

Surface Water Supply of Hawaii 1951-52

Prepared under the direction of J. V. B. WELLS, Chief, Surface Water Branch

GEOLOGICAL SURVEY WATER-SUPPLY PAPER 1249

*Prepared in cooperation with the
Territory of Hawaii*



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PREFACE

This report was prepared by the Geological Survey in cooperation with the Territory of Hawaii by personnel of the Water Resources Division, C. G. Paulsen, chief, under the general direction of J. V. B. Wells, chief, Surface Water Branch, and B. J. Peterson, chief, Annual Reports Section.

The data were computed under the supervision of M. H. Carson, district engineer, Honolulu.

CONTENTS

	Page
Scope of work.....	1
Cooperation.....	1
Division of work.....	1
Definition of terms and abbreviations.....	1
Downstream order of listing gaging stations.....	2
Explanation of data.....	2
Accuracy of field data and computed results.....	4
Publications.....	5
Records of discharge collected by agencies other than the Geological Survey.....	5
Gaging-station records.....	8
<u>Island of Kauai:</u>	
<u>Waimea River:</u>	
Kawaikoi Stream near Waimea.....	8
Mohihi Stream near Waimea.....	9
Kokee ditch near Waimea.....	10
Waiahulu Stream near Waimea.....	11
Kekaha ditch at camp 1, near Waimea.....	12
Waimea River below Kekaha ditch intake, near Waimea.....	13
Waimea River near Waimea.....	14
Makaweli River near Waimea.....	15
Hanapepe River at Koula, near Eleele.....	16
South Fork Waialua River near Lihue.....	17
North Fork Waialua River:	
Hanalei tunnel outlet near Lihue.....	18
North Waialua ditch near Lihue.....	19
Stable storm ditch near Lihue.....	20
North Fork Waialua River at altitude 650 ft, near Lihue.....	21
Kanaha ditch near Lihue.....	22
East Branch of North Fork Waialua River near Lihue.....	23
Waialua ditch near Kapaa.....	24
Kapaa River at Kapahi ditch intake, near Kapaa.....	25
Kapahi ditch near Kealia.....	26
Makaleha ditch near Kealia.....	27
Anahola River:	
Anahola ditch wasteway near Kealia.....	28
Anahola ditch above Kaneha Reservoir, near Kealia.....	29
Anahola River near Kealia.....	30
Lower Anahola ditch near Kealia.....	31
Ka Loko ditch near Kilauea.....	32
Puu Ka Ele ditch near Kilauea.....	33
Kalihuiwai ditch near Kilauea.....	34
Hanalei River at altitude 625 ft, near Hanalei.....	35
Hanakapi'ai Stream near Hanalei.....	36
Hanakoa Stream near Hanalei.....	37
Kalalau Stream near Hanalei.....	38
Miscellaneous discharge measurements.....	39
<u>Island of Oahu:</u>	
Left Branch of North Fork Kaukonahua Stream near Wahiawa.....	40
Right Branch of North Fork Kaukonahua Stream near Wahiawa.....	41
Kaukonahua ditch near Wahiawa.....	42
North Fork Kaukonahua Stream near Wahiawa.....	43
South Fork Kaukonahua Stream near Wahiawa.....	44
South Fork Kaukonahua Stream above Wahiawa Reservoir, near Wahiawa.....	45
Poamoho Stream near Wahiawa.....	46
Pearl Harbor Springs at Waiawa, near Pearl City.....	47
Morikone pond outlet at Pearl City.....	48
Pearl Harbor Springs at Kaluaopu, near Pearl City.....	49
Waimalu Stream near Aiea.....	50
Pearl Harbor Springs at Kaluaou, near Aiea.....	51
Moanalua Stream near Honolulu.....	52
Kalihl Stream near Honolulu.....	53
Nuuanu Stream below reservoir 2 wasteway, near Honolulu.....	54
East Branch Manoa Stream near Honolulu.....	55
West Branch Manoa Stream near Honolulu.....	56
Palolo Stream:	
Pukele Stream near Honolulu.....	57
Waiomao Stream above Pukele Stream, near Honolulu.....	58
Palolo Stream near Honolulu.....	59
Haiku Stream near Heeia.....	60
Iolekaa Stream mauka near Heeia.....	61
Kahaluu Stream near Heeia.....	62
Waihee Stream near Heeia.....	63
Waiahole Valley Basin:	
Waiahole tunnel at Waianu, near Waiahole.....	64
Waiahole tunnel wasteway at intake 31, near Waiahole.....	65
Waiahole tunnel at north portal, near Waiahole.....	66
Miscellaneous discharge measurements.....	67
<u>Island of Molokai:</u>	
Halawa Stream near Halawa.....	68
Wailau Stream:	
Pulena Stream near Wailau.....	70
Waiakeakua Stream near Wailau.....	71
Pelekunu Stream near Pelekunu.....	73
Lanipuni Stream near Pelekunu.....	75

Gaging-station records--Continued

Island of Molokai--Continued	Page
Waikolu Stream below pipeline crossing, near Kalaupapa.....	76
Waialala Springs near Kalae.....	77
Kawela Stream:	
Right Branch of East Fork Kawela Stream near Kamalo.....	78
Punaula Stream near Pukoo.....	79
Island of Maui:	
Makamakaole Stream:	
Left Branch Makamakaole Stream near Waihee.....	80
Kahakuloa Stream near Honokohau.....	81
Honokohau Stream near Honokohau.....	82
Olowalu ditch near Olowalu.....	83
Oheo Stream below diversion dam, near Kipahulu.....	84
Right Branch Kahalawe Stream near Kipahulu.....	85
Makapipi ditch near Nahiku.....	86
Hanawi Stream near Nahiku.....	87
Kapaula Stream near Nahiku.....	88
Koolau ditch at Nahiku weir, near Nahiku.....	89
Waiohue Stream near Nahiku.....	90
West Kopiliula Stream near Keanae.....	91
East Wailuaiki Stream near Keanae.....	92
West Wailuaiki Stream near Keanae.....	93
West Wailuanui Stream near Keanae.....	94
East Wailuanui Stream near Keanae.....	95
Taro patch feeder ditch at Keanae.....	96
Koolau ditch near Keanae.....	97
Haipuaena Stream near Huelo.....	98
Kula diversion from Haipuaena Stream near Olinda.....	99
Haipuaena diversion ditch at Kolea Gulch, near Keanae.....	100
Spreckels ditch at Haipuaena weir, near Huelo.....	101
Koolau ditch at Haipuaena, near Huelo.....	102
Puohokamoa Stream near Huelo.....	103
Manuel Luis ditch at Puohokamoa Gulch, near Huelo.....	104
Waiakamoi Stream above Wailoa ditch, near Huelo.....	105
Alo Stream near Huelo.....	106
Kaaiea Stream near Huelo.....	107
Oopuola Stream near Huelo.....	108
Naililihaele Stream near Huelo.....	109
Kailua Stream near Huelo.....	110
Hoolawallilili Stream near Huelo.....	111
Hoolawanui Stream near Huelo.....	112
Honopou Stream near Huelo.....	113
Wailoa ditch at Honopou, near Huelo.....	114
New Hamakua ditch at Honopou, near Huelo.....	115
Old Hamakua ditch at Honopou, near Huelo.....	116
Lowrie ditch at Honopou Gulch, near Huelo.....	117
Haiku ditch at Honopou Gulch, near Kailua.....	118
Island of Hawaii:	
Waiakea Stream at middle flume house, near Mountain View.....	119
Wailuku River above Hilo Boarding School ditch intake, near Hilo.....	120
Waililikahi Stream near Waimanu.....	121
Kaimu Stream near Waimanu.....	122
Punalulu Stream near Waimanu.....	123
Waialala Stream near Waimanu.....	124
Paopao Stream near Waimanu.....	125
Kukui Stream near Waimanu.....	126
Awini ditch at East Honokaneiki Gulch, near Niulii.....	127
East Honokaneiki intake to Awini ditch at East Honokaneiki Gulch, near Niulii.....	128
Kohala ditch at Po'olu, near Niulii.....	129
Kehena ditch near Kohala.....	130
Waikoloa Stream near Kamuela.....	131
Waikoloa Stream at Marine Dam, near Kamuela.....	132
Miscellaneous discharge measurements.....	133
Index.....	135

SCOPE OF WORK

This volume contains results of measurements of the flow of streams and ditches in the Territory of Hawaii during the year ending June 30, 1952. Since the beginning of stream-gaging work in Hawaii, in 1910, records of flow of streams and ditches have been obtained at about 575 stations for periods ranging from a few months to 41 years. In addition, discharge measurements only have been made at many other points, and rather extensive studies of ground water have been made on all the inhabited islands.

In this volume are given the records of daily flow obtained at stations that were operated during the year ending June 30, 1952, and the results of discharge measurements made at other points during that year. Most of the results of ground-water studies have been published in bulletins of the Territorial Division of Hydrography.

COOPERATION

The work during the year ending June 30, 1952, was done under cooperative agreement with the Territory of Hawaii through the commissioner of public lands. Assistance in collecting records was rendered also on the island of Kauai by the Kekaha Sugar Co. Ltd., the McBryde Sugar Co. Ltd., the East Kauai Water Co. Ltd., the Kilauea Sugar Co. Ltd., and the Lihue Plantation Co. Ltd.; on the island of Oahu by the Wahiawa Water Co. Ltd., and Waiahole Water Co. Ltd.; on the island of Maui by the Pioneer Mill Co. Ltd., the East Maui Irrigation Co. Ltd., the Maui County Engineer, Maui County Board of Water Works, and Territory of Hawaii Board of Agriculture and Forestry; and on the island of Hawaii by the City of Hilo Water Works, the Kohala Ditch Co. Ltd., and the Olaa Sugar Co. Ltd.

Acknowledgment of records collected by individuals or corporations is made in connection with the description of each station for which such records were furnished.

DIVISION OF WORK

The stream gaging was done by the Water Resources Division of the Geological Survey, Carl G. Paulsen, chief hydraulic engineer, and Joseph V. B. Wells, chief of the Surface Water Branch. The data were collected and prepared for publication under the direction of M. H. Carson, district engineer, Honolulu. The records were reviewed and the manuscript prepared for publication under the direction of B. J. Peterson, chief, Annual Reports Section.

Information of a more detailed nature than that published for most of the gaging stations given in this report is on file in the district office, Room 225, Federal Building, Honolulu. Provisional records of discharge prior to publication, and other unpublished data concerning the gaging-station records may usually be obtained from the district office.

DEFINITION OF TERMS AND ABBREVIATIONS

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

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.

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.

Acre-foot is the quantity of water required to cover an acre to the depth of 1 foot and is equivalent to 43,560 cubic feet. The term is commonly used in relation to storage for irrigation.

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

In the Territory of Hawaii the unit most commonly used in measuring water is "million gallons." This is used with two meanings-- (1) to indicate a rate of flow and (2) to express an actual quantity of water. In the former sense "million gallons a day" is inferred, 1,000,000 gallons being taken as the unit of quantity and 24 hours as the unit of time. With this meaning the term is generally used in connection with pumping and irrigation. In the latter sense "million gallons" as an absolute quantity is used in the measurement of storage capacities of reservoirs.

The following convenient approximate relations exist between cubic feet per second, million gallons a day, and acre-feet: 1 cubic foot per second flowing 24 hours equals about 2 acre-feet; 1,000,000 gallons equals about 3 acre-feet; and 1,000,000 gallons a day equals about 1.55 cubic feet per second.

DOWNSTREAM ORDER OF LISTING GAGING STATIONS

Beginning with the report for the year ending June 30, 1950, the order of listing gaging-station records was changed. Proceeding in a downstream direction along the main stem, all stations on a tributary entering above a main-stem station are listed before that station. If a tributary enters between two main-stem stations, it is listed between them. Tributary streams are indicated by indentation. This downstream order and the system of indentation show which gaging stations are on tributaries between any two stations on a main stem.

The order of listing used in previous reports listed first all stations on the main stem from headwaters toward mouth, then all stations on the uppermost tributary to the main stem from the tributary's source to mouth.

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. All records of stage are obtained from water-stage recorders that give continuous records of fluctuations. 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. Occasionally discharge is determined from a weir or rating flume, using standard formulas, and for several stations the high-water discharge has been determined from rating developed by the use of models.

Rating tables giving the discharge for any stage are prepared from stage-discharge relation curves defined by discharge measurements. The application of the daily mean gage height to those rating tables gives the daily mean discharge, from which the monthly and the 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 essentially the shifting-control method.

The data herein presented generally comprise a description of the station, a skeleton rating table, and a table showing the daily discharge and monthly and yearly discharge and runoff of the stream.

The description of the station gives the location, drainage area, records available, type and history of gages, average discharge, extremes of discharge, general remarks, and notations of revisions of the previously published record. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Under "Gage" are given the type of gage currently in use and the datum of the present 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. 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 and the minimum discharge. In the first paragraph, the data given are for the complete current water 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 are 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. 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 conditions which affect the natural flow at the gaging station is given under "Remarks."

Previously published records of some stations have been found to be in error on the basis of data or information later obtained. Revisions of such records are usually published along with the current records in one of the annual reports. In order to make it

easier to find such revised records, a paragraph headed "Revisions (fiscal years)" has been added to the description of all stations for which revised records have been published. Listed therein are all the reports in which revisions have been published, each followed by the fiscal years for which figures are revised in that report. In listing the fiscal years only one number is given; for instance, 1933 stands for the fiscal year July 1, 1932, to June 30, 1933. If no daily, monthly, or annual figures of discharge are concerned in the revision, that fact is brought out by notations after the year dates as follows: "(M)" means that only the instantaneous maximum discharge was revised; "(m)" that only the instantaneous minimum was revised; and "(P)" that only peak discharges were revised. If the drainage area has been revised, the report in which the revised figure was first published is given.

Skeleton rating tables are published for all stations except for ditch or spring stations.

The daily table gives, in general, the discharge corresponding to the daily mean gage height. For stations subject to sudden or rapid diurnal fluctuation, the daily mean gage height may not indicate the true daily mean discharge, which must be obtained by averaging the discharge for parts of the day.

Records of daily discharge are published on the basis of Hawaiian standard time.

In the table of daily discharge, the values for the maximum and the minimum day are underlined. If the value is repeated, it is underlined only on the first day of its occurrence.

In the monthly summary below the daily table, the line headed "Total" gives the sum of the daily values in million gallons. The mean for the month is given both in terms of million gallons a day (line headed "mgd") and in cubic feet per second (line headed "cfs"). The line headed "Ac-ft" gives the runoff for the month in acre-feet.

In the yearly summary below the monthly summary, the values 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 of 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 will be presented. Peak discharges are not published for canals, ditches, springs, or for any stream for which the peaks are subject to substantial control by man.

Footnotes to the table of daily discharge indicate periods when discharge was computed or estimated by unusual or special methods during periods of no gage-height record or by other effects that reduce the degree of accuracy of the records.

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 states the degree of accuracy of the records. "Excellent" indicates that, in general, the error in the daily records is believed to be less than 5 percent; "good," less than 10 percent; "fair," less than 15 percent; and "poor," probably more than 15 percent. The records of monthly and yearly mean discharge and runoff are, in general, more nearly accurate than the daily records.

Computations are carried to not more than three significant figures, except that monthly and yearly total runoff (million gallons and acre-feet) above 10,000 are carried to four significant figures.

PUBLICATIONS

The following table lists, by years and numbers, the papers on the surface-water supply of Hawaii published during the period 1903-52 and, used in conjunction with the list of stations maintained, which is given in Water-Supply Paper 795, provides a convenient index for finding the data for any station. Except as indicated, the year or years covered by each report begin July 1 and end on June 30. The data for any particular station will be found in the reports covering the years during which that station was maintained, unless, owing to undeveloped rating curves, publication was postponed. Occasionally data are revised and republished in later papers. Miscellaneous discharge measurements made during any year at points other than regular gaging stations are included in the data published for that year.

Numbers of water-supply papers containing data on the surface water supply of Hawaii, 1903-52

Year	WSP	Year	WSP	Year	WSP	Year	WSP	Year	WSP
1903	*77	1919-20	516	1928-29	695	1936-37	835	1944-45	1045
1909-11†	318	1920-21	535	1929-30	710	1937-38	865	1945-46	1065
1912†	336	1921-22	555	1930-31	725	1938-39	885	1946-47	1095
1913†	373	1922-23	575	1931-32	740	1939-40	905	1947-48	1125
1913-15	430	1923-24	595	1932-33	755	1940-41	935	1948-49	1155
1915-16	445	1924-25	615	1933-34	770	1941-42	965	1949-50	1185
1916-17	465	1925-26	635	1934-35	795	1942-43	985	1950-51	1219
1917-18	485	1926-27	655	1935-36	815	1943-44	1015	1951-52	1249
1918-19	515	1927-28	675						

* This paper, entitled "Water resources of Molokai," by Waldemar Lindgren, contains data on both the surface and ground-water supplies of the island named.

† Calendar years. Data for the last half of the calendar year 1913 appears not only in Water-Supply Paper 373 but also in Water-Supply Paper 430, the first of the reports covering a year ending June 30.

A summary of records of flow in streams and ditches in the Territory of Hawaii was published in 1939 by the Territorial Planning Board. This report, entitled "Surface-water resources of the Territory of Hawaii, 1901-38," gives, by gaging stations for the periods of record, (1) monthly-discharge tables, which show for each month the maximum, minimum, and mean daily discharge and the total discharge, and (2) duration-discharge tables. Nearly all available records of flow in the Territory up to December 1938 were considered in making the summary. Some of these records are not contained in publications of the Geological Survey; some are revisions of records published in the Survey's water-supply papers.

RECORDS OF DISCHARGE COLLECTED BY AGENCIES OTHER THAN THE GEOLOGICAL SURVEY

The following table lists the gaging stations in the Territory of Hawaii at which records of discharge were collected during the fiscal year July 1951 to June 1952 by agencies *

other than the Geological Survey. The records for these stations are not contained in the publications of the Geological Survey, and, except as indicated, have not been published elsewhere.

Records of discharge collected by agencies other than the Geological Survey

ISLAND OF KAUAI			
Stream	Location	Period	Operated by
East Lawa' storm ditch..	Near Government Road, near Kalaheo.	1924-52	McBryde Sugar Co.
Eleele ditch.....	.....do.....	1924-52	Do.
Hanalei ditch.....	Above Kalihiwai Reservoir, near Kilauea.	1923-52	Kilauea Sugar Plantation Co.
Hanamaulu ditch.....	Below intake, near Hanamaulu.....	1925-52	Lihue Plantation Co.
Hanapepe field ditch....	Below Hanapepe River intake, near Eleele.	1924-52	McBryde Sugar Co.
Hanapepe Stream.....	At tidewater, near Eleele.....	1924-52	Do.
Kamooloa ditch.....	Below Kauai Belt Road crossing, near Koloa.	1924-52	Do.
Kealia River.....	1 mile west of Kaneha Reservoir and $\frac{5}{8}$ miles northwest of Kealia.	1936-52	Lihue Plantation Co.
Koloa ditch.....	$4\frac{1}{2}$ miles north of Koloa and $6\frac{1}{2}$ miles west of Lihue.	1927-52	Do.
Koula ditch.....	In Hanonui Valley, near Makaweli...	1949-52	Gay & Robinson.
Lawai Stream.....	$\frac{1}{2}$ mile above cannery, near Kalaheo.	1924-52	McBryde Sugar Co.
Lihue lower ditch.....	Below intake, near Lihue.....	1925-52	Lihue Plantation Co.
Olokele ditch.....	.....do.....	1925-52	Do.
Olokele ditch.....	At powerhouse, near Makaweli.....	1925-52	Gay & Robinson.
Wahiawa main stream....	Above Alexander Reservoir, near Kalaheo.	1924-52	McBryde Sugar Co.
Wahiawa Stream, East Branch.	.....do.....	1929-52	Do.
West Lawai ditch.....	Near camp 12, near Kalaheo.....	1924-52	Do.

ISLAND OF OAHU			
Alewa Heights Spring....	Below reservoir 3.....	1932-52*	Board of Water Supply, City and County of Honolulu.
Booth Springs.....	In Pauoa Valley, at altitude 685 feet.	1929-52*	Do.
Helemano ditch.....	About 3 miles below Upper Helemano Reservoir.	1933-52	Waialua Agricultural Co.
Hering Springs.....	In Makiki Valley, at altitude 970 feet.	1925-52*	Board of Water Supply, City and County of Honolulu.
Kahuawai Springs.....	In Pauoa Valley, at altitude 618 feet.	1925-52*	Do.
Kalihi tunnels.....	At diversion, at altitude 650 feet.	1926-52*	Do.
Kananui ditch.....	In Kawaihoa Gulch about 500 yards above third siphon from Government Road.	1934-52	Waialua Agricultural Co.
Kipapa Stream.....	At altitude 375 feet.....	1917-52	Waiahole Water Co.
Makiki Springs.....	In Makiki Valley, at altitude 350 feet.	1926-52*	Board of Water Supply, City and County of Honolulu.
Manoa tunnels.....	Upper Manoa Valley.....	1925-52*	Do.
Nuuanu tunnels.....	At Lower Luakaha.....	1926-52*	Do.
Nuuanu tunnel 3.....	At overflow, in upper Nuuanu valley	1931-52*	Do.
Palolo tunnel.....	Upper Palolo Valley.....	1926-52*	Do.
Wahiawa Reservoir Outlet	About 1,200 feet below dam.....	1912-52*	Waialua Water Co.
Waiahole tunnel.....	At adit 8.....	1916-52	Waiahole Water Co.
Waiawa Stream.....	At altitude 750 feet.....	1917-52	Do.
Waikakalaua Stream.....	.....do.....	1917-52	Do.
Waimalu Stream.....	At altitude 535 feet, near Alea...	1947-52	Do.

* Published in biennial reports of Honolulu Sewer & Water Commission and of Honolulu Board of Water Supply.

ISLAND OF MAUI (WEST MAUI)			
Everett ditch.....	Below intake, near Wailuku.....	1935-52	Wailuku Sugar Co.
Honokohau tunnel.....	At outlet of tunnel, at Mahinahina weir.	1917-52	Pioneer Mill Co.
Iao-Waikapu ditch.....	At lower end of tunnels, near Wailuku.	1923-52	Wailuku Sugar Co.
Kahoma tunnel.....	2,000 feet upstream from outlet, above Lahaina.	1920-52	Pioneer Mill Co.
Kama ditch.....	Below intake, near Wailuku.....	1933-52	Wailuku Sugar Co.
Kanaha ditch.....	At intake in Kanaha Gulch, above Lahainaluna.	1921-52	Pioneer Mill Co.
Kauaula tunnel.....	At outlet, above Lahaina.....	1920-52	Do.
K-3 flume.....	Above Lahainaluna.....	1931-52	Do.
Launiupoko ditch.....	At outlet, above Lahaina.....	1921-52	Do.
Maniania ditch.....	Below intake, near Wailuku.....	1923-52	Wailuku Sugar Co.
North Waiehu Stream....	Near end of Waiehu Camp road, near Wailuku.	1922-52	Do.
South Waikapu ditch....	Above second lateral, near reservoir 1, near Waikapu.	1935-52	Do.
Spreckels ditch.....	Below intake, near Waihee.....	1931-52	Do.
Ukumehame ditch.....	At outlet in Ukumehame Gulch, near Olowalu.	1931-52	Pioneer Mill Co.
Waihee ditch.....	Below intake, near Waihee.....	1931-52	Wailuku Sugar Co.

Records of discharge collected by agencies other than the Geological Survey--Continued

ISLAND OF MAUI (EAST MAUI)			
Stream	Location	Period	Operated by
Marawi Stream.....	Below Government Road, near Nahiku.	1927-52 1947-52.	East Maui Irrigation Co.
ISLAND OF HAWAII			
Hionamoa Gulch.....	Below all development tunnels, near Pahala.	1926-52	Hawaiian Agricultural Co.
Honokaape ditch.....	At Kukuihaele Village.....	1923-52	Hawaiian Irrigation Co.
Keaiwa Gulch.....	Below all development tunnels, near Pahala.	1926-52	Hawaiian Agricultural Co.
Kohala ditch.....	At Awini weir in Honokane, near Niulii.	1917-52†	Kohala Ditch Co.
Do.....	At Niulii weir, near Niulii.....	1917-52†	Do.
Lalakea ditch.....	At altitude 1,900 ft, near Waipio..	1905-52	Hawaiian Irrigation Co.
Lower Hamakua ditch.....	At main weir, near Kukuihaele.....	1921-52†	Do.
Moaui Gulch.....	Below all development tunnels, near Pahala.	1929-52	Hawaiian Agricultural Co.
Noguchi tunnel 19.....	5.3 miles from Pahala, at altitude 3,500 feet.	1928-52	Do.
Pololu Inlet 1.....	At Pololu, near Niulii.....	1929-52	Kohala Ditch Co.
Pololu Inlet 2.....	In Waiakalae Gulch at Pololu, near Niulii.	1929-52	Do.
Pololu Inlet 3.....	In Opaepilau Gulch, above Kohala ditch, near Niulii.	1937-52	Do.
Pololu Inlet 5.....	In Niulii Gulch, above Kohala ditch, near Niulii.	1937-52	Do.
Pololu Inlet 6.....	In Waikane Gulch, above Kohala ditch, near Niulii.	1937-52	Do.
Puwaiole Stream.....	Above Kohala ditch, near Halawa....	1937-52	Do.
Waipuka Stream.....	Above Kohala ditch, near Niulii....	1929-52	Do.
Waipuhi Stream.....	Above Kohala ditch, near Halawa....	1933-52	Do.
Waipunalau Stream.....	....do.....	1929-52	Do.

† Records for some earlier years published in water-supply papers of Geological Survey.

GAGING-STATION RECORDS

ISLAND OF KAUAI

Kawaikoi Stream near Waimea

Location.--Lat 22°08'00", long 159°37'15", on left bank at old trail crossing, 12.5 miles northeast of Waimea.

Drainage area.--4.1 sq mi.

Records available.--April 1909 to December 1916, July 1919 to June 1952.

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.--33 years (1919-52), 21.7 mgd (33.6 cfs).

Extremes.--Maximum discharge during year, 3,440 mgd (5,320 cfs) Dec. 16 (gage height, 11.19 ft), from rating curve extended as explained below; minimum, 1.16 mgd (1.79 cfs) July 11.

1909-17, 1919-52: Maximum discharge, 6,900 mgd (10,700 cfs) Dec. 18, 1916 (gage height, 15.2 ft), from rating curve extended above 200 mgd on basis of slope-area determination at gage height 13.43 ft; minimum, that of July 11, 1951.

Remarks.--Records good except those above 200 mgd, which are fair.

Revisions (fiscal years).--WSP 1185: 1914-17(M), 1920-38(M), 1940-43(M), 1947(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.8	0.80	3.0	31
1.9	1.40	3.5	69
2.0	2.25	4.0	141
2.1	3.4	4.5	241
2.3	6.6	5.0	355
2.5	11.2	6.0	670
2.7	17.8		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.74	2.6	34.5	5.9	45	8.0	14.6	5.9	68	*7.6	16.4	8.6
2	1.74	7.5	43	5.2	19.3	6.6	12.4	5.7	19.1	7.2	23.5	7.4
3	1.57	28	16.8	4.4	12.4	5.9	14.6	5.5	9.6	7.0	96	6.6
4	1.40	33	9.4	3.85	10.4	5.5	14.0	5.2	28.5	6.8	30	6.2
5	1.40	48	11.2	3.55	9.1	5.5	11.2	5.0	38.5	12.6	30.5	6.2
6	1.40	100	11.2	3.4	9.2	5.2	8.6	4.8	10.7	12.1	38	6.6
7	1.40	99	6.6	3.4	14.0	4.9	8.0	4.8	11.2	18.0	27	6.6
8	1.34	17.7	18.8	28.5	29	4.7	7.6	4.8	44	15.4	15.0	5.9
9	1.28	31	17.7	106	82	9.5	13.0	4.7	42	9.4	14.6	10.7
10	1.22	20	7.4	21	88	99	13.4	4.7	31.5	8.6	13.0	9.4
11	1.22	10.2	5.4	8.2	30.5	18.4	29	4.8	38	18.4	22	7.6
12	1.22	6.6	4.6	6.0	16.0	9.9	29.5	4.6	132	26.5	14.0	7.0
13	1.48	19.8	4.1	5.2	11.8	7.6	19.8	4.4	164	40	10.4	19.1
14	10.5	33	3.85	4.7	10.4	6.8	20.5	4.3	62	13.0	9.9	12.1
15	10.4	21.5	3.55	4.4	9.1	140	14.3	4.1	21.5	8.0	9.4	8.4
16	6.6	14.0	3.3	4.1	9.4	523	8.9	4.0	15.4	6.8	8.6	13.4
17	5.0	11.4	3.15	3.85	11.1	241	7.6	4.0	12.8	14.6	15.7	12.1
18	2.8	6.2	3.05	3.55	25	44	7.0	9.3	11.8	21	16.0	13.9
19	2.0	6.8	3.3	3.55	25.5	25	372	65	10.2	11.5	32	19.4
20	6.6	5.2	5.0	28.5	14.3	19.0	30.5	15.0	8.9	20.5	32.5	18.7
21	4.8	4.6	15.8	38.5	15.0	15.4	20.5	9.6	8.4	81	83	15.3
22	2.6	4.1	178	24	14.0	13.1	21	10.8	7.6	75	19.8	15.7
23	2.0	4.1	15.8	40	9.6	11.2	12.4	41	7.0	23.5	22	10.2
24	2.4	10.8	8.4	32.5	7.8	13.4	10.2	13.1	6.6	15.2	17.8	8.6
25	3.7	8.0	6.8	10.7	8.2	10.4	9.1	8.4	6.4	19.8	11.2	6.2
26	5.7	5.7	5.9	9.6	9.4	9.1	8.2	7.2	12.0	101	18.1	5.4
27	*9.5	6.0	5.4	*21	19.5	1.2	7.8	5.7	91	79	15.3	15.9
28	15.4	12.4	5.0	37	18.0	7.8	7.2	5.0	83	25	9.6	22.5
29	5.7	15.6	6.0	81	9.1	6.2	6.1	5.0	18.4	26	9.4	9.6
30	4.4	6.2	9.4	48	12.8	115	6.2	-	10.4	56	15.7	8.0
31	3.3	9.9	-	45	-	112	5.2	-	8.4	-	12.1	-
Total	121.81	610.9	470.40	694.55	603.9	1,513.2	772.7	276.4	1,038.9	766.3	708.5	323.3
Mean:												
mgd	3.93	19.7	15.7	22.4	20.1	48.8	24.9	9.53	33.5	25.5	22.9	10.8
cfs	6.08	30.5	24.3	34.7	31.1	75.5	38.5	14.7	51.8	39.5	35.4	16.7
Ac-ft	374	1,870	1,440	2,130	1,850	4,640	2,370	848	3,190	2,350	2,170	992

Calendar year 1951: Max 661 Min 1.22 Mean(mgd) 28.9 Mean(cfs) 44.7 Ac-ft 32,390
Fiscal year 1951-52: Max 523 Min 1.22 Mean(mgd) 21.6 Mean(cfs) 33.4 Ac-ft 24,220

Peak discharge (base, 850 mgd).--Dec. 16 (10:30 a.m.) 3,440 mgd (5,320 cfs), 11.19 ft; Dec. 30 (11:30 p.m.) 1,090 cfs (1,690 cfs), 7.08 ft; Jan. 19 (7 a.m.) 2,850 mgd (4,360 cfs), 10.30 ft.

* Discharge measurement made on this day.

Mohihi Stream near Waimea

Location.--Lat 22°07'05", long 159°36'15", on left bank at upper trail crossing, 3.8 miles northeast of confluence of Waiahulu and Poomau streams and 12 miles northeast of Waimea.

Drainage area.--1.6 sq mi.

Records available.--April 1909 to December 1911 (fragmentary), June 1920 to October 1926, October 1936 to June 1952. Prior to July 1947, published as Mohihi Stream at altitude 3,500 ft, near Waimea.

Gage.--Water-stage recorder. Altitude of gage is 3,500 ft (from topographic map). Apr. 13, 1909, to Dec. 31, 1911, staff gage at site 2 miles downstream at different datum.

Average discharge.--21 years (1920-26, 1937-52), 5.22 mgd (8.08 cfs).

Extremes.--Maximum discharge during year, 795 mgd (1,230 cfs) Dec. 16 (gage height, 6.13 ft), from rating curve extended above 21 mgd; minimum, 0.35 mgd (0.54 cfs) July 11-13. 1920-26, 1936-52: Maximum discharge, 1,250 mgd (1,930 cfs) Aug. 15, 1950 (gage height, 7.23 ft), from rating curve extended above 21 mgd; minimum, 0.05 mgd (0.08 cfs) May 3, 4, 1941.

Remarks.--Records fair except those above 25 mgd, which are poor.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.64	0.56	5.1	1.12	11.1	1.45	5.7	1.61	7.0	*3.1	3.9	1.67
2	.64	.71	10.5	.99	5.1	1.12	4.7	1.55	5.6	2.75	2.85	1.40
3	.58	2.5	4.5	.85	3.1	.99	4.8	1.49	2.15	2.55	22	1.28
4	.50	4.8	1.57	.74	2.15	.91	6.6	1.43	8.2	2.35	6.8	1.18
5	.44	1.78	1.51	.67	1.70	.88	4.6	1.38	20.1	2.55	7.6	1.14
6	.44	11.9	2.0	.61	*1.57	.85	2.9	*1.28	4.7	2.7	7.4	1.18
7	.44	28	1.12	.61	2.6	.78	2.25	1.28	2.55	3.35	6.2	1.14
8	.42	4.9	2.55	4.6	6.9	.74	1.93	1.23	5.1	3.7	3.5	1.14
9	.39	4.9	*5.3	33	19.5	1.44	5.7	1.19	8.0	2.75	2.85	1.33
10	.37	4.0	1.78	7.6	23.5	24	8.3	1.23	7.6	2.35	2.6	1.88
11	.35	1.57	1.03	2.15	11.8	6.1	11.6	1.33	6.1	2.3	3.2	1.40
12	.35	.95	.85	1.17	5.5	2.5	9.0	1.19	19.8	4.9	2.85	1.60
13	.42	.74	.74	.99	3.55	1.70	6.4	1.15	36	7.4	2.25	3.5
14	1.62	4.2	.67	.88	3.0	1.57	7.8	1.11	23.5	9.5	2.0	2.95
15	1.17	3.9	.61	.78	2.1	33	5.5	1.07	6.9	2.45	1.88	2.35
16	1.12	1.78	.58	.71	1.93	177	2.8	1.04	4.2	2.05	1.72	2.0
17	.85	1.27	.53	.64	1.93	77	2.15	1.04	3.25	1.97	1.88	2.45
18	.61	.88	.53	.58	6.4	19.0	1.93	1.23	3.05	2.5	2.7	2.05
19	.50	.71	.58	.58	8.9	8.7	127	8.2	2.55	2.45	6.1	4.5
20	.50	.64	.78	3.85	4.4	5.8	13.4	3.9	2.25	2.2	9.1	4.4
21	.58	.61	11.3	9.6	3.1	4.4	6.7	2.0	2.1	8.3	14.7	6.8
22	.53	.58	64	4.5	4.5	3.55	5.0	1.49	1.86	21.5	4.4	4.9
23	.47	.58	7.1	9.0	2.5	2.7	3.9	8.5	1.73	7.0	*6.4	2.7
24	.47	2.0	2.9	10.2	1.57	2.6	3.15	3.05	1.61	3.05	4.7	2.0
25	.61	2.0	1.70	3.1	1.33	2.25	2.75	1.94	1.61	2.95	2.6	1.51
26	.56	1.12	1.39	2.4	1.27	1.70	2.5	1.86	2.1	13.3	2.2	1.31
27	*.53	.88	1.17	9.6	2.7	1.57	2.25	1.49	42	12.0	2.15	1.31
28	1.26	.91	1.03	11.6	3.75	1.39	2.1	1.43	44	5.8	1.83	2.05
29	.99	1.39	.95	28	2.15	1.33	1.94	1.49	9.9	4.2	1.77	1.83
30	.78	1.17	1.45	32	2.15	34.6	1.85	5.0	7.0	7.7	1.77	1.40
31	.67	2.0	1.45	7.9		37	1.73	-	*3.6	-	1.88	-
Total	19.80	93.73	135.80	191.02	151.75	458.62	268.93	58.13	294.11	150.97	145.78	66.33
Mean:	0.639	3.02	4.53	6.16	5.06	14.8	8.68	2.01	9.49	5.03	4.64	2.21
mgd	0.989	4.27	7.01	9.53	7.83	22.9	13.4	3.11	14.7	7.78	7.18	3.42
cfs	61	288	417	586	466	1,410	825	179	903	463	441	204
Ac-ft												

Calendar year 1951: Max 299 Min 0.35 Mean(mgd) 7.88 Mean(cfs) 12.2 Ac-ft 8,640
 Fiscal year 1951-52: Max 177 Min 0.35 Mean(mgd) 5.55 Mean(cfs) 8.59 Ac-ft 6,240

Peak discharge (base, 200 mgd).--Dec. 16 (8 a.m.) 795 mgd (1,230 cfs), 6.13 ft; Dec. 30 (10:30 p.m.) 332 mgd (514 cfs), 4.77 ft; Jan. 19 (6 p.m.) 755 mgd (1,170 cfs), 6.00 ft.

* Discharge measurement made on this day.

ISLAND OF KAUAI

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 1952.

Gage.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (by barometer).

Average discharge.--25 years (1927-52), 16.2 mgd (25.1 cfs).

Extremes.--1926-52: Maximum daily discharge, 68 mgd (105 cfs) Dec. 2, 1929, Mar. 4, 1933; no flow at times.

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

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.0	4.1	23	7.7	16.3	10.3	29.5	8.0	17.6	15.1	22.5	12.2
2	3.0	7.0	52.5	6.7	16.3	7.3	26.5	15.1	28	14.2	22	10.7
3	3.0	19.9	21.5	5.8	16.3	.07	28	12.8	17.5	13.3	39	9.8
4	3.0	28	11.8	5.2	14.9	0	17.4	3.05	19.2	12.6	31	9.2
5	2.9	20	11.1	4.8	13.7	0	24	0	39	17.5	32.5	9.2
6	2.9	32.5	13.5	4.6	12.2	0	13.7	0	21	17.5	28	9.4
7	2.9	32.5	8.4	4.4	17.5	2.0	0	0	15.1	21	28	9.4
8	2.9	17.0	15.4	14.2	22.5	5.8	0	4.3	33	21	20	8.6
9	2.9	18.8	19.7	34	19.8	7.0	0	12.0	41	15.1	20	11.6
10	2.8	17.4	9.8	18.9	20	42	0	12.0	34	13.5	17.5	12.8
11	2.8	8.8	6.7	11.3	13.0	28	11.6	12.0	29.5	18.9	25	10.1
12	2.8	5.5	5.6	8.1	3.5	12.1	32.5	11.5	31	29.5	18.8	9.2
13	3.0	5.4	5.2	6.8	.62	.06	18.8	11.1	25	34	14.9	19.2
14	12	23	4.6	6.2	3.25	4.3	0	10.7	21	20	14.0	13.0
15	13	15.1	4.2	5.6	10.1	22.5	0	10.5	20	13.3	13.5	11.3
16	7.0	10.1	4.1	5.3	12.4	34	0	10.1	16.3	11.5	12.4	13.1
17	6.0	9.6	3.95	4.8	12.2	35.5	0	10.1	20	14.8	16.6	15.1
18	3.5	5.2	3.8	4.7	26.5	31	1.67	13.9	20	25.5	20	14.1
19	3.3	5.0	3.65	4.4	24	16.4	25	28	17.5	16.3	22.5	21
20	6.0	4.1	5.7	23.5	19.0	0	22.5	24	16.3	19.4	21	20
21	5.0	3.55	12.9	29.5	17.5	5.1	29.5	16.3	15.1	36	29	15.9
22	3.5	3.3	37.5	23	16.3	18.7	29.5	14.2	14.0	43	14.9	20
23	3.0	2.9	25	25	13.3	22.5	29.5	33	13.0	28	12.5	13.5
24	3.5	5.9	14.0	29	10.7	24	26.5	21	12.2	21	14.0	11.3
25	4.5	5.8	10.3	14.4	10.7	15.9	25	14.9	12.0	25	16.3	8.6
26	5.5	4.4	8.8	13.7	8.5	0	22.5	13.0	17.6	37.5	18.3	7.7
27	*9.0	3.55	7.9	22	0.16	0	15.6	11.3	34	43	20.5	12.7
28	16.5	6.8	7.4	22.5	0	6.2	0	10.5	39	29.5	13.7	25
29	8.1	10.7	7.5	26.5	0	20	0	10.1	26	31	12.6	12.0
30	6.2	9.2	10.9	16.8	2.75	23.5	0	-	21	39	17.5	10.1
31	4.8	10.1	-	18.8	-	43	1.14	-	*17.5	-	16.3	-
Total	158.3	355.20	356.40	428.2	373.98	437.23	430.41	354.05	703.4	697.0	624.8	385.8
Mean	5.11	11.5	11.9	13.9	12.5	14.1	13.9	12.2	22.7	23.2	20.2	12.9
mgd	7.91	17.8	18.4	21.4	19.3	21.8	21.5	18.9	35.1	35.9	31.3	20.0
cfs	486	1,090	1,090	1,310	1,150	1,340	1,320	1,090	2,160	2,140	1,920	1,180
Ac-ft												

Calendar year 1951: Max 43 Min 0 Mean(mgd) 11.0 Mean(cfs) 17.0 Ac-ft 12,280
 Fiscal year 1951-52: Max 43 Min 0 Mean(mgd) 14.5 Mean(cfs) 22.4 Ac-ft 16,280

* Discharge measurement made this day.

Note.--No gage-height record July 1-27; discharge estimated on basis of records from stations on nearby streams.

Waiahulu Stream near Waimea

Location.--Lat 22°04'45", long 159°39'15", on right bank in Waimea Canyon, 0.5 mile up-stream from confluence with 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 June 1952.

Gage.--Water-stage recorder. Altitude of gage is 890 ft (by barometer). Prior to May 25, 1925, at datum 1.55 ft lower.

Average discharge.--24 years (1925-48, 1951-52), 29.7 mgd (46.0 cfs).

Extremes.--Maximum discharge during year, 9,900 mgd (15,300 cfs) Dec. 16 (gage height, 13.52 ft), from rating curve extended above 320 mgd; minimum, 6.1 mgd (9.4 cfs) Sept. 17, 19.

1916, 1917-18, 1925-52: 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 and those above 320 mgd, which are poor. Kokee ditch diverts water above station for irrigation near Kekaha (see preceding page).

Revisions (fiscal years).--WSP 1095: 1928(M)

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Feb. 8 to Mar. 11)

July 1 to Dec. 16

Dec. 17 to June 30

2.3	5.2	4.5	280	2.0	8.9	4.0	222
2.5	10.2	5.0	450	2.3	19.1	4.5	350
2.8	22.5	5.5	650	2.6	34.5	5.0	530
3.2	51	6.0	920	3.0	65	6.0	1,000
3.5	97	7.0	1,700	3.5	130	7.0	1,700
4.0	163	8.0	2,700				

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.2	9.4	11.1	12.2	55	13	35	26	84	17.1	17.9	12.4
2	11.5	9.4	39	11.2	30	14	31	16	35.5	15.9	14.4	11.7
3	10.9	11.6	17.8	11.2	23	19	35	18	12.7	*14.8	130	11.7
4	10.2	21.5	9.7	11.5	16	18	34	26	29	14.4	30.5	11.4
5	9.9	27	8.3	11.5	15	17	29	29	60	14.1	24	11.4
6	9.7	91	9.0	11.8	13	16	35	28	15.4	14.1	28	11.4
7	10.2	178	8.3	10.5	17	14	47	*27	11.1	14.4	29.5	11.4
8	9.5	30.5	12.0	9.9	35	13	44	23.5	26	15.9	15.9	11.4
9	9.7	25	13.5	157	110	12	53	14.1	41	14.4	14.4	11.4
10	9.7	25.5	9.7	46	200	150	58	13.4	24	13.7	14.4	12.4
11	9.7	14.7	7.8	14.7	60	40	68	13.4	20	13.4	14.8	12.0
12	9.7	12.5	7.0	12.9	30	*30	47	13.4	157	18.3	14.8	11.7
13	9.4	10.9	6.8	11.5	24	25.5	43	13.4	306	28	13.7	13.1
14	9.7	36	8.6	10.9	19	21	60	13.1	127	19.6	13.1	17.0
15	12.2	20.5	6.6	10.5	10	395	52	12.7	30	14.4	12.7	13.4
16	11.5	16.7	6.4	10.5	7.5	1,920	41	12.4	20	13.4	12.7	12.4
17	10.9	17.3	6.4	10.5	9.5	1,130	37	12.4	17.1	12.7	12.7	13.1
18	10.2	12.2	6.4	9.7	30	320	35	12.4	16.3	14.8	14.1	12.7
19	9.7	10.9	6.4	9.7	32	171	1,400	67	15.9	14.1	24	14.8
20	9.7	9.9	7.2	11.4	21	80	150	23	14.8	13.1	52	15.9
21	9.7	9.4	30	23.5	21	60	55	13.4	14.4	77	121	15.8
22	9.7	9.1	564	26	22	37	40	11.7	14.4	114	31.5	*18.9
23	*9.7	8.8	52	20	15	30	30	34	14.1	36.5	34.5	14.4
24	9.7	11.1	20.5	*59	13	28	26	14.1	13.4	15.9	30.5	12.7
25	9.7	13.5	14.7	14.7	13	33	23	11.1	13.4	14.4	14.4	12.0
26	9.9	11.2	12.5	13.2	16	41	21	10.9	15.1	117	13.1	11.7
27	9.9	9.7	10.2	25.5	35	38	26	10.3	184	97	14.4	11.4
28	10.2	11.2	9.9	62	33	31	40	10.0	216	30	12.7	15.2
29	11.5	16.2	9.9	284	24	14	36	9.7	51	16.7	12.4	13.1
30	10.2	8.6	10.9	300	24	250	-	23	26	12.4	15.0	-
31	9.7	8.0	-	50	-	278	34	-	19.1	-	12.7	-
Total	315.5	707.3	940.6	1,282.9	975.0	5,258.5	2,703	539.4	1,640.7	855.1	813.2	389.9
mgd	10.2	22.8	31.4	41.4	32.5	170	87.2	18.6	52.9	28.5	26.2	13.0
cfs	15.8	35.3	48.6	64.1	50.3	263	135	28.8	81.8	44.1	40.5	20.1
Ac-ft	968	2,170	2,890	3,940	2,990	16,140	8,300	1,660	5,040	2,620	2,500	1,200

Calendar year 1951: Max - Min - Mean(mgd) - Mean(cfs) - Ac-ft -
Fiscal year 1951-52: Max 1,920 Min 6.4 Mean(mgd) 44.9 Mean(cfs) 69.5 Ac-ft 50,420

Peak discharge (base, 1,200 mgd).--Sept. 22 (7 a.m.) 1,800 mgd (2,790 cfs), 7.06 ft; Oct. 30 (time unknown) 2,920 mgd (4,520 cfs), 8.24 ft; Dec. 16 (9:30 a.m.) 9,900 mgd (15,300 cfs), 13.52 ft; Dec. 30 (9:30 p.m.) 2,700 mgd (4,180 cfs), 8.02 ft; Jan. 19 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 30 to Dec. 12, Dec. 20-30, Jan. 1 to Feb. 7; discharge estimated on basis of records for stations on nearby streams.

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.--November 1907 to June 1952.

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

Average discharge.--33 years (1918-24, 1925-52), 35.6 mgd (55.1 cfs).

Extremes.--1907-52: 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 excellent except those for period of no gage-height record, which are fair. Ditch diverts water from Waimea River 1 mile downstream from confluence with Waialae River. Flow regulated by headgates. Water used for irrigation in vicinity of Kekaha.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June	
1	34.5	32	44	34.5	28	39	2.75	36.5	36.5	51	51	39	
2	36.5	39	36.5	36.5	30	39	5.4	34.5	44	51	51	36.5	
3	32	46	36.5	36.5	30	46	9.0	39	46	51	46	34.5	
4	30	41	44	34.5	30	48	10.6	39	46	*51	41	34.5	
5	30	41	44	32	30	51	5.4	36.5	53	44	51	32	
6	30	51	*48	32	30	48	3.76	36.5	51	41	51	34.5	
7	30	51	41	32	32	41	5.5	39	39	51	51	41	
8	30	51	36.5	34.5	30	36.5	12.2	36.5	36.5	51	51	39	
9	28	48	39	51	32	39	14.7	36.5	41	51	48	48	
10	28	48	46	48	32	36.5	1.79	36.5	53	41	41	a46	
11	28	39	36.5	48	30	36.5	.91	36.5	51	41	41	a40	
12	28	36.5	34.5	39	48	32	1.16	*39	53	41	48	a42	
13	28	39	32	36.5	51	32	4.2	39	53	44	41	a50	
14	34.5	48	32	34.5	51	30	28	39	39	51	39	a46	
15	41	51	30	34.5	51	28	36.5	36.5	34.5	48	39	a46	
16	39	48	30	34.5	41	25	39	34.5	39	44	36.5	a40	
17	39	51	30	32	36.5	17.9	39	36.5	51	41	36.5	a38	
18	32	39	30	32	41	13.8	36.5	41	53	46	39	a38	
19	30	36.5	36.5	32	51	6.4	23	48	51	41	46	a46	
20	30	36.5	46	36.5	51	6.1	11.4	51	51	39	53	a46	
21	30	41	44	41	41	9.0	4.5	46	39	51	53	a46	
22	30	39	32	51	41	15.3	3.5	39	34.5	51	51	41	
23	28	36.5	32	51	41	22	1.94	36.5	36.5	51	53	51	
24	32.5	48	32	51	39	23	.73	41	46	51	46	51	
25	46	41	32	*51	41	24	0	46	46	51	41	44	
26	41	39	32	44	46	23	17.8	48	51	41	44	39	
27	46	39	32	39	51	22	25	46	44	41	46	46	
28	39	41	30	39	51	19.2	32	41	34.5	51	41	44	
29	41	48	32	28	51	14.7	32	39	32	51	39	41	
30	48	44	39	25	44	22	32	-	34.5	53	41	39	
31	39	48	-	25	-	10.7	32	-	51	-	41	-	
Total	1,059.0	1,337.0	1,090.0	1,176.0	1,201.5	856.6	472.23	1,154.0	1,370.5	1,408	1,400.0	1,257.0	
Mean:													
mgd	34.2	43.1	36.3	37.9	40.0	27.6	15.2	39.8	44.2	46.9	45.2	41.9	
cfs	52.9	66.7	56.2	58.6	61.9	42.7	23.5	61.6	68.4	72.5	69.9	64.8	
Ac-ft	3,250	4,100	3,350	3,610	3,690	2,630	1,450	3,540	4,210	4,320	4,300	3,860	
Calendar year 1951: Max	51			Min	0		Mean(mgd)	34.6		Mean(cfs)	53.5	Ac-ft	36,710
Fiscal year 1951-52: Max	53			Min	0		Mean(mgd)	37.7		Mean(cfs)	58.3	Ac-ft	42,310

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby streams.

Waimea River below Kekaha ditch intake, near Waimea

Location.--Lat 22°02'40", long 159°38'35", on right bank in Waimea Canyon, 500 ft downstream from Kekaha ditch lower intake and 6.5 miles northeast of Waimea.

Drainage area.--45.0 sq mi.

Records available.--July 1921 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 490 ft (by barometer). Prior to May 7, 1926, at datum 3.85 ft higher.

Average discharge.--26 years (1925-47, 1948-52), 49.8 mgd (77.1 cfs).

Extremes.--Maximum discharge during year, about 15,000 mgd (23,000 cfs) Dec. 16; no flow Aug. 23, Sept. 12-18.

1921-52: Maximum discharge, 20,000 mgd (30,900 cfs) Aug. 17, 1950 (gage height, about 25 ft, from floodmarks), from rating curve extended above 500 mgd by test on model of station site; no flow at times.

Remarks.--Records fair except those for periods of no gage-height record and those below 20 mgd, which are poor. Kokee and Kekaha ditches divert practically all flow below medium stages for irrigation near Waimea and Kekaha.

Revisions (fiscal years).--WSP 740: 1921-31. WSP 1125: 1947.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 16

Dec. 17 to June 30

5.9	0	7.3	64	7.0	0.5	8.2	85
8.0	.1	7.6	121	7.1	1.2	8.8	178
8.1	.2	8.0	240	7.2	5.1	9.0	330
8.2	.6	8.5	450	7.3	9.9	9.5	595
8.3	1.1	9.0	710	7.4	9.8	10.0	940
8.5	3.8	10.0	1,330	7.6	20.5	11.0	1,650
8.7	10.3	11.0	2,050	7.9	48	12.0	2,530
7.0	30	12.0	3,000				

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.4	0.1	21	24.5	250	13	230	20	38	16.3	21	1.4
2	.4	.1	71	15.4	100	8.0	100	20	36.5	10.3	3.1	1.2
3	.3	2.8	22.5	6.2	60	6.5	110	13	1.4	3.7	144	1.2
4	.3	18.4	1.0	4.0	46	8.0	90	12	11.4	*2.3	50	1.2
5	.3	17.9	7.5	3.4	34	18	100	14	284	5.5	33	1.2
6	.3	188	*4.8	3.4	30	12	90	12	32	10.9	27	1.4
7	.3	451	.3	3.6	26	13	85	7.0	18.5	7.7	36	1.4
8	.3	35.5	13.7	3.8	50	17	75	9.0	46	15.7	5.5	1.4
9	.3	27	35.5	661	190	20	95	8.0	72	7.1	2.5	18.0
10	.3	29	1.7	50	400	450	110	7.0	43	6.2	2.2	9.8
11	.3	7.0	.1	10	130	85	150	5.0	34	8.2	6.7	1.1
12	.3	.4	0	6.0	75	24	150	*1.6	157	17.8	2.9	10.9
13	.2	.2	0	3.5	55	18	120	1.6	550	40	2.2	33
14	.3	30.5	0	3.5	70	32	80	1.6	282	15.2	2.0	29.5
15	.4	15.8	0	2.5	30	899	65	1.4	54	1.6	2.0	29.5
16	.3	4.5	0	2.5	18	3,000	50	1.2	37	1.1	2.0	24.5
17	.3	7.3	0	3.0	17	1,500	36	2.9	12.0	1.1	2.2	12.7
18	.2	1.5	0	3.0	36	600	34	1.4	23.5	1.2	2.0	1.1
19	.2	.8	8.1	3.0	65	340	2,100	51	4.2	5.1	4.5	41
20	.2	.2	10.7	26	44	160	260	20.5	13.5	4.5	53	30.5
21	.2	.1	246	100	20	100	170	1.4	47	41	115	49
22	.2	.1	1,480	50	60	85	140	1.2	14.2	133	32	46
23	.2	0	212	30	26	70	110	44	7.9	55	60	12.6
24	2.2	13.0	76	150	15	60	95	14.7	1.1	6.0	44	6.2
25	5.3	14.6	46	*19	11	60	85	1.2	.6	2.5	12.5	.6
26	2.3	3.1	37.5	42	9.0	55	60	1.2	5.2	101	1.4	.4
27	2.8	.2	34	183	13	50	50	1.2	774	137	1.6	.7
28	9.0	.1	29	183	30	46	36	1.2	813	46	1.4	37
29	8.4	9.8	26	876	18	48	30	1.2	106	22	1.4	8.6
30	8.4	.4	48	1,110	16	900	28	-	53	56	1.4	.5
31	.3	.5	-	217	-	1,000	28	-	27.5	-	1.4	-
Total	52.6	849.9	2,432.2	3,798.3	1,944.0	9,695.5	4,970	277.5	3,599.5	781.0	677.9	413.6
Mean	1.70	27.4	81.1	123	64.8	313	160	9.57	116	26.0	21.9	13.8
cfs	2.63	42.4	125	190	100	484	248	14.8	179	40.2	33.9	21.4
Ac-ft	161	2,610	7,460	11,660	5,970	29,750	15,250	852	11,050	2,400	2,080	1,270
Calendar year 1951.	Max	4,000	Min	0	Mean(mgd)	132	Mean(cfs)	204	Ac-ft	147,500		
Fiscal year 1951-52.	Max	3,000	Min	0	Mean(mgd)	80.6	Mean(cfs)	125	Ac-ft	90,510		

Peak discharge (base, 5,000 mgd).--Dec. 16 (time unknown) about 15,000 mgd (23,000 cfs).

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 10-25. May 1-15. Dec. 17-25. No gage-height record Aug. 19-25.

Waimea River near Waimea

Location.--Lat 21°58'55", long 159°39'50", on right bank 1.2 miles upstream from confluence with Makaweli River and 1.8 miles north of Waimea.

Drainage area.--57.8 sq mi.

Records available.--July 1910 to October 1919, November 1943 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 25 ft (by hand levels from estuary at confluence with Makaweli River). Prior to Oct. 5, 1911, staff gage at site 1 mile downstream at different datum. Oct. 5, 1911, to June 30, 1918, staff gage at same site at different datum.

Average discharge.--8 years (1944-52), 85.0 mgd (132 cfs).

Extremes.--Maximum discharge during year, 18,000 mgd (27,900 cfs) Dec. 16 (gage height, 17.46 ft), from rating curve extended above 3,300 mgd as explained below; minimum, 0.81 mgd (1.25 cfs) July 24.
1943-52: Maximum discharge, 24,000 mgd (37,100 cfs) Feb. 7, 1949 (gage height, 19.3 ft), from rating curve extended above 3,300 mgd on basis of slope-area determinations at gage heights 10.28, 13.6, and 18.7 ft; minimum, less than 0.01 mgd (0.02 cfs) Sept. 27, 1948.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Several ditches divert most of low flow for irrigation of sugarcane.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 16

Dec. 17 to June 30

0.8	0.44	2.6	80	2.8	1.25	3.7	81
.9	.90	3.0	140	2.9	3.05	4.1	171
1.0	1.70	3.5	255	3.0	6.4	4.5	296
1.1	2.8	4.0	415	3.1	11.4	5.0	495
1.2	4.2	5.0	820	3.2	18.1	6.0	1,000
1.5	11.0	7.0	1,940	3.4	38	8.0	2,450
1.8	20.5	9.0	3,500				
2.2	42						

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.4	1.58	27	15.2	192	17.5	260	26	45	32.5	28	3.95
2	4.2	1.14	74	10.5	98	9.0	110	22	104	*23.5	8.4	3.05
3	4.9	1.46	47	7.8	60	6.9	120	20	11.4	18.1	160	2.55
4	2.8	25	10.7	5.0	47	6.9	95	18	8.4	14.5	60	2.35
5	2.45	14.2	*4.5	3.95	36.5	24	100	19	350	13.8	29	2.35
6	2.25	90	19.1	3.65	30.5	13.8	95	17	65	20.5	20.5	*2.45
7	2.05	41.7	5.3	3.4	26	14.6	85	20	36	15.9	37	3.65
8	1.92	55	5.5	3.5	51	20	80	18	65	25	13.2	4.2
9	2.35	19.3	60	348	195	18.1	90	17	134	18.9	6.4	11.0
10	1.92	39.5	14.4	110	423	481	120	16	77	12.6	5.2	19.1
11	1.62	15.4	3.8	16.5	212	126	160	*16	54	16.6	11.4	3.35
12	1.54	8.4	2.35	5.6	84	55	160	13.2	230	18.4	8.4	4.8
13	1.38	2.85	2.05	5.0	57	72	120	8.9	642	44	4.9	29
14	1.38	22.5	2.15	2.95	79	67	90	8.4	416	33	3.95	27.5
15	5.8	28	2.25	2.6	32	815	65	7.9	92	10.9	3.35	29
16	2.45	13.8	2.35	2.35	21	3,500	65	8.9	64	6.9	3.05	22
17	1.92	11.8	2.6	2.95	20.5	1,800	40	9.9	26	*6.0	3.05	18.0
18	1.62	12.1	2.6	2.35	35	650	40	10.4	39.5	5.6	4.2	5.6
19	1.30	6.2	3.1	2.35	75	460	2,300	75	18.1	7.4	4.2	33
20	1.22	3.25	31	24	50	240	400	47	14.6	10.4	49	33.5
21	*1.14	2.25	130	144	24	150	200	9.9	92	28	121	50
22	.90	4.4	1,350	59	69	90	140	8.4	30.5	150	34.5	64
23	.85	2.35	161	*32	32.5	70	120	72	19.8	81	53	17.2
24	.81	8.5	56	169	19.6	65	100	35	9.4	12.0	50	10.9
25	17.7	30	32.5	26.5	15.7	60	90	9.9	7.4	4.9	19.1	4.2
26	1.54	11.3	23.5	53	10.5	55	60	7.9	8.9	9.7	5.2	2.15
27	7.7	3.7	18.8	150	18.5	50	55	8.4	648	154	3.35	1.95
28	7.5	2.35	16.4	96	39	48	40	7.4	771	53	3.05	31
29	15.0	12.9	14.1	*770	23	48	32	7.4	*173	15.5	3.05	14.8
30	16.7	8.4	27	875	21	1,000	30	-	76	55	3.35	3.35
31	6.3	3.1	-	163	-	1,100	28	-	42	-	3.65	-
Total	127.61	877.53	2,151.05	3,115.15	2,095.3	11,132.8	5,490	562.9	4,370.0	917.6	762.45	459.95
Mean	4.12	28.3	71.7	100	69.8	359	177	19.4	141	30.6	24.6	15.3
mgd	6.37	43.8	111	155	108	555	274	30.0	218	47.3	38.1	23.7
cfs	392	2,690	6,600	9,560	6,430	34,170	16,850	1,750	13,410	2,820	2,340	1,410

Calendar year 1951. Max 4,710 Min 0.81 Mean(mgd) 147 Mean(cfs) 227 Ac-ft 164,200
Fiscal year 1951-52: Max 3,500 Min 0.81 Mean(mgd) 87.6 Mean(cfs) 136 Ac-ft 98,400

Peak discharge (base. 5.600 mgd).--Dec. 16 (8 a.m.) 18,000 mgd (27,900 cfs), 17.46 ft.

Makaweli River near Waimea

Location.--Lat 21°58'15", long 159°38'55", on left bank 0.7 mile upstream from mouth, 1.9 miles northeast of Waimea, and 3.8 miles northwest of Makaweli.

Drainage area.--25.0 sq mi.

Records available.--October 1911 to June 1917, July 1943 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 30 ft (hand levels from estuary at confluence with Waimea River). Oct. 6, 1911, to June 30, 1917, staff gage at site 0.2 mile downstream at different datum.

Average discharge.--13 years (1912-17, 1944-52), 61.9 mgd (95.8 cfs).

Extremes.--Maximum discharge during year, 8,800 mgd (13,600 cfs) Jan. 19 (gage height, 11.19 ft), from rating curve extended above 150 mgd on basis of slope-area determination at gage height 9.46 ft; minimum, 2.05 mgd (3.15 cfs) July 19.
1943-52: Maximum discharge, that of Jan. 19, 1952; minimum, that of July 19, 1951.

Remarks.--Records good except those above 150 mgd, which are fair.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.1	2.8	3.0	181
1.2	7.2	3.5	275
1.5	22	4.0	405
1.9	48	5.0	760
2.5	110	6.0	1,340

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.2	7.2	24	14.5	98	16.4	95	24	14.4	39	25.5	12.9
2	11.9	11.6	48	13.4	56	15.4	87	23	19.6	32.5	22	12.4
3	9.3	7.6	23.5	11.0	42	15.5	236	25	14.4	28	89	10.5
4	6.3	11.0	11.4	10.5	36	34.5	314	19.6	68	25	25.5	9.5
5	5.0	8.2	35	8.1	28	32.5	143	*16.9	368	32.5	25	10.5
6	4.6	52	19.2	7.2	23	22	80	15.9	81	32.5	22.5	*23.5
7	4.6	249	11.0	6.7	44	44	86	15.4	44	35	23.5	17.8
8	5.2	34.5	19.5	20.5	87	23	53	15.4	87	36	18.0	36.5
9	5.0	39.5	44	239	173	28	239	14.9	75	25	15.4	84
10	3.7	33	*29	53	323	144	226	16.4	70	23.5	15.4	33
11	8.4	15.4	10.5	18.0	170	41	202	18.9	112	18.5	19.6	31
12	4.1	9.5	9.1	12.4	93	182	14.4	199	25	15.9	66	
13	6.9	8.7	7.2	14.0	77	158	116	13.9	428	52	13.9	65
14	18.4	18.1	6.3	11.9	97	71	151	13.4	350	22.5	13.4	92
15	9.4	13.4	6.3	9.1	33	246	98	13.4	147	16.9	12.9	91
16	10.6	9.8	6.3	9.1	26.5	1,330	65	12.9	76	15.9	12.9	113
17	5.9	25	6.3	9.1	21.5	800	81	15.4	122	15.4	12.4	42
18	3.7	19.1	10.9	8.1	34	270	45	45	80	18.0	13.4	34.5
19	2.8	11.0	42	10.0	132	137	1,160	60	70	19.0	16.4	88
20	2.8	9.5	36	67	41	104	183	21	84	19.1	27.5	55
21	*3.7	41	217	187	94	87	110	15.4	79	40	40	100
22	3.25	9.5	448	36.5	185	77	87	15.4	43	68	29.5	68
23	10.4	12.9	97	*55	35	54	76	61	37	31.5	141	55
24	55	48	39	118	24.5	70	54	15.9	31.5	18.0	37.5	27.5
25	19.6	27	24.5	45	24	60	39.5	19.4	35.5	18.3	18.0	15.4
26	42	12.9	19.6	66	19.6	44	33.5	35	40	54	15.5	15.4
27	23.5	9.1	15.4	183	23	46	31	19.6	685	141	17.0	41
28	31	11.6	12.9	104	18.5	37.5	29	50	979	50	17.8	57
29	22.5	34.5	35.5	356	18	57	27.5	18.3	*169	57	39.5	17.4
30	44	13.4	35.5	328	19.6	458	26.5	-	71	69	26.5	11.9
31	11.9	20	-	98	-	568	25	-	48	-	15.6	-
Total	402.85	831.0	1,351.9	2,107.1	2,048.6	5,175.8	4,379.0	658.8	4,707.4	1,077.1	838.01	336.7
Mean:	13.0	26.8	45.1	68.0	68.3	167	141	22.7	152	35.9	27.0	44.6
cfs	20.1	41.5	69.8	105	106	258	218	35.1	235	55.5	41.8	69.0
Ac-ft	1,240	2,550	4,150	6,470	6,290	15,880	13,440	2,020	14,450	3,310	2,570	4,100
Calendar year 1951:	Max	2,090	Min	2.8	Mean(mgd)	77.7	Mean(cfs)	120	Ac-ft	87,070		
Fiscal year 1951-52:	Max	1,330	Min	2.8	Mean(mgd)	68.1	Mean(cfs)	105	Ac-ft	76,470		

Peak discharge (base, 1,300 mgd).--Dec. 16 (11 a.m.) 4,940 mgd (7,640 cfs), 9.19 ft; Dec. 30 (12 p.m.) 4,010 mgd (6,200 cfs), 8.82 ft; Jan. 19 (7:30 a.m.) 8,800 mgd (13,600 cfs), 11.19 ft; Mar. 28 (12 m.) 2,550 mgd (3,950 cfs), 7.45 ft.

* Discharge measurement made on this day.

ISLAND OF KAUAI

Hanapepe River at Koula, near Eleele

Location.--Lat 21°57'20", long 159°33'15", on left bank just downstream from Manuaahi Stream, 4 miles northeast of Eleele.

Drainage area.--18.8 sq mi.

Records available.--May 1917 to January 1921, December 1926 to June 1952. August 1910 to December 1916, at site half a mile upstream; records not equivalent due to inflow.

Gage.--Water-stage recorder. Altitude of gage is 150 ft (by barometer). Prior to Dec. 15, 1926, staff gage, and Dec. 16, 1926, to June 30, 1951, water-stage recorder at same site at datum 1.00 ft higher.

Average discharge.--28 years (1917-20, 1927-52), 57.1 mgd (88.3 cfs).

Extremes.--Maximum discharge during year, 6,740 mgd (10,400 cfs) Jan. 19 (gage height, 10.61 ft), from rating curve extended as explained below; minimum, 6.2 mgd (9.6 cfs) July 19, 21, 22.

1910-21, 1926-52: Maximum discharge, 10,400 mgd (16,100 cfs) Dec. 17, 1949 (gage height, 11.74 ft), from rating curve extended above 2,400 mgd by test on model of station site; minimum, 6.2 mgd (9.6 cfs) Oct. 4, 5, 1939, June 9-13, 15, 20-23, 25, 26, 28, 29, July 19, 21, 22, 1951.

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

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Jan. 19

Jan. 20 to June 30

0.6	5.2	1.8	113
.8	11.1	2.0	145
1.0	21	3.0	360
1.2	35.5	4.0	710
1.4	56	5.1	1,320

0.5	7.8	1.1	37
.6	10.8	1.4	64
.8	18.8	1.8	113

Note.--Same as preceding table above 1.8 ft.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.0	10.8	32	23	95	13.6	102	11.5	16.0	35	29	11.5
2	15.2	10.6	69	16.0	47	12.4	167	10.8	12.6	*26.5	34.5	9.3
3	10.8	8.5	30	10.8	36	14.3	312	11.5	12.2	21	60	8.4
4	8.5	8.5	*13.5	10.4	29.5	28	377	*11.2	35.5	16.6	19.3	7.8
5	8.5	23.5	51	9.4	19.3	20.5	195	10.2	253	33.5	16.1	8.4
6	7.8	86	25.5	8.5	14.9	66	96	9.3	76	29.5	13.3	14.1
7	7.8	350	13.2	8.5	28.5	76	102	9.3	47	35.5	11.5	11.5
8	7.8	50	204	29	132	28	54	9.0	100	30	8.7	25
9	7.3	42	184	382	201	22	252	8.7	86	19.8	8.4	106
10	7.0	38.5	61	101	389	148	241	10.4	83	19.2	8.4	*44
11	7.5	18.1	19.8	31	200	30	175	12.9	80	14.1	14.4	69
12	6.8	10.8	12.4	16.9	116	63	165	8.7	176	15.3	9.0	91
13	8.6	8.8	9.8	17.0	174	63	105	8.4	421	66	8.4	88
14	19.8	11.0	8.5	14.0	185	39	181	8.4	473	18.4	8.1	101
15	9.4	14.0	7.8	11.1	105	224	124	8.1	177	13.3	28	117
16	11.4	37	7.3	10.8	82	801	91	8.1	109	10.8	41	182
17	7.8	76	7.3	15.7	48	611	140	22	202	10.2	23.5	75
18	6.8	36	25.5	11.9	34	236	69	82	164	11.5	8.1	63
19	6.5	15.1	45	15.4	179	123	1,270	57	371	10.8	9.0	121
20	6.9	14.1	74	62	89	82	161	16.0	153	13.6	13.6	76
21	6.5	55	420	228	257	56	82	9.6	105	18.5	18.2	122
22	6.5	11.9	407	*63	443	45	54	11.0	67	38.5	26	110
23	10.6	18.5	122	87	100	39	41	10.4	56	15.7	143	103
24	*28	53	44	237	59	55	31.5	14.0	42	9.9	34.5	52
25	9.8	29	26	69	40	45	26.5	18.9	46	10.2	14.4	30
26	48	15.3	18.5	54	31.5	29	23	45	68	47	29.5	24
27	14.9	19.1	14.0	217	30	41	19.8	17.5	289	163	14.5	51
28	23.5	20.5	12.8	142	19.9	25.5	17.9	97	775	43	18.1	60
29	14.5	68	68	388	17.0	72	15.7	23.5	138	77	68	25.5
30	46	16.4	41	308	17.0	741	13.7	-	66	74	50	17.5
31	13.4	21.5	-	98	-	590	12.6	-	44	-	20.5	-
Total	400.8	1,197.5	2,073.9	2,695.4	3,218.6	4,439.3	4,716.7	673.9	4,741.3	947.4	809.0	1,824.0
Mean:	12.9	38.6	69.1	86.9	107	143	152	23.2	153	31.6	26.1	60.8
cfs	20.0	59.7	107	134	166	221	235	35.9	237	48.9	40.4	94.1
Ac-ft	1,230	3,670	6,360	8,270	9,880	13,620	14,480	2,070	14,550	2,910	2,480	5,600
Calendar year 1951:	Max	1,330	Min	6.2	Mean(mgd)	74.1	Mean(cfs)	115	Ac-ft	82,940		
Fiscal year 1951-52:	Max	1,270	Min	6.5	Mean(mgd)	75.8	Mean(cfs)	117	Ac-ft	85,120		

Peak discharge (base, 2,300 mgd).--Dec. 16 (12 m.) 2,730 mgd (4,220 cfs), 6.92 ft; Dec. 30 (11 p.m.) 4,350 mgd (6,730 cfs), 8.46 ft; Jan. 13 (8 a.m.) 6,740 mgd (10,400 cfs), 10.61 ft.

* Discharge measurement made on this day.

South Fork Wailua River near Lihue

Location.--Lat 22°02'10", long 159°22'55", on right bank 0.3 mile upstream from Wailua Falls and 5 miles north of Lihue.

Drainage area.--22.4 sq mi.

Records available.--December 1911 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 230 ft (by barometer). Prior to Nov. 18, 1918, at site 0.3 mile upstream at different datum.

Average discharge.--30 years (1921-24, 1925-52), 67.5 mgd (104 cfs).

Extremes.--Maximum discharge during year, 11,000 mgd (17,000 cfs) Jan. 19 (gage height, 8.73 ft), from rating curve extended above 4,200 mgd; minimum, 1.19 mgd (1.84 cfs) July 22.

1911-52: Maximum discharge, 29,000 mgd (44,900 cfs) Jan. 16, 1920 (gage height, 11.25 ft), from rating curve extended above 9,000 mgd; minimum, 1.15 mgd (1.78 cfs) June 9-11, 1947.

Revisions.--The figures of maximum discharge for some fiscal years have been revised, as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
935	1941	Aug. 12, 1940	6,650	10,300	7.60
955	1942	June 16, 1942	1,740	2,690	5.34
985	1943	June 2, 1943	13,000	20,100	9.08
1015	1944	Feb. 29, 1944	9,200	14,200	8.26
1045	1945	Apr. 6, 1945	5,440	8,420	7.24
1065	1946	Dec. 5, 1945	4,660	7,210	6.92
1095	1947	Nov. 14, 1946	8,400	13,000	8.09
1125	1948	Nov. 12, 1947	6,330	9,790	7.54
1155	1949	Feb. 7, 1949	12,500	19,300	8.99
1185	1950	Not determined	-	-	-
1219	1951	Aug. 16, 1950	22,500	34,800	10.6

Remarks.--Records good except those for periods of no gage-height record, which are fair.

Several ditches divert about 20 mgd for irrigation of cane lands above station.

Revisions.--The figures of peak discharge for fiscal years 1948-51, have been revised as shown below. They supersede figures published in WSP 1125, 1155, 1185, and 1219.

Revised peak discharge.--1947-48: Nov. 12 (6:30 a.m.) 6,650 mgd (10,300 cfs);

Apr. 1 (8:30 p.m.) 4,910 mgd (7,600 cfs); June 29 (1 p.m.) 4,190 mgd (6,480 cfs).

1948-49: Jan. 9 (8:30 a.m.) 3,970 mgd (6,140 cfs); Jan. 20 (8:30 a.m.) 4,660 mgd

(7,210 cfs); Feb. 7 (2 p.m.) 12,500 mgd (19,300 cfs).

1949-50: Dec. 17 (time and discharge unknown); Jan. 6 (10 p.m.) 7,350 mgd (11,400

cfs), 7.80 ft; Apr. 14 (4:30 p.m.) 4,910 mgd (7,600 cfs), 6.97 ft.

1950-51: Aug. 16 (time unknown) 22,500 mgd (34,800 cfs), 10.6 ft, from floodmarks;

Mar. 11 (time unknown) 11,500 mgd (17,800 cfs), 8.75 ft.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.74	3.3	21.5	6.1	250	63	197	12.4	21.5	97	18.1	8.2
2	2.25	2.6	33	4.8	143	58	731	27.5	45	72	17.0	5.8
3	2.0	2.3	26	4.7	117	42	587	27.5	27	41	97	3.75
4	1.74	2.2	11.7	4.2	111	25	400	21	7.1	17.6	66	3.45
5	1.81	2.95	4.2	3.9	81	33.5	273	9.2	105	69	26.5	3.45
6	1.88	56	5.0	3.6	60	100	166	7.9	56	102	5.9	3.55
7	1.62	297	3.2	3.3	78	101	184	7.5	30.5	45	5.2	4.0
8	1.50	24	119	3.5	168	104	117	6.5	44	34	4.9	9.0
9	1.45	4.3	169	362	243	50	218	5.6	47	18.6	4.6	68
10	1.45	4.1	37	96	396	140	168	19.4	25.5	13.0	4.4	7.4
11	1.55	3.8	4.3	41	225	30.5	181	56	13.3	10.1	9.0	6.1
12	1.45	5.5	3.3	30.5	127	51	172	15.8	20.5	15.8	5.6	17.2
13	1.50	4.7	2.75	36.5	155	129	127	38.5	105	4.8	30.5	
14	1.74	2.5	2.45	30.5	160	95	185	5.3	68	34.5	4.3	55
15	2.2	2.5	2.5	20	100	259	160	5.1	62	6.5	4.1	134
16	2.05	56	2.35	13.6	91	1,010	129	4.8	74	5.8	4.0	147
17	1.88	56	2.35	11.2	84	1,140	166	117	81	5.6	4.1	41
18	1.55	27.5	4.4	6.2	85	380	116	480	16.5	5.3	4.0	9.4
19	1.34	18.0	24.5	5.6	270	211	1,390	225	225	5.2	4.1	125
20	1.34	7.6	14.0	11.6	144	149	253	79	172	5.0	4.4	55
21	1.29	11.0	116	207	415	129	124	45	149	5.2	4.3	115
22	*1.24	2.7	349	60	601	116	98	32.5	225	9.5	5.3	132
23	1.45	1.88	93	38	172	100	91	159	240	9.8	135	*95
24	5.6	9.3	52	180	129	108	91	54	47	4.8	8.3	35
25	4.5	5.0	30	85	111	98	88	55	31.5	4.6	18.3	9.9
26	22.5	2.3	16.1	73	89	89	80	99	47	20	15.4	6.6
27	4.1	2.35	14.6	389	95	119	77	49	*356	180	7.5	12.0
28	2.85	2.45	13.1	377	80	95	69	135	40	50	4.1	53
29	2.6	35.5	34	755	69	130	52	40	167	51	26.5	64.8
30	13.6	11.1	33.5	460	64	677	68.5	-	68	52	16.8	14.6
31	3.35	3.85	-	122	-	895	23.5	-	62	-	10.9	-
Total	97.12	670.23	1,243.80	3,444.8	4,914	6,727.0	6,742.0	1,807.0	3,040.9	1,094.9	550.4	1,256.10
Mean:												
mgd	3.13	21.6	41.5	111	164	217	217	62.3	98.1	36.5	17.8	41.9
cfs	4.84	35.4	64.2	172	234	336	336	96.4	152	56.5	27.5	64.8
Ac-ft	298	2,060	3,820	10,570	15,080	20,840	20,890	5,550	9,350	3,360	1,690	3,850

Calendar year 1951: Max 1,140 Min 1.24 Mean(mgd) 86.2 Mean(cfs) 133 Ac-ft 96,520

Fiscal year 1951-52: Max 1,380 Min 1.24 Mean(mgd) 86.3 Mean(cfs) 134 Ac-ft 96,940

Peak discharge (base, 2,900 mgd).--Dec. 16 (1:30 p.m.) 4,420 mgd (6,840 cfs), 6.76 ft; Dec. 30 (11:30 p.m.) 7,700 mgd (11,900 cfs), 7.90 ft; Jan. 2 (9:30 a.m.) 4,660 mgd (7,210 cfs), 6.88 ft; Jan. 19 (9 a.m.) 11,000 mgd (17,000 cfs), 8.73 ft.

* Discharge measurement made on this day.
Note.--No gage-height record Mar. 6-27, 30, 31; discharge estimated on basis of occasional readings of staff gage, recorded range in stage, and records for stations on nearby streams.

Hanalei tunnel outlet near Lihue

Location--Lat 22°05'00", long 159°28'15", on right bank at end 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 1952.

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

Average discharge--20 years, 22.4 mgd (34.7 cfs).

Extremes--1932-52: Maximum daily discharge, 64 mgd (99 cfs) Apr. 11, 25, 26, 1942; no flow Aug. 27, 1938, Apr. 4-9, 1945, June 23, 1948.

Remarks--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River and empties into north branch of North Fork Waialua River, from which it is later diverted and used for irrigation in vicinity of Lihue and Kapaa. Flow regulated by spillway and headgates.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	17.6	23	24	19.0	19.4	14.8	6.3	0.30	0.30	0.22	0.22	0.22
2	17.3	23.5	26	18.8	16.4	14.8	11.5	.30	.22	.22	.22	.22
3	17.2	24	23	17.2	16.4	14.8	3.35	.22	.22	.22	.30	.22
4	19.6	23	21	16.8	15.2	16.8	3.35	.22	.22	.22	.22	.22
5	18.4	25	24	16.8	14.8	17.1	1.73	.22	.40	.40	.22	.22
6	18.0	29	22	16.4	15.6	20.5	1.20	.30	.22	.30	.22	.22
7	16.4	30	20	16.4	16.2	19.2	1.20	.30	.22	.30	.22	.22
8	16.0	25.5	24.5	22.5	21	15.6	1.75	.30	.22	.30	.22	.22
9	16.0	27.5	20.5	30	21.5	16.3	2.55	.30	.22	.22	.22	.22
10	15.9	25	19.2	22.5	26	18.0	2.25	.40	.22	.22	.22	.22
11	17.6	23.5	15.6	19.6	20	15.0	1.55	.30	.26	.22	.22	.22
12	17.2	22	14.8	18.4	17.2	17.9	1.04	.22	.30	.22	.22	.22
13	17.8	21.5	14.8	20.5	19.6	16.4	1.04	.22	.40	.30	.22	.22
14	20.5	23	14.5	18.4	17.6	14.8	1.65	.22	.40	.22	.22	.22
15	19.6	22.5	14.5	19.6	15.6	19.0	1.20	.22	.30	.22	.22	.22
16	20	24	14.1	18.8	15.6	27	.96	.22	.30	.22	.22	.22
17	16.8	23	13.7	17.4	15.6	26	1.04	.30	.40	.22	.22	.22
18	16.2	21.5	14.5	16.8	15.6	15.6	1.17	.22	.40	.22	.22	.22
19	16.0	20.5	15.7	18.8	21.5	12.0	10.9	.70	.49	.22	.22	.22
20	18.0	22	14.5	23.5	18.4	11.5	1.37	.22	.44	.30	.22	.22
21	16.4	26	16.8	28	21.5	11.1	1.04	.22	.30	.30	.22	.22
22	15.6	21	20	21	23.5	10.8	.89	.22	.30	.30	.22	.22
23	21.5	23.5	14.8	24	16.8	10.8	.75	.22	.22	.22	.22	.22
24	25	26	14.5	24.5	15.6	11.5	.62	.22	.22	.22	.22	.22
25	22.5	23.5	14.5	22.5	15.2	10.8	.62	.22	.30	.22	.22	.22
26	25.5	21.5	14.5	18.8	14.8	10.6	.51	.22	.30	.22	.22	.22
27	24	22	14.5	22	16.0	10.8	.51	.22	.40	.30	.22	.22
28	25	23.5	15.2	22.5	15.2	10.4	.40	.40	.30	.22	.22	.22
29	24	24	23	23.5	14.8	14.5	.40	.22	.22	.22	.22	.22
30	24	23	19.2	21.5	14.8	28	.39	-	.22	.22	.22	.22
31	24	24	-	19.2	-	14.4	.30	-	.22	-	.22	-
Total	599.6	737.0	537.9	635.7	527.4	486.8	62.53	8.46	9.15	7.42	6.90	6.60
Mean	19.3	23.8	17.9	20.5	17.6	15.7	2.02	0.292	0.295	0.247	0.223	0.220
cfs	29.9	36.8	27.7	31.7	27.2	24.3	3.13	0.452	0.456	0.362	0.345	0.340
Ac-ft	1,840	2,260	1,650	1,950	1,620	1,490	192	26	28	23	21	20
Calendar year 1951: Max	35.5			Min	0.40	Mean(mgd)	16.1	Mean(cfs)	24.9	Ac-ft	17,980	
Fiscal year 1951-52: Max	32			Min	0.22	Mean(mgd)	9.91	Mean(cfs)	15.3	Ac-ft	11,120	

North Wailua ditch near Lihue

Location.--Lat 22°03'40", long 159°27'55", on left bank 300 ft downstream from intake diversion dam on North Fork Wailua River, 8 miles west of Wailua and 8.5 miles northwest of Lihue.

Records available.--July 1932 to June 1952 in reports of Geological Survey. 1926 to June 1932 in files of Lihue Plantation Co.

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.--20 years, 12.2 mgd (18.9 cfs).

Extremes.--1932-52: Maximum daily discharge, 38 mgd (59 cfs) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

Remarks.--Records good. Water used for power and irrigation in vicinity of Lihue.

