Water Resources Data Hawaii and other Pacific Areas Water Year 1988

Volume 1. Hawaii

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-88-1
Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development and with other agencies

CALENDAR FOR WATER YEAR 1988

1987

OCTOBER

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
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NOVEMBER

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DECEMBER

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1988

JANUARY

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FEBRUARY

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MAY

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JUNE

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JULY

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31						

AUGUST

S	M	T	W	T	F	S
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21	22	23	24	25	26	27
28	29	30	31			

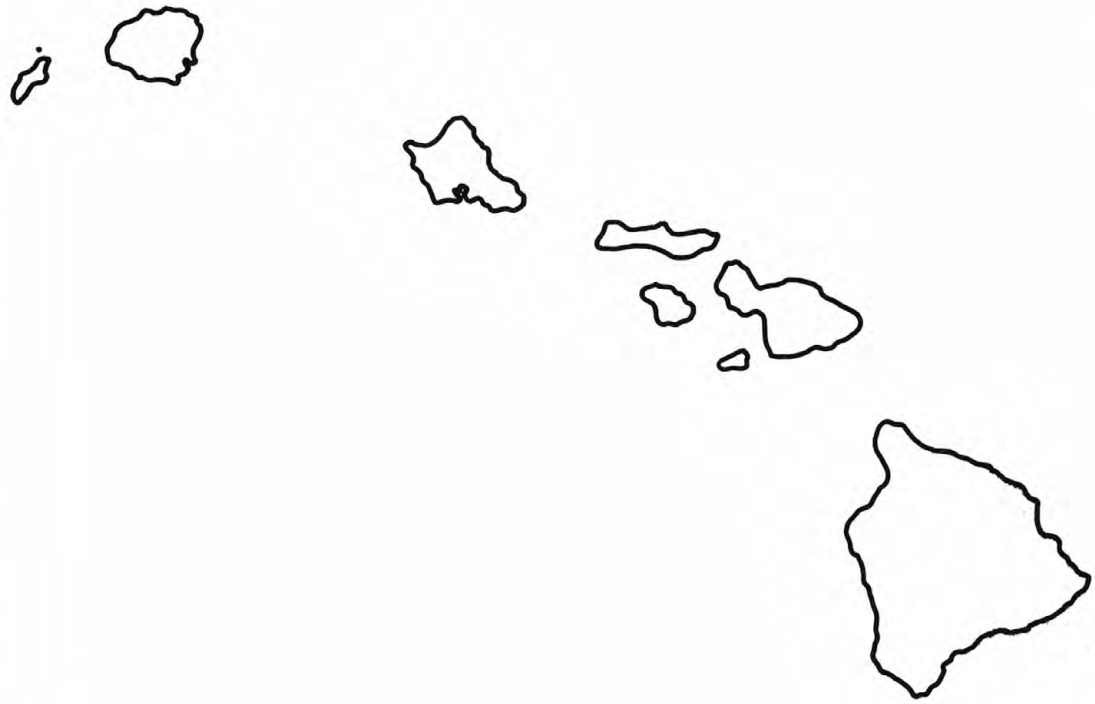
SEPTEMBER

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

Water Resources Data Hawaii and other Pacific Areas Water Year 1988

Volume 1. Hawaii

by R.H. Nakahara, J.J.S. Yee, I.Yamashiro, G.A. Tateishi, and J.A. Domingo



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-88-1
Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Division of Water and Land Development and with other agencies

UNITED STATES DEPARTMENT OF THE INTERIOR

MANUEL LUJAN, JR., Secretary

GEOLOGICAL SURVEY

Dallas L. Peck, Director

For information on the water program in Hawaii
and other Pacific Areas write to
District Chief, Water Resources Division
U.S. Geological Survey
677 Ala Moana Boulevard, Suite 415
Honolulu, Hawaii 96813

1989

PREFACE

This volume of the annual hydrologic data report of Hawaii and other Pacific Areas is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface- and ground-water data-collection networks in each State, Puerto Rico, and the Trust Territories. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources. Hydrologic data for Hawaii and other Pacific Areas are contained in two volumes:

Volume 1. Hawaii
Volume 2. Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, and American Samoa.

This report is the culmination of a concerted effort by dedicated personnel of the U.S. Geological Survey who collected, compiled, analyzed, verified, and organized the data, and who typed, edited, and assembled the report. In addition to the authors, who had primary responsibility for assuring that the information contained herein is accurate, complete, and adheres to Geological Survey policy and established guidelines, the following individuals contributed significantly to the collection, processing, and tabulation of the data:

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James K. Kanno
Marty Lum
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This report was prepared in cooperation with the State of Hawaii, the Governments of Guam, Northern Mariana Islands, Federated States of Micronesia, Palau, American Samoa, and with other agencies under the general supervision of William Meyer, District Chief, Hawaii.

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15. Supplementary Notes

Prepared in cooperation with the State of Hawaii and with other agencies.

16. Abstract (Limit: 200 words)

Water resources data for the 1988 water year for Hawaii and other Pacific Areas consist of records of stage, discharge, and water quality of streams and springs; and water levels and water quality in wells. This report, volume 1, contains discharge records for 82 gaging stations; water quality for 14 gaging stations, 54 partial-record flow stations, and 148 wells; and water levels for 37 observations wells. Also included are 107 crest-stage partial record stations, 25 miscellaneous partial-record sites, and 8 low-flow partial-record stations, These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

17. Document Analysis a. Descriptors

*Hawaii, *Hydrologic data, *Surface water, *Ground water, *Water quality, Flow rate, Gaging stations, Chemical analyses, Sediments, Water temperatures, Sampling sites, Water levels, Water analyses.

b. Identifiers/Open-Ended Terms

c. COSATI Field/Group

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SURFACE-WATER AND WATER-QUALITY STATIONS,
IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED

Letters after station name designate type of data:
(d) discharge, (c) chemical, (m) microbiological,
(t) water temperature, (s) sediment

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Letters after well number designate type of data:
(c) chemical, (t) water temperature, (w) water level

			Page
HAWAII			
ISLAND OF KAUAI			
(2-0021-01)	220057159210301	(w)	189
(2-0044-13)	220018159444702	(ctw)	190
(2-0044-14)	220019159444801	(w)	191
(2-0044-15)	220016159442701	(ctw)	192
(2-0120-01)	220136159205501	(ct)	243
(2-0120-02)	220134159205401	(w)	193
(2-0145-10)	220148159453501	(ct)	243
(2-0145-11)	220148159453502	(w)	193
(2-0320-01)	220354159205601	(ctw)	196
(2-0320-03)	220354159205602	(w)	197
(2-0345-04)	220341159453901	(ctw)	198
(2-0545-01)	220530159450401	(ct)	243
(2-0818-01)	220827159185401	(ctw)	199
(2-0818-02)	220826159185401	(ct)	243
(2-1020-03)	221038159203801	(ctw)	200
(2-1125-01)	221141159252501	(ctw)	194
(2-1125-02)	221141159252502	(ct)	243
(2-1126-01)	221150159264501	(ctw)	195
(2-1126-02)	221151159265001	(ct)	243
(2-1229-03)	221201159293401	(ct)	243
(2-1232-01)	221247159324801	(ctw)	201
(2-1333-01)	221318159335901	(ctw)	202
(2-5426-03)	215434159263301	(w)	203
(2-5427-01)	215454159274201	(ctw)	204
(2-5526-01)	215536159263501	(ctw)	205
(2-5530-02)	215528159303001	(ct)	243
(2-5530-03)	215535159302601	(ct)	243
(2-5534-03)	215522159342601	(ctw)	206
(2-5634-01)	215607159344301	(w)	207
(2-5635-01)	215635159355001	(ct)	244
(2-5840-01)	215803159401201	(ctw)	208
(2-5842-02)	215854159424601	(ct)	244
(2-5842-03)	215843159422901	(ct)	244
(2-5843-01)	215857159430101	(w)	209
(2-5921-01)	215958159214301	(w)	209
(2-5923-01)	215901159235301	(ctw)	210
(2-5923-07)	215901159235201	(ctw)	211
(2-5939-01)	215906159395601	(ctw)	212
(2-5943-01)	215937159434201	(ctw)	213
ISLAND OF OAHU			
(3-1646-01)	211646157465201	(ct)	245
(3-1851-19A)	211832157515501	(ct)	245
(3-1851-19B)	211832157515502	(ct)	245
(3-1851-22)	211828157515801	(ct)	255
(3-1905-04)	211945158053401	(ct)	256
(3-1905-05)	211945158053501	(ct)	257
(3-1959-05)	211907157594701	(w)	214
(3-2042-13)	212038157422501	(ct)	245
(3-2101-03)	212154158015201	(w)	214
(3-2103-03)	212133158035501	(ct)	245
(3-2153-02)	212106157533701	(ct)	245
(3-2153-05)	212123157535501	(w)	215
(3-2255-35)	212259157554201	(ct)	245
(3-2256-10)	212238157561101	(w)	215
(3-2256-12)	212238157561102	(ct)	245
(3-2300-11)	212343158001001	(ct)	245
(3-2300-18)	212340158001901	(w)	216
(3-2301-09,10)	212358158010901	(ct)	246
(3-2358-22)	212342157584301	(ct)	246
(3-2358-29)	212343157584701	(ct)	246
(3-2359-05)	212336157591801	(ct)	246

			Page
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ISLAND OF OAHU--Continued			
(3-2448-01)	212422157485601	(ct)	246
(3-2550-01)	212556157500301	(ct)	245,246
(3-2558-10)	212506157582301	(ct)	246
(3-2600-04)	212659158004102	(w)	217
(3-2603-01)	212617158033801	(ct)	246
(3-2607-01)	212656158071801	(ct)	246
(3-2800-01)	212803158000701	(ct)	246
(3-2808-01)	212813158080201	(ct)	246
(3-2809-06)	212828158092001	(ct)	246
(3-2812-01)	212859158124301	(ct)	246
(3-2901-07)	212927158014801	(ctw)	218
(3-2901-09)	212945158014301	(ct)	246
(3-2911-02)	212939158112301	(ct)	247
(3-3103-01)	213115158035701	(ct)	258
(3-3213-06)	213224158135901	(ct)	247
(3-3251-01)	213243157510001	(ct)	245,247
(3-3352-01)	213327157524401	(ctw)	219
(3-3405-01)	213429158055501	(ct)	247
(3-3405-02)	213427158055501	(ct)	247
(3-3407-25)	213411158074501	(ct)	247
(3-3407-30)	213444158075501	(ct)	247
(3-3410-08)	213446158104901	(w)	220
(3-3506-03,04)	213512158061601	(ct)	247
(3-3605-03)	213636158053701	(ct)	247
(3-3605-21)	213636158053702	(ct)	247
(3-3655-01)	213656157550401	(ct)	247
(3-3956-04)	213902157561601	(ct)	247
(3-4101-03)	214125158013401	(w)	221
(3-4258-04)	214233157583501	(ct)	247
ISLAND OF MOLOKAI			
(4-0448-02)	210425156483001	(w)	222
(4-0449-01)	210402156495801	(ctw)	223
(4-0457-01)	210419156570501	(ctw)	224
(4-0601-01)	210605157012001	(ctw)	225
(4-0700-01)	210711157000501	(w)	226
(4-0801-01)	210856157011201	(c)	248
(4-0801-02)	210857156010701	(c)	248
(4-0855-06)	210850156552201	(c)	260
(4-0901-01)	210903157013001	(c)	248
ISLAND OF MAUI			
(6-3806-01)	203835156065001	(ct)	249
(6-3904-01)	203908156041201	(w)	227
(6-3925-01)	203912156255901	(w)	227
(6-3926-03)	203947156261201	(ct)	249
(6-4600-01)	204601156001501	(ct)	249
(6-4600-03)	204633156003201	(ct)	249
(6-4627-14)	204635156270101	(ct)	249
(6-4824-01)	204827156242201	(w)	228
(6-4825-01)	204845156255001	(ct)	249
(6-4831-01)	204818156310301	(w)	228
(6-4928-02)	204909156281401	(w)	229
(6-4937-01)	204931156371201	(ct)	249
(6-5021-01)	205014156212701	(ct)	249
(6-5128-02)	205102156282301	(ct)	249
(6-5130-01)	205140156304501	(w)	229
(6-5130-02)	205154156303801	(w)	230
(6-5224-02)	205243156243201	(ct)	249
(6-5330-09)	205329156305502	(ct)	249
(6-5330-11)	205330156305401	(ct)	249
(6-5339-01)	205322156394501	(ct)	250
(6-5339-02)	205320156394501	(ct)	250
(6-5340-01)	205343156401101	(ct)	250
(6-5419-01)	205412156193801	(w)	230
(6-5424-01)	205416156244301	(ct)	250
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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1988

Volume 1

INTRODUCTION

Water resources data for the 1988 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams, ditches, and springs; and water-levels and water quality of wells. This report, Volume 1, contains discharge records for 82 gaging stations; water quality for 14 gaging stations, 54 partial-record flow stations, and 148 wells; and water levels for 37 observation wells. Also included are 107 crest-stage partial-record stations, 25 miscellaneous partial-record sites, and 8 low-flow partial-record stations. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Federal, and other agencies in Hawaii.

Through September 30, 1960 (June 30, 1960, for Hawaii and other Pacific areas), the records of discharge (or stage) of streams, and contents (or stage) of lakes and reservoirs were first published in a series of U.S. Geological Survey water-supply papers entitled, "Surface Water Supply of the United States." The records in Hawaii were contained in the series as "Surface Water Supply of Hawaii." Records for other Pacific areas were contained in one volume entitled, "Surface Water Supply of Mariana, Caroline, and Samoa Islands." Through water year 1960, these water-supply papers were in an annual series and then in a 5-year series for 1961-65 and 1966-70. Records of chemical quality, water temperatures, and suspended sediment were published from 1941 to 1970 in an annual series of water-supply papers entitled, "Quality of Surface Waters of the United States." Records of ground-water levels were published from 1935 to 1974 in a series of water-supply papers entitled, "Ground-Water Levels in the United States." Water-supply papers may be consulted in the libraries of the principal cities in the United States or may be purchased from Branch of Distribution, U.S. Geological Survey, 1200 South Eads Street, Arlington, VA 22202.

Beginning with the 1961 water year (fiscal year for Hawaii) and continuing through water year 1974, streamflow data have been released by the Geological Survey in annual reports on a state-boundary bases. Water-quality records beginning with the 1964 water year, and ground-water data since the 1971 water year have been similarly released either in separate reports or in conjunction with streamflow records.

Beginning with the 1975 water year, water data for streamflow, water quality, and ground water are published as an official Survey report on a state-boundary basis. These official Survey reports carry an identification number consisting of the two-letter state abbreviation, the last two digits of the water year, and the volume number. For example, this report is identified as "U.S. Geological Survey Water-Data Report HI-88-1." For archiving and general distribution, the reports for water years 1971-74 are also indentified as water-data reports. These water-data reports are for sale, in paper copy or in microfiche by the National Technical Information Service, U.S. Department of Commerce, Springfield, VA 22161.

Additional information for ordering specific reports may be obtained from the district chief at the address given on the back of the title page or by telephone (808) 541-2655.

COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii have had cooperative agreements for the systematic collection of streamflow and ground water-level records since 1909, and for water-quality records since 1967. Organizations that supplied data are acknowledged in station descriptions. Organizations that assisted in collecting data through cooperative agreement with the Survey are:

Hawaii Department of Land and Natural Resources, Division of Water and Land Development, Manabu Tagomori, Deputy for Water Resources Management.
Hawaii Department of Transportation, Edward Y. Hirata, Director.
City and County of Honolulu, Board of Water Supply, Kazu Hayashida, Manager and Chief Engineer.
City and County of Honolulu, Department of Public Works, Alfred J. Thiede, Director and Chief Engineer.

Assistance in the form of funds or services was given by the Corps of Engineers, U.S. Army and the Public Works, U.S. Navy.

The following organizations aided in collecting records:

Maui County Board of Water Supply; East Kauai Water Co., Ltd.; McBryde Sugar Co., Ltd.; East Maui Irrigation Co., Ltd.; and B. P. Bishop Estate.

SUMMARY OF HYDROLOGIC CONDITIONS

Runoff during the 1988 year was excessive (upper 25 percent of record) at the index stations on the islands of Kauai, Oahu, and Maui and normal at the station on the island of Hawaii.

At East Branch of North Fork Wailua River near Lihue, Kauai, streamflow was excessive for the months of October to January and March. Its annual mean discharge was 33 percent greater than the 1951-80 annual median. Streamflow at Kalihi Stream near Honolulu, Oahu was excessive for the months of November to January and March. The yearly mean was 40 percent greater than the 1951-80 annual median. Monthly mean discharge at Honopou Stream near Huelo, Maui was excessive for the months of November and January and the yearly mean was 26 percent greater than the 1951-80 annual median. Monthly mean flows at Waiakea Stream near Mountain View, Hawaii was normal for the months of November, January to March and August and the annual mean was 89 percent of the 1951-80 annual mean.

The storm of December 31, 1987, which recorded rainfall intensities of 22 inches in a 24-hour period, caused flooding, landslides and/or debris flows to occur in Niu, Hahaione, and Kuliouou Valleys and in the Coconut Grove and Waimanalo areas of the island of Oahu. Damages to property was estimated to be about $34 million.

Monthly and yearly mean discharges of the four index stations are compared with their medians in figure 1.

Dissolved-solids concentrations at the six NASQAN (National Stream Quality Accounting Network) stations showed no significant change during the 1988 year from the previous year. Samples collected every other month showed dissolved-solids concentrations ranged from 28 to 305 mg/L (milligrams per liter) during 1988. Waikele Stream at Waipahu, Oahu, had the highest concentration values.

Average dissolved-oxygen concentrations ranged from 84 to 102 percent saturation. Waikele Stream was lowest at 84 percent.

Concentrations of trace metals were less than the maximum contaminant levels established by EPA (Environmental Protection Agency). Fecal coliform densities decreased at five of the six NASQAN sites in Hawaii. Kalihi Stream at Kalihi, Oahu had the highest fecal coliform density. The geometric-mean values were:

	Fecal Coliform (colonies per 100 milliliters)	
NASQAN Station	1987	1988
Waimea River at Waimea, Kauai	920	860
Waikele Stream at Waipahu, Oahu	5,200	4,400
Kalihi Stream at Kalihi, Oahu	9,700	8,800
Halawa Stream near Halawa, Molokai	15	224
Kahakuloa Stream at Kahakuloa, Maui	45	38
Wailuku River at Hilo, Hawaii	230	155
Benchmark Station		
Honolii Stream near Papaikou, Hawaii	82	78

Analyses of water samples taken at more than 148 basal water-table wells generally did not show significant changes in chloride concentration.

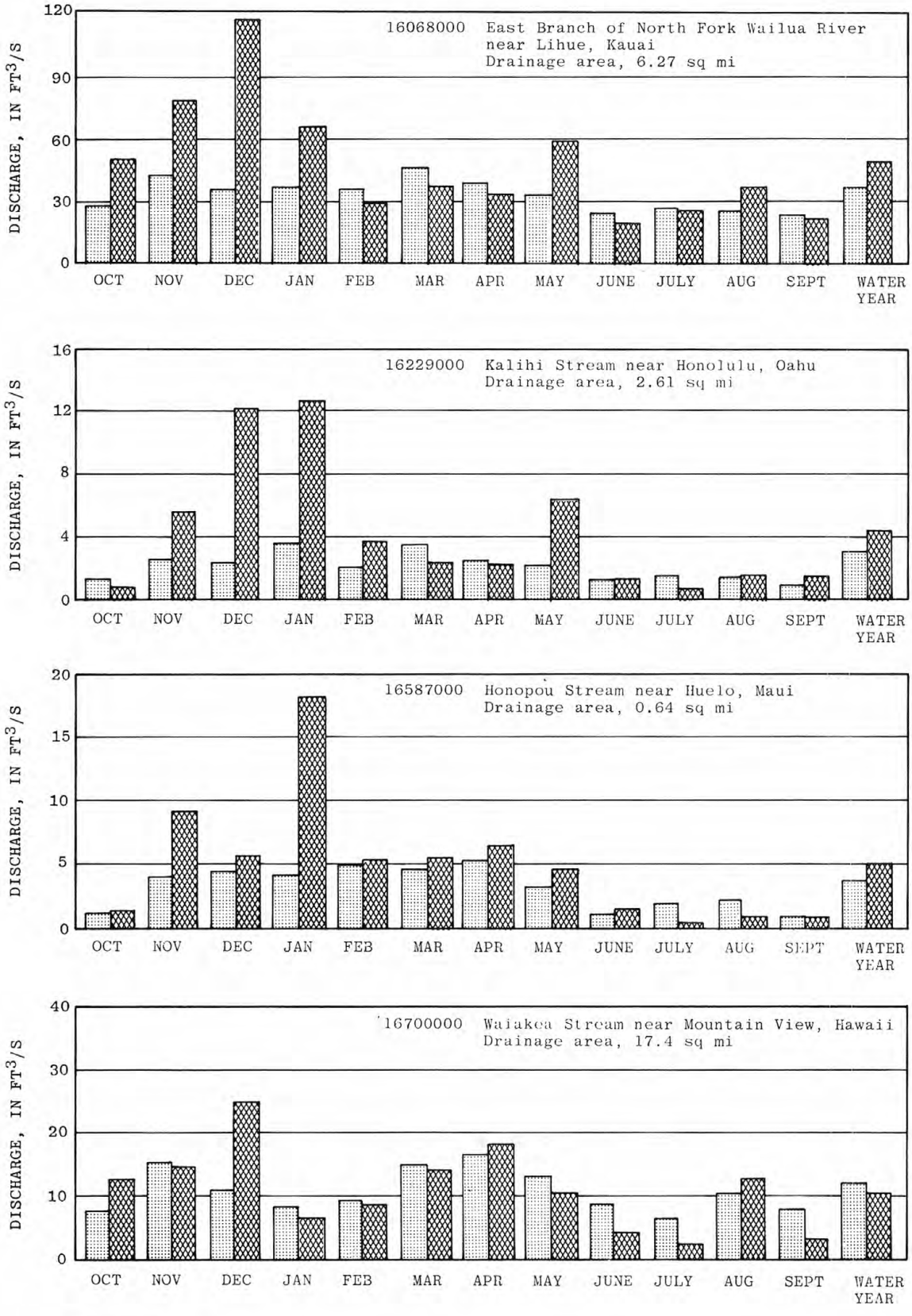

FIGURE 1. DISCHARGE DURING 1988 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1951-80 FOR FOUR REPRESENTATIVE GAGING STATIONS.

DEFINITION OF TERMS

Definition of terms related to streamflow, water-quality, and other hydrologic data are defined as follows:

Acre-foot (AC-FT, acre-ft) is the quantity of water required to cover 1 acre to a depth of 1 foot and is equivalent to 43,560 cubic feet or 325,851 gallons or 1,233 cubic meters.

Algae are mostly aquatic single-celled, colonial, or multi-celled plants, containing chlorophyll and lacking roots, stems, and leaves.

Aquifer is a geologic formation, group of formations, or part of a formation that contains sufficient saturated permeable material to yield significant quantities of water to wells and springs.

Artesian means confined and is used to describe a well in which the water level stands above the top of the aquifer tapped by the well. A flowing artesian well is one in which the water level is above the land surface.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, others perform an essential role in nature in the recycling of materials; for example, by decomposing organic matter into a form available for reuse by plants.

Total coliform bacteria are a particular group of bacteria that are used as indicators of possible sewage pollution. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria which ferment lactose with gas formation within 48 hours at 35°C. In the laboratory these bacteria are defined as all the organisms which produce colonies withing 24 hours when incubated at 35°C ± 0.5°C on M-Endoagar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory they are defined as all organisms which produce blue colonies within 24 hours when incubated at 44.5°C ± 0.2°C on M-FC agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 milliliter of of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacterial which are capable of growth in brain-heart infusion broth. In the laboratory they are defined as all the organisms which produce red or pink colonies within 48 hours at 35°C ± 0.5°C on KF Streptococcus agar (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Biochemical oxygen demand (BOD) is a measure of the quantity of dissolved oxygen, in milligrams per liter, necessary for the decomposition of organic matter by microorganisms, such as bacteria.

Biomass is the amount of living matter present at any time, expressed as the weight per unit area or volume of habitat.

Ash mass is the mass or amount of residue present after the residue from the dry mass determination has been ashed in a muffle furnace at a temperature of 500°C for 1 hour. The ash mass values of zooplankton and phytoplankton are expressed in g/m^3 (grams per cubic meter), and periphyton and benthic organisms in g/m^2 (grams per square meter).

Dry mass refers to the mass of residue present after drying in an oven at 60°C for zooplankton and 105°C for periphyton, until the mass remains unchanged. This mass represents the total organic matter, ash, and sediment, in the sample. Dry mass values are expressed in the same units as ash mass.

Organic mass or volatile mass of the living substance is the difference between the dry mass and the ash mass, and represents the actual mass of the living matter. The organic mass is expressed in the same units as for ash and dry mass.

Wet mass is the mass of living matter plus contained water.

Bottom material is the unconsolidated material of which a streambed, lake, pond, reservoir, or estuary bottom is composed.

Recoverable from bottom material is the amount of a given constituent that is in solution after a representative sample of bottom material has been digested by a method (usually using an acid or mixture of acids) that results in dissolution of only readily soluble substances. Complete dissolution of all bottom material is not achieved by the digestion treatment and thus the determination represents less than the total amount (that is, less than 95 percent) of the constituent in the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Total in bottom material is the total amount of a given constituent in a representative sample of bottom material. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total in bottom material."

Cells/volume refers to the number of cells of any organism which is counted by using a microscope and grid or counting cell. Many planktonic organisms are multicelled and are counted according to the number of contained cells per sample, usually milliliters of liters (L).

CFS-day is the volume of water represented by a flow of 1 cubic foot per second for 24 hours. It is equivalent to 86,400 cubic feet, 1.9835 acre-feet, or 646,317 gallons or 2,447 cubic meters.

Chlorophyll refers to the green pigments of plants. Chlorophyll a and b are the two most common pigments in plants.

Coliform organisms are a group of bacteria used as an indicator of the sanitary quality of the water. The number of coliform colonies per 100 milliliters is determined by the immediate or delayed incubation membrane filter method.

Color unit is produced by one milligram per liter of platinum in the form of the chloroplatinate ion. Color is expressed in units of the platinum-cobalt scale.

Contents is the volume of water in a reservoir or lake. Unless otherwise indicated, volume is computed on the basis of a level pool and does not include bank storage.

Continuing record station is a specified site which meets one or all conditions listed:

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.
2. When water temperature records include observations taken one or more times daily.
3. When sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

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, an artificial structure, or a uniform cross section over a long reach of the channel.

Control structure as used in this report is a structure on a stream or canal that is used to regulate the flow or stage of the stream or to prevent the intrusion of salt water.

Cubic foot per second (FT^3/S, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point during 1 second and is equivalent to 7.48 gallons per second or 448.8 gallons per minute or 0.02832 cubic meters per second.

Discharge is the volume of water (or more broadly, volume of fluid plus suspended sediment), that passes a given point within a given period of time.

Mean discharge (MEAN) is the arithmetic average of individual daily mean discharges during a specified period.

Instantaneous discharge is the discharge at a particular instant of time. If this discharge is reported instead of the daily mean, the heading of the discharge column in the table is "STREAMFLOW INSTANTANEOUS (CFS)."

Dissolved is that material in a representative water sample which passes through a 0.45 micrometer membrane filter. This is a convenient operational definition used by Federal agencies that collect water data. Determinations of "dissolved" constituents are made on subsamples of the filtrate.

Drainage area of a stream at a specific location is that area, measured in a horizontal plane, enclosed by a topographic divide from which direct surface runoff from precipitation normally drains 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.

Drainage basin is a part of the surface of the earth that is occupied by a drainage system, which consists of a surface stream or a body of impounded surface water together with all tributary surface streams and bodies of impounded water.

Gage height (G.H.) is the water-surface elevation referred to some arbitrary gage datum. Gage height is often used interchangeably with the more general term "stage," although gage height is more appropriate when used with a reading on a gage.

Gaging station is a particular site on a stream, canal, lake, or reservoir where systematic observations of hydrologic data are obtained.

Hardness of water is a physical-chemical characteristic that is commonly recognized by the increased quantity of soap required to produce lather. It is attributable to the presence of alkaline earths (principally calcium and magnesium) and is expressed as equivalent calcium carbonate ($CaCO_3$).

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as delineated by the Office of Water Data Coordination on the State Hydrologic Unit Maps; each hydrologic unit is identified by an 8-digit number.

Microgram per gram ($\mu g/g$) is a unit expressing the concentration of a chemical element as the mass (micrograms) of the element sorbed per unit mass (gram) of sediment.

Microgram per liter ($\mu G/L$, $\mu g/L$) is a unit expressing the concentration of chemical constituents in solution as mass (micrograms) of solute per unit volume (liter) of water. One thousand micrograms per liter is equivalent to one milligram per liter.

Milligram per liter (MG/L, mg/L) is a unit for expressing the concentration of chemical constituents in solution. Milligrams per liter represent the mass of solute per unit volume (liter) of water. Concentration of suspended sediment also is expressed in mg/L, and is based on the mass of sediment per liter of water-sediment mixture.

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

Particle size is the diameter, in millimeters (mm), of suspended sediment or bed material determined by either sieve or sedimentation methods. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube) determine fall diameter of particles in either distilled water (chemically dispersed) or in native water (the river water at the time and point of sampling).

Particle-size classification used in this report agrees with recommendations made by the American Geophysical Union Subcommittee on Sediment Terminology. The classification is as follows:

Classification	Size (mm)	Method of analysis
Clay.....	0.00024 - 0.004	Sedimentation.
Silt.....	.004 - .062	Sedimentation.
Sand.....	.062 - 2.0	Sedimentation or sieve.
Gravel.....	2.0 - 64.0	Sieve.

The particle-size distributions given in this report are not necessarily representative of all particles in transport in the stream. Most of the organic material is removed and the sample is subjected to mechanical and chemical dispersion before analysis in distilled water. Chemical dispersion is not used for native-water analysis.

Percent composition is a unit for expressing the ratio of a particular part of a sample or population to the total sample or population, in terms of types, numbers, mass, or volume.

Pesticides are chemical compounds used to control the growth of undesirable plants and animals. Major categories of pesticides include insecticides, miticides, fungicides, herbicides, and rodenticides.

Picocurie (Pc,pCi) is one trillionth (1×10^{-12}) of the amount of radioactivity represented by a curie (Ci). A curie is the amount of radioactivity that yields 3.7×10^{10} radio-active disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Polychlorinated biphenyls (PCBs) are industrial chemicals that are mixtures of chlorinated biphenyl compounds having various percentages of chlorine. They are similar in structure to organochlorine insecticides.

Sediment is solid material that originates mostly from disintegrated rocks and is transported by, suspended in, or deposited from water; it includes chemical and biochemical precipitates and decomposed organic material, such as humus. The quantity, characteristics, and cause of the occurrence of sediment in streams are influenced by environmental factors. Some major factors are degree of slope, length of slope, soil characteristics, land usage, and quantity and intensity of precipitation.

Suspended sediment is the sediment that at any given time is maintained in suspension by the upward components of turbulent currents or that exists in suspension as a colloid.

Suspended-sediment concentration is the velocity-weighted concentration of suspended sediment in the sampled zone (from the water surface to a point approximately 0.3 ft above the bed) expressed as milligrams of dry sediment per liter of water-sediment mixture (mg/L).

Suspended-sediment discharge (tons/day) is the rate at which dry weight of sediment passes a section of a stream or is the quantity of sediment, as measured by dry weight or volume, that passes a section in a given time. It is computed by multiplying discharge times milligrams per liter times 0.0027.

Suspended-sediment load is quantity of suspended sediment passing a section in a specified period.

Total-sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bedload discharge. It is the total quantity of sediment, as measured by dry weight or volume, that passes a section during a given time.

Mean concentration is the time-weight concentration of suspended sediment passing a stream section during a 24-hour day.

Solute is any substance derived from the atmosphere, vegetation, soil, or rocks that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage-discharge relation is the relation between gage height (stage) and volume of water per unit of time, flowing in a channel.

Streamflow is the discharge that occurs in a natural channel. Although the term "discharge" can be applied to the flow of a canal, the word "streamflow" uniquely describes the discharge in a surface stream course. The term "streamflow" is more general than "runoff" as streamflow may be applied to discharge whether or not it is affected by diversion or regulation.

Suspended (as used in tables of chemical analyses) refers to the amount (concentration) of the total concentration in a water-sediment mixture. The water-sediment mixture is associated with (or sorbed on) that material retained on a 0.45 micrometer filter.

Suspended recoverable is the amount of a given constituent that is insolution after the part of a respresentative water-suspended sediment sample that is retained on a 0.45 micrometer membrane filter has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all the particulate matter is not achieved by the digestion treatment and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the sample. To achieve comparibility of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Determinations of "suspended, recoverable" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total recoverable concentrations of the constituent.

Suspended, total is the total amount of a given constituent in the part of a representative water-suspended sediment sample that is retained on a 0.45 micrometer membrane filter. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent determined. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to determine when the results should be reported as "suspended, total."

Determinations of "suspended, total" constituents are made either by analyzing portions of the material collected on the filter or, more commonly, by difference, based on determinations of (1) dissolved and (2) total concentrations of the constituents.

Total, recoverable is the amount of a given constituent that is in solution after a representative water-suspended sediment sample has been digested by a method (usually using a dilute acid solution) that results in dissolution of only readily soluble substances. Complete dissolution of all particulate matter is not achieved by the digestion treatment, and thus the determination represents something less than the "total" amount (that is, less than 95 percent) of the constituent present in the dissolved and suspended phases of the sample. To achieve comparability of analytical data, equivalent digestion procedures would be required of all laboratories performing such analyses because diggerent digestion procedures are likely to produce different analytical results.

Total is the total amount of a given constituent in a representative water-suspended sediment sample, regardless of the constituent's physical or chemical form. This term is used only when the analytical procedure assures measurement of at least 95 percent of the constituent present in both the dissolved and suspended phases of the sample. A knowledge of the expected form of the constituent in the sample, as well as the analytical methodology used, is required to judge when the results should be reported as "total." (Note that the word "total" does double duty here, indicating both that the sample consists of a water-suspended sediment mixture and that the analytical method determines all of the constituent in the sample.)

Time-weighted average is computed by multiplying the number of days in the sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the total number of days. A time-weighted average represents the composition of water that would be contained in a vessel or reservoir that had received equal quantities of water from the stream each day for the year.

Tons per acre-foot indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

Tons per day is the quantity of substance in solution or suspension that passes a stream section during a 24-hour day.

Total load (tons) is the total quantity of any individual constituent, as measured by dry mass or volume, that is dissolved in a specific amount of water (discharge) during a given time. It is computed by multiplying the total discharge, times the mg/L of the constituent, times the factor 0.0027, times the number of days.

Turbidity of a sample is the reduction of transparency dur to the presence of particulate matter. in this report it is expressed Nephelometric turbidity units (NTU).

WDR is used as an abbreviation for "Water-Data Reports" in the summary REVISIONS paragraph to refer to previously published Stat annual basic-data reports.

Weighted average is used in this report to indicate discharge-weighted average. It is computed by multiplying the discharge for a sampling period by the concentrations of individual constituents for the corresponding period and dividing the sum of the products by the sum of discharges. A discharge-weighted average approximates the composition of water that would be found in a reservoir containing all the water passing a given location during the water year after thorough mixing in the reservoir.

WRD is used as an abbreviation for "Water-Resources Data" in the REVISED RECORDS paragraph to refer to State annual basic-data reports published before 1975.

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

DOWNSTREAM ORDER AND STATION NUMBER

Records are listed in a downstream direction along the main stream, and stations on tributaries are listed between stations on the main stream in the order in which those tributaries enter the main stream. Stations on tributaries entering above all main-stream stations are listed before the first main-stream station. Stations on tributaries to tributaries are listed in a similar manner. In the lists of gaging stations and water-quality stations in the front of this report the rank of tributaries is indicated by indention, each indention representing one rank.

As an added means of identification, each gaging station, partial-record station, and water-quality station has been assigned a station number. These are in the same downstream order used in this report. In assigning sstation numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station inidcated downstream order position in a list made up of both types of stations. Water-quality stations located at or near gaging stations or partial-record stations have the same number as the gaging or partial-record station. Gaps are left in the series of numbers to allow for new stations that may be established; hence, the numbers are not consecutive. The complete 8-digit number for each sstation, such as 16200000 which appears just

to the left of the station name includes the 2-digit number "16" plus the 6-digit downstream order number "200000." In this report, the records are listed in downstream order by islands. Locations of the stations are shown in figures 2, 4, 6, 8, and 10.

NUMBERING SYSTEM FOR WELLS AND MISCELLANEOUS SITES

Miscellaneous downstream order station numbers are not assigned to wells and miscellaneous sites where only random water-quality samples or discharge measurements are taken.

The well and miscellaneous site numbering system of the U.S. Geological Survey is based on the grid system of latitude and longitude. The system provides the geographic location of the well or miscellaneous site and a unique number for each site. The number consists of 15 digits. The first 6 digits denote the degrees, minutes, and seconds of latitude, the next 7 digits denote degrees, minutes, and seconds of longitude, and the last 2 digits is a sequential number for wells within a 1-second grid. In the event that the latitude-longitude coordinates for a well and a miscellaneous site are the same, assign sequential numbers "01," "02," etc. as one would for wells. See figure 12.

Beginning in 1971, the local well-numbering system for Hawaii was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00" of latitude, and 60 was added to the minutes of latitude in areas more than 20°00" of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00" of longitude, and 60 was added to the minutes of longitudes more than 156°00" longitude. See figures 13 and 14.

To distinguish wells within a minute grid, two digits are added following the 4-digit minute-grid numbers with a dash separator. These two-digit numbers are assigned with the oldest well dug within the grid as 01 and increase chronologically, with few exceptions, to the latest dug.

Since it is possible to have a same 6-digit number for wells on different islands, another digit distinguishing each of the islands, is added in front of the 6-digit number with a dash separator.

Well locations on the islands of Kauai, Oahu, Molokai, Maui, and Hawaii are shown in figures 3, 5, 7, 9, and 11.

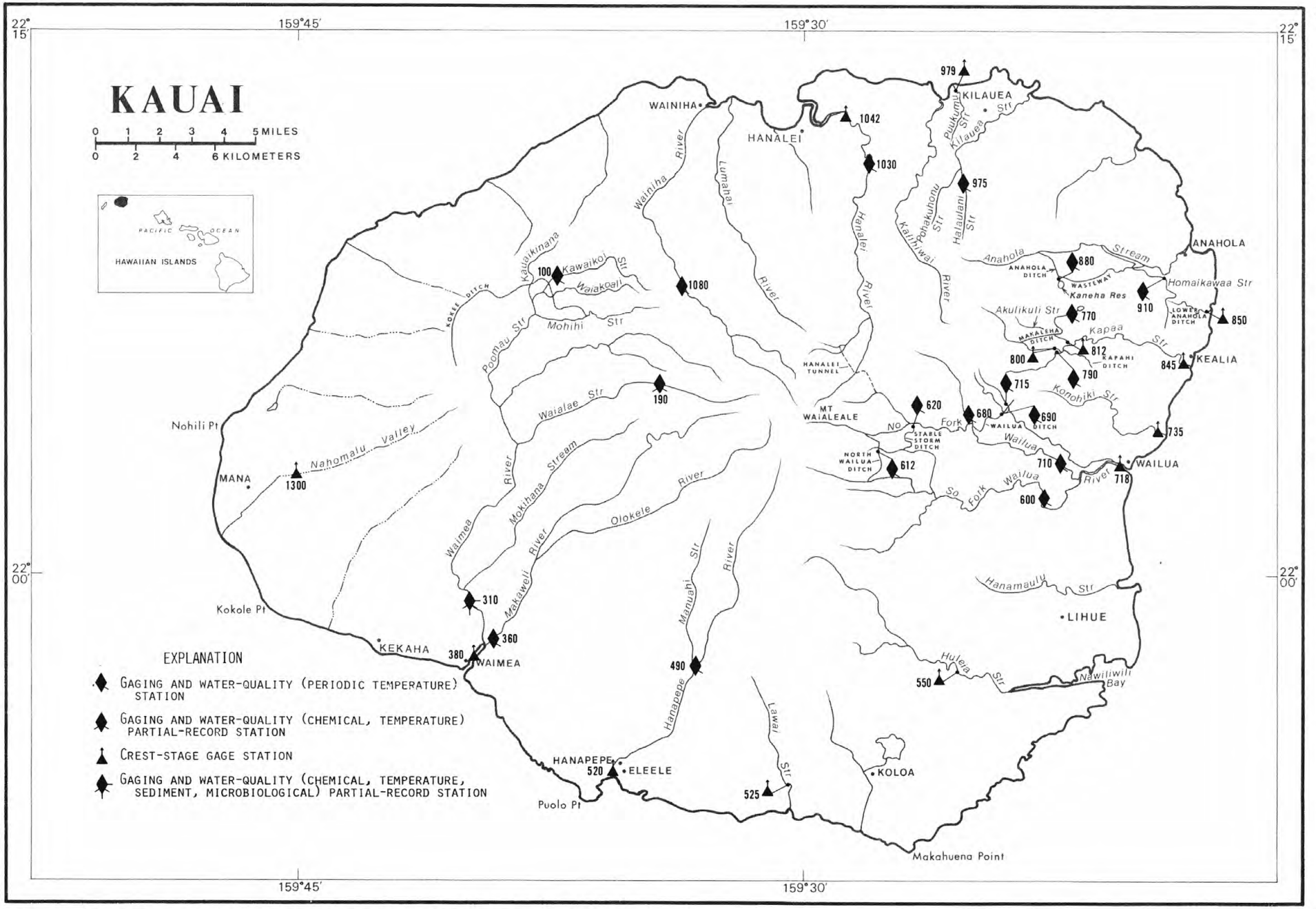

FIGURE 2.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON KAUAI.

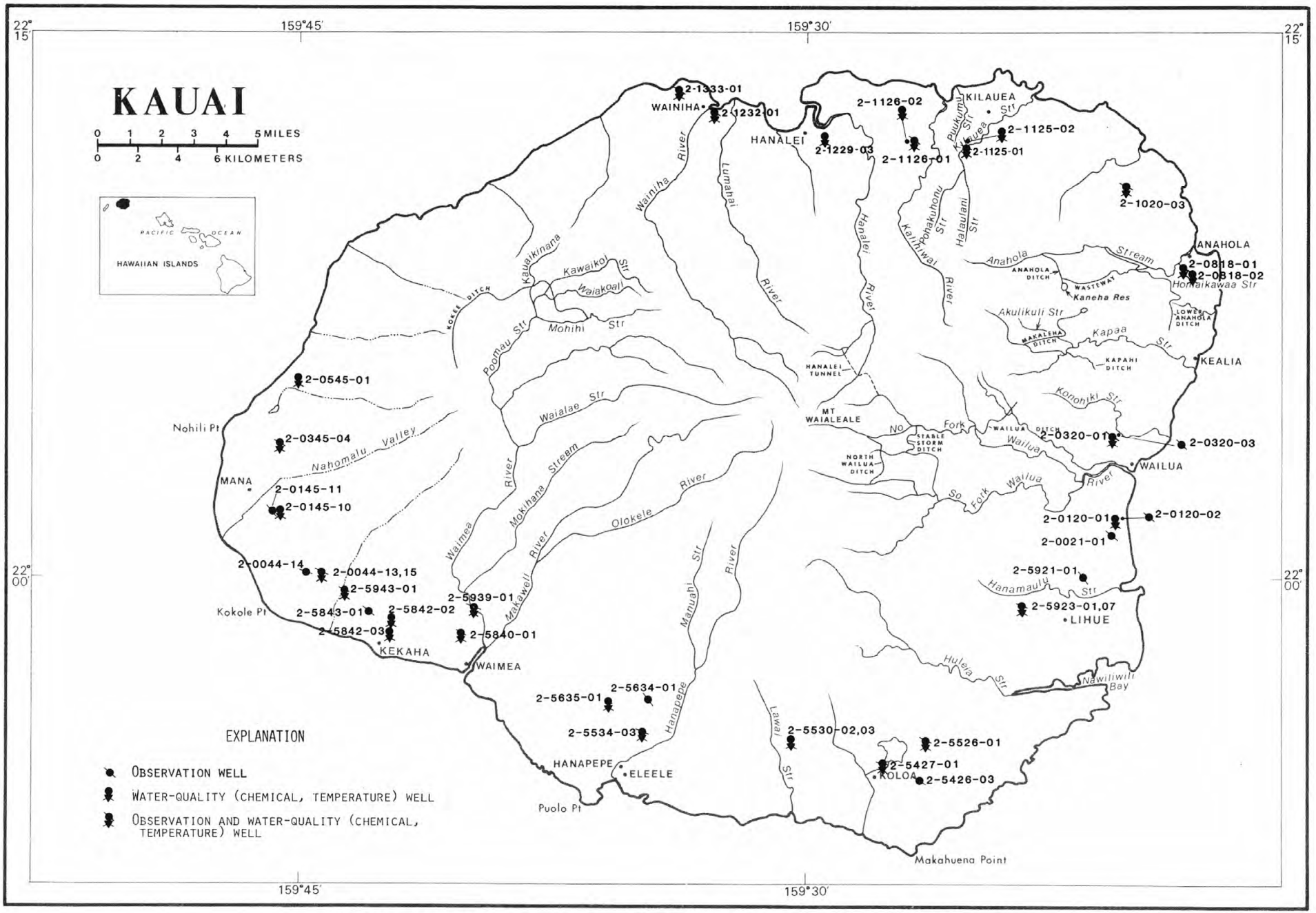

FIGURE 3.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON KAUAI.

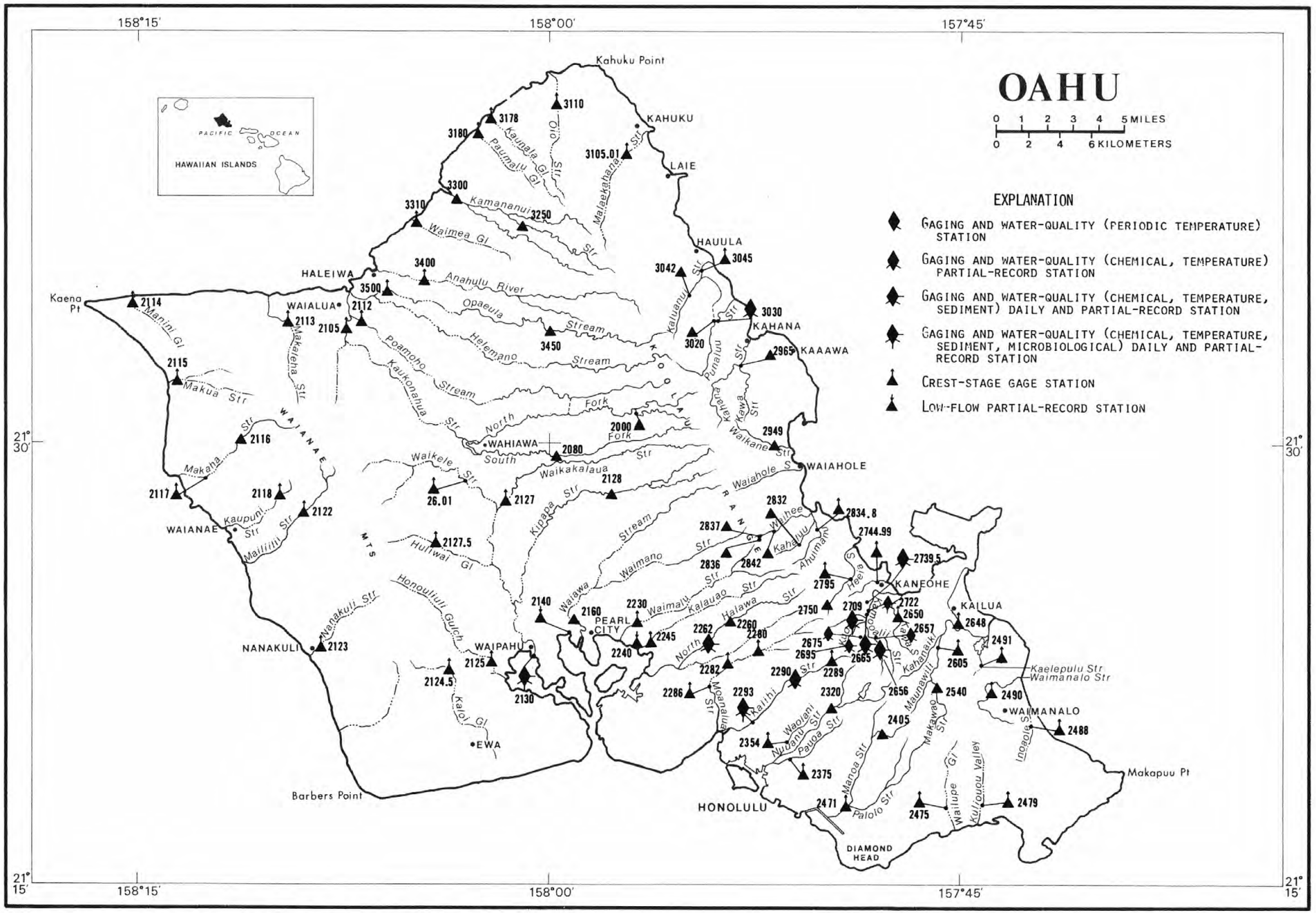

FIGURE 4.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON OAHU.

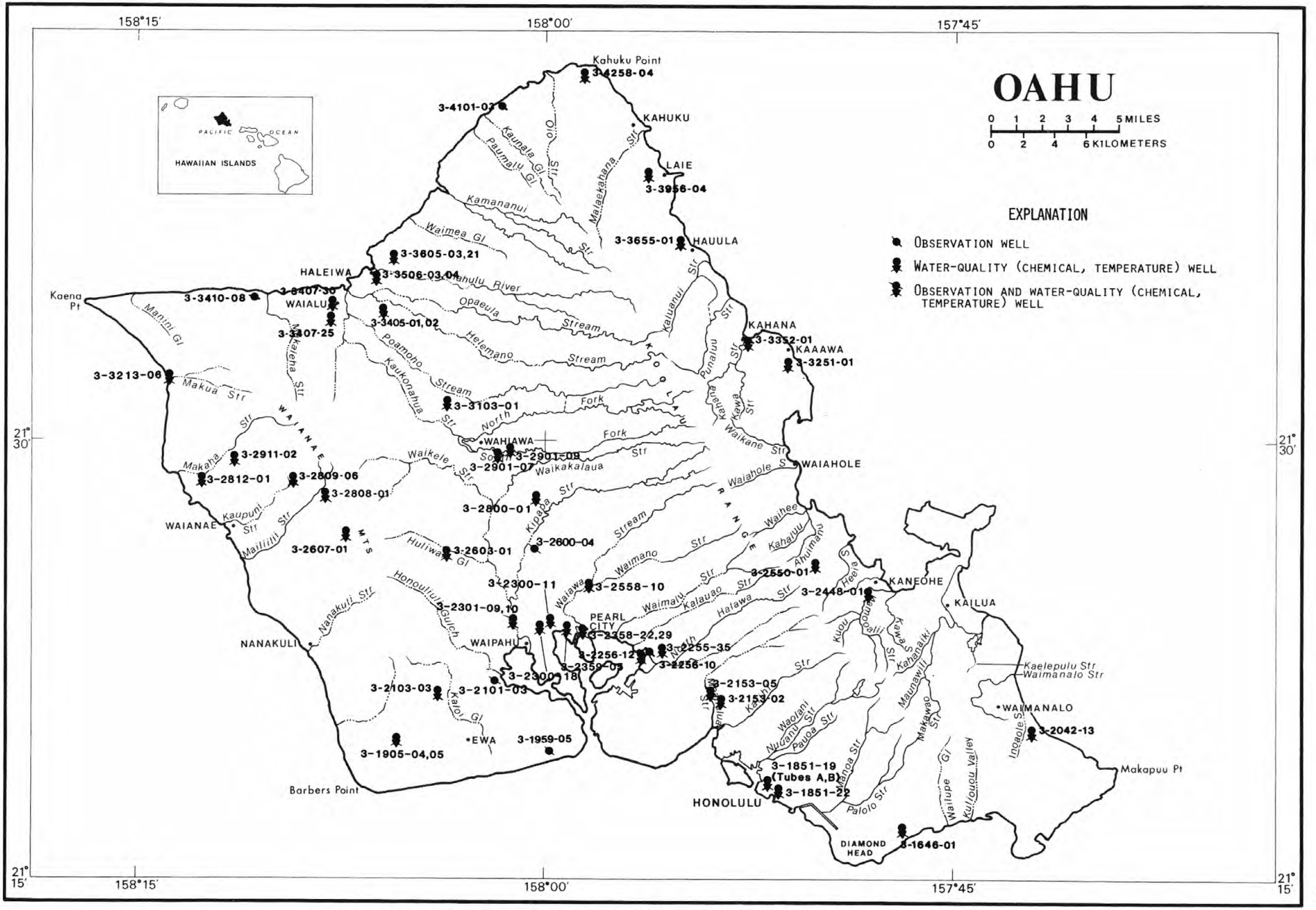

FIGURE 5.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON OAHU.

