	1.6	.24	16	9.0	1.6	.30	4.5	.08	2.6	55
8	6.5	0	.92	.18	3.0	58	1.3	.30	2.6	.08	2.0	79
9	3.2	0	.75	.12	1.4	13	1.0	.27	1.7	.12	1.3	10
10	2.0	0	1.3	.10	45	6.8	.83	.24	1.2	.12	.92	4.5
11	1.3	0	1.4	.09	7.1	4.0	.75	.24	.92	.10	.61	2.8
12	.83	0	.68	.09	3.2	12	2.1	.24	.68	.10	.45	2.1
13	.55	1.2	.45	.07	2.1	6.5	1.4	.18	.61	.16	.91	3.8
14	.37	16	.33	.06	1.6	3.6	.92	.56	.50	.12	3.0	4.2
15	.30	33	44	.52	1.1	2.3	.68	1.2	.41	.09	1.7	20
16	.27	7.4	6.5	.37	.75	21	.61	.55	.33	.06	1.2	197
17	.18	21	3.2	.18	.61	7.1	.55	.41	.27	.03	.55	23
18	.09	7.1	2.0	.14	.50	3.8	.45	.33	.30	.01	.45	6.2
19	.02	5.0	1.0	.10	.37	2.6	.41	.30	.27	.20	.41	3.6
20	0	4.0	.68	.07	.37	2.6	.33	.24	.27	7.4	1.9	2.4
21	0	4.0	.50	.01	.41	8.2	.30	.21	1.8	2.0	17	1.6
22	0	65	114	0	.30	4.0	.27	.18	1.4	.83	13	1.1
23	0	8.5	237	0	.21	3.8	.27	.18	.61	.50	3.8	.68
24	0	4.8	24	0	.16	3.4	.24	.18	.41	8.5	2.0	.55
25	0	4.8	5.9	.05	4.1	66	.24	.33	.33	19	1.3	.45
26	0	3.2	2.8	.06	3.2	16	.18	.41	.30	5.0	1.0	.33
27	0	2.0	2.0	.01	1.4	6.5	.18	.33	.27	2.8	.61	.24
28	0	1.2	1.2	0	1.0	3.8	.16	.27	.24	2.1	.37	.18
29	0	.75	.83	0	.68	2.6	.41	----------	.21	3.6	.27	.12
30	0	.45	.61	0	1.0	2.0	.41	----------	.18	2.1	.88	.10
31	.44	.41	----------	.01	----------	2.1	.30	----------	.16	----------	24	----------
Total	220.13	190.05	537.35	5.08	108.90	275.11	168.79	11.64	72.26	55.74	161.03	760.95
Mean	7.10	6.13	17.9	0.164	3.63	8.87	5.44	0.416	2.33	1.86	5.19	25.4
Ac-ft	437	377	1,070	10	216	546	335	23	143	111	319	1,510
Max	64	65	237	0.52	45	66	132	2.0	39	19	39	228
Min	0	0	0.30	0	0.05	0.41	0.16	0.18	0.16	0.01	0.27	0.10

Calendar year 1966: Max 237 Min 0 Mean 10.4 Ac-ft 7,510
Fiscal year 1966-67: Max 237 Min 0 Mean 7.03 Ac-ft 5,090

Peak discharge (base, 650 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-23	1600	7.80	882	6-16	1930	7.57	838

16-8824. Tengan-gawa at Tengan

Location.--Lat 26°22'54" N., long 127°51'39" E., on right bank at upstream side of bridge on Highway 24, 0.2 mile south of Tengan, and 3.4 miles northeast of Chibana.

Drainage area.--10 sq mi, approximately.

Records available.--August 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 15 ft (from topographic map).

Extremes.--Maximum discharge during period, 3,430 cfs Jan. 1 (gage height, 12.77 ft), from rating curve extended above 1,200 cfs; minimum, 0.70 cfs Apr. 19.

Remarks.--Records good. Slight regulation by Tengan Reservoir (capacity, 997 acre-ft). Upstream pumping stations divert water for domestic use.

Discharge, in cubic feet per second, August 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		-	22	35	17	13	932	13	6.4	1.8	1.6	17
2		-	331	34	21	12	48	20	6.0	2.8	2.2	7.4
3		-	40	32	16	11	33	39	5.1	3.1	10	7.4
4		-	28	30	15	11	31	17	5.8	3.8	14	60
5		-	28	30	16	11	27	19	31	3.1	9.0	565
6		-	27	61	60	16	28	12	16	3.0	5.6	703
7		-	25	33	64	14	37	13	9.2	3.6	4.7	468
8		-	23	30	21	111	34	11	6.7	3.2	2.3	152
9		-	55	28	28	40	34	9.2	6.8	3.3	3.5	74
10		-	46	28	139	25	32	11	6.5	2.8	3.8	39
11		-	27	27	27	20	32	11	5.3	2.9	1.3	30
12		-	25	26	21	26	35	11	4.6	1.8	2.3	28
13		-	23	26	18	20	30	8.7	4.7	2.0	12	65
14		-	22	25	19	15	28	11	4.9	2.4	48	34
15		-	80	38	15	13	28	13	4.6	2.0	5.8	33
16		-	32	28	16	42	30	9.0	8.2	1.3	3.9	615
17		-	27	25	16	20	27	7.5	8.2	1.3	2.2	267
18		-	24	24	16	15	26	7.4	7.9	1.3	2.1	44
19		38	22	25	14	14	25	7.8	8.4	2.6	2.1	37
20		36	22	24	19	16	24	7.0	4.7	23	10	32
21		35	21	22	15	47	23	6.4	7.9	5.1	544	30
22		446	187	22	13	20	22	6.4	8.4	2.5	115	27
23		45	1,790	20	12	19	21	6.8	4.0	1.7	68	26
24		37	181	27	11	16	21	5.8	3.6	14	12	25
25		41	73	24	28	245	20	8.2	3.2	30	7.4	28
26		32	51	19	22	60	17	7.0	3.9	6.0	6.2	23
27		26	46	19	14	30	12	7.5	3.7	3.3	5.1	20
28		25	40	18	13	24	13	6.6	2.6	2.3	4.7	20
29		24	39	17	11	20	15	----------	2.4	3.6	4.4	20
30		23	36	17	14	18	16	----------	2.9	4.6	5.1	19
31		23	----------	16	----------	20	13	----------	2.2	----------	24	----------
Total		-	3,393	830	731	984	1,714	312.3	205.8	144.2	942.3	3,515.8
Mean		-	113	26.8	24.4	31.7	55.3	11.2	6.64	4.81	30.4	117
Ac-ft		-	6,730	1,650	1,450	1,950	3,400	619	408	286	1,870	6,970
Max		-	1,790	61	139	245	932	39	31	30	544	703
Min		-	21	16	11	11	12	5.8	2.2	1.3	1.3	7.4

Calendar year 1966: Max - Min - Mean - Ac-ft -
Fiscal year 1966-67: Max - Min - Mean - Ac-ft -

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
9-23	1800	12.58	3,370	6-16	2200	10.75	2,820
1-1	0930	12.77	3,430				

16-8828. Kanna-gawa near Kanna

Location.--Lat 26°29'20" N., long 127°56'46" E., on left bank 1.6 miles northwest of Kanna-shogakko (elementary school), 1.7 miles upstream from bridge at mouth, and 2.6 miles northeast of Kin.

Drainage area.--0.9 sq mi, approximately.

Records available.--June 1963 to June 1967.

Gage.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 70 ft (from topographic map). Prior to Nov. 14, 1963, at datum 0.40 ft higher.

Extremes.--Maximum discharge during year, 834 cfs June 4 (gage height, 5.66 ft), from rating curve extended above 43 cfs as explained below; minimum, 0.72 cfs May 12.
1963-67: Maximum discharge, 1,390 cfs Aug. 5, 1965 (gage height, 6.80 ft, from floodmarks), from rating curve extended above 43 cfs on basis of theoretical rating for artificial control; minimum, 0.12 cfs July 24, 26, 27, 1963.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.1	2.5	2.1	3.0	2.3	1.7	53	1.6	1.3	0.94	0.98	3.0
2	16	2.4	7.4	2.9	1.8	1.6	4.2	3.9	1.2	.90	.90	2.1
3	17	2.3	2.6	2.7	1.6	1.6	3.3	2.5	1.2	1.2	3.8	2.3
4	8.3	2.2	2.3	2.6	1.6	1.6	3.0	1.8	1.3	1.0	1.8	46
5	6.1	2.2	2.2	2.6	2.1	2.5	2.7	1.7	2.3	.94	1.2	65
6	19	2.1	2.1	2.5	18	2.5	2.6	1.6	1.5	1.1	1.0	77
7	8.5	2.1	2.0	2.4	3.5	2.4	2.6	1.6	1.3	.98	1.0	20
8	5.8	2.0	2.0	2.4	2.2	16	2.4	1.7	1.2	1.0	.94	15
9	5.1	2.5	7.4	2.4	1.8	3.7	2.4	1.6	1.2	1.0	.87	7.5
10	4.8	2.1	3.1	2.3	8.0	2.9	2.3	1.6	1.2	.98	.84	5.1
11	4.5	2.0	2.4	2.3	2.2	2.3	2.6	1.6	1.2	1.3	.80	4.8
12	4.2	2.7	2.2	2.2	2.0	2.5	2.7	1.5	1.2	1.3	.80	4.5
13	3.9	4.2	2.1	2.2	1.9	2.1	2.2	1.5	1.2	1.1	2.8	33
14	3.8	3.0	5.9	2.2	3.0	1.9	2.1	2.3	1.1	.94	11	5.8
15	3.7	3.0	4.7	2.2	1.9	1.9	2.1	1.7	1.1	.90	1.6	5.8
16	3.5	2.9	2.6	2.1	1.8	3.4	2.0	1.5	1.1	.84	1.2	56
17	3.4	11	2.4	2.1	2.0	2.1	2.0	1.5	1.1	.80	.98	11
18	3.4	3.0	2.3	2.0	1.8	1.9	2.0	1.6	1.3	.80	.87	7.5
19	3.2	4.4	2.2	2.0	1.9	1.9	2.0	1.4	1.1	1.9	.84	5.8
20	3.2	4.3	2.2	2.0	2.0	1.9	1.9	1.4	1.1	3.1	2.5	5.0
21	3.0	6.0	2.2	1.9	1.8	2.1	1.9	1.4	1.6	1.1	60	4.5
22	3.0	30	3.3	1.8	1.7	1.8	1.9	1.4	1.2	.94	5.0	4.0
23	2.9	3.6	68	1.8	1.6	1.8	1.9	1.4	1.0	.98	2.5	3.7
24	2.8	2.9	12	3.2	1.7	1.8	1.9	1.4	1.0	2.1	2.0	3.5
25	2.7	2.6	5.4	2.2	8.7	20	1.8	1.6	1.0	1.8	1.8	3.3
26	2.7	2.4	4.5	1.9	2.7	4.5	1.8	1.4	1.0	1.0	3.0	3.2
27	2.6	2.3	3.8	1.8	2.0	2.7	1.8	1.4	1.0	.94	2.0	3.1
28	2.5	2.2	3.5	2.0	1.8	2.5	1.8	1.3	1.0	1.1	1.4	2.9
29	2.5	2.2	3.2	1.8	1.8	2.3	2.0	----------	1.0	1.8	1.4	2.9
30	2.4	2.1	3.1	1.7	2.2	2.2	1.7	----------	.98	1.0	1.6	3.1
31	2.9	2.1	----------	1.7	---------	2.4	1.7	----------	.90	---------	6.6	---------
Total	162.5	121.3	171.2	68.9	89.4	102.5	120.3	46.9	36.88	35.78	124.02	416.4
Mean	5.24	3.91	5.71	2.22	2.98	3.31	3.88	1.68	1.19	1.19	4.00	13.9
Ac-ft	322	241	340	137	177	203	239	93	73	71	246	826
Max	19	30	68	3.2	18	20	53	3.9	2.3	3.1	60	77
Min	2.4	2.0	2.0	1.7	1.6	1.6	1.7	1.3	0.90	0.80	0.80	2.1

Calendar year 1966: Max 98 Min 0.77 Mean 4.92 Ac-ft 3,560
Fiscal year 1966-67: Max 77 Min 0.80 Mean 4.10 Ac-ft 2,970

Peak discharge (base, 400 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
1- 1	0600	4.80	510	6- 4	1500	5.66	834
5-21	about 1500	5.10	615	6-13	0800	5.04	594
				6-16	1800	5.31	694

16-8830. Ufu-kawa near Ginoza

Location.--Lat 26°29'36" N., long 127°58'08" E., on left bank 1.1 miles northwest of Ginoza and 1.4 miles northeast of Kanna.

Drainage area.--1.3 sq mi, approximately.

Records available.--June 1963 to June 1967 (discontinued).

Gage.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 120 ft (from topographic map). Prior to Nov. 14, 1963, at datum 0.50 ft higher.

Extremes.--Maximum discharge during year, not determined; maximum daily, 80 cfs June 6; minimum discharge, 0.40 cfs May 13.
1963-67: Maximum discharge recorded, 703 cfs Aug. 5, 1965 (gage height, 7.05 ft), from rating curve extended above 44 cfs on basis of theoretical rating for artificial control; minimum, 0.05 cfs July 29, 1963.

Remarks.--Records fair. Some regulation by two reservoirs above station. Diversion from reservoirs for irrigation of 262 acres of rice fields below station. Small diversion from reservoir on Left Fork for domestic use in Ginoza.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	9.5	3.8	1.8	2.4	1.4	1.2	55	1.3	1.0	0.69	1.3	3.7
2	19	3.6	18	2.3	1.4	1.1	12	2.6	.97	.66	.86	3.2
3	19	3.5	4.2	2.1	1.1	1.0	4.1	3.8	.97	.69	3.5	3.1
4	11	3.0	2.7	2.0	1.0	1.0	2.9	1.8	.97	.72	2.9	35
5	10	2.3	2.3	2.0	1.5	1.6	2.5	1.4	2.3	.66	1.8	50
6	22	5.0	2.2	1.9	16	2.0	2.3	1.2	1.6	.83	1.3	80
7	12	6.5	2.0	1.9	3.5	2.1	2.2	1.2	1.2	.75	.93	25
8	9.8	2.2	1.9	1.8	2.6	16	2.1	1.3	1.0	.75	.82	15
9	9.4	1.5	2.7	1.8	2.6	5.3	2.0	1.2	.93	.79	.66	8.0
10	9.0	1.3	3.7	1.8	4.5	3.0	1.9	1.4	.89	.66	.57	5.6
11	8.5	1.3	2.5	1.7	1.9	2.1	2.2	1.3	.86	.82	.49	4.5
12	8.5	1.5	2.0	1.7	1.8	2.2	2.3	1.1	.82	1.0	.44	4.0
13	8.5	4.8	1.9	1.6	1.7	1.8	2.0	1.3	.82	.93	1.6	26
14	8.5	2.8	1.9	1.6	2.1	1.6	1.8	1.9	.72	.75	10	7.0
15	8.3	1.2	2.7	1.8	10	1.5	1.7	2.3	.57	.66	.93	6.0
16	8.1	1.4	2.2	1.7	3.1	2.8	1.7	1.7	.49	.57	.63	45
17	7.9	11	1.5	1.7	1.7	1.9	1.6	1.5	.47	.51	.51	7.0
18	7.6	4.9	1.5	1.4	1.4	1.5	1.6	1.4	.56	.51	.49	5.0
19	7.6	4.3	1.9	1.4	1.4	1.4	1.6	1.2	1.2	1.3	.47	4.3
20	7.4	4.5	1.7	1.4	1.4	1.4	1.5	1.2	1.6	3.7	2.0	4.0
21	7.1	6.0	1.5	1.3	1.2	1.5	1.5	1.1	1.5	1.6	62	3.6
22	6.2	37	23	1.3	1.1	1.3	1.5	1.2	1.2	1.0	3.5	3.4
23	5.9	5.3	55	1.4	1.0	1.2	1.5	1.2	.86	.82	1.8	3.2
24	5.9	2.6	27	2.0	1.1	1.2	1.4	1.2	.72	1.7	1.4	3.1
25	5.6	1.6	6.1	1.6	5.3	21	1.4	1.4	.69	1.7	1.2	3.0
26	5.7	3.5	3.9	1.4	3.2	8.6	1.4	1.2	.69	.49	1.7	2.9
27	5.0	2.8	3.2	1.2	1.7	3.0	1.4	1.1	.60	.44	6.0	2.8
28	4.8	2.2	3.0	1.2	1.4	2.3	1.4	1.0	.63	.48	4.4	2.7
29	4.3	1.9	2.7	1.1	1.2	1.9	1.5	----------	.82	1.6	3.5	2.7
30	4.2	2.0	2.6	1.0	1.5	1.8	1.4	----------	.75	2.0	3.0	2.7
31	4.1	1.9	----------	1.0	----------	2.0	1.3	----------	.69	----------	6.4	----------
Total	270.4	137.2	189.3	50.5	80.8	98.3	120.7	41.5	29.09	29.78	127.10	371.5
Mean	8.72	4.43	6.31	1.63	2.69	3.17	3.89	1.48	0.938	0.993	4.10	12.4
Ac-ft	536	272	375	100	160	195	239	82	58	59	252	737
Max	22	37	55	2.4	16	21	55	3.8	2.3	3.7	62	80
Min	4.1	1.2	1.5	1.0	1.0	1.0	1.3	1.0	0.47	0.44	0.44	2.7

Calendar year 1966: Max 77 Min 0.47 Mean 5.68 Ac-ft 4,110
Fiscal year 1966-67: Max 80 Min 0.44 Mean 4.24 Ac-ft 3,070

16-8833. Left Fork O-kawa near Kushi

Location.--Lat 26°31'18" N., long 127°59'50" E., on left bank 1.1 miles northwest of Kushi and 1.1 miles north of Kataharu.

Drainage area.--0.3 sq mi, approximately.

Records available.--June 1963 to June 1967.

Gage.--Water-stage recorder and combination of sharp-crested weir and concrete control. Altitude of gage is 60 ft (from topographic map). Prior to Nov. 20, 1963, at datum 0.40 ft higher.

Extremes.--Maximum discharge during year, 201 cfs June 4 (gage height, 3.95 ft), from rating curve extended above 23 cfs as explained below; minimum, 0.17 cfs May 12.
1963-67: Maximum discharge, 438 cfs Aug. 5, 1965 (gage height, 5.19 ft), from rating curve extended above 23 cfs on basis of theoretical rating for the artificial control; minimum, 0.05 cfs July 17-27, 29, 1963.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.2	0.63	0.60	0.91	0.58	0.39	8.8	0.39	0.30	0.22	0.25	1.1
2	2.1	.60	4.0	.85	.47	.39	1.1	.97	.28	.21	.22	.68
3	2.0	.58	1.4	.82	.45	.37	.85	.60	.28	.30	.95	.60
4	1.6	.55	1.1	.77	.43	.37	.77	.43	.30	.25	.42	3.3
5	1.2	.53	.97	.74	.56	.72	.71	.41	.51	.24	.28	14
6	4.5	.51	.91	.71	3.9	.63	.65	.39	.35	.27	.25	20
7	2.1	4.4	.85	.71	.89	.79	.60	.39	.30	.24	.24	6.1
8	1.4	.71	.82	.71	.51	3.5	.55	.43	.28	.25	.21	2.3
9	1.2	.58	.93	.74	.47	.87	.55	.39	.28	.27	.21	1.7
10	1.1	.55	.82	.68	1.8	.65	.53	.37	.28	.24	.20	1.2
11	1.1	.53	.74	.68	.53	.55	.62	.39	.27	.47	.20	1.1
12	1.0	.78	.71	.65	.49	.58	.60	.35	.27	.42	.18	1.1
13	.94	1.2	.68	.63	.47	.49	.51	.35	.27	.28	.61	5.5
14	.91	.90	1.3	.63	.69	.47	.49	.53	.27	.24	2.2	1.5
15	.88	.80	.94	.74	.47	.45	.49	.39	.25	.22	.43	1.6
16	.88	3.0	.74	.58	.45	.72	.49	.35	.25	.22	.32	9.7
17	.85	.90	.71	.58	.45	.47	.47	.35	.25	.21	.25	2.5
18	.85	1.2	.68	.55	.43	.45	.47	.37	.28	.20	.22	2.0
19	.82	1.1	.65	.53	.45	.43	.45	.35	.24	.67	.21	1.4
20	.80	1.0	.65	.53	.45	.43	.45	.33	.24	.82	1.2	1.2
21	.77	1.5	.65	.51	.41	.45	.45	.32	.35	.27	17	1.1
22	.74	7.0	7.6	.51	.39	.41	.45	.32	.25	.24	1.3	1.0
23	.71	1.5	10	.51	.39	.43	.43	.33	.24	.28	.60	.94
24	.68	1.1	3.2	.58	.42	.39	.43	.33	.24	.57	.49	.91
25	.65	.90	1.7	.49	1.5	4.3	.43	.37	.24	.40	.43	.85
26	.63	.80	1.4	.49	.56	1.1	.41	.33	.24	.25	.90	.80
27	.60	.75	1.2	.47	.45	.68	.41	.32	.24	.22	.45	.75
28	.58	.70	1.1	.47	.41	.60	.41	.32	.24	.33	.39	.75
29	.58	.65	1.0	.47	.41	.53	.47	----------	.24	.75	.37	.70
30	.65	.65	.94	.45	.47	.51	.41	----------	.24	.28	.60	.75
31	.71	.60	----------	.45	---------	.57	.39	----------	.22	---------	2.7	---------
Total	34.73	37.20	48.99	19.14	20.35	23.69	24.84	11.17	8.49	9.83	34.28	87.13
Mean	1.12	1.20	1.63	0.617	0.678	0.764	0.801	0.399	0.274	0.328	1.11	2.90
Ac-ft	69	74	97	38	40	47	49	22	17	19	68	173
Max	4.5	7.0	10	0.91	3.9	4.3	8.8	0.97	0.51	0.82	17	20
Min	0.58	0.51	0.60	0.45	0.39	0.37	0.39	0.32	0.22	0.20	0.18	0.60

Calendar year 1966: Max 21 Min 0.18 Mean 1.30 Ac-ft 941
Fiscal year 1966-67: Max 20 Min 0.18 Mean 0.986 Ac-ft 714

Peak discharge (base, 80 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-21	1500	3.78	173	6-16	1800	3.10	86
6- 4	1400	3.95	201				

16-8835.5. Oura-gawa at Okawa

Location.--Lat 26°34'10" N., long 128°02'23" E., on left bank 0.4 mile north of Okawa and 1.8 miles northwest of Sedake.