Revisions (fiscal years).--WSP 770: 1933.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.8	18.6	13.4	11.9	8.7	10.2	0.15	12.2	9.1	8.4	14.0	10.7
2	11.4	16.8	13.7	11.3	10.2	10.2	.93	12.2	8.8	9.1	16.4	11.1
3	12.8	16.4	12.8	11.6	11.2	10.3	.22	12.2	9.0	10.2	18.2	13.2
4	14.6	15.9	12.5	11.3	11.0	11.0	.29	11.9	9.3	10.5	15.7	14.0
5	11.9	18.7	14.0	11.0	11.3	10.8	.15	11.6	10.3	15.9	12.2	15.8
6	12.2	25	13.4	11.0	12.2	11.3	.15	11.9	9.3	13.5	12.2	17.8
7	10.5	19.4	12.8	10.7	12.6	11.6	.15	11.6	9.1	9.9	12.2	13.4
8	10.2	11.3	13.4	12.1	12.4	10.5	.15	11.6	9.3	9.9	11.9	14.3
9	9.9	11.6	6.7	12.7	11.6	10.9	.25	11.6	9.1	9.9	11.9	10.4
10	10.0	13.4	9.0	9.9	12.2	11.0	.22	14.1	9.3	9.9	12.2	8.6
11	13.9	13.9	12.5	10.2	11.0	10.1	.15	12.8	9.8	9.9	13.4	8.8
12	11.8	13.1	13.9	11.0	10.5	10.9	.07	11.6	10.2	9.9	11.9	8.8
13	12.4	12.8	13.7	11.5	11.0	11.0	.30	11.9	10.7	10.6	11.9	8.5
14	14.3	13.4	12.8	11.0	10.7	10.2	4.8	11.6	10.5	9.6	11.6	9.1
15	13.7	13.4	12.5	11.4	11.2	12.0	8.5	11.3	10.2	9.6	12.5	8.8
16	15.3	14.4	11.9	11.4	11.6	13.0	8.5	12.8	9.3	11.6	12.8	9.3
17	11.3	14.3	11.6	11.1	11.6	12.8	8.8	15.1	10.5	13.4	13.4	8.5
18	10.7	13.8	12.7	11.6	11.6	11.4	8.5	10.4	9.9	14.2	13.1	8.6
19	10.5	13.1	14.2	14.2	13.9	3.85	5.0	8.7	10.5	13.7	14.6	9.1
20	11.2	13.9	13.7	17.9	11.0	.22	0	8.6	9.7	14.2	14.3	8.8
21	10.5	14.6	14.5	21	10.6	.22	0	8.8	9.1	14.6	14.6	8.8
22	9.9	13.1	14.3	16.9	10.2	.22	4.8	9.3	9.3	17.2	15.9	8.8
23	17.9	13.7	12.2	16.9	9.1	.22	11.9	9.3	9.3	13.6	14.2	8.8
24	21	14.6	11.6	14.8	8.8	.22	11.9	8.8	8.8	13.7	13.4	9.6
25	16.9	13.4	11.6	14.1	8.8	.15	11.6	8.8	9.1	13.1	13.7	11.3
26	*19.8	12.8	11.6	13.0	9.1	.15	11.6	9.3	9.3	17.0	14.0	11.6
27	16.6	13.1	11.6	14.7	10.5	.15	11.6	8.8	8.7	20	13.4	11.1
28	17.6	13.7	11.3	15.2	10.2	.15	11.6	9.9	8.0	15.7	15.8	8.2
29	16.9	13.6	12.9	11.2	10.2	.22	11.6	9.1	8.4	16.2	13.4	8.6
30	18.2	13.4	11.6	*8.9	9.9	1.08	11.6	-	8.5	14.0	11.0	11.3
31	19.7	13.4	-	8.2	-	.33	12.0	-	8.5	-	10.7	-
Total	424.4	452.6	374.4	389.7	324.9	206.38	157.48	317.8	290.9	379.0	416.5	315.7
Mean:	13.7	14.6	12.5	12.6	10.8	6.66	5.08	11.0	9.38	12.6	13.4	10.5
cfs	21.2	22.6	19.3	19.5	16.7	10.3	7.86	17.0	14.5	19.5	20.7	16.2
Ac-ft	1,500	1,390	1,150	1,200	997	633	483	975	893	1,160	1,280	969
Calendar year 1951: Max	25			Min	0.15	Mean(mgd)	11.8	Mean(cfs)	18.3	Ac-ft	13,220	
Fiscal year 1951-52: Max	25			Min	0	Mean(mgd)	11.1	Mean(cfs)	17.2	Ac-ft	12,430	

* Discharge measurement made on this day.

Stable storm ditch near Lihue

Location--Lat 22°04'00", long 159°26'45", 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 1952.

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

Average discharge--15 years (1937-52), 7.07 mgd (10.9 cfs).

Extremes--1936-52: Maximum daily discharge, 46 mgd (71 cfs) Apr. 3, 1948; no flow at times each year.

Remarks--Records good. Ditch diverts water from North Fork Waialua River for irrigation of sugarcane in vicinity of Lihue. Flow regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	19.8	28	0	0	0.10	0	0	0	0	0	0	0
2	21.5	28	.10	0	0	0	.46	0	0	0	.10	0
3	19.8	29.5	.10	0	0	0	.20	0	0	0	.10	7.4
4	23	29.5	.10	0	0	.10	0	0	0	0	0	9.1
5	21.5	31	21.5	0	0	0	0	0	0	0	0	10.1
6	21.5	9.8	28	0	0	0	0	4.5	0	0	0	17.2
7	18.3	.20	7.8	0	0	0	0	7.0	0	0	11.1	15.1
8	18.3	.10	.28	19.7	0	0	0	6.8	0	0	13.5	22
9	17.7	0	.10	11.6	0	0	0	6.6	0	0	12.7	14.2
10	18.0	.10	.20	0	0	0	0	15.8	0	0	14.1	.10
11	23	0	.10	0	0	0	0	9.8	0	0	22	.10
12	19.8	0	0	0	0	0	0	2.35	0	0	14.3	.10
13	21.5	0	18.6	0	0	0	0	4.4	0	0	12.4	0
14	24.5	20.5	24.5	0	0	0	0	*6.6	0	0	11.4	0
15	23	30.5	*24	0	0	0	0	6.4	0	0	9.6	0
16	24.5	35	23	0	0	.25	0	9.9	0	0	8.4	0
17	19.8	34.5	23	0	0	0	0	18.8	0	9.5	9.9	0
18	18.3	11.0	24.5	19.1	0	0	0	9.2	0	13.0	8.7	0
19	18.3	0	24.5	28	0	0	0	0	.02	11.9	12.6	0
20	19.8	0	24.5	29.5	0	0	1.83	0	.21	12.2	11.1	0
21	18.3	0	12.2	33	.10	0	0	0	0	14.3	13.1	0
22	17.7	21	0	29.5	.10	0	0	0	0	21	17.3	0
23	26.2	31	0	31	.10	0	0	0	0	13.0	8.5	0
24	31	33	0	10.5	.10	0	0	0	0	11.4	.10	0
25	28	8.5	0	.58	0	0	0	0	0	10.4	0	0
26	27.5	0	0	.50	0	0	0	0	0	7.8	0	0
27	28	0	0	.60	0	0	0	0	.10	0	9.0	0
28	31	0	0	.60	0	0	0	0	0	0	21	0
29	31	0	0	.67	0	0	0	0	0	0	9.2	0
30	31	0	0	1.05	0	.52	0	-	0	0	.10	0
31	31	0	-	.60	-	.10	0	-	0	-	.10	-
Total	712.6	381.20	257.08	216.50	0.50	0.97	2.49	108.15	0.33	123.5	250.40	95.40
Mean	23.0	12.3	8.57	6.98	0.017	0.031	0.080	3.73	0.011	4.12	8.08	3.18
cfs	35.6	19.0	13.3	10.8	0.026	0.048	0.124	5.77	0.017	6.37	12.5	4.92
Ac-ft	2,190	1,170	789	664	1.5	3.0	7.6	332	1.0	379	768	293

Calendar year 1951: Max 35 Min 0 Mean(mgd) 9.46 Mean(cfs) 14.6 Ac-ft 10,610
 Fiscal year 1951-52: Max 35 Min 0 Mean(mgd) 5.87 Mean(cfs) 9.08 Ac-ft 6,600

* Discharge measurement made on this day.

North Fork Waialua River at altitude 650 ft, near Lihue

Location.--Lat 22°03'50", long 159°26'20", on right bank 1.5 miles upstream from intake of Hanalei ditch and 7.8 miles northwest of Lihue.

Drainage area.--6.6 sq mi.

Records available.--September 1914 to June 1952.

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

Average discharge.--31 years (1921-52), 49.1 mgd (76.0 cfs).

Extremes.--Maximum discharge during year, 2,590 mgd (4,010 cfs) Jan. 19 (gage height, 9.77 ft), from rating curve extended above 240 mgd by test on model of station site; minimum, 0.27 mgd (0.42 cfs) July 1, 9, 10, 11, 19, 22, 23.
1914-52: Maximum discharge, 4,020 mgd (6,220 cfs) June 2, 1943 (gage height, 9.96 ft, datum then in use), from rating curve extended above 600 mgd by test on model of station site; minimum, 0.27 mgd (0.42 cfs) June 28, 29, 30, July 1, 9, 10, 11, 19, 22, 23, 1951.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Since 1925 Hanalei tunnel has discharged its water into river, and North Waialua and Stable Storm ditches have diverted water above station for irrigation in vicinity of Lihue.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Feb. 13					Feb. 14 to June 30			
0.9	0.23	2.0	29.5		0.7	0.40	1.2	3.8
1.0	.66	2.5	64		.8	.69	1.4	7.0
1.1	1.40	3.0	116		.9	1.11	1.7	15.5
1.2	2.45	3.5	197		1.0	1.76	2.0	29.5
1.3	3.95	4.0	297					
1.5	8.5	5.0	540					
1.7	14.5							

Note.--Same as preceding table above 2.0 ft.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.27	8.5	60	45	96	36	95	9.6	41	32	18.2	19.1
2	.36	7.0	65	35	56	36	300	9.1	32.5	27	28	16.3
3	.36	3.15	55	38	55	37.5	165	8.8	29.5	23	44	5.9
4	.40	3.75	38	32.5	46	54	110	8.1	35.5	19.5	25	.92
5	.36	8.1	37	30	41	54	130	7.8	73	60	23	.88
6	.36	60	17.1	29.5	41	95	100	3.85	44	38	21.5	2.6
7	.32	149	29.5	28.5	50	76	90	.73	32.5	32	7.1	1.28
8	.32	60	*134	32	88	46	80	.66	41	31	1.16	6.6
9	.27	60	97	199	104	52	140	.62	35	25.5	2.06	55
10	.27	50	76	70	172	69	119	8.7	36.5	23.5	1.44	47
11	2.05	50	41	48	86	*38.5	88	1.42	65	23.5	7.9	50
12	.36	48	34.5	39.5	60	62	64	4.4	85	21	1.06	62
13	.32	48	13.0	51	79	62	56	3.2	154	55	.96	52
14	1.09	20	2.35	39.5	64	44	85	.88	134	22	.88	78
15	.44	11	2.15	50	47	121	56	.84	86	18.7	.84	69
16	2.85	36	2.05	48	43	397	57	3.55	54	18.1	.84	112
17	.40	17	1.93	37.5	42	490	71	11.6	138	4.7	.84	54
18	.32	36	3.1	15.2	41	180	71	116	92	1.07	.80	57
19	.27	48	30	5.5	128	110	500	181	228	.92	1.06	77
20	.36	46	7.6	28.5	80	85	150	42	130	.92	1.87	62
21	.36	55	47	94	142	70	75	31.5	69	1.24	*.90	71
22	.32	13	143	18.3	161	65	55	42	64	6.0	10.5	65
23	7.3	3.2	45	41	64	60	38	64	56	1.01	80	64
24	16.6	4.0	35.5	71	56	55	34	27	43	.80	28.5	40
25	*4.2	42	33.5	93	52	48	30	28.5	47	.80	16.3	30
26	31.5	55	32	53	48	48	24	43	54	14.2	20	31
27	11.8	60	30.5	127	52	48	20	23.5	148	6	5.9	48
28	9.3	75	29	130	42	46	19	64	*140	25.5	5.8	50
29	8.5	100	79	175	40	75	16	32.5	52	42	48	30
30	17.1	65	-50	169	37	200	*14	-	39	31.5	44	22.5
31	9.6	55	-	*78	-	260	10.7	-	32.5	-	23.5	-
Total	128.33	1,296.70	1,270.78	1,947.5	2,111	3,118.0	2,862.7	758.85	2,311.0	667.46	470.91	2,278.08
Mean	4.14	41.8	42.4	62.8	70.4	101	92.3	26.2	74.5	22.2	15.2	42.6
cfs	6.41	64.7	65.6	97.2	109	156	143	40.5	115	34.3	23.5	65.9
Ac-ft	394	3,980	3,900	5,980	6,480	9,570	8,790	2,330	7,090	2,050	1,450	3,920
Calendar year 1951: Max	490				Min	0.27	Mean(mgd)	44.9	Mean(cfs)	69.5	Ac-ft	50,290
Fiscal year 1951-52: Max	500				Min	0.27	Mean(mgd)	49.8	Mean(cfs)	77.1	Ac-ft	55,930

Peak discharge (base, 1,200 mgd).--Sept. 8 (2 p.m.) 1,380 mgd (2,140 cfs), 7.38 ft; Jan. 2 (10 p.m.) 2,100 mgd (3,250 cfs), 8.92 ft; Jan. 19 (7:30 p.m.) 2,590 mgd (4,010 cfs), 9.77 ft; Mar. 20 (5:30 p.m.) 1,380 mgd (2,140 cfs), 7.35 ft.

* Discharge measurement made on test day.

Note.--No gage-height record Aug. 9 to Sept. 4, Dec. 17 to Jan. 2, Jan. 4-9, 19-30, Feb. 18-20, 22, 23, 28, Mar. 5; discharge estimated on basis of recorded range in stage and records for nearby streams.

Kanaha ditch near Lihue

Location.--Lat 22°03'50", long 159°25'30", on right bank 750 ft downstream from intake and 7 miles northwest of Lihue.

Records available.--August 1910 to June 1952.

Gage.--Water-stage recorder and sharp-crested weir. Altitude of gage is 540 ft (by barometer). Prior to May 28, 1913, staff gage at site 250 ft upstream at different datum. May 28, 1913, to July 24, 1921, staff gage at site 450 ft upstream at different datum. July 25, 1921, to Mar. 4, 1926, water-stage recorder at site 750 ft downstream at different datum. Mar. 5, 1926, to Sept. 13, 1932, water-stage recorder at site 1,750 ft downstream at different datum.

Extremes.--1910-52: Maximum daily discharge, 25.6 mgd (39.6 cfs) Aug. 8, 1918; no flow at times.

Remarks.--Records poor. Ditch diverts water from North Fork Wailua River for domestic use only. Flow regulated by headgate.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.31	0.42	1.09	0.62	0.47	0.21	0.12	0.12	0.12	0.12	0.12	0
2	.25	.55	.80	.55	.55	.21	.98	.12	.12	.12	.12	0
3	.31	.31	.80	.31	.43	.21	.21	.12	.12	.12	.05	0
4	.31	.21	.94	.21	.43	.43	.21	.12	.21	.12	.05	0
5	.31	.21	.80	.21	.43	.43	.12	.12	.58	.12	.05	0
6	.31	.31	.80	.21	.43	.67	.05	.12	.12	.05	.05	0
7	.21	.21	.67	.21	.43	.67	.05	.12	.12	.05	.05	0
8	.21	.18	.43	.26	.94	.43	.12	.12	.21	.05	.05	0
9	.21	.21	0	1.18	1.09	.43	.54	.12	.12	.12	.05	0
10	.36	.31	1.48	.80	1.24	.55	.31	.07	.12	.12	.05	0
11	.43	.21	.94	.67	.80	.43	.12	0	.31	.12	.05	0
12	.31	.31	.67	.55	.67	.55	.05	0	.43	.05	.05	0
13	.21	.31	.20	.67	.80	.67	.12	0	1.09	.12	.05	0
14	.02	.43	.22	.67	.72	.55	.31	0	.94	.05	.05	0
15	0	.25	.43	.67	.55	.80	.21	0	.43	.05	.05	0
16	0	.21	.43	.67	.55	1.09	.21	0	.12	.05	0	0
17	.42	2.05	.43	.55	.43	1.09	.21	0	.82	.05	0	0
18	.48	5.1	.43	.23	.43	.80	.19	1.13	.55	.05	0	0.03
19	.43	5.3	.91	.05	1.09	.62	.80	.80	1.19	.05	0	.12
20	.55	5.3	.67	.31	.80	.55	.21	.12	.71	.05	0	.03
21	.55	5.6	1.09	.80	1.09	.55	.21	.12	.31	.05	.05	.03
22	.55	3.25	2.2	.43	1.24	.43	.21	.12	.21	.05	.05	0
23	.94	2.2	1.40	.55	.80	.43	.21	.21	.21	.05	.21	.03
24	1.40	2.2	1.24	.67	.55	.43	.21	.05	.21	.05	.05	0
25	*1.15	2.2	1.09	.55	.43	.43	.21	.05	.21	0	.05	0
26	1.09	2.2	.81	.31	.43	.29	.21	.05	.21	.02	.05	0
27	.94	2.2	.55	.55	.43	.21	.21	.05	.60	.12	.05	0
28	.80	2.2	.67	.43	.37	.21	.21	.46	.50	0	.05	0
29	.67	1.81	1.09	.55	.31	.31	.21	.12	.05	.05	.05	0
30	.31	1.40	.80	.43	.21	.55	.12	-	.05	.05	0	0
31	.21	1.24	-	*.31	-	.21	.12	-	.05	-	0	-
Total	14.25	48.89	24.08	15.18	19.14	15.44	7.27	4.43	11.04	2.07	1.50	0.24
Mean:												
mgd	0.460	1.58	0.803	0.490	0.638	0.498	0.235	0.153	0.356	0.069	0.048	0.008
cfs	0.712	2.44	1.24	0.758	0.987	0.771	0.364	0.237	0.551	0.107	0.074	0.012
Ac-ft	44	150	74	47	59	47	22	14	34	6.4	4.6	0.7
Calendar year 1951: Max	5.6			Min	0	Mean(mgd)	0.533	Mean(cfs)	0.825	Ac-ft	597	
Fiscal year 1951-52: Max	5.6			Min	0	Mean(mgd)	0.447	Mean(cfs)	0.692	Ac-ft	503	

* Discharge measurement made on this day.

East Branch of North Fork Wailua River near Lihue

Location.--Lat 22°04'10", 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.

Records available.--July 1912 to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 500 ft (by barometer). Prior to Oct. 1, 1914, staff gage at site 725 ft downstream at different datum. Oct. 1, 1914, to May 10, 1934, water-stage recorder at site 75 ft upstream at present datum.

Average discharge.--32 years (1920-52), 30.5 mgd (47.2 cfs).

Extremes.--Maximum discharge during year, 2,060 mgd (3,190 cfs) Jan. 19 (gage height, 8.85 ft), from rating curve extended above 270 mgd by test on model of station site; minimum, 8.7 mgd (13.5 cfs) July 22, 23.
1912-52: Maximum discharge, 3,340 mgd (5,170 cfs) Dec. 24, 1927 (gage height, 10.57 ft), from rating curve extended above 500 mgd; minimum, 4.4 mgd (6.8 cfs) July 3, 13, 1926.

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

Revisions (fiscal years).--WSP 770: 1932-33.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.0	8.7	2.5	113
1.2	14.1	3.0	167
1.4	21	3.5	216
1.6	30.5	4.0	280
1.8	42	4.5	358
2.0	57		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.0	17.1	21	17.2	58	21.5	62	17	43	28.5	22.5	20
2	10.5	17.4	24	15.1	41	21	265	17	28	25.5	37	18.9
3	10.2	16.4	19.3	14.1	37	21	144	16	24.5	24	64	17.4
4	10.4	17.4	16.2	13.8	34	25.5	70	17	24	29	16.7	
5	10.2	24.5	22	13.2	30	23.5	90	16	44	70	26	16.7
6	10.4	46	18.9	12.9	26	57	65	15	29	36.5	25	18.5
7	9.7	94	*15.8	12.6	34	43	55	15	24.5	27	22.5	17.1
8	9.4	29	51	20.5	44	27.5	55	14	27.5	26	20.5	19.2
9	9.2	32	41	14.7	55	24	85	17	28	23.5	19.7	43
10	9.2	23.5	31.5	42	115	28.5	70	32	31.5	24	19.3	27.5
11	10.0	19.7	21	25	59	22	55	17	34.5	23.5	27.5	28
12	9.7	16.7	18.5	20.5	40	23	40	15	44	24	20	51
13	10.2	15.1	17.4	30.5	40	55	40	14.8	87	*43	20	35
14	12.3	18.2	16.1	19.7	36	34.5	55	14.4	76	23.5	18.9	36
15	10.4	22.5	15.1	24.5	29	57	46	13.8	44	21	17.4	36
16	12.5	42	14.4	53	28.5	223	48	13.5	34	19.7	16.7	71
17	10.2	30	13.5	23.5	25.5	246	55	19.6	71	18.9	17.4	42
18	9.4	21	14.4	19.3	26.5	112	50	121	55	21	17.1	38.5
19	9.2	17.4	36.5	18.5	78	68	350	127	212	18.9	17.4	67
20	9.7	17.4	19.3	24	45	52	110	37.5	132	17.8	20.5	51
21	9.2	28.5	18.9	59	74	43	55	29	79	20.5	27.5	41
22	9.0	16.7	24.5	29	105	36	40	34.5	55	30.5	22.5	38.5
23	12.7	17.4	17.1	41	46	32.5	32	50	44	20	48	38
24	17.2	19.8	15.4	58	38	31.5	30	26	36	17.8	31	30.5
25	16.1	17.8	15.4	53	33.5	28	28	24	36	17.1	22	26
26	23	15.8	14.8	33.5	29.5	26.5	26	30	85	31	18.9	25
27	19.8	15.8	14.4	129	34.5	28	24	22	85	49	17.8	*33.5
28	21	19.2	13.5	93	29	27.5	22	27.5	53	29.5	24	37.5
29	15.4	25.5	25.5	192	25.5	41	20	22.5	40	31.5	37.5	24
30	19.8	19.3	20.5	108	23.5	145	*20	-	33	30	31.5	21.5
31	17.4	19.7	-	69	-	183	19	-	30.5	-	23	-
Total	383.4	741.8	626.9	1,431.4	1,320.0	1,807.0	2,126	835.1	1,670.0	815.7	782.1	986.0
Mean	12.4	23.9	20.9	46.2	44.0	58.3	68.6	28.8	53.9	27.2	25.2	32.9
cfs	19.2	37.0	32.3	71.5	68.1	90.2	106	44.6	83.4	42.1	39.0	50.9
Ac-ft	1,180	2,280	1,920	4,390	4,050	5,550	6,520	2,560	5,130	2,500	2,400	3,050

Calendar year 1951. Max 338 Min 9.0 Mean(mgd) 35.2 Mean(cfs) 54.5 Ac-ft 39,460
Fiscal year 1951-52: Max 350 Min 9.0 Mean(mgd) 37.0 Mean(cfs) 57.2 Ac-ft 41,510

Peak discharge (base, 1,000 mgd)--Oct. 29 (7 a.m.) 1,070 mgd (1,660 cfs), 6.98 ft; Jan. 2 (9 p.m.) 1,920 mgd (2,970 cfs), 8.64 ft; Jan. 19 (time unknown) 2,060 mgd (3,190 cfs), 8.85 ft; Mar. 19 (8:50 a.m.) 1,270 mgd (1,960 cfs), 7.35 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 4 to Feb. 12; discharge estimated on basis of records for nearby streams.

Wailua ditch near Kapaa

Location.--Lat 22°04'25", long 159°24'05", 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 1952 in reports of Geological Survey. April 1932 to November 1936 in files of East Kauai Water Co.

Gage.--Water-stage recorder. Altitude of gage is 462 ft (by estimating slope of 2,000-foot length of ditch on basis of levels by Lihue Plantation Co.).

Average discharge.--15 years (1937-52), 11.8 mgd (18.3 cfs).

Extremes.--1936-52: Maximum daily discharge, 41 mgd (63 cfs) June 4, 1937; no flow at times in 1940, 1950, and 1951.

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. Flow regulated by gates at reservoir.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.6	9.4	4.3	16.5	0.30	0.24	0.36	0.30	3.9	8.9	23.5	8.9
2	10.2	12.1	0	16.6	.30	.24	.77	4.5	3.8	9.6	18.8	8.4
3	5.2	16.5	3.75	13.2	.30	3.0	.42	11.0	3.7	11.0	13.2	12.1
4	3.0	16.5	12.8	13.2	.30	7.9	.36	11.6	3.7	11.6	11.0	15.4
5	3.1	12.6	21	8.4	.30	8.4	.36	11.0	3.65	11.6	12.6	*13.2
6	3.1	12.6	21	5.4	.30	7.9	.36	9.9	3.65	*11.0	15.4	13.9
7	9.5	11.0	*12.3	6.9	.30	4.6	.36	9.9	3.5	11.0	15.4	12.1
8	13.8	9.9	4.6	8.4	.30	4.0	.36	10.4	3.4	10.4	16.5	11.0
9	13.2	9.4	6.2	4.7	.30	6.9	.36	10.4	3.15	9.9	18.8	11.0
10	12.6	9.4	7.9	.42	.30	3.75	.30	10.4	4.8	6.8	13.8	11.0
11	12.1	9.4	6.0	.48	.30	.30	.30	10.4	7.9	3.55	9.9	8.4
12	11.6	8.9	12.0	.42	.30	.24	.30	10.4	10.4	3.5	14.3	7.9
13	11.6	9.4	15.4	.36	.24	.30	.36	10.4	12.6	3.4	16.5	9.4
14	11.6	9.9	11.6	.36	.24	.24	.36	10.4	11.6	8.8	16.5	8.9
15	11.6	10.4	10.4	.36	.30	.24	.36	10.4	8.9	15.6	16.5	8.9
16	11.6	10.4	10.4	2.45	.30	.30	.30	10.4	8.9	17.6	16.5	8.9
17	11.6	10.4	12.1	2.75	.30	.36	.30	10.4	8.4	22.5	14.3	8.9
18	11.0	9.9	13.8	3.55	.30	.30	.30	8.4	9.9	26.5	12.1	11.0
19	11.0	9.9	13.8	3.15	.30	.30	.36	4.6	13.8	16.1	12.1	12.6
20	10.4	10.4	15.4	3.30	.30	.30	.36	4.5	10.8	7.4	12.1	11.0
21	9.9	16.3	8.6	4.6	.30	.30	.36	4.3	5.9	17.0	11.6	6.7
22	9.9	21	.12	16.0	.30	.30	.36	4.2	5.9	23.5	11.6	3.7
23	9.9	17.6	.12	21	.30	.30	.36	4.0	5.7	21	11.6	3.8
24	11.6	14.3	.60	7.4	.30	.30	.30	4.0	5.6	21	11.6	9.8
25	13.2	14.3	10.6	.24	.30	.30	.30	4.0	9.5	21	11.6	14.3
26	14.3	13.8	21	.30	.30	.36	.30	3.95	12.1	15.4	12.1	11.0
27	16.5	13.8	22.5	.30	.30	.36	.30	4.0	3.2	11.6	13.8	7.9
28	11.4	15.4	11.0	.30	.24	.36	.30	3.9	.24	12.1	15.4	7.9
29	6.9	15.4	.42	.42	.24	.36	.30	3.9	.24	14.3	12.6	7.9
30	7.4	14.3	7.0	.30	.24	.36	.30	-	.24	21	8.9	7.9
31	7.9	12.1	-	.30	-	.36	.30	-	4.6	-	8.9	-
Total	318.3	386.7	296.71	162.06	8.70	53.47	10.79	215.95	193.67	404.65	429.5	293.7
Mean												
mgd	10.3	12.5	9.89	5.23	0.290	1.72	0.348	7.45	6.25	13.5	13.9	9.79
cfs	15.9	19.3	15.3	8.09	0.449	2.66	0.538	11.5	9.67	20.9	21.5	15.1
Ac-ft	977	1,190	911	497	27	164	33	663	594	1,240	1,320	901

Calendar year 1951: Max 30.5 Min 0 Mean(mgd) 6.44 Mean(cfs) 9.96 Ac-ft 7,220
 Fiscal year 1951-52: Max 26.5 Min 0 Mean(mgd) 7.58 Mean(cfs) 11.7 Ac-ft 8,520

* Discharge measurement made on this day.

Kapaa River at Kapahi ditch intake, near Kapaa

Location.--Lat 22°06'05", long 159°22'30", on right bank at diversion dam, 4 miles north-west of Kapaa and 4.5 miles northwest of Wailua.

Drainage area.--3.3 sq mi.

Records available.--December 1936 to June 1952.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 365 ft (by barometer).

Average discharge.--15 years (1937-52), 13.2 mgd (20.4 cfs).

Extremes.--Maximum discharge during year, 2,550 mgd (3,950 cfs) Jan. 19 (gage height, 4.02 ft), from rating curve extended above 330 mgd by logarithmic plotting; no flow at times.

1936-52: Maximum discharge, 3,570 mgd (5,520 cfs) Feb. 7, 1949 (gage height, 4.65 ft), from rating curve extended as explained above; no flow at times.

Remarks.--Records good except those above 330 mgd, which are fair. Entire low flow is diverted into several ditches above station. Records do not include flow of Kapahi ditch (see following page).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

-0.03	0	0.6	28.5
0.0	.10	.8	54
.1	.74	1.0	90
.2	2.55	1.2	140
.3	6.1	1.5	235
.4	11.5	2.0	470
.5	18.9		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0	4.3	2.35	34	15.4	24	7.5	24	5.8	6.6	3.75
2		0	7.9	1.00	17.3	15.0	193	9.2	10.5	2.55	20.5	1.24
3		0	3.4	0	15.0	12.9	78	10.3	.95	4.0	43	0
4		0	.32	0	14.3	11.5	41	8.6	.39	4.8	22.5	0
5		2.35	.49	0	12.9	7.6	25	4.3	8.4	30	7.5	0
6		18.6	0	.58	13.3	44	18.1	1.30	1.43	20.5	7.0	.08
7		34	.82	1.85	23.5	19.9	17.8	1.79	3.05	*11.5	1.21	0
8		1.75	32.5	7.9	28	12.9	13.6	1.92	9.0	12.2	0	1.74
9		12.5	26	125	34.5	12.2	44	3.75	9.1	10.3	.91	15.0
10		13.6	21.5	22	69	18.9	30	26	14.2	13.6	1.08	10.1
11		5.0	7.0	11.5	31	12.2	24	7.3	14.1	14.1	8.0	6.4
12		1.65	2.45	8.0	17.3	14.2	17.3	1.38	18.7	11.9	.07	12.3
13		1.09	0	19.1	27.5	48	16.7	.18	34	24.5	0	1.84
14		2.65	0	10.9	17.3	19.3	39	0	25	.93	0	7.1
15		8.3	0	55	15.0	32.5	18.1	0	15.0	0	0	8.8
16		24.5	0	62	17.8	183	16.5	0	12.2	0	0	18.4
17		10.5	0	11.6	15.0	216	16.5	18.4	32.5	0	.82	4.3
18		7.4	.01	3.15	16.5	45	14.0	47	16.1	0	0	7.0
19		11.5	0	8.0	56	24.5	333	76	74	0	1.44	18.9
20		11.5	0	16.1	27.5	18.1	23.5	15.7	61	0	3.7	12.2
21		4.5	.94	31	52	15.7	16.5	15.0	24	0	12.6	13.9
22		0	5.6	1.73	66	13.6	14.3	25	13.6	1.26	6.5	10.5
23		0	2.55	12.9	22.5	14.6	11.5	29.5	14.3	0	24	8.7
24		0	2.05	34.5	18.9	13.9	10.3	14.3	6.6	0	4.0	.09
25		0	1.23	15.7	18.9	12.9	10.3	13.6	6.6	0	2.5	0
26		0	0	15.7	16.5	12.9	9.7	14.1	40	3.0	.78	.88
27		0	.14	72	23.5	13.6	10.3	2.65	34.5	12.2	0	12.8
28		0	0	*72	18.9	15.0	9.1	4.8	22	4.9	.15	15.1
29		0	12.6	153	17.3	29	9.1	0	15.7	15.4	14.3	5.6
30		.09	5.0	35	15.7	90	8.6	-	12.2	13.5	9.9	.60
31		1.82	-	43	-	111	8.6	-	11.0	-	4.8	-
Total Mean:	0	173.30	136.80	852.56	772.9	1,125.3	1,121.4	359.57	584.10	217.00	203.84	197.32
mgd cfs	0	5.59	4.56	27.5	25.8	36.3	36.2	12.4	18.8	7.23	6.58	6.58
Ac-ft	0	8.65	7.06	42.5	39.9	56.2	56.0	19.2	29.1	11.2	10.2	10.2
	0	532	420	2,620	2,370	3,450	3,440	1,100	1,790	666	626	606
Calendar year 1951.	Max	260	Min	0	Mean(mgd)	17.1	Mean(cfs)	26.5	Ac-ft	19,110		
Fiscal year 1951-52:	Max	333	Min	0	Mean(mgd)	15.7	Mean(cfs)	24.3	Ac-ft	17,620		

Peak discharge (base, 1,400 mgd).--Oct. 29 (5:30 a.m.) 2,250 mgd (3,480 cfs), 3.75 ft; Jan. 2 (time and discharge unknown); Jan. 19 (7:30 a.m.) 2,550 mgd (3,950 cfs), 4.02 ft.

* Discharge measurement made on this day.

Kapahi ditch near Kealia

Location.--Lat 22°06'00", long 159°22'30", on right bank 500 ft downstream from intake and 4.5 miles west of Kealia.

Records available.--April 1909 to May 1914, May 1915 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 360 ft (by barometer). Prior to Nov. 26, 1936, water-stage recorder at site 61 ft upstream at datum 2.52 ft higher.

Average discharge.--34 years (1917-20, 1921-52), 5.37 mgd (8.31 cfs).

Extremes.--1909-14, 1915-52: Maximum daily discharge, 89.2 mgd (138 cfs) Feb. 6, 1913; no flow at times.

Remarks.--Records good. Ditch diverts water from Kapaa River for irrigation in vicinity of Kapaa. Flow regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.75	5.7	1.06	2.1	0.01	0.04	0.10	2.3	3.7	8.2	4.6	0.16
2	2.15	3.8	.23	1.83	.01	.02	4.7	.73	.10	9.6	4.6	2.6
3	1.73	3.4	.19	2.55	.01	2.75	.16	.13	6.3	8.7	1.83	3.15
4	2.1	5.0	2.2	3.7	.01	10.1	.13	1.72	5.2	6.2	.19	3.05
5	1.82	10.7	8.0	3.3	.01	9.9	.13	2.15	5.2	4.2	8.1	*3.35
6	1.82	7.8	5.1	1.33	.01	6.0	.13	2.15	5.0	.40	6.9	4.4
7	1.64	.85	2.0	.16	.01	2.5	.16	2.1	4.9	2.2	10.8	3.35
8	1.64	6.9	.31	3.1	.01	.38	.16	1.95	5.3	2.35	10.8	4.7
9	1.64	7.6	.23	2.05	.01	.04	.58	.40	5.2	2.65	8.5	3.45
10	1.55	.68	.54	.01	.01	.02	.13	.35	5.3	.16	4.7	4.6
11	1.55	1.55	.96	.25	.02	.01	.13	1.94	3.05	.13	3.9	6.1
12	1.55	.85	2.65	1.25	.02	0	.13	2.35	.27	5.7	4.5	9.5
13	1.55	1.30	2.95	1.34	.04	.09	.16	3.95	2.8	.23	4.9	9.6
14	3.5	2.95	2.55	.17	.04	.02	.27	3.6	4.6	10.9	5.3	7.0
15	1.99	3.15	2.35	.48	.02	.04	.19	3.25	1.13	11.1	3.45	3.55
16	3.55	.56	2.25	.07	.02	.77	.19	3.15	.19	6.6	3.05	6.0
17	1.64	.80	2.25	3.2	.02	.97	.23	1.28	5.4	3.7	3.9	8.0
18	1.46	.78	3.75	7.6	.02	.07	.23	.98	8.2	7.3	3.7	6.6
19	1.38	.19	3.6	1.13	.10	.04	.92	.28	5.6	4.4	4.0	8.7
20	1.64	1.41	2.95	.16	.07	.04	.23	.10	.89	3.7	5.3	4.4
21	1.46	9.2	1.76	.07	.10	.07	.23	.10	2.9	4.4	1.54	.10
22	*1.38	2.75	.31	12.0	.10	.04	.60	.99	3.75	10.5	4.7	2.75
23	6.0	2.75	.23	7.4	.02	.10	1.20	.31	.35	4.0	6.3	6.0
24	4.4	3.70	.23	3.05	.02	1.04	1.50	.31	6.4	3.45	9.9	6.6
25	4.3	3.25	1.88	.02	.02	.19	1.14	.31	6.7	3.35	3.35	4.3
26	8.9	2.45	2.35	.04	.02	.16	.92	3.0	2.7	15.4	3.85	5.5
27	5.1	3.0	2.45	.15	.04	.81	.16	9.0	.19	3.5	3.8	4.5
28	6.6	9.0	2.15	.37	.02	.16	1.33	7.8	.13	8.4	5.7	3.15
29	3.05	8.8	1.65	.37	.02	.56	.96	4.9	.31	6.6	4.9	.16
30	3.45	4.6	1.64	.01	.02	.32	1.50	-	.31	4.7	4.6	3.35
31	3.75	2.85	-	.01	-	.14	1.59	-	.27	-	1.11	-
Total	87.04	118.32	60.57	59.27	0.85	37.99	20.09	61.57	102.34	158.72	152.57	158.67
Mean:	2.81	3.82	2.02	1.91	0.028	1.23	0.648	2.12	3.30	5.29	4.92	4.62
mgd	4.35	5.91	3.13	2.96	0.043	1.90	1.00	3.28	5.11	8.18	7.61	7.15
cfs	267	363	186	182	2.6	117	62	189	314	487	468	426
Ac-ft												
Calendar year 1951:	Max 17.4	Min 0				Mean(mgd) 1.99		Mean(cfs) 3.08		Ac-ft 2,230		
Fiscal year 1951-52:	Max 13.4	Min 0				Mean(mgd) 2.73		Mean(cfs) 4.22		Ac-ft 3,060		

* Discharge measurement made on this day.

Makaleha ditch near Kealia

Location.--Lat 22°06'55", long 159°22'05", on left bank at end of last tunnel from which water spills down slope into Mimino Reservoir, 3.9 miles northwest of Kealia and 4.1 miles northwest of Kapaa.

Records available.--December 1936 to June 1952 in reports of Geological Survey. July 1925 to November 1936 in files of East Kauai Water Co.

Gage.--Water-stage recorder and Parshall flume. Prior to December 1936, water-stage recorder at site 150 ft downstream at different datum.

Average discharge.--15 years (1937-52), 3.80 mgd (5.88 cfs).

Extremes.--1936-52: Maximum daily discharge, 15.1 mgd (23.4 cfs) Oct. 27, 1938, Dec. 5, 1944, Mar. 27, 1945; minimum daily, 0.02 mgd (0.03 cfs) Nov. 28, 1942, Sept. 24-26, 1944, Aug. 31, 1947.

Remarks.--Records good. Ditch diverts water from Makaleha Stream for irrigation of sugarcane. Diversion is regulated by headgates.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.2	10.4	8.8	8.3	1.10	0.08	0.79	0.08	5.4	0.14	0.05	4.6
2	6.0	9.3	9.3	6.9	.68	.08	4.2	.06	5.3	.10	.07	4.5
3	5.4	9.3	7.8	7.8	.46	.08	4.6	.06	5.1	.10	.47	4.0
4	7.9	9.8	6.4	5.8	.31	.08	1.55	.06	5.0	.06	.62	3.8
5	6.4	10.9	9.3	4.9	.20	.08	.84	1.72	5.3	.19	.22	5.8
6	6.4	12.0	8.8	5.6	.14	.12	.53	3.0	5.0	.17	.12	4.9
7	5.4	11.4	6.9	5.3	.20	.10	.39	3.0	2.9	.10	.08	4.6
8	5.0	6.0	6.6	7.8	.17	.06	.34	*3.0	.10	.08	.06	5.2
9	5.0	.14	4.9	5.9	.20	.06	.41	3.0	.12	.08	.03	5.6
10	5.4	.08	4.8	1.29	.70	.06	.36	4.1	.20	.06	2.35	5.8
11	6.0	4.7	3.95	.84	.68	.06	.31	4.2	.17	.06	5.5	5.8
12	6.4	6.9	5.0	.72	.39	.05	.31	3.35	.14	.08	4.8	5.8
13	6.4	6.4	6.0	.56	.36	.36	.28	3.7	.34	.10	4.9	5.7
14	7.8	9.3	5.4	.22	.25	.36	.43	3.45	.44	.06	5.0	5.6
15	6.4	10.9	5.3	.22	.20	.42	.34	3.25	.22	.06	4.0	5.5
16	7.4	9.8	5.0	.42	.20	4.9	.31	3.15	.12	2.1	3.7	5.8
17	5.5	10.4	4.9	.28	.10	8.1	.25	4.6	.32	4.2	4.6	5.7
18	5.0	4.6	6.4	.20	.10	2.5	.20	5.3	.28	4.5	4.3	5.5
19	4.9	.17	6.4	.12	.28	1.15	5.2	5.4	.53	4.2	3.6	6.0
20	6.0	.14	5.6	.12	.28	.64	1.62	1.93	1.18	4.1	2.45	5.8
21	5.0	3.65	6.0	.17	.34	.42	.70	.14	1.19	4.2	4.1	5.8
22	4.7	6.4	7.8	.14	.87	.31	.46	.20	.57	5.0	4.3	5.8
23	7.9	6.9	5.9	.17	.57	.22	.31	.34	.34	4.5	5.5	5.8
24	8.8	8.3	5.3	.62	.36	.17	.22	.17	.22	4.2	5.0	*5.4
25	8.3	7.8	6.0	.42	.25	.17	.20	.12	.14	4.1	4.5	5.0
26	9.8	6.4	6.0	.34	.20	.14	.17	.12	.71	5.1	4.1	5.2
27	9.3	7.4	6.0	.77	.17	.12	.14	.12	.68	5.2	3.95	5.8
28	9.8	9.3	5.2	1.29	.14	.12	.10	2.7	.49	3.05	4.8	5.8
29	8.8	9.3	7.8	5.5	.12	.12	.10	4.6	.36	.08	5.6	5.3
30	8.8	8.8	7.8	1.86	.10	.35	.10	-	.22	.08	5.4	5.0
31	10.4	8.8	-	1.06	-	2.35	.10	-	.20	-	4.7	-
Total	212.5	225.68	191.35	75.65	10.12	23.83	25.86	64.92	43.28	56.05	98.87	158.9
Mean:												
mgd	6.85	7.28	6.38	2.44	0.337	0.769	0.834	2.24	1.40	1.87	3.19	5.30
cfs	10.6	11.3	9.87	3.78	0.521	1.19	1.29	3.47	2.17	2.89	4.94	8.20
Ac-ft	652	693	587	232	31	73	79	199	133	172	303	488
Calendar year 1951:	Max	12.0	Min	0.03	Mean(mgd)	3.29	Mean(cfs)	5.09	Ac-ft	3,680		
Fiscal year 1951-52:	Max	12.0	Min	0.03	Mean(mgd)	3.24	Mean(cfs)	5.01	Ac-ft	3,640		

* Discharge measurement made on this day.

Anahola ditch wasteway near Kealia

Location.--Lat 22°08'10", long 159°22'30", on right bank 300 ft downstream from wasteway gates on Anahola ditch, 500 ft upstream from Kaneha Reservoir, 3.8 miles west of Anahola, and 4.9 miles northwest of Kealia.

Records available.--December 1936 to June 1952.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 820 ft above mean sea level (hand levels from East Kauai Water Co. benchmark).

Average discharge.--15 years (1937-52), 3.24 mgd (5.01 cfs).

Extremes.--1936-52: Maximum daily discharge, 48 mgd (74 cfs) Feb. 7, 1949; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Water that passes station is returned to Anahola River.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0.11	a0.11	0.11	21	0.11	8.3	0.05	6.1	4.9	0.11	0.11
2	0	.11	a.11	.05	7.9	.11	18.9	.05	8.2	4.2	.23	.11
3	0	.11	a.11	.05	6.3	.13	19.4	0	7.8	5.2	13.1	.11
4	0	.11	a.11	.05	*5.4	.11	16.2	.05	8.2	1.70	8.5	.11
5	0	.17	a.11	.05	4.4	0	10.8	.05	10.5	*10.7	7.2	.11
6	0	.31	a.11	.05	3.65	.11	7.7	.11	6.1	8.0	7.9	.17
7	.05	.31	a.11	a.05	5.0	.03	7.8	.11	4.6	5.0	1.38	.11
8	.05	.11	12.1	a.05	10.8	0	5.4	.28	4.6	1.11	.31	.17
9	.05	.17	14.8	a7.0	12.4	0	15.3	.17	7.1	.17	.23	.17
10	.05	.11	11.2	a4.6	19.7	8.3	13.3	.31	6.5	.17	.23	.17
11	.11	.05	4.8	a3.2	11.8	5.0	9.2	.17	6.2	.23	.31	.11
12	.11	.05	*3.65	2.65	5.6	6.1	6.9	1.83	7.7	.23	.23	.17
13	.11	.05	1.05	3.0	12.1	11.7	5.6	.99	15.2	.39	.23	.17
14	.11	.11	a.11	2.35	9.8	*5.2	10.6	.17	15.7	.17	.23	0
15	.11	.17	a.11	.78	4.6	11.6	5.4	.17	6.1	.17	.17	0
16	.11	.17	a.11	11.5	5.2	29.5	4.6	.11	4.8	.17	.17	.11
17	0	2.45	a.17	4.6	4.8	37	4.4	.23	21	.17	.17	0
18	0	.90	.17	3.3	5.6	17.6	4.3	.47	12.4	.24	.17	0
19	0	.17	a.23	3.0	14.6	9.0	32.5	19.5	19.9	.17	.17	.11
20	0	.17	a.17	9.2	13.8	6.9	10.0	8.3	16.9	.17	.23	.11
21	0	.17	.11	19.8	21	6.1	10.6	7.4	11.3	.17	.31	.05
22	0	.11	.11	3.3	18.8	5.0	9.6	15.3	7.2	.23	.23	.05
23	0	.11	.05	.31	7.2	4.8	5.6	16.0	6.1	.17	.23	.05
24	0	.11	.05	.23	5.4	6.3	4.6	5.9	5.6	.17	.17	0
25	0	.11	.11	.05	4.6	4.6	4.0	4.8	5.8	.17	.11	0
26	.11	.11	.11	3.3	4.0	4.2	3.65	5.2	a13.9	.31	.11	0
27	.05	.17	.11	13.1	7.2	9.4	3.3	4.2	a11.2	.31	.11	.04
28	.05	.17	.11	12.0	6.3	5.9	1.38	9.5	14.5	.17	.11	.11
29	.11	.17	.23	22	4.2	18.1	.11	1.80	8.3	.23	.23	0
30	.17	.11	.17	14.2	2.35	17.1	.11	-	6.1	.17	.17	0
31	.11	.11	-	19.1	-	22	.05	-	5.0	-	.11	-
Total	1.46	7.36	50.60	163.03	265.50	252.00	259.60	103.22	290.6	45.26	43.16	2.42
Mean:												
mgd	0.047	0.237	1.69	5.26	8.85	8.13	8.37	3.56	9.37	1.51	1.39	0.081
cfs	0.073	0.367	2.61	8.14	13.7	12.6	13.0	5.51	14.5	2.34	2.15	0.125
Ac-ft	4.5	23	155	500	815	773	797	317	892	139	132	7.4
Calendar year 1951:	Max	39.5	Min	0	Mean(mgd)	4.69	Mean(cfs)	7.25	Ac-ft	5,250		
Fiscal year 1951-52:	Max	37	Min	0	Mean(mgd)	4.06	Mean(cfs)	6.28	Ac-ft	4,550		

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for stations on nearby streams.

Anahola ditch above Kaneha Reservoir, near Kealia

Location.--Lat 22°08'00", long 159°22'30", 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 1952. May 1915 to December 1921, at site 0.3 mile upstream; records 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 benchmark). Dec. 9, 1921, to June 2, 1934, at site 480 ft upstream at different datum.

Average discharge.--29 years (1921-25, 1927-52), 3.27 mgd (5.06 cfs).

Extremes.--1921-52: Maximum daily discharge, 40 mgd (62 cfs) Nov. 12, 1947; no flow at times.

Remarks.--Records good. Ditch diverts water from Anahola River to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted to Anahola ditch wasteway (see preceding page).

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.97	3.9	6.1	3.45	0.12	3.35	0.04	2.45	8.2	0.04	4.4	3.8
2	1.94	5.1	9.5	2.35	.09	3.35	.80	2.35	2.7	.04	11.4	3.45
3	1.18	5.5	5.5	2.1	.06	3.7	.06	2.35	2.35	.04	6.8	3.1
4	1.26	9.2	3.65	1.91	.06	5.5	.06	2.2	.37	2.15	.04	2.9
5	1.18	15.3	5.1	1.82	.04	5.0	.04	2.1	.04	7.7	.04	3.1
6	1.18	27.5	5.0	1.82	.04	13.1	.04	2.0	.02	.04	.02	5.5
7	.97	22.5	3.0	1.73	.02	10.9	.04	2.0	.02	.02	3.6	3.35
8	.83	7.4	9.6	12.4	.02	5.3	.04	*1.68	.02	3.6	3.65	8.5
9	.77	9.1	.06	22	.04	4.2	.06	1.73	.02	3.8	3.25	9.6
10	.83	8.1	.06	3.0	.12	6.5	.04	9.0	.02	3.55	3.25	8.3
11	1.04	4.8	.06	1.34	.09	.04	.04	5.2	.02	6.4	12.8	8.5
12	1.18	3.45	.04	.77	.06	.04	.04	.93	.02	8.3	6.8	14.1
13	2.4	3.1	2.9	.83	.06	.09	.04	1.48	.04	15.8	7.9	9.9
14	3.9	9.1	3.0	.59	.06	.04	.04	2.2	.04	4.4	7.1	13.3
15	2.9	12.4	2.65	7.3	.06	.09	.04	1.73	.02	4.4	3.65	7.1
16	4.9	13.2	2.35	5.5	.06	.44	.04	1.73	.02	3.8	3.1	15.3
17	1.42	4.7	2.25	.06	.06	.55	.04	9.2	.06	3.9	4.7	8.0
18	.97	3.3	4.6	.06	.06	.12	.04	27	.02	6.9	3.35	6.7
19	.77	4.2	4.2	.06	.09	.09	.56	7.7	.04	3.35	3.7	15.2
20	*1.24	5.7	2.35	.06	.06	.06	.04	.02	.22	3.35	5.2	10.2
21	.97	6.7	2.2	.12	.09	.04	.04	.02	.02	6.2	14.5	7.0
22	.90	3.2	2.8	2.1	.09	.04	.04	.04	.02	8.5	10.8	7.9
23	2.95	3.1	1.91	8.3	.06	.04	.04	.04	.02	3.55	17.9	8.3
24	3.75	4.0	1.73	17.7	.06	.04	.04	.02	.02	3.8	9.0	*4.9
25	3.4	4.2	1.73	9.8	.06	.02	.04	.02	.02	3.3	6.0	3.9
26	7.7	3.35	1.82	4.9	.06	.02	.04	.01	.17	13.3	3.9	3.9
27	6.0	6.4	1.82	1.67	.04	.02	.04	.01	.04	16.5	3.45	7.9
28	3.35	9.1	1.64	.11	.04	.02	1.93	.02	.04	8.6	4.7	10.9
29	8.3	7.0	7.7	.23	.04	.06	3.0	2.2	.04	10.1	13.8	4.4
30	8.4	6.3	4.4	.09	1.53	.12	2.7	-	.04	8.5	10.7	3.55
31	4.7	5.9	-	.16	-	.18	2.65	-	.04	-	4.8	-
Total	83.25	236.80	99.72	114.33	3.34	64.06	12.70	87.43	14.73	163.93	194.30	222.35
Mean:												
mgd	2.69	7.64	3.32	3.69	0.111	2.07	0.410	3.01	0.475	5.46	6.27	7.41
cfs	4.16	11.8	5.14	5.71	0.172	3.20	0.634	4.66	0.735	8.45	9.70	11.5
Ac-ft	255	727	306	351	10	197	39	268	45	503	596	692
Calendar year 1951: Max	30				Min	0.02	Mean(mgd)	2.38	Mean(cfs)	3.68	Ac-ft	2,670
Fiscal year 1951-52: Max	27.5				Min	0.01	Mean(mgd)	3.54	Mean(cfs)	5.48	Ac-ft	3,980

* Discharge measurement made on this day.

Anahola River near Kealia

Location.--Lat 22°08'55", long 159°21'20", on right bank just upstream from intake of Lower Anahola ditch, 4.5 miles northwest of Kealia.

Drainage area.--5.5 sq mi.

Records available.--August to November 1910, December 1910 to November 1912 (fragmentary), December 1912 to June 1952.

Gage.--Water-stage recorder and concrete dam and orifice control. Datum of gage is 295.11 ft above mean sea level (Highway Department benchmark). Aug. 22 to Nov. 2, 1910, water-stage recorder, Dec. 15, 1910, to Dec. 29, 1912, staff gage and Dec. 30, 1912, to May 3, 1934, water-stage recorder, at site one-eighth of a mile upstream at different datum.

Average discharge.--33 years (1919-52), 13.3 mgd (20.0 cfs).

Extremes.--Maximum discharge during year, 3,120 mgd (4,830 cfs) Jan. 2 (gage height, 7.23 ft), from rating curve extended above 230 mgd by logarithmic plotting; minimum, 1.75 mgd (2.71 cfs) July 20, 21, 22, 23.
1910, 1912-52: Maximum discharge, 7,940 mgd (12,300 cfs) Apr. 1, 1948 (gage height, 11.06 ft), from rating curve extended as explained above; minimum, slightly less than 1.4 mgd (about 2.2 cfs) Sept. 12, 13, 1923.

Remarks.--Records fair. Anahola ditch diverts water 3 miles above station for irrigation in vicinity of Kealia (see preceding page).

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Feb. 18

Feb. 19 to June 30

0.9	1.70	2.0	35	1.2	4.5	2.0	38
1.0	2.2	2.3	60	1.4	6.8	2.3	65
1.1	2.8	2.6	95	1.6	12.5	2.5	88
1.2	3.6	3.0	162	1.8	23		
1.4	6.1	3.5	282				
1.6	12.5	4.0	456				
1.8	22.5						

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.45	2.4	3.6	2.65	33	5.3	15.7	7.6	22.5	10.1	6.8	6.8
2	2.7	3.05	4.1	2.55	16.5	4.9	196	8.0	18.9	9.8	19.0	6.5
3	2.55	3.15	3.95	2.2	13.4	5.0	63	7.7	15.1	10.1	37.5	6.1
4	2.15	6.7	2.8	2.1	11.2	5.8	29	7.1	12.1	9.2	10.9	5.7
5	2.1	6.9	2.75	2.05	9.5	6.6	18.7	6.8	12.9	*22	9.4	5.7
6	2.1	16.4	3.2	1.95	8.3	39	15.3	6.3	10.1	12.1	9.4	6.4
7	2.05	29	2.7	1.95	8.0	11.1	13.9	6.1	8.9	8.9	8.5	5.7
8	1.95	5.2	37	5.0	8.3	8.0	12.5	*5.8	8.4	8.4	7.9	6.1
9	1.90	4.6	16.3	58	11.6	6.9	20	5.8	8.9	7.9	7.6	6.5
10	1.85	4.6	9.8	10.5	26.5	17.5	13.4	6.9	7.9	7.7	7.3	6.4
11	1.85	3.45	5.6	5.8	10.9	10.1	12.1	8.9	7.7	8.3	15.7	6.4
12	1.95	2.75	*4.5	4.2	8.0	8.0	9.8	5.8	7.7	8.9	8.5	8.6
13	1.95	2.5	4.0	4.6	8.3	19.2	8.6	5.3	8.9	16.1	9.1	8.7
14	2.5	4.2	3.4	3.55	8.0	11.1	10.0	5.0	9.7	7.7	10.8	9.4
15	2.4	4.8	3.2	21	6.6	14.7	9.2	4.7	6.7	7.3	7.6	6.1
16	2.9	8.6	3.0	21.5	6.1	138	9.5	4.6	6.5	7.0	7.0	7.0
17	2.3	4.4	2.75	6.2	6.1	195	9.2	8.0	24.5	6.8	7.3	6.1
18	1.95	3.0	2.8	4.0	6.3	43	8.6	62	7.3	7.9	7.0	5.7
19	1.80	2.8	3.85	3.55	20	22.5	317	75	30	6.7	6.8	8.6
20	*1.80	3.0	2.8	5.4	10.1	17.1	24	14.8	55	6.2	6.8	7.9
21	1.85	3.95	2.7	14.8	14.7	14.8	23	11.7	25	6.8	9.0	6.7
22	1.80	2.65	2.9	6.6	17.0	12.5	23.5	20.5	13.9	7.2	8.3	6.7
23	2.2	2.4	2.55	5.9	9.8	11.7	14.8	30.5	12.1	6.4	19.2	6.7
24	2.65	2.4	2.3	20	8.3	10.5	12.5	11.7	10.9	6.0	8.3	*6.3
25	2.5	2.65	2.25	8.9	7.7	9.8	12.1	10.1	10.5	5.8	7.5	5.6
26	3.55	2.65	2.2	8.0	6.8	9.2	10.9	9.5	63	14.7	7.2	5.4
27	2.7	3.3	2.15	29	7.7	9.2	9.8	8.6	23	11.6	6.9	6.0
28	2.4	4.1	2.05	17.1	7.1	9.5	9.2	20	23	8.7	6.6	8.2
29	3.2	4.1	2.9	107	6.3	21	8.3	9.2	14.4	8.6	7.8	6.2
30	5.6	3.95	3.7	27	5.8	35.5	8.3	-	11.7	8.6	8.1	5.4
31	3.0	3.85	-	31.5	-	80	8.0	-	10.9	-	7.2	-
Total	74.55	157.50	147.80	444.55	327.9	812.5	956.5	394.0	514.1	273.5	307.0	197.6
Mean	2.40	5.08	4.93	14.3	10.9	26.2	30.9	13.6	16.6	9.12	9.90	6.59
mgd	3.71	7.86	7.63	22.1	16.9	40.5	47.6	21.0	25.7	14.1	15.3	10.2
cfs	229	483	454	1,360	1,010	2,490	2,940	1,210	1,580	833	942	606
Ac-ft												
Calendar year 1951: Max	295				Min 1.80		Mean(mgd) 13.8		Mean(cfs) 21.4		Ac-ft 15,480	
Fiscal year 1951-52: Max	317				Min 1.80		Mean(mgd) 12.6		Mean(cfs) 19.5		Ac-ft 14,140	

Peak discharge (base, 900 mgd).--Oct. 29 (7 a.m.) 1,380 mgd (2,140 cfs), 5.49 ft; Jan. 2 (8 p.m.) 3,120 mgd (4,830 cfs), 7.26 ft; Jan. 19 (8 a.m.) 2,500 mgd (3,870 cfs), 6.72 ft; Feb. 18 (2 p.m.) 1,000 mgd (1,550 cfs), 4.99 ft; Mar. 20 (6:30 p.m.) 1,000 mgd (1,550 cfs), 4.96 ft.

* Discharge measurement made on this day.

Lower Anahola ditch near Kealia

Location--Lat 22°08'00", long 159°19'30", on left bank 100 ft downstream from last wasteway, 1.3 miles southwest of mouth of Anahola River, and 2.5 miles northwest of Kealia.

Records available--December 1936 to June 1952 in reports of Geological Survey. July 1925 to December 1936 in files of East Kauai Water Co.

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

Average discharge--15 years (1937-52), 2.46 mgd (3.81 cfs).

Extremes--1936-52: Maximum daily discharge, 12.0 mgd (18.6 cfs) June 1, 1938; no flow at times.

Remarks--Records good. Ditch diverts water from Anahola River for irrigation of sugar-cane. Flow regulated by spillways and gates.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.5	2.8	0	3.25		0	0	0	7.0	0	0	0
2	3.1	2.9	0	3.05		0	0.03	0	8.0	0	0	0
3	2.8	3.05	0	2.65		0	0	0	4.6	0	0	0
4	2.35	3.9	0	2.55		0	0	0	0	0	0	0
5	2.2	3.75	0	2.45		0	0	3.4	0	0	0	0
6												
7	2.15	5.0	0	2.4		4.2	0	6.6	0	0	0	0
8	1.92	5.5	0	2.3		6.9	0	7.0	0	0	0	0
9	1.74	4.6	0.03	2.65		8.2	0	7.0	0	0	2.8	0
10	1.69	4.4	0	1.90		5.9	0	7.0	0	0	6.0	0
11	1.69	4.4	0	0		3.55	0	7.0	0	0	6.0	0
12	1.74	3.9	0	0		0	0	7.5	0	0	6.6	0
13	1.69	3.35	0	0		0	0	7.0	0	0	6.6	0
14	1.74	3.05	0	0		0	0	7.5	0	0	3.85	0
15	2.2	3.8	0	0		0	0	6.6	0	0	0	0
16	2.15	4.0	0	0		0	0	6.1	0	0	0	0
17												
18	2.35	4.2	0	0		.04	0	5.9	0	0	0	0
19	2.2	4.4	1.53	0		.03	0	6.2	0	0	0	0
20	1.92	5.1	3.7	0		0	0	4.2	0	2.65	0	0
21	1.74	3.25	4.5	0		0	.04	0	0	6.1	0	1.94
22	1.69	.83	3.35	0		0	0	0	0	6.0	0	1.40
23												
24	1.69	3.1	3.25	0		0	0	0	0	6.0	0	0
25	1.64	3.1	3.45	0		0	0	0	0	6.1	0	0
26	2.15	2.65	3.2	0		0	0	0	0	6.0	0	0
27	2.7	2.6	3.1	1.16		0	0	0	0	5.8	0	0
28	2.65	1.49	2.8	1.64		0	0	0	0	5.6	0	0
29												
30	2.85	0	2.65	2.9		0	0	0	0	2.3	0	0
31	2.85	0	2.6	7.5		0	0	0	0	0	0	0
32	2.55	0	2.55	8.5		0	0	3.15	0	0	0	0
33	2.65	0	2.8	4.4		0	0	6.9	0	0	0	0
34	3.45	0	3.45	0		0	0	-	0	0	0	0
35	3.1	0	-	0		0	0	-	0	-	0	-
Total	70.84	89.12	42.96	49.30	0	26.72	0.07	99.05	19.6	46.55	31.85	3.34
Mean:												
mgd	2.29	2.87	1.43	1.59	0	0.862	0.002	3.42	0.632	1.55	1.03	0.111
cfs	3.54	4.44	2.21	2.46	0	1.33	0.003	5.29	0.978	2.40	1.59	0.172
Ac-ft	217	273	132	151	0	82	0.2	304	60	143	98	10
Calendar year 1951. Max	8.5			Min	0	Mean(mgd)	1.52	Mean(cfs)	2.35	Ac-ft	1,700	
Fiscal year 1951-52. Max	8.5			Min	0	Mean(mgd)	1.31	Mean(cfs)	2.03	Ac-ft	1,470	

Ka Loko ditch near Kilauea

Location.--Lat 22°10'35", long 159°23'00", 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 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 750 ft (from topographic map).

Average discharge.--19 years (1933-52), 3.67 mgd (5.68 cfs).

Extremes --1932-52: Maximum daily discharge, 63 mgd (98 cfs) Dec. 10, 1935; minimum daily, 0.46 mgd (0.71 cfs) Nov. 21, 22, 1949.

Remarks.--Records excellent except those for period of no gage-height record, which are fair. Ditch diverts water from Moloaa and Puu Ka Ele Streams, 0.5 mile southeast and 1.5 miles southwest of station, respectively. Water used for irrigation in vicinity of Kilauea. Flow regulated by wasteway gates.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.69	1.09	a1.5	1.23	11.9	2.95	7.0	3.15	7.3	3.9	2.75	2.65
2	1.31	1.09	a1.5	1.09	5.9	2.75	9.2	3.15	6.3	3.7	6.6	2.55
3	.95	1.61	a1.5	1.09	4.9	2.75	5.0	3.05	6.1	4.3	7.2	2.35
4	.81	2.15	a1.5	1.02	4.5	3.35	2.45	2.85	4.3	3.7	3.55	2.15
5	.81	2.35	a1.7	.88	4.0	3.15	1.80	2.75	5.0	5.5	3.15	2.15
6	.75	5.8	a1.6	.88	3.8	9.7	1.47	2.65	4.0	4.1	3.25	2.8
7	.75	9.0	1.39	.81	3.7	6.2	3.0	2.65	3.55	3.45	2.75	2.25
8	.75	2.45	12.1	2.65	4.5	3.8	4.0	2.55	3.45	3.25	2.55	*2.45
9	1.01	2.7	5.3	14.3	6.7	3.25	6.4	2.55	3.45	3.05	2.45	3.1
10	.81	2.7	3.6	4.6	12.0	9.6	5.8	3.35	3.35	2.95	2.55	3.4
11	.81	1.98	2.15	2.25	6.4	4.6	5.1	3.7	4.0	3.4	5.8	3.25
12	.81	1.98	1.80	1.80	4.3	3.7	5.6	2.55	4.5	3.7	2.9	4.4
13	.81	1.39	1.89	2.15	4.5	6.1	4.3	2.45	6.8	5.8	3.25	4.6
14	1.38	2.05	1.63	1.71	4.4	4.0	5.4	2.25	6.6	2.95	4.0	5.5
15	1.13	3.2	1.54	1.87	3.45	6.2	2.5	2.15	3.8	2.75	2.55	3.4
16	1.33	2.45	1.47	6.6	3.25	27	3.25	2.15	3.25	2.75	2.35	5.1
17	*.93	2.0	1.39	2.35	3.25	41	3.05	3.3	7.5	3.45	2.7	3.25
18	.75	1.39	1.47	1.71	3.6	12.2	2.95	6.5	5.0	3.65	2.25	3.4
19	.75	1.39	1.54	1.71	6.6	8.0	14.1	9.5	5.8	2.75	2.35	7.1
20	.75	1.71	1.31	3.85	5.5	6.4	2.85	4.4	10.5	2.65	2.45	5.6
21	.75	3.45	1.31	9.4	9.1	5.6	5.1	3.7	7.5	3.25	6.1	3.55
22	.75	1.71	1.47	3.4	9.8	5.0	7.7	6.2	5.0	3.45	4.3	3.8
23	1.02	1.54	1.23	3.6	4.9	4.6	3.05	10.4	4.4	2.45	10.0	4.1
24	1.16	a2.2	1.16	9.0	4.0	4.9	1.31	3.9	3.9	2.45	4.9	3.15
25	1.09	a2.0	1.16	4.3	3.8	3.7	1.16	3.35	4.5	2.35	3.45	2.85
26	1.84	a1.8	1.09	4.3	3.45	4.1	1.02	3.15	10.1	5.3	2.75	2.75
27	1.32	a1.9	1.09	9.5	4.2	4.1	.95	2.95	4.3	6.2	2.75	3.9
28	.95	a3.0	1.02	5.7	3.55	5.1	1.82	9.1	6.6	4.7	2.75	5.2
29	2.05	a2.5	1.88	20.5	3.25	12.9	*3.45	3.45	5.5	4.2	5.5	3.05
30	2.8	a1.8	2.05	8.9	2.95	10.2	3.55	-	4.6	3.8	5.0	2.75
31	1.54	a1.5	-	10.1	-	26	3.35	-	4.1	-	3.05	-
Total	34.36	73.88	61.34	143.25	156.15	252.90	125.68	113.85	165.05	109.90	117.95	106.55
Mean:												
mgd	1.11	2.38	2.04	4.62	5.20	8.16	4.05	3.93	5.32	3.66	3.80	3.55
cfs	1.72	3.68	3.16	7.15	8.05	12.6	6.27	6.08	8.23	5.66	5.88	5.49
Ac-ft	105	227	188	440	479	776	386	349	507	337	362	327
Calendar year 1951: Max	41			Min	0.63	Mean(mgd)	3.74	Mean(cfs)	5.79	Ac-ft	4,190	
Fiscal year 1951-52: Max	41			Min	0.75	Mean(mgd)	3.99	Mean(cfs)	6.17	Ac-ft	4,480	

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of ditchman's notes and recorded range in stage.

Puu Ka Ele ditch near Kilauea

Location.--Lat 22°11'05", long 159°24'20", on left bank 200 ft upstream from Puu Ka Ele Reservoir and 2 miles south of Kilauea.

Records available.--August 1932 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 430 ft (by barometer).

Average discharge.--19 years (1933-52), 3.00 mgd (4.64 cfs).

Extremes.--1932-52: Maximum daily discharge, 21 mgd (32 cfs) Sept. 2, 1943; no flow at times each year.

Remarks.--Records excellent except those for periods of no gage-height record, which are fair.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.54	1.39	2.25	1.7	4.1	3.1	0.3	0	3.3	5.1	3.0	3.35
2	1.63	1.23	2.35	1.6	1.16	2.9	0	0	3.7	4.6	5.7	3.05
3	1.39	1.63	2.15	1.6	3.65	2.9	0	0	5.0	5.2	6.7	2.85
4	1.31	1.80	1.98	1.54	*4.5	3.8	0	0	4.0	4.1	4.0	2.65
5	1.23	1.71	2.55	1.54	4.1	3.7	0	1.32	4.5	5.9	3.55	2.65
6	1.23	4.6	2.35	1.47	3.7	3.05	0	2.65	4.1	4.6	3.7	3.0
7	1.23	6.9	1.98	1.47	3.45	7.1	0	2.55	3.9	4.0	3.15	2.8
8	1.16	2.55	7.8	2.35	3.7	4.7	.4	2.45	3.7	3.8	2.95	*2.9
9	1.54	2.65	5.5	10.3	5.2	3.7	.8	2.45	3.7	3.55	2.85	3.05
10	1.23	2.85	3.9	4.3	7.8	5.0	.1	3.15	3.6	3.45	2.75	3.25
11	1.23	2.35	3.15	2.75	5.5	6.0	0	3.05	4.0	3.55	4.4	4.1
12	1.23	1.89	2.75	2.35	4.3	3.35	0	2.55	4.5	3.7	3.0	4.8
13	1.23	1.71	2.75	2.95	4.4	0	0	2.45	6.2	4.9	2.75	4.8
14	1.63	2.45	2.35	2.25	4.1	0	0	2.3	6.2	3.25	3.15	5.6
15	1.39	2.95	2.25	2.4	3.7	0	0	2.1	4.6	3.05	2.45	4.4
16	1.54	2.55	2.15	4.1	3.45	.82	0	2.1	4.1	3.05	2.45	5.3
17	*1.23	2.35	2.05	2.65	3.45	1.31	0	3.0	7.7	3.25	2.75	4.3
18	1.02	1.98	1.98	2.25	3.45	.52	0	5.0	5.6	3.25	2.45	4.1
19	1.02	1.98	1.98	3.05	5.6	0	1.08	7.0	6.5	2.85	2.35	7.3
20	1.09	2.85	1.89	3.75	5.5	0	0	.2	10	2.65	2.55	6.8
21	1.02	4.0	1.98	8.6	8.0	0	0	0	8.0	3.3	5.0	4.9
22	1.02	2.15	2.05	4.5	8.5	0	0	4.7	6.0	3.3	4.1	4.7
23	1.31	2.05	1.80	4.3	5.5	0	0	7.9	5.0	2.6	7.0	4.6
24	1.39	2.35	1.71	8.8	4.5	0	0	4.1	4.5	2.45	4.0	4.3
25	1.16	2.35	1.71	5.9	4.0	0	0	3.7	5.0	2.45	3.3	4.0
26	1.98	1.98	1.63	5.2	3.7	0	0	3.7	6.0	5.5	3.1	3.7
27	1.23	1.98	1.6	10.5	4.5	0	0	3.35	.1	6.0	3.1	4.0
28	1.16	2.9	1.6	6.3	4.2	0	0	6.4	.1	5.0	3.1	5.0
29	2.2	3.45	2.5	14.7	3.7	0	0	3.8	.12	4.2	5.6	3.7
30	2.3	4.0	2.4	11.0	3.2	.56	0	-	.12	3.6	5.1	3.3
31	1.89	3.05	-	10.5	-	1.0	0	-	.49	-	3.7	-
Total	43.06	80.43	75.09	146.67	133.61	53.51	2.68	81.97	134.33	116.20	113.75	123.25
Mean:												
mgd	1.39	2.59	2.50	4.73	4.45	1.73	0.086	2.83	4.33	3.87	3.67	4.11
cfs	2.15	4.01	3.87	7.32	6.89	2.68	0.133	4.38	6.70	5.99	5.68	6.36
Ac-ft	132	247	230	450	410	164	8.2	252	412	357	349	378
Calendar year 1951. Max	14.7											
Fiscal year 1951-52: Max	14.7											
Min	0											
Mean(mgd)												
Mean(cfs)												
Ac-ft												
2,290												
3,390												

* Discharge measurement made on this day.

Note.--No gage-height record; Sept. 27 to Oct. 3, Nov. 21 to Dec. 4, Dec. 31 to Jan. 15, Feb. 14-21, Mar. 2-11, 19-28, Apr. 21-23, Apr. 26 to May 1, May 23-28, June 6-8, 25-30; discharge estimated on basis of ditchman's notes and records for nearby stations.

ISLAND OF KAUAI

Kalihiwai ditch near Kilauea

Location.--Lat 22°10'55", long 159°25'55", on right bank 0.1 mile upstream from Kalihiwai Reservoir and 2.4 miles southwest of Kilauea.

Records available.--June 1934 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 410 ft (by barometer).

Average discharge.--17 years (1934-42, 1943-52), 2.65 mgd (4.10 cfs).

Extremes.--1934-52: Maximum daily discharge, 29.5 mgd (45.6 cfs) July 16, 1937; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are fair. Ditch diverts low-water flow from most branches of Pohakuohonu Stream at intakes, about 1 mile south of station. Diversion of flow to Kahililolo Stream, 0.1 mile above station, regulated by gates. Water discharges into Kalihiwai Reservoir, where it is stored for irrigation in vicinity of Kilauea.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.82	2.15	3.9	2.05	2.4	3.25	0.17	0.17	2.2	3.6	2.5	3.5
2	.76	1.78	4.3	1.87	.78	3.05	.17	.14	2.5	3.6	6.0	3.2
3	.76	2.05	.9	1.87	3.05	2.85	.25	.11	3.9	4.3	6.5	2.9
4	.82	3.05	3.25	1.87	*4.3	3.45	.25	9.4	2.3	4.8	3.2	2.8
5	.76	3.8	3.8	1.70	3.7	3.15	.25	2.25	.47	6.1	3.0	2.8
6	.76	8.5	3.6	1.62	3.6	5.1	.21	2.15	1.25	5.2	2.7	3.2
7	.76	12.5	3.05	1.62	3.6	4.8	.17	1.57	2.65	3.75	2.6	3.0
8	.76	5.3	11.7	2.8	3.9	3.8	.21	2.05	2.65	*2.75	3.2	3.1
9	.76	5.5	8.0	9.9	4.8	3.25	.25	1.96	2.55	2.65	3.4	3.2
10	.70	5.8	5.7	4.1	6.1	8.1	.25	2.65	2.85	3.05	3.4	3.3
11	.82	4.2	4.3	2.35	5.4	4.9	.21	2.55	3.6	*4.2	4.5	3.9
12	.82	3.15	3.7	1.78	4.5	2.65	.21	2.15	3.8	4.0	3.2	4.5
13	.88	2.55	3.45	1.87	4.5	.64	.21	2.15	5.0	5.0	3.6	4.5
14	1.16	4.1	3.05	1.54	4.5	.70	.21	2.05	5.0	3.45	3.8	6.0
15	1.16	5.6	2.85	5.1	3.8	.70	.17	1.96	4.0	3.05	3.3	5.0
16	1.02	7.6	2.65	7.3	3.45	1.09	.17	1.96	2.8	2.85	2.8	6.0
17	.82	6.0	2.55	2.85	3.25	.76	1.68	2.55	5.0	3.15	3.0	5.0
18	.76	3.8	2.35	2.05	3.45	.47	3.9	4.6	4.5	3.05	2.6	4.5
19	.70	3.15	2.25	1.87	4.8	.42	8.8	2.95	5.0	2.65	2.7	8.0
20	.76	3.05	2.05	5.1	5.3	.29	.88	.60	8.0	2.75	3.2	7.5
21	.76	3.8	2.05	11.3	8.1	.25	.76	1.70	6.0	3.35	5.5	5.5
22	.76	2.75	2.35	5.4	7.4	.21	.88	3.65	4.5	3.35	4.0	5.5
23	.88	2.85	2.05	5.9	5.9	.17	.70	4.2	3.5	2.85	8.0	5.0
24	1.16	3.7	1.78	11.1	5.3	.17	.64	3.05	.6	2.8	6.0	4.6
25	1.09	3.25	1.78	6.9	4.9	.11	.2	2.75	1.5	2.8	4.5	4.3
26	3.55	2.95	1.70	5.5	3.9	.11	.1	2.75	5.0	5.0	3.9	3.9
27	2.25	3.05	1.62	7.6	5.3	.08	0	2.45	2.6	5.5	3.9	3.9
28	1.62	5.4	1.62	5.5	4.8	.08	0	2.95	4.5	4.5	3.9	5.5
29	5.5	5.0	3.1	9.9	4.0	.11	.25	2.55	4.0	4.0	5.0	4.2
30	3.9	4.8	2.95	9.6	3.6	.11	.25	-	4.3	3.5	4.8	3.9
31	2.95	4.2	-	6.1	-	.29	.21	-	4.2	-	4.0	-
Total	40.98	135.38	101.40	146.01	132.36	55.11	22.61	72.02	110.72	111.60	122.7	132.2
Mean:												
mgd	1.32	4.37	3.58	4.71	4.41	1.78	0.729	2.46	3.57	3.72	3.96	4.41
cfs	2.04	6.76	5.23	7.29	6.82	2.75	1.13	3.84	5.52	5.76	6.13	6.82
Ac-ft	126	415	311	448	406	169	69	221	340	342	377	406
Calendar year 1951: Max	21.5											
Min	0.04											
Mean(mgd)	2.46											
Fiscal year 1951-52: Max	12.5											
Min	0											
Mean(mgd)	3.23											
Mean(cfs)	3.84											
Ac-ft	2,780											
Fiscal year 1951-52: Max	12.5											
Min	0											
Mean(mgd)	3.23											
Mean(cfs)	3.84											
Ac-ft	2,780											

* Discharge measurement made this day.

Note.--No gage-height record; Jan. 25-28, Mar. 16-31, Apr. 24 to June 30; discharge estimated on basis of recorded range in stage and records of nearby stations.

Hanalei River at altitude 625 ft, near Hanalei

Location.--Lat 22°07'10", long 159°28'05", on right bank 0.4 mile downstream from Kaapoko Stream and 6.2 miles southeast of Hanalei.

Drainage area.--7.4 sq mi.

Records available.--January 1914 to January 1952 (destroyed by flood of Jan. 3, 1952).

Gage.--Water-stage recorder. Altitude of gage is 625 ft (from topographic map). Prior to July 20, 1921, at site 300 ft downstream at same datum.

Average discharge.--33 years (1918-51), 46.9 mgd (72.5 cfs).

Extremes.--Maximum discharge during year, at least 9,200 mgd (14,200 cfs) Jan. 3 (gage height, at least 13.0 ft, from floodmark), from rating curve extended above 200 mgd on basis of slope-area determination at gage height 10.12 ft; minimum daily during period July to December, 8.3 mgd (12.8 cfs) Oct. 7.

1914-52: Maximum discharge, that of Jan. 3, 1952; minimum, 5.8 mgd (9.0 cfs) Apr. 28, May 1-3, 1926.

Remarks.--Records fair. Since 1925 Hanalei tunnel has diverted an average of about 25 mgd from Hanalei River and its tributary Kaapoko Stream at points about 2 miles above station, for irrigation in vicinity of Lihue.

Rating table, July 1, 1951, to Jan. 2, 1952 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Sept. 30 to Oct. 9)

0.3	8.0	1.4	66
.4	10.9	2.0	133
.5	14.0	2.5	209
.6	17.5	3.0	306
.8	26	4.0	560
1.1	44		

Discharge, in million gallons a day, July 1951 to January 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	10.3	18.8	34	17.2	85	26.5	70					
2	13.0	23.5	47	12.1	44	25.5	450					
3	9.7	23.5	28.5	11.8	41	25	-					
4	10.6	26	21	10.9	31.5	38	-					
5	9.7	48	37	9.4	*28	51	-					
6	10.0	127	24	8.9	31	113	-					
7	9.2	164	17.9	8.3	40	79	-					
8	9.2	49	131	48	90	39.5	-					
9	9.2	63	68	222	90	42	-	+29.5				
10	9.2	40	46	45	172	62	-					
11	10.0	26.5	*26.5	26	82	32	-					
12	9.7	21.5	22.5	19.4	48	60	-					
13	10.6	19.4	20	35.5	73	49	-					
14	16.0	28	18.3	19.4	55	31	-					
15	11.2	28	16.8	26.5	36	93	-					
16	15.1	52	15.0	27	36	405	-					
17	9.7	30	14.4	17.5	34	540	-					
18	6.2	21	17.3	15.0	33	134	-					
19	9.2	17.2	26	19.4	132	70	-					
20	10.6	20	16.8	51	74	58	-					
21	9.2	58	24	121	123	50	-					
22	8.9	17.2	50	37	154	50	-					
23	17.7	27.5	17.2	75	50	44	-					
24	36	41	14.0	86	42	47	-					
25	18.7	28	15.0	105	37	41	-					
26	50	20.5	13.7	44	31.5	37.5	-					
27	36.5	23.5	13.1	99	47	44	-					
28	33	33.5	11.2	82	36.5	41	-					
29	25.5	41	47	123	31	100	-					
30	32.5	29.5	23.5	112	27.5	447	-					
31	23	34.5	-	104	-	214	-					
Total	502.4	1,202.6	876.7	1,638.3	1,835.0	2,889.0	-					
Mean	16.2	38.8	29.2	52.8	61.2	93.2	-					
mgd	25.1	60.0	45.2	81.7	94.7	144	-					
cfs	1,540	3,690	2,690	5,030	5,630	8,870	-					
Ac-ft												
Calendar year 1951. Max	802			Min 8.3	Mean(mgd)	59.8	Mean(cfs)	92.5	Ac-ft	66,960		
Fiscal Year 1951-52: Max	-			Min -	Mean(mgd)	-	Mean(cfs)	-	Ac-ft	-		

* Discharge measurement made on this day.

† Result of discharge measurement.

Note.--Recorder and shelter destroyed by flood Jan. 3. No record Jan. 3 to June 30.

Hanakapi'ai Stream near Hanalei

Location.--Lat 22°11'20", long 159°35'50", on left bank 1.5 miles upstream from mouth and 6 miles west of Hanalei.

Drainage area.--2.6 sq mi.

Records available.--December 1931 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 450 ft (by barometer).

Average discharge.--20 years (1932-52), 11.0 mgd (17.0 cfs).

Extremes.--Maximum discharge during year, 1,680 mgd (2,600 cfs) Dec. 16 (gage height, 6.95 ft), from rating curve extended above 60 mgd; minimum, 2.9 mgd (4.5 cfs) Feb. 16, 1931-52: Maximum discharge, 2,680 mgd (4,150 cfs) Dec. 23, 1937 (gage height, 8.41 ft), from rating curve extended above 60 mgd; minimum, 1.50 mgd (2.32 cfs) Oct. 14, 15, 1945.

Remarks.--Records good except those for periods of no gage-height record and those above 60 mgd, which are poor.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.4	2.9	1.5	28
.5	4.0	2.0	55
.7	6.7	2.5	96
1.0	12.5	3.0	158

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.9	3.9	12.9	4.7	20	4.1	6.0	*3.5	46	4.9	8.1	5.2
2	3.9	5.7	15.5	4.3	10	3.65	5.3	3.45	10.1	4.6	17.1	4.6
3	3.9	12.6	8.8	4.0	7.4	3.55	5.2	3.45	5.7	5.0	44	4.3
4	3.9	13.4	6.0	3.8	5.0	3.55	4.5	3.35	23	4.3	16.3	4.1
5	3.9	24	6.7	3.5	4.4	3.65	3.7	3.25	20.5	7.6	16.4	4.3
6	3.8	32.5	6.3	3.5	4.1	3.45	3.7	3.25	7.4	6.2	17.7	4.6
7	3.8	44	5.0	3.5	4.6	*3.45	3.4	3.25	8.3	7.3	11.3	4.4
8	3.8	10.4	17.8	14	9.6	3.45	3.2	3.25	16.6	6.6	7.2	4.1
9	3.8	22.5	10.6	44	26.5	6.2	5.0	3.25	24.5	5.0	6.7	6.9
10	3.8	13.6	6.0	11	33.5	55	5.0	3.25	12.7	*5.4	7.9	5.4
11	3.8	9.0	5.0	5.4	13.0	8.8	11.7	3.25	13.7	10.4	10.3	5.2
12	3.8	5.7	4.5	4.4	6.9	5.6	14	3.1	44	11.8	6.6	5.4
13	3.9	5.9	4.4	4.1	5.6	4.6	7.8	3.0	60	18.8	6.0	8.9
14	7.5	27	*4.1	3.9	4.9	4.1	8.5	3.0	40	7.2	9.4	8.5
15	7.4	16.2	3.9	3.65	4.4	35.5	5.7	3.0	11.0	5.3	6.1	5.9
16	5.5	9.8	3.8	3.5	4.3	147	4.4	3.25	7.6	4.6	5.2	7.8
17	4.6	7.6	3.65	3.4	4.8	72	3.9	3.0	6.3	11.9	9.8	6.3
18	4.0	5.7	3.9	3.4	6.8	17.8	3.7	8.1	5.9	9.6	7.0	11.7
19	*3.8	5.2	4.0	3.4	7.6	7.6	80	5.1	6.0	5.9	10.5	*10.7
20	5.1	4.8	3.8	14	6.5	6.0	13.4	8.6	6.0	9.3	17.0	10.1
21	4.3	4.5	4.4	18	8.4	5.2	30	6.0	4.9	20	38.5	13.5
22	4.0	4.3	24	13	6.1	4.6	19	13.7	4.4	22	13.5	9.7
23	4.0	4.6	5.4	19	4.8	4.7	8.5	17.6	4.0	9.6	12.3	7.7
24	5.8	8.2	4.9	17	4.5	5.3	6.0	7.0	3.9	7.6	9.7	6.1
25	4.5	6.4	4.5	6.7	4.6	4.1	5.0	5.4	4.4	8.3	6.4	5.0
26	6.4	5.3	4.2	6.2	6.0	4.0	4.5	4.4	8.1	33.5	5.7	4.8
27	6.0	9.7	4.1	11	11.1	4.0	4.2	3.9	52	27	9.1	11.4
28	7.2	9.6	4.0	18	8.0	4.0	4.0	3.8	40	10.5	6.4	10.7
29	4.8	9.4	4.7	34	5.2	5.0	3.9	3.55	11.0	14.1	6.1	6.3
30	4.5	7.6	6.2	40	4.8	36.5	4.5	-	6.4	18.1	8.5	5.6
31	4.1	7.6	-	22	-	23.5	3.8	-	5.3	-	6.0	-
Total	143.5	355.7	203.05	350.35	253.4	497.95	291.5	187.90	519.7	322.2	362.8	209.2
Mean												
mgd	4.63	11.5	6.77	11.3	8.45	16.1	9.40	6.48	16.8	10.7	11.7	6.97
cfs	7.16	17.8	10.5	17.5	13.1	24.9	14.5	10.0	26.0	16.6	18.1	10.8
Ac-ft	440	1,090	623	1,080	778	1,530	895	577	1,590	989	1,110	642

1st. year year 1951: Max 220 Min 3.4 Mean(mgd) 11.7 Mean(cfs) 18.1 Ac-ft 13,120
Fiscal year 1951-52: Max 147 Min 3.0 Mean(mgd) 10.1 Mean(cfs) 15.6 Ac-ft 11,340

Peak discharge (base, 400 mgd).--Dec. 16 (9 a.m.) 1,680 mgd (2,600 cfs), 6.95 ft; Mar. 1 (3:30 p.m.) 544 mgd (842 cfs), 4.47 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 1-19, Sept. 24 to Oct. 10, Oct. 16 to Nov. 3, Jan. 5 to Feb. 1; discharge estimated on basis of records for stations on nearby streams.