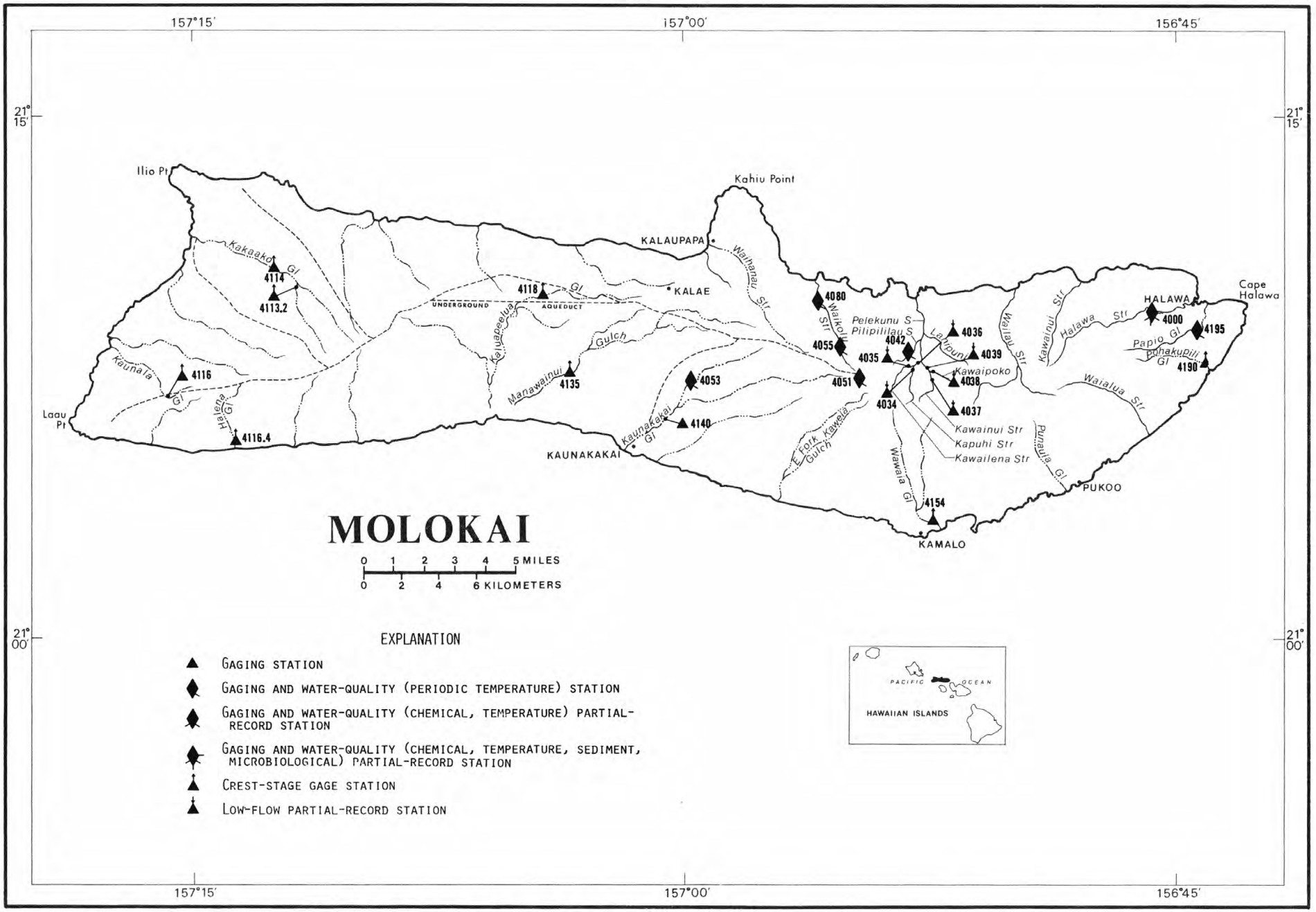

FIGURE 6.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MOLOKAI.

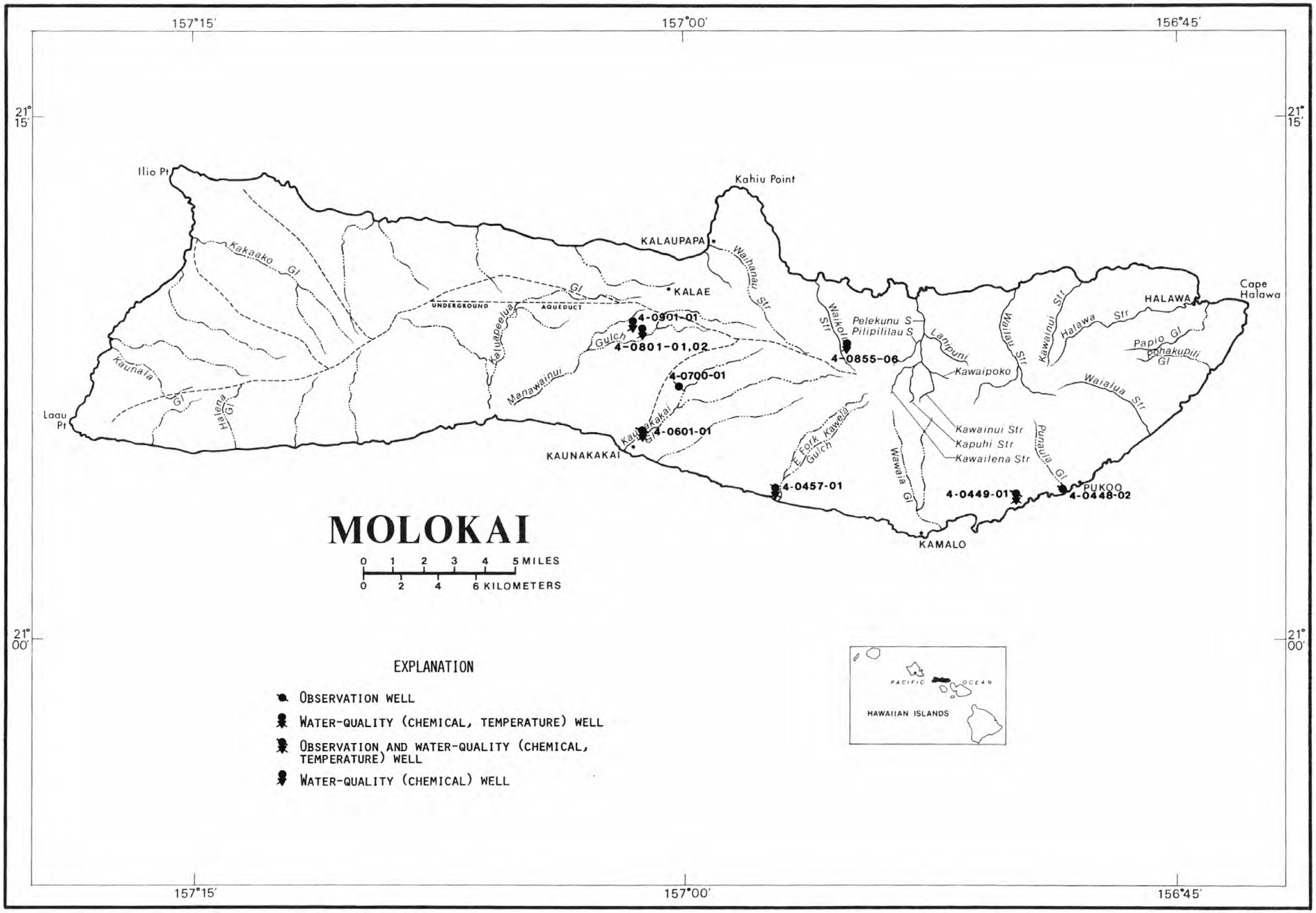

FIGURE 7.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MOLOKAI.

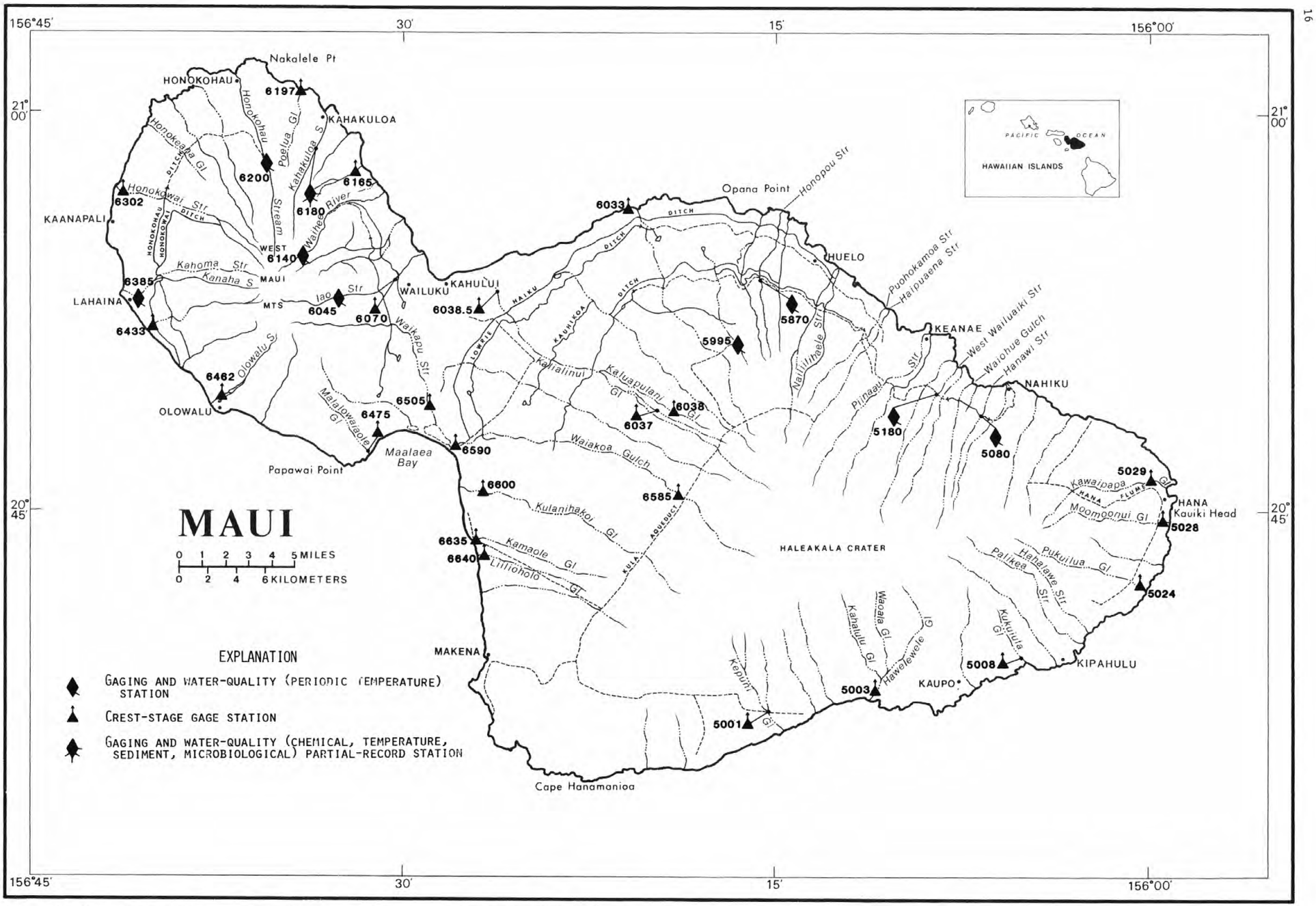

FIGURE 8.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON MAUI.

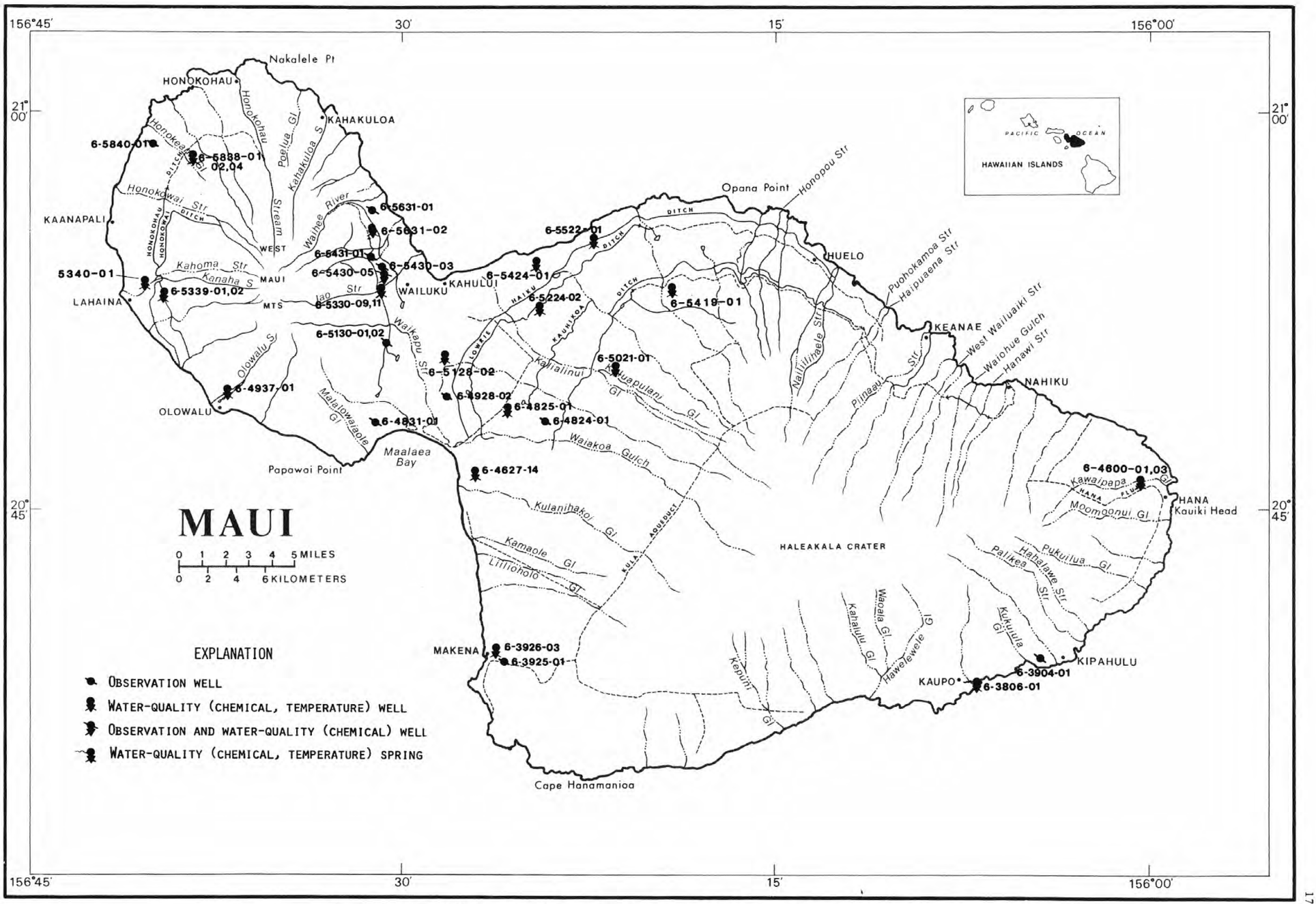

FIGURE 9.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON MAUI.

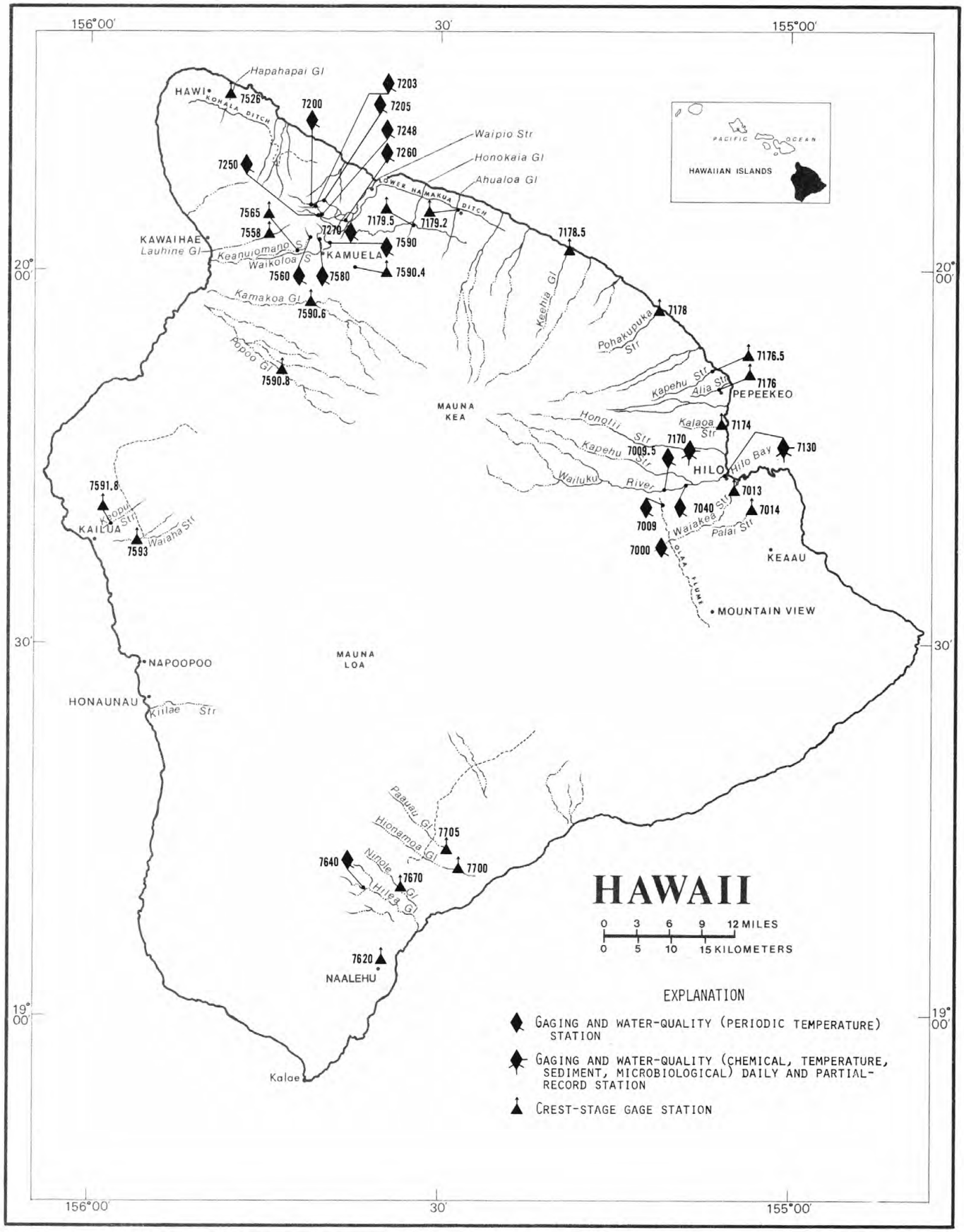

FIGURE 10.--LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS ON HAWAII.

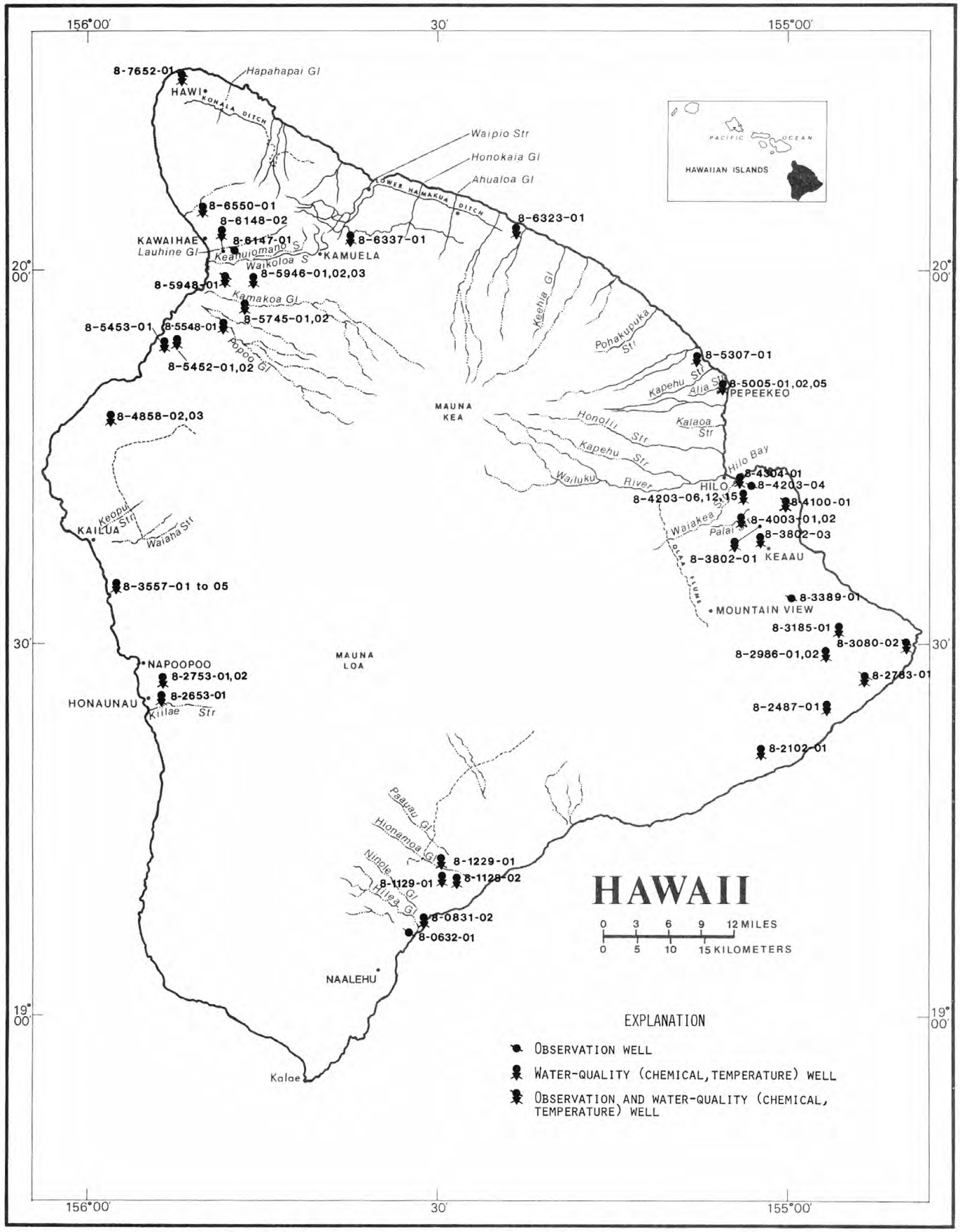

FIGURE 11.--LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES ON HAWAII.

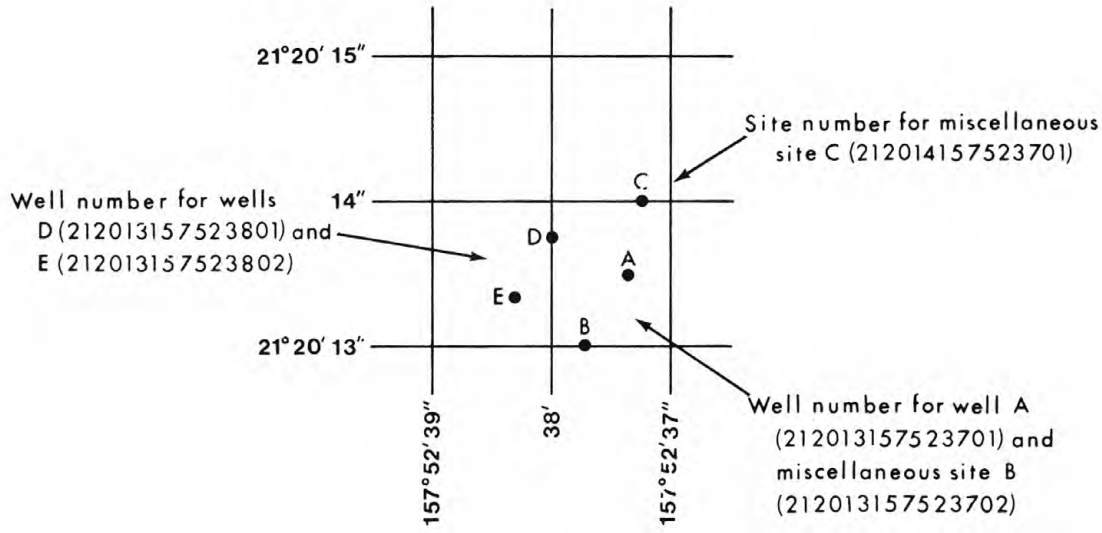

Figure 12. Sketch showing system for numbering wells and miscellaneous sites

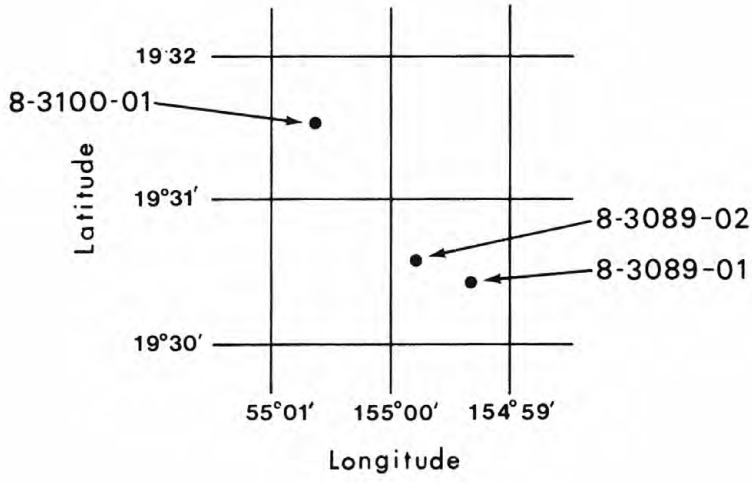

Figure 13. Sketch showing local well numbering system

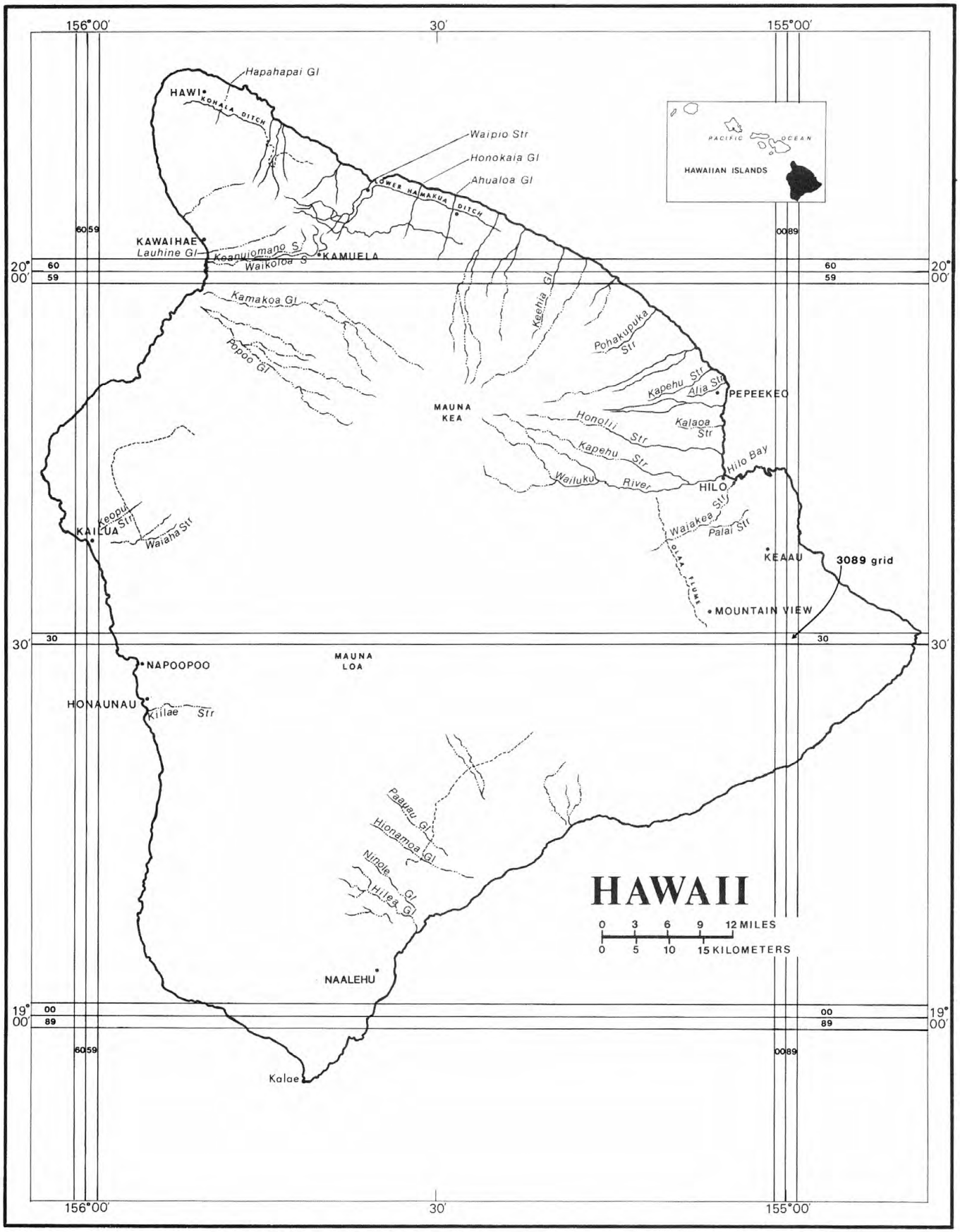

FIGURE 14.--MAP OF HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic bench-mark station is one that provides hydrologic data for a basin in which the hydrologic regimen will likely to be governed solely by natual conditions. Data collected at a bench-mark station may be used to separate effects of natural from manmade changes in other basins which have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped bench-mark basin.

National stream-quality accounting network is an accounting network designed by the U.S. Geological Survey to meet many of the information demands of agencies or groups involved in national or regional water-quality planning and management. Both accounting and broad-scale monitoring objectives have been incorporated in the network design. Areal configuration of the network is based on the river-basin accounting units designated by the Office of Water Data Coordination in consultation with the Water Resources Council. Primary objectives of the network are (1) to depict areal variability of water-quality conditions nationwide on a year-by-year basis and (2) to detect and assess long-term changes in stream quality.

EXPLANATION OF STAGE AND WATER-DISCHARGE RECORDS

Collection and computation of data

The base data collected at gaging stations consist of records of stage and measurements of discharge of streams or canals, and stage, surface area, and contents of lakes or reservoirs. In addition, observations of factors affecting the stage-discharge relation or the stage-capacity relation, weather records and other information are used to supplement base data in determining the daily flow or volume of water in storage. Records of stage are obtained from either direct readings on a nonrecording gage or from a water-stage recorder that gives either a continuous graph of the fluctuations or a tape punched at selected time intervals. Measurements of discharge are made with a current meter, using the general methods adopted by the Geological Survey. These methods are described in standard text books, in Water-Supply Paper 888, and in U.S. Geological Survey Techniques of Water Resources Investigations, book 3, chapter A6.

For stream-gaging stations, rating tables giving the discharge for any stage are prepared from stage-discharge relation curves. If extensions to the rating curves are necessary to express discharge greater than measured, they are made on the basis of indirect measurements of peak discharge (such as slope-area or contracted-opening measurements, computation of flow over dams or weirs), step-backwater techniques, velocity-area studies, and logarithmic plotting. The daily mean discharge is computed from gage heights and rating tables, then the monthly and yearly mean discharges are computed from the daily figures. If the stage-discharge relation is subject to change because of frequent of continual change in the physical features that form the control, the daily mean discharge is computed 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 basically the shifting-control method.

At some stream-gaging stations, the stage-discharge relation is affected by the backwater from reservoirs, tributary streams, or other sources. This necessitates the use of the slope method in which the slope or fall in a reach of the stream is a factor in computing discharge. The slope or fall is obtained by means of an auxiliary gage set at some distance from the base gage. At some stations the stage-discharge relation is affected by changing stage; at these stations the rate of change in stage is used as a factor in computing discharge.

For some gaging stations there are periods when no gage-height record is obtained or the recorded gage height is so faulty that it cannot be used to computed daily discharge or contents. This happens when the recorder stop or otherwise fails to operate properly, intakes are plugged, the float is frozen in the well, or for various other reasons. For such periods the daily discharges are estimated on the basis of recorded range in stage, prior and subsequent records, discharge measurements, weather records, and comparison with records for other stations, in the same or nearby basins. Likewise daily contents may be estimated on the basis of operator's log, prior and subsequent records, inflow-outflow studies, and other information.

The data in this report generally comprise a description of the station and tabulations of daily and monthly figures. For gaging stations on streams or canals a table showing the daily discharge and monthly and yearly discharge is given. For gaging station on lakes and reservoirs a monthly summary table of stage and contents or a table showing the daily contents is given. Tables of daily mean gage heights are included for some streamflow stations and for some reservoir stations. Records are published for the water year, which begins on October 1 and ends on September 30.

The description of the gaging station gives the location, drainage area, period of record, notations of revisions of previously published records, type and history of gages, general remarks, average discharge, and extremes of discharge or contents. The location of the gaging station and the drainage area are obtained from the most accurate maps available. Periods for which there are published records for the present station or for stations generally equivalent to the present one are given under "PERIOD OF RECORD."

Previously published streamflow 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 or compilation reports. In order to make it easier to find such revised records, a paragraph headed "REVISED RECORDS" 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 water years for which figures are revised in that report. In listing the water years only one number is given; for instance, 1965 stands for the water year October 1, 1964, to September 30, 1965. If no daily, monthly, or annual figures of discharge are affected by the revision, the 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 discharge were revised. If the drainage area has been revised, the report in which the revised figures was first published is given.

The type of gage currently in use, 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 record are given under "GAGE." In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the Topographic Division of the Geological Survey unless otherwise qualified.

Information pertaining to the accuracy of the discharge records and to conditions which affect the natural flow of the gaging station is given under "REMARKS." For reservoir stations information on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir is given under "REMARKS."

The average discharge for the number of years indicated is given under "AVERAGE DISCHARGE", it is not given for stations having fewer than 5 complete years of record or for station where changes to water development during the period of record cause the figure to have little significance. In addition, the median of yearly mean discharges is given for stream-gaging stations having 10 or more complete years of record if the median differs from the average by more than 10 percent. Under "EXTREMES" are given first, the extremes for the period of record, second, information available outside the period of record, and last, those for the current year. Unless otherwise qualified, the maximum discharge (or contents) is the instantaneous maximum corresponding to the crest stage obtained by use of a water-stage recorder (graphic or digital), a crest-stage gage, or a nonrecording gage read at the time of the crest. If the maximum gage height did not occur on the same day as the maximum discharge (or contents), it is given separately. Similarly, the minimum is the instantaneous minimum unless otherwise qualified. For some stations peak discharges are listed with EXTREMES FOR THE CURRENT YEAR; if they are, all independent peaks, including the maximum for the year, above the selected base with time of occurrence and corresponding gage heights are published in tabular format. The base discharge, which is given in the table heading, is selected so that an average of about three peaks a year will be presented. Peak discharges are not published for any canals, ditches, drains, or for any stream for which the peaks are subject to substantial control by man. Time of day is expressed in 24-hour local standard time; for example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimums for these stations are published in a separate paragraph following the table of peaks.

The daily table for stream-gaging stations gives the mean discharge for each day and is followed by monthly and yearly summaries. In the monthly summary below the daily table, the line headed "TOTAL" gives the sum of the daily figures. The line headed "MEAN" gives the average flow in cubic feet per second during the month. The lines headed "MAX" and "MIN" give the maximum and minimum daily discharges, respectively, for the month. Discharge for the month also may be expressed in cubic feet per second per square mile (line headed "CFSM"), or in inches (line headed "IN"), or in acre-feet (line headed "AC-FT"). In the yearly summary below the monthly summary, the figures shown are the appropriate daily discharges for the calendar and water years.

Footnotes to the table of daily discharge are introduced by the word "NOTE." Footnotes are used to indicate periods for which the discharge is computed or estimated by special methods because of no gage-height record, backwater from various sources, or other unusual conditions. Periods of no gage-height record are indicated if the period is continuous for a month or more or includes the maximum discharge for the year. Periods of backwater from an unusual source, of indefinite stage relation, or of any other unusual condition at the gage site are indicated only if they are a month or more in length and the accuracy of the records is affected.

For most gaging station on lakes and reservoirs the data presented comprise a description of the station and a monthly summary table of stage and contents. For some reservoirs a table showing daily contents or stage is given. A skeleton table of capacity at given stages is published for all reservoirs for which records are published on a daily basis, but is not published for reservoirs for which only monthly data are given.

Data collected at partial-record stations follow the information for continuous-record sites. Data for partial-record discharge stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. The tables of partial-record stations are followed by a listing of discharge measurements made at sites other than continuous-record or partial-record stations. Occasionally, a series of discharge measurements are made within a short time period to investigate the seepage gains or losses along a reach of a stream or to determine the low-flow characteristics of an area. Such measurements are also given in special tables following the tables of partial-record stations.

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 interpretations of records.

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

Figures of daily mean discharge in this report are shown to the nearest hundredth of a cubic foot per second for discharges of less than 1 cfs; to tenths between 1.0 and 10 cfs; to whole numbers between 10 and 1,000 cfs; and to 3 significant figures above 1,000 cfs. The number of significant figures used is based solely on the magnitude of the figure.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff in inches are not published unless satisfactory adjustments can be made for diversions, for changes in contents of reservoirs, or for other changes incident to use and control. Evaporation from a reservoir is not included in the adjustments for changes in reservoir contents, unless it is so stated. Even at those stations where adjustments are made, large errors in computed runoff may occur if adjustments or losses are large in comparison with the observed discharge.

Records of discharge collected by agencies other than the Geological Survey

The National Water Data Exchange, Water Resources Division, U.S. Geological Survey, National Center, Reston, VA 22092, maintains an index of water-data sites not published by the Geological Survey. Information on records available at specific sites can be obtained upon request.

Other data available

Information of a more detailed nature than that published for most of the gaging stations such as observations of water temperature, discharge measurements, gage-height records, and rating tables is on file in the district office. Also most gaging-station records are available in computer-usable form and many statistical analyses have been made.

Information on the availability of unpublished data or statistical analyses may be obtained from the district office.

Publications

In each water-supply paper entitled, "Surface Water Supply of the United States" there is a list of numbers of preceding water-supply papers containing streamflow information for the area covered by that report. In addition, there is a list of numbers of water-supply papers containing detailed information on major floods in the area. Records for stations in Hawaii and other Pacific areas for the period October 1959 to September 1965, are in Water-Supply Paper 1937.

Two series of summary reports entitled, "Compilation of Records of Surface Waters of the United States" have been published; the first series covers the entire period of record through September 1950 (June 1950, for Hawaii), and the second series covers the period October 1950 to September 1960 (July 1950 to June 1960, for Hawaii and other Pacific areas). These reports contain summaries of monthly and annual discharge and monthend storage for all previously published records, as well as some record not contained in the annual series of water-supply papers. All records were reexamined and revised where warranted. Estimates of discharge were made to fill short gaps whenever practical. The yearly summary table for each gaging station lists the numbers of the water-supply papers in which daily records were published for that station. Records for stations in Hawaii and other Pacific areas are compiled in Water-Supply Paper 1319 through June 1950, in 1739 and 1751 for July 1950 to June 1960, in 1937 for October 1959 to September 1965, and 2137 for October 1966 to September 1970.

Special reports on major floods or droughts or of other hydrologic studies for the area have been issued in publications other than water-supply papers. Information relative to these reports may be obtained from the district.

EXPLANATION OF WATER-QUALITY RECORDS

Collection and examination of data

Surface water samples for analyses usually are collected at or near gaging stations. The water-quality records are given immediately following the discharge records at these stations.

The descriptive heading for water-quality records gives periods of record for the various types of water-quality data (chemical, specific conductance, biological determination, water temperatures, sediment discharge), period of record, and extremes of pertinent data, and general remarks.

For ground-water records, no descriptive statements are given; however, the well number, depth of well, date of sampling and/or other pertinent data are given in the table containing the chemical analyses of the ground water.

Water analysis

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey Techniques of Water-Resources Investigations listed on a following page.

One sample can define adequately the water-quality at a given time if the mixture of solutes throughout the stream cross section is homogeneous. However, the concentration of solutes at different locations in the cross section may vary widely with different rates of water discharge, depending on the source of material and the turbulence and mixing of the stream. Some streams must be sampled through several vertical sections to obtain a representative sample needed for an accurate mean concentration and for use in calculating load.

Chemical-quality data published in this report are considered to be the most representative values available for the stations listed. The values reported represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis.

For chemical-quality stations equipped with digital monitors, the records consist of daily maximum, minimum, and mean values for each constituent measured and are based upon hourly punches beginning at 0100 hours and ending at 2400 hours for the day of record. More detailed records (hourly values) may be obtained from the district office.

Water temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are taken at time of discharge measurements for water-discharge stations. Large streams have a small diel temperature change; shallow streams may have a daily range of several degrees and may follow closely the changes in air temperature. Some streams may be affected by waste-heat discharges.

At stations where recording instruments are used, either mean temperatures or maximum and minimum temperatures for each day are published.

Sediment

Suspended-sediment concentrations are determined from samples collected by using depth-integrating samplers. Samples usually are obtained several verticals in the cross section, or a single or a single sample may be obtained at a fixed point and a coefficient applied to determine the mean concentration in the cross sections.

During periods of rapidly changing flow or rapidly changing concentration, samples may have been collected more frequently (twice daily or, in some instances, hourly). The published sediment discharges for days of rapidly changing flow or concentration were computed by the subdivided day method (time-discharge weighted average). Therefore, for those days when the published sediment discharge value differs from the value computed as the product of discharge times mean concentration time 0.0027, the reader can assume that the sediment discharge for that day was computed by the subdivided day method. For periods when no samples were collected, daily loads of suspended sediment were estimated on the basis of water discharge, sediment concentrations observed immediately before and after the periods, and suspended-sediment loads for other periods of similar discharge.

At other stations, suspended-sediment samples were collected periodically at many verticals in the stream cross section. Although data collected periodically may represent conditions only at the time of observations, such data are useful in establishing seasonal relations between quality and streamflow in predicting long-term sediment-discharge characteristics of the stream.

In addition to the records of the quantities of suspended sediment, records of the periodic measurements of the particle-size distribution of the suspended sediment and bed material are included.

Publications

The annual series of water-supply papers that contain information on quality of surface waters in Hawaii and other Pacific areas are listed below.

Water year	WSP No.	Water year	WSP No.	Water year	WSP No.
1964	1966	1967	2016	1970	2160
1965	1966	1968	2016		
1966	1996	1969	2150		

EXPLANATION OF GROUND-WATER LEVEL RECORDS

Collection of the data

Only ground-water level data from a basic network of observation wells are published herein. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers.

Each well is identified by means of (1) a 15-digit number that is based on latitude and longitiude and (2) a local number that is provided for local needs. See figure 13.

Measurements are made in many types of wells, under varying conditions of access and at different temperatures, hence, neither the method of measurement nor the equipment can be standardized. At each observation well, however, the equipment and techniques used are those that will ensure that measurements at each well are consistent.

Water-level measurements in this report are given in feet with reference to either mean sea level (msl) or land-surface datum (lsd). Mean sea level is the datum plane on which the national network of precise levels is based; land-surface datum is a datum plane that is approximately at land surface at each well. If known, the altitude of the land-surface datum above mean sea level is given in the well description. The height of the measuring point (MP) above or below land-surface datum is given in each well description. Water levels in wells equipped with recording gages are reported for every fifth day and the end of each month (eom). To show the intraday variation in the ground-water levels caused by local pumping and tidal fluctuations, instantaneous maximum and minimum water levels are given with the mean water levels for the day.

Water levels are reportd to as many significant figures as can be justified by the local conditions. For example, in a measurement of a depth to water of several hundred feet, the error in determining the absolute value of the total depth to water may be a few tenths of a foot, whereas the error in determining the net change of water level between successive measurements may be only a hundredth or a few hundredths of a foot. For lesser depths to water the accuracy is greater. Accordingly, most measurements are reported to a hundredth of a foot, but some are given only to a tenth of a foot or a larger unit.

Publications

Publication of ground-water level data for the United States in Water-Supply Papers was begun by the Geological Survey in 1935. From 1935 through 1939, a single Water-Supply Paper for each year covering the entire nation was issued (Water-Supply Papers 777, 817, 840, 845, and 886). From 1940 through 1974, separate Water-Supply Papers were issued for 6 sections of the United States. Water-level data for Hawaii are in the Water-Supply Papers listed below each report containing one or more calendar years (January-December) of data. Data in this report are for the 12-month water year ending September 30.

Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.	Calendar year	WSP No.
1935	777	1942	949	1949	1161	1956-60	1770
1936	817	1943	991	1950	1170	1961-65	1855
1937	840	1944	1021	1951	1196	1966-70	2010
1938	845	1945	1028	1952	1226	1971-74	2162
1939	886	1946	1076	1953	1270		
1940	911	1947	1101	1954	1326		
1941	941	1948	1131	1955	1409		

ACCESS TO WATSTORE DATA

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General inquiries about WATSTORE may be directed to:

Chief Hydrologist
U.S. Geological Survey
437 National Center
Reston, Virginia 22092

The U.S. Geological Survey publishes a series of manuals describing procedures for planning and conducting specialized work in water-resources investigations. The material is grouped under major subject headings called books and is further divided into sections and chapters. For example, Section A of Book 3 (Applications of Hydraulics) pertains to surface water. The chapter, the unit of publication, is limited to a narrow field of subject matter. This format permits flexibility in revision and publication as the need arises.

The reports listed below are for sale by the U.S. Geological Survey, Books and Open-File Reports Section, Federal Center, Box 25425, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

1-D1. Water temperature--influential factors, field measurement, and data presentation, by H. H. Stevens, Jr., J. F. Ficke, and G. F. Smoot: USGS--TWRI Book 1, Chapter D1. 1975. 65 pages.

1-D2. Guidelines for collection and field analysis of ground-water samples for selected unstable constituents, by W. W. Wood: USGS--TWRI Book 1, Chapter D2. 1976. 24 pages.

2-D1. Application of surface geophysics to ground-water investigations, by A. A. R. Zohdy, G. P. Eaton, and D. R. Mabey: USGS--TWRI Book 2, Chapter D1. 1974. 116 pages.

2-E1. Application of borehole geophysics to water-resources investigations, by W. S. Keys and L. M. MacCary: USGS--TWRI Book 2, Chapter E1. 1971. 126 pages.

3-A1. General field and office procedures for indirect discharge measurements, by M. A. Benson and Tate Dalrymple: USGS--TWRI Book 3, Chapter A1. 1967. 30 pages.

3-A2. Measurement of peak discharge by the slope-area method, by Tate Dalrymple and M. A. Benson: USGS--TWRI Book 3, Chapter A2. 1967. 12 pages.

3-A3. Measurement of peak discharge at culverts by indirect methods, by G. L. Bodhaine: USGS--TWRI Book 3, Chapter A3. 1968. 60 pages.

3-A4. Measurement of peak discharge at width contractions by indirect methods, by H. J. Matthai: USGS--TWRI Book 3, Chapter A4. 1967. 44 pages.

3-A5. Measurement of peak discharge at dams by indirect methods, by Harry Hulsing: USGS--TWRI Book 3, Chapter A5. 1967. 29 pages.

3-A6. General procedure for gaging streams, by R. W. Carter and Jacob Davidian: USGS--TWRI Book 3, Chapter A6. 1968. 13 pages.

3-A7. Stage measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3. Chapter A7. 1968. 28 pages.

3-A8. Discharge measurements at gaging stations, by T. J. Buchanan and W. P. Somers: USGS--TWRI Book 3, Chapter A8. 1969. 65 pages.

3-A9. Measurement of time of travel and dispersion in streams by dye tracing, by E. F. Hubbard, F. A. Kilpatrick, L. A. Martens, and J. F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1982. 44 pages.

3-A10. Discharge ratings at gaging stations, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

3-A11. Measurement of discharge by moving-boat method, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 3, Chapter A11. 1969. 22 pages.

3-A12. Fluorometric procedures for dye tracing, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A12. 1986. 41 pages.

3-A13. Computation of continuous records of streamflow, by E. J. Kennedy: USGS--TWRI Book 3, Chapter A13. 1983. 53 pages.

3-A14. Use of flumes in measuring discharge, by F. A. Kilpatrick and V. R. Schneider: USGS--TWRI Book 3, Chapter A14. 1983. 46 pages.

3-A15. Computation of water-surface profiles in open channels, by Jacob Davidian: USGS--TWRI Book 3, Chapter A15. 1984. 48 pages.

3-A16. Measurement of discharge using tracers, by F. A. Kilpatrick and E. D. Cobb: USGS--TWRI Book 3, Chapter A16. 1985. 52 pages.

3-A17. Acoustic velocity meter systems, by Antonius Laenen: USGS--TWRI Book 3, Chapter A17. 1985. 38 pages.

3-B1. Aquifer-test design, observation, and data analysis, by R. W. Stallman: USGS--TWRI Book 3, Chapter B1. 1971. 26 pages.

3-B2. Introduction to ground-water hydraulics, a programed test for self-instruction, by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 pages.

3-B3. Type curves for selected problems of flow to wells in confined aquifers, by J. E. Reed: USGS--TWRI Book 3, Chapter B3. 1980. 106 pages.

3-B5. Definition of boundary and initial conditions in the analysis of saturated ground-water flow systems--An introduction, by O. L. Franke, T. E. Reilly, and G. D. Bennett: USGS--TWRI Book 3, Chapter B5. 1987. 15 pages.

3-B6. The principle of superposition and its application in ground-water hydraulics, by T. E. Reilly, O. L. Franke, and G. D. Bennett: USGS--TWRI Book 3, Chapter B6. 1987. 28 pages.

3-C1. Fluvial sediment concepts, by H. P. Guy: USGS--TWRI Book 3, Chapter C1. 1970. 55 pages.

3-C2. Field methods for measurement of fluvial sediment, by H. P. Guy and V. W. Norman: USGS--TWRI Book 3, Chapter C2. 1970. 59 pages.

3-C3. Computation of fluvial-sediment discharge, by George Porterfield: USGS--TWRI Book 3, Chapter C3. 1972. 66 pages.

4-A1. Some statistical tools in hydrology, by H. C. Riggs: USGS--TWRI Book 4, Chapter A1. 1968. 39 pages.

4-A2. Frequency curves, by H. C. Riggs: USGS--TWRI Book 4, Chapter A2. 1968. 15 pages.

4-B1. Low-flow investigations, by H. C. Riggs: USGS--TWRI Book 4, Chapter B1. 1972. 18 pages.

4-B2. Storage analyses for water supply, by H. C. Riggs and C. H. Hardison: USGS--TWRI Book 4, Chapter B2. 1973. 20 pages.

4-B3. Regional analyses of streamflow characteristics, by H. C. Riggs: USGS--TWRI Book 4, Chapter B3. 1973. 15 pages.