Drainage area.--1.9 sq mi, approximately.

Records available.--May 1966 to June 1967.

Gage.--Water-stage recorder and, since Mar. 10, 1967, concrete control. Altitude of gage is 30 ft (from topographic map).

Extremes.--1966: Maximum discharge during period May to June, 532 cfs June 8 (gage height, 4.61 ft), from rating curve extended above 66 cfs; minimum, 3.9 cfs June 28-30.
1966-67: Maximum discharge during fiscal year, 890 cfs June 4 (gage height, 6.60 ft), from rating curve extended above 66 cfs; no flow for part of Mar. 26.

Remarks.--Records fair. No diversion above station. Samples for chemical analysis and of sediment are collected intermittently, and continuous records of rainfall are obtained at station. Records of chemical analyses and suspended sediment loads for the fiscal years 1966 and 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, May to June 1966

Day	May	June	Day	May	June	Day	May	June	Day	May	June	Day	May	June
1	-	23	7	-	15	13	34	31	19	53	10	25	15	5.2
2	-	20	8	-	80	14	25	26	20	33	8.7	26	13	4.9
3	-	18	9	-	53	15	21	18	21	115	8.0	27	11	4.9
4	-	19	10	-	30	16	18	15	22	55	7.3	28	9.5	4.2
5	-	18	11	-	23	17	15	13	23	25	6.4	29	13	4.4
6	-	16	12	-	79	18	14	11	24	19	5.5	30	10	4.2
												31	44	---
Total													-	581.7
Mean, in cubic feet per second													-	19.4
Runoff in acre-feet													-	1,150
Maximum													-	80
Minimum													-	4.2

Peak discharge (base, 500 cfs).--June 8 (1600) 532 cfs (4.61 ft).

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	5.5	1.2	3.0	4.4	1.6	1.7	48	1.1	0.31	0.07	1.3	13
2	8.7	.92	39	3.9	1.4	1.4	14	5.0	.22	.07	1.0	8.1
3	8.0	.78	9.1	3.5	.53	1.2	9.5	7.5	.22	.07	2.3	7.4
4	10	.65	7.0	3.3	.22	.92	7.7	2.4	.14	.10	2.8	100
5	7.3	.53	5.2	3.0	.14	2.4	6.4	1.7	3.6	.24	1.3	87
6	38	.41	4.4	2.8	24	6.4	5.5	1.4	3.5	.18	1.1	111
7	25	.31	3.9	2.6	9.7	5.1	4.7	1.2	1.2	.15	.84	85
8	14	.22	3.5	2.4	2.8	19	4.2	1.2	.65	.15	.76	36
9	10	.14	3.5	2.4	1.9	11	3.9	1.2	.41	.15	.76	28
10	7.3	.48	3.7	2.2	6.9	7.3	3.3	1.1	.33	.28	.56	21
11	6.4	.78	3.3	1.9	3.0	5.2	4.4	2.2	.28	.21	.44	18
12	5.5	.87	3.0	1.7	2.0	5.8	5.8	1.4	.24	1.4	.33	16
13	4.9	4.5	2.4	1.5	1.7	4.2	3.9	1.1	.21	1.2	40	61
14	4.4	5.8	2.2	1.4	1.5	3.5	3.3	2.4	.21	.62	42	26
15	4.2	2.8	3.0	1.7	1.2	3.0	3.0	2.6	.18	.28	18	21
16	3.9	1.1	2.4	1.4	.92	4.7	2.8	1.5	.18	.18	8.1	73
17	3.5	18	2.2	1.1	.78	3.0	2.8	1.2	.15	.09	5.2	37
18	3.3	8.2	1.9	.78	.78	2.6	2.6	1.2	.18	.04	4.0	24
19	2.8	22	1.7	.65	.65	2.4	2.4	1.1	.18	.16	3.1	18
20	2.6	37	1.5	.65	1.0	2.4	2.2	.78	.12	8.4	8.6	15
21	2.4	20	1.9	.53	1.7	3.3	2.2	.65	.12	1.6	93	12
22	2.2	16	29	.41	.78	2.4	2.0	.65	.33	.84	31	10
23	2.2	9.5	79	.31	.53	2.4	1.9	.65	.18	.56	17	9.1
24	2.0	7.0	30	1.2	.31	2.2	1.7	.65	.07	.44	12	7.7
25	1.9	6.7	14	1.1	15	27	1.5	1.2	.03	1.5	9.5	7.0
26	1.9	4.7	10	.65	6.2	13	1.4	1.1	.02	.69	10	6.0
27	1.5	4.9	8.0	.53	3.3	8.4	1.4	.65	.06	.44	7.4	5.2
28	1.5	3.9	6.4	.53	2.2	6.1	1.2	.47	.09	.81	6.3	4.4
29	1.4	3.3	5.5	.53	2.0	4.7	1.7	----------	.10	8.8	5.4	4.2
30	1.4	3.5	4.7	.31	2.4	3.7	1.2	----------	.15	1.9	5.2	4.0
31	1.5	3.3	----------	.14	----------	3.5	1.1	----------	.10	---------	15	----------
Total	195.2	189.49	294.4	49.52	97.14	169.92	157.7	45.30	13.76	31.62	354.29	875.1
Mean	6.30	6.11	9.81	1.60	3.24	5.48	5.09	1.62	0.444	1.05	11.4	29.2
Ac-ft	387	376	584	98	193	337	313	90	27	63	703	1740
Max	38	37	79	4.4	24	27	48	7.5	3.6	8.8	93	111
Min	1.4	0.14	1.5	0.14	0.14	0.92	1.1	0.47	0.02	0.04	0.33	4.0

Calendar year 1966: Max - Min - Mean - Ac-ft -
Fiscal year 1966-67: Max 111 Min 0.02 Mean 6.78 Ac-ft 4,910

Peak discharge (base, 500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
5-21	1600	5.10	620	6-13	1000	5.70	728
6-4	1600	6.60	890	6-16	1830	4.82	570

16-8841. Fukuji-gawa near Yubaru

Location.--Lat 26°38'32" N., long 128°13'00" E., on left bank 1.1 miles north of Yubaru and 2.4 miles northeast of Miyaji.

Drainage area.--5.8 sq mi, approximately.

Records available.--January 1964 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 130 ft (from topographic map).

Extremes.--Maximum discharge during year, 4,480 cfs June 13 (gage height, 10.22 ft), from rating curve extended above 200 cfs as explained below; minimum, 4.3 cfs Apr. 17-19.
1964-67: Maximum discharge, 10,400 cfs Aug. 5, 1965 (gage height, 17.20 ft), from rating curve extended above 590 cfs on basis of slope-area measurement of peak flow; minimum, 3.4 cfs Apr. 19-21, 25, May 3-5, 1964.

Remarks.--Records fair. No diversion above station. Sediment samples are collected intermittently and continuous records of rainfall are obtained at station. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	18	9.8	17	14	8.5	8.1	319	7.7	5.9	4.9	7.4	38
2	33	9.4	112	13	9.2	7.4	32	44	5.9	5.2	6.2	16
3	24	9.0	23	13	7.4	7.0	20	33	5.5	5.5	18	31
4	48	9.0	20	12	7.0	7.4	16	8.8	5.5	5.2	19	103
5	30	8.4	18	12	8.8	8.5	15	7.7	24	5.2	7.4	306
6	270	8.4	17	12	154	11	14	7.0	15	4.9	5.9	442
7	70	8.0	16	11	43	9.6	13	7.0	8.8	4.9	5.5	213
8	31	8.0	15	11	10	74	13	7.0	7.0	5.2	9.9	76
9	24	11	14	11	8.8	23	12	7.4	6.6	6.2	9.0	49
10	20	9.0	20	11	26	12	12	7.0	6.2	5.9	5.9	27
11	19	8.0	15	11	12	10	12	7.4	5.9	6.2	5.5	22
12	18	14	13	10	8.8	10	14	7.4	5.9	7.4	5.2	30
13	17	16	12	10	8.5	8.8	11	6.6	5.5	5.9	6.2	390
14	17	17	16	10	8.8	8.5	10	22	5.5	5.2	8.1	40
15	16	15	13	11	8.1	8.5	10	17	5.2	4.9	6.2	29
16	16	11	11	10	7.7	20	9.6	8.1	5.2	4.6	5.9	271
17	15	232	12	9.6	7.4	11	9.6	7.0	5.2	4.3	5.2	64
18	14	37	10	9.6	7.4	9.2	9.6	7.0	5.5	4.3	4.9	34
19	14	135	9.2	9.2	8.2	9.2	9.2	7.0	5.5	6.3	4.9	29
20	14	173	9.2	9.2	9.1	9.2	8.8	6.6	5.2	24	13	25
21	13	242	12	8.8	7.7	10	8.8	6.6	5.9	7.7	215	23
22	13	364	385	8.8	7.0	8.5	8.8	6.6	6.6	5.5	32	20
23	12	39	513	8.5	6.6	10	8.8	6.6	5.2	5.2	15	20
24	12	29	109	9.2	6.6	9.6	8.8	6.6	4.9	5.5	13	18
25	12	33	42	8.8	63	204	8.8	7.0	4.9	7.7	18	17
26	11	23	28	8.5	16	38	8.5	6.6	4.9	5.2	41	16
27	11	21	23	8.5	8.8	18	8.5	6.2	4.9	4.9	16	15
28	14	19	20	8.1	8.1	15	8.5	5.9	4.9	5.1	13	14
29	12	18	18	7.7	7.7	13	8.8	----------	5.2	64	12	13
30	11	17	16	7.4	8.5	12	8.1	----------	4.9	8.5	11	13
31	10	19	----------	7.0	---------	12	7.7	----------	4.9	---------	92	---------
Total	859	1,572.0	1,558.4	310.9	508.7	622.5	663.9	284.8	202.2	245.5	637.3	2,404
Mean	27.7	50.7	51.9	10.0	17.0	20.1	21.4	10.2	6.52	8.18	20.6	80.1
Ac-ft	1,700	3,120	3,090	617	1,010	1,230	1,320	565	401	487	1,260	4,770
Max	270	364	513	14	154	204	319	44	24	64	215	442
Min	10	8.0	9.2	7.0	6.6	7.0	7.7	5.9	4.9	4.3	4.9	13

Calendar year 1966: Max 1,230 Min 5.0 Mean 43.7 Ac-ft 31,600
Fiscal year 1966-67: Max 513 Min 4.3 Mean 27.0 Ac-ft 19,580

Note.--No gage-height record July 1 to Aug. 16.

Peak discharge (base, 2,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-17	0730	6.84	2,580	6-13	1130	10.22	4,480
9-23	1900	7.20	2,830	6-16	1930	7.40	2,640

16-8842. Fukuji-gawa at Fukuji

Location.--Lat 26°38'16" N., long 128°10'13" E., on left bank at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.

Drainage area.--12 sq mi, approximately.

Records available.--January 1964 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Mar. 7, 1967, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, 8,900 cfs June 13 (gage height, 11.00 ft), from rating curve extended above 780 cfs on basis of slope-area measurements at gage heights 11.00 and 12.10 ft; minimum, 7.6 cfs Apr. 17-19.
1964-67: Maximum discharge, 18,300 cfs Aug. 5, 1965 (gage height, 15.97 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 8.37, 10.48 and 15.97 ft; minimum, 6.0 cfs Apr. 23-25, 1964.
Flood of Oct. 14, 1959, reached a stage of 18.9 ft, present datum, from information by local residents (discharge, 23,000 cfs).
Minimum discharge known, 2.57 cfs Oct. 22, 1963, reault of discharge measurement.

Remarks.--Records fair. No diversion above station. Daily sediment samples are obtained at station. Records of chemical analyses, water temperatures and suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	38	20	32	38	17	14	510	13	10	9.5	15	103
2	68	19	195	34	19	13	93	47	9.2	10	13	42
3	50	19	57	30	12	12	56	67	9.2	11	28	89
4	100	18	43	28	12	12	44	19	9.2	10	47	236
5	60	17	38	26	19	12	39	15	44	10	17	700
6	536	17	36	25	178	26	32	13	31	9.7	14	1024
7	153	16	32	24	95	19	28	12	20	10	13	621
8	63	16	30	23	24	115	25	14	16	11	23	171
9	47	20	28	22	19	55	24	14	15	12	26	129
10	42	17	39	21	52	30	24	12	14	11	15	85
11	39	16	31	20	27	22	24	15	13	13	13	69
12	37	28	28	19	20	23	34	13	13	14	13	71
13	35	30	26	18	18	20	25	11	12	11	17	926
14	34	31	32	18	19	17	22	39	12	9.4	21	101
15	32	30	25	21	18	16	21	43	11	8.2	15	61
16	31	21	22	19	15	37	21	18	11	7.8	13	563
17	31	482	24	18	14	23	20	14	11	7.6	12	187
18	31	79	19	17	14	19	19	13	12	7.6	10	99
19	29	199	18	17	13	19	18	13	11	8.6	10	75
20	28	250	18	16	18	18	17	12	11	53	19	61
21	27	382	21	16	15	21	17	12	12	15	377	53
22	27	802	618	15	13	16	16	11	13	10	92	48
23	26	140	1070	15	12	19	16	11	11	9.8	39	44
24	26	92	330	18	12	19	16	11	11	9.8	29	40
25	26	90	126	16	88	249	15	13	10	16	35	39
26	25	63	79	15	39	79	15	12	10	10	74	36
27	24	50	63	14	18	43	15	11	10	9.2	45	33
28	28	44	52	14	14	34	15	10	10	10	28	31
29	23	40	44	13	13	26	16	----------	10	112	24	29
30	22	35	40	12	16	22	14	----------	9.8	18	23	28
31	21	35	----------	12	---------	22	13	----------	9.5	---------	190	---------
Total	1759	3118	3216	614	863	1072	1264	508	410.9	464.2	1310	5794
Mean	56.7	101	107	19.8	28.8	34.6	40.8	18.1	13.3	15.5	42.3	193
Ac-ft	3490	6180	6380	1220	1710	2130	2510	1010	815	921	2600	11490
Max	536	802	1070	38	178	249	510	67	44	112	377	1024
Min	21	16	18	12	12	12	13	10	9.2	7.6	10	28

Calendar year 1966: Max 2490 Min 9.1 Mean 85.4 Ac-ft 61790
Fiscal year 1966-67: Max 1070 Min 7.6 Mean 55.9 Ac-ft 40450

Peak discharge (base, 4,000 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
7- 6	2100	7.30	4,640	6-13	1200	11.00	8,900
9-23	1930	7.25	4,580	6-16	2000	8.31	5,470

16-8846. Aha-gawa at Aha

Location.--Lat 26°42'41" N., long 128°16'55" E., on right bank 0.3 mile southwest of Aha School and 1.4 miles upstream from mouth.

Drainage area.--9.5 sq mi, approximately.

Records available.--December 1963 to June 1967.

Gage.--Water-stage recorder. Altitude of gage is 10 ft (from topographic map). Prior to Oct. 13, 1966, at datum 1.00 ft higher.

Extremes.--Maximum discharge during year, 8,560 cfs June 13 (gage height, 9.72 ft), from rating curve extended above 120 cfs on basis of slope-area measurement of peak flow; minimum, 10 cfs Apr. 2, 5, 6.
1963-67: Maximum discharge, 12,700 cfs June 16, 1964 (gage height, 11.60 ft), from rating curve extended above 1,100 cfs on basis of slope-area measurements at gage heights 9.35 and 10.5 ft; minimum, 6.8 cfs Nov. 25-28, 1964, Jan. 16, 1966.
Minimum discharge known, 5.08 cfs Oct. 22, 1963, result of discharge measurement.

Remarks.--Records fair. No diversion above station. Samples for chemical analysis and of sediment are collected intermittently, and continuous records of rainfall are obtained at station. Records of chemical analyses and suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	34	18	30	36	20	15	474	18	14	11	20	69
2	72	17	171	34	17	14	86	202	14	10	16	47
3	42	17	44	32	12	13	59	77	13	11	19	194
4	88	17	35	31	11	14	49	28	13	11	20	263
5	53	16	32	30	21	31	44	24	62	11	15	540
6	202	15	30	29	186	45	40	22	33	13	14	678
7	111	14	30	27	57	28	39	20	21	13	14	461
8	64	15	28	26	19	90	34	20	18	15	19	253
9	49	15	32	26	16	46	33	19	17	26	17	160
10	43	14	47	25	34	36	32	19	16	14	16	95
11	39	14	38	24	19	29	31	23	17	15	14	79
12	37	21	46	23	16	115	47	18	15	16	14	86
13	34	24	42	22	15	40	32	18	14	15	14	717
14	32	27	31	21	17	31	30	34	14	13	20	124
15	31	19	28	22	14	28	28	32	14	12	41	89
16	30	15	26	21	13	56	28	20	14	11	19	371
17	29	136	27	20	13	30	26	19	14	11	14	140
18	29	51	25	20	13	27	25	18	16	11	13	89
19	27	221	24	19	13	27	24	18	13	12	12	73
20	25	142	24	18	16	25	22	17	13	51	38	63
21	23	195	38	17	15	29	22	16	16	19	346	56
22	23	692	883	17	12	25	22	16	14	15	76	52
23	21	85	831	16	11	30	21	17	12	13	39	50
24	20	63	190	17	11	28	20	17	12	14	33	47
25	20	91	83	15	106	282	20	19	11	19	92	43
26	19	52	62	14	37	95	19	16	11	14	88	39
27	19	41	51	13	22	54	19	15	11	12	48	37
28	28	38	45	15	17	45	19	14	12	13	37	35
29	19	36	40	13	16	38	20	----------	12	99	31	34
30	18	32	38	12	20	34	18	----------	11	23	30	33
31	24	30	----------	12	---------	34	18	----------	11	---------	104	---------
Total	1305	2183	3051	667	809	1434	1401	796	498	543	1293	5017
Mean	42.1	70.4	102	21.5	27.0	46.3	45.2	28.4	16.1	18.1	41.7	167
Ac-ft	2590	4330	6050	1320	1600	2840	2780	1580	988	1080	2560	9950
Max	202	692	883	36	186	282	474	202	62	99	346	717
Min	18	14	24	12	11	13	18	14	11	10	12	33

Calendar year 1966: Max 1630 Min 7.5 Mean 77.2 Ac-ft 55920
Fiscal year 1966-67: Max 883 Min 10 Mean 52.0 Ac-ft 37680

Peak discharge (base, 4,500 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-22	0100	8.24	7,010	6-13	1100	9.72	8,560
9-22	2130	7.10	5,250				

16-8848. Fun-gawa near Aha

Location.--Lat 26°44'33" N., long 128°16'53" E., on right bank 50 ft downstream from bridge, 2.0 miles north of Aha School, and 2.2 miles west of Ada.

Drainage area.--3.3 sq mi, approximately.

Records available.--February 1964 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 380 ft (from topographic map).

Extremes.--Maximum discharge during year, 5,280 cfs Aug. 22 (gage height, 16.75 ft), from rating curve extended above 1,300 cfs as explained below; minimum, 3.6 cfs Apr. 2, 3, 6.

1964-67: Maximum discharge, 5,860 cfs May 12, 1966 (gage height, 17.91 ft), from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft; minimum, 3.3 cfs Jan. 15, 16, 1966.

Flood of Oct. 25, 1963, reached a stage of 18.1 ft, from floodmarks, and that of Dec. 2, 1963, a stage of 21.5 ft, from floodmarks (discharge, 5,950 and 7,650 cfs, respectively, from rating curve extended above 1,300 cfs on basis of slope-area measurement at gage height 18.1 ft). Minimum discharge known, 2.50 cfs Oct. 22, 1963, result of discharge measurement.

Remarks.--Records good. No diversion above station. Sediment samples are collected intermittently. Records of suspended sediment loads for the fiscal year 1967 are published in Part 2 of this report.