Hanakoa Stream near Hanalei

Location.--Lat 22°11'00", long 159°37'35", on left bank 0.8 mile upstream from mouth and 8 miles west of Hanalei.

Drainage area.--1.1 sq mi.

Records available.--December 1931 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 470 ft (by barometer).

Average discharge.--20 years (1932-52), 3.64 mgd (5.63 cfs).

Extremes.--Maximum discharge during year, 692 mgd (1,070 cfs) Dec. 16 (gage height, 5.98 ft), from rating curve extended above 30 mgd by area-square root of depth studies; minimum, 0.33 mgd (0.51 cfs) Aug. 1, 2, Feb. 12-17.
1931-52: Maximum discharge, 1,100 mgd (1,700 cfs) Aug. 16, 1950 (gage height, 7.29 ft), from rating curve extended as explained above; minimum, 0.17 mgd (0.26 cfs) Mar. 21, 22, 1934.

Remarks.--Records good.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.9	0.14	1.7	15.5
1.0	1.60	2.0	27
1.1	1.47	2.5	56
1.2	2.6	3.0	101
1.4	6.9		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.48	0.38	3.95	0.74	*7.1	0.96	1.81	0.60	23.5	1.23	2.65	1.04
2	.48	.87	5.4	.67	2.65	.80	1.57	.53	3.7	1.12	7.3	.96
3	.43	3.4	2.35	.60	2.5	.74	1.34	.53	1.69	1.12	15.4	.86
4	.43	3.05	1.34	.53	1.47	.74	1.12	.48	8.6	.96	5.8	.80
5	.43	6.4	1.47	.48	1.23	.74	.88	.43	7.0	2.0	5.8	.88
6	.38	9.9	1.12	.48	1.12	.74	.80	.43	2.35	1.7	7.2	.88
7	.38	14.1	.80	.48	1.23	.74	.80	.43	2.5	1.9	4.0	.80
8	.38	2.35	4.9	6.2	2.75	.67	.74	.38	6.0	1.8	2.65	.74
9	.38	6.4	2.5	13.0	11.2	2.1	1.32	.38	8.3	*1.12	2.35	1.15
10	.38	3.2	1.23	2.95	15.3	31	1.34	.38	4.3	1.12	2.2	.88
11	.38	1.47	.96	1.47	5.5	3.65	4.1	.38	4.5	2.35	2.35	.80
12	.38	.96	.80	1.04	2.5	2.05	5.1	.33	20	3.55	1.69	.80
13	.38	1.17	*.80	.96	1.81	1.57	2.35	.33	26.5	5.7	1.57	1.34
14	.43	9.7	.80	.80	1.57	1.23	2.65	.33	14.4	1.81	2.55	1.23
15	.60	4.7	.74	.74	1.34	21	1.57	.33	4.4	1.23	1.57	.88
16	.60	2.65	.67	.67	1.23	79	1.12	.33	2.8	1.12	1.23	1.12
17	.53	1.69	.67	.80	1.36	41	.96	.33	2.05	2.25	2.7	.96
18	*.43	1.12	.74	.60	1.92	6.7	.88	.53	1.81	2.2	2.5	*2.05
19	.38	.96	.80	.67	1.81	3.5	50	8.5	2.0	1.34	3.5	1.93
20	.43	.80	.74	4.1	1.42	2.35	4.8	1.23	1.69	2.6	7.7	1.69
21	.53	.74	.96	4.4	1.81	1.81	14.7	.80	1.23	8.3	16.2	2.1
22	.43	.60	13.0	3.25	1.34	1.47	7.7	2.8	1.12	9.1	4.3	1.47
23	.38	.67	1.69	8.8	1.04	1.34	2.65	4.3	.96	3.2	3.3	.96
24	.48	1.23	1.12	5.4	1.04	1.34	1.69	1.34	.88	2.5	2.35	.80
25	.53	.96	.96	1.81	1.04	1.04	1.34	.88	1.29	2.8	1.81	.67
26	.48	.74	.80	1.23	1.47	.96	1.12	.67	2.3	14.8	1.47	.60
27	.74	1.75	.74	2.1	2.85	.88	.96	.53	19.8	11.7	1.47	1.95
28	1.04	1.81	.74	2.55	1.93	.80	.88	.53	14.0	3.85	1.23	1.84
29	.53	1.69	.96	9.1	1.23	.88	.80	.43	3.95	4.5	1.23	.96
30	.48	1.23	.96	17.5	1.12	14.8	1.12	-	2.05	6.1	1.57	.80
31	.38	1.23	-	7.6	-	8.3	*.78	-	1.57	-	1.12	-
Total	14.64	87.72	54.71	101.52	81.88	234.90	118.99	29.47	197.04	104.97	118.76	33.96
Mean:	0.474	2.83	1.82	3.27	2.73	7.58	3.64	1.02	6.36	3.50	3.63	1.13
mgd	0.733	4.38	2.82	5.05	4.22	11.7	5.94	1.58	9.84	5.42	5.93	1.75
cfs	45	269	168	312	251	721	365	90	605	322	364	104
Ac-ft												

Calendar year 1951: Max 111 Min 0.38 Mean(mgd) 4.50 Mean(cfs) 6.96 Ac-ft 5,040
Fiscal year 1951-52: Max 79 Min 0.33 Mean(mgd) 3.22 Mean(cfs) 4.98 Ac-ft 3,620

Peak discharge (base, 220 mgd).--Dec. 16 (8 a.m.) 692 mgd (1,070 cfs), 5.98 ft; Jan. 19 (5:30 a.m.) 430 mgd (655 cfs), 4.87 ft.

* Discharge measurement made on this day.

Kaalalau Stream near Hanalei

Location.--Lat 22°09'50", long 159°38'15", on left bank 2 miles upstream from mouth and 9 miles southwest of Hanalei.

Drainage area.--1.6 sq mi.

Records available.--November 1931 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 960 ft (by barometer).

Average discharge.--20 years (1932-52), 4.59 mgd (7.10 cfs).

Extremes.--Maximum discharge during year, about 380 mgd (588 cfs) Dec. 16 (gage height, about 3.9 ft), from rating curve extended above 18 mgd by logarithmic plotting; minimum, 2.5 mgd (3.9 cfs) Dec. 8, 9.

1931-52: Maximum discharge, 665 mgd (1,030 cfs) Aug. 15, 1950 (gage height, 4.55 ft), from rating curve extended as explained above; minimum, 1.73 mgd (2.68 cfs) June 2, 1945.

Remarks.--Records good except those for periods of no gage-height record and those above 18 mgd, which are fair.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 16

Dec. 17 to June 30

1.0 2.4 2.0 36
1.2 4.9 2.5 80
1.4 9.1 3.0 153
1.6 15.3

1.0 2.9 1.7 21
1.2 5.9 2.0 37
1.4 10.4 2.5 81

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.3	3.9	3.5	3.05	5.1	2.6	5.0	3.55	9.1	4.2	4.0	3.7
2	4.3	3.9	3.65	3.05	*4.1	2.6	4.0	3.55	5.6	4.1	4.0	3.7
3	4.3	3.9	3.5	3.05	3.65	2.6	3.7	3.55	4.2	3.95	5.0	3.7
4	4.2	3.9	3.5	3.05	3.4	2.6	3.5	3.4	4.4	3.95	4.3	3.7
5	4.2	4.1	3.4	3.05	3.15	2.6	3.4	3.4	4.4	3.8	4.0	3.7
6	4.2	4.2	3.4	3.05	3.05	*2.6	3.4	3.4	3.95	3.8	3.9	3.7
7	4.1	4.6	3.4	3.05	3.05	2.6	3.4	3.4	3.8	3.8	3.8	3.7
8	4.1	3.9	3.5	3.15	3.05	2.6	3.4	3.4	4.1	3.8	3.8	3.7
9	4.1	3.9	3.5	3.8	3.5	2.95	3.4	3.4	4.5	*3.7	3.8	3.7
10	4.1	3.9	3.4	3.3	4.6	15.2	3.4	3.4	4.2	3.8	3.8	3.7
11	4.1	3.8	3.4	3.05	4.1	5.5	3.5	3.4	4.4	3.95	3.8	3.7
12	4.1	3.8	3.4	3.05	3.5	3.9	3.6	3.4	7.5	3.95	3.8	3.7
13	4.1	3.8	*3.4	2.95	3.3	3.3	3.5	3.4	21	4.2	3.8	3.7
14	4.1	4.1	3.4	2.95	3.15	3.15	3.5	3.4	13.6	4.0	3.8	3.7
15	4.1	4.1	3.3	2.95	2.95	23	3.5	3.4	7.3	3.9	3.8	3.7
16	4.1	4.1	3.3	2.95	2.95	110	3.5	3.4	5.6	3.8	3.8	3.7
17	4.1	3.8	3.3	2.95	2.95	45	3.5	3.4	4.9	3.9	3.8	3.7
18	*4.1	3.8	3.4	2.85	2.85	6.2	3.5	3.4	4.5	3.9	3.8	*3.7
19	4.1	3.8	3.3	2.85	2.85	5.4	3.4	3.7	4.5	3.8	3.8	3.7
20	4.1	3.65	3.3	3.05	2.65	4.5	4.5	3.4	4.2	3.9	4.2	3.7
21	3.9	3.65	3.4	3.05	2.85	3.95	9.0	3.4	4.1	4.6	5.2	3.7
22	3.9	3.65	7.6	3.15	2.75	3.7	7.0	3.4	3.95	4.2	4.1	3.55
23	3.9	3.65	4.2	3.3	2.75	3.55	5.2	3.55	3.95	4.0	3.9	3.55
24	3.9	3.65	3.5	3.4	2.75	3.55	4.7	3.4	3.8	3.8	3.8	3.55
25	3.9	3.65	3.4	3.05	2.75	3.8	4.3	3.4	3.8	3.8	3.8	3.55
26	3.9	3.5	3.3	3.05	2.6	3.7	4.1	3.4	3.95	4.0	3.8	3.55
27	3.9	3.5	3.15	3.05	2.75	3.55	3.9	3.4	5.9	4.0	3.8	3.7
28	3.9	3.5	3.15	3.4	2.75	3.4	3.9	3.4	7.5	4.0	3.8	3.7
29	3.9	3.5	3.15	7.1	2.6	3.4	3.8	3.4	6.1	4.0	3.8	3.55
30	3.9	3.5	3.05	16.1	2.6	42	3.8	-	5.0	4.0	3.8	3.55
31	3.9	3.5	-	5.7	-	16	*3.8	-	4.5	-	3.7	-
Total	125.8	118.40	106.15	115.55	95.25	339.50	156.7	99.50	178.30	118.60	122.3	109.95
Mean:												
mgd	4.06	3.82	3.54	3.73	3.18	11.0	5.05	3.43	5.75	3.95	3.95	3.66
cfs	6.28	5.91	5.48	5.77	4.92	17.0	7.81	5.31	8.90	6.11	6.11	5.66
Ac-ft	366	363	326	355	292	1,040	481	305	547	364	375	337
Calendar year 1951: Max	141			Min	2.6	Mean(mgd)	6.78	Mean(cfs)	10.5	Ac-ft	7,600	
Fiscal year 1951-52: Max	110			Min	2.6	Mean(mgd)	4.61	Mean(cfs)	7.13	Ac-ft	5,170	

Peak discharge (base, 70 mgd).--Oct. 30 (2:30 a.m.) 86 mgd (133 cfs), 2.56 ft; Dec. 16 (7 a.m.) about 380 mgd (588 cfs), about 3.9 ft; Dec. 30 (7 a.m.) 305 mgd (472 cfs), 3.66 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1-30; Apr. 13 to June 18; discharge estimated on basis of records for stations on nearby streams.

Miscellaneous discharge measurements

Measurements on the island of Kauai at points other than regular gaging stations are listed below:

Miscellaneous discharge measurements on Kauai during fiscal year July 1951 to June 1952

Date	Stream	Tributary to--	Locality	Discharge	
				Cubic feet per second	Million gallons a day
July 24	Hanapepe River...	Pacific Ocean..	At road crossing $\frac{1}{4}$ mile above confluence with Manuahi Stream, near Eleele.	23.4	15.1
28	....do.....	....do.....	....do.....	22.0	14.2
28	Manuahi.....	Hanapepe River.	250 ft above confluence with Hanapepe River near Eleele	.598	.386
Sept. 12	Manoa.....	Pacific Ocean..	Near Haena.....	.225	.145
12	Limahuli.....	....do.....	....do.....	7.24	4.68

Left Branch of North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°31'10", long 157°56'55", on left bank 140 ft upstream from intake of Wahiawa Water Co.'s tunnel and confluence with Right Branch, and 5.5 miles northeast of Wahiawa.

Drainage area.--1.5 sq mi.

Records available.--May 1913 to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--35 years (1915-24, 1926-52), 10.7 mgd (16.6 cfs).

Extremes.--Maximum discharge during year, 1,960 mgd (3,030 cfs) Mar. 4 (gage height, 8.88 ft), from rating curve extended above 43 mgd by test on model of station site; minimum, 0.29 mgd (0.45 cfs) July 16.

1913-52: Maximum discharge, 3,550 mgd (5,490 cfs) Jan. 1, 1933 (gage height, 11.7 ft, from floodmarks), from rating curve extended above 15 mgd by test on model of station site; minimum, 0.08 mgd (0.12 cfs) Mar. 2, 13, 1941.

Remarks.--Records good except those above 50 mgd, which are fair.

Revisions (fiscal years).--WSP 1219: 1931-33(M), 1935(M), 1937-38(M).

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Nov. 21

Nov. 22 to June 30

1.5	0.30	2.4	9.6	1.7	0.93	2.5	13.4
1.6	.52	2.7	20	1.8	1.45	2.8	27.5
1.7	.84	3.0	38.5	1.9	2.15	3.0	42
1.8	1.31	3.3	68	2.1	4.3	3.4	86
2.0	2.85	3.6	107	2.3	7.9	3.8	148
2.2	5.4						

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.43	3.05	3.4	2.2	7.3	3.2	9.5	2.3	57	6.9	11.8	1.94
2	.39	2.15	7.4	2.25	4.1	3.0	13.6	6.5	6.0	4.6	*4.5	1.66
3	3.0	1.85	2.95	3.95	3.75	4.8	31	2.35	3.2	6.4	36	1.45
4	2.05	2.75	2.4	1.78	2.95	35	38.5	1.94	<u>123</u>	3.95	9.7	<u>1.35</u>
5	1.31	15.9	*3.8	<u>1.38</u>	2.95	4.9	11.0	1.80	24.5	21.5	6.8	4.2
6	2.7	31.5	2.4	1.64	2.5	24.5	9.2	1.73	6.6	5.4	4.9	11.5
7	.95	<u>101</u>	3.9	3.65	2.35	18.6	6.9	1.52	9.3	5.6	3.95	5.1
8	.50	8.0	18.8	1.96	3.65	10.0	5.9	1.45	9.6	18.3	3.45	4.1
9	.41	17.8	5.0	11.7	5.6	4.9	60	1.65	7.4	6.0	3.2	41
10	.67	8.7	3.55	2.55	4.2	27.5	10.8	8.2	9.8	5.7	2.9	17.0
11	.58	9.2	2.6	2.15	2.6	8.6	15.4	3.5	12.5	5.0	3.4	29
12	1.26	4.1	2.4	1.58	1.98	18.9	12.0	1.52	7.0	7.7	5.1	44
13	*.48	3.85	1.98	2.25	5.2	5.6	6.9	5.7	15.5	12.4	2.35	18.1
14	.34	3.9	1.85	5.2	12.1	4.5	15.7	2.45	35.5	5.3	2.25	34
15	<u>.30</u>	2.85	1.65	3.5	2.5	3.95	6.6	2.05	13.4	5.3	2.1	16.7
16	.30	12.3	1.60	5.6	1.98	7.9	7.0	<u>1.35</u>	6.5	4.5	1.87	69
17	.56	4.7	1.57	1.85	1.90	7.2	5.9	13.1	61	4.2	1.80	10.7
18	.39	2.6	2.45	4.4	<u>8.9</u>	*15.6	4.5	3.55	12.4	4.5	1.80	43
19	.34	3.05	17.5	4.0	97	4.3	54	36.5	29	3.7	<u>1.73</u>	27
20	1.46	8.7	2.6	5.8	78	3.95	10.8	<u>5.1</u>	27.5	6.3	<u>1.79</u>	20.5
21	.54	7.5	1.95	5.9	67	4.3	6.1	2.6	9.2	4.3	3.5	50
22	.34	2.7	2.5	2.25	24.5	3.85	5.3	5.3	8.1	3.7	28.5	15.9
23	.84	6.5	1.44	4.7	9.9	10.0	4.5	6.4	12.0	3.2	11.8	11.0
24	6.8	9.6	1.26	3.95	7.9	4.5	3.95	2.15	6.3	<u>2.9</u>	5.0	6.4
25	.99	5.7	3.0	*4.1	6.3	3.1	3.7	1.87	9.6	3.55	3.75	6.9
26	8.1	2.85	1.38	3.85	5.3	3.1	3.45	2.35	18.6	7.8	2.9	6.4
27	9.2	2.7	1.12	60	4.6	9.2	3.2	7.5	23	22	1.87	24
28	7.1	3.5	<u>1.03</u>	15.6	4.2	3.6	3.0	9.0	28	12.0	1.87	8.8
29	8.2	2.95	<u>32</u>	12.2	3.7	26	2.6	4.6	8.6	<u>22.5</u>	6.9	14.4
30	10.5	5.1	3.15	19.0	3.35	45	2.45	-	6.5	22.5	5.5	33
31	<u>13.0</u>	10.1	-	6.6	-	<u>138</u>	<u>2.15</u>	-	5.7	-	2.25	-
Total	64.03	307.15	138.61	207.54	388.26	464.95	375.60	146.03	612.5	249.70	183.23	580.10
Mean:												
mgd	2.71	9.91	4.62	6.69	12.9	15.0	12.1	5.04	19.8	8.32	5.91	19.3
cfs	4.19	15.3	7.15	10.4	20.0	23.2	18.7	7.80	30.6	12.9	9.14	29.9
Ac-ft	258	943	425	637	1,190	1,430	1,150	448	1,880	766	562	1,780

Calendar year 1951: Max 192 Min 0.30 Mean(mgd) 9.30 Mean(cfs) 14.4 Ac-ft 10,420

Fiscal year 1951-52: Max 136 Min 0.30 Mean(mgd) 10.2 Mean(cfs) 15.8 Ac-ft 11,470

Peak discharge (base, 700 mgd).--Dec. 31 (2 a.m.) 880 mgd (1,360 cfs), 6.30 ft; Mar. 1 (3 p.m.) 880 mgd (1,360 cfs), 6.27 ft; Mar. 4 (3 p.m.) 1,960 mgd (3,030 cfs), 8.88 ft.

* Discharge measurement made on this day.

Right Branch of North Fork Kaukonahua Stream near Wahiawa

Location.--lat 21°31'15", long 157°56'55", on left bank 190 ft upstream from confluence with Left Branch, 200 ft upstream from intake of Wahiawa Water Co.'s tunnel, and 5.5 miles northeast of Wahiawa.

Drainage area.--1.2 sq mi.

Records available.--May 1913 to January 1933, February 1934 to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--33 years (1915-24, 1926-32, 1934-52), 7.22 mgd (11.2 cfs).

Extremes.--Maximum discharge during year, 911 mgd (1,410 cfs) Mar. 4 (gage height, 7.72 ft), from rating curve extended as explained below; minimum, 0.29 mgd (0.45 cfs) part of each day, July 14-19, 22, 23.

1913-52: Maximum discharge, 1,500 mgd (2,320 cfs) Aug. 12, 1940 (gage height, 9.34 ft), from rating curve extended above 40 mgd by test on model of station site; minimum, 0.09 mgd (0.15 cfs) Mar. 22, 1926.

Remarks.--Records good except those for days of fragmentary or no gage-height record, which are fair.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

2.6	0.29	3.4	14.9
2.7	.79	3.6	24.5
2.8	1.59	4.0	49
3.0	4.1	4.5	88
3.2	8.4	5.0	144

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.39	1.06	1.59	1.6	6.9	2.1	7.2	2.0	50	3.95	3.55	0.99
2	.59	.79	3.7	1.6	3.25	2.0	10.7	5.4	8.4	3.55	*2.0	.92
3	4.4	.74	1.59	2.9	3.0	4.75	21	2.0	3.8	4.0	21.5	.79
4	1.78	1.38	1.23	1.3	2.45	11.3	33	1.59	85	3.0	6.8	1.74
5	1.08	6.3	*2.95	1.1	2.35	2.85	8.7	1.50	24.5	11.0	3.4	1.12
6	.79	13.6	1.32	1.2	2.0	7.1	6.9	1.41	6.5	3.6	3.0	3.85
7	.64	35.5	2.15	2.4	1.90	17.6	5.4	1.23	5.9	3.0	2.45	3.65
8	.44	3.8	10.2	1.5	2.1	8.3	4.3	1.14	6.4	4.5	2.0	5.0
9	.39	6.9	2.85	6.0	2.95	3.15	66	1.23	5.3	3.75	1.90	22
10	.49	3.25	1.90	1.7	2.75	20.5	9.8	6.6	5.5	2.6	1.79	8.3
11	.44	4.4	1.59	1.4	1.90	4.9	10.8	3.15	5.4	2.7	2.1	19.1
12	.39	2.0	1.5	1.1	1.50	12.3	7.5	1.32	3.9	4.1	1.8	21
13	*.39	2.0	1.3	1.6	18.4	3.7	5.2	11.5	6.4	4.6	1.5	9.0
14	.34	2.1	1.2	3.3	9.7	2.85	17.5	2.5	18.5	2.25	1.4	18.7
15	.29	1.50	1.2	2.2	2.45	2.6	6.3	1.84	10.5	2.1	1.3	12.6
16	.34	11.2	1.1	3.7	1.90	5.2	6.2	1.23	4.5	2.3	1.2	35
17	.44	3.5	1.1	1.3	1.75	4.4	5.5	7.7	47	2.0	1.2	6.7
18	.34	1.50	1.6	3.0	5.8	*10.7	3.95	2.1	8.6	1.90	f1.14	23
19	.34	1.50	10	2.7	43	3.4	39.5	25.5	*11.5	1.79	f1.14	10.2
20	.72	6.1	1.7	3.8	43	3.25	8.2	4.6	12.9	2.5	f1.23	8.4
21	.44	4.1	1.4	3.9	38.5	3.25	4.8	2.35	5.2	2.35	f2.05	28
22	.34	1.59	1.6	1.6	13.1	2.8	4.4	2.0	5.8	1.79	f16.8	10
23	.73	3.5	1.0	3.0	5.8	3.25	3.7	3.5	8.7	1.50	10.5	7.0
24	7.4	4.5	.90	1.7	4.6	3.0	3.25	1.68	4.4	1.32	2.6	5.0
25	.77	2.75	1.5	1.32	3.8	2.35	3.0	1.50	6.6	1.41	1.68	*4.1
26	2.1	1.50	1.0	1.73	3.25	2.45	2.75	5.1	19.5	2.0	1.32	3.7
27	1.92	1.32	.90	46	3.0	4.5	2.6	14.7	14.4	5.2	1.08	6.3
28	1.34	1.90	.85	11.7	2.75	2.35	2.35	9.0	22.5	2.35	1.08	4.1
29	2.4	1.68	18	9.1	2.45	10.9	*2.25	7.0	6.8	8.5	2.4	4.7
30	3.3	2.3	2.5	14.8	2.25	36	2.1	-	5.0	7.2	1.50	15.2
31	3.1	2.6	-	5.6	-	99	2.0	-	4.3	-	1.08	-
Total	58.66	136.86	81.42	145.85	238.55	300.65	316.85	132.37	431.7	102.81	104.43	299.16
Mean	1.25	4.41	2.71	4.70	7.95	9.70	10.2	4.56	13.9	3.43	3.37	9.97
cfs	1.93	6.82	4.19	7.27	12.3	15.0	15.8	7.06	21.5	5.31	5.21	15.4
Ac-ft	119	420	250	448	732	923	972	406	1,320	316	320	918
Calendar year 1951: Max	147			Min	0.29	Mean(mgd)	7.01	Mean(cfs)	10.8	Ac-ft	7,860	
Fiscal year 1951-52: Max	99			Min	0.29	Mean(mgd)	6.36	Mean(cfs)	9.84	Ac-ft	7,140	

Peak discharge (base, 420 mgd).--Dec. 31 (2 a.m.) 680 mgd (1,050 cfs), 6.96 ft; Mar. 1 (5 p.m.) 544 mgd (842 cfs), 8.59 ft; Mar. 4 (5 p.m.) 911 mgd (1,410 cfs), 7.72 ft.

* Discharge measurement made on this day.

f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

Note.--No gage-height record Sept. 12 to Oct. 24, May 12-17, June 20-24; discharge estimated on basis of records for stations on nearby streams.

Kaukonahua ditch near Wahiawa

Location.--Lat 21°30'45", long 157°59'20", on left bank 3 miles northeast of Wahiawa.

Records available.--March 1947 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 1,100 ft (from topographic map).

Average discharge.--5 years, 2.62 mgd (4.05 cfs).

Extremes.--1947-52: Maximum daily discharge, 10.1 mgd (15.6 cfs) Jan. 27, 1948; no flow at times in each year.

Remarks.--Records good. Ditch diverts water from North Fork Kaukonahua Stream for domestic use.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.06	4.4	5.3	3.7	6.4	5.2	6.2	4.4	7.2	6.1	5.3	2.8
2	.08	3.0	5.7	3.7	5.9	5.1	6.1	5.4	6.6	5.7	4.6	2.5
3	3.0	2.6	5.0	6.1	5.8	5.6	6.4	4.6	5.9	5.9	6.1	2.35
4	3.7	3.65	3.9	3.7	5.6	6.6	6.6	4.0	6.0	5.6	5.4	2.15
5	3.1	6.3	5.4	2.8	5.3	6.1	6.4	3.7	1.52	6.4	5.1	2.95
6	3.0	5.3	3.8	2.9	5.0	6.4	6.1	3.4	3.55	5.7	4.6	4.7
7	1.88	8.2	*3.6	5.2	4.4	6.4	5.9	3.2	6.8	5.4	4.5	4.0
8	1.10	6.9	7.5	3.5	4.7	6.1	5.8	3.0	6.6	5.8	4.3	4.3
9	.91	7.3	6.8	7.0	5.2	5.7	6.5	3.0	6.6	5.8	4.0	1.99
10	1.10	6.8	5.8	5.3	5.6	6.2	6.2	4.7	6.9	5.3	4.0	0
11	1.10	6.8	4.6	4.4	4.6	5.9	6.1	5.5	*6.6	5.2	4.2	0
12	1.59	5.8	4.4	3.3	3.8	6.2	5.9	3.3	6.6	5.7	4.0	0
13	.91	5.3	3.7	6.5	5.2	5.8	5.8	5.3	6.9	5.7	3.7	0
14	.67	5.4	3.4	6.4	6.4	5.6	6.1	5.1	7.5	5.2	3.5	0
15	.62	4.4	3.2	5.3	5.0	5.4	5.7	4.2	7.1	5.1	3.3	0
16	.58	4.0	3.0	*6.4	4.3	5.6	5.6	3.0	6.8	5.1	3.2	0
17	*.77	5.6	2.8	3.6	3.8	5.9	5.7	5.5	7.3	4.8	3.0	0
18	.77	4.2	5.1	5.4	6.1	6.1	5.6	5.0	7.2	4.8	2.9	0
19	.58	4.4	5.9	4.1	7.5	5.6	6.5	7.0	7.1	4.7	2.9	0
20	1.79	5.6	5.7	6.5	7.1	5.4	6.2	6.2	7.0	5.0	2.8	0
21	1.00	5.8	3.6	5.8	7.2	5.3	5.9	5.2	6.6	4.8	4.0	0
22	.67	4.3	4.4	4.0	6.9	5.2	5.8	4.5	6.6	4.6	4.4	0
23	1.01	4.9	2.9	5.2	6.6	5.6	5.7	6.1	6.8	4.2	5.2	0
24	5.4	4.5	2.35	5.9	6.5	5.4	5.6	4.3	6.4	3.8	4.0	0
25	1.96	5.8	3.7	3.8	6.4	5.0	5.6	3.6	6.6	3.8	3.6	0
26	4.4	4.5	2.6	5.2	6.1	4.8	5.3	5.5	7.5	5.1	3.4	0
27	5.2	3.0	2.1	7.2	5.9	5.7	5.2	4.3	7.3	5.9	2.9	0
28	4.9	.08	1.82	7.2	5.8	5.2	5.1	6.6	7.2	5.3	2.8	0
29	6.1	.06	6.1	7.2	5.6	5.7	4.8	5.9	6.5	6.1	3.8	0
30	6.6	2.7	5.4	7.1	5.3	6.6	4.7	-	6.2	*6.2	3.8	0
31	6.6	6.9	-	6.6	-	7.1	4.5	-	6.1	-	3.0	-
Total	71.13	148.49	129.37	161.0	170.0	178.5	179.6	135.5	201.87	158.8	122.3	27.74
Mean:	2.29	4.79	4.31	5.19	5.67	5.76	5.79	4.67	6.51	5.29	3.95	0.925
mgd	3.54	7.41	6.67	8.03	8.77	8.91	8.96	7.23	10.1	8.18	6.11	1.43
cfs	218	456	397	494	522	548	551	416	620	487	375	85
Ac-ft												
Calendar year 1951:	Max	8.2	Min	0.03	Mean(mgd)	2.63	Mean(cfs)	4.07	Ac-ft	2,950		
Fiscal year 1951-52:	Max	8.2	Min	0	Mean(mgd)	4.60	Mean(cfs)	7.12	Ac-ft	5,170		

* Discharge measurement made on this day.

North Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°30'55", long 157°59'20", on left bank 3 miles northeast of Wahiawa and 8.6 miles north of Pearl City.

Drainage area.--4.9 sq mi.

Records available.--September 1946 to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (from topographic map).

Average discharge.--5 years (1947-52), 25.2 mgd (39.0 cfs).

Extremes.--Maximum discharge during year, 3,140 mgd (4,860 cfs) Mar. 4 (gage height, 10.90 ft), from rating curve extended above 120 mgd as explained below; minimum, 0.43 mgd (0.66 cfs) July 9, 10, Sept. 17.

1946-52: Maximum discharge, 3,340 mgd (5,170 cfs) Apr. 3, 1948 (gage height, 11.34 ft), from rating curve extended above 120 mgd by test on model of station site; minimum, 0.35 mgd (0.54 cfs) Mar. 26-28, 1947.

Remarks.--Records good except those for periods of no gage-height record and those above 120 mgd, which are fair. Poamoho tunnel diverts floodwater from Poamoho Stream into North Fork Kaukonahua Stream about 1 mile above station. Kaukonahua ditch diverts water 2.6 miles above station for domestic use in Wahiawa (see preceding page).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.3	0.39	1.6	37.5
.4	.80	2.0	74
.5	1.45	2.5	143
.6	2.35	3.0	235
.8	5.0	3.5	338
1.0	9.1	4.2	509
1.3	20		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.54	2.5	3.0	1.12	19.1	a2.9	26.5	2.35	180	11.3	17.3	1.38
2	1.45	1.06	5.8	.86	7.0	a2.6	20.0	8.3	16.2	8.6	5.7	1.12
3	2.95	.93	3.5	5.9	5.4	a3.5	57	3.6	4.7	9.4	63	.86
4	2.8	1.06	1.06	1.82	3.8	a4.4	91	2.1	325	6.4	21	.76
5	.93	22.5	3.35	.76	3.15	a5.0	29	1.90	99	27.5	8.9	1.36
6	.80	3.6	1.71	.64	2.7	a4.0	14.9	1.81	18.8	10.3	6.3	16.7
7	1.02	24.4	*.84	2.0	2.15	43	13.4	1.72	17.1	7.0	4.7	9.4
8	.64	12.2	24.5	1.41	2.8	16.1	8.4	1.63	18.1	12.2	3.5	12.1
9	.51	27	6.1	12.9	5.2	6.1	160	1.54	17.4	14.5	3.05	80
10	.51	10.7	2.25	3.25	6.2	82	27	4.1	21.5	5.9	2.7	28
11	.80	12.7	1.00	1.26	2.8	12.6	33	12.1	18.1	4.8	2.6	61
12	.72	3.55	.68	.93	1.63	31.5	24.5	1.81	13.6	8.1	3.35	93
13	.60	2.25	.60	8.7	22.5	7.7	12.1	11.7	23	12.3	2.35	43
14	.55	2.7	.55	5.6	28	5.4	45	5.5	77	4.2	1.81	63
15	.55	1.81	.55	2.9	2.6	5.0	14.6	1.54	27.5	4.1	1.54	66
16	.60	13.1	.51	*4.0	1.45	17.2	a15	1.26	12.5	3.8	1.38	121
17	*.58	16.8	.47	1.30	1.45	18.4	a12	14.7	105	3.15	1.32	27.5
18	.86	1.76	1.16	1.00	13.1	33.5	a8.0	6.0	24.5	3.5	1.32	73
19	.72	1.12	3.9	2.1	212	9.2	a130	63	22	4.2	1.38	49
20	.86	6.4	8.1	9.4	156	6.8	a20	8.1	70	4.4	1.32	50
21	.93	10.9	1.38	4.1	127	5.5	a10	2.35	14.3	4.2	2.75	124
22	.68	1.86	1.45	1.78	49	6.0	a9.0	1.32	14.7	3.25	24.5	39.5
23	.76	7.8	.93	3.95	18.7	13.6	a8.0	8.3	29.5	2.35	35.5	24.5
24	16.4	20	.72	7.5	13.9	9.3	a6.5	1.90	12.1	1.90	5.7	20.5
25	2.65	15.6	.80	1.45	10.0	4.7	*5.5	1.19	20	1.81	4.2	16.1
26	5.6	2.7	1.00	3.75	a8.0	3.95	4.8	8.4	95	4.7	3.05	14.3
27	6.0	1.88	.68	235	a6.5	10.8	4.1	13.5	73	23	1.72	32.5
28	8.4	6.4	.55	54	a5.5	5.6	3.5	28	76	10.1	1.19	22.5
29	7.1	6.4	66	39.5	a4.0	13.8	3.15	7.9	26	29	4.7	25.5
30	10.8	6.8	5.7	53	a3.4	86	2.8	-	14.6	*56	5.9	61
31	15.0	9.7	-	19.9	-	488	2.6	-	11.8	-	2.45	-
Total	94.31	477.78	183.94	491.78	745.03	1,039.75	821.35	227.62	1,496.0	301.96	245.28	1,176.58
Mean:												
mgd	3.04	15.4	6.13	15.9	24.8	33.5	26.5	7.85	48.3	10.1	7.91	39.2
cfs	4.70	23.8	9.48	24.6	38.4	51.8	41.0	12.1	74.7	15.6	12.2	60.7
Ac-ft	289	1,470	564	1,510	2,290	3,190	2,520	699	4,590	927	753	3,610

Calendar year 1951: Max 632 Min 0.47 Mean(mgd) 24.9 Mean(cfs) 38.5 Ac-ft 27,900
Fiscal year 1951-52: Max 488 Min 0.47 Mean(mgd) 19.9 Mean(cfs) 30.8 Ac-ft 22,410

Peak discharge (base, 1,500 mgd).--Dec. 31 (4 a.m.) 2,090 mgd (3,230 cfs), 8.66 ft; Mar. 1 (5:30 a.m.) 1,800 mgd (2,790 cfs), 8.05 ft; Mar. 4 (5 p.m.) 3,140 mgd (4,860 cfs), 10.90 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for stations on Left and Right Branches of North Fork Kaukonahua Stream.

South Fork Kaukonahua Stream near Wahiawa

Location.--Lat 21°30'05", long 157°56'50", on right bank at Canon Dam, 5.4 miles east of Wahiawa and 7.7 miles north of Pearl City.

Drainage area.--1.9 sq mi.

Records available.--May 1944 to June 1952.

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

Average discharge.--8 years, 7.06 mgd (10.9 cfs).

Extremes.--Maximum discharge during year, 647 mgd (1,000 cfs) Mar. 4 (gage height, 5.39 ft), from rating curve extended as explained below; minimum, 0.03 mgd (0.05 cfs) July 23, 24.

1944-52: Maximum discharge, 765 mgd (1,180 cfs) Mar. 26, 1951 (gage height, 5.86 ft), from rating curve extended above 15 mgd by test on model of station site; 0.01 mgd (0.02 cfs) Feb. 21, 1945.

Remarks.--Records good except those for periods of no gage-height record and those above 15 mgd, which are fair.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.03	1.0	2.3
.3	.09	1.1	5.5
.4	.17	1.2	9.8
.5	.30	1.4	19.2
.6	.47	1.7	36
.7	.68	2.1	74
.8	.95	2.6	135
.9	1.33		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.14	1.06	4.7	*1.17	*8.2	2.5	8.9	1.37	47	*5.2	*10.1	1.05
2	*.11	.59	9.6	1.12	4.3	2.05	*8.3	3.1	5.7	3.3	4.3	*7.9
3	.16	.53	3.8	1.01	3.6	2.3	12.4	1.50	2.3	6.0	43	.70
4	.30	1.80	2.5	.70	3.0	26	17.9	1.17	67	2.75	10.5	.61
5	.78	14.5	3.95	.55	3.3	3.3	7.6	.98	14.9	27	8.1	1.45
6	2.55	35	1.84	.68	2.5	17.5	5.1	.92	5.5	5.5	5.5	2.75
7	.60	82	2.55	6.0	1.84	10.1	4.3	.83	8.4	5.4	4.3	1.29
8	.16	12.0	14.0	2.75	5.9	7.7	3.6	.75	8.7	10.4	3.6	.92
9	.10	17.8	3.95	16.3	5.5	3.6	28	1.40	7.6	7.3	3.3	14.8
10	.15	8.9	2.3	2.05	3.95	21	5.9	2.15	9.3	5.5	2.75	3.3
11	.15	5.5	1.50	1.25	1.84	8.1	6.8	3.25	9.6	3.5	3.0	5.3
12	.12	3.0	1.73	.86	1.50	18.3	5.5	.90	6.4	10.3	2.75	14.7
13	.09	3.0	1.21	.86	1.63	4.7	4.2	2.05	8.3	14.0	2.3	10.2
14	.08	3.3	1.01	2.0	4.8	3.3	12	1.06	19.3	3.95	2.05	7.6
15	.08	1.84	.89	1.89	1.56	2.75	4.7	1.01	6.8	3.6	1.63	5.1
16	.08	8.0	.80	4.2	1.37	7.5	3.6	.86	4.7	2.75	1.50	24.5
17	.07	6.3	.73	1.10	1.25	7.6	3.2	13	20	2.5	1.37	5.1
18	.05	1.56	3.0	5.3	8.3	11.1	2.5	6.0	7.9	2.5	1.50	12.9
19	.07	3.2	21.5	6.6	75	3.6	65	55	27	2.05	1.41	13.5
20	.39	2.3	3.2	6.5	59	2.75	18	5.0	24	2.5	1.30	11.0
21	.13	3.0	2.05	4.3	34.5	2.3	8.0	2.0	9.5	4.5	3.6	13.2
22	.05	1.25	3.3	3.6	14.4	2.3	6.0	1.1	5.1	3.0	14.3	7.2
23	.03	1.54	1.17	4.7	7.2	5.7	4.5	6.0	5.1	1.84	8.7	6.4
24	.08	3.0	.80	3.4	5.9	3.0	3.5	2.3	3.6	1.56	2.5	4.7
25	.10	4.6	2.1	3.7	4.7	1.84	3.0	.85	4.3	5.2	2.1	3.3
26	1.78	1.72	1.14	3.3	4.3	1.84	2.6	1.9	20	6.0	2.85	4.0
27	11.0	2.75	.73	80	3.6	4.6	2.3	.80	18.6	12.0	1.21	13.4
28	9.2	1.63	.64	20.5	3.0	1.84	1.9	2.5	26.5	7.0	1.01	8.5
29	5.9	4.1	11	14.0	2.75	6.9	1.7	*1.17	7.6	9.6	2.25	17.0
30	3.3	7.2	1.5	21.5	*2.5	28.5	1.5	-	5.1	18.9	4.8	20
31	3.8	19.6	-	9.3	-	135	*1.37	-	4.7	-	1.33	-
Total	41.60	262.57	108.99	231.19	281.19	359.57	263.87	120.72	420.5	195.60	158.91	235.26
Mean:												
mgd	1.34	8.47	3.36	7.46	9.37	11.6	8.51	4.16	13.6	6.52	5.13	7.84
cfs	2.07	13.1	5.62	11.5	14.5	17.9	13.2	6.44	21.0	10.1	7.94	12.1
Ac-ft	128	806	334	709	863	1,100	810	370	1,290	600	488	722

Calendar year 1951: Max 167 Min 0.03 Mean(mgd) 7.78 Mean(cfs) 12.0 Ac-ft 8,710

Fiscal year 1951-52: Max 135 Min 0.03 Mean(mgd) 7.32 Mean(cfs) 11.3 Ac-ft 8,220

Peak discharge (base, 400 mgd).--Dec. 31 (5:30 a.m.) 558 mgd (863 cfs), 5.0 ft; Mar. 4 (3 p.m.) 647 mgd (1,000 cfs), 5.39 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 29, 30, Jan. 12-30, Feb. 17-28; discharge estimated on basis of records for nearby streams.

South Fork Kaukonahua Stream above Wahiawa Reservoir, near Wahiawa

Location.--Lat 21°29'35", long 157°59'55", on right bank 2 miles southeast of Wahiawa and 7.5 miles north of Waipahu.

Drainage area.--5.2 sq mi (revised).

Records available.--October 1946 to June 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 844.51 ft above mean sea level.

Average discharge.--5 years (1947-52), 17.3 mgd (26.8 cfs).

Extremes.--Maximum discharge during year, 560 mgd (866 cfs) Mar. 4 (gage height, 5.65 ft); from rating curve extended above 80 mgd as explained below; maximum gage height, 7.05 ft Dec. 31 (backwater from Wahiawa Reservoir Dam); minimum, 0.52 mgd (0.80 cfs) July 26.

1946-52: Maximum discharge, 2,540 mgd (3,930 cfs) Jan. 16, 1949 (gage height, 12.71 ft), from rating curve extended above 80 mgd by test on model of station site; minimum, 0.48 mgd (0.74 cfs) Oct. 29, 1946.

Revisions.--The maximum discharge for the fiscal year 1951 as published in WSP 1219 is in error. The peak discharge of Aug. 3, 1951, previously considered to be the maximum discharge, has been revised to 850 mgd (1,320 cfs) gage height, 7.47 ft. The maximum discharge for the fiscal year 1951 probably occurred Mar. 26, 1951, discharge not determined (gage height, 11.10 ft, backwater from Wahiawa Reservoir Dam).

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in millions gallons a day)

0.3	0.44	1.3	20.5
.4	.90	1.5	30.5
.5	1.58	1.7	43
.6	2.55	2.0	70
.7	3.7	2.5	131
.8	5.3	3.0	193
.9	7.2	3.5	257
1.1	12.6		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.80	0.75	10	1.4	30.5	5.7	18.8	6.6	68	9.9	21.5	4.0
2	.75	.65	13	1.3	22.5	5.1	15.0	7.5	14.5	8.0	10.4	3.05
3	.75	.80	6.5	1.2	20	5.1	18.3	8.0	5.3	8.7	51	2.85
4	.75	1.44	5.5	.80	18.4	37	30	*6.2	93	6.2	19.2	2.55
5	.75	20.5	7.0	.65	18.4	9.8	16.8	5.7	42	31.5	13.0	3.5
6	.80	6.3	5.0	.70	17.2	19.8	11.2	5.7	12.6	13.9	10.4	8.1
7	.75	162	6.0	3.8	10.6	*15.3	10.4	5.7	16.8	12.9	8.2	5.3
8	.65	20	20	2.4	11.0	11.8	9.0	5.1	26	12.6	7.0	4.0
9	.65	30	12	20	11.2	9.8	40	5.0	26	16.8	6.8	21.5
10	.60	15	5.5	5.0	11.6	38.5	15.1	6.2	30	11.8	6.4	8.2
11	.65	10	4.0	2.05	7.0	14.8	13.7	6.6	25.5	12.0	6.6	9.8
12	.56	7.0	3.5	1.16	5.5	25.5	14.5	2.75	26	18.2	5.9	25
13	.56	6.5	3.2	.96	5.3	11.8	10.9	2.45	24.5	25.5	5.5	19.8
14	.65	7.5	2.9	2.7	8.1	9.3	19.3	3.05	44	12.3	5.0	12.6
15	.80	4.5	2.7	2.2	5.1	8.5	12.6	1.94	21	11.8	4.8	13.0
16	.75	14	2.6	4.4	4.7	14.3	9.3	1.76	18.0	10.6	4.5	31.5
17	*.65	11	2.5	1.80	4.3	18.6	9.0	15.77	29.5	10.1	4.3	10.2
18	.60	4.5	8.0	4.0	13.0	17.3	8.0	10.6	24.5	10.6	4.3	13.8
19	.75	7.0	35	*2.75	11.7	10.5	80	82	19.6	10.4	4.0	18.6
20	1.23	5.5	5.0	19.5	76	8.8	30.5	9.9	*61	10.4	3.7	15
21	.80	6.5	3.5	7.1	51	8.0	15.6	4.7	21.5	12.6	6.5	18
22	.60	3.8	5.0	7.1	26.5	7.7	13.0	2.75	16.4	7.7	11.6	13
23	.56	4.5	2.8	9.4	13.4	11.3	11.2	13.4	16.4	5.7	19.5	12
24	.75	8.0	2.0	8.7	11.2	11.9	10.1	3.55	11.1	4.8	6.4	10
25	.65	10	4.5	3.3	9.8	7.7	9.3	2.45	7.0	5.3	4.8	8.0
26	.56	5.0	2.5	6.5	9.0	6.8	9.0	3.2	34	16.5	5.7	9.0
27	7.0	6.5	2.1	148	7.2	8.6	8.5	2.35	37.5	22	3.55	18
28	16.0	4.5	1.8	63	6.8	7.7	7.7	5.2	42	13.7	3.2	14
29	9.1	9.5	15	37	6.2	7.1	7.5	*2.5	18.7	15.7	4.1	22
30	1.76	18	2.0	47	6.1	29.5	7.0	-	10.4	46	9.8	25
31	1.02	*28	-	33	-	205	6.8	-	9.0	-	4.9	-
Total	53.25	439.24	201.1	448.87	564.6	608.7	498.1	242.55	851.8	414.2	282.55	381.35
Mean	1.72	14.2	6.70	14.5	18.8	19.6	16.1	8.36	27.5	13.8	9.11	12.7
cfs	2.66	22.0	10.4	22.4	29.1	30.3	24.9	12.9	42.5	21.4	14.1	19.6
Ac-ft	163	1,350	617	1,380	1,730	1,870	1,530	744	2,610	1,270	867	1,170
Calendar year 1951: Max	225				0.56	Mean(mgd)	16.3	Mean(cfs)	25.2	Ac-ft	18,220	
Fiscal year 1951-52: Max	205				0.56	Mean(mgd)	13.6	Mean(cfs)	21.0	Ac-ft	15,300	

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 8 to Oct. 10, June 20-30; discharge estimated on basis of records for nearby stations.

Poamoho Stream near Wahiawa

Location.--Lat 21°31'25", long 157°58'55", on left bank just below concrete diversion dam, 3.5 miles northeast of Wahiawa and 9.5 miles north of Waipahu.

Drainage area.--1.8 sq mi.

Records available.--January 1947 to June 1952.

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

Average discharge.--5 years, 3.56 mgd (5.51 cfs).

Extremes.--Maximum discharge during year, 580 mgd (897 cfs) Mar. 4 (gage height, 4.10 ft), from rating curve extended above 26 mgd as explained below; minimum daily, 0.01 mgd (0.02 cfs) Jan. 1.

1947-52: Maximum discharge, 916 mgd (1,420 cfs) Mar. 30, 1947 (gage height, 5.68 ft), from rating curve extended above 26 mgd by test on model of station site; no flow Feb. 4, 5, 1948.

Remarks.--Records good. Poamoho tunnel diverts floodwater into North Fork Kaukonahua Stream about 175 ft above station.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.0	0	0.7	3.6
.1	.03	.8	5.2
.2	.14	1.0	9.8
.3	.37	1.2	16.2
.4	.76	1.4	25.5
.5	1.44	1.6	39.5
.6	2.45		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.24	0.46	1.18	0.66	6.4	0.94	0.01	1.71	21	4.0	3.2	0.54
2	.22	.28	2.05	.50	2.9	.88	3.25	3.95	7.3	3.45	1.53	.50
3	1.90	.24	1.29	4.8	2.35	1.00	11.2	2.0	3.25	3.7	9.8	.46
4	1.35	.83	.54	.93	1.81	5.4	18.6	1.53	30.5	2.9	4.5	.40
5	.76	4.1	1.34	.46	1.62	1.71	6.6	1.36	17.2	8.5	2.8	.48
6	.46	2.55	.66	.37	1.36	*2.7	3.85	1.28	6.4	3.9	2.1	.94
7	.43	16.8	*.40	.33	1.13	11.9	3.65	1.20	5.4	2.9	1.62	1.97
8	.31	2.4	5.4	.62	1.20	5.9	2.8	1.13	5.4	2.8	1.28	4.1
9	.22	5.9	2.25	4.8	1.36	2.5	33	1.06	5.8	3.9	1.20	11.1
10	.20	1.92	.94	1.53	1.81	8.3	8.8	4.9	5.7	2.45	1.06	2.5
11	.18	1.80	.62	1.00	1.20	4.2	7.2	4.3	4.9	2.25	1.13	9.0
12	.16	.76	.54	.58	.82	8.0	5.6	1.28	4.2	3.0	1.13	10.2
13	.16	.71	.43	8.8	3.7	3.0	3.75	12.0	4.5	4.3	.94	4.3
14	.16	1.13	.37	1.81	6.3	1.27	17.4	3.3	14.0	2.1	.88	6.2
15	.18	.58	.31	1.98	1.71	.22	6.4	1.81	7.1	1.71	.76	10.1
16	.16	3.0	.28	*1.38	1.06	.20	4.4	1.20	4.0	1.71	.76	13.0
17	*.20	5.0	.24	.76	.94	.18	6.3	4.6	20.5	1.62	.71	3.3
18	.18	.82	1.95	.62	3.8	.18	3.35	2.65	7.2	1.53	.76	7.4
19	.20	.62	5.2	.62	9.2	.14	35.5	12.9	6.9	1.53	.76	5.4
20	.20	1.70	2.45	3.85	6.2	.14	11.4	3.35	*7.7	1.36	.71	6.3
21	.16	2.5	.71	1.39	4.3	.12	5.2	2.0	3.6	2.6	1.58	6.2
22	.18	.71	.88	.82	.28	.11	4.7	1.44	4.2	2.25	3.9	4.7
23	.22	1.21	.58	1.09	.22	.11	3.35	3.3	6.9	1.36	9.5	2.8
24	2.5	2.9	.37	1.80	.22	.09	3.0	1.53	3.45	1.13	1.64	2.25
25	.85	3.1	.31	.66	.20	.08	2.65	1.28	4.9	1.06	1.00	1.81
26	.31	.71	.31	.71	1.04	.08	2.45	10.2	30.5	1.71	.76	1.62
27	.79	.50	.24	15.0	1.44	.07	2.35	6.3	20.5	3.9	.68	1.81
28	.50	.46	.24	11.8	1.28	.07	2.25	9.5	25.5	1.71	.62	2.25
29	1.11	.50	8.4	11.4	1.06	.07	2.1	6.2	8.8	3.7	.68	2.55
30	.76	.70	2.0	17.7	1.00	.09	1.91	-	5.2	*5.8	.82	7.4
31	.66	2.45	-	7.0	-	15.0	1.71	-	4.4	-	.66	-
Total	15.91	67.14	42.49	106.37	69.91	74.65	224.73	109.86	306.90	84.83	59.23	131.56
Mean mgd	0.513	2.17	1.42	3.43	2.33	2.41	7.25	3.79	9.90	2.83	1.91	4.39
cfs	0.794	3.36	2.20	5.31	3.61	3.73	11.2	5.86	15.3	4.38	2.96	6.79
Ac-ft	49	206	130	326	215	229	690	337	942	260	182	404

Calendar year 1951: Max 76 Min 0.07 Mean(mgd) 4.60 Mean(cfs) 7.12 Ac-ft 5,150
 Fiscal year 1951-52: Max 35.5 Min 0.01 Mean(mgd) 3.53 Mean(cfs) 5.46 Ac-ft 3,970

Peak discharge (base, 130 mgd)--Dec. 31 (3 a.m.) 348 mgd (538 cfs), 3.45 ft; Mar. 4 (7 p.m.) 580 mgd (897 cfs), 4.10 ft.

* Discharge measurement made on this day.

Pearl Harbor Springs at Waiawa, near Pearl City

Location.--Lat 21°23'35", long 157°59'10", on right bank at rear of Oahu Sugar Co.'s pumping plant 9, 0.7 mile west of Pearl City and 9.8 miles northwest of Honolulu.

Records available.--March 1931 to June 1934, July 1937 to June 1952.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 0.73 ft below mean sea level.

Average discharge.--18 years (1931-34, 1937-52), 12.1 mgd (18.7 cfs), unadjusted for pumpage.

Extremes.--1931-34, 1937-52: Maximum daily discharge, 18.7 mgd (28.9 cfs) Feb. 27, 1949; minimum daily, 6.0 mgd (9.3 cfs) on several days in 1941 and 1947.

Remarks.--Records good. Oahu Sugar Co.'s pump 9 diverts about 3 mgd at times when water is needed for irrigation of sugarcane. Surface runoff from floods not included in figures of discharge given below.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.6	14.8	14.3	14.8	15.2	15.6	15.6	16.0	15.6	15.6	14.3	14.3
2	15.6	14.8	14.3	14.8	15.2	15.6	15.6	16.0	14.8	15.6	14.3	11.3
3	15.6	14.8	14.3	14.8	15.2	14.3	15.6	16.4	15.2	15.2	14.3	11.6
4	15.6	14.8	14.8	14.8	15.6	12.3	15.6	16.0	15.2	15.2	14.3	13.5
5	15.6	14.8	14.8	14.3	15.6	12.3	15.6	15.6	15.2	15.2	14.3	13.9
6	15.6	14.8	14.3	14.8	15.6	12.7	15.6	15.6	15.2	15.2	14.3	12.7
7	15.6	14.8	13.9	14.8	15.6	14.3	15.2	15.6	15.2	15.2	*14.3	13.5
8	15.6	14.3	13.9	14.8	15.6	15.6	15.2	15.2	15.2	14.8	14.8	14.3
9	15.6	14.8	13.9	14.8	15.6	16.0	15.2	15.2	14.8	14.8	14.8	11.6
10	15.6	14.8	14.3	14.8	15.6	15.6	15.2	16.0	14.8	13.5	14.8	12.3
11	13.9	14.8	14.3	14.8	15.6	15.6	15.2	15.6	14.8	14.8	14.8	12.7
12	12.7	14.8	14.8	14.8	15.6	15.6	15.2	15.2	14.8	13.1	12.0	12.3
13	13.1	14.8	14.3	14.8	15.6	*15.6	15.2	15.2	14.8	14.3	11.3	12.3
14	15.2	14.8	14.3	14.8	15.2	15.2	15.2	15.6	14.8	12.0	13.1	13.9
15	15.2	14.3	14.3	12.0	15.2	15.2	15.2	15.6	14.8	13.1	12.7	13.9
16	*15.2	14.3	14.8	11.6	15.2	15.6	15.2	15.6	15.2	13.5	13.1	12.3
17	15.2	14.3	14.8	11.6	15.6	15.6	14.8	15.6	15.2	13.1	12.7	12.7
18	14.8	14.3	14.8	12.7	15.6	16.0	14.8	15.2	15.2	14.3	14.8	13.1
19	15.2	14.8	14.8	*14.3	15.6	15.6	14.8	15.2	15.2	13.9	13.1	12.0
20	14.8	14.8	14.8	14.3	15.6	15.6	14.8	15.2	15.2	14.3	13.1	12.3
21	14.8	14.8	14.8	14.3	16.0	16.0	15.2	14.3	15.6	14.3	12.7	12.3
22	15.2	14.8	14.8	14.8	16.0	16.0	15.2	12.0	15.6	14.3	11.6	13.9
23	15.2	14.3	15.2	14.8	16.0	16.0	15.2	15.6	15.6	12.0	11.6	13.1
24	15.2	14.3	15.2	14.8	16.0	16.0	15.2	15.6	15.6	12.7	12.3	12.3
25	15.2	14.3	15.2	14.8	16.0	16.0	15.2	15.2	15.6	14.3	14.8	11.6
26	15.2	14.8	14.8	14.8	16.0	16.0	15.2	15.2	15.2	14.3	11.6	13.1
27	14.8	14.8	14.8	14.8	15.6	16.0	15.2	15.2	15.2	15.2	11.3	12.7
28	14.8	14.8	14.8	14.8	14.3	15.6	15.6	14.8	15.6	14.8	11.3	12.7
29	14.8	14.3	14.8	14.8	13.9	15.6	16.0	15.2	15.6	14.3	11.3	12.3
30	15.2	14.3	14.8	15.2	13.5	15.6	15.6	-	13.0	14.3	11.6	12.3
31	15.2	*14.3	-	15.2	-	16.0	*16.0	-	16.0	-	12.3	-
Total	466.9	453.3	438.0	446.3	462.9	474.7	474.4	444.7	472.8	427.2	407.6	382.8
Mean:	15.1	14.6	14.6	14.4	15.4	15.3	15.3	15.3	15.3	14.2	13.1	12.8
mgd	23.4	22.6	22.6	22.3	23.8	23.7	23.7	23.7	23.7	22.0	20.3	19.8
cfs	1,430	1,390	1,340	1,370	1,420	1,460	1,460	1,360	1,450	1,310	1,250	1,170
Ac-ft												
Calendar year 1951: Max	16.0			Min	10.6	Mean(mgd)	14.5	Mean(cfs)	22.4	Ac-ft	16,270	
Fiscal year 1951-52: Max	16.4			Min	11.3	Mean(mgd)	14.6	Mean(cfs)	22.6	Ac-ft	16,410	

* Discharge measurement made on this day.

Morikone pond outlet at Pearl City

Location.--Lat 21°23'31", long 157°59'10", on left bank of Waiawa Springs flow, 0.7 mile west of Pearl City, 1.5 miles east of Waipahu, and 9.8 miles northwest of Honolulu.

Records available.--August 1951 to June 1952.

Gage.--Water-stage recorder and submerged orifice control.

Extremes.--Maximum daily discharge during period, 1.99 mgd (3.08 cfs) Oct. 31; minimum daily, 0.06 mgd (0.09 cfs) Nov. 17.

Remarks.--Records fair.

Discharge, in million gallons a day, August 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		-	1.03	<u>0.68</u>	<u>1.82</u>	1.30	1.32	0.84	0.77	0.57	a0.69	0.47
2		-	1.01	.70	1.53	1.41	1.08	.62	1.23	.61	a.75	.53
3		-	1.02	.73	1.30	a1.43	1.01	<u>.54</u>	.78	.59	a.68	.51
4		-	.98	.84	1.35	a.99	.98	<u>.84</u>	.95	.64	a.79	.49
5		-	.96	.78	1.33	a.90	1.35	.73	1.02	.65	a.76	.52
6		-	1.05	.77	1.30	a.85	1.32	.66	.55	.63	a.70	.30
7		-	1.03	.78	1.25	a.79	1.28	.92	.61	.63	a.68	.33
8		-	1.14	.83	1.19	.88	1.34	1.15	.81	.57	a.39	.57
9		-	.98	.80	1.20	.67	1.36	1.20	1.12	.57	.44	<u>1.12</u>
10		-	1.09	.83	1.36	1.36	1.31	1.00	1.16	.62	.66	.47
11		-	1.08	.80	1.42	1.28	1.32	.91	<u>1.25</u>	.63	.72	.53
12		-	1.16	.82	1.48	1.46	1.32	.98	1.16	.61	.69	.73
13		-	1.03	.80	1.55	1.08	1.21	.91	1.07	.52	.54	.54
14		-	1.06	.87	1.72	1.25	1.29	.72	1.03	<u>.51</u>	.61	.54
15		-	1.02	.95	1.49	a1.09	1.30	.58	.92	<u>.58</u>	.58	.62
16		-	.90	.96	1.56	a.90	1.25	.64	1.06	.61	.57	.70
17		-	.84	1.05	<u>.06</u>	a1.50	1.19	.78	1.09	.63	.47	1.00
18		-	<u>1.74</u>	1.05	1.61	.73	1.20	1.12	1.01	.68	.46	.90
19		-	1.19	.94	1.30	.93	1.64	1.39	.95	.65	.47	.89
20		-	1.14	1.02	1.20	.90	1.60	1.03	1.08	<u>.79</u>	.51	.65
21		-	.82	.96	.85	1.01	.87	<u>1.47</u>	.73	.76	.46	.31
22		-	.79	.96	.90	.86	1.08	1.06	.62	.72	.53	.33
23		-	.73	.92	.81	.77	1.65	.93	.66	.71	.51	.44
24		-	.69	1.04	.98	.62	1.05	.92	.63	.68	.51	.27
25		-	.68	1.12	1.15	<u>.59</u>	<u>1.78</u>	1.08	.63	.66	.49	.37
26		-	.67	1.00	1.15	.77	1.65	1.10	.62	.63	.48	.37
27		-	<u>.66</u>	1.31	1.38	.87	1.43	.96	.52	.59	.47	.29
28		-	.69	1.89	1.12	.97	.98	1.00	.57	.64	.42	.25
29		-	.70	1.38	1.26	1.42	.89	.84	.60	a.70	.45	.26
30		-	.67	1.60	1.14	1.31	.61	-	.60	a.61	.43	.27
31		0.92	-	<u>1.99</u>	-	1.40	<u>.73</u>	-	.61	-	.42	-
Total		-	75.15	31.17	37.76	32.51	38.59	26.92	26.41	18.99	17.33	15.37
Mean:		-										
mgd		-	0.358	1.01	1.26	1.05	1.24	0.928	0.852	0.633	0.559	0.512
cfs		-	1.45	1.56	1.95	1.62	1.92	1.44	1.32	0.979	0.865	0.792
Ac-ft		-	88	96	116	100	118	83	81	58	53	47
Calendar year	: Max					Mean(mgd)		Mean(cfs)			Ac-ft	
Fiscal year	: Max					Mean(mgd)		Mean(cfs)			Ac-ft	

a No gage-height record; discharge estimated on basis of probable increase or decrease in flow.

Pearl Harbor Springs at Kaluaooopu, near Pearl City

Location.--Lat 21°23'30", long 157°57'55", on right bank of stream 0.2 mile below Kamehameha Highway, 0.7 mile east of Pearl City, and 8.7 miles northwest of Honolulu.

Records available.--August 1931 to June 1937, November 1943 to October 1947, February to June 1952.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 0.15 ft above mean sea level.

Extremes.--Not determined because of incomplete record.

Remarks.--Records fair.

Discharge, in million gallons a day, February to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1								-	4.0	0.58	-	1.61
2								-	.94	.29	-	.94
3								-	.20	.13	-	1.07
4								-	1.46	.29	-	1.61
5								-	4.0	.47	-	1.61
6								-	1.76	1.91	-	1.46
7								-	1.61	.13	-	1.07
8								-	3.85	1.33	1.61	1.20
9								27	1.91	1.46	1.46	.94
10								22.5	.07	2.9	1.46	1.07
11								20.5	.69	4.5	2.4	1.07
12								22.5	.58	2.25	1.46	1.20
13								21	.81	4.3	2.05	.81
14								-	.81	2.25	1.33	1.07
15								-	1.91	2.4	1.61	2.25
16								27	3.85	3.1	1.61	.81
17								21.5	.94	2.75	1.33	.81
18								17.5	4.0	-	1.76	1.07
19								18.4	2.4	-	1.61	1.07
20								-	4.9	-	1.91	.81
21								-	1.46	-	1.76	.69
22								-	2.4	-	1.76	1.61
23								20.5	2.25	-	2.05	.58
24								13.9	.13	-	.81	.47
25								5.1	.07	-	.81	.47
26								7.2	.13	-	.81	.94
27								1.76	1.20	-	1.61	.81
28								0	.69	-	1.61	1.07
29								1.20	1.76	-	1.61	1.46
30								-	3.1	-	.81	.94
31								-	.29	-	1.07	-
Total								-	54.17	-	-	32.59
Mean:								-	1.75	-	-	1.09
mgd								-	2.71	-	-	1.69
cfs								-	166	-	-	100
Ac-ft								-		-	-	
Calendar year	: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft			
Fiscal year	: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft			

Note.--Data insufficient to compute discharge for days for which no figures are given.

Waimalu Stream near Aiea

Location.--Lat 21°23'35", long 157°57'05", on right bank of stream just downstream from bridge on Moanalua Highway, 1.5 miles northwest of Aiea and 1.6 miles east of Pearl City.

Drainage area.--6.1 sq mi.

Records available.--January to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 5 ft (from topographic map).

Extremes.--Maximum discharge during period, 860 mgd (1,330 cfs) Mar. 26 (gage height, 6.27 ft); minimum, 0.01 mgd (0.02 cfs) Jan. 18.

Remarks.--Records good.

Rating table, Jan. 18 to June 30, 1952 (gage height, in feet,
and discharge, in million gallons a day)
(Shifting-control method used Mar. 6-26)

0.2	0.21	0.8	10.4
.3	.66	1.0	19.7
.4	1.48	1.2	33.5
.5	2.75	1.5	64
.6	4.6	1.8	107

Discharge, in million gallons a day, January to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1							-	1.14	3.1	1.22	0.66	1.72
2							-	.98	2.95	.90	.49	1.38
3							-	1.06	3.65	.90	26.5	1.22
4							-	1.06	32.5	1.24	20.5	.98
5							-	.90	26.5	2.05	*6.1	1.06
6							-	.98	4.7	2.45	3.3	1.14
7							-	1.22	1.85	1.14	1.46	1.14
8							-	1.30	1.59	.74	1.06	1.22
9							-	1.22	1.48	.82	.49	2.05
10							-	.98	2.95	.54	.54	1.99
11							-	.98	2.75	.54	.44	3.95
12							-	1.14	2.95	.49	.54	4.5
13							-	1.06	2.25	1.16	.66	3.1
14							-	7.4	*8.4	1.06	.82	2.35
15							-	4.2	4.1	.54	.60	3.3
16							-	1.59	1.85	.82	.66	9.6
17							-	6.8	3.95	.98	.44	4.9
18							0.39	2.75	4.0	.82	.34	4.3
19							104	*97	1.46	.82	.44	6.7
20							22.5	15.4	5.3	.54	6.4	6.8
21							*7.4	5.5	1.22	.54	.39	13.5
22							4.4	3.5	.60	.34	.96	7.6
23							3.3	3.05	.44	.44	12.3	3.75
24							2.5	2.6	.49	.34	1.75	*2.15
25							2.25	2.35	.39	.49	.82	1.06
26							1.98	2.1	59	.49	.82	.74
27							1.38	1.98	23.5	.44	.95	.74
28							1.30	2.5	12.3	.49	.90	1.14
29							1.30	2.35	4.8	.82	.74	2.05
30							1.22	-	2.5	.66	1.13	4.0
31							1.14	-	1.46	-	1.59	-
Total							-	175.09	224.96	24.82	94.79	100.13
Mean:							-	-	-	-	-	-
mgd							-	6.04	7.26	0.827	3.06	3.34
cfs							-	9.35	11.2	1.28	4.73	5.17
Ac-ft							-	537	690	76	291	307

Calendar year	: Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft
Fiscal year	: Max	Min	Mean(mgd)	Mean(cfs)	Ac-ft

* Discharge measurement made on this day.

Pearl Harbor Springs at Kalauao, near Aiea

Location.--Lat 21°23'05", long 157°56'47", on left bank 900 ft downstream from Oahu Sugar Co.'s pump 6, 1.1 miles west of Aiea, and 7.6 miles northwest of Honolulu.

Records available.--March 1931 to June 1952.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1.38 ft below mean sea level.

Average discharge.--21 years, 16.0 mgd (24.8 cfs), unadjusted for pumpage.

Extremes.--1931-52: Maximum daily discharge, 25 mgd (39 cfs) Feb. 17-26, 1938; minimum daily, 7.2 mgd (11.1 cfs) Aug. 25, Sept. 2, 1947.

Remarks.--Records good. When water is needed for irrigation of sugarcane, Oahu Sugar Co.'s pump 6 diverts about 7 mgd as a high-lift pump or 9 mgd as a low-lift pump. Surface runoff from floods not included in figures of discharge given below.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	21.5	13.8	13.3	21	21	21	22.5	21.5	19.8	18.5	15.4	18.5
2	18.0	14.2	19.4	21	21	21	22.5	21	20.5	18.5	15.4	15.4
3	18.5	14.2	21	17.6	21	16.7	22.5	21	16.7	18.5	15.9	18.0
4	21.5	15.4	18.0	17.2	21	16.3	22	19.0	16.7	18.0	20.5	17.2
5	16.3	19.0	18.5	16.7	21	16.3	22	16.3	19.8	18.0	*16.3	16.7
6	16.7	13.8	17.6	17.2	21	16.3	22	18.0	20.5	21	14.2	16.7
7	21.5	15.9	16.3	21	21	17.2	22	19.0	19.8	21	14.2	16.7
8	20.5	15.9	17.6	17.2	21	21	22	18.5	19.8	21	15.9	18.0
9	15.8	14.2	19.0	15.8	21	19.0	22	21	19.8	21	15.9	13.8
10	16.3	18.0	14.2	16.7	21	19.4	22	21	19.4	21	17.6	15.0
11	15.4	17.6	13.8	20.5	21	18.0	22	20.5	19.4	21	17.2	14.6
12	15.0	18.5	12.5	19.8	21	21	22	20.5	19.4	18.0	16.3	14.2
13	15.4	14.2	12.5	20.5	21	21	22	17.6	14.6	21	15.4	14.2
14	17.6	14.2	15.0	20.5	21	21.5	22	17.6	*16.3	16.3	16.7	16.3
15	19.0	14.6	20.5	16.7	21	21.5	22	17.6	18.0	16.3	16.3	18.0
16	15.0	13.8	19.0	19.5	21	21.5	22	20.5	20.5	16.3	16.3	15.4
17	15.9	13.8	15.9	15.4	21	21.5	22	20.5	17.6	15.9	15.9	15.9
18	15.9	15.4	15.4	13.8	21	21.5	22	19.0	21	15.9	18.0	17.6
19	14.2	18.0	14.6	13.3	21	21.5	23	20.5	21	15.9	15.4	13.3
20	13.3	13.8	17.6	17.6	21	21.5	23	19.8	18.0	17.6	15.0	15.0
21	15.4	13.8	17.6	19.8	21	21	22.5	19.8	21.5	18.0	15.0	16.3
22	19.0	14.2	17.2	14.2	21	21.5	22.5	20.5	18.5	20.5	15.0	19.4
23	14.6	14.2	17.2	13.3	21	22	22.5	20.5	20.5	17.6	15.9	15.0
24	14.2	14.2	16.7	13.3	21	22	22.5	20.5	17.6	18.0	15.9	15.4
25	14.6	16.3	20.5	14.2	21	22	22.5	20.5	21	18.0	18.0	15.9
26	14.2	18.5	20.5	13.3	21	19.4	22.5	19.8	17.6	20.5	15.4	17.2
27	14.6	14.2	16.7	19.0	21	18.0	22	17.2	21	18.5	15.9	16.7
28	15.9	14.2	20.5	21.5	18.0	19.8	22	16.3	18.0	18.0	15.0	16.7
29	19.0	13.8	21	22	17.6	22	22.5	19.4	18.0	17.6	15.0	18.0
30	14.6	13.8	21	21	18.5	22	22	-	21	17.6	15.9	14.6
31	14.2	13.8	-	21	-	22.5	19.4	-	19.8	-	15.9	-
Total	511.6	469.3	520.6	550.7	621.1	626.9	686.4	564.9	593.1	555.0	498.7	485.7
Mean, mgd	16.5	15.1	17.4	17.8	20.7	20.2	22.1	19.5	19.1	18.5	16.0	16.2
cfs	25.5	23.4	26.9	27.5	32	31.3	34.2	30.2	29.6	28.6	24.8	25.1
Ac-ft	1,570	1,440	1,600	1,690	1,910	1,920	2,110	1,730	1,820	1,700	1,520	1,490
Calendar year 1951: Max	23			Min	12.5	Mean(mgd)	18.3	Mean(cfs)	28.3	Ac-ft	20,470	
Fiscal year 1951-52: Max	23			Min	12.5	Mean(mgd)	18.3	Mean(cfs)	28.3	Ac-ft	20,500	

* Discharge measurement made on this day.

ISLAND OF OAHU

Moanalua Stream near Honolulu

Location.--Lat 21°22'50", long 157°52'20", on left bank 5 miles upstream from mouth and 5 miles north of Honolulu Post Office.

Drainage area.--2.8 sq mi.

Records available.--June 1926 to June 1952.

Gage.--Water-stage recorder and concrete weir. Datum of gage is 339.12 ft above mean sea level (city and county of Honolulu benchmark).

Average discharge.--26 years, 2.12 mgd (3.28 cfs).

Extremes.--Maximum discharge, 945 mgd (1,460 cfs) Mar. 26 (gage height, 7.26 ft), from rating curve extended as explained below; no flow for most of year.
1926-52: Maximum discharge, 2,960 mgd (4,580 cfs) Nov. 18, 1930 (gage height, 11.58 ft), from rating curve extended above 71 mgd by test on model of station site; no flow at times each year.

Remarks.--Records good except those above 71 mgd, which are fair. Continuous records of rainfall are obtained at station.

Revisions (fiscal years).--WSF 935: 1931(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

-0.2	0	0.6	2.85
-1	.01	1.8	5.7
0.0	.03	1.0	10.2
.1	.10	1.5	27
.2	.30	2.0	55
.3	.63	2.5	91
.4	1.13	2.8	121
.5	1.86		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1		0		0	1.52	0	9.8	0.02	0.39	0.44	0	0
2		0		0	.49	0	4.6	.02	.79	.25	0	0
3		0		0	.10	0	2.5	.02	.23	.13	14.4	0
4		0		0	.03	0	1.78	.01	34	.06	6.2	0
5		0		0	.02	0	1.13	0	11.1	.05	*1.43	0
6		0		0	.02	0	.59	0	3.45	.04	.43	0
7		5.9		0	0	0	.35	0	1.70	.04	.10	0
8		.03		0	0	0	.17	0	1.01	.03	.03	0
9		0		0	0	0	11.1	0	.86	.03	.02	0
10		0		0	0	1.70	3.95	0	.76	.02	.01	0
11		0		0	0	1.71	1.86	0	.59	.02	0	0
12		0		0	0	13.9	1.20	0	.51	.01	0	0
13		0		0	0	*2.65	.71	0	.67	0	0	0
14		0		0	0	.87	2.05	2.15	3.9	0	0	0
15		0		0	0	.35	1.86	.35	1.78	0	0	0
16		.56		0	0	.90	1.01	.01	.91	0	0	.45
17		.17		0	0	7.8	.59	4.1	3.85	0	0	.08
18		0		0	0	4.7	.35	.88	2.2	0	0	0
19		0		0	7.0	1.82	59	45	1.01	0	0	0
20		0		0	16.2	.81	15.6	7.7	1.08	0	0	0
21		0		0	7.8	.35	5.7	1.90	*.68	0	0	4.8
22		0		0	2.55	.12	2.85	1.05	.41	0	1.31	1.75
23		0		0	.99	.05	1.47	1.12	.28	0	.47	.49
24		0		0	.34	.04	.81	.48	.10	0	.01	.14
25		0		0	.10	.03	.48	.23	.08	0	0	.04
26		0		0	.05	.02	.30	.13	.71	0	0	.02
27		0		14.4	.03	.02	.15	.05	*14.9	0	0	.01
28		0		5.0	.02	.02	.06	.03	4.9	0	0	.01
29		0		8.9	.02	.01	.04	.02	2.35	0	0	0
30		0		14.4	.01	8.5	.03	-	1.20	0	0	0
31		0		3.85	-	121	.02	-	.71	-	0	-
Total	0	6.66	0	46.55	37.29	167.37	132.11	62.27	167.38	1.12	24.41	7.77
Mean:	0	0.215	0	1.50	1.24	5.40	4.26	2.15	5.40	0.037	0.787	0.259
mgd	0	0.333	0	2.32	1.92	8.36	6.59	3.33	8.36	0.057	1.22	0.401
cfs	0	20	0	143	114	514	405	191	514	3.4	75	24
Ac-ft	0											

Calendar year 1951: Max 208 Min 0 Mean(mgd) 2.91 Mean(cfs) 4.50 Ac-ft 3,260
Fiscal year 1951-52: Max 121 Min 0 Mean(mgd) 1.78 Mean(cfs) 2.75 Ac-ft 2,000

Peak discharge (base, 150 mgd).--Dec. 31 (2:30 a.m.) 630 mgd (975 cfs), 6.18 ft; Jan. 19 (11 a.m.) 370 mgd (572 cfs), 4.64 ft; Feb. 19 (3 a.m.) 400 mgd (619 cfs), 4.83 ft; Mar. 4 (2 p.m.) 670 mgd (1,040 cfs), 6.39 ft; Mar. 26 (8 p.m.) 945 mgd (1,460 cfs), 7.26 ft.
* Discharge measurement made on this day.

Kalihi Stream near Honolulu

Location.--Lat 21°22'00", long 157°50'45", on right bank at Kioi Pool, 0.4 mile upstream from Catholic Orphanage and 4.1 miles north of Honolulu Post Office.

Drainage area.--2.7 sq mi.

Records available.--September 1913 to June 1952.

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

Average discharge.--35 years (1916-20, 1921-52), 4.68 mgd (7.24 cfs).

Extremes.--Maximum discharge during year, 1,060 mgd (1,640 cfs) Mar. 26 (gage height, 9.52 ft), from rating curve extended as explained below; minimum, 0.20 mgd (0.31 cfs) July 5.

1913-52: Maximum discharge, 10,900 mgd (16,900 cfs) Nov. 18, 1930 (gage height, 13.81 ft), from rating curve extended above 220 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) Oct. 22, 1933.

Remarks.--Records good except those above 220 mgd, which are fair. Water for domestic use diverted from stream above station.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

2.0	0.08	2.9	16.2
2.1	.40	3.5	38
2.2	1.08	4.0	63
2.3	2.2	5.0	134
2.4	3.9		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.51	0.35	0.70	1.17	5.0	1.70	11.6	2.65	5.0	2.95	1.59	1.27
2	.45	.35	.84	.84	3.7	1.59	8.2	2.95	3.3	2.65	1.48	1.17
3	.63	.51	.63	.84	2.8	1.59	6.4	2.2	2.65	4.0	25.5	1.08
4	.57	.40	.51	.70	2.35	2.55	6.0	2.05	32.5	2.65	7.2	1.08
5	.51	1.34	.51	.63	2.05	1.59	4.8	2.05	10.9	3.3	3.9	1.08
6	.51	1.01	.40	.84	1.93	1.59	4.4	2.05	5.7	2.5	3.3	1.27
7	.45	14.3	.64	1.39	1.59	1.70	3.9	1.81	4.4	2.95	2.5	1.17
8	.40	2.5	1.36	.84	1.81	2.6	3.3	1.70	3.7	2.65	2.2	1.08
9	.40	1.93	.70	2.05	1.70	1.81	12.9	1.59	4.4	2.5	2.05	2.4
10	.40	1.59	.57	1.17	1.59	*4.9	5.7	2.6	3.3	2.8	1.81	1.37
11	.40	1.17	*.62	1.00	1.37	4.6	4.6	2.7	3.5	2.35	1.93	1.99
12	.35	.84	.70	.77	1.17	25.5	3.7	2.05	*3.1	2.2	1.81	3.7
13	.35	.84	.57	.77	1.27	6.0	3.3	4.0	3.3	2.2	1.59	2.5
14	.35	.77	.51	.70	1.17	4.1	5.0	5.2	5.0	1.93	1.59	2.05
15	.45	.63	.51	1.25	1.08	3.5	3.5	4.1	3.7	1.93	1.48	1.93
16	.51	2.25	.51	.92	1.08	4.8	3.1	2.5	2.95	2.35	1.48	6.5
17	.77	1.93	.51	.63	1.08	6.2	2.8	7.7	6.6	2.05	1.48	3.5
18	.45	1.08	.40	.57	2.25	5.9	2.65	5.0	4.6	1.81	1.81	6.0
19	.89	1.00	.45	.63	10.8	4.4	79	54	3.9	1.59	1.37	5.0
20	*.62	1.27	.45	2.05	15.0	3.5	17.1	8.5	4.4	1.59	1.37	4.4
21	.45	1.08	.89	1.37	13.0	2.95	8.0	5.0	3.7	1.59	1.37	8.8
22	.40	.77	.84	.96	6.7	2.65	6.4	5.0	3.1	1.70	6.6	5.5
23	.40	.77	.51	.77	4.4	3.1	*5.3	4.4	2.8	1.48	4.4	3.7
24	.45	.70	.45	.70	.71	2.5	4.6	3.5	2.5	1.48	2.2	2.95
25	.40	.70	.45	.63	2.65	2.2	3.9	2.95	2.35	1.48	1.81	2.5
26	.40	.57	.40	.63	2.65	2.2	3.7	3.3	6.0	1.93	1.59	2.2
27	.40	.57	.45	25.5	2.2	2.05	3.3	2.95	11.3	2.05	1.48	2.5
28	.40	.57	.40	8.8	1.93	2.2	3.1	2.95	5.7	1.59	1.48	2.5
29	.40	.51	6.9	10.7	1.81	2.05	2.95	2.8	4.4	*1.59	1.48	2.5
30	.45	.57	1.81	29	1.70	10.4	2.8	-	3.7	2.1	1.37	3.3
31	.40	1.27	-	7.8	-	13.9	2.5	-	3.3	-	1.27	-
Total	14.52	43.94	25.19	104.62	100.95	255.42	238.50	150.75	219.75	65.94	92.49	86.99
Mean:												
mgd	0.468	1.42	0.840	3.37	3.36	8.24	7.69	5.20	7.09	2.20	2.98	2.90
cfs	0.724	2.20	1.50	5.21	5.20	12.7	11.9	8.05	11.0	3.40	4.61	4.49
Ac-ft	45	135	77	321	310	784	732	463	674	202	284	267

Calendar year 1951. Max 202 Min 0.31 Mean(mgd) 4.84 Mean(cfs) 7.49 Ac-ft 5,420
Fiscal year 1951-52: Max 133 Min 0.31 Mean(mgd) 3.82 Mean(cfs) 5.91 Ac-ft 4,290

Peak discharge (base, 400 mgd).--Dec. 31 (5 a.m.) 600 mgd (928 cfs), 8.00 ft; Feb. 19 (7 a.m.) 470 mgd (727 cfs), 7.36 ft; Mar. 4 (3:30 p.m.) 450 mgd (696 cfs), 7.27 ft; Mar. 26 (8 p.m.) 1,060 mgd (1,640 cfs), 9.52 ft.

* Discharge measurement made on this day.

Nuuanu Stream below reservoir 2 wasteway, near Honolulu

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

Drainage area--3.4 sq mi.

Records available--October 1913 to June 1952.

Gage--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level. Prior to Sept. 7, 1915, staff gage at same site at datum 0.03 ft lower. Sept. 7, 1915, to Apr. 4, 1918, staff gage at same site and datum.

Average discharge--33 years (1917-20, 1922-52), 5.00 mgd (7.74 cfs).

Extremes--Maximum discharge during year, 811 mgd (1,250 cfs) Mar. 4 (gage height, 5.75 ft), from rating curve extended as explained below; minimum, 1.04 mgd (1.61 cfs) Oct. 19. 1913-52: Maximum discharge, 4,520 mgd (6,990 cfs) Jan. 16, 1921 (gage height, 8.74 ft, from floodmarks), from rating curve extended above 300 mgd by test on model of station site; minimum, 0.06 mgd (0.09 cfs) Sept. 10, 11, 1925.