4-D1. Computation of rate and volume of stream depletion by wells, by C. T. Jenkins: USGS-TWRI Book 4, Chapter D1. 1970. 17 pages.

5-A1. Methods for determination of inorganic substances in water and fluvial sediments, by M. W. Skougstad and others, editors: USGS--TWRI Book 5, Chapter A1. 1979. 626 pages.

5-A2. Determination of minor elements in water by emission spectroscopy, by P. R. Barnett and E. C. Mallory, Jr.: USGS--TWRI Book 5, Chapter A2. 1971. 31 pages.

5-A3. Methods for analysis of organic substances in water, by D. F. Goerlitz and Eugene Brown: USGS--TWRI Book 5, Chapter A3. 1972. 40 pages.

5-A4. Methods for collection and analysis of aquatic biological and microbiological samples, edited by P. E. Greeson, T. A. Ehlke, G. A. Irwin, B. W. Lium, and K. V. Slack: USGS--TWRI Book 5, Chapter A4. 1977. 332 pages.

5-A5. Methods for determination of radioactive substances in water and fluvial sediments, by L. L. Thatcher, V. J. Janzer, and K. W. Edwards: USGS--TWRI Book 5, Chapter A5. 1977. 95 pages.

5-A6. Quality assurance practices for the chemical and biological analyses of water and fluvial sediments, by L. C. Friedman and D. E. Erdmann: USGS--TWRI Book 5, Chapter A6. 1982. 181 pages.

5-C1. Laboratory theory and methods for sediment analysis, by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 pages.

6-A1. A modular three-dimensional finite-difference ground-water flow model, by M. G. McDonald and A. W. Harbaugh: USGS--TWRI Book 6, Chapter A1. 1988. 586 pages.

7-C1. Finite difference model for aquifer simulation in two dimensions with results of numerical experiments, by P. C. Trescott, G. F. Pinder, and S. P. Larson: USGS--TWRI Book 7, Chapter C1. 1976. 116 pages.

7-C2. Computer model of two-dimensional solute transport and dispersion in ground water, by L. F. Konikow and J. D. Bredehoeft: USGS--TWRI Book 7, Chapter C2. 1978. 90 pages.

7-C3. A model for simulation of flow in singular and interconnected channels, by R. W. Schaffrannek, R. A. Baltzer, and D. E. Goldberg: USGS--TWRI Book 7, Chapter C3. 1981. 110 pages.

8-A1. Methods of measuring water levels in deep wells, by M. S. Garber and F. C. Koopman: USGS--TWRI Book 8, Chapter A1. 1968. 23 pages.

8-A2. Installation and service manual for U.S. Geological Survey manometers, by J. D. Craig: USGS--TWRI Book 8, Chapter A2. 1983. 57 pages.

8-B2. Calibration and maintenance of vertical-axis type current meters, by G. F. Smoot and C. E. Novak: USGS--TWRI Book 8, Chapter B2. 1968. 15 pages.

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

LOCATION.--Lat 22°08'09", long 159°37'22", Hydrologic Unit 20070000, on left bank 0.2 mi upstream from Kokee-Mohihi Road crossing, 2.5 mi east of Kokee Lodge, and 12.5 mi north of Waimea.

DRAINAGE AREA.--3.95 mi^2.

PERIOD OF RECORD.--April 1909 to October 1912, December 1912 to March 1913, May 1913 to June 1915, August 1915 to May 1916, July to December 1916, July 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 555: 1920-21. WSP 1185: 1914-17(M), 1920-38(M), 1940-43(M), 1947(M). WSP 1719: 1912, 1921-25, 1927-32, 1936. WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,420 ft, by barometer. Prior to May 26, 1910, nonrecording gage at site 300 ft downstream at different datum.

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--71 years (water years 1912, 1914, 1920-88), 34.4 ft^3/s (25,000 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s Jan. 13, 1967, gage height, 15.33, from rating curve extended above 470 ft^3/s on basis of slope-area measurements at gage heights 12.12 ft and 13.43 ft; minimum, 1.14 ft^3/s, Sept. 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,100 ft^3/s and maximim (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 5	0230	*5,970	*11.87	Dec. 17	0700	4,180	10.08

Mininum discharge, 3.7 ft^3/s, June 3, Sept. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	129	18	761	17	9.4	79	20	8.4	4.1	4.6	12
2	15	45	15	171	16	8.5	116	18	7.8	4.1	4.3	7.2
3	12	95	14	211	18	8.0	71	17	7.4	3.9	90	5.9
4	20	531	13	53	42	7.5	69	14	7.1	14	13	5.3
5	58	691	42	41	18	7.3	42	14	6.9	15	26	4.9
6	21	106	32	32	14	7.1	23	102	6.7	9.3	31	5.1
7	16	42	15	26	12	6.9	19	132	7.2	161	19	4.7
8	11	26	12	22	12	6.6	16	29	9.5	138	24	4.4
9	8.5	21	12	20	11	6.4	18	18	15	132	16	5.1
10	7.8	18	11	42	10	6.3	42	36	13	40	8.3	30
11	24	15	11	31	11	6.2	26	124	8.8	24	45	14
12	86	14	77	19	10	5.9	14	76	6.7	55	17	7.5
13	46	13	181	16	9.6	13	11	92	5.9	35	8.5	5.8
14	14	13	342	14	8.9	29	9.6	218	5.5	79	6.8	4.7
15	17	185	345	14	8.5	34	27	107	5.3	21	6.6	4.2
16	19	24	89	30	8.3	12	32	30	5.2	12	7.2	3.9
17	12	69	814	20	8.0	11	20	22	5.0	9.3	8.0	3.8
18	11	65	131	15	7.7	8.6	11	19	4.8	8.0	7.2	5.1
19	13	84	52	12	7.5	18	9.2	17	4.6	7.3	6.1	7.4
20	15	57	40	11	7.4	172	8.5	15	4.6	7.1	25	5.3
21	15	317	30	11	7.0	48	7.9	14	4.8	6.7	25	4.4
22	58	38	25	10	83	33	7.5	13	5.0	6.6	17	12
23	24	33	22	476	18	33	7.5	13	5.5	6.5	10	42
24	13	27	19	1030	99	15	7.3	14	9.7	5.7	7.2	13
25	9.4	52	17	247	240	11	161	13	6.7	6.5	5.9	7.4
26	8.3	73	43	73	22	9.7	150	16	4.9	6.2	5.4	8.8
27	8.5	29	23	49	14	8.3	78	18	4.4	5.3	5.1	99
28	10	72	17	33	13	21	158	13	4.1	5.1	7.2	31
29	21	34	15	26	11	15	56	13	4.0	5.9	46	15
30	48	22	320	22	---	42	25	9.9	3.8	5.5	35	8.6
31	14	---	274	19	---	85	---	9.0	---	5.3	23	---
TOTAL	672.5	2940	3071	3557	763.9	704.7	1321.5	1265.9	198.3	844.4	560.4	387.5
MEAN	21.7	98.0	99.1	115	26.3	22.7	44.0	40.8	6.61	27.2	18.1	12.9
MAX	86	691	814	1030	240	172	161	218	15	161	90	99
MIN	7.8	13	11	10	7.0	5.9	7.3	9.0	3.8	3.9	4.3	3.8
AC-FT	1330	5830	6090	7060	1520	1400	2620	2510	393	1670	1110	769

CAL YR 1987	TOTAL	17053.8	MEAN	46.7	MAX	814	MIN	4.5	AC-FT	33830
WTR YR 1988	TOTAL	16287.1	MEAN	44.5	MAX	1030	MIN	3.8	AC-FT	32310

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA

LOCATION.--Lat 22°05'20", long 159°34'18", Hydrologic Unit 20070000, on left bank 5.0 mi northeast of mouth, 6.4 mi southeast of Kokee Lodge, and 11 mi northeast of Waimea.

DRAINAGE AREA.--1.79 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--January 1920 to July 1932, June 1952 to current year. Prior to July 1954, published as Waialae River at altitude 3,700 ft near Waimea.

REVISED RECORDS.--WSP 1937: 1921, 1922-32(M), 1953(M), 1954. WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 3,820 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharge, which are fair. No diversion upstream.

AVERAGE DISCHARGE.--47 years (water years 1921-31, 1953-88), 21.8 ft^3/s (15,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft^3/s Jan. 16, 1921, gage height, 8.44 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 4.60 ft; minimum, 0.99 ft^3/s, May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,250 ft^3/s Dec. 13, gage height, 4.41 ft, no peak greater than base discharge of 1,300 ft^3/s; minimum, 2.2 ft^3/s, Sept. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	60	7.2	e100	4.8	3.4	38	e5.0	e3.2	e2.7	3.0	3.6
2	59	35	5.8	e40	4.2	2.8	34	e4.7	e3.2	e2.7	2.7	2.9
3	17	18	5.2	e50	4.2	2.6	59	e4.0	e3.1	e2.6	114	2.6
4	8.8	112	4.8	18	4.5	2.4	55	e3.5	e3.1	e4.5	14	2.4
5	14	187	e10	9.6	3.8	2.4	18	e3.5	e3.0	e6.0	11	2.2
6	7.2	27	10	e8.0	3.4	2.4	10	e15	e3.1	e4.5	6.4	2.9
7	5.2	14	5.5	e7.0	3.2	2.4	27	e25	e3.2	29	7.0	2.5
8	4.8	9.2	4.8	e6.4	3.2	2.3	11	e6.0	e3.7	77	15	2.5
9	4.2	7.2	4.7	6.0	3.2	2.4	9.2	e4.0	e4.2	29	11	6.8
10	6.4	5.8	e141	6.0	3.0	2.6	18	e7.0	e4.0	25	5.2	34
11	23	5.0	e104	5.8	3.8	2.3	11	e20	e3.5	37	44	12
12	32	4.2	e456	5.0	4.5	2.0	6.8	e15	e3.2	36	19	21
13	9.2	4.0	e451	4.5	4.0	2.0	5.2	e17	e3.0	12	7.9	4.9
14	5.5	3.8	e88	4.0	3.5	2.4	4.5	e35	e2.9	83	5.9	3.2
15	63	5.0	e80	3.8	3.8	5.0	4.2	e20	e2.8	14	8.1	2.7
16	19	5.2	e40	9.6	16	4.0	4.2	e8.0	e2.7	7.1	22	2.5
17	9.2	8.4	e100	16	5.8	2.9	4.0	e6.0	e2.6	4.9	8.3	2.4
18	6.4	11	e50	8.0	3.8	2.4	3.8	e5.0	e2.6	4.0	8.6	12
19	11	28	23	4.8	3.2	4.6	4.0	e4.5	e2.6	3.5	5.6	8.0
20	6.8	61	21	4.0	2.9	60	5.0	e4.0	e2.6	3.9	18	4.4
21	11	e322	15	3.5	2.8	36	5.5	e3.7	e2.7	3.5	11	4.3
22	14	18	11	3.4	3.0	12	4.2	e3.5	e2.9	3.9	11	9.3
23	12	18	8.8	12	2.9	44	e3.5	e3.5	e3.1	5.1	6.5	16
24	6.8	e29	7.6	e150	3.4	45	e8.0	e3.8	e3.5	4.0	4.4	6.6
25	5.5	14	6.8	81	24	10	e15	e3.6	e3.0	3.3	3.6	4.2
26	6.8	31	e21	18	5.8	5.8	e35	e4.5	e2.8	3.1	3.2	18
27	11	21	12	11	4.0	4.2	e20	e5.0	e2.7	2.9	3.0	185
28	7.2	e38	8.8	14	5.2	4.0	e35	e3.8	e2.6	2.9	3.4	23
29	6.4	17	7.2	10	4.5	3.5	e12	e3.8	e2.5	3.0	3.7	8.0
30	25	9.2	e56	6.8	---	26	e6.0	e3.4	e2.5	4.2	6.6	5.1
31	8.8	---	e50	5.5	---	56	---	e3.3	---	3.9	5.6	---
TOTAL	432.6	1128.0	1816.2	631.7	144.4	359.8	476.1	254.1	90.6	428.2	398.7	415.0
MEAN	14.0	37.6	58.6	20.4	4.98	11.6	15.9	8.20	3.02	13.8	12.9	13.8
MAX	63	322	456	150	24	60	59	35	4.2	83	114	185
MIN	4.2	3.8	4.7	3.4	2.8	2.0	3.5	3.3	2.5	2.6	2.7	2.2
AC-FT	858	2240	3600	1250	286	714	944	504	180	849	791	823

CAL YR 1987	TOTAL	6656.9	MEAN	18.2	MAX	456	MIN	2.3	AC-FT	13200
WTR YR 1988	TOTAL	6575.4	MEAN	18.0	MAX	456	MIN	2.0	AC-FT	13040

e Estimated

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT, NEAR WAIMEA--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB-ONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO
NOV												
10...	1005	5.9	28	7.20	15.0	6	2	0.91	0.98	4.1	57	0.7
JAN												
08...	1000	6.8	29	7.00	11.0	7	4	1.4	0.86	3.7	52	0.6
MAR												
02...	1015	3.0	30	--	12.5	8	3	1.4	1.2	3.9	49	0.6
MAY												
09...	1030	13	26	6.50	17.0	4	2	0.65	0.68	3.0	58	0.6
JUL												
06...	1020	18	34	6.80	18.0	9	4	1.4	1.3	2.9	40	0.4
SEP												
07...	1100	2.5	32	7.10	18.5	7	2	0.99	1.2	3.8	51	0.6

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
NOV											
10...	0.40	4.0	10	--	0.10	5.5	--	--	<0.100	350	4
JAN											
08...	0.40	3.0	7.9	6.9	0.10	5.5	29	0.04	<0.100	220	3
MAR											
02...	0.40	5.0	13	6.4	0.10	5.3	35	0.05	<0.100	360	3
MAY											
09...	0.30	2.0	16	6.5	0.10	3.7	32	0.04	<0.100	350	4
JUL											
06...	0.50	5.0	16	7.9	0.20	3.1	37	0.05	<0.100	490	7
SEP											
07...	0.40	5.0	8.4	6.7	<0.10	6.1	31	0.04	<0.100	330	2

< Actual value is known to be less than the value shown.

16031000 WAIMEA RIVER NEAR WAIMEA

(National stream-quality accounting network station)

LOCATION.--Lat 21°59'02", long 159°39'47", Hydrologic Unit 20070000, on right bank 1.3 mi upstream from Makaweli River and 1.9 mi north of Waimea Post Office.

DRAINAGE AREA.--57.8 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1910 to June 1918, July to October 1919, November 1943 to September 1968, October 1969 to September 1972 (discontinued as a continuous-record station, converted to a crest-stage partial-record station October 1972 to April 1975), May 1975 to current year.

GAGE.--Water-stage recorder. Datum of gage is 20.0 ft above mean sea level (Department of Water, County of Kauai bench mark). Prior to Oct. 5, 1911, nonrecording gage at site 1.0 mi downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, nonrecording gage at present site at different datum.

REMARKS.--Records good. Several upstream diversions for power and irrigation.

AVERAGE DISCHARGE.--47 years (water years 1911-17, 1945-68, 1970-72, 1976-88), 125 ft^3/s (90,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft^3/s Feb. 7, 1949, gage height, 19.3 ft, from rating curve extended above 5,200 ft^3/s on basis of slope-area measurements at gage heights 10.28 ft and 18.7 ft; practically no flow occasionally owing to upstream diversions.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Apr. 19, 1974, which destroyed the station reached a stage of 19.05 ft, from floodmarks, discharge, 29,100 ft^3/s, from rating curve extended above 2,200 ft^3/s on basis of slope-area measurement at gage height 19.05 ft.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 5	0630	8,760	11.18	Dec. 14	0400	*17,200	*14.88

Minimum discharge, 3.3 ft^3/s, Nov. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	32	12	2050	7.5	6.0	124	134	9.0	5.6	6.5	8.0
2	88	345	e7.6	1000	6.7	5.2	218	55	5.3	5.6	5.7	5.5
3	51	86	e6.8	745	7.7	5.1	149	26	4.6	6.5	307	5.4
4	21	1190	e6.4	280	7.5	5.2	193	13	4.8	6.9	57	5.8
5	67	2310	e6.8	170	9.0	5.2	68	22	4.8	13	11	5.6
6	25	283	e7.4	123	6.6	5.4	28	295	4.5	15	8.7	5.6
7	14	107	e8.0	102	6.0	5.2	15	1360	32	95	8.6	6.4
8	8.4	34	e7.0	95	5.8	5.2	29	175	31	392	8.9	7.2
9	7.9	14	e6.6	85	5.5	5.6	8.3	57	9.4	94	26	41
10	8.5	8.4	e6.4	78	5.8	5.8	7.6	24	36	109	10	32
11	11	6.2	e6.2	107	36	5.7	28	103	17	27	23	69
12	133	5.2	e350	76	41	5.5	9.3	208	6.7	82	72	23
13	143	5.4	e1100	69	40	5.4	6.2	129	5.1	29	20	12
14	11	5.2	e3000	60	38	5.4	5.8	325	5.1	147	8.2	6.4
15	176	223	1930	47	37	6.2	5.9	436	5.0	68	7.2	5.4
16	157	43	1190	12	45	8.3	7.7	52	4.4	10	8.4	5.4
17	61	58	6050	47	58	6.4	8.4	20	5.1	7.1	18	5.7
18	29	54	1900	33	39	5.6	6.2	10	5.8	6.1	8.1	5.4
19	22	155	618	19	12	5.4	5.4	8.0	5.3	6.0	8.1	13
20	21	82	387	9.8	6.0	172	5.5	7.7	5.3	5.8	7.1	8.2
21	7.4	1340	284	8.7	5.7	211	5.9	7.1	5.3	5.2	31	6.3
22	43	121	213	8.3	33	38	5.9	6.5	6.0	5.8	10	6.0
23	21	53	170	436	18	50	5.6	6.3	6.1	6.2	8.8	13
24	15	70	139	2550	6.2	76	5.4	6.7	5.8	7.1	6.9	28
25	7.0	62	122	1140	360	27	5.2	6.9	6.3	6.5	5.9	8.7
26	5.9	130	136	202	34	10	457	6.3	6.1	7.2	6.1	7.0
27	7.2	62	156	101	7.5	6.3	72	7.1	5.3	6.4	6.2	566
28	11	55	112	46	20	11	306	7.3	5.1	5.7	6.0	203
29	7.5	143	100	38	41	33	173	6.7	5.2	6.2	6.1	28
30	30	27	526	17	---	8.6	87	7.7	5.4	6.3	13	6.5
31	41	---	567	9.7	---	219	---	17	---	6.1	11	---
TOTAL	1279.8	7109.4	19131.2	9764.5	945.5	969.7	2051.3	3545.3	262.8	1199.3	740.5	1148.5
MEAN	41.3	237	617	315	32.6	31.3	68.4	114	8.76	38.7	23.9	38.3
MAX	176	2310	6050	2550	360	219	457	1360	36	392	307	566
MIN	5.9	5.2	6.2	8.3	5.5	5.1	5.2	6.3	4.4	5.2	5.7	5.4
AC-FT	2540	14100	37950	19370	1880	1920	4070	7030	521	2380	1470	2280

CAL YR 1987	TOTAL	43091.3	MEAN	118	MAX	6050	MIN	4.7	AC-FT	85470
WTR YR 1988	TOTAL	48147.8	MEAN	132	MAX	6050	MIN	4.4	AC-FT	95500

e Estimated

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1971-74, November 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
13...	1030	762	104	43	6.80	21.5	250	8.7	99	4300
DEC										
22...	1030	762	208	83	7.20	19.0	2.3	9.8	106	230
FEB										
24...	1030	760	6.4	134	7.30	22.0	7.1	8.9	102	720
MAR										
28...	0900	764	5.5	150	8.00	22.0	12	8.1	92	620
APR										
27...	1000	765	70	63	7.40	18.5	2.7	9.0	96	900
JUN										
13...	1030	766	4.7	150	7.80	25.0	13	8.6	104	880
AUG										
15...	1000	765	6.7	130	8.00	25.0	4.6	8.1	98	1000

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
13...	6700	12	2	1.6	1.9	4.1	42	0.5	0.40	13
DEC										
22...	270	27	6	3.9	4.2	6.0	32	0.5	0.70	24
FEB										
24...	580	50	1	6.3	8.3	7.6	24	0.5	1.0	--
MAR										
28...	1100	59	2	7.1	10	8.2	23	0.5	0.70	69
APR										
27...	1500	22	3	3.0	3.5	4.6	31	0.4	0.40	23
JUN										
13...	470	57	1	7.1	9.6	9.6	26	0.6	1.3	67
AUG										
15...	320	56	0	6.9	9.5	7.7	23	0.5	0.50	66

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
13...	0	10	11	12	2.1	0.20	9.3	51	39
DEC									
22...	0	21	20	6.0	13	0.10	16	73	63
FEB									
24...	--	49	--	5.5	10	0.10	21	85	90
MAR									
28...	0	57	57	6.9	11	0.10	21	92	99
APR									
27...	0	19	19	15	7.5	0.10	12	53	58
JUN									
13...	0	56	55	4.9	10	0.30	21	98	97
AUG									
15...	0	56	54	3.9	10	<0.10	22	98	94

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT									
13...	0.07	0.140	0.140	0.120	1.8	1.9	0.050	0.050	0.010
DEC									
22...	0.10	--	0.030	0.030	0.37	0.40	<0.010	<0.010	<0.010
FEB									
24...	0.12	<0.100	0.010	0.010	--	<0.20	0.020	<0.010	<0.010
MAR									
28...	0.13	<0.100	0.020	<0.010	0.28	0.30	0.010	0.010	<0.010
APR									
27...	0.07	<0.100	0.040	0.050	--	<0.20	0.020	0.010	<0.010
JUN									
13...	0.13	<0.100	<0.010	0.040	--	0.30	0.010	0.010	<0.010
AUG									
15...	0.13	<0.100	<0.010	<0.010	--	0.30	0.030	0.020	<0.010

< Actual value is known to be less than the value shown.

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
13...	1030	180	<1	2	<0.5	<1	<1	<3	4	320	<5
FEB											
24...	1030	80	<1	3	<0.5	1	2	<3	4	200	<5
MAR											
28...	0900	80	<1	2	<0.5	<1	<1	<3	4	140	<5
APR											
27...	1000	150	<1	2	<0.5	<1	<1	<3	2	310	<5
AUG											
15...	1000	60	<1	2	<0.5	<1	<1	<3	2	190	<5

DATE	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
13...	<4	12	0.2	<10	1	<1	<1.0	11	<6	10
FEB										
24...	<4	23	<0.1	<10	4	<1	1.0	41	<6	15
MAR										
28...	7	26	<0.1	<10	5	<1	1.0	46	<6	4
APR										
27...	<4	9	<0.1	<10	8	<1	<1.0	19	<6	6
AUG										
15...	<4	18	0.2	<10	2	<1	<1.0	42	<6	4

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
13...	1030	476	134	99
DEC				
22...	1030	5	2.8	100
FEB				
24...	1030	5	0.09	100
MAR				
28...	0900	6	0.09	100
APR				
27...	1000	6	1.1	100
JUN				
13...	1030	9	0.11	100
AUG				
15...	1000	8	0.14	100

< Actual value is known to be less than the value shown.

16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58'31", long 159°38'55", Hydrologic Unit 20070000, on left bank 0.7 mi upstream from mouth and 1.9 mi northeast of Waimea.

DRAINAGE AREA.--26.0 mi^2.

PERIOD OF RECORD.--July 1943 to current year. Records for October 1911 to June 1917 at site 0.2 mi downstream not equivalent owing to intervening diversion.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 18.2 ft above mean sea level (by stadia survey). Prior to June 16, 1959, at datum 1.00 ft higher.

REMARKS.--Records good except for estimated daily discharges, which are fair. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft^3/s capacity ditch diverts water from upstream of the station for irrigation of taro in the vicinity of the station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--45 years, 85.2 ft^3/s (61,730 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s Jan. 31, 1975, gage height, 15.51 ft, from rating curve extended above 3,200 ft^3/s on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.15 ft^3/s, July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,330 ft^3/s Dec. 13, gage height, 7.94 ft, no peak greater than base discharge of 4,700 ft^3/s; minimum, 5.5 ft^3/s, Sept. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e14	157	16	248	35	12	62	254	12	11	9.3	10
2	e150	119	14	186	56	11	56	225	11	12	9.0	9.5
3	e250	30	14	152	59	11	107	62	11	11	317	7.8
4	e50	370	13	79	60	11	127	79	9.9	53	80	7.5
5	e40	292	12	62	46	11	38	86	9.5	34	38	7.4
6	e30	43	12	57	18	11	26	292	20	17	16	9.3
7	e22	27	12	54	16	13	98	642	158	28	17	11
8	17	22	11	51	16	18	30	158	38	124	126	18
9	15	20	11	51	15	13	28	60	57	33	32	25
10	21	26	11	54	15	17	24	38	106	57	15	181
11	41	52	56	57	20	14	23	51	25	93	173	89
12	90	16	280	50	16	12	17	172	16	94	124	106
13	19	15	1880	49	14	11	15	156	13	24	42	20
14	14	15	1080	48	14	11	14	140	12	205	22	13
15	203	18	564	55	13	12	14	130	11	39	30	11
16	105	18	306	122	47	12	16	31	11	20	44	11
17	31	13	1740	145	18	11	16	26	11	15	38	9.6
18	e22	13	537	63	14	11	13	22	9.5	14	33	30
19	e200	13	205	56	13	96	12	19	9.5	12	19	19
20	e45	80	158	48	13	132	18	18	9.5	11	50	8.8
21	e110	940	124	33	12	90	14	17	9.6	12	24	7.2
22	e130	130	102	27	12	26	12	17	15	64	19	22
23	e60	118	80	42	12	98	11	21	12	19	16	18
24	20	176	81	415	14	161	11	18	9.7	13	13	14
25	16	46	65	151	19	32	20	17	9.6	11	12	12
26	28	113	134	35	17	23	119	16	9.0	9.5	12	42
27	34	52	128	28	23	17	27	17	9.0	9.7	12	395
28	20	55	76	76	29	31	132	14	9.0	8.9	11	101
29	17	34	70	30	14	52	85	15	8.8	8.9	15	27
30	107	19	122	24	---	94	304	43	8.4	11	15	18
31	26	---	150	22	---	175	---	13	---	11	13	---
TOTAL	1947	3042	8064	2570	670	1249	1489	2869	660.0	1085.0	1396.3	1260.1
MEAN	62.8	101	260	82.9	23.1	40.3	49.6	92.5	22.0	35.0	45.0	42.0
MAX	250	940	1880	415	60	175	304	642	158	205	317	395
MIN	14	13	11	22	12	11	11	13	8.4	8.9	9.0	7.2
AC-FT	3860	6030	15990	5100	1330	2480	2950	5690	1310	2150	2770	2500

CAL YR 1987	TOTAL	20389.0	MEAN	55.9	MAX	1880	MIN	7.7	AC-FT 40440
WTR YR 1988	TOTAL	26301.4	MEAN	71.9	MAX	1880	MIN	7.2	AC-FT 52170

e Estimated

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

LOCATION.--Lat 21°57'29", long 159°33'13", Hydrologic Unit 20070000, on left bank 200 ft downstream from Manuahi Stream and 4.0 mi northeast of Eleele.

DRAINAGE AREA.--18.5 mi^2.

PERIOD OF RECORD.--July 1917 to January 1921, December 1926 to current year. Prior to July 1952, published as "at Koula, near Eleele." Records for August 1910 to December 1916 at site 0.5 mi upstream not equivalent owing to intervening inflow.

REVISED RECORDS.--WSP 740: 1931. WSP 1719: 1929-31(M). WSP 1937: 1918, 1919(M), 1920, 1921(M), 1927-28(M), 1930, 1936-37(M), 1941(P), 1943-46(P), 1947(M), 1948-52(P), 1955(M), 1956-57(P), 1958(M), 1960(M). WSP 2137: Drainage area.

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

REMARKS.--Records good . Koula ditch diverts 3.0 mi upstream for irrigation in vicinity of Makaweli. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years 1918-20, 1928-88), 84.7 ft^3/s (61,440 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft^3/s Apr. 15, 1963, gage height, 14.87 ft, from rating curve extended above 7,600 ft^3/s on basis of slope-area measurement of peak flow; minimum, 5.1 ft^3/s, May 21, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 3,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1230	3,660	6.04	Dec. 13	1300	*4,880	*6.85

Minimum discharge, 13 ft^3/s, Mar. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	327	e17	43	15	21	78	464	18	22	16	17
2	274	278	e16	37	15	14	62	378	18	18	16	17
3	371	76	e15	27	15	14	163	137	17	18	410	17
4	54	641	16	23	15	14	190	153	18	98	67	17
5	49	250	16	22	15	14	62	174	18	59	50	17
6	26	90	16	21	15	14	33	581	46	26	18	20
7	22	e48	16	20	15	14	153	888	185	29	17	18
8	21	e25	16	20	17	14	43	217	68	147	294	18
9	17	e22	16	20	15	14	37	85	72	53	66	19
10	43	e18	16	20	15	15	56	52	134	288	22	144
11	88	e18	96	23	21	14	29	61	39	150	317	47
12	119	16	440	19	15	14	21	181	26	178	194	43
13	33	16	1310	18	15	14	19	282	22	55	91	16
14	21	16	758	18	14	14	18	351	21	319	36	16
15	140	16	612	17	15	14	18	196	20	78	75	16
16	51	15	390	46	94	14	19	65	20	29	71	16
17	22	15	1490	111	16	14	19	54	20	22	51	16
18	21	15	591	22	15	14	17	36	20	19	43	29
19	307	15	e250	18	14	193	17	28	19	18	26	17
20	85	210	e125	17	14	360	19	25	18	20	74	16
21	206	1060	e80	17	14	138	17	26	18	18	32	19
22	225	98	e60	17	14	35	16	24	39	60	30	26
23	115	90	e40	18	14	126	17	30	18	22	21	19
24	47	282	e90	191	19	304	16	22	21	18	20	17
25	32	80	38	43	16	41	17	24	16	18	18	24
26	97	121	94	19	14	23	71	40	16	19	18	59
27	189	71	101	18	76	26	37	26	16	17	18	399
28	64	79	43	95	34	18	150	22	16	17	18	127
29	32	43	33	24	15	214	117	22	16	17	18	31
30	192	e21	47	15	---	557	605	65	17	18	20	20
31	61	---	37	15	---	335	---	19	---	16	18	---
TOTAL	3041	4072	6885	1034	601	2630	2136	4728	1012	1886	2185	1277
MEAN	98.1	136	222	33.4	20.7	84.8	71.2	153	33.7	60.8	70.5	42.6
MAX	371	1060	1490	191	94	557	605	888	185	319	410	399
MIN	17	15	15	15	14	14	16	19	16	16	16	16
AC-FT	6030	8080	13660	2050	1190	5220	4240	9380	2010	3740	4330	2530

CAL YR 1987	TOTAL	23493	MEAN	64.4	MAX	1490	MIN	13	AC-FT	46600
WTR YR 1988	TOTAL	31487	MEAN	86.0	MAX	1490	MIN	14	AC-FT	62450

e Estimated

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°02'24", long 159°22'58", Hydrologic Unit 20070000, on right bank 0.2 mi upstream from Wailua Falls and 4.3 mi north of Lihue.

DRAINAGE AREA.--22.4 mi^2.

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

REVISED RECORDS.--WSP 1249: 1941-47(M), 1948-51(P). WSP 1719: 1943-49. WSP 1937: 1958-60.

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

REMARKS.--Records good. Lihue and Hanamaulu ditches divert upstream for irrigation of sugarcane in vicinity of Lihue. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--71 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-88), 114 ft^3/s (82,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft^3/s Apr. 15, 1963, gage height, 22.90 ft, from rating curve extended above 13,000 ft^3/s on basis of slope-area measurement of peak flow; minimum, 1.5 ft^3/s, Aug. 21, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 5,800 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1100	*12,320	*16.48	Dec. 13	1430	11,360	16.24

Minimum discharge, 4.9 ft^3/s, June 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	286	76	434	151	41	206	223	56	17	26	9.0
2	379	279	49	308	121	50	164	286	45	20	25	8.1
3	386	173	40	216	111	45	187	466	10	10	273	8.7
4	109	2110	60	165	104	36	244	378	12	65	78	28
5	107	673	58	141	98	31	131	348	21	116	83	33
6	70	297	60	129	86	35	106	499	31	46	40	36
7	68	203	52	121	78	40	177	961	78	32	30	26
8	63	162	34	114	87	36	106	339	55	158	1090	15
9	40	116	11	107	83	30	118	204	87	96	342	15
10	67	86	12	106	80	33	127	144	151	317	135	27
11	56	117	81	103	92	7.1	73	125	79	157	437	33
12	202	107	617	50	77	6.0	24	288	58	144	360	55
13	109	96	2040	36	78	5.9	17	328	51	55	192	19
14	75	87	712	31	71	6.0	14	424	38	180	108	13
15	112	80	738	28	70	7.1	13	294	8.2	99	128	14
16	99	73	441	62	140	7.8	17	151	7.1	61	155	19
17	147	69	1740	170	84	7.2	29	156	6.6	50	115	14
18	256	52	1020	54	72	7.1	14	116	6.4	35	119	26
19	460	21	420	31	69	152	13	87	6.1	39	89	27
20	176	115	310	24	63	312	19	81	6.0	48	132	16
21	526	951	248	18	60	133	30	85	6.1	45	92	17
22	365	100	207	17	58	49	40	76	27	108	60	27
23	216	133	190	23	56	99	39	81	21	31	27	29
24	134	262	238	258	66	690	35	69	11	13	19	19
25	115	135	174	176	156	233	42	68	6.9	19	15	29
26	187	153	281	83	26	380	151	92	5.4	40	12	43
27	259	121	292	72	140	208	62	83	5.1	36	11	397
28	115	110	165	1620	112	132	88	65	5.0	32	30	713
29	87	100	148	693	49	365	89	61	5.1	31	26	167
30	205	83	234	341	---	748	223	150	5.7	33	12	89
31	93	---	204	211	---	568	---	68	---	29	11	---
TOTAL	5317	7350	10952	5942	2538	4500.2	2598	6796	910.7	2162	4272	1971.8
MEAN	172	245	353	192	87.5	145	86.6	219	30.4	69.7	138	65.7
MAX	526	2110	2040	1620	156	748	244	961	151	317	1090	713
MIN	34	21	11	17	26	5.9	13	61	5.0	10	11	8.1
AC-FT	10550	14580	21720	11790	5030	8930	5150	13480	1810	4290	8470	3910

CAL YR 1987	TOTAL	35887.3	MEAN	98.3	MAX	2110	MIN	3.9	AC-FT	71180
WTR YR 1988	TOTAL	55309.7	MEAN	151	MAX	2110	MIN	5.0	AC-FT	109700

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

LOCATION.--Lat 22°03'34", long 159°28'00", Hydrologic Unit 20070000, on left bank 380 ft downstream from Waikoko Stream, 8.1 mi west of Wailua, and 8.4 mi northwest of Lihue.

PERIOD OF RECORD.--January 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,070 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 23.3 ft^3/s (16,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft^3/s, Oct. 11, 1966; no flow, Jan. 1-18, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 33 ft^3/s, Jan. 28; minimum daily, 11 ft^3/s, Apr. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	27	19	30	24	24	27	29	22	21	20	21
2	31	25	18	27	23	23	26	30	22	21	20	21
3	29	26	18	26	23	22	27	30	22	21	27	21
4	24	30	18	24	23	22	28	29	22	25	24	20
5	24	27	18	24	23	22	25	29	22	24	23	20
6	23	24	17	23	22	23	24	30	23	23	22	22
7	24	22	17	22	22	23	28	31	25	23	22	22
8	22	21	17	22	22	22	25	28	23	26	30	21
9	22	20	17	21	24	22	27	26	25	24	26	21
10	24	20	19	22	22	22	26	25	25	26	24	22
11	24	22	20	23	24	22	24	27	24	26	29	23
12	26	20	27	21	22	21	23	30	23	25	29	23
13	24	20	32	21	23	21	23	29	22	23	26	21
14	22	19	26	21	22	22	22	29	22	26	24	21
15	24	19	27	21	23	23	23	28	22	24	25	21
16	23	19	24	24	25	22	25	25	21	23	26	23
17	24	19	32	26	23	21	23	21	21	22	25	21
18	27	19	26	22	23	21	23	11	21	22	25	24
19	28	19	21	21	22	28	24	19	21	22	25	22
20	25	25	20	18	22	29	24	23	21	22	26	21
21	27	29	25	20	21	28	22	23	22	21	24	23
22	27	22	18	20	23	26	22	23	24	24	23	23
23	24	22	23	23	23	28	22	23	21	23	23	23
24	23	25	25	30	26	30	21	22	22	22	22	22
25	24	22	23	27	29	27	25	23	21	22	22	23
26	25	23	27	24	25	27	28	24	20	21	22	25
27	26	22	27	24	29	25	27	23	20	21	22	30
28	23	22	25	33	28	25	28	22	20	21	22	31
29	22	20	25	29	25	30	28	22	20	21	22	27
30	26	20	28	26	---	31	30	26	20	21	22	24
31	23	---	28	25	---	29	---	23	---	21	21	---
TOTAL	764	670	707	740	686	761	750	783	659	707	743	682
MEAN	24.6	22.3	22.8	23.9	23.7	24.5	25.0	25.3	22.0	22.8	24.0	22.7
MAX	31	30	32	33	29	31	30	31	25	26	30	31
MIN	22	19	17	18	21	21	21	11	20	21	20	20
AC-FT	1520	1330	1400	1470	1360	1510	1490	1550	1310	1400	1470	1350

CAL YR 1987	TOTAL	8579	MEAN	23.5	MAX	32	MIN	17	AC-FT	17020
WTR YR 1988	TOTAL	8652	MEAN	23.6	MAX	33	MIN	11	AC-FT	17160

16062000 STABLE STORM DITCH NEAR LIHUE

LOCATION.--Lat 22°04'09", long 159°26'46", Hydrologic Unit 20070000, on left bank 100 ft downstream from intake, 7.8 mi northwest of Lihue, and 7.9 mi west of Kapaa.

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

GAGE.--Water-stage recorder and sharp-crested weir. Elevation of gage is 710 ft, by barometer.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue. Periodic determinations of temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--51 years (water years 1938-88), 10.8 ft^3/s (7,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft^3/s, Apr. 3, 1948; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maxiumum daily discharge, 42 ft^3/s, July 10, 11; no flow for few days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.11	.50	.11	.05	.11	.50	.36	.36	.36	26	.50	.22
2	.22	.50	.05	.05	.11	.50	.36	.36	.36	25	.50	.22
3	.11	.50	.05	.05	.05	.50	.36	.50	.36	21	.50	.22
4	.05	.75	.05	.05	.05	.50	.36	.36	.36	37	.50	.22
5	.05	.50	.05	.02	.05	.50	.22	.36	.36	36	.36	.22
6	.05	.50	.05	.02	.11	.50	.22	.36	.36	30	.36	.22
7	.11	.36	.05	.02	.11	.50	.11	.36	.50	32	.22	.22
8	.22	.36	.05	.01	.11	.50	.11	.36	.50	41	.36	.22
9	.22	.36	.05	.01	.11	.50	.11	.22	.50	36	.36	.22
10	.11	.36	.05	.01	.11	.50	.11	.22	.50	42	.22	.22
11	.11	.65	.08	.01	.11	.50	.11	.22	.36	42	.33	.13
12	.22	.50	.11	.00	.11	.36	.11	.22	.36	13	.32	.12
13	.11	.50	1.0	.00	.11	.36	.11	.22	.36	1.0	.23	.11
14	.11	.50	.11	.00	.11	.36	.11	.22	.36	1.0	.22	.11
15	.22	.50	.11	.00	.11	.36	.22	.22	.36	.65	.21	.11
16	.22	.36	.11	.01	2.0	.36	.22	.22	.36	.65	.23	.11
17	.22	.11	.13	.02	6.5	.36	.22	.22	.36	.65	.24	.11
18	.36	.05	.11	.01	6.5	.36	.22	.22	.36	.65	.22	.11
19	.36	.11	.11	.00	6.8	.65	.22	.22	.36	.65	.22	.11
20	.36	.11	.11	.00	6.5	.65	.36	.22	.36	.65	.25	.11
21	.36	.25	.11	.00	6.5	.50	.36	.22	.36	.65	.22	.11
22	.36	.11	.05	.00	7.7	.50	.36	.22	.36	.65	.22	.11
23	.36	.11	.05	.03	8.0	.50	.36	.11	.36	.65	.15	.17
24	.36	.11	.05	.22	8.3	.50	.36	.22	.36	.65	.13	.22
25	.36	.11	.02	.11	9.2	.36	.36	.36	.36	.65	.17	.22
26	.36	.11	.05	.11	7.1	.36	.36	.36	.22	.65	.22	.23
27	.36	.11	.05	.05	8.3	.36	.36	.36	4.9	.65	.22	.33
28	.36	.11	.05	.22	8.0	.36	.36	.36	7.1	.65	.22	.34
29	.36	.11	.05	.22	2.7	.36	.36	.36	16	.50	.21	.11
30	.36	.11	.05	.22	---	.36	.36	.36	22	.50	.22	.11
31	.50	---	.05	.11	---	.36	---	.36	---	.50	.22	---
TOTAL	7.64	9.32	3.12	1.63	95.57	13.84	7.82	8.95	59.78	393.60	8.55	5.28
MEAN	.25	.31	.10	.053	3.30	.45	.26	.29	1.99	12.7	.28	.18
MAX	.50	.75	1.0	.22	9.2	.65	.36	.50	22	42	.50	.34
MIN	.05	.05	.02	.00	.05	.36	.11	.11	.22	.50	.13	.11
AC-FT	15	18	6.2	3.2	190	27	16	18	119	781	17	10

CAL YR 1987	TOTAL	3579.32	MEAN	9.81	MAX	41	MIN	.00	AC-FT	7100
WTR YR 1988	TOTAL	615.10	MEAN	1.68	MAX	42	MIN	.00	AC-FT	1220

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

LOCATION.--Lat 22°04'19", long 159°25'05", Hydrologic Unit 20070000, on right bank 1,200 ft upstream from mouth and 7.2 mi northwest of Lihue.

DRAINAGE AREA.--6.27 mi^2.

PERIOD OF RECORD.--July 1912 to September 1914, December 1914 to March 1915, May 1915 to March 1919, June 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 770: 1932-33. WSP 1719: 1916. WSP 1937: 1918. WSP 2137: Drainage area.

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

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--73 years (water years 1913-14, 1916-17, 1920-88), 48.2 ft^3/s (34,920 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft^3/s Nov. 12, 1955, gage height, 14.7 ft, from floodmarks, from rating curve extended above 2,700 ft^3/s; minimum, 6.8 ft^3/s, July 3, 13, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	0900	2,230	6.20	Dec. 13	1300	*4,620	*8.22

Minimum discharge, 15 ft^3/s, Sept. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	43	118	37	350	51	28	78	53	26	22	17	20
2	108	74	34	167	44	26	69	86	25	20	17	19
3	103	159	32	138	41	24	78	105	24	18	89	18
4	51	520	31	87	40	23	93	131	24	42	32	18
5	73	448	34	71	36	23	52	136	23	42	32	17
6	46	156	32	58	34	28	43	204	28	24	25	19
7	83	100	28	51	32	24	51	359	41	29	23	18
8	48	76	28	46	32	22	37	105	39	79	265	17
9	41	63	28	43	30	21	44	72	35	44	78	16
10	46	52	38	44	28	20	43	60	44	73	42	16
11	68	88	98	41	31	19	33	72	30	49	83	33
12	70	51	299	37	27	18	29	129	25	60	89	25
13	60	45	940	34	27	19	27	111	24	35	57	18
14	44	40	257	32	24	21	26	124	23	62	45	16
15	59	86	434	30	24	25	26	86	22	39	45	25
16	44	40	200	38	29	21	38	57	21	30	52	22
17	59	38	707	33	24	20	26	49	21	27	49	17
18	84	35	320	29	23	18	23	44	20	25	41	29
19	82	43	156	27	21	71	22	40	20	23	38	21
20	78	87	120	26	21	e84	22	37	19	23	47	18
21	148	282	90	25	20	e35	20	37	21	22	38	18
22	85	79	69	24	27	e33	19	34	25	30	32	18
23	64	69	60	51	37	e48	20	e33	21	36	28	24
24	53	94	56	311	60	e110	18	e28	26	23	27	19
25	46	63	47	145	109	120	33	e28	19	23	25	20
26	53	64	82	60	33	e100	101	e45	18	22	24	27
27	49	49	72	53	92	e60	46	e31	18	20	24	83
28	44	50	51	374	48	e54	63	30	17	19	23	97
29	40	44	67	148	32	e90	49	32	17	19	22	80
30	70	39	201	82	---	e160	68	43	17	21	24	42
31	40	---	210	61	---	144	---	28	---	18	21	---
TOTAL	1982	3152	4858	2716	1077	1509	1297	2429	733	1019	1454	830
MEAN	63.9	105	157	87.6	37.1	48.7	43.2	78.4	24.4	32.9	46.9	27.7
MAX	148	520	940	374	109	160	101	359	44	79	265	97
MIN	40	35	28	24	20	18	18	28	17	18	17	16
AC-FT	3930	6250	9640	5390	2140	2990	2570	4820	1450	2020	2880	1650

CAL YR 1987	TOTAL	20570	MEAN	56.4	MAX	940	MIN	13	AC-FT	40800
WTR YR 1988	TOTAL	23056	MEAN	63.0	MAX	940	MIN	16	AC-FT	45730

e Estimated

16069000 WAILUA DITCH NEAR KAPAA

LOCATION.--Lat 22°04'34", long 159°24'04", Hydrologic Unit 20070000, on right bank 2,000 ft downstream from Wailua Reservoir, 5.2 mi west of Kapaa, and 7.0 mi north of Lihue.

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

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

REMARKS.--Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft upstream and thence to fields for irrigation of sugarcane in vicinity of Kapaa. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--51 years (water years 1938-88), 16.0 ft^3/s (11,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft^3/s, June 4, 1937; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 39 ft^3/s, Oct. 18; minimum daily, 7.1 ft^3/s, May 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	33	25	20	18	19	23	25	28	26	25	23
2	12	33	25	20	18	19	22	25	28	26	24	23
3	24	33	25	20	18	19	21	25	28	26	23	23
4	23	34	25	20	18	19	20	24	28	26	22	23
5	22	34	25	20	18	19	20	24	28	27	20	23
6	22	33	25	20	18	19	20	24	28	27	18	23
7	21	31	24	20	18	19	20	23	28	26	16	23
8	20	30	24	20	18	19	20	18	28	27	12	23
9	19	28	24	20	18	19	19	18	28	28	14	24
10	18	28	24	19	18	19	19	17	29	28	13	24
11	17	29	24	19	17	19	19	16	28	28	17	24
12	17	29	25	19	17	18	20	7.1	28	28	20	24
13	18	29	27	19	17	18	21	16	28	28	22	24
14	18	29	27	19	17	18	22	21	28	27	22	24
15	22	29	27	18	17	18	23	20	28	27	23	24
16	24	24	16	18	16	18	23	18	28	27	24	24
17	38	23	20	18	16	18	24	17	28	27	24	24
18	39	23	20	18	17	18	24	19	28	27	25	24
19	36	23	19	18	17	18	24	20	28	27	25	24
20	33	23	18	19	17	18	25	22	28	26	25	24
21	33	24	17	19	17	19	25	23	28	26	25	24
22	33	24	16	20	17	19	24	24	28	26	25	24
23	33	25	14	20	17	19	23	25	28	26	24	24
24	33	25	14	20	18	19	22	26	28	26	24	24
25	33	25	14	20	18	16	22	26	28	26	24	24
26	33	25	13	20	18	10	22	27	28	26	24	24
27	33	25	13	20	18	10	23	28	28	25	24	24
28	33	25	13	21	19	15	24	28	27	25	24	24
29	33	25	15	21	19	19	25	28	27	25	24	23
30	33	25	17	20	---	15	25	28	27	25	24	23
31	33	---	19	19	---	24	---	28	---	25	24	---
TOTAL	814.7	826	634	604	509	556	664	690.1	838	820	680	710
MEAN	26.3	27.5	20.5	19.5	17.6	17.9	22.1	22.3	27.9	26.5	21.9	23.7
MAX	39	34	27	21	19	24	25	28	29	28	25	24
MIN	8.7	23	13	18	16	10	19	7.1	27	25	12	23
AC-FT	1620	1640	1260	1200	1010	1100	1320	1370	1660	1630	1350	1410

CAL YR 1987	TOTAL	8924.7	MEAN	24.5	MAX	39	MIN	8.7	AC-FT	17700
WTR YR 1988	TOTAL	8345.8	MEAN	22.8	MAX	39	MIN	7.1	AC-FT	16550

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

LOCATION.--Lat 22°03'08", long 159°22'22", Hydrologic Unit 20070000, on right bank 1.1 mi upstream from confluence with South Fork, 3.7 mi southwest of Kapaa, and 5.0 mi north of Lihue.

DRAINAGE AREA.--17.9 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-75-1: 1974.

GAGE.--Water-stage recorder. Elevation of gage is 18 ft, from topographic map.

REMARKS.--Records good. Wailua ditch (station 16069000) diverts upstream for irrigation of sugarcane in vicinities of Kapaa and Wailua. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--36 years, 123 ft^3/s (89,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft^3/s Nov. 12, 1955, gage height, 19.88 ft in gage well, 20.8 ft, from floodmarks, from rating curve extended above 3,700 ft^3/s on basis of slope-area measurement of peak flow; minimum, 2.1 ft^3/s, Oct. 28, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 7,950 ft^3/s, Dec. 13, gage height, 9.15 ft, no other peak greater than base discharge of 4,100 ft^3/s; minimum, 9.4 ft^3/s, July 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	114	241	80	732	150	69	195	157	49	11	30	39
2	405	185	73	380	120	63	169	247	45	13	34	37
3	339	290	69	283	110	61	181	326	42	10	236	36
4	145	1210	66	187	105	58	202	298	42	37	85	35
5	186	922	67	154	97	57	124	290	40	46	98	33
6	124	347	74	128	91	64	104	386	54	22	70	43
7	171	224	58	112	87	58	141	740	109	17	64	39
8	118	182	55	112	88	55	96	230	72	90	614	32
9	99	141	55	105	84	53	114	173	80	43	244	31
10	132	110	71	97	79	53	109	161	122	84	105	59
11	127	191	149	99	90	49	76	176	71	61	236	46
12	221	118	636	90	82	48	57	279	52	104	268	72
13	121	99	1820	83	82	47	53	239	45	73	155	34
14	90	88	715	82	90	52	50	249	40	154	e100	31
15	147	121	866	77	76	55	50	202	39	81	e100	39
16	100	80	513	98	84	52	71	139	37	56	e110	41
17	105	80	1610	119	60	48	57	117	36	48	e96	32
18	246	72	898	76	57	45	45	105	34	44	e84	52
19	281	87	416	55	52	204	42	82	33	40	e76	40
20	157	148	310	47	51	237	47	63	33	39	e120	33
21	296	711	251	44	50	93	51	65	35	35	e80	34
22	214	164	212	39	67	83	55	59	51	99	e68	37
23	154	141	166	67	76	118	54	59	38	68	e60	42
24	118	238	159	540	92	315	53	51	42	44	e56	35
25	100	130	124	309	289	347	70	53	32	41	e52	36
26	130	169	198	116	73	285	224	71	30	39	50	51
27	136	118	190	102	118	169	91	61	27	37	49	272
28	97	116	125	1140	115	138	124	52	23	34	47	362
29	84	100	113	528	71	256	105	55	20	34	45	152
30	175	87	304	276	---	415	192	123	11	37	48	94
31	87	---	320	187	---	380	---	57	---	31	42	---
TOTAL	5019	6910	10763	6464	2686	4027	3002	5365	1384	1572	3522	1919
MEAN	162	230	347	209	92.6	130	100	173	46.1	50.7	114	64.0
MAX	405	1210	1820	1140	289	415	224	740	122	154	614	362
MIN	84	72	55	39	50	45	42	51	11	10	30	31
AC-FT	9960	13710	21350	12820	5330	7990	5950	10640	2750	3120	6990	3810

CAL YR 1987	TOTAL	42513.4	MEAN	116	MAX	1820	MIN	6.9	AC-FT	84330
WTR YR 1988	TOTAL	52633	MEAN	144	MAX	1820	MIN	10	AC-FT	104400

e Estimated

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'43", long 159°23'55", Hydrologic Unit 20070000, on left bank 0.4 mi upstream from mouth, 0.6 mi northeast of Wailua Reservoir, and 4.9 mi west of Kapaa.