Discharge, in cubic feet per second, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	14	7.0	9.0	13	8.9	5.6	189	5.8	5.4	3.8	5.8	23
2	30	6.5	33	12	6.1	5.6	29	114	5.2	3.6	5.2	16
3	19	6.3	11	11	5.4	5.4	22	35	5.0	4.0	5.2	113
4	65	6.3	9.8	10	5.2	5.2	18	11	5.0	4.0	5.0	147
5	22	6.1	9.2	9.8	9.3	15	16	9.2	20	3.8	4.6	324
6	52	5.8	9.3	9.8	71	22	15	8.4	10	5.7	4.8	327
7	51	5.8	9.0	8.9	21	13	15	7.8	6.8	5.0	4.8	173
8	26	7.8	8.1	8.7	6.8	32	13	7.5	6.1	5.4	9.9	135
9	19	6.5	26	8.7	5.8	16	12	7.3	5.8	11	7.0	62
10	17	5.8	30	8.4	8.1	13	12	7.0	5.6	5.0	5.2	39
11	16	6.5	49	7.8	6.1	10	12	9.8	5.4	7.3	5.0	33
12	14	8.5	15	7.5	5.6	43	18	7.0	5.2	7.0	4.8	45
13	13	9.0	13	7.3	5.4	15	11	6.5	5.2	5.8	5.2	323
14	12	10	13	7.3	5.6	12	10	18	5.0	5.0	7.0	42
15	12	7.5	12	7.3	5.4	10	10	14	5.0	4.6	18	32
16	11	6.3	10	7.0	5.2	13	9.8	8.4	4.8	4.4	6.3	102
17	10	26	10	6.8	5.2	9.8	9.2	7.8	4.6	4.2	5.4	44
18	10	13	9.5	6.5	5.2	8.9	8.7	7.3	5.8	4.0	5.0	31
19	9.8	30	8.7	6.3	5.2	8.7	8.4	7.0	4.8	5.2	4.8	26
20	9.5	51	9.2	6.3	13	8.4	8.4	6.5	4.6	19	13	23
21	8.9	77	8.9	6.1	7.8	14	7.8	6.3	5.8	6.1	143	20
22	8.9	363	307	6.1	5.6	9.8	7.5	6.1	4.6	4.8	22	18
23	8.7	24	319	5.8	5.2	25	7.3	6.3	4.4	4.6	11	17
24	8.4	32	67	5.8	5.4	15	7.3	6.1	4.2	5.1	10	16
25	7.8	17	32	5.4	46	164	7.0	7.0	4.0	6.5	50	14
26	7.5	15	23	5.2	12	59	6.8	5.8	4.0	4.8	23	13
27	7.5	13	19	5.2	7.3	27	6.5	5.6	4.0	4.2	14	13
28	9.2	12	17	6.3	6.3	22	6.5	5.4	4.0	7.0	12	12
29	7.3	13	15	5.6	5.8	18	7.8	----------	4.2	35	10	11
30	7.0	10	14	5.4	7.3	16	6.1	----------	3.8	7.0	11	11
31	7.3	8.9	----------	5.2	---------	16	6.1	----------	3.8	---------	55	---------
Total	520.8	816.6	1125.7	232.5	318.2	657.4	523.2	353.9	172.1	202.9	493.0	2205
Mean	16.8	26.3	37.5	7.50	10.6	21.2	16.9	12.6	5.55	6.76	15.9	73.5
Ac-ft	1030	1620	2230	461	631	1300	1040	702	341	402	978	4370
Max	65	363	319	13	71	164	189	114	20	35	143	327
Min	7.0	5.8	8.1	5.2	5.2	5.2	6.1	5.4	3.8	3.6	4.6	11

Calendar year 1966: Max 932 Min 3.3 Mean 28.9 Ac-ft 20,910
Fiscal year 1966-67: Max 363 Min 3.6 Mean 20.9 Ac-ft 15120

Peak discharge (base, 1,700 cfs)

Date	Time	Gage height	Discharge	Date	Time	Gage height	Discharge
8-22	0100	16.75	5,280	6- 3	1930	9.73	2,040
9-22	2130	9.50	1,950	6-13	1030	14.25	4,020

16-9060. Vaitolu Stream at Aoa

Location.--Lat 14°16'19" S., long 170°35'32" W., on left bank 0.5 mile upstream from mouth and 0.7 mile southwest of Aoa.

Drainage area.--0.16 sq mi.

Records available.--March 1958 to June 1967. Prior to July 1960, published as "near Aoa."

Gage.--Water-stage recorder. Altitude of gage is 190 ft (from topographic map).

Average discharge.--9 years, 0.293 mgd (0.453 cfs).

Extremes.--Maximum discharge during year, 142 mgd (220 cfs) Dec. 2 (gage height, 5.93 ft), from rating curve extended above 2.1 mgd as explained below; no flow for several days.
1958-67: Maximum discharge, 154 mgd (238 cfs) Dec. 19, 1962 (gage height, 6.16 ft), from rating curve extended above 2.1 mgd by logarithmic plotting; no flow at times in 1964-67.

Remarks.--Records good. Small diversion above station for domestic use since Sept. 14, 1964.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	0.05	0.02	0.07	0.07	11	0.12	0.03	0.01	0.40	0.04	0.03
2	.02	.06	.02	1.7	.37	12	.12	.06	.01	1.1	.04	.03
3	.06	.32	.04	.23	.04	1.1	.12	.03	.02	.90	.04	.03
4	.03	.44	.03	.06	.02	.35	.10	.02	0	3.0	.16	.03
5	1.7	.05	.03	.03	.03	.26	.10	.46	.02	.70	.04	.03
6	.12	.03	.03	.03	.03	1.5	.10	.02	.02	.45	.07	.03
7	.04	.02	.03	.04	.03	1.4	.08	.02	.01	.32	.03	.04
8	.03	.01	.03	.03	.03	.32	.08	.02	.01	.24	.03	.04
9	.03	0	.03	.04	.03	.29	.08	.03	.50	.23	.36	.05
10	.03	.01	.03	.03	.05	.92	.07	.03	.01	.40	.08	.70
11	.03	.01	.03	.03	.04	.32	.07	.03	0	.10	.04	.14
12	.03	.19	.03	.03	.18	.21	.07	.03	0	.08	.03	.03
13	.04	.02	.03	.03	.04	.21	.07	.08	0	.06	.52	.03
14	.05	.01	.14	.04	.03	.19	.07	.01	0	.05	.29	.12
15	.65	.01	.03	.03	.03	.16	.07	.05	0	.07	.04	.05
16	.10	.01	.02	.02	.02	.39	.07	.03	0	.10	.02	.03
17	.03	.01	1.2	.02	.03	.23	.06	.06	0	.15	.02	.39
18	.02	.01	.14	.02	.03	.16	.05	.24	0	.09	.04	2.1
19	.03	0	.02	.04	.03	.16	.05	.05	0	.06	.05	2.7
20	.03	.01	.02	.06	.03	.40	.05	.04	0	.04	.34	.60
21	.04	.01	.01	1.4	.02	.26	.05	.05	.01	.03	.41	.21
22	.03	.01	.01	.41	.03	.40	.05	.01	0	.03	.04	.07
23	.03	.01	.02	.10	.04	.35	.06	.02	0	.25	.02	.04
24	.03	.01	.08	.07	.11	.19	.08	.07	.01	1.1	.02	.03
25	.03	.02	.02	.05	.02	.14	.10	.05	.04	.19	.02	.03
26	.03	.02	.02	.37	.03	.19	.14	.02	.30	.05	.02	.03
27	.03	.02	.03	1.2	.03	.14	.03	.02	.20	.04	.02	.03
28	.03	.02	.03	1.8	.03	.14	.02	.01	.12	.05	.02	.03
29	.03	.02	.02	2.0	.02	.14	.03	----	.07	.04	.02	.03
30	.05	.02	.03	.44	.22	.14	.03	----	.04	.04	.03	.12
31	.04	.02	----	.51	----	.12	.03	----	.14	----	.03	----
Total	3.47	1.45	2.22	10.93	1.71	33.78	2.22	1.59	1.54	10.36	2.93	7.82
Mean												
Mgd	0.112	0.047	0.074	0.353	0.057	1.09	0.072	0.057	0.050	0.345	0.095	0.261
Cfs	0.173	0.073	0.114	0.546	0.088	1.69	0.111	0.088	0.077	0.534	0.147	0.404
Ac-ft	11	4.4	6.8	34	5.2	104	6.8	4.9	4.7	32	9.0	24
Max	1.7	0.44	1.2	2.0	0.37	12	0.14	0.46	0.50	3.0	0.52	2.7
Min	0.02	0	0.01	0.02	0.02	0.12	0.02	0.01	0	0.03	0.02	0.03

Calendar Year 1966: Max 12 Min 0 Mean (mgd) 0.233 Mean (cfs) 0.361 Ac-ft 261
Fiscal Year 1966-67: Max 12 Min 0 Mean (mgd) 0.219 Mean (cfs) 0.339 Ac-ft 246

Peak discharge (base, 40 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
10- 2	1200	4.77	84	130	12- 6	1530	3.65	42	65
12- 2	0200	5.93	142	220					

16-9120. Pago Stream at Afono

Location.--Lat 14°16'03" S., long 170°39'02" W., on left bank 0.2 mile south of Afono and 0.3 mile upstream from mouth.

Drainage area.--0.60 sq mi.

Records available.--October 1958 to June 1967. Prior to July 1960, published as Afono Stream at Afono.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 30 ft (from topographic map).

Average discharge.--8 years (1959-67), 2.14 mgd (3.31 cfs).

Extremes.--Maximum discharge during year, 470 mgd (727 cfs) Dec. 1 (gage height, 4.65 ft), from rating curve extended above 14 mgd as explained below; minimum, 0.32 mgd (0.50 cfs) Oct. 18.
1958-67: Maximum discharge, 490 mgd (758 cfs) May 9, 1964 (gage height, 4.70 ft), from rating curve extended above 14 mgd by logarithmic plotting; minimum, 0.16 mgd (0.25 cfs) Sept. 30, 1961.

Remarks.--Records good. About 0.04 mgd diverted above station for domestic use in Afono.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.99	0.57	0.86	0.52	3.0	64	1.1	0.52	0.80	2.2	1.2	0.74
2	1.1	.57	.86	4.2	4.1	26	1.5	.52	.86	7.8	1.1	.68
3	1.2	3.4	1.3	1.6	2.6	5.4	1.1	.86	.80	13	.99	.68
4	2.0	8.6	1.1	.86	1.9	3.2	.99	1.6	.74	20	1.3	.62
5	12	3.9	.99	.62	1.7	2.3	.92	3.2	.92	15	1.3	.62
6	2.4	2.6	.92	.57	1.4	3.3	.99	1.1	.92	12	1.6	.62
7	1.7	1.5	.92	.52	1.2	6.8	.92	.74	.86	6.0	1.4	.74
8	1.3	1.2	.92	.44	1.3	2.7	.80	.62	.80	4.1	1.5	1.3
9	1.2	.92	.92	.48	1.2	2.3	.74	.57	1.4	14	3.5	1.1
10	1.1	.74	.92	.44	1.1	4.5	.68	.57	.92	8.7	1.7	7.7
11	.99	.68	.92	.48	.99	2.3	.68	.57	.74	4.1	1.5	3.8
12	.92	16	.86	.40	2.9	1.8	.68	.57	.68	2.9	2.0	1.8
13	.92	2.6	.86	.40	2.3	1.5	.68	.62	.62	2.1	2.1	1.5
14	.92	1.6	2.2	.40	1.3	1.6	.80	.57	.62	1.7	2.7	3.0
15	6.4	1.3	1.9	.44	1.1	1.5	.62	.48	.52	2.1	1.6	2.3
16	2.4	1.1	.86	.44	.92	5.6	.68	1.0	.48	1.6	1.2	1.7
17	1.6	.99	12	.44	.86	4.5	.57	1.5	.48	2.2	1.1	4.5
18	1.2	.92	2.7	.40	.80	2.2	.57	3.4	.44	1.7	1.1	13
19	.99	.86	.80	.74	.68	1.7	.57	1.4	.40	1.3	1.2	17
20	.92	1.2	.80	.86	3.1	4.5	.99	2.4	.44	1.5	2.5	5.4
21	.86	1.4	.68	8.0	2.0	3.3	.74	5.1	.48	1.2	5.4	3.5
22	.86	1.4	.68	4.4	1.1	2.9	.57	1.7	.45	1.1	2.0	2.6
23	.74	1.6	.62	2.0	.92	3.8	.52	1.1	.42	1.1	1.3	2.1
24	.74	.99	.74	1.3	.92	2.2	.57	1.3	.50	4.2	1.1	1.8
25	.74	.92	.62	1.0	.80	1.7	.92	3.6	.72	2.1	.99	1.6
26	.68	.92	.62	5.0	.80	1.7	2.0	1.7	1.0	1.4	.92	1.4
27	.68	.92	.57	6.6	.86	1.5	1.4	1.1	.84	2.6	1.7	1.5
28	.68	.92	.57	9.0	.80	1.3	.80	.92	.78	4.9	1.2	1.4
29	.62	.92	.57	12	.68	1.1	.62	----------	.60	2.3	.99	3.0
30	.62	.92	.52	4.0	.74	1.1	.52	----------	2.5	1.6	.86	3.5
31	.68	.80	----------	5.0	----------	1.1	.62	----------	2.3	----------	.80	----------
Total	50.15	62.96	39.80	73.55	44.07	169.4	25.86	39.33	25.03	146.5	49.85	91.20
Mean												
Mgd	1.62	2.03	1.33	2.37	1.47	5.46	0.834	1.40	0.807	4.88	1.61	3.04
Cfs	2.51	3.14	2.06	3.67	2.27	8.45	1.29	2.17	1.25	7.55	2.49	4.70
Ac-ft	154	193	122	226	135	520	79	121	77	450	153	280
Max	12	16	12	12	4.1	64	2.0	5.1	2.5	20	5.4	17
Min	0.62	0.57	0.52	0.40	0.68	1.1	0.52	0.48	0.40	1.1	0.80	0.62

Calendar Year 1966: Max 64 Min 0.36 Mean (mgd) 2.23 Mean (cfs) 3.45 Ac-ft 2490
Fiscal Year 1966-67: Max 64 Min 0.40 Mean (mgd) 2.24 Mean (cfs) 3.47 Ac-ft 2510

Peak discharge (base, 130 mgd)

Date	Time	Gage height	Discharge	
			Mgd	Cfs
12-1	1000	4.65	470	727

16-9175. Leele Stream at mouth, at Fagasa

Location.--Lat 14°17'28" S., long 170°43'09" W., on left bank at Fagasa and 200 ft upstream from mouth.

Drainage area.--0.23 sq mi.

Records available.--June 1966 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 10 ft (from topographic map).

Extremes.--1966: Maximum discharge during June, 29 mgd (45 cfs) June 24 (gage height, 2.77 ft), from rating curve extended above 2.9 mgd as explained below; minimum, 0.38 mgd (0.59 cfs) June 16.
1966-67: Maximum discharge during fiscal year, 99 mgd (153 cfs) Sept. 17 (gage height, 3.26 ft), from rating curve extended above 2.9 mgd on basis of slope-area measurement at gage height 3.61 ft; minimum, 0.14 mgd (0.22 cfs) Mar. 21-24.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, 1966

June 16..... 0.43	June 21..... 2.5	June 26..... 1.2
17..... .78	22..... 1.7	27..... .85
18..... 4.9	23..... 1.0	28..... .72
19..... 2.6	24..... 2.6	29..... .78
20..... 2.8	25..... 2.6	30..... .61

Peak discharge (base, 50 mgd).--No peak above base.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.56	0.29	0.38	0.43	1.1	7.0	0.54	0.56	0.38	1.7	0.43	0.43
2	.99	.29	.38	.85	.98	8.0	1.1	.43	.38	8.9	.47	.38
3	.98	1.9	1.3	.47	.85	2.1	.52	.38	.38	4.3	.47	.34
4	1.8	5.6	.67	.34	.72	1.0	.65	3.5	.29	4.3	.43	.29
5	7.9	3.2	.43	.29	.85	2.4	.47	1.8	.38	4.7	.95	.25
6	1.7	1.5	.34	.25	.78	2.1	.43	.72	.38	4.1	.91	.25
7	1.0	1.7	.34	.25	1.1	1.6	.38	.47	.29	3.7	.47	.44
8	.85	1.5	.34	.25	.72	.98	.34	.38	.34	3.0	1.4	2.1
9	.72	.78	.29	.38	1.9	.98	.34	.43	1.0	2.4	2.0	1.6
10	.61	.61	.29	.22	.78	2.5	.34	.38	.43	2.2	.72	8.5
11	.56	.56	.25	.22	.61	1.0	.25	.38	.43	2.0	2.3	2.1
12	.52	7.0	.25	.22	.98	.72	.25	6.2	.34	1.7	4.4	.98
13	.61	1.4	.25	.19	.78	.56	.43	.57	.25	1.3	1.6	.61
14	1.1	.85	2.3	.22	.61	.98	.34	.43	.22	1.0	1.2	1.8
15	8.0	.61	2.1	.49	.52	.72	.29	.29	.19	1.5	.72	1.8
16	2.8	.52	.72	.22	.43	2.2	.29	.34	.50	2.0	.56	1.0
17	1.2	.47	19	.22	.38	1.7	.25	1.2	.25	2.5	.47	4.0
18	.85	.43	2.6	.19	.34	.91	1.0	1.7	.19	1.0	.61	7.2
19	.67	.43	1.1	.95	.34	.61	.56	1.5	.19	.70	.58	7.9
20	.56	4.7	.72	.56	.34	2.7	1.6	1.6	.19	.60	2.5	2.3
21	.56	2.9	.56	7.8	.34	1.8	.72	1.9	.16	.52	3.5	1.3
22	.47	1.8	.52	3.4	.34	2.9	.43	.78	.16	.67	1.9	.91
23	.47	1.0	.47	2.1	.43	2.5	.34	.52	.16	.67	1.1	.78
24	.47	.72	.56	2.6	.34	1.0	.29	1.5	.37	.61	.67	.67
25	.47	.56	.47	2.6	.34	.72	.72	2.0	.25	.47	.56	.56
26	.38	.52	.38	4.5	.38	.72	.78	.78	.64	.38	.52	.56
27	.38	.47	.34	9.6	.38	.72	.78	.52	.47	.38	1.5	.72
28	.38	.43	.29	6.9	.38	.61	.47	.43	.29	.43	.78	2.0
29	.43	.43	.29	2.9	.30	.52	.34	----------	.19	.38	.56	1.9
30	.34	.38	.29	1.7	.60	.56	.49	----------	.19	.38	.52	.78
31	.34	.38	----------	2.3	----------	.47	.61	----------	1.3	----------	.43	----------
Total	38.67	43.93	38.22	53.61	18.94	53.28	16.34	31.69	11.18	58.49	35.23	54.45
Mean												
Mgd	1.25	1.42	1.27	1.73	0.631	1.72	0.527	1.13	0.361	1.95	1.14	1.82
Cfs	1.93	2.20	1.96	2.68	0.976	2.66	0.815	1.75	0.559	3.02	1.76	2.82
Ac-ft	119	135	117	165	58	164	50	97	34	179	108	167
Max	8.0	7.0	19	9.6	1.9	8.0	1.6	6.2	1.3	8.9	4.4	8.5
Min	0.34	0.29	0.25	0.19	0.30	0.47	0.25	0.29	0.16	0.38	0.43	0.25

Calendar Year 1966: Max - Min - Mean (mgd) - Mean (cfs) - Ac-ft -
Fiscal Year 1966-67: Max 19 Min 0.16 Mean (mgd) 1.24 Mean (cfs) 1.92 Ac-ft 1390

Peak discharge (base, 50 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-15	0430	3.17	81	125	9-17	0800	3.26	99	153
8-20	0800	3.03	58	90	6-28	2300	2.97	50	77

16-9205. Aasu Stream at Aasu

Location.--Lat 14°17'51" S., long 170°45'30" W., on right bank at Aasu and 200 ft upstream from mouth.

Drainage area.--1.03 sq mi.

Records available.--October 1958 to June 1967.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (by hand levels from high-tide mark).

Average discharge.--8 years (1959-67), 4.19 mgd (6.48 cfs).

Extremes.--Maximum discharge during year, 367 mgd (568 cfs) June 29 (gage height, 4.51 ft), from rating curve extended above 12 mgd as explained below; minimum, 0.88 mgd (1.4 cfs) Mar. 22.
1958-67: Maximum discharge, 415 mgd (642 cfs) Aug. 10, 1962 (gage height, 4.72 ft), from rating curve extended above 12 mgd by logarithmic plotting; minimum, 0.32 mgd (0.50 cfs) Sept. 29 to Oct. 1, 1961.