Remarks--Records good except those affected by debris, which are fair. Reservoirs 2, 3, and 4 (capacities, 21, 34, and 1,630 acre-ft, respectively) regulate flow only when cleaning reservoirs. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Revisions (fiscal years)--WSP 985: 1921-35(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 31				Jan. 1 to June 30			
0.4	0.90	1.2	6.5	0.6	1.90	1.3	9.7
.5	1.25	1.5	14.9	.8	2.95	1.7	23
.7	2.1	2.0	37.5	1.0	4.1	2.0	37.5
1.0	3.65	2.8	89	1.1	5.2	2.5	68
1.1	4.6						

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.3	1.57	a1.8	c1.54	2.75	g2.15	9.4	5.6	9.2	5.1	2.85	2.1
2	2.3	1.57	a1.85	c1.54	2.4	c2.1	7.2	5.6	5.4	5.1	2.9	2.0
3	2.45	1.57	a1.7	c1.71	2.2	2.25	7.0	5.1	5.6	c6.2	16.8	2.0
4	2.3	1.70	*a1.6	c1.54	2.0	*3.0	8.0	5.0	68	c4.8	5.6	1.90
5	2.25	2.4	1.57	c1.39	1.96	2.05	7.2	5.0	13.0	c5.0	3.7	2.05
6	2.2	3.2	1.45	c1.39	1.92	2.35	7.2	4.7	8.2	c4.6	3.6	2.05
7	2.1	14.9	1.57	c1.71	1.96	3.35	7.2	3.8	7.4	c4.9	3.15	2.2
8	2.05	2.5	2.2	c1.54	1.96	3.5	7.2	3.75	7.2	c4.3	3.0	2.0
9	2.0	2.3	1.65	c2.2	2.3	2.35	c19.4	3.8	7.2	c4.4	2.95	3.7
10	2.0	2.1	1.53	c1.54	2.25	4.8	c8.0	5.8	*6.8	c4.2	2.9	2.7
11	*2.0	1.92	1.53	c1.54	1.92	4.1	c6.8	5.3	6.6	3.9	2.85	2.8
12	1.96	1.74	1.45	c1.39	1.83	12.7	c6.2	4.0	6.2	3.8	2.8	3.0
13	2.1	1.70	1.45	c1.39	2.0	4.2	c6.2	5.0	7.2	3.75	2.7	2.3
14	2.1	1.65	1.41	c1.39	2.15	3.4	c9.6	4.6	10.1	3.6	2.6	2.65
15	2.0	1.61	1.37	*c1.27	1.83	2.95	6.2	3.85	6.6	3.6	2.5	4.8
16	2.0	6.0	1.33	1.22	2.05	7.5	5.8	3.7	6.0	3.55	2.5	a7.2
17	2.1	2.6	1.25	1.14	1.74	4.0	5.2	6.1	11.7	6.3	2.7	a3.8
18	1.96	2.05	1.52	1.11	2.65	4.2	5.2	4.4	7.2	3.2	2.6	4.8
19	c2.15	2.0	1.41	1.14	12.6	5.3	c56	25	7.0	3.2	2.8	3.75
20	c1.92	2.05	1.37	1.63	6.9	2.95	c11.8	6.8	6.6	3.4	2.9	5.2
21	c1.88	1.78	1.72	1.37	9.8	2.85	c8.0	5.2	5.8	3.45	2.85	c9.8
22	c1.83	1.65	1.53	1.25	5.6	2.7	*c7.4	5.1	5.4	3.4	6.3	c4.2
23	c1.83	1.83	1.41	1.25	4.0	3.05	7.7	4.8	5.6	3.2	4.6	c2.25
24	c1.78	1.88	c1.71	1.18	c3.4	2.75	6.8	4.3	5.2	3.1	3.1	c2.95
25	c1.74	1.74	c1.39	1.25	c2.95	2.55	6.6	4.4	5.1	4.1	2.95	2.8
26	c1.70	1.61	c1.22	1.11	c2.75	2.6	6.2	5.4	21	3.45	2.5	2.55
27	c1.65	1.61	c1.39	1.11	c2.5	3.35	6.2	6.0	9.8	3.85	2.25	2.8
28	c1.65	1.61	c1.39	3.1	c2.35	2.75	6.0	5.2	6.2	*3.0	2.2	2.8
29	c1.65	1.57	c5.4	5.2	c2.3	2.65	5.8	5.4	5.6	3.45	2.2	2.95
30	c1.65	1.74	c1.87	23.5	c2.25	5.6	5.8	-	5.2	3.5	2.15	4.2
31	1.65	a2.2	-	4.2	-	89	5.4	-	5.8	-	2.1	-
Total	61.25	76.35	50.04	83.80	95.27	197.05	278.7	162.70	293.9	121.80	107.60	101.50
Mean:												
mgd	1.98	2.46	1.67	2.70	3.18	6.36	8.99	5.61	9.48	4.06	3.47	3.38
cfs	3.06	3.81	2.58	4.18	4.92	9.84	13.9	8.68	14.7	6.28	5.37	5.23
Ac-ft	188	234	154	257	292	605	855	499	902	374	330	311

Calendar year 1951: Max 190 Min 1.11 Mean(mgd) 5.97 Mean(cfs) 9.24 Ac-ft 6,690

Fiscal year 1951-52: Max 89 Min 1.11 Mean(mgd) 4.45 Mean(cfs) 6.89 Ac-ft 5,000

Peak discharge (base, 150 m.d.)--Oct. 30 (12 m.) 175 mgd (271 cfs), 3.75 ft; Dec. 31 (3:30 a.m.) 605 mgd (936 cfs), 5.42 ft; Jan. 19 (12:30 p.m.) 254 mgd (393 cfs), 4.40 ft; Mar. 4 (3 p.m.) 811 mgd (1,250 cfs), 5.75 ft; Mar. 26 (7 p.m.) 218 mgd (337 cfs), 4.23 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby streams.

c Backwater from debris.

East Branch Manoa Stream near Honolulu

Location.--Lat 21°19'50", long 157°48'10", on right bank just downstream from highway bridge, 400 ft upstream from confluence with West Branch and 4 miles northeast of Honolulu Post Office.

Drainage area.--1.0 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1952.

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 benchmark). 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 50 ft upstream (revised) at different datum. Aug. 18, 1925, to Oct. 18, 1933, water-stage recorder at present site at datum 0.41 ft higher.

Average discharge.--33 years (1913-20, 1926-52), 3.10 mgd (4.80 cfs).

Extremes.--Maximum discharge during year, 272 mgd (421 cfs) Jan. 19 (gage height, 3.54 ft), from rating curve extended above 21 mgd by test on model of station site; minimum, 1.43 mgd (2.21 cfs) Nov. 16, 17.

1913-21, 1925-52: Maximum gage height, 10.4 ft Jan. 16, 1921, from floodmarks, site and datum then in use (discharge, 2,000 mgd or 3,090 cfs, estimated from rating curve extended above 37 mgd); minimum discharge, 0.4 mgd (0.6 cfs) June 7, 8, 1926.

Remarks.--Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnels in drainage area.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.3	1.15	1.2	13.9
.5	2.65	1.5	23.5
.7	4.5	2.0	49
.9	7.3		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.78	1.85	2.25	2.0	2.35	2.0	4.2	2.4	3.65	2.25	2.1	2.0
2	1.78	1.85	2.5	1.93	2.1	1.93	3.1	2.75	2.5	2.1	3.35	2.0
3	1.98	1.78	2.0	2.15	1.78	2.0	2.75	2.35	2.25	4.4	2.4	2.0
4	1.98	1.93	*1.86	1.85	1.71	*3.7	2.75	2.15	9.0	2.25	4.8	2.0
5	1.85	4.7	1.71	1.78	1.71	1.85	2.35	2.15	5.0	5.3	3.7	2.1
6	1.85	5.3	1.64	2.15	1.71	2.35	2.25	2.35	2.65	2.5	4.4	2.1
7	1.71	2.2	2.6	1.57	2.55	2.2	2.1	2.4	2.85	2.85	2.85	2.25
8	1.71	3.95	3.5	2.35	2.6	3.0	2.15	2.1	2.35	3.45	2.5	2.1
9	1.71	4.0	2.0	3.65	2.2	1.85	9.1	2.15	2.7	2.65	2.5	3.85
10	1.71	3.55	1.71	2.35	2.25	4.8	2.75	5.5	*2.4	3.15	2.35	2.85
11	*1.74	2.65	1.64	2.1	1.71	3.35	2.4	3.75	2.55	2.55	2.5	2.9
12	1.78	2.35	1.64	1.93	1.64	15.3	2.25	2.55	2.35	2.65	2.25	2.4
13	1.85	2.35	1.64	1.93	1.64	3.5	2.1	2.65	2.55	3.2	2.15	2.8
14	1.78	2.1	1.57	2.0	1.57	2.5	3.2	2.55	3.6	2.4	2.15	2.5
15	2.15	2.0	1.57	*2.3	1.50	2.15	2.35	2.35	2.5	2.35	2.1	2.65
16	2.4	4.3	1.57	2.0	1.50	3.0	2.1	2.15	2.25	2.35	2.1	*8.4
17	2.45	2.5	1.57	1.85	1.64	2.6	2.0	2.45	7.7	2.35	2.1	2.85
18	1.85	2.1	2.15	1.78	4.6	2.6	2.0	2.45	3.55	2.25	2.1	4.5
19	3.35	2.15	1.64	1.78	12.2	2.0	36	20	4.2	2.25	2.0	5.8
20	2.25	2.7	1.57	2.9	6.3	1.85	6.4	0.6	3.15	2.4	2.2	5.1
21	1.93	2.1	4.3	2.4	8.4	1.85	3.65	2.65	2.75	2.35	2.3	8.1
22	1.93	2.0	2.0	2.0	3.75	1.71	*5.2	2.5	2.65	2.8	10.7	4.0
23	2.0	2.15	1.85	1.93	2.85	2.85	2.9	2.4	2.55	2.35	4.1	5.3
24	2.0	2.35	1.78	1.78	2.4	1.85	2.75	2.25	2.4	2.25	2.4	3.1
25	1.85	2.0	1.93	1.78	2.25	1.71	2.65	2.15	2.65	2.6	2.25	2.65
26	1.93	1.85	1.78	1.78	2.35	1.71	2.5	2.4	2.9	3.8	2.1	2.55
27	1.93	1.85	1.93	12.3	2.1	2.55	2.5	2.9	2.5	4.0	2.1	3.9
28	2.05	1.85	1.85	2.85	2.0	2.0	2.4	3.0	2.25	*2.3	2.1	3.1
29	2.0	1.71	7.9	4.4	1.85	1.85	2.4	2.55	2.25	2.25	2.15	4.6
30	2.1	2.65	2.25	7.4	1.85	2.85	2.35	-	2.1	2.6	2.1	6.3
31	2.0	3.75	-	2.9	-	42	2.35	-	2.1	-	2.0	-
Total	61.38	100.37	65.90	87.60	86.08	127.81	124.05	93.30	96.40	82.95	108.50	104.75
Mean:												
mgd	1.98	3.24	2.20	2.83	2.87	4.12	4.00	3.22	3.11	2.76	3.50	3.49
cfs	3.06	5.01	3.40	4.38	4.44	6.37	6.19	4.98	4.81	4.27	5.42	5.40
Ac-ft	188	308	202	269	264	392	381	286	296	255	333	321

Calendar year 1951: Max 63 Min 1.36 Mean(mgd) 3.34 Mean(cfs) 5.17 Ac-ft 3,740
Fiscal year 1951-52: Max 42 Min 1.50 Mean(mgd) 3.11 Mean(cfs) 4.81 Ac-ft 3,500

Peak discharge (base, 200 mgd).--Oct. 27 (4 p.m.) 204 mgd (316 cfs), 3.24 ft; Dec. 12 (9 a.m.) 248 mgd (384 cfs), 3.46 ft; Dec. 31 (4 a.m.) 260 mgd (402 cfs), 3.52 ft; Jan. 19 (12:30 p.m.) 272 mgd (421 cfs), 3.54 ft.

* Discharge measurement made on this day.

West Branch Manoa Stream near Honolulu

Location.--Lat 21°19'50", long 157°48'15", on left bank 100 ft upstream from highway bridge and 4.2 miles northeast of Honolulu Post Office.

Drainage area.--1.1 sq mi.

Records available.--May 1913 to January 1921, August 1925 to June 1952.

Gage.--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 benchmark). Prior to June 17, 1914, staff gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft upstream at different datum. Aug. 4, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 8.40 ft lower.

Average discharge.--33 years (1913-20, 1926-52), 2.55 mgd (3.95 cfs).

Extremes.--Maximum discharge during year, 515 mgd (797 cfs) Dec. 31 (gage height, 4.53 ft), from rating curve extended above 33 mgd by test on model of station site; minimum, 0.18 mgd (0.28 cfs) July 9-12.

1913-21, 1925-52: Maximum gage height, 10.4 ft Jan. 16, 1921, from floodmarks, site and datum then in use (discharge, 2,100 mgd or 3,250 cfs, estimated from rating curve extended above 40 mgd); minimum discharge, about 0.05 mgd (0.08 cfs) Mar. 16, 22, 1926.

Remarks.--Records good except those for periods of backwater from debris and for period of no gage-height record, which are fair. Small quantity of water is diverted above station occasionally for irrigation.

Rating tables, fiscal year 1951-52, except periods of backwater from debris (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 4-17)

July 1 to Dec. 31

Jan. 1 to June 30

0.0	0	0.6	3.5	0.1	0.22	0.8	6.5
.1	.25	.8	6.5	.2	.67	1.0	11.4
.2	.62	1.0	11.4	.4	2.0	1.2	18.7
.3	1.11	1.2	18.7	.6	3.8	1.6	40
.4	1.78	1.5	34				
.5	2.6	2.0	71				

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.22	0.40	80.80	0.58	1.68	1.08	4.3	c1.2	3.3	1.16	0.98	0.52
2	.20	.36	a.90	.51	1.28	.99	2.8	c1.6	1.35	.91	1.34	.47
3	.44	.32	a.72	.67	1.03	.95	2.15	c1.0	1.04	2.65	17.0	.42
4	.33	.56	*a.68	.55	.94	*5.7	2.45	c.94	18.3	.91	3.15	.42
5	.32	2.95	.62	.44	.94	1.15	1.64	c.90	5.2	3.0	1.93	.47
6	.29	4.3	.51	.62	.89	1.37	1.42	c1.3	2.15	1.28	2.25	.67
7	.22	22	.75	2.05	.79	2.2	1.35	c.90	1.50	2.45	1.42	.68
8	.20	3.7	2.35	.62	1.34	2.3	1.16	c.87	1.28	2.15	1.22	.57
9	.18	2.6	.72	2.2	1.80	1.13	11.5	c1.0	1.61	1.50	1.04	3.6
10	.18	1.84	.55	1.06	1.69	3.7	2.55	c4.5	*1.35	1.92	.94	2.65
11	*.18	1.29	.47	.86	1.03	2.35	1.86	c3.0	1.61	1.35	.98	2.5
12	.20	.91	.47	.67	.79	9.0	1.42	c1.9	1.35	1.22	.85	1.88
13	.22	.82	.44	.58	.84	2.25	1.22	2.75	2.4	2.1	.67	1.96
14	.22	.77	.44	.67	.95	1.77	3.8	1.95	5.3	1.16	.67	2.2
15	.44	.72	.40	*.87	.72	1.28	1.99	1.72	2.3	.98	.62	2.8
16	.84	4.8	.36	.58	.68	1.93	1.22	1.42	1.57	.91	.62	*10.8
17	.86	1.23	.36	.44	.75	1.51	1.10	2.5	8.0	.90	.62	2.8
18	.36	.77	.96	.40	3.75	2.15	.91	.78	3.95	.85	.82	3.55
19	1.32	.72	.47	.40	18.7	1.18	34.5	13.2	3.5	.73	.67	4.8
20	.71	1.16	.40	1.89	9.5	1.03	6.1	3.0	2.45	.92	.80	5.7
21	.40	.67	1.66	1.29	9.8	.99	2.85	1.50	1.78	.79	.98	9.6
22	.36	.67	.58	.77	5.0	.89	*2.25	1.22	1.64	1.32	7.7	4.0
23	.44	c.72	.47	.67	2.7	1.92	c1.8	1.16	1.75	.79	2.15	2.7
24	.55	c.86	.40	.62	2.05	1.08	c1.7	.85	1.42	.67	1.04	2.1
25	.36	.62	.36	.55	1.68	.94	c1.6	.79	2.05	.85	.79	1.71
26	.36	.55	.32	.55	1.61	1.03	c1.4	1.06	2.85	2.2	.67	1.57
27	.36	a.55	.44	7.7	1.28	2.65	c1.3	1.30	1.94	3.15	.62	2.85
28	.36	a.55	.36	2.05	1.18	1.39	c1.3	1.53	1.50	*1.10	.57	2.1
29	.40	a.51	5.0	3.5	1.08	1.28	c1.2	1.22	1.28	.98	.67	3.35
30	.51	a1.0	.77	11.5	1.03	3.6	c1.1	-	1.10	2.45	.62	5.1
31	.47	a2.2	-	2.9	-	62	c1.1	-	1.04	-	.57	-
Total	12.50	61.12	25.43	48.96	78.10	120.75	103.04	57.06	88.06	43.33	54.77	84.54
Mean:												
mgd	0.403	1.97	0.781	1.58	2.60	3.90	3.32	1.97	2.84	1.44	1.77	2.82
cfs	0.624	3.05	1.21	2.44	4.02	6.03	5.14	3.05	4.39	2.23	2.74	4.36
Ac-ft	38	188	72	150	240	371	316	175	270	133	168	259

Calendar year 1951: Max 66 Min 0.18 Mean(mgd) 2.24 Mean(cfs) 3.47 Ac-ft 2,520
Fiscal year 1951-52: Max 62 Min 0.18 Mean(mgd) 2.12 Mean(cfs) 3.28 Ac-ft 2,380

Peak discharge (base, 200 mgd).--Oct. 30 (12:50 p.m.) 205 mgd (317 cfs), 3.17 ft; Dec. 31 (3:30 a.m.) 515 mgd (797 cfs), 4.53 ft; Jan. 19 (12:30 p.m.) 350 mgd (542 cfs), 3.82 ft; Mar. 4 (4:30 p.m.) 305 mgd (472 cfs), 3.60 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby streams.

c Backwater from debris.

Note.--Shifting-control method used July 1-11, Oct. 27 to Dec. 31, May 4-17.

Pukele Stream near Honolulu

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

Drainage area.--1.2 sq mi.

Records available.--April 1912 to September 1913, June 1926 to June 1952.

Gage.--Water-stage recorder and V-notch weir. Datum of gage is 344.78 ft above mean sea level (Honolulu Board of Water Supply benchmark). Apr. 16, 1912, to Sept. 30, 1913, staff gage just above present site at different datum.

Average discharge.--26 years (1926-52), 1.28 mgd (1.98 cfs).

Extremes.--Maximum discharge during year, 280 mgd (433 cfs) Jan. 19 (gage height, 4.43 ft), from rating curve extended above 36 mgd as explained below; minimum daily, 0.11 mgd (0.17 cfs) Aug. 4.

1912-13, 1926-52: Maximum discharge, 1,680 mgd (2,600 cfs) Apr. 11, 1930 (gage height, 7.75 ft, from floodmarks), from rating curve extended above 14 mgd by test on model of station site; minimum, 0.07 mgd (0.11 cfs) Nov. 15-25, 1945.

Remarks.--Records good except those for period of doubtful or no gage-height record, which are fair. A 2-inch pipe diverts water from stream above station.

Revisions (fiscal years).--WSP 835: 1930(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.9	0.06	1.6	4.6
1.0	.19	1.9	10.0
1.1	.49	2.2	19.0
1.2	.98	2.4	27
1.4	2.4		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.16	0.15	0.19	0.28	0.60	0.56	1.41	0.59	0.59	0.49	0.34	0.40
2	.16	.15	.19	.28	.50	.54	.83	.59	.54	.49	.36	.40
3	.16	.14	.19	.28	.43	.52	.83	.49	.49	.49	11.2	.40
4	.16	.12	.16	.28	.40	.66	.83	.49	.59	.46	1.64	.40
5	.16	.16	.18	.28	.37	.54	.83	.46	.64	.79	.83	.40
6	.16	.49	.18	.28	.34	.52	.83	.43	.59	.46	1.12	.40
7	.16	8.3	.18	.40	.34	.55	.78	.43	.59	.46	.83	.40
8	.18	.55	.18	.28	.43	.55	.74	.40	.59	.49	.83	.37
9	.18	.42	.18	.39	.59	.50	1.71	.40	.59	.46	.88	.34
10	.16	.40	.19	.31	.40	*1.70	.74	.43	.59	.49	.83	.34
11	.16	.40	*.18	.31	.35	1.50	.74	.99	.59	.46	.83	.34
12	.16	.40	.18	.31	.34	7.3	.69	.49	.54	.46	.78	.37
13	.16	.40	.18	.31	.33	2.1	.69	.46	.54	.59	.74	.34
14	.16	.40	.19	.31	.31	.98	.69	.54	.64	.46	.69	.35
15	.16	.40	.19	.31	.31	.93	.64	.49	.54	.46	.64	.41
16	.16	.40	.19	.28	.31	1.06	.64	.49	.54	.46	.59	*1.97
17	.15	.37	.19	*.28	.40	.98	.59	.49	2.5	.46	.54	.40
18	*.15	.37	.19	.25	.60	.93	.59	.75	.98	.46	.49	.43
19	.15	.34	.19	.25	5.0	.88	26.5	10.5	.78	.43	.46	1.19
20	.15	.31	.19	.25	5.5	.88	3.6	1.39	.78	.43	.46	.88
21	.14	.28	.48	.22	3.2	.83	1.24	.74	.63	.43	.43	1.58
22	.14	.28	.22	.22	1.2	.83	1.04	.69	.83	.43	2.2	1.04
23	.14	.25	.19	.22	.68	.85	*.98	.64	.83	.43	.73	.93
24	.14	.25	.19	.22	.78	.74	.96	.59	.83	.43	.46	.93
25	.14	.22	.19	.24	.74	.64	.93	.59	.78	.40	.46	.88
26	.15	.22	.19	.22	.74	.64	.93	.59	.77	.37	.46	.83
27	.15	.22	.22	4.1	.70	.73	.88	.54	.74	.37	.46	.83
28	.15	.19	.19	.71	.65	.54	.83	.59	.64	.34	.46	.78
29	.15	.19	1.37	1.41	.60	.49	.74	.59	.59	*.34	.46	.74
30	.15	.19	.28	4.7	.55	.49	.69	-	.54	.34	.46	.69
31	.15	.25	-	.92	-	15.4	.64	-	.49	-	.43	-
Total	4.80	17.21	7.23	19.10	25.69	46.34	54.78	26.66	22.10	13.63	32.09	19.74
Mean:												
mgd	0.155	0.555	0.241	0.616	0.856	1.49	1.77	0.926	0.713	0.454	1.04	0.658
cfs	0.240	0.859	0.373	0.953	1.32	2.31	2.74	1.43	1.10	0.702	1.61	1.02
Ac-ft	15	53	22	59	79	142	168	82	68	42	98	61
Calendar year 1951:	Max	85	Min	0.12	Mean(mgd)	1.48	Mean(cfs)	2.29	Ac-ft	1,660		
Fiscal year 1951-52:	Max	26.5	Min	0.12	Mean(mgd)	0.791	Mean(cfs)	1.22	Ac-ft	889		

Peak discharge (base, 90 mgd).--Dec. 31 (4:30 a.m.) 95 mgd (147 cfs), 3.46 ft; Jan. 19 (11 a.m.) 280 mgd (433 cfs), 4.43 ft.

* Discharge measurement made on this day.

Note.--Doubtful or no gage-height record Oct. 31 to Dec. 9; discharge estimated on basis of records for stations on nearby streams.

Waiomao Stream above Pukele Stream, near Honolulu

Location.--Lat 21°18'30", long 157°47'10", on left bank 300 ft west of road, 1 mile upstream from confluence with Pukele Stream, and 5 miles east of Honolulu Post Office.

Drainage area.--1.0 sq mi.

Records available.--April 1911 to September 1913 (gage heights only), June 1926 to June 1952.

Gage.--Water-stage recorder and V-notch weir. Datum of gage is 373.66 ft above mean sea level (Honolulu Board of Water Supply benchmark). Apr. 12, 1911, to Sept. 30, 1913, staff gage at site 0.3 mile downstream at different datum.

Average discharge.--26 years (1926-52), 1.17 mgd (1.81 cfs).

Extremes.--Maximum discharge during year, 295 mgd (456 cfs) Jan. 19 (gage height, 4.72 ft), from rating curve extended as explained below; no flow at times.
1911-12, 1926-52: Maximum discharge, 602 mgd (931 cfs) Oct. 15, 1938 (gage height, 5.43 ft), from rating curve extended above 45 mgd by test on model of station site; no flow in extremely dry weather.

Remarks.--Records good except those for period of no gage-height record and those above 45 mgd, which are fair. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 6					Aug. 7 to June 30				
0.84	0	1.4	1.30		0.84	0	1.5	2.7	
1.0	.03	1.5	2.0		1.0	.06	1.7	5.2	
1.1	.12	1.7	4.0		1.1	.22	1.9	8.5	
1.2	.36	1.9	7.2		1.2	.55	2.3	20.5	
1.3	.74	2.1	12.4		1.3	1.07	2.6	34	
					1.4	1.78			

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.01	0.01	0.18	0.28	1.42	0.18	2.35	0.11	0.87	0.12	0.09	0.09
2	.01	.01	.36	.18	.88	.16	1.07	.25	.43	.11	.13	.07
3	.01	0	.25	.48	.51	.16	.72	.14	.28	.26	13.5	.06
4	.01	.01	.14	.25	.30	1.07	.63	.11	1.45	.16	2.85	.06
5	.04	1.09	.09	.14	.28	.33	.43	.08	1.19	1.09	1.42	.05
6	.03	.71	.06	.16	.25	.51	.30	.11	.47	.43	1.72	.07
7	.01	10.2	.09	1.29	.20	.55	.30	.08	.30	.28	.72	.07
8	.01	1.67	1.30	.56	.59	.98	*.28	.07	.25	.40	.47	.08
9	0	1.46	.40	.77	.55	.43	2.8	.06	.33	.30	.36	.44
10	0	.88	*.21	.36	.72	*3.2	.68	1.76	.30	.30	.28	.22
11	0	.51	.12	.22	.36	3.8	.47	3.5	.36	.22	.30	.16
12	0	.30	.16	.20	.20	17.1	.36	1.04	*.36	.22	.25	.16
13	0	.22	.09	.14	.16	3.9	.28	.63	.43	.30	.20	.16
14	0	.22	.08	.12	.14	1.53	.68	2.3	.94	.20	.16	.18
15	0	.18	.08	.12	.12	.88	.36	1.12	.43	.16	.12	.43
16	0	.14	.06	.14	.09	1.19	.28	.43	.30	.12	.11	*3.1
17	0	.25	.05	*.09	.09	1.36	.25	2.8	3.45	.12	.11	.60
18	*.03	.16	.69	.07	.71	.88	.28	1.89	1.10	.09	.09	.82
19	.37	.22	.30	.06	5.5	.51	a34	19.0	1.07	.07	.08	2.05
20	.20	.40	.20	.11	3.05	.40	a5.0	2.65	.68	.06	.08	1.44
21	.07	.30	1.24	.18	4.7	.33	a1.5	1.14	1.18	.06	.09	2.25
22	.03	.16	.74	.11	1.72	.28	a.7	.78	.43	.09	4.4	1.21
23	.03	.16	.30	.08	.78	.66	.59	.72	.36	.06	1.85	.73
24	.11	.12	.18	.07	.47	.43	.40	.43	.28	.05	.47	.70
25	.03	.08	.14	.47	.33	.28	.33	.33	.22	.08	.30	.33
26	.02	.06	.12	.76	.36	.22	.30	.51	.30	.22	.22	.22
27	.03	.06	.16	7.1	.25	.77	.25	.50	.33	.59	.16	.57
28	.01	.05	.12	2.5	.20	*.43	.20	.58	.25	.20	.12	.78
29	.01	.05	3.5	3.55	.16	.30	.20	.40	.20	*.15	.12	.72
30	.01	.09	.63	8.5	.14	.30	.14	-	.16	.18	.12	1.21
31	.01	.47	-	3.75	-	.22	.11	-	.14	-	.09	-
Total	1.09	20.24	12.04	32.11	25.23	65.12	56.24	42.92	18.84	6.69	30.78	19.03
Mean:												
mgd	0.035	0.653	0.401	1.04	0.841	2.10	1.81	1.48	0.608	0.223	0.993	0.634
cfs	0.054	1.01	0.620	1.61	1.30	3.25	2.80	2.29	0.941	0.345	1.54	0.981
Ac-ft	3.3	62	37	99	77	200	173	132	58	21	94	58

Calendar year 1951: Max 89 Min 0 Mean(mgd) 1.54 Mean(cfs) 2.38 Ac-ft 1,720
Fiscal year 1951-52: Max 34 Min 0 Mean(mgd) 0.903 Mean(cfs) 1.40 Ac-ft 1,010

Peak discharge (base, 70 mgd)--Dec. 12 (10 a.m.) 210 mgd (325 cfs), 4.49 ft; Dec. 31 (4 a.m.) 83 mgd (128 cfs), 3.38 ft; Jan. 19 (probably 10 a.m.) 295 mgd (456 cfs), 4.72 ft; Feb. 19 (6 a.m.) 87 mgd (135 cfs), 3.45 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of recorded range in stage and records for nearby streams.

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.--3.0 sq mi.

Records available.--April to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 95 ft (from topographic map).

Extremes.--Maximum discharge during period, 60 mgd (93 cfs) May 3 (gage height, 2.20 ft); minimum, 0.56 mgd (0.87 cfs) Apr. 24.

Remarks.--Records fair.

Rating table, Apr. 1 to June 30, 1952 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used May 4-7)

1.0	0.49	1.4	1.40
1.1	.64	1.6	4.0
1.2	.81	1.8	14.0
1.3	1.01	2.0	33

Discharge, in million gallons a day, April to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1										0.62	0.60	0.61
2										.61	1.04	.60
3										.71	32	.60
4										.62	4.3	.61
5										3.6	2.8	.60
6										.97	2.95	.60
7										.69	1.91	.62
8										.91	1.2	.61
9										.87	1.2	.80
10										1.04	1.1	.61
11										.76	1.1	.61
12										.71	1.0	.61
13										1.95	.92	.61
14										.64	.84	.66
15										.60	.76	1.67
16										.60	.70	6.2
17										.60	.62	1.36
18										.60	.62	1.90
19										.58	.62	5.6
20										.61	.66	4.4
21										.58	.64	6.0
22										.61	7.0	3.8
23										.58	4.4	3.5
24										.58	1.13	2.8
25										.62	.78	1.20
26										.62	.62	.88
27										1.49	.61	1.55
28										.64	.60	2.95
29										.61	.60	1.78
30										.65	.61	5.5
31										-	.61	-
Total										25.27	74.54	59.86
Mean:										0.842	2.40	2.00
mgd										1.30	3.71	3.09
cfs										78	229	184
Ac-ft												
Calendar year	: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft			
Fiscal year	: Max		Min		Mean(mgd)		Mean(cfs)		Ac-ft			

Haiku Stream near Heela

Location.--Lat 21°24'40", long 157°49'40", on left bank 1.7 miles west of Kaneohe Post Office and 1.8 miles southwest of Heela.

Drainage area.--1.0 sq mi.

Records available.--January 1914 to October 1919, July 1939 to June 1952.

Gage.--Water-stage recorder. Prior to Apr. 28, 1914, staff gage, and Apr. 29, 1914, to Oct. 25, 1919, water-stage recorder, at same site at different datum.

Extremes.--Maximum discharge during year, 172 mgd (266 cfs) Oct. 27 (gage height, 3.11 ft), from rating curve extended as explained below; minimum, 0.51 mgd (0.79 cfs) July 31.
1914-19, 1939-52: Maximum discharge, 1,150 mgd (1,780 cfs) Mar. 26, 1951 (gage height, 5.39 ft), from rating curve extended above 13 mgd by test on model of station site; minimum, 0.17 mgd (0.26 cfs) Oct. 25, 1946.

Remarks.--Records good except those above 13 mgd, which are fair. Suburban Water System diverts ground water from tunnel in drainage area.

Revisions (fiscal years).--WSP 935: 1940.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Aug. 15

Aug. 16 to June 30

1.0	0.39	1.0	0.53	1.5	4.2
1.1	.78	1.1	.92	1.7	9.2
1.2	1.28	1.2	1.45	2.0	30.5
1.3	1.92	1.3	2.1		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.88	0.66	1.03	0.88	1.34	0.97	2.75	1.18	1.43	1.18	1.13	1.03
2	.88	.66	1.03	.88	1.18	.97	1.78	1.18	1.29	1.18	1.13	1.08
3	.88	.66	1.03	.88	1.08	.97	1.58	1.18	1.24	1.18	2.5	1.08
4	.88	.70	1.03	.88	1.03	1.03	1.40	1.18	3.35	1.18	1.80	1.03
5	.83	.70	.97	.88	1.03	.97	1.29	1.18	1.80	1.18	1.13	1.03
6	.83	.70	.97	.88	1.03	.97	1.29	1.18	1.40	1.18	*.97	1.03
7	.83	1.58	.97	.88	1.03	.97	1.24	1.18	1.29	1.18	.92	1.03
8	.83	.83	.97	.88	1.13	.97	1.24	1.18	1.24	1.18	.92	1.03
9	.83	.70	.92	.88	1.13	.92	1.34	1.18	1.29	1.18	.97	1.03
10	.83	.70	*.92	.88	1.13	2.2	1.29	1.24	1.24	1.24	.97	1.03
11	.83	.70	.92	.88	1.18	2.2	1.24	1.18	1.24	1.29	1.03	1.03
12	.83	.70	.92	.88	1.18	*14.2	1.18	1.13	1.24	1.18	1.03	1.08
13	.83	.70	.92	.88	1.18	2.15	1.18	1.24	1.24	1.18	1.03	1.08
14	.83	.70	.92	.88	1.18	1.45	1.18	4.7	1.24	1.18	1.08	1.08
15	.78	.70	.92	.88	1.18	1.24	1.18	2.05	1.24	2.13	1.08	1.08
16	*.78	6.1	.92	.84	1.13	1.24	1.18	1.29	1.18	1.13	1.08	1.08
17	.78	2.2	.92	.84	1.13	1.82	1.18	4.5	1.24	1.13	1.08	1.08
18	.74	1.13	.92	.84	1.13	1.64	1.13	2.35	*1.18	1.13	1.08	1.08
19	.74	1.03	.92	.84	1.29	1.45	20.5	12.9	1.29	1.13	1.03	1.08
20	.74	1.08	.88	.84	3.95	1.29	4.5	2.55	2.2	1.13	1.03	1.08
21	.74	1.08	.92	.80	1.58	1.24	1.90	1.71	1.58	1.13	1.03	1.13
22	.74	1.08	.92	.80	1.24	1.18	1.52	1.52	1.29	1.13	1.44	1.13
23	.74	1.08	.88	*.76	1.08	1.18	1.34	1.45	1.18	1.13	1.32	*1.08
24	.74	1.08	.84	.76	1.08	1.18	*1.24	1.40	1.18	1.13	1.08	1.03
25	.74	1.08	.84	.76	1.03	1.13	1.18	1.29	1.18	1.13	1.03	1.03
26	.74	1.08	.84	.80	1.03	1.13	*1.18	1.24	1.32	1.13	1.03	1.08
27	.74	1.08	.84	12.6	1.03	1.13	1.18	1.24	1.29	1.13	1.03	1.08
28	.70	1.03	.84	2.25	1.03	1.13	1.18	1.24	1.24	1.13	1.03	1.08
29	.70	1.03	1.07	2.4	1.03	1.13	1.18	1.24	1.18	1.13	1.03	1.03
30	.70	1.03	.88	5.1	1.03	1.13	1.18	-	1.18	1.13	1.03	1.03
31	.66	1.03	-	1.92	-	27	1.18	-	1.18	-	1.03	-
Total	24.32	34.41	27.87	46.35	36.80	78.18	63.91	58.08	42.66	34.77	34.87	31.85
Mean:												
mgd	0.785	1.11	0.929	1.50	1.23	2.52	2.06	2.00	1.38	1.16	1.12	1.06
cfs	1.21	1.72	1.44	2.32	1.90	3.90	3.19	3.09	2.14	1.79	1.73	1.64
Ac-ft	75	106	86	142	113	240	196	178	131	107	107	98

Calendar year 1951: Max 92 Min 0.66 Mean(mgd) 1.89 Mean(cfs) 2.92 Ac-ft 2,110
Fiscal year 1951-52: Max 27 Min 0.66 Mean(mgd) 1.40 Mean(cfs) 2.17 Ac-ft 1,580

Peak discharge (base, 100 mgd).--Oct. 27 (3 p.m.) 172 mgd (266 cfs), 3.11 ft; Dec. 12 (7:30 a.m.) 138 mgd (210 cfs), 2.92 ft; Dec. 31 (3 a.m.) 101 mgd (156 cfs), 2.65 ft; Jan. 19 (12 m.) 153 mgd (237 cfs), 3.02 ft.

* Discharge measurement made on this day.

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--0.3 sq mi.

Records available--March 1940 to June 1952.

Gage--Water-stage recorder and concrete control. Datum of gage is 320 ± 1.0 ft above mean sea level (transit levels by U. S. Navy).

Average discharge--11 years (1940-42, 1943-52), 0.362 mgd (0.560 cfs).

Extremes--Maximum discharge during year not determined; minimum, 0.28 mgd (0.43 cfs) Apr. 28, 30, May 2.

1940-52: Maximum discharge, 69 mgd (107 cfs) Oct. 22, 1941 (gage height, 2.40 ft), from rating curve extended above 4.0 mgd by rating for Columbus-type control and test on model of station site; minimum daily, 0.10 mgd (0.16 cfs) Oct. 31 to Nov. 9, Nov. 24, 27, 1946.

Remarks--Records good except those for periods of fragmentary gage-height record, which are fair.

Revisions (fiscal years)--WSP 935: 1940.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.5	0.18	0.9	1.92
.6	.35	1.0	2.9
.7	.68	1.2	5.9
.8	1.20	1.4	10.5

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.38	0.42	0.42	0.58	0.61	0.32	0.84	0.30	0.40	0.32	0.30	0.32
2	.39	.42	.45	.35	.48	.30	.55	.32	.35	.32	.30	.32
3	.42	.42	.42	.38	.45	.30	.45	.32	.35	.32	.35	.32
4	.38	.45	.42	.35	.42	.32	.38	.32	f1.31	.32	.48	.32
5	.38	.48	.42	.35	.42	*.30	.35	.32	.45	.32	.32	.32
6	.38	.45	.42	.35	.38	.30	.33	.32	.38	.32	*.32	.32
7	.38	1.07	.45	.38	.38	.32	.33	.32	.38	.32	.32	.32
8	.38	.42	.45	.38	.42	.32	.33	.32	.38	.32	.32	.32
9	.38	.42	.42	.42	.38	.30	.42	.32	.38	.32	.32	.32
10	.38	.42	.42	.38	.38	1.06	.33	.33	.35	.32	.32	.32
11	.38	.38	.42	.35	.38	.86	.32	.33	.35	.32	.33	.32
12	*.42	.38	.38	.35	.38	f5.0	.32	.32	.33	.32	.32	.32
13	.42	.38	.38	.35	.38	.86	.32	.35	.35	.32	.32	.32
14	.42	.38	.38	.35	.38	.52	.32	f1.67	.33	.32	.33	.32
15	.42	.38	.38	.35	.35	.42	.32	.80	.33	.32	.32	.32
16	.42	f1.79	.38	.35	.35	.42	.32	.45	.33	.32	.32	.33
17	.45	1.14	.38	.35	.35	.58	.32	f1.57	.35	.32	.32	.32
18	.42	.61	.42	.35	.38	.55	.32	.80	*.33	.32	.32	.35
19	.42	.52	.38	.35	.54	.42	f4.3	f2.55	.45	.32	.32	.32
20	.42	.58	.35	.38	1.42	.38	1.31	.73	.83	.32	.32	.32
21	.42	.45	.42	.33	.58	.35	.58	.48	.52	.32	.32	.48
22	.42	.45	.38	.33	.45	.35	.42	.42	.42	.30	.68	.33
23	.45	.45	.38	*.32	.42	.35	.35	.38	.35	.30	.40	.32
24	.45	.45	.38	.32	.38	.33	.33	.35	.33	.30	.32	.32
25	.45	.45	.33	.35	.35	.32	.33	.35	.33	.30	.32	.32
26	.45	.45	.38	.32	.35	.32	.32	.35	.41	.32	.32	.32
27	.45	.35	f7.0	.33	.32	.32	.32	.33	.33	.30	.32	.32
28	.42	.45	.35	1.17	.33	.32	.32	.33	.33	.30	.32	.32
29	.42	.45	.30	1.20	.32	.32	.32	.33	.32	.30	.32	.32
30	.42	.45	.42	f1.88	.32	.39	.30	-	.32	.30	.32	.32
31	.42	.45	-	.94	-	f6.2	.30	-	.32	-	.32	-
Total	12.80	12.49	12.51	21.41	15.06	23.42	16.37	16.08	12.29	9.44	11.14	9.81
Mean:	0.413	0.532	0.417	0.691	0.455	0.755	0.528	0.554	0.396	0.315	0.359	0.327
mgd	0.639	0.823	0.645	1.07	0.673	1.17	0.817	0.857	0.613	0.487	0.555	0.506
cfs	.39	.51	.38	.66	.40	.72	.50	.49	.38	.29	.34	.30
Ac-ft												

Calendar year 1951: Max 14 Min 0.21 Mean(mgd) 0.580 Mean(cfs) 0.897 Ac-ft 650
Fiscal Year 1951-52: Max 7.0 Min 0.30 Mean(mgd) 0.478 Mean(cfs) 0.740 Ac-ft 536

* Discharge measurement made on this day.

f Fragmentary gage-height record; discharge computed from partly estimated gage heights.

Kahaluu Stream near Heeia

Location--Lat 21°26'20", long 157°51'05", 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--0.4 sq mi.

Records available--October 1935 to June 1952.

Gage--Water-stage recorder and Parshall flume. Datum of gage is 357.52 ft above mean sea level (levels by Wright, Harvey & Wright).

Extremes--Maximum discharge during year, 60 mgd (93 cfs) Feb. 14 (gage height, 2.76 ft), from rating curve extended above 9 mgd by test on model of station site; minimum, 0.35 mgd (0.54 cfs) June 25, 28, 30.

1935-52: Maximum discharge, 290 mgd (449 cfs) Sept. 27, 1937 (gage height, 5.47 ft, control then in use), from rating curve computed from 11 to 240 mgd by Parshall flume formula and extended above; minimum daily, 0.07 mgd (0.11 cfs) Mar. 19, 1947.

Remarks--Records good. Suburban Water System has diverted ground water from tunnel in drainage area since 1948. Continuous records of rainfall are obtained at the station.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.1	0.14	0.4	1.60
.2	.43	.5	2.45
.3	.92	.7	4.6

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.66	0.61	0.47	0.51	0.61	0.61	0.92	0.92	0.86	0.71	0.61	0.47
2	.71	.61	.51	.51	.61	.81	.92	.92	.86	.66	.61	.43
3	.71	.61	.51	.51	.61	.66	.86	.86	.86	.71	1.22	.39
4	.71	.66	.51	.51	.56	.66	.76	.86	1.23	.66	.86	.39
5	.66	.66	.47	.51	.56	.66	.76	.92	1.04	.66	.61	.39
6	.66	.77	.47	.51	.56	.66	.71	.86	.86	.66	*.56	.39
7	.66	1.34	.51	.51	.56	.66	.71	.86	.86	.66	.51	.39
8	.61	.66	.51	.51	.56	.71	.71	.86	.86	.66	.51	.39
9	.61	.61	.51	.56	.61	.71	.86	.86	.86	.61	.51	.43
10	.61	.61	.51	.56	.61	1.08	.76	.92	.86	.66	.51	.43
11	.61	.56	.51	.51	.61	1.01	.76	.86	.86	.66	.56	.43
12	*.61	.56	.51	.51	.6.	*2.75	.76	.86	.86	.66	.51	.43
13	.66	.56	.56	.51	.61	.86	.71	.92	.86	.66	.51	.43
14	.66	.56	.56	.51	.61	.76	.76	4.3	.86	.66	.51	.43
15	.66	.56	.56	.56	.56	.76	.76	1.04	.81	.61	.47	.39
16	.66	1.69	.56	.51	.56	.86	.76	.92	.76	.61	.47	.43
17	.66	.66	.56	.51	.56	1.10	.76	3.5	.68	.61	.51	*.41
18	.66	.47	.75	*.51	.61	.98	.81	1.10	.71	.61	.51	.39
19	.71	.43	.61	.51	.81	.76	4.5	2.95	.82	.61	.51	.45
20	.66	.51	.59	.51	1.20	.71	1.28	1.04	.86	.61	.51	.43
21	.66	.47	.61	.51	1.00	.71	.92	.98	.81	.61	.51	.47
22	.66	.43	.61	.51	.71	.71	.81	.92	.76	.56	1.06	.43
23	.66	.43	.56	.51	.66	.76	.86	.86	.71	.56	.61	.43
24	.66	.47	.51	.51	.61	.71	.81	.86	.71	.61	.51	.39
25	.66	.43	.51	.51	.66	.76	.86	.81	.71	.61	.47	.35
26	.66	.43	.51	.56	.66	.76	.81	.81	1.15	.61	.47	.35
27	.66	.43	.51	2.95	.61	.76	.81	.81	.81	.61	.47	.35
28	.66	.43	.51	.81	.61	.76	.81	.81	.76	.61	.47	.35
29	.66	.47	1.46	.86	.61	.76	.81	.76	.71	.61	.47	.39
30	.66	.51	.61	1.21	.61	4.3	*.81	-	.71	.61	.47	.35
31	.66	.51	-	.66	-	4.6	.86	-	.71	-	.47	-
Total	20.41	18.71	17.15	19.95	19.33	33.16	29.00	33.95	25.78	18.95	17.56	12.16
Mean:												
mgd	0.658	0.604	0.572	0.644	0.644	1.07	0.935	1.17	0.832	0.632	0.566	0.405
cfs	1.02	0.935	0.885	0.996	0.996	1.66	1.45	1.81	1.29	0.979	0.876	0.627
Ac-ft	63	57	53	61	59	102	89	104	79	56	54	37

Calendar year 1951: Max 12.8 Min 0.43 Mean(mgd) 0.881 Mean(cfs) 1.36 Ac-ft 987

Fiscal year 1951-52: Max 4.6 Min 0.35 Mean(mgd) 0.727 Mean(cfs) 1.12 Ac-ft 816

Peak discharge (base, 30 mgd)--Dec. 30 (12 p.m.) 37 mgd (57 cfs), 2.16 ft; Feb. 14 (1 p.m.) 60 mgd (93 cfs), 2.76 ft; Feb. 17 (11 a.m.) 37 mgd (57 cfs), 2.14 ft.

* Discharge measurement made on this day.

Waihee Stream near Heeia

Location.--Lat 21°27'05", long 157°51'35", on left bank 70 ft upstream from intake of Kine ditch, 120 ft downstream from forest-reserve boundary, and 4.1 miles northwest of Heeia (corrected).

Drainage area.--1.1 sq mi.

Records available.--December 1935 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 193 ft (from topographic map).

Average discharge.--16 years (1936-52), 6.34 mgd (9.81 cfs).

Extremes.--Maximum discharge during year not determined; maximum daily discharge, 36.5 mgd (56.5 cfs) Dec. 31; minimum discharge, 5.1 mgd (7.9 cfs) Dec. 3.
1935-52: Maximum discharge, 465 mgd (719 cfs) Feb. 28, 1939 (gage height, 5.47 ft, control then in use), from rating curve computed from 20 to 230 mgd by Parshall flume formula and extended above; minimum, 3.2 mgd (5.0 cfs) Oct. 1, 1946.

Remarks.--Records good except those for periods of no gage-height record, which are fair. A 2-inch pipeline diverts water above station for domestic use.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Sept. 17

Sept. 18 to June 30

0.8	4.8	0.7	4.1	1.6	23
1.0	7.8	.9	7.1	2.1	39.5
1.3	13.8	1.2	12.8		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	6.2	5.6	5.6	6.0	6.8	5.2	8.6	5.5	6.3	5.5	5.5	5.5
2	6.2	5.6	5.6	5.8	6.3	5.2	7.2	5.8	6.0	5.5	5.5	5.5
3	6.5	5.6	5.6	5.8	6.0	5.2	6.4	5.5	6.0	5.5	5.5	5.5
4	6.4	5.6	5.6	5.8	5.8	5.2	6.3	5.5	6.6	5.5	5.5	5.5
5	6.2	5.9	5.5	5.8	5.8	*5.2	5.8	5.5	6.6	5.5	5.5	5.5
6	6.2	5.9	*5.5	5.8	5.7	5.4	5.7	5.5	6.0	5.5	5.5	5.5
7	6.2	8.3	5.5	5.8	5.5	5.4	5.7	5.5	6.0	5.5	5.5	5.5
8	6.2	5.9	5.6	6.0	5.5	5.8	5.5	5.5	6.0	5.5	5.5	5.5
9	6.1	5.8	5.5	6.1	5.5	5.4	6.3	5.5	6.1	5.5	*5.7	5.5
10	5.9	5.8	5.5	6.0	5.5	7.1	5.7	6.0	6.0	5.5	5.5	5.5
11	5.9	5.6	5.5	6.0	5.5	6.3	5.7	5.7	6.1	5.5	5.7	5.7
12	*5.9	5.6	5.5	6.0	5.5	19	5.5	5.4	6.0	5.5	5.7	5.7
13	5.9	5.6	5.5	6.0	5.5	7.2	5.5	5.8	6.1	5.5	5.5	5.5
14	5.8	5.6	5.5	5.8	5.5	6.1	5.5	16.4	6.0	5.5	5.5	5.5
15	5.8	5.6	5.4	5.8	5.4	5.7	5.4	9.0	6.0	5.5	5.5	5.4
16	5.8	13	5.4	5.8	5.4	6.0	5.5	7.1	5.8	5.5	5.5	5.8
17	5.8	7.3	5.4	5.7	5.2	6.3	5.5	13.2	*6.3	5.5	5.7	5.7
18	5.6	6.2	6.9	*5.7	5.4	6.6	5.5	8.6	6	5.5	5.7	5.8
19	5.6	5.9	6.3	5.8	6.1	6.0	20.5	16.1	6	5.5	5.7	5.7
20	5.6	6.4	6.4	5.8	9	5.8	10.1	8.6	7	5.5	5.8	5.7
21	5.6	5.8	6.4	5.8	8	5.7	6.9	7.2	6	5.5	5.7	6.0
22	5.6	5.6	6.4	5.8	6.4	5.5	6.3	6.9	6	5.5	7.3	5.7
23	5.8	5.6	6.3	5.8	5.8	5.5	5.8	6.6	5.5	5.5	6.3	*5.7
24	5.8	5.8	6.1	5.8	5.7	5.4	5.8	6.4	5.5	5.5	5.7	5.5
25	5.6	5.8	6.1	5.8	5.5	5.4	5.8	6.3	5.5	5.5	5.7	5.5
26	5.8	5.8	6.0	5.8	5.5	5.4	5.7	6.1	8	5.5	5.7	5.5
27	5.8	5.8	6.0	16	5.5	5.4	5.5	6.1	6	5.5	5.5	5.5
28	5.8	5.8	6.0	7	5.4	5.4	5.5	6.1	5.5	5.5	5.5	5.5
29	5.8	5.8	6.2	8	5.2	5.4	5.5	6.1	5.5	5.5	5.5	5.7
30	5.8	5.8	6.1	10	5.2	5.4	5.5	6.1	5.5	5.5	5.5	5.7
31	5.6	5.8	-	7.8	-	36.5	5.5	-	5.5	-	5.4	-
Total	182.8	190.4	175.9	200.9	175.1	221.3	201.7	209.5	187.4	165.0	179.3	167.8
Mean:												
mgd	5.90	6.14	5.86	6.48	5.84	7.14	6.51	7.22	6.05	5.50	5.78	5.59
cfs	9.13	9.50	9.07	10.0	9.04	11.0	10.1	11.2	9.36	8.51	8.94	8.65
Ac-ft	561	584	540	617	537	679	619	643	575	506	550	515
Calendar year 1951.	Max 90	Min 4.8	Mean(mgd) 6.67	Mean(cfs) 10.3	Ac-ft 7,480							
Fiscal year 1951-52:	Max 36.5	Min 5.2	Mean(mgd) 6.17	Mean(cfs) 9.55	Ac-ft 6,930							

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 16, Oct. 27-30, Nov. 20, 21, Dec. 12, 31, Mar. 18 to May 8; discharge estimated on basis of records for nearby streams.

Waiahole tunnel at Waianu, near Waiahole

Location.--Lat 21°29'05", long 157°53'15", on left bank in Waiahole tunnel at intake No. 29 and 2.1 miles southwest of Waiahole.

Records available.--December 1950 to June 1952 in reports of Geological Survey. June 1916 to November 1950 in files of Waiahole Water Co.

Gage.--Water-stage recorder and Parshall flume.

Extremes.--1950-52: Maximum daily discharge, 60 mgd (93 cfs) Mar. 26, 1951; minimum daily, 16.0 mgd (24.8 cfs) Jan. 24-29, 1952.

Remarks.--Records good. Tunnel diverts water from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Water may be diverted at various intakes above the station.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	23.5	22	21	20	*27.5	20	24.5	*22	32.5	24.5	*23.5	22
2	23.5	22	23.5	*20	22	20	27	22	23.5	*24.5	23.5	*22
3	24.5	22	21	20	21	*20	*26.5	22	22	25.5	42	22
4	23.5	22	21	20	21	24	29	22	*36	24.5	29	22
5	23.5	26.5	21	20	20	20	23.5	21	26.5	31.5	24.5	22
6	23.5	27.5	21	20	20	28.5	22	21	23.5	25.5	23.5	22
7	23.5	44	22	21	20	26.5	22	21	23.5	24.5	23.5	22
8	23.5	24.5	27	20	20	23.5	22	21	23.5	25.5	23.5	22
9	23.5	25.5	22	23.5	20	21	35	22	22	25.5	23.5	27
10	23.5	23.5	21	20	20	30.5	22	24.5	22	24.5	23.5	24.5
11	23.5	23.5	21	20	20	25.5	23.5	23.5	23.5	24.5	23.5	25.5
12	23.5	22	21	20	20	37	22	21	22	26.5	23.5	26.5
13	23.5	22	21	19.0	20	23.5	22	23.5	23.5	25.5	23.5	23.5
14	23.5	22	21	19.0	21	21	23.5	23.5	25.5	25.5	23.5	24.5
15	23.5	22	21	19.0	20	21	22	22	23.5	24.5	23.5	23.5
16	23.5	34	21	20	20	22	22	23.5	22	24.5	23.5	45
17	23.5	27	21	20	20	26.5	22	36	39	24.5	23.5	24.5
18	23.5	23.5	21	20	20	27	22	34.5	26.5	23.5	23.5	29
19	23.5	23.5	27	20	42	22	46	54	39.5	23.5	23.5	26.5
20	23.5	24.5	21	20	47	21	26.5	28	39.5	23.5	22	24.5
21	23.5	24.5	21	19.0	48	21	23.5	24.5	31.5	23.5	23.5	29
22	22	23.5	21	19.0	24.5	21	22	23.5	24.5	23.5	25	24.5
23	22	23.5	20	19.0	21	21	19.0	24.5	24.5	23.5	39	23.5
24	23.5	22	20	19.0	21	21	16.0	22	23.5	23.5	24.5	23.5
25	22	22	20	25.5	20	21	16.0	22	24.5	23.5	23.5	23.5
26	23.5	22	20	20	20	21	16.0	22	24.5	23.5	23.5	23.5
27	23.5	22	20	48	20	21	16.0	22	28.5	23.5	23.5	24.5
28	23.5	22	20	31.5	20	21	16.0	24.5	38	23.5	23.5	23.5
29	23.5	22	31.5	28	20	27	16.0	22	26.5	24.5	23.5	23.5
30	23.5	22	21	32.5	20	32	19.0	-	24.5	24.5	23.5	31.5
31	23.5	22	-	25.5	-	58	21	-	24.5	-	22	-
Total	725.0	751.0	651.0	688.5	696.0	765.5	705.5	715.0	834.5	739.0	768.5	751.0
Mean:	23.4	24.2	21.7	22.2	23.2	24.7	22.8	24.7	26.9	24.6	24.8	25.0
cfs	36.2	37.4	33.6	34.3	35.9	38.2	35.3	38.2	41.6	38.1	38.4	38.7
Ac-ft	2,220	2,300	2,000	2,110	2,140	2,350	2,170	2,190	2,560	2,270	2,360	2,300
Calendar year 1951: Max	60			Min 19.0		Mean(mgd)	24.5		Mean(cfs)	37.9	Ac-ft	27,470
Fiscal year 1951-52: Max	58			Min 16.0		Mean(mgd)	24.0		Mean(cfs)	37.1	Ac-ft	26,970

* Discharge measurement made on this day.

Waiahole tunnel wasteway at intake 31, near Waiahole

Location.--Lat 21°28'30", long 157°53'15", on left bank 150 ft below wasteway gates of intake No. 31 of Waiahole tunnel and 2.2 miles southwest of Waiahole.

Records available.--January 1951 to June 1952.

Gage.--Water-stage recorder and Parshall flume.

Extremes.--1951-52: Maximum daily discharge, 29 mgd (45 cfs) Mar. 26, 1951; no flow for most of time.

Remarks.--Records good. Station measures releases from Waiahole tunnel.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

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		0	0	0				
4				0		0	0	0				
5				0		0	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	0	0				
12				0		0	0	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	0.01				
18				0		0	0	0				
19				0		0	3.75	0.01				
20				0		0	12.2	0				
21				0		0	3.05	0				
22				0		0	0	0				
23				0		0	0	0				
24				0		0	0	0				
25				0		0	0	0				
26				0		0	0	0				
27				1.96		0	0	0				
28				.23		0	0	0				
29				.11		0	0	0				
30				0		0	0	-				
31				0		.36	0	-				
Total	0	0	0	2.30	0	0.36	19.00	0.02	0	0	0	0
Mean:												
mgd	0	0	0	0.074	0	0.012	0.613	0.001	0	0	0	0
cfs	0	0	0	0.114	0	0.019	0.948	0.002	0	0	0	0
Ac-ft	0	0	0	7.1	0	1.1	58	0.1	0	0	0	0
Calendar year 1951.	Max	-	Min	-	Mean(mgd)	-	Mean(cfs)	-	Ac-ft	-		
Fiscal year 1951-52:	Max	12.2	Min	0	Mean(mgd)	0.059	Mean(cfs)	0.091	Ac-ft	66		

Waiahole tunnel at north portal, near Waiahole

Location.--Lat 21°28'15", long 157°53'30", on right bank in Waiahole tunnel at the boundary of Territorial and private lands, 2.6 miles southwest of Waiahole.

Records available.--January 1951 to June 1952 in reports of Geological Survey. May 1916 to December 1950 in files of Waiahole Water Co.

Gage.--Water-stage recorder and Parshall flume.

Extremes.--1951-52: Maximum daily discharge, 65 mgd (101 cfs) Dec. 31, 1951; minimum daily, 7.0 mgd (10.8 cfs) Jan. 24, 25, 1951.

Remarks.--Records good. Tunnel diverts water from headwaters of nearly all streams from Waiahole Valley to Kahana Valley for irrigation in central Oahu. Numerous intakes can divert water above station.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	27	*24.5	24.5	23.5	*29	21	27	*24.5	36	28	*27	25.5
2	27	24.5	24.5	*23.5	23.5	21	29	25.5	27	*27	27	*25.5
3	27.5	24.5	24.5	23.5	22.5	*21	*27	24.5	25.5	28	42	25.5
4	27	24.5	24.5	22.5	22.5	29	24.5	29	24.5	27	31.5	25.5
5	27	28	24.5	22.5	22.5	21	24.5	24.5	29	34	28	25.5
6	27	29.5	23.5	22.5	21	29.5	24.5	24.5	27	28	27	25.5
7	27	47	24.5	23.5	21	27	23.5	24.5	27	25.5	27	25.5
8	25.5	27	29	23.5	21	24.5	23.5	24.5	25.5	27	27	25.5
9	25.5	28	24.5	25.5	21	22.5	36.5	24.5	25.5	27	27	29
10	25.5	25.5	24.5	23.5	21	33.5	24.5	27	25.5	27	27	28
11	25.5	25.5	23.5	22.5	21	27	24.5	27	25.5	27	27	29
12	25.5	25.5	23.5	22.5	21	40	23.5	24.5	25.5	29	27	29
13	25.5	24.5	23.5	22.5	21	24.5	23.5	27	25.5	28	25.5	27
14	25.5	24.5	23.5	22.5	22.5	22.5	24.5	27	28	27	25.5	28
15	25.5	24.5	23.5	22.5	21	22.5	23.5	25.5	27	27	25.5	27
16	25.5	36	23.5	23.5	21	23.5	23.5	27	25.5	27	25.5	47
17	25.5	29.5	23.5	22.5	21	28	23.5	38.5	40	27	25.5	27
18	25.5	25.5	24.5	22.5	21	30.5	23.5	37	29	27	25.5	34
19	25.5	25.5	31	22.5	42	23.5	49	59	41	27	25.5	29
20	25.5	28	24.5	22.5	51	22.5	16.0	31.5	43	27	25.5	28
21	25.5	27	23.5	22.5	48	22.5	21	27	34	27	25.5	31.5
22	25.5	24.5	23.5	22.5	25.5	22.5	23.5	27	28	27	28.5	27
23	24.5	24.5	23.5	22.5	23.5	22.5	20	27	27	27	41	27
24	25.5	24.5	23.5	22.5	22.5	22.5	18.0	25.5	27	27	27	27
25	24.5	24.5	22.5	27	22.5	22.5	18.0	25.5	27	27	27	24.5
26	25.5	24.5	23.5	23.5	22.5	22.5	18.0	25.5	28	27	27	25.5
27	25.5	24.5	22.5	52	21	22.5	18.0	25.5	31.5	27	25.5	28
28	25.5	24.5	22.5	34	21	22.5	18.0	28	39	27	25.5	27
29	24.5	24.5	34.5	31.5	21	26.5	18.0	25.5	29	28	25.5	27
30	25.5	24.5	23.5	34.5	21	32.5	20	-	28	27	25.5	32.5
31	25.5	*24.5	-	-	29	-	65	24.5	-	28	-	-
Total	798.5	824.0	737.0	781.5	736.0	815.0	741.0	809.0	923.5	822.5	852.0	843.0
Mean:												
mgd	25.8	26.6	24.6	25.2	24.5	26.3	23.9	27.9	29.8	27.4	27.5	28.1
cfs	39.9	41.2	38.1	39.0	37.9	40.7	37.0	43.2	46.1	42.4	42.5	43.5
Ac-ft	2,450	2,530	2,260	2,400	2,260	2,500	2,270	2,480	2,850	2,520	2,610	2,590
Calendar year 1951.	Max	-	Min	-	Mean(mgd)	-	Mean(cfs)	-	Ac-ft	-		
Fiscal year 1951-52:	Max	65	Min	10.0	Mean(mgd)	26.5	Mean(cfs)	41.0	Ac-ft	29,700		

* Discharge measurement made on this day.

Miscellaneous discharge measurements

Measurements on the island of Oahu at points other than regular gaging stations are listed below:

Miscellaneous discharge measurements on Oahu during fiscal year July 1951 to June 1952

Date	Stream	Tributary to--	Locality	Discharge	
				Cubic feet per second	Million gallons a day
Nov. 27	Wahiawa Reservoir Outlet.	Canefields....	Wahiawa Reservoir outlet at Wahiawa...	81.5	52.7
27	....do.....	....do.....	....do.....	68.3	44.1
27	....do.....	....do.....	....do.....	52.9	34.2
28	....do.....	....do.....	....do.....	39.1	25.3
28	....do.....	....do.....	....do.....	23.3	15.1
28	....do.....	....do.....	....do.....	5.91	3.82
28	....do.....	....do.....	....do.....	11.0	7.11
29	....do.....	....do.....	....do.....	78.6	50.6
Dec. 11	Waialua Plantation Wahiawa ditch.	....do.....	1 mile below distribution gates at tunnel outlet, near Waialua	15.9	10.3
26	....do.....	....do.....	....do.....	61.7	39.9
26	....do.....	....do.....	....do.....	41.6	26.9
11	Waialua Plantation Kaukonahua Power-plant ditch.	....do.....	100 ft below distribution gates at tunnel outlet, near Waialua.	31.6	20.4
28	....do.....	....do.....	....do.....	20.0	12.9
28	....do.....	....do.....	....do.....	11.8	7.62
Oct. 9	Tunnel 15.....	West Fork Kalalula Stream.	At weir 13, near Waianae.....	.404	.261
9	West Fork Kalalula Stream.	Kalalula Stream.	At weir 14 below tunnel 15, above pipeline diversion, near Waianae.	.846	.547
8	East Fork Kalalula.	....do.....	At weir 30, near Waianae.....	.023	.015
8	Hiu.....	Honua Stream..	At weir 26, above flume intake, near Waianae.	.044	.028
8	Kumaipo.....	....do.....	At weir 11, below tunnel 16, near Waianae.	.080	.052
8	....do.....	....do.....	At weir 12, above diversion flume to Hiu Stream, near Waianae.	.132	.085

Halawa Stream near Halawa

Location.--Lat 21°09'30", long 156°46'00", on right bank 500 ft downstream from confluence of two main branches, 1.8 miles west of Halawa, and 6 miles northeast of Pukoo.

Drainage area.--4.5 sq mi.

Records available.--August 1917 to July 1932, November 1937 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 200 ft (from topographic map). Prior to June 24, 1923, at site 250 ft upstream at different datum.

Average discharge.--28 years (1918-32, 1938-52), 19.1 mgd (29.6 cfs).

Extremes.--1950-51: Maximum discharge during fiscal year, 5,420 mgd (8,390 cfs)

Dec. 3 (gage height, 11.55 ft), from rating curve extended above 45 mgd on basis of slope-area determination at gage height 6.7 ft; minimum daily, 1.85 mgd (2.86 cfs) June 30.

1951-52: Maximum discharge during fiscal year, 2,480 mgd (3,840 cfs) Jan. 19 (gage height, 8.62 ft), from rating curve extended above 45 mgd as explained above; minimum daily, 1.85 mgd (2.86 cfs) July 1, 2, Sept. 24, 25.

1917-32, 1937-52: Maximum discharge, that of Dec. 3, 1950; maximum gage height, 12.30 ft Apr. 2, 1948; minimum discharge, 0.8 mgd (1.2 cfs) Oct. 13-15, 1917.

Remarks.--Records poor. A 2-inch pipeline diverts water about a quarter of a mile above station for domestic use of Halawa village.

Rating tables, July 1, 1950, to June 30, 1952 (gage height, in feet, and discharge, in million gallons a day)

July 1, 1950, to Mar. 27, 1951

0.9	2.55	2.5	77
1.0	3.35	3.0	130
1.2	5.7	3.5	200
1.5	11.3	4.0	294
2.0	42	5.0	540

Mar. 28, 1951, to June 30, 1952

0.6	1.85	1.4	10.4
.8	3.1	1.6	18
1.0	4.7	2.0	42
1.2	6.9		

Note.--Same as preceding table above 2.0 ft.

Discharge, in million gallons a day, fiscal year July 1950 to June 1951

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	4.4	7.2	7.2	2.95	5.7	68	11.8	5.7	11.6	16.9	26	3.8
2	5.7	8.7	10.7	21	4.4	58	10.2	5.7	10.2	11.7	8.3	3.8
3	4.4	9.0	3.9	4.5	3.9	223	58	7.2	8.2	14.1	*7.6	3.45
4	4.4	16.9	3.9	2.95	9.0	57	28	7.8	7.2	28.5	6.3	3.45
5	19.4	7.2	4.4	12.2	5.7	120	23	15.0	40	27	5.7	3.1
6	9.9	20.5	3.9	32.5	3.9	157	20	7.2	28	21.5	5.2	3.1
7	5.0	35.5	4.4	9.1	3.9	65	11.3	5.0	23.5	11.7	30.5	3.1
8	4.4	*9.1	8.2	5.0	4.1	36	11.3	5.7	10.2	9.4	26.5	2.8
9	3.9	8.2	12.0	6.6	26	26	13.4	4.4	8.2	11.1	9.0	3.1
10	4.4	7.0	21.5	52	37.5	39.5	10.2	3.9	10.1	11.7	26.5	5.3
11	5.0	10.1	22	41	27.5	29.5	9.1	3.9	9.1	12.5	9.1	4.7
12	3.9	18.7	6.4	14.4	33.5	23	22.5	7.5	13.3	19.5	6.9	10.2
13	11.4	8.4	5.0	7.2	8.0	20	11.3	8.2	422	10.8	6.3	10.5
14	6.4	102	4.4	6.4	5.0	15.5	30.5	4.4	85	7.6	14.9	6.3
15	4.4	240	3.9	8.6	406	13.4	33.5	12.3	20	6.9	7.6	5.2
16	7.2	33	9.4	8.2	225	11.3	22	21.5	11.3	6.9	6.3	4.7
17	18.3	29.5	10.7	6.4	29.5	10.2	11.3	13.3	10.2	6.3	5.7	5.2
18	9.1	15.5	4.4	6.4	29.5	10.2	19.8	72	12.5	11.8	9.4	3.8
19	10.2	11.3	3.35	5.7	26	9.1	10.2	58	15.2	6.3	6.9	3.45
20	54	9.1	2.95	4.4	112	9.1	*15.6	17.6	9.1	9.2	5.7	3.1
21	30.5	8.2	3.35	3.9	23	8.2	12.0	79	10.1	6.3	5.7	3.45
22	38	7.2	2.95	3.9	13.4	8.2	32.5	42	166	5.7	5.2	2.8
23	37	6.4	2.55	10.6	10.2	7.2	36	16.5	15.4	6.3	4.7	2.45
24	48	5.7	2.95	11.3	9.1	7.2	18.4	40	32	6.9	4.7	4.2
25	46	5.0	2.95	11.1	167	6.4	10.2	13.9	141	5.7	4.7	4.2
26	26	4.4	*2.55	6.4	262	6.4	9.1	11.3	114	5.7	10.1	3.45
27	36	5.0	10.0	6.9	122	14.7	8.2	17.9	279	5.2	5.7	2.8
28	22.5	4.4	3.35	5.7	80	44	7.2	10.2	64	5.2	5.2	2.45
29	10.2	3.9	2.55	5.7	31.5	41	6.4	-	23	19.1	4.2	2.15
30	9.1	8.1	3.9	32.5	171	40	6.4	-	17.5	23.5	4.2	1.85
31	8.2	5.1	-	15.5	-	12.9	5.7	-	13.0	-	3.8	-
Total	517.3	670.3	189.70	371.00	1,895.3	1,197.0	533.1	517.1	1,639.9	351.0	288.6	121.95
Mean	16.7	21.6	6.32	12.0	63.2	38.6	17.2	18.5	52.9	11.7	9.31	4.06
mgd	25.8	33.4	9.78	18.6	97.8	59.7	26.6	28.6	81.8	18.1	14.4	6.28
Ac-ft	1,590	2,060	582	1,140	5,820	3,670	1,640	1,590	5,030	1,080	886	374
Calendar year 1950.	Max	406	Min	1.88	Mean(mgd)	19.6	Mean(cfs)	30.3	Ac-ft	21,900		
Fiscal year 1950-51.	Max	422	Min	1.85	Mean(mgd)	22.7	Mean(cfs)	35.1	Ac-ft	25,460		

Peak discharge (base, 950 mgd).--Aug. 14 (12 p.m.) 2,080 mgd (3,220 cfs), 8.13 ft; Nov. 15 (2 p.m.) 3,520 mgd (5,430 cfs), 9.77 ft; Nov. 26 (11 p.m.) 1,600 mgd (2,480 cfs), 7.43 ft; Dec. 3 (8:30 p.m.) 5,420 mgd (8,390 cfs), 11.55 ft; Mar. 13 (3:50 p.m.) 3,250 mgd (5,030 cfs), 9.5 ft; Mar. 22 (3:30 a.m.) 1,130 mgd (1,750 cfs), 6.50 ft; Mar. 27 (6 a.m.) 1,430 mgd (2,210 cfs), 7.12 ft.

* Discharge measurement made on this day.

Halawa Stream near Halawa--Continued

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	*1.85	4.7	5.2	5.2	32	5.7	38.5	8.9	92	12.9	5.7	5.2
2	1.85	4.2	4.7	5.2	13.0	5.7	22.5	21.5	16.0	13.5	4.7	4.7
3	51	4.2	4.2	5.5	10.4	7.9	18.0	6.3	33	29.5	67	4.7
4	21	26.5	4.2	4.7	7.6	24.5	26.5	5.7	74	10.4	35.5	4.2
5	12.8	49	3.8	3.45	9.1	17.6	10.6	5.2	27	23	15.3	4.7
6	24	40	7.3	3.7	10.9	*8.9	8.3	5.2	11.3	12.5	9.7	6.3
7	13.3	114	28.5	19.8	8.3	8.3	8.3	5.2	8.3	11.9	6.3	4.7
8	5.7	23	20.5	4.7	12.0	9.8	6.9	4.7	11.4	19.6	5.7	4.2
9	4.7	28	6.9	*6.6	10.3	10.1	65	9.2	9.4	17.2	5.7	20.5
10	5.2	23	5.2	5.2	8.3	6.9	13.0	23	9.8	9.4	5.2	19.1
11	4.7	10.4	4.7	13.5	6.9	160	12.9	14.3	16.2	7.6	4.7	31
12	4.2	7.6	4.2	5.2	5.7	98	11.3	6.3	11.4	8.9	4.7	24
13	3.8	*6.9	3.8	4.7	8.3	18.0	7.6	24.5	10.7	10.4	4.2	32
14	4.7	6.3	3.45	7.3	6.9	18.9	20.5	11.0	18.3	10.7	6.7	4.2
15	4.2	5.7	3.45	14.0	7.0	13.6	8.3	6.9	10.0	6.9	4.7	3.85
16	3.45	5.2	3.1	16.8	9.6	8.3	6.9	42	7.6	6.3	4.2	32
17	15.4	5.7	3.1	7.4	6.3	7.6	6.9	8.3	43	*5.7	4.7	8.8
18	4.7	4.7	3.1	5.2	12.9	29	5.7	12.6	15.5	5.2	4.7	38
19	9.9	5.2	2.8	4.2	66	10.4	374	143	23.5	5.2	4.7	21
20	9.7	80	2.45	6.0	29.5	11.6	68	24	18.0	5.7	4.2	23.5
21	5.2	10.5	2.45	7.3	36	8.3	18.0	10.2	11.7	6.9	5.2	42
22	4.2	6.3	2.15	4.7	19.8	6.3	15.5	8.3	11.2	5.7	30	23
23	5.7	5.7	2.15	7.2	9.4	7.5	*10.4	12.6	10.9	5.2	10.4	11.7
24	9.9	5.7	1.85	7.4	8.3	6.9	8.3	7.6	7.6	4.7	5.7	9.4
25	5.2	6.3	1.85	23.5	6.9	5.7	8.3	6.9	7.5	4.2	31	7.6
26	5.2	5.2	2.15	11.3	6.9	5.2	7.6	6.9	27.5	5.2	6.9	6.9
27	4.2	5.7	2.15	82	14.7	17.8	6.9	11.1	65	19.6	8.1	29.5
28	4.2	5.2	5.1	51	8.3	8.1	6.3	7.5	27.5	7.6	12.3	33
29	5.2	5.2	39.5	36	6.3	6.9	5.7	*6.3	11.0	5.7	12.6	3.95
30	16.6	6.3	6.4	80	6.3	45	5.7	-	6.3	11.8	7.6	27
31	6.9	14.8	-	29	-	139	8.7	-	7.6	-	5.7	-
Total	258.65	531.2	190.40	487.75	401.9	735.5	841.1	465.2	662.2	307.1	344.0	490.70
Mean:												
mgd	8.34	17.1	6.35	15.7	13.4	23.7	27.1	16.0	21.4	10.2	11.1	16.4
cfs	12.9	26.5	9.82	24.3	20.7	36.7	41.9	24.8	33.1	15.8	17.2	25.4
Ac-ft	794	1,630	584	1,500	1,230	2,260	2,580	1,430	2,030	942	1,060	1,510

Calendar year 1951. Max 422 Min 1.85 Mean(mgd) 16.6 Mean(cfs) 25.7 Ac-ft 18,600
 Fiscal year 1951-52: Max 374 Min 1.85 Mean(mgd) 15.6 Mean(cfs) 24.1 Ac-ft 17,560

Peak discharge (base, 950 mgd)--Oct. 30 (5 p.m.) 1,480 mgd (2,290 cfs), 7.21 ft; Jan. 19 (6:30 p.m.) 2,480 mgd (3,840 cfs), 8.62 ft.

* Discharge measurement made on this day.

Pulena Stream near Wailau

Location.--Lat 21°07'40", long 156°49'50", on left bank 0.5 mile upstream from confluence with Waiakakua Stream, 3 miles south of Wailau, and 4 miles northwest of Pukoo.

Drainage area.--4.4 sq mi.

Records available.--October 1919 to December 1928, September 1937 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 591 ft (corrected) above mean sea level (hand levels by Bureau of Reclamation). Prior to Dec. 5, 1928, at site 150 ft upstream at different datum.

Average discharge.--22 years (1920-28, 1938-52), 22.5 mgd (34.8 cfs).

Extremes.--Maximum discharge during year, 2,010 mgd (3,110 cfs) Jan. 19 (gage height, 7.77 ft), from rating curve extended as explained below; minimum, 3.75 mgd (5.80 cfs) July 1, 2.
1919-28, 1937-52: Maximum discharge, 5,970 mgd (9,240 cfs) Jan. 26, 1948 (gage height, 13.16 ft), from rating curve extended above 200 mgd by test on model of station site; minimum, 3.0 mgd (4.6 cfs) June 28, July 14, 1920.
Flood of Jan. 20, 1929, reached a stage of at least 22 ft (discharge, approximately 11,000 mgd, 17,000 cfs).

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

Revisions (fiscal years).--WSP 1185: 1938-48(M).

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Oct. 30				Oct. 31 to June 30			
0.5	2.75	1.5	36.5	0.6	4.6	2.0	80
.6	4.2	2.0	73	.8	9.0	2.5	138
.7	5.9	2.5	130	1.0	15.5	3.0	225
.9	10.8	3.0	210	1.3	29	3.5	335
1.2	21.3			1.7	55	4.2	535

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.9	6.0	8.9	6.7	34.5	9.9	41	11.1	24.5	18.9	11.0	5.2
2	3.9	5.5	8.1	5.6	21	9.6	23	11.9	*12.6	13.3	8.5	5.4
3	8.2	6.0	7.7	7.4	17.5	10.2	33.5	8.0	15.4	15.9	46	5.0
4	6.0	10	6.8	5.1	13.3	26	37	7.6	74	11.3	31.5	4.6
5	14.0	55	6.4	4.4	15.5	13.3	19.5	7.3	45	17.2	23.5	6.6
6	15	45	5.9	5.1	16.3	16.8	16.7	7.1	22.5	12.3	16.3	8.4
7	10	140	10.7	13.1	11.6	13.8	14.8	6.6	19.0	16.3	11.9	*5.0
8	8.0	*38.5	16.8	5.2	19.6	17.4	12.6	6.2	31	25.5	10.2	5.2
9	6.5	33	7.0	7.6	15.1	*11.0	89	7.1	23.5	18.8	9.0	21.5
10	5.5	23.5	5.9	8.1	13.0	17.9	31.5	12.3	26	12.3	8.3	16.0
11	4.5	16.3	5.9	8.5	10.4	48	31.5	8.1	30.5	*11.3	7.8	33
12	4.0	12.3	5.4	5.4	8.8	62	25	7.1	22.5	10.4	7.3	39
13	4.0	10.8	5.2	5.9	14.7	28.5	18.4	8.4	24	27	7.1	31.5
14	4.0	9.4	5.1	6.3	10.4	19.1	53	6.0	31	11.9	6.8	23
15	4.0	8.1	5.1	*6.3	9.3	15.1	24	5.8	21	10.2	6.6	36
16	4.0	7.9	4.9	5.4	8.5	13.3	18.7	5.6	15.1	9.0	6.2	32.5
17	9.0	7.7	4.7	4.5	8.3	12.6	15.9	5.6	26	8.3	6.2	16.6
18	4.5	6.8	4.7	4.2	18.4	16.3	13.3	6.6	17.1	7.8	8.3	35.5
19	5.5	6.6	4.5	5.1	11.6	11.6	513	115	16.7	7.8	7.9	29
20	6.0	27.5	4.4	5.4	57	17.7	136	28	14.4	13.5	6.2	36
21	5.5	9.4	5.7	8.2	44	13.0	46	14.4	13.7	12.8	6.0	51
22	5.0	7.0	4.2	5.6	49	9.9	31.5	12.7	20.5	9.9	13.9	30.5
23	5.5	7.9	4.2	6.5	25.5	16.9	21.5	18.0	17.7	8.3	9.3	21
24	6.0	13.7	4.0	4.9	19.5	11.9	17.5	10.7	11.3	6.6	6.2	16.3
25	5.0	14.9	4.5	4.5	15.5	9.6	14.8	11.3	12.3	8.3	12.9	12.6
26	4.5	8.1	4.2	4.5	17.8	8.5	13.0	14.1	24	8.0	6.2	12.0
27	4.0	9.1	4.5	181	25.5	12.2	11.3	16.8	38	26	6.0	34
28	4.0	7.9	5.3	*9.0	14.8	9.0	10.4	11.3	51	12.9	7.3	37
29	5.0	8.1	19.4	*46	11.9	10.1	9.9	11.7	17.5	12.3	9.6	44
30	5.5	12.7	5.6	185	11.9	23.5	9.0	-	13.3	24	7.8	34
31	6.5	16.7	-	65	-	109	15.2	-	12.6	-	5.8	-
Total	189.0	591.4	195.7	696.5	669.6	623.7	1,365.5	402.4	723.7	408.1	337.6	687.4
Mean:	6.10	19.1	6.52	22.5	22.3	20.1	44.0	13.9	23.3	13.6	10.9	22.9
mgd	9.44	29.6	10.1	34.8	34.3	31.1	68.1	21.5	36.1	21.0	16.9	35.4
cfs	580	1,810	601	2,140	2,050	1,910	4,190	1,230	2,220	1,250	1,040	2,110
Ac-ft												

Calendar year 1951: Max 929 Min 3.9 Mean(mgd) 23.8 Mean(cfs) 36.8 Ac-ft 26,620
Fiscal year 1951-52: Max 513 Min 3.9 Mean(mgd) 18.8 Mean(cfs) 29.1 Ac-ft 21,130

Peak discharge (base, 1,800 mgd).--Oct. 30 (4:30 p.m.) 1,970 mgd (3,050 cfs), 7.68 ft; Jan. 19 (4:30 p.m.) 2,010 mgd (3,110 cfs), 7.77 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 6 to Aug. 7; discharge estimated on basis of recorded range in stage and records for nearby streams.

ISLAND OF MOLOKAI

71

Waiakeakua Stream near Wailau

Location.--Lat 21°07'30", long 156°49'40", on right bank 0.8 mile upstream from confluence with Pulehena Stream, 3.2 miles south of Wailau, and 3.3 miles northwest of Pukoo.

Drainage area.--1.4 sq mi.

Records available.--November 1919 to September 1929, September 1937 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 698 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Dec. 6, 1919, at datum 0.17 ft higher.

Average discharge.--23 years (1920-29, 1938-52), 7.53 mgd (11.7 cfs);

Extremes.--1950-51: Maximum discharge during fiscal year, 980 mgd (1,520 cfs) Dec. 3 (gage height, 7.62 ft), from rating curve extended as explained below; minimum, 1.73 mgd (2.68 cfs) June 30.

1951-52: Maximum discharge during fiscal year, 540 mgd (836 cfs) Jan. 19 (gage height, 6.00 ft), from rating curve extended as explained below; minimum, 1.73 mgd (2.68 cfs) July 1-3.

1919-29, 1937-52: Maximum discharge, 1,730 mgd (2,680 cfs) Jan. 26, Apr. 2, 1948, from rating curve extended above 25 mgd by test on model of station site; maximum gage height, 9.90 ft Jan. 26, 1948; minimum discharge, 1.15 mgd (1.78 cfs) Nov. 1, 1949.

Revisions.--The figures of maximum discharge for some fiscal years have been revised as shown in the following table. They supersede figures published in the water-supply papers indicated.

WSP	Fiscal year	Date	Discharge		Gage height (feet)
			(mgd)	(cfs)	
516	1919-20†	Mar. 11, 1920	310	480	5.00
575	1923	Mar. 31, 1923	875	1,350	7.15
885	1939	Aug. 24, 1938	1,190	1,840	8.26
985	1943	Mar. 18, 1943	1,680	2,600	9.82
1095	1947	Dec. 7, 1946	1,850	1,320	7.06
1125	1948	Jan. 26, 1948, Apr. 2, 1948	1,730	2,680	††9.90

† Period November 1919 to June 1920.

†† Occurred Jan. 26, 1948.

Remarks.--Records fair. No diversions.

Revisions (water years).--The figures of peak discharge for the fiscal year 1948 have been revised as shown below. They supersede figures published in WSP 1125.

Revised peak discharge.--Sept. 4 (5 a.m.) 590 mgd (913 cfs); Oct. 26 (2 p.m.) 370 mgd (572 cfs); Dec. 12 (2 p.m.) 220 mgd (340 cfs); Dec. 17 (8:30 a.m.) 250 mgd (387 cfs); Jan. 26 (8 p.m.) 1,730 mgd (2,680 cfs); Apr. 2 (9 a.m.) 1,730 cfs (2,680 cfs).