DRAINAGE AREA.--0.65 mi^2.

PERIOD OF RECORD.--May 1960 to current year. Prior to July 1960, published as Left Branch Opaikaa Stream near Kapaa.

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good. No diversion upstream. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--28 years, 2.61 ft^3/s (1,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft^3/s Jan. 31, 1975, gage height, 5.58 ft, from rating curve extended above 415 ft^3/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft^3/s, Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 70 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	0830	*146	*2.97	Dec. 17	1400	72	2.32
Dec. 13	1430	134	2.87	Jan. 28	1400	110	2.67

Minimum discharge, 1.0 ft^3/s, July 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	4.5	3.2	18	5.7	2.2	4.4	2.0	2.5	1.6	1.0	1.8
2	2.2	4.3	2.9	12	5.5	2.2	4.1	2.8	2.4	1.5	1.1	1.8
3	2.2	3.8	2.9	9.5	5.0	2.0	4.1	2.9	2.4	1.5	1.8	1.8
4	2.0	2.8	2.9	8.0	4.8	2.0	3.8	4.3	2.4	1.5	1.3	1.8
5	2.2	14	2.9	7.1	4.5	2.0	3.6	4.4	2.3	1.8	1.3	1.8
6	2.0	8.9	2.8	6.4	4.3	2.0	3.2	7.6	2.3	1.5	1.1	1.7
7	3.1	6.8	2.7	5.9	4.2	2.0	3.2	19	2.3	1.5	1.1	1.6
8	2.4	5.9	2.7	5.7	3.9	2.0	2.9	6.1	2.3	2.1	9.8	1.4
9	2.2	5.5	2.6	5.5	3.8	1.8	3.1	4.8	2.3	1.7	3.5	1.3
10	2.6	5.0	2.7	5.3	3.6	1.8	2.8	4.3	2.4	1.9	2.2	1.3
11	2.6	5.0	4.3	5.0	3.6	1.8	2.6	3.9	2.2	1.7	3.0	1.5
12	3.2	4.6	17	5.0	3.4	1.8	2.5	4.8	2.1	1.8	2.7	1.5
13	3.3	4.3	36	4.8	3.4	1.8	2.5	4.1	2.0	1.6	2.3	1.3
14	2.8	4.1	15	4.6	3.1	1.8	2.4	4.3	2.0	1.8	2.1	1.3
15	2.9	3.9	20	4.3	3.1	1.8	2.2	4.3	1.9	1.7	2.0	1.6
16	3.5	3.8	14	4.3	2.8	1.8	2.6	3.8	1.9	1.5	2.3	1.5
17	4.1	3.4	44	4.1	2.8	1.8	2.2	3.8	1.9	1.5	2.1	1.3
18	7.1	3.2	28	3.9	2.7	1.7	2.2	3.8	1.8	1.4	2.0	1.3
19	5.5	3.2	16	3.8	2.7	2.0	2.0	3.4	1.8	1.3	2.0	1.2
20	4.9	3.4	12	3.4	2.6	2.5	2.0	3.2	1.8	1.3	2.0	1.2
21	7.9	7.1	10	3.2	2.5	2.2	2.0	3.4	1.7	1.3	1.9	1.2
22	5.0	4.1	8.6	3.1	2.5	1.8	2.0	3.1	1.8	1.4	1.9	1.2
23	4.4	3.9	7.4	3.2	2.6	1.8	2.0	3.1	1.7	1.4	1.8	1.2
24	4.1	4.1	6.8	5.1	2.9	2.8	2.0	2.9	1.7	1.3	1.7	1.2
25	3.8	4.1	6.1	4.8	6.0	5.3	1.8	2.9	1.6	1.2	1.7	1.2
26	3.8	3.9	6.4	3.6	2.9	6.6	2.4	2.9	1.6	1.2	1.7	1.2
27	3.4	3.6	5.9	3.2	2.8	3.9	2.2	2.8	1.6	1.2	1.7	2.0
28	3.2	3.6	5.5	27	2.6	3.3	2.2	2.7	1.5	1.1	1.6	1.7
29	3.1	3.4	5.7	13	2.4	4.8	2.2	2.7	1.5	1.1	1.6	1.2
30	3.4	3.2	11	7.7	---	5.3	2.2	2.7	1.5	1.1	1.7	1.1
31	2.9	---	8.1	6.4	---	5.9	---	2.5	---	1.1	1.7	---
TOTAL	107.8	141.4	316.1	206.9	102.7	82.5	79.4	129.3	59.2	45.6	65.7	43.2
MEAN	3.48	4.71	10.2	6.67	3.54	2.66	2.65	4.17	1.97	1.47	2.12	1.44
MAX	7.9	14	44	27	6.0	6.6	4.4	19	2.5	2.1	9.8	2.0
MIN	2.0	2.8	2.6	3.1	2.4	1.7	1.8	2.0	1.5	1.1	1.0	1.1
AC-FT	214	280	627	410	204	164	157	256	117	90	130	86

CAL YR 1987	TOTAL	1000.44	MEAN	2.74	MAX	44	MIN	.72	AC-FT	1980
WTR YR 1988	TOTAL	1379.8	MEAN	3.77	MAX	44	MIN	1.0	AC-FT	2740

16077000 MAKALEHA DITCH NEAR KEALIA

LOCATION.--Lat 22°07'06", long 159°22'04", Hydrologic Unit 20070000, on left bank at end of last tunnel from which flow enters Mimino Reservoir, 3.9 mi northwest of Kealia, and 4.0 mi northwest of Kapaa.

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

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

REMARKS.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane in vicinity of Kealia. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--51 years (water years 1938-88), 6.81 ft^3/s (4,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s, Aug. 1, 1961, June 30, 1982; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 17 ft^3/s, Aug. 8; minimum daily, 0.30 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	15	4.8	9.1	1.8	8.0	1.4	2.7	8.5	1.8	6.3	7.8
2	9.0	9.7	8.2	4.7	1.4	7.7	.92	3.2	8.4	1.7	8.4	7.7
3	12	13	8.1	2.2	1.3	7.4	.75	3.0	8.2	1.6	15	7.5
4	9.2	13	7.8	1.3	1.2	7.4	.65	6.9	8.6	1.8	13	7.4
5	16	6.4	11	.86	1.0	7.5	4.3	5.0	8.2	6.0	11	7.5
6	13	3.4	10	.60	.92	7.7	7.1	3.7	11	10	11	8.7
7	16	2.0	8.2	.50	.86	7.5	8.0	8.5	10	11	9.9	8.1
8	14	1.4	8.2	.42	.86	7.0	6.7	2.4	11	13	17	7.4
9	5.0	1.0	4.6	.38	.75	6.9	7.5	1.4	10	12	14	7.0
10	1.6	.80	1.4	.34	.75	6.9	7.1	.92	11	12	12	7.0
11	.80	.70	1.4	.34	.70	6.7	5.9	.80	9.3	13	10	7.1
12	.75	.60	3.4	.30	.65	6.9	6.1	.92	8.5	13	3.7	7.8
13	1.0	.55	9.6	.30	.65	6.6	6.0	.86	7.8	11	2.7	7.3
14	.98	.50	4.4	.30	.65	7.1	5.8	.86	7.5	12	2.2	7.4
15	.70	.86	9.4	.30	.65	9.0	5.9	.86	8.0	9.4	1.8	8.4
16	.80	.55	6.6	.30	.55	8.9	5.6	.75	8.2	9.0	1.9	7.7
17	.92	.46	11	.34	.46	8.6	4.5	.65	7.7	8.9	1.9	7.9
18	1.2	.42	7.9	.34	.42	8.2	4.5	.60	3.8	8.6	1.7	9.5
19	1.2	.38	3.1	.30	.42	9.4	4.6	.50	7.8	7.4	1.3	8.7
20	1.2	.38	1.7	.30	.42	10	4.5	.50	8.0	6.3	1.1	8.0
21	2.2	1.3	1.2	1.9	.42	9.3	4.2	.50	9.0	6.0	1.4	7.7
22	1.4	.98	.86	3.4	.42	8.4	3.9	.46	11	6.0	1.3	8.2
23	1.1	.80	.65	5.5	4.6	8.0	3.7	.42	8.6	5.8	6.6	9.5
24	.86	.75	.50	7.8	9.6	8.5	3.3	.38	10	4.9	9.1	8.7
25	.75	.65	.42	6.1	11	5.3	3.1	.38	6.8	4.6	9.0	8.9
26	5.2	.60	.42	4.9	9.0	1.3	3.5	.38	4.5	4.5	8.5	9.1
27	8.9	.55	.42	4.4	9.2	1.4	3.1	.38	5.4	4.3	8.8	10
28	8.2	.46	.38	14	8.9	.86	3.1	.38	6.3	4.1	8.5	9.9
29	7.0	.42	.57	15	8.2	.75	2.8	.38	6.1	4.0	8.4	9.7
30	11	.42	2.6	5.3	---	1.2	2.8	3.8	5.0	3.8	9.6	9.4
31	6.4	---	3.2	2.9	---	2.0	---	8.6	---	3.7	8.4	---
TOTAL	159.96	78.03	142.02	94.72	77.75	202.41	131.32	61.08	244.2	221.2	225.5	247.0
MEAN	5.16	2.60	4.58	3.06	2.68	6.53	4.38	1.97	8.14	7.14	7.27	8.23
MAX	16	15	11	15	11	10	8.0	8.6	11	13	17	10
MIN	.70	.38	.38	.30	.42	.75	.65	.38	3.8	1.6	1.1	7.0
AC-FT	317	155	282	188	154	401	260	121	484	439	447	490

CAL YR 1987	TOTAL	2478.45	MEAN	6.79	MAX	21	MIN	.38	AC-FT	4920
WTR YR 1988	TOTAL	1885.19	MEAN	5.15	MAX	17	MIN	.30	AC-FT	3740

16079000 KAPAHI DITCH NEAR KEALIA

LOCATION.--Lat 22°06'09", long 159°22'28", Hydrologic Unit 20070000, on right bank 500 ft downstream from intake and 4.0 mi west of Kealia.

PERIOD OF RECORD.--April 1909 to February 1911, May 1911, July 1911 to May 1914, July 1915 to April 1917, June 1917 to current year. Published as "at Kapahi, near Kapaa" prior to January 1914 and as "at Kapahi, near Kealia" January to December 1913.

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

REMARKS.--Records good. Ditch diverts from Kapaa Stream for irrigation of sugarcane in vicinity of Kapaa. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--70 years (water years 1918-20, 1922-88), 6.15 ft^3/s (4,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft^3/s, Feb. 6, 1913; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/s, May 25-27; minimum daily, 0.01 ft^3/s, Jan. 5, 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	2.1	11	2.8	.42	.50	7.6	13	8.0	22	5.9	5.5
2	1.3	.90	6.4	.60	.42	3.9	4.5	14	7.8	7.8	.72	2.5
3	2.8	1.1	6.2	.42	.42	10	2.5	14	7.5	.76	.62	1.2
4	2.9	2.4	6.1	.12	.50	13	2.5	13	7.9	.61	.24	.70
5	3.2	2.1	7.6	.01	.50	15	2.0	3.5	7.5	.33	2.6	3.1
6	2.9	.50	7.8	.01	11	12	6.4	1.1	13	.28	6.1	6.2
7	3.0	2.4	5.6	.95	16	12	13	2.1	17	.23	.49	5.4
8	2.9	2.5	5.4	2.0	16	10	13	.23	18	.33	1.8	4.9
9	2.9	8.2	10	1.5	16	9.0	17	.23	17	.23	8.1	4.7
10	2.6	15	16	2.0	10	8.6	16	.23	22	.23	15	4.6
11	3.1	17	16	1.9	1.3	8.4	15	.35	14	3.3	16	4.7
12	2.6	10	12	1.6	.80	8.2	14	.90	2.8	12	18	5.3
13	3.2	10	4.7	1.5	.70	8.0	12	.35	.29	11	17	4.7
14	2.8	10	.70	1.3	.60	7.6	5.6	.70	.25	8.3	17	4.7
15	2.8	11	2.9	1.2	.60	5.9	.19	.29	.23	2.4	16	6.2
16	2.5	10	.70	1.2	5.8	5.6	.19	5.1	.23	1.9	5.5	5.1
17	3.0	10	3.4	1.3	16	6.6	.15	10	.23	1.6	1.2	4.7
18	3.2	10	1.4	1.8	15	9.4	.19	10	.21	2.1	1.1	8.1
19	2.4	10	.29	3.7	16	11	4.3	10	.19	4.9	.92	5.4
20	2.7	7.2	.23	10	16	8.0	14	3.4	.19	.23	.93	3.9
21	2.7	3.8	.19	13	11	7.4	13	.35	.19	.19	.96	3.8
22	1.9	2.5	.15	12	.50	7.2	11	5.1	.19	.19	.93	4.3
23	1.8	5.3	.12	9.9	.29	7.4	12	15	.19	.24	1.1	6.4
24	1.6	12	.12	8.1	.82	7.8	12	18	.19	.19	.62	5.2
25	4.1	13	.12	3.0	1.5	7.8	9.1	24	.19	1.5	.35	5.1
26	8.4	15	.19	2.5	.15	8.4	.96	24	.19	8.6	.37	5.0
27	10	15	.19	2.5	4.2	7.6	.23	24	4.8	9.7	.41	5.1
28	10	15	.15	6.3	6.1	7.4	.29	21	8.4	7.0	2.7	1.4
29	3.3	15	.19	2.3	3.7	7.8	.23	22	8.3	.38	6.5	1.5
30	1.4	15	1.3	.60	---	8.2	3.9	19	11	.39	8.0	1.8
31	2.7	---	1.5	.42	---	8.0	---	7.9	---	3.1	6.0	---
TOTAL	101.7	254.00	128.64	96.53	172.32	257.70	212.83	282.83	177.96	112.01	163.16	131.20
MEAN	3.28	8.47	4.15	3.11	5.94	8.31	7.09	9.12	5.93	3.61	5.26	4.37
MAX	10	17	16	13	16	15	17	24	22	22	18	8.1
MIN	1.0	.50	.12	.01	.15	.50	.15	.23	.19	.19	.24	.70
AC-FT	202	504	255	191	342	511	422	561	353	222	324	260

CAL YR 1987	TOTAL	1440.08	MEAN	3.95	MAX	22	MIN	.12	AC-FT	2860
WTR YR 1988	TOTAL	2090.88	MEAN	5.71	MAX	24	MIN	.01	AC-FT	4150

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

LOCATION.--Lat 22°08'10", long 159°22'28", Hydrologic Unit 20070000, on left bank at point of discharge into Kaneha Reservoir, 500 ft below wasteway gates, and 4.8 mi northwest of Kealia.

PERIOD OF RECORD.--December 1921 to current year. Records for May 1915 to December 1921 at site 520 ft upstream not equivalent owing to intervening diversion.

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

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flood sometimes diverted upstream by Anahola ditch wasteway (see sta. 16087000). Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years, 1923-25, 1928-88), 4.34 ft^3/s (3,140 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft^3/s, Nov. 12, 1947; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 33 ft^3/s, Feb. 25; minimum daily, 0.44 ft^3/s, Dec. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	6.5	3.4	4.9	2.9	.97	3.6	10	4.1	4.5	2.8	2.8
2	1.2	5.0	4.4	1.7	2.4	1.9	3.9	22	3.9	4.6	2.8	2.5
3	1.2	6.9	4.4	1.4	2.6	3.5	1.9	22	3.7	2.3	24	2.3
4	.79	4.5	4.3	.97	2.4	3.3	5.7	16	3.7	14	10	2.2
5	.88	1.6	5.7	.88	2.0	3.2	8.2	17	3.5	14	12	2.2
6	2.6	.97	4.8	.72	1.9	3.3	7.4	19	4.5	5.3	9.2	2.2
7	5.3	.72	4.1	.72	1.9	3.3	18	22	12	12	8.0	2.5
8	5.5	.64	3.9	.57	1.9	2.9	7.6	3.1	7.0	17	23	2.0
9	5.0	1.0	4.1	.97	1.9	2.6	14	4.2	6.9	9.8	13	1.8
10	6.2	1.8	6.4	1.8	4.5	2.4	12	12	14	7.6	6.6	1.8
11	9.3	2.2	8.2	1.4	7.2	2.3	7.4	19	4.7	10	16	1.8
12	5.3	1.9	24	1.2	5.5	2.2	5.5	17	3.8	13	6.0	1.8
13	2.2	1.9	12	1.2	5.9	19	5.0	9.8	3.5	5.9	7.1	1.8
14	1.2	2.0	1.4	1.2	4.6	18	4.4	14	3.4	16	6.3	1.7
15	1.4	26	5.1	1.2	4.4	18	4.3	7.8	3.1	8.7	9.8	1.7
16	1.4	9.3	1.7	1.4	11	14	9.9	4.3	2.9	4.9	13	1.6
17	1.7	10	4.5	1.4	4.6	11	5.0	2.6	2.7	4.2	7.7	1.5
18	1.4	8.7	1.8	1.2	4.1	5.3	4.1	3.7	2.6	3.8	7.8	3.8
19	1.4	9.8	.97	1.2	3.9	30	3.6	1.8	2.5	3.4	6.4	2.5
20	1.4	14	.79	1.2	3.6	22	4.1	1.6	2.5	3.2	10	1.8
21	2.3	11	.72	1.2	3.5	7.9	3.8	1.7	2.9	2.9	8.7	2.0
22	1.0	2.8	.64	1.2	21	2.6	3.5	4.7	3.6	6.1	5.2	2.9
23	2.7	2.2	.57	5.8	15	4.7	3.3	6.6	3.0	9.6	4.4	3.1
24	4.6	2.4	.57	13	16	9.0	3.0	5.1	8.0	3.7	3.8	1.9
25	4.3	1.8	.50	4.1	33	8.2	9.1	6.4	2.8	3.0	3.5	7.5
26	4.8	1.9	.64	3.0	10	5.7	26	6.0	2.3	3.3	3.4	3.6
27	4.6	1.6	.44	2.6	10	4.5	15	5.8	2.2	3.0	4.0	18
28	4.4	1.4	.44	21	1.9	2.2	21	5.5	2.1	2.9	7.1	18
29	3.9	1.4	.74	16	1.2	4.2	11	4.8	2.1	3.0	3.6	8.6
30	5.4	1.2	2.1	5.3	---	11	12	9.8	2.1	2.9	4.9	4.7
31	3.9	---	4.6	3.6	---	5.4	---	4.7	---	2.5	3.1	---
TOTAL	98.27	143.13	117.92	104.03	190.8	234.57	243.3	290.0	126.1	207.1	253.2	112.6
MEAN	3.17	4.77	3.80	3.36	6.58	7.57	8.11	9.35	4.20	6.68	8.17	3.75
MAX	9.3	26	24	21	33	30	26	22	14	17	24	18
MIN	.79	.64	.44	.57	1.2	.97	1.9	1.6	2.1	2.3	2.8	1.5
AC-FT	195	284	234	206	378	465	483	575	250	411	502	223

CAL YR 1987	TOTAL	2518.12	MEAN	6.90	MAX	44	MIN	.44	AC-FT	4990
WTR YR 1988	TOTAL	2121.02	MEAN	5.80	MAX	33	MIN	.44	AC-FT	4210

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

LOCATION.--Lat 22°08'14", long 159°19'31", Hydrologic Unit 20070000, on left bank 100 ft downstream from last wasteway, 1.5 mi southwest of mouth of Anahola Stream, and 2.8 mi northwest of Kealia.

PERIOD OF RECORD.--December 1936 to September 1983, October 1984 to current year.

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

REMARKS.--Records good. Ditch diverts from Anahola Stream for irrigation of sugarcane in vicinity of Anahola.

AVERAGE DISCHARGE.--50 years (water years 1938-83, 1986-88), 2.67 ft^3/s (1,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18.6 ft^3/s, June 1, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 0.43 ft^3/s, Jan. 28; minimum daily discharge, no flow for most of the year.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
15	.00	.09	.16	.00	.00	.00	.00	e.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
26	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
28	.00	.00	.00	.43	.00	.00	.00	e.00	.00	.00	.00	.00
29	.00	.00	.00	.05	.00	.00	.00	e.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	e.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	.09	.16	.48	.00	.00	.00	.00	.00	.00	.00	.00
MEAN	.00	.003	.005	.015	.00	.00	.00	.00	.00	.00	.00	.00
MAX	.00	.09	.16	.43	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.2	.3	.9	.00	.00	.00	.00	.00	.00	.00	.00

CAL YR 1987	TOTAL	.25	MEAN	.00	MAX	.16	MIN	.00	AC-FT	.5
WTR YR 1988	TOTAL	.73	MEAN	.00	MAX	.43	MIN	.00	AC-FT	1.4

e Estimated

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

LOCATION.--Lat 22°10'54", long 159°25'17", Hydrologic Unit 20070000, on left bank 0.5 mi upstream from confluence with Pohakuhonu Stream and 2.3 mi south of Kilauea.

DRAINAGE AREA.--1.9 mi^2.

PERIOD OF RECORD.--November 1957 to current year.

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--30 years (water years 1959-88), 11.7 ft^3/s (8,480 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,070 ft^3/s Aug. 6, 1959, gage height, 8.30 ft, from rating curve extended above 190 ft^3/s on basis of slope-area measurement of peak flow; minimum, 1.8 ft^3/s, Sept. 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 580 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 5	0400	680	4.70	Dec. 13	1430	*1,670	*6.63

Minimum discharge, 5.5 ft^3/s, Sept. 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	36	9.2	103	12	8.5	14	11	7.8	7.3	6.5	6.7
2	38	19	8.9	29	11	8.3	14	21	7.6	8.4	6.9	6.6
3	19	31	8.7	23	11	8.2	13	23	7.5	6.8	29	6.5
4	12	43	8.5	15	15	8.1	15	13	7.5	15	11	6.4
5	18	98	9.2	14	9.9	8.0	16	14	7.3	14	11	6.5
6	13	27	8.7	12	9.4	7.9	11	27	7.6	8.8	8.3	6.8
7	12	16	8.1	11	9.1	8.0	16	47	8.8	9.2	7.8	6.6
8	10	13	8.0	9.9	9.7	7.8	10	15	9.9	14	29	6.1
9	9.6	12	7.8	9.6	9.6	7.8	16	12	10	9.7	13	6.1
10	14	11	10	16	8.9	7.7	14	11	11	12	8.9	8.1
11	24	12	24	12	11	7.5	11	16	8.3	11	42	6.8
12	28	12	85	9.6	8.9	7.3	9.6	39	7.7	14	19	6.4
13	21	10	309	9.2	8.7	8.8	9.2	47	7.5	9.4	12	6.1
14	12	20	57	8.9	8.5	14	9.0	50	7.3	21	9.5	5.9
15	15	149	146	8.7	8.8	17	9.2	31	7.3	15	9.3	5.9
16	12	16	38	14	9.8	18	12	18	7.0	9.6	13	5.8
17	25	15	162	10	8.5	12	9.0	13	6.9	9.4	11	5.8
18	22	12	41	8.9	8.3	9.2	8.4	14	6.8	8.8	9.2	6.3
19	26	16	22	8.5	8.1	47	8.2	11	6.8	8.2	9.0	6.0
20	29	48	17	8.6	8.0	52	8.0	10	6.8	8.2	9.0	5.8
21	46	74	14	8.2	8.2	26	7.8	9.8	6.9	7.8	8.8	6.1
22	18	22	13	8.5	11	16	7.6	9.8	7.1	13	8.3	6.0
23	18	23	11	36	9.3	22	7.6	9.4	6.8	8.2	8.3	5.8
24	13	23	12	115	11	36	7.4	8.8	7.9	7.7	7.5	5.8
25	11	15	10	26	31	18	12	9.0	6.7	7.5	7.3	7.5
26	13	16	19	15	9.5	17	18	8.8	6.6	7.2	7.2	7.2
27	13	13	13	15	15	32	11	8.4	6.5	7.1	7.1	40
28	13	11	11	162	9.7	17	20	8.2	6.4	7.0	7.9	27
29	11	10	18	39	8.8	17	12	8.2	6.3	6.8	7.1	11
30	16	9.6	97	20	---	36	13	11	6.4	7.1	7.4	8.0
31	10	---	131	14	---	23	---	8.0	---	6.6	7.2	---
TOTAL	553.6	832.6	1337.1	799.6	307.7	533.1	349.0	542.4	225.0	305.8	358.5	251.6
MEAN	17.9	27.8	43.1	25.8	10.6	17.2	11.6	17.5	7.50	9.86	11.6	8.39
MAX	46	149	309	162	31	52	20	50	11	21	42	40
MIN	9.6	9.6	7.8	8.2	8.0	7.3	7.4	8.0	6.3	6.6	6.5	5.8
AC-FT	1100	1650	2650	1590	610	1060	692	1080	446	607	711	499

CAL YR 1987	TOTAL	6235.7	MEAN	17.1	MAX	309	MIN	5.5	AC-FT	12370
WTR YR 1988	TOTAL	6396.0	MEAN	17.5	MAX	309	MIN	5.8	AC-FT	12690

16103000 HANALEI RIVER NEAR HANALEI

LOCATION.--Lat 22°11'31", long 159°27'57", Hydrologic Unit 20070000, on right bank 2.6 mi southeast of Hanalei School and 4.9 mi upstream from mouth.

DRAINAGE AREA.--19.1 mi^2.

PERIOD OF RECORD.--January 1912 to November 1919, annual maximum, water years 1962-63, December 1962 to current year.

REVISED RECORDS.--WSP 1937: Drainage area. WSP 2137: 1962(M), 1963-65(P). WDR HI-77-1: 1970-76(M), 1975-76.

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Since 1925, Hanalei tunnel (sta. 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream upstream to North Branch of North Fork Wailua River for irrigation. China ditch upstream diverts for irrigation of taro in vicinity of Hanalei. Periodic determinations of temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--25 years (water years 1964-88), 215 ft^3/s (155,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft^3/s Apr. 19, 1974, gage height, 14.28 ft, from rating curve extended above 9,600 ft^3/s; minimum, 31 ft^3/s, Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 9,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 5	0200	16,920	12.48	Dec. 13	1300	*20,440	*13.36

Minimum discharge, 81 ft^3/s, Sept. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	218	468	136	e1500	155	130	338	394	109	109	90	92
2	678	289	125	e500	143	122	354	407	107	110	92	89
3	469	625	120	482	185	118	333	559	104	96	423	88
4	224	2220	114	250	226	113	367	305	105	185	132	87
5	402	2740	148	224	148	110	274	383	103	170	150	86
6	220	e720	e120	192	132	120	200	1080	132	130	136	100
7	248	e345	110	174	125	113	246	798	210	253	121	93
8	182	220	108	162	137	108	176	244	156	308	704	85
9	155	186	109	155	125	105	222	188	162	259	214	85
10	174	167	122	216	119	103	220	180	194	308	146	150
11	296	225	e300	180	136	101	169	273	128	234	438	114
12	296	166	e600	149	134	100	148	522	112	238	306	122
13	200	146	e2500	142	120	220	137	359	106	186	191	88
14	166	174	e2000	136	110	170	130	740	103	294	155	84
15	328	e450	e1000	132	113	161	133	426	102	176	165	91
16	184	190	e500	223	163	149	166	226	99	140	196	88
17	331	212	e3000	218	113	146	133	198	99	126	175	83
18	287	176	e600	143	108	122	122	169	97	119	151	117
19	331	244	304	134	105	549	122	152	96	110	139	93
20	272	560	236	128	103	666	121	145	96	113	173	85
21	692	e1080	210	128	102	319	113	142	101	106	142	87
22	363	307	180	131	294	218	108	137	112	155	124	97
23	290	274	166	1060	140	295	110	134	99	134	113	113
24	212	356	190	e3000	562	672	105	122	107	106	105	89
25	180	225	150	e1000	995	482	262	127	96	105	102	99
26	214	264	296	e350	184	310	466	146	93	103	101	135
27	198	192	260	222	262	212	228	134	92	98	99	753
28	176	192	174	864	184	184	328	128	91	95	103	712
29	166	170	224	300	140	331	244	136	90	94	98	197
30	250	144	e 800	200	---	644	497	190	90	100	106	142
31	155	---	e1000	170	---	438	---	122	---	92	98	---
TOTAL	8557	13727	15902	12865	5563	7631	6572	9266	3391	4852	5488	4344
MEAN	276	458	513	415	192	246	219	299	113	157	177	145
MAX	692	2740	3000	3000	995	672	497	1080	210	308	704	753
MIN	155	144	108	128	102	100	105	122	90	92	90	83
AC-FT	16970	27230	31540	25520	11030	15140	13040	18380	6730	9620	10890	8620

CAL YR 1987	TOTAL	94957	MEAN	260	MAX	3040	MIN	72	AC-FT 188300
WTR YR 1988	TOTAL	98158	MEAN	268	MAX	3000	MIN	83	AC-FT 194700

e Estimated

16108000 WAINIHA RIVER NEAR HANALEI

LOCATION.--Lat 22°08'20", long 159°33'38", Hydrologic Unit 20070000, on left bank at Puwainui Falls, 1.5 mi upstream from Wainiha powerplant intake, and 6.0 mi southwest of Hanalei.

DRAINAGE AREA.--10.2 mi^2.

PERIOD OF RECORD.--August 1952 to February 1956, October 1957 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 960 ft, from topographic map.

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--33 years (water years 1953-55, 1959-88), 139 ft^3/s (100,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft^3/s Apr. 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 32 ft^3/s Oct. 21-23, 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft, from floodmarks, discharge, about 40,000 ft^3/s, from unit-discharge study.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 3,880 ft^3/s, Nov. 5, gage height, 5.33 ft; minimum, 57 ft^3/s for few days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	107	473	72	1160	68	66	252	307	68	98	62	64
2	524	182	67	432	67	64	245	273	65	101	61	61
3	216	204	64	368	66	62	283	164	64	70	537	59
4	103	993	62	135	80	63	277	115	80	213	133	58
5	178	1210	110	105	66	67	155	161	66	144	114	59
6	92	304	86	84	64	71	111	315	125	120	130	106
7	100	130	65	76	63	72	200	465	262	237	88	82
8	81	90	62	70	72	67	94	176	132	354	285	64
9	68	77	65	68	76	60	118	101	171	228	124	64
10	108	68	80	107	68	61	139	106	185	206	79	166
11	255	91	208	89	99	60	93	319	87	248	377	118
12	193	72	388	69	75	58	76	470	71	224	255	109
13	97	67	1500	65	83	67	70	388	67	126	126	65
14	69	60	1110	64	65	96	67	566	65	385	121	60
15	216	130	632	62	81	131	67	311	66	131	129	61
16	93	75	261	209	144	70	77	125	65	85	147	73
17	84	126	1540	174	69	65	69	117	63	74	140	69
18	146	140	301	73	70	64	70	87	62	70	115	147
19	193	201	122	66	63	246	100	77	61	67	101	83
20	103	434	100	64	61	417	92	75	70	79	167	65
21	167	1150	85	63	60	215	69	85	85	67	108	91
22	167	166	75	62	90	142	63	89	125	142	88	111
23	179	180	70	351	70	263	65	108	69	90	73	111
24	107	324	111	1850	143	248	65	76	81	66	67	74
25	91	131	70	559	295	120	285	99	63	64	65	91
26	147	196	200	164	93	98	393	116	61	74	63	169
27	106	131	143	124	150	82	241	97	61	68	63	746
28	87	185	81	229	125	81	402	95	60	66	80	199
29	78	111	73	94	74	138	259	101	59	68	75	88
30	232	84	453	80	---	303	563	141	72	86	94	72
31	80	---	599	73	---	304	---	73	---	63	74	---
TOTAL	4467	7785	8855	7189	2600	3921	5060	5798	2631	4114	4141	3385
MEAN	144	260	286	232	89.7	126	169	187	87.7	133	134	113
MAX	524	1210	1540	1850	295	417	563	566	262	385	537	746
MIN	68	60	62	62	60	58	63	73	59	63	61	58
AC-FT	8860	15440	17560	14260	5160	7780	10040	11500	5220	8160	8210	6710

CAL YR 1987	TOTAL	54861	MEAN	150	MAX	1540	MIN	49	AC-FT	108800
WTR YR 1988	TOTAL	59946	MEAN	164	MAX	1850	MIN	58	AC-FT	118900

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

LOCATION.--Lat 21°31'09", long 157°56'53", Hydrologic Unit 20060000, on left bank 140 ft upstream from Mauka ditch intake and Right Branch, and 4.5 mi northeast of Wahiawa.

DRAINAGE AREA.--1.38 mi^2.

PERIOD OF RECORD.--May 1913 to July 1953, April 1960 to current year. Monthly discharge only for some periods, published in WSP 1319. Prior to August 1953, published as Left Branch of North Fork Kaukonahua Stream near Wahiawa.

REVISED RECORDS.--WSP 1219: 1931-33(M), 1935(M), 1937-38(M). WSP 1319: 1914, 1917-18(M), 1920-23(M), 1925(M), 1927-30(M). WSP 1719: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,150 ft, from topographic map.

REMARKS.--Records good, except for estimated daily discharges, which are fair.

AVERAGE DISCHARGE.--65 years (water years 1914-24, 1927-52, 1961-88), 16.4 ft^3/s (11,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft^3/s Oct. 28, 1981, gage height, 13.2 ft, from rating curve extended above 68 ft^3/s on basis of slope-area measurement at gage height, 12.46 ft; minimum, 0.12 ft^3/s, Mar. 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximmum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 31	2300	*3,670	*10.29	No other peak greater than base discharge.			

Minimum discharge, 2.3 ft^3/s, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	40	8.2	198	e14	4.9	26	22	7.1	12	3.4	3.5
2	73	7.9	7.4	89	e8.4	4.4	10	24	9.3	4.2	5.5	3.2
3	30	41	6.7	53	e7.0	5.0	22	48	5.7	4.5	36	3.1
4	7.2	53	7.4	22	e8.2	3.9	67	77	5.1	6.1	4.8	2.8
5	14	24	11	17	e6.6	3.7	24	34	8.8	7.5	5.1	4.1
6	5.9	15	7.7	15	e5.8	8.3	8.7	12	25	3.6	3.4	6.5
7	5.9	16	5.5	13	e5.2	4.5	27	44	33	4.2	74	2.8
8	4.6	7.0	13	11	e7.0	4.0	8.5	17	30	35	34	2.5
9	3.9	5.3	27	10	e5.4	68	6.7	8.9	34	29	7.6	39
10	3.5	4.9	27	40	e4.6	5.5	9.7	8.2	12	13	5.3	40
11	3.3	4.6	7.4	11	e4.3	3.9	5.8	86	8.6	16	91	20
12	7.4	7.1	164	9.0	4.0	3.4	5.2	289	6.8	18	48	5.9
13	3.0	3.9	36	7.7	3.8	5.8	4.7	98	5.9	5.6	15	3.5
14	2.6	3.8	34	7.0	4.7	22	4.3	76	5.2	52	24	17
15	9.7	3.9	19	7.2	10	4.9	4.0	58	4.7	6.5	18	29
16	25	3.1	11	88	9.4	5.0	3.8	19	4.5	5.3	9.9	3.8
17	4.9	42	14	37	4.1	4.1	3.7	15	4.1	4.6	56	3.1
18	18	11	26	12	3.8	3.0	3.8	12	6.9	11	9.5	3.1
19	7.9	15	91	8.7	5.3	28	9.3	10	4.2	7.1	8.7	3.3
20	3.8	140	18	7.7	6.1	6.5	4.9	9.0	8.5	7.1	15	3.6
21	3.1	170	13	7.0	3.2	4.7	3.7	8.1	29	9.2	13	3.5
22	9.5	39	10	6.5	18	7.7	4.1	14	39	30	15	7.4
23	5.9	20	24	5.9	20	22	3.9	28	8.4	5.4	6.8	26
24	13	53	40	6.7	4.3	25	2.9	7.5	22	4.3	5.8	4.6
25	15	16	10	55	86	14	6.2	6.7	5.8	27	6.0	5.8
26	34	12	32	52	16	17	41	6.4	5.6	6.3	4.9	42
27	24	12	25	49	74	5.7	18	5.7	18	4.3	5.5	161
28	8.4	8.7	9.3	80	7.6	10	28	15	4.9	7.1	5.0	99
29	4.9	36	7.9	e30	5.6	39	52	7.8	4.1	4.4	4.2	15
30	21	12	60	e16	---	15	24	14	5.3	14	3.9	8.3
31	5.1	---	743	e9.0	---	28	---	5.9	---	3.8	4.2	---
TOTAL	390.5	827.2	1515.5	980.4	362.4	386.9	442.0	1086.2	371.5	368.1	548.5	572.4
MEAN	12.6	27.6	48.9	31.6	12.5	12.5	14.7	35.0	12.4	11.9	17.7	19.1
MAX	73	170	743	198	86	68	67	289	39	52	91	161
MIN	2.6	3.1	5.5	5.9	3.2	3.0	2.9	5.7	4.1	3.6	3.4	2.5
AC-FT	775	1640	3010	1940	719	767	877	2150	737	730	1090	1140

CAL YR 1987	TOTAL	6479.02	MEAN	17.8	MAX	743	MIN	.38	AC-FT	12850
WTR YR 1988	TOTAL	7851.6	MEAN	21.5	MAX	743	MIN	2.5	AC-FT	15570

e Estimated

16208000 SOUTH FORK KAUKONAHUA STREAM AT EAST PUMP RESERVOIR, NEAR WAHIAWA

LOCATION.--Lat 21°29'32", long 157°59'54", Hydrologic Unit 20060000, on right bank on upstream side of dam at East Pump Reservoir, 2.3 mi east of Wahiawa Post Office, and 7.1 mi north of Waipahu.

DRAINAGE AREA.--4.04 mi^2.

PERIOD OF RECORD.--July 1957 to June 1963, water years 1963-64 (annual maximum), July 1964 to current year.

GAGE.--Water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level.

REMARKS.--Records good except for estimated daily discharges which are fiar. Prior to 1960, diversions from reservoirs upstream for use at Schofield Barracks.

AVERAGE DISCHARGE.--26 years (water years, 1961-62, 1965-88), 21.5 ft^3/s (15,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft^3/s Apr. 15, 1963, gage height, 11.33 ft, from rating curve extended above 1,100 ft^3/s on basis of computation of peak flow over dam; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 31	2330	*2,330	*7.09	No other peak greater than base discharge.			

Minimum discharge, 2.5 ft^3/s, Mar. 13, 18, 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.3	e50	14	402	19	4.6	90	18	12	14	4.2	5.7
2	38	e12	12	147	11	4.2	23	19	8.9	6.7	3.9	4.9
3	34	e52	10	129	9.2	4.1	49	37	12	6.3	57	4.4
4	8.6	e68	11	50	10	4.4	127	114	7.4	5.7	9.0	4.1
5	35	e30	12	37	8.7	3.7	60	52	7.1	6.7	6.1	3.9
6	15	e18	18	34	7.4	3.7	20	16	18	5.2	4.6	4.3
7	7.1	e20	8.0	27	6.8	4.2	22	27	40	7.1	50	3.9
8	5.8	e8.5	7.3	23	8.7	3.5	14	18	31	74	32	3.6
9	4.3	e7.0	19	20	8.1	45	11	10	56	43	9.5	3.4
10	4.0	e6.5	22	53	6.6	6.8	23	9.0	26	32	5.6	74
11	3.7	e6.0	10	19	5.9	3.6	11	91	13	25	102	16
12	6.6	e9.0	258	16	5.5	3.0	8.3	272	10	29	17	9.3
13	4.2	e5.6	73	14	5.4	2.8	7.5	219	8.8	12	16	4.5
14	4.2	e5.4	53	13	8.2	19	6.8	188	8.0	35	19	3.7
15	e10	e5.6	34	11	11	5.3	6.2	184	7.4	11	25	24
16	e30	e5.0	20	79	8.1	4.9	5.9	47	6.8	8.1	13	5.3
17	e6.0	e50	23	52	5.6	8.4	5.4	33	6.4	7.1	49	3.6
18	e20	e15	51	22	4.6	3.1	5.3	26	5.9	9.8	15	4.0
19	e10	e20	203	14	4.1	9.6	5.6	21	5.8	9.1	8.2	3.8
20	e5.6	e200	57	12	4.0	12	6.2	18	6.7	9.2	19	3.2
21	e4.5	264	32	11	4.0	5.7	5.2	17	9.3	7.4	30	3.8
22	e10	92	23	10	11	3.3	6.8	21	50	21	39	7.8
23	e7.0	27	19	9.4	24	6.7	4.9	38	22	8.2	14	59
24	e14	38	31	13	6.7	51	4.5	15	34	5.7	8.8	12
25	e18	20	16	73	91	10	13	13	9.3	24	7.9	8.2
26	e40	22	26	78	14	29	42	14	10	14	7.1	20
27	e30	17	27	57	43	12	23	11	47	6.1	6.5	171
28	e14	12	14	88	12	8.1	60	17	11	5.1	7.3	105
29	e8.0	68	11	41	5.6	31	63	20	7.5	7.0	7.0	19
30	e25	26	113	19	---	47	24	12	7.4	7.6	9.6	11
31	e9.0	---	685	13	---	74	---	10	---	5.5	7.3	---
TOTAL	440.9	1179.6	1912.3	1586.4	369.2	433.7	753.6	1607.0	504.7	467.6	609.6	606.4
MEAN	14.2	39.3	61.7	51.2	12.7	14.0	25.1	51.8	16.8	15.1	19.7	20.2
MAX	40	264	685	402	91	74	127	272	56	74	102	171
MIN	3.7	5.0	7.3	9.4	4.0	2.8	4.5	9.0	5.8	5.1	3.9	3.2
AC-FT	875	2340	3790	3150	732	860	1490	3190	1000	927	1210	1200

CAL YR 1987	TOTAL	8864.96	MEAN	24.3	MAX	685	MIN	.61	AC-FT	17580
WTR YR 1988	TOTAL	10471.0	MEAN	28.6	MAX	685	MIN	2.8	AC-FT	20770

e Estimated

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, on right bank 1.5 mi northeast of Kaneaki Heiau and 3.4 mi northeast of Makaha.

DRAINAGE AREA.--2.31 mi^2.

PERIOD OF RECORD.--July 1959 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records good. Wells and water-development tunnels in the vicinity and upstream may affect low-flow records. Recording rain gage located at station.

AVERAGE DISCHARGE.--29 years, 1.94 ft^3/s (1,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,450 ft^3/s Jan. 6, 1982, gage height, 7.40 ft, from floodmarks, from rating curve extended above 51 ft^3/s on basis of slope-area measurements at gage heights 6.50 ft and 7.40 ft; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1953, about 7.8 ft Nov. 24, 1954, from information by local resident. Discharge, about 1,700 ft^3/s.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0300	322	3.89	Jan. 1	0430	*338	*3.95
Dec. 30	2030	242	3.57				

Minimum discharge, 0.08 ft^3/s, July 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.41	.56	.90	149	3.5	2.6	1.4	1.7	1.7	.29	.96	1.6
2	.32	.54	.75	60	3.1	2.4	1.1	1.7	1.7	.26	1.6	1.6
3	.26	9.0	.68	28	2.8	2.1	1.0	1.6	1.6	.25	3.1	1.6
4	.24	1.5	.82	15	5.0	2.0	1.3	1.8	1.6	.25	1.9	1.6
5	.95	1.0	1.3	11	2.9	1.9	1.3	2.0	1.6	1.2	.91	1.6
6	1.2	2.4	1.6	8.7	2.5	1.8	1.0	3.8	1.6	2.0	.29	1.5
7	1.0	4.7	1.1	6.5	2.2	1.7	.85	2.9	1.6	1.9	.25	1.5
8	.99	1.4	.95	5.5	2.0	1.7	1.2	2.0	1.6	2.0	.22	1.5
9	1.0	.93	.91	4.7	1.9	1.7	1.7	1.8	1.0	2.0	.19	1.5
10	.99	.72	.86	6.4	1.8	1.6	1.6	1.7	.51	2.0	.16	1.5
11	1.0	.60	.92	4.3	1.7	1.6	1.1	8.3	.46	1.1	.17	1.6
12	1.0	.50	53	3.7	1.7	1.6	.65	5.0	.46	.31	.15	1.6
13	.53	.42	12	3.4	1.6	4.2	.65	5.9	.45	1.1	.15	1.6
14	.48	.41	5.8	3.0	1.6	12	.62	5.3	1.3	1.6	.15	1.6
15	.97	5.5	4.9	2.7	1.5	3.8	.60	5.4	1.1	1.6	.15	1.6
16	.76	2.2	4.1	3.0	1.5	2.6	.62	4.0	1.3	1.5	.16	1.5
17	.59	23	14	6.2	1.4	2.0	.59	3.3	1.9	1.5	1.0	1.5
18	.59	8.8	23	5.7	1.4	1.8	.56	2.8	1.9	1.5	1.7	1.5
19	.59	4.0	49	3.4	1.4	1.6	.65	2.5	1.8	1.5	1.7	1.5
20	.59	3.2	20	2.9	1.4	1.4	.64	2.2	1.1	1.5	1.7	1.5
21	.56	4.0	11	2.6	1.4	1.3	.59	2.1	.35	1.4	1.6	1.5
22	.54	2.4	6.6	2.3	5.7	1.2	1.1	2.0	.35	1.4	1.6	1.5
23	.54	1.7	4.6	2.1	2.6	1.1	1.6	2.0	.34	1.4	1.6	1.5
24	.54	1.4	3.9	2.0	2.1	1.0	1.5	1.9	.36	1.4	1.6	1.5
25	.54	1.3	3.4	20	31	2.7	1.5	1.9	.46	1.4	1.6	1.5
26	.53	1.2	3.3	17	6.9	1.9	3.1	1.9	.45	1.4	1.6	1.5
27	.54	1.0	2.8	9.0	5.1	1.4	3.0	1.8	.41	1.4	1.6	1.5
28	.54	.86	2.2	6.7	3.8	1.3	3.0	1.8	.35	1.4	1.6	1.5
29	.54	1.6	1.9	5.2	3.1	1.3	2.7	1.7	.33	.70	1.6	1.4
30	.54	1.4	38	4.3	---	1.4	1.9	1.7	.30	.11	1.6	1.3
31	.54	---	64	3.8	---	1.5	---	1.7	---	.10	1.6	---
TOTAL	20.41	88.24	338.29	408.1	104.6	68.2	39.12	86.2	29.98	37.47	34.21	45.7
MEAN	.66	2.94	10.9	13.2	3.61	2.20	1.30	2.78	1.00	1.21	1.10	1.52
MAX	1.2	23	64	149	31	12	3.1	8.3	1.9	2.0	3.1	1.6
MIN	.24	.41	.68	2.0	1.4	1.0	.56	1.6	.30	.10	.15	1.3
AC-FT	40	175	671	809	207	135	78	171	59	74	68	91

CAL YR 1987	TOTAL	922.35	MEAN	2.53	MAX	64	MIN	.24	AC-FT 1830
WTR YR 1988	TOTAL	1300.52	MEAN	3.55	MAX	149	MIN	.10	AC-FT 2580

16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°28'13", long 157°57'40", Hydrologic Unit 20060000, on left bank 1,700 ft downstream from forest-reserve boundary, 4.9 mi southeast of Wahiawa Post Office, and 6.3 mi northeast of Waipahu.

DRAINAGE AREA.--4.29 mi^2.

PERIOD OF RECORD.--January 1957 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 690 ft, from topographic map.

REMARKS.--Records good except estimated daily discharges which are poor and discharges below 1.0 ft^3/s which are fair. At times, a small amount of water is diverted from the gage pool for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--31 years, 10.8 ft^3/s (7,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,680 ft^3/s May 14, 1963, gage height, 12.29 ft, from rating curve extended above 300 ft^3/s on basis of slope-area measurements at gage heights 7.96 ft and 12.29 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0430	1,380	7.85	Sept. 27	2400	1,100	7.30
Dec. 31	2215	*1,670	*8.37				

Minimum discharge, 0.54 ft^3/s, July 6, Sept. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	22	5.1	220	14	2.1	67	15	3.0	1.1	.75	.99
2	21	6.6	4.1	109	5.5	1.8	18	13	2.8	.89	.64	.93
3	19	39	3.5	e76	4.4	1.7	20	45	4.1	.80	62	.81
4	4.8	6.7	3.3	e25	4.7	1.6	73	37	2.2	.73	4.9	.75
5	2.9	32	6.0	e15	5.4	1.3	54	15	2.1	.81	2.4	.69
6	2.5	16	9.6	e10	3.7	1.6	11	8.0	3.9	.67	1.7	.75
7	3.7	32	3.0	e8.3	3.1	2.2	9.5	34	6.8	.99	26	.81
8	2.8	7.6	2.5	e7.2	3.0	1.3	5.7	7.7	8.8	26	21	.64
9	1.5	4.7	14	e6.4	2.8	3.1	4.1	5.1	8.1	22	4.7	.69
10	1.5	3.8	31	e20	2.4	2.5	5.0	4.5	8.0	15	2.5	14
11	1.3	3.0	6.3	7.3	2.2	1.2	4.3	76	3.4	14	33	13
12	6.1	2.9	263	5.7	2.1	.93	2.9	154	2.3	11	15	5.0
13	2.2	2.6	63	4.9	2.1	.87	2.5	47	1.8	4.0	6.4	1.7
14	1.3	2.8	45	4.4	2.3	14	2.2	55	1.4	29	6.8	1.1
15	7.2	5.6	31	4.0	3.3	3.3	2.0	68	1.2	4.9	7.2	19
16	12	2.6	16	8.0	4.6	2.6	1.9	15	1.1	2.9	3.9	2.4
17	4.0	36	20	41	2.6	5.3	1.8	11	.97	2.2	25	1.1
18	6.6	10	46	10	1.9	1.9	1.7	8.0	.91	5.1	6.4	.93
19	7.8	5.3	152	5.3	1.6	9.5	2.1	6.5	.88	2.8	3.2	.81
20	3.1	43	37	4.2	1.4	2.8	2.8	5.5	.98	1.8	3.4	.81
21	1.8	109	19	3.7	1.3	1.6	2.2	4.9	1.2	1.4	5.1	.87
22	5.2	48	12	3.3	11	1.1	1.9	5.8	14	1.7	11	1.6
23	3.1	12	8.4	3.0	22	2.2	1.3	9.1	7.5	1.3	4.5	26
24	9.1	31	23	3.2	7.7	38	1.3	4.7	23	.89	2.4	5.2
25	5.9	9.1	7.1	50	76	20	8.7	3.6	3.8	16	2.2	4.5
26	6.8	8.5	13	43	8.4	43	43	3.3	2.3	6.8	2.4	4.1
27	6.4	6.2	24	40	10	12	29	2.9	7.3	1.9	1.7	101
28	3.7	4.6	7.0	90	3.8	6.3	16	3.1	3.0	1.1	1.6	85
29	2.5	30	5.8	38	2.6	3.7	19	3.5	1.7	1.1	1.3	11
30	8.8	9.2	65	10	---	3.8	8.4	3.2	1.4	1.1	1.1	5.4
31	2.8	---	363	6.9	---	12	---	2.7	---	1.2	1.1	---
TOTAL	172.2	551.8	1308.7	882.8	215.9	205.30	422.3	677.1	129.94	181.18	271.29	311.58
MEAN	5.55	18.4	42.2	28.5	7.44	6.62	14.1	21.8	4.33	5.84	8.75	10.4
MAX	21	109	363	220	76	43	73	154	23	29	62	101
MIN	1.3	2.6	2.5	3.0	1.3	.87	1.3	2.7	.88	.67	.64	.64
AC-FT	342	1090	2600	1750	428	407	838	1340	258	359	538	618

CAL YR 1987	TOTAL	4703.83	MEAN	12.9	MAX	363	MIN	.18	AC-FT	9330
WTR YR 1988	TOTAL	5330.09	MEAN	14.6	MAX	363	MIN	.64	AC-FT	10570

e Estimated

16213000 WAIKELE STREAM AT WAIPAHU
(National stream-quality accounting network station)

LOCATION.--Lat 21°23'11", long 158°00'49", Hydrologic Unit 20060000, on left bank 300 ft upstream from bridge on Highway 90 and 0.3 mi southwest of sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--June to October 1951, December 1951 to October 1959, July 1960 to current year.