Remarks.--Records good. Small diversion above station for domestic use. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.3	1.8	2.1	2.2	6.9	7.5	3.3	1.4	4.6	2.1	2.3	2.4
2	3.1	1.6	2.1	4.5	6.2	15	3.3	1.4	4.3	25	2.2	2.3
3	3.1	10	3.1	2.9	5.2	6.2	2.4	1.4	3.8	21	2.0	2.1
4	4.2	8.7	2.2	2.3	5.5	6.6	2.8	5.2	3.5	51	1.8	2.0
5	19	8.7	1.8	2.0	5.2	6.4	3.5	2.6	3.1	32	5.2	2.2
6	6.2	6.2	1.7	1.8	4.3	4.3	3.6	1.6	2.9	28	7.0	2.0
7	5.0	7.5	1.4	1.7	7.4	6.4	2.9	1.2	2.6	24	3.8	2.2
8	4.6	6.2	1.3	1.7	5.0	4.6	2.3	1.2	2.3	15	3.8	4.0
9	4.2	5.2	1.3	1.7	6.4	4.0	1.8	2.2	4.0	15	4.8	4.0
10	3.8	4.8	1.2	1.4	4.2	4.2	1.7	1.7	2.4	14	3.1	31
11	3.5	4.3	1.1	1.3	3.8	3.6	1.7	4.2	2.3	9.6	3.3	13
12	3.3	6.9	1.0	1.3	5.2	3.3	2.0	4.3	2.3	7.5	2.9	8.7
13	2.9	5.0	1.1	1.3	4.8	3.1	2.3	2.9	2.1	6.2	2.8	6.9
14	3.6	4.0	5.3	1.2	3.6	3.8	2.0	2.2	1.7	5.5	2.9	12
15	32	3.6	3.8	1.2	3.3	3.5	1.7	2.0	1.4	8.2	2.4	12
16	10	3.3	2.2	1.1	2.8	6.6	1.6	2.1	1.4	10	2.3	9.0
17	6.9	3.1	27	1.1	2.6	5.0	2.1	3.1	1.2	15	2.2	14
18	5.9	3.1	9.6	1.0	2.4	3.6	1.7	5.2	1.2	7.2	2.2	26
19	5.2	2.6	5.9	1.6	2.3	3.1	1.6	7.7	1.1	5.5	2.3	29
20	4.8	7.3	5.2	1.4	2.2	4.7	2.2	5.5	1.1	4.8	4.8	16
21	4.3	6.2	4.6	12	2.1	4.6	1.8	5.5	1.0	4.6	5.0	12
22	6.2	5.9	4.2	7.2	2.2	7.6	1.4	4.3	.95	4.2	4.8	9.3
23	3.6	4.3	3.8	7.9	2.1	6.9	1.2	3.6	1.0	3.8	3.6	7.5
24	3.3	3.6	4.0	12	2.1	5.0	1.2	11	1.6	4.5	2.8	6.4
25	3.1	3.3	3.6	7.5	1.8	4.3	1.8	11	2.4	3.8	2.4	5.7
26	2.8	3.1	3.6	10	1.8	4.3	2.2	6.6	4.8	3.3	2.3	4.8
27	2.4	2.9	3.1	25	1.8	4.0	2.6	5.5	3.8	3.1	4.9	11
28	2.3	2.6	2.4	19	2.0	4.0	1.7	5.0	2.2	2.9	3.6	13
29	2.1	2.4	2.3	13	1.4	3.5	1.4	----------	1.7	2.6	2.8	31
30	2.1	2.4	2.2	11	1.6	3.5	1.4	----------	1.4	2.4	2.4	11
31	2.0	2.2	----------	8.7	----------	3.1	1.6	----------	1.6	----------	2.3	----------
Total	168.8	142.8	114.2	168.0	108.2	156.3	64.8	111.6	71.75	341.8	101.0	312.5
Mean												
Mgd	5.45	4.61	3.81	5.42	3.61	5.04	2.09	3.99	2.31	11.4	3.26	10.4
Cfs	8.43	7.13	5.89	8.39	5.59	7.80	3.23	6.17	3.57	17.6	5.04	16.1
Ac-ft	518	438	350	516	332	480	199	342	220	1050	310	959
Max	32	10	27	25	7.4	15	3.6	11	4.8	51	7.0	31
Min	2.0	1.6	1.0	1.0	1.4	3.1	1.2	1.2	0.95	2.1	1.8	2.0

Calendar Year 1966: Max 41 Min 0.82 Mean (mgd) 4.46 Mean (cfs) 6.90 Ac-ft 5,000
Fiscal Year 1966-67: Max 51 Min 0.95 Mean (mgd) 5.10 Mean (cfs) 7.89 Ac-ft 5,710

Peak discharge (base, 100 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-15	0530	3.72	209	323	6-10	1600	3.96	257	398
4- 2	0100	3.24	128	198	6-29	0200	4.51	367	568
4- 4	0930	4.12	289	447					

16-9310. Ataulona Stream at Afao

Location.--Lat 14°20'10" S., long 170°48'02" W., on left bank at Afao, 100 ft upstream from highway bridge, and 300 ft upstream from mouth.

Drainage area.--0.24 sq mi.

Records available.--October 1958 to June 1967.

Gage.--Water-atage recorder. Altitude of gage is 20 ft (by hand levels from high-tide mark).

Average discharge.--8 years (1959-67), 0.943 mgd (1.46 cfs).

Extremes.--Maximum discharge during year, 351 mgd (543 cfs) June 30 (gage height, 3.87 ft), from rating curve extended above 5.3 mgd by logarithmic plotting; minimum, 0.17 mgd (0.26 cfs) Sept. 12, 13.
1958-67: Maximum discharge, that of June 30, 1967; minimum, 0.04 mgd (0.06 cfs) Oct. 21, 1963.

Remarks.--Records good. Diversion above station for use at Ataulona School averages 10,400 gallons per day. Continuous records of rainfall are obtained at station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.64	0.44	0.31	0.55	1.1	1.3	0.40	0.44	0.68	1.2	0.64	0.85
2	.60	.40	.31	1.2	1.1	3.2	.37	.48	.68	2.5	.60	.60
3	.60	5.5	.58	.73	.83	.94	.34	.55	.60	4.5	.55	.44
4	.98	2.4	.34	.55	.94	.60	.34	3.3	.55	9.5	.44	.40
5	6.0	1.2	.31	.51	.78	.51	.34	1.5	.51	7.3	2.8	.97
6	2.2	1.3	.28	.44	.64	.51	.34	.68	.48	4.9	2.9	.55
7	1.4	2.6	.26	.40	1.9	.44	.28	.51	.44	3.9	.94	.48
8	1.0	1.7	.26	.40	.89	.40	.26	.51	.44	1.9	.60	.73
9	.83	1.0	.23	.40	.68	.40	.26	.48	1.6	1.8	1.1	.73
10	.73	.78	.21	.37	.60	.48	.26	.44	.60	1.7	.64	6.2
11	.64	.64	.21	.34	.60	.37	.28	.57	.51	1.4	.51	2.1
12	.60	1.2	.19	.34	.74	.34	.26	.64	.44	1.0	1.6	1.4
13	.55	.78	.21	.34	.55	.31	.62	.68	.44	.83	1.0	.89
14	.68	.64	1.6	.34	.48	.37	.31	.55	.40	.78	1.0	6.0
15	9.3	.55	1.1	.34	.48	.34	.26	.48	.40	1.4	.68	3.1
16	1.7	.51	.64	.44	.44	.56	.26	.51	.37	1.1	.51	1.2
17	1.2	.48	5.6	.37	.40	.37	.31	1.4	.34	1.9	.51	1.5
18	.89	.48	1.5	.40	.37	.31	1.0	1.7	.34	1.2	.44	3.7
19	.78	.51	.94	.96	.37	.28	.48	2.3	.31	.83	.40	3.0
20	.68	2.2	.73	.48	.37	.98	.64	1.6	.28	.78	1.0	2.0
21	.60	1.5	.64	4.0	.37	1.0	.48	1.4	.28	.68	1.3	1.5
22	.51	1.3	.60	1.7	.44	1.4	.34	.94	.26	.64	1.9	1.3
23	.48	.83	.60	1.9	.40	1.3	.31	.73	.26	.83	1.0	1.2
24	.48	.64	.64	2.4	.37	.68	.28	6.0	.31	.84	.68	1.1
25	.48	.55	.60	1.3	.34	.71	.78	2.4	.44	.64	.51	1.1
26	.44	.51	2.0	2.0	.37	.68	.89	1.4	.55	.60	.48	1.1
27	.40	.44	1.1	4.9	.37	.51	.64	.94	.44	.64	1.3	5.6
28	.40	.37	.73	3.6	.34	.48	.44	.78	.44	.55	.78	5.0
29	.40	.37	.60	2.2	.31	.37	.37	----------	.34	1.7	.55	4.3
30	.87	.34	.51	2.3	.31	.37	.40	----------	1.4	1.0	.51	8.0
31	.51	.31	----------	1.4	----------	.40	.52	----------	1.3	----------	.48	----------
Total	37.57	32.47	23.83	37.60	17.88	20.91	13.06	33.91	16.43	58.54	28.35	67.04
Mean												
Mgd	1.21	1.05	0.794	1.21	0.596	0.675	0.421	1.21	0.530	1.95	0.915	2.23
Cfs	1.87	1.62	1.23	1.87	0.922	1.04	0.651	1.87	0.820	3.02	1.42	3.45
Ac-ft	115	100	73	115	55	64	40	104	50	180	87	206
Max	9.3	5.5	5.6	4.9	1.9	3.2	1.0	6.0	1.6	9.5	2.9	8.0
Min	0.40	0.31	0.19	0.34	0.31	0.28	0.26	0.44	0.26	0.55	0.40	0.40

Calendar Year 1966: Max 16 Min 0.17 Mean (mgd) 1.05 Mean (cfs) 1.62 Ac-ft 1,180
Fiscal Year 1966-67: Max 9.5 Min 0.19 Mean (mgd) 1.06 Mean (cfs) 1.64 Ac-ft 1,190

Peak discharge (base, 70 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
7-15	0530	2.87	140	217	6-14	2130	2.95	152	235
2-24	1130	2.37	76	118	6-27	1530	2.61	103	159
4- 4	0930	2.89	142	220	6-28	2230	2.73	119	184
6-10	1700	2.63	106	164	6-30	1100	3.87	351	543

16-9480. Afuelo Stream at Matuu

Location.--Lat 14°18'07" S., long 170°41'07" W., on left bank 0.2 mile northwest of Matuu and 0.3 mile upstream from mouth.

Drainage area.--0.25 sq mi.

Records available.--March 1958 to June 1967. Prior to July 1960, published as Matuu Stream at Matuu.

Gage.--Water-stage recorder. Altitude of gage is 80 ft (from topographic map).

Average discharge.--9 years, 0.963 mgd (1.49 cfs).

Extremes.--Maximum discharge during year, 122 mgd (189 cfs) Nov. 30 (gage height, 2.90 ft), from rating curve extended above 5.4 mgd as explained below; minimum, 0.11 mgd (0.17 cfs) Sept. 12, 13.
1958-67: Maximum discharge, 262 mgd (405 cfs) May 17, 1962 (gage height, 3.70 ft), from rating curve extended above 5.4 mgd by logarithmic plotting; minimum, 0.06 mgd (0.09 cfs) Oct. 14, 15, 1965.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.31	0.16	0.14	0.32	0.91	18	0.51	0.23	0.31	1.5	0.80	0.27
2	.94	.16	.14	2.5	1.4	11	1.3	.28	.34	3.5	.80	.23
3	.68	1.9	.74	.78	.91	1.8	.48	.34	.29	6.0	.29	.23
4	1.5	3.2	.36	.44	.68	.91	.44	1.5	.29	12	1.9	.23
5	7.9	1.0	.21	.34	.78	.82	.42	.80	.34	10	1.8	.21
6	1.0	.56	.17	.34	.73	1.8	.36	.35	.36	6.0	2.3	.21
7	.60	.59	.17	.31	.96	2.0	.31	.25	.29	5.0	.96	.19
8	.48	.56	.16	.31	.56	.86	.31	.25	.29	3.0	1.0	.61
9	.44	.34	.14	.29	1.1	.68	.27	.25	1.4	2.3	3.0	.60
10	.39	.27	.12	.19	.34	2.6	.31	.20	.48	2.0	1.2	4.9
11	.31	.27	.12	.17	.36	.82	.29	.30	.42	1.8	3.1	1.4
12	.29	4.4	.11	.19	.50	.50	.27	.30	.48	1.5	2.7	.64
13	.29	.82	.11	.16	.44	.39	.36	.35	.39	1.0	1.5	.44
14	.39	.44	1.3	.19	.31	.39	.42	.23	.36	1.0	1.2	1.4
15	2.6	.34	.96	.33	.29	.36	.29	.19	.36	2.0	.78	1.6
16	1.2	.27	.39	.19	.27	1.6	.30	.25	.36	1.5	.56	.82
17	.56	.27	6.7	.17	.24	1.3	.23	1.1	.36	2.5	.50	1.9
18	.39	.25	1.2	.14	.22	.68	.53	1.3	.34	1.5	.44	4.6
19	.31	.23	.60	1.2	.21	.42	.29	.44	.36	1.0	.48	6.8
20	.27	3.4	.48	.68	.21	4.1	2.6	.42	.36	1.0	3.1	1.7
21	.29	.91	.44	4.5	.21	1.8	.56	1.5	.36	.90	4.3	.91
22	.25	.60	.42	1.6	.21	2.6	.31	.39	.39	.90	1.2	.64
23	.21	.42	.50	1.2	.23	2.2	.25	.34	.39	1.0	.96	.50
24	.19	.29	.88	1.4	.23	.96	.30	.80	.39	1.1	.64	.48
25	.17	.25	.56	.96	.19	.64	.60	1.8	.52	.90	.48	.42
26	.19	.21	.48	1.8	.21	.64	1.2	.68	.78	.80	.42	.36
27	.17	.17	.44	7.1	.23	.73	.60	.42	.60	.90	.68	.39
28	.17	.17	.34	6.6	.19	.50	.34	.36	.60	.80	.48	1.8
29	.17	.16	.27	2.0	.19	.39	.23	----------	.50	2.0	.39	2.1
30	.19	.16	.27	1.7	1.6	.48	.28	----------	2.0	1.5	.39	1.6
31	.17	.14	----------	2.6	----------	.39	.27	----------	1.5	----------	.31	----------
Total	23.02	22.91	18.92	40.70	14.91	62.36	15.23	15.63	16.21	76.90	38.66	38.18
Mean												
Mgd	0.743	0.739	0.631	1.31	0.497	2.01	0.491	0.558	0.523	2.56	1.25	1.27
Cfs	1.15	1.14	0.976	2.03	0.769	3.11	0.760	0.863	0.809	3.96	1.93	1.96
Ac-ft	71	70	58	125	46	191	47	48	50	236	119	117
Max	7.9	4.4	6.7	7.1	1.6	18	2.6	1.8	2.0	12	4.3	6.8
Min	0.17	0.14	0.11	0.14	0.19	0.36	0.23	0.19	0.29	0.80	0.29	0.19

Calendar Year 1966: Max 18 Min 0.11 Mean (mgd) 0.960 Mean (cfs) 1.49 Ac-ft 1,070
Fiscal Year 1966-67: Max 18 Min 0.11 Mean (mgd) 1.05 Mean (cfs) 1.62 Ac-ft 1,180

Note.--No gage-height record Mar. 28 to May 2.

Peak discharge (base, 80 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
11-30	2400	2.90	122	189	2-4	1030	2.69	95	147
12-20	2000	2.58	82	127	4-4	-	2.87	118	183

16-9600. Alega Stream at Alega

Location.--Lat 14°16'58" S., long 170°38'19" W., on left bank 0.2 mile northwest of Alega and 0.3 mile upstream from mouth.

Drainage area.--0.19 sq mi.

Records available.--March 1958 to June 1967. Prior to July 1960, published as West Branch Alega Stream at Alega.

Gage.--Water-stage recorder. Altitude of gage is 180 ft (from topographic map).

Average discharge.--9 years, 0.811 mgd (1.25 cfs).

Extremes.--Maximum discharge during year, 55 mgd (85 cfs) Dec. 1 (gage height, 3.14 ft), from rating curve extended above 3.5 mgd as explained below; minimum, 0.30 mgd (0.46 cfs) Mar. 21, 22.
1958-67: Maximum discharge, 73 mgd (113 cfs) July 24, 1962 (gage height, 3.47 ft), from rating curve extended above 3.5 mgd by logarithmic plotting; minimum, 0.20 mgd (0.31 cfs) July 11, 12, 1959.

Remarks.--Records good. No diversion above station.

Discharge, in million gallons a day, fiscal year July 1966 to June 1967

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.55	0.41	0.48	0.48	1.5	13	0.79	0.48	0.38	0.59	0.74	0.44
2	.55	.41	.44	1.5	2.0	8.1	.84	.56	.41	2.6	.70	.44
3	.58	1.5	.51	.68	1.6	3.0	.70	.62	.38	2.5	.66	.44
4	.81	1.6	.44	.48	1.3	1.8	.70	1.1	.35	6.0	1.3	.41
5	3.0	.89	.44	.44	1.3	1.4	.62	.90	.38	3.3	1.2	.41
6	1.1	.74	.41	.41	1.1	1.9	.62	.60	.38	3.4	1.2	.38
7	.89	.66	.41	.41	1.0	3.0	.58	.52	.35	2.5	.99	.41
8	.70	.58	.41	.41	.94	1.6	.58	.50	.35	1.5	1.0	.41
9	.66	.55	.41	.44	.89	1.4	.55	.48	.54	4.9	1.7	.38
10	.62	.55	.38	.38	.84	2.0	.55	.43	.41	3.4	1.0	1.2
11	.62	.51	.38	.38	.82	1.3	.55	.50	.38	2.0	2.3	.70
12	.58	3.5	.38	.38	.80	1.1	.55	.56	.38	1.5	1.9	.51
13	.58	1.1	.38	.38	.78	.99	.55	.58	.38	1.3	1.2	.44
14	.58	.89	.82	.38	.76	1.0	.51	.50	.38	1.1	1.2	.93
15	1.5	.74	.58	.38	.70	.94	.51	.44	.35	1.4	.89	.70
16	.70	.70	.44	.38	.66	2.0	.51	.48	.35	1.1	.79	.66
17	.55	.66	1.9	.35	.66	1.4	.48	.90	.35	.99	.70	1.1
18	.51	.62	.79	.35	.62	.99	.48	1.0	.35	.89	.70	2.9
19	.55	.62	.55	.49	.62	.84	.48	.70	.32	.74	.66	4.1
20	.58	.58	.51	.51	.94	2.0	.55	.64	.38	.74	1.1	1.8
21	.58	.58	.48	2.5	.74	1.7	.44	1.3	.32	.79	1.4	1.3
22	.58	.55	.48	.99	.66	1.7	.44	.55	.32	.70	.94	.99
23	.55	.51	.51	.74	.66	1.8	.44	.44	.35	.66	.70	.84
24	.55	.51	.76	.99	.62	1.3	.44	.51	.35	1.5	.62	.74
25	.48	.48	.51	.84	.58	1.1	.48	.51	.41	.94	.58	.70
26	.44	.48	.48	1.0	.66	1.0	.88	.44	.65	.84	.55	.62
27	.44	.48	.48	2.3	.62	.99	.74	.41	.48	.94	.55	.66
28	.44	.48	.44	4.0	.58	.89	.56	.38	.38	1.7	.51	.62
29	.44	.48	.44	2.6	.58	.79	.48	----------	.35	1.0	.48	.62
30	.44	.48	.44	1.8	.59	.89	.56	----------	.35	.84	.48	1.3
31	.44	.48	----------	2.5	----------	.74	.54	----------	.52	----------	.48	----------
Total	21.59	23.32	16.08	29.87	26.12	62.66	17.70	17.03	12.03	52.36	29.22	27.15
Mean												
Mgd	0.696	0.752	0.536	0.964	0.871	2.02	0.571	0.608	0.388	1.75	0.943	0.905
Cfs	1.08	1.16	0.829	1.49	1.35	3.13	0.883	0.941	0.600	2.71	1.46	1.40
Ac-ft	66	72	49	92	80	192	54	52	37	161	90	83
Max	3.0	3.5	1.9	4.0	2.0	13	0.88	1.3	0.65	6.0	2.3	4.1
Min	0.44	0.41	0.38	0.35	0.58	0.74	0.44	0.38	0.32	0.59	0.48	0.38

Calendar Year 1966: Max 13 Min 0.28 Mean (mgd) 0.917 Mean (cfs) 1.42 Ac-ft 1030
Fiscal Year 1966-67: Max 13 Min 0.32 Mean (mgd) 0.918 Mean (cfs) 1.42 Ac-ft 1030

Peak discharge (base, 25 mgd)

Date	Time	Gage height	Discharge Mgd	Discharge Cfs	Date	Time	Gage height	Discharge Mgd	Discharge Cfs
12- 1	0900	3.14	55	85	4-4	1030	2.65	33	51
12-20	2000	2.61	31	48	4-9	1530	2.64	33	51

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow, partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the fiscal years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during fiscal year 1967

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Kauai					
16-0110	Waiakoali Stream near Waimea	lat 22°07'25", long 159°37'25", 0.3 mile above mouth and 12 miles northeast of Waimea.	1.7	1909-13≠, 1914-18, 1920-25≠, 1961-64, 1966-67	6- 5-67	1.75	2.71
16-0120	Kauaikinana Stream near Waimea	lat 22°07'45", long 159°38'05", 0.6 mile above mouth and 12 miles northeast of Waimea.	1.17	1912-13, 1915-17, 1920-25≠, 1961-64, 1966-67	6- 5-67	1.23	1.90
16-0295	Mokihana Stream near Waimea	lat 21°59'35", long 159°40'03", 500 ft above mouth and 2.5 miles north of Waimea.	4.77	1962-64, 1966-67	5-18-67	.45	.70
		Island of Oahu					
16-2140	Pearl Harbor Springs at Waiawa, near Pearl City	lat 21°23'35", long 157°59'10", at rear of Oahu Sugar Co. pumping plant 9, 0.7 mile west of Pearl City, and 1.5 miles east of Waipahu Post Office.	-	1931-34≠, 1938-64≠, 1967	1-10-67 3-22-67 4-20-67 5-16-67	9.10 8.41 8.60 8.34	14.1 13.0 13.3 12.9
16-2240	Pearl Harbor Springs at Kalauao, near Aiea	(a) lat 21°23'04", long 157°56'46", 300 ft below Highway 90, 900 ft below Oahu Sugar Co. pump 6, and 0.8 mile west of Aiea Post Office.	-	1931-62≠, 1964-65≠, 1966-67	1-24-66 1-25-66 4-19-66 6- 6-66 7- 9-66 8-15-66 1- 3-67 3- 2-67 4-13-67 4-20-67 6-23-67	18.7 19.5 17.5 17.0 14.9 14.3 16.1 14.7 15.4 15.7 14.6	28.9 30.2 27.1 26.3 23.1 22.1 24.9 22.7 23.8 24.3 22.6
16-2709	Luluku Stream at altitude 220 ft, near Kaneohe	(a) lat 21°23'42", long 157°48'46", 0.5 mile above mouth, 1.4 miles southwest of Castle High School, and 1.9 miles south of Kaneohe Post Office.	(a) .44	1960-63, 1965-67	6-29-67 6-30-67 do do do do	.64 6.39 3.51 2.60 1.21 .87	.99 9.89 5.43 4.02 1.87 1.35
		Island of Maui					
16-5320	Haipuaena Stream at Haiku-uka boundary, near Kailiili	(a) lat 20°49'28", long 156°12'28", 350 ft below Haiku-uka trail, 4.5 miles southeast of Kailiili, and 4.5 miles southwest of Keanae.	(a) .63	1919-27≠, 1933-34≠, 1963-67	7-20-66 8-30-66 10-11-66 11-29-66 1-19-67 3- 8-67 4-25-67 6- 6-67	.55 1.00 1.68 .55 .94 .73 .54 .30	.85 1.55 2.60 .85 1.45 1.13 .84 .46

≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1967--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Maui--Continued					
16-5420	East Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'36", long 156°12'39", 200 ft below Haiku-uka trail, 4.3 miles east of Kailiili, and 4.6 miles southwest of Keanae.	0.14	1920-27≠, 1933≠, 1963-67	7-20-66	0.13	0.20
					10-11-66	.47	.73
					11-29-66	.23	.36
					1-19-67	.32	.50
					3- 8-67	.30	.46
					4-25-67	.22	.34
					6- 6-67	.16	.25
16-5440	West Branch Puohokamoa Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'51", long 156°13'03", 150 ft below Haiku-uka trail, 3.8 miles southeast of Kailiili, and 4.8 miles southwest of Keanae.	.45	1919-28≠, 1933-35≠, 1963-67	7-20-66	.37	.57
					10-11-66	.80	1.24
					11-29-66	.30	.46
					1-19-67	.68	1.05
					3- 8-67	.78	1.21
					4-25-67	.44	.68
					6- 6-67	.12	.19
16-5540	Waikamoi Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'55", long 156°13'23", at Haiku-uka trail, 3.4 miles east of Kailiili, and 4.3 miles south of Kailua.	3.46	1918-28≠, 1933-35≠, 1963-67	8-29-66	4.49	6.95
					10-11-66	1.89	2.92
					11-28-66	2.87	4.44
					1-18-67	3.90	6.03
					3- 8-67	2.14	3.31
					4-24-67	1.80	2.79
					6- 5-67	1.01	1.56
16-5545	East Branch Waikamoi Stream at Haiku-uka boundary, near Kailiili	Lat 20°49'53", long 156°13'21", 150 ft above Haiku-uka trail, 3.4 miles southeast of Kailiili, and 5.1 miles southwest of Keanae.	.07	1918-28≠, 1933≠, 1963-67	11-28-66	.35	.54
					1-18-67	.76	1.18
					3- 8-67	.29	.45
					4-24-67	.22	.34
					6- 5-67	.11	.17
16-5691	Nailiilihaele Stream near Kailiili	(a) Lat 20°50'27", long 156°13'38", 200 ft below lower Kula pipeline, 3.0 miles east of Kailiili, and 3.7 miles south of Kailua.	.11	1963-67	10-10-66	.03	.05
					11-28-66	.03	.05
					1-18-67	.03	.05
					3- 7-67	.02	.03
					4-24-67	.01	.02
					6- 5-67	0	0
16-5697	West Branch Nailiilihaele Stream near Kailiili	Lat 20°50'27", long 156°14'00", 3 ft above lower Kula pipeline, 2.6 miles east of Kailiili, and 3.8 miles south of Kailua.	.04	1967	7-19-66	.40	.62
					8-29-66	.44	.68
					10-10-66	.25	.39
					11-28-66	.26	.40
					1-18-67	.49	.76
					3- 7-67	.35	.54
					4-24-67	.29	.45
					6- 5-67	.17	.26
16-5762	East Branch Kailua Stream near Kailiili	(a) Lat 20°50'25", long 156°14'07", 40 ft below lower Kula pipeline, 2.5 miles east of Kailiili, and 3.9 miles south of Kailua.	.35	1963-67	7-19-66	.42	.65
					10-10-66	.32	.50
					11-28-66	.37	.57
					1-18-67	.77	1.19
					3- 7-67	.42	.65
					4-24-67	.46	.71
					6- 5-67	.21	.32
		Island of Guam, Mariana Islands					
*16-8073	Fonte River at dam, near Nimitz Hill	Lat 13°27'25" N., long 144°43'34" E., at old diversion dam, 0.4 mile south of Force Headquarters building on Nimitz Hill, and 1.2 miles southeast of Asan.	.60	1961-67	5-17-67		.29
16-8077	Masso River at dam, near Piti	Lat 13°27'21" N., long 144°41'43" E., at end of penstocks on downstream side of dam, 0.5 mile southeast of Schroeder Junction, and 0.7 mile south of approximate center of Piti.	.74	1962, 1964-65, 1967	5-17-67		.59
16-8082	Faata Spring near Agat	Lat 13°22'25" N., long 144°39'58" E., 0.4 mile southwest of Alifan Mountain and 1.0 mile southeast of Agat.	-	1963-67	5-17-67		.27
16-8085	Taleyfac River near Agat	Lat 13°21'40" N., long 144°39'00" E., 800 ft above bridge on Agat-Umatac Road and 1.7 miles southwest of Agat School.	1.77	1960-67	5-17-67		1.33

* Also a crest-stage partial-record station.
≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1967--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Guam, Mariana Islands--Continued					
16-8100	Right Branch Umatac River at Umatac	Lat 13°17'50" N., long 144°39'50" E., 50 ft above confluence with Left Branch and 0.3 mile southeast of Umatac Catholic Church.	0.95	1960-67	6-16-67		1.00
16-8120	Left Fork of Left Branch Umatac River near Umatac	Lat 13°17'25" N., long 144°39'50" E., 0.4 mile above confluence with Right Fork and 1.2 miles southeast of Umatac Catholic Church.	.35	1960-67	6-16-67		.53
16-8130	Piga Spring near Umatac	Lat 13°17'55" N., long 144°40'47" E., at the source of the Right Fork of Left Branch Umatac River and 1.4 miles due east of Umatac Catholic Church.	-	1955, 1961-65, 1967	6-16-67		.13
16-8140	Right Fork of Left Branch Umatac River at Umatac	Lat 13°17'40" N., long 144°40'20" E., 50 ft above confluence with Left Fork and 0.9 mile southeast of Umatac Catholic Church.	.36	1960-67	6-16-67		.20
16-8170	Toguan River near Umatac	Lat 13°17'05" N., long 144°39'35" E., at highway bridge on Route 4 and 1.0 mile south of Umatac Catholic Church.	.48	1952, 1960-67	6-16-67		.17
16-8200	Geus River above Siligin Spring tributary, near Merizo	Lat 13°16'45" N., long 144°49'55" E., above pipeline diversion to village of Merizo and 2.0 miles northeast of Merizo School.	.50	1960-67	6-16-67		1.23
16-8205	Siligin Spring near Merizo	Lat 13°16'44" N., long 144°40'55" E., 0.2 mile above Geus River diversion dam and 1.6 miles northeast of Merizo School.	-	1954, 1961-67	6-16-67		.05
16-8207	Geus River below Siligin Spring tributary, near Merizo	Lat 13°16'41" N., long 144°40'55" E., 1.6 miles northeast of Merizo School and 2.0 miles southeast of Umatac School.	.60	1962-67	6-16-67		1.35
16-8250	Ajayan River near Inarajan	Lat 13°15'16" N., long 144°42'56" E., 2.4 miles southwest of Inarajan School and 3.8 miles southeast of Merizo School.	1.08	1962-67	5-25-67		.21
16-8280	Agfayan River near Inarajan	Lat 13°16'03" N., long 144°43'42" E., 1.2 miles southwest of Inarajan School and 4.5 miles east of Merizo School.	1.67	1962-65, 1967	5-25-67		.33
16-8300	Right Fork of Right Branch Inarajan River near Inarajan	(a) Lat 13°16'59" N., long 144°43'23" E., above confluence with Left Fork and 1.6 miles northwest of Inarajan Catholic Church.	1.40	1960-67	5-25-67		1.45
16-8310	Left Fork of Right Branch Inarajan River near Inarajan	(a) Lat 13°17'00" N., long 144°43'23" E., above confluence with Right Fork and 1.6 miles northwest of Inarajan Catholic Church.	.97	1960-67	5-25-67		1.49
16-8330	Right Fork of Left Branch Inarajan River near Inarajan	Lat 13°17'25" N., long 144°43'45" E., 1.6 miles northwest of Inarajan Catholic Church and 4.9 miles southwest of Talofofo School.	.84	1960-67	5-25-67		1.24
16-8340	Left Fork of Left Branch Inarajan River near Inarajan	Lat 13°17'10" N., long 144°44'10" E., above confluence with Right Fork and 1.0 mile northwest of Inarajan Catholic Church.	.39	1960-67	5-25-67		.21
16-8420	Asalonso River near Talofofo	Lat 13°19'41" N., long 144°45'34" E., 300 ft below highway bridge on Route 4 and 1.8 miles south of Talofofo School.	1.50	1952, 1961-67	5-19-67		.73
16-8450	Tolaeyuus River near Agat	Lat 13°21'55" N., long 144°42'40" E., 3.7 miles southeast of Agat and 4.8 miles southwest of Yona.	6.54	1952-61≠, 1962-67	6-19-67		6.99
16-8460	Tolaeyuus River at mouth, near Agat	Lat 13°21'30" N., long 144°42'30" E., above confluence with Fena River, 0.4 mile east of Fena Dam spillway, and 4.0 miles southeast of Agat School.	7.42	1962-67	6-19-67		8.85

≠ Operated as a continuous-record gaging station.
a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1967--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge Mgd	Discharge Cfs
		Island of Guam, Mariana Islands--Continued					
16-8540	Left Branch Ugum River near Talofofo	(a) Lat 13°19'08" N., long 144°43'45" E., 50 ft above confluence with Right Branch and 2.9 miles southwest of Talofofo School.	2.96	1961-67	5-19-67		7.36
16-8545	Right Branch Ugum River near Talofofo	(a) Lat 13°19'06" N., long 144°43'46" E., above confluence with Left Branch and 2.9 miles southwest of Talofofo School.	2.70	1961-67	5-19-67		5.74
16-8670	Janum Spring near Yigo	Lat 13°30'56" N., long 144°54'49" E., in small cave at sea level in limestone cliff on edge of reef, 2.2 miles southeast of Yigo.	-	1954-56, 1958, 1960-62, 1965, 1967	5- 8-67		4.36
		Island of Okinawa, Ryukyu Islands					
16-8757	Hiji-gawa at Hiji	Lat 26°43'12" N., long 128°10'40" E., at Hiji, 0.4 mile above Taihoza-gawa, and 1.1 miles east of Hama.	3.3	1964-67	7-21-66 10- 6-66 10-26-66 2-16-67 5-16-67		7.12 8.63 4.36 6.60 6.71
16-8758	Taihoza-gawa at Hiji	Lat 26°43'21" N., long 128°10'55" E., 0.2 mile east of Hiji, 0.6 mile above mouth, and 1.4 miles northeast of Hama.	2.3	1964-67	7-21-66 10- 6-66 10-26-66 2-16-67 5-16-67		5.38 6.85 3.08 4.21 2.30
16-8765	Taiho-okawa at Taiho	Lat 26°39'01" N., long 128°08'37" E., 1.0 mile east of Taiho and 1.7 miles north of Taira.	5.2	1964-67	12-14-66 1- 4-67 2-27-67 4-14-67 5-18-67 6-29-67		9.41 17.8 7.03 5.21 6.79 14.6
16-8772	North Fork Henan-gawa at Tsuha	Lat 26°38'28" N., long 128°05'47" E., 0.4 mile above confluence with South Fork and 0.8 mile south of Tsuha.	1.4	1964-67	3-20-67 5-16-67 6-27-67		1.30 2.62 3.57
16-8777	Genka-kawa at Genka	Lat 26°36'48" N., long 128°03'38" E., 0.9 mile southwest of Genka and 1.9 miles southeast of Nakaoshi.	5.5	1964, 1966-67	10-25-66 1- 5-67 2-24-67 6-27-67		8.71 27.2 7.47 19.0
16-8780	Makiya-okawa at Makiya	Lat 26°37'10" N., long 128°02'18" E., 0.3 mile south of Makiya, 0.5 mile east of Nakaoshi, and 0.6 mile above mouth.	1.7	1964-67	10- 7-66 2-24-67 5-18-67 5-24-67 6-27-67		3.36 2.21 2.59 7.00 4.50
16-8790	Manna-gawa at Manna	Lat 26°39'12" N., long 127°55'06" E., at Manna, 0.5 mile east of Inoha-shogakko (elementary school), and 1.4 miles above highway bridge at mouth.	2.2	1964-67	2-21-67 5-18-67 5-19-67 6-29-67		5.38 1.68 1.63 14.5
16-8794	Yofuke-gawa at Yofuke	Lat 26°34'02" N., long 127°59'43" E., 0.6 mile southeast of Yofuke and 0.6 mile northeast of Sukuta.	1.2	1964-67	2-24-67 5-24-67 6-29-67		.79 3.92 2.24
16-8795	Sukuta-kawa at Sukuta	Lat 26°33'33" N., long 127°59'23" E., 0.4 mile southeast of Sukuta, 0.6 mile above mouth, and 0.8 mile south of Yofuke.	1.1	1964-67	2-21-67 5-24-67 6-29-67		.50 3.51 1.84
16-8796	Fukuchi-gawa at Kyoda	Lat 26°32'37" N., long 127°58'40" E., 0.7 mile northeast of Kyoda and 1.5 miles southwest of Sukuta.	1.1	1964-67	5-24-67 6-29-67		2.41 1.89
16-8832	O-kawa at Kushi	Lat 26°30'50" N., long 127°59'50" E., 0.7 mile north of junction of Highways 13 and 108 and 0.7 mile west of Kushi.	1.3	1964-67	8-13-66 2-23-67		1.33 1.26
16-8835	Suginda-gawa at Suginda	Lat 26°32'41" N., long 128°01'56" E., 0.1 mile west of Suginda and 0.4 mile south of Futami.	.9	1964-67	2-23-67 3-27-67 5-17-67 6-30-67		1.01 .76 1.90 2.48

a Revised.

Discharge measurements made at low-flow partial-record stations during fiscal year 1967--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Okinawa, Ryukyu Islands--Continued					
16-8836	Oura-gawa at Oura	Lat 26°33'32" N., long 128°02'35" E., 0.5 mile north of Oura and 1.0 mile northwest of Sedake.	3.1	1964-67	1-11-67		8.23
					2-23-67		4.03
					6-30-67		9.02
16-8838	Teema-gawa at Mihara	Lat 26°33'11" N., long 128°04'48" E., below Mihara-gawa, 0.1 mile southeast of Mihara-sho-chugakko (school), and 0.9 mile east of Teema.	3.2	1964-67	1-11-67		6.55
					2-23-67		4.36
					3-27-67		3.07
					5-17-67		4.48
					6-30-67		8.27
		Island of Tutuila, Samoa Islands					
16-9050	Lepa Stream at Aoa	Lat 14°16'21" S., long 170°35'17" W., 0.5 mile above mouth and 0.6 mile southwest of Aoa.	.09	1959-65, 1967	5-26-67	0.12	.19
16-9080	Vaipito Stream at Masausi	Lat 14°16'05" S., long 170°36'18" W., 0.2 mile south of Masausi and 0.3 mile above mouth.	.08	1959-64, 1967	5-25-67	.07	.11
16-9095	Talaloa Stream at Masefau	Lat 14°15'51" S., long 170°38'07" W., 50 ft below unnamed tributary, 0.5 mile southwest of Masefau, and 0.5 mile above mouth.	.47	1959-64, 1967	5-25-67	.45	.70
16-9325	Asili Stream at Asili	Lat 14°20'04" S., long 170°47'40" W., 100 ft above highway bridge at Asili and 0.1 mile above mouth.	.66	1958-59≠, 1960-65, 1967	5-25-67	2.25	3.48
16-9370	Vaitele Stream at Lepine	Lat 14°18'51" S., long 170°43'35" W., 0.7 mile north of Lepine and 1.1 miles above mouth.	.18	1959-65, 1967	5-24-67	.65	1.01
16-9380	Vaitele Stream tributary at Lepine	Lat 14°18'57" S., long 170°43'21" W., 0.2 mile above mouth and 0.7 mile northeast of Lepine.	.09	1959-65, 1967	5-24-67	.30	.46
16-9440	Papa Stream near Nuuuli	Lat 14°18'31" S., long 170°42'29" W., 0.3 mile above Tauese Stream and 0.9 mile northwest of Nuuuli.	.57	1960-64, 1967	5-24-67	2.06	3.19
16-9442	Papa Stream at Nuuuli	Lat 14°18'48" S., long 170°42'33" W., 500 ft below Tauese Stream and 0.8 mile northwest of Nuuuli.	.78	1966-67	6-17-66	.83	1.28
					6-30-66	1.32	2.04
					do	1.29	2.00
					11- 4-66	4.04	6.25
					12- 5-66	2.70	4.18
					1- 4-67	1.01	1.56
					2-13-67	.85	1.32
					3-10-67	.63	.98
					5-27-67	4.45	6.89
					6-13-67	2.40	3.71
					6-20-67	5.80	8.97
16-9460	Avau Stream at Faganeanea	Lat 14°18'34" S., long 170°41'35" W., 0.2 mile above mouth and 0.4 mile southwest of Faganeanea.	.09	1960-65, 1967	5-29-67	.23	.36
16-9470	Afu Stream at Faganeanea	Lat 14°18'16" S., long 170°41'25" W., 0.2 mile northwest of Faganeanea and 0.3 mile above mouth.	.22	1959-65, 1967	5-29-67	.21	.32
16-9497	Vaima Stream at Pago Pago	Lat 14°17'30" S., long 170°42'29" W., 0.4 mile above mouth and 1.0 mile southwest of Pago Pago.	.05	1960-65, 1967	5-29-67	.06	.09
16-9498	Utumoa Stream near Pago Pago	Lat 14°17'35" S., long 170°42'20" W., 0.6 mile above mouth and 1.1 miles south of Pago Pago.	.07	1961-65, 1967	5-26-67	.30	.46
16-9505	Utumoa Stream at Pago Pago	Lat 14°17'21" S., long 170°42'21" W., 150 ft below pipeline diversion, 0.3 mile above mouth, and 0.8 mile south of Pago Pago.	.17	1957-58≠, 1961-65, 1967	5-29-67	.25	.39
16-9510	Vaipito Stream at Pago Pago	Lat 14°16'57" S., long 170°42'16" W., 800 ft above Pago Stream and 0.3 mile southwest of highway junction in Pago Pago.	.75	1966-67	6-11-66	2.40	3.71
					6-30-66	1.24	1.92
					9-20-66	2.15	3.33
					11-29-66	.90	1.39
					2-28-67	1.23	1.90

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during fiscal year 1967--Continued

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Measurements		
					Date	Discharge	
						Mgd	Cfs
		Island of Tutuila, Samoa Islands--Continued					
16-9580	Visa Stream at Alega	Lat 14°17'21" S., long 170°38'37" W., 0.2 mile above mouth and 0.5 mile southwest of Alega.	0.10	1959-65, 1967	5-25-67	0.33	0.51
16-9585	Visa Stream tributary at Aumi	Lat 14°17'24" S., long 170°38'35" W., 200 ft above mouth and 0.3 mile northeast of Aumi.	.02	1959-65, 1967	5-25-67	.13	.20
16-9605	Alega Stream tributary at Alega	Lat 14°16'57" S., long 170°38'16" W., 300 ft above mouth and 0.2 mile north of Alega.	.04	1962-65, 1967	5-26-67	.21	.32

Crest-stage partial-record stations

Crest-stage partial-record stations for the State of Hawaii are published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharges for crest-stage stations not included in that report. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements of peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each fiscal year is given. Information on some lower floods may have been obtained but is not published herein. The years given in the period of record represent fiscal years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations

Station No.	Station name	Location	Drainage area (sq mi)	Period of record	Annual maximum		
					Date	Gage height (feet)	Discharge (cfs)
Island of Guam, Mariana Islands							
*16-8073	Fonte River at dam, near Nimitz Hill	Lat 13°27'25" N., long 144°43'34" E., at old diversion dam, 0.4 mile south of Force Headquarters building on Nimitz Hill, and 1.2 miles southeast of Asan.	0.60	1962-64, 1967	9- 8-66	3.47	338
16-8098	Sabu River at Umatac	Lat 13°17'52" N., long 144°39'37" E., at highway culvert between Catholic church and public school at Umatac.	.04	1963-64, 1967	9- 8-66	4.81	153
Island of Okinawa, Ryukyu Islands							
16-8808	Hiya-gawa at Ojana	Lat 26°15'35" N., long 127°44'08" E., 0.1 mile south of Ojana and 0.6 mile above mouth.	2.2	1964-67	9-23-66	2.6	(/)
16-8812	Kanegusuku-gawa at Kanegusuku	Lat 26°11'31" N., long 127°43'36" E., 0.2 mile northwest of Kanegusuku and 1.3 miles east of Kokubu.	3.0	1964-67	9-23-66	6.9	(/)
16-8815	Mukue-gawa near Itomancho	Lat 26°07'58" N., long 127°41'22" E., at highway bridge, 0.6 mile west of Yoza, and 0.9 mile northeast of Itomancho.	6.4	1964-67	9-23-66	8.2	(/)

* Also a low-flow partial-record station.
/ Discharge not determined.

Measurements at miscellaneous sites

Measurements of streamflow at points other than gaging stations or partial-record stations are given in the following table.