Discharge, in million gallons a day, fiscal year July 1950 to June 1951

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.55	5.1	4.7	3.45	3.7	20.5	6.1	3.25	4.6	9.0	10.7	2.5
2	3.7	5.4	4.5	*4.8	3.55	16.2	5.2	3.25	4.4	7.3	4.9	2.4
3	3.7	7.4	4.0	3.25	3.4	*63	12.1	3.1	3.7	7.6	4.9	2.3
4	3.55	8.5	3.85	3.1	4.1	20	5.9	3.45	3.4	14.8	4.0	2.15
5	6.8	*5.0	4.0	4.3	3.4	18.1	6.1	3.4	25	13.3	3.7	2.3
6	4.2	10.8	4.5	10.2	3.5	34	8.6	2.95	10.6	8.9	3.55	2.3
7	3.55	13.7	4.2	4.6	3.4	23.5	5.0	2.95	7.3	6.9	5.0	2.3
8	3.4	5.7	5.4	3.4	3.0	14.2	5.2	2.9	4.9	7.0	10.9	2.15
9	3.25	5.1	6.1	4.3	5.5	10.4	4.8	2.65	4.2	7.1	4.2	2.15
10	4.4	6.0	6.4	4.2	5.0	20.5	4.4	2.65	*4.6	9.6	9.5	2.65
11	3.55	6.0	9.6	5.8	3.55	12.7	4.3	2.5	4.4	10.3	4.4	2.5
12	3.25	6.0	4.8	3.85	4.4	9.7	6.0	3.7	4.4	7.9	4.0	3.8
13	7.2	6.7	4.4	3.55	3.4	8.6	5.3	3.1	121	5.9	4.9	4.6
14	3.55	60	4.2	3.4	3.4	7.5	9.0	2.65	40	5.1	7.7	3.2
15	3.4	73	4.3	3.55	159	6.5	11.9	4.4	9.4	4.9	3.65	2.8
16	4.4	11.9	4.4	3.55	73	6.1	*7.4	6.7	7.1	4.9	*3.45	2.5
17	5.4	15.9	5.2	3.25	14.6	5.7	5.5	3.55	5.9	4.2	4.2	2.9
18	5.5	8.2	4.2	3.25	9.6	5.2	8.1	12.5	5.1	4.9	4.5	2.3
19	5.5	6.8	4.0	3.1	10.8	5.0	4.9	23.5	5.1	4.0	3.55	2.15
20	19.0	6.3	3.85	3.0	28	4.8	5.0	6.2	4.4	4.6	3.4	2.15
21	10.9	5.9	3.7	3.0	8.5	4.6	4.4	25	4.6	3.7	3.4	2.15
22	17.3	5.5	3.7	3.0	6.9	4.4	19.1	12.0	57	3.55	3.1	2.05
23	14.4	5.0	3.55	4.1	5.7	4.3	8.2	6.4	7.4	4.0	2.85	1.95
24	19.1	4.8	3.55	4.1	5.8	4.2	5.3	15.5	9.3	3.55	2.85	2.8
25	18.2	4.6	3.55	3.85	56	4.2	4.6	5.7	81	3.55	3.0	2.05
26	11.1	4.4	3.4	3.4	74	4.9	4.4	4.4	65	3.55	4.1	1.95
27	18.4	4.4	3.55	3.55	45	7.9	4.0	6.6	146	3.25	3.45	1.84
28	9.3	4.2	3.25	3.25	17.8	15.9	3.85	4.4	36.5	3.7	2.8	1.84
29	7.1	4.2	3.1	6.9	10.7	22	3.55	-	12.6	9.5	2.65	*1.84
30	6.6	4.6	3.25	8.1	54	18.6	3.55	-	9.6	14.6	2.5	1.84
31	5.7	4.0	-	4.5	-	7.0	3.4	-	8.3	-	2.5	-
Total	238.95	325.1	131.20	129.65	632.70	410.2	195.15	179.25	716.8	201.15	138.70	72.41
Mean:												
mgd	7.71	10.5	4.37	4.18	21.1	13.2	6.30	6.40	23.1	6.70	4.47	2.41
cfs	11.9	16.2	6.76	6.47	32.6	20.4	9.75	9.90	35.7	10.4	6.92	3.73
Ac-ft	733	998	403	398	1,940	1,260	599	550	2,200	617	426	222

Calendar year 1950: Max 159 Min 2.2 Mean(mgd) 8.55 Mean(cfs) 13.2 Ac-ft 9,570
Fiscal year 1950-51: Max 159 Min 1.64 Mean(mgd) 9.24 Mean(cfs) 14.3 Ac-ft 10,350

Peak discharge (base, 240 mgd).--Aug. 15 (1 a.m.) 415 mgd (642 cfs), 5.50 ft; Nov. 15 (1:30 p.m.) 650 mgd (1,010 cfs), 6.43 ft; Nov. 26 (7:30 p.m.) 270 mgd (418 cfs), 4.85 ft; Nov. 30 (7 a.m.) 270 mgd (418 cfs), 4.79 ft; Dec. 3 (8:30 p.m.) 980 mgd (1,520 cfs), 7.62 ft; Mar. 13 (3:30 p.m.) 650 mgd (1,010 cfs), 6.38 ft; Mar. 22 (6 a.m.) 270 mgd (418 cfs), 4.85 ft; Mar. 27 (7 a.m.) 540 mgd (836 cfs), 5.98 ft.

* Discharge measurement made on this day.

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Waiakeakua Stream near Wailau--Continued

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.73	2.3	3.7	3.1	9.1	3.4	10.5	4.3	*a9.0	7.7	3.15	2.65
2	1.73	2.05	3.55	2.65	5.7	3.25	9.9	4.1	4.2	5.3	2.9	2.5
3	9.0	2.35	3.4	3.1	4.9	3.7	9.1	2.8	9.9	9.5	26	2.35
4	5.5	4.1	3.1	2.65	4.0	9.4	8.9	2.65	27	4.9	9.1	2.25
5	5.5	22	3.1	2.4	4.2	5.1	5.7	2.65	9.2	9.4	7.9	2.5
6	7.7	23.5	3.25	3.25	4.6	3.85	5.3	2.4	5.5	5.6	4.9	*2.65
7	3.85	74	8.9	7.0	3.7	3.55	4.6	2.4	4.6	5.6	4.2	2.35
8	2.65	*11.8	5.7	2.95	4.6	4.2	4.4	2.3	8.1	9.0	3.7	2.35
9	2.4	9.8	3.4	3.55	3.85	*3.4	34.5	2.8	5.1	7.6	3.3	9.1
10	2.5	8.1	3.1	3.1	3.7	4.1	7.3	8.6	4.9	*5.3	3.15	7.0
11	2.15	6.2	2.8	4.5	3.4	14.2	7.5	3.6	9.0	*4.6	3.0	11.1
12	2.05	4.9	2.65	2.95	3.1	21.5	5.9	3.7	5.3	4.2	2.9	11.2
13	2.15	4.6	2.5	2.8	3.55	6.2	6.8	4.1	5.4	7.7	2.75	11.3
14	2.3	4.0	2.4	*3.5	3.25	5.1	11.9	2.8	7.0	4.4	2.75	6.2
15	2.05	3.85	2.4	*4.2	3.4	4.2	5.5	2.65	5.3	3.85	2.65	6.6
16	2.05	3.7	2.3	5.8	3.25	3.85	4.9	2.9	4.0	3.5	2.5	15.5
17	8.0	5.2	2.3	3.95	2.95	3.7	4.4	a2.4	16.7	3.3	2.5	6.0
18	2.15	3.4	2.3	3.1	5.5	6.0	4.0	a3.3	5.9	3.15	2.5	17.0
19	3.85	3.4	2.15	2.95	38	3.7	122	a40	10.5	3.0	2.5	9.9
20	4.1	28	2.15	3.1	18.7	6.2	21	a9.0	7.6	4.1	2.5	12.2
21	2.4	5.2	2.4	3.4	18.8	4.0	9.1	a5.5	5.3	3.3	2.35	18.2
22	2.3	4.2	2.3	3.1	11.0	3.4	6.9	a4.7	6.3	3.0	8.7	9.5
23	2.8	4.2	2.15	3.65	6.4	3.85	5.5	a7.5	5.1	2.9	3.35	6.7
24	3.1	4.4	2.15	3.45	5.7	3.4	4.6	a3.7	3.85	2.65	2.5	5.6
25	2.3	3.85	2.3	3.75	4.9	3.1	4.2	a3.9	5.5	2.9	11.7	4.9
26	2.3	3.55	2.3	3.4	4.6	3.1	3.85	a5.5	6.4	3.0	3.15	5.2
27	2.05	3.85	2.15	*24	6.4	5.4	3.55	a7.0	19.9	8.5	3.15	11.7
28	2.15	3.55	3.85	*13.1	4.4	3.4	3.4	a4.0	9.2	3.7	3.7	13.9
29	2.4	3.55	13.3	10.1	3.85	5.7	3.25	a4.2	5.8	4.4	3.7	21
30	4.1	5.2	3.1	27.5	3.7	14.2	3.25	-	4.9	5.2	3.3	12.3
31	2.8	6.6	-	15.4	-	52	3.4	-	4.9	-	2.75	-
Total	100.11	275.40	101.15	181.45	203.20	220.15	345.10	155.45	241.35	152.25	143.20	251.70
Mean:												
mgd	3.23	8.88	3.37	5.85	6.77	7.10	11.1	5.36	7.79	5.08	4.62	8.39
cfs	5.00	13.7	5.21	9.05	10.5	11.0	17.2	8.29	12.1	7.86	7.15	13.0
Ac-ft	307	845	310	557	624	676	1,060	477	741	467	439	772

Calendar year 1951: Max 146 Min 1.73 Mean(mgd) 7.08 Mean(cfs) 11.0 Ac-ft 7,930

Fiscal year 1951-52: Max 122 Min 1.73 Mean(mgd) 6.48 Mean(cfs) 10.0 Ac-ft 7,280

Peak discharge (base, 240 mgd).--Oct. 30 (4 p.m.) 270 mgd (418 cfs), 4.85 ft; Jan. 19 (3 p.m.) 540 mgd (836 cfs), 8.00 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for stations on nearby streams.

Pelekunu Stream near Pelekunu

Location.--Lat 21°08'20", long 156°52'50", on right bank 0.8 mile upstream from Lanipuni Stream, 1.8 miles south of Pelekunu, and 6.8 miles northwest of Pukoo.

Drainage area.--2.4 sq mi.

Records available.--December 1919 to January 1929, September 1937 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 546 ft above mean sea level (levels by Bureau of Reclamation). Prior to Sept. 15, 1937, at site 250 ft upstream at different datum.

Average discharge.--21 years (1920-28, 1938-47, 1948-52), 11.0 mgd (17.0 cfs).

Extremes.--1950-51: Maximum discharge during year not determined; minimum daily, 2.2 mgd (3.4 cfs) for several days in September, October, and November.
1951-52: Maximum discharge during year, 1,800 mgd (2,790 cfs) Jan. 19 (gage height, 3.63 ft), from rating curve extended above 20 mgd by test on model of station site; minimum daily, 2.3 mgd (3.6 cfs) Sept. 21-27.
1919-29, 1937-52: Maximum discharge observed, 3,080 mgd (4,770 cfs) Nov. 20, 1940 (gage height, 6.81 ft), from rating curve extended above 80 mgd by logarithmic plotting, but may have been greater Jan. 26, 1948, when flood of undetermined magnitude destroyed station; minimum, 1.46 mgd (2.26 cfs) Nov. 26, 27, 1943.

Remarks.--Records for 1951 poor, and those for 1952, fair. No diversions.

Discharge, in million gallons a day, fiscal year July 1950 to June 1951

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.8	5.2	4.0	2.4	3.0	111	18	6.0	17	21	11	3.1
2	3.8	4.3	4.0	2.8	2.8	56	14	5.6	12	15	7.5	3.0
3	3.8	4.3	3.8	2.2	2.6	114	14	5.6	13	14	8.0	3.0
4	3.6	5.4	3.6	2.2	3.0	70	11	7.0	11	20	5.5	3.0
5	7.2	4.0	3.8	4.6	2.4	80	12	6.0	50	16	4.8	3.0
6	5.2	*7.9	4.6	6.2	2.2	130	11	5.5	28	15	*4.4	3.7
7	3.6	13.0	4.3	3.2	2.2	90	10	5.0	*17	11	5.0	3.6
8	3.6	5.2	5.4	3.0	2.2	60	9.0	5.2	10.5	9.0	6.0	3.5
9	3.4	4.6	5.4	3.85	6.7	35	8.0	4.8	8.0	9.0	4.5	4.0
10	4.9	5.7	4.6	3.2	8.7	50	7.5	4.6	8.5	10	6.0	7.0
11	4.9	5.2	9.0	5.5	7.4	40	7.5	4.5	7.0	8.5	*4.2	5.0
12	3.6	5.7	4.0	3.4	5.7	36	8.0	8.0	8.0	9.0	3.7	5.5
13	4.9	10.7	3.8	3.0	3.8	28	8.5	9.0	200	7.5	3.5	7.5
14	3.4	311	3.4	2.6	3.4	18	40	6.0	120	6.5	3.5	4.7
15	3.2	290	3.4	3.0	273	15	60	9.0	20	5.7	3.6	5.0
16	3.8	39	4.0	3.4	222	14	45	15	13	5.3	3.5	5.0
17	5.5	33.5	4.0	2.4	79	13	18	11	9.5	5.0	8.5	4.8
18	4.0	15.3	3.2	2.4	40	12	19	22	8.0	5.6	9.0	4.5
19	4.6	11.6	3.2	2.4	44	11	11	24	7.5	4.7	4.5	3.7
20	6.8	9.6	3.0	2.2	38	11	9.0	25	6.5	5.2	4.8	3.4
21	8.1	8.4	3.0	2.2	19.3	10	8.5	70	8.0	4.5	4.5	3.2
22	14.1	7.3	2.8	2.2	13.5	9.5	10	28	110	4.5	4.2	3.1
23	8.4	6.3	2.8	6.5	11.2	9.0	24	13	25	5.0	3.8	*3.0
24	13.5	6.0	2.8	5.7	11.8	9.0	12	11	35	4.5	3.6	3.3
25	15.9	5.7	2.8	4.8	234	8.5	9.0	9.5	210	4.4	3.8	3.1
26	10.7	5.4	2.6	3.6	194	10	8.0	9.0	250	4.3	4.0	2.8
27	16.5	5.4	2.4	4.2	182	48	7.5	17	500	3.9	3.7	2.8
28	11.2	4.6	*2.4	3.0	51	45	7.0	15	120	4.3	3.5	*2.55
29	7.7	4.3	2.2	4.0	*24	80	6.5	-	40	20	3.7	2.8
30	5.6	4.6	2.2	5.4	221	65	6.0	-	27	17	3.5	2.65
31	5.4	4.3	-	3.6	-	27	6.0	-	19	-	3.3	-
Total	205.7	853.5	110.5	109.15	1,713.9	1,313.0	445.0	361.3	1,918.5	275.4	153.1	115.70
Mean	6.64	27.5	3.68	3.52	57.1	42.4	14.4	12.9	61.9	9.18	4.94	3.86
cfs	10.3	42.5	5.69	5.45	88.3	65.6	22.3	20.0	95.8	14.2	7.84	5.97
Ac-ft	631	2,620	339	335	5,260	4,030	1,370	1,110	5,890	845	470	355

Calendar year 1950: Max 311 Min 2.2 Mean(mgd) 20.2 Mean(cfs) 31.3 Ac-ft 22,600
Fiscal year 1950-51: Max 500 Min 2.2 Mean(mgd) 20.8 Mean(cfs) 32.2 Ac-ft 23,260

Peak discharge (base, 300 mgd).--Aug. 15 (12:30 a.m.) 1,350 mgd (2,090 cfs), 7.27 ft; Nov. 18 (3:30 p.m.) 820 mgd (959 cfs), 6.38 ft; Nov. 27 (2 p.m.) 440 mgd (681 cfs), 6.06 ft; Nov. 30 (3:30 p.m.) 1,260 mgd (1,980 cfs), 7.16 ft; Dec. 3 (8:30 p.m.) 910 mgd (1,410 cfs), 6.73 ft; Dec. 29 (time and discharge unknown); Feb. 21 (time and discharge unknown); Mar. 13 (time and discharge unknown); Mar. 27 (time and discharge unknown).

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 3 to Jan. 27; discharge estimated on basis of records for near-by streams.

Pelekunu Stream near Pelekunu--Continued

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.7	3.85	3.2	4.0	13.6	5.8	14.3	5.5	7.6	7.8	6.3	3.45
2	2.6	3.45	3.2	3.7	10.2	5.6	10.5	5.8	6.0	7.0	5.3	3.45
3	3.25	3.65	3.1	3.9	8.8	5.8	15.0	5.0	5.6	7.0	14.1	3.4
4	3.75	4.1	2.8	3.3	7.6	10.3	17.0	4.6	11.8	6.3	13.0	3.2
5	4.7	11.9	2.75	3.0	8.6	7.6	10.7	4.4	11.2	7.0	12.2	4.0
6	5.9	8.4	2.65	3.5	7.8	7.8	9.6	4.3	7.8	6.3	10.2	4.8
7	3.2	27.5	6.3	5.7	6.6	8.3	8.8	4.1	8.1	7.8	8.0	3.45
8	2.8	12.3	7.2	3.2	9.9	9.4	7.8	4.0	13.6	10.6	6.8	*3.65
9	2.7	9.6	3.4	4.1	8.3	6.8	26	*4.0	11.3	7.8	8.3	8.5
10	2.9	*8.3	3.0	4.1	7.8	8.9	13.6	4.8	12.0	6.8	5.6	6.3
11	2.8	7.3	2.9	4.3	6.6	18.8	13.9	3.9	12.6	5.8	5.3	11.7
12	2.7	5.8	2.8	3.1	5.8	23	11.0	3.75	10.5	5.6	5.0	13.3
13	3.1	5.5	2.7	2.9	8.8	14.5	9.6	3.9	12.3	8.3	4.8	12.0
14	3.55	5.3	2.6	3.8	7.6	12.0	21	3.65	14.2	5.8	4.6	11.3
15	2.9	4.4	2.5	3.5	6.3	9.9	12.3	<u>3.45</u>	10.5	*5.3	4.4	15.0
16	2.75	4.1	2.5	2.7	5.8	8.8	10.2	3.45	8.3	5.1	4.1	12.6
17	4.5	3.9	2.5	2.6	5.5	8.0	8.8	3.45	10.5	4.8	3.9	8.8
18	2.8	3.75	2.4	*2.5	7.6	9.1	8.0	3.65	8.0	4.8	4.4	11.7
19	4.9	3.55	2.4	*2.7	28	7.6	e350	57	7.3	4.6	4.6	9.9
20	5.4	7.3	2.4	3.1	15.6	8.6	e100	16.2	6.8	6.0	4.1	11.7
21	3.05	4.4	2.3	*4.5	13.3	7.6	19.5	9.6	6.0	5.6	3.9	21
22	3.05	3.65	2.3	*3.1	13.6	6.3	13.0	7.8	8.0	5.3	6.3	13.0
23	4.6	3.85	2.3	3.4	10.2	9.9	10.2	7.6	8.7	5.0	5.5	10.2
24	6.9	5.2	2.3	2.9	9.1	8.0	8.8	6.6	6.3	4.1	3.9	8.6
25	3.45	6.4	2.3	2.8	7.8	6.6	7.6	6.6	6.6	5.0	4.6	7.0
26	3.55	3.85	2.3	2.75	9.4	6.3	7.0	7.5	21.5	5.1	3.85	6.6
27	3.05	3.65	2.3	45	9.4	6.8	6.3	8.2	14.4	11.3	3.85	13.9
28	3.55	3.4	3.5	30.5	7.6	5.8	5.8	7.8	13.2	6.3	3.9	11.7
29	3.7	3.4	9.0	18.0	6.6	5.8	5.5	6.8	9.6	6.3	4.4	13.0
30	5.5	4.4	3.9	e90	6.6	8.8	5.3	-	8.0	10.2	4.6	11.0
31	7.0	5.2	-	26.5	-	34.5	7.6	-	7.6	-	5.55	-
Total	117.30	191.35	95.80	299.15	280.4	305.0	774.7	217.40	305.9	194.5	181.35	278.20
Mean	3.78	6.17	3.19	9.65	9.35	9.77	25.0	7.50	9.87	6.48	5.85	9.27
cfs	5.85	9.55	4.94	14.9	14.5	15.1	38.7	11.6	15.3	10.0	9.05	14.3
Ac-ft	360	587	294	918	861	930	2,380	667	939	597	557	854

Calendar year 1951: Max 500 Min 2.3 Mean(mgd) 12.5 Mean(cfs) 19.3 Ac-ft 13,990

Fiscal year 1951-52: Max 350 Min 2.3 Mean(mgd) 8.85 Mean(cfs) 13.2 Ac-ft 9,940

Peak discharge (base, 300 mgd).--Oct. 30 (4:30 p.m.) 1,760 mgd (2,720 cfs), 3.30 ft; Jan. 19 (6 p.m.) 1,800 mgd (2,790 cfs), 3.63 ft.

* Discharge measurement made on this day.

e Stage-discharge relation indefinite; discharge estimated on basis of records for nearby stations and partial good record.

Note.--No gage-height record Sept. 11 to Oct. 19; discharge estimated on basis of records for nearby stations.

Lanipuni Stream near Pelekunu

Location.--Lat 21°08'40", long 156°52'30", on left bank 0.4 mile upstream from mouth, 1.5 miles southeast of Pelekunu, and 6.8 miles northwest of Pukoo.

Drainage area.--0.8 sq mi.

Records available.--December 1919 to September 1929, September 1937 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 418 ft above mean sea level (hand levels from Geological Survey benchmark).

Average discharge.--22 years (1920-29, 1938-47, 1948-52), 9.53 mgd (14.7 cfs).

Extremes.--Maximum discharge during year, 530 mgd (820 cfs) Oct. 30 (gage height, 5.50 ft), from rating curve extended as explained below; minimum, 1.85 mgd (2.86 cfs) Oct. 26. 1919-29, 1937-52: Maximum discharge, 1,550 mgd (2,400 cfs), revised, Mar. 18, 1943 (gage height, 9.02 ft), from rating curve extended above 35 mgd by test on model of station site; minimum, 1.45 mgd (2.24 cfs) Jan. 29, 1944.

Revisions.--The maximum discharge for the fiscal year 1943 has been revised to 1,550 mgd (2,400 cfs) Mar. 18, 1943 (gage height, 9.02 ft), superseding figure published in WSP 1219.

Remarks.--Records fair. No diversions.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Oct. 20

Oct. 21 to June 30

0.1	1.68	0.6	9.5	0.3	1.75	1.0	19.5
.2	2.35	.7	12.3	.4	2.94	2.0	57
.3	3.35	1.0	22.9	.5	4.7	2.6	92
.4	4.95	1.3	37	.7	9.4		
.5	7.0	1.5	49				

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.25	3.15	2.9	2.95	6.2	3.15	7.6	5.3	6.4	5.4	4.4	2.75
2	2.2	3.0	2.9	2.55	4.7	2.95	5.5	4.3	4.0	4.9	3.35	2.75
3	2.75	3.6	2.8	3.1	4.2	3.35	13.8	2.9	3.5	5.8	26	2.6
4	3.4	5.5	2.6	2.45	3.55	8.5	13.2	2.75	13.1	4.4	18.6	2.35
5	6.3	14.7	2.6	2.2	4.7	5.3	6.8	2.75	8.	8.3	12.8	4.1
6	10.2	18.2	2.6	3.95	4.2	5.8	6.2	2.6	5.3	5.8	7.6	4.5
7	3.65	46	7.8	5.9	3.35	5.3	4.9	2.35	7.3	6.7	5.5	2.95
8	2.6	11.8	5.0	2.7	6.8	6.0	4.2	2.35	10.8	8.5	4.5	*2.95
9	2.55	9.0	3.0	3.15	5.3	4.4	22.5	*2.6	8.9	6.4	4.2	9.3
10	2.9	*7.8	2.8	2.7	4.4	4.5	8.1	3.3	9.7	5.3	3.65	8.9
11	2.8	5.8	2.7	3.55	3.35	28	10.3	2.35	12.4	4.4	3.35	15.1
12	2.55	4.6	2.55	2.55	2.95	28.5	7.3	2.45	7.6	4.2	2.95	15.1
13	2.8	4.4	2.45	2.55	5.3	9.1	6.4	2.6	9.5	9.7	2.9	12.2
14	2.9	3.8	2.45	2.8	4.3	6.8	17.7	2.1	12.1	4.7	2.9	10.0
15	2.55	3.35	2.35	2.85	3.5	5.5	7.3	2.1	6.8	*3.8	2.75	13.0
16	2.45	3.15	2.35	2.25	2.95	4.7	6.0	2.1	5.5	3.15	2.6	10.0
17	4.0	3.0	2.35	2.2	3.15	4.2	4.9	2.1	6.8	2.9	2.75	C.4
18	2.45	2.9	2.25	*2.1	7.1	5.1	4.2	4.3	5.3	2.9	3.8	12.7
19	4.8	2.8	2.2	2.25	32	3.65	87	65	5.1	2.75	3.85	10.7
20	4.4	7.1	2.2	*2.8	13.2	4.9	24	14.0	4.0	4.5	3.5	11.3
21	2.6	3.35	2.2	*3.7	8.4	4.2	8.9	6.4	3.8	4.2	2.9	18.3
22	2.6	2.9	2.1	*2.35	8.1	3.15	6.6	5.3	5.1	2.95	6.8	8.9
23	4.4	3.35	2.1	4.3	5.8	6.2	5.3	6.2	5.8	3.15	4.7	7.3
24	6.6	5.9	2.1	2.35	5.1	4.4	4.7	4.2	3.8	2.45	2.95	6.0
25	3.0	6.9	2.1	2.1	4.0	3.5	4.2	4.2	4.0	3.4	4.6	4.7
26	3.2	3.35	2.2	1.96	5.8	3.15	3.8	5.1	15.1	3.25	2.9	5.1
27	2.6	3.15	2.2	25	7.5	4.2	3.5	4.8	11.7	10.8	3.35	17.4
28	3.45	2.9	3.05	17.3	4.7	2.95	3.15	4.9	8.3	5.1	3.5	13.6
29	4.5	3.15	6.0	8.8	3.8	4.6	2.9	4.4	5.3	5.0	5.3	17.3
30	6.0	4.5	2.45	47	4.0	6.4	2.75	-	4.2	9.4	4.4	10.7
31	5.5	4.4	-	11.6	-	23	5.4	-	4.4	-	2.95	-
Total	114.95	207.50	85.35	184.01	182.20	215.45	319.10	178.80	224.3	154.20	164.30	268.95
Mean:												
mgd	3.71	6.69	2.84	5.94	6.07	6.95	10.3	6.10	7.24	5.14	5.30	8.96
cfs	5.74	10.4	4.39	9.19	9.39	10.8	15.9	9.44	11.2	7.95	8.20	13.9
Ac-ft	353	637	262	585	559	661	979	543	688	473	504	825

Calendar year 1951. Max 240 Min 1.96 Mean(mgd) 8.12 Mean(cfs) 12.6 Ac-ft 9,100
Fiscal year 1951-52: Max 87 Min 1.96 Mean(mgd) 6.28 Mean(cfs) 9.72 Ac-ft 7,050

Peak discharge (base, 300 mgd).--Oct. 30 (4:30 p.m.) 530 mgd (820 cfs), 5.50 ft; Jan. 19 (6 p.m.) 455 mgd (704 cfs), 5.18 ft; Feb. 19 (12:30 p.m.) 410 mgd (634 cfs), 5.01 ft; Mar. 26 (7:30 a.m.) 350 mgd (542 cfs), 4.70 ft.

* Discharge measurement made on this day.

Waikolu Stream below pipeline crossing, near Kalaupapa

Location.--Lat 21°09'50", long 156°56'00", on left bank 0.8 mile upstream from mouth and 3.9 miles southeast of Kalaupapa Post Office.

Drainage area.--4.0 sq mi.

Records available.--June 1919 to July 1932, September 1937 to June 1952. Prior to November 1930, published as Waikolu Stream at pipeline crossing.

Gage.--Water-stage recorder and artificial control. Datum of gage is 253 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 18, 1930, water-stage recorder at site 500 ft upstream at different datum. Sept. 20, 1937, to July 1948 water-stage recorder at present site at datum 0.49 ft higher.

Average discharge.--22 years (1919-29, 1938-47, 1949-52), 11.8 mgd (18.3 cfs).

Extremes.--Maximum discharge during year, 980 mgd (1,520 cfs) Jan. 19 (gage height, 5.97 ft), from rating curve extended as explained below; minimum, 4.3 mgd (6.6 cfs) Apr. 17, 1919-32, 1937-52: Maximum discharge, 3,700 mgd (5,720 cfs) Jan. 26, 1948 (gage height, about 10.25 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 1.3 mgd (2.0 cfs) Nov. 1, 2, 1925, June 5, 1926.

Remarks.--Records fair except those for period of no gage-height record, which are poor. Kalaupapa water-supply system diverts water above station.

Revisions (fiscal years).--WSP 1155: 1932, 1938-48(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.8	2.85	2.3	19.5
1.9	4.7	2.5	35
2.0	7.2	2.8	68
2.1	10.3	3.2	124
2.2	14.3	3.6	197

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.5	7.8	6.6	6.4	10	7.0	10.3	8.4	6.6	5.8	6.4	4.7
2	7.5	7.2	6.6	6.1	8.0	6.5	7.2	8.4	6.4	5.8	5.1	4.7
3	7.5	*7.5	6.4	6.1	7.5	6.5	13.4	6.4	6.1	5.8	4.0	4.5
4	7.5	8.8	6.4	6.1	7.0	10	19.0	6.1	13.4	6.1	21	4.5
5	8.8	16.7	6.4	5.8	8.0	8.0	9.4	5.8	14.2	7.5	13.6	4.5
6	11.9	12.0	6.4	6.4	8.0	9.0	6.6	5.8	6.6	7.5	9.7	5.4
7	9.1	28	8.0	8.8	6.5	*8.0	7.5	5.8	6.6	7.8	6.4	5.1
8	7.8	13.1	9.4	6.6	8.5	9.1	6.4	5.8	22	10.7	5.6	5.4
9	7.8	8.8	8.9	6.4	7.5	6.9	23.5	5.8	11.1	7.2	5.1	*9.0
10	7.5	8.1	6.6	6.1	6.5	13.4	13.5	*5.8	13.1	6.1	5.1	6.6
11	7.2	7.8	6.4	6.6	6.0	101	14.5	5.8	11.0	5.8	5.1	9.7
12	7.2	7.2	6.4	6.4	5.5	85	9.4	5.6	9.7	5.6	4.9	9.4
13	7.2	6.9	6.4	6.1	7.0	15.8	6.9	5.6	15.7	11.9	4.9	10.8
14	7.5	6.9	6.4	5.8	6.5	11.2	22	5.6	19.0	*6.6	4.9	8.1
15	7.5	6.9	6.4	5.8	6.0	8.4	9.7	5.6	9.4	5.8	4.7	9.8
16	7.2	6.9	6.4	5.8	6.0	7.2	6.6	5.6	7.8	5.4	4.7	8.1
17	7.5	6.6	6.4	5.8	5.5	6.9	6.4	5.6	7.2	5.1	4.7	5.6
18	7.2	6.6	6.4	5.8	8.0	8.0	6.1	7.1	7.5	4.7	4.7	7.2
19	8.1	6.6	6.4	5.8	25	6.9	187	144	6.4	4.9	5.4	6.6
20	9.4	7.5	6.1	5.8	15	7.8	41	17.8	6.1	4.9	5.1	8.8
21	7.8	7.8	6.1	6.4	10	6.6	11.1	8.8	6.1	5.1	4.9	18.9
22	7.2	6.9	6.1	6.1	10	6.4	10.0	7.2	6.6	5.1	5.1	8.1
23	7.8	6.6	6.1	6.1	9.5	7.4	7.5	6.6	10.2	5.1	6.6	6.4
24	10.0	6.6	6.1	*5.6	8.5	8.4	6.6	6.6	6.4	4.9	5.1	5.8
25	7.8	6.9	6.1	5.4	7.5	6.6	6.4	6.4	6.1	5.1	4.9	5.1
26	7.2	6.9	6.1	5.6	8.0	6.4	6.4	8.1	18.2	5.6	4.9	4.9
27	7.2	6.6	6.1	4.0	9.5	6.1	6.4	6.9	11.4	11.3	4.9	9.8
28	7.2	6.6	6.4	25	8.0	6.4	6.1	8.8	12.9	6.6	4.7	11.4
29	7.2	6.6	6.6	20	7.0	7.5	6.1	6.4	6.6	5.4	4.9	10.3
30	8.8	6.6	6.4	6.0	7.0	9.4	6.1	-	5.8	8.3	5.4	8.8
31	10.3	6.6	-	25	-	61	9.4	-	5.8	-	4.9	-
Total	247.4	262.6	195.5	329.7	253.0	474.8	508.5	338.0	302.0	193.5	223.4	228.0
Mean:	7.98	8.47	6.52	10.6	8.43	15.3	16.4	11.7	9.74	6.45	7.21	7.60
mgd	12.3	13.1	10.1	16.4	13.0	23.7	25.4	18.1	15.1	9.98	11.2	11.8
cfs	759	806	600	1,010	776	1,460	1,560	1,040	927	594	686	700
Ac-ft												

Calendar year 1951: Max 200 Min 5.4 Mean(mgd) 13.1 Mean(cfs) 20.3 Ac-ft 14,720
Fiscal year 1951-52: Max 187 Min 4.5 Mean(mgd) 9.72 Mean(cfs) 15.0 Ac-ft 10,920

Peak discharge (base, 450 mgd).--Oct. 30 (time unknown) 601 mgd (930 cfs), 5.14 ft; Dec. 12 (7:30 a.m.) 837 mgd (936 cfs), 5.24 ft; Jan. 19 (7 p.m.) 980 mgd (1,520 cfs), 5.97 ft; Feb. 19 (8 a.m.) 715 mgd (1,110 cfs), 5.37 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 26 to Dec. 6; discharge estimated on basis of recorded range in stage and records for Pulena Stream near Waialua.

Waialala Springs near Kalae

Location.--Lat 21°10'20", long 157°00'05", on left bank on highway from Kalae to Kalaupapa Pali, 0.8 mile northeast of Kalae and 5.7 miles northeast of Kaunakakai Post Office.

Records available.--September 1940 to June 1952.

Gage.--Water-stage recorder and sharp-crested V-notch weir. Altitude of gage is 1,600 ft above mean sea level (from topographic map).

Average discharge.--11 years (1941-52), 0.018 mgd (0.028 cfs).

Extremes.--1940-52: Maximum daily discharge, 0.275 mgd (0.425 cfs) Mar. 11, 1942; minimum daily, 0.002 mgd (0.003 cfs) Jan. 2, 11-13, 1947, Mar. 3-12, 14-17, 1949.

Remarks.--Records good. Maui County Water Works diverts the entire flow for domestic supply, from tail bay at station.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.017	0.015	0.014	0.013	0.013	0.012	0.012	0.012	0.013	0.012	0.012	0.012
2	0.016	0.015	0.014	0.013	0.013	0.012	0.012	0.012	0.013	0.012	0.012	0.012
3	0.016	0.015	0.014	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.011
4	0.016	0.015	0.015	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.011
5	0.016	0.014	0.014	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.011
6	0.016	0.014	0.014	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.012
7	0.016	0.014	0.015	0.013	0.013	0.012	0.012	0.012	0.012	0.012	0.012	0.012
8	0.016	0.014	0.015	* 0.013	0.013	0.012	0.012	0.013	0.012	0.012	0.012	0.012
9	0.016	0.014	0.014	0.012	0.013	0.012	0.012	0.013	0.012	0.012	0.012	0.012
10	0.017	0.014	0.014	0.012	0.013	0.013	0.012	0.013	0.012	0.012	0.012	0.012
11	0.016	0.013	0.014	0.013	0.013	0.016	0.012	0.013	0.012	0.012	0.012	0.012
12	0.017	0.013	0.014	0.013	0.013	0.017	0.012	0.013	0.012	0.012	0.012	0.012
13	0.017	0.015	0.014	0.013	0.012	0.013	0.012	0.013	0.012	0.012	0.012	0.012
14	0.016	0.014	0.014	0.012	0.012	0.013	0.012	0.013	0.012	0.012	0.012	0.011
15	0.016	0.014	0.014	0.012	0.012	0.013	0.012	0.013	0.012	0.012	0.012	0.011
16	0.016	0.014	0.014	0.012	0.012	0.013	0.012	0.013	0.012	0.012	0.011	0.011
17	0.016	0.015	0.014	0.013	0.012	0.013	0.012	0.013	0.012	0.012	0.012	0.011
18	0.016	0.014	0.014	0.013	0.012	0.013	0.012	0.013	0.012	0.012	0.012	0.011
19	0.017	0.014	0.014	0.013	0.012	0.012	0.018	0.017	0.012	0.012	0.012	0.011
20	0.017	0.015	0.014	0.014	0.012	0.012	0.016	0.015	0.012	0.012	0.012	0.011
21	0.016	0.014	0.014	0.014	0.012	0.012	0.014	0.015	0.012	0.012	0.012	0.011
22	0.016	0.014	0.014	0.014	0.012	0.012	0.012	0.014	0.012	0.012	0.012	0.011
23	0.016	0.014	0.014	0.014	0.012	0.012	0.012	0.014	0.012	0.012	0.012	0.010
24	0.016	0.014	0.014	0.013	0.012	0.012	0.012	0.013	0.012	0.012	0.012	0.010
25	0.016	0.014	0.014	0.013	0.012	0.012	0.012	0.013	0.012	0.012	0.012	0.010
26	0.016	0.014	0.013	0.013	0.012	0.012	0.012	0.013	0.012	0.012	0.012	0.010
27	0.016	0.014	0.013	0.013	0.012	0.012	0.012	0.013	0.012	0.012	0.012	0.010
28	0.016	0.014	0.014	0.014	0.012	0.012	0.012	0.013	0.012	0.012	0.012	0.010
29	0.015	0.014	0.013	0.014	0.012	0.012	0.012	0.013	0.012	0.012	0.012	0.010
30	0.015	0.014	0.013	0.017	0.012	0.012	0.012	-	0.012	0.012	0.012	0.010
31	0.015	0.014	-	0.013	-	0.014	0.012	-	0.012	-	0.012	-
Total	0.499	0.439	0.419	0.408	0.372	0.392	0.384	0.380	0.374	0.360	0.371	0.332
Mean	0.016	0.014	0.014	0.013	0.012	0.013	0.012	0.013	0.012	0.012	0.012	0.011
mgd	0.025	0.022	0.022	0.020	0.019	0.020	0.019	0.020	0.019	0.019	0.019	0.017
cfs	1.5	1.3	1.3	1.3	1.1	1.2	1.2	1.2	1.1	1.1	1.1	1.0
Ac-ft												
Calendar year 1951. Max	0.034			Min	0.005	Mean(mgd)	0.016	Mean(cfs)	0.025	Ac-ft	18	
Fiscal year 1951-52: Max	0.018			Min	0.010	Mean(mgd)	0.013	Mean(cfs)	0.020	Ac-ft	14	

* Discharge measurement made on this day.

Right Branch of East Fork Kawela Stream near Kamalo

Location.--Lat 21°06'50", long 156°54'30", on left bank at Molokai Ranch pipeline intake, 4.7 miles northwest of Kamalo and 7.6 miles northeast of Kaunakakai.

Drainage area.--0.2 sq mi.

Records available.--September 1946 to June 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 3,624.86 ft above mean sea level (Territorial Survey benchmark).

Average discharge.--5 years (1948-52), 1.67 mgd (2.58 cfs).

Extremes.--Maximum discharge during year, 135 mgd (209 cfs) Oct. 30, Jan 19, from rating curve extended as explained below; maximum gage height, 4.47 ft Oct. 30; no flow many times.

1946-52: Maximum discharge, 882 mgd (1,360 cfs) Jan. 26, 1948 (gage height, 7.97 ft), from rating curve extended above 2.5 mgd by test on model of station site; no flow for many days.

Remarks.--Records good except those above 2.5 mgd and those for periods of no gage-height record, which are fair. Molokai Ranch diverts low flow from stream above station.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

2.28	0	2.9	1.84
2.4	.03	3.1	4.2
2.5	.14	3.3	12.5
2.6	.36	3.5	25.5
2.7	.71	3.8	54
2.8	1.18		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0.20	0.02	0.16	1.92	0	2.25	0.12	0.14	0	0.70	0
2	0	0	0	.23	.22	0	.27	.58	0	0	.03	0
3	0	0	0	.18	.01	.03	4.7	.01	0	.03	4.8	0
4	.24	.45	0	.07	0	3.5	4.8	0	1.16	0	2.45	0
5	.73	8.0	0	0	.66	*2.45	1.14	0	2.35	.25	2.05	.19
6	2.2	4.0	0	.99	1.31	1.06	.39	0	.26	.27	1.18	1.36
7	.34	10	1.52	3.25	.56	1.36	.89	0	.93	1.55	.14	.21
8	0	.70	2.55	.23	2.7	1.70	.15	0	5.7	3.8	0	4.48
9	0	1.4	.05	.20	1.95	.35	9.2	0	2.55	1.06	0	3.45
10	0	.55	0	.50	1.77	1.72	3.0	.06	3.1	.60	0	1.21
11	0	.30	0	.64	.60	4.6	4.2	.02	3.2	.16	0	3.5
12	0	*.10	0	.09	.05	5.5	1.64	0	1.64	0	0	3.35
13	0	0	0	0	2.25	1.85	.44	0	4.6	1.00	0	3.1
14	0	0	0	0	1.27	1.20	6.9	0	4.5	.16	0	2.55
15	0	0	0	0	.07	.60	1.34	0	1.50	0	0	2.4
16	0	0	0	0	0	.46	.25	0	.57	0	0	2.15
17	1.3	0	0	0	0	.40	.02	0	1.13	0	0	.33
18	.10	0	.18	0	.98	1.29	0	0	.70	0	0	2.5
19	.35	0	0	0	8.2	.46	37	11.0	.16	0	0	.50
20	.40	.58	0	.01	2.6	1.60	7.8	2.05	.03	.24	0	1.0
21	0	.34	0	1.09	1.50	.54	1.90	.12	0	.68	.02	3.5
22	0	0	0	.40	2.05	.05	.74	0	.80	.71	.73	.90
23	.25	0	0	.04	.98	1.77	.14	.09	2.2	.76	1.16	.30
24	.90	.15	0	0	1.41	1.95	0	.04	.16	.04	.08	.20
25	.10	1.18	0	0	.22	.40	0	.15	.20	.16	.24	0
26	0	.03	0	0	1.54	.01	0	.92	3.15	.49	.13	0
27	0	0	0	9.3	1.79	0	0	.69	2.25	5.4	0	1.3
28	0	0	0	6.0	.40	.01	0	1.13	1.65	.73	0	1.8
29	0	0	2.75	4.1	.06	0	0	.10	.12	.65	.37	7.0
30	.30	.02	.29	16.1	.07	1.74	0	-	0	2.85	1.12	1.0
31	1.0	.79	-	5.5	-	10.6	.18	-	0	-	.08	-
Total	8.21	28.79	7.36	49.08	36.94	47.20	89.34	17.08	44.75	21.59	15.28	44.28
Mean:												
mgd	0.265	0.929	0.245	1.58	1.23	1.52	2.88	0.589	1.44	0.720	0.493	1.48
cfs	0.410	1.44	0.379	2.44	1.90	2.35	4.46	0.911	2.23	1.11	0.763	2.29
Ac-ft	25	88	23	151	113	145	274	52	137	66	47	136

Calendar year 1951. Max 43 Min 0 Mean(mgd) 1.30 Mean(cfs) 2.01 Ac-ft 1,460
fiscal year 1951-52: Max 37 Min 0 Mean(mgd) 1.12 Mean(cfs) 1.73 Ac-ft 1,260

Peak discharge (base, 100 mgd).--Oct. 30 (6 p.m.) 135 mgd (209 cfs), 4.47 ft; Jan. 19 (6:30 p.m.) 135 mgd (209 cfs), 4.43 ft.

* Discharge measurement made on this day.

Note.--No gage-height record July 7 to Aug. 12; June 19-30; discharge estimated on basis of recorded range in stage and records for stations on nearby streams.

Punaula Stream near Pukoo

Location.--Lat 21°05'40", long 156°48'40", on right bank 1.5 miles northwest of Pukoo and 5.5 miles northeast of Kamalo.

Drainage area.--0.4 sq mi.

Records available.--March 1947 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,200 ft (from topographic map).

Average discharge.--5 years, 0.811 mgd (1.25 cfs).

Extremes.--Maximum discharge during year, 202 mgd (313 cfs) Jan. 19 (gage height, 4.47 ft), from rating curve extended as explained below; minimum, 0.03 mgd (0.05 cfs) July 1.
1947-52: Maximum discharge, 330 mgd (511 cfs) Apr. 2, 1948 (gage height, 6.35 ft), from rating curve extended above 2 mgd by test on model of station site; minimum, 0.01 mgd (0.02 cfs) Mar. 13, 1947.

Remarks.--Records good.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.4	0.01	1.0	2.55
.5	.04	1.1	3.85
.6	.16	1.2	5.4
.7	.39	1.4	9.5
.8	.78	1.6	14.7
.9	1.48	2.0	28

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.03	0.16	0.31	0.12	0.64	0.09	1.35	0.08	0.88	0.34	0.16	0.09
2	*.04	.10	.14	.10	.26	.09	.64	.26	.39	.31	.09	.07
3	2.45	.09	.11	.10	.22	.12	.98	.09	1.09	1.70	5.0	.08
4	1.30	.67	.09	.09	.11	.96	1.47	.07	4.2	.33	1.71	.07
5	1.32	6.2	.09	.05	.19	.74	.36	.06	1.42	1.09	1.10	.07
6	1.88	5.0	.10	.34	.46	.30	.24	.06	.24	.69	.43	.11
7	.60	8.2	1.47	2.05	.20	.22	.22	.05	.14	.38	.20	.08
8	.16	.90	1.41	*.16	.31	.34	.16	.05	.67	.88	.12	.06
9	.09	1.64	.24	.12	.28	.20	5.3	.13	.48	.74	.10	1.26
10	.08	.98	.14	.20	.28	*.30	.60	1.18	.28	.28	.09	1.57
11	.06	.42	.10	.58	.24	2.1	.66	.55	1.10	.18	.09	*1.35
12	.05	.24	.09	.15	.11	3.3	.49	.14	.49	*.14	.09	1.81
13	.06	.22	.08	.06	.18	.42	.26	.70	.36	.30	.08	1.34
14	.08	*.18	.07	.11	.22	.97	2.6	.22	.77	.24	.07	.38
15	.09	.12	.06	.25	.12	.38	.45	.10	.54	.14	.07	.52
16	.07	.11	.05	.34	.20	.18	.22	.09	.24	.10	.06	2.4
17	1.64	.59	.05	.51	.28	.16	.18	.06	2.95	.09	.07	.40
18	.19	.18	.05	.16	1.06	.84	.12	.05	.72	.08	.07	2.75
19	.85	.20	.05	.06	6.1	.33	25	8.0	2.45	.08	.10	.63
20	1.10	5.8	.04	.07	2.15	1.55	4.2	1.64	1.46	.11	.07	1.42
21	.20	.55	.04	.12	2.65	.36	.39	.25	.52	.16	.09	2.75
22	.10	.22	.04	.08	1.00	.20	.24	.14	.61	.12	1.26	1.12
23	.48	.20	.05	.09	.30	.27	*.16	1.01	.48	.12	.87	.39
24	.45	.24	.05	.08	.24	.33	.12	.22	.22	.08	.14	.26
25	.18	.28	.06	.10	.16	.16	.11	.18	.27	.09	.65	.16
26	.16	.14	.07	.16	.16	.10	.10	.28	.66	.12	.17	.13
27	.10	.14	.05	3.85	.54	.68	.09	.36	3.4	1.24	.11	1.79
28	.10	.22	.15	2.3	.26	.30	.08	.25	1.16	.39	.33	2.15
29	.09	.16	2.9	2.45	.12	.29	.08	.19	.26	.35	.28	2.85
30	.42	.39	.28	6.2	.11	2.35	.07	-	.14	.64	.20	1.42
31	.36	1.08	-	1.09	-	8.8	.08	-	.11	-	.11	-
Total	14.78	35.82	8.43	22.16	19.33	27.33	47.22	16.46	28.70	11.49	13.78	29.48
Mean:												
mgd	0.477	1.16	0.281	0.715	0.644	0.882	1.52	0.568	0.926	0.383	0.445	0.983
cfs	0.738	1.79	0.435	1.11	0.996	1.36	2.35	0.879	1.43	0.593	0.689	1.52
Ac-ft	45	110	26	68	59	84	145	51	88	35	42	90

Calendar year 1951. Max	22.5	Min	0.03	Mean(mgd)	0.879	Mean(cfs)	1.36	Ac-ft	984
Fiscal year 1951-52: Max	25	Min	0.03	Mean(mgd)	0.751	Mean(cfs)	1.16	Ac-ft	843

Peak discharge (base, 70 mgd).--Oct. 30 (4 p.m.) 126 mgd (195 cfs), 3.72 ft; Jan. 19 (1 p.m.) 202 mgd (313 cfs, 4.47 ft).

* Discharge measurement made on this day.

Left Branch Makamakaole Stream near Waihee

Location.--Lat 20°57'35", long 156°32'55", on left bank at Intake to Marshall Ranch diversion ditch, 0.2 mile upstream from mouth, 2.8 miles south of Kahakuloa village, and 3 miles northwest of Waihee.

Drainage area.--0.4 sq mi.

Records available.--July 1939 to July 1952 (discontinued).

Gage.--Water-stage recorder and combined orifice and concrete control. Altitude of gage is 1,500 ft (by barometer).

Average discharge.--13 years, 1.89 mgd (2.92 cfs).

Extremes.--Maximum discharge during fiscal year, 252 mgd (390 cfs) Dec. 31 (gage height, 4.59 ft), from rating curve extended above 20 mgd as explained below; minimum, 0.56 mgd (0.87 cfs) July 2.

1939-52: Maximum discharge, 287 mgd (444 cfs) Apr. 2, 1948 (gage height, 4.98 ft), from rating curve extended above 20 mgd by test on model of station site; minimum, 0.43 mgd (0.66 cfs) Jan. 10, 11, 1946.

Remarks.--Records good except those above 20 mgd, which are fair. Marshall Ranch diversion ditch diverts water from gage pool for watering stock.

Rating table, July 1, 1951, to July 7, 1952 (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Nov. 7-14)

1.2	0.56	1.8	3.9
1.3	.66	1.9	5.9
1.4	.76	2.0	8.3
1.5	1.09	2.1	12.0
1.6	1.68	2.3	26
1.7	2.6	2.4	33

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.60	0.66	0.80	0.70	1.56	1.33	2.95	7.6	1.09	*0.93	0.80	1.15
2	.58	.67	.71	.67	1.38	1.27	1.77	2.8	1.37	1.31	.76	.99
3	.66	.62	.68	.64	1.27	1.27	1.62	1.68	.99	1.33	.9	.90
4	1.11	.79	.68	.62	1.21	1.33	1.62	1.50	.99	1.09	3.75	.84
5	1.09	2.75	1.57	.61	1.38	1.27	1.44	1.38	1.04	1.92	2.05	.86
6	3.8	2.7	3.8	.61	1.21	1.27	1.27	1.38	.84	1.66	1.56	.94
7	1.41	13.8	5.1	1.18	1.09	1.27	1.21	1.33	.86	1.15	1.21	.82
8	.75	1.68	1.93	.68	1.15	1.21	1.15	1.27	1.54	1.21	1.04	1.04
9	.89	1.54	1.09	.78	1.04	1.15	1.09	1.27	1.21	1.21	.99	.86
10	1.39	.99	.86	.63	.99	1.21	1.09	1.74	1.04	1.09	.94	2.95
11	2.05	.84	.90	.74	.86	32.5	1.04	1.39	1.73	.94	.84	1.33
12	.82	.80	.78	.66	.84	11.2	1.09	1.21	1.09	.86	.80	1.09
13	.64	.76	.74	1.71	.84	7.9	1.04	1.56	1.97	2.1	.80	.99
14	.80	.75	.72	.72	.86	3.5	1.38	1.54	1.33	2.4	.82	.94
15	.72	*.72	.71	.65	.80	2.3	.99	1.27	1.09	1.15	.76	.94
16	.67	2.55	.70	.63	.84	1.96	.90	1.15	.99	.99	.94	.99
17	.76	1.07	.68	.61	.80	1.77	.86	2.35	.94	.86	5.4	.84
18	.66	1.80	.69	.60	1.55	1.68	.86	3.7	.90	.86	3.05	2.8
19	.80	.80	.66	.68	3.9	1.56	12.6	*21.5	.86	.82	2.75	1.21
20	.74	1.65	.64	1.14	7.2	1.56	13.3	5.3	.82	.84	*1.30	1.09
21	.70	.99	.62	1.35	2.35	1.50	2.15	1.86	.80	.86	1.09	1.15
22	.82	.78	.61	.75	1.56	1.44	1.86	1.62	.80	.84	4.7	1.09
23	.69	.74	.60	1.18	1.44	1.77	1.56	1.96	.80	.94	1.62	.94
24	.69	.83	.60	.85	1.38	1.56	1.44	1.62	.76	.78	1.21	.90
25	.67	1.19	.61	.76	1.33	1.33	1.38	1.27	.86	.94	1.56	1.15
26	.74	.75	.60	.72	1.86	1.27	1.44	1.15	.86	.82	1.27	.86
27	.63	.71	*.61	.76	2.65	1.85	1.33	1.04	3.8	.99	1.38	1.27
28	.73	.98	1.20	1.46	1.56	1.62	1.27	.99	1.76	.84	1.33	1.56
29	.69	.72	1.38	1.34	1.44	3.85	1.27	.94	.99	.80	1.44	2.95
30	.79	.68	.73	19.0	1.38	11.0	1.21	-	.86	.94	1.09	2.15
31	.68	1.21	-	3.6	-	25.5	2.5	-	.84	-	.99	-
Total	28.77	46.52	32.00	47.18	47.72	131.20	66.68	75.37	35.82	33.47	58.14	37.59
Mean;												
mgd	0.928	1.50	1.07	1.52	1.59	4.23	2.15	2.60	1.16	1.12	1.88	1.25
cfs	1.44	2.32	1.66	2.35	2.46	6.54	3.33	4.02	1.79	1.73	2.91	1.93
Ac-ft	.88	143	.98	145	146	403	205	231	110	103	178	115

Calendar year 1951: Max 32.5 Min 0.58 Mean(mgd) 1.73 Mean(cfs) 2.68 Ac-ft 1,940

Fiscal year 1951-52: Max 32.5 Min 0.58 Mean(mgd) 1.75 Mean(cfs) 2.71 Ac-ft 1,960

Peak discharge (base, 90 mgd).--Oct. 30 (7 p.m.) 236 mgd (365 cfs), 4.38 ft; Dec. 11 (10:30 a.m.) 94 mgd (145 cfs), 3.13 ft; Dec. 31 (9 a.m.) 252 mgd (390 cfs), 4.59 ft.

* Discharge measurement made on this day.

Discharge, in million gallons a day, 1952

July 1	1.21
2	1.04
3	.99
4	.90
5	3.45
6	1.68
7	1.27

Kahakuloa Stream near Honokohau

Location.--Lat 20°58'50", long 156°33'25", on right bank just 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.--3.4 sq mi.

Records available.--January 1913 to December 1914 (fragmentary), July 1939 to August 1943, September 1947 to June 1952.

Gage.--Water-stage recorder and concrete control. Jan. 22, 1913, to Dec. 16, 1914, water-stage recorder at site 1 mile upstream at different datum.

Average discharge.--7 years (1940-43, 1948-52), 12.2 mgd (18.9 cfs).

Extremes.--Maximum discharge during year, 1,080 mgd (1,670 cfs) Dec. 31 (gage height, 8.35 ft), from rating curve extended above 30 mgd on basis of slope-area determination at gage height 8.35 ft; minimum, 2.65 mgd (4.10 cfs) Oct. 19.

1939-43, 1947-52: 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, 2.5 mgd (3.9 cfs) Oct. 31, 1949.

Remarks.--Records good except those above 30 mgd, which are fair.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 31

Jan. 1 to June 30

2.9	1.9	3.6	22	2.8	2.6	3.7	32.5
3.0	3.2	3.9	42	2.9	4.0	4.0	53
3.1	4.9	4.2	69	3.1	8.2	4.5	108
3.3	9.9	4.6	123	3.4	17.9		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.05	4.0	5.1	3.7	4.7	3.7	17.6	49	11.4	*8.6	4.5	7.1
2	3.35	3.8	3.7	3.7	4.2	3.5	9.5	14.0	8.2	8.7	4.0	5.5
3	3.7	3.5	3.5	3.2	3.5	3.35	8.4	5.9	5.5	10.3	4.7	4.5
4	11.3	4.4	3.35	3.05	3.2	3.7	9.7	5.1	7.2	7.0	22	4.2
5	9.1	16.8	7.1	2.9	6.6	3.7	6.6	4.7	7.8	17.3	14.7	4.5
6	23	38.5	22.5	2.9	4.5	3.2	5.5	4.5	7.0	12.8	8.4	6.6
7	11.5	79	24	8.1	5.7	3.05	5.3	4.9	5.1	7.0	5.7	4.5
8	4.5	14.0	10.8	3.5	5.8	2.9	4.9	4.5	10.1	7.0	4.5	5.5
9	*3.8	11.0	5.6	3.5	4.9	2.8	5.5	4.2	7.9	7.3	4.4	5.7
10	12.0	6.7	4.5	2.9	4.2	2.9	5.1	12.2	7.0	6.6	4.0	19.6
11	12.2	4.7	5.3	3.85	3.2	86	4.9	7.1	12.3	5.3	4.0	7.7
12	4.9	4.5	4.2	3.35	2.9	54	5.7	4.8	8.0	5.5	4.0	6.1
13	5.4	4.0	3.7	7.9	2.8	36	5.1	19.9	13.0	18.2	5.8	5.3
14	4.9	3.7	3.5	3.5	4.9	15.8	10.5	9.5	8.4	15.6	4.4	7.3
15	4.0	3.7	3.2	3.2	3.05	6.7	4.9	4.9	6.1	6.1	4.0	7.4
16	3.7	7.1	3.2	3.05	4.0	5.4	4.5	4.4	5.5	4.9	5.1	7.3
17	5.3	5.2	3.2	2.9	3.05	4.5	4.4	6.9	8.0	*4.4	14.4	4.5
18	3.7	3.8	3.2	2.8	10.8	4.2	4.0	19.7	7.3	4.0	12.1	21.5
19	5.0	4.0	3.05	2.9	41	3.8	49	105	6.1	4.0	21	7.8
20	4.7	12.6	2.9	10.3	54	4.2	49	37	4.5	4.4	*6.4	7.3
21	3.8	6.0	2.9	10.0	18.5	3.7	8.4	9.1	4.5	6.2	5.5	7.0
22	4.7	3.8	2.9	3.7	6.7	3.5	8.6	8.5	4.4	4.4	27	7.0
23	4.0	3.7	2.9	5.7	4.7	5.0	5.3	17.4	4.5	4.9	10.2	5.3
24	4.4	3.95	2.9	4.0	4.7	4.5	4.9	11.0	4.4	4.0	5.5	4.9
25	3.7	10.9	2.9	3.7	4.2	3.7	4.7	7.0	9.5	5.9	16.9	8.9
26	5.2	4.0	2.9	3.05	10.5	3.2	4.9	5.9	8.3	4.7	6.1	4.9
27	3.5	3.7	*2.9	2.9	15.6	10.1	4.5	5.3	17.3	9.5	8.5	13.3
28	4.6	7.5	11.5	7.4	6.0	7.6	4.4	5.1	12.9	4.7	10.5	11.7
29	4.3	4.0	10.2	5.7	4.5	29.5	4.2	4.9	5.5	4.2	10.3	32.5
30	6.4	3.7	3	65	3.7	67	4.0	-	4.9	5.6	6.5	16.9
31	4.2	8.2	3.7	13.6	-	*114	8.2	-	5.0	-	5.5	-
Total	187.90	294.45	171.30	205.95	256.20	505.20	280.2	402.4	237.6	219.1	310.9	262.3
Mean:												
mgd	6.06	9.50	5.71	6.84	8.54	16.3	9.04	13.9	7.66	7.30	10.0	8.74
cfs	9.38	14.7	8.83	10.3	13.2	25.2	14.0	21.5	11.9	11.3	15.5	13.5
Ac-ft	577	904	526	632	786	1,556	860	1,230	729	672	954	805

Calendar year 1951: Max 114 Min 2.8 Mean(mgd) 8.60 Mean(cfs) 13.3 Ac-ft 9,640
Fiscal year 1951-52: Max 114 Min 2.8 Mean(mgd) 9.11 Mean(cfs) 14.1 Ac-ft 10,220

Peak discharge (base, 400 mgd).--Oct. 30 (6:30 p.m.) 830 mgd (1,280 cfs), 7.45 ft; Dec. 11 (9:30 a.m.) 415 mgd (642 cfs), 5.75 ft; Dec. 31 (10 a.m.) 1,080 mgd (1,670 cfs), 8.35 ft.

* Discharge measurement made on this day.

Honokohau Stream near Honokohau

Location.--Lat 20°57'45", long 156°35'20", on right bank 1,000 ft upstream from intake of Honokohau ditch and 5 miles southeast of Honokohau.

Drainage area.--4.2 sq mi.

Records available.--March 1913 to September 1920, May 1922 to June 1952.

Gage.--Water-stage recorder and masonry control. Altitude of gage is 950 ft (by barometer).

Average discharge.--34 years (1916-20, 1922-52), 25.3 mgd (39.1 cfs).

Extremes.--Maximum discharge during year, 1,070 mgd (1,660 cfs) Oct. 30 (gage height, 6.16 ft), from rating curve extended above 120 mgd by logarithmic plotting; minimum daily, 7.9 mgd (12.2 cfs) Oct. 26.
1913-20, 1922-52: Maximum discharge, 2,420 mgd (3,740 cfs) Dec. 14, 1942 (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 except those above 120 mgd, which are fair.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.9	6.9	2.9	62
2.2	15.9	3.4	130
2.5	31	3.9	226

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	8.4	12.1	13.1	16.1	12	10.3	16.5	78	25	21.5	19.5	14.7
2	8.6	12.4	9.4	11.0	10	9.4	12	22	13.1	*15.9	10.3	14.3
3	10.0	9.4	9.4	*10.1	10	9.4	30	10.6	10.9	16.6	93	11.5
4	19.9	18.5	9.4	8.6	9.5	14.4	34	10.0	32	12.1	30.5	10.0
5	26	36.5	10.9	8.2	20	12.4	11	10.9	20.5	34	26.5	20.5
6	48	145	25.5	13.0	14	9.2	10	11.2	11.8	21	24.5	28
7	18.4	215	42	23	18	8.6	12	11.2	21.5	14.7	13.7	21
8	9.4	40	13.6	9.2	24	8.6	10	10.3	36.5	18.4	10.6	18.2
9	13.6	24	10.0	10.7	15	8.6	42	9.7	23	16.5	10.0	32
10	34.5	17.0	9.4	8.6	13	8.6	11.8	14.0	28	14.0	10.0	42
11	31.5	11.8	10.3	10.0	10	69	13.6	10.9	33	11.5	9.7	37.5
12	10.9	12.4	9.2	8.6	9.0	81	17.4	10.0	18.4	11.5	9.4	29
13	17.0	10.6	8.9	11.0	24	63	18.0	31.5	35	53	9.4	18.0
14	11.8	10.0	8.6	8.9	17	24.5	26	14.7	21	20	9.4	75
15	10.3	9.4	8.6	12.3	12	11.8	11.5	10.0	15.2	11.5	9.7	49
16	9.2	10.0	8.6	9.2	11	10.0	10.6	9.7	12.1	10.6	10.0	45
17	19.0	9.2	8.6	8.2	9.0	9.4	9.7	10.0	45	10.0	10.3	13.4
18	9.2	9.2	8.4	8.6	30	8.9	9.2	*37	15.4	11.7	34.5	64
19	17.5	8.9	8.4	10.0	160	8.9	122	133	11.5	11.2	46	30.5
20	13.7	33.5	8.2	32.5	134	14.3	78	32.5	10.3	26.5	13.0	28.5
21	9.7	*13.0	8.2	20	78	10.3	18.6	12.8	10.0	31.5	10.9	43
22	12.9	9.4	8.2	10.0	23	8.9	11.8	16.7	14.8	12.4	*68	20.5
23	15.3	14.5	8.2	15.2	12.4	16.4	10.3	39.5	15.8	32.5	26	14.8
24	26.5	20.5	8.2	8.9	13.2	11.5	10.0	24	16.4	10.0	12.1	15.4
25	10.9	30	8.6	8.2	11.4	9.7	10.0	13.1	22	19.0	24.5	16.4
26	18.8	10.0	8.4	7.9	43	8.9	10.9	13.8	53	10.9	10.9	11.5
27	9.4	10.0	10.0	9.8	34.5	14.2	9.7	11.8	34	50	34	71
28	20.5	16.8	30.5	24.5	18.2	11.8	9.4	13.8	18.4	12.8	33.5	28.5
29	26	10.0	21.5	12.3	11.2	49	9.4	28.5	10.9	10.6	24	100
30	27.5	10.3	11.0	100	9.7	115	9.2	-	10.3	26.5	15.2	37
31	26	24.5	-	24	-	123	12.4	-	17.4	-	12.4	-
Total	550.4	823.9	363.3	478.6	816.1	779.0	627.0	661.2	662.2	578.4	681.5	960.2
Mean:												
mgd	17.8	26.6	12.1	15.4	27.2	25.1	20.2	22.8	21.4	19.3	22.0	32.0
cfs	27.5	41.2	18.7	23.8	42.1	38.8	31.3	35.3	33.1	29.9	34.0	49.5
Ac-ft	1,690	2,530	1,110	1,470	2,500	2,390	1,920	2,030	2,030	1,780	2,090	2,950

Calendar year 1951: Max 215 Min 7.9 Mean(mgd) 19.9 Mean(cfs) 30.8 Ac-ft 22,320
Fiscal year 1951-52: Max 215 Min 7.9 Mean(mgd) 21.8 Mean(cfs) 33.7 Ac-ft 24,490

Peak discharge (base, 700 mgd).--Oct. 30 (6:30 p.m.) 1,070 mgd (1,660 cfs), 6.16 ft; Jan. 19 (9 p.m.) 720 mgd (1,110 cfs), 5.39 ft; Mar. 26 (2 p.m.) 975 mgd (1,510 cfs), 5.95 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 31 to Nov. 19, Jan. 2-8; discharge estimated on basis of records for nearby streams.

Olowalu ditch near Olowalu

Location.--Lat 20°49'30", long 156°36'50", on left bank 40 ft upstream from intake of pipeline to hydroelectric plant, 1.2 miles northeast of Olowalu, and 5.5 miles south-east of Lahaina.

Records available.--August 1911 to June 1952.

Gage.--Water-stage recorder and Parshall flume. 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 21, 1932, water-stage recorder, at site 300 ft upstream at different datum. July 1, 1932, to Oct. 7, 1933, records obtained by combining flows of three stations about 1,000 ft downstream.

Average discharge.--34 years (1917-20, 1929-52), 4.94 mgd (7.64 cfs).

Extremes.--1911-52: Maximum daily discharge, 13.7 mgd (21.2 cfs) Apr. 17, 1935; no flow at times.

Remarks.--Ditch diverts water from Olowalu Stream at altitude of about 450 ft. Water used for power and irrigation. Regulated by headgates.

Cooperation.--Records of daily discharges furnished by Pioneer Mill Co.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.1	4.1	3.15	3.0	5.3	4.8	7.2	7.6	4.2	4.2	5.5	4.2
2	3.0	3.75	2.95	2.9	4.6	4.4	5.4	7.2	4.6	4.1	4.5	3.95
3	2.9	3.3	2.95	2.75	3.85	4.5	5.2	5.4	3.95	4.1	7.9	3.65
4	3.35	3.35	2.85	2.55	3.45	4.1	6.9	4.7	5.1	3.75	8.6	3.4
5	4.4	5.4	2.8	2.5	4.2	3.85	5.4	4.7	5.5	5.2	7.6	3.85
6	6.2	6.9	4.3	2.6	3.55	3.75	4.5	4.5	4.2	5.2	7.5	4.3
7	5.4	6.8	4.0	4.0	3.65	3.6	4.1	4.4	4.1	4.6	6.6	3.6
8	3.95	9.5	4.0	2.95	3.95	3.45	3.9	4.1	5.5	4.6	5.2	4.6
9	3.6	9.1	3.15	2.9	3.75	3.4	4.8	4.0	6.5	4.4	4.6	6.2
10	5.0	8.3	2.95	2.6	3.25	3.7	4.1	4.0	6.0	4.2	4.2	7.2
11	5.6	6.6	3.05	2.6	3.05	3.5	3.75	3.9	5.1	3.8	4.0	8.1
12	4.2	5.8	2.85	2.5	4.9	7.3	3.75	3.75	4.9	3.85	3.9	8.2
13	4.9	5.2	2.8	2.6	3.25	6.4	3.65	4.1	5.3	7.6	3.75	7.0
14	3.85	4.7	2.75	2.5	4.2	8.2	4.3	4.0	4.9	7.3	3.65	7.1
15	3.55	4.3	2.8	2.45	3.4	7.6	3.55	3.65	4.6	5.4	3.5	8.7
16	3.35	4.1	2.7	2.45	3.3	7.1	3.4	3.55	4.2	4.5	3.3	8.8
17	3.6	4.0	2.65	2.4	3.4	6.4	3.25	3.5	4.4	3.95	3.25	8.0
18	3.15	3.75	2.7	2.35	5.1	5.5	3.15	3.85	4.3	3.9	3.75	8.7
19	3.65	3.6	2.65	2.45	7.4	4.9	3.8	9.3	3.85	3.6	6.0	9.7
20	3.6	4.2	2.6	3.55	9.4	4.8	5.3	8.2	3.65	3.7	4.0	8.6
21	3.15	3.75	2.65	3.05	8.9	4.3	8.7	6.0	3.45	5.5	3.5	8.6
22	3.3	3.35	3.05	2.5	8.4	4.0	8.5	5.1	3.5	4.1	5.3	8.3
23	3.3	3.8	2.7	2.55	7.6	6.0	8.2	8.1	3.4	4.5	6.6	6.9
24	3.4	3.9	2.65	2.45	6.2	3.85	7.4	7.8	3.45	3.6	4.5	6.1
25	3.25	5.4	2.75	2.4	5.5	3.65	6.5	6.1	3.8	4.2	4.2	5.7
26	3.15	3.65	2.55	2.35	7.9	3.3	6.1	5.2	5.5	3.55	3.7	4.9
27	2.95	3.35	2.6	5.0	8.7	3.65	5.4	4.8	6.2	7.5	5.2	8.3
28	3.25	3.4	3.05	8.7	8.0	3.55	5.1	4.4	6.1	6.0	6.2	8.3
29	3.45	3.15	3.45	7.3	6.3	4.2	4.8	4.2	4.6	4.6	5.9	8.7
30	4.1	3.05	2.8	8.1	5.4	6.4	4.6	-	4.1	6.1	5.1	8.5
31	5.4	3.25	-	8.3	-	7.2	4.4	-	4.2	-	4.4	-
Total	119.05	146.80	88.90	107.30	159.85	151.35	159.10	148.90	143.15	141.40	155.90	201.15
Mean	3.84	4.74	2.96	3.46	5.33	4.88	5.13	4.62	4.71	5.03	6.70	
mgd	5.94	7.33	4.58	5.35	8.25	7.55	7.94	7.94	7.15	7.29	7.78	10.4
cfs	365	451	273	329	491	464	488	457	439	434	478	617
Ac-ft												
Calendar year 1951: Max	9.8			Min 2.35		Mean(mgd)	5.06	Mean(cfs)	7.83	Ac-ft	5,670	
Fiscal year 1951-52: Max	9.5			Min 2.35		Mean(mgd)	4.71	Mean(cfs)	7.29	Ac-ft	5,290	

Right Branch Kahalawe Stream near Kipahulu

Location.--Lat 20°41'05", long 156°03'00", on left bank at old ditch intake, 2 miles north of Kipahulu.

Records available.--February 1927 to April 1937, April 1938 to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,100 ft (from topographic map). Prior to Apr. 21, 1938, at same site at datum 8 ft lower.

Average discharge.--22 years (1927-34, 1935-36, 1938-52), 3.53 mgd (5.46 cfs).

Extremes.--Maximum discharge during year, 480 mgd (743 cfs) Dec. 31 (gage height, 3.82 ft), from rating curve extended above 52 mgd by test on model of station site; minimum, 0.75 mgd (1.16 cfs) May 17.

1927-37, 1938-52: 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 52 mgd by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Dec. 18, 1929.

Remarks.--Records good.

Revisions (fiscal years).--WSP 1219: 1935(M), 1937(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.9	0.62	1.6	9.3
1.0	1.01	1.7	12.4
1.1	1.54	1.8	17.4
1.2	2.3	2.0	29.5
1.3	3.5	2.2	47
1.4	4.8	2.5	89
1.5	6.8		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.92	3.3	3.45	3.55	2.95	2.1	38.5	2.65	8.0	2.05	2.5	1.10
2	.97	1.95	1.80	1.54	2.9	2.85	14.7	3.7	24	3.05	1.41	1.53
3	8.0	1.68	1.66	2.2	3.5	2.3	10.4	1.26	17.3	3.65	6.2	1.10
4	3.1	2.3	1.54	1.15	2.1	2.45	7.8	1.07	37.5	1.73	1.54	1.01
5	2.95	4.9	2.3	1.10	2.6	2.95	3.3	1.14	6.5	2.6	1.68	3.55
6	3.15	25	6.6	.97	3.25	5.5	3.05	1.01	2.65	3.2	2.55	3.6
7	6.7	*35	6.1	1.50	4.2	2.85	2.65	.95	5.6	2.1	1.54	1.41
8	1.68	6.7	8.6	.97	5.3	8.9	2.25	.95	7.7	2.65	1.35	1.55
9	1.35	5.7	2.3	1.54	2.4	3.45	12.2	10.9	3.05	2.65	1.20	4.4
10	1.47	3.05	1.87	1.30	2.05	2.1	4.1	6.9	3.1	1.80	1.10	8.4
11	2.7	2.4	1.60	4.4	1.87	1.87	2.95	26	2.95	1.54	1.05	5.7
12	1.41	2.2	1.41	2.55	2.1	5.7	3.15	*3.15	2.1	1.47	1.01	4.4
13	1.41	1.95	1.30	4.1	8.1	5.3	3.9	6.1	3.8	4.7	.97	2.9
14	1.35	1.80	1.25	1.90	3.45	2.55	6.2	5.8	3.25	3.05	*1.05	3.25
15	1.15	1.60	1.15	4.3	3.5	3.6	2.35	2.45	2.3	2.5	.92	4.1
16	1.05	5.3	1.05	5.0	2.25	2.1	2.05	12.3	1.73	1.54	.87	8.8
17	3.8	3.8	1.05	4.4	2.1	3.05	1.80	2.05	9.7	1.35	.85	2.1
18	1.15	1.60	1.01	1.66	2.9	5.0	2.5	1.73	2.95	1.25	1.31	7.6
19	1.88	1.79	.97	1.62	15.9	*2.5	6.1	6.1	4.0	1.20	2.95	7.0
20	1.15	15.9	*.92	6.1	23.5	4.9	13.3	2.45	7.0	2.65	.97	6.4
21	1.10	2.3	.87	3.3	17.3	2.4	9.7	1.66	4.5	2.5	.92	5.2
22	1.10	1.66	.87	1.87	8.8	1.95	2.55	1.60	4.4	1.78	6.7	3.45
23	1.79	1.60	1.61	5.9	4.0	3.95	2.05	3.7	3.0	1.47	2.95	2.95
24	2.35	3.8	.87	2.35	3.4	2.1	1.70	2.1	2.1	1.20	1.30	2.85
25	1.41	4.6	1.32	10.0	2.65	1.80	4.0	3.25	*2.2	2.1	2.7	2.95
26	2.3	1.66	.97	11.8	6.7	1.66	1.90	3.0	2.3	1.41	1.15	2.2
27	3.9	1.74	1.31	14.7	7.0	1.82	1.65	2.95	13.2	3.6	2.55	9.0
28	1.54	5.6	1.51	4.9	3.65	1.75	1.40	1.73	4.5	1.62	3.0	5.2
29	3.6	1.95	4.4	8.3	2.55	1.90	1.33	2.0	2.2	3.85	2.1	9.5
30	8.8	2.65	1.46	18.4	2.1	20	1.28	-	1.95	5.1	2.1	6.1
31	.71	6.8	-	4.2	-	74	1.14	-	1.87	-	1.25	-
Total	82.31	162.26	65.12	137.37	155.07	185.35	171.43	120.65	197.40	71.36	59.72	129.10
Mean:												
mgd	2.66	5.23	2.10	4.43	5.17	5.98	5.53	4.16	6.37	2.38	1.93	4.30
cfs	4.12	8.09	3.25	6.85	8.00	9.25	8.56	6.44	9.86	3.68	2.99	6.65
Ac-ft	253	498	194	422	476	569	526	370	606	219	183	396
Calendar year 1951: Max	74											
Fiscal year 1951-52: Max	74											
Min												
Mean(mgd)												
Mean(cfs)												
Ac-ft												

Peak discharge (base, 200 mgd).--Aug. 7 (12:30 a.m.) 250 mgd (387 cfs), 3.17 ft; Oct. 30 (7 p.m.) 295 mgd (456 cfs), 3.28 ft; Dec. 31 (1 p.m.) 480 mgd (743 cfs), 3.82 ft; Jan. 1 (9 p.m.) 382 mgd (591 cfs), 3.55 ft; Feb. 11 (7 a.m.) 220 mgd (340 cfs), 3.04 ft; Mar. 2 (2 a.m.) 235 mgd (364 cfs), 3.12 ft; Mar. 4 (4 p.m.) 330 mgd (511 cfs), 3.42 ft.

* Discharge measurement made on this day.

ISLAND OF MAUI

Makapipi ditch near Nahiku

Location.--Lat 20°48'20", long 156°06'25", on right bank at entrance to tunnel No. 1, 1.8 miles south of Nahiku and 4.8 miles southeast of Keanae.

Records available.--July 1948 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 1,350 ft (from topographic map).

Extremes.--1948-52: Maximum daily discharge, 7.8 mgd (12.1 cfs) Nov. 21, 1951; minimum daily, 0.72 mgd (1.11 cfs) Oct. 17-19, 1951.

Remarks.--Records good except those for period of no gage-height record, which are poor.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.45	4.2	2.0	1.06	1.55	4.5	5.1	3.5	3.4	3.25	5.0	3.0
2	1.45	4.0	2.1	1.01	1.50	4.1	4.5	3.4	3.35	3.0	4.5	2.85
3	1.39	3.95	2.4	.97	1.50	3.9	4.4	2.9	3.25	2.85	5.2	2.7
4	1.34	3.9	2.7	.92	1.45	3.7	5.0	2.85	4.3	2.65	5.6	2.65
5	1.29	4.3	2.7	.88	1.45	3.55	5.2	2.8	4.7	2.7	5.6	2.65
6	1.45	5.2	2.8	.83	1.45	3.35	5.0	2.7	4.5	2.7	5.6	2.8
7	1.65	7.4	2.8	.83	*1.55	3.25	4.7	2.6	4.2	2.65	5.1	2.85
8	1.65	*6.9	2.6	.83	1.65	3.1	4.3	2.55	4.2	2.65	4.7	2.9
9	1.65	6.5	2.5	.79	1.81	2.9	4.4	2.45	4.3	2.65	4.3	3.25
10	1.65	5.6	2.3	.75	1.87	2.8	4.5	2.4	4.3	2.65	4.1	3.6
11	1.71	5.2	2.2	.75	1.93	5.2	4.5	2.35	4.5	2.6	3.9	4.0
12	1.76	4.7	2.2	.75	1.93	5.2	4.4	2.3	4.4	2.6	3.7	4.3
13	1.81	4.3	2.1	.83	1.99	4.8	4.3	2.3	4.5	2.6	*3.45	4.4
14	1.81	3.9	2.0	.79	2.3	4.3	4.3	2.45	4.8	3.25	3.55	4.6
15	1.76	3.5	1.9	.79	2.35	4.2	4.5	2.35	5.2	3.0	3.45	5.0
16	1.76	3.2	1.8	.75	2.45	3.95	4.6	2.2	5.2	3.05	3.4	5.2
17	1.76	3.0	1.8	.72	2.6	3.75	4.5	2.1	5.2	3.0	3.4	4.8
18	1.71	2.8	1.7	.72	2.65	3.55	4.3	1.99	5.2	2.9	3.45	4.6
19	1.65	2.7	1.7	.72	4.1	3.35	4.1	3.5	4.9	2.8	4.7	4.5
20	1.65	2.6	1.6	.75	7.4	3.05	4.6	3.7	4.3	2.8	4.3	4.6
21	1.60	2.5	1.50	.88	7.8	2.8	4.3	3.4	3.95	3.25	4.0	4.9
22	1.55	2.5	1.45	.92	8.5	2.6	4.0	3.1	3.75	2.8	4.2	5.0
23	1.55	2.4	1.39	1.15	6.0	2.45	3.75	3.55	3.9	2.8	4.2	3.15
24	1.55	2.4	1.34	1.20	5.2	2.35	3.55	3.6	3.6	2.7	4.0	1.34
25	1.55	2.3	1.29	1.29	4.8	2.2	3.35	3.25	3.45	2.65	4.3	1.48
26	1.71	2.2	1.24	1.24	5.2	2.05	3.1	3.6	*3.5	2.65	3.9	4.3
27	1.76	2.2	1.20	1.20	6.0	2.1	2.9	3.6	4.0	3.95	*3.75	4.2
28	1.81	2.1	1.15	1.15	5.2	2.1	2.8	3.45	4.3	3.1	3.6	4.3
29	1.93	2.1	1.15	1.15	5.0	2.8	2.6	3.4	4.1	3.1	3.4	4.8
30	3.75	2.1	1.06	1.70	4.7	4.1	2.45	-	3.75	4.1	3.35	5.6
31	4.4	2.0	-	1.76	-	5.2	2.4	-	3.45	-	3.2	-
Total	55.51	112.65	56.67	30.08	101.88	107.25	126.40	83.69	130.45	87.45	128.90	114.32
Mean:												
mgd	1.79	3.63	1.89	0.970	3.40	3.46	4.08	2.89	4.21	2.92	4.16	3.81
cfs	2.77	5.62	2.92	1.50	5.26	5.35	6.31	4.47	6.51	4.52	6.44	5.89
Ac-ft	170	346	174	92	313	329	368	257	400	268	396	351

Calendar year 1951: Max 7.8 Min 0.72 Mean(mgd) 2.55 Mean(cfs) 3.95 Ac-ft 2,860
 Fiscal year 1951-52: Max 7.8 Min 0.72 Mean(mgd) 3.10 Mean(cfs) 4.80 Ac-ft 3,480

* Discharge measurement made on this day.

Note.--No gage-height record Aug. 11 to Sept. 20; discharge estimated on basis of recorded range in stage and records for nearby stations.

Hanawi Stream near Nahiku

Location.--Lat 20°48'35", long 156°06'50", on left bank 200 ft upstream from Koolau ditch intake and trail, 1.8 miles southwest of Nahiku, and 4.5 miles southeast of Keanae.

Drainage area.--0.8 sq mi.

Records available.--January 1914 to January 1916, November 1921 to June 1952.

Gage.--Water-stage recorder. Jan. 9, 1914, to Jan. 6, 1916, at site 50 ft downstream in same pool at datum 0.12 ft lower.

Average discharge.--30 years (1922-52), 13.6 mgd (21.0 cfs).

Extremes.--Maximum discharge during year, 1,950 mgd (3,020 cfs) Dec. 11 (gage height, 8.68 ft), from rating curve extended above 260 mgd as explained below; minimum, 1.54 mgd (2.38 cfs) Oct. 17, 18.

1914-16, 1921-52: Maximum discharge, about 3,600 mgd (5,570 cfs) Jan. 18, 1916 (gage height, 11.6 ft at site of present gage), by test on model of station site; minimum, 1.1 mgd (1.7 cfs) Feb. 19, 20, 1944.

Remarks.--Records good except those for period of no gage-height record, which are fair. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 1045: 1922-43(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.2	1.43	2.0	33
.3	1.98	2.5	54
.5	3.4	3.0	85
.7	5.3	4.0	176
1.0	9.0	4.5	250
1.5	18.6		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.87	8.1	7.2	2.1	2.25	4.2	10.6	47	3.8	5.4	42	4.5
2	1.76	5.4	3.7	2.15	1.98	3.7	11.7	9.0	3.55	4.9	7.3	4.1
3	1.87	*3.7	3.9	1.87	1.92	3.4	67	4.4	3.25	5.2	39	3.6
4	1.92	4.7	3.4	1.76	1.82	4.1	64	4.0	187	4.6	18.8	3.6
5	2.15	15.6	4.0	1.70	*2.75	5.7	11.7	6.3	149	11.7	25.5	24
6	14.3	58	6.8	1.70	5.3	4.1	6.4	4.4	20.5	7.8	33.5	11
7	8.8	147	11.1	1.76	14.9	3.7	5.4	3.7	27.5	8.0	10.4	5
8	2.6	18.7	5.0	1.65	19.9	4.0	4.5	3.3	104	10.2	*6.1	7
9	2.1	14.2	3.55	1.76	8.0	3.65	13.8	3.8	96	8.6	5.1	16
10	3.35	7.2	3.15	1.65	3.1	3.5	11.6	4.8	170	7.7	4.6	13
11	4.8	5.4	3.1	1.70	2.5	232	32	3.55	79	4.9	4.8	7
12	2.7	4.0	2.8	1.70	2.25	III	21	3.25	68	4.3	4.4	12
13	2.85	3.55	2.6	2.35	6.0	9.5	15.8	3.9	93	19.1	5	13
14	3.25	3.15	2.55	1.87	6.1	6.8	22	5.2	78	13.5	20	10
15	2.55	2.95	2.45	1.76	4.1	5.5	12.0	3.5	22.5	5.3	11	14
16	2.15	2.7	2.35	1.70	3.7	4.9	7.0	3.1	10.0	4.2	9	9
17	2.9	2.55	2.25	1.60	3.25	4.2	5.0	3.0	9.1	3.7	8	6.5
18	2.15	2.5	2.15	1.60	6.0	3.9	4.2	3.3	6.3	3.7	24	17
19	4.0	2.35	2.05	1.60	64	3.8	76	145	*5.5	3.7	70	13
20	4.2	3.3	1.98	7.9	113	4.0	51	36	5.3	25.5	14	14
21	2.45	2.7	1.92	6.2	32.5	3.55	31	6.3	5.3	11.9	6	18
22	2.3	2.35	1.87	3.95	13.2	3.3	7.3	4.9	6.3	7.1	8	8.5
23	2.3	2.8	1.87	14.0	8.3	3.95	4.6	32.5	9.4	16.0	6	9
24	3.6	7.1	1.82	3.3	6.8	3.65	4.6	27.5	6.4	4.5	7	*9
25	2.65	16.0	1.87	21.5	4.4	3.55	3.95	9.0	6.4	7.8	5	8.8
26	4.2	3.25	1.82	7.5	68	3.25	3.65	9.9	7.2	5.0	4.2	5.8
27	3.8	2.95	1.82	2.15	29.5	7.1	3.5	5.2	71	64	4.5	10.2
28	4.8	3.65	1.82	1.98	15.4	5.4	3.55	5.2	18.4	7.8	5	9.4
29	9.4	3.2	2.25	2.65	6.8	24	3.5	4.4	6.8	6.8	5	21.4
30	53	4.3	1.98	37.5	4.5	18.4	3.25	-	5.8	29.5	4.9	11.4
31	12.9	13.5	-	9.8	-	72	4.8	-	5.5	-	4.1	-
Total	173.67	376.85	95.12	152.41	462.22	573.60	526.20	403.30	1,282.80	322.4	422.2	318.4
Mean:												
mgd	5.60	12.2	3.17	4.92	15.4	18.5	17.0	13.9	40.7	10.7	13.6	10.6
cfs	8.65	18.9	4.90	7.61	23.8	28.6	26.3	21.5	63.0	16.6	21.0	16.4
Ac-ft	533	1,160	292	468	1,420	1,760	1,610	1,240	3,880	989	1,300	977

Calendar year 1951: Max 232 Min 1.60 Mean(mgd) 12.5 Mean(cfs) 19.3 Ac-ft 14,010
Fiscal year 1951-52: Max 232 Min 1.60 Mean(mgd) 13.9 Mean(cfs) 21.5 Ac-ft 15,630

Peak discharge (base, 850 mgd).--Dec. 11 (11 p.m.) 1,950 mgd (3,020 cfs), 8.68 ft; Jan. 19 (10 p.m.) 930 mgd (1,440 cfs), 5.95 ft; Mar. 4 (8:30 p.m.) 1,380 mgd (2,140 cfs), 7.34 ft.