REVISED RECORDS.--WSP 1639: 1955(M). WSP 1937: Drainage area. WSP 2137: 1965.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.37 ft above mean sea level. Prior to July 1, 1960, at site 300 ft downstream at datum 1.30 ft higher.

REMARKS.--Records good. Diversions upstream for irrigation of sugarcane in vicinity of Waipahu.

AVERAGE DISCHARGE.--35 years (water years 1953-59, 1961-88), 37.9 ft^3/s (27,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft^3/s Nov. 28, 1954, gage height, 14.82 ft, site and datum then in use, from rating curve extended above 730 ft^3/s on basis of slope-area measurement of peak flow; no flow for part of Feb. 25, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0630	1,770	5.27	Jan. 1	0030	*3,040	*6.52
Dec. 19	1000	1,710	5.20				

Minimum discharge, 6.8 ft^3/s, Oct. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.5	21	28	865	39	19	132	51	16	15	11	12
2	22	31	23	253	36	18	65	52	16	17	11	12
3	39	58	21	231	29	17	82	60	16	23	64	15
4	30	37	19	105	27	19	190	103	16	21	39	15
5	20	27	18	70	27	19	128	76	15	16	17	21
6	16	46	26	64	27	20	59	62	16	13	19	16
7	11	58	22	53	25	20	46	73	17	13	26	17
8	12	32	19	46	24	17	42	56	23	33	53	15
9	10	19	29	42	24	16	38	39	23	32	29	61
10	8.9	14	43	62	24	17	35	38	26	66	18	39
11	8.6	12	37	45	24	17	37	78	24	38	54	39
12	8.7	11	691	38	23	16	25	277	21	36	35	30
13	11	9.2	233	35	23	15	23	119	20	29	24	18
14	11	15	97	33	22	22	22	129	20	38	17	14
15	9.2	19	94	30	22	23	26	160	17	31	18	24
16	20	19	55	35	23	23	29	79	13	19	21	20
17	26	54	83	82	25	27	28	57	14	16	26	20
18	22	35	134	68	23	21	27	48	13	15	35	17
19	22	21	804	44	22	30	27	39	16	17	20	15
20	18	24	204	40	21	29	27	30	16	15	21	16
21	10	210	81	38	23	27	25	38	13	15	20	14
22	9.1	145	83	28	27	24	26	38	18	14	21	13
23	15	46	55	31	43	22	26	39	22	17	28	36
24	11	56	63	26	37	55	25	39	32	18	16	39
25	18	38	48	52	102	49	28	28	30	17	15	20
26	15	32	48	132	54	76	63	20	24	37	14	19
27	15	26	60	96	32	62	65	19	19	19	14	134
28	14	23	40	150	35	40	63	23	20	12	14	144
29	11	48	34	93	28	26	56	21	16	13	13	43
30	12	53	128	52	---	24	47	20	15	11	12	29
31	18	---	605	37	---	39	---	20	---	11	12	---
TOTAL	483.0	1239.2	3925	2976	891	849	1512	1931	567	687	737	927
MEAN	15.6	41.3	127	96.0	30.7	27.4	50.4	62.3	18.9	22.2	23.8	30.9
MAX	39	210	804	865	102	76	190	277	32	66	64	144
MIN	8.6	9.2	18	26	21	15	22	19	13	11	11	12
AC-FT	958	2460	7790	5900	1770	1680	3000	3830	1120	1360	1460	1840

CAL YR 1987	TOTAL	12921.8	MEAN	35.4	MAX	804	MIN	7.6	AC-FT	25630
WTR YR 1988	TOTAL	16724.2	MEAN	45.7	MAX	865	MIN	8.6	AC-FT	33170

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-72. April 1973 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to September 1981.
WATER TEMPERATURE: April 1973 to September 1981.
SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

INSTRUMENTATION.--Water-quality monitor April 1973 to September 1981. Automatic pumping sediment sampler since July 1972.

REMARKS.--In addition to the sediment record, water-quality samples are collected.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm Dec. 1, 1980; minimum, 30 micromhos/cm Apr. 19, 1974.
WATER TEMPERATURES: Maximum, 30.0°C May 6, 1973; minimum, 16.0°C Mar. 16, 1976.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L Feb. 7, 1976; minimum daily mean, 5 mg/L for many days in 1983, 1988.
SEDIMENT DISCHARGE: Maximum daily, 32,900 tons Apr. 19, 1974; minimum daily, 0.07 ton Sept. 4, Oct. 1, 1975.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,350 mg/L Dec. 12; minimum daily mean, 5 mg/L for many days.
SEDIMENT DISCHARGE: Maximum daily, 2,980 tons Dec. 19; minimum daily, 0.18 ton June 21.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
20...	0930	761	22	390	7.00	24.5	11	6.8	82	660
DEC										
15...	0945	760	98	135	7.00	21.5	55	8.3	94	--
FEB										
23...	0930	766	37	370	7.20	22.5	5.0	7.6	87	12000
APR										
20...	0850	766	29	385	7.20	22.0	4.2	7.8	89	4900
JUL										
19...	1015	763	18	408	7.20	23.5	3.5	6.6	78	4600
AUG										
30...	0910	763	12	490	7.00	22.0	2.7	6.2	71	9200

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
OCT									
20...	1400	75	27	12	11	51	59	3	2.4
DEC									
15...	32000	22	3	4.0	2.8	14	57	1	1.4
FEB									
23...	8300	62	15	10	9.0	44	59	2	2.6
APR									
20...	3000	66	8	11	9.4	49	61	3	2.4
JUL									
19...	1200	67	9	11	9.7	54	63	3	2.1
AUG									
30...	1600	73	6	11	11	65	65	3	2.4

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)
OCT									
20...	56	0	48	46	20	80	0.20	43	249
DEC									
15...	24	0	19	20	11	22	0.10	14	76
FEB									
23...	57	0	47	47	17	67	0.20	39	221
APR									
20...	69	0	58	57	18	64	0.20	51	240
JUL									
19...	69	0	58	58	19	74	0.20	52	255
AUG									
30...	80	0	67	66	21	88	0.20	65	305

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT									
20...	253	0.34	0.980	0.040	0.050	0.46	0.50	0.110	0.110
DEC									
15...	82	0.10	0.290	0.020	<0.010	0.28	0.30	0.030	0.020
FEB									
23...	222	0.30	0.990	0.040	0.040	--	<0.20	0.120	0.070
APR									
20...	245	0.33	1.10	0.030	0.030	0.17	0.20	0.130	0.110
JUL									
19...	262	0.35	1.20	0.040	<0.010	0.36	0.40	0.150	0.140
AUG									
30...	311	0.41	1.50	0.090	0.100	0.31	0.40	0.210	0.200

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
20...	0930	70	<1	7	<0.5	<1	4	<3	2	110	<5
FEB											
23...	0930	30	<1	5	<0.5	<1	1	<3	1	26	<5
APR											
20...	0850	20	<1	6	<0.5	<1	<1	<3	2	34	<5
AUG											
30...	0910	<10	<1	6	<0.5	<1	<1	<3	<1	17	<5

< Actual value is known to be less than the value shown.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
20...	<4	47	0.1	<10	2	2	<1.0	88	24	13
FEB										
23...	<4	58	<0.1	<10	<1	1	<1.0	73	21	<3
APR										
20...	<4	70	<0.1	<10	3	2	<1.0	75	26	<3
AUG										
30...	<4	55	<0.1	<10	<1	2	<1.0	80	38	<3

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
20...	0930	18	1.1	100
DEC				
15...	0945	92	24	99
FEB				
23...	0930	12	1.2	95
APR				
20...	0850	11	0.86	100
JUL				
19...	1015	10	0.49	100
AUG				
30...	0910	6	0.19	100

< Actual value is known to be less than the value shown.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	9.5	13	0.33	21	30	1.7	28	12	0.91
2	22	22	1.3	31	44	3.7	23	11	0.68
3	39	20	2.1	58	139	33	21	8	0.45
4	30	19	1.5	37	58	5.8	19	11	0.56
5	20	19	1.00	27	39	2.8	18	11	0.53
6	16	18	0.78	46	60	7.5	26	14	0.98
7	11	17	0.50	58	40	6.3	22	10	0.59
8	12	17	0.55	32	22	1.9	19	8	0.41
9	10	17	0.46	19	21	1.1	29	15	1.2
10	8.9	16	0.38	14	21	0.79	43	17	2.0
11	8.6	18	0.42	12	16	0.52	37	16	1.6
12	8.7	16	0.38	11	15	0.45	691	1350	2840
13	11	15	0.45	9.2	14	0.35	233	210	132
14	11	16	0.48	15	21	0.85	97	67	23
15	9.2	18	0.45	19	27	1.4	94	109	33
16	20	30	1.6	19	23	1.2	55	29	4.3
17	26	23	1.6	54	31	4.5	83	138	80
18	22	21	1.2	35	27	2.6	134	198	68
19	22	20	1.2	21	20	1.1	803	962	2980
20	18	23	1.1	24	26	1.7	204	160	88
21	10	17	0.46	210	187	124	81	50	11
22	9.1	17	0.42	145	160	85	82	300	112
23	15	17	0.69	46	23	2.9	55	65	9.7
24	11	17	0.50	56	20	3.0	63	38	6.5
25	18	18	0.87	38	14	1.4	48	22	2.9
26	15	16	0.65	32	11	0.95	48	25	3.2
27	15	16	0.65	26	10	0.70	60	99	18
28	14	13	0.49	23	10	0.62	40	15	1.6
29	11	14	0.42	48	22	2.9	34	12	1.1
30	12	13	0.42	53	24	3.4	126	181	306
31	18	13	0.63	--	--	--	604	791	2290
TOTAL	483.00	--	23.98	1239.20	--	304.13	3920.00	--	9020.21
		JANUARY			FEBRUARY			MARCH	
1	866	603	2850	39	8	0.84	19	12	0.62
2	253	110	75	36	8	0.78	18	8	0.39
3	231	113	74	29	8	0.63	17	8	0.37
4	105	56	16	27	8	0.58	19	10	0.51
5	70	25	4.7	27	8	0.58	19	14	0.72
6	64	15	2.6	27	6	0.44	20	14	0.76
7	53	10	1.4	25	7	0.47	20	14	0.92
8	46	8	0.99	24	6	0.39	17	17	0.78
9	42	6	0.68	24	8	0.52	16	10	0.43
10	62	16	2.7	24	5	0.32	17	9	0.41
11	45	10	1.2	24	6	0.39	17	10	0.46
12	38	10	1.00	23	7	0.43	16	14	0.60
13	35	7	0.66	23	13	0.81	15	12	0.49
14	33	8	0.71	22	6	0.36	22	9	0.53
15	30	6	0.49	22	6	0.36	23	9	0.56
16	35	8	0.76	23	5	0.31	23	10	0.62
17	80	48	10	23	6	0.37	27	11	0.80
18	68	28	5.1	22	6	0.36	21	11	0.62
19	44	14	1.7	21	6	0.34	30	12	0.97
20	40	11	1.2	21	6	0.34	29	12	0.94
21	38	9	0.92	23	6	0.37	27	11	0.80
22	28	7	0.53	27	6	0.44	24	10	0.65
23	31	7	0.59	43	21	2.4	22	10	0.59
24	26	5	0.35	37	36	3.6	55	58	8.6
25	51	20	7.0	100	99	32	49	42	5.6
26	132	125	45	54	33	4.8	76	106	35
27	96	79	20	32	17	1.5	62	85	16
28	150	55	22	35	15	1.4	40	37	4.0
29	93	40	10	38	13	1.3	26	28	2.0
30	52	13	1.8	--	--	--	24	23	1.5
31	37	8	0.80	--	--	--	39	130	14
TOTAL	2974.00	--	3159.87	895.00	--	57.43	849.00	--	101.24

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	132	182	88	51	27	3.7	16	8	0.35
2	65	41	7.2	52	22	3.1	16	6	0.26
3	82	101	22	60	28	4.5	16	7	0.30
4	190	144	100	103	82	29	16	8	0.35
5	128	88	30	76	e60	12	15	8	0.32
6	59	34	5.4	62	25	4.2	16	6	0.26
7	46	20	2.5	73	26	5.1	17	8	0.37
8	42	16	1.8	56	21	3.2	23	7	0.43
9	38	16	1.6	38	15	1.5	23	7	0.43
10	35	14	1.3	38	15	1.5	26	11	0.77
11	37	15	1.5	78	46	27	24	8	0.52
12	25	12	0.81	278	165	134	21	5	0.28
13	23	12	0.75	119	40	13	20	7	0.38
14	22	16	0.95	129	41	14	20	6	0.32
15	26	20	1.4	160	58	29	17	7	0.32
16	29	16	1.3	79	21	4.5	13	6	0.21
17	28	15	1.1	57	19	2.9	14	6	0.23
18	27	14	1.00	48	20	2.6	13	8	0.28
19	27	e15	1.1	39	17	1.8	16	8	0.35
20	27	e17	1.2	30	13	1.1	16	6	0.26
21	25	20	1.3	38	19	1.9	13	5	0.18
22	26	19	1.3	38	15	1.5	18	7	0.34
23	26	17	1.2	39	14	1.5	22	10	0.59
24	25	17	1.1	39	14	1.5	32	12	1.00
25	28	16	1.2	28	11	0.83	30	11	0.89
26	63	36	10	20	9	0.49	24	8	0.52
27	65	46	8.1	19	8	0.41	19	7	0.36
28	63	34	5.8	23	8	0.50	20	6	0.32
29	56	22	3.3	21	7	0.40	16	7	0.30
30	47	21	2.7	20	11	0.59	15	7	0.28
31	--	--	--	20	8	0.43	--	--	--
TOTAL	1512.00	--	306.91	1931.00	--	307.75	567.00	--	11.77
		JULY			AUGUST			SEPTEMBER	
1	15	8	0.32	11	9	0.27	12	e7	0.23
2	17	7	0.32	11	11	0.33	12	e7	0.23
3	23	7	0.43	64	108	27	15	e7	0.28
4	21	6	0.34	39	22	2.3	15	e7	0.28
5	16	6	0.26	17	15	0.69	21	e8	0.45
6	13	9	0.32	19	13	0.67	16	e7	0.30
7	13	11	0.39	26	12	0.84	17	e7	0.32
8	33	18	1.6	53	e18	2.6	15	e7	0.28
9	32	13	1.1	29	e15	1.2	63	e192	169
10	66	55	9.8	18	e10	0.49	39	e75	7.9
11	38	15	1.5	54	e50	7.3	39	e25	2.6
12	36	13	1.3	35	e30	2.8	30	e15	1.2
13	29	11	0.86	24	e10	0.65	18	e10	0.49
14	38	20	2.1	17	e8	0.37	14	e7	0.26
15	31	16	1.3	18	e7	0.34	24	e7	0.45
16	19	11	0.56	21	e7	0.40	20	e20	1.1
17	16	9	0.39	26	e15	1.1	20	e10	0.54
18	15	11	0.45	35	e12	1.1	17	e8	0.37
19	17	8	0.37	20	e10	0.54	15	e8	0.32
20	15	8	0.32	21	e10	0.57	16	e7	0.30
21	15	9	0.36	20	e8	0.43	14	e7	0.26
22	14	7	0.26	21	e8	0.45	13	e7	0.25
23	17	9	0.41	28	e10	0.76	36	e25	2.4
24	18	6	0.29	16	e8	0.35	39	e15	1.6
25	17	7	0.32	15	e8	0.32	20	e10	0.54
26	37	12	1.2	14	e7	0.26	19	e8	0.41
27	19	e10	0.51	14	e7	0.26	132	e163	99
28	12	8	0.26	14	e7	0.26	140	e138	86
29	13	8	0.28	13	e7	0.25	43	e25	2.9
30	11	9	0.27	12	e7	0.23	29	e20	1.6
31	11	8	0.24	12	e7	0.23	--	--	--
TOTAL	687.00	--	28.43	737.00	--	55.36	923.00	--	381.86
YEAR	16717.20		13758.93						

e Estimated.

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft upstream from lower bridge on Highway 90, 0.6 mi northwest of Pearl City, and 2.0 mi northeast of Waipahu.

DRAINAGE AREA.--26.4 mi^2.

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

REVISED RECORDS.--WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level.

REMARKS.--Records good except those above 200 ft^3/s which are poor. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--36 years, 33.3 ft^3/s (24,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s Oct. 28, 1981, gage height, 26.46 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, 1.1 ft^3/s for several days in 1984 and 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0530	9,550	15.03	Dec. 31	2300	*16,200	*18.08
Dec. 19	1830	5,190	11.89	Apr. 4	0530	5,470	12.14

Minimum discharge, 1.4 ft^3/s, Oct. 11-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	23	14	1960	16	2.7	55	21	2.4	2.1	1.8	2.1
2	42	18	8.1	227	9.8	2.5	37	19	2.3	2.0	2.1	2.0
3	17	87	5.3	185	6.0	2.5	85	48	4.7	2.0	173	2.0
4	6.2	28	3.8	58	5.0	2.5	604	88	3.5	2.1	14	2.1
5	3.4	17	3.1	32	6.0	2.5	148	47	2.7	2.0	3.9	2.1
6	2.2	21	3.6	29	5.1	2.4	38	30	3.6	2.0	2.2	2.1
7	8.3	43	3.2	19	3.6	2.4	24	60	4.4	2.3	5.9	2.1
8	4.7	14	2.3	14	2.8	2.4	15	24	3.2	10	29	2.1
9	2.3	6.1	15	11	2.7	2.4	8.5	11	8.1	12	5.8	3.0
10	1.7	3.5	56	88	2.6	2.3	5.8	7.3	7.8	28	2.7	25
11	1.5	2.4	13	17	2.5	2.3	6.4	248	4.0	24	242	6.8
12	1.5	3.2	2800	9.6	2.5	2.3	4.6	709	2.8	15	53	13
13	1.5	3.7	516	6.6	2.5	2.2	4.0	223	2.3	7.6	16	3.3
14	1.4	4.6	156	5.2	2.4	11	3.8	154	2.1	43	14	2.2
15	6.2	11	127	5.0	2.5	4.4	3.4	386	2.0	11	17	47
16	7.9	4.1	78	18	2.4	2.5	3.2	67	2.0	4.3	8.6	6.9
17	2.6	101	84	94	2.4	2.3	3.1	35	1.9	2.6	41	2.8
18	1.8	23	355	37	2.4	2.3	3.1	21	2.0	2.0	16	2.1
19	7.9	9.8	2100	17	2.4	4.6	3.2	14	2.0	2.0	6.5	2.0
20	4.4	187	370	11	2.4	3.6	3.1	9.9	2.1	2.0	4.0	2.0
21	2.2	473	99	7.9	2.4	2.6	3.3	7.7	2.1	2.0	3.0	2.0
22	1.8	287	59	5.5	9.4	2.3	3.3	6.6	5.1	2.1	5.1	2.0
23	2.0	32	39	4.3	40	2.2	3.3	6.8	8.9	2.1	8.2	15
24	2.1	49	91	4.2	12	44	3.3	6.5	35	2.1	4.0	9.2
25	13	20	34	29	161	91	3.3	4.9	10	14	2.7	3.5
26	3.6	17	43	78	26	216	53	5.7	4.3	13	2.2	2.2
27	4.5	9.6	73	98	9.5	35	79	2.7	9.0	2.6	2.1	336
28	4.7	6.4	29	132	5.5	12	46	2.6	6.8	1.9	2.1	144
29	4.0	122	13	54	3.3	5.6	48	2.6	3.4	1.9	2.0	25
30	2.5	38	314	28	---	6.4	24	2.5	2.4	1.9	2.0	11
31	3.0	---	3380	14	---	7.9	---	2.4	---	1.9	2.0	---
TOTAL	169.5	1664.4	10887.4	3298.3	353.1	487.1	1324.7	2273.2	152.9	223.5	693.9	682.6
MEAN	5.47	55.5	351	106	12.2	15.7	44.2	73.3	5.10	7.21	22.4	22.8
MAX	42	473	3380	1960	161	216	604	709	35	43	242	336
MIN	1.4	2.4	2.3	4.2	2.4	2.2	3.1	2.4	1.9	1.9	1.8	2.0
AC-FT	336	3300	21600	6540	700	966	2630	4510	303	443	1380	1350

CAL YR 1987	TOTAL	19051.8	MEAN	52.2	MAX	3380	MIN	1.4	AC-FT	37790
WTR YR 1988	TOTAL	22210.6	MEAN	60.7	MAX	3380	MIN	1.4	AC-FT	44050

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, on left bank 2.7 mi upstream from confluence with South Halawa Stream and 2.7 mi northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi^2.

PERIOD OF RECORD.--August 1929 to June 1933, July 1953 to current year. Monthly discharge only May, June 1931, published in WSP 1319.

REVISED RECORDS.--WSP 1319: Drainage area. WSP 1719: 1954-55(P), 1956, 1957(P), 1958-59.

GAGE.--Water-stage recorder. Elevation of gage is 320 ft, from topographic map.

REMARKS.--Records good. Recording rain gage located at station.

AVERAGE DISCHARGE.--38 years (water years 1930-32, 1954-88), 4.92 ft^3/s (3,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft^3/s Feb. 28, 1932, gage height, 13.36 ft, from rating curve extended above 420 ft^3/s; maximum gage height, 13.46 ft, May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 570 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	2045	740	9.40	Dec. 31	2130	*1,140	*10.43
Dec. 30	1745	671	9.17				

Minimum discharge, no flow for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	2.3	2.3	221	9.9	1.2	5.8	5.1	.53	.05	.00	.01
2	9.2	1.4	1.4	85	3.5	1.1	3.4	4.6	2.2	.03	.00	.01
3	2.2	4.1	.87	71	2.8	.89	9.3	11	2.1	.01	18	.01
4	.89	1.2	.58	26	7.5	.75	43	14	.65	.02	1.4	.01
5	.59	1.5	1.4	13	4.2	.67	27	9.7	.39	.02	.23	.01
6	.38	1.9	2.3	8.1	2.4	.68	8.4	4.9	1.7	.01	.09	.01
7	1.7	26	.66	5.7	1.9	.63	4.3	8.6	1.0	.01	4.7	.01
8	.54	3.7	.43	4.4	1.7	.58	2.6	3.5	.90	.55	3.9	.00
9	.32	1.3	3.8	3.7	1.6	.64	1.7	1.9	1.8	3.6	.42	.00
10	.14	.57	2.3	22	1.4	.54	1.2	1.2	1.2	2.1	.09	.01
11	.05	.39	1.4	5.0	1.2	.41	.93	46	.54	.60	24	.30
12	.03	.45	159	3.5	1.2	.36	.72	94	.33	.95	6.3	.43
13	.02	.37	52	2.8	1.1	.36	.56	80	.26	.49	2.4	.04
14	.01	.65	17	2.4	1.2	20	.44	38	.17	1.1	4.8	.04
15	.01	2.3	14	2.0	1.2	3.1	.35	55	.10	.58	2.0	19
16	.01	.57	11	11	1.2	1.9	.31	17	.07	.20	.87	1.3
17	.01	53	13	36	.98	1.4	.25	7.8	.04	.10	7.4	.26
18	.01	22	45	26	.87	2.8	.19	4.5	.02	.04	1.9	.12
19	.01	7.7	94	8.6	.78	8.5	.16	3.1	.02	.02	.50	.06
20	.01	31	37	4.8	.73	1.4	.11	2.3	.02	.03	.23	.03
21	.01	47	13	3.4	.70	.72	.09	1.9	.02	.03	.20	.02
22	.01	33	6.9	2.6	8.7	.48	.08	1.7	.02	.02	.75	.02
23	.01	8.1	4.4	2.2	9.6	.51	.05	1.4	.01	.02	.39	4.3
24	.00	11	11	1.9	2.1	5.8	.04	1.1	1.0	.01	.12	.63
25	.00	4.1	3.9	36	70	29	5.2	.98	.46	.01	.07	.09
26	.00	2.6	8.2	57	10	4.9	23	.81	.21	.01	.03	.06
27	.00	1.6	14	58	4.2	2.2	6.1	.63	.90	.01	.02	51
28	.00	1.1	4.5	48	2.5	1.8	11	.65	.40	.01	.02	20
29	.00	10	2.8	22	1.5	1.4	6.7	.55	.21	.01	.03	12
30	.01	5.5	80	8.8	---	5.7	4.1	.58	.11	.00	.01	2.8
31	.01	---	344	5.4	---	12	---	.46	---	.00	.01	---
TOTAL	17.28	286.40	952.14	807.3	156.66	112.42	167.08	422.96	17.38	10.64	80.88	112.58
MEAN	.56	9.55	30.7	26.0	5.40	3.63	5.57	13.6	.58	.34	2.61	3.75
MAX	9.2	53	344	221	70	29	43	94	2.2	3.6	24	51
MIN	.00	.37	.43	1.9	.70	.36	.04	.46	.01	.00	.00	.00
AC-FT	34	568	1890	1600	311	223	331	839	34	21	160	223

CAL YR 1987	TOTAL	2131.94	MEAN	5.84	MAX	344	MIN	.00	AC-FT	4230
WTR YR 1988	TOTAL	3143.72	MEAN	8.59	MAX	344	MIN	.00	AC-FT	6240

16226200 NORTH HALAWA STREAM NEAR HONOLULU

LOCATION.--Lat 21°23'04", long 157°54'22", Hydrologic Unit 20060000, on right bank 0.5 mi north of Halawa quarry, 1.7 mi east of Aiea High School, and 1.9 mi east of Aiea.

DRAINAGE AREA.--4.01 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 160 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--5 Years, 4.55 ft^3/s (3,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft^3/s Dec. 31, 1987, gage height, 11.25 ft, no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 750 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	2100	1,090	11.08	Dec. 31	2145	*1,180	*11.25
Dec. 30	1800	848	10.57				

No flow for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.45	.51	3.3	271	9.9	1.2	6.2	5.1	.58	.12	.00	.03
2	10	1.4	2.1	105	3.4	1.0	3.8	4.8	1.7	.04	.00	.02
3	2.9	3.7	1.3	86	2.7	.85	9.3	9.1	2.8	.02	19	.01
4	1.3	1.6	1.1	29	6.8	.73	49	16	.98	.03	1.8	.01
5	.91	1.1	1.6	14	4.1	.63	30	11	.64	.03	.42	.00
6	.65	2.6	3.0	8.8	2.4	.58	10	5.4	1.7	.01	.14	.00
7	1.8	25	1.2	6.0	1.9	.56	5.0	9.3	1.4	.02	2.9	.00
8	.94	4.4	.84	4.5	1.7	.48	3.0	4.0	.97	.04	5.5	.00
9	.53	1.7	4.0	3.6	1.5	.63	2.1	2.4	1.8	3.1	.78	.00
10	.29	.87	2.7	24	1.3	.49	1.5	1.5	1.6	3.0	.25	.01
11	.18	.58	2.4	5.0	1.2	.43	1.2	47	.80	.76	26	.01
12	.13	.50	209	3.4	1.1	.37	.90	111	.50	.96	6.9	.01
13	.16	.52	72	2.7	1.1	.31	.73	95	.38	.78	2.8	.00
14	.11	.58	27	2.3	1.1	20	.58	43	.30	.98	4.8	.00
15	.13	2.6	24	2.1	1.2	3.6	.46	63	.20	.91	2.5	20
16	.12	.88	19	9.7	1.2	1.8	.39	20	.12	.38	1.1	1.7
17	.08	55	20	38	.91	1.7	.32	9.6	.08	.21	7.6	.51
18	.07	25	65	30	.84	2.5	.23	5.2	.04	.12	2.6	.22
19	.05	8.2	134	10	.76	8.0	.25	3.5	.03	.05	.81	.11
20	.04	32	56	5.4	.70	1.6	.23	2.7	.06	.04	.40	.09
21	.03	52	23	3.7	.65	.85	.20	2.2	.05	.01	.32	.05
22	.03	38	12	2.7	7.6	.51	.17	2.1	.10	.01	.66	.05
23	.03	9.1	7.5	2.2	10	.63	.13	1.7	.07	.01	.70	4.6
24	.03	11	16	2.1	2.5	4.5	.12	1.4	.16	.01	.26	1.1
25	.02	4.8	6.4	35	78	33	4.8	1.1	.58	.01	.12	.39
26	.02	3.4	10	62	11	5.8	25	1.0	.28	.01	.06	.19
27	.02	2.3	21	62	4.2	2.5	6.7	.82	.71	.01	.04	58
28	.01	1.5	7.2	51	2.5	2.1	11	.77	.66	.01	.04	23
29	.01	11	4.4	23	1.6	1.6	7.1	.69	.31	.00	.04	13
30	.01	6.7	104	9.3	---	5.4	4.3	.67	.19	.00	.07	3.2
31	.01	---	399	5.3	---	13	---	.60	---	.00	.05	---
TOTAL	21.06	308.54	1260.04	918.8	163.86	117.35	184.71	481.65	19.79	11.68	88.66	126.31
MEAN	.68	10.3	40.6	29.6	5.65	3.79	6.16	15.5	.66	.38	2.86	4.21
MAX	10	55	399	271	78	33	49	111	2.8	3.1	26	58
MIN	.01	.50	.84	2.1	.65	.31	.12	.60	.03	.00	.00	.00
AC-FT	42	612	2500	1820	325	233	366	955	39	23	176	251

CAL YR 1987	TOTAL	2521.48	MEAN	6.91	MAX	399	MIN	.01	AC-FT 5000
WTR YR 1988	TOTAL	3702.45	MEAN	10.1	MAX	399	MIN	.00	AC-FT 7340

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1983 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1983.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 819 mg/L Dec. 12, 1987; no flow for many days each year.
SEDIMENT DISCHARGE: Maximum daily, 842 tons Dec. 12, 1987; no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 819 mg/L Dec. 12; no flow for several days.
SEDIMENT DISCHARGE: Maximum daily, 842 tons Dec. 12; no flow for several days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV										
17...	1030	758	207	60	7.10	19.5	78	8.8	96	K8500
17...	1145	758	105	49	6.60	19.5	73	8.6	94	K8000
AUG										
03...	1100	757	19	48	6.20	23.0	550	8.3	97	2400

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)
NOV											
17...	1030	12	1	2.0	1.7	6.2	49	0.8	1.4	11	7.4
AUG											
03...	1100	5	2	0.80	0.83	6.2	69	1	0.50	3.0	8.0

DATE	TIME	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
NOV											
17...	1030	12	0.10	6.9	41	45	0.06	684	--	1.9	0.070
17...	1145	--	--	--	--	--	--	198	--	2.8	0.040
AUG											
03...	1100	8.4	0.20	6.2	31	33	0.04	--	0.90	0.80	0.020

K Results based on colony count outside the acceptable range (non-ideal colony count).

16226200 NORTH HALAWA NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
NOV												
17...	1030	56000	220	<1	<1	<100	2	<10	<0.5	<1	<1	190
AUG												
03...	1100	62000	70	<1	<1	<100	<2	<10	<0.5	<1	<1	250

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
NOV												
17...	2	20	<3	59	11	51000	190	<5	<5	<10	<4	1300
AUG												
03...	<1	10	<3	65	3	59000	43	<5	<5	<10	<4	600

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)
NOV												
17...	12	0.20	0.1	<1	<10	92	1	<1	<1	<1	<1.0	16
AUG												
03...	25	0.10	<0.1	2	<10	100	2	--	<1	<1	<1.0	4

DATE	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
NOV											
17...	<6	100	9	89	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010
AUG											
03...	<6	70	<3	17	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010

< Actual value is known to be less than the value shown.

16226200 NORTH HALAWA NEAR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
NOV											
17...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
AUG											
03...	0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
NOV											
17...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG											
03...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	0.45	11	0.01	0.51	e7	0.01	3.3	e1	0.01
2	10	62	4.4	1.4	e9	0.03	2.1	e1	0.01
3	2.9	3	0.02	3.7	e10	0.10	1.3	e1	0.00
4	1.3	e2	0.01	1.6	e9	0.04	1.1	e1	0.00
5	0.91	e1	0.00	1.1	e9	0.03	1.6	e3	0.01
6	0.65	e1	0.00	2.6	12	0.08	3.0	e2	0.02
7	1.8	e4	0.02	25	162	26	1.2	e1	0.00
8	0.94	e3	0.01	4.4	6	0.07	0.84	e1	0.00
9	0.53	e2	0.00	1.7	6	0.03	4.0	20	0.22
10	0.29	e2	0.00	0.87	e5	0.01	2.7	5	0.04
11	0.18	e1	0.00	0.58	e4	0.01	2.4	e2	0.01
12	0.13	e1	0.00	0.50	e3	0.00	209	819	842
13	0.16	e3	0.00	0.52	e2	0.00	72	45	10
14	0.11	e1	0.00	0.58	e3	0.00	27	10	0.73
15	0.13	e2	0.00	2.6	30	0.21	24	10	0.65
16	0.12	e1	0.00	0.88	e5	0.01	19	6	0.31
17	0.08	e1	0.00	55	291	61	20	68	9.0
18	0.07	e1	0.00	25	10	0.67	65	105	27
19	0.05	e1	0.00	8.2	8	0.18	134	158	92
20	0.04	e1	0.00	32	54	13	56	11	1.7
21	0.03	e1	0.00	52	55	8.8	23	3	0.19
22	0.03	e1	0.00	38	46	9.1	12	3	0.10
23	0.03	e1	0.00	9.1	2	0.05	7.5	2	0.04
24	0.03	e1	0.00	11	5	0.15	16	8	0.35
25	0.02	e1	0.00	4.8	e8	0.10	6.4	2	0.03
26	0.02	e1	0.00	3.4	8	0.07	10	5	0.13
27	0.02	e1	0.00	2.3	e6	0.04	21	10	0.57
28	0.01	e1	0.00	1.5	e4	0.02	7.2	2	0.04
29	0.01	e1	0.00	11	33	2.0	4.4	2	0.02
30	0.01	e1	0.00	6.7	6	0.11	104	319	258
31	0.01	e1	0.00	--	--	--	399	460	824
TOTAL	21.06	--	4.48	308.54	--	121.93	1260.04	--	2067.19
		JANUARY			FEBRUARY			MARCH	
1	271	162	184	9.9	e15	0.40	1.2	e3	0.01
2	105	20	5.7	3.4	e8	0.07	1.0	e2	0.01
3	86	42	13	2.7	e6	0.04	0.85	e1	0.00
4	29	3	0.23	6.8	e13	0.24	0.73	e1	0.00
5	14	2	0.08	4.1	e11	0.12	0.63	e1	0.00
6	8.8	e2	0.05	2.4	e9	0.06	0.58	e1	0.00
7	6.0	3	0.05	1.9	e7	0.04	0.56	e1	0.00
8	4.5	1	0.01	1.7	e5	0.02	0.48	e1	0.00
9	3.6	2	0.02	1.5	e3	0.01	0.63	e3	0.01
10	24	14	0.91	1.3	e10	0.04	0.49	e1	0.00
11	5.0	2	0.03	1.2	e5	0.02	0.43	e1	0.00
12	3.4	1	0.01	1.1	e5	0.01	0.37	e1	0.00
13	2.7	e1	0.01	1.1	e5	0.01	0.31	e1	0.00
14	2.3	e1	0.01	1.1	e5	0.01	20	e181	18
15	2.1	e1	0.01	1.2	e5	0.02	3.6	e20	0.19
16	9.7	6	0.16	1.2	e5	0.02	1.8	e9	0.04
17	38	23	2.5	0.91	10	0.02	1.7	e8	0.04
18	30	14	1.1	0.84	e9	0.02	2.5	e9	0.06
19	10	3	0.08	0.76	e8	0.02	8.0	e26	0.56
20	5.4	2	0.03	0.70	e7	0.01	1.6	e8	0.03
21	3.7	2	0.02	0.65	e7	0.01	0.85	e5	0.01
22	2.7	e1	0.01	7.5	124	8.8	0.51	e4	0.01
23	2.2	e1	0.01	10	31	0.84	0.63	e190	0.32
24	2.1	e1	0.01	2.5	e10	0.07	4.5	60	0.73
25	35	72	20	78	233	101	33	443	85
26	59	35	5.8	11	5	0.15	5.8	11	0.17
27	62	e16	2.7	4.2	14	0.16	2.5	e7	0.05
28	51	e14	1.9	2.5	e6	0.04	2.1	e5	0.03
29	23	e12	0.75	1.6	e4	0.02	1.6	e5	0.02
30	9.3	e8	0.20	--	--	--	5.4	30	0.44
31	5.3	e6	0.09	--	--	--	13	45	1.6
TOTAL	915.80	--	239.48	163.76	--	112.29	117.35	--	107.35

e Estimated

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	6.2	9	0.15	5.1	e9	0.12	0.58	e1	0.00
2	3.8	7	0.07	4.8	15	0.19	1.7	e10	0.05
3	9.3	10	0.25	9.1	30	0.74	2.8	60	0.45
4	49	304	78	16	45	1.9	0.98	e10	0.03
5	30	9	0.73	11	20	0.59	0.64	e8	0.01
6	10	70	1.9	5.4	12	0.17	1.7	e12	0.06
7	5.0	e17	0.23	9.3	15	0.38	1.4	e8	0.03
8	3.0	e14	0.11	4.0	10	0.11	0.97	e6	0.02
9	2.1	e9	0.05	2.4	e7	0.05	1.8	e7	0.03
10	1.5	e7	0.03	1.5	e6	0.02	1.6	e6	0.03
11	1.2	e5	0.02	47	308	62	0.80	e5	0.01
12	0.90	e3	0.01	111	282	100	0.50	e3	0.00
13	0.73	e2	0.00	95	185	51	0.38	e2	0.00
14	0.58	e1	0.00	43	69	8.0	0.30	e1	0.00
15	0.46	e1	0.00	63	171	47	0.20	e1	0.00
16	0.39	e1	0.00	20	15	0.81	0.12	e1	0.00
17	0.32	e1	0.00	9.6	6	0.16	0.08	e1	0.00
18	0.23	e1	0.00	5.2	5	0.07	0.04	e1	0.00
19	0.25	e1	0.00	3.5	4	0.04	0.03	e1	0.00
20	0.23	e1	0.00	2.7	e3	0.02	0.06	e1	0.00
21	0.20	e1	0.00	2.2	e2	0.01	0.05	e1	0.00
22	0.17	e1	0.00	2.1	e2	0.01	0.10	e1	0.00
23	0.13	e1	0.00	1.7	e1	0.00	0.07	e1	0.00
24	0.12	e1	0.00	1.4	30	0.11	0.16	e2	0.00
25	4.8	e30	0.39	1.1	e10	0.03	0.58	e2	0.00
26	25	219	38	1.0	e8	0.02	0.28	e1	0.00
27	6.7	14	0.25	0.82	e6	0.01	0.71	e3	0.01
28	11	11	0.33	0.77	e4	0.01	0.66	e2	0.00
29	7.1	9	0.17	0.69	e2	0.00	0.31	e1	0.00
30	4.3	7	0.08	0.67	e1	0.00	0.19	e1	0.00
31	--	--	--	0.60	e1	0.00	--	--	--
TOTAL	184.71	--	120.78	481.65	--	273.58	19.79	--	0.75
		JULY			AUGUST			SEPTEMBER	
1	0.12	e1	0.00	0.00	e0	0.00	0.03	e1	0.00
2	0.04	e1	0.00	0.00	e0	0.00	0.02	e1	0.00
3	0.02	e1	0.00	18	e495	74	0.01	e1	0.00
4	0.03	e1	0.00	1.8	e40	0.19	0.01	e1	0.00
5	0.03	e1	0.00	0.42	e10	0.01	0.00	e0	0.00
6	0.01	e1	0.00	0.14	e5	0.00	0.00	e0	0.00
7	0.02	e1	0.00	2.9	e30	0.23	0.00	e0	0.00
8	0.04	e1	0.00	5.5	e50	0.74	0.00	e0	0.00
9	3.1	e10	0.08	0.78	e15	0.03	0.00	e0	0.00
10	3.0	e9	0.07	0.25	e10	0.01	0.01	e1	0.00
11	0.76	e7	0.01	24	e353	44	0.01	e1	0.00
12	0.96	e7	0.02	6.9	e40	0.75	0.01	e1	0.00
13	0.78	e6	0.01	2.8	e20	0.15	0.00	e0	0.00
14	0.98	e7	0.02	4.8	e25	0.32	0.00	e0	0.00
15	0.91	e5	0.01	2.5	e15	0.10	18	e306	41
16	0.38	e3	0.00	1.1	e10	0.03	1.7	e30	0.14
17	0.21	e2	0.00	7.1	e112	5.3	0.51	e5	0.01
18	0.12	e1	0.00	2.6	e20	0.14	0.22	e2	0.00
19	0.05	e1	0.00	0.81	e5	0.01	0.11	e1	0.00
20	0.04	e1	0.00	0.40	e1	0.00	0.09	e1	0.00
21	0.01	e1	0.00	0.32	e1	0.00	0.05	e1	0.00
22	0.01	e1	0.00	0.66	e1	0.00	0.05	e1	0.00
23	0.01	e1	0.00	0.70	e1	0.00	4.6	e100	1.2
24	0.01	e1	0.00	0.26	e1	0.00	1.1	e20	0.06
25	0.01	e1	0.00	0.12	e1	0.00	0.39	e5	0.01
26	0.01	e1	0.00	0.06	e1	0.00	0.19	e2	0.00
27	0.01	e1	0.00	0.04	e1	0.00	57	e676	255
28	0.01	e1	0.00	0.04	e1	0.00	23	e138	15
29	0.00	e0	0.00	0.04	e1	0.00	13	e109	8.2
30	0.00	e0	0.00	0.07	e1	0.00	3.2	e20	0.17
31	0.00	e0	0.00	0.05	e1	0.00	--	--	--
TOTAL	11.68	--	0.22	85.16	--	126.02	123.31	--	320.79
YEAR	3692.84		3494.87						

e Estimated

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'00", long 157°50'49", Hydrologic Unit 20060000, on right bank 1.9 mi upstream from Kamanaiki Stream and 4.1 mi north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--September 1913 to April 1914, July 1914 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1719: 1921-22(M), 1923-24, 1925-26(M), 1927-28, 1929-32(M), 1935, 1937, 1938-39(M), 1943(M), 1948-52(P), 1955-56, 1957-58(M), 1959.

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

REMARKS.--Records good except period of no gage-height record which are fair. No diversion upstream.

AVERAGE DISCHARGE.--74 years (water years 1915-88), 6.61 ft^3/s (4,790 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft^3/s Nov. 18, 1930, gage height, 13.81 ft, from rating curve extended above 280 ft^3/s on basis of indirect measurements at gage heights 8.9 ft, 10.96 ft, and 11.27 ft; minimum, 0.09 ft^3/s, Oct. 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0330	1,800	9.33	Dec. 31	1700	*2,070	*9.64
Nov. 11	1030	930	7.90				

Minimum discharge, 0.65 ft^3/s for a few days in July, August, and September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	6.2	4.6	e160	11	3.2	5.4	3.6	3.9	1.3	.77	1.0
2	3.2	3.2	4.0	e77	8.0	2.9	3.2	4.6	4.2	1.2	1.9	.95
3	2.0	6.1	3.8	e33	7.7	3.0	19	6.8	3.3	1.2	15	.90
4	1.5	2.4	3.8	e20	15	2.8	29	10	3.0	1.2	2.0	.83
5	1.6	12	6.3	e14	8.7	2.6	7.7	5.4	2.7	1.2	1.4	.90
6	1.3	7.4	3.6	e12	7.7	3.0	4.6	4.0	4.3	1.1	1.1	1.1
7	5.2	17	3.0	e11	7.4	2.4	4.0	4.2	2.7	1.2	2.1	.84
8	1.6	4.6	4.0	e9.6	6.8	2.3	3.6	3.4	2.6	2.6	1.9	.78
9	1.4	3.2	8.2	e8.6	6.5	3.4	3.2	3.0	2.9	2.2	1.2	.85
10	1.2	2.6	6.2	e20	6.2	2.4	2.8	2.8	2.5	2.1	1.1	1.6
11	1.2	2.0	3.8	e13	5.9	2.3	2.4	46	2.4	1.7	22	4.3
12	2.0	3.1	138	e11	5.6	2.0	2.4	75	2.1	1.7	6.5	1.8
13	1.3	2.0	28	e9.0	5.4	2.8	2.3	54	2.1	1.3	3.7	.93
14	1.3	4.6	14	e8.6	5.4	16	2.2	37	2.0	3.1	6.0	2.1
15	1.6	2.8	10	e8.0	5.6	4.0	2.0	45	1.9	1.5	3.3	12
16	1.4	2.9	7.7	e20	6.2	3.2	2.0	14	2.0	1.2	2.4	2.0
17	1.2	45	17	e20	4.4	2.8	2.2	11	1.9	1.2	3.1	1.3
18	1.8	12	32	e50	4.6	3.2	2.2	8.4	1.8	1.3	2.1	1.2
19	1.3	11	79	e22	4.2	3.4	2.2	7.1	1.5	1.1	2.2	1.1
20	1.2	40	23	e15	4.0	2.8	2.0	6.5	1.6	1.4	1.9	1.0
21	1.1	53	14	e12	4.2	2.4	2.0	5.6	2.0	1.3	2.1	1.0
22	2.3	25	9.8	e9.0	5.1	3.0	1.9	6.2	2.3	1.1	1.7	1.1
23	1.4	11	8.7	e8.2	6.2	3.1	1.8	5.4	1.9	.93	1.4	4.8
24	2.3	11	14	e7.5	4.2	17	1.6	4.6	2.8	.89	1.4	1.6
25	1.6	6.5	7.1	e30	37	25	2.7	4.4	1.7	3.8	1.4	1.4
26	1.9	5.9	14	e38	5.9	4.2	3.2	4.0	1.8	1.2	1.2	1.7
27	1.4	4.9	11	e35	4.2	3.2	2.0	3.8	4.6	1.1	1.1	24
28	1.3	4.2	6.5	48	3.7	2.8	4.8	3.8	2.1	.94	1.1	10
29	1.2	18	5.9	34	3.4	3.7	2.8	3.6	1.7	.90	1.2	6.8
30	1.4	6.2	e60	14	---	3.2	3.2	3.3	1.4	.93	1.1	3.7
31	1.1	---	e200	11	---	5.4	---	3.1	---	.87	1.0	---
TOTAL	52.2	335.8	751.0	788.5	210.2	143.5	130.4	399.6	73.7	44.76	96.37	93.58
MEAN	1.68	11.2	24.2	25.4	7.25	4.63	4.35	12.9	2.46	1.44	3.11	3.12
MAX	5.2	53	200	160	37	25	29	75	4.6	3.8	22	24
MIN	1.1	2.0	3.0	7.5	3.4	2.0	1.6	2.8	1.4	.87	.77	.78
AC-FT	104	666	1490	1560	417	285	259	793	146	89	191	186

CAL YR 1987	TOTAL	2370.3	MEAN	6.49	MAX	200	MIN	1.1	AC-FT	4700
WTR YR 1988	TOTAL	3119.61	MEAN	8.52	MAX	200	MIN	.77	AC-FT	6190

e Estimated

16229000 KALIHI STREAM NEAR HONOLULU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1972, 1974 to current year.

REMARKS.--Miscellaneous chemical analyses published for this station for 1969, 1973 water years.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD NESS-NONCARB-ONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO
NOV												
27...	1045	4.6	145	7.10	20.5	34	14	5.5	4.9	14	47	1
FEB												
03...	1150	8.1	145	7.00	19.5	32	9	5.1	4.8	14	48	1
MAY												
27...	1120	4.0	145	7.00	21.5	33	7	5.0	4.9	14	48	1
SEP												
28...	1010	5.9	135	7.40	22.0	31	4	5.0	4.6	13	46	1

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
NOV											
27...	0.90	20	6.8	23	<0.10	13	85	0.12	1.10	120	17
FEB											
03...	0.70	24	6.9	22	0.10	12	81	0.11	0.100	59	17
MAY											
27...	0.60	26	6.4	22	0.20	12	81	0.11	<0.100	120	18
SEP											
28...	1.0	27	6.3	17	<0.10	14	77	0.10	<0.100	110	5

< Actual value is known to be less than the value shown.

16229300 KALIHI STREAM AT KALIHI
(National stream-quality accounting network station)

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, on right bank at Kalihi, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--Water year 1962 (annual maximum), July 1962 to current year.

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

REMARKS.--Records fair. No diversion upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--26 years, 10.5 ft^3/s (7,610 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s Apr. 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft^3/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0.16 ft^3/s, June 24, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft from floodmarks, present site and datum, discharge, 6,350 ft^3/s, from slope-area measurement of peak flow.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0430	*2,420	*6.00	Dec. 13	1700	2,240	5.77

Minimum discharge, 1.3 ft^3/s for a few days in September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	8.6	7.0	336	13	3.4	12	8.5	5.1	2.3	1.7	1.7
2	4.1	3.6	5.5	123	9.8	3.2	10	8.4	4.9	2.4	2.0	1.5
3	2.5	6.9	4.7	84	9.0	3.1	37	11	4.1	2.4	24	1.4
4	2.3	2.9	4.8	39	16	2.9	55	17	3.8	2.4	2.9	1.4
5	2.4	18	9.1	e27	9.5	2.8	15	7.9	4.7	2.8	2.1	1.5
6	2.1	8.8	5.2	e21	7.8	3.4	7.8	6.1	6.8	2.4	1.8	1.9
7	6.0	22	3.6	e17	7.3	2.9	6.4	5.7	4.2	3.6	2.6	1.4
8	2.3	5.3	4.1	e15	6.6	2.7	4.8	4.2	4.4	5.2	2.5	1.4
9	1.8	3.3	11	e13	6.6	4.4	4.1	3.6	4.6	4.0	1.8	1.4
10	1.7	2.8	6.8	e35	5.7	2.8	4.1	3.4	3.6	3.7	1.7	4.4
11	1.9	2.5	4.7	e23	5.0	2.6	3.7	62	3.4	3.5	30	5.6
12	3.0	3.5	361	e15	4.9	2.5	3.6	129	3.3	3.3	7.8	2.0
13	9.3	2.3	71	e13	4.5	2.7	3.6	99	3.1	3.0	4.5	1.5
14	1.8	7.8	28	e12	5.2	17	3.3	75	2.9	4.9	8.6	1.8
15	4.4	4.0	21	e11	5.5	3.8	3.1	76	2.7	2.6	5.4	15
16	2.5	3.4	16	e30	6.5	3.5	3.1	25	2.8	2.3	3.8	2.7
17	1.9	62	36	e35	3.9	3.0	3.0	16	3.1	2.1	3.7	2.0
18	2.5	17	79	e100	3.8	3.3	2.7	12	3.1	2.3	2.9	2.0
19	2.3	14	205	e28	3.8	3.7	3.0	9.4	2.7	2.0	3.1	1.6
20	1.7	63	56	e25	3.6	3.4	2.7	8.3	2.8	2.8	3.3	1.6
21	1.5	102	23	e18	6.2	2.8	2.7	7.5	3.1	3.1	4.3	1.6
22	4.3	48	15	e14	4.6	3.6	2.7	9.0	4.0	2.1	4.0	2.1
23	2.3	14	12	e11	5.9	4.6	2.5	7.0	2.8	1.9	2.7	12
24	3.3	15	22	e10	3.6	24	2.9	6.0	3.8	2.1	2.2	2.7
25	2.4	8.7	11	e41	47	36	6.0	5.6	2.5	5.4	2.3	2.6
26	3.2	7.2	20	51	6.9	5.0	6.1	5.3	2.7	2.2	2.2	2.7
27	2.3	5.8	18	47	5.1	3.8	3.1	4.6	6.7	1.9	2.2	33
28	1.9	4.9	9.6	56	3.9	3.4	9.0	5.5	2.8	1.7	2.0	13
29	2.0	46	8.0	45	3.6	4.4	4.9	4.2	2.5	1.6	2.4	8.3
30	2.8	14	129	17	---	5.5	7.1	4.3	2.3	1.8	2.4	3.8
31	1.6	---	547	13	---	12	---	4.1	---	1.7	1.8	---
TOTAL	87.6	527.3	1754.1	1325	224.8	182.2	235.0	650.6	109.3	85.5	144.7	135.6
MEAN	2.83	17.6	56.6	42.7	7.75	5.88	7.83	21.0	3.64	2.76	4.67	4.52
MAX	9.3	102	547	336	47	36	55	129	6.8	5.4	30	33
MIN	1.5	2.3	3.6	10	3.6	2.5	2.5	3.4	2.3	1.6	1.7	1.4
AC-FT	174	1050	3480	2630	446	361	466	1290	217	170	287	269

CAL YR 1987	TOTAL	4202.8	MEAN	11.5	MAX	547	MIN	1.5	AC-FT	8340
WTR YR 1988	TOTAL	5461.7	MEAN	14.9	MAX	547	MIN	1.4	AC-FT	10830

e Estimated

16229300 KALIHI STREAM AT KALIHI--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
OCT												
20...	1300	758	1.5	237	7.70	24.5	1.8	7.5	91	11000	33000	68
FEB												
23...	1145	764	5.6	190	7.20	22.0	6.9	9.1	104	11000	15000	47
APR												
20...	1100	765	2.5	245	8.10	22.0	0.50	9.3	106	5400	18000	65
AUG												
30...	1130	761	2.9	240	8.10	25.0	4.6	8.3	101	9100	9300	63

DATE	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)
OCT												
20...	4	13	8.5	22	41	1	1.6	74	0	64	61	9.2
FEB												
23...	5	8.8	6.1	18	45	1	1.1	49	0	42	40	10
APR												
20...	6	12	8.4	23	43	1	1.3	70	0	59	57	11
AUG												
30...	3	12	8.0	22	43	1	1.4	72	0	60	59	10

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
OCT												
20...	29	0.10	19	142	142	0.19	0.180	0.040	0.040	0.36	0.40	0.050
FEB												
23...	24	0.10	13	110	107	0.15	0.180	0.040	0.020	0.16	0.20	0.060
APR												
20...	30	0.10	16	133	138	0.18	0.100	0.010	0.010	0.19	0.20	0.080
AUG												
30...	27	<0.10	16	135	134	0.18	0.190	0.040	0.040	0.36	0.40	0.100

< Actual value is known to be less than the value shown.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)
OCT											
20...	0.060	0.040	20	<1	6	<0.5	<1	3	<3	5	260
FEB											
23...	0.020	0.010	60	<1	4	<0.5	<1	<1	<3	2	100
APR											
20...	0.050	0.040	<10	<1	5	<0.5	<1	<1	<3	5	210
AUG											
30...	0.080	0.060	20	1	6	<0.5	<1	<1	<3	3	80

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT											
20...	7	<4	19	0.1	<10	<1	<1	<1.0	110	<6	<3
FEB											
23...	<5	<4	10	<0.1	<10	<1	<1	<1.0	70	<6	5
APR											
20...	<5	<4	10	0.3	<10	2	1	2.0	95	<6	<3
AUG											
30...	<5	<4	10	0.3	<10	<1	<1	<1.0	110	<6	<3

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
20...	1300	3	0.01	100
FEB				
23...	1145	8	0.12	100
APR				
20...	1100	2	0.01	100
AUG				
30...	1130	17	0.13	100

< Actual value is known to be less than the value shown.