Discharge measurements made at miscellaneous sites during fiscal year 1967

Stream	Tributary to	Location	Measured previously (fiscal years)	Measurements		
				Date	Discharge	
					Mgd	Cfs
Island of Kauai						
Kawaikoi Stream tributary	Kawaikoi Stream	Lat 22°08'05", long 159°37'29", at mouth, 100 ft below Kawaikoi Stream gaging station, and 12.5 miles north of Waimea.	1963, 1965-66	7- 7-66 8-25-66 10-13-66	0.07 .03 .03	0.11 .05 .05
Island of Oahu						
Kaluanui Stream	Pacific Ocean	Lat 21°34'08", long 157°55'23", 50 ft above right bank tributary and 2.9 miles south of Hauula Post Office.		9-29-66	.10	.16
Kaluanui Stream tributary	Kaluanui Stream	Lat 21°34'09", long 157°55'22", 25 ft above mouth and 2.9 miles south of Hauula Post Office.		9-29-66	.05	.08
Kaluanui Stream	Pacific Ocean	Lat 21°34'12", long 157°55'24", 50 ft above left bank tributary and 2.9 miles south of Hauula Post Office.		9-29-66	.23	.36
Kaluanui Stream tributary No. 2	Kaluanui Stream	Lat 21°34'13", long 157°55'27", 300 ft above mouth and 2.9 miles south of Hauula Post Office.		9-29-66	.07	.11
Kaluanui Stream	Pacific Ocean	Lat 21°34'14", long 157°55'22", 0.3 mile above Castle trail and 2.8 miles south of Hauula Post Office.		9-29-66	.30	.46
Kaluanui Stream	Pacific Ocean	Lat 21°34'22", long 157°55'22", 30 ft above Castle trail and 2.7 miles south of Hauula Post Office.		9-29-66 do	.31 .28	.48 .43
Kaluanui Stream	Pacific Ocean	Lat 21°34'27", long 157°55'17", above first falls 0.5 mile below Castle trail and 2.6 miles south of Hauula Post Office.		9-29-66	.19	.29
Kaluanui Stream	Pacific Ocean	Lat 21°34'55", long 157°54'57", 200 ft below Sacred Falls and 2.0 miles south of Hauula Post Office.		9-29-66	.35	.54
Kaluanui Stream	Pacific Ocean	Lat 21°35'08", long 157°54'50", 600 ft below Sacred Falls and 1.7 miles south of Hauula Post Office.		9-29-66	.35	.54
Kaluanui Stream	Pacific Ocean	Lat 21°35'22", long 157°54'38", 600 ft above left bank tributary and 1.4 miles south of Hauula Post Office.		9-29-66	.28	.43
Kaluanui Stream	Pacific Ocean	Lat 21°35'32", long 157°54'28", 100 ft below left bank tributary and 1.4 miles south of Hauula Post Office.		9-29-66	.30	.46
Island of Maui						
Honolua Stream	Pacific Ocean	Lat 20°59'07", long 156°37'18", at ditch intake 2.5 miles southwest of Honokohau.		6-22-67	.23	.36
Kahoma Stream	Pacific Ocean	Lat 20°54'17", long 157°37'36", at upper ditch intake 4 miles northeast of Lahaina.		6-21-67	2.29	3.54
Kanaha Stream	Kahoma Stream	Lat 20°53'45", long 156°38'41", 100 ft above pipeline intake and 2.8 miles northeast of Lahaina.		6-21-67	2.29	3.54
Olowalu Stream	Pacific Ocean	Lat 20°50'08", long 156°36'10", 75 ft above Olowalu ditch intake and 2.1 miles northeast of Olowalu.		6-20-67	3.76	5.82
Ukumehame Gulch	Pacific Ocean	Lat 20°49'03", long 156°35'20", 40 ft above upper ditch intake, 1.1 miles above mouth, and 2.4 miles northeast of Olowalu.		6-23-67	3.06	4.73

Discharge measurements made at miscellaneous sites during fiscal year 1967--Continued

Stream	Tributary to	Location	Measured previously (fiscal years)	Measurements		
				Date	Discharge	
					Mgd	Cfs
Island of Maui--Continued						
Ukumehame Gulch	Pacific Ocean	Lat 20°48'47", long 156°35'40", about 400 ft above Honoapiilani Highway 30 and 2.1 miles southeast of Olowalu.		3-24-67	/982	/1,520
Pohakea Gulch	Pacific Ocean	Lat 20°48'31", long 156°29'50", 50 ft above Lower Maalaea Road and 2.6 miles northwest of Kihei Post Office.	1963	3-24-67	/218	/337
Paleaahu Gulch	Kealia Pond	Lat 20°48'58", long 156°29'32", 1,500 ft above Lower Maalaea Road and 2.8 miles northwest of Kihei Post Office.		3-24-67	/143	/221
Pulehu Gulch	Kealia Pond	Lat 20°48'38", long 156°28'23", 0.2 mile below Highway 35 and 1.8 miles northwest of Kihei Post Office.		3-24-67	/297	/460
Kalaloa Gulch	Kealia Pond	Lat 20°48'23", long 156°28'13", 80 ft below concrete bridge on Highway 35 and 1.5 miles northwest of Kihei Post Office.	1963	3-24-67	/320	/495
Keahuaiwi Gulch	Kealia Pond	Lat 20°47'20", long 156°27'55", 40 ft below concrete bridge on Highway 35 and 0.4 mile north of Kihei Post Office.	1963	3-24-67	/241	/373
Waipuilani Gulch	Pacific Ocean	Lat 20°45'43", long 156°27'02", 0.6 mile above Kihei Road and 1.8 miles southeast of Kihei Post Office.		3-24-67	/866	/1,340
Keokea Gulch	Pacific Ocean	Lat 20°44'38", long 156°27'04", 0.4 mile east of Kihei Road along Welakahao Street extension and 3.0 miles southeast of Kihei Post Office.		3-24-67	/503	/778
Charley Young Gulch	Pacific Ocean	Lat 20°43'56", long 156°27'03", 800 ft above Charley Young Bridge on Kihei Road and 3.8 miles southeast of Kihei Post Office.		3-24-67	/177	/274
Kamaole Gulch	Pacific Ocean	Lat 20°43'37", long 156°26'58", 250 ft above Kihei Road and 4.1 miles southeast of Kihei Post Office.		3-24-67	/392	/607
Liilioholo Gulch	Pacific Ocean	Lat 20°43'03", long 156°26'46", 800 ft above Kihei Road and 4.8 miles southeast of Kihei Post Office.		3-24-67	/353	/546
Inoaole Gulch	Pacific Ocean	Lat 20°41'54", long 156°26'46", 500 ft above mouth and 0.7 mile south of Keauakapu.		3-24-67	/195	/302
Island of Hawaii						
Alenaio Stream	Wailoa River	Lat 19°43'12", long 155°05'23", at Kapiolani Street in Hilo and 0.6 mile south of Hilo Post Office.		7-25-66	1,810	2,800
Wailuku River	Pacific Ocean	Lat 19°42'59", long 155°18'28", 5.3 miles southeast of Pua Akala and 11.0 miles west of Piihonua.	1966	9-13-66	.11	.17
Wailuku River	Pacific Ocean	Lat 19°43'01", long 155°17'34", 5.7 miles southeast of Pua Akala and 10.0 miles west of Piihonua.	1966	9-13-66	.21	.32
Wailuku River	Pacific Ocean	Lat 19°43'08", long 155°16'41", 6.1 miles southeast of Pua Akala and 9.1 miles west of Piihonua.	1966	9-13-66	.72	1.11
Wailuku River tributary	Wailuku River	Lat 19°43'09", long 155°16'41", 100 ft above mouth, 6.1 miles southeast of Pua Akala, and 9.1 miles west of Piihonua.	1966	9-13-66	.29	.45

/ Peak flow.

Discharge measurements made at miscellaneous sites during fiscal year 1967--Continued

Stream	Tributary to	Location	Measured previously (fiscal years)	Measurement		
				Date	Discharge	
					Mgd	Cfs
Island of Hawaii--Continued						
West Branch Honokane Iki Stream	Honokane Iki Stream	Lat 20°09'47", long 155°43'25", 30 ft below trail crossing, 1.8 miles above confluence with East Branch, and 4.5 miles south of Niulii.	1961-66	7-20-66	0.70	1.08
				9- 8-66	.13	.20
				10-19-66	21.8	33.7
				11-30-66	.15	.23
				1-25-67	.19	.29
				3-15-67	.29	.45
				4-26-67	.12	.19
				6-14-67	.02	.03
East Branch Honokane Nui Stream	Honokane Nui Stream	Lat 20°08'58", long 155°43'59", at trail crossing, 0.2 mile above confluence with West Branch, and 5.3 miles south of Niulii.	1964-66	7-19-66	7.45	11.5
				9- 7-66	.27	.42
				10-18-66	8.08	12.5
				11-29-66	.58	.90
				1-24-67	4.32	6.68
				3-14-67	3.72	5.76
				4-25-67	1.38	2.14
				6-13-67	.38	.59
Waiulaula Gulch	Pacific Ocean	Lat 20°00'50", long 155°48'58", at new Kawaihae-Puako Road, 2.0 miles southeast of Kawaihae.		1-11-67	2,070	3,200
Kamakoa Gulch tributary	Kamakoa Gulch	Lat 19°56'56", long 155°41'00", at Highway 19, 0.8 mile northeast of Saddle Road Junction, and 5.2 miles south of Kamuela.		11-20-66	853	1,320
Kawa Springs	Pacific Ocean	Lat 19°06'51", long 155°31'47", 0.2 mile southwest of Keeku Heiau and 2.0 miles northeast of sugar mill at Honuapo.	1964-66	2-27-67	10.1	15.6
				3-27-67	5.11	7.91
				4-26-67	5.68	8.79
				5-25-67	7.43	11.5
				6-22-67	5.31	8.22
Ninole Springs	Pacific Ocean	Lat 19°07'57", long 155°30'54", 0.7 mile southwest of Punaluu and 3.6 miles northeast of Honuapo.	1964-66	2-27-67	21.5	33.3
				3-27-67	19.1	29.6
				4-26-67	18.5	28.6
				5-25-67	21.6	33.4
				6-22-67	20.6	31.9
Island of Okinawa, Ryukyu Islands						
Henan-gawa	East China Sea	Lat 26°38'35" N., long 128°05'27" E., 900 ft above bridge on Highway 1 and 0.8 mile southwest of Tsuha.		4-17-67		2.32
Genka-kawa	East China Sea	Lat 26°36'43" N., long 128°03'47" E., at former gaging station, 1.2 miles south of Genka, and 2.1 miles southeast of Nakaoshi.	1964-66≠	7- 8-66		23.1
				1- 5-67		18.0
				2-24-67		5.26
				6-27-67		14.0
Genka-kawa	East China Sea	Lat 26°37'50" N., long 128°04'01" E., at bridge at Genka and 0.4 mile above bridge on Highway 1.		4-17-67		4.90

≠ Operated as a continuous-record gaging station.

United States Department of the Interior
Geological Survey - Water Resources Division

WATER RESOURCES DATA
FOR
HAWAII AND OTHER PACIFIC AREAS

Fiscal Year 1967

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Prepared in cooperation with

Corps of Engineers, U.S. Army

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Part 2. Water Quality Records

(Symbols after station name designate type of data: c, chemical; t, water temperature, s, sediment)

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1967

Part 2. Water Quality Records

INTRODUCTION

The water-quality records for the period July 1966 to June 1967 for daily sampling stations and partial-record sites in Okinawa are given in this report. Some additional data are available in files of the district office. The data were collected and computed by the Water Resources Division of the U.S. Geological Survey, under the direction of Mearle M. Miller, district chief.

The publishing of water-quality records on a fiscal-year basis (the 12-month period July 1 to June 30) will be discontinued after this report. Future reports will contain water-quality records on a water-year basis (the 12-month period October 1 to September 30). To facilitate this conversion from fiscal-year to water-year basis, a second report, "Part 2. Water Quality Records, Water Year 1967," containing the records for the period October 1966 to September 1967 will be published this year.

Distribution of this report is limited and it is primarily for local and immediate use. The records will be published in the Geological Survey water-supply papers at 5-year intervals.

Water-quality information is presented for chemical quality, fluvial, sediment, and water temperatures. The chemical quality includes concentrations of individual dissolved constituents and certain properties or characteristics such as hardness, specific conductance, and pH. Fluvial-sediment information is given for suspended-sediment discharges and concentrations and for particle-size distribution of suspended sediment and bed material. Water-temperature data represent once-daily observations.

COOPERATION

The work was done by the U.S. Geological Survey with assistance in the form of funds given by the Corps of Engineers, U.S. Army.

DEFINITION OF TERMS AND ABBREVIATIONS

A number of terms commonly used in relation to hydrologic data are defined in Part 1 of this report. Other terms related especially to water quality data are as follows:

Color in water analysis refers to the appearance of water that is free from suspended solids. Many turbid waters that appear yellow, red, or brown when viewed in the stream show very little color after the suspended matter has been removed. The yellow-to-brown color of some waters is usually caused by organic matter extracted from leaves, roots, and other organic substances in the ground. A color less than 10 units generally passes unnoticed. Some swamp waters have natural color of 200 to 300 units or more.

Cubic feet per second (cfs) is a unit expressing rates of discharge. One cubic foot per second is equal to the discharge of a stream of rectangular cross section, 1 foot wide and 1 foot deep, flowing water at an average velocity of 1 foot per second.

Discharge in its simplest concept, means outflow; therefore, the use of this term is not restricted as to course or location, and it can be applied to describe the flow of water from a pipe or from a drainage basin. It is also correct to speak of the discharge of a canal or stream into a lake, a stream, or an ocean.

Daily mean discharge is the mean discharge for one day.

Mean daily discharge is the arithmetic mean discharge for the same day during a specific period of years.

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

Instantaneous discharge (at time of sampling). If the discharge value at the time of sampling is reported instead of daily mean value, the heading of the discharge column will be given as "Discharge (cfs)."

Drainage area is that area, in a specified location, measured in a horizontal plane, which is enclosed by a drainage divide.

Equivalents per million (epm) is a unit for expressing the concentration of chemical constituents in solution in terms of the interreacting values of the electrically charged particles, or ions. One equivalent per million of a positively charged ion will react with one equivalent per million of a negatively charged ion. Parts per million is converted to equivalents per million by multiplying by the reciprocal of the combining weight of the ion. (See table, p. 242.)

Hardness of water is the property of water attributable to the presence of alkaline earths and is expressed as equivalent calcium carbonate ($CaCO_3$). Hardness is a physical-chemical characteristic, not a substance.

Particle size is the diameter, in millimeters (mm) of suspended sediment or bed material determined by sieve and sedimentation methods.

Particle-size classification agrees closely with recommendations made by the American Geophysical Union Subcommittee on sediment terminology (Lane and others, 1947, p. 937). The classification is as follows:

Clay:	Smaller than 0.004 mm.
Silt:	Between 0.004 and 0.062 mm.
Sand:	Between 0.062 and 2.0 mm.
Gravel:	Between 2.0 and 64.0 mm.

The particle-size distributions given in this report are not necessarily representative of the particle sizes of sediment in transport in the natural stream. Most of the organic matter is removed and the sample is subjected to mechanical and chemical dispersion before analysis of the silt and clay.

Conversion factors: Parts per million to equivalents per million

Ion	Multiply by
Aluminum (Al^{+3})	0.11119
Ammonia as NH_4^{+1}	.05544
Barium (Ba^{+2})	.01456
Bicarbonate (HCO_3^{-1})	.01639
Bromide (Br^{-1})	.01251
Calcium (Ca^{+2})	.04990
Carbonate (CO_3^{-2})	.03333
Chloride (Cl^{-1})	.02821
Chromium (Cr^{+6})	.11539
Cobalt (Co^{+2})	.03394
Copper (Cu^{+2})	.03148
Cyanide (CN^{-1})	.03844
Fluoride (F^{-1})	.05264
Hydrogen (H^{+1})	.99209
Hydroxide (OH^{-1})	.05880
Iodide (I^{-1})	.00788
Iron (Fe^{+3})	.05372
Lead (Pb^{+2})	.00965
Lithium (Li^{+1})	.14411
Magnesium (Mg^{+2})	.08226
Manganese (Mn^{+2})	.03640
Nickel (Ni^{+2})	.03406
Nitrate (NO_3^{-1})	.01613
Nitrite (NO_2^{-1})	.02174
Phosphate (PO_4^{-3})	.03159
Potassium (K^{+1})	.02557
Sodium (Na^{+1})	.04350
Strontium (Sr^{+2})	.02283
Sulfate (SO_4^{-2})	.02082
Zinc (Zn^{+2})	.03060

Parts per million (ppm) is a unit for expressing the concentration of chemical constituents by weight, usually as grams of constituents per million grams of solution. In the laboratory the results are expressed in weights of solutes in a given volume of water. To express the results in parts per million, the data must be converted. For most waters, this conversion is made by assuming that a liter of water weighs 1 kilogram; thus milligrams per liter is equivalent to parts per million. Parts per million, for suspended sediment, is computed as 1 million times the ratio of the weight of sediment to the weight of the mixture of water and sediment.

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

Sediment discharge is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight, or by volume, that is discharged in a given time.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks and is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current and is expressed in micromhos per centimeter at 25°C. Because the specific conductance is related to the number and specific chemical types of ions in solution, it can be used for approximating the dissolved-solids content in the water. The following general relations are applicable:

Specific conductance x 0.65±0.05=ppm dissolved solids;

$$\frac{\text{Specific conductance}}{100} = \frac{\text{total epm}}{2}$$

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

Tons per acre-foot indicates the dry weight of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in parts per million by 0.00136.

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

COLLECTION AND EXAMINATION OF SAMPLES

Water samples for analyses usually are collected at or near points on streams where gaging stations are maintained by the U.S. Geological Survey for measurement of water discharge. These discharge records are published in Part 1 of this report. Some of these records are used in conjunction with the computations of the chemical constituents and sediment loads in this report.

Data on the quality of surface waters were collected infrequently at several stations.

Solutes

Data for chemical-quality sites include the chemical characteristics of water collected at a single point in the stream. The methods of collecting and analyzing water samples for determining the kinds and concentrations of solutes are described by Rainwater and Thatcher (1960). One sample can define adequately the water quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge depending on the source of material and the turbulence and mixing of the stream.

Temperature

Water temperatures were measured at most of the water-quality stations. For daily stations, the water temperatures were taken at about the same time each day in order that the data would be relatively unaffected by diurnal variations in temperature. The thermometers used for determining the water temperature were accurate to plus or minus 0.5°F

Sediment

At some stations, suspended-sediment samples were collected daily with depth-integrating cable-suspended samplers from fixed sampling points at three or more

verticals in the cross section. A hand sampler was used at many stations during periods of low flow. Depth-integrated samples were collected periodically at many verticals in the cross section to determine the ratio of the cross sectional distribution of the concentration of suspended sediment to the daily sampling verticals. During periods of high or rapidly changing flow, samples were taken twice or more often throughout the day at most stations. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

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

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

16-8755. YONA-GAWA AT YONA, OKINAWA

LOCATION.--Lat 26°45'10" N., long 128°13'18" E., at gaging station 0.9 milo southeast of Yona, and 2.7 miles oast of Hentona School.
DRAINAGE AREA.--1.7 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1964 to June 1967. (discontinued).
Sediment records: May 1964 to June 1967. (discontinued).
EXTREMES, 1966-67.--Water temperatures: Maximum, 84°F July 30, Aug. 6, 11; minimum, 52°F Jan. 17.
Sediment concentrations: Maximum daily, 470 ppm June 13; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 960 tons June 13; minimum daily, less than 0.05 ton on many days.
EXTREMES, 1964-67.--Water temperatures: Maximum, 84°F July 30, Aug. 6, 11, 1966; minimum, 51°F Jan. 16, 1965.
Sediment concentrations: Maximum daily, 540 ppm May 12, 1966; minimum daily, 1 ppm on many days each yoar.
Sediment loads: Maximum daily, 1,500 tons May 12, 1966; minimum daily, less than 0.05 ton on many days each year.