* Discharge measurement made on this day.
Note.--No gage-height record May 10 to June 24; discharge estimated on basis of records for nearby streams.

Kapaula Stream near Nahiku

Location.--Lat 20°48'50", long 156°07'05", on right bank 40 ft upstream from intake to Kociau ditch, 300 ft upstream from ditch trail, 1.8 miles southwest of Nahiku, and 4 miles southeast of Keanae.

Records available.--November 1921 to June 1952.

Gage.--Water-stage recorder.

Average discharge.--30 years (1922-52), 10.7 mgd (16.6 cfs).

Extremes.--Maximum discharge during year, 1,370 mgd (2,120 cfs) Dec. 11 (gage height, 7.32 ft), from rating curve extended above 220 mgd by logarithmic plotting; minimum, 0.52 mgd (0.80 cfs) Oct. 5, 6, 8, 12, 17-20.

1921-52: Maximum discharge, 1,780 mgd (2,750 cfs) Apr. 6, 1938 (gage height, 8.40 ft), from rating curve extended above 220 mgd by logarithmic plotting; minimum, 0.2 mgd (0.3 cfs) Nov. 23-25, 1933, Oct. 2-5, 1938.

Remarks.--Records good except those for period of no gage-height record, which are fair. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.4	0.38	1.4	12.4
.5	1.08	1.7	26
.6	2.2	2.0	44
.7	3.35	2.5	83
.8	4.8	3.0	140
1.0	8.6	3.4	200
1.2	11.6		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.94	8.8	9.5	0.87	2.05	3.35	5.8	46	2.65	2.45	41	2.65
2	1.01	5.1	2.9	.94	1.30	2.65	4.3	9.7	2.2	2.3	5.5	2.65
3	.94	a3.0	2.9	.80	.94	2.2	37	2.85	2.35	2.55	39.5	2.55
4	1.08	a6.5	2.2	.66	.80	2.9	53	2.1	108	2.55	20.5	2.5
5	1.45	a28	3.05	.59	2.8	4.0	11.4	3.7	72	11.4	26.5	24.5
6	14.9	a70	7.2	.59	7.3	2.55	3.95	3.0	12.6	8.1	34	11.3
7	11.1	65	11.4	.73	19.1	2.1	3.1	2.2	35.5	7.0	9.0	4.0
8	2.45	20	5.2	.66	20	2.3	2.45	1.75	64	10.1	*4.2	4.8
9	1.42	14.4	2.45	.80	11.1	1.86	11.3	1.87	83	7.5	3.25	12.7
10	3.05	6.7	1.86	.66	3.7	1.42	9.0	3.0	72	6.7	2.65	10.6
11	4.9	4.2	1.64	.73	2.45	192	25	2.3	68	3.65	2.65	6.5
12	2.1	2.9	1.30	.88	1.88	68	19.8	1.75	53	2.8	2.55	9.2
13	3.3	2.45	1.08	1.57	6.1	6.1	14.0	2.8	69	18.4	2.55	10.3
14	4.1	2.1	1.01	.94	7.0	4.2	24	6.8	57	16.4	20.5	8.6
15	2.1	1.75	.94	.80	4.7	2.8	11.5	2.8	21.5	4.2	9.6	12.7
16	1.53	1.53	.87	.66	3.8	2.2	5.3	2.1	7.5	2.8	6.3	8.3
17	2.6	1.30	.80	.59	3.5	1.86	3.1	1.64	9.5	2.3	7.2	4.5
18	1.53	1.19	.80	.52	8.1	*1.64	2.55	2.0	4.0	2.2	22.5	11.9
19	4.5	1.08	*.73	.52	61	1.64	24.5	105	*2.9	2.2	57	10.6
20	5.0	2.7	.73	8.3	82	1.86	42	29	2.55	21	7.8	13.2
21	2.1	1.81	.73	6.8	26.5	1.64	15.1	4.3	2.2	15.7	3.8	21.5
22	1.86	1.19	.66	3.6	15.7	1.42	4.4	3.1	2.75	8.4	6.8	7.5
23	1.98	1.68	.66	15.5	7.5	1.75	3.0	34.5	6.2	18.1	5.1	8.0
24	3.35	6.1	.59	2.95	6.3	1.86	3.1	28	3.1	3.8	3.5	8.3
25	2.1	18.5	.66	1.50	4.1	1.75	2.55	8.3	2.8	7.6	6.4	7.5
26	4.5	2.85	.66	2.4	59	1.53	1.98	7.8	3.45	4.4	3.0	3.95
27	2.85	2.1	.66	1.40	35	6.1	1.64	3.9	57	58	2.8	9.7
28	5.1	2.85	.73	1.19	17.8	4.5	1.64	3.8	15.9	7.0	3.45	8.2
29	12.6	2.55	1.01	3.65	7.4	28	1.64	3.0	3.25	5.2	3.65	26
30	49	3.95	.87	28.5	3.8	26	1.53	-	2.55	31.5	3.8	13.3
31	18.3	14.1	-	7.2	-	45	2.65	-	2.3	-	2.8	-
Total	171.74	337.38	65.79	95.50	437.52	425.18	352.28	329.06	850.75	296.30	369.85	287.80
Mean	5.54	10.9	2.19	3.08	14.6	13.7	11.4	11.3	27.4	9.88	11.9	9.59
mgd	8.57	16.9	3.39	4.77	22.6	21.2	17.6	17.5	42.4	15.3	18.4	14.8
Ac-ft	527	1,040	202	293	1,540	1,300	1,080	1,010	2,610	909	1,140	883

Calendar year 1951. Max 192 Min 0.52 Mean(mgd) 9.19 Mean(cfs) 14.2 Ac-ft 10,280
Fiscal year 1951-52: Max 192 Min 0.52 Mean(mgd) 11.0 Mean(cfs) 17.0 Ac-ft 12,330

Peak discharge (base, 450 mgd)--Dec. 11 (11 p.m.) 1,370 mgd (2,120 cfs), 7.32 ft; Feb. 19 (1 p.m.) 594 mgd (919 cfs), 4.98 ft; Mar. 4 (6:30 p.m.) 594 mgd (919 cfs), 5.00 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Waiohine Stream.

Koolau ditch at Nahiku weir, near Nahiku

Location--Lat 20°48'55", long 156°07'15", on right bank between Kapaula and Waiohue Streams, 1.8 miles southwest of Nahiku and 3.8 miles southeast of Keanae.

Records available--February 1919 to June 1952 in reports of Geological Survey. Gage-height records collected in this vicinity since 1904 are contained in files of East Maui Irrigation Co.

Gage--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft above mean sea level. Prior to Apr. 28, 1922, staff gage at same site and datum.

Average discharge--33 years, 21.6 mgd (33.4 cfs).

Extremes--1919-52: Maximum daily discharge, 58 mgd (90 cfs) Apr. 11, 1942; no flow at times.

Remarks--Records excellent. Flow regulated by spillways and gates. Ditch diverts water from nearly all streams from the Makapipi west to the Alo. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	7.9	38	27	7.1	10.1	21.5	45	45	19.5	21	52	17.2
2	7.6	27.5	15.2	7.1	8.7	18.1	35.5	31.5	17.5	19.2	*31	16.5
3	7.4	20.5	14.8	6.6	8.2	16.2	40	19.2	17.4	19.5	45	15.5
4	7.6	22.5	13.2	6.1	7.4	16.5	52	16.8	40	18.1	48	14.5
5	8.4	40	15.6	5.9	*10.4	19.9	48	21.5	*42	33.5	48	35.5
6	28	*48	26.5	5.9	13.9	16.2	35.5	17.8	31	29.5	52	35.5
7	26	52	29	6.1	31	14.2	28.5	15.8	33.5	26	42	21.5
8	12.2	50	21	5.9	26	15.2	22.5	14.5	38	33.5	29.5	24
9	9.8	48	15.2	6.1	26.5	13.5	42	14.8	35.5	28	24	40
10	13.4	38	13.5	5.9	14.2	12.5	38.5	17.5	35.5	26.5	21	38
11	18.0	28.5	12.9	5.9	11.3	41	42	14.8	35.5	19.9	19.9	35.5
12	12.2	22	11.6	6.1	10.1	29	45	13.8	33.5	17.8	18.5	38
13	12.8	18.8	10.7	8.5	19.7	.99	38	17.9	35.5	36	17.8	42
14	13.5	16.5	10.1	6.6	24	15.1	50	20	35.5	40	31	40
15	11.3	15.2	9.5	6.4	17.3	23.5	42	15.5	33.5	23	31	45
16	10.1	13.8	8.9	5.9	16.1	20.5	35.5	13.5	29.5	18.8	26	42
17	11.9	12.9	8.7	5.7	14.5	18.1	26.5	12.5	30	16.5	30	31
18	9.8	11.9	8.2	5.4	22	17.0	22.5	13.1	23.5	15.8	38	42
19	14.4	11.3	8.1	5.7	47	16.2	23.5	36	*20.5	15.2	52	42
20	15.5	14.8	7.6	20.5	52	16.2	20	45	18.1	29.5	35.5	45
21	10.4	11.6	7.4	18.9	50	14.5	0	26	17.2	38	26.5	48
22	9.8	10.1	7.1	12.9	45	13.5	0	21.5	18.5	25.5	33.5	40
23	9.8	11.3	6.9	31	38	14.8	0	43	26.5	34	31	33.5
24	13.5	21	6.6	13.2	33	14.2	0	45	19.9	18.1	24.5	27
25	11.0	32	6.9	15.4	23.5	13.5	0	31	19.5	25	31	17.2
26	16.1	13.8	6.6	15.8	47	12.5	6.2	33	21.5	18.8	22	18.0
27	14.8	12.2	6.6	9.2	50	22	14.2	24.5	33.5	50	20.5	40
28	16.6	13.8	6.6	8.4	45	21	13.8	23.5	33.5	29	22	38
29	23.5	12.5	7.6	11.7	33.5	44	13.2	21	29	26	22	48
30	50	15.5	7.1	20.5	24.5	50	12.5	-	24	52	21.5	45
31	45	33.5	-	23	-	50	15.5	-	22	-	18.1	-
Total	478.3	737.5	356.7	319.4	779.9	631.39	807.9	685.0	870.1	803.7	964.8	1,015.4
Mean:												
mgd	15.4	23.8	11.9	10.3	26.0	20.4	26.1	23.6	28.1	26.8	31.1	33.8
cfs	23.8	36.8	18.4	15.9	40.2	31.6	40.4	36.5	43.5	41.5	48.1	52.3
Ac-ft	1,470	2,260	1,090	980	2,390	1,940	2,480	2,100	2,670	2,470	2,960	3,120
Calendar year 1951: Max	52			Min	0.99			Mean(mgd)	19.0		Ac-ft	21,270
Fiscal year 1951-52: Max	52			Min	0			Mean(mgd)	23.1		Ac-ft	25,930

* Discharge measurement made on this day.

Waiohue Stream near Nahiku

Location.--Lat 20°49'05", long 156°07'40", on left bank 200 ft upstream from intake to Koolau ditch, 300 ft upstream from ditch trail, 2.2 miles southwest of Nahiku, and 3.5 miles southeast of Keanae.

Drainage area.--1.5 sq mi.

Records available.--October 1921 to June 1952.

Gage.--Water-stage recorder.

Average discharge.--30 years (1922-52), 7.74 mgd (12.0 cfs).

Extremes.--Maximum discharge during year, 575 mgd (890 cfs) Dec. 11 (gage height, 5.47 ft), from rating curve extended above 50 mgd by logarithmic plotting; minimum, 1.73 mgd (2.68 cfs) Oct. 17-20.

1921-52: Maximum discharge, 760 mgd (1,180 cfs) Apr. 7, 1938 (gage height, 6.24 ft), from rating curve extended above 50 mgd by logarithmic plotting; minimum, 1.37 mgd (2.12 cfs) Feb. 21, 1944, June 2, 1945.

Remarks.--Records excellent except those above 50 mgd, which are fair. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.5	1.61	1.5	20
.7	3.05	2.0	45
.9	5.4	2.6	93
1.2	11.1		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.1	5.0	5.3	2.15	2.3	3.8	5.2	17.1	3.25	3.35	13.6	3.45
2	2.05	3.9	3.25	2.1	2.15	3.45	4.1	5.1	2.95	3.15	4.3	3.55
3	2.1	3.25	3.35	1.98	2.1	3.35	17.7	3.05	2.9	3.35	19.0	3.25
4	2.3	4.8	3.05	1.92	2.05	3.55	2.1	2.9	5.5	3.25	10.0	3.05
5	2.6	10.7	4.1	1.86	2.4	4.0	6.7	4.3	28.5	6.8	11.9	9.7
6	6.7	32	5.8	1.86	4.0	3.35	4.2	3.15	6.5	4.9	13.5	6.2
7	5.6	46	7.6	1.98	8.0	3.15	3.7	2.95	12.6	4.4	6.2	3.9
8	2.5	10.2	3.7	1.86	8.5	3.25	3.35	2.7	24.5	5.5	*4.4	5.3
9	2.25	7.8	3.05	2.05	4.5	2.95	8.4	3.25	29	4.7	3.8	7.6
10	3.4	5.5	2.9	1.92	2.65	2.9	5.5	3.7	27	4.6	3.45	7.6
11	4.4	4.6	2.8	1.92	2.4	86	10.3	2.9	22	3.35	3.85	6.0
12	2.55	3.9	2.65	1.99	2.4	31	8.6	2.8	18.2	3.05	3.95	7.4
13	2.7	3.7	2.55	2.65	4.2	5.9	7.1	4.2	23.5	7.0	4.2	6.8
14	2.7	3.35	2.5	2.05	4.0	4.6	10.5	5.2	24.5	9.1	7.7	7.6
15	2.5	3.25	2.5	1.92	3.4	3.8	7.3	2.9	10.1	3.55	5.7	9.9
16	2.3	3.15	2.4	1.80	2.9	3.35	4.9	2.7	6.0	3.15	4.6	7.4
17	2.75	2.95	2.3	1.73	2.95	3.15	3.7	2.65	7.0	2.9	5.4	5.3
18	2.25	2.9	2.3	1.73	4.7	3.05	3.35	3.0	4.9	2.95	10.8	8.0
19	2.85	2.8	*2.25	1.73	25.5	2.95	12.1	58	4.2	2.95	18.7	7.1
20	3.15	4.1	2.25	5.4	42	*3.25	17.6	12.3	3.9	9.2	4.9	8.1
21	2.5	2.9	2.15	3.6	11.3	2.9	6.6	4.0	3.7	7.5	3.8	11.5
22	2.4	2.7	2.15	2.7	7.6	2.7	4.0	3.5	4.2	4.9	7.4	6.2
23	2.55	3.25	2.1	7.4	5.0	3.3	3.35	11.2	6.8	7.2	5.3	8.2
24	3.1	5.3	2.1	2.5	4.8	2.9	3.35	10.4	*4.1	3.25	3.95	*6.0
25	2.55	9.3	2.1	2.15	3.8	2.7	3.05	5.3	3.9	4.6	6.5	6.3
26	3.75	3.05	2.05	2.05	23	2.65	2.9	5.4	4.4	3.35	3.7	4.6
27	3.3	2.95	2.05	2.1	12.9	7.2	2.8	3.85	24.5	20	3.8	8.2
28	3.55	3.45	2.05	1.98	8.0	5.3	2.8	3.95	8.0	4.5	4.6	6.5
29	6.3	3.05	2.4	2.65	5.0	14.3	2.7	3.6	3.9	4.7	4.2	17.4
30	20.5	3.65	2.1	15.5	3.9	15.0	2.65	-	3.45	12.5	4.2	8.3
31	8.5	8.0	-	3.6	-	22	3.55	-	3.35	-	3.45	-
Total	118.75	211.65	87.85	88.83	218.60	261.75	203.25	196.05	384.80	163.80	210.85	208.60
Mean	3.83	6.83	2.93	2.87	7.29	8.44	6.56	6.76	12.4	5.46	6.80	6.95
mgd	5.93	10.6	4.53	4.44	11.3	13.1	10.1	10.5	19.2	8.45	10.5	10.8
cfs	364	650	270	273	671	803	624	602	1,180	503	647	640
Ac-ft												

Calendar year 1951: Max 86 Min 1.73 Mean(mgd) 5.78 Mean(cfs) 8.94 Ac-ft 6,480
Fiscal year 1951-52: Max 86 Min 1.73 Mean(mgd) 6.43 Mean(cfs) 9.95 Ac-ft 7,230

Peak discharge (base, 300 mgd).--Dec. 11 (11 p.m.) 575 mgd (890 cfs), 5.47 ft; Feb. 19 (1:30 p.m.) 315 mgd (487 cfs), 4.24 ft.

* Discharge measurement made on this day.

West Kopiliula Stream near Keanae

Location.--Lat 20°49'10", long 156°08'15", on left bank 600 ft upstream from Koolau ditch crossing and highway bridge and 3 miles southeast of Keanae Post Office.

Drainage area.--3.9 sq mi.

Records available.--January 1914 to September 1917, October 1921 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 1,292.30 ft above mean sea level. Prior to Dec. 9, 1935, at several sites within 200 ft of present site at various datums.

Average discharge.--30 years (1915-17, 1922-34, 1936-52), 18.3 mgd (28.3 cfs).

Extremes.--Maximum discharge during year, 1,980 mgd (3,060 cfs) Dec. 11 (gage height, 6.59 ft), from rating curve extended above 75 mgd by logarithmic plotting; minimum, 0.82 mgd (1.27 cfs) Oct. 17-19.

1914-17, 1921-52: Maximum discharge, 5,050 mgd (7,810 cfs) Jan. 26, 1948 (gage height, about 9.5 ft), from rating curve extended above 75 mgd by logarithmic plotting; minimum, 0.6 mgd (0.9 cfs) Sept. 15-17, 1917.

Remarks.--Records good except those above 50 mgd, which are poor. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 755: 1931-52.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Dec. 11					Dec. 12 to June 30			
-0.1	0.44	0.9	19.0		0.1	2.1	0.6	10.9
0.0	1.03	1.2	31		.2	3.3	0.9	19.2
.1	2.05	1.6	57		.4	6.7	1.2	31
.2	3.3	2.0	97		Note.--Same as preceding table above 1.2 ft.			
.4	6.3	2.5	165					
.6	10.2	2.8	220					

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.35	10.0	10.3	2.05	4.4	6.3	9.0	32	3.6	3.75	30.5	3.6
2	1.83	7.0	4.4	1.94	3.15	5.0	6.4	9.6	3.9	3.3	10.1	3.6
3	1.50	5.0	4.4	1.40	2.4	4.2	23.5	4.2	3.95	3.8	28.5	3.15
4	1.70	6.6	3.65	1.20	2.05	5.0	29.5	*3.6	116	3.45	21.5	3.15
5	2.45	15.7	4.2	1.20	4.6	5.8	12.4	7.0	76	11.2	22.5	17.5
6	15.6	51	8.8	1.30	8.6	3.95	6.5	3.9	17.2	9.3	28	11.4
7	10.8	128	13.9	1.50	*17.6	3.4	4.8	3.3	33	8.5	13.6	4.7
8	3.0	19.3	7.0	1.30	19.3	3.65	3.75	2.75	84	10.8	8.3	5.6
9	2.2	14.8	3.95	1.60	14.7	3.3	9.2	3.6	82	8.9	6.1	12.1
10	4.3	9.6	3.15	1.30	6.9	3.05	8.0	4.4	82	8.4	5.0	9.8
11	5.5	6.8	2.9	1.20	4.5	208	18.6	2.9	62	4.8	4.9	6.6
12	2.55	5.1	2.55	1.26	3.7	94	16.7	2.65	52	4.0	*4.5	9.5
13	4.9	4.6	2.3	2.25	6.8	12.3	14.0	3.4	72	16.4	5.4	10.1
14	6.1	3.8	2.55	1.60	7.7	8.3	17.7	8.7	40	14.0	17.5	8.8
15	3.3	3.4	2.2	1.30	6.1	5.8	12.0	4.1	19.2	5.9	13.1	10.4
16	2.55	3.15	2.05	1.03	5.2	5.0	7.2	3.15	12.6	4.4	11.0	7.7
17	4.2	2.9	1.94	.89	5.0	4.0	4.8	3.05	12.1	3.6	9.6	5.1
18	2.4	2.65	1.82	.82	9.8	3.6	3.9	3.7	7.7	3.6	18.8	12.1
19	7.1	2.65	1.70	1.03	45	3.3	35.5	138	6.3	3.45	51	10.9
20	8.4	4.9	1.60	8.8	81	3.75	60	29.5	5.8	16.2	13.4	11.7
21	3.65	3.35	*1.60	7.4	25.5	2.9	21.5	8.7	5.0	17.1	7.7	14.7
22	3.3	2.55	1.50	4.7	16.9	2.65	10.5	5.8	5.7	11.4	8.7	8.2
23	2.9	3.35	1.50	13.9	10.9	3.55	6.5	25.5	8.4	17.9	6.9	9.1
24	4.5	8.2	1.40	3.3	9.1	3.05	6.0	25	*4.6	7.0	4.7	9.7
25	2.8	15.4	1.60	2.3	6.5	2.9	4.6	12.7	4.4	10.5	6.9	9.4
26	5.8	3.65	1.60	3.3	45	2.4	3.75	9.1	4.5	7.0	3.9	5.2
27	3.85	3.15	2.2	3.8	28.5	6.2	3.15	6.1	37	41	4.0	11.8
28	7.5	4.0	1.70	2.95	18.9	6.1	3.45	4.8	18.9	11.1	4.9	9.4
29	9.9	5.9	2.55	8.3	11.6	19.7	3.15	4.6	5.6	8.0	4.4	17.9
30	44	5.4	1.94	41	7.4	16.2	2.75	-	4.4	21.5	4.4	*12.3
31	14.5	14.5	-	12.2	-	32.5	5.8	-	3.9	-	3.6	-
Total Mean:	195.43	374.40	102.95	138.12	438.80	489.85	374.60	375.80	895.75	300.25	383.4	275.20
mgd	6.30	12.1	3.43	4.46	14.6	15.8	12.1	13.0	28.8	10.0	12.4	9.17
cfs	9.75	18.7	5.31	6.90	22.6	24.4	18.7	20.1	44.6	15.5	19.2	14.2
Ac-ft	600	1,150	316	424	1,350	1,500	1,150	1,150	2,740	921	1,180	845

Calendar year 1951: Max 208 Min 0.82 Mean(mgd) 11.7 Mean(cfs) 18.1 Ac-ft 13,100
Fiscal year 1951-52: Max 208 Min 0.82 Mean(mgd) 11.9 Mean(cfs) 18.4 Ac-ft 13,350

Peak discharge (base, 1,000 mgd).--Dec. 11 (12 p.m.) 1,980 mgd (3,060 cfs), 6.59 ft.

* Discharge measurement made on this day.

East Wailuaiki Stream near Keanae

Location.--Lat 20°49'05", long 156°08'25", on left bank 1,000 ft upstream from Koolau ditch crossing and trail and 3 miles southeast of Keanae Post Office.

Drainage area.--3.7 sq mi.

Records available.--December 1913 to October 1917, July 1922 to June 1952.

Gage.--Water-stage recorder. Dec. 21, 1913, to Oct. 23, 1917, at site 50 ft downstream.

Average discharge.--32 years (1915-17, 1922-52), 20.0 mgd (30.9 cfs).

Extremes.--Maximum discharge during year, 2,250 mgd (3,480 cfs) Dec. 11 (gage height, 8.44 ft), from rating curve extended as explained below; minimum, 1.16 mgd (1.79 cfs) Oct. 17, 18.

1913-17, 1922-52: Maximum discharge, 3,060 mgd (4,730 cfs) Apr. 6, 1938 (gage height, 9.26 ft), from rating curve extended above 310 mgd by logarithmic plotting; minimum, 1.0 mgd (1.6 cfs) Oct. 22, 23, 1917, Aug. 1, 2, 1922.

Remarks.--Records good except those for period of no gage-height record, which are fair. Water used for irrigation in central Maui.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Mar. 4				Mar. 5 to June 30			
0.37	1.16	1.5	14.5	0.8	3.5	1.5	13.8
.4	1.32	2.0	28.5	1.0	5.4	2.0	28.5
.5	1.82	2.5	52	1.2	8.1		
.6	2.4	3.0	88				
.8	3.9	3.5	138				
1.0	6.0	4.0	213				
1.2	8.8	4.2	250				

Note.--Same as preceding table above 2.0 ft.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.35	10.4	12.0	2.35	3.35	6.3	9.0	65	4.4	4.9	52	4.9
2	2.35	6.8	4.2	2.35	2.35	5.2	7.0	16	4.5	4.3	10.0	4.6
3	1.94	4.8	4.6	1.73	2.0	4.5	30	6.0	4.0	5.3	53	3.9
4	2.2	8.1	3.75	1.52	1.77	5.6	40	*5.0	140	4.4	33	3.9
5	3.0	26	4.5	1.47	4.3	6.4	15	9.0	109	18.5	37.5	33.5
6	29.5	88	12.0	1.57	8.6	4.2	7.5	4.7	20.5	10.6	48	14.1
7	17.7	169	24	1.82	22	3.65	6.0	3.9	42	9.6	15.6	5.5
8	3.05	28	8.0	1.62	26	3.75	5.0	3.4	110	12.2	8.3	7.6
9	2.4	17.7	4.0	2.0	15.4	3.25	8.0	4.7	130	9.5	6.4	18.7
10	6.0	10.0	3.35	1.62	5.2	3.0	7.5	5.5	107	8.9	5.5	14.5
11	7.9	7.5	3.15	1.52	3.4	239	22	3.6	89	5.1	5.8	8.3
12	2.8	5.5	2.8	1.54	3.15	98	20	3.35	78	4.6	*5.3	14.0
13	4.6	5.0	2.6	2.95	6.5	14.5	18	4.4	99	27.5	6.3	14.5
14	5.7	4.3	2.6	1.92	7.9	9.1	26	14.9	68	20.5	26	11.5
15	3.0	3.9	2.5	1.57	6.3	6.2	15	4.8	25.5	6.0	13.6	16.5
16	2.65	3.65	2.3	1.42	4.8	5.4	8.0	3.45	13.8	*4.7	11.2	10.8
17	4.5	3.4	2.25	1.25	4.2	4.7	6.5	4.4	12.9	4.2	8.9	7.3
18	2.5	3.1	2.1	1.20	11.0	4.3	5.0	4.1	8.3	4.4	26	20
19	8.3	2.95	2.05	1.46	87	4.1	20	236	7.0	4.4	86	15.0
20	8.3	6.0	2.0	16.9	142	*4.8	90	46	6.2	29	15.6	16.4
21	3.15	3.45	*1.94	9.8	42	3.75	15	9.3	5.5	22.5	7.4	22.5
22	2.9	2.8	1.88	5.7	21	3.4	10	6.0	6.6	10.7	10.0	10.5
23	2.9	4.2	1.77	11.4	22	5.0	8.0	38	10.7	23	7.9	12.0
24	4.8	11.7	1.72	3.35	9.7	4.0	7.0	33.5	*5.7	6.4	5.5	12.1
25	2.85	25.5	1.95	2.25	6.5	3.9	6.0	12.4	5.3	11.1	8.4	12.2
26	6.5	3.8	2.0	1.94	82	3.15	5.0	9.2	5.5	6.6	4.6	6.7
27	3.8	3.4	2.55	2.25	43	10.5	4.5	6.2	63	77	4.8	17.2
28	11.1	4.4	2.05	2.3	22.5	9.5	5.0	5.4	23.5	11.7	5.9	12.7
29	16.1	4.7	3.2	5.5	11.3	36	4.0	5.4	6.2	8.7	5.7	31.5
30	73	5.5	2.3	46	7.2	25	5.3	-	5.1	39.5	5.5	17.0
31	20.5	19.6	-	14.1	-	39	15	-	4.8	-	4.5	-
Total	269.34	503.15	123.09	164.97	623.82	579.15	448.3	573.60	1,221.0	415.8	544.2	399.9
Mean:												
mgd	8.69	16.2	4.10	5.32	20.8	18.7	14.5	19.8	39.4	13.9	17.6	13.3
cfs	13.4	25.1	6.34	8.23	32.2	28.9	22.4	30.6	61.0	21.5	27.2	20.6
Ac-ft	827	1,540	378	506	1,910	1,780	1,380	1,780	3,750	1,280	1,670	1,230

Calendar year 1951. Max 239 Min 1.20 Mean(mgd) 14.2 Mean(cfs) 22.0 Ac-ft 15,880
Fiscal year 1951-52: Max 239 Min 1.20 Mean(mgd) 16.0 Mean(cfs) 24.8 Ac-ft 18,010

Peak discharge (base, 600 mgd).--Aug. 7 (2 a.m.) 680 mgd (1,050 cfs), 5.82 ft; Nov. 20 (5:30 a.m.) 605 mgd (936 cfs), 5.62 ft; Dec. 11 (11 p.m.) 2,250 mgd (3,480 cfs), 8.44 ft; Feb. 19 (12:30 p.m.) 980 mgd (1,520 cfs), 6.47 ft; Mar. 4 (9 p.m.) 930 mgd (1,440 cfs), 6.35 ft.

* Discharge measurement made on this day.

Note.--No gage-height record Jan. 1 to Feb. 4; discharge estimated on basis of recorded range in stage and records for West Wailuaiki Stream.

West Wailuaiki Stream near Keanae

Location.--Lat 20°49'20", long 156°08'35", on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 miles south of Keanae Post Office.

Drainage area.--3.6 sq mi.

Records available.--January 1914 to October 1917, November 1921 to June 1952.

Gage.--Water-stage recorder.

Average discharge.--30 years (1922-52), 24.4 mgd (37.8 cfs).

Extremes.--Maximum discharge during year, 2,680 mgd (4,150 cfs) Dec. 11 (gage height, 10.63 ft), from rating curve extended above 420 mgd by logarithmic plotting; minimum, 1.36 mgd (2.10 cfs) Oct. 17-19.

1914-17, 1921-52: Maximum discharge, 4,500 mgd (6,960 cfs) Jan. 14, 1923 (gage height, about 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. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.4	1.20	2.0	40
.5	1.74	2.5	73
.7	3.15	3.0	121
1.0	6.3	3.5	185
1.2	9.5	4.0	270
1.5	17.4	4.4	354

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.85	11.3	13.5	*2.65	4.6	8.3	10.1	68	5.0	5.4	60	5.0
2	2.55	8.1	5.8	2.7	3.4	6.8	7.5	16.5	5.2	4.7	13.1	4.6
3	2.2	6.0	5.8	2.0	2.9	5.8	35	6.2	4.5	5.4	58	4.0
4	2.3	7.9	4.6	1.69	2.55	6.6	44	5.6	172	5.0	38	4.5
5	3.15	25	5.3	1.69	5.1	6.9	15.0	8.4	131	17.1	44	51
6	27	98	11.4	1.87	7.1	5.0	7.8	5.2	24.5	11.0	54	13.1
7	18.2	215	27	2.2	26.5	4.5	6.3	4.4	44	10.3	17.4	6.0
8	4.1	33.5	10.2	2.0	29.5	4.5	5.2	3.95	129	12.0	10.1	6.9
9	3.15	18.8	5.4	2.4	20.5	3.95	8.4	5.1	147	9.9	8.0	16.5
10	5.6	11.1	4.4	1.93	7.2	3.65	8.2	5.3	119	9.6	6.8	11.8
11	6.6	8.3	4.1	1.74	5.2	348	22	*3.85	98	6.0	6.6	8.0
12	3.25	6.6	3.6	1.69	4.6	128	20.5	3.5	94	5.4	5.7	11.8
13	5.2	5.9	3.3	3.2	6.9	17.0	18.4	4.3	114	27	*6.6	12.5
14	6.8	5.0	3.3	2.25	7.5	10.8	24.5	13.2	68	21	24	9.9
15	4.0	4.6	3.0	1.80	6.8	7.8	15.0	5.9	29.5	8.1	16.2	13.3
16	3.25	4.7	2.75	1.58	5.7	6.6	8.8	4.0	16.4	6.0	12.4	9.4
17	4.9	4.3	2.6	1.42	5.5	5.7	6.6	4.8	13.7	5.2	10.3	6.9
18	2.9	3.85	2.55	1.36	11.6	5.0	5.6	5.1	9.5	5.2	29.5	16.8
19	7.6	3.6	2.4	2.0	93	4.7	38	307	8.1	4.8	92	12.7
20	8.3	6.6	2.25	15.4	169	5.4	99	64	7.4	28.5	17.2	13.9
21	4.2	4.0	2.1	9.3	52	4.2	15.8	11.5	6.4	26	8.8	18.7
22	3.65	3.5	2.05	6.0	25.5	3.85	9.2	7.6	6.8	11.7	10.0	9.7
23	3.5	4.2	2.0	20.5	13.7	4.8	7.6	38.5	9.2	24.5	8.0	10.6
24	4.7	11.3	1.87	4.5	10.8	4.2	6.9	40	5.9	8.1	6.0	11.2
25	3.25	24	2.25	3.15	8.3	4.2	5.8	13.8	5.6	11.7	7.6	11.0
26	5.8	4.7	2.45	2.7	94	3.4	5.0	9.4	*5.3	7.5	5.2	6.4
27	4.1	4.2	3.45	3.15	54	8.0	4.5	7.0	56	84	5.3	14.1
28	12.5	4.8	2.45	3.0	29	9.0	4.6	6.0	29	14.1	5.9	10.7
29	14.9	5.3	3.45	6.8	26.5	36.5	4.2	5.9	7.5	9.9	5.7	28
30	82	7.0	2.65	39	9.7	25	3.75	-	5.9	37.5	5.7	16.6
31	20.5	18.3	-	15.6	-	32.5	6.9	-	5.4	-	4.8	-
Total	283.00	579.25	147.97	167.27	748.65	730.65	480.15	684.00	1,382.8	442.6	602.9	355.2
Mean:												
mgd	9.13	18.7	4.93	5.40	25.0	23.6	15.5	23.6	44.6	14.8	19.4	11.8
cfs	14.1	28.9	7.63	8.36	38.7	36.5	24.0	36.5	69.0	22.9	30.0	18.3
Ac-ft	868	1,780	454	513	2,300	2,240	1,470	2,100	4,240	1,360	1,850	1,090
Calendar year 1951. Max	348			Min	1.36	Mean(mgd)	16.1	Mean(cfs)	24.9	Ac-ft	18,060	
Fiscal year 1951-52: Max	348			Min	1.36	Mean(mgd)	18.0	Mean(cfs)	27.9	Ac-ft	20,260	

Peak discharge (base, 1,200 mgd).--Dec. 11 (11 p.m.) 2,680 mgd (4,150 cfs), 10.63 ft; Feb. 19 (7:30 p.m.) 1,860 mgd (2,860 cfs), 8.68 ft; Mar. 4 (9 p.m.) 1,340 mgd (2,070 cfs), 7.40 ft.

* Discharge measurement made on this day.

West Wailuanui Stream near Keanae

Location.--Lat 20°49'40", long 156°08'55", on left bank 150 ft upstream from Koolau ditch crossing and intake and 2.2 miles south of Keanae Post Office.

Drainage area.--0.7 sq mi.

Records available.--December 1913 to June 1917, July 1922 to June 1952.

Gage.--Water-stage recorder and Columbus-type control. December 1913 to June 1917 water-stage recorder at site 100 ft downstream at different datum.

Average discharge.--30 years (1922-52), 9.07 mgd (14.0 cfs).

Extremes.--Maximum discharge during year, 555 mgd (859 cfs) Feb. 19 (gage height, 4.84 ft), from rating curve extended above 130 mgd by logarithmic plotting; minimum, 0.52 mgd (0.80 cfs) Oct. 18.
1913-17, 1922-52: Maximum discharge, 1,730 mgd (2,680 cfs) Jan. 25, 1948 (gage height, 7.32 ft), from rating curve extended above 130 mgd by logarithmic plotting; minimum, 0.2 mgd (0.3 cfs) July 16-21, 1922.

Remarks.--Records good. Water used for irrigation of sugarcane in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.7	0.52	1.6	13.5
.8	.81	1.8	22.5
.9	1.26	2.0	35.5
1.0	1.96	2.3	60
1.2	4.2	2.7	106
1.4	7.7		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.22	5.1	4.6	1.06	1.50	3.55	5.0	25.5	2.4	2.8	13.3	3.2
2	1.98	3.55	2.3	1.06	1.20	2.9	3.4	5.1	2.3	2.4	5.0	2.6
3	1.02	2.7	2.3	.77	1.06	2.4	14.3	2.6	2.15	3.25	22.5	2.25
4	1.20	4.7	1.96	.67	.94	2.7	17.6	2.3	48	2.5	13.0	2.25
5	2.7	11.4	3.5	.64	1.89	3.15	6.3	4.4	41	7.8	14.5	12.2
6	12.6	36.5	6.4	.70	2.55	2.05	3.9	2.3	9.5	7.5	17.7	6.7
7	5.8	8.4	8.6	.86	5.8	1.80	3.3	2.05	13.7	4.6	7.8	3.3
8	1.72	15.6	4.5	.70	6.8	1.72	2.6	1.64	50	5.0	5.0	4.8
9	1.44	9.1	2.5	.97	5.5	1.50	5.6	2.45	50	4.3	4.0	8.6
10	3.35	5.4	2.05	.70	2.3	1.44	4.4	3.0	45	4.5	3.4	7.7
11	4.6	4.6	1.88	.64	1.80	82	6.6	*1.80	32	2.8	4.1	5.4
12	1.72	3.55	1.57	.66	1.57	50	7.0	1.50	34	2.6	3.4	7.7
13	2.95	3.05	1.44	1.56	2.95	7.7	5.6	3.2	39.5	10.6	*3.55	7.3
14	2.75	*2.6	1.32	.90	3.3	4.8	9.0	3.25	28.5	8.9	4.5	7.3
15	1.72	2.25	1.20	.73	2.85	3.4	7.1	2.1	12.6	3.65	5.0	9.7
16	1.50	2.05	1.20	.61	2.15	2.8	4.7	1.64	7.5	2.9	4.3	6.5
17	2.4	1.96	1.10	.56	2.05	2.3	3.3	2.0	7.5	2.5	5.9	4.8
18	1.38	1.80	1.06	.54	3.55	1.96	2.8	3.85	5.1	2.6	10.2	10.4
19	2.9	1.64	.64	*29.5	1.80	16.8	97	4.0	2.6	30.5	7.7	
20	2.8	3.45	.98	7.3	.65	2.25	37.5	27	3.65	8.6	7.5	8.1
21	1.50	1.80	.94	3.2	21.5	1.64	6.9	5.8	3.15	8.1	4.3	11.8
22	1.44	1.44	.90	2.1	10.0	1.50	4.2	3.8	3.7	3.8	7.1	6.0
23	1.57	2.05	.86	7.6	5.8	2.25	3.65	12.4	5.6	5.9	4.8	6.4
24	2.65	6.1	.77	1.48	4.8	1.72	2.9	10.1	3.15	3.15	3.4	5.8
25	1.57	9.3	.90	1.10	3.65	1.57	2.5	5.3	2.9	4.8	5.4	6.6
26	3.35	2.15	.86	.98	25	1.32	2.15	4.3	*2.7	3.25	2.7	4.0
27	2.3	1.80	1.13	.98	16.0	4.5	1.88	3.15	24.5	25.5	2.8	8.6
28	6.0	2.25	.96	.94	9.6	6.4	1.88	3.15	9.7	5.4	4.1	6.4
29	7.9	2.2	1.45	1.77	5.8	15.6	1.72	2.9	3.65	4.9	3.8	15.4
30	21	3.3	1.02	10.7	4.0	13.4	1.50	-	2.9	15.7	3.4	8.8
31	9.7	7.5	-	5.1	-	12.4	3.6	-	2.7	-	2.7	-
Total	115.73	244.89	61.27	58.22	250.41	244.52	199.68	245.58	502.85	169.90	227.65	208.30
Mean	3.73	7.90	2.04	1.88	8.35	7.89	6.44	8.47	16.2	5.66	7.34	6.94
mgd	5.77	12.2	3.16	2.91	12.9	12.2	9.96	13.1	25.1	8.76	11.4	10.7
Ac-ft	355	752	188	179	768	750	613	754	1,540	521	699	639
Calendar year 1951.	Max	84	Min	0.54	Mean(mgd)	6.07	Mean(cfs)	9.39	Ac-ft	6,800		
Fiscal year 1951-52:	Max	97	Min	0.54	Mean(mgd)	6.91	Mean(cfs)	10.7	Ac-ft	7,760		

Peak discharge (base, 300 mgd).--Dec. 11 (11:30 p.m.) 505 mgd (781 cfs), 4.65 ft; Feb. 19 (7:30 p.m.) 555 mgd (859 cfs), 4.84 ft.

* Discharge measurement made on this day.

East Wailuanui Stream near Keanae

Location.--Lat 20°49'25", long 156°08'40", on left bank 125 ft upstream from Koolau ditch intake, 250 ft upstream from trail, and 2.5 miles south of Keanae.

Drainage area.--0.6 sq mi.

Records available.--January 1914 to October 1917, November 1921 to June 1952.

Gage.--Water-stage recorder. Jan. 1, 1914, to Oct. 23, 1917, at site 500 ft upstream at different datum.

Average discharge.--30 years (1922-52), 5.64 mgd (8.73 cfs).

Extremes.--Maximum discharge during year, 430 mgd (665 cfs) Dec. 11 (gage height, 4.25 ft), from rating curve extended above 50 mgd by logarithmic plotting; minimum, 0.45 mgd (0.70 cfs) Oct. 17-19.

1914-17, 1921-52: Maximum discharge, 1,050 mgd (1,620 cfs) Feb. 12, 1925 (gage height, 6.96 ft), from rating curve extended above 100 mgd; minimum, 0.1 mgd (0.2 cfs) Apr. 11, 1926.

Remarks.--Records good except those above 50 mgd, which are fair. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.3	0.33	0.8	9.1
.4	.89	1.1	22
.5	2.05	1.5	45
.6	3.8	2.0	86

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.07	4.2	3.85	0.81	1.17	2.35	3.9	24.5	1.63	2.05	10.1	2.55
2	.89	3.05	1.77	.81	1.07	1.91	*2.55	3.5	1.51	1.77	3.25	2.05
3	.97	2.35	1.77	.67	.89	1.77	14.7	1.77	1.39	2.35	20.5	1.77
4	1.07	4.5	1.63	.55	.89	1.91	19.5	1.90	35.5	1.77	8.4	1.77
5	2.05	13.1	2.8	.49	1.56	2.35	5.4	4.2	16.3	7.8	11.4	12.0
6	11.9	33	5.4	.61	2.65	1.63	2.7	1.77	3.4	3.25	12.7	6.4
7	5.5	41	5.8	.87	4.6	1.51	2.35	1.63	6.7	3.25	4.9	2.55
8	1.63	9.9	2.35	.61	5.6	1.39	1.91	1.39	13.3	3.4	3.05	4.3
9	1.39	6.3	1.63	.73	2.85	1.17	4.4	2.05	18.8	3.25	2.55	8.9
10	3.0	3.8	1.51	.61	1.63	1.17	3.9	2.35	15.5	3.4	2.2	8.0
11	4.2	3.25	1.39	.55	1.27	64	5.5	*1.63	18.5	2.2	2.55	4.7
12	1.63	2.55	1.17	.67	1.27	29	5.6	1.39	10.1	2.05	2.05	7.9
13	2.8	2.35	1.07	1.17	2.7	4.1	4.4	2.35	15.4	9.9	*2.3	7.3
14	2.55	*1.91	1.07	.73	2.85	2.55	7.4	2.35	25	8.0	2.55	7.1
15	1.63	1.63	.97	.67	2.6	2.05	6.0	1.63	8.6	2.7	2.35	10.5
16	1.63	1.51	.89	.49	1.91	1.77	3.4	1.27	4.7	2.2	2.35	6.6
17	2.05	1.39	.89	.45	1.77	1.63	2.55	1.63	4.5	1.91	2.55	4.4
18	1.39	1.17	.73	.45	3.25	1.51	2.05	2.6	2.85	1.91	8.0	10.4
19	2.65	1.17	.73	.49	28	1.27	9.1	51	2.55	1.91	13.6	7.9
20	2.3	2.35	.73	7.5	49	1.63	12.1	10.3	2.2	8.3	3.25	8.5
21	1.39	1.27	.73	3.1	11.6	1.17	2.55	2.55	1.91	5.9	2.35	12.8
22	1.39	1.17	.67	1.91	6.3	1.17	2.2	2.05	2.35	2.55	5.3	5.9
23	1.63	1.51	.77	7.3	4.2	1.63	1.77	10.4	4.4	3.25	3.65	6.3
24	2.35	5.0	.67	1.27	3.4	1.39	1.63	5.6	2.05	1.91	2.55	5.1
25	1.63	9.0	.73	1.07	2.7	1.27	1.51	2.55	1.91	3.4	4.1	6.4
26	3.05	1.63	.67	.89	18.7	1.07	1.39	2.85	*2.1	2.5	2.05	3.25
27	2.05	1.51	.81	.97	9.1	4.8	1.27	2.05	24.5	22.5	2.2	8.3
28	5.5	1.77	.73	.81	5.7	6.1	1.39	2.05	5.7	3.4	2.85	5.7
29	7.9	1.77	1.17	1.61	3.25	15.6	1.17	2.05	2.55	3.8	2.7	16.3
30	18.7	2.55	.81	8.4	2.55	13.6	1.07	-	2.05	15.3	2.55	8.8
31	9.4	6.7	-	2.3	-	13.1	2.7	-	2.05	-	2.35	-
Total	107.29	174.36	45.81	49.36	185.03	187.57	138.06	153.36	260.00	137.88	153.25	204.44
Mean:												
mgd	3.46	5.62	1.53	1.59	6.17	6.05	4.45	5.29	8.39	4.60	4.94	6.81
cfs	5.35	8.70	2.37	2.46	9.55	9.36	6.89	8.18	13.0	7.12	7.64	10.5
Ac-ft	329	535	141	151	568	576	424	471	798	423	470	627

Calendar year 1951: Max 64 Min 0.45 Mean(mgd) 3.94 Mean(cfs) 6.10 Ac-ft 4,410
Fiscal year 1951-52: Max 64 Min 0.45 Mean(mgd) 4.91 Mean(cfs) 7.60 Ac-ft 5,510

Peak discharge (base, 300 mgd).--Dec. 11 (11:30 p.m.) 430 mgd (665 cfs), 4.25 ft; Feb. 19 (1 p.m.) 370 mgd (572 cfs), 3.90 ft.

* Discharge measurement made on this day.

Taro patch feeder ditch at Keanae

Location.--Lat 20°51'40", long 156°09'00", on right bank 25 ft downstream from intake, 500 ft downstream from highway bridge over Palauhulu Stream at Keanae, 4.2 miles northwest of Nahiku, and 4.8 miles southeast of Kailua.

Records available.--September 1934 to June 1952.

Gage.--Water-stage recorder and Parshall flume.

Average discharge.--17 years (1935-52), 2.25 mgd (3.48 cfs).

Extremes.--1934-52: Maximum daily discharge, 7.9 mgd (12.2 cfs) June 30, 1941; minimum daily, 0.05 mgd (0.08 cfs) Mar. 5, 1939.

Remarks.--Records excellent except those for period of no gage-height record, which are fair.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.48	1.57	1.71	1.66	1.57	1.57	2.45	3.05	2.15	2.35	3.1	2.15
2	1.48	1.43	1.39	1.66	1.52	1.48	2.25	2.45	2.1	2.3	2.5	2.05
3	1.52	1.43	1.39	1.66	1.52	a1.4	2.55	2.05	2.1	2.3	3.1	1.99
4	1.52	1.48	1.39	1.61	1.52	a1.4	2.8	1.95	3.45	2.25	2.9	1.90
5	1.52	2.3	1.48	1.61	1.52	a1.4	*2.45	1.95	2.4	2.55	2.85	2.55
6	2.3	2.9	1.75	1.61	1.52	a1.3	2.25	1.80	1.30	2.4	3.05	2.5
7	1.95	2.6	1.82	1.61	1.97	a1.3	2.2	1.75	1.50	2.35	2.7	2.3
8	1.52	*1.56	1.71	1.61	1.87	a1.3	2.15	1.71	2.35	2.35	2.6	2.3
9	1.52	2.2	1.48	1.61	1.96	a1.2	2.3	1.71	2.85	2.3	2.55	2.5
10	1.52	1.95	1.61	1.61	1.52	a1.2	2.2	1.71	2.55	2.3	2.5	2.45
11	1.57	1.85	1.75	1.61	1.52	a2.5	2.35	1.71	2.45	2.25	2.5	2.35
12	*1.52	1.75	1.75	1.61	1.52	a2.3	2.45	1.71	2.35	2.15	2.45	2.4
13	1.52	1.71	1.75	1.61	1.52	a2.2	2.35	*1.75	2.55	2.7	2.4	2.45
14	1.52	1.61	1.75	1.61	1.52	a2.1	2.5	2.5	2.35	2.7	2.45	2.45
15	1.52	1.52	1.75	1.61	1.52	a2.0	2.35	1.86	1.66	2.35	2.35	2.55
16	1.52	1.55	1.75	1.57	1.52	a2.0	2.2	1.71	1.48	2.3	2.3	2.5
17	1.52	1.48	1.75	1.57	1.52	a2.0	2.1	1.85	1.48	2.2	2.25	2.35
18	1.48	1.39	1.75	1.57	1.80	a2.0	2.05	1.80	1.43	2.2	2.45	2.6
19	1.48	1.39	1.75	1.57	2.9	a2.0	2.15	3.9	1.39	2.15	3.2	2.5
20	1.48	1.52	1.75	1.97	3.65	a2.0	3.0	1.89	1.67	2.5	2.55	2.55
21	1.48	1.43	1.71	1.85	2.3	1.95	2.25	2.4	2.45	2.65	2.4	2.65
22	1.48	1.39	1.71	1.57	1.90	1.95	2.2	2.25	2.45	2.25	2.55	2.5
23	1.48	1.43	1.71	2.1	1.57	1.95	2.1	2.85	2.45	2.5	2.5	2.45
24	1.48	1.55	1.71	1.57	1.57	1.85	2.05	2.75	*2.35	2.25	2.4	2.45
25	1.48	2.2	1.71	1.57	1.48	1.75	1.99	2.35	2.35	2.3	2.6	2.45
26	1.48	1.52	1.71	1.52	2.7	1.71	1.95	2.25	2.25	2.2	2.4	2.35
27	1.52	1.43	1.71	1.52	2.35	1.99	1.85	2.2	3.1	3.3	2.4	2.5
28	1.81	1.48	1.71	1.52	1.99	2.2	1.80	2.2	2.7	2.45	2.35	2.5
29	1.80	1.39	1.71	1.57	1.75	2.95	1.75	2.2	2.45	2.35	2.35	2.8
30	2.75	1.39	1.66	1.88	1.61	2.8	1.75	-	2.4	2.95	2.25	2.65
31	2.1	1.84	-	1.83	-	2.75	1.95	-	2.35	-	2.15	-
Total	50.32	52.24	50.28	51.05	54.90	58.50	68.74	62.26	68.86	72.15	79.10	72.69
Mean												
mgd	1.62	1.69	1.68	1.65	1.83	1.89	2.22	2.15	2.22	2.40	2.55	2.42
cfs	2.61	2.61	2.60	2.55	2.83	2.92	3.45	3.33	3.45	3.71	3.95	3.74
Ac-ft	154	160	154	157	168	180	211	191	211	221	243	223
Calendar year 1951: Max	3.85			Min 1.13			Mean(mgd) 1.78		Mean(cfs) 2.75		Ac-ft 1,990	
Fiscal year 1951-52: Max	3.9			Min 1.2			Mean(mgd) 2.02		Mean(cfs) 3.13		Ac-ft 2,270	

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for stations on nearby streams.

Koolau ditch near Keanae

Location.--Lat 20°49'55", long 156°10'30", on right bank on west side of Keanae Valley, 2.8 miles southwest of Keanae Post Office and 5.1 miles southeast of Kailua.

Records available.--January 1910 to December 1912 and November 1917 to June 1952 in reports of Geological Survey. Gage-height records collected in this vicinity since 1904 are contained in files of East Maui Irrigation Co.

Gage.--Water-stage recorder. Jan. 1, 1910, to Dec. 31, 1912, staff gage at same site and datum.

Average discharge.--34 years (1918-52), 66.8 mgd (103 cfs).

Extremes.--1910-12, 1917-52: Maximum daily discharge, 172 mgd (266 cfs) Apr. 19, 1935; no flow at times.

Remarks.--Records excellent below 100 mgd, good above. Flow regulated by gates and spillways. Ditch diverts water at altitude 1,200 ft from nearly all streams from the Makapipi west to the Alo for power and irrigation in central Maui. No diversion above station except from several spillways.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	26.5	106	93	23.5	36	69	113	127	49	56	134	54
2	23.5	77	47	23.5	28	56	82	98	47	51	102	49
3	22	56	47	19.2	25	49	102	56	45	59	116	45
4	25	74	40	18.0	22	52	136	48	106	51	136	43
5	33.5	118	52	18.0	39.5	64	124	80	120	101	138	116
6	114	127	94	18.0	53	47	84	51	120	99	128	118
7	95	122	87	20.5	100	40	73	45	124	87	129	65
8	36	134	74	19.2	85	43	56	38	125	105	91	81
9	28	133	47	21	97	36	106	47	120	90	73	121
10	54	106	38	18.0	51	34	92	56	120	90	60	116
11	70	80	36	18.0	38	96	107	40	121	58	62	101
12	34	85	32	17.9	34	104	130	35	122	51	60	101
13	47	56	30	32	63	68	110	*52	120	119	62	123
14	56	49	28	20.5	74	74	135	77	122	123	86	122
15	36	45	28.5	19.2	58	65	120	48	136	71	104	128
16	30	45	25	16.8	50	56	95	38	116	56	94	115
17	46	38	25	15.5	47	49	69	41	111	49	91	88
18	28	34	23.5	15.5	76	45	58	52	84	47	122	130
19	58	32	23.5	16.8	129	43	62	95	69	47	128	130
20	68	*57	22	68	134	49	102	124	58	98	115	130
21	34	38	22	71	134	38	56	88	54	112	81	133
22	32	30	20.5	48	131	36	34	66	59	94	93	116
23	32	37.5	20.5	97	*108	45	30	122	92	110	92	110
24	47	83	19.2	37.5	95	40	34	130	56	62	69	104
25	34	108	20.5	29	70	38	28	108	56	89	91	101
26	60	43	20.5	34.5	131	32	32	94	58	65	56	69
27	45	38	25	28	133	63	40	66	132	132	56	129
28	67	45	20.5	25	130	84	40	66	121	105	70	120
29	82	45	28.5	47	108	136	38	58	77	79	65	135
30	133	60	23.5	69	77	134	36	-	60	136	65	128
31	133	113	-	86	-	138	62	-	56	-	54	-
Total	1,629.5	2,194.5	1,111.2	1,011.1	2,356.5	1,913	2,386	2,047	2,856	2,492	2,821	3,141
Mean:												
mgd	52.6	70.8	37.0	32.6	78.6	61.7	77.0	70.6	92.1	83.1	91.0	105
cfs	81.4	110	57.2	50.4	122	95.5	119	109	142	129	141	162
Ac-ft	5,000	6,730	3,410	3,100	7,230	5,870	7,320	6,280	8,760	7,650	8,660	9,640
Calendar year 1951:	Max 136			Min 15.5	Mean(mgd) 58.4		Mean(cfs) 90.4		Ac-ft 65,360			
Fiscal year 1951-52:	Max 136			Min 15.5	Mean(mgd) 70.9		Mean(cfs) 110		Ac-ft 79,650			

* Discharge measurement made on this day.

Haipuaena Stream near Huelo

Location.--Lat 20°51'05", long 156°11'30", 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 south-east of Huelo.

Drainage area.--1.1 sq mi.

Records available.--October 1913 to June 1952. December 1910 to September 1913 at site 600 ft downstream; records not equivalent owing to inflow from Spreckels ditch.

Gage.--Water-stage recorder. Datum of gage is 1,512.22 ft above mean sea level (East Maui Irrigation Co. benchmark).

Average discharge.--36 years (1916-52), 10.0 mgd (15.5 cfs).

Extremes.--Maximum discharge during year, 680 mgd (1,050 cfs) Feb. 19 (gage height, 5.86 ft), from rating curve extended above 9 mgd by logarithmic plotting; minimum not determined; minimum daily, 0.12 mgd (0.19 cfs) Oct. 18.
1913-52: Maximum discharge, 6,100 mgd (9,440 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) several days during January, February, May, and June 1945.

Remarks.--Records good except those for periods of indefinite stage-discharge relation and those above 6 mgd, which are fair. Haipuaena diversion ditch diverts water above station. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 except periods of indefinite stage-discharge relation (gage height, in feet, and discharge, in million gallons a day)
(Shifting-control method used Apr. 27 to May 9)

1.3	0.04	2.0	5.3
1.4	.21	2.3	12.0
1.5	.58	2.6	23.5
1.6	1.03	3.0	46
1.8	2.6	3.5	94

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	e0.21	3.95	5.5	0.30	e1.0	1.81	4.1	26	0.58	1.70	15.3	2.75
2	e.19	2.4	1.09	.30	e.50	1.15	1.89	5.3	.86	3.5	3.6	1.65
3	e.21	1.43	.88	.24	e.35	.78	9.6	1.22	2.15	2.6	17.0	1.36
4	e.24	3.1	.58	.21	e.30	.83	11.6	.74	32	1.73	9.3	1.29
5	.89	14.4	1.90	.18	1.15	.93	4.4	1.44	24.5	6.8	9.5	14.5
6	16.8	43	9.9	.18	1.35	e.66	2.15	.74	6.0	5.0	13.0	8.1
7	6.4	64	12.2	.24	6.9	e.58	1.50	.58	10.9	4.8	4.6	2.8
8	1.04	12.0	3.9	.18	8.0	e.58	1.03	e.45	31	4.5	2.95	3.25
9	.42	8.4	1.36	.27	5.2	e.42	1.74	1.10	39.5	3.4	2.5	8.0
10	1.87	4.2	.83	.21	1.36	e.38	1.67	1.57	32.5	3.8	2.05	7.9
11	2.55	2.7	.70	.18	.88	53	4.9	.95	26	2.35	2.35	5.2
12	.78	1.89	e.50	.21	.58	45	5.3	.42	20.5	1.97	1.95	7.3
13	1.88	1.57	e.42	2.4	1.04	e3.3	4.2	5.5	24.5	16.2	1.85	7.1
14	3.0	1.22	e.37	e.30	1.82	e2.2	6.4	2.95	17.0	9.0	2.2	6.0
15	.88	.83	e.33	e.20	1.89	e1.4	4.2	.66	8.4	3.05	1.97	9.4
16	.38	3.2	e.30	e.17	1.65	e1.1	2.6	e.45	5.1	2.15	2.25	5.4
17	1.69	1.10	e.28	e.14	1.20	*.83	1.50	1.24	4.3	1.57	2.35	3.55
18	.38	.58	e.26	e.12	4.1	.66	1.03	1.56	*3.5	1.70	6.4	11.1
19	1.51	.54	e.24	e.14	39.5	.50	12.8	69	2.8	1.57	21.5	7.9
20	1.94	5.6	e.23	7.7	59	.79	27.5	15.8	2.05	7.9	5.2	7.9
21	.58	1.75	e.22	4.7	18.8	e.50	3.5	2.6	1.65	10.1	2.15	9.6
22	.39	.50	e.21	1.31	9.3	e.40	1.50	1.57	1.89	2.6	3.4	5.5
23	.36	.84	e.20	7.0	4.2	.66	1.03	12.9	3.05	7.7	*3.4	4.9
24	*.71	4.9	*e.19	1.09	3.3	.51	.93	10.6	1.57	e2.5	1.81	5.0
25	.46	14.4	.18	.42	2.25	e.45	.88	3.15	1.36	e4.0	2.7	5.4
26	.66	1.49	.21	e.25	26	e.35	.66	1.73	1.22	e2.4	1.50	2.8
27	.50	.88	.27	e.23	12.4	1.23	e.55	1.09	24	16.1	1.73	9.3
28	4.9	1.31	.27	e.25	7.9	3.45	e.45	.88	8.2	3.45	3.0	6.1
29	8.7	1.09	.83	3.5	3.8	14.6	e.38	.95	2.25	2.8	2.6	13.8
30	23.5	1.61	.39	15.9	2.35	12.8	e.33	-	1.57	10.9	2.4	11.0
31	8.7	8.7	-	5.3	-	13.8	1.46	-	1.50	-	1.89	-
Total	92.72	213.58	44.74	53.62	228.07	165.65	121.78	173.12	342.20	147.84	154.40	195.65
Mean:												
mgd	2.99	6.89	1.49	1.73	7.60	5.34	3.93	5.97	11.0	4.93	4.98	6.52
cfs	4.63	10.7	2.31	2.68	11.8	8.26	6.08	9.24	17.0	7.63	7.71	10.1
Ac-ft	285	655	137	165	700	508	374	531	1,050	454	474	600
Calendar year 1951: Max	73			Min	0.12	Mean(mgd)	4.39	Mean(cfs)	6.79	Ac-ft	4,920	
Fiscal year 1951-52: Max	69			Min	0.12	Mean(mgd)	5.28	Mean(cfs)	8.17	Ac-ft	5,930	

Peak discharge (base, 750 mgd).--No peak above base.

* Discharge measurement made on this day.

e Stage-discharge relation indefinite; discharge estimated on basis of probable decrease in flow or records for stations on nearby streams.

Kula diversion from Haipuaena Stream near Olinda

Location.--Lat 20°48'15", long 156°13'30", on left bank 3.7 miles east of Olinda and 5.2 miles south of Kailua.

Records available.--July 1945 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 4,300 ft (from topographic map).

Average discharge.--6 years (1940-52), 0.448 mgd (0.693 cfs).

Extremes.--1945-52: Maximum daily discharge, 2.05 mgd (3.17 cfs) Mar. 20, 1948; minimum daily, 0.02 mgd (0.03 cfs) for several days in 1945-47, 1949-52.

Remarks.--Records excellent except those for periods of no gage-height record, which are fair.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.07	0.57	1.03	0.10	0.25	0.30	0.74	1.1	0.19	0.17	1.35	0.21
2	.06	*.43	.42	.10	.18	.22	.48	.73	.50	.61	.73	.17
3	.07	.26	.32	.07	.14	.17	.76	.27	.41	.55	1.10	.14
4	.22	.24	.27	.05	.12	.15	1.08	.17	.67	.32	1.11	.11
5	.31	1.14	.63	.04	.30	.14	.60	.12	1.22	.76	1.04	.73
6	1.18	.95	1.02	.03	.35	.12	.45	.10	1.04	1.02	1.19	.96
7	.82	1.25	1.21	.13	.80	.12	.35	.09	1.03	.61	.96	.47
8	.26	1.13	.78	.12	.85	.09	.30	.09	1.34	.52	.54	.26
9	.14	1.13	.41	.11	.70	.09	.38	.08	.80	.38	.35	.35
10	.14	.72	.26	.11	.35	.09	.36	.16	.63	.38	.25	.48
11	.14	.38	.18	.07	.25	.86	.62	.34	1.43	.36	.18	.58
12	.11	.27	.15	.08	.17	.93	.66	.16	1.72	.30	.16	.52
13	.59	.23	.11	.50	.28	.75	.56	.61	1.62	.81	.17	.64
14	.67	.18	.09	.20	.40	.56	.80	*.70	1.08	.92	.19	.34
15	.26	.15	.07	.10	.38	.34	.65	.28	.76	.48	*.18	.26
16	.16	.12	.06	.06	.35	.25	.45	.17	.50	.30	.30	.37
17	.43	.19	.05	.04	.30	.18	.30	.49	.65	.22	.32	.37
18	.21	.35	.05	.02	.50	.15	.26	.60	.83	.17	.66	.95
19	.24	.24	.04	.04	1.6	.11	.70	.61	.56	.14	1.38	.94
20	.60	.86	.03	1.0	2.0	.11	1.5	.54	.34	.45	.90	.82
21	.23	.56	.03	.60	*1.5	.09	.60	.55	.25	.89	.40	.66
22	.15	.25	.02	.25	1.06	.08	.40	.34	.21	.66	.65	.48
23	.11	.17	.02	.80	.68	.07	.26	.78	.19	1.16	.76	.35
24	.10	.41	.02	.20	.48	.06	.23	1.16	.16	.53	.40	.42
25	.10	1.00	.02	.15	.35	.06	.22	.67	.14	.56	.32	.34
26	.23	.40	.02	.13	1.58	.05	.19	.36	.26	.40	.25	.23
27	.15	.28	.03	.11	1.35	.15	.17	.27	*.98	1.32	.42	*.52
28	.31	.61	.10	.14	1.16	.50	.15	.27	.84	.71	.74	.48
29	.54	.44	.31	.50	.77	1.3	.13	.21	.37	.40	.66	.74
30	1.30	.99	.16	1.5	.44	1.22	.12	-	.23	1.14	.46	.90
31	.89	1.56	-	.70	-	1.33	.22	-	.17	-	.28	-
Total	10.79	17.46	7.91	8.05	19.64	10.64	14.68	12.02	21.12	17.24	18.40	14.79
Mean:												
mgd	0.348	0.563	0.264	0.260	0.655	0.343	0.474	0.414	0.681	0.575	0.594	0.493
cfs	0.539	0.871	0.408	0.402	1.01	0.531	0.733	0.641	1.05	0.890	0.919	0.763
Ac-ft	33	54	24	25	60	33	45	37	65	53	58	45
Calendar year 1951: Max	2.0			Min	0.02	Mean(mgd)	0.405	Mean(cfs)	0.627	Ac-ft	453	
Fiscal year 1951-52: Max	2.0			Min	0.02	Mean(mgd)	0.472	Mean(cfs)	0.730	Ac-ft	530	

* Discharge measurement made on this day.

Note.--No gage-height record Oct. 12 to Nov. 21, Dec. 25-29, Jan. 5-21, Jan. 27 to Feb. 1; discharge estimated on basis of recorded range in stage and records for stations on nearby streams.

Haipuaena diversion ditch at Kolea Gulch, near Keanae

Location.--Lat 20°50'50", long 156°11'40", on right bank 15 ft downstream from end of tunnel in Kolea Gulch, 3.1 miles southwest of Keanae, and 3.7 miles southeast of Kailua.

Records available.--March 1938 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Altitude of gage is 1,800 ft (from topographic map).

Average discharge.--14 years, 2.04 mgd (3.16 cfs).

Extremes.--1938-52: Maximum daily discharge, 11.4 mgd (17.6 cfs) Aug. 14, 1950; minimum daily, 0.19 mgd (0.29 cfs) Jan. 30, 31, 1947.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from Haipuaena Stream for East Maui Irrigation Co.'s hydroelectric plant about 1 mile downstream.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.31	*2.6	2.8	1.36	*1.96	2.25	2.6	5.5	1.49	2.0	4.9	1.76
2	1.25	2.3	2.1	1.31	1.76	2.1	2.25	2.8	1.56	2.4	2.55	1.62
3	1.31	2.2	2.05	1.02	1.62	2.05	3.45	2.1	1.69	2.4	4.9	1.56
4	1.36	2.45	1.96	.90	1.49	2.05	3.7	2.05	4.0	2.0	3.75	1.56
5	1.81	3.9	2.35	.80	2.05	2.05	2.8	2.2	5.2	3.2	3.85	3.8
6	4.4	5.8	3.35	.90	2.2	1.90	2.3	1.96	2.75	3.0	4.4	2.85
7	3.15	7.8	3.9	1.19	3.0	1.90	2.1	1.83	3.4	2.9	2.85	1.96
8	1.96	3.75	2.55	1.02	3.1	1.83	2.05	1.76	5.6	2.9	2.25	1.96
9	1.83	3.35	2.1	1.19	2.85	1.76	2.1	2.05	6.8	2.6	2.05	2.85
10	2.15	2.7	2.05	1.02	2.1	1.62	2.1	2.2	6.1	2.7	1.90	2.75
11	2.25	2.3	1.96	.80	1.90	6.7	2.75	2.05	5.2	2.2	1.83	2.3
12	1.90	2.25	1.90	1.03	1.83	5.6	2.85	1.83	5.0	2.0	1.83	2.75
13	2.2	2.2	1.83	2.35	1.96	2.7	2.8	2.45	5.4	4.0	1.90	2.8
14	2.4	2.1	1.76	1.42	2.2	2.4	3.1	2.5	*4.2	3.3	1.90	2.4
15	1.96	1.96	1.69	1.07	2.2	2.25	2.7	1.96	3.15	2.5	1.83	2.95
16	1.83	2.55	1.56	.85	2.2	2.1	2.3	1.76	2.6	2.1	1.90	2.4
17	2.25	2.05	1.49	.75	2.05	1.96	2.1	2.15	2.3	1.8	1.96	2.1
18	1.83	1.96	1.42	.70	2.6	1.90	2.05	2.15	2.2	1.9	2.75	3.3
19	2.2	1.90	1.36	.85	6.2	1.83	2.8	6.2	2.1	1.8	4.9	2.85
20	2.25	2.9	1.25	3.1	8.3	1.96	5.4	4.2	2.0	3.2	2.45	2.8
21	1.90	2.15	1.13	2.7	4.9	1.76	2.55	2.1	1.9	3.4	1.83	2.95
22	1.76	1.90	1.07	2.05	3.55	1.69	2.2	1.83	2.0	2.4	2.05	2.5
23	1.76	2.05	1.02	3.0	2.7	1.83	2.05	3.75	2.3	3.1	2.05	2.4
24	1.90	2.95	.96	2.05	2.55	1.76	1.96	3.5	1.9	2.3	1.76	2.5
25	1.69	3.85	1.13	1.76	2.3	1.76	1.96	2.25	1.8	2.6	1.83	2.4
26	1.83	2.2	1.02	1.62	5.8	1.56	1.83	1.83	1.7	2.2	1.62	2.05
27	1.76	2.05	1.49	1.56	3.9	1.85	1.76	1.69	5.0	6.0	1.76	5.1
28	2.65	2.2	1.31	1.69	3.3	2.5	1.76	1.62	3.5	3.0	1.96	2.55
29	3.3	2.15	1.96	2.55	2.6	4.1	*1.76	1.62	2.3	2.5	1.90	3.55
30	5.0	2.25	1.42	3.75	2.3	3.75	1.62	-----	2.1	*4.5	1.83	3.3
31	5.35	3.5	-----	2.8	-----	4.1	2.1	-----	2.0	-----	1.76	-----
Total	68.50	86.27	53.94	49.16	87.47	75.57	75.85	71.89	99.24	82.9	77.00	76.72
Mean:												
mgd	2.21	2.78	1.80	1.59	2.92	2.44	2.45	2.48	3.20	2.76	2.48	2.56
cfs	3.42	4.30	2.79	2.46	4.52	3.78	3.79	3.84	4.85	4.27	3.84	3.96
Ac-ft	210	265	166	151	268	232	233	221	305	254	236	235

Calendar year 1951. Max 8.3 Min 0.70 Mean(mgd) 2.29 Mean(cfs) 3.54 Ac-ft 2,560
 Fiscal Year 1951-52: Max 8.3 Min 0.70 Mean(mgd) 2.47 Mean(cfs) 3.82 Ac-ft 2,780

* Discharge measurement made on this day.

Note.--No gage-height record Mar. 17 to Apr. 30; discharge estimated on basis of records for nearby streams.

Spreckels ditch at Haipuaena weir, near Huelo

Location.--Lat 20°51'20", long 156°11'25", on left bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.5 miles west of Keanae, 3.5 miles south-east of Kailua, and 4.5 miles southeast of Huelo.

Records available.--April 1922 to June 1952 in reports of Geological Survey. May 1919 to April 1922 in files of East Maui Irrigation Co.

Gage.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft above mean sea level (East Maui Irrigation Co. benchmark). 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.--29 years (1922-29, 1930-52), 13.2 mgd (20.4 cfs).

Extremes.--1922-52: Maximum daily discharge, 77 mgd (119 cfs) Nov. 5, 1946; no flow at times.

Remarks.--Records excellent. Regulated by gates and spillways. Spreckels ditch diverts water from all streams between the Nuaaialua and the Kailua, above Koolau ditch east of the Puohokamoa and below Koolau ditch west of the Puohokamoa. About 4 mgd is diverted from Spreckels ditch to East Maui Irrigation Co.'s hydroelectric plant at Kolea Gulch. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 770: 1932-33.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.36	10.6	8.3	0.49	3.4	2.1	5.5	31.5	2.6	6.8	36	8.5
2	.20	7.8	3.2	.43	2.0	1.50	2.1	7.6	2.75	9.1	13.2	6.8
3	.33	4.7	2.75	.16	1.30	1.04	13.3	1.70	5.6	9.0	39	5.7
4	.74	7.9	1.80	.16	.92	1.20	14.6	1.04	16.9	7.3	24.5	5.5
5	4.9	24	4.0	.15	6.0	1.50	5.9	2.4	23	14.6	*25	23
6	27	33	14.2	.16	8.0	.92	2.75	1.20	9.5	11.2	31	16.0
7	14.0	52	18.1	.23	18.7	.74	1.80	1.04	11.1	10.9	15.7	8.8
8	3.9	18.5	7.2	.16	18.0	.68	1.10	.62	25.5	10.9	10.9	9.3
9	3.55	*14.5	3.4	.30	15.3	.50	2.55	1.80	28.5	*9.8	9.6	16.2
10	7.6	9.0	2.25	.16	7.1	.40	2.2	2.6	27	10.1	8.0	16.0
11	9.7	6.8	1.90	.16	4.5	.43	6.1	1.47	24.5	8.0	8.8	11.9
12	3.05	5.3	1.20	.23	3.1	.29	6.8	.74	31	8.0	7.8	14.5
13	6.9	4.5	.86	5.3	6.6	5.7	6.2	5.2	31	35	7.6	12.4
14	9.0	3.4	.68	.54	10.4	4.0	9.1	4.5	31	26	9.0	12.8
15	3.7	2.4	.40	.23	10.0	2.1	6.0	3.05	27	12.5	8.5	17.6
16	1.90	5.8	.26	.16	9.2	1.60	3.65	3.55	20.5	9.0	8.8	12.5
17	6.5	3.6	.23	.16	7.8	1.10	1.70	7.3	19.4	6.2	9.0	10.1
18	1.90	2.1	.19	.16	15.0	.92	1.20	10.0	15.4	7.1	14.3	20
19	6.5	2.0	.16	.16	44	.80	8.6	31.5	11.9	6.9	32.5	14.9
20	7.6	9.5	.16	12.0	53	1.10	26.5	21	9.0	21	12.5	15.3
21	2.6	4.6	.16	9.1	27	.68	4.5	7.5	7.3	24.5	7.8	17.7
22	1.80	1.70	.16	4.0	13.4	.47	1.70	5.9	8.8	10.9	10.2	11.2
23	2.05	3.15	.15	13.6	6.4	1.17	1.10	19.2	14.1	20.5	9.6	10.9
24	3.4	10.4	.14	4.4	5.0	.86	1.04	16.8	6.2	9.6	6.8	10.9
25	1.60	19.4	.16	1.90	3.05	.74	.98	6.8	5.3	13.6	9.2	12.2
26	2.9	3.9	.16	1.20	34.5	.36	.74	4.7	5.1	9.6	5.9	8.3
27	2.7	2.75	.46	2.3	17.1	2.8	.50	3.55	28.5	44	7.1	15.6
28	10.0	3.7	.25	1.95	10.5	5.0	.50	3.2	18.1	15.3	9.3	12.5
29	14.2	3.15	1.78	8.5	5.5	21	.36	3.4	8.8	11.9	8.8	23
30	32	4.3	.76	18.2	2.9	18.1	.50	-----	6.2	30.0	8.0	18.3
31	17.2	12.3	-----	14.5	-----	18.5	*1.96	-----	6.4	-----	6.8	-----
Total	209.58	296.75	75.42	101.85	369.67	169.58	141.33	211.46	487.95	429.3	421.2	396.4
Mean	6.76	9.57	2.51	3.29	12.3	5.47	4.56	7.29	15.7	14.3	13.6	13.3
mgd	10.5	14.6	3.86	5.09	19.0	8.46	7.06	11.3	24.3	22.1	21.0	20.6
cfs	643	911	231	313	1,130	520	434	649	1,500	1,320	1,290	1,220
Calendar year 1951.	Max	53	Min	0.14	Mean(mgd)	6.44	Mean(cfs)	9.96	Ac-ft	7,200		
Fiscal year 1951-52.	Max	53	Min	0.14	Mean(mgd)	9.05	Mean(cfs)	14.0	Ac-ft	10,160		

* Discharge measurement made on this day.

Koolau ditch at Haipuaena, near Huelo

Location.--Lat 20°51'15", long 156°11'15", on right bank 1,000 ft upstream from intake at Puohokamoa Stream, 3.5 miles southeast of Kailua, and 4.7 miles southeast of Huelo.

Records available.--April 1932 to June 1952.

Gage.--Water-stage recorder and Parshall flume. Prior to Mar. 21, 1933, at datum 1.94 ft lower. Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft lower.

Average discharge.--20 years, 80.0 mgd (124 cfs).

Extremes.--1932-52: Maximum daily discharge, 193 mgd (299 cfs) Jan. 17, 1946; no flow. Feb. 14-28, Mar. 7-18, 1933, Feb. 26 to Mar. 22, 1935.

Remarks.--Records excellent except those for periods of backwater and those for periods of no gage-height record, which are good. Flow regulated by floodgates. Water used for domestic supply and irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	29.5	113	116	29.5	41	80	126	182	55	63	183	67
2	26.5	80	52	28	32.5	67	89	116	55	63	108	59
3	26.5	59	52	23.5	29.5	59	127	63	61	65	172	52
4	28	83	46	20.5	26.5	63	162	54	145	55	180	50
5	39.5	148	58	19.4	47	76	143	*90	183	129	180	162
6	152	c163	c121	20.5	54	55	94	59	152	111	190	150
7	114	190	c107	23.5	c115	48	80	52	155	102	152	72
8	41	176	c90	22	c93	50	63	44	183	120	97	93
9	32.5	162	52	25	111	44	117	57	190	99	76	153
10	60	113	44	20.5	55	41	104	69	190	100	67	149
11	78	89	42	20.5	42	150	130	50	183	63	70	119
12	39	67	37	20.5	39	144	155	42	176	55	65	149
13	52	59	35.5	43	65	90	128	71	183	c152	69	152
14	62	55	34	25	78	88	162	89	183	144	93	147
15	41	50	32.5	22	63	76	142	55	162	74	111	170
16	34	58	31	19.4	55	67	108	42	125	59	101	139
17	51	44	29.5	18.1	52	59	78	47	117	52	99	99
18	32.5	41	28	16.8	86	52	67	54	89	52	144	174
19	52	37	26.5	19.4	c155	50	83	137	76	52	190	163
20	73	85	26.5	94	c190	57	153	172	63	126	136	159
21	39	46	25	90	c164	46	72	101	59	127	85	175
22	37	35.5	23.5	56	169	42	44	73	59	91	104	136
23	35.5	42	23.5	127	125	54	39	168	97	132	106	126
24	52	102	22	44	107	48	41	174	59	67	72	125
25	37	c134	23.5	33.5	80	46	35.5	135	59	98	102	124
26	63	50	23.5	39	*c162	39	37	105	59	70	63	75
27	48	42	31	32.5	176	76	46	76	c173	188	63	c166
28	c82	52	25	31	169	110	46	72	140	109	81	146
29	104	50	37	55	125	169	42	67	80	92	77	c179
30	176	67	29.5	89	89	162	39	-	67	183	73	167
31	162	140	-	98	-	155	72	-	63	-	59	-
Total	1,899.5	2,632.5	1,324.0	1,226.1	2,795.5	2,363	2,820.5	2,516	3,641	2,893	3,368	3,897
Mean:												
mgd	61.3	84.9	44.1	39.6	93.2	76.2	91.0	86.8	117	96.4	109	130
cfs	94.8	131	68.2	61.3	144	118	141	134	181	149	169	201
Ac-ft	5,830	8,080	4,060	3,760	8,580	7,250	8,660	7,720	11,170	8,880	10,340	11,960

Calendar year 1951. Max 190 Min 16.8 Mean(mgd) 69.2 Mean(cfs) 107 Ac-ft 77,520
 Fiscal year 1951-52: Max 190 Min 16.8 Mean(mgd) 85.7 Mean(cfs) 133 Ac-ft 96,290

- * Discharge measurement made on this day.
 a No gage-height record; discharge estimated on basis of recorded range in stage and comparison with other Koolau ditch stations.
 c Stage-discharge relation affected by backwater from Puohokamoa intake.

Puohokamoa Stream near Huelo

Location.--Lat 20°51'20", long 156°11'25", on right bank 650 ft upstream from Spreckels ditch inflow and trail crossing, 3.2 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Drainage area.--2.6 sq mi.

Records available.--June 1913 to June 1952. December 1910 to May 1913 at site 700 ft downstream; records not equivalent due 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. benchmark). Prior to May 31, 1934, water-stage recorder at site 130 ft downstream at different datum.

Average discharge.--35 years (1917-52), 21.2 mgd (32.8 cfs).

Extremes.--Maximum discharge during year, 1,210 mgd (1,870 cfs) Feb. 19 (gage height, 6.81 ft), from rating curve extended above 400 mgd by logarithmic plotting; minimum, 1.05 mgd (1.62 cfs) Oct. 19.
1913-52: Maximum discharge, 1,600 mgd (2,480 cfs) Aug. 12, 1940 (gage height, 7.81 ft), from rating curve extended above 400 mgd by logarithmic plotting; minimum, 0.1 mgd (0.2 cfs) Nov. 17, 1929.

Remarks.--Records good. Kula pipeline diverts small amount of water above station, at altitude 4,800 ft, for domestic supply.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.6	1.20	1.2	15.5
.7	2.15	1.5	36
.8	3.45	2.0	86
.9	5.8	2.5	165
1.0	8.8		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.15	12.4	16.3	2.6	5.2	8.2	14.0	80	5.2	6.7	60	8.6
2	1.95	8.8	5.5	2.6	3.8	6.6	8.8	19.9	5.2	9.1	16.8	5.8
3	2.15	6.0	4.4	1.95	3.15	5.8	31	6.6	10.5	9.2	60	5.0
4	2.35	10.0	3.6	1.75	2.7	6.0	35	5.2	71	6.6	56.5	5.0
5	4.1	38.5	6.8	1.56	5.7	6.0	15.6	7.0	72	18.4	35.5	39.5
6	51	108	28.5	1.65	6.3	4.4	9.4	5.0	21.5	15.1	50	23.5
7	18.2	165	30	2.25	20	4.0	7.2	4.4	32	14.4	20.5	9.4
8	5.0	36	13.4	1.85	20.5	3.8	5.2	3.6	76	14.8	12.2	10.0
9	3.3	25	6.6	2.05	16.0	3.45	7.4	5.8	106	11.2	9.7	25
10	7.1	14.8	5.2	1.75	5.8	3.15	6.9	8.0	95	11.8	8.2	24
11	9.1	10.3	4.7	1.56	4.2	146	16.0	5.7	69	8.2	8.9	14.4
12	4.2	8.2	3.45	1.75	3.45	113	17.1	3.8	61	7.0	7.4	22
13	6.6	7.0	3.0	1.90	4.8	14.6	13.6	10.4	72	44	7.0	21
14	10.2	5.8	2.7	2.7	7.4	10.4	21	11.4	55	25.5	8.2	17.5
15	4.4	5.2	2.6	1.95	7.3	7.6	14.7	4.4	29	10.6	8.2	26
16	3.3	9.1	2.35	1.56	6.9	6.4	10.3	3.45	18.5	7.8	8.5	15.0
17	6.5	6.0	2.25	1.38	5.2	5.0	6.4	3.75	15.3	6.0	7.8	11.1
18	3.3	4.2	2.15	1.20	12.3	4.4	5.2	6.4	*13.3	6.6	16.6	34
19	5.6	3.8	2.05	1.47	110	4.0	32.5	158	10.9	6.0	5.4	22
20	7.3	16.6	1.95	25.5	163	4.7	77	47	8.8	24.5	15.6	22.5
21	3.6	7.5	1.85	15.9	54	3.6	12.1	12.9	7.6	27.5	7.8	27.5
22	3.3	3.8	1.75	6.0	30.5	3.15	8.2	9.7	8.2	9.8	11.2	16.3
23	3.3	5.1	1.75	21.5	15.1	4.3	6.4	43	10.9	21	10.1	15.0
24	*4.0	16.2	*1.70	5.5	12.4	3.6	5.8	33	6.6	9.0	6.4	15.9
25	3.15	43	1.95	3.15	9.4	3.45	5.2	13.8	5.8	12.1	8.6	16.4
26	3.45	7.4	1.85	2.6	76	2.7	4.7	9.1	5.2	8.2	5.2	10.5
27	3.0	5.2	2.35	2.35	37	6.0	4.0	7.2	66	82	6.4	30
28	15.5	6.6	2.3	2.8	27	12.6	3.8	6.4	25	16.2	9.8	19.7
29	23	6.0	4.6	10.0	14.1	44	3.15	6.4	9.1	11.0	8.5	41
30	60	7.8	2.9	49	10.3	36	2.85	-	7.0	49	7.7	31.5
31	24	21	-	16.5	-	39.5	*6.6	-	6.6	-	6.4	-
Total	304.10	630.3	170.50	204.13	699.50	526.40	417.10	541.30	1,005.4	509.3	539.7	583.9
Mean:												
mgd	9.81	20.3	5.68	6.58	23.3	17.0	13.5	18.7	32.4	17.0	17.4	19.5
cfs	15.2	31.4	8.79	10.2	36.1	26.3	20.9	28.9	50.1	26.3	26.9	30.2
Ac-ft	933	1,930	523	626	2,150	1,620	1,280	1,680	3,090	1,560	1,660	1,790
Calendar year 1951: Max	165			Min	1.20	Mean(mgd)	13.3	Mean(cfs)	20.6	Ac-ft	14,950	
Fiscal year 1951-52: Max	165			Min	1.20	Mean(mgd)	16.8	Mean(cfs)	26.0	Ac-ft	18,920	

Peak discharge (base, 750 mgd).--Feb. 19 (7:30 p.m. 1,210 mgd (1,870 cfs), 6.81 ft.

* Discharge measurement made on this day.

Manuel Luis ditch at Puohokamoa Gulch, near Huelo

Location.--Lat 20°51'50", long 156°11'00", on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.1 miles west of Keanae, 3 miles southeast of Kailua, and 4.4 miles southeast of Huelo.

Records available.--December 1917 to June 1952.

Gage.--Water-stage recorder and sharp-crested weir.

Average discharge.--33 years (1918-24, 1925-52), 5.84 mgd (9.03 cfs).

Extremes.--1917-52: Maximum daily discharge, 68 mgd (105 cfs) for one or more days in 1938, 1941-42, 1947-48, and 1950; no flow at times.