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

LOCATION.--Lat 21°20'57", long 157°49'40", Hydrologic Unit 20060000, on right bank beside Old Pali Road in upper Nuuanu Valley, 0.2 mi downstream from reservoir 2 wasteway, and 3.5 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi^2.

PERIOD OF RECORD.--October 1913 to January 1921. September 1921 to current year.

REVISED RECORDS.--WSP 985: 1921-35(M). WSP 1319: 1931. WSP 1569: Drainage area. WSP 1639: 1931, 1935.

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

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

AVERAGE DISCHARGE.--72 years (water years 1915-16, 1918-20, 1922-88), 6.98 ft^3/s (5,060 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft^3/s Jan. 16, 1921, gage height, 8.74 ft, from floodmarks, from rating curve extended above 420 ft^3/s by test of model of station site; minimum, 0.09 ft^3/s, Sept. 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 240 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0400	896	5.17	Dec. 31	2030	*1,840	*6.10

Minimum discharge, 1.3 ft^3/s, Aug. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	5.0	4.6	391	16	6.2	5.4	5.7	4.2	2.3	1.6	1.8
2	2.8	2.7	4.3	143	13	6.0	5.3	6.3	4.3	2.3	2.0	1.8
3	2.5	3.7	4.3	134	12	5.9	9.2	11	4.0	2.3	12	1.7
4	2.2	2.7	4.3	105	15	5.7	28	7.2	3.9	2.3	2.4	1.7
5	2.5	4.6	4.3	97	14	5.7	7.5	7.5	4.0	2.6	2.0	1.8
6	2.3	3.8	4.2	95	13	6.1	5.8	5.4	4.3	2.0	2.0	1.8
7	2.9	12	3.9	88	11	5.2	5.6	5.7	3.9	2.3	2.4	1.6
8	2.2	3.2	4.4	82	9.6	5.4	5.3	5.2	3.7	3.1	2.2	1.6
9	2.1	2.6	5.9	78	8.5	6.6	5.0	4.6	3.9	2.7	1.7	1.8
10	2.1	2.7	4.3	89	8.2	5.5	5.2	4.6	3.7	2.4	1.8	2.0
11	2.2	2.7	4.0	42	8.0	5.1	5.0	39	3.5	2.4	17	3.5
12	2.5	2.8	118	16	7.8	5.0	4.5	63	3.3	2.3	4.8	2.0
13	2.0	2.4	25	15	7.5	6.0	4.5	69	3.2	2.1	2.8	1.7
14	2.0	2.9	14	13	7.7	11	4.6	80	3.3	4.4	4.6	2.1
15	2.3	3.0	11	11	7.5	5.5	4.4	81	3.0	2.1	3.6	9.4
16	2.7	2.5	9.3	26	7.5	5.3	4.3	59	2.9	2.0	2.8	2.1
17	2.2	22	13	20	7.0	5.0	4.3	27	3.0	2.0	3.0	1.7
18	2.6	7.7	24	33	6.6	4.9	4.2	8.4	2.9	2.1	2.7	1.9
19	2.3	6.1	64	14	6.3	5.3	4.4	7.9	2.8	1.8	2.7	1.7
20	2.1	20	33	11	6.2	4.9	3.8	7.4	2.7	2.1	2.6	1.8
21	2.0	25	23	9.3	6.5	4.5	4.0	6.8	3.1	2.0	2.7	1.7
22	2.9	15	17	8.8	6.5	5.1	3.9	7.1	3.2	1.9	2.4	1.7
23	2.1	6.8	17	8.6	7.8	4.6	3.8	5.8	2.8	1.7	2.3	3.2
24	3.2	6.2	32	8.5	6.4	17	3.8	5.7	2.6	1.8	2.2	2.2
25	2.7	5.3	27	21	34	17	4.2	5.3	2.6	5.8	2.3	2.3
26	2.4	5.1	30	27	8.0	5.9	4.2	5.1	2.8	2.1	2.2	1.9
27	2.4	4.7	31	26	7.2	4.8	3.9	4.9	3.3	1.8	2.1	9.5
28	2.2	4.5	25	31	6.7	5.0	6.4	5.0	2.6	1.7	2.0	6.0
29	2.1	12	24	51	6.2	5.2	4.7	4.8	2.4	1.7	2.0	4.4
30	2.5	5.8	61	23	---	5.0	5.1	4.6	2.4	1.8	2.0	2.8
31	2.0	---	341	18	---	5.3	---	4.0	---	1.7	1.9	---
TOTAL	73.6	205.5	987.8	1735.2	281.7	195.7	170.3	564.0	98.3	71.6	100.8	81.2
MEAN	2.37	6.85	31.9	56.0	9.71	6.31	5.68	18.2	3.28	2.31	3.25	2.71
MAX	3.2	25	341	391	34	17	28	81	4.3	5.8	17	9.5
MIN	2.0	2.4	3.9	8.5	6.2	4.5	3.8	4.0	2.4	1.7	1.6	1.6
AC-FT	146	408	1960	3440	559	388	338	1120	195	142	200	161

CAL YR 1987	TOTAL	2565.2	MEAN	7.03	MAX	341	MIN	2.0	AC-FT	5090
WTR YR 1988	TOTAL	4565.7	MEAN	12.5	MAX	391	MIN	1.6	AC-FT	9060

16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19'53", long 157°48'12", Hydrologic Unit 20060000, on right bank 5 ft downstream from bridge on Waaloa Way, 500 ft upstream from confluence with Waihi Stream, and 4.2 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi^2.

PERIOD OF RECORD.--May 1913 to January 1921, August 1925 to current year. Prior to July 1960, published as East Branch Manoa Stream near Honolulu.

REVISED RECORDS.--WSP 1319: 1919(M), 1930-33(M). WSP 1569: Drainage area. WSP 1937: 1949(M), 1960(M).

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

REMARKS.--Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel upstream. Occasional small diversions for irrigation upstream.

AVERAGE DISCHARGE.--70 years (water years 1914-20, 1926-88), 5.06 ft^3/s (3,670 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s Jan. 16, 1921, gage height, 10.4 ft, from floodmarks, site and datum then in use, from rating curve extended above 58 ft^3/s. Current peak discharges are derived from rating curve extended above 1,760 ft^3/s on the basis of slope-area measurement at gage height 5.28 ft; minimum, 0.6 ft^3/s, June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 310 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0400	570	3.90	Mar. 24	2000	442	3.63
Dec. 31	1600	*708	*4.13				

Minimum discharge, 2.6 ft^3/s for few days in October.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	7.1	4.5	72	7.6	5.5	6.4	6.4	5.5	4.4	3.8	3.8
2	5.8	5.0	4.1	23	6.9	5.5	7.1	6.2	8.4	4.3	5.0	3.8
3	4.2	5.0	3.9	29	6.7	5.5	9.7	19	5.5	4.3	13	3.7
4	3.8	3.4	5.5	13	14	5.3	25	11	5.3	4.2	4.3	3.7
5	3.8	5.0	6.9	9.5	7.8	5.2	11	13	5.2	4.1	4.1	3.8
6	3.3	3.6	4.5	9.6	7.2	5.6	6.6	11	6.0	4.2	4.2	3.8
7	3.9	19	3.8	7.9	6.4	5.2	6.3	7.9	5.2	5.8	7.8	3.7
8	3.0	3.9	6.8	7.3	6.2	5.1	5.7	6.6	5.8	10	5.5	3.7
9	2.8	3.3	7.1	7.4	6.3	14	5.6	5.7	5.4	6.3	4.3	4.5
10	2.7	3.2	5.5	21	6.1	5.7	5.7	5.5	5.1	5.0	4.8	5.2
11	2.9	3.4	4.6	7.8	5.9	5.3	5.9	62	4.9	5.2	30	8.5
12	3.2	5.0	51	6.8	5.9	5.1	5.3	54	4.8	5.7	11	4.1
13	2.7	3.1	13	6.5	5.8	14	5.1	44	4.8	5.2	5.9	3.7
14	2.7	3.7	6.8	6.2	6.9	15	5.1	22	4.7	11	10	3.6
15	2.7	3.5	5.6	6.2	5.9	6.0	5.1	26	4.6	5.0	6.3	7.5
16	3.6	3.5	4.5	19	5.8	5.9	5.2	11	4.5	4.6	5.4	3.7
17	3.0	20	8.8	14	5.6	5.4	5.1	9.1	4.5	4.4	6.5	3.5
18	3.9	11	15	18	5.8	5.4	4.9	8.0	4.7	5.2	4.8	3.5
19	3.0	8.9	34	7.2	5.5	6.1	4.9	7.4	4.5	4.3	5.0	3.4
20	2.7	25	11	6.5	5.5	5.5	4.8	7.1	4.8	4.1	4.9	3.3
21	2.6	26	20	6.1	6.2	5.1	4.9	6.8	5.2	5.0	4.8	3.3
22	5.5	11	8.0	6.0	9.2	6.2	4.8	8.5	7.9	4.1	5.5	3.4
23	3.6	7.2	7.3	5.8	8.4	5.9	4.7	6.7	5.6	4.1	4.5	7.7
24	5.4	7.5	11	5.8	5.8	26	4.6	6.2	7.9	4.6	4.2	3.8
25	3.7	5.1	6.5	19	28	12	4.9	6.1	4.9	7.3	4.3	4.2
26	3.5	4.7	10	22	7.2	6.0	8.1	6.0	6.9	4.2	4.1	4.0
27	3.4	4.3	7.7	26	6.2	5.5	5.8	6.0	7.1	4.1	4.1	13
28	3.0	4.0	5.8	31	5.8	5.4	13	6.4	4.9	4.0	4.0	14
29	2.9	17	5.4	23	5.7	5.4	7.1	5.7	4.6	4.0	4.1	6.1
30	3.0	5.8	29	9.2	---	8.2	6.3	5.4	4.5	4.0	4.1	4.2
31	2.7	---	164	7.8	---	8.8	---	5.4	---	3.8	4.0	---
TOTAL	107.3	238.2	481.6	459.6	216.3	230.8	204.7	412.1	163.7	156.5	194.3	148.2
MEAN	3.46	7.94	15.5	14.8	7.46	7.45	6.82	13.3	5.46	5.05	6.27	4.94
MAX	5.8	26	164	72	28	26	25	62	8.4	11	30	14
MIN	2.6	3.1	3.8	5.8	5.5	5.1	4.6	5.4	4.5	3.8	3.8	3.3
AC-FT	213	472	955	912	429	458	406	817	325	310	385	294

CAL YR 1987	TOTAL	2065.2	MEAN	5.66	MAX	164	MIN	2.6	AC-FT	4100
WTR YR 1988	TOTAL	3013.3	MEAN	8.23	MAX	164	MIN	2.6	AC-FT	5980

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft upstream from mouth, 2.7 mi southwest of Kailua, and 4.3 mi southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi^2.

PERIOD OF RECORD.--November 1912 to June 1916, January 1958 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 80 ft, from topographic map. Prior to Jan. 1, 1958, nonrecording gage at sites about 200 ft upstream at different datums.

REMARKS.--Records good except for estimated daily discharges, which are poor. Maunawili ditch diverts 1.5 mi upstream for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--32 years (water years 1914-15, 1959-88), 5.10 ft^3/s (3,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft^3/s Feb. 4, 1965, gage height, 12.41 ft, from rating curve extended above 470 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.43 ft^3/s, Sept. 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 390 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0430	1,080	6.95	Jan. 28	2330	980	6.70
Dec. 31	2300	*3,100	*10.05				

Minimum discharge, 1.6 ft^3/s for few days in September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.9	4.1	e140	16	7.9	6.0	e7.0	4.4	e2.4	e2.2	e2.0
2	3.4	2.6	3.4	e45	15	8.4	5.8	e7.1	4.6	e2.4	e2.5	e2.0
3	4.3	3.0	3.0	53	13	8.5	6.3	e17	4.4	e2.4	e5.0	e1.9
4	4.7	2.2	3.1	28	33	8.1	10	e10	4.8	e2.3	e2.7	e1.9
5	4.1	2.2	3.7	23	14	8.1	6.9	e9.0	4.6	e2.3	e2.3	e1.9
6	3.2	2.2	3.7	20	13	8.0	6.4	e12	4.2	e2.3	e2.2	e1.9
7	2.9	14	3.2	17	12	7.7	6.4	e9.0	3.4	e2.3	e3.5	e1.9
8	2.4	3.4	3.3	16	11	7.3	5.7	e8.0	3.6	e4.0	e2.5	e1.8
9	2.2	2.7	3.4	15	11	7.8	5.5	e7.0	3.6	e2.5	e2.2	e1.8
10	2.3	2.5	3.4	30	11	7.6	5.5	e6.5	3.6	e2.3	e2.2	e2.8
11	2.5	2.6	3.0	16	10	7.6	5.9	e70	3.8	e2.3	e28	e2.0
12	3.3	2.8	122	14	10	7.4	6.6	e50	3.9	e2.3	e4.5	e1.9
13	2.5	2.2	43	13	8.6	7.8	5.8	e35	3.9	e2.4	e2.6	e1.8
14	2.2	2.7	17	12	7.8	13	5.7	e22	3.9	e4.6	e3.0	e1.8
15	2.2	2.9	13	12	7.8	8.8	6.1	e30	3.9	e2.3	e2.7	2.4
16	2.3	2.6	11	18	8.1	19	6.0	e8.0	3.9	e2.2	e2.4	1.8
17	2.4	10	26	29	7.8	11	5.9	6.8	3.6	e2.2	e2.6	1.7
18	3.0	9.2	34	27	7.6	8.9	5.6	6.4	3.3	e2.4	e2.4	1.9
19	2.6	5.6	100	14	7.4	7.9	5.7	5.5	3.8	e2.2	e2.3	1.9
20	2.3	6.7	32	13	7.2	7.1	5.4	5.3	3.6	e2.8	e2.3	1.7
21	2.7	6.3	22	13	7.1	6.5	5.5	5.7	3.2	e2.5	e2.3	1.7
22	2.9	5.4	16	13	7.3	6.7	5.2	5.1	3.3	e2.3	e2.2	1.9
23	2.7	4.4	13	14	7.4	6.7	4.8	4.8	2.8	e2.2	e2.2	2.2
24	2.6	4.0	14	12	7.2	18	4.1	5.1	2.7	e2.2	e2.2	2.1
25	3.1	3.3	11	24	30	16	4.5	5.1	2.9	e3.5	e2.1	2.3
26	2.7	4.2	10	23	9.3	6.4	5.6	4.8	2.9	e2.3	e2.1	2.4
27	2.2	4.0	9.9	37	8.3	5.8	e8.0	4.6	2.8	e2.2	e2.1	3.9
28	2.3	4.1	9.4	92	8.0	6.0	e6.0	4.9	e2.5	e2.2	e2.0	3.1
29	2.2	4.9	9.3	64	7.9	6.4	e12	4.8	e2.4	e2.2	e2.0	2.8
30	1.9	4.3	9.9	20	---	7.4	e7.4	4.4	e2.4	e2.2	e2.0	2.3
31	1.8	---	518	17	---	6.6	---	4.2	---	e2.2	e2.0	---
TOTAL	84.8	129.9	1077.8	884	323.8	270.4	186.3	385.1	106.7	76.9	103.3	63.5
MEAN	2.74	4.33	34.8	28.5	11.2	8.72	6.21	12.4	3.56	2.48	3.33	2.12
MAX	4.7	14	518	140	33	19	12	70	4.8	4.6	28	3.9
MIN	1.8	2.2	3.0	12	7.1	5.8	4.1	4.2	2.4	2.2	2.0	1.7
AC-FT	168	258	2140	1750	642	536	370	764	212	153	205	126

CAL YR 1987	TOTAL	2360.0	MEAN	6.47	MAX	518	MIN	1.8	AC-FT 4680
WTR YR 1988	TOTAL	3692.5	MEAN	10.1	MAX	518	MIN	1.7	AC-FT 7320

e Estimated

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'22", long 157°47'44", Hydrologic Unit 20060000, on left bank 0.3 mi south of Hawaiian Memorial Park cemetary, 1.0 mi northwest of Pali Golf Course, and 1.3 mi south of Castle High School.

DRAINAGE AREA.--1.11 mi^2.

PERIOD OF RECORD.--February 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft, from topographic map.

REMARKS.--Records poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,310 ft^3/s, Dec. 31, 1987, gage height, 12.40 ft from rating curve extended above 100 ft^3/s on basis of slope-conveyance computation; minimum, 0.03 ft^3/s for several days in November, December 1984 and January 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0400	940	10.55	Dec. 31	2200	*1,310	*12.40

Minimum discharge, 0.41 ft^3/s, Oct. 30, 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.47	.59	.51	e9.7	e1.8	1.4	1.7	1.5	1.6	1.0	.71	.56
2	.49	.62	.49	e3.1	e1.6	1.3	1.6	1.5	1.7	.92	1.9	.56
3	.50	.68	.49	e2.5	e1.6	1.3	2.4	3.2	1.5	.92	2.4	.56
4	.48	.40	.47	e2.1	e4.2	1.3	8.9	2.3	1.5	.92	.84	.56
5	1.2	.52	.49	e2.0	e2.3	1.3	2.2	2.1	1.5	.92	.71	.71
6	.46	.86	.51	e1.8	e1.9	1.4	1.9	2.7	1.8	.92	.78	.56
7	.56	3.0	.49	e1.8	e1.8	1.3	1.8	2.5	1.7	1.0	.71	.56
8	.48	.57	.57	e1.7	e1.8	1.3	1.7	1.8	1.5	1.1	.71	.56
9	.53	.45	.49	e1.7	e1.7	1.4	1.7	1.6	1.5	.92	.66	1.8
10	.54	.45	.47	e4.4	e1.7	1.3	1.6	1.6	1.4	.92	.66	1.8
11	.93	.45	.51	e1.8	e1.7	1.3	1.7	1.7	1.4	.85	1.8	.87
12	.61	.43	116	e1.7	e1.6	1.3	1.6	2.1	1.3	1.0	.93	.51
13	.47	.43	16	e1.7	e1.7	1.3	1.6	3.2	1.3	.85	.71	.56
14	.47	.73	4.0	e1.6	e1.7	1.5	1.6	2.2	1.2	.85	1.3	.56
15	.51	.49	.89	e1.5	e2.0	1.3	1.5	4.6	1.2	.85	1.2	1.7
16	.52	.45	.84	e1.6	e1.7	4.3	1.6	1.6	1.2	.78	.71	.51
17	.49	1.8	20	e4.0	e1.5	1.6	1.6	1.7	1.2	.78	1.5	.51
18	.47	.49	17	e5.2	e1.5	1.4	1.7	1.6	1.3	.85	.71	.56
19	.48	.59	79	e1.7	e1.4	1.4	1.7	1.6	1.1	.78	.75	.51
20	.47	1.5	1.7	e1.6	e1.4	1.5	1.6	1.5	1.1	.78	.68	.51
21	.47	4.5	.85	e1.6	e1.4	1.4	1.6	1.5	1.1	.85	.66	.61
22	.50	.62	.82	e1.5	e3.2	1.5	1.7	1.6	1.0	.78	.66	.56
23	.46	.57	.80	e1.4	e5.4	1.4	1.7	1.5	1.0	.78	.61	1.2
24	.47	.54	1.5	e2.4	e4.4	4.0	1.7	1.5	1.1	.78	.94	.51
25	.47	.54	.75	e10	e7.0	2.3	2.3	1.5	1.0	2.2	.66	.51
26	.45	.51	.81	e7.6	1.5	1.5	2.0	1.4	1.1	.85	.61	.56
27	.45	.51	.71	e20	1.4	1.6	1.7	2.6	1.4	.78	.61	3.9
28	.43	.49	.68	e19	1.4	1.6	1.9	1.6	1.1	.78	.66	2.4
29	.43	.92	.68	e4.9	1.4	1.8	1.8	1.4	1.1	.71	.61	.52
30	.41	.54	.19	e2.3	---	1.7	1.6	1.5	1.0	.71	.61	.42
31	.41	---	177	e1.7	---	1.7	---	1.5	---	.71	.61	---
TOTAL	16.08	25.24	464.52	125.6	63.7	50.7	59.7	60.2	38.9	27.84	27.61	26.22
MEAN	.52	.84	15.0	4.05	2.20	1.64	1.99	1.94	1.30	.90	.89	.87
MAX	1.2	4.5	177	20	7.0	4.3	8.9	4.6	1.8	2.2	2.4	3.9
MIN	.41	.40	.47	1.4	1.4	1.3	1.5	1.4	1.0	.71	.61	.42
AC-FT	32	50	921	249	126	101	118	119	77	55	55	52

CAL YR 1987	TOTAL	776.23	MEAN	2.13	MAX	177	MIN	.40	AC-FT	1540
WTR YR 1988	TOTAL	986.31	MEAN	2.69	MAX	177	MIN	.40	AC-FT	1960

e Estimated

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--February 1983 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1983 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1983.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,230 mg/L Apr. 19, 1984; minimum daily mean, 1 mg/L for several days in 1988.
SEDIMENT DISCHARGE: Maximum daily, 966 tons Dec. 31, 1987; minimum daily, less than 0.01 ton for many days.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 654 mg/L Dec. 31; minimum daily mean, 1 mg/L for several days.
SEDIMENT DISCHARGE: Maximum daily, 966 tons Dec. 31; minimum daily, less than 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV										
03...	0940	757	0.42	213	6.30	23.5	20	4.2	50	2500
MAY										
10...	1000	758	2.2	240	6.60	24.0	41	6.2	74	1000
JUN										
28...	0900	759	1.1	217	6.60	24.0	4.1	6.4	76	--

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)
JUN											
28...	0900	62	10	13	7.1	18	38	1	0.90	52	14

DATE	TIME	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)
NOV											
03...	0940	--	--	--	--	--	--	26	0.500	0.40	0.90
MAY											
10...	1000	--	--	--	--	--	--	5	0.500	<0.20	--
JUN											
28...	0900	20	0.30	20	126	125	0.17	4	0.500	0.30	0.80

< Actual value is known to be less than the value shown.

16265600 RIGHT BRANCH KAMOOALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
JUN 28...	0900	210	<10	<1	<1	<100	12	<10	<0.5	<1	<1	2

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
JUN 28...	<1	3	<3	2	2	670	23	<5	<5	<10	<4	120

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)
JUN 28...	80	<0.10	<0.1	4	<10	7	2	<1	<1	<1	<1.0	72

DATE	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
JUN 28...	<6	40	42	1.2	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
JUN 28...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
JUN 28...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

16265600 RIGHT BRANCH OF KAMOOLII STREAM NEAR KANEOHE--Contunued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	0.47	19	0.02	0.59	10	0.02	0.51	3	0.00
2	0.49	e10	0.01	0.62	5	0.01	0.49	e3	0.00
3	0.50	e10	0.01	0.68	30	0.06	0.49	e3	0.00
4	0.48	e15	0.02	0.40	5	0.01	0.47	e3	0.00
5	1.1	92	1.3	0.42	150	0.17	0.49	e2	0.00
6	0.46	18	0.02	0.86	94	1.7	0.51	e2	0.00
7	0.56	28	0.04	2.9	153	5.0	0.49	e2	0.00
8	0.48	15	0.02	0.57	7	0.01	0.57	e2	0.00
9	0.53	5	0.01	0.45	4	0.00	0.49	e1	0.00
10	0.54	10	0.01	0.45	3	0.00	0.47	e1	0.00
11	0.93	12	0.03	0.45	2	0.00	0.51	50	0.07
12	0.61	7	0.01	0.43	9	0.01	117	568	440
13	0.47	15	0.02	0.43	5	0.01	16	126	8.5
14	0.47	9	0.01	0.73	35	0.07	4.0	60	0.65
15	0.51	6	0.01	0.49	10	0.01	0.89	15	0.04
16	0.52	7	0.01	0.45	5	0.01	0.84	10	0.02
17	0.49	6	0.01	1.7	69	1.1	20	188	44
18	0.47	10	0.01	0.49	5	0.01	16	240	23
19	0.48	12	0.02	0.59	25	0.04	79	274	148
20	0.47	4	0.01	1.4	69	1.00	1.7	34	0.16
21	0.47	2	0.00	4.3	160	10	0.85	e5	0.01
22	0.50	2	0.00	0.62	40	0.07	0.82	e4	0.01
23	0.46	5	0.01	0.57	7	0.01	0.80	e4	0.01
24	0.47	15	0.02	0.54	4	0.01	1.5	19	0.08
25	0.47	2	0.00	0.54	2	0.00	0.75	e4	0.01
26	0.45	2	0.00	0.51	2	0.00	0.81	e4	0.01
27	0.45	2	0.00	0.51	3	0.00	0.71	e3	0.01
28	0.43	3	0.00	0.49	1	0.00	0.68	e3	0.01
29	0.43	3	0.00	0.92	20	0.05	0.68	e3	0.01
30	0.41	2	0.00	0.54	7	0.01	19	182	30
31	0.41	2	0.00	--	--	--	179	654	966
TOTAL	15.98	--	1.65	24.64	--	19.41	466.52	--	1660.63
		JANUARY			FEBRUARY			MARCH	
1	9.7	25	0.66	1.8	e8	0.04	1.4	e4	0.02
2	3.1	e29	0.24	1.6	e7	0.03	1.3	e4	0.01
3	2.5	e15	0.10	1.6	e7	0.03	1.3	e4	0.01
4	2.1	e12	0.07	4.2	e40	0.45	1.3	e4	0.01
5	2.0	e12	0.06	2.3	e20	0.12	1.3	e4	0.01
6	1.8	e11	0.05	1.9	e15	0.08	1.4	e6	0.02
7	1.8	e11	0.05	1.8	e9	0.04	1.3	e5	0.02
8	1.7	e9	0.04	1.8	e9	0.04	1.3	e5	0.02
9	1.7	e9	0.04	1.7	e9	0.04	1.4	e5	0.02
10	4.4	e38	0.45	1.7	e8	0.04	1.3	e5	0.02
11	1.8	e11	0.05	1.7	e8	0.04	1.3	e5	0.02
12	1.7	e11	0.05	1.6	e8	0.03	1.3	e5	0.02
13	1.7	e11	0.05	1.7	e8	0.04	1.3	e4	0.01
14	1.6	e10	0.04	1.7	e8	0.04	1.5	e5	0.02
15	1.5	e10	0.04	2.0	e10	0.05	1.3	e5	0.02
16	1.6	e10	0.04	1.7	e8	0.04	4.4	70	2.1
17	4.0	e35	0.38	1.5	e7	0.03	1.6	e5	0.02
18	5.2	e40	0.56	1.5	e5	0.02	1.4	e5	0.02
19	1.7	e11	0.05	1.4	e4	0.02	1.4	e5	0.02
20	1.6	e10	0.04	1.4	e4	0.02	1.5	e5	0.02
21	1.6	e8	0.03	1.4	e4	0.02	1.4	e5	0.02
22	1.5	e8	0.03	3.2	e15	0.13	1.5	e5	0.02
23	1.4	e8	0.03	5.4	e25	0.36	1.4	e5	0.02
24	2.4	e13	0.08	4.4	e14	0.17	4.1	50	2.1
25	10	e43	1.2	7.0	e30	0.57	2.3	e23	0.14
26	7.6	e35	0.72	1.5	e5	0.02	1.5	e10	0.04
27	20	e95	5.1	1.4	e4	0.02	1.6	e8	0.03
28	19	e47	2.4	1.4	e4	0.02	1.6	e8	0.03
29	4.9	70	0.93	1.4	e20	0.08	1.8	e8	0.04
30	2.3	e18	0.11	--	--	--	1.7	e8	0.04
31	1.7	e9	0.04	--	--	--	1.7	e8	0.04
TOTAL	125.64	--	13.73	63.70	--	2.63	50.92	--	4.95

e Estimated

16265600 RIGHT BRANCH OF KAMOOLII STREAM NEAR KANEOHE--Contunued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	1.7	e8	0.04	1.5	e8	0.03	1.6	e10	0.04
2	1.6	e8	0.03	1.5	e8	0.03	1.7	e11	0.05
3	2.4	40	0.26	3.3	46	0.73	1.5	e10	0.04
4	8.9	108	7.5	2.3	e14	0.09	1.5	e10	0.04
5	2.2	e25	0.15	2.1	e9	0.05	1.5	e10	0.04
6	1.9	e10	0.05	2.7	e43	0.31	1.8	e11	0.05
7	1.8	e10	0.05	2.5	e85	0.57	1.7	e11	0.05
8	1.7	e9	0.04	1.8	e15	0.07	1.5	e10	0.04
9	1.7	e9	0.04	1.6	e12	0.05	1.5	e10	0.04
10	1.6	e8	0.03	1.6	e11	0.05	1.4	e9	0.03
11	1.7	e8	0.04	1.7	e11	0.05	1.4	e9	0.03
12	1.6	e8	0.03	2.1	e36	0.20	1.3	e8	0.03
13	1.6	e8	0.03	3.2	e100	0.86	1.3	e8	0.03
14	1.6	e7	0.03	2.2	e40	0.24	1.2	e8	0.03
15	1.5	e7	0.03	4.6	e110	1.4	1.2	e8	0.03
16	1.6	e7	0.03	1.6	e8	0.03	1.2	e8	0.03
17	1.6	e7	0.03	1.7	e8	0.04	1.2	e8	0.03
18	1.7	e6	0.03	1.6	e8	0.03	1.3	e8	0.03
19	1.7	e6	0.03	1.6	e8	0.03	1.1	e7	0.02
20	1.6	e6	0.03	1.5	e7	0.03	1.1	e7	0.02
21	1.6	e6	0.03	1.5	e7	0.03	1.1	e7	0.02
22	1.7	e6	0.03	1.6	e7	0.03	1.0	e6	0.02
23	1.7	e5	0.02	1.5	e7	0.03	1.0	e6	0.02
24	1.7	e5	0.02	1.5	e7	0.03	1.1	e6	0.02
25	2.3	e34	0.21	1.5	e7	0.03	1.0	e6	0.02
26	2.0	e25	0.13	1.4	e7	0.03	1.1	e6	0.02
27	1.7	e8	0.04	2.6	e15	0.11	1.4	e10	0.04
28	1.9	e8	0.04	1.6	e11	0.05	1.1	e7	0.02
29	1.8	e8	0.04	1.4	e11	0.04	1.1	e8	0.02
30	1.6	e8	0.03	1.5	e10	0.04	1.0	e10	0.03
31	--	--	--	1.5	e10	0.04	--	--	--
TOTAL	59.70	--	9.09	60.30	--	5.35	38.90	--	0.93
		JULY			AUGUST			SEPTEMBER	
1	1.0	e10	0.03	0.71	e8	0.02	0.56	e5	0.01
2	0.92	e9	0.02	1.9	e60	0.31	0.56	e5	0.01
3	0.92	e9	0.02	2.4	e115	0.75	0.56	e5	0.01
4	0.92	e9	0.02	0.84	e10	0.02	0.56	e5	0.01
5	0.92	e8	0.02	0.71	e5	0.01	0.71	e8	0.02
6	0.92	e8	0.02	0.78	e6	0.01	0.56	e5	0.01
7	1.0	e0	0.03	0.71	e5	0.01	0.56	e5	0.01
8	1.1	e10	0.03	0.71	e5	0.01	0.56	e5	0.01
9	0.92	e9	0.02	0.66	e5	0.01	1.8	55	1.7
10	0.92	e9	0.02	0.66	e5	0.01	1.8	156	3.0
11	0.85	e8	0.02	1.8	e50	0.24	0.87	e13	0.03
12	1.0	e10	0.03	0.93	e20	0.05	0.51	e5	0.01
13	0.85	e8	0.02	0.71	e9	0.02	0.56	e5	0.01
14	0.85	e8	0.02	1.3	e20	0.07	0.56	e18	0.03
15	0.85	e8	0.02	1.2	e20	0.06	1.7	60	0.76
16	0.78	e7	0.01	0.71	e8	0.02	0.51	e5	0.01
17	0.78	e7	0.01	1.5	e22	0.09	0.51	e5	0.01
18	0.85	e9	0.02	0.71	e8	0.02	0.56	e5	0.01
19	0.78	e8	0.02	0.75	e8	0.02	0.51	e5	0.01
20	0.78	e8	0.02	0.68	e6	0.01	0.51	e5	0.01
21	0.85	e9	0.02	0.66	e5	0.01	0.61	e9	0.01
22	0.78	e7	0.01	0.66	e5	0.01	0.56	e5	0.01
23	0.78	e7	0.01	0.61	e5	0.01	1.2	e38	0.12
24	0.78	e7	0.01	0.94	e8	0.02	0.51	e5	0.01
25	2.2	e50	0.30	0.66	e6	0.01	0.51	e5	0.01
26	0.85	e10	0.02	0.61	e5	0.01	0.56	e5	0.01
27	0.78	e9	0.02	0.61	e5	0.01	3.9	137	3.0
28	0.78	e9	0.02	0.66	e7	0.01	2.4	77	1.4
29	0.71	e8	0.02	0.61	e5	0.01	0.52	e8	0.01
30	0.71	e8	0.02	0.61	e5	0.01	0.42	e4	0.00
31	0.71	e8	0.02	0.61	e5	0.01	--	--	--
TOTAL	27.84	--	0.89	27.61	--	1.88	26.22	--	10.26
YEAR	987.97		1731.41						

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE

LOCATION.--Lat 21°23'42", long 157°48'44", Hydrologic Unit 20060000, on right bank 0.5 mi upstream from mouth, 1.4 mi southwest of Castle High School, and 1.9 mi south of Kaneohe Post Office.

DRAINAGE AREA.--0.44 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--1960-63 (low-flow measurements), 1965-71, 1971-84 (annual maximum), April 1984 to current year. Prior to April 1984, the station was located 400 ft upstream.

GAGE.--Water-stage recorder and wooden control. Elevation of gage is 200 ft (from Corps of Engineers).

REMARKS.--Records poor. Honolulu Board of Water Supply diverts water from tunnel in drainage area.

AVERAGE DISCHARGE.--8 years (water years 1968-71, 1985-88), 1.33 ft^3/s (964 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 651 ft^3/s Nov. 26, 1970 (gage height, 6.18 ft for datum and site then in use), from rating curve extended above 10 ft^3/s on basis of slope-area measurement at gage height 6.09 ft; minimum, 0.03 ft^3/s for many days 1984-85.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	1630	350	4.30	Mar. 25	0330	232	2.18
Dec. 31	2300	*Unknown	*Unknown				

Minimum discharge, 0.30 ft^3/s, Oct. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.56	.56	.64	e9.8	1.9	.90	1.2	1.0	1.1	.81	.77	.73
2	.76	.62	.58	e3.3	1.5	.90	1.0	1.0	1.1	.81	.90	.77
3	.56	.89	.59	e2.4	1.4	.90	1.4	2.0	1.1	.81	1.5	.73
4	.56	.56	.60	e2.1	2.4	.89	2.2	1.4	1.1	.81	.85	.81
5	.76	2.1	.61	e1.8	1.5	.85	1.3	1.5	1.1	.81	.81	.81
6	.56	1.2	.66	e1.6	1.4	.85	1.2	1.2	1.2	.81	.81	.81
7	.69	2.2	.50	e1.5	1.3	.85	1.2	1.3	1.0	.81	.90	.81
8	.56	.69	.77	e1.3	1.3	.85	1.2	1.1	1.1	.81	.85	.81
9	.56	.62	.66	e1.3	1.3	.95	1.1	1.1	1.1	1.0	.85	.95
10	.62	.56	.66	e1.2	1.2	.85	1.1	1.2	1.0	.91	.81	1.0
11	.83	.56	.59	e1.9	1.2	.85	1.1	1.4	1.0	.81	1.0	.95
12	.62	.56	23	e1.2	1.2	.81	1.1	2.3	1.0	.81	.90	.85
13	.56	.50	3.2	1.4	1.1	.95	1.1	2.5	1.0	.81	.81	.85
14	.56	.76	2.5	1.2	1.1	2.0	1.2	1.7	1.0	.81	.81	.90
15	.56	.62	1.6	1.4	1.1	1.1	1.2	3.1	1.0	.77	.81	2.1
16	.50	.56	1.3	1.5	1.1	1.3	1.2	1.6	.95	.77	.81	.95
17	.56	5.9	2.7	2.7	1.1	1.1	1.2	1.5	.95	.77	.81	.77
18	.56	1.5	4.2	3.6	1.1	1.2	1.1	1.2	1.0	.81	.81	.69
19	.56	.89	13	1.5	1.0	1.1	1.1	1.2	.95	.73	.81	.73
20	.56	2.6	2.9	1.4	1.0	1.0	1.0	1.0	1.0	.81	.81	.77
21	.56	1.6	1.8	1.3	.99	1.1	1.1	1.1	1.0	.81	.81	.95
22	.56	1.0	1.5	1.2	1.0	1.0	1.0	1.2	1.0	.81	.81	.85
23	.56	.78	1.6	1.2	1.1	1.0	1.0	1.1	.95	.81	.81	.73
24	.50	.75	1.7	1.2	1.0	3.1	1.0	1.1	.95	.81	1.4	.73
25	.50	.69	1.5	2.0	1.9	4.8	1.2	1.0	.95	.85	1.0	.73
26	.50	.63	1.6	1.6	1.0	1.2	1.3	1.0	.95	.81	1.0	.72
27	.39	.66	1.3	2.4	.94	1.1	1.0	1.2	1.0	.81	.85	2.3
28	.39	.68	1.3	6.2	.94	1.0	1.3	1.0	.90	.77	.81	1.7
29	.39	.81	1.2	5.1	.90	.98	1.1	1.1	.95	.77	.81	.90
30	.39	.67	5.3	1.9	---	1.0	1.0	1.0	.81	.81	.81	.59
31	.39	---	e47	1.7	---	1.1	---	1.1	---	.81	.81	---
TOTAL	17.19	32.72	127.06	69.9	35.97	37.58	35.2	42.2	30.21	25.16	27.35	27.99
MEAN	.55	1.09	4.10	2.25	1.24	1.21	1.17	1.36	1.01	.81	.88	.93
MAX	.83	5.9	47	9.8	2.4	4.8	2.2	3.1	1.2	1.0	1.5	2.3
MIN	.39	.50	.50	1.2	.90	.81	1.0	1.0	.81	.73	.77	.59

CAL YR 1987 TOTAL 385.08 MEAN 1.06 MAX 47 MIN .39
WTR YR 1988 TOTAL 508.53 MEAN 1.39 MAX 47 MIN .39

e Estimated

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1984 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: April 1984 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since April 1984.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 660 mg/L July 22, 1987; minimum daily mean, 2 mg/L Mar. 2-4, 1985, Feb. 2, 3, 1988.
SEDIMENT DISCHARGE: Maximum daily, 342 tons Dec. 31, 1987; minimum daily, less than 0.01 ton for many days each year.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 642 mg/L Dec. 31; minimum daily mean, 2 mg/L Feb. 2, 3.
SEDIMENT DISCHARGE: Maximum daily, 342 tons Dec. 31; minimum daily, 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
03...	1025	757	--	156	6.70	21.5	1.9	8.1	92	K1800	--
MAY											
03...	1300	758	1.1	159	7.70	22.0	0.80	8.7	100	470	--
JUN											
27...	1240	760	1.0	163	7.60	22.0	0.40	8.6	99	1100	46

DATE	TIME	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
JUN											
27...	1240	0	8.7	5.8	13	38	0.9	1.1	47	3.7	15

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
NOV											
03...	1025	--	--	--	--	--	7	0.200	0.20	0.40	<0.010
MAY											
03...	1300	--	--	--	--	--	<1	0.200	<0.20	--	0.030
JUN											
27...	1240	0.30	29	104	105	0.14	15	0.200	<0.20	--	0.030

< Actual value is known to be less than the value shown.
K Results based on colony count outside the acceptable range (non-ideal colony count).

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
JUN 27...	1240	20	<10	2	1	<100	<2	<10	<0.5	1	<1	1

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
JUN 27...	<1	3	<3	2	2	90	23	<5	<5	<10	<4	20

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)
JUN 27...	10	<0.10	<0.1	3	<10	2	2	<1	<1	<1	<1.0	52

DATE	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
JUN 27...	<6	<10	<3	0.7	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
JUN 27...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
JUN 27...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

16270900 LULUKU STREAM AT 220 FT, NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	0.56	e4	0.01	0.56	e4	0.01	0.64	e4	0.01
2	0.76	e6	0.01	0.62	e4	0.01	0.58	e4	0.01
3	0.56	e4	0.01	0.89	e4	0.01	0.59	e4	0.01
4	0.56	e4	0.01	0.56	e4	0.01	0.60	e4	0.01
5	0.76	e5	0.01	2.1	65	1.9	0.61	e4	0.01
6	0.56	e4	0.01	1.2	e12	0.04	0.66	e4	0.01
7	0.69	e4	0.01	2.2	31	0.76	0.50	e4	0.01
8	0.56	e4	0.01	0.69	e4	0.01	0.77	e4	0.01
9	0.56	e4	0.01	0.62	e4	0.01	0.66	e4	0.01
10	0.62	e4	0.01	0.56	e4	0.01	0.66	e4	0.01
11	0.83	e5	0.01	0.56	e4	0.01	0.59	e4	0.01
12	0.62	e4	0.01	0.56	e4	0.01	23	348	31
13	0.56	e4	0.01	0.50	e4	0.01	3.2	44	2.2
14	0.56	e4	0.01	0.76	e7	0.01	2.5	18	0.38
15	0.56	e4	0.01	0.62	e4	0.01	1.6	e5	0.02
16	0.50	e4	0.01	0.56	e4	0.01	1.3	e4	0.01
17	0.56	e4	0.01	5.9	137	6.4	2.7	41	2.0
18	0.56	e4	0.01	1.5	e13	0.05	4.2	64	1.8
19	0.56	e4	0.01	0.89	e4	0.01	13	197	14
20	0.56	e4	0.01	2.6	79	18	2.9	e5	0.04
21	0.56	e4	0.01	1.6	e5	0.02	1.8	e4	0.02
22	0.56	e4	0.01	1.0	e5	0.01	1.5	e4	0.02
23	0.56	e4	0.01	0.78	e4	0.01	1.6	e4	0.02
24	0.50	e4	0.01	0.75	e4	0.01	1.7	e4	0.02
25	0.50	e4	0.01	0.69	e4	0.01	1.5	e4	0.02
26	0.50	e4	0.01	0.63	e4	0.01	1.6	e4	0.02
27	0.39	e4	0.00	0.66	e4	0.01	1.3	e4	0.01
28	0.39	e4	0.00	0.68	e4	0.01	1.3	e4	0.01
29	0.39	e4	0.00	0.81	e5	0.01	1.2	e4	0.01
30	0.39	e4	0.00	0.67	e4	0.01	5.3	207	9.9
31	0.39	e4	0.00	--	--	--	47	642	342
TOTAL	17.19	--	0.28	32.72	--	27.40	127.06	--	403.61
		JANUARY			FEBRUARY			MARCH	
1	9.8	e150	4.0	1.9	6	0.03	0.90	e3	0.01
2	3.3	e30	0.27	1.5	2	0.01	0.90	e3	0.01
3	2.4	e15	0.10	1.4	2	0.01	0.90	e3	0.01
4	2.1	e6	0.03	2.4	9	0.06	0.89	e3	0.01
5	1.8	e4	0.02	1.5	3	0.01	0.85	e3	0.01
6	1.6	e4	0.02	1.4	e3	0.01	0.85	e3	0.01
7	1.5	e4	0.02	1.3	e3	0.01	0.85	e3	0.01
8	1.3	e4	0.01	1.3	e3	0.01	0.85	e3	0.01
9	1.3	e4	0.01	1.3	e3	0.01	0.95	e4	0.01
10	1.2	e12	0.04	1.2	e3	0.01	0.85	e3	0.01
11	1.9	e4	0.02	1.2	e3	0.01	0.85	e3	0.01
12	1.2	e4	0.01	1.2	e3	0.01	0.81	e3	0.01
13	1.4	e4	0.02	1.1	e3	0.01	0.95	e3	0.01
14	1.2	e4	0.01	1.1	e3	0.01	2.0	e5	0.03
15	1.4	e4	0.02	1.1	e3	0.01	1.1	e3	0.01
16	1.5	e4	0.02	1.1	e3	0.01	1.3	e3	0.01
17	2.7	23	0.28	1.1	e3	0.01	1.1	e3	0.01
18	3.6	115	2.5	1.1	e3	0.01	1.2	e3	0.01
19	1.5	4	0.02	1.0	e3	0.01	1.1	e3	0.01
20	1.4	4	0.02	1.0	e3	0.01	1.0	e3	0.01
21	1.3	4	0.01	0.99	e3	0.01	1.1	e3	0.01
22	1.2	4	0.01	1.0	e3	0.01	1.0	e3	0.01
23	1.2	e4	0.01	1.1	e3	0.01	1.0	e3	0.01
24	1.2	e4	0.01	1.0	e3	0.01	3.1	146	13
25	2.0	e6	0.03	1.9	6	0.03	4.8	32	13
26	1.6	e4	0.02	1.0	e3	0.01	1.2	e4	0.01
27	2.4	e4	0.03	0.94	e3	0.01	1.1	e4	0.01
28	6.2	118	5.6	0.94	e3	0.01	1.0	e4	0.01
29	5.1	123	4.8	0.90	e3	0.01	0.98	e4	0.01
30	1.9	4	0.02	--	--	--	1.0	e4	0.01
31	1.7	4	0.02	--	--	--	1.1	e4	0.01
TOTAL	69.90	--	18.00	35.97	--	0.38	37.58	--	26.31

e Estimated

16270900 LULUKU STREAM AT 220 FT, NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	1.2	e4	0.01	1.0	e4	0.01	1.1	e4	0.01
2	1.0	e4	0.01	1.0	e4	0.01	1.1	e4	0.01
3	1.4	e4	0.02	2.0	e40	0.22	1.1	e4	0.01
4	2.2	e6	0.04	1.4	e4	0.02	1.1	e4	0.01
5	1.3	e4	0.01	1.5	e4	0.02	1.1	e4	0.01
6	1.2	e4	0.01	1.2	e4	0.01	1.2	e4	0.01
7	1.2	e4	0.01	1.3	e4	0.01	1.0	e4	0.01
8	1.2	e4	0.01	1.1	e4	0.01	1.1	e4	0.01
9	1.1	e4	0.01	1.1	e4	0.01	1.1	e4	0.01
10	1.1	e4	0.01	1.2	e4	0.01	1.0	e4	0.01
11	1.1	e4	0.01	1.4	e4	0.02	1.0	e4	0.01
12	1.1	e4	0.01	2.3	e6	0.04	1.0	e4	0.01
13	1.1	e4	0.01	2.5	e7	0.05	1.0	e4	0.01
14	1.2	e4	0.01	1.7	e4	0.02	1.0	e4	0.01
15	1.2	e4	0.01	3.1	e8	0.07	1.0	e4	0.01
16	1.2	e4	0.01	1.6	e4	0.02	0.95	e4	0.01
17	1.2	e4	0.01	1.5	e4	0.02	0.95	e4	0.01
18	1.1	e4	0.01	1.2	e4	0.01	1.0	e4	0.01
19	1.1	e4	0.01	1.2	e4	0.01	0.95	e4	0.01
20	1.0	e4	0.01	1.0	e4	0.01	1.0	e4	0.01
21	1.1	e4	0.01	1.1	e4	0.01	1.0	e4	0.01
22	1.0	e4	0.01	1.2	e4	0.01	1.0	e4	0.01
23	1.0	e4	0.01	1.1	e4	0.01	0.95	e4	0.01
24	1.0	e4	0.01	1.1	e4	0.01	0.95	e4	0.01
25	1.2	e4	0.01	1.0	e4	0.01	0.95	e4	0.01
26	1.3	e4	0.01	1.0	e4	0.01	0.95	e4	0.01
27	1.0	e4	0.01	1.2	e4	0.01	1.0	e4	0.01
28	1.3	e4	0.01	1.0	e4	0.01	0.90	e4	0.01
29	1.1	e4	0.01	1.1	e4	0.01	0.95	e4	0.01
30	1.0	e4	0.01	1.0	e4	0.01	0.81	e4	0.01
31	--	--	--	1.1	e4	0.01	--	--	--
TOTAL	35.20	--	0.34	42.20	--	0.71	30.21	--	0.30
		JULY			AUGUST			SEPTEMBER	
1	0.81	e4	0.01	0.77	e4	0.01	0.73	e4	0.01
2	0.81	e4	0.01	0.90	e4	0.01	0.77	e4	0.01
3	0.81	e4	0.01	1.5	e6	0.02	0.73	e4	0.01
4	0.81	e4	0.01	0.85	e4	0.01	0.81	e4	0.01
5	0.81	e4	0.01	0.81	e4	0.01	0.81	e4	0.01
6	0.81	e4	0.01	0.81	e4	0.01	0.81	e4	0.01
7	0.81	e4	0.01	0.90	e4	0.01	0.81	e4	0.01
8	0.81	e4	0.01	0.85	e4	0.01	0.81	e4	0.01
9	1.0	e4	0.01	0.85	e4	0.01	0.95	e4	0.01
10	0.91	e4	0.01	0.81	e4	0.01	1.0	e4	0.01
11	0.81	e4	0.01	1.0	e5	0.01	0.95	e4	0.01
12	0.81	e4	0.01	0.90	e4	0.01	0.85	e4	0.01
13	0.81	e4	0.01	0.81	e4	0.01	0.85	e4	0.01
14	0.81	e4	0.01	0.81	e4	0.01	0.90	e4	0.01
15	0.77	e4	0.01	0.81	e4	0.01	2.1	e6	0.03
16	0.77	e4	0.01	0.81	e4	0.01	0.95	e4	0.01
17	0.77	e4	0.01	0.81	e4	0.01	0.77	e4	0.01
18	0.81	e4	0.01	0.81	e4	0.01	0.69	e4	0.01
19	0.73	e4	0.01	0.81	e4	0.01	0.73	e4	0.01
20	0.81	e4	0.01	0.81	e4	0.01	0.77	e4	0.01
21	0.81	e4	0.01	0.81	e4	0.01	0.95	e4	0.01
22	0.81	e4	0.01	0.81	e4	0.01	0.88	e4	0.01
23	0.81	e4	0.01	0.81	e4	0.01	0.73	e4	0.01
24	0.81	e4	0.01	1.4	e4	0.02	0.73	e4	0.01
25	0.85	e4	0.01	1.0	e4	0.01	0.73	e4	0.01
26	0.81	e4	0.01	1.0	e4	0.01	0.72	e4	0.01
27	0.81	e4	0.01	0.85	e4	0.01	2.3	206	4.9
28	0.77	e4	0.01	0.81	e4	0.01	1.7	84	1.6
29	0.77	e4	0.01	0.81	e4	0.01	0.90	e5	0.01
30	0.81	e4	0.01	0.81	e4	0.01	0.59	e4	0.01
31	0.81	e4	0.01	0.81	e4	0.01	--	--	--
TOTAL	25.16	--	0.31	27.35	--	0.33	28.02	--	6.80
YEAR	508.56		484.77						

e Estimated.