Chemical analyses, in parts per million, fiscal year July 1966 to June 1967

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (calculated)			Hardness as $CaCO_3$		Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Noncarbonate				
Sept. 22, 1966...	28	13	0.50	2.8	1.6	11	0.0	13	0	5.0	16	0.0	0.0		60	0.08		11	3		65	6.9	40
Jan. 19, 1967....	4.6	20	.11	5.6	2.9	15	.5	26	0	7.5	22	.0	.0		78	.11		21	5		105	7.7	5
Mar. 17.....	2.8	19	.05	6.8	2.9	16	.7	32	0	6.5	24	.0	.2		83	.11		26	3		110	7.8	20
June 23.....	10	17	.10	3.6	2.7	16	--	20	0	5.5	24	.0	.2		87	.12		16	4		100	8.0	10

16-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Temperature (°F) of water, fiscal year July 1966 to June 1967

Month	Day																														Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July	75	73	73	73	74	74	74	78	78	77	82	81	80	81	76	81	77	78	80	81	81	82	78	81	81	80	81	79	81	84	82	78
August	82	81	82	83	82	84	82	82	82	80	84	78	79	79	82	82	81	79	75	75	79	76	77	78	79	78	77	79	76	78	76	79
September	75	76	80	79	77	77	77	77	79	81	80	77	77	78	75	77	76	81	78	76	78	74	74	72	73	70	70	70	72	69	---	75
October	71	72	72	68	71	71	72	73	72	74	73	72	71	69	71	70	69	67	67	66	67	68	66	71	69	70	69	69	66	67	67	69
November	67	67	66	67	67	69	69	69	70	70	70	71	76	71	68	69	68	69	71	68	63	63	65	66	68	67	64	66	66	62	---	67
December	60	60	61	63	65	64	64	65	64	63	63	64	61	59	62	63	64	66	67	66	65	65	64	64	65	61	59	58	59	59	62	62
January	63	60	57	56	58	58	60	58	57	57	58	57	56	56	57	53	52	55	59	59	58	59	58	59	59	59	59	65	59	57	57	57
February	57	57	58	56	55	54	57	58	60	60	59	60	54	56	53	55	56	56	56	58	59	62	60	63	60	58	56	56	---	---	---	57
March	58	61	61	63	60	57	57	57	60	60	61	62	60	59	62	63	65	61	61	61	62	65	60	63	62	71	69	68	68	72	68	62
April	75	74	74	66	67	66	69	69	72	71	72	72	72	73	73	73	71	73	73	66	68	66	68	64	68	70	72	72	74	74	---	70
May	77	78	74	72	74	78	77	78	79	77	75	76	79	73	72	74	76	75	73	71	70	73	72	71	70	72	72	71	72	72	73	74
June	73	72	72	73	71	69	69	68	70	68	70	71	71	69	68	69	70	70	72	72	75	76	74	73	77	75	79	81	76	80	---	72

16-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Suspended sediment, fiscal year July 1966 to June 1967

Day	JULY				AUGUST				SEPTEMBER			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	8.5	10	S	0.6	3.6	3	C	T	6.1	5		0.1
2	16	13	S	.7	3.4	3	C	T	31	26	S	3.8
3	14	13	S	1.1	3.4	3	C	T	9.5	4		.1
4	20	10		.5	3.2	3	C	T	7.9	3	C	.1
5	10	2		.1	3.2	3	C	T	7.2	3	C	.1
6	26	13	S	2.4	3.2	2	C	T	6.8	3	C	.1
7	19	5		.3	3.0	2	C	T	6.2	3	C	.1
8	12	3		.1	3.0	2	C	T	5.9	2		T
9	10	3	C	.1	2.8	2	C	T	5.9	4		.1
10	9.1	3	C	.1	2.8	2	C	T	6.5	3	C	.1
11	8.3	3	C	.1	3.0	2	C	T	5.6	3	C	T
12	7.9	3	C	.1	5.4	9		.1	9.5	8	S	.4
13	7.2	3	C	.1	6.2	6		.1	6.5	4		.1
14	6.5	3	C	.1	7.9	7		.1	5.6	2	C	T
15	6.2	3	C	.1	4.8	2	C	T	5.4	2	C	T
16	5.9	3	C	T	3.6	2	C	T	5.1	2	C	T
17	5.6	3	C	T	16	40	S	3.8	5.6	3		T
18	5.4	3	C	T	7.9	6		.1	4.8	2		T
19	5.1	3	C	T	50	90	S	24	4.4	1	C	T
20	4.8	3	C	T	24	36	S	6.2	5.1	1	C	T
21	4.8	3	C	T	25	18		1.2	6.0	3		T
22	4.6	3	C	T	103	--	E	220	138	--	E	340
23	4.6	2	C	T	20	4		.2	170	330	B	150
24	4.4	2	C	T	14	3	C	.1	54	6		.9
25	4.1	2	C	T	11	3	C	.1	26	4		.3
26	4.1	2	C	T	9.1	3	C	.1	18	3	C	.1
27	4.1	2	C	T	7.9	3	C	.1	14	3	C	.1
28	6.2	12		.2	8.7	6	C	.1	12	3	C	.1
29	4.4	6		.1	6.8	3	C	.1	10	3	C	.1
30	3.8	5		.1	6.2	3	C	.1	9.1	3	C	.1
31	3.6	4		T	5.9	3	C	T	--	--		--
Total	256.2	--		7.3	378.0	--		256.9	607.7	--		497.1

Day	OCTOBER				NOVEMBER				DECEMBER			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	8.3	2	C	T	4.3	2		T	3.4	1	C	T
2	7.6	2	C	T	3.4	1	C	T	3.2	1	C	T
3	6.8	2	C	T	2.8	1	C	T	3.2	1	C	T
4	6.5	2	C	T	2.8	1	C	T	3.0	1	C	T
5	6.2	2	C	T	5.0	4		.1	13	23	S	1.7
6	6.2	3	C	.1	25	15	S	3.0	10	14		.4
7	5.6	3	C	T	9.3	4		.1	7.2	7		.1
8	5.4	2	C	T	4.1	2		T	13	11		.4
9	5.4	2	C	T	3.6	1		T	9.1	3		.1
10	5.1	2	C	T	4.8	4		.1	7.6	3		.1
11	4.8	2	C	T	3.6	1	C	T	6.2	2		T
12	4.6	2	C	T	3.4	1	C	T	18	16	S	1.4
13	4.4	2	C	T	3.2	1	C	T	8.7	2		T
14	4.4	2	C	T	3.6	3		T	7.2	1	C	T
15	4.6	2	C	T	3.0	1	C	T	6.2	1	C	T
16	4.1	2	C	T	3.0	1	C	T	8.3	8		.2
17	3.8	2	C	T	3.4	4		T	5.9	2		T
18	3.6	1	C	T	3.0	2	C	T	5.9	1	C	T
19	3.6	1	C	T	3.0	2	C	T	5.6	1	C	T
20	3.6	1	C	T	3.6	2	C	T	5.4	2	C	T
21	3.4	1	C	T	3.2	2	C	T	5.6	2	C	T
22	3.4	1	C	T	2.8	1	C	T	4.8	2	C	T
23	3.2	1	C	T	2.6	1	C	T	5.4	3		T
24	3.2	1	C	T	2.6	3		T	5.4	2		T
25	3.2	1	C	T	24	17	S	1.9	42	38	S	7.3
26	3.0	1	C	T	7.6	3		.1	21	4		.2
27	3.0	1	C	T	4.6	1	C	T	13	2		.1
28	3.0	1	C	T	4.1	1	C	T	10	1	C	T
29	3.0	1	C	T	3.6	1	C	T	9.1	1	C	T
30	3.0	1	C	T	4.1	2		T	7.9	1	C	T
31	2.8	1	C	T	--	--		--	7.9	2		T
Total	138.8	--		0.7	157.1	--		5.7	282.2	--		12.5

E Estimated.
S Computed by subdividing day.
T Less than 0.05 ton.
B Computed from estimated-concentration graph.
C Composite period.

16-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Suspended sediment, fiscal year July 1966 to June 1967--Continued

Day	JANUARY				FEBRUARY				MARCH			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	56	36	S	10	3.2	C 1		T	2.8	C 1		T
2	16	3		.1	23	25	S	7.1	2.8	C 1		T
3	12	2		.1	11	8		.2	2.6	C 1		T
4	10	C 1		T	5.1	2		T	2.6	C 1		T
5	9.1	C 1		T	4.4	C 1		T	12	15		.5
6	7.9	C 1		T	4.1	C 1		T	6.5	4		.1
7	7.9	2		T	3.8	C 1		T	4.4	C 2		T
8	6.8	C 1		T	4.1	2		T	3.8	C 2		T
9	6.2	C 1		T	3.6	1		T	3.6	C 2		T
10	5.9	C 1		T	3.6	1		T	3.4	C 2		T
11	6.4	6		.1	4.4	2		T	3.4	C 2		T
12	10	7		.2	3.6	C 1		T	3.2	C 1		T
13	6.2	C 1		T	3.4	C 1		T	3.2	C 1		T
14	5.6	C 1		T	6.4	6		.1	3.0	C 1		T
15	5.4	C 1		T	4.8	2		T	3.0	C 1		T
16	5.1	C 1		T	3.8	C 1		T	2.8	C 1		T
17	4.8	C 1		T	3.6	C 1		T	2.8	C 1		T
18	4.6	C 1		T	3.4	C 1		T	3.4	2		T
19	4.6	C 1		T	3.4	C 1		T	2.8	C 1		T
20	4.4	C 1		T	3.2	C 1		T	2.8	C 1		T
21	4.4	C 1		T	3.2	C 1		T	3.3	2		T
22	4.1	C 1		T	3.2	C 1		T	2.8	C 1		T
23	4.1	C 1		T	3.4	2		T	2.6	C 1		T
24	3.8	C 1		T	3.4	2		T	2.4	C 1		T
25	3.8	C 1		T	4.4	3		T	2.4	C 1		T
26	3.6	C 1		T	3.4	2		T	2.4	C 1		T
27	3.6	C 1		T	3.2	C 1		T	2.4	C 1		T
28	3.4	C 1		T	3.0	C 1		T	2.6	2		T
29	3.8	2		T	--	--		--	2.6	C 1		T
30	3.4	C 1		T	--	--		--	2.4	C 1		T
31	3.2	C 1		T	--	--		--	2.2	C 1		T
Total	236.1	--		10.9	133.1	--		7.8	103.0	--		1.0

Day	APRIL				MAY				JUNE			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	2.2	C 1		T	3.6	3		T	11	7		0.2
2	2.2	C 1		T	3.2	C 2		T	8.3	5		.1
3	2.1	C 1		T	3.4	C 2		T	10	6		.2
4	2.4	2		T	3.4	C 2		T	49	87	S	24
5	2.2	C 1		T	2.8	C 2		T	117	75	S	42
6	2.4	C 1		T	2.8	C 2		T	112	130	B	40
7	2.4	C 1		T	2.8	3		T	85	12	S	3.6
8	4.4	3		T	3.8	7		.1	52	29	S	7.3
9	6.2	5		.1	3.4	4		T	36	4		.4
10	3.0	C 2		T	2.8	2		T	22	2		.1
11	2.6	C 2		T	2.6	2		T	17	2		.1
12	2.4	C 2		T	2.4	2		T	20	6	S	.5
13	2.8	C 2		T	2.4	3		T	126	470	S	960
14	2.6	C 1		T	3.4	5		T	30	4		.3
15	2.4	C 1		T	10	33	S	2.2	21	2		.1
16	2.4	C 1		T	3.8	5		.1	50	300	B	40
17	2.2	C 1		T	3.0	3		T	27	3		.2
18	2.2	C 1		T	2.6	2		T	20	2		.1
19	3.2	4		T	2.6	2		T	16	1		T
20	13	10		.4	5.6	6	S	.2	14	1		T
21	4.1	2		T	39	51	S	17	12	1		T
22	3.2	C 1		T	12	4		.1	11	1		T
23	3.0	C 1		T	7.9	2		T	10	C 2		.1
24	3.2	C 2		T	6.8	2		T	9.1	C 2		T
25	3.6	C 2		T	15	15	S	.7	8.3	C 2		T
26	2.8	C 2		T	10	5		.1	7.6	C 2		T
27	2.6	C 2		T	8.3	3		.1	7.2	C 1		T
28	2.8	4		T	6.8	C 2		T	6.8	C 1		T
29	12	18	S	1.6	6.2	C 2		T	6.5	C 1		T
30	4.1	3		T	5.6	3		T	6.2	C 1		T
31	--	--		--	16	90	B	4	--	--		--
Total	106.7	--		2.5	204.0	--		25.1	928.0	--		1119.6

Total discharge for year (cfs-days)..... 3530.9
Total load for year (tons)..... 1947.1

S Compnted by subdividing day.
T Less than 0.05 ton.
B Computed from estimated-concentration graph.
C Composite period.

16-8755. YONA-GAWA AT YONA, OKINAWA--Continued

Particle-size analyses of suspended sediment, fiscal year July 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
June 13, 1967.....	1510	71		358	1690		13	22		54		69	75	82	90	100		VPWC

Particle-size analysis of bed material, fiscal year July 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material: Percent finer than size indicated, in millimeters											Method of analysis
							0.062	0.125	0.250	0.500	1.000	2.00	4.00	8.00	16.0	32.0	64.0	
June 23, 1967.....	1100		3	10				3	5	8	11	19	32	56	79	84	100	S

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA

LOCATION.--Lat 26°36'28" N., long 128°01'16" E., at gaging station 0.4 mile south of Kawakami, 0.7 mile southeast of Taira School, and 1.0 mile southwest of Nakaoshi.
DRAINAGE AREA.--4.4 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: October 1966 to June 1967.
Sediment records: October 1966 to June 1967.
EXTREMES, October 1966 to June 1967.--Water temperatures: Maximum, 84°F June 24; minimum, 53°F Jan. 16, Mar. 7.
Sediment concentrations: Maximum daily, 718 ppm June 13; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 1,950 tons June 4; minimum daily, less than 0.05 ton on many days.

Chemical analyses, in parts per million, October 1966 to June 1967

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (calculated)			Hardness as $CaCO_3$		Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Noncarbonate				
Oct. 10, 1966....	8.4	14	0.60	4.8	3.2	14	0.0	24	0	5.8	21	0.0	0.2		80	0.11		20	5		95	7.0	50
Jan. 20, 1967....	7.6	15	.04	6.8	3.8	15	.3	27	0	9.5	24	.0	.0		99	.13		22	11		120	8.0	5
Mar. 17.....	3.6	14	.04	7.2	4.4	16	.7	32	0	11	24	.1	.2		88	.12		26	10		122	8.0	20
June 23.....	24	14	.10	5.2	2.9	16	--	24	0	9.0	24	.0	.4		94	.13		20	5		110	7.8	15

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA

Temperature (°F) of water, October 1966 to June 1967

Month	Day																													Average
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
August.....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
September....	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--	--
October.....	76	78	70	79	76	78	73	75	80	80	73	80	72	73	--	--	--	--	--	--	--	--	--	--	--	69	78	76	66	65	71	--
November.....	68	70	71	70	71	71	75	72	78	73	75	71	73	70	65	71	71	74	72	70	62	68	72	68	71	62	65	70	65	65	--	69
December.....	60	63	67	67	72	67	68	67	70	66	68	63	62	65	64	67	70	71	69	70	68	70	64	64	64	63	55	62	64	65	64	65
January.....	64	61	54	54	62	58	63	57	57	58	62	60	58	63	60	53	56	60	63	64	64	65	64	64	65	65	68	68	62	58	62	61
February.....	64	61	58	60	65	60	57	68	67	68	59	62	64	58	55	56	64	58	63	57	65	66	65	63	58	57	59	58	--	--	--	61
March.....	64	64	65	65	62	58	53	62	62	61	59	71	71	61	65	69	71	58	59	67	64	65	58	56	67	72	69	67	75	69	67	64
April.....	74	78	79	64	74	76	72	74	74	74	73	73	77	81	76	79	79	65	71	68	61	81	78	75	64	65	66	73	70	78	--	73
May.....	77	82	78	77	78	82	80	82	80	76	80	81	75	81	75	70	70	68	67	78	74	70	70	71	71	75	78	75	75	78	75	75
June.....	74	71	81	78	72	70	73	70	71	76	75	78	73	75	74	73	70	71	72	75	76	78	77	84	83	78	71	79	78	80	--	75

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA--Continued

Suspended sediment, October 1966 to June 1967

Day	OCTOBER			NOVEMBER			DECEMBER		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	12	C 3	0.1	9.3	13	0.3	7.1	C 3	0.1
2	11	C 3	.1	7.2	4	.1	6.9	C 3	.1
3	10	C 3	.1	5.0	2	T	6.5	C 3	.1
4	9.7	C 3	.1	4.3	2	T	6.2	C 3	.1
5	9.4	C 2	.1	6.1	7	.1	16	11	S .8
6	9.2	C 2	T	64	170	B 30	25	11	.7
7	9.0	C 2	T	38	8	.8	14	7	.3
8	8.7	C 2	T	12	4	.1	54	52	S 8.4
9	8.7	C 2	T	9.0	3	.1	35	10	.9
10	8.4	C 2	T	19	9	S .5	25	5	.3
11	8.2	C 2	T	12	3	.1	16	4	.2
12	8.2	C 2	T	9.7	2	.1	14	4	.2
13	8.0	C 2	T	8.4	2	T	12	C 3	.1
14	7.6	C 2	T	9.2	2	T	12	C 3	.1
15	8.7	4	.1	7.6	C 1	T	11	C 3	.1
16	7.2	C 3	.1	7.1	C 1	T	16	7	.3
17	6.9	C 3	.1	7.6	2	T	12	2	.1
18	6.7	C 3	.1	7.1	C 1	T	11	1	T
19	6.3	C 2	T	6.5	C 1	T	10	1	T
20	6.2	C 2	T	10	3	.1	10	2	.1
21	5.8	C 2	T	9.8	2	.1	11	3	.1
22	5.6	C 2	T	7.1	C 1	T	10	2	.1
23	5.4	C 2	T	6.5	C 1	T	10	2	.1
24	6.8	8	.1	6.2	C 1	T	9.7	1	T
25	5.7	4	.1	52	70	B 10	65	100	S 22
26	5.1	C 2	T	16	4	.2	46	11	1.4
27	4.8	C 2	T	11	C 3	.1	24	5	.3
28	4.7	C 2	T	9.0	C 3	.1	16	C 2	.1
29	4.4	C 1	T				14	C 2	.1
30	4.2	C 1	T	8.7	4	.1	12	C 2	.1
31	4.2	C 1	T	--	--	--	12	C 2	.1
Total	226.8	--	1.8	393.4	--	43.3	549.4	--	37.5

S Computed by subdividing day.
T Less than 0.05 ton.
B Computed from estimated-concentration graph.
C Composite period.

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA--Continued

Suspended sediment, October 1966 to June 1967--Continued

Day	JANUARY			FEBRUARY			MARCH		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	97	228	S 118	5.4	C 2	T	4.6	C 1	T
2	44	14	1.7	18	24	S 2.6	4.4	C 1	T
3	31	5	.4	21	11	S 1.0	4.3	C 1	T
4	24	3	.2	8.2	4	.1	4.2	C 1	T
5	20	2	.1	6.9	3	.1	12	9	.3
6	18	C 2	.1	6.0	2	T	9.2	5	.1
7	15	C 2	.1	5.8	C 1	T	6.0	2	T
8	14	C 2	.1	5.8	C 1	T	5.1	C 2	T
9	12	C 2	.1	5.6	C 1	T	4.6	C 2	T
10	12	C 2	.1	5.4	C 1	T	4.3	C 2	T
11	12	C 3	.1	7.6	4	.1	4.2	C 2	T
12	15	C 3	.1	5.6	2	T	4.1	C 2	T
13	12	C 3	.1	5.2	2	T	3.8	C 1	T
14	10	C 3	.1	7.6	6	.1	3.7	C 1	T
15	9.4	C 3	.1	8.0	3	.1	3.7	C 1	T
16	9.2	C 3	.1	5.8	1	T	3.6	C 1	T
17	8.7	C 3	.1	5.4	1	T	3.6	C 1	T
18	8.4	C 2	T	5.7	2	T	4.0	C 1	T
19	8.0	C 2	T	5.2	C 1	T	3.6	C 1	T
20	7.6	C 2	T	5.0	C 1	T	3.5	C 1	T
21	7.4	C 2	T	5.0	C 1	T	4.9	4	.1
22	7.2	C 2	T	4.8	C 1	T	4.2	3	T
23	7.1	C 2	T	5.1	2	T	3.5	C 2	T
24	6.9	C 2	T	5.2	1	T	3.2	C 2	T
25	6.7	C 2	T	6.8	2	T	3.2	C 2	T
26	6.3	C 2	T	5.4	C 1	T	3.2	C 2	T
27	6.0	C 2	T	4.8	C 1	T	3.2	C 2	T
28	5.8	C 2	T	4.6	C 1	T	3.5	3	T
29	6.9	3	.1	--	--	--	4.1	5	.1
30	5.7	C 2	T	--	--	--	3.2	4	T
31	5.4	C 2	T	--	--	--	3.1	3	T
Total	458.7	--	122.2	190.9	--	4.5	135.8	--	1.1

Day	APRIL			MAY			JUNE		
	Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment		Mean discharge (cfs)	Suspended sediment	
		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day		Mean concentration (ppm)	Tons per day
1	3.1	3	T	5.8	5	0.1	39	9	1.0
2	3.0	C 2	T	5.1	4	.1	24	3	.2
3	2.9	C 2	T	7.5	10	.2	18	2	.1
4	4.1	4	T	9.0	8	.2	298	522	S 1950
5	3.3	C 2	T	5.8	4	.1	271	338	S 354
6	3.2	C 2	T	5.1	3	T	311	380	S 553
7	3.0	C 2	T	4.7	3	T	270	224	S 218
8	3.4	3	T	4.8	4	.1	100	50	S 14
9	4.7	3	T	4.6	4	T	73	25	4.9
10	3.5	2	T	4.1	C 3	T	55	20	3.0
11	4.2	4	T	4.0	C 3	T	46	12	1.5
12	7.7	7	.1	3.7	C 3	T	44	10	1.2
13	5.7	3	T	28	106	S 17	261	718	S 1820
14	4.0	2	T	48	51	S 8.2	79	25	5.3
15	3.4	C 1	T	24	12	.8	55	16	2.4
16	3.0	C 1	T	10	7	.2	180	340	S 512
17	2.7	C 1	T	10	5	.1	98	75	20
18	2.7	2	T	8.2	3	.1	58	15	2.3
19	4.6	11	S .4	7.2	2	T	46	5	.6
20	29	24	S 2.6	22	34	S 4.8	37	4	.4
21	6.2	3	.1	227	615	S 991	31	C 3	.3
22	4.7	3	T	74	20	S 3.8	27	C 3	.2
23	4.1	2	T	35	8	.8	24	C 3	.2
24	5.3	7	.1	25	5	.3	20	C 3	.2
25	7.8	10	.2	22	3	.2	18	C 3	.1
26	4.7	4	.1	28	9	.7	15	C 2	.1
27	4.1	3	T	20	4	.2	14	C 2	.1
28	4.4	14	S 1.2	14	3	.1	12	C 2	.1
29	30	44	S 6.6	12	2	.1	12	C 2	.1
30	7.8	6	.1	12	2	.1	11	C 2	.1
31	--	--	--	42	18	S 4.3	--	--	--
Total	180.3	--	12.0	732.6	--	1033.9	2547	--	5465.4

Total discharge for period Oct. 1, 1966 to June 30, 1967 (cfs-days)..... 5414.9
Total load for period Oct. 1, 1966 to June 30, 1967 (tons)..... 6721.7

S Computed by subdividing day.
C Composite period.
T Less than 0.05 ton.