Remarks.--Records excellent. Ditch is extension of Center ditch and picks up water at altitude of 500 ft from streams between the Kolea and the Waiakamoi. Flow regulated by gates. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.79	4.5	4.2	0.56	1.08	1.61	6.6	21	1.15	1.70	8.5	1.61
2	.56	3.55	2.25	.51	.74	1.23	3.2	3.3	.85	1.57	1.38	1.15
3	.65	2.55	2.15	.34	.56	1.08	17.3	1.08	6.0	1.31	23.5	1.08
4	1.08	3.8	1.53	.28	.45	1.15	31.5	.93	24	1.69	7.0	.85
5	3.05	17.6	2.85	.28	1.51	1.15	6.0	1.08	21	3.45	9.4	7.4
6	14.6	28.5	7.9	.28	1.17	.85	2.85	.85	4.1	1.61	*13.0	3.5
7	5.2	52	11.8	.34	2.6	.74	1.99	1.00	10.3	1.95	3.95	1.08
8	2.1	12.2	4.3	.34	5.2	.68	1.46	.74	26	2.4	2.35	1.64
9	1.31	7.9	2.9	.45	2.15	.62	3.25	1.00	34.5	1.38	1.89	4.1
10	4.2	*5.4	2.25	.28	.74	.56	2.15	1.31	31.5	1.38	1.53	5.8
11	4.6	4.3	2.1	.25	.62	46	3.6	.85	27	.93	2.2	2.75
12	1.75	3.45	1.46	.48	.51	39	3.1	.68	22	.85	2.1	3.75
13	2.8	3.0	1.15	4.1	.75	5.7	2.9	2.45	32	9.3	1.31	3.3
14	5.4	2.35	.93	.74	1.14	3.15	4.6	1.78	25	6.0	1.38	4.8
15	1.89	1.80	.85	.34	1.13	2.1	2.9	.85	6.3	1.38	1.23	7.2
16	1.08	2.6	.68	.25	.94	1.61	2.15	.68	3.45	1.00	1.23	4.2
17	2.8	2.1	.62	.22	.79	*1.38	1.46	.62	3.9	1.31	1.08	8.4
18	1.08	1.53	.56	.22	2.35	1.15	1.31	1.64	2.35	1.28	5.2	9.7
19	2.6	1.56	.51	.25	36.5	1.08	8.9	31.5	1.80	1.37	8.2	4.2
20	3.2	5.5	.45	8.2	55	1.08	24.5	17.6	1.46	2.9	1.95	*5.9
21	1.38	2.65	.39	5.8	14.6	.85	3.2	1.89	1.31	4.1	1.04	10.5
22	1.31	1.23	.39	2.85	5.9	.74	2.25	1.38	1.31	.93	5.7	4.6
23	1.45	2.1	.34	8.9	2.75	.83	1.70	7.5	2.1	1.63	2.85	3.45
24	2.4	5.3	.39	1.33	2.35	.79	1.46	4.3	1.15	.79	1.67	3.1
25	1.31	12.8	.39	.62	1.61	.68	1.15	1.46	1.15	1.21	9.3	3.3
26	2.05	2.45	.34	.45	21	.62	1.08	1.23	1.28	.74	2.25	1.80
27	1.41	1.89	.45	.64	7.5	4.2	.93	1.00	21.5	15.4	2.35	6.4
28	5.3	2.8	.43	.60	5.1	9.8	.85	1.00	8.6	1.44	2.35	4.3
29	6.4	2.1	1.70	1.73	2.4	36	.74	1.15	1.61	.95	1.80	15.3
30	18.7	2.75	.72	13.3	1.70	33.5	.68	-	1.38	8.6	1.53	7.9
31	7.4	6.0	-	43	-	29	1.28	-	1.38	-	1.23	-
Total	107.85	208.26	57.08	59.13	178.84	229.03	146.74	111.85	327.43	80.55	130.45	143.06
Mean:												
mgd	3.48	6.72	1.90	1.91	5.96	7.39	4.73	3.86	10.6	2.68	4.21	4.77
cfs	5.38	10.4	2.94	2.96	9.22	11.4	7.32	5.97	16.4	4.15	6.51	7.38
Ac-ft	331	639	175	181	549	703	450	343	1,000	247	400	439
Calendar year 1951	Max	53	Min	0.22	Mean(mgd)	4.04	Mean(cfs)	6.25	Ac-ft	4,520		
Fiscal year 1951-52	Max	53	Min	0.22	Mean(mgd)	4.86	Mean(cfs)	7.52	Ac-ft	5,460		

* Discharge measurement made on this day.

Waiakamoi Stream above Wailoa ditch, near Huelo

Location.--Lat 20°51'45", long 156°11'55", on left bank 500 ft upstream from intake of Wailoa ditch, 0.2 mile upstream from Spreckels ditch trail, 2.5 miles southeast of Kailua, and 3.8 miles southeast of Huelo.

Drainage area.--4.4 sq mi.

Records available.--January 1922 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 1,293.59 ft above mean sea level.

Average discharge.--30 years, 16.4 mgd (25.4 cfs).

Extremes.--Maximum discharge during year, 2,350 mgd (3,640 cfs) Feb. 19 (gage height, 8.21 ft), from rating curve extended above 370 mgd as explained below; minimum, 0.39 mgd (0.60 cfs) Oct. 18, 19.
1922-52: Maximum discharge, 7,040 mgd (10,900 cfs) Jan. 26, 1948 (gage height, 12.76 ft), from rating curve extended above 370 mgd on basis of area-mean-depth study; minimum, 0.16 mgd (0.25 cfs) Feb. 11, 1945.

Remarks.--Records good. Haleakala Ranch and Kula pipelines divert small quantities of water above station. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 615: 1922-24. WSP 740: 1922-31(M). WSP 1155: 1948(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.6	0.27	1.5	6.3
.7	.45	1.7	11.2
.8	.70	2.0	22
.9	1.00	2.5	52
1.1	1.70	3.0	102
1.3	3.2	3.5	175

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.62	7.4	16.5	2.0	4.2	6.0	11.9	53	3.7	4.4	51	5.1
2	1.50	5.4	4.8	2.05	2.85	5.1	5.8	16.9	3.85	7.0	12.5	3.85
3	1.00	4.1	4.1	1.76	2.45	4.3	21	4.5	7.6	7.0	45	3.3
4	1.00	6.9	3.6	.84	1.90	3.6	23.5	3.6	63	5.1	33.5	2.4
5	1.38	30.5	5.1	.56	3.15	3.7	9.6	3.85	74	10.2	27.5	30.5
6	27	94	25	.47	4.9	3.7	5.6	3.2	19.0	12.0	*41	17.9
7	12.3	189	30	.78	18.5	3.3	4.5	2.95	30.5	9.9	16.4	7.0
8	4.0	22.5	12.9	.92	19.2	2.3	4.1	2.55	100	10.9	8.5	6.4
9	2.85	19.1	4.8	.84	17.1	2.1	5.1	3.75	115	7.4	6.3	15.4
10	4.2	10.4	3.6	.75	5.2	2.0	4.7	5.1	97	7.9	5.4	14.6
11	4.3	7.0	3.3	.59	4.1	99	9.7	4.6	62	5.8	5.7	10.1
12	2.5	5.6	3.05	.47	3.45	120	12.9	3.3	58	5.2	5.0	11.9
13	3.95	5.1	2.75	5.9	4.1	9.0	11.2	9.2	69	29.5	4.5	13.5
14	9.0	4.4	2.4	2.6	5.8	6.1	14.9	9.0	36	18.8	5.1	10.8
15	4.1	3.85	1.46	1.77	5.2	5.1	10.1	4.1	17.2	7.1	5.1	14.1
16	2.95	4.5	1.25	.70	5.9	4.3	7.1	3.2	10.4	5.2	6.1	9.1
17	5.1	2.95	1.16	.45	4.5	3.7	5.2	2.95	8.5	4.5	5.1	7.0
18	3.55	2.2	1.09	.39	9.9	3.45	4.4	5.1	7.9	4.5	8.3	19.4
19	4.1	2.05	1.12	.43	79	2.75	21	166	7.2	4.3	46	14.4
20	6.2	11.9	1.03	12.3	116	2.6	95	39	*5.8	13.0	13.6	15.2
21	3.7	6.1	.75	13.8	47	2.2	10.8	7.5	5.1	25	5.4	15.8
22	3.05	3.45	.70	4.2	23.5	1.85	5.6	4.9	5.1	7.0	7.2	10.3
23	2.7	3.5	.59	11.8	9.6	2.2	4.3	20	6.4	20	6.4	8.6
24	2.2	8.4	.54	4.5	8.6	2.2	3.85	28.5	4.5	7.3	4.5	9.9
25	1.85	28.5	*.62	2.85	6.5	2.65	3.7	10.3	4.1	7.7	5.7	9.3
26	2.0	4.8	.67	1.80	68	2.15	3.3	5.9	3.85	5.8	4.0	6.1
27	1.85	3.45	.92	1.58	34	2.8	2.95	4.7	47	65	4.3	18.3
28	7.7	4.0	.99	2.05	18.2	5.1	2.85	4.3	25	11.0	5.6	12.6
29	13.9	3.65	3.8	10.0	9.9	26.5	2.75	4.3	5.6	6.1	5.4	24.5
30	49	4.9	2.45	46	6.5	25.5	2.55	-	4.3	33	4.9	20.5
31	14.4	17.6	-	21	-	36.5	4.7	-	4.1	-	4.1	-
Total	204.95	507.00	141.04	156.15	549.20	401.75	334.65	436.25	910.70	367.6	409.1	367.85
Mean:	6.61	16.4	4.70	5.04	18.3	13.0	10.8	15.0	29.4	12.3	13.2	12.3
cfs	10.2	25.4	7.27	7.80	28.3	20.1	16.7	23.2	45.5	19.0	20.4	19.0
Ac-ft	629	1,560	433	479	1,690	1,230	1,030	1,340	2,790	1,130	1,260	1,130

Calendar year 1951: Max 169 Min 0.39 Mean(mgd) 11.0 Mean(cfs) 17.0 Ac-ft 12,340
Fiscal year 1951-52: Max 169 Min 0.39 Mean(mgd) 13.1 Mean(cfs) 20.3 Ac-ft 14,700

Peak discharge (base, 900 mgd).--Feb. 19 (7 p.m.) 2,350 mgd (3,640 cfs), 8.21 ft.

* Discharge measurement made on this day.

Alo Stream near Huelo

Location.--Lat 20°51'50", long 156°11'45", on right bank just upstream from Spreckels ditch inflow, trail crossing, and Wailoa ditch intake, 2.5 miles southeast of Kailua and 3.8 miles southeast of Huelo.

Drainage area.--0.2 sq mi.

Records available.--December 1910 to June 1952.

Gage.--Water-stage recorder. Datum of gage is 1,248.38 ft above mean sea level. Prior to June 18, 1914, staff gage at site 300 ft downstream at different datum.

Average discharge.--41 years (1911-52), 4.85 mgd (7.50 cfs).

Extremes.--Maximum discharge during year, 227 mgd (351 cfs) Oct. 30 (gage height, 3.17 ft), from rating curve extended above 130 mgd; minimum, 0.39 mgd (0.60 cfs) Oct. 10, 11, 12, 17, 18, 19.

1910-52: Maximum discharge, 1,600 mgd (2,480 cfs) Nov. 18, 1930 (gage height, 6.90 ft), from rating curve extended above 130 mgd; minimum, 0.2 mgd (0.3 cfs) Nov. 22, 23, 1932.

Remarks.--Records good except those for period of no gage-height record, which are fair. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.5	0.39	1.3	9.7
.7	1.07	1.5	18.5
.9	2.3	1.8	38
1.1	4.6	2.0	55

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.61	3.2	2.3	0.78	1.38	2.15	3.35	15.4	1.29	1.38	8.2	5.1
2	.58	2.1	1.12	.74	1.07	1.58	2.15	3.05	1.27	1.32	2.55	2.35
3	.74	1.48	1.07	.54	.96	1.4	9.6	1.32	9.9	1.99	21	1.99
4	1.03	3.75	.96	.45	.85	1.7	10.1	1.07	26.5	1.97	6.4	1.48
5	1.76	14.2	3.55	.42	2.05	1.9	3.9	*2.3	7.6	4.4	7.9	9.7
6	6.7	31.5	5.9	.45	2.1	1.5	2.5	1.48	2.8	2.3	*11.3	5.6
7	2.35	32.3	.8	.58	3.65	1.2	2.05	1.73	4.8	3.55	4.1	2.4
8	.88	7.6	2.6	.45	7.2	1.1	1.48	1.00	9.4	4.2	2.6	5.9
9	.80	4.7	1.48	.63	2.6	1.0	3.95	3.05	9.5	3.15	2.0	8.6
10	4.1	3.35	1.22	.48	1.38	.92	3.45	3.3	10.3	3.05	1.58	9.3
11	4.6	2.7	1.17	.42	1.12	55	5.0	1.58	13.9	1.72	3.55	5.8
12	1.27	2.0	.96	.69	1.00	20	3.9	1.12	6.0	1.43	2.35	6.4
13	1.98	1.65	.88	2.35	2.35	3.5	4.5	5.8	11.0	11.3	1.71	5.7
14	1.60	1.38	.81	.74	2.25	2.2	5.4	2.35	13.4	6.6	1.91	10.4
15	1.12	1.22	.77	.61	3.05	1.8	4.0	1.27	6.2	2.25	1.80	12.5
16	.92	1.96	.74	.48	1.64	1.5	3.05	1.07	3.8	1.65	1.53	6.3
17	1.74	1.22	.67	.42	1.70	1.3	1.94	1.03	4.3	1.38	1.59	4.1
18	.85	.96	.64	.39	4.6	1.2	1.58	2.95	2.8	1.82	4.7	10.8
19	1.34	.92	.61	.48	24	1.1	17.1	32	2.15	2.3	4.7	6.5
20	1.54	5.3	.58	6.4	40	1.3	11.7	8.7	*1.80	5.7	1.95	8.5
21	.88	1.29	.54	2.85	9.2	1.0	2.6	2.3	1.53	5.3	1.48	13.4
22	1.03	.92	.51	1.87	5.1	.77	1.87	1.87	2.45	1.58	7.8	5.2
23	1.32	1.96	.48	8.8	3.95	1.53	1.48	5.4	3.9	1.58	3.65	5.6
24	1.95	7.1	.48	1.37	3.4	1.08	1.32	3.2	1.88	1.22	2.0	4.6
25	1.04	8.5	*.54	.96	2.5	.92	1.12	2.0	1.71	2.75	5.5	7.2
26	1.70	1.38	.51	.85	12.6	.74	1.03	2.05	1.62	1.39	1.58	3.0
27	1.12	1.17	.51	.85	7.6	4.3	.96	1.38	22.5	12.3	2.55	10.0
28	3.65	2.3	.71	1.05	5.8	5.1	.96	1.47	4.4	2.55	3.9	6.4
29	4.6	1.07	1.07	2.55	3.1	15.0	.85	1.98	2.0	2.65	2.95	17.5
30	9.3	1.49	.73	18.9	2.25	14.0	.61	-	1.53	11.4	2.7	8.9
31	6.3	5.4	-	3.05	-	11.9	1.95	-	1.38	-	2.15	-
Total	69.40	156.27	42.91	61.60	160.45	159.69	115.65	113.22	193.61	106.18	129.68	211.22
Mean:												
mgd	2.24	5.04	1.43	1.99	5.35	5.15	3.73	3.90	6.25	3.54	4.18	7.04
cfs	3.47	7.80	2.21	3.08	8.28	7.97	5.77	6.03	9.67	5.48	6.47	10.9
Ac-ft	213	480	132	189	492	490	355	347	594	326	398	648

Calendar year 1951: Max 55 Min 0.39 Mean(mgd) 3.21 Mean(cfs) 4.97 Ac-ft 3,590

Fiscal year 1951-52: Max 55 Min 0.39 Mean(mgd) 4.15 Mean(cfs) 6.42 Ac-ft 4,660

Peak discharge (base, 250 mgd).--No peak above base.

* Discharge measurement made on this day.

Note.--No gage-height record Dec. 3-21; discharge estimated on basis of records for Kaalea Stream.

Kaaiea Stream near Huelo

Location.--Lat 20°52'05", long 156°12'15", on left bank 700 ft upstream from Hamakua ditch trail crossing, 2 miles southeast of Kailua, 3.2 miles southeast of Huelo, and 3.5 miles west of Keanae.

Drainage area.--0.5 sq mi.

Records available.--December 1921 to June 1952.

Gage.--Water-stage recorder and concrete weir. Prior to Aug. 1, 1934, water-stage recorder at site 40 ft downstream at different datum.

Average discharge.--30 years (1922-52), 4.62 mgd (7.15 cfs).

Extremes.--Maximum discharge during year, 202 mgd (313 cfs) Dec. 11 (gage height, (312 ft), from rating curve extended above 130 mgd by logarithmic plotting; minimum, 0.36 mgd (0.56 cfs) Oct. 5, 6, 8, 11, 12, 18, 19.
1921-52: Maximum discharge, 2,300 mgd (3,560 cfs) Nov. 18, 1930 (gage height, 7.93 ft, site and datum then in use), from rating curve extended above 50 mgd by logarithmic plotting; minimum, 0.22 mgd (0.34 cfs) June 1, 1945.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.27	.8	9.0
.3	.63	1.0	16.5
.4	1.34	1.3	31.5
.5	2.45	1.6	49
.6	4.1		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.58	3.3	2.55	0.68	1.34	2.05	3.9	18.2	1.34	1.43	9.7	4.5
2	.54	2.05	1.25	.74	1.09	1.53	2.2	3.55	1.34	1.43	2.6	2.05
3	.68	1.53	1.17	.50	.94	1.34	10.6	1.53	7.8	1.73	19.7	1.73
4	.80	2.95	1.01	.42	.80	1.53	11.5	1.25	22.5	1.73	7.0	1.43
5	1.47	14.2	2.85	.39	1.77	1.73	4.4	2.1	11.5	4.5	7.2	10.1
6	8.1	29.5	6.8	.39	1.25	2.45	1.53	3.5	2.45	12.1	6.0	
7	2.4	34.5	8.3	.46	4.0	1.09	1.95	1.53	4.6	3.1	4.3	2.2
8	1.01	8.7	2.85	.42	6.7	1.01	1.43	1.09	11.7	4.8	2.45	5.3
9	.80	5.2	1.63	.54	2.85	.94	3.25	2.9	12.9	3.25	1.84	8.8
10	3.65	3.25	1.25	.46	1.43	.87	3.15	3.4	14.0	3.15	1.53	8.7
11	4.9	2.3	1.17	.42	1.17	49	5.6	1.79	15.8	1.84	2.3	5.9
12	1.43	1.73	1.01	.71	1.94	19.6	4.3	1.34	8.0	1.53	2.1	6.7
13	1.87	1.53	.87	2.7	1.74	3.25	4.3	5.5	12.6	12.6	1.53	6.1
14	1.63	1.25	.80	.68	2.55	2.05	6.2	2.8	15.4	6.5	1.84	8.6
15	1.17	1.09	.74	.58	3.25	1.63	4.5	*1.55	7.4	2.2	1.73	14.2
16	.94	3.25	.68	.46	1.92	1.43	3.25	1.25	4.5	1.63	1.63	6.1
17	1.51	1.34	.63	.42	1.53	1.17	2.05	1.17	4.1	1.34	1.43	3.85
18	.87	1.01	.63	.39	4.5	1.09	1.63	2.05	2.9	1.63	3.95	12.1
19	1.15	.94	.58	.42	26.5	1.01	15.2	27	2.2	2.05	*5.7	6.6
20	1.52	5.1	.54	21.5	43	1.17	13.4	11.7	1.84	5.3	2.05	7.9
21	.94	1.45	.60	3.0	10.5	.94	2.75	2.45	1.63	6.4	1.43	13.0
22	1.01	1.01	.80	1.86	5.9	.80	1.84	1.84	2.05	1.63	6.1	6.0
23	1.17	1.39	.46	8.1	3.85	1.39	1.53	7.1	4.2	1.84	4.4	5.2
24	1.63	4.7	.46	1.35	3.5	1.31	1.34	4.1	1.84	1.25	1.84	4.5
25	1.09	12.8	.50	.94	2.3	1.09	1.17	2.05	1.63	2.45	3.85	6.5
26	1.34	1.53	*.50	.80	13.8	.80	1.09	1.95	1.54	1.43	1.53	*2.85
27	1.09	1.25	.50	.74	8.7	2.75	1.01	1.43	24	15.0	2.0	10.0
28	3.15	2.0	.58	.88	7.0	3.4	.94	1.43	5.8	2.9	3.6	6.0
29	4.7	1.17	1.09	2.95	3.25	15.6	.87	1.63	2.2	2.3	2.8	17.3
30	10.7	1.53	.78	16.2	2.2	15.4	.80	-	1.73	12.8	2.5	9.0
31	6.7	4.5	-	3.1	-	12.4	1.94	-	*1.53	-	2.05	-
Total	70.54	158.05	43.18	73.19	170.79	150.62	120.54	117.21	214.07	112.19	124.78	209.21
Mean:												
mgd	2.28	5.10	1.44	2.36	5.69	4.86	3.89	4.04	6.91	3.74	4.03	6.97
cfs	3.53	7.89	2.23	3.85	8.80	7.52	6.02	6.25	10.7	5.79	6.24	10.8
Ac-ft	216	485	133	225	524	462	370	360	657	344	383	642

Calendar year 1951: Max 49 Min 0.39 Mean(mgd) 3.25 Mean(cfs) 5.03 Ac-ft 3,640

Fiscal year 1951-52: Max 49 Min 0.39 Mean(mgd) 4.27 Mean(cfs) 6.61 Ac-ft 4,800

Peak discharge (base, 250 mgd).--No peak above base.

* Discharge measurement made on this day.

ISLAND OF MAUI

Opuola Stream near Huelo

Location--Lat 20°52'15", long. 156°12'30", on left bank between Kaaiea and Nallilihaele Streams, 100 ft upstream from Wailoa ditch intake, 300 ft upstream from ditch trail, 1.8 miles southeast of Kailua, 3 miles southeast of Huelo, and 3.8 miles west of Keanae.

Drainage area--0.2 sq mi.

Records available--August 1930 to June 1952. December 1910 to June 1915 at site half a mile downstream; records not equivalent.

Gage--Water-stage recorder and concrete control.

Average discharge--21 years (1931-52), 1.75 mgd (2.71 cfs).

Extremes--Maximum discharge during year, 181 mgd (280 cfs) Dec. 11 (gage height, 4.02 ft), from rating curve extended above 20 mgd as explained below; minimum, 0.14 mgd (0.22 cfs) Oct. 18, 19.
1930-52: Maximum discharge, 340 mgd (526 cfs) Jan. 22, 1946 (gage height, 5.54 ft), from rating curve extended above 20 mgd by test on model of station site; minimum, 0.04 mgd (0.06 cfs) Oct. 29, 30, 1943, June 1, 1945

Remarks--Records good. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.6	0.05	2.1	5.75
1.7	.23	2.3	8.2
1.8	.65	2.5	14.7
1.9	1.32	2.8	30
2.0	2.35		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.19	0.81	0.97	0.32	0.55	0.75	1.84	6.0	0.71	0.55	2.4	1.97
2	.18	.55	.36	.28	.40	.55	.94	1.32	.60	.50	.75	.75
3	.25	.40	.36	.19	.32	.45	4.0	.60	5.9	.75	8.2	.75
4	.46	1.46	.28	.18	.28	.65	4.0	.50	11.6	.75	2.45	.50
5	.59	6.5	1.20	.18	.62	.81	1.53	.85	4.4	1.14	2.8	2.7
6	2.15	14.3	2.55	.16	.75	.45	1.02	.65	1.32	.75	4.0	2.1
7	.74	16.5	3.85	.19	1.28	.32	.81	.87	1.36	1.00	1.60	.70
8	.28	2.9	1.10	.18	2.55	.32	.60	.50	3.65	2.05	.87	2.0
9	.23	1.66	.60	.19	.93	.28	2.35	1.11	2.3	1.10	.65	3.2
10	1.55	1.10	.45	.18	.50	.25	1.47	1.58	3.1	.94	.55	4.2
11	1.83	.75	.40	.18	.36	27.5	2.1	.75	6.1	.55	1.18	2.2
12	.45	.55	.32	.28	.32	6.6	1.65	.50	2.3	.45	.97	2.05
13	.69	.50	.28	1.29	.61	1.18	1.99	2.95	4.6	2.6	.74	1.91
14	.60	.45	.25	.28	1.00	.75	2.7	1.23	5.9	2.7	.94	3.85
15	.36	.40	.23	.25	1.39	.55	1.80	*6.0	2.45	.70	.81	4.5
16	.28	.68	.23	.18	.65	.45	1.40	.45	1.44	.50	.65	2.35
17	.50	.45	.23	.16	.50	.36	.81	.40	1.82	.40	.55	1.19
18	.25	.32	.21	.14	1.79	.32	.65	1.60	1.10	.55	1.70	3.95
19	.38	.28	.19	.18	9.5	.28	7.3	14.9	.81	.95	*2.4	2.1
20	.64	2.25	.19	2.1	17.2	.40	6.9	4.1	.65	1.63	.75	3.2
21	.28	.50	.19	1.10	3.15	.28	1.18	.94	.55	1.84	.55	5.2
22	.40	.32	.18	.54	1.86	.23	.81	.75	.87	.50	3.3	2.2
23	.55	.38	.18	3.65	1.32	.50	.65	1.69	1.74	.45	1.97	1.76
24	.89	1.33	.18	.50	1.13	.45	.55	1.17	.75	.36	.81	1.48
25	.40	3.65	.19	.28	.75	.36	.50	.81	.75	.71	3.5	2.25
26	.55	.45	*.19	.23	4.5	.23	.45	.81	.75	.45	.75	*.81
27	.36	.36	.19	.23	3.85	1.98	.40	.55	10.0	3.0	1.14	3.65
28	1.29	.85	.29	.25	2.45	1.36	.36	.60	2.15	.75	1.47	2.5
29	1.42	.36	.55	1.32	1.10	6.4	.32	.99	.87	.84	.94	7.0
30	2.3	.40	.32	8.3	.75	7.9	.32	-	.65	3.6	.81	3.35
31	1.91	2.0	-	1.29	-	6.1	.91	-	*.55	-	.60	-
Total	22.95	63.41	16.71	24.78	62.56	69.01	52.31	49.77	81.74	33.06	50.80	76.37
Mean:												
mgd	0.740	2.05	0.557	0.799	2.09	2.23	1.69	1.72	2.64	1.10	1.64	2.55
cfs	1.14	3.17	0.862	1.24	3.23	3.45	2.61	2.66	4.08	1.70	2.54	3.95
Ac-ft	70	195	51	76	192	212	161	153	251	101	156	234

Calendar year 1951: Max 27.5 Min 0.14 Mean(mgd) 1.26 Mean(cfs) 1.95 Ac-ft 1,420
Fiscal year 1951-52: Max 27.5 Min 0.14 Mean(mgd) 1.65 Mean(cfs) 2.55 Ac-ft 1,850

* Peak discharge (base, 130 mgd)--Dec. 11 (6:30 a.m.) 181 mgd (280 cfs), 4.02 ft.

* Discharge measurement made on this day.

Naililihaele Stream near Huelo

Location.--Lat 20°52'30", long 156°13'05", on left bank 200 ft upstream from Wailoa ditch intake, 700 ft upstream from New Hamakua ditch trail, 1.5 miles south of Kailua, and 2.5 miles southeast of Huelo.

Drainage area.--2.8 sq mi.

Records available.--December 1910 to December 1911, October 1913 to June 1918, August 1919 to June 1952. July to December 1912, at site 700 ft downstream; records not equivalent due to diversion.

Gage.--Water-stage recorder and masonry control. Dec. 9, 1910, to Dec. 31, 1911, staff gage at site 300 ft downstream at different datum. Oct. 8, 1913, to Mar. 20, 1922, at present site at datum 0.50 ft higher.

Average discharge.--31 years (1920-24, 1925-52), 24.4 mgd (37.8 cfs).

Extremes.--Maximum discharge during year, 1,740 mgd (2,690 cfs) Feb. 19 (gage height, 6.38 ft) from rating curve extended above 130 mgd by logarithmic plotting; minimum, 2.1 mgd (3.2 cfs) Oct. 18, 19.

1910-18, 1919-52: Maximum discharge, 8,100 mgd (12,500 cfs) Apr. 27, 1950 (gage height, 10.36 ft), from rating curve extended above 130 mgd by logarithmic plotting; minimum, 0.45 mgd (0.70 cfs) July 14, 1920.

Remarks.--Records good except those for period of no gage-height record and those above 130 mgd, which are fair. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 755: 1932. WSP 795: 1934.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.8	1.50	2.7	39.5
1.9	2.9	3.0	73
2.0	5.0	3.5	159
2.2	10.8	4.0	290
2.4	19.0		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.55	15.0	14.2	4.2	8.6	13.5	17.6	115	8.3	10.2	68	17.4
2	3.3	10.8	8.0	4.4	6.9	10.8	11.6	21	8.3	10.2	16.8	10.2
3	3.75	8.9	7.2	3.3	5.8	9.9	56	8.9	25.5	10.8	101	8.9
4	4.4	14.4	6.4	2.6	5.3	10.2	51	7.4	112	10.2	42	8.3
5	6.0	71	13.4	2.6	9.0	10.8	19.4	10.2	77	19.7	36.5	64
6	54	167	36	2.6	9.3	8.6	12.7	8.3	20.5	14.6	68	30
7	14.2	234	48	3.1	19.7	7.4	10.8	7.7	31	17.3	23.5	12.3
8	6.4	44	14.6	2.6	30.5	7.2	8.9	6.1	65	22.5	15.5	19.9
9	4.8	28	9.2	3.3	15.9	6.9	14.1	10.3	113	15.9	12.7	44
10	12.4	18.1	8.3	2.6	8.6	6.1	13.1	15.0	108	15.9	11.2	40
11	18.1	13.8	7.4	2.45	7.4	285	27.5	8.9	103	11.2	11.9	25.5
12	7.2	11.6	6.9	3.4	6.9	148	20.5	6.9	61	9.9	10.8	31.5
13	11.5	*10.2	5.8	13.4	9.0	17.2	18.6	25.5	90	66	10.0	30
14	10.2	9.2	5.5	4.2	*12.3	12.7	26.5	14.6	93	31.5	11.6	35.5
15	6.9	8.3	5.0	3.3	15.2	10.2	20.5	*8.6	41	12.7	10.8	61
16	5.8	9.2	4.8	2.6	10.7	9.6	15.0	7.2	24	10.2	9.9	27
17	8.3	7.7	4.6	2.45	8.9	8.3	10.8	6.6	22	9.2	9.6	18.7
18	5.5	6.9	4.4	2.3	20	7.7	9.9	7.5	15.4	5.9	19.2	66
19	7.4	6.4	4.2	2.6	166	7.2	112	178	13.5	10.8	43	a30
20	9.2	21	3.75	45	240	8.3	88	60	11.6	34	13.3	a38
21	5.8	8.6	3.55	16.6	58	6.9	14.6	13.1	10.2	39.5	9.2	a48
22	6.1	6.6	3.55	8.6	35	5.8	11.2	10.2	10.8	10.5	25.5	a26
23	6.4	7.2	3.3	38.5	20.5	8.1	9.6	48	17.6	14.6	17.4	a22
24	8.3	18.3	3.3	8.2	19.1	7.7	8.6	27	10.2	9.6	9.9	a24
25	6.1	72	3.3	5.8	14.2	6.9	8.0	13.5	9.2	14.4	15.3	a22
26	6.6	9.2	3.3	5.0	100	5.5	7.4	11.2	9.2	9.9	8.3	a17
27	5.5	7.4	3.3	4.6	50	9.2	6.9	9.2	138	107	9.9	54
28	17.1	9.8	3.75	5.7	38.5	13.8	6.4	8.6	27.5	16.4	14.6	28
29	25	7.2	6.4	17.0	19.0	71	5.8	9.3	11.9	13.8	11.9	83
30	58	8.6	4.6	87	14.6	60	5.3	-	10.2	78	11.6	44
31	28	18.2	-	17.0	-	64	9.8	-	9.9	-	9.9	-
Total	375.80	888.6	256.00	327.00	984.9	864.5	658.1	683.8	1,324.8	666.4	687.8	986.2
Mean:	12.1	28.7	8.53	10.5	32.8	27.9	21.2	23.6	42.7	22.2	22.2	32.9
cfs	18.7	44.4	13.2	16.2	50.7	43.2	32.8	36.5	66.1	34.3	34.3	50.9
Ac-ft	1,150	2,730	786	1,000	3,020	2,650	2,020	2,100	4,070	2,050	2,110	3,030

Calendar year 1951: Max 300 Min 2.3 Mean(mgd) 19.2 Mean(cfs) 29.7 Ac-ft 21,500
Fiscal year 1951-52: Max 285 Min 2.3 Mean(mgd) 23.8 Mean(cfs) 36.8 Ac-ft 26,720

Peak discharge (base, 1,250 mgd).--Dec. 11 (9 a.m.), 1,310 mgd (2,030 cfs), 5.92 ft; Feb. 19 (8:30 p.m.), 1,740 mgd (2,690 cfs), 6.38 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for Kailua Stream.

Kailua Stream near Huelo

Location.--Lat 20°52'35", long 156°13'25", on left bank just upstream from Wailoa ditch intake, 1.2 miles southwest of Kailua and 2.5 miles south of Huelo.

Drainage area.--3.0 sq mi.

Records available.--December 1910 to December 1911, June 1913 to June 1918, July 1919 to June 1952. July 1912 to May 1913 at site 1 mile downstream; records not equivalent.

Gage.--Water-stage recorder. Datum of gage is 1,252.99 ft above mean sea level. Prior to Dec. 31, 1911, staff gage at site 400 ft downstream at different datum. June 17 to Sept. 30, 1913, staff gage at present site and datum.

Average discharge.--33 years (1919-52), 19.0 mgd (29.4 cfs).

Extremes.--Maximum discharge during year, 2,390 mgd (3,700 cfs) Feb. 19 (gage height, 7.75 ft), from rating curve extended above 650 mgd by logarithmic plotting; minimum, 0.93 mgd (1.44 cfs) Oct. 18, 19.

1910-11, 1913-18, 1919-52: Maximum discharge, 4,920 mgd (7,610 cfs) Dec. 17, 1946 (gage height, 9.27 ft), from rating curve extended above 650 mgd by logarithmic plotting; minimum, 0.07 mgd (0.11 cfs) June 27, 1921.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.7	1.00	2.7	29
1.8	2.05	3.0	48
1.9	3.4	3.5	97
2.1	7.4	4.0	163
2.4	16.4	4.5	253

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.30	7.4	10.0	1.83	5.9	7.0	13.8	71	3.95	5.0	60	5.5
2	1.20	4.8	4.3	1.83	3.95	5.9	6.7	19.3	3.95	5.6	16.3	3.95
3	1.40	3.95	3.4	1.50	3.1	4.8	24	6.1	6.7	6.1	52	3.6
4	1.40	5.4	3.1	1.30	2.55	4.8	31	4.1	58	5.2	37	3.4
5	1.61	36.5	4.4	1.20	3.5	4.8	11.9	4.8	88	9.1	28.5	38.5
6	27	90	24.5	1.20	4.4	3.95	7.0	4.3	22.5	9.7	48	22
7	9.9	206	31.5	1.40	16.4	3.6	5.6	3.75	30.5	9.9	18.2	7.4
8	3.4	29	14.0	1.30	19.7	3.25	4.8	*3.4	113	12.8	10.6	7.4
9	2.3	17.8	5.6	1.30	17.0	3.1	5.4	3.75	138	8.2	8.2	21.5
10	3.6	10.6	4.3	1.20	5.6	3.0	4.8	5.9	123	8.7	6.7	19.5
11	5.8	7.4	3.75	1.10	4.1	142	12.2	4.7	75	6.3	6.3	12.4
12	3.0	5.9	3.25	1.20	3.25	150	13.0	3.6	75	5.4	5.6	16.0
13	5.5	5.0	3.0	4.6	3.75	13.2	10.0	8.9	84	32.5	5.0	18.0
14	6.6	4.3	2.7	2.05	6.0	8.2	16.0	9.0	55	19.6	5.6	14.0
15	3.4	3.95	2.45	1.50	5.2	6.5	11.8	4.5	26.5	7.4	5.6	21.5
16	2.55	3.6	2.3	1.20	5.6	5.2	8.2	3.75	15.4	5.9	5.6	11.5
17	3.75	*3.4	2.3	1.10	4.1	4.7	5.9	3.1	12.1	4.8	4.7	8.2
18	2.85	3.1	2.05	1.00	9.0	3.95	4.8	3.6	10.0	4.8	5.9	29
19	3.25	3.0	1.94	1.10	96	3.6	55	132	8.2	4.8	37	15.2
20	4.5	87.2	1.85	20.5	142	3.75	113	53	7.0	14.1	13.6	18.5
21	3.0	5.8	1.72	12.2	51	3.4	14.1	9.2	*6.3	28	5.9	23
22	2.55	3.1	1.72	3.95	25.5	3.0	8.4	6.7	5.9	7.0	7.9	12.4
23	2.45	3.1	1.61	15.3	12.4	3.1	6.5	27	7.4	15.7	8.3	10.9
24	2.7	7.4	1.50	4.7	10.6	3.1	5.6	13.0	5.4	7.4	4.8	12.1
25	2.45	36	1.61	2.7	7.7	3.0	4.8	11.5	4.8	9.5	5.7	11.2
26	2.3	5.2	1.61	2.3	77	2.45	4.5	7.0	4.7	6.7	3.95	7.9
27	2.05	3.75	1.50	2.05	43	3.1	3.95	5.6	61	79	4.3	27
28	7.4	3.95	1.61	2.6	23.5	4.2	3.75	4.8	26.5	14.6	5.6	16.0
29	11.3	3.25	2.3	9.3	12.6	30.5	3.25	4.7	7.9	8.7	5.4	35.8
30	39.5	4.3	2.3	59	8.4	27	3.0	5.9	50	4.8	4.8	26.5
31	13.8	9.8	-	21.5	-	43	4.7	-	5.2	-	4.1	-
Total	183.81	544.95	148.15	185.01	632.90	511.15	427.45	442.05	1,096.80	412.5	441.15	479.05
Means	5.93	17.6	4.94	5.97	21.1	16.8	13.8	15.2	35.4	13.8	14.2	16.0
cfs	9.18	27.2	7.64	9.24	32.6	28.0	21.4	23.5	54.8	21.4	22.0	24.8
Ac-ft	564	1,670	455	568	1,940	1,600	1,310	1,360	3,370	1,270	1,550	1,470

Calendar year 1951: Max 206 Min 1.00 Mean(mgd) 12.5 Mean(cfs) 19.3 Ac-ft 14,030
Fiscal year 1951-52: Max 206 Min 1.00 Mean(mgd) 15.1 Mean(cfs) 23.4 Ac-ft 16,930

Peak discharge (base, 1,300 mgd)--Feb. 19 (8 p.m.) 2,390 mgd (3,700 cfs), 7.75 ft.

* Discharge measurement made on this day.

Hoolawalilili Stream near Huelo

Location.--Lat 20°53'15", long 156°14'35", on right bank just upstream from Wailoa ditch intake, 2 miles west of Kailua and 2 miles southwest of Huelo.

Records available.--April 1911 to June 1952.

Gage.--Water-stage recorder and concrete control. Prior to June 19, 1914, staff gage at same site and datum.

Average discharge.--40 years (1911-15, 1916-52), 4.77 mgd (7.38 cfs).

Extremes.--Maximum discharge during year, 210 mgd (325 cfs) Dec. 11 (gage height, 4.04 ft), from rating curve extended above 90 mgd by broad-crested weir formula; minimum, 0.98 mgd (1.52 cfs) Oct. 16-20.

1911-52: Maximum discharge, 787 mgd (1,220 cfs) Feb. 7, 1939 (gage height, 5.42 ft), from rating curve extended above 220 mgd by broad-crested weir formula; minimum, 0.2 mgd (0.3 cfs) June 8, 1926.

Remarks.--Records good. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 755: 1931-32.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.3	0.80	1.8	8.7
1.4	1.50	2.0	15.2
1.5	2.7	2.3	29
1.6	4.2		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.12	2.15	1.93	1.34	1.71	3.55	4.7	7.6	2.4	3.0	5.6	3.75
2	1.05	1.82	1.71	*1.26	1.60	3.1	3.55	3.75	2.3	2.7	3.25	2.7
3	1.12	1.71	1.71	1.19	1.50	2.8	5.7	2.7	3.2	2.55	11.1	2.55
4	1.19	2.1	1.60	1.19	1.42	3.0	6.9	2.55	9.7	2.55	5.6	2.3
5	1.12	8.1	1.96	1.12	1.60	2.8	4.6	2.85	7.5	2.55	5.5	4.5
6	1.99	18.3	3.1	1.12	1.60	2.4	3.9	2.4	3.7	2.4	7.5	4.5
7	1.50	27	5.3	1.19	1.82	2.15	3.4	2.4	3.7	2.55	*5.0	3.0
8	1.34	7.4	2.85	1.12	2.6	2.05	3.1	2.1	6.8	3.25	4.0	4.3
9	1.34	5.2	2.15	1.19	2.3	2.05	3.9	2.3	6.4	2.85	3.7	6.4
10	2.05	4.2	2.05	1.05	1.82	1.93	3.55	2.7	7.2	2.7	3.25	7.1
11	2.55	3.7	1.93	1.05	1.60	29	4.0	2.3	10.5	2.4	3.4	5.2
12	1.71	3.25	1.82	1.36	1.50	15.5	3.7	2.15	7.0	2.15	3.1	5.2
13	1.82	3.0	1.71	1.50	1.71	5.6	3.75	3.8	9.8	3.75	2.85	5.0
14	1.93	2.7	1.71	1.19	1.82	4.4	4.6	2.85	12.0	3.5	2.85	6.7
15	1.60	2.55	1.71	1.12	2.3	3.7	4.0	2.3	7.2	2.55	2.85	9.3
16	1.50	*2.25	1.60	1.05	1.93	3.25	3.55	2.15	5.6	2.3	2.55	5.6
17	1.60	2.15	1.60	.98	1.93	3.0	3.1	2.05	5.0	2.15	2.3	5.0
18	1.50	2.05	1.60	.98	2.8	2.7	3.0	2.55	4.2	2.3	2.7	7.9
19	1.60	1.93	1.50	1.05	10.7	2.4	12.4	19.7	3.7	2.4	4.2	5.4
20	1.60	2.55	1.50	2.2	19.9	2.4	14.0	8.9	3.4	2.55	2.7	6.9
21	1.50	1.93	1.50	1.60	7.5	2.15	4.8	3.9	*3.1	3.15	2.4	10.0
22	1.50	1.82	1.50	1.34	5.6	2.05	4.0	3.4	3.25	2.3	4.3	6.3
23	1.50	1.93	1.50	3.4	4.4	2.3	3.55	3.9	3.55	2.3	3.85	*5.4
24	1.71	2.05	1.42	1.60	4.0	2.05	3.1	3.55	3.0	1.93	2.85	4.8
25	1.50	4.6	1.42	1.42	3.55	1.93	2.85	3.1	2.85	2.3	3.85	5.3
26	1.50	2.05	1.42	1.34	7.6	1.93	2.7	2.85	2.85	2.05	2.55	4.0
27	1.42	1.82	1.42	1.34	7.4	3.0	2.4	2.55	14.5	5.5	2.85	7.1
28	1.82	2.15	1.60	1.42	5.7	2.4	2.4	2.4	5.7	2.85	2.85	5.6
29	1.89	1.71	1.60	1.71	4.4	5.7	2.15	2.55	3.7	2.55	2.7	13.5
30	2.7	1.71	1.34	5.5	3.7	6.9	2.05	-	3.1	5.6	2.55	8.7
31	2.7	2.15	-	2.75	-	8.3	2.55	-	3.0	-	2.4	-
Total	50.97	126.03	55.76	47.67	118.01	136.49	131.95	108.30	169.90	83.68	117.15	174.00
Mean:												
mgd	1.64	4.07	1.88	1.54	3.93	4.40	4.26	3.73	5.48	2.79	3.78	5.80
cfs	2.54	6.30	2.88	2.38	6.08	6.81	6.59	5.77	8.48	4.32	5.85	8.97
Ac-ft	156	387	171	146	362	419	405	352	521	257	360	534

Calendar year 1951: Max 29 Min 0.98 Mean(mgd) 2.92 Mean(cfs) 4.52 Ac-ft 3,280

Fiscal year 1951-52: Max 29 Min 0.98 Mean(mgd) 3.61 Mean(cfs) 5.59 Ac-ft 4,050

Peak discharge (base, 150 mgd).--Dec. 11 (8 a.m.) 210 mgd (325 cfs), 4.04 ft; Feb. 19 (5 p.m.) 158 mgd (244 cfs), 3.72 ft.

* Discharge measurement made on this day.

Hoolawanui Stream near Huelo

Location.--Lat 20°53'15", long 156°14'55", on right bank 250 ft upstream from intake of Wailoa ditch, 2 miles west of Kailua, and 2 miles southwest of Huelo.

Records available.--December 1910 to June 1952.

Gage.--Water-stage recorder and concrete control. Datum of gage is 1,219.42 ft above mean sea level (East Maui Irrigation Co. benchmark). 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.--40 years (1911-15, 1916-52), 7.86 mgd (12.2 cfs).

Extremes.--Maximum discharge during year, 460 mgd (712 cfs) Dec. 11 (gage height, 3.03 ft), from rating curve extended above 100 mgd by logarithmic plotting; minimum, 0.65 mgd (1.01 cfs) Oct. 16-19.
1910-52: Maximum discharge, 3,240 mgd (5,010 cfs) Apr. 27, 1950 (gage height, 5.94 ft), from rating curve extended above 100 mgd by logarithmic plotting; minimum, 0.15 mgd (0.23 cfs) Oct. 25, 1917.

Remarks.--Records good. Water used for irrigation in central Maui.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.3	0.53	0.8	10.2
.4	1.23	1.0	18.6
.5	2.45	1.2	30.5
.6	4.2	1.6	67
.7	7.0		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.71	1.80	2.2	1.07	1.45	5.0	5.5	16.5	2.9	3.8	14.2	4.9
2	.71	1.23	1.67	.99	1.15	4.4	3.8	6.0	2.9	3.8	6.4	2.9
3	.71	1.07	1.56	.84	1.07	3.8	8.4	3.6	3.95	3.6	18.8	2.75
4	.77	1.68	1.45	.77	.99	4.0	10.2	3.4	20.5	3.6	11.0	2.6
5	.91	9.6	2.4	.77	1.23	3.8	6.0	4.0	14.2	4.5	10.2	10.2
6	3.6	25	4.6	.71	1.45	3.2	5.0	3.05	6.2	3.6	14.7	7.3
7	1.23	50	8.1	.84	2.2	2.9	4.2	2.9	6.9	4.5	*8.9	3.8
8	.77	9.2	3.4	.77	3.75	2.75	3.8	*2.6	22.5	5.7	7.0	5.1
9	.71	6.0	2.2	.84	3.05	2.75	4.7	2.9	32	4.2	6.0	9.9
10	1.45	4.4	1.93	.71	1.56	2.45	4.2	4.2	31	4.2	5.2	9.2
11	2.25	3.6	1.93	.71	1.34	66	6.1	2.75	27.5	3.2	5.0	7.3
12	.99	3.2	1.67	.98	1.23	42	5.0	2.6	29.5	3.05	4.7	7.9
13	1.45	2.9	1.56	1.52	1.56	9.6	4.9	5.4	24.5	9.0	4.2	8.8
14	1.45	2.6	1.56	.84	1.93	7.3	6.4	3.2	24.5	6.6	4.4	9.1
15	.99	2.45	1.45	.71	2.45	5.8	5.4	2.6	15.0	3.8	4.2	13.1
16	.84	*2.3	1.45	.65	2.05	5.0	4.7	2.3	10.9	3.2	3.6	7.9
17	.99	2.2	1.23	.65	1.58	4.2	3.8	2.2	9.2	2.9	3.2	6.8
18	.84	2.05	1.23	.65	3.5	3.8	3.4	2.5	7.6	3.05	4.4	14.8
19	.99	2.05	1.15	.71	24	3.6	30	26.5	6.4	3.2	8.0	8.2
20	1.15	3.15	1.15	4.1	33.5	3.6	31.5	10.7	5.8	4.3	4.2	10.4
21	.84	2.05	1.07	1.84	10.7	3.05	7.6	4.4	*5.0	7.7	3.2	14.1
22	.99	1.80	1.07	1.07	7.9	2.9	6.0	3.8	5.0	3.2	5.9	9.2
23	.91	2.05	1.07	4.7	6.0	3.2	5.0	8.4	5.5	3.8	4.7	7.9
24	1.07	2.45	1.07	1.45	5.4	2.9	4.2	6.8	4.2	2.9	3.2	7.6
25	.84	9.3	1.07	.99	4.7	2.75	3.8	4.7	3.8	3.8	3.95	8.0
26	.91	2.2	1.07	.84	17.2	2.3	3.8	3.8	4.1	2.9	2.9	5.4
27	.77	2.05	1.07	.84	13.4	3.75	3.2	3.2	30.5	19.7	3.2	13.1
28	1.20	2.05	1.15	.91	10.5	3.2	3.05	2.9	8.9	5.0	3.6	8.9
29	1.40	1.80	1.34	1.59	7.6	9.8	2.9	3.6	5.0	4.4	3.2	17.5
30	4.3	1.80	1.07	11.6	5.4	8.6	2.75	-	4.4	15.1	3.2	11.4
31	2.9	2.65	-	4.0	-	12.0	3.6	-	4.0	-	3.05	-
Total	39.64	166.68	54.94	49.66	179.82	240.40	202.90	151.50	384.35	152.30	188.40	257.05
Mean:	1.28	5.38	1.83	1.60	5.99	7.75	6.55	5.22	12.4	5.08	6.08	8.57
mgd	1.98	8.32	2.83	2.48	9.27	12.0	10.1	8.08	19.2	7.86	9.41	13.3
cfs	122	512	169	152	552	738	623	465	1,180	467	578	789
Ac-ft												

Calendar year 1951: Max 80 Min 0.65 Mean(mgd) 4.29 Mean(cfs) 6.64 Ac-ft 4,800
Fiscal year 1951-52: Max 66 Min 0.65 Mean(mgd) 5.65 Mean(cfs) 8.74 Ac-ft 6,350

Peak discharge (base, 300 mgd).--Dec. 11 (8 a.m.) 460 mgd (712 cfs), 3.03 ft; Jan. 19 (11 p.m.) 342 mgd (529 cfs), 2.76 ft.

* Discharge measurement made on this day.

Honopou Stream near Huelo

Location.--Lat 20°53'20", long 156°15'05", on left bank just upstream from Wailoa ditch intake, 2.2 miles southwest of Huelo and 2.2 miles west of Kailua.

Drainage area.--1.0 sq mi.

Records available.--December 1910 to June 1952.

Gage.--Water-stage recorder and concrete control. Altitude of gage is 1,250 ft (from topographic map). Prior to June 19, 1914, staff gage at same site and datum.

Average discharge.--39 years (1911-14, 1916-52), 3.09 mgd (4.78 cfs).

Extremes.--Maximum discharge during year, 202 mgd (313 cfs) Feb. 19 (gage height, 3.17 ft), from rating curve extended above 70 mgd as explained below; minimum, 0.25 mgd (0.39 cfs) July 9.

1910-52: Maximum discharge, 3,690 mgd (5,710 cfs) Nov. 18, 1930 (gage height, 7.28 ft), from rating curve extended above 70 mgd by model studies of the station site; minimum, 0.01 mgd (0.02 cfs) for several days in 1933 and 1934.

Remarks.--Records good. No diversion above station. Water used for irrigation in central Maui.

Revisions (fiscal years).--WSP 1219: 1913-50(M). The figures of peak discharge for the fiscal years 1948-50 have been revised as shown below. They supersede figures published in WSP 1125, 1155, 1185.

Revised peak discharge.--1947-48: Sept. (date and time unknown) 202 mgd (313 cfs); Oct. 26 (6:30 p.m.) 120 mgd (186 cfs); Jan. 25 (10 p.m.) 830 mgd (1,280 cfs); Mar. 20 (7 a.m.) 120 mgd (186 cfs); Apr. 3 (1 p.m.) 335 mgd (518 cfs).
1948-49: July 18 (5 p.m.) 120 mgd (186 cfs); Sept. 27 (10:30 p.m.) 410 mgd (634 cfs); Dec. 24 (2 a.m.) 220 mgd (340 cfs).
1949-50: Apr. 19 (12 p.m.) 170 mgd (263 cfs); 3.03 ft; Apr. 24 (4 a.m.) 130 mgd (201 cfs); 2.92 ft; Apr. 27 (3 a.m.) 1,380 mgd (2,140 cfs); 5.14 ft; May 18 (6:30 a.m.) 260 mgd (402 cfs); 3.28 ft.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.4	0.03	1.1	8.6
.5	.48	1.4	15.7
.6	1.26	1.7	25
.8	3.55		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.30	0.60	0.84	0.48	0.60	2.3	2.05	6.1	1.46	2.05	*3.95	2.35
2	.30	.48	.68	.48	.54	2.05	1.76	2.45	1.46	1.86	2.2	1.26
3	.30	.36	.60	.48	.48	1.86	3.6	2.2	1.66	1.76	8.3	1.08
4	.36	.77	.54	.48	.42	1.86	4.1	1.56	7.8	1.76	3.55	1.00
5	.36	4.9	.93	.48	.48	1.76	2.55	1.76	4.0	1.66	4.0	3.15
6	1.11	13.0	1.78	.48	.48	1.56	2.2	1.46	1.96	1.56	5.0	2.55
7	.42	16.4	3.5	.48	.84	1.36	2.05	1.46	2.05	*1.76	3.2	1.36
8	.36	3.55	1.36	.48	1.25	1.26	1.86	1.26	5.2	2.4	2.7	2.8
9	.30	2.55	.84	.54	.84	1.16	2.4	1.26	4.9	1.76	2.4	4.2
10	.80	1.96	.84	.48	.54	1.08	2.05	1.93	5.8	1.56	2.2	4.1
11	1.39	1.76	.76	.48	.48	23.5	2.7	1.26	8.9	1.36	2.1	2.8
12	.48	1.56	.68	.68	.42	12.2	2.3	1.16	6.2	1.26	2.1	2.9
13	.54	1.46	.68	.84	.54	4.3	2.2	2.55	8.6	2.4	1.76	2.9
14	.76	1.26	.68	.42	.68	3.55	2.9	1.46	10.0	2.05	1.86	4.0
15	.48	1.16	.68	.42	1.07	3.05	2.3	1.08	6.4	1.36	1.76	5.9
16	.36	*1.08	.68	.36	.76	2.7	1.96	1.08	5.0	1.26	1.56	3.4
17	.42	1.00	.68	.30	.68	2.3	1.66	1.00	*4.4	1.16	1.46	*3.05
18	.36	.92	.60	.30	1.57	2.05	1.56	1.21	3.85	1.26	1.77	5.7
19	.36	.92	.54	.42	6.8	1.86	10.5	16.1	3.3	1.36	2.8	3.55
20	.48	1.16	.54	1.46	11.4	1.76	10.9	4.3	2.9	1.66	1.46	4.6
21	.36	.92	.48	1.00	4.0	1.56	3.55	2.05	2.7	1.86	1.26	6.5
22	.36	.84	.54	.54	3.2	1.46	5.2	1.76	2.55	1.16	2.65	4.0
23	.36	.84	2.45	2.7	1.56	2.7	2.55	2.8	2.8	1.36	2.05	3.85
24	.54	1.00	.48	.68	2.4	1.46	2.3	2.05	2.05	1.08	1.26	3.3
25	.36	2.75	.48	.48	1.96	1.36	2.05	1.86	1.96	1.46	1.82	4.1
26	.36	.84	.54	.48	5.4	1.16	1.86	1.66	1.76	1.08	1.08	2.9
27	.30	.76	.54	.42	5.0	1.97	1.76	1.56	13.2	4.4	1.26	5.3
28	.63	.84	.60	.42	4.0	1.60	1.66	1.46	4.0	1.76	1.36	3.85
29	.58	.68	.60	.84	3.05	4.4	1.56	1.56	2.55	1.56	1.26	10.0
30	1.15	.68	.48	*4.7	2.55	3.4	*1.46	-	2.2	4.5	1.16	5.5
31	1.00	1.00	-	1.40	-	4.7	1.76	-	2.05	-	1.08	-
Total	16.20	68.00	23.59	23.95	65.13	98.15	87.46	69.15	133.66	53.48	72.37	111.95
Mean	0.523	2.19	0.786	0.775	2.17	3.17	2.82	2.38	4.31	1.78	2.33	3.73
cfs	0.809	3.39	1.22	1.20	3.36	4.90	4.36	3.68	6.87	2.75	3.61	5.77
Ac-ft	50	209	72	73	200	301	268	212	410	164	222	344

Calendar year 1951: Max 23.5 Min 0.26 Mean(mgd) 1.79 Mean(cfs) 2.77 Ac-ft 2,000
Fiscal year 1951-52: Max 23.5 Min 0.25 Mean(mgd) 2.25 Mean(cfs) 3.48 Ac-ft 2,520

Peak discharge (base, 100 mgd).--Dec. 11 (8:30 a.m.) 185 mgd (286 cfs), 3.12 ft; Jan. 19 (10 p.m.) 102 mgd (158 cfs), 2.74 ft; Feb. 19 (4 p.m.) 202 mgd (313 cfs), 3.17 ft; Mar. 27 (8:30 p.m.) 102 mgd (158 cfs), 2.76 ft.

* Discharge measurement made on this day.

Wailoa ditch at Honopou, near Huelo

Location.--Lat 20°53'20", long 156°15'05", on right (corrected) bank 100 ft downstream from intake at Honopou Stream, 0.5 mile west of Lupi, 2.2 miles southwest of Huelo, and 2.2 miles west of Kailua.

Records available.--November 1922 to June 1952.

Gage.--Water-stage recorder.

Average discharge.--29 years (1923-52), 113 mgd (175 cfs).

Extremes.--1922-52: Maximum daily discharge, 186 mgd (288 cfs) June 25, 30, 1941; no flow Jan. 24-27, 1923.

Remarks.--Records good except those above 150 mgd and those for periods of no gage-height record, which are fair. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from the Alo west to the Halehaku at altitude of about 1,200 ft. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	47	150	141	50	79	132	152	164	93	112	*172	140
2	44	131	90	48	63	112	144	156	93	120	164	108
3	44	101	86	40	56	97	144	108	101	128	168	97
4	50	112	75	36	50	103	156	90	164	112	172	86
5	66	156	90	34	86	116	152	156	168	144	172	160
6	146	156	140	36	93	90	148	97	168	164	172	168
7	139	159	150	40	151	79	132	90	168	152	172	140
8	74	156	141	36	128	79	108	76	168	164	164	152
9	56	156	101	42	152	72	144	98	168	160	148	168
10	106	156	82	34	99	66	140	132	160	156	128	168
11	124	147	79	32	76	109	148	93	156	124	128	172
12	72	141	69	32.5	66	124	152	76	156	108	128	156
13	94	108	*63	97	100	144	152	110	156	160	120	168
14	119	97	63	47	126	146	156	148	160	168	144	168
15	76	86	56	38	104	124	152	97	156	144	160	172
16	59	102	55	32	119	108	148	79	152	116	152	168
17	92	82	55	29	94	93	128	83	*152	101	148	164
18	59	72	50	27.5	133	86	108	101	148	101	164	172
19	95	69	48	30.5	172	79	112	144	144	104	172	168
20	116	120	46	116	176	93	117	144	132	148	164	172
21	69	94	44	128	172	76	86	148	116	164	156	172
22	66	66	42	92	172	66	66	128	120	148	156	168
23	66	77	40	143	168	82	69	140	156	156	156	168
24	86	134	40	86	160	79	66	112	116	124	124	168
25	66	153	42	59	140	72	56	136	108	140	148	168
26	89	97	44	62	172	63	58	132	108	124	108	152
27	76	79	46	53	172	108	59	116	172	168	116	172
28	103	97	50	53	172	124	72	112	168	164	144	172
29	124	86	65	106	168	156	72	112	148	148	140	172
30	153	108	50	128	148	156	66	-	120	172	132	172
31	153	150	-	145	-	156	111	-	112	-	108	-
Total	2,729	3,598	2,143	1,932.5	3,767	3,190	3,574	3,358	4,407	4,194	4,580	4,763
Mean:												
mgd	88.0	116	71.4	62.3	126	103	115	116	142	140	148	159
cfs	136	179	110	96.4	195	159	178	179	220	217	229	246
Ac-ft	8,370	11,040	6,580	5,930	11,560	9,790	10,970	10,310	13,520	12,870	14,060	14,620
Calendar year 1951:	Max	176	Min	27.5	Mean(mgd)	92.9	Mean(cfs)	144	Ac-ft	104,000		
Fiscal year 1951-52:	Max	176	Min	27.5	Mean(mgd)	115	Mean(cfs)	178	Ac-ft	129,600		

* Discharge measurement made on this day.

Note.--No gage-height record Sept. 4-7, Sept. 16 to Oct. 10; discharge estimated on basis of recorded range in stage, ditchman's notes, and records for nearby ditches.

New Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'30", long 156°15'10", on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing, 2.1 miles southwest of Huelo, and 2.3 miles west of Kailua.

Records available.--January 1918 to June 1952.

Gage.--Water-stage recorder. Prior to May 15, 1921, at site 300 ft upstream at different datum.

Average discharge.--34 years, 27.3 mgd (42.2 cfs).

Extremes.--1918-52: Maximum daily discharge, 116 mgd (179 cfs) Feb. 13, 14, 27, 1932; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Ditch diverts water from streams between the Waiakamoi and the Halehaku above Center and Lowrie ditches. Flow regulated by gates and spillways. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.28	38.5	44	0.62	1.04	10.9	a45	51	2.55	2.1	94	10.1
2	.24	3.45	1.15	.68	.71	4.9	a15	7.7	1.90	2.55	51	1.83
3	.28	.71	.98	.51	.66	4.2	a10	2.45	12.3	2.85	70	1.69
4	.39	9.2	.88	.39	.55	4.4	a95	1.90	*70	1.99	92	1.41
5	.43	82	5.4	.28	.68	4.8	a70	5.3	88	48	92	61
6	69	74	62	.28	.77	3.7	a4.5	1.99	72	40	96	83
7	49	98	45	.56	50	3.15	a3.0	1.99	55	23.5	86	5.1
8	.71	92	36	.36	24	3.0	2.35	1.62	90	63	25.5	28.5
9	.36	88	2.4	.28	49	2.8	39.5	1.90	80	19.4	4.4	80
10	7.7	51	1.55	.28	.93	2.6	17.5	2.95	92	20	2.15	79
11	23.5	10.2	1.34	.28	.66	29	41	2.3	94	1.93	5.5	70
12	.90	2.45	1.20	.32	.55	.88	84	1.48	94	1.41	7.5	74
13	.62	1.99	1.09	3.8	.58	19.2	54	22.5	*94	67	2.3	80
14	8.4	1.83	.93	.55	13.5	17.7	88	22	94	81	8.2	80
15	.66	1.69	.88	.39	9.0	9.9	72	2.65	94	6.5	9.7	92
16	.55	3.85	.82	.24	9.9	8.2	40	1.48	86	1.27	9.4	78
17	.58	1.58	.77	.04	.98	5.4	5.1	1.41	*75	1.27	2.3	*21
18	.47	1.20	.71	.08	33.5	2.25	2.45	7.6	44	.71	24	92
19	.69	1.09	.66	.37	74	1.90	14.7	49	10.7	.82	92	90
20	.77	33.5	.66	33	96	1.99	2.2	59	2.9	28	51	92
21	.47	4.4	.66	35	94	1.76	.66	25	2.6	63	2.4	94
22	.47	1.09	.62	1.80	90	1.62	.32	5.5	2.55	8.7	23.5	84
23	.43	1.04	.62	58	55	1.90	.15	40	32	51	41	62
24	1.04	15.5	.58	3.45	44	1.90	.15	51	2.55	4.3	2.25	66
25	.62	69	.55	.51	7.0	1.48	.15	46	2.55	25	34	64
26	.62	1.52	.55	.28	76	1.20	.15	28	2.65	2.1	2.55	5.7
27	.47	1.09	.51	.28	92	7.5	.15	4.7	86	80	2.8	82
28	28	1.68	.55	.28	90	26	2.6	2.25	75	49	6.3	88
29	22.5	1.09	.77	10.8	*56	92	3.35	2.45	6.0	2.75	4.2	96
30	*90	.98	.66	31	11.2	68	*3.0	-	2.45	92	2.1	94
31	88	49	-	*45	-	37.5	5.2	-	2.15	-	1.76	-
Total	398.15	740.61	214.49	229.45	982.19	379.73	721.18	453.12	1,479.45	791.15	947.81	1,856.33
Mean	12.9	23.9	7.15	7.40	32.7	12.2	23.3	15.6	47.7	26.4	30.6	61.9
mgd	19.8	37.0	11.1	11.4	50.6	18.9	36.1	24.1	73.8	40.8	47.3	95.8
cfs	1,220	2,270	658	704	3,010	1,170	2,210	1,390	4,540	2,430	2,910	5,700
Ac-ft												
Calendar year 1951. Max	96			Min	-	Mean(mgd)	13.7	Mean(cfs)	21.2	Ac-ft	15,380	
Fiscal year 1951-52: Max	96			Min	0.04	Mean(mgd)	25.1	Mean(cfs)	38.8	Ac-ft	28,210	

* Discharge measurement made on this day.

a No gage height record; discharge estimated on basis of engineer's notes.

Old Hamakua ditch at Honopou, near Huelo

Location.--Lat 20°53'30", long 156°15'05", on right bank 400 ft downstream from Honopou Stream and Wailoa ditch trail crossing in Honopou Gulch, 2.0 miles southwest of Huelo, 2.3 miles west of Kailua, and 5.0 miles east of Haiku.

Records available.--January 1918 to June 1922, November 1936 to June 1952.

Gage.--Water-stage recorder and modified Parshall flume.

Average discharge.--19 years (1918-22, 1937-52), 2.52 mgd (3.90 cfs).

Extremes.--1918-22, 1936-52: Maximum daily discharge, 39.5 mgd (61.1 cfs) Apr. 7, 1938; no flow for short periods.

Remarks.--Records good. Wailoa and New Hamakua ditches divert most of flow above this station. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0	0.15	0.36	0.03	0.06	0.27	0.07	0.07	0.07	0.06	*8.4	0.20
2	0	.06	.08	.03	.03	.07	.07	.06	.05	.05	1.86	.08
3	0	.03	.06	.02	.02	.05	.07	.05	1.03	.05	8.9	.07
4	0	.04	.05	.02	.02	.05	.07	.05	*5.8	.04	7.5	.07
5	0	8.4	.07	.02	.02	.04	.06	.05	13.0	.62	6.3	4.5
6	3.65	8.9	4.5	.02	.02	.04	.05	.04	5.0	.15	9.3	5.5
7	.48	16.5	5.0	.03	.45	.03	.04	.04	1.75	.07	5.4	.17
8	.07	9.8	2.7	.02	1.50	.02	.04	.04	14.0	1.22	.19	.50
9	.03	7.0	.08	.02	2.05	.02	.05	.04	14.0	.08	.12	5.8
10	.03	.24	.07	.02	.05	.02	.05	.05	14.8	.08	.08	6.2
11	.12	.08	.05	.01	.03	.24	.05	.04	14.0	.07	.08	.77
12	.07	.06	.05	.01	.02	.07	.05	.03	13.2	.04	.08	2.4
13	.04	.05	.04	.03	.02	.05	.05	.05	*14.0	4.1	.08	5.1
14	.03	.04	.03	.02	.02	.05	.05	.05	14.8	5.4	.07	4.9
15	.04	.04	.03	.02	.02	.05	.05	.05	12.5	.12	.08	9.6
16	.03	.03	.03	.02	.02	.05	.05	.04	7.4	.06	.08	3.2
17	.03	.03	.03	.01	.03	.04	.04	.03	*2.95	.04	.08	.20
18	.03	.03	.02	0	.22	.04	.03	.05	.28	.04	.44	9.7
19	.03	.03	.02	0	10.3	.04	.08	.12	.10	.03	7.2	6.7
20	.03	.30	.02	3.55	17.3	.05	.10	.07	.07	.76	1.76	8.3
21	.02	.09	.02	.22	9.8	.06	.07	.05	.07	4.1	.12	11.8
22	.03	.05	.02	.04	6.8	.07	.07	.05	.06	.08	1.16	4.5
23	.03	.04	.02	2.0	.19	.06	.07	.06	.12	1.12	1.56	.30
24	.03	.05	.02	.08	.19	.06	.07	.07	.07	.08	.13	2.4
25	.02	6.5	.02	.03	.07	.05	.07	.07	.06	.12	1.74	2.85
26	.02	.10	.03	.02	9.8	.06	.07	.06	.06	.07	.13	.16
27	.02	.07	.03	.02	12.5	.07	.07	.05	10.0	7.9	.10	7.9
28	.44	.06	.03	.01	9.8	.06	.06	.05	6.3	1.76	.12	6.0
29	.72	.05	.03	.02	1.34	.10	.05	.05	.13	.08	.10	13.8
30	8.5	.05	.03	3.0	.08	.10	.05	-	.07	7.7	.08	9.9
31	5.2	.22	-	2.95	-	.10	.05	-	.06	-	.08	-
Total	19.74	59.09	13.04	12.29	82.57	2.08	1.82	1.53	165.80	36.09	62.92	133.57
Mean:												
mgd	0.637	1.91	0.435	0.396	2.75	0.067	0.059	0.053	5.35	1.20	2.03	4.45
cfs	0.986	2.96	0.673	0.613	4.25	0.104	0.091	0.082	8.28	1.86	3.14	6.89
Ac-ft	61	181	40	38	253	6.4	5.6	4.7	509	111	193	410
Calendar year 1951: Max	17.3											
Fiscal year 1951-52: Max	17.3											
Min	0											
Mean(mgd)	0.877											
Mean(cfs)	1.61											
Ac-ft	982											
Ac-ft	1,810											

* Discharge measurement made on this day.

Lowrie ditch at Honopou Gulch, near Huelo

Location.--Lat 20°54'55", long 156°15'05", on left bank 0.2 mile downstream from siphon across Honopou Stream, 1.6 miles west of Huelo, and 2.5 miles northwest of Kailua.

Records available.--January 1910 to March 1927, February 1930 to June 1952. Published as "at Opana weir" 1910-27.

Gage.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft above mean sea level. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 miles downstream at different datum.

Average discharge.--38 years (1910-26, 1930-52), 29.2 mgd (45.2 cfs).

Extremes.--1910-27, 1930-52: Maximum daily discharge, 75 mgd (116 cfs) Oct. 31, 1921; no flow at times.

Remarks.--Records good except those for period of no gage-height record, which are fair. Lowrie ditch diverts water from all streams between the Kailua and the Halehaku. Flow regulated by gates. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.05	19.4	27	3.9	10.3	32.5	23	39.5	18.9	23	51	14.2
2	2.55	15.3	9.6	4.3	7.6	20.5	10.8	32.5	12.0	15.3	*37	11.8
3	3.2	15.8	9.1	3.6	5.5	17.0	18.3	15.8	14.5	15.6	44	10.5
4	3.6	13.0	18.3	3.2	5.2	14.3	56	20.5	54	14.3	51	9.8
5	4.8	50	8.6	3.05	11.0	14.6	49	33	54	27	51	30
6	35	42	42	2.9	12.6	12.0	30.5	24	49	19.4	51	51
7	26.5	56	30	3.3	26	10.3	26.5	14.0	a38	14.2	49	17.6
8	11.0	56	35	3.2	15.0	9.8	32.5	12.0	a55	37	31	27
9	10.3	56	17.0	3.3	37.5	8.8	45	12.3	a55	18.3	34.5	43
10	15.3	37	18.3	2.9	10.0	8.3	32.5	17.0	a55	14.4	22	45
11	18.3	24	19.4	2.8	12.6	29	34.5	13.6	a55	10.5	13.1	36.5
12	13.8	18.3	16.4	2.8	13.8	3.95	47	10.8	a55	9.0	15.6	34.5
13	5.7	21.5	7.8	9.4	12.3	22	28	16.0	a55	29	12.0	47
14	7.8	21.5	7.2	4.5	12.0	13.8	51	28.5	a55	48	13.1	41
15	5.7	19.4	6.7	3.6	8.8	5.7	49	12.6	a55	16.5	13.8	53
16	4.2	17.0	6.0	2.8	10.9	5.0	45	10.0	a55	25.5	13.5	47
17	5.4	*14.0	5.7	2.55	6.9	4.3	24.5	9.3	a50	19.9	10.9	27
18	4.0	9.6	5.3	2.55	21	15.2	15.8	12.1	*a44	9.0	11.7	51
19	4.3	8.8	5.0	2.65	41	32.5	21	41	37	9.0	51	51
20	6.2	25	4.8	22	58	13.3	25.5	*36	28	13.4	35	53
21	4.3	17.8	4.6	23.5	46	12.8	7.8	43	17.0	46	17.6	55
22	4.0	12.0	4.3	9.0	8.6	12.6	4.1	43	15.0	21	41	53
23	3.75	8.3	4.2	34	26.5	14.6	1.70	37	23	29.5	47	45
24	5.5	12.8	4.0	11.3	30.5	12.8	1.61	41	14.8	12.8	23.5	51
25	4.5	48	4.5	10.3	18.3	8.9	1.53	37	14.6	11.6	43	51
26	5.0	15.3	4.3	13.6	43	2.65	1.44	35	14.6	8.8	25.5	29
27	*4.6	19.4	4.2	10.0	56	9.2	1.36	26.5	47	39.5	19.9	46
28	12.2	20.5	4.2	6.5	54	20	10.8	13.6	51	32.5	21	53
29	11.8	15.3	5.5	5.9	*42	52	30.5	13.4	24	20	17.6	53
30	54	9.8	4.6	18.9	25.5	44	25.5	-	28	48	14.9	55
31	51	26	-	38.5	-	32.5	15.8	-	30.5	-	12.9	-
Total	351.35	746.8	343.6	270.80	688.4	514.90	767.34	700.0	1,171.9	658.0	895.1	1,191.9
Mean:	11.3	21.1	11.5	8.74	22.9	16.6	24.8	24.1	37.8	21.9	28.9	39.7
mgd	17.5	37.3	17.9	13.5	35.4	25.7	38.4	37.5	58.5	33.9	44.7	61.4
cfs	1,080	2,290	1,050	831	2,110	1,580	2,350	2,150	3,800	2,020	2,750	3,660
Ac-ft												
Calendar year 1951: Max 58				Min 0.70	Mean(mgd) 14.5	Mean(cfs) 22.4	Mean(cfs) 35.1	Ac-ft 16,280				
Fiscal year 1951-52: Max 58				Min 1.36	Mean(mgd) 22.7	Mean(cfs) 35.1	Ac-ft 25,470					

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby ditches.

Haiku ditch at Honopou Gulch, near Kailua

Location.--Lat 20°55'05", long 156°14'55", on right bank of ditch and west side of Honopou Gulch, 180 ft below new Government Road, 2.5 miles northwest of Kailua, and 5 miles east of Haiku.

Records available.--January 1910 to December 1928, February 1930 to June 1952. Published as "at Peahi weir" January 1910 to October 1914, as "at Manawai Gulch" October 1914 to December 1928, and as "at Kapalalaea Gulch" February 1930 to January 1940.

Gage.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft above mean sea level. Jan. 1, 1910, to Oct. 6, 1914, water-stage recorder at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, water-stage recorder at site 2.9 miles downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, water-stage recorder at site 0.9 mile downstream at different datum.

Average discharge.--40 years (1910-28, 1930-52), 21.7 mgd (33.6 cfs).

Extremes.--1910-28, 1930-52: 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 good. Haiku ditch diverts water from all streams between Kailua Stream and Maliko Gulch. Flow regulated by gates. Water used for irrigation in central Maui.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.20	0.56	0.58	0.05	0.80	2.85	1.22	16.2	2.6	1.78	67	0.90
2	.16	.37	.30	.05	.58	1.36	30	1.29	1.94	1.71	11.4	.90
3	.15	.34	.30	.05	.48	1.10	32	1.22	7.2	1.57	38	.80
4	.15	.34	.34	.06	.40	1.10	52	2.0	40	1.36	55	.75
5	.05	.42	.34	.06	.48	1.05	24.5	2.35	63	2.15	22.5	25.5
6	18.1	27.5	25	.07	.40	.90	4.3	2.1	33.5	1.64	67	36
7	.92	.62	19.9	.09	2.55	.80	3.7	1.71	12.3	1.22	29	1.39
8	.26	.55	16.5	.08	9.1	.80	5.4	1.50	63	1.57	1.71	1.10
9	.24	.41	.70	.08	21.5	.65	5.9	1.50	67	1.22	1.36	28.5
10	.28	3.25	.54	.06	.58	.65	4.2	1.64	67	1.05	1.15	37
11	.34	2.1	.51	.05	.44	29	4.7	1.43	67	.95	.95	3.15
12	.22	1.64	.44	.06	.40	32	24.5	1.36	*67	.90	1.00	8.1
13	.24	1.05	.34	.32	.48	42	3.5	3.25	29	13.1	.85	31
14	.24	.75	.30	.24	.40	34	17.6	7.4	25.5	27.5	1.05	8.2
15	.24	.62	.28	.26	.44	24	10.0	1.29	67	1.22	.90	52
16	.18	.54	.28	.24	.40	19.9	3.9	1.15	33	1.05	.75	11.0
17	.22	.48	.28	.09	.34	17.2	2.3	1.10	7.6	1.00	.70	1.85
18	.22	.40	.12	.03	.72	17.3	1.71	1.18	6.0	.80	.65	52
19	.22	.37	.06	.03	*40	6.3	9.0	17.1	5.9	.75	62	11.6
20	.18	1.62	.07	12.7	.66	5.2	6.4	1.56	5.2	.70	14.6	44
21	.06	.83	.07	2.55	66	3.9	1.43	2.1	4.5	32	.95	54
22	.06	.32	.08	.24	62	1.71	.79	2.8	4.2	.90	3.8	30.5
23	.07	.14	.08	20.5	10.8	2.0	.18	1.84	3.3	1.12	15.2	3.2
24	.07	.48	.11	.86	2.3	1.71	.16	.90	1.43	.81	1.29	8.3
25	.07	.36	.28	.26	1.43	2.8	.18	.90	1.50	.75	21	11.7
26	.07	.64	.26	.26	42	7.9	.16	.85	1.50	.58	1.71	2.45
27	.08	.48	.17	.26	62	10.7	.16	.75	49	46	1.57	32
28	.51	.51	.08	.26	40	2.0	3.85	.65	*36.5	14.7	1.64	27
29	.24	.37	.06	.37	7.3	42	3.6	1.00	2.55	1.05	1.36	47
30	*47	.30	.05	12.6	2.1	20	2.9	-	2.1	53	1.10	54
31	16.9	.83	-	*26.5	-	1.29	2.9	-	1.85	-	1.00	-
Total	87.94	282.83	68.42	79.14	442.42	334.17	263.12	80.12	779.17	214.15	428.19	625.89
Mean:												
mgd	2.84	9.12	2.28	2.55	14.7	10.8	8.49	2.76	25.1	7.14	13.8	20.9
cfs	4.39	14.1	3.53	3.95	22.7	16.7	13.1	4.27	38.8	11.0	21.4	32.3
Ac-ft	270	868	210	243	1,360	1,030	807	246	2,390	657	1,310	1,920

Calendar year 1951: Max 66 Min 0.03 Mean(mgd) 5.35 Mean(cfs) 8.28 Ac-ft 6,000
 Fiscal year 1951-52: Max 67 Min 0.03 Mean(mgd) 10.1 Mean(cfs) 15.6 Ac-ft 11,310

* Discharge measurement made on this day.

Waiakea Stream at middle flume house, near Mountain View

Location.--Lat 19°38'25", long 155°10'35", on left bank at middle flume house, 800 ft upstream from Olaa Sugar Co.'s main flume and 7.5 miles northwest of Mountain View.

Records available.--September 1930 to June 1952.

Gage.--Water-stage recorder and combined Parshall flume and concrete weir. Altitude of gage is 1,820 ft (by barometer).

Average discharge.--21 years (1931-52), 7.30 mgd (11.3 cfs).

Extremes.--Maximum discharge during year, 163 mgd (252 cfs) Nov. 21 (gage height, 4.42 ft), from rating curve extended as explained below; minimum, 0.66 mgd (1.02 cfs) Oct. 12.

1930-52: Maximum discharge, 166 mgd (257 cfs) Mar. 14, 1942 (gage height, 4.43 ft), from rating curve extended above 40 mgd on basis of weir formulas; no flow at times.

Remarks.--Records good except those for periods of no gage-height record or backwater from debris, which are poor. Large part of flow comes from three tunnels. Water is used for fluming sugarcane.

Rating table, fiscal year 1951-52, except periods of backwater from debris (gage height, in feet, and discharge, in million gallons a day)

0.3	0.66	2.0	15.3
.5	1.53	2.5	25
1.0	4.8	3.0	39.5
1.5	9.2	3.5	66

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.2	8.7	10.2	1.75	11.9	c10	6.2	8.7	8.3	15.3	15	4.0
2	3.0	*7.8	9.7	1.58	11.9	c9.5	7.6	7.8	7.8	13.2	9.5	3.8
3	2.85	6.9	9.2	*1.48	11.9	c9.2	16.0	7.4	7.4	11.9	8.2	3.6
4	2.65	6.5	8.7	1.34	10.8	*8.7	27.5	6.9	14.8	10.8	8.1	3.45
5	2.55	6.9	8.7	1.25	10.2	8.7	27	6.5	13.2	10.2	8.4	3.55
6	2.5	17.4	8.7	1.11	9.7	7.8	28.5	5.3	13.8	9.2	12	3.4
7	2.35	27	7.8	1.02	9.2	8.4	27	5.4	15.6	8.7	11.9	3.1
8	2.2	26	7.8	.98	9.2	10.6	22.5	5.0	18.6	7.8	11.3	3.2
9	2.0	27	7.4	.86	9.2	9.7	20.5	4.7	22.5	7.8	10.8	3.75
10	1.91	26	7.4	.82	8.7	9.7	17.8	4.8	37.5	6.9	10.2	3.8
11	1.75	22.5	6.9	.86	8.3	8.5	17.7	4.8	39.5	6.9	9.7	4.1
12	1.64	19.6	6.5	1.08	7.8	8.9	16.1	4.4	44	6.5	9.2	4.8
13	1.64	18.9	6.0	1.97	8.3	8.3	14.6	*7.4	44	6.5	8.7	4.6
14	1.58	14.6	6.0	1.06	7.8	7.8	14.6	9.0	44	8.9	7.8	4.5
15	1.39	12.5	5.4	1.49	8.3	7.4	16.1	9.0	39.5	6.0	7.4	5.4
16	1.34	11.3	5.0	1.34	7.8	6.9	15.3	11.3	36	5.5	6.9	5.2
17	1.48	10.2	4.6	1.15	7.4	6.5	15.3	10.8	31	5.1	6.9	5.6
18	1.20	9.7	4.3	1.02	7.8	6.0	15.3	9.7	27	4.8	6.5	6.0
19	1.44	8.7	4.0	1.02	15.0	5.4	16.1	8.7	22.5	4.5	6.0	6.5
20	1.44	11.0	3.8	1.40	64	5.0	17.6	10.8	19.6	6.1	5.6	6.9
21	1.20	9.2	3.6	3.45	c50	4.6	16.9	9.2	17.8	6.0	5.4	6.5
22	1.11	8.7	3.3	2.85	c36	4.3	16.1	8.7	17.8	6.0	5.3	6.9
23	1.02	8.3	3.05	2.5	c32	4.0	15.3	9.7	16.9	11	5.3	6.9
24	1.06	7.8	2.95	2.6	c24	3.8	13.2	8.7	16.9	5.8	5.0	7.4
25	1.02	9.9	2.65	8.5	c20	3.6	12.5	8.7	16.1	5.2	4.9	7.4
26	2.25	9.2	2.6	15.8	c16	3.3	11.3	9.2	17.4	5.0	4.6	7.4
27	1.30	9.2	2.35	15.2	c14	3.1	10.2	8.7	20.5	8.0	4.5	7.4
28	1.25	10.4	2.25	13.2	c12	2.95	9.2	8.3	19.6	9.0	5.0	7.4
29	1.90	9.7	2.05	11.9	c12	3.0	8.7	7.8	18.7	6.5	4.9	8.2
30	9.3	9.7	1.91	11.9	c11	5.3	8.3	-	17.8	12	4.6	8.7
31	11.6	10.8	-	13.8	-	6.4	7.4	-	16.9	-	4.3	-
Total	73.12	400.1	164.81	126.28	472.2	208.35	488.4	227.7	702.8	235.1	233.9	163.45
Mean:												
mgd	2.36	12.9	5.49	4.07	15.7	6.72	15.8	7.85	22.7	7.84	7.55	5.45
cfs	3.65	20.0	8.49	6.30	24.3	10.4	24.4	12.1	35.1	12.1	11.7	8.43
Ac-ft	224	1,250	506	388	1,450	639	1,500	699	2,160	721	718	502
Calendar year 1951:	Max 64			Min 0.82	Mean(mgd) 8.17	Mean(cfs) 12.6	Ac-ft 9,160					
Fiscal year 1951-52:	Max 64			Min 0.82	Mean(mgd) 9.55	Mean(cfs) 14.8	Ac-ft 10,740					

Peak discharge (base, 50 mgd).--Aug. 6 (10 p.m.) 74 mgd (114 cfs), 3.58 ft; Nov. 21 (1:30 a.m.) 163 mgd (252 cfs), 4.42 ft; Mar. 10 (2:30 a.m.) 66 mgd (102 cfs), 3.51 ft.

* Discharge measurement made on this day.

c Backwater from debris.

Note.--No gage-height record Apr. 21 to May 6; discharge estimated on basis of recorded range in stage and records for Wailuku River near Hilo.

Wailuku River above Hilo Boarding School ditch intake, near Hilo

Location.--Lat 19°42'55", long 155°09'10", on left bank 1,000 ft upstream from intake of Hilo Boarding School ditch, 0.8 mile west of reservoir 1, and 4 miles west of Hilo.

Drainage area.--125 sq mi.

Records available.--July 1928 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,060 ft (by barometer).

Average discharge.--21 years (1929-40, 1941-47, 1948-52), 177 mgd (274 cfs).