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

LOCATION.--Lat 21°23'47", long 157°48'23", Hydrologic Unit 20060000, on left bank 300 ft downstream from Luluku Stream, 1.0 mi southwest of Castle High School, and 1.9 mi northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--November 1976 to current year.

GAGE.--Water-stage recorder and concrete control.

REMARKS.--Records good. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--11 years, 11.0 ft^3/s (7,970 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,650 ft^3/s Dec. 31, 1987, gage height, 5.72 ft, from rating curve extended above 200 ft^3/s; minimum, 0.25 ft^3/s several days in October 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 21	0500	785	4.37	Dec. 31	2315	*1,650	*5.72

Minimum discharge, 0.79 ft^3/s, Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	6.9	8.6	724	25	14	14	10	11	8.0	6.5	5.8
2	7.8	6.7	8.4	55	21	14	12	10	11	8.0	7.7	5.9
3	6.3	9.4	8.4	46	21	14	16	13	10	7.8	15	5.8
4	6.3	6.0	8.8	31	37	14	33	13	10	7.9	7.7	5.8
5	8.4	8.4	8.9	28	22	13	15	12	10	7.8	7.1	5.9
6	6.5	9.0	8.5	27	22	14	13	13	11	7.7	6.9	6.1
7	7.0	16	8.0	25	19	13	13	14	10	7.9	7.7	5.8
8	6.0	8.0	9.8	23	19	13	13	11	10	8.9	7.1	5.7
9	5.8	6.7	11	23	19	14	12	10	9.6	8.9	6.7	6.3
10	5.7	6.3	9.6	43	18	13	12	11	9.6	8.3	6.7	9.2
11	6.3	6.1	8.3	24	18	13	12	12	9.2	8.2	9.9	8.8
12	7.6	6.4	186	23	17	13	12	18	9.2	8.2	8.0	6.4
13	6.2	5.8	58	20	17	14	11	21	9.2	7.8	7.0	5.9
14	7.5	7.9	23	18	17	19	11	18	9.2	8.1	7.8	6.5
15	3.7	8.1	17	19	17	14	11	24	8.8	7.3	7.1	14
16	5.6	6.3	14	21	17	20	11	14	8.8	7.0	6.9	7.2
17	5.5	24	24	34	16	15	11	13	8.8	6.9	8.6	6.4
18	5.5	16	54	49	16	15	11	12	8.4	7.5	7.0	6.2
19	5.5	11	121	21	16	15	11	12	8.4	6.8	6.8	6.0
20	5.3	16	35	19	16	13	10	12	8.8	6.9	6.6	5.9
21	5.2	17	21	19	15	13	10	11	8.8	7.0	6.9	6.3
22	6.2	18	18	17	16	13	10	12	8.8	6.8	6.7	6.5
23	5.5	9.8	17	17	18	13	10	11	8.8	6.7	6.5	8.2
24	5.7	9.3	18	17	16	33	10	11	9.2	6.7	7.0	6.3
25	5.5	8.9	15	22	24	48	12	11	8.4	8.5	6.8	6.1
26	5.4	8.8	16	23	16	15	11	11	8.8	7.1	6.2	6.3
27	5.4	8.6	15	28	15	14	10	12	10	6.8	6.3	21
28	5.3	8.4	14	89	15	13	12	11	8.6	6.6	6.1	30
29	5.3	11	14	101	14	13	10	10	8.3	6.6	6.0	13
30	5.2	9.4	49	27	---	13	10	11	8.2	6.8	6.1	8.9
31	5.1	---	323	23	---	14	---	10	---	6.6	6.2	---
TOTAL	185.0	300.2	1150.3	1656	539	489	369	394	278.9	232.1	225.6	248.2
MEAN	5.97	10.0	37.1	53.4	18.6	15.8	12.3	12.7	9.30	7.49	7.28	8.27
MAX	8.4	24	323	724	37	48	33	24	11	8.9	15	30
MIN	3.7	5.8	8.0	17	14	13	10	10	8.2	6.6	6.0	5.7
AC-FT	367	595	2280	3280	1070	970	732	781	553	460	447	492

CAL YR 1987	TOTAL	3930.3	MEAN	10.8	MAX	323	MIN	3.7	AC-FT	7800
WTR YR 1988	TOTAL	6067.3	MEAN	16.6	MAX	724	MIN	3.7	AC-FT	12030

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--November 1976 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: November 1976 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since November 1976.

REMARKS.--In addition to the sediment sampler record, observations of specific conductance, pH, and water temperature were collected during the year.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L Mar. 18, 1980; minimum daily mean, 1 mg/L several days in 1988.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons Mar. 18, 1980; minimum daily, less than 0.01 ton, Oct. 9-11, 1981.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 400 mg/L Dec. 12; minimum daily mean, 1 mg/L for several days.
SEDIMENT DISCHARGE: Maximum daily, 813 tons Dec. 31; minimum daily, 0.02 ton, Sept. 24, 25.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	HARDNESS TOTAL (MG/L AS CACO3)
NOV											
03...	1230	759	8.3	185	7.00	24.5	0.90	8.4	101	K260	--
DEC											
12...	0330	--	20	--	--	--	530	--	--	--	--
12...	0400	--	19	--	--	--	550	--	--	--	--
12...	0430	--	26	--	--	--	330	--	--	--	--
12...	0500	--	44	--	--	--	240	--	--	--	--
12...	0530	--	65	--	--	--	160	--	--	--	--
12...	0600	--	72	--	--	--	200	--	--	--	--
12...	0630	--	76	--	--	--	170	--	--	--	--
12...	0700	--	162	--	--	--	170	--	--	--	--
12...	0730	--	615	--	--	--	160	--	--	--	--
12...	0800	--	745	--	--	--	170	--	--	--	--
12...	0830	--	705	--	--	--	160	--	--	--	--
12...	0900	--	555	--	--	--	150	--	--	--	--
12...	0930	--	470	--	--	--	130	--	--	--	--
12...	1000	--	398	--	--	--	150	--	--	--	--
12...	1030	--	348	--	--	--	130	--	--	--	--
12...	1100	--	311	--	--	--	100	--	--	--	--
MAY											
03...	1145	760	10	195	7.80	25.5	0.50	7.3	90	K130	55
JUN											
27...	0950	761	9.7	180	7.90	26.0	1.7	8.3	103	K120	55
SEP											
06...	0930	763	6.3	185	7.60	26.0	1.6	7.2	89	--	57

K Results based on colony count outside the acceptable range (non-ideal colony count).

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)
MAY												
03...	1145	2	8.9	8.0	15	37	0.9	1.2	53	7.3	19	0.10
JUN												
27...	0950	0	8.5	8.3	16	38	1	0.90	56	6.7	18	0.30
SEP												
06...	0930	3	8.9	8.5	16	37	0.9	0.90	54	5.6	17	<0.10

DATE	TIME	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	SOLIDS, RESIDUE AT 105 DEG. C, TOTAL (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
NOV											
03..	1230	--	--	--	--	5	--	0.300	0.50	0.80	<0.010
DEC											
12...	0330	--	--	--	--	--	1370	--	--	--	--
12...	0400	--	--	--	--	--	1910	--	--	--	--
12...	0430	--	--	--	--	--	754	--	--	--	--
12...	0500	--	--	--	--	--	422	--	--	--	--
12...	0530	--	--	--	--	--	311	--	--	--	--
12...	0600	--	--	--	--	--	425	--	--	--	--
12...	0630	--	--	--	--	--	317	--	--	--	--
12...	0700	--	--	--	--	--	324	--	--	--	--
12...	0730	--	--	--	--	--	304	--	--	--	--
12...	0800	--	--	--	--	--	294	--	--	--	--
12...	0830	--	--	--	--	--	268	--	--	--	--
12...	0900	--	--	--	--	--	256	--	--	--	--
12...	0930	--	--	--	--	--	243	--	--	--	--
12...	1000	--	--	--	--	--	271	--	--	--	--
12...	1030	--	--	--	--	--	229	--	--	--	--
12...	1100	--	--	--	--	--	235	--	--	--	--
MAY											
03...	1145	21	111	112	0.15	7	--	0.300	0.30	0.60	0.010
JUN											
27...	0950	22	112	114	0.15	5	--	0.300	0.30	0.60	0.010
SEP											
06...	0930	23	109	112	0.15	5	--	0.300	0.30	0.60	<0.010

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
MAY												
03...	1145	140	<10	2	2	<100	3	<10	<0.5	1	<1	<1
JUN												
27...	0950	130	<10	1	1	<100	3	<10	<0.5	1	<1	2
SEP												
06...	0930	130	<10	1	1	<100	4	<10	<0.5	<1	<1	2

< Actual value is known to be less than the value shown.

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
MAY												
03...	<1	1	<3	3	1	280	20	<5	<5	<10	6	70
JUN												
27...	<1	3	<3	4	1	230	13	<5	<5	<10	<4	110
SEP												
06...	<1	<1	<3	3	<1	170	9	<5	<5	<10	<4	60

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)
MAY												
03...	12	0.40	0.3	4	<10	5	1	<1	<1	<1	<1.0	71
JUN												
27...	23	--	<0.1	3	<10	11	<1	<1	<1	<1	<1.0	73
SEP												
06...	13	<0.10	<0.1	2	<10	3	<1	<1	<1	<1	2.0	74

DATE	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
MAY											
03...	<6	<10	<3	2.1	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010
JUN											
27...	<6	20	6	2.0	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010
SEP											
06...	<6	<10	3	1.2	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
MAY											
03...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUN											
27...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP											
06...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	METHYL TRI-THION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
MAY											
03...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
JUN											
27...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
SEP											
06...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

16272200 KAMOOALII STREAM BELOW LULUKU STREAM, NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	6.7	7	0.13	6.9	2	0.04	8.6	3	0.07
2	7.8	7	0.15	6.7	2	0.04	8.4	3	0.07
3	6.3	6	0.10	9.4	2	0.05	8.4	e3	0.07
4	6.3	6	0.10	6.0	2	0.03	8.8	e2	0.05
5	8.4	6	0.14	8.4	159	5.5	8.9	2	0.05
6	6.5	4	0.07	9.0	170	4.1	8.5	8	0.18
7	7.0	5	0.09	16	14	0.60	8.0	4	0.09
8	6.0	5	0.08	8.0	4	0.09	9.8	8	0.21
9	5.8	4	0.06	6.7	e3	0.05	11	109	4.3
10	5.7	4	0.06	6.3	2	0.03	9.6	42	1.1
11	6.3	3	0.05	6.1	2	0.03	8.3	25	0.56
12	7.6	3	0.06	6.4	2	0.03	186	400	349
13	6.2	7	0.12	5.8	e2	0.03	57	78	13
14	7.5	8	0.16	7.9	3	0.06	23	46	2.9
15	3.7	7	0.07	8.1	3	0.07	17	27	1.2
16	5.6	4	0.06	6.3	2	0.03	14	24	0.91
17	5.5	2	0.03	24	25	2.1	24	29	1.9
18	5.5	2	0.03	17	31	1.5	54	45	6.6
19	5.5	3	0.04	11	19	0.56	123	166	86
20	5.3	e3	0.04	16	27	1.6	35	48	4.5
21	5.2	e3	0.04	17	25	1.1	21	20	1.1
22	6.2	3	0.05	18	19	0.92	18	11	0.53
23	5.5	3	0.04	9.8	15	0.40	17	52	2.4
24	5.7	e3	0.05	9.3	14	0.35	18	3	0.15
25	5.5	2	0.03	8.9	15	0.36	15	4	0.16
26	5.4	e2	0.03	8.8	9	0.21	16	1	0.04
27	5.4	2	0.03	8.6	5	0.12	15	1	0.04
28	5.3	e2	0.03	8.4	5	0.11	14	3	0.11
29	5.3	e2	0.03	11	6	0.18	14	4	0.15
30	5.2	e2	0.03	9.4	5	0.13	49	e40	5.3
31	5.1	e2	0.03	--	--	--	326	e376	813
TOTAL	185.00	--	2.03	301.20	--	20.42	1154.30	--	1295.74
		JANUARY			FEBRUARY			MARCH	
1	723	e244	622	25	e10	0.67	14	12	0.45
2	55	66	9.8	21	e7	0.40	14	16	0.60
3	46	39	4.8	21	e5	0.28	14	20	0.76
4	31	24	2.0	37	e12	1.2	14	10	0.38
5	28	18	1.4	22	e7	0.42	13	2	0.07
6	27	15	1.1	22	e4	0.24	14	2	0.08
7	25	12	0.81	19	e2	0.10	13	2	0.07
8	23	9	0.56	19	e2	0.10	13	2	0.07
9	23	7	0.43	19	e2	0.10	14	7	0.26
10	43	11	1.3	18	e2	0.10	13	8	0.28
11	24	e7	0.45	18	e2	0.10	13	9	0.32
12	23	e5	0.31	17	e2	0.09	13	8	0.28
13	20	e3	0.16	17	e2	0.09	14	e30	1.1
14	18	e3	0.15	17	e2	0.09	19	50	2.6
15	19	e2	0.10	17	e2	0.09	14	10	0.38
16	21	e2	0.11	17	e2	0.09	20	e12	0.65
17	34	e10	0.92	16	e2	0.09	15	e10	0.40
18	49	e20	2.6	16	e2	0.09	15	e6	0.24
19	21	14	0.79	16	e2	0.09	15	e4	0.16
20	19	9	0.46	16	e2	0.09	13	e2	0.07
21	19	8	0.41	15	e2	0.08	13	e2	0.07
22	17	6	0.28	16	e2	0.09	13	e2	0.07
23	17	5	0.23	18	7	0.34	13	e2	0.07
24	17	5	0.23	16	e5	0.22	34	e86	28
25	22	10	0.59	24	e7	0.45	44	e246	64
26	23	e7	0.43	16	e5	0.22	15	e30	1.2
27	28	17	1.3	15	e3	0.12	14	e15	0.57
28	89	69	20	15	e2	0.08	13	e7	0.25
29	101	115	51	14	e6	0.23	13	e4	0.14
30	27	e20	1.5	--	--	--	13	e3	0.11
31	23	e12	0.75	--	--	--	14	e2	0.08
TOTAL	1655.00	--	726.97	539.00	--	6.35	486.00	--	103.78

e Estimated

16272200 KAMOOALII STREAM BELOW LULUKU STREAM, NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	14	e2	0.08	10	e4	0.11	11	e2	0.06
2	12	e2	0.06	10	e3	0.08	11	e2	0.06
3	16	e10	0.43	13	e10	0.35	10	e2	0.05
4	33	e20	1.8	13	e5	0.18	10	e2	0.05
5	15	e8	0.32	12	e5	0.16	10	e2	0.05
6	13	e8	0.28	13	e3	0.11	11	e2	0.06
7	13	e8	0.28	14	e3	0.11	10	e2	0.05
8	13	e7	0.25	11	e2	0.06	10	e2	0.05
9	12	e7	0.23	10	e2	0.05	9.6	e2	0.05
10	12	e7	0.23	11	e3	0.09	9.6	e2	0.05
11	12	e7	0.23	12	e4	0.13	9.2	e2	0.05
12	12	e6	0.19	18	e6	0.29	9.2	e2	0.05
13	11	e6	0.18	21	e8	0.45	9.2	e2	0.05
14	11	e6	0.18	18	e5	0.24	9.2	e2	0.05
15	11	e6	0.18	24	e9	0.58	8.8	e2	0.05
16	11	e5	0.15	14	e4	0.15	8.8	e2	0.05
17	11	e5	0.15	13	e3	0.11	8.8	e2	0.05
18	11	e5	0.15	12	e2	0.06	8.4	e2	0.05
19	11	8	0.24	12	e2	0.06	8.4	e2	0.05
20	10	8	0.22	12	e2	0.06	8.8	e2	0.05
21	10	4	0.11	11	e2	0.06	8.8	e2	0.05
22	10	6	0.16	12	e2	0.06	8.8	e2	0.05
23	10	8	0.22	11	e2	0.06	8.8	e2	0.05
24	10	11	0.30	11	e2	0.06	9.2	e2	0.05
25	12	e8	0.26	11	e2	0.06	8.4	e2	0.05
26	11	e6	0.18	11	e2	0.06	8.8	e2	0.05
27	10	e4	0.11	12	e2	0.06	10	e2	0.05
28	12	e3	0.10	11	e2	0.06	8.6	e2	0.05
29	10	e3	0.08	10	e2	0.05	8.3	e2	0.04
30	10	e3	0.08	11	e2	0.06	8.2	e2	0.04
31	--	--	--	10	e2	0.05	--	--	--
TOTAL	369.00	--	7.43	394.00	--	4.07	278.90	--	1.51
		JULY			AUGUST			SEPTEMBER	
1	8.0	e2	0.04	6.5	e2	0.04	5.8	e2	0.03
2	8.0	e2	0.04	7.7	e4	0.08	5.9	e3	0.05
3	7.8	e2	0.04	15	e12	0.49	5.8	e4	0.06
4	7.9	e2	0.04	7.7	e4	0.08	5.8	e2	0.03
5	7.8	e2	0.04	7.1	e2	0.04	5.9	e3	0.05
6	7.7	e2	0.04	6.9	e2	0.04	6.1	5	0.08
7	7.9	e2	0.04	7.7	e2	0.04	5.8	5	0.08
8	8.9	e5	0.12	7.1	e2	0.04	5.7	5	0.08
9	8.9	e6	0.14	6.7	e2	0.04	6.3	20	0.34
10	8.3	e4	0.09	6.7	e2	0.04	9.2	22	0.55
11	8.2	e3	0.07	9.9	e10	0.27	8.8	8	0.19
12	8.2	e2	0.04	8.0	e5	0.11	6.4	e7	0.12
13	7.8	e2	0.04	7.0	e3	0.06	5.9	e7	0.11
14	8.1	e2	0.04	7.8	e2	0.04	6.5	10	0.18
15	7.3	e2	0.04	7.1	e2	0.04	14	18	0.68
16	7.0	e2	0.04	6.9	e2	0.04	7.2	6	0.12
17	6.9	e2	0.04	8.6	e4	0.09	6.4	6	0.10
18	7.5	e2	0.04	7.0	e3	0.06	6.2	4	0.07
19	6.8	e2	0.04	6.8	e2	0.04	6.0	4	0.06
20	6.9	e2	0.04	6.6	e2	0.04	5.9	4	0.06
21	7.0	e2	0.04	6.9	e2	0.04	6.3	2	0.03
22	6.8	e2	0.04	6.7	e2	0.04	6.5	2	0.04
23	6.7	e2	0.04	6.5	e2	0.04	8.2	2	0.04
24	6.7	e2	0.04	7.0	e2	0.04	6.3	1	0.02
25	8.5	e2	0.05	6.8	e2	0.04	6.1	1	0.02
26	7.1	e2	0.04	6.2	e2	0.03	6.3	7	0.12
27	6.8	e2	0.04	6.3	e2	0.03	21	e190	19
28	6.6	e2	0.04	6.1	e2	0.03	30	230	43
29	6.6	e2	0.04	6.0	e2	0.03	13	10	0.35
30	6.8	e2	0.04	6.1	e2	0.03	8.9	5	0.12
31	6.6	e2	0.04	6.2	e2	0.03	--	--	--
TOTAL	232.10	--	1.51	225.60	--	2.10	248.20	--	65.78
YEAR	6068.00		2237.69						

e Estimated

16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24'46", long 157°49'33", Hydrologic Unit 20060000, on left bank 1.7 mi west of Kaneohe Post Office and 1.8 mi southwest of Heeia.

DRAINAGE AREA.--0.97 mi^2.

PERIOD OF RECORD.--January 1914 to October 1919, July 1939 to September 1977, October 1982 to current year.

REVISED RECORDS (FISCAL YEARS).--WSP 935: 1940. WSP 1319: 1916-19(M). WSP 1569: Drainage area. WSP 1719: 1942-43, 1946(M), 1947, 1949, 1951, 1954(M), 1955, 1957-59. WSP 1937: 1940-45(M), 1947(M), 1948-50(P), 1951, 1952(P), 1953(M), 1955-57(P), 1958-59, 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 271.9 ft above mean sea level (levels by city and county of Honolulu). Prior to Apr. 28, 1914, nonrecording gage and Apr. 28, 1914, to Oct. 25, 1919, water-stage recorder, at same site at different datums.

REMARKS.--Records fair. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1943.

AVERAGE DISCHARGE (since diversion from tunnel began).--40 years (water years 1944-77, 1984-88), 2.16 ft^3/s (1,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,740 ft^3/s May 2, 1965, gage height, 7.94 ft, from rating curve extended above 57 ft^3/s on basis of slope-area measurements at gage heights 3.87 ft, 3.88 ft, and 7.94 ft; minimum, 0.20 ft^3/s, July 20, 1957, Sept. 17, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 340 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	2030	710	3.50	Mar. 25	0300	384	3.12
Dec. 31	2200	*754	*3.54				

Minimum, 1.6 ft^3/s for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.6	1.8	98	7.2	2.1	2.1	2.1	2.1	1.8	1.6	1.7
2	2.0	1.6	1.8	13	3.4	2.1	2.1	2.1	2.1	1.7	2.1	1.6
3	1.9	1.8	1.7	9.2	3.0	2.1	2.3	5.8	2.0	1.7	4.8	1.6
4	1.7	1.7	1.7	5.6	4.0	2.1	5.4	3.3	2.0	1.7	2.2	1.6
5	1.7	1.7	1.7	4.3	3.3	2.1	3.3	4.0	2.0	1.7	1.8	1.6
6	1.7	1.7	1.7	3.6	2.9	2.1	2.6	2.9	2.1	1.8	1.7	1.6
7	1.8	4.4	1.7	3.3	2.7	2.1	2.4	3.2	2.0	1.8	2.1	1.6
8	1.7	2.0	1.7	3.0	2.6	2.0	2.2	2.8	2.0	1.8	2.2	1.6
9	1.7	1.7	1.7	2.9	2.5	2.0	2.1	2.4	2.0	1.9	2.0	1.6
10	1.7	1.7	1.7	6.1	2.5	2.0	2.1	2.2	2.0	1.8	1.9	1.7
11	1.7	1.6	1.7	3.2	2.4	2.0	2.1	3.3	1.9	1.7	3.9	1.7
12	1.7	1.6	50	2.8	2.4	2.0	2.1	6.6	1.9	1.7	2.3	1.6
13	1.7	1.6	11	2.7	2.4	2.1	2.0	6.0	1.9	1.7	1.9	1.6
14	1.6	1.7	4.9	2.6	2.3	3.8	2.0	4.0	1.9	1.7	1.9	1.7
15	1.6	1.7	3.3	2.5	2.3	2.9	2.0	7.5	1.8	1.7	1.8	3.7
16	1.6	1.7	2.9	2.6	2.2	2.6	2.0	3.6	1.8	1.6	1.7	2.0
17	1.6	16	3.9	8.6	2.2	2.3	2.0	2.9	1.8	1.7	2.2	1.7
18	1.6	6.8	7.4	7.3	2.2	2.2	2.0	2.6	1.8	1.7	2.1	1.7
19	1.6	2.9	28	3.3	2.2	2.7	2.0	2.5	1.7	1.7	1.9	1.6
20	1.6	3.9	8.6	2.8	2.2	2.4	1.9	2.4	1.7	1.7	1.8	1.6
21	1.6	4.2	4.7	2.6	2.2	2.2	1.9	2.4	1.7	1.6	1.7	1.6
22	1.6	3.1	3.5	2.5	2.5	2.1	1.9	2.3	1.8	1.6	1.7	1.6
23	1.6	2.5	3.2	2.5	2.9	2.1	1.9	2.2	1.8	1.6	1.8	1.8
24	1.6	2.2	3.3	2.4	2.6	5.4	1.9	2.2	1.8	1.7	1.7	1.7
25	1.6	2.0	3.2	4.7	7.4	16	2.2	2.2	1.7	1.7	1.7	1.7
26	1.6	2.0	3.3	5.2	2.8	3.1	3.8	2.2	1.8	1.7	1.7	1.6
27	1.6	1.9	3.2	7.6	2.3	2.6	2.6	2.1	1.7	1.6	1.8	7.6
28	1.6	1.8	3.0	20	2.1	2.4	2.6	2.2	1.7	1.6	1.7	5.3
29	1.6	1.8	2.9	13	2.1	2.2	2.3	2.1	1.7	1.6	1.7	5.7
30	1.6	1.8	5.2	5.0	---	2.2	2.1	2.1	1.8	1.6	1.8	2.9
31	1.6	---	127	4.7	---	2.2	---	2.1	---	1.6	1.7	---
TOTAL	51.3	82.7	301.4	257.6	83.8	88.2	69.9	96.3	56.0	52.5	62.9	66.6
MEAN	1.65	2.76	9.72	8.31	2.89	2.85	2.33	3.11	1.87	1.69	2.03	2.22
MAX	2.0	16	127	98	7.4	16	5.4	7.5	2.1	1.9	4.8	7.6
MIN	1.5	1.6	1.7	2.4	2.1	2.0	1.9	2.1	1.7	1.6	1.6	1.6
AC-FT	102	164	598	511	166	175	139	191	111	104	125	132

CAL YR 1987	TOTAL	965.0	MEAN	2.64	MAX	127	MIN	1.5	AC-FT	1910
WTR YR 1988	TOTAL	1269.2	MEAN	3.47	MAX	127	MIN	1.5	AC-FT	2520

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1982 to September 1985, October 1986 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: December 1983 to September 1984, July 1987 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since December 1983.

REMARKS.--Water-quality samples were also collected at this site.

EXTREMES FOR PERIOD OF RECOD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 656 mg/L Dec. 31, 1987; minimum daily mean, 1 mg/L for many days in 1984, 1988.
SEDIMENT DISCHARGE: Maximum daily, 676 tons Dec. 31, 1987; minimum daily, less than 0.01 ton for many days in 1984, 1988.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 656 mg/L Dec. 31; minimum daily mean, 1 mg/L for many days.
SEDIMENT DISCHARGE: Maximum daily, 676 tons Dec. 31; minimum daily, less than 0.01 ton for many days.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
MAY										
10...	1000	754	2.2	154	7.70	20.0	0.80	8.6	96	110
JUN										
28...	0930	756	1.7	148	7.80	20.5	0.80	8.1	91	130
SEP										
06...	1235	754	1.4	155	7.70	21.0	0.60	5.5	62	--

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY											
10...	1000	48	0	9.1	6.2	12	35	0.8	48	4.0	14
SEP											
06...	1235	47	1	8.6	6.1	12	35	0.8	46	3.1	14

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
MAY										
10...	1000	0.10	27	99	102	0.13	--	<0.100	<0.20	0.070
JUN										
28...	0930	--	--	--	--	--	9	<0.100	<0.20	0.020
SEP										
06...	1235	<0.10	28	96	100	0.13	<1	<0.100	0.20	0.010

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
MAY												
10...	1000	40	<10	<1	<1	<100	<2	<10	<0.5	<1	<1	2
SEP												
06...	1235	30	<10	<1	<1	<100	<2	<10	<0.5	<1	<1	2

< Actual value is known to be less than the value shown.

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
MAY												
10...	1	3	<3	1	1	200	100	<5	<5	<10	<4	20
SEP												
06...	<1	<1	<3	1	<1	170	90	<5	8	<10	<4	20

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)
MAY												
10...	15	0.30	<0.1	4	<10	<1	7	<1	<1	<1	<1.0	56
SEP												
06...	13	<0.10	<0.1	2	<10	1	<1	<1	<1	<1	1.0	53

DATE	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
MAY											
10...	<6	<10	<3	0.8	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010
SEP											
06...	<6	<10	<3	0.5	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
MAY											
10...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
SEP											
06...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
MAY											
10...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
SEP											
06...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

16275000 HAIKU STREAM NEAR HEEIA-- Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		OCTOBER			NOVEMBER			DECEMBER	
1	1.5	2	0.01	1.6	2	0.01	1.8	e9	0.04
2	2.0	3	0.02	1.6	2	0.01	1.8	e9	0.04
3	1.9	2	0.01	1.8	1	0.00	1.7	e8	0.04
4	1.7	1	0.00	1.7	1	0.00	1.7	e8	0.04
5	1.7	2	0.01	1.7	1	0.00	1.7	e8	0.04
6	1.7	2	0.01	1.7	1	0.00	1.7	e7	0.03
7	1.8	2	0.01	4.4	12	0.14	1.7	e7	0.03
8	1.7	1	0.00	2.0	3	0.02	1.7	e7	0.03
9	1.7	1	0.00	1.7	1	0.00	1.7	e7	0.03
10	1.7	1	0.00	1.7	1	0.00	1.7	7	0.03
11	1.7	1	0.00	1.6	1	0.00	1.7	10	0.05
12	1.7	1	0.00	1.6	1	0.00	50	588	144
13	1.7	1	0.00	1.6	2	0.01	11	150	4.5
14	1.6	1	0.00	1.7	2	0.01	4.9	70	0.93
15	1.6	1	0.00	1.7	1	0.00	3.3	e40	0.36
16	1.6	2	0.01	1.7	1	0.00	2.9	e20	0.16
17	1.6	2	0.01	16	39	2.3	3.9	e40	0.42
18	1.6	2	0.01	6.8	11	0.20	7.4	135	44
19	1.6	2	0.01	2.9	7	0.05	28	295	22
20	1.6	e2	0.01	3.9	12	0.13	8.6	90	2.1
21	1.6	2	0.01	4.2	10	0.11	4.7	20	0.25
22	1.6	2	0.01	3.1	8	0.07	3.5	7	0.07
23	1.6	2	0.01	2.5	8	0.05	3.2	8	0.07
24	1.6	1	0.00	2.2	8	0.05	3.3	9	0.08
25	1.6	1	0.00	2.0	8	0.04	3.2	4	0.03
26	1.6	1	0.00	2.0	9	0.05	3.3	3	0.03
27	1.6	1	0.00	1.9	10	0.05	3.2	4	0.03
28	1.6	1	0.00	1.8	10	0.05	3.0	5	0.04
29	1.6	1	0.00	1.8	e10	0.05	2.9	5	0.04
30	1.6	1	0.00	1.8	e9	0.04	5.2	90	3.9
31	1.6	1	0.00	--	--	--	127	656	676
TOTAL	51.30	--	0.22	82.70	--	3.49	301.40	--	899.41
		JANUARY			FEBRUARY			MARCH	
1	98	634	307	7.2	68	6.3	2.1	e9	0.05
2	13	100	3.5	3.4	18	0.17	2.1	e8	0.05
3	9.2	85	2.1	3.0	14	0.11	2.1	e8	0.05
4	5.6	60	0.91	4.0	14	0.15	2.1	8	0.05
5	4.3	25	0.29	3.3	12	0.11	2.1	6	0.03
6	3.6	20	0.19	2.9	10	0.08	2.1	5	0.03
7	3.3	15	0.13	2.7	10	0.07	2.1	6	0.03
8	3.0	10	0.08	2.6	8	0.06	2.0	5	0.03
9	2.9	8	0.06	2.5	8	0.05	2.0	5	0.03
10	6.1	15	0.25	2.5	7	0.05	2.0	5	0.03
11	3.2	8	0.07	2.4	7	0.05	2.0	5	0.03
12	2.8	8	0.06	2.4	7	0.05	2.0	6	0.03
13	2.7	8	0.06	2.4	7	0.05	2.1	7	0.04
14	2.6	8	0.06	2.3	8	0.05	3.8	8	0.08
15	2.5	8	0.05	2.3	9	0.06	2.9	5	0.04
16	2.6	10	0.07	2.2	10	0.06	2.6	5	0.04
17	8.6	20	0.46	2.2	8	0.05	2.3	7	0.04
18	7.3	215	12	2.2	e8	0.05	2.2	9	0.05
19	3.3	20	0.18	2.2	e8	0.05	2.7	10	0.07
20	2.8	8	0.06	2.2	e8	0.05	2.4	5	0.03
21	2.6	5	0.04	2.2	9	0.05	2.2	4	0.02
22	2.5	3	0.02	2.5	12	0.08	2.1	5	0.03
23	2.5	3	0.02	2.9	13	0.10	2.1	10	0.06
24	2.4	3	0.02	2.6	7	0.05	5.4	236	16
25	4.7	10	0.13	7.4	13	0.26	16	225	9.6
26	5.2	9	0.13	2.8	8	0.06	3.1	27	0.23
27	7.6	8	0.16	2.3	8	0.05	2.6	15	0.11
28	20	152	14	2.1	9	0.05	2.4	8	0.05
29	13	130	14	2.1	9	0.05	2.2	e8	0.05
30	5.0	10	0.13	--	--	--	2.2	e8	0.05
31	4.7	61	4.9	--	--	--	2.2	e8	0.05
TOTAL	257.60	--	361.13	83.80	--	8.42	88.20	--	27.08

e Estimated

16275000 HAIKU STREAM NEAR HEEIA-- Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DAY	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)	MEAN DISCHARGE (CFS)	MEAN CONCEN-TRATION (MG/L)	SEDIMENT DISCHARGE (TONS/DAY)
		APRIL			MAY			JUNE	
1	2.1	7	0.04	2.1	e3	0.02	2.1	e6	0.03
2	2.1	7	0.04	2.1	e3	0.02	2.1	e6	0.03
3	2.3	6	0.04	5.8	e20	0.31	2.0	e5	0.03
4	5.4	76	0.82	3.3	e9	0.08	2.0	e5	0.03
5	3.3	12	0.11	4.0	e15	0.16	2.0	e5	0.03
6	2.6	6	0.04	2.9	e8	0.06	2.1	e6	0.03
7	2.4	5	0.03	3.2	e9	0.08	2.0	e5	0.03
8	2.2	e5	0.03	2.8	e8	0.06	2.0	e5	0.03
9	2.1	e5	0.03	2.4	e7	0.05	2.0	e5	0.03
10	2.1	e5	0.03	2.2	e7	0.04	2.0	e5	0.03
11	2.1	e5	0.03	3.3	e9	0.08	1.9	e5	0.03
12	2.1	e5	0.03	6.6	e25	0.45	1.9	e5	0.03
13	2.0	e5	0.03	6.0	e20	0.32	1.9	e5	0.03
14	2.0	e5	0.03	4.0	e15	0.16	1.9	e5	0.03
15	2.0	e5	0.03	7.5	e30	0.61	1.8	e5	0.02
16	2.0	e5	0.03	3.6	e10	0.10	1.8	e5	0.02
17	2.0	e5	0.03	2.9	e7	0.05	1.8	5	0.02
18	2.0	e5	0.03	2.6	e7	0.05	1.8	6	0.03
19	2.0	5	0.03	2.5	e7	0.05	1.7	6	0.03
20	1.9	4	0.02	2.4	e7	0.05	1.7	6	0.03
21	1.9	e4	0.02	2.4	e7	0.05	1.7	6	0.03
22	1.9	e4	0.02	2.3	e7	0.04	1.8	7	0.03
23	1.9	e4	0.02	2.2	e6	0.04	1.8	7	0.03
24	1.9	4	0.02	2.2	e6	0.04	1.8	6	0.03
25	2.2	8	0.05	2.2	e6	0.04	1.7	e6	0.03
26	3.8	12	0.12	2.2	e6	0.04	1.8	e6	0.03
27	2.6	6	0.04	2.1	e6	0.03	1.7	e6	0.03
28	2.6	4	0.03	2.2	e6	0.04	1.7	6	0.03
29	2.3	3	0.02	2.1	e6	0.03	1.7	7	0.03
30	2.1	e3	0.02	2.1	e6	0.03	1.8	7	0.03
31	--	--	--	2.1	e6	0.03	--	--	--
TOTAL	69.90	--	1.86	96.30	--	3.21	56.00	--	0.87
		JULY			AUGUST			SEPTEMBER	
1	1.8	7	0.03	1.6	2	0.01	1.7	2	0.01
2	1.7	7	0.03	2.1	3	0.02	1.6	1	0.00
3	1.7	7	0.03	4.8	6	0.08	1.6	1	0.00
4	1.7	7	0.03	2.2	1	0.01	1.6	1	0.00
5	1.7	7	0.03	1.8	1	0.00	1.6	1	0.00
6	1.8	6	0.03	1.7	1	0.00	1.6	1	0.00
7	1.8	6	0.03	2.1	2	0.01	1.6	1	0.00
8	1.8	5	0.02	2.2	2	0.01	1.6	1	0.00
9	1.9	6	0.03	2.0	1	0.01	1.6	1	0.00
10	1.8	6	0.03	1.9	1	0.01	1.7	1	0.00
11	1.7	6	0.03	3.9	5	0.05	1.7	1	0.00
12	1.7	6	0.03	2.3	2	0.01	1.6	1	0.00
13	1.7	6	0.03	1.9	2	0.01	1.6	1	0.00
14	1.7	5	0.02	1.9	1	0.01	1.7	1	0.00
15	1.7	5	0.02	1.8	1	0.00	3.7	5	0.05
16	1.6	7	0.03	1.7	1	0.00	2.0	4	0.02
17	1.7	7	0.03	2.2	2	0.01	1.7	5	0.02
18	1.7	7	0.03	2.1	1	0.01	1.7	5	0.02
19	1.7	7	0.03	1.9	1	0.01	1.6	4	0.02
20	1.7	6	0.03	1.8	1	0.00	1.6	2	0.01
21	1.6	5	0.02	1.7	1	0.00	1.6	2	0.01
22	1.6	4	0.02	1.7	1	0.00	1.6	2	0.01
23	1.6	5	0.02	1.8	1	0.00	1.8	5	0.02
24	1.7	4	0.02	1.7	1	0.00	1.7	2	0.01
25	1.7	6	0.03	1.7	1	0.00	1.7	2	0.01
26	1.7	3	0.01	1.7	1	0.00	1.6	2	0.01
27	1.6	2	0.01	1.8	1	0.00	7.6	45	1.7
28	1.6	2	0.01	1.7	1	0.00	5.3	20	0.29
29	1.6	e2	0.01	1.7	2	0.01	5.7	22	0.34
30	1.6	2	0.01	1.8	4	0.02	2.9	10	0.08
31	1.6	2	0.01	1.7	4	0.02	--	--	--
TOTAL	52.50	--	0.74	62.90	--	0.38	66.60	--	2.68
YEAR	1269.20		1309.50						

e Estimated

16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26'32", long 157°50'47", Hydrologic Unit 20060000, on left bank 1.1 mi west of Valley of the Temples Memorial Park, 1.3 mi south of Kahaluu School, and 2.7 mi northwest of Heeia Elementary School, and 2.7 mi northwest of Heeia Elementary School.

DRAINAGE AREA.--0.99 mi^2.

PERIOD OF RECORD.--October 1983 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft, from topographic map. Honolulu Board of Water Supply).

REMARKS.--Records good. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947.

AVERAGE DISCHARGE.--5 years, 2.27 ft^3/s (1,640 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 486 ft^3/s Dec. 31, 1987, gage height, 5.28 ft; minimum, 0.58 ft^3/s, several days in September, October, November 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 180 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	2000	332	4.51	Dec. 31	2330	*486	*5.28

Minimum discharge, 1.4 ft^3/s, Oct. 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.0	1.8	2.0	66	4.9	4.0	3.9	3.9	4.0	3.5	2.9	2.8
2	7.3	1.6	2.0	11	4.6	4.0	3.9	3.9	3.9	3.4	4.0	3.0
3	3.3	2.3	2.0	8.1	4.4	4.0	6.8	7.2	3.5	3.4	9.4	2.8
4	2.6	2.3	1.9	5.5	5.2	3.9	8.0	7.3	3.3	3.4	3.6	2.7
5	5.3	2.1	1.9	4.6	4.4	3.9	6.2	6.2	3.2	3.3	3.2	2.7
6	3.1	2.0	1.8	4.3	4.3	4.0	4.8	5.3	3.5	3.4	3.1	2.7
7	3.1	4.9	1.8	3.9	4.2	3.9	4.4	8.2	4.0	3.4	3.9	2.7
8	2.3	2.3	3.2	3.8	4.2	3.9	4.3	5.2	4.0	3.8	3.4	2.6
9	2.2	2.0	2.6	3.7	4.1	3.9	4.1	4.6	4.1	4.0	3.1	2.7
10	2.0	1.9	2.9	12	4.1	3.8	4.1	4.4	4.0	3.7	3.0	2.7
11	2.1	1.8	2.3	4.3	4.1	3.8	4.0	6.5	3.9	3.6	8.7	2.9
12	2.1	1.9	54	3.9	4.0	3.8	4.0	9.2	3.9	3.5	3.7	2.6
13	2.0	1.8	14	3.7	4.0	4.0	4.0	7.0	3.9	3.4	3.2	2.6
14	2.0	2.2	7.7	3.6	4.1	4.9	4.0	6.3	3.8	3.9	3.2	3.4
15	2.0	2.0	5.3	3.5	4.0	4.1	3.9	15	3.8	3.5	3.1	8.3
16	1.9	2.4	4.3	4.9	4.0	4.9	3.9	6.1	3.7	3.4	3.1	3.1
17	1.9	11	5.8	18	4.0	4.5	3.8	5.1	3.7	3.4	5.1	2.7
18	1.9	6.8	13	6.2	4.0	5.1	3.8	4.7	3.7	3.5	3.5	2.6
19	1.9	3.1	28	4.5	4.0	5.0	3.9	4.5	3.7	3.3	3.2	2.7
20	1.8	6.7	9.6	4.1	4.0	4.3	3.9	4.5	3.7	3.3	3.1	2.7
21	1.9	7.6	5.5	3.9	4.0	4.2	3.8	4.4	3.8	3.3	3.1	2.7
22	1.9	4.3	4.3	3.8	4.1	4.1	3.8	4.3	3.7	3.3	3.1	2.4
23	1.8	3.0	3.9	3.7	5.0	4.0	3.8	4.3	3.7	3.3	2.9	2.7
24	1.8	2.6	4.8	3.7	4.3	13	3.8	4.2	3.8	3.3	2.8	2.5
25	1.9	2.3	3.6	8.6	10	9.2	4.7	4.2	3.6	3.5	2.8	2.5
26	1.9	2.2	3.7	6.2	4.6	5.0	9.2	4.2	3.6	3.3	2.8	2.7
27	1.8	2.1	3.5	11	4.3	4.4	4.6	4.1	3.7	3.3	2.9	18
28	1.8	2.0	3.1	21	4.1	4.3	4.2	4.2	3.6	3.3	2.7	8.7
29	1.7	2.4	2.9	15	4.0	4.2	5.9	4.1	3.6	3.1	2.7	4.9
30	1.7	2.1	15	6.5	---	4.2	4.1	4.0	3.4	3.0	2.8	3.7
31	1.7	---	80	5.3	---	4.1	---	4.0	---	2.9	2.8	---
TOTAL	79.7	93.5	296.4	268.3	129.0	144.4	137.6	171.1	111.8	105.7	110.9	111.8
MEAN	2.57	3.12	9.56	8.65	4.45	4.66	4.59	5.52	3.73	3.41	3.58	3.73
MAX	9.0	11	80	66	10	13	9.2	15	4.1	4.0	9.4	18
MIN	1.7	1.6	1.8	3.5	4.0	3.8	3.8	3.9	3.2	2.9	2.7	2.4
AC-FT	158	185	588	532	256	286	273	339	222	210	220	222

CAL YR 1987	TOTAL	1045.2	MEAN	2.86	MAX	80	MIN	1.3	AC-FT	2070
WTR YR 1988	TOTAL	1760.2	MEAN	4.81	MAX	80	MIN	1.6	AC-FT	3490

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'47", long 157°52'12", Hydrologic Unit 20060000, on left bank 0.2 mi upstream from confluence with North Fork, 3.0 mi southwest of Waiahole School, and 4.0 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records fair. Honolulu Board of Water Supply diverts water from wells in drainage area.

AVERAGE DISCHARGE.--26 years, 1.44 ft^3/s (1,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft^3/s Oct. 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft^3/s; no flow July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 31	2230	*110	*2.88	No other peak greater than base discharge.			

Minimum discharge, 0.03 ft^3/s, Oct. 31 to Nov. 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	.38	e.37	e3.5	.42	.56	.52	e.60	.56	.51	.51	.56
2	1.3	.33	e.37	e1.2	.42	.56	.51	e.60	.58	.51	.55	.56
3	.85	.42	e.37	e.70	.42	.56	.70	e1.9	.56	.51	2.0	.56
4	.85	.47	e.37	e.50	.45	.51	e3.1	e.84	.56	.51	.56	.56
5	.80	.47	e.37	e.39	.42	.51	e1.8	e.84	.56	.51	.56	.56
6	.80	e.33	e.37	e.39	.42	.51	e1.0	e.68	.56	.51	.55	.51
7	.85	e.37	e.37	e.39	.42	.51	e.76	e1.2	.56	.56	.62	.51
8	.80	e.37	e.46	e.39	.42	.51	e.61	e.64	.57	.56	.58	.51
9	.75	e.37	e.35	e.39	.42	.51	e.61	e.64	.56	.56	.56	.51
10	.75	e.37	e.56	e.87	.42	.51	e.61	e.64	.56	.56	.54	.56
11	.75	e.37	e.38	e.41	.42	.51	e.61	e1.0	.55	.51	1.7	.65
12	.75	e.37	e6.0	e.39	.42	.51	e.61	e1.8	.56	.51	.65	.51
13	.75	e.37	e1.3	e.39	.42	.60	e.61	1.2	.56	.51	.60	.51
14	.75	e.39	e.49	e.39	.45	.60	e.61	.54	.56	.60	.60	.70
15	.75	e.38	e.43	.39	.46	.56	e.61	1.4	.56	.51	.56	1.2
16	.75	e.37	e.30	.55	.46	.60	e.61	.61	.56	.51	.56	.49
17	.75	e.47	e.50	1.4	.46	.56	e.61	.60	.56	.51	1.0	.46
18	.75	e.47	e.61	.44	.46	.56	e.61	.60	.51	.51	.60	.46
19	.75	e.37	e1.4	.41	.46	.60	e.61	.60	.51	.51	.56	.46
20	.75	e1.1	e.43	.41	.46	.56	e.61	.60	.51	.51	.56	.46
21	.75	e1.4	e.41	.41	.47	.56	e.61	.60	.51	.51	.56	.46
22	.75	e.41	e.39	.41	.68	.56	e.61	.60	.51	.51	.56	.46
23	.75	e.37	e.38	.41	e.85	.56	e.61	.60	.51	.51	.56	.46
24	.75	e.37	e.43	.40	e.65	.80	e.61	.63	.51	.51	.56	.46
25	.75	e.37	e.38	1.1	e1.1	1.1	e.61	.59	.51	.51	.56	.46
26	.70	e.37	e.38	.66	.56	.51	e.68	.57	.51	.51	.56	.46
27	.51	e.37	e.38	1.5	.56	.51	e.61	.56	.51	.51	.56	2.5
28	.51	e.37	e.38	1.9	.56	.51	e.61	.57	.51	.51	.56	.80
29	.51	e.40	e.38	.73	.56	.51	e.61	.58	.51	.51	.56	.64
30	.47	e.37	e2.0	.45	---	.51	e.61	.58	.51	.51	.56	.46
31	.33	---	e13	.42	---	.51	---	.57	---	.51	.56	---
TOTAL	23.93	13.34	34.31	22.29	14.69	17.55	22.49	23.98	16.17	16.10	20.58	18.46
MEAN	.77	.44	1.11	.72	.51	.57	.75	.77	.54	.52	.66	.62
MAX	1.9	1.4	13	3.5	1.1	1.1	3.1	1.9	.58	.60	2.0	2.5
MIN	.33	.33	.30	.39	.42	.51	.51	.54	.51	.51	.51	.46
AC-FT	47	26	68	44	29	35	45	48	32	32	41	37

CAL YR 1987	TOTAL	346.33	MEAN	.95	MAX	13	MIN	.30	AC-FT	687
WTR YR 1988	TOTAL	243.89	MEAN	.67	MAX	13	MIN	.30	AC-FT	484

e Estimated

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'48", long 157°52'18", Hydrologic Unit 20060000, on left bank 0.3 mi upstream from confluence with South Fork, 2.8 mi southwest of Waiahole School, and 4.3 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 639.00 ft above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good except for estimated daily discharges, which are poor. Honolulu Board of Water Supply diverts water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--26 years, 1.60 ft^3/s (1,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft^3/s Feb. 4, 1965, gage height, 3.38 ft, from rating curve extended above 19 ft^3/s; no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 31	2300	*51	*1.80	No other peak greater than base discharge.			