16-8782. HANECHI-OKAWA AT KAWAKAMI, OKINAWA--Continued

Particle-size analyses of suspended sediment, October 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
June 6, 1967.....	1707	70		562	835		--	--		--		79	89	99	100			V
June 16.....	1905	72		1030	2910		11	24		50		69	81	91	97	99	99	VPWC
June 16.....	1920	72		1130	2750		18	28		55		75	88	97	100			VPWC

Particle-size analyses of bed material, October 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material: Percent finer than size indicated, in millimeters											Method of analysis
							0.062	0.125	0.250	0.500	1.000	2.00	4.00	8.00	16.0	32.0	64.0	
June 12, 1967.....	1300		3	34				4	11	17	19	29	52	82	95	96	100	S
June 29.....	1300		3	12			1	3	5	20	39	57	72	81	90	100		S

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA

LOCATION.--Lat 26°38'16" N., long 128°10'13" E., at gaging station at Fukuji, 0.9 mile north of Kawata, and 1.3 miles northeast of Taira.
DRAINAGE AREA.--12 square miles, approximately.
RECORDS AVAILABLE.--Water temperatures: May 1964 to June 1967.
Sediment records: May 1964 to June 1967.
EXTREMES, 1966-67.--Water temperatures: Maximum, 83°F Sept. 12; minimum, 51°F Feb. 17.
Sediment concentrations: Maximum daily, 858 ppm June 13; minimum daily, 1 ppm on many days.
Sediment loads: Maximum daily, 9,130 tons June 13; minimum daily, less than 0.05 ton on many days.
EXTREMES, 1964-67.--Water temperatures: Maximum, 83°F July 13-16, 1964, July 28, 29, 1965, Sept. 12, 1966; minimum, 51°F Jan. 16, 1965, Feb. 17, 1967.
Sediment concentrations: Maximum daily, 4,500 ppm June 23, 1965; minimum daily, 1 ppm on many days each year.
Sediment loads: Maximum daily, 64,000 tons Aug. 5, 1965; minimum daily, less than 0.05 ton on many days each year.

Chemical analyses, in parts per million, fiscal year July 1966 to June 1967

Date of collection	Discharge (cfs)	Silica (SiO_2)	Iron (Fe)	Calcium (Ca)	Magnesium (Mg)	Sodium (Na)	Potassium (K)	Bicarbonate (HCO_3)	Carbonate (CO_3)	Sulfate (SO_4)	Chloride (Cl)	Fluoride (F)	Nitrate (NO_3)	Boron (B)	Dissolved solids (calculated)			Hardness as $CaCO_3$		Sodium adsorption ratio	Specific conductance (micromhos at 25°C)	pH	Color
															Parts per million	Tons per acre-foot	Tons per day	Calcium, Magnesium	Noncarbonate				
Jan. 20, 1967....	17	18	0.04	5.6	3.3	19	0.5	23	0	6.5	29	0.0	0.0		94	0.13		19	9		120	7.7	5
Mar. 28.....	10	14	.04	5.2	3.2	20	1.0	29	0	8.0	29	.0	.0		96	.13		24	3		130	7.9	5
June 23.....	42	16	.10	3.6	2.7	18	--	17	0	7.5	28	.0	.2		91	.12		14	6		110	7.6	10

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Temperature (°F) of water, fiscal year July 1966 to June 1967

Month	Day																														Aver-age
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	
July.....	79	77	74	75	75	74	73	76	77	78	78	79	79	79	79	79	79	80	80	81	81	80	80	80	81	81	78	81	81	81	81	78
August.....	82	81	82	82	81	81	82	82	82	80	80	82	80	79	80	81	78	78	78	78	77	77	76	77	77	77	78	77	77	77	77	79
September...	77	77	77	78	78	79	78	78	77	79	80	83	78	78	77	78	79	78	77	78	79	78	77	74	72	71	71	70	70	69	--	76
October.....	70	70	70	70	70	71	71	70	72	73	73	73	71	70	71	71	69	67	67	66	67	68	68	70	69	69	70	70	68	67	68	69
November....	71	68	66	68	68	69	69	69	70	71	70	71	73	72	69	69	69	69	69	70	65	63	63	65	69	63	62	62	65	65	--	67
December....	61	60	61	61	66	65	64	66	63	63	62	63	62	61	61	62	63	65	65	67	67	66	66	66	64	61	60	58	66	67	60	63
January.....	63	60	58	56	56	58	59	57	57	57	57	58	57	57	57	52	52	53	53	53	52	54	58	58	59	57	58	61	63	58	57	56
February....	56	58	58	55	52	54	56	57	61	61	60	63	57	57	54	52	51	56	54	56	57	60	63	64	61	61	59	67	--	--	--	57
March.....	66	55	68	70	62	58	56	57	58	58	57	56	57	58	60	60	61	65	64	63	64	63	63	61	58	62	67	69	69	70	70	62
April.....	71	72	72	74	66	66	69	69	69	72	73	73	73	73	73	72	70	68	72	71	67	67	67	67	64	66	69	71	69	71	--	69
May.....	74	75	75	71	70	75	78	74	74	75	72	72	75	77	73	72	72	72	73	74	72	72	72	72	75	73	73	72	73	73	74	73
June.....	72	73	73	73	73	72	71	70	70	70	71	73	73	70	70	71	71	71	71	74	77	77	78	78	80	80	79	79	81	81	--	74

10-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Suspended sediment, fiscal year July 1966 to June 1967

Day	JULY				AUGUST				SEPTEMBER			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	38	1		0.1	20	C 2		0.1	32	5		0.4
2	68	12	S	2.4	19	C 2		.1	195	22	S	15
3	50	2		.3	19	C 2		.1	57	5		.8
4	100	C 1		.3	18	C 2		.1	43	3		.3
5	60	C 1		.2	17	C 2		.1	38	3		.3
6	536	532	S	2820	17	C 2		.1	36	C 3		.3
7	153	24	S	16	16	C 2		.1	32	C 3		.3
8	63	3		.5	16	C 2		.1	30	C 3		.2
9	47	C 2		.3	20	C 2		.1	28	C 3		.2
10	42	C 2		.2	17	C 2		.1	39	8		.8
11	39	C 2		.2	16	C 2		.1	31	4		.3
12	37	C 2		.2	28	10		.8	28	5		.4
13	35	C 1		.1	30	5		.4	26	3		.2
14	34	C 1		.1	31	4		.3	32	8		.7
15	32	C 1		.1	30	5		.4	25	3		.2
16	31	C 1		.1	21	2		.1	22	C 2		.1
17	31	C 1		.1	482	761	S	3370	24	C 2		.1
18	31	C 1		.1	79	28	S	7.2	19	C 2		.1
19	29	C 1		.1	199	55	S	43	18	1		T
20	28	C 1		.1	250	155	S	281	18	1		T
21	27	C 1		.1	382	330	A	340	21	2		.1
22	27	C 2		.1	802	815	S	3900	618	778	S	3200
23	26	C 2		.1	140	5		1.9	1070	--	E	3300
24	26	C 2		.1	92	3		.7	330	15	S	16
25	26	C 2		.1	90	5		1.2	126	4		1.4
26	25	C 2		.1	63	C 3		.5	79	2		.4
27	24	C 2		.1	50	C 3		.4	63	1		.2
28	28	5		.4	44	C 3		.4	52	C 1		.1
29	23	C 3		.2	40	C 3		.3	44	C 1		.1
30	22	C 3		.2	39	C 3		.3	40	C 1		.1
31	21	C 3		.2	35	5		.5	--	--		--
Total	1759	--		2843.2	3118	--		7950.5	3216	--		6539.2

Day	OCTOBER			NOVEMBER				DECEMBER			
1	38	C 1	0.1	17	5		0.2	14	C 1		T
2	34	C 1	.1	19	2		.1	13	C 1		T
3	30	C 1	.1	12	C 1		T	12	C 1		T
4	28	C 1	.1	12	C 1		T	12	C 1		T
5	26	C 1	.1	19	4		.2	12	2		.1
6	25	C 1	.1	178	390	A	190	26	2		.1
7	24	C 1	.1	95	16	S	7.2	19	2		.1
8	23	C 1	.1	24	3		.2	115	19	S	9.1
9	22	C 1	.1	19	2		.1	55	5		.7
10	21	C 1	.1	52	13	S	2.2	30	3		.2
11	20	C 1	.1	27	3		.2	22	2		.1
12	19	C 1	.1	20	2		.1	23	2		.1
13	18	C 1	T	18	C 1		T	20	C 1		.1
14	18	C 1	T	19	C 1		.1	17	C 1		T
15	21	C 1	.1	18	C 1		T	16	C 1		T
16	19	C 1	.1	15	C 1		T	37	9	S	1.3
17	18	C 1	T	14	C 1		T	23	2		.1
18	17	C 1	T	14	C 1		T	19	C 1		.1
19	17	C 1	T	13	C 1		T	19	C 1		.1
20	16	C 1	T	18	2		.1	18	C 1		T
21	16	C 1	T	15	C 1		T	21	1		.1
22	15	C 1	T	13	C 1		T	16	1		T
23	15	C 1	T	12	C 1		T	19	C 1		.1
24	18	C 1	T	12	C 1		T	19	C 1		.1
25	16	C 1	T	88	26	S	12	249	94	S	135
26	15	C 1	T	39	11		1.2	79	6		1.3
27	14	C 1	T	18	3		.1	43	2		.2
28	14	C 1	T	14	C 1		T	34	1		.1
29	13	C 1	T	13	C 1		T	26	1		.1
30	12	C 1	T	16	C 1		T	22	1		.1
31	12	C 1	T	--	--		--	22	1		.1
Total	614	--	2.1	863	--		214.6	1072	--		149.7

E Estimated.
S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
C Composite period.

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Suspended sediment, fiscal year July 1966 to Juue 1967--Continued

Day	JANUARY				FEBRUARY				MARCH			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	510	284	S	877	13	1		T	10	2	C	0.1
2	93	6		1.5	47	470	A	60	9.2	2	C	T
3	56	3		.5	67	43	S	15	9.2	2	C	T
4	44	2		.2	19	4		.2	9.2	2	C	T
5	39	1	C	.1	15	2		.1	44	9		1.1
6	32	1	C	.1	13	1	C	T	31	4		.3
7	28	1	C	.1	12	1	C	T	20	2		.1
8	25	1		.1	14	1		T	16	1	C	T
9	24	2	C	.1	14	1		T	15	1	C	T
10	24	2	C	.1	12	1		T	14	1	C	T
11	24	2	C	.1	15	3		.1	13	1	C	T
12	34	2		.2	13	2		.1	13	1	C	T
13	25	1	C	.1	11	2		.1	12	1	C	T
14	22	1	C	.1	39	16	S	3.1	12	1	C	T
15	21	1	C	.1	43	5		.6	11	1	C	T
16	21	1	C	.1	18	2		.1	11	1	C	T
17	20	1	C	.1	14	2		.1	11	1	C	T
18	19	1	C	.1	13	2	C	.1	12	1		T
19	18	1	C	T	13	2	C	.1	11	1		T
20	17	1	C	T	12	2	C	.1	11	1		T
21	17	1	C	T	12	1	C	T	12	2		.1
22	16	1	C	T	11	1	C	T	13	2		.1
23	16	1	C	T	11	1	C	T	11	2		.1
24	16	1	C	T	11	1	C	T	11	1		T
25	15	1	C	T	13	3		.1	10	1		T
26	15	2	C	.1	12	2		.1	10	2		.1
27	15	2	C	.1	11	2		.1	10	1		T
28	15	2	C	.1	10	2		.1	10	1	C	T
29	16	2		.1	--	--		--	10	1	C	T
30	14	2		.1	--	--		--	9.8	1	C	T
31	13	1		T	--	--		--	9.5	1	C	T
Total	1264	--		881.6	508	--		80.5	410.9	--		2.8

Day	APRIL				MAY				JUNE			
	Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment			Mean discharge (cfs)	Suspended sediment		
		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day		Mean concentration (ppm)		Tons per day
1	9.5	1	C	T	15	4		0.2	103	20		5.6
2	10	1	C	T	13	3		.1	42	3		.3
3	11	1	C	T	28	10	S	2.0	89	330	A	80
4	10	1	C	T	47	12	S	2.2	236	227	S	290
5	10	1	C	T	17	3		.1	700	281	S	1540
6	9.7	1	C	T	14	2	C	.1	1024	493	S	3130
7	10	1		T	13	2	C	.1	621	86	S	315
8	11	1		T	23	7	S	.7	171	13	S	9.6
9	12	1		T	26	5		.4	129	7		2.4
10	11	1		T	15	2		.1	85	2		.5
11	13	1		T	13	2	C	.1	69	2		.4
12	14	1		T	13	2	C	.1	71	55	S	13
13	11	1		T	17	5		.2	926	858	S	9130
14	9.4	1	C	T	21	3		.2	101	6		1.6
15	8.2	1	C	T	15	2		.1	61	3		.5
16	7.8	1	C	T	13	2		.1	563	483	S	2260
17	7.6	1	C	T	12	2	C	.1	187	18		9.1
18	7.6	1	C	T	10	2	C	.1	99	5		1.3
19	8.6	2		T	10	2	C	.1	75	3		.6
20	53	7		1.0	19	10	S	1.1	61	3		.5
21	15	2		.1	377	310	S	570	53	3		.4
22	10	1	C	T	92	12		3.0	48	2		.3
23	9.8	1	C	T	39	4		.4	44	2		.2
24	9.8	2		.1	29	3		.2	40	2		.2
25	16	2		.1	35	5		.5	39	2		.2
26	10	1	C	T	74	21	S	6.4	36	2		.2
27	9.2	1	C	T	45	6		.7	33	2		.2
28	10	7		.2	28	3		.2	31	2		.2
29	112	300		90	24	3		.2	29	2	C	.2
30	18	6		.3	23	3		.2	28	2	C	.2
31	--	--		--	190	780	A	400	--	--		--
Total	464.2	--		92.5	1310	--		990.0	5794	--		16792.7

Total discharge for year (cfs-days)..... 20393.1
Total load for year (tons)..... 36539.4

S Computed by subdividing day.
T Less than 0.05 ton.
A Computed from partly estimated-concentration graph.
C Composite period.

16-8842. FUKUJI-GAWA AT FUKUJI, OKINAWA--Continued

Particle-size analyses of suspended sediment, fiscal year July 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters											Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
May 31, 1967.....	1515	76		172	661		48	67		96		98	99	100	--			SPWC
June 13.....	1050	73		8340	3700		15	23		43		60	76	90	100			VPWC
June 13.....	1140	73		8620	2500		14	24		43		61	80	97	100			VPWC

Particle-size analyses of bed material, fiscal year July 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Bed material: Percent finer than size indicated, in millimeters											Method of analysis
							0.062	0.125	0.250	0.500	1.000	2.00	4.00	8.00	16.0	32.0	64.0	
June 7, 1967.....	1400		3	290					2	14	25	36	54	76	91	97	100	S
June 14.....	1130		3	96					2	6	16	29	50	77	93	98	100	S
June 21.....	1100		3	53				1	2	6	14	29	49	60	76	94	100	S

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA

Periodic determinations of suspended-sediment discharge, fiscal year July 1966 to June 1967
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
✓ 16-8752. BENOKI-GAWA AT BENOKI (Lat 26°47'06" N., long 128°14'59" E.)																	
Feb. 15, 1967.....	1440	53		13	1	T											
Apr. 12.....	1230	70		5.7	2	T											
June 1.....	1310	72		16	1	T											
✓ 16-8762. TAKAZATO-GAWA NEAR HAMA (Lat 26°40'10" N., 128°10'48" E.)																	
Jan. 18, 1967.....	1500	54		2.5	2	T											
Feb. 15.....	1145	53		2.8	1	T											
Apr. 13.....	0915	68		1.2	2	T											
June 20.....	1155	--		7.6	2	T											
✓ 16-8765. TAIHO-OKAWA AT TAIHO (Lat 26°39'01" N., long 128°08'37" E.)																	
Apr. 14, 1967.....	1010	70		5.2	5	0.1											
✓ 16-8770. RIGHT BRANCH OF SOUTH FORK HENAN-GAWA NEAR TSUHA (Lat 26°37'42" N., long 128°05'52" E.)																	
Feb. 20, 1967.....	1305	58		0.88	4	T											
Apr. 6.....	1120	64		.78	3	T											
May 23.....	1410	73		2.4	2	T											
June 9.....	1210	71		6.2	3	0.1											
✓ 16-8775. GENKA-KAWA NEAR GENKA (Lat 26°36'43" N., long 128°03'47" E.)																	
Jan. 5, 1967.....	1140	51		18	2	0.1											
✓ 16-8785. OI-KAWA AT JINGUSUKU (Lat 26°39'07" N., long 127°57'24" E.)																	
Feb. 21, 1967.....	1125	58		0.76	12	T											
June 9.....	1505	72		26	103	0.7											
✓ 16-8805. NAGATA-GAWA AT KADENA (Lat 26°22'23" N., long 127°45'50" E.)																	
Feb. 20, 1967.....	1655	62		3.9	21	0.2											
✓ 16-8809. MACHINATO-GAWA NEAR OJANA (Lat 26°14'43" N., long 127°44'16" E.)																	
Apr. 20, 1967.....	1410			6.5	145	2.5											
✓ 16-8824. TENGAN-GAWA AT TENGAN (Lat 26°22'54" N., long 127°51'39" E.)																	
Feb. 20, 1967.....	1510	63		5.8	25	0.4											
✓ 16-8828. KANNA-GAWA NEAR KANNA (Lat 26°29'20" N., long 127°56'46" E.)																	
Feb. 18, 1967.....	1100	54		1.6	2	T											
May 27.....	1110	77		1.6	16	0.1											
June 3.....	1025	73		1.9	7	T											
✓ 16-8830. UFU-KAWA NEAR GINOZA (Lat 26°29'36" N., long 127°58'08" E.)																	
Feb. 18, 1967.....	1210	52		1.4	42	0.2											
May 27.....	1210	79		5.2	275	3.9											
June 3.....	1205	73		2.3	164	1.0											

T Less than 0.05 ton.

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA--Continued

Periodic determinations of suspended-sediment discharge, fiscal year July 1966 to June 1967--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
16-8833. LEFT FORK O-KAWA NEAR KUSHI (Lat 26°31'18" N., long 127°59'50" E.)																	
Feb. 18, 1967	1400	55		0.39	4	T											
May 27	1425	72		.43	3	T											
June 3	1500	73		.55	3	T											
16-8835.5. OURA-GAWA AT OKAWA (Lat 26°34'10" N., long 128°02'23" E.)																	
Feb. 20, 1967	1120	58		0.65	1	T											
May 23	1115	72		16	2	0.1											
16-8841. FUKUJI-GAWA NEAR YUBARU (Lat 26°38'32" N., long 128°13'00" E.)																	
Jan. 20, 1967	1230	60		8.8	1	T											
Feb. 17	1315	50		7.0	2	T											
Mar. 7	1130	55		8.5	4	0.1											
Apr. 17	1145	72		4.3	2	T											
May 26	1135	79		159	158	68											
May 26	1305	76		117	33	10											
May 26	1420	76		89	13	3.1											
16-8846. AHA-GAWA AT AHA (Lat 26°42'41" N., long 128°16'55" E.)																	
Aug. 17, 1966	0740	--		610	G 1080	1780											
Aug. 17	1135	79		158	142	61											
Aug. 17	1140	79		156	140	59											
Aug. 17	1220	79		125	108	36											
Aug. 17	1225	79		124	102	34											
Aug. 19	0525	--		610	G 1360	2240											
Aug. 22	0030	--		1600	G 1120	4840											
Aug. 22	0035	--		3100	G 1310	11000											
Aug. 22	0040	--		5100	G 1120	15400											
Sept. 21	1145	78		34	3	.3											
Sept. 22	1400	--		610	G 560	922											
Sept. 22	1405	--		1600	G 420	1810											
Sept. 22	1440	--		3100	G 420	3520											
Sept. 22	2140	--		5100	G 508	7000											
Nov. 6	1810	--		690	G 275	512											
Dec. 25	1410	--		690	G 242	451											
Jan. 1, 1967	0600	--		1730	G 205	958											
Jan. 19	1055	54		23	1	.1											
Feb. 2	2030	--		700	G 201	380											
Feb. 16	1050	52		20	2	.1											
Apr. 13	1300	71		15	1	T											

T Less than 0.05 ton.
G Samples collected with single-stage sampler.

MISCELLANEOUS ANALYSES OF STREAMS IN OKINAWA--Continued

Periodic determinations of suspended-sediment discharge, fiscal year July 1966 to June 1967--Continued
(Methods of analysis: B, bottom withdrawal tube; C, chemically dispersed; D, decantation; N, in native water; P, pipet; S, sieve; V, visual accumulation tube; W, in distilled water)

Date of collection	Time (24 hour)	Water temperature (°F)	Sampling point	Discharge (cfs)	Sediment concentration (ppm)	Sediment discharge (tons per day)	Suspended sediment: Percent finer than size indicated, in millimeters										Method of analysis
							0.002	0.004	0.008	0.016	0.031	0.062	0.125	0.250	0.500	1.000	2.000	
16-8846. AHA-GAWA AT AHA--Continued																	
May 10, 1967.....	1650	78		16	1	T											
May 21.....	1300	--		810	G 361	789											
May 21.....	1310	--		1820	462	2280											
May 24.....	1255	74		38	2	.2											
May 25.....	1115	72		144	20	7.8											
May 25.....	1200	72		122	19	6.2											
May 25.....	1250	72		105	18	5.1											
May 25.....	1410	72		90	22	5.4											
May 31.....	1535	74		37	5	.5											
June 3.....	1930	--		810	G 728	1590											
June 3.....	1935	--		1830	G 234	1160											
June 7.....	1430	71		261	6	4.2											
June 8.....	1810	--		810	G 1540	3370											
June 13.....	1000	--		1730	G 3110	14500											
June 13.....	1005	--		3300	G 3360	29900											
June 14.....	1150	71		119	3	1.0											
June 16.....	1830	--		700	G 297	5610											
16-8848. FUN-GAWA NEAR AHA (Lat 26°44'33" N., long 128°16'53" E.)																	
Jan. 19, 1967.....	1310	--		8.4	1	T											
Feb. 16.....	1320	52		8.1	1	T											
Apr. 13.....	1445	71		5.4	3	T											
May 24.....	1200	71		12	2	0.1											

T Less than 0.05 ton.
G Samples collected with single-stage sampler.

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