Extremes.--Maximum discharge during year, 15,100 mgd (23,400 cfs) Nov. 20 (gage height, 20.6 ft), from rating curve extended above 3,400 mgd by logarithmic plotting; minimum, 1.30 mgd (2.01 cfs) Oct. 10.

1928-52: Maximum discharge, 41,000 mgd (63,400 cfs) Aug. 11, 1940 (gage height, 28.6 ft, from floodmarks), from rating curve extended above 3,400 mgd by logarithmic plotting; minimum, 0.16 mgd (0.25 cfs) Mar. 9, 1941.

Remarks.--Records good. Hilo Water Works diverts about 1 mgd above station for domestic supply, and water passing station is used for power by Hilo Electric Light Co.

Revisions (fiscal years).--WSP 865: 1929-36(M). WSP 965: 1941.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.3	1.3	4.0	137
1.4	2.3	5.0	245
1.6	5.2	7.0	570
1.8	9.4	9.0	1,140
2.1	18.0	11.0	2,020
2.5	34.5	14.0	4,460
3.0	60	17.0	8,300

Discharge in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	11.0	340	102	7.0	155	79	235	127	79	137	417	28
2	10.4	175	66	*6.0	102	66	270	148	79	110	355	24.5
3	10.2	110	49	5.2	153	*57	1,730	69	80	94	197	21
4	9.7	72	44	4.9	110	54	2,780	54	568	76	137	19.4
5	9.2	60	46	3.6	76	60	1,250	49	986	66	110	21
6	9.2	1,590	127	2.8	69	72	435	42	583	66	136	25.5
7	12.9	3,310	55	2.55	79	119	287	46	429	79	119	34
8	9.4	650	60	2.45	72	278	185	37	568	66	82	34.5
9	7.2	408	44	2.2	178	192	175	34.5	2,280	69	66	42
10	5.6	273	34.5	1.80	102	137	155	42	4,720	76	54	49
11	6.5	197	30	5.0	102	252	421	49	1,840	57	49	86
12	7.0	137	26.5	12.5	72	183	584	*55	1,980	49	44	78
13	14.6	110	25	78	76	94	307	186	1,280	49	39	57
14	19.8	82	22.5	21.5	206	86	207	654	1,600	96	37	52
15	12.6	66	21.5	46	137	63	490	294	910	57	34.5	60
16	9.9	68	19.8	82	119	52	315	209	558	49	34.5	66
17	35	79	17.7	29	79	46	233	170	408	42	34.5	96
18	42	49	16.2	18.7	88	57	155	160	376	37	39	78
19	21.5	44	14.7	17.4	552	46	284	119	287	39	37	90
20	30	208	12.3	25.5	7,720	39	358	278	233	63	30	105
21	18.0	126	11.5	217	3,090	34.5	345	128	221	234	27	90
22	14.4	66	9.9	79	1,610	30	301	94	315	90	38	102
23	11.5	57	9.2	54	695	28.5	221	166	490	82	54	110
24	22.5	70	9.0	39	424	27.5	155	102	376	63	44	102
25	25.5	219	9.0	271	287	30	119	137	273	49	49	102
26	76	90	8.7	1,040	245	34.5	102	205	308	42	34.5	72
27	34.5	69	9.0	673	175	26	79	110	1,100	298	37.5	60
28	29.5	97	8.3	450	146	22	66	146	705	175	69	60
29	55	107	7.2	215	119	26	57	86	315	102	49	80
30	1,330	69	7.6	532	102	180	72	-	221	167	39	146
31	838	102	-	266	-	302	49	-	175	-	34.5	-
Total	2,748.6	9,100	923.1	4,210.10	17,140	2,773.0	12,422	5,996.5	24,343	2,683	2,527.0	1,990.9
Mean:	88.7	294	30.8	136	571	89.5	401	138	785	89.4	81.5	66.4
mgd	137	455	47.7	210	883	138	620	214	1,210	138	126	103
cfs	8,440	27,330	2,850	12,920	52,600	8,510	38,120	12,260	74,710	8,230	7,760	6,110
Ac-ft												

Calendar year 1951: Max 7,720 Min 1.80 Mean(mgd) 230 Mean(cfs) 356 Ac-ft 257,200
 Fiscal year 1951-52: Max 7,720 Min 1.80 Mean(mgd) 232 Mean(cfs) 359 Ac-ft 260,400

Peak discharge (base, 5,600 mgd).--Aug. 6 (10:30 p.m.) 13,000 mgd (20,100 cfs), 19.59 ft; Nov. 20 (7 a.m.) 15,100 mgd (23,400 cfs), 20.6 ft; Mar. 10 (1 a.m.) 11,800 mgd (18,300 cfs), 19.01 ft.

* Discharge measurement made on this day.

Waialikahi Stream near Waimanu

Location.--Lat 20°07'40", long 155°39'55", on right bank 30 ft upstream from Waimanu trail bridge, 1.7 miles upstream from confluence with Waimanu Stream, 1.9 miles southeast of head of Awini ditch, and 2.2 miles southwest of Waimanu.

Drainage area.--0.4 sq mi.

Records available.--March 1939 to June 1952. Prior to July 1941, published as Waimanulili Stream near Waimanu.

Gage.--Water-stage recorder. Altitude of gage is 2,740 ft (by barometer).

Average discharge.--13 years, 6.44 mgd (9.96 cfs).

Extremes.--Maximum discharge during year, 210 mgd (325 cfs) Dec. 11 (gage height, 3.70 ft), from rating curve extended as explained below; minimum not determined; minimum daily discharge, 0.60 mgd (0.93 cfs) July 2.

1939-52: Maximum discharge, 544 mgd (842 cfs) Dec. 20, 1946 (gage height, 5.17 ft), from rating curve extended above 25 mgd by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Mar. 17, 18, 1944.

Remarks.--Records good except those above 25 mgd, which are fair, and those for periods of no gage-height record, which are poor.

Rating tables, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Nov. 20,
Mar. 10 to June 30

Nov. 21 to Mar. 9

0.4	0.28	1.4	11.5	0.5	0.81	1.4	11.5
.5	.70	1.8	23.5	.6	1.42	1.6	16.5
.6	1.30	2.2	43	.8	3.03	1.8	23.5
.8	3.05	2.6	69	1.0	5.1	2.3	48
1.0	5.1	2.8	88	1.2	7.9		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.70	6.0	6.8	3.3	1.61	4.1	2.85	31.5	3.5	2.15	35	7.0
2	.60	3.0	2.2	2.15	1.09	2.25	2.75	4.7	1.8	13.5	13	4.3
3	3.55	2.2	2.5	1.88	1.16	1.72	9.1	1.80	2.3	17.0	12	3.35
4	7.6	6.0	1.53	2.15	.97	1.72	18.0	1.57	2.0	14.0	12	8.8
5	1.7	21	12.0	1.30	7.1	2.1	10.6	9.2	12	15.0	12	8.6
6	8.5	28	15.0	1.03	7.9	1.64	2.15	6.2	8.0	7.0	17	5.6
7	7.0	30	23.5	1.37	6.1	1.30	1.87	12.5	2.5	7.0	9.0	5.3
8	2.5	12	4.8	2.6	6.3	1.30	1.50	3.6	8.0	5.0	3.05	3.3
9	.97	*11	7.7	1.45	6.2	1.50	1.24	6.5	45	11	2.15	13.3
10	.97	18.2	2.5	*1.33	1.53	*1.18	4.7	13.5	40	7.0	1.95	9.3
11	8.0	8.2	2.5	4.1	1.23	36	10.4	5.5	17	6.0	*1.86	4.8
12	3.5	5.4	1.77	3.2	1.16	6.8	5.9	2.3	22	4.2	2.15	5.4
13	1.6	4.2	1.45	8.4	1.59	2.45	3.25	26.5	18	17	1.69	7.1
14	4.7	4.4	1.23	1.79	5.1	2.6	4.3	15.3	24	14	2.9	2.4
15	3.2	2.85	1.09	4.0	15.4	1.64	14.6	2.35	17	3.3	6.1	3.15
16	2.3	2.2	1.03	1.45	3.75	1.30	4.5	1.80	7.5	2.2	6.5	8.0
17	6.5	2.5	1.03	.97	2.85	1.12	1.94	4.9	8.0	1.77	5.3	7.8
18	1.5	1.61	.97	.75	6.3	.99	1.42	1.94	9.0	2.6	5.8	12.9
19	1.7	1.53	.85	.85	34	.93	1.24	*11.9	4.0	3.2	9.1	14.3
20	2.4	2.05	.80	.95	82	1.24	9.0	f14	f22.3	5.5	4.1	8.7
21	1.4	2.3	.75	6.2	15.7	1.18	11.7	f4.0	f21.1	5.0	6.0	8.8
22	4.0	1.45	.75	10.5	12.5	.99	10.7	2.75	8.0	4.0	5.7	14.5
23	7.0	2.2	.70	1.91	5.8	1.19	2.75	19	9.0	15	9.4	15.6
24	6.5	6.0	.70	2.55	2.6	7.1	3.45	10	7.0	5.5	3.2	17.5
25	4.5	6.1	.80	1.16	2.1	10.3	3.05	8.5	5.5	f2.5	5.4	16.3
26	6.0	2.4	3.5	1.37	8.0	4.5	1.64	3.0	4.0	f1.6	2.3	7.1
27	1.7	1.86	5.1	1.03	5.3	3.3	1.42	f1.9	7.5	18	7.9	24.5
28	1.2	7.7	1.37	.80	3.2	1.50	1.24	1.57	6.5	14	13.9	18.8
29	6.5	2.75	3.45	1.19	2.2	15.7	1.12	1.57	2.5	9.0	8.0	26
30	50	2.9	6.5	9.0	12.0	27.5	.99	-	f2.8	23	7.7	15.5
31	21	15.4	-	8.9	-	5.5	5.2	-	3.8	-	8.2	-
Total	179.29	225.40	114.87	69.63	260.74	152.64	154.57	219.85	312.6	216.02	240.35	306.00
Mean:												
mgd	5.78	7.27	3.83	2.89	8.69	4.92	4.99	7.58	10.1	7.20	7.75	10.2
cfs	8.94	11.2	5.93	4.47	13.4	7.61	7.72	11.7	15.6	11.1	12.0	15.8
Ac-ft	550	692	353	275	800	468	474	675	959	663	738	939

Calendar year 1951. Max	82	Min	0.60	Mean(mgd)	4.80	Mean(cfs)	7.43	Ac-ft	5,380
Fiscal year 1951-52. Max	82	Min	0.60	Mean(mgd)	6.75	Mean(cfs)	10.4	Ac-ft	7,590

Peak discharge (base, 150 mgd).--Sept. 7 (6:30 p.m.) 202 mgd (313 cfs), 3.66 ft; Dec. 11 (2:30 p.m.) 210 mgd (325 cfs), 3.70 ft.

* Discharge measurement made on this day.

f Computed on basis of partly estimated gage-height record.

Note:--No gage-height record July 5 to Aug. 9, Feb. 23-26, Mar. 1-19, 22-29, 31, Apr. 6-14, 16, 19-24, Apr. 27 to May 7; discharge estimated on basis of records for nearby streams.

Kaimu Stream near Waimanu

Location.--Lat 20°08'30", long 155°39'40", on right bank 300 ft upstream from Waimanu trail crossing, 1.5 miles west of Waimanu, and 1.6 miles upstream from mouth.

Drainage area.--0.5 sq mi.

Records available.--March 1939 to June 1947, July 1950 to July 1952 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 1,980 ft (by barometer).

Average discharge.--10 years, 5.54 mgd (8.57 cfs).

Extremes.--Maximum discharge during period July 1951 to July 1952, 600 mgd (928 cfs)

Sept. 7, Dec. 11 (gage height, 3.62 ft), from rating curve extended as explained below; minimum, 0.48 mgd (0.74 cfs) July 2, 1951.

1939-47, 1950-52: Maximum discharge, 3,050 mgd (4,720 cfs) June 30, 1941 (gage height, 9.6 ft, from floodmarks), from rating curve extended above 7 mgd by test on model of station site; minimum, 0.15 mgd (0.23 cfs) Feb. 16, 17, 1942, Feb. 1, 1943.

Remarks.--Records good except those for period of no gage-height record and those above 7 mgd, which are fair.

Rating tables, July 1, 1951, to July 26, 1952 (gage height, in feet, and discharge, in million gallons a day)

July 1 to Oct. 11, 1951				Oct. 12, 1951, to July 26, 1952			
0.3	0.30	0.9	5.5	0.3	0.52	0.7	3.15
.4	.62	1.1	9.5	.4	.90	.9	5.85
.5	1.10	1.5	21	.5	1.45	1.1	9.5
.6	1.80	2.0	43	.6	2.20		
.7	2.75	2.3	69				

Note.--Same as preceding table above 1.1 ft.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.55	7.8	5.4	2.2	1.39	3.75	3.0	20	3.0	1.88	29.5	6.4
2	.51	2.3	1.55	1.29	1.00	2.05	2.85	4.7	1.52	4.8	11.6	3.65
3	1.69	1.55	1.80	1.05	1.05	1.52	8.1	1.66	2.4	4.4	11.3	3.2
4	6.4	4.9	1.10	1.23	1.01	1.52	13.1	1.39	1.77	4.3	11.3	7.5
5	1.47	16.2	9.2	.79	5.3	1.73	9.5	7.5	9.9	7.1	11.2	7.7
6	7.4	21.5	11.3	.70	6.2	1.27	2.35	5.8	6.7	5.1	15.3	4.5
7	5.8	24.5	31.5	.79	4.6	1.05	1.80	11.9	2.4	6.4	8.9	4.1
8	1.16	9.5	4.7	1.63	4.7	1.05	1.39	3.65	6.8	4.7	a3.8	2.95
9	.74	7.8	6.9	.93	4.8	1.15	1.21	5.7	33.5	10.1	a2.5	10.0
10	.76	13.6	2.1	.77	1.33	*.90	3.15	10.6	27	6.3	a2.1	8.2
11	6.8	8.2	1.99	*2.95	1.10	38.5	7.5	5.2	14.2	5.2	a1.9	4.7
12	3.1	*4.9	1.41	2.8	1.05	6.1	6.0	2.2	18.7	3.9	*a2.1	4.0
13	1.41	3.9	1.05	6.9	1.35	2.7	2.9	20.5	15.0	14.3	1.45	6.9
14	4.1	3.85	.93	1.56	2.45	2.55	3.65	12.0	20.5	11.3	3.45	2.4
15	2.8	2.35	.79	3.5	11.1	1.39	13.3	2.75	14.2	3.4	5.7	3.25
16	2.15	1.63	.74	1.27	3.5	1.10	4.6	1.96	6.3	2.85	6.6	6.7
17	5.5	1.70	.74	.90	2.4	1.00	6.1	6.6	1.80	5.2	7.6	7.6
18	1.23	1.23	.70	.77	5.4	.90	1.33	2.05	7.8	3.05	6.1	8.9
19	1.55	1.05	.62	.81	29	.81	1.10	*2.0	3.6	3.9	6.4	10.9
20	2.1	1.44	.58	.85	68	1.21	8.1	17.3	2.45	6.0	4.2	7.2
21	1.29	1.63	.55	4.9	13.0	1.00	9.4	4.3	2.45	4.9	4.5	5.7
22	3.4	.98	.55	7.6	10.5	.81	8.5	2.65	6.6	3.9	5.7	12.4
23	6.2	1.25	.51	1.64	5.5	.98	2.75	16.5	7.4	13.5	7.9	10.1
24	5.5	4.0	.51	1.95	2.75	5.5	3.95	8.7	5.9	5.1	2.75	13.0
25	4.4	7.0	.58	1.05	2.1	8.2	3.05	7.1	4.7	2.05	5.2	13.2
26	5.3	1.63	2.65	1.10	6.9	4.1	1.59	2.85	3.7	1.59	1.96	7.7
27	1.49	1.29	3.45	.90	4.7	2.9	1.33	1.80	6.3	15.9	5.5	15.4
28	.98	6.9	.88	.77	3.05	1.27	1.15	1.59	5.4	11.9	11.4	13.1
29	5.4	1.80	2.25	1.11	1.96	12.5	1.05	1.96	2.3	7.7	7.6	19.3
30	40	2.65	5.1	6.3	9.9	19.1	1.00	-	2.6	19.8	6.2	13.2
31	17.5	11.1	-	7.3	-	5.9	2.9	-	3.3	-	7.5	-
Total	148.68	180.13	102.13	68.31	217.09	134.51	133.40	192.41	254.99	197.12	216.81	243.85
Mean												
mgd	4.80	5.81	3.40	2.20	7.24	4.34	4.30	6.63	8.23	6.57	6.99	8.13
cfs	7.43	8.99	5.26	3.40	11.2	6.71	6.65	10.3	12.7	10.2	10.8	12.6
Ac-ft	456	553	313	210	666	413	409	590	783	605	665	748

Calendar year 1951: Max 68 Min 0.51 Mean(mgd) 3.96 Mean(cfs) 6.13 Ac-ft 4,440
Fiscal year 1951-52: Max 68 Min 0.51 Mean(mgd) 5.71 Mean(cfs) 8.83 Ac-ft 6,410

Peak discharge (base, 200 mgd).--Sept. 7 (5:30 p.m.) 600 mgd (928 cfs), 3.62 ft; Nov. 19 (7 p.m.) 240 mgd (371 cfs), 2.97 ft; Dec. 11 (2 p.m.) 600 mgd (928 cfs), 3.62 ft; Mar. 9 (12:30 p.m.) 240 mgd (371 cfs), 3.02 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of records for nearby streams.

Discharge, in million gallons a day, 1952

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
July 1	5.1	July 8	23.5	July 15	10.4	July 22	9.8
2	5.9	9	10.2	16	10.0	23	4.4
3	3.15	10	6.7	17	31.5	24	2.75
4	6.3	11	8.0	18	18.7	25	2.3
5	9.1	12	4.2	19	6.0	26	2.55
6	7.4	13	2.85	20	7.1		
7	5.2	14	22	21	5.7		

Punalulu Stream near Waimanu

Location--Lat 20°08'50", long 155°39'40", on right bank 200 ft upstream from Waimanu trail, 1.0 mile southeast of head of Awini ditch, 1.5 miles upstream from mouth, and 1.5 miles west of Waimanu.

Drainage area--1.4 sq mi.

Records available--March 1939 to July 1952 (discontinued).

Gage--Water-stage recorder. Altitude of gage is 1,870 ft (by barometer).

Average discharge--13 years, 4.14 mgd (6.41 cfs).

Extremes--Maximum discharge during period July 1951 to July 1952, 150 mgd (232 cfs)

Dec. 11 (gage height, 3.90 ft), from rating curve extended above 8 mgd as explained below; minimum, 0.20 mgd (0.31 cfs) Sept. 24.

1939-52: Maximum discharge, 980 mgd (1,520 cfs) June 30, 1941 (gage height, 4.90 ft), from rating curve extended above 8 mgd by test on model of station site (pool conditions then existing); minimum, 0.06 mgd (0.09 cfs) Oct. 14, 25, 26, 1945.

Remarks--Records good except those for periods of no gage-height record, which are fair.

Rating table, July 1, 1951, to July 26, 1952 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.13	0.8	3.9
.3	.30	1.0	6.3
.4	.64	1.5	15.0
.5	1.22	2.0	28
.6	1.92	2.6	51

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.27	a4.0	4.3	1.35	0.77	2.35	2.15	17.3	2.2	1.02	2.5	5.3
2	.25	a1.5	1.09	.84	.44	1.15	1.75	3.6	.96	2.95	9.1	2.55
3	.91	a.90	1.22	.44	.41	.79	7.0	1.08	1.50	2.95	9.3	2.2
4	4.6	a5.0	.69	.60	.38	.74	11.8	.84	1.40	2.75	8.8	5.6
5	1.04	a1.0	6.7	.38	3.5	.79	7.1	5.1	8.0	5.1	9.2	6.0
6	5.3	a2.0	9.5	.30	4.1	.64	1.61	4.9	4.3	3.6	17.0	2.9
7	4.4	a22	12.3	.35	3.25	.48	1.15	10.2	1.59	4.4	8.5	2.8
8	.85	a6.5	3.35	.94	3.2	.44	.84	2.75	5.7	3.05	2.4	2.0
9	.48	5.5	4.9	.49	4.0	*.52	.84	4.1	26.5	7.6	1.64	8.0
10	.43	*11.4	1.49	.30	.74	.41	2.35	8.9	17.4	4.2	1.43	6.0
11	4.5	6.5	1.36	*1.99	.48	22	5.8	4.2	11.6	3.45	1.29	3.4
12	2.25	3.2	.90	1.89	.41	4.9	4.2	1.56	15.6	2.45	*1.29	2.3
13	.98	2.5	.89	5.6	.54	2.2	1.83	16.9	12.2	10.9	.98	5.4
14	2.85	2.45	.56	.86	1.35	1.72	2.45	10.5	17.7	9.5	2.15	1.71
15	1.93	1.66	.48	2.4	9.3	.84	10.9	2.05	11.6	2.35	4.8	2.3
16	1.28	1.02	.44	.60	2.5	.60	3.15	1.43	4.4	1.93	4.9	4.7
17	a4.2	.96	.38	.38	1.43	.52	1.08	3.45	4.7	1.15	3.7	5.5
18	a.84	.69	.35	.27	3.95	.41	.74	1.28	5.3	1.98	4.5	6.6
19	a1.08	.56	.30	.30	18.7	.35	.56	1.28	2.25	2.65	4.9	8.8
20	a1.43	.79	.27	.27	50	.60	6.4	14.6	1.57	3.95	2.95	5.5
21	a.79	.96	.25	2.95	11.1	.44	7.7	3.1	1.51	3.45	3.65	3.6
22	1.89	.56	.23	5.9	8.6	.35	6.7	1.91	4.6	2.3	4.1	10.2
23	4.4	.51	.23	.87	4.3	.46	1.71	14.6	5.2	10.9	6.2	7.5
24	3.8	2.4	.21	1.24	1.78	4.7	2.6	7.1	4.2	3.65	1.85	10.4
25	3.0	5.4	.25	.44	1.29	6.5	1.93	5.3	2.95	1.43	3.85	11.0
26	a3.5	1.08	1.18	.56	5.1	2.85	.90	2.0	2.2	.96	1.36	6.5
27	a.90	.79	2.3	.35	3.1	1.83	.74	1.22	4.7	13.7	3.55	11.1
28	a.60	5.1	.44	.30	1.81	.64	.60	.96	3.85	9.7	10.0	10.5
29	a3.0	1.25	1.05	.52	1.15	10.8	.52	1.20	1.43	5.8	5.9	16.5
30	a35	1.34	3.4	4.2	7.4	17.2	.41	-	1.39	16.5	4.1	12.3
31	a8.0	8.7	-	6.2	-	4.5	1.83	-	1.97	-	6.1	-
Total	104.73	133.22	60.81	44.08	155.08	92.72	99.14	153.41	190.47	146.32	149.97	189.16
Mean:												
mgd	3.38	4.30	2.03	1.42	5.17	2.99	3.20	5.29	6.14	4.88	4.84	6.31
cfs	5.23	6.65	3.14	2.20	8.00	4.63	4.95	8.18	9.50	7.55	7.49	9.76
Ac-ft	321	409	187	135	476	285	304	471	585	449	460	580

Calendar year 1951: Max 50 Min 0.20 Mean(mgd) 2.73 Mean(cfs) 4.22 Ac-ft 3,060
Fiscal year 1951-52: Max 50 Min 0.21 Mean(mgd) 4.15 Mean(cfs) 6.42 Ac-ft 4,680

Peak discharge (base, 100 mgd)--Sept. 7 (6 p.m.) 101 mgd (156 cfs), 3.39 ft; Dec. 11 (2 p.m.) 150 mgd (232 cfs), 3.90 ft.

* Discharge measurement made on this day.

a No gage-height record; discharge estimated on basis of nearby streams.

Discharge, in million gallons a day, 1952

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
July 1	3.6	July 8	19.9	July 15	8.9	July 22	6.4
2	4.7	9	9.3	16	a3.6	23	3.05
3	1.92	10	4.9	17	a12	24	1.78
4	4.2	11	6.3	18	a9.0	25	1.43
5	7.4	12	2.85	19	4.4	26	1.47
6	5.3	13	1.92	20	5.0		
7	3.25	14	3.7	21	3.8		

a No gage-height record; discharge estimated on basis of records for nearby streams.

ISLAND OF HAWAII

Waiaalala Stream near Waimanu

Location.--Lat 20°09'05", long 155°39'55", on right bank 0.7 mile east from head of Awini ditch, 1.3 miles upstream from mouth, and 1.8 miles west of Waimanu.

Drainage area.--0.2 sq mi.

Records available.--March 1939 to August 1952 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 1,880 ft (by barometer).

Average discharge.--13 years, 0.707 mgd (1.09 cfs).

Extremes.--Maximum discharge during period July 1951 to August 1952, 20 mgd (31 cfs) Nov. 19, 1951 (gage height, 1.6 ft); minimum, 0.15 mgd (0.23 cfs) July 18, 21, 22, 1951. 1939-52: Maximum discharge, 67 mgd (104 cfs) Feb. 22, 1940 (gage height, 3.83 ft), from rating curve extended above 2.0 mgd by test on model of station site; minimum, 0.10 mgd (0.16 cfs) Mar. 15, 1944.

Remarks.--Records fair except those for period of no gage-height record, which are poor.

Rating table, July 1, 1951, to Aug. 2, 1952 (gage height, in feet, and discharge, in million gallons a day)

0.15	0.11	0.6	2.4
.2	.18	.7	3.5
.3	.43	.9	6.4
.4	.78	1.1	10.9
.5	1.44		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.16	0.58	0.44	0.32	0.24	0.37	0.68	2.1	0.55	0.46	2.7	0.84
2	.16	.43	.34	.29	.22	.34	.55	.65	.63	.54	1.54	.65
3	.18	.37	.32	.29	.22	.32	1.01	.46	.62	.49	1.38	.61
4	.22	.34	.29	.29	.22	.32	<u>1.36</u>	<u>.43</u>	.52	<u>.43</u>	1.06	.65
5	.18	1.92	<u>1.32</u>	.29	.27	.29	.78	<u>.43</u>	.62	<u>.73</u>	1.34	.79
6	.32	2.95	1.04	.29	.22	.29	.55	1.69	.56	.52	1.29	.73
7	.58	2.65	<u>1.80</u>	.27	.20	.29	.49	1.66	<u>.46</u>	.46	.82	.65
8	.18	a.88	.69	.29	.26	.29	.46	.61	.72	.43	.69	.61
9	.16	a.65	.58	*.24	.33	*.29	.43	.73	1.54	.61	.65	.69
10	.18	a1.0	.46	.24	<u>.18</u>	<u>.27</u>	.43	-1.07	<u>2.7</u>	.49	<u>.58</u>	.73
11	.20	*.69	.43	.22	.18	<u>6.0</u>	.46	.63	1.27	.49	.65	.61
12	.16	.58	.40	.33	.18	.88	.49	.52	1.51	.46	*.65	<u>.58</u>
13	.16	.52	.40	.41	.20	1.05	.40	<u>3.9</u>	1.67	1.16	.61	.72
14	.16	.49	.37	.22	.18	.56	<u>.37</u>	<u>2.0</u>	1.75	.95	1.18	.58
15	.18	.43	.37	.20	1.07	.49	.75	.73	1.02	.72	1.35	.61
16	.16	.40	.37	<u>.18</u>	.32	.43	.46	.65	.78	.58	1.00	.61
17	.18	.37	.34	.18	.24	.40	.40	2.35	.69	.49	.82	.80
18	.16	.34	.34	.18	.40	.37	.37	*.82	.65	.49	.90	.87
19	.20	.34	.34	.18	2.95	.34	.37	.80	.61	.46	.78	.80
20	.18	.32	.34	.18	<u>9.4</u>	.34	.98	3.65	.58	.52	.78	.65
21	<u>.16</u>	.32	.34	.22	1.74	.34	1.04	.82	.58	.49	1.09	.58
22	.16	<u>.29</u>	.34	.24	.82	.32	.60	.69	.58	.46	.90	1.00
23	.18	.29	.34	.20	.61	.32	.46	2.5	.55	1.11	.78	.65
24	.20	.29	.32	.20	.49	.93	.71	1.27	.55	.52	.69	1.04
25	.20	.32	.32	.18	.43	.55	.49	.88	.52	.46	.73	1.63
26	.25	.29	.34	.18	.49	.34	.43	.69	.52	.46	.61	1.13
27	.16	.33	.32	.18	.43	.34	.43	.61	.60	<u>1.91</u>	.65	1.59
28	.15	.53	.29	.20	.37	.32	.40	.58	.55	.88	1.84	1.43
29	.18	.32	.32	.20	.37	2.15	.37	.61	.49	.65	.88	6.15
30	<u>2.55</u>	.34	.34	<u>1.27</u>	.46	2.05	.37	-	.49	1.77	.69	<u>2.3</u>
31	1.69	.63	-	.57	-	.83	.37	-	.46	-	.69	-
Total Mean:	9.73	20.20	14.25	8.73	23.67	22.42	17.46	34.49	25.34	20.17	29.82	27.28
mgd	0.314	0.652	0.475	0.282	0.789	0.723	0.563	1.19	0.817	0.672	0.962	0.909
cfs	0.4866	1.01	0.735	0.436	1.22	1.12	0.871	1.84	1.26	1.04	1.49	1.41
Ao-ft	30	62	44	27	73	69	54	106	78	62	92	84

Calendar year 1951:	Max	9.4	Min	0.15	Mean(mgd)	0.484	Mean(cfs)	0.749	Ac-ft	544
Fiscal year 1951-52:	Max	9.4	Min	0.15	Mean(mgd)	0.693	Mean(cfs)	1.07	Ac-ft	781

Peak discharge (base, 20 mgd).--Nov. 19 (8 p.m.) 20 mgd (31 cfs), 1.6 ft.

* Discharge measurement made on this day.

* Discharge measurement made on this day.
a No gage-height record; discharge estimated on basis of records for nearby streams.

Discharge, in million gallons a day, 1952

[illegible]

Paopao Stream near Waimanu

Location.--Lat 20°09'05", long 155°40'05", on left bank 150 ft upstream from Waimanu trail, 0.6 mile east of intake to Awini ditch, 1.4 miles upstream from mouth, and 1.9 miles west of Waimanu.

Drainage area.--0.6 sq mi.

Records available.--February 1939 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,910 ft (by barometer).

Average discharge.--13 years, 2.17 mgd (3.36 cfs).

Extremes.--Maximum discharge during year, 120 mgd (186 cfs) Dec. 11 (gage height, 3.27 ft), from rating curve extended as explained below; minimum, 0.14 mgd (0.22 cfs) Oct. 21.

1939-52: Maximum discharge, 462 mgd (715 cfs) Dec. 20, 1946 (gage height, 5.55 ft), from rating curve extended above 8 mgd by test on model of station site; minimum, 0.08 mgd (0.12 cfs) July 27, 28, 1945.

Remarks.--Records good.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.16	1.0	8.6
.3	.43	1.2	13.1
.4	.88	1.4	18.4
.5	1.52	1.7	28.5
.6	2.35	2.0	41
.8	4.9		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952:

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.18	2.4	1.64	0.51	0.40	0.78	1.23	10.3	1.10	0.59	14.4	2.25
2	.18	.83	.47	.40	.28	.47	1.13	1.28	.68	1.98	4.7	.78
3	.20	.59	.47	.28	.25	.40	4.7	.55	.88	1.30	5.8	.78
4	1.43	1.00	.37	.25	.25	.34	7.2	.47	.65	1.10	4.8	2.0
5	.31	9.1	5.6	.22	1.24	.34	3.15	1.69	3.15	2.9	5.6	2.35
6	2.25	13.3	5.0	.22	1.31	.34	.83	4.7	1.72	1.48	7.1	.98
7	1.93	12.8	8.3	.22	.89	.31	.63	6.2	.68	1.67	3.15	.68
8	.34	*2.8	1.64	.25	1.84	.31	.55	1.24	2.95	.88	1.30	.63
9	.25	2.3	2.35	*.22	1.44	*.28	.47	3.25	12.0	3.35	.98	3.3
10	.22	5.1	.73	.22	.31	.28	.73	4.8	10.4	1.63	.90	1.88
11	.96	3.95	.68	.45	.22	17.7	2.25	1.58	6.3	1.51	.83	.93
12	.61	1.37	.55	1.52	.22	2.7	3.65	.73	7.3	1.14	*.88	.63
13	.34	1.04	.43	2.7	.28	1.78	.55	13.6	7.5	6.2	.68	2.05
14	.88	.93	.43	.40	.40	1.39	.83	6.8	9.1	5.5	2.55	.59
15	.47	.78	.40	.81	6.1	.73	5.4	1.30	5.6	1.21	3.75	1.23
16	.31	.63	.37	.31	.94	.59	1.03	.88	1.79	1.24	2.6	2.0
17	.56	.51	.34	.22	.55	.51	.43	2.5	1.93	.78	2.2	2.35
18	.28	.47	.34	.20	1.70	.43	.37	*1.17	2.65	.83	2.5	2.6
19	.43	.43	.31	.20	13.4	.40	.31	1.18	1.14	.93	2.1	3.3
20	.43	.43	.31	.18	4.1	.51	5.6	11.7	.83	1.15	1.12	1.42
21	.31	.55	.28	.38	6.2	.40	4.1	1.64	.83	1.54	2.7	.88
22	.28	.43	.28	2.4	2.4	.31	2.45	1.04	1.80	.78	1.78	4.8
23	1.32	.37	.28	2.8	1.85	.31	.83	9.9	1.74	6.1	2.55	1.92
24	1.38	.69	.25	.37	.83	3.0	1.52	3.95	1.21	1.48	.83	4.6
25	1.02	2.1	.28	.22	.63	3.1	.90	2.35	1.17	.73	1.95	6.3
26	1.70	.51	.36	.22	1.98	1.01	.51	1.04	1.45	.59	.68	2.95
27	.40	.51	.59	.22	1.10	.74	.43	.83	2.3	9.6	1.46	6.3
28	.28	2.8	.28	.22	.78	.37	.37	.68	1.59	4.1	5.5	4.9
29	1.11	.51	.60	.37	.51	9.4	.34	.83	.68	2.5	2.25	9.8
30	16.6	.83	1.30	4.4	3.1	11.2	.31	-	.78	9.4	1.50	6.8
31	9.8	3.7	-	2.55	-	2.2	.70	-	1.09	-	2.55	-
Total	46.76	73.76	35.23	21.41	92.40	62.63	51.50	98.18	93.09	74.19	91.47	81.98
Mean:												
mgd	1.51	2.38	1.17	0.691	3.08	2.02	1.66	3.39	3.00	2.47	2.95	2.73
cfs	2.34	3.68	1.81	1.07	4.77	3.13	2.57	5.25	4.64	3.82	4.56	4.22
Ac-ft	144	226	108	66	284	192	158	301	286	228	281	252

Calendar year 1951: Max 50 Min 0.15 Mean(mgd) 1.61 Mean(cfs) 2.49 Ac-ft 1,810
Fiscal year 1951-52: Max 41 Min 0.18 Mean(mgd) 2.25 Mean(cfs) 3.48 Ac-ft 2,530

Peak discharge (base, 60 mgd).--Sept. 7 (6 p.m.) 86 mgd (133 cfs), 2.83 ft; Nov. 20 (6:30 a.m.) 86 mgd (133 cfs), 2.82 ft; Dec. 11 (2 p.m.) 120 mgd (186 cfs), 3.27 ft.

* Discharge measurement made on this day.

Kukul Stream near Waimanu

Location.--Lat 20°09'10", long 155°40'10", on left bank 300 ft upstream from Waimanu trail crossing, 0.4 mile east from head of Awini ditch, and 2.1 miles west of Waimanu.

Drainage area.--0.4 sq mi.

Records available.--February 1939 to July 1952 (discontinued).

Gage.--Water-stage recorder. Altitude of gage is 1,940 ft (by barometer).

Average discharge.--13 years, 1.29 mgd (2.00 cfs).

Extremes.--Maximum discharge during period July 1951 to July 1952, 40 mgd (62 cfs) Dec. 11 (gage height, 2.79 ft), from rating curve extended as explained below; minimum, 0.18 mgd (0.28 cfs) Oct. 9, 10.
1939-52: Maximum discharge, 116 mgd (179 cfs) Oct. 23, 1941 (gage height, 3.97 ft), from rating curve extended above 5 mgd by test on model of station site; minimum, 0.13 mgd (0.20 cfs) Oct. 25, 1945.

Remarks.--Records fair.

Rating table, July 1, 1951, to July 27, 1952 (gage height, in feet, and discharge, in million gallons a day)

0.2	0.18	1.0	5.2
.3	.46	1.3	8.8
.4	.83	1.6	13.5
.5	1.30	2.0	21
.7	2.55		

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.29	1.53	0.97	0.40	0.40	0.68	1.07	5.7	0.87	0.61	7.7	1.54
2	.26	.76	.50	.35	.35	.53	.90	1.09	.72	.96	2.75	.83
3	.35	.64	.46	.29	.29	.46	2.6	.64	.85	.95	3.15	.79
4	.67	.64	.40	.26	.26	.43	4.0	.57	.64	.72	2.9	1.15
5	.35	4.6	2.85	.24	.61	.43	2.05	.92	1.29	1.54	2.95	1.55
6	1.04	7.5	2.8	.24	.52	.40	.88	2.85	1.21	1.00	3.9	.97
7	.98	7.0	.46	.24	.46	.40	.72	3.95	.68	.94	1.98	.76
8	.38	*1.93	1.21	.24	.55	.40	.61	1.12	1.37	.72	1.21	.72
9	.29	1.46	1.57	*.21	.95	*.35	.57	1.53	4.4	1.50	1.02	1.67
10	.29	2.3	.64	.21	.32	.35	.57	2.7	6.8	.95	.92	1.22
11	.53	2.5	.61	.29	.26	9.5	1.09	1.34	3.3	.95	.83	.88
12	.40	1.02	.57	.58	.26	1.75	.95	.76	3.75	.87	*.79	.72
13	.35	.88	.53	1.22	.32	1.58	.57	7.9	4.2	2.55	.72	1.31
14	.43	.76	.46	.35	.38	1.09	.57	4.9	4.8	3.2	1.63	.72
15	.38	.68	.43	.40	3.15	.68	2.45	1.32	2.9	1.08	2.45	1.03
16	.32	.61	.43	.26	.70	.61	.88	.97	1.47	.98	1.80	1.10
17	.40	.53	.40	.24	.46	.53	.53	2.75	1.36	.76	1.43	1.58
18	.32	.50	.38	.24	.35	.50	*1.18	1.61	.76	1.74	1.75	
19	.46	.50	.38	.26	6.2	.43	.43	1.02	.97	.72	1.17	1.96
20	.40	.50	.38	.24	20.5	.50	2.15	7.4	.83	.80	1.05	1.12
21	.29	.50	.35	.26	4.1	.43	2.35	1.25	.83	.98	1.88	.88
22	.32	.43	.35	.78	2.2	.40	1.58	.97	1.12	.68	1.42	2.65
23	.62	.43	.32	.29	1.36	.40	.72	5.5	.97	2.9	1.46	1.33
24	.69	.46	.32	.29	.88	1.92	1.16	2.6	.83	1.03	.88	2.6
25	.55	.92	.32	.24	.72	1.52	.79	1.75	.83	.72	1.31	3.85
26	.83	.50	.38	.24	1.12	.61	.61	.97	.89	.64	.76	2.2
27	.38	.50	.40	.24	.88	.57	.57	.88	1.21	5.1	1.04	3.9
28	.32	1.37	.35	.26	.68	.43	.53	.76	1.06	2.2	3.6	3.0
29	.42	.50	.41	.35	.57	4.9	.50	.81	.68	1.43	1.65	5.2
30	8.6	.45	.72	1.65	1.29	5.7	.43	-	.68	4.9	1.13	4.4
31	5.2	1.70	-	2.45	-	1.60	.52	-	.79	-	1.51	-
Total	27.11	44.60	24.49	13.81	51.67	40.08	33.85	66.10	53.91	43.14	58.73	53.36
Mean:												
mgd	0.875	1.44	0.816	0.445	1.72	1.29	1.09	2.28	1.74	1.44	1.89	1.78
cfs	1.35	2.23	1.26	0.689	2.66	2.00	1.69	3.53	2.69	2.23	2.92	2.75
Ac-ft	83	137	75	42	159	123	104	203	165	132	180	164

Calendar year 1951: Max 20.5 Min 0.21 Mean(mgd) 0.938 Mean(cfs) 1.45 Ac-ft 1,050

Fiscal year 1951-52: Max 20.5 Min 0.21 Mean(mgd) 1.40 Mean(cfs) 2.17 Ac-ft 1,570

Peak discharge (base, 30 mgd)--July 30 (5 a.m.) 38.5 mgd (59.6 cfs), 2.73 ft; Sept. 7 (6 p.m.) 38.5 mgd (59.6 cfs), 2.77 ft; Nov. 20 (8 a.m.) 38.5 mgd (59.6 cfs), 2.77 ft; Dec. 11 (7 p.m.) 40 mgd (62 cfs), 2.79 ft.

* Discharge measurement made on this day.

Discharge, in million gallons a day, 1952

Day	Discharge	Day	Discharge	Day	Discharge	Day	Discharge
July 1	1.70	July 8	8.9	July 15	3.7	July 22	2.6
2	1.36	9	4.4	16	3.25	23	1.25
3	1.16	10	2.15	17	10.3	24	1.02
4	1.53	11	2.7	18	7.1	25	.88
5	2.55	12	1.1	19	2.1	26	.88
6	1.87	13	1.11	20	1.81	27	1.25
7	1.28	14	7.9	21	1.47		

Awini ditch at East Honokaneiki Gulch, near Niulii

Location.--Lat 20°09'55", long 155°43'10", at flume across East Honokaneiki Gulch, 4.5 miles southeast of Niulii.

Records available.--October 1927 to June 1949, July 1950 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 2,000 ft (from topographic map).

Average discharge.--22 years (1928-38, 1939-49, 1950-52), 12.0 mgd (18.6 cfs).

Extremes.--1927-49, 1950-52: Maximum daily discharge, 33 mgd (51 cfs) Jan. 8, 1935, Aug. 10, 1938; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	3.0	18.1	19.7	13.2	9.3	12.9	17.2	26	11.3	10.6	25.5	17.1
2	2.8	15.6	10.0	10.0	6.0	7.8	13.2	19	10.6	16.8	20.5	7.8
3	3.5	10.6	9.4	6.0	5.4	6.0	22	11	12.0	15.2	25.5	6.0
4	8.5	11.7	6.9	6.4	5.0	6.0	26.5	10	16.6	17.5	25.5	10.8
5	7.5	25.5	12.8	5.0	19.3	6.0	21	18	23.5	23.5	26.5	16.9
6	14	26.5	22.5	3.95	18.3	5.4	13.8	14	21.5	19.8	24	15.5
7	13	*28	21.5	3.95	19.3	5.5	12.0	24	16.0	20.5	22	19.0
8	8.0	24.5	16.1	*5.9	13.9	*6.0	10.6	19	20.5	20.5	18	16.8
9	4.5	23.5	16.6	5.2	19.2	6.4	9.4	20	28	23.5	15	23.5
10	4.2	25.5	9.4	3.85	8.3	5.5	12.5	22	20	21.5	13.8	23.5
11	22	24.5	9.4	11.3	6.4	12.7	23.5	17	19.8	19.8	12.6	21.5
12	17	21.5	8.8	7.9	6.4	11.8	23.5	14.5	22.5	16.0	12.0	18.2
13	9.0	18.2	6.9	18.2	8.1	17.5	17.5	21.5	18.4	26.5	10.6	23.5
14	15	16.0	6.0	7.7	16.1	20	17.8	24	21.5	20.5	14.0	15.2
15	13	13.9	5.5	12.8	19.5	12.0	25.5	16.0	18.2	16.8	23.5	18.5
16	8.5	10.0	5.1	5.6	18.8	8.8	20	13.2	12.6	12.6	22.5	20.5
17	16	8.3	4.8	3.75	13.2	7.8	13.2	*13.3	16.4	10.0	19.8	22.5
18	7.4	7.4	4.4	2.85	18.8	6.9	10.0	10.6	13.2	17.7	21.5	22.5
19	12.0	6.9	4.1	2.75	23.5	6.0	8.5	10.8	10.0	17.5	19.9	24.5
20	13.8	6.4	3.85	2.95	28	8.3	24.5	23.5	10.6	22.5	19.9	23.5
21	8.8	6.9	3.55	13.2	19.0	6.9	25.5	14.5	19.0	17.5	19.0	21.5
22	9.5	6.0	3.4	12.0	16.0	6.0	24.5	12.0	23.5	21	20.5	24.5
23	19.8	5.5	3.2	4.6	12.4	7.0	16.8	24	24.5	23.5	22.5	24.5
24	17.9	8.5	3.0	7.8	7.8	19.1	19.0	22.5	22.5	16.8	16.0	25.5
25	17.7	20.5	3.25	5.1	6.4	23.5	16.0	19.6	19.0	12.0	17.5	25.5
26	17.5	10.6	3.95	6.0	13.3	18.4	11.3	12.6	19.5	18.2	13.2	23.5
27	10.4	8.8	13.0	4.4	11.3	14.4	9.4	10.6	23.5	25.5	15.5	24.5
28	6.4	17.7	6.0	4.5	7.8	8.3	8.3	10.0	18.8	22.5	24.5	24.5
29	6.3	12.0	5.0	13.2	6.0	23.5	7.8	11.3	13.2	25.5	22.5	25.5
30	21.5	8.4	15.3	14.6	16.2	25.5	6.9	-	13.2	26	21.5	25.5
31	20.5	22.5	-	20.5	-	23.5	9.5	-	12.6	-	22.5	-
Total	359.0	470.0	263.40	245.05	399.0	355.4	497.2	484.5	552.5	579.8	607.8	612.3
Mean:	11.6	15.2	8.78	7.90	13.3	11.5	16.0	16.7	17.8	19.3	19.6	20.4
mgd	17.9	23.5	13.6	12.2	20.6	17.8	24.8	25.8	27.5	29.9	30.3	31.6
cfs	1,100	1,440	808	752	1,220	1,090	1,530	1,490	1,700	1,780	1,870	1,880
Ac-ft												
Calendar year 1951: Max	28				2.75		Mean(mgd)	11.1	Mean(cfs)	17.2	Ac-ft	12,410
Fiscal year 1951-52: Max	28				2.75		Mean(mgd)	14.8	Mean(cfs)	22.9	Ac-ft	16,660

* Discharge measurement made on this day.

Note.--No gage-height record July 1-17, Jan. 31 to Feb. 11, May 6-9; discharge estimated on basis of records for nearby stations.

East Honokaneiki intake to Awini ditch at East Honokaneiki Gulch, near Niulii

Location--Lat 20°09'55", long 155°43'15", on intake tunnel delivering water from East Honokaneiki Gulch to Awini ditch, on west side of gulch, 4.5 miles southeast of Niulii.

Records available--October 1927 to June 1938, July 1939 to June 1949, July 1951 to June 1952.

Gage--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,000 ft (from topographic map).

Average discharge--19 years (1928-36, 1937-38, 1939-40, 1941-49, 1951-52), 1.15 mgd (1.78 cfs).

Extremes--1927-38, 1939-49, 1951-52: Maximum daily discharge, 8.0 mgd (12.4 cfs) Dec. 29, 1937, Mar. 20, Apr. 7, 1938, Jan. 12, 1946; no flow at times.

Remarks--Records good except those for periods of no gage-height record, which are poor.

Revisions (fiscal years)--WSP 725: 1928-30.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	0.05	2.4	1.37	0.56	0.43	1.50	1.19	3.5	0.65	0.35	4.4	2.9
2	.04	.92	.32	.46	.21	.60	.56	1.4	.81	.54	2.75	1.08
3	.08	.50	.26	.17	.14	.41	3.55	.84	.50	.54	3.85	.68
4	.35	1.10	.17	.10	.13	.35	4.7	.60	1.62	.76	3.7	2.65
5	.25	5.6	.96	.07	1.52	.32	2.8	1.3	2.55	1.84	6.3	4.7
6	1.1	6.4	3.25	.05	1.84	.28	1.15	1.1	1.54	1.30	3.2	2.0
7	1.0	6.2	2.8	.04	1.53	.24	.80	2.5	.72	1.18	2.5	1.78
8	.31	3.4	1.88	*.04	1.48	*.24	.56	1.5	2.5	1.52	1.4	1.11
9	.15	2.3	1.32	.04	1.81	.21	.47	1.8	4.8	2.8	.82	3.9
10	.10	4.1	.57	.04	.32	.19	1.33	2.0	2.6	1.19	.64	2.4
11	5.0	3.5	.32	.29	.21	1.11	2.9	1.3	2.6	.86	.53	1.74
12	3.0	1.36	.24	.19	.24	1.44	2.5	.70	3.05	.60	.47	1.30
13	.80	.96	.19	1.38	.57	1.39	1.21	2.4	2.55	4.9	.41	3.0
14	2.0	.76	.17	.42	1.62	1.62	1.50	3.45	3.05	1.48	1.21	.76
15	1.4	.60	.14	.64	3.7	.56	3.5	1.08	4.7	.60	2.9	1.12
16	.60	.47	.12	.19	1.46	.41	1.59	.76	2.4	.44	2.25	2.3
17	2.6	.38	.10	.08	.68	.32	.64	*.64	4.6	.35	.84	2.0
18	.26	.32	.10	.05	2.2	.28	.47	.47	2.2	1.25	1.06	2.2
19	.72	.26	.08	.04	3.0	.24	.42	.53	1.30	1.04	2.55	3.9
20	.80	.24	.08	.03	3.25	.28	2.65	3.8	1.04	2.15	1.39	2.75
21	.35	.21	.07	.31	1.85	.24	2.85	1.00	1.85	1.05	1.75	1.90
22	.34	.19	.05	2.2	1.57	.19	2.5	.60	2.95	2.85	1.87	4.1
23	1.58	.14	.05	.31	1.28	.50	1.41	4.7	3.05	3.0	2.55	4.3
24	1.51	.19	.04	.19	.96	2.85	1.08	3.75	1.63	.94	.70	4.3
25	1.33	1.46	.05	.10	.76	2.35	.72	2.8	.87	.50	.56	4.7
26	1.35	.41	.10	.07	1.39	.82	.53	.99	1.32	3.3	.38	2.7
27	.41	.26	.68	.05	1.08	.47	.47	.68	2.9	4.4	1.52	4.0
28	.21	1.18	.19	.25	.84	.28	.58	.64	1.00	2.8	3.8	4.1
29	.34	.44	.12	1.35	.56	4.2	.35	.73	.53	4.9	1.78	4.9
30	4.4	.25	.25	1.76	2.2	4.8	.28	-	.44	5.2	1.62	4.1
31	3.3	2.55	-	2.2	-	2.65	.49	-	.38	-	2.7	-
Total	35.73	49.05	16.04	13.67	38.83	30.14	45.55	47.56	62.70	54.63	62.40	83.37
Mean:	1.15	1.58	0.535	0.441	1.29	0.972	1.47	1.64	2.02	1.82	2.01	2.78
mgd	1.78	2.44	0.828	0.682	2.00	1.50	2.27	2.54	3.13	2.82	3.11	4.30
cfs	110	151	49	42	119	92	140	146	192	168	191	256
Ac-ft												
Calendar year 1951: Max	-	-	-	-	-	-	-	-	-	-	-	-
Fiscal year 1951-52: Max	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4	6.4
Min	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03	0.03
Mean(mgd)	-	-	-	-	-	-	-	-	-	-	-	-
Mean(cfs)	-	-	-	-	-	-	-	-	-	-	-	-
Ac-ft	-	-	-	-	-	-	-	-	-	-	-	-

* Discharge measurement made on this day.

Note.--No gage-height record July 1-17, Jan. 31 to Feb. 11, May 6-9; discharge estimated on basis of records for nearby stations.

Kohala ditch at Pololu, near Niulii

Location.--Lat 20°10'20", long 155°44'15", on right bank of open section of ditch in Pololu Valley just downstream from boundary between land of Honokane and land of Pololu, 2.8 miles upstream from mouth of Pololu Stream and 4 miles south of Niulii.

Records available.--August 1927 to June 1952.

Gage.--Water-stage recorder. Altitude of gage is 1,100 ft (from topographic map).

Average discharge.--23 years (1928-38, 1939-52), 26.3 mgd (40.7 cfs).

Extremes.--1927-52: Maximum daily discharge, 63 mgd (98 cfs) May 1, 1952; no flow at times.

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 1,200 ft from Honokane and all streams west. Water is used for irrigation in vicinity of Kohala.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	15.8	44	41	27	31.5	38	36.5	50	25	27	63	42
2	15.8	35	26	24	21.5	25	26	38.5	24	33.5	51	27
3	16.6	27	24	19.7	18.9	21.5	40	27	27	31.5	46	23
4	27	25	21.5	19.7	20	22.5	57	25	34	32.5	49	37.5
5	21.5	*47	24	18.1	43	22.5	51	37	44	36	47	48
6	31	51	47	17.4	44	20.5	33.5	33	41	39	51	42
7	36	57	45	*17.4	46	19.7	31.5	43	34	38.5	43	38.5
8	22.5	49	41	18.1	27	19.7	26	36	38	46	36	36
9	18.1	46	36	18.1	45	19.7	24	30	55	41	31.5	45
10	17.4	51	27	16.6	25	18.9	27.5	41	38	35	31.5	46
11	41	46	24	22.5	12.9	39	48	38.5	38	33.5	29.5	42
12	38.5	41	23	19.7	13.6	38.5	46	31.5	44	36	27	37
13	24	36	21.5	33.5	21	*36.5	38.5	43	35	48	26	46
14	34	33.5	20.5	21.5	38.5	45	36.5	47	40	36	*29	33.5
15	32	31.5	19.7	27	37	29.5	51	33.5	35	31.5	41	33.5
16	25	25	18.9	19.7	41	23	41	*28	31	26	41	36
17	39	23	18.9	17.4	29.5	21.5	31.5	27	34	27	33.5	38.5
18	23	22.5	18.1	15.8	36	21.5	26	25	31	36	36	39
19	25	20.5	18.1	15.8	47	20.5	23	24	29.5	36	36.5	49
20	29.5	20.5	17.4	15.8	58	21.5	48	46	31.5	41	38.5	49
21	25	20.5	17.4	28	51	21.5	53	33	43	36	36.5	46
22	21.5	19.7	17.4	25	49	19.7	52	29.5	51	40	41	49
23	39.5	19.7	16.6	16.6	36.5	19.7	36	46	45	43	43	51
24	36	20.5	16.6	21.5	27	30	38	48	41	37	33.5	51
25	41	34.5	16.6	18.1	23	44	31.5	44	36	32	33.5	51
26	35	25	17.6	18.9	40	36	27	32.5	42	26	29.5	43
27	36.5	22.5	27	17.4	38	29.5	25	27	45	50	30	49
28	20.5	30	19.7	17.4	25	22.5	23	23	31.5	49	46	50
29	20	28	18.1	23	22.5	38.5	22.5	25	27	47	41	56
30	54	21.5	28	34	43	46	20.5	-	29.5	60	41	51
31	50	40	-	46	-	43	27	-	26	-	43	-
Total	801.7	1,013.4	727.6	670.7	1,011.4	874.9	1,096.0	1,010.0	1,124.0	1,131.0	1,205.0	1,285.5
Mean:	29.1	32.7	24.3	21.6	33.7	28.2	35.4	34.8	36.3	37.7	38.9	42.8
cfs	45.0	50.6	37.6	33.4	52.1	43.6	54.8	53.8	56.2	58.3	60.2	66.2
Ac-ft	2,770	3,110	2,230	2,060	3,100	2,680	3,360	3,100	3,450	3,470	3,700	3,950
Calendar year 1951:	Max 58			Min 12.9		Mean(mgd) 27.3		Mean(cfs) 42.2		Ac-ft 30,580		
Fiscal year 1951-52:	Max 63			Min 12.9		Mean(mgd) 32.9		Mean(cfs) 50.9		Ac-ft 36,980		

* Discharge measurement made on this day.

Note.--No gage-height record Feb. 27 to Mar. 18, Apr. 19-25; discharge estimated on basis of records for nearby station.

Kehena ditch near Kohala

Location.--Lat 20°07'25", long 155°45'05", on right bank at old Honokane weir, near head of West Branch of Honokanenui Gulch, 8.5 miles southeast of Kohala.

Records available.--December 1917 to November 1919, April 1928 to June 1952.

Gage.--Water-stage recorder and artificial control. Altitude of gage is 3,850 ft (from topographic map). Prior to Apr. 26, 1928, water-stage recorder at same site at different datum.

Average discharge.--24 years (1928-52), 7.61 mgd (11.8 cfs).

Extremes.--1917-19, 1928-52: Maximum daily discharge, 54 mgd (84 cfs) Mar. 23, 1919; no flow at times.

Remarks.--Records good except those for periods of no gage-height record, which are poor. Intake on Honokanenui Stream 2 miles upstream from station, at altitude of about 4,200 ft. Water used for irrigation in vicinity of Hawi.

Revisions (fiscal years).--WSP 740: 1930.

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	1.23	12	10.2	6.4	1.90	15.5	6.7	29	2.1	1.64	37.5	16.1
2	.84	3.5	2.85	4.3	1.36	7.1	2.65	12.3	1.96	1.64	27	10.9
3	1.10	3.0	2.65	2.65	1.80	4.4	15.8	3.05	2.1	2.1	13.8	5.4
4	5.1	*5.0	1.64	2.45	1.36	14.4	35	1.96	2.2	2.3	18.4	20.5
5	3.05	19.9	2.3	1.50	11.6	9.2	23.5	10.4	17.3	2.85	12.8	28
6	9.2	22.5	13.6	*1.10	20.5	4.0	5.8	5.0	18.6	5.7	26.5	20.5
7	6.3	31.5	20.5	1.50	20	*2.65	10.6	12.5	4.4	8.1	11.2	10.9
8	2.45	15.2	9.5	3.25	9.6	2.1	3.65	4.2	10.5	13.1	4.6	7.6
9	1.36	12.8	5.1	2.1	18.7	1.80	2.3	2.55	36.5	21	2.65	21
10	1.10	21	2.65	1.23	4.1	1.50	5.7	13.0	33.5	11.0	2.1	17.8
11	21.5	14.8	1.80	2.45	5.4	16.2	22.5	6.4	34	6.3	1.80	15.7
12	9.0	7.4	1.50	1.96	5.6	13.2	20.5	2.65	37	3.65	1.64	10.6
13	2.0	6.2	1.23	8.2	2.85	9.6	11.7	10.5	28	8.6	1.50	17.8
14	2.7	3.85	.97	2.65	12.3	12.7	10.0	16.0	35.5	18.7	1.64	5.6
15	2.3	2.65	.72	3.25	14.7	3.25	27	*3.6	29.5	4.4	2.65	3.85
16	8.5	1.96	.72	1.96	12.5	1.96	13.0	2.1	19.0	2.45	4.6	8.0
17	9.0	1.50	.61	1.23	5.1	1.50	4.4	1.64	11.2	1.80	2.85	12
18	2.2	1.36	.61	.84	12.5	1.23	2.65	1.36	14.3	1.80	2.65	18
19	1.8	1.10	.40	.84	20	1.10	1.80	1.74	5.2	5.2	2.85	25
20	1.6	.97	.40	1.22	36	1.10	30	16.4	3.45	13.6	3.65	19
21	1.6	.97	.30	15.3	24.5	1.10	33.5	5.0	2.65	15.0	2.3	10
22	4.5	.84	.30	11.2	23	.97	28	3.25	7.7	15.7	6.6	25
23	7.0	.97	.30	3.45	14.6	1.97	7.4	23	22.5	25.5	13.6	30
24	4.5	1.55	0	1.96	9.2	6.8	4.1	20	12.2	14.8	4.7	21
25	4.8	8.8	0	1.36	5.4	16.8	3.05	20	9.4	4.7	3.45	18
26	5.0	2.65	.91	1.10	28	5.1	2.85	6.1	5.4	2.65	2.45	15
27	2.3	1.64	5.5	.97	18.3	3.05	2.3	2.85	10.6	27.5	2.75	20
28	1.6	5.7	1.64	.84	7.4	1.96	1.80	3.45	16.4	23.5	17.4	27
29	9.0	3.45	1.10	1.76	4.8	6.3	1.50	2.45	3.8	16.0	11.2	35
30	30	2.05	2.6	6.8	27.5	20	1.36	-	2.1	36	9.8	22
31	21	14.2	-	15.2	-	13.4	3.2	-	1.80	-	11.0	-
Total	185.63	231.01	92.60	111.02	378.57	201.94	344.31	242.45	440.86	317.28	267.63	517.25
Mean:												
mgd	5.99	7.45	3.09	3.58	12.6	6.41	11.1	6.36	14.2	10.6	8.63	17.2
cfs	9.27	11.5	4.78	5.54	19.5	10.1	17.2	12.9	22.0	16.4	13.4	26.6
Ac-ft	570	709	284	341	1,160	620	1,060	744	1,350	974	821	1,590

Calendar year 1951: Max 36.5 Min 0 Mean(mgd) 6.46 Mean(cfs) 10.0 Ac-ft 7,240
 Fiscal year 1951-52: Max 37.5 Min 0 Mean(mgd) 9.10 Mean(cfs) 14.1 Ac-ft 10,220

* Discharge measurement made on this day.

Note.--No gage-height record July 13 to Aug. 4, June 16-30; discharge estimated on basis of records for nearby stations.

Waikoloa Stream near Kamuela

Location.--Lat 20°03'15", long 155°39'55", on left bank 350 ft downstream from Parker Ranch boundary and 2.1 miles north of Kamuela.

Drainage area.--1.0 sq mi.

Records available.--May 1947 to June 1952.

Gage.--Water-stage recorder and artificial control. Altitude of gage is 3,500 ft (from topographic map).

Average discharge.--5 years, 4.85 mgd (7.50 cfs).

Extremes.--Maximum discharge during year, 110 mgd (170 cfs) Oct. 30 (gage height, 3.40 ft), from rating curve extended as explained below; minimum, 1.24 mgd (1.92 cfs) Jan. 31, 1947-52: Maximum discharge, 545 mgd (843 cfs) Jan. 11, 1949 (gage height, 5.47 ft), from rating curve extended above 10 mgd by logarithmic plotting; minimum, 1.04 mgd (1.61 cfs) Nov. 6-10, 1950, Feb. 12, 1951.

Remarks.--Records good.

Revisions (fiscal years).--WSP 1155: 1948(M).

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.3	1.17	1.7	6.3
1.4	1.96	1.9	10.5
1.5	3.1	2.2	20
1.6	4.6	2.5	34

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.15	7.9	6.1	2.85	2.15	3.65	3.0	12.2	1.62	2.25	27.5	5.7
2	1.54	2.75	2.35	2.35	1.86	2.35	2.5	4.0	1.62	3.15	11.7	5.0
3	3.1	*1.96	2.75	2.05	1.86	1.96	5.1	1.86	1.62	4.2	9.7	3.85
4	6.8	7.6	1.96	2.05	2.1	2.15	12.8	1.70	1.62	4.0	9.6	7.2
5	2.35	11.7	5.6	*1.78	7.6	2.15	7.4	4.4	3.5	5.9	10.2	5.7
6	6.3	14.6	8.9	1.70	4.1	*1.78	2.25	3.25	5.0	5.5	14.7	6.2
7	4.2	18.9	12.5	1.96	4.9	1.62	2.15	4.7	1.96	5.5	*9.4	5.5
8	1.78	8.9	4.5	2.85	2.8	1.62	1.78	2.25	4.1	5.0	3.9	4.2
9	1.54	6.9	6.3	1.96	4.0	1.54	1.70	3.4	19.2	9.7	2.7	9.2
10	2.6	14.8	2.7	1.96	1.96	1.54	1.70	6.7	22	6.9	2.35	8.5
11	6.8	6.3	2.7	2.85	1.70	3.15	3.25	3.4	9.7	5.3	2.25	5.8
12	2.65	5.1	2.5	2.35	1.62	5.7	3.95	2.65	14.7	4.3	2.15	5.0
13	2.2	4.3	1.86	7.3	1.54	2.65	2.5	8.7	8.4	11.1	1.96	5.8
14	2.35	3.7	1.78	2.5	1.62	2.25	3.55	*7.3	11.8	13.4	2.05	2.85
15	2.25	2.75	1.70	3.55	5.9	1.78	13.8	3.0	12.2	3.5	2.6	2.5
16	5.7	2.15	1.62	2.15	3.7	1.62	4.7	2.5	5.7	2.55	3.7	5.4
17	5.3	1.96	1.54	1.78	2.85	1.54	2.05	1.86	6.8	1.96	3.55	7.4
18	1.86	1.78	1.54	1.62	3.05	1.46	1.78	1.66	6.3	2.05	4.1	8.9
19	1.70	1.70	1.46	1.62	10.7	1.46	1.62	1.78	2.85	2.5	3.7	10.9
20	1.62	1.78	1.46	1.89	28.5	1.38	11.3	10.9	2.15	7.7	3.4	8.9
21	1.62	1.86	1.46	6.3	12.3	1.38	11.4	4.0	1.96	5.1	2.9	6.4
22	4.0	1.78	1.38	7.3	11.2	1.38	18.5	2.6	4.3	7.2	6.8	14.1
23	4.8	3.0	1.38	2.15	5.5	1.46	3.35	12.4	7.9	14.0	6.8	15.6
24	3.7	5.7	1.46	1.86	2.85	2.2	2.5	6.8	5.7	6.4	2.85	13.1
25	3.85	6.0	1.38	1.78	2.5	6.0	2.7	7.0	3.95	2.85	3.6	12.4
26	4.2	2.25	1.54	1.86	4.7	4.0	1.96	2.85	3.6	2.15	2.25	8.8
27	2.15	1.96	1.86	1.78	3.7	2.6	1.70	1.96	7.2	9.3	3.15	13.7
28	1.70	4.2	1.54	1.62	2.85	1.78	1.62	1.86	5.5	11.0	8.6	15.0
29	7.7	3.05	2.35	3.55	2.6	6.9	1.54	1.70	2.35	7.5	7.6	16.5
30	19.5	3.1	4.5	14.9	6.3	13.0	1.38	-	2.35	14.7	6.1	12.3
31	9.6	11.3	-	10.6	-	6.1	2.45	-	3.8	-	5.7	-
Total	127.61	171.63	90.67	102.82	149.01	90.15	137.98	129.58	191.45	186.46	187.16	252.40
Mean	4.12	5.54	3.02	3.32	4.97	2.91	4.45	4.47	6.18	6.22	6.04	8.41
mgd	6.37	8.57	4.67	5.14	7.69	4.50	6.89	6.92	9.56	9.62	9.35	13.0
cfs	392	527	278	316	457	277	423	398	588	572	574	775
Ac-ft												

Calendar year 1951: Max 28.5 Min 1.10 Mean(mgd) 3.45 Mean(cfs) 5.34 Ac-ft 3,870
Fiscal year 1951-52: Max 28.5 Min 1.38 Mean(mgd) 4.96 Mean(cfs) 7.67 Ac-ft 5,580

Peak discharge (base, 100 mgd).--Oct. 30 (11:30 p.m.) 110 mgd (170 cfs), 3.40 ft.

* Discharge measurement made on this day.

Waikoloa Stream at Marine Dam, near Kamuela

Location--Lat 20°02'45", long 155°39'55", on right bank 160 ft upstream from Marine Dam and 1.5 miles north of Kamuela.

Drainage area--1.3 sq mi.

Records available--May 1947 to June 1952.

Gage--Water-stage recorder and artificial control. Altitude of gage is 3,450 ft (from topographic map).

Average discharge--5 years, 5.96 mgd (9.22 cfs).

Extremes--Maximum discharge during year, 129 mgd (200 cfs) Oct. 30 (gage height, 3.52 ft), from rating curve extended as explained below; minimum, 1.16 mgd (1.79 cfs) Dec. 22, 23.

1947-52: Maximum discharge, 615 mgd (952 cfs) Jan. 11, 1949 (gage height, 5.53 ft), from rating curve extended above 10 mgd by logarithmic plotting; minimum, 0.79 mgd (1.22 cfs) Mar. 6-8, 1949.

Remarks--Records good. Diversions above station for stock and domestic use.

Rating table, fiscal year 1951-52 (gage height, in feet, and discharge, in million gallons a day)

1.5	1.00	2.0	8.7
1.6	1.78	2.2	15.3
1.7	2.9	2.5	30.5
1.8	4.4	2.8	52

Discharge, in million gallons a day, fiscal year July 1951 to June 1952

Day	July	Aug.	Sept.	Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	June
1	2.65	12.1	8.0	3.35	2.45	4.2	3.95	19.3	1.89	2.55	42	8.8
2	1.62	3.35	2.45	2.7	1.78	2.45	2.75	5.4	1.89	3.4	17.4	7.1
3	3.2	*2.4	2.8	2.35	1.78	1.89	6.2	2.35	1.78	4.9	12.9	5.2
4	9.8	10.1	2.0	2.55	1.71	2.1	21	1.89	1.70	4.8	13.5	10.1
5	2.5	17.5	7.3	*1.89	9.7	2.1	10.9	5.4	4.7	7.1	13.2	7.7
6	7.6	23	11.6	1.62	4.4	*1.70	2.7	4.0	7.5	7.0	22.5	8.4
7	5.7	30.5	18.0	1.89	6.5	1.62	2.45	6.2	2.25	6.0	13.5	7.7
8	2.0	12.1	5.4	2.8	2.65	1.55	2.0	2.9	4.9	8.1	5.5	6.3
9	1.62	8.9	7.7	2.0	4.8	1.47	1.78	4.4	27	13.7	3.8	13.7
10	2.8	22.5	2.9	1.78	1.89	1.39	1.70	9.9	30.5	9.1	3.35	12.2
11	9.0	8.1	2.8	2.8	1.62	3.3	3.45	4.7	13.8	6.9	2.8	8.0
12	3.2	5.7	2.7	2.2	1.47	7.3	4.6	3.3	23.5	5.5	2.8	6.8
13	2.25	4.8	2.0	8.8	1.39	3.2	2.7	12.6	11.8	14.7	2.55	8.1
14	2.7	4.1	1.78	2.6	1.39	2.45	4.3	*11.4	16.7	20.5	2.45	4.0
15	2.35	3.05	1.70	3.85	6.3	1.78	21.5	3.6	18.7	4.3	3.35	3.35
16	6.8	2.25	1.62	2.35	4.5	1.62	6.2	3.15	7.7	2.8	4.4	7.2
17	7.8	1.89	1.62	1.78	2.8	1.47	2.45	2.35	8.4	2.25	4.4	10.5
18	2.1	1.70	1.55	1.62	3.0	1.39	1.89	2.25	8.4	2.1	5.2	13.2
19	1.70	1.62	1.55	1.62	18.8	1.31	1.70	2.0	3.35	2.7	4.4	17.1
20	1.62	1.62	1.55	1.77	46	1.31	18.0	15.9	2.35	9.3	4.4	14.2
21	1.62	1.78	1.47	7.6	18.6	1.31	18.4	5.1	2.1	6.8	3.0	9.0
22	4.3	1.62	1.47	10.1	16.0	1.23	30.5	3.35	4.7	8.9	9.2	23
23	5.8	2.85	1.47	2.35	7.0	1.31	4.4	17.6	10.2	19.4	9.6	26.5
24	4.2	6.2	1.55	1.89	3.2	1.91	2.9	9.7	7.2	8.2	4.1	20.5
25	4.6	7.3	1.47	1.70	2.55	7.2	3.05	10.4	5.1	3.2	4.5	19.0
26	4.8	2.45	1.62	1.78	5.6	4.7	2.45	3.85	3.85	2.35	3.05	14.6
27	2.35	2.0	2.1	1.70	3.95	2.8	2.0	2.45	9.0	13.2	3.9	21
28	1.78	4.5	1.70	1.55	2.9	1.89	1.78	2.35	7.9	15.6	12.3	24
29	9.5	3.3	2.3	3.4	2.45	9.1	1.62	2.0	2.7	9.9	11.5	29
30	29.5	3.0	5.3	20.5	7.0	19.2	1.55	-	2.55	23.5	9.0	21
31	21.5	14.7	-	16.0	-	8.6	3.1	-	4.2	-	8.2	-
Total	168.96	226.98	107.47	120.89	194.18	104.85	193.97	179.79	258.31	247.35	262.75	387.25
Mean:												
mgd	5.45	7.32	3.58	3.90	6.47	3.38	6.26	6.20	8.33	8.24	8.48	12.9
cfs	8.43	11.3	5.54	6.03	10.0	5.23	9.69	9.59	12.9	12.7	13.1	20.0
Ac-ft	519	697	330	371	596	322	595	552	793	759	806	1,190

Calendar year 1951:	Max	46	Min	0.90	Mean(mgd)	4.23	Mean(cfs)	6.54	Ac-ft	4,740
Fiscal year 1951-52:	Max	46	Min	1.23	Mean(mgd)	6.70	Mean(cfs)	10.4	Ac-ft	7,530

Peak discharge (base, 100 mgd)--Oct. 30 (11:30 p.m.) 129 mgd (200 cfs), 3.52 ft.

* Discharge measurement made on this day.

Miscellaneous discharge measurements

Measurements on the island of Hawaii at points other than regular gaging stations are listed below:

Miscellaneous discharge measurements on Hawaii during fiscal year July 1951 to June 1952

Date	Stream	Tributary to--	Locality	Discharge	
				Cubic feet per second	Million gallons a day
Aug. 9	Lahomene.....	Pacific Ocean...	At altitude 3,250 ft, near Waimanu.	10.2	6.59
Oct. 10	....do.....	....do.....	....do.....	.994	.642
Dec. 10	....do.....	....do.....	....do.....	1.18	.763
Feb. 19	....do.....	....do.....	....do.....	2.05	1.32
Aug. 9	Kakaauki.....	....do.....	At altitude 2,930 ft, near Waimanu.	4.98	3.22
Oct. 10	....do.....	....do.....	....do.....	.630	.407
Dec. 10	....do.....	....do.....	....do.....	.606	.392
Feb. 19	....do.....	....do.....	....do.....	.959	.620

INDEX

	Page		Page
Accuracy of field data and computed results.....	4-5	Huelo, Kaaiea Stream near.....	107
Acree-foot, definition of.....	2	Kailua Stream near.....	110
Agencies other than Geological Survey, records collected by.....	5-7	Koolau ditch near.....	102
Aiea, Pearl Harbor Springs near.....	51	Lowrie ditch near.....	117
Waimalu Stream near.....	50	Manuel Luis ditch at Puohokamoa Gulch near.....	104
Alo Stream near Huelo.....	106	Naillilihaele Stream near.....	109
Anahola ditch, above Kaneha Reservoir, near Kealia.....	29	New Hamakua ditch near.....	115
wasteway of, near Kealia.....	28	Old Hamakua ditch near.....	116
Anahola River near Kealia.....	30	Oopuola Stream near.....	108
Awini ditch at East Honokaneiki Gulch, near Niulii.....	127	Puohokamoa Stream near.....	103
		Spreckels ditch near.....	101
		Waiaakamoi Stream near.....	105
		Wailoa ditch near.....	114
Computations, accuracy of results of..	4-5	Iolekaa Stream mauka near Heeia.....	61
Control, definition of.....	2		
Cooperation, record of.....	1	Ka Loko ditch near Kilauea.....	32
Cubic foot per second, definition of..	2	Kaaiea Stream near Huelo.....	107
		Kahakuloa Stream near Honokohau.....	81
Data, accuracy of.....	4-5	Kahalawe Stream, Right Branch, near Kipahulu.....	85
explanation of.....	2-4	Kahaluu Stream near Heeia.....	62
Drainage area, definition of.....	2	Kailua, Haiku ditch near.....	118
		Kailua Stream near Huelo.....	110
East Honokaneiki intake to Awini ditch at East Honokaneiki Gulch, near Niulii.....	128	Kaimu Stream near Waimanu.....	122
East Wailuaiki Stream near Keanae.....	92	Kakaauki Stream, Hawaii, discharge measurements of.....	133
East Wailuanui Stream near Keanae.....	95	Kalae, Waialala Springs near.....	77
Eleele, Hanapepe River near.....	16	Kalalau Stream near Hanalei.....	38
		Kalalula Stream, Oahu, East Fork, discharge measurement of.....	67
Haiku ditch at Honopou Gulch, near Kailua.....	118	West Fork, discharge measurement of..	67
Haiku Stream near Heeia.....	60	Kalaupapa, Waikolu Stream near.....	76
Haipuaena diversion ditch at Kolea Gulch, near Keanae.....	100	Kalihi Stream near Honolulu.....	53
Haipuaena Stream near Huelo.....	98	Kalihiwai ditch near Kilauea.....	34
Halawa Stream near Halawa.....	68-69	Kamalo, Right Branch of East Fork Kawela Stream near.....	78
Hanakapi'ai Stream near Hanalei.....	36	Kamuela, Waikoloa Stream near.....	131,132
Hanakoa Stream near Hanalei.....	37	Kanaha ditch near Lihue.....	22
Hanalei, Hanakapi'ai Stream near.....	36	Kapaa, Kapaa River near.....	25
Hanakoa Stream near.....	37	Wailua ditch near.....	24
Hanalei River near.....	35	Kapaa River at Kapahi ditch intake, near Kapaa.....	25
Kalalau Stream near.....	38	Kapahi ditch near Kealia.....	26
Hanalei River at altitude 625 ft, near Hanalei.....	35	Kapaula Stream near Nahiku.....	88
Hanalei tunnel outlet near Lihue.....	18	Kauai, island of, discharge measurements of streams on.....	39
Hanapepe River at Koula, near Eleele discharge measurements of.....	16	gaging-station records on.....	9-38
Hanawi Stream near Nahiku.....	39	Kaukonahua ditch near Wahiawa.....	42
Hawaii, island of, discharge measurements of streams on.....	87	Kaukonahua Stream, North Fork, Left Branch of, near Wahiawa.....	40
gaging-station records on.....	133	North Fork, near Wahiawa.....	43
Heeia, Haiku Stream near.....	119-132	Right Branch of, near Wahiawa.....	41
Iolekaa Stream mauka near.....	60	South Fork, above Wahiawa Reservoir, near Wahiawa.....	45
Kahaluu Stream near.....	61	near Wahiawa.....	44
Waihee Stream near.....	62	Kawaikoi Stream near Waimea.....	8
Hilo, Wailuku River near.....	63	Kawela Stream, Right Branch of East Fork near Kamalo.....	78
Hiu Stream, Oahu, discharge measurement of.....	120	Kealia, Anahola ditch near.....	29
Honokohau, Honokohau Stream near.....	67	Anahola ditch wasteway near.....	28
Kahakuloa Stream near.....	81	Anahola River near.....	30
Honokohau Stream near Honokohau.....	82	Kapahi ditch near.....	26
Honolulu, East Branch Manoa Stream, near.....	55	Lower Anahola ditch near.....	31
Kalihi Stream near.....	53	Makaleha ditch near.....	27
Moanalua Stream near.....	52	Keanae, East Wailuaiki Stream near.....	92
Nuuanu Stream near.....	54	East Wailuanui Stream near.....	95
Palolo Stream near.....	59	Haipuaena diversion ditch near.....	100
Pukele Stream near.....	57	Koolau ditch near.....	97
Waioamao Stream near.....	58	Taro patch feeder ditch at.....	96
West Branch Manoa Stream near.....	56	West Kopiliula Stream near.....	91
Honopou Stream near Huelo.....	113	West Wailuaiki Stream near.....	93
Hoolawaliili Stream near Huelo.....	111	West Wailuanui Stream near.....	94
Hoolawanui Stream near Huelo.....	112	Keheha ditch near Kohala.....	130
Huelo, Alo Stream near.....	106	Kekaha ditch at camp 1, near Waimea.....	12
Haipuaena Stream near.....	98	Kilauea, Ka Loko ditch near.....	32
Honopou Stream near.....	113	Kalihiwai ditch near.....	34
Hoolawaliili Stream near.....	111	Puu Ka Ele ditch near.....	33
Hoolawanui Stream near.....	112	Kipahulu, Oheo Stream near.....	84

	Page		Page
Kipahulu, Right Branch Kahalawe Stream near.....	85	Poamoho Stream near Wahiawa.....	46
Kohala, Kehena ditch near.....	130	Publications on streamflow by Geologi- cal Survey.....	5
Kohala ditch at Pololu, near Nulihi.....	129	Pukele Stream near Honolulu.....	57
Kokee ditch near Waimea.....	10	Pukoo, Punaula Stream near.....	79
Koolau ditch, at Haipuaena, near Huelo at Nahiku weir, near Nahiku.....	102	Pulena Stream near Wailau.....	70
near Keanae.....	89	Punalulu Stream near Waimanu.....	123
Kukui Stream near Waimanu.....	126	Punaula Stream near Pukoo.....	79
Kula diversion from Haipuaena near Olinda.....	99	Puohokamoa Stream near Huelo.....	103
Kumaipo Stream, Oahu, discharge meas- urement of.....	67	Puu Ka Ele ditch near Kilauea.....	33
Lahomene Stream, Hawaii, discharge measurements of.....	133	Spreckels ditch at Haipuaena weir, near Huelo.....	101
Lanipuni Stream near Pelekunu.....	75	Stable storm ditch near Lihue.....	20
Lihue, East Branch of North Fork Wailua River near.....	23	Stage-discharge relation, definition of.....	2
Hanalei tunnel outlet near.....	18	Taro patch feeder ditch at Keanae.....	96
Kanaha ditch near.....	22	Terms, definition of and abbreviations.....	1-2
North Fork Wailua River near.....	21	WSP, definition of.....	2
North Wailua ditch near.....	19	Wahiawa, Kaukonahua ditch near.....	42
South Fork Wailua River near.....	17	Left Branch of North Fork Kaukonahua Stream near.....	40
Stable storm ditch near.....	20	North Fork Kaukonahua Stream near.....	43
Limahuli Stream, Kauai, discharge measurement of.....	39	Poamoho Stream near.....	46
Lower Anahola ditch near Kealia.....	31	Right Branch of North Fork Kaukonahua Stream near.....	41
Lowrie ditch at Honopou Gulch, near Huelo.....	117	South Fork Kaukonahua Stream near.....	44,45
Makaleha ditch near Kealia.....	27	Wahiawa Reservoir Outlet, Oahu, dis- charge measurements of.....	67
Makamakaole Stream, Left Branch, near Waihee.....	80	Waiiaala Stream near Waimanu.....	124
Makapihi ditch near Nahiku.....	86	Waiahole tunnel, at north portal, near Waiahole.....	66
Makaweli River near Waimea.....	15	at Waiianu, near Waiahole.....	64
Manoa Stream, Kauai, discharge meas- urement of.....	39	wasteway at intake 31, near Waiahole.....	65
East Branch, near Honolulu.....	55	Waiahulu Stream near Waimea.....	11
West Branch, near Honolulu.....	56	Waiakamoi Stream above Wailoa ditch, near Huelo.....	105
Manuahi Stream, Kauai, discharge meas- urement of.....	39	Waiakea Stream at middle flume house, near Mountain View.....	119
Manuel Luis ditch at Puohokamoa Gulch, near Huelo.....	104	Waiakeakua Stream near Wailau.....	71-72
Maui, island of, gaging-station rec- ords on.....	80-118	Waiiala Springs near Kalae.....	77
Million gallons, definition of.....	2	Waiialua Plantation Kaukonahua Power- plant ditch, Oahu, discharge meas- urement of.....	67
Moanalua Stream near Honolulu.....	52	Waiialua Plantation Wahiawa ditch, Oahu, discharge measurements of.....	67
Mohihi Stream near Waimea.....	9	Waihee, Left Branch Makamakaole Stream near.....	80
Molokai, island of, gaging-station records on.....	68-79	Waihee Stream near Heeia.....	63
Morikone pond outlet at Pearl City.....	48	Waiilikahi Stream near Waimanu.....	121
Mountain View, Waiakea Stream near.....	119	Waikoloa Stream, at Marine Dam, near Kamuela.....	132
Nahiku, Hanawi Stream near.....	87	near Kamuela.....	131
Kapaula Stream near.....	88	Waikolu Stream below pipeline crossing, near Kalaupapa.....	76
Koolau ditch near.....	89	Wailau, Pulena Stream near.....	70
Makapihi ditch near.....	86	Waiakeakua Stream near.....	71-72
Waiouhe Stream near.....	90	Wailoa ditch at Honopou, near Huelo.....	114
Naillihale Stream near Huelo.....	109	Wailua ditch near Kapaa.....	24
New Hamakua ditch at Honopou, near Huelo.....	115	Wailua River, North Fork, at altitude 650 ft, near Lihue.....	21
Niuli, Awini ditch at.....	127	North Fork, East Branch of, near Lihue.....	23
East Honokaneiki intake to Awini ditch near.....	128	South Fork, near Lihue.....	17
Kohala ditch near.....	129	Wailuku River above Hilo Boarding School ditch intake, near Hilo.....	120
North Wailua ditch near Lihue.....	19	Waimalu Stream near Aiea.....	50
Nuanu Stream below reservoir 2 waste- way, near Honolulu.....	54	Waimanu, Kaimu Stream near.....	122
Oahu, island of, discharge measure- ments of streams on.....	67	Kukui Stream near.....	126
gaging-station records on.....	40-66	Paopao Stream near.....	125
Oheo Stream below diversion dam, near Kipahulu.....	84	Punalulu Stream near.....	123
Old Hamakua ditch at Honopou, near Huelo.....	116	Waiiaala Stream near.....	124
Olinda, Kula diversion near.....	99	Waiilikahi Stream near.....	121
Olowalu ditch near Olowalu.....	83	Waimea, Kawaiki Stream near.....	8
Oopuola Stream near Huelo.....	108	Kekaha ditch near.....	12
Order of listing gaging stations, downstream.....	2	Kokee ditch near.....	10
Palolo Stream near Honolulu.....	59	Makaweli River near.....	15
Paopao Stream near Waimanu.....	125	Mohihi Stream near.....	9
Pearl City, Morikone pond outlet at.....	48	Waiahulu Stream near.....	11
Pearl Harbor Springs, at Kalaupapa, near Aiea.....	47,49	Waimea River near.....	13,14
at Kalaupapa, near Pearl City.....	51	Waimea River, below Kekaha ditch in- take, near Waimea.....	13
at Waiawa, near Pearl City.....	49	near Waimea.....	14
Pelekunu, Lanipuni Stream near.....	75	Waiouhe Stream near Nahiku.....	90
Pelekunu Stream near Pelekunu.....	73-74	Waiomao Stream above Pukele Stream, near Honolulu.....	58
		West Kopiliula Stream near Keanae.....	91
		West Wailuaiki Stream near Keanae.....	93
		West Wailuanui Stream near Keanae.....	94
		Work, division of.....	1
		scope of.....	1