Minimum discharge, 0.82 ft^3/s, Oct. 31, Nov. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2.2	e1.0	.92	4.5	.98	1.0	1.2	1.2	1.2	1.1	1.1	1.1
2	e1.5	e.90	.92	1.4	.98	1.0	1.2	1.2	1.2	1.1	1.2	1.1
3	e1.4	e1.0	.92	1.1	.98	1.0	1.3	2.1	1.2	1.1	1.9	1.1
4	e1.4	e1.1	.92	1.0	.98	1.0	1.9	1.4	1.2	1.1	1.2	1.1
5	e1.3	e1.0	.92	.98	.98	1.0	1.6	1.4	1.2	1.1	1.1	1.1
6	e1.3	e.86	.92	.98	.98	1.0	1.3	1.3	1.1	1.1	1.1	1.1
7	e1.4	1.1	.92	.98	.98	1.0	1.3	1.6	1.1	1.1	1.2	1.1
8	e1.3	.87	1.1	.98	.98	1.0	1.3	1.2	1.1	1.1	1.2	1.1
9	e1.3	.87	1.0	.98	.98	1.0	1.3	1.2	1.1	1.1	1.1	1.2
10	1.3	.87	1.3	1.4	.98	1.0	1.3	1.2	1.1	1.1	1.1	1.2
11	1.3	.87	.98	1.0	.98	1.0	1.3	1.7	1.1	1.1	2.1	1.3
12	1.3	.92	3.8	.98	.98	1.0	1.3	2.0	1.1	1.1	1.2	1.2
13	e1.3	.87	1.4	.98	.98	1.2	1.3	1.4	1.1	1.1	1.1	1.1
14	e1.3	.92	1.2	.98	.98	1.1	1.3	1.4	1.1	1.3	1.1	1.4
15	e1.3	.87	1.1	.98	.98	1.1	1.3	1.9	1.1	1.1	1.1	1.4
16	e1.3	.92	1.0	1.0	.98	1.2	1.3	1.3	1.1	1.1	1.1	1.1
17	e1.3	1.2	1.1	1.7	.98	1.1	1.3	1.2	1.1	1.1	1.5	1.1
18	e1.3	1.1	1.4	1.0	.98	1.1	1.3	1.2	1.1	1.1	1.2	1.1
19	e1.3	.92	2.1	.98	.98	1.2	1.3	1.2	1.1	1.1	1.1	1.1
20	e1.3	1.4	1.1	.98	1.0	1.1	1.3	1.2	1.1	1.1	1.1	1.1
21	e1.3	1.6	.98	.98	1.0	1.1	1.3	1.2	1.1	1.1	1.1	1.1
22	e1.3	1.0	.92	.98	1.1	1.1	1.3	1.2	1.1	1.1	1.1	1.1
23	e1.3	.92	.92	.98	1.4	1.1	1.3	1.2	1.1	1.1	1.1	1.1
24	e1.3	.92	1.0	.98	1.0	1.4	1.3	1.2	1.1	1.1	1.1	1.1
25	e1.3	.92	.92	1.5	1.9	1.7	1.3	1.2	1.1	1.1	1.1	1.1
26	e1.2	.92	.92	1.3	1.0	1.2	1.5	1.2	1.1	1.1	1.1	1.1
27	e1.0	.92	.92	1.7	1.0	1.2	1.3	1.2	1.1	1.1	1.1	2.6
28	e1.0	.92	.92	2.0	1.0	1.2	1.3	1.2	1.1	1.1	1.1	1.5
29	e1.0	.98	.87	1.4	1.0	1.2	1.3	1.2	1.1	1.1	1.1	1.4
30	e.96	.92	1.6	1.0	---	1.2	1.3	1.2	1.1	1.1	1.1	1.3
31	e.90	---	7.1	1.0	---	1.2	---	1.2	---	1.1	1.1	---
TOTAL	39.96	29.58	42.09	38.70	30.02	34.7	39.9	41.5	33.5	34.3	36.9	36.5
MEAN	1.29	.99	1.36	1.25	1.04	1.12	1.33	1.34	1.12	1.11	1.19	1.22
MAX	2.2	1.6	7.1	4.5	1.9	1.7	1.9	2.1	1.2	1.3	2.1	2.6
MIN	.90	.86	.87	.98	.98	1.0	1.2	1.2	1.1	1.1	1.1	1.1
AC-FT	79	59	83	77	60	69	79	82	66	68	73	72

CAL YR 1987	TOTAL	523.33	MEAN	1.43	MAX	7.1	MIN	.86	AC-FT	1040
WTR YR 1988	TOTAL	437.65	MEAN	1.20	MAX	7.1	MIN	.86	AC-FT	868

e Estimated

16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", Hydrologic Unit 20060000, on right bank 0.2 mi downstream from forest-reserve boundary, 1.0 mi south of Kahaluu School, and 1.6 mi west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi^2.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft, from topographic map.

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--14 years, 5.98 ft^3/s (4,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,180 ft^3/s Mar. 14, 1982, gage height, 7.52 ft, from rating curve extended above 100 ft^3/s; minimum, 1.1 ft^3/s, Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 150 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	2030	*664	*6.31	Dec. 31	2330	548	5.98
Dec. 19	1700	169	4.45	Apr. 4	0300	222	4.73
Dec. 30	1700	311	5.13				

Minimum discharge, 5.2 ft^3/s, Oct. 31, Nov. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	5.8	5.5	77	7.1	6.6	6.8	7.4	6.8	6.6	6.2	6.1
2	9.7	5.4	5.5	15	6.9	6.6	6.8	7.4	6.8	6.6	6.4	6.1
3	6.8	6.1	5.5	10	6.8	6.6	7.7	16	6.8	6.6	12	6.1
4	6.6	7.4	5.5	8.0	7.0	6.6	16	9.0	6.8	6.6	6.6	6.1
5	6.4	6.6	5.5	7.5	6.8	6.6	12	8.3	6.8	6.6	6.4	6.1
6	6.4	5.9	5.3	7.3	6.8	6.6	7.7	7.9	6.8	6.6	6.4	6.1
7	6.4	6.8	5.3	6.8	6.8	6.6	7.6	11	6.8	6.6	6.6	6.1
8	6.3	6.1	6.0	6.7	6.8	6.6	7.5	8.2	6.8	6.6	6.5	6.0
9	6.3	5.8	6.2	6.6	6.8	6.6	7.2	7.5	6.8	6.6	6.3	5.9
10	6.3	5.4	9.5	15	6.8	6.6	7.2	7.2	6.8	6.6	6.3	6.1
11	6.3	5.4	5.8	7.0	6.8	6.6	7.2	9.5	6.8	6.6	13	6.3
12	6.3	5.8	87	6.8	6.8	6.6	7.2	13	6.7	6.6	7.0	6.0
13	6.3	5.4	18	6.8	6.8	6.8	7.2	8.8	6.6	6.6	6.6	5.9
14	6.3	5.9	13	6.6	6.8	7.1	7.2	8.8	6.6	6.7	6.6	6.1
15	6.3	5.6	8.5	6.4	6.8	6.8	7.2	15	6.6	6.3	6.6	11
16	6.3	5.8	7.3	7.2	6.8	6.9	7.2	8.3	6.6	6.3	6.5	6.2
17	6.3	7.9	10	19	6.8	6.8	7.2	7.6	6.6	6.3	7.7	6.0
18	6.1	7.2	17	7.6	6.8	6.8	7.2	7.3	6.6	6.3	6.6	5.9
19	6.1	6.3	38	7.2	6.8	7.1	7.1	7.2	6.6	6.3	6.3	5.9
20	6.1	9.8	12	7.0	6.8	6.9	7.0	7.2	6.6	6.3	6.3	5.9
21	6.1	12	8.5	6.7	6.8	6.8	7.0	7.2	6.6	6.3	6.3	5.9
22	6.1	7.9	7.5	6.6	7.0	6.8	7.0	7.2	6.6	6.3	6.2	5.9
23	6.1	6.4	7.2	6.6	7.7	6.8	7.0	7.2	6.6	6.3	6.1	5.9
24	6.1	6.1	7.9	6.6	6.9	7.8	7.1	7.2	6.6	6.3	6.1	5.9
25	6.1	5.9	6.8	15	14	11	7.3	7.2	6.6	6.3	6.1	5.9
26	6.1	5.8	6.6	9.0	7.1	7.2	8.0	7.2	6.6	6.3	6.1	5.9
27	5.6	5.6	6.6	16	6.9	7.0	7.5	7.2	6.6	6.3	6.1	18
28	5.6	5.5	6.6	34	6.8	6.8	7.4	7.2	6.6	6.3	6.1	9.3
29	5.4	5.7	6.5	16	6.7	6.8	7.5	7.0	6.6	6.3	6.1	7.8
30	5.4	5.5	22	8.4	---	6.8	7.4	6.8	6.6	6.2	6.1	6.7
31	5.3	---	117	7.5	---	6.8	---	6.8	---	6.2	6.1	---
TOTAL	201.5	192.8	479.6	373.9	206.5	215.0	231.4	260.8	200.3	199.4	210.3	203.1
MEAN	6.50	6.43	15.5	12.1	7.12	6.94	7.71	8.41	6.68	6.43	6.78	6.77
MAX	14	12	117	77	14	11	16	16	6.8	6.7	13	18
MIN	5.3	5.4	5.3	6.4	6.7	6.6	6.8	6.8	6.6	6.2	6.1	5.9
AC-FT	400	382	951	742	410	426	459	517	397	396	417	403

CAL YR 1987	TOTAL	2714.9	MEAN	7.44	MAX	117	MIN	5.3	AC-FT	5390
WTR YR 1988	TOTAL	2974.6	MEAN	8.13	MAX	117	MIN	5.3	AC-FT	5900

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, on right bank 0.3 mi downstream from Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi^2.

PERIOD OF RECORD.--December 1959 to current year.

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are poor. Waiahole tunnel diverts from two tributaries upstream for irrigation in vicinity of Waipahu. Recording rain gage located at station.

AVERAGE DISCHARGE.--28 years (water years 1961-88), 8.61 ft^3/s (6,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s Feb. 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s, Oct. 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0400	1,810	6.75	May 3	1930	1,110	5.68
Dec. 31	2300	*3,970	*9.00				

Minimum discharge, 2.4 ft^3/s, Sept. 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	4.9	6.1	451	19	8.9	22	5.1	5.4	3.2	e4.0	3.1
2	14	4.9	5.7	104	16	8.2	8.0	5.0	5.7	3.2	e5.0	3.1
3	9.3	30	5.5	56	13	7.6	7.5	109	5.3	3.0	e25	3.1
4	7.2	9.9	5.8	30	17	7.1	18	23	5.1	3.2	e6.8	2.9
5	6.9	17	5.6	24	11	6.7	15	12	4.9	3.1	e5.6	3.1
6	6.2	15	5.2	19	9.8	6.7	8.4	8.7	4.9	3.0	e5.0	3.0
7	5.8	23	5.0	16	8.9	6.3	7.4	14	5.0	3.3	e36	2.9
8	5.4	9.4	6.5	13	8.1	6.0	6.9	8.3	4.9	e10	e22	2.8
9	5.4	7.0	6.7	12	7.6	5.8	6.5	6.9	5.3	e8.0	e9.8	2.8
10	5.2	6.2	7.9	28	7.0	5.5	6.4	6.9	4.8	e5.8	e7.0	2.8
11	5.6	5.7	8.0	11	6.7	5.5	6.0	35	4.5	e4.8	e43	4.1
12	18	5.6	240	9.7	6.5	5.2	5.9	30	4.3	e5.7	e18	3.0
13	5.4	5.3	68	8.9	6.3	7.5	5.7	17	4.2	e4.4	e10	2.7
14	5.0	5.6	70	8.1	6.2	14	5.7	21	4.1	e13	e11	2.8
15	22	5.3	40	7.6	6.4	7.9	5.5	36	4.1	e5.4	e8.0	10
16	11	5.1	20	8.5	5.8	9.1	5.4	14	4.0	e4.5	e6.6	3.1
17	10	28	22	19	5.6	7.8	5.2	11	4.0	e4.2	e20	2.7
18	7.5	16	34	10	5.5	7.1	5.1	9.4	4.0	e5.6	e7.8	2.7
19	6.4	8.3	84	7.8	5.3	7.5	5.2	8.7	3.9	e5.0	e5.6	2.7
20	5.5	24	34	7.1	5.2	6.2	5.0	8.0	3.9	e4.4	e5.0	2.7
21	5.2	36	23	6.7	5.2	5.7	4.9	7.4	4.0	e4.3	e4.6	2.5
22	5.2	23	17	6.4	13	5.5	4.9	7.4	5.1	e4.9	e5.2	2.6
23	5.0	11	14	6.2	49	5.6	4.8	7.3	4.3	e4.2	e4.4	4.6
24	5.1	9.7	14	6.3	15	28	4.9	6.4	8.7	e3.9	e4.0	2.9
25	5.1	8.2	11	57	133	11	5.2	6.3	4.3	e15	3.7	3.0
26	5.3	7.4	10	49	20	16	14	6.1	3.9	e7.5	3.5	3.6
27	4.9	6.9	9.5	73	13	8.3	9.7	5.9	4.1	e5.6	3.7	48
28	4.5	6.6	8.4	176	11	6.9	6.9	5.8	3.7	e5.2	3.3	18
29	4.4	9.0	7.7	124	9.5	6.1	5.5	5.6	3.5	e5.0	3.3	12
30	4.8	6.6	32	34	---	6.1	5.2	5.6	3.2	e4.8	3.2	6.2
31	4.2	---	539	23	---	7.6	---	5.5	---	e4.3	3.2	---
TOTAL	239.5	360.6	1365.6	1412.3	445.6	253.4	226.8	458.3	137.1	167.5	303.3	169.5
MEAN	7.73	12.0	44.1	45.6	15.4	8.17	7.56	14.8	4.57	5.40	9.78	5.65
MAX	24	36	539	451	133	28	22	109	8.7	15	43	48
MIN	4.2	4.9	5.0	6.2	5.2	5.2	4.8	5.0	3.2	3.0	3.2	2.5
AC-FT	475	715	2710	2800	884	503	450	909	272	332	602	336

CAL YR 1987	TOTAL	4666.4	MEAN	12.8	MAX	539	MIN	2.9	AC-FT	9260
WTR YR 1988	TOTAL	5539.5	MEAN	15.1	MAX	539	MIN	2.5	AC-FT	10990

e Estimated

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 600 ft upstream from Kawa Stream, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi^2.

PERIOD OF RECORD.--December 1958 to current year.

REVISED RECORDS.--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft, from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts water from tributaries and tunnels at 800-ft elevation upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--29 years (water years 1960-88), 36.5 ft^3/s (26,440 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft^3/s Apr. 15, 1963, gage height, 8.10 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over submerged weir; minimum, 10 ft^3/s, Sept. 17, 18, 20, 1961.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0430	2,150	5.40	Dec. 31	2330	*3,990	*7.07
Dec. 14	1800	1,990	5.22	Sept. 27	0900	1,970	5.20

Minimum discharge, 17 ft^3/s, July 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	93	40	28	634	110	31	57	33	25	20	19	19
2	151	32	26	184	47	30	31	39	28	19	23	19
3	92	142	25	121	43	30	35	303	24	18	110	19
4	47	69	26	70	65	27	105	294	23	18	27	19
5	47	68	25	57	44	25	49	126	22	18	24	19
6	34	64	24	50	38	28	32	61	24	18	22	19
7	33	58	23	44	36	25	37	110	30	18	152	19
8	29	40	33	41	34	26	31	52	26	50	96	18
9	28	35	43	38	34	53	29	42	31	39	40	18
10	26	32	58	94	32	27	32	39	25	28	32	42
11	25	31	32	41	32	25	27	140	23	24	172	35
12	77	30	462	36	31	25	25	219	22	27	94	22
13	27	27	163	35	30	25	25	108	22	21	46	19
14	25	27	185	33	30	65	25	122	20	58	49	34
15	50	26	145	32	31	32	24	132	20	23	37	90
16	116	25	64	51	29	33	23	58	19	21	32	25
17	47	90	63	101	28	29	22	47	19	20	97	22
18	62	48	91	41	27	27	22	43	20	26	37	20
19	42	33	194	36	33	39	23	37	18	24	31	20
20	32	131	84	33	31	29	22	34	19	20	29	19
21	30	161	63	32	27	26	21	32	19	20	28	19
22	30	92	50	32	36	26	21	31	37	24	31	19
23	28	48	44	31	83	27	20	35	21	20	26	27
24	37	53	57	31	34	76	20	28	43	19	24	19
25	29	38	39	107	175	45	22	27	22	68	24	19
26	37	34	62	109	40	47	46	26	20	30	22	22
27	31	32	53	158	63	31	46	25	22	23	22	224
28	28	30	37	335	34	36	32	25	19	23	21	188
29	26	40	34	198	32	34	30	25	19	22	19	75
30	30	30	74	79	---	30	31	29	19	22	19	41
31	25	---	836	59	---	39	---	25	---	20	19	---
TOTAL	1414	1606	3143	2943	1309	1048	965	2347	701	801	1424	1170
MEAN	45.6	53.5	101	94.9	45.1	33.8	32.2	75.7	23.4	25.8	45.9	39.0
MAX	151	161	836	634	175	76	105	303	43	68	172	224
MIN	25	25	23	31	27	25	20	25	18	18	19	18
AC-FT	2800	3190	6230	5840	2600	2080	1910	4660	1390	1590	2820	2320

CAL YR 1987	TOTAL	16396	MEAN	44.9	MAX	836	MIN	13	AC-FT	32520
WTR YR 1988	TOTAL	18871	MEAN	51.6	MAX	836	MIN	18	AC-FT	37430

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Hydrologic Unit 20060000, on right bank 800 ft downstream from intake, 1.5 mi west of Kahana, and 1.7 mi southwest of Punaluu.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1719: 1954-55.

GAGE.--Water-stage recorder. Elevation of gage is 200 ft, from topographic map.

REMARKS.--Records poor. Ditch diverts from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--35 years, 7.23 ft^3/s (5,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft^3/s, Jan. 27; minimum daily, 3.9 ft^3/s, Mar. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	19	15	7.3	21	11	17	12	12	12	16	11
2	19	21	17	12	22	7.1	12	11	10	15	16	17
3	21	12	13	12	22	4.8	9.4	14	7.7	13	14	16
4	23	16	20	17	19	3.9	11	9.0	6.5	15	9.9	16
5	20	14	12	15	15	6.1	18	15	16	9.1	12	16
6	15	16	16	12	12	13	17	9.2	16	12	18	13
7	9.9	20	21	10	9.4	9.4	14	14	12	10	12	12
8	16	17	18	7.2	6.2	6.0	10	14	8.2	8.5	9.0	13
9	16	12	18	16	17	7.9	13	13	11	12	18	16
10	12	12	21	12	20	7.1	17	15	16	14	18	12
11	8.8	22	22	8.5	18	9.4	13	6.9	16	12	16	8.6
12	16	17	7.7	14	17	9.5	12	13	18	11	13	11
13	22	11	12	21	15	7.9	15	11	16	15	7.6	14
14	21	14	15	19	12	6.0	14	13	17	13	11	13
15	17	13	13	16	14	4.5	14	16	15	12	16	12
16	11	16	15	11	18	10	15	13	9.9	14	14	13
17	24	19	14	13	17	17	16	9.0	13	12	9.8	8.3
18	23	18	18	18	18	22	12	11	15	11	12	5.8
19	20	10	16	20	19	15	12	19	11	17	13	12
20	18	12	6.3	20	11	10	13	14	14	14	11	12
21	14	18	17	15	8.1	13	14	15	14	14	7.5	8.5
22	9.0	14	22	13	15	11	14	12	8.2	16	13	9.1
23	16	11	19	13	14	14	14	10	13	16	14	15
24	20	22	16	11	8.6	12	14	18	11	15	16	14
25	16	13	20	8.1	13	17	15	15	11	11	15	12
26	16	16	12	17	8.7	18	15	17	15	6.0	15	14
27	19	12	16	25	9.4	17	14	17	13	8.9	18	6.7
28	19	15	22	18	16	17	13	12	10	15	16	7.6
29	20	9.9	19	18	15	14	11	12	12	11	15	12
30	15	17	14	24	---	16	12	19	9.9	12	16	6.9
31	17	---	10	22	---	13	---	16	---	15	10	---
TOTAL	535.7	458.9	497.0	465.1	430.4	349.6	410.4	415.1	379.4	391.5	421.8	357.5
MEAN	17.3	15.3	16.0	15.0	14.8	11.3	13.7	13.4	12.6	12.6	13.6	11.9
MAX	24	22	22	25	22	22	18	19	18	17	18	17
MIN	8.8	9.9	6.3	7.2	6.2	3.9	9.4	6.9	7.7	6.0	7.5	5.8
AC-FT	1060	910	986	923	854	693	814	823	753	777	837	709

CAL YR 1987	TOTAL	3288.9	MEAN	9.01	MAX	24	MIN	1.0	AC-FT	6520
WTR YR 1988	TOTAL	5112.4	MEAN	14.0	MAX	25	MIN	3.9	AC-FT	10140

16303000 PUNALUU STREAM NEAR PUNALUU

LOCATION.--Lat 21°33'33", long 157°54'06", Hydrologic Unit 20060000, on left bank at Punaluu ditch diversion dam, 1.4 mi west of Kahana, and 1.8 mi southwest of Punaluu.

DRAINAGE AREA.--2.78 mi^2.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WRD Hawaii 1974: 1971-72(P), 1973(M). WDR HI-78-1: 1954(M), 1955-70(P).

GAGE.--Water-stage recorder and masonry control. Elevation of gage is 212 ft, from topographic map.

REMARKS.--Records good except for estimated discharges, which are poor. Records do not include flow of Punaluu ditch (see sta. 16302000).

AVERAGE DISCHARGE.--35 years, 18.0 ft^3/s (13,040 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft^3/s July 17, 1974, gage height, 7.60 ft, from rating curve extended above 170 ft^3/s on basis of slope-area measurements at gage heights 5.77 ft and 7.60 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 930 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0230	1,440	4.21	Dec. 31	2330	*3,080	*6.00
Dec. 14	1800	962	3.47	Sept. 27	0830	1,600	4.44

Minimum discharge, 1.2 ft^3/s, Sept. 25.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	35	11	11	382	30	16	9.9	14	11	7.7	4.0	8.6
2	54	12	10	70	15	18	7.7	25	12	5.0	5.9	2.7
3	22	23	15	40	14	19	12	51	14	5.9	51	3.2
4	13	17	8.1	27	35	19	54	43	13	4.7	12	3.2
5	15	49	15	23	22	16	12	22	6.3	9.3	8.6	4.1
6	17	21	10	23	22	8.6	6.4	30	6.7	6.9	3.5	5.0
7	23	21	7.5	23	22	14	11	46	10	8.4	22	6.5
8	13	16	14	23	23	16	13	19	13	13	26	5.4
9	14	18	14	18	14	14	9.3	16	11	16	6.6	2.8
10	16	15	55	58	9.1	14	16	14	6.5	7.8	6.0	11
11	35	6.4	12	23	11	11	9.4	79	6.2	9.1	47	19
12	36	13	216	16	13	9.7	9.3	68	3.9	9.1	21	8.3
13	7.3	15	65	8.0	15	13	7.4	45	5.0	5.2	19	3.0
14	9.1	11	75	9.0	15	52	9.3	40	4.6	12	16	6.5
15	23	14	87	11	13	17	7.3	52	5.8	8.2	9.2	20
16	48	10	22	24	13	12	5.2	24	10	6.3	9.0	6.9
17	7.7	59	25	40	13	8.0	5.5	25	7.2	7.6	30	10
18	19	23	36	12	8.4	6.9	9.8	19	5.9	9.3	12	12
19	15	23	92	11	12	11	8.2	11	9.3	3.9	9.8	6.1
20	14	65	42	12	17	13	6.0	14	6.5	5.5	11	5.7
21	15	53	26	11	18	9.8	5.4	13	7.0	5.4	14	8.9
22	17	35	16	12	15	13	5.9	15	12	4.1	9.6	8.1
23	10	21	16	13	25	11	5.0	18	7.7	3.6	7.6	4.7
24	19	17	20	15	19	29	5.4	7.6	12	4.4	5.9	4.2
25	13	19	12	49	36	18	8.7	10	8.8	44	5.9	5.5
26	15	17	23	34	21	13	21	7.9	5.3	17	6.0	5.0
27	11	17	21	57	20	7.8	15	7.5	6.8	11	3.3	136
28	8.4	14	9.7	126	12	7.8	13	12	8.9	5.5	5.0	53
29	8.6	21	12	58	12	8.8	12	11	7.9	8.7	5.4	19
30	12	11	20	23	---	8.8	17	5.3	9.4	7.5	4.2	18
31	8.8	---	402	18	---	12	---	8.4	---	4.8	9.2	---
TOTAL	573.9	667.4	1409.3	1269.0	514.5	447.2	337.1	772.7	253.7	276.9	405.7	412.4
MEAN	18.5	22.2	45.5	40.9	17.7	14.4	11.2	24.9	8.46	8.93	13.1	13.7
MAX	54	65	402	382	36	52	54	79	14	44	51	136
MIN	7.3	6.4	7.5	8.0	8.4	6.9	5.0	5.3	3.9	3.6	3.3	2.7
AC-FT	1140	1320	2800	2520	1020	887	669	1530	503	549	805	818

CAL YR 1987	TOTAL	7786.2	MEAN	21.3	MAX	402	MIN	5.2	AC-FT	15440
WTR YR 1988	TOTAL	7339.8	MEAN	20.1	MAX	402	MIN	2.7	AC-FT	14560

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Hydrologic Unit 20060000, on right bank 0.8 mi downstream from Sacred Falls, 1.6 mi west of Punaluu Beach Park, and 1.7 mi south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi^2.

PERIOD OF RECORD.--May 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 110 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--21 years, 4.31 ft^3/s (3,120 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s Jan. 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/s on basis of slope-area measurements at gage heights 8.85 ft and 10.0 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 3	0900	835	9.33	Dec. 31	2345	*1,380	*10.40
Dec. 15	0030	569	8.64	Sept. 27	0845	1,220	10.11

Minimum discharge, 0.07 ft^3/s, Sept. 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	10	1.3	182	6.1	.61	5.1	5.4	2.1	.52	.45	.37
2	17	6.9	1.1	26	2.2	.75	1.9	6.2	2.1	.45	7.0	.30
3	4.7	58	.91	11	2.7	.64	8.0	13	1.2	.37	25	.27
4	2.5	3.4	1.8	4.2	21	.63	17	10	.71	.54	1.2	.24
5	2.9	29	5.9	6.5	3.2	.44	3.1	4.1	.70	.64	1.2	.65
6	1.8	10	1.8	3.5	1.6	1.4	1.3	4.9	1.7	.34	.97	1.5
7	3.1	15	.81	2.3	1.3	1.1	2.5	18	4.4	2.0	18	.41
8	1.4	2.5	12	1.9	1.2	.48	1.1	2.4	1.9	16	15	.24
9	1.3	1.9	8.3	1.6	1.8	.56	.84	1.7	5.7	15	2.1	.18
10	3.9	2.0	32	35	1.2	.50	4.2	5.8	1.9	6.5	1.1	.14
11	4.1	2.1	3.7	3.3	.87	.27	.99	51	.97	3.1	24	11
12	20	7.9	94	2.0	.84	.23	.70	32	.76	5.6	6.9	.95
13	1.4	1.4	26	1.4	.75	21	.56	18	.65	1.3	2.6	.31
14	1.0	4.2	35	1.2	1.4	46	.53	15	.59	10	6.4	.19
15	7.7	11	40	1.1	1.7	3.3	.65	22	.49	1.2	3.7	7.8
16	12	2.9	4.3	4.6	5.2	2.2	.51	3.9	.45	.90	2.1	.44
17	1.6	52	6.5	17	.82	3.5	.43	3.2	.38	.92	4.4	.19
18	6.6	16	21	2.9	.62	6.4	.31	2.5	.32	4.5	1.7	.15
19	4.7	6.4	39	1.4	1.0	6.2	.27	1.9	.30	1.8	1.2	.13
20	1.6	27	8.5	1.1	.99	2.0	.44	1.6	.32	.90	1.5	.12
21	1.1	21	4.8	.93	.50	1.9	.45	1.4	2.8	.60	1.4	.10
22	1.0	10	2.6	.85	5.9	1.4	.24	1.6	8.9	.67	3.6	1.0
23	.84	3.7	2.1	.72	8.5	1.7	.19	6.0	4.5	.48	1.2	9.5
24	3.8	8.0	8.2	1.8	3.6	11	.17	1.3	14	.39	.82	.84
25	2.2	3.7	2.3	36	38	8.2	2.3	1.8	1.3	23	.76	.53
26	1.5	2.5	5.3	34	1.9	3.3	14	1.1	1.2	2.6	.65	4.3
27	1.3	2.3	5.2	52	1.8	1.4	9.8	.85	3.3	.85	.82	78
28	.95	1.5	1.6	80	.95	.93	8.5	.72	.94	1.8	.55	12
29	.71	5.2	1.3	31	.69	1.4	3.2	.69	.65	1.1	.45	3.3
30	1.4	2.3	13	5.1	---	3.5	7.7	1.6	.51	1.4	.41	1.6
31	3.0	---	158	3.1	---	2.6	---	6.3	---	.61	.37	---
TOTAL	139.10	329.8	548.32	555.50	118.33	135.54	96.98	245.96	65.74	106.08	137.55	136.75
MEAN	4.49	11.0	17.7	17.9	4.08	4.37	3.23	7.93	2.19	3.42	4.44	4.56
MAX	22	58	158	182	38	46	17	51	14	23	25	78
MIN	.71	1.4	.81	.72	.50	.23	.17	.69	.30	.34	.37	.10
AC-FT	276	654	1090	1100	235	269	192	488	130	210	273	271

CAL YR 1987	TOTAL	2432.07	MEAN	6.66	MAX	158	MIN	.04	AC-FT	4820
WTR YR 1988	TOTAL	2615.65	MEAN	7.15	MAX	182	MIN	.10	AC-FT	5190

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on left bank 75 ft upstream from Pupukea Military Road and 3.5 mi southeast of Maunawai.

DRAINAGE AREA.--3.13 mi^2.

PERIOD OF RECORD.--June 1963 to current year. Occasional low-flow measurements, water years 1961 and 1963.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Elevation of gage is 590 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream. Recording rain gage located at station.

AVERAGE DISCHARGE.--25 years, 10.4 ft^3/s (7,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft^3/s Jan. 30, 1975, gage height, 10.06 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurement at gage height 10.06 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 950 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 3	1000	1,400	8.05	Dec. 31	2330	*2,870	*9.62

Minimum discharge, 0.96 ft^3/s, Sept. 21.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	16	6.7	568	13	2.8	14	11	5.0	1.8	2.1	1.7
2	23	10	5.9	188	10	2.9	7.2	7.1	4.1	1.7	2.3	1.5
3	14	129	5.5	135	9.5	2.7	28	5.9	5.5	1.7	41	1.4
4	5.5	12	5.5	92	16	2.6	47	5.6	3.3	1.7	5.4	1.3
5	3.6	22	8.0	83	9.6	2.5	13	5.3	2.9	1.7	3.1	1.4
6	3.0	25	10	66	7.7	2.7	7.9	3.5	4.8	1.6	2.5	2.3
7	2.9	37	4.7	48	7.0	2.8	7.1	5.3	8.6	1.9	4.5	1.7
8	2.9	9.1	4.6	38	7.5	2.4	6.3	5.1	5.2	19	10	1.4
9	2.4	5.9	14	32	8.2	2.3	5.2	2.9	5.7	23	5.1	1.4
10	2.9	5.3	23	121	6.2	2.2	4.7	3.3	5.0	21	2.6	6.1
11	3.3	5.2	8.1	43	5.2	2.0	4.3	97	2.8	7.7	46	13
12	20	7.9	150	31	4.8	1.9	4.1	147	2.3	11	9.2	5.7
13	3.9	4.1	37	28	4.5	13	3.8	56	2.0	5.2	7.1	2.3
14	2.7	3.8	27	27	4.3	51	3.5	54	2.0	20	4.8	1.6
15	2.5	35	25	25	8.3	13	3.2	70	1.8	6.2	6.6	3.5
16	2.6	7.1	12	38	12	4.5	2.9	26	1.7	3.7	3.8	2.6
17	3.5	113	28	35	4.7	3.2	2.8	19	1.7	2.9	7.5	1.4
18	3.3	46	45	34	3.8	4.7	2.7	14	1.7	2.9	5.6	1.3
19	7.6	25	74	21	3.3	10	2.5	12	1.7	3.1	2.8	1.2
20	3.4	83	36	18	3.2	4.2	2.5	10	1.7	2.6	2.7	1.1
21	2.2	74	19	15	3.0	3.0	2.4	9.2	2.1	2.5	3.4	1.0
22	2.4	42	14	14	6.6	2.5	2.3	8.5	13	2.4	5.7	1.6
23	1.9	19	11	13	7.2	2.8	2.1	9.3	8.1	2.3	3.6	27
24	3.5	33	15	13	3.8	42	2.2	6.7	22	2.2	2.3	7.0
25	5.7	14	9.2	65	52	61	4.4	6.9	5.6	17	2.1	2.9
26	2.9	12	10	149	8.0	17	28	6.2	3.2	6.2	1.9	2.2
27	2.9	11	14	147	14	8.9	10	4.8	6.6	2.9	1.9	129
28	2.1	8.6	7.4	154	4.6	6.5	29	4.7	3.2	2.3	1.9	26
29	2.0	8.6	6.5	70	3.2	5.5	9.5	4.4	2.2	2.4	1.8	9.8
30	5.2	9.7	23	22	---	5.2	11	3.9	2.0	2.7	1.8	5.8
31	2.8	---	483	16	---	8.0	---	7.2	---	3.1	1.8	---
TOTAL	152.6	833.3	1142.1	2349	251.2	295.8	273.6	631.8	137.5	186.4	202.9	266.2
MEAN	4.92	27.8	36.8	75.8	8.66	9.54	9.12	20.4	4.58	6.01	6.55	8.87
MAX	23	129	483	568	52	61	47	147	22	23	46	129
MIN	1.9	3.8	4.6	13	3.0	1.9	2.1	2.9	1.7	1.6	1.8	1.0
AC-FT	303	1650	2270	4660	498	587	543	1250	273	370	402	528

CAL YR 1987	TOTAL	4129.83	MEAN	11.3	MAX	483	MIN	.95	AC-FT	8190
WTR YR 1988	TOTAL	6722.4	MEAN	18.4	MAX	568	MIN	1.0	AC-FT	13330

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank 0.5 mi upstream from Kamehameha Highway, 4.9 mi northeast of Waialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2, revised, including that of Elehaha Stream which is mostly diverted into Kamananui Stream since June 14, 1975.

PERIOD OF RECORD.--February 1958 to current year.

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M). WDR HI-81-1: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 20 ft, from topographic map. Prior to May 13, 1965, at datum 2.00 ft higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft higher.

REMARKS.--Records fair. Small diversion upstream.

AVERAGE DISCHARGE.--30 years, 17.7 ft^3/s (12,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft^3/s Mar. 18, 1980, gage height, 11.46 ft, from rating curve extended above 150 ft^3/s on basis of slope-area measurements at gage heights 5.68 ft and 11.46 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 3	1030	2,240	6.63	Mar. 25	1600	1,730	6.03
Dec. 12	0530	2,100	6.48	Sept. 27	1100	1,620	5.89
Dec. 31	2400	*6,100	*9.93				

Minimum discharge, 0.70 ft^3/s, Sept. 20-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8	23	13	1940	24	5.4	21	18	e9.0	e1.8	1.8	1.3
2	28	16	11	485	20	5.1	11	12	e7.0	e1.6	1.6	1.1
3	21	296	9.3	251	18	4.7	51	9.0	e6.0	e1.5	76	.97
4	9.3	27	8.8	124	29	4.4	135	7.8	e4.5	e1.4	8.6	.85
5	5.1	29	8.7	86	18	3.9	26	7.1	e4.0	e1.4	3.9	.81
6	4.0	39	17	63	14	4.0	14	5.5	e7.0	e1.3	2.7	1.2
7	3.5	64	8.1	45	13	4.3	10	5.2	e15	e2.0	2.4	1.5
8	3.4	20	6.7	37	13	3.7	9.1	9.0	e9.0	18	12	1.0
9	2.8	12	17	30	13	3.3	7.1	4.6	e10	36	8.2	1.0
10	2.8	10	41	153	11	3.2	6.0	3.9	e7.0	51	3.3	6.7
11	4.0	9.9	18	36	9.3	2.9	5.3	195	e5.0	11	64	19
12	44	11	626	27	8.4	2.7	4.7	547	e4.2	13	13	8.7
13	6.6	8.8	133	23	7.8	2.8	4.4	161	e3.5	8.1	9.8	3.4
14	3.6	7.7	91	20	7.3	123	4.0	216	e2.5	28	6.2	1.9
15	3.1	64	59	18	12	24	3.6	291	e2.0	11	7.3	1.6
16	3.4	18	27	25	19	8.6	3.4	79	e1.7	4.8	5.8	3.1
17	5.4	275	119	25	10	5.5	3.1	42	e1.5	3.5	4.8	1.4
18	3.2	97	162	26	6.8	6.2	3.0	29	e1.6	3.0	8.8	1.0
19	8.6	43	405	17	5.8	15	2.8	22	e1.7	3.1	3.8	.92
20	5.8	135	149	14	5.3	8.2	2.8	18	e2.5	2.6	3.1	.83
21	3.0	226	52	12	5.0	5.4	2.7	16	e6.0	2.2	3.2	.74
22	2.7	80	34	12	6.0	4.6	2.6	15	e25	2.1	5.0	.85
23	2.5	33	28	10	12	4.9	2.3	15	e15	1.9	5.0	32
24	2.1	59	29	10	6.8	128	2.5	13	e50	1.7	2.7	11
25	7.4	28	22	61	134	302	4.0	11	e8.0	21	2.2	3.7
26	3.8	23	20	241	19	52	52	12	e4.0	9.5	1.9	2.4
27	3.6	21	25	217	20	18	18	8.5	e10	3.8	1.7	367
28	2.7	16	17	253	10	11	53	7.6	e3.5	2.4	1.8	53
29	2.3	15	15	104	6.7	8.1	21	e6.0	e2.5	2.1	1.7	16
30	4.4	17	37	41	---	7.0	16	e8.0	e2.1	2.1	1.6	7.5
31	5.1	---	1110	30	---	9.0	---	e13	---	2.5	1.5	---
TOTAL	217.0	1723.4	3318.6	4436	484.2	790.9	501.4	1807.2	230.8	255.4	275.4	552.47
MEAN	7.00	57.4	107	143	16.7	25.5	16.7	58.3	7.69	8.24	8.88	18.4
MAX	44	296	1110	1940	134	302	135	547	50	51	76	367
MIN	2.1	7.7	6.7	10	5.0	2.7	2.3	3.9	1.5	1.3	1.5	.74
AC-FT	430	3420	6580	8800	960	1570	995	3580	458	507	546	1100

CAL YR 1987	TOTAL	8903.78	MEAN	24.4	MAX	1110	MIN	.79	AC-FT	17660
WTR YR 1988	TOTAL	14592.77	MEAN	39.9	MAX	1940	MIN	.74	AC-FT	28940

e Estimated

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 200600000, on left bank 4.3 mi northeast of Leilehua High School in Wahiawa and 8.1 mi east of Waialua School.

DRAINAGE AREA.--2.98 mi^2.

PERIOD OF RECORD.--August 1959 to current year.

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--29 years, 13.7 ft^3/s (9,930 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft^3/s July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft^3/s on basis of slope-area measurements at gage heights 6.74 ft and 10.12 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 3	1100	2,060	7.73	Sept. 27	1030	2,140	7.85
Dec. 31	2330	*3,630	*9.79				

Minimum discharge, 0.58 ft^3/s, Sept. 21, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	14	6.5	540	14	3.5	13	20	8.2	1.6	1.7	1.2
2	49	12	5.1	188	7.5	3.4	11	29	4.9	1.5	1.2	1.2
3	16	160	4.5	114	6.3	3.3	9.2	18	5.7	1.4	66	1.0
4	6.4	13	4.3	27	12	3.2	80	16	3.3	1.3	6.4	.89
5	4.2	56	7.2	25	10	3.0	12	13	2.7	1.3	2.9	.83
6	3.5	28	13	23	5.5	2.6	6.6	6.8	2.9	1.3	2.5	1.8
7	3.0	47	4.5	13	4.7	3.9	6.8	36	11	1.5	17	3.5
8	4.6	11	3.5	9.8	4.7	3.3	5.7	10	5.1	31	34	1.5
9	2.8	6.2	33	8.4	4.4	2.4	3.5	5.2	8.6	18	9.3	.95
10	2.8	5.1	83	75	5.2	2.9	13	6.3	11	23	3.8	.87
11	4.4	4.5	11	12	3.8	2.5	5.8	136	4.2	6.6	91	12
12	21	8.5	249	8.1	3.5	1.8	3.4	194	2.8	13	16	11
13	4.4	5.5	66	6.6	3.4	1.7	2.7	96	2.3	6.0	7.6	2.9
14	2.5	3.7	48	5.9	3.4	99	2.3	59	2.1	20	9.5	1.5
15	2.5	13	50	5.3	4.9	16	2.1	81	1.9	6.3	11	10
16	25	7.6	16	8.9	12	4.5	2.1	17	1.8	3.0	5.4	4.3
17	8.5	108	17	36	5.1	3.5	2.0	11	1.6	2.2	20	1.8
18	4.4	56	44	19	3.4	6.3	1.9	9.2	1.5	5.8	9.3	1.1
19	13	15	124	7.5	4.0	12	1.8	7.0	1.3	5.3	3.8	.88
20	5.6	88	34	5.2	5.7	5.1	1.8	5.8	1.5	3.4	3.7	.69
21	3.1	95	14	4.6	3.8	4.2	2.0	5.3	1.8	2.3	5.7	.60
22	2.6	78	10	4.3	19	3.3	1.8	5.7	26	2.0	6.8	.67
23	3.3	14	7.5	4.0	21	4.0	1.5	14	9.0	1.6	6.5	24
24	3.2	33	17	3.9	6.9	66	1.4	6.8	33	1.3	3.0	7.3
25	9.6	11	7.6	101	190	15	6.8	4.5	6.5	14	2.3	2.6
26	8.3	13	9.3	147	15	11	48	4.8	3.5	16	2.1	1.6
27	6.1	8.4	23	83	9.8	5.5	33	3.7	6.7	3.6	1.9	236
28	4.2	6.5	6.8	121	5.5	3.5	43	3.5	4.4	2.0	1.9	57
29	2.8	26	5.1	47	4.0	3.3	22	3.6	2.4	3.5	2.0	11
30	3.8	17	44	15	---	5.3	24	3.5	1.8	2.6	1.6	5.3
31	4.4	---	664	9.7	---	12	---	6.3	---	1.9	1.4	---
TOTAL	249.0	964.0	1631.9	1678.2	398.5	317.0	370.2	838.0	179.5	204.3	357.3	405.98
MEAN	8.03	32.1	52.6	54.1	13.7	10.2	12.3	27.0	5.98	6.59	11.5	13.5
MAX	49	160	664	540	190	99	80	194	33	31	91	236
MIN	2.5	3.7	3.5	3.9	3.4	1.7	1.4	3.5	1.3	1.3	1.2	.60
AC-FT	494	1910	3240	3330	790	629	734	1660	356	405	709	805

CAL YR 1987	TOTAL	6516.72	MEAN	17.9	MAX	664	MIN	.43	AC-FT	12930
WTR YR 1988	TOTAL	7593.88	MEAN	20.7	MAX	664	MIN	.60	AC-FT	15060

16400000 HALAWA STREAM NEAR HALAWA
(National stream-quality accounting network station)

LOCATION.--Lat 21°09'31", long 156°45'53", Hydrologic Unit 20050000, on right bank 600 ft downstream from Hipuapua Stream and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi^2.

WATER- DISCHARGE RECORDS

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS.--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft, from topographic map. Prior to June 25, 1923, at site 350 ft upstream at different datum. June 25, 1923, to July 18, 1932, and Nov. 17, 1937, to Feb. 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--64 years (water years 1918-31, 1939-88), 29.3 ft^3/s (21,230 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s Feb. 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft^3/s, about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0900	*2,030	*8.47	Jan. 1	0730	1,950	8.36

Minimum discharge, 3.0 ft^3/s, Sept. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	76	14	724	20	7.2	13	36	27	10	4.2	5.8
2	87	55	10	349	14	7.9	13	22	57	6.7	43	4.6
3	29	56	9.0	147	21	9.1	115	63	14	9.4	114	4.3
4	13	88	8.6	49	137	7.0	76	23	13	6.4	10	4.0
5	10	47	47	55	17	6.0	32	17	28	9.9	8.2	4.0
6	9.9	33	49	55	14	18	13	13	46	27	31	4.2
7	28	12	9.6	20	15	13	18	27	45	57	97	3.6
8	8.8	9.2	88	16	14	7.5	12	19	14	65	43	3.3
9	7.5	8.2	18	117	14	20	11	8.9	37	21	11	3.3
10	6.8	20	38	204	10	6.7	15	17	15	13	22	44
11	6.5	34	12	36	9.6	5.6	9.9	184	9.0	33	150	51
12	6.1	22	390	20	9.3	5.2	7.5	182	7.4	57	68	7.5
13	69	8.7	250	16	11	4.8	7.0	133	6.6	22	25	4.9
14	17	45	44	14	9.7	256	9.8	39	6.5	64	31	4.1
15	7.3	165	56	50	10	77	6.8	55	5.9	11	49	3.7
16	9.9	43	38	102	11	124	14	15	5.7	8.9	16	3.6
17	6.4	256	41	76	8.2	59	11	16	5.2	9.7	54	3.4
18	11	202	208	18	8.1	73	12	11	8.2	10	11	3.2
19	9.2	57	174	13	7.5	48	10	9.1	5.4	6.9	9.5	3.2
20	6.2	130	130	12	8.4	20	7.6	8.4	9.5	6.3	8.6	4.0
21	5.6	97	33	13	6.9	13	7.2	9.5	27	28	8.3	3.7
22	100	30	25	14	14	17	6.7	31	46	12	18	3.3
23	22	25	19	14	24	17	5.5	15	21	6.1	16	20
24	35	59	29	21	13	15	5.2	9.1	17	6.8	6.8	6.9
25	14	29	38	15	252	128	20	7.4	21	36	5.9	3.8
26	17	18	80	254	50	17	62	6.8	71	8.6	5.9	5.8
27	23	13	52	238	14	11	57	6.2	47	6.1	5.4	77
28	21	12	23	238	10	9.8	73	7.7	11	5.2	5.2	111
29	21	44	14	97	8.0	13	18	8.5	8.3	5.0	5.7	41
30	29	56	13	29	---	27	21	8.1	8.9	6.0	10	10
31	9.1	---	44	36	---	32	---	6.1	---	4.7	12	---
TOTAL	685.3	1750.1	2004.2	3062	760.7	1074.8	689.2	1013.8	643.6	578.7	904.7	452.2
MEAN	22.1	58.3	64.7	98.8	26.2	34.7	23.0	32.7	21.5	18.7	29.2	15.1
MAX	100	256	390	724	252	256	115	184	71	65	150	111
MIN	5.6	8.2	8.6	12	6.9	4.8	5.2	6.1	5.2	4.7	4.2	3.2
AC-FT	1360	3470	3980	6070	1510	2130	1370	2010	1280	1150	1790	897

CAL YR 1987	TOTAL	14537.2	MEAN	39.8	MAX	745	MIN	3.8	AC-FT 28830
WTR YR 1988	TOTAL	13619.3	MEAN	37.2	MAX	724	MIN	3.2	AC-FT 27010

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-74, 1975 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT										
20...	1130	757	6.3	52	7.10	21.5	2.9	9.0	103	59
DEC										
08...	1220	759	50	62	6.60	20.0	6.6	9.0	99	1100
FEB										
02...	1225	758	15	55	6.90	20.0	5.9	9.2	102	150
APR										
26...	1215	759	36	52	6.70	19.5	6.8	9.2	101	1800
JUN										
14...	1130	762	6.7	56	7.20	23.0	2.8	8.2	96	24
AUG										
30...	1100	763	17	57	7.20	22.0	1.7	8.4	96	300

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
20...	1800	8	1	1.2	1.2	6.8	63	1	0.70	7
DEC										
08...	2500	9	6	1.1	1.4	7.4	63	1	0.80	3
FEB										
02...	530	8	2	1.2	1.3	7.4	64	1	0.70	7
APR										
26...	2200	8	4	1.1	1.2	6.8	64	1	0.60	5
JUN										
14...	560	9	1	1.3	1.3	7.8	64	1	0.70	9
AUG										
30...	1800	9	0	1.4	1.4	7.7	63	1	0.60	9

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
20...	0	7.0	6	10	1.9	0.10	8.2	41	35
DEC									
08...	0	3.0	3	8.4	14	0.20	3.4	47	39
FEB									
02...	0	6.0	6	6.6	11	0.10	7.7	38	40
APR									
26...	0	4.0	4	8.7	11	0.10	5.7	37	38
JUN									
14...	0	8.0	7	4.9	10	0.10	8.0	41	39
AUG									
30...	0	9.0	8	3.4	10	<0.10	9.6	39	40

< Actual value is known to be less than the value shown.

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT									
20...	0.06	<0.100	<0.010	0.010	--	<0.20	0.010	0.020	<0.010
DEC									
08...	0.06	<0.100	0.050	0.050	0.35	0.40	0.020	0.020	--
FEB									
02...	0.05	<0.100	0.040	<0.010	0.26	0.30	0.030	0.010	<0.010
APR									
26...	0.05	--	0.020	--	0.18	0.20	0.030	0.020	--
JUN									
14...	0.06	<0.100	0.030	0.050	0.37	0.40	0.010	<0.010	0.020
AUG									
30...	0.05	<0.100	0.040	0.050	0.36	0.40	0.020	0.020	<0.010

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT											
20...	1130	80	<1	4	<0.5	<1	2	<3	1	140	--
FEB											
02...	1225	180	<1	4	<0.5	<1	<1	<3	<1	200	<5
APR											
26...	1215	170	<1	4	<0.5	1	<1	<3	1	240	<5
AUG											
30...	1100	50	<1	4	<0.5	<1	<1	<3	<1	85	<5

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
20...	5	4	<0.1	<10	1	<1	<1.0	17	<6	<3
FEB										
02...	<4	5	<0.1	<10	<1	<1	<1.0	16	<6	3
APR										
26...	<4	6	0.2	<10	<1	<1	1.0	16	<6	<3
AUG										
30...	<4	5	<0.1	<10	<1	<1	<1.0	19	<6	3

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
20...	1130	5	0.08	100
DEC				
08...	1220	11	1.5	100
FEB				
02...	1225	14	0.57	100
APR				
26...	1215	12	1.2	100
JUN				
14...	1130	7	0.13	100
AUG				
30...	1100	5	0.23	100

< Actual value is known to be less than the value shown.

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'08", long 156°53'09", Hydrologic Unit 20050000, on right bank 500 ft downstream from left-bank tributary, 1.9 mi south of former village of Pelekunu, and 5.8 mi north of Kamalo.

DRAINAGE AREA.--0.49 mi^2.

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years, 1.56 ft^3/s (1,130 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft^3/s Jan. 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft^3/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft^3/s, Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 105 ft^3/s Mar. 25, gage height, 2.96 ft, no other peak greater than base discharge of 100 ft^3/s; minimum 0.76 ft^3/s, for several days in Sept.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.99	.99	1.7	16	2.8	2.0	2.0	2.2	1.3	1.1	.94	.84
2	.94	.94	1.5	14	2.6	1.9	2.0	2.0	1.4	1.1	1.3	.84
3	.94	.89	1.4	9.3	2.6	1.9	3.8	1.8	1.3	1.1	1.2	.84
4	.94	.89	1.3	5.8	5.6	1.8	2.8	1.6	1.3	1.2	.99	.80
5	.94	.94	2.3	6.5	2.8	1.8	2.5	1.6	1.4	1.2	.94	.84
6	.89	.84	2.8	5.2	2.6	1.9	2.0	1.6	1.3	1.3	.99	.80
7	.89	.80	1.6	4.0	2.5	1.7	2.0	1.5	1.6	1.8	.94	.80
8	.89	.80	1.6	3.5	2.3	1.7	1.9	1.4	1.3	1.2	.94	.80
9	.89	.80	1.4	4.9	2.3	1.8	2.0	1.4	1.3	1.2	.89	.80
10	.84	.80	1.3	7.4	2.2	1.6	2.2	1.6	1.3	1.1	.97	.99
11	.89	.80	1.3	4.0	2.2	1.6	2.0	3.4	1.2	1.1	.99	.89
12	.89	.80	10	3.4	2.2	1.6	1.9	3.2	1.2	1.2	.99	.84
13	.89	.80	6.8	3.1	2.1	1.8	1.8	3.0	1.2	1.1	.94	.80
14	.89	1.2	3.4	3.0	2.2	4.4	1.7	2.1	1.2	1.0	.94	.80
15	.84	4.5	2.6	2.9	2.1	2.1	1.7	2.1	1.2	.99	.99	.80
16	.84	1.7	2.3	2.8	2.0	2.0	1.6	1.9	1.2	.94	.89	.80
17	.84	5.1	2.2	2.8	2.0	5.8	1.6	1.8	1.2	.94	.89	.80
18	.84	4.8	4.1	2.6	2.0	3.7	1.6	1.7	1.2	.94	.89	.84
19	.84	1.9	4.8	2.4	2.0	2.4	1.6	1.6	1.2	.94	.89	.84
20	.84	1.8	5.1	2.4	2.0	2.1	1.6	1.6	1.2	.94	.89	.84
21	.84	6.5	3.1	2.4	1.9	2.0	1.6	1.6	1.2	1.0	.89	.84
22	1.0	2.8	2.6	2.3	2.2	2.0	1.6	1.8	1.2	.99	.89	.80
23	.89	2.0	2.4	2.3	2.0	2.1	1.6	1.6	1.2	.99	.89	.89
24	.89	2.0	2.2	2.2	1.9	2.0	1.6	1.6	1.1	1.1	.89	.80
25	.89	1.6	2.2	3.6	8.4	4.6	1.8	1.5	1.2	1.0	.89	.80
26	.84	1.4	2.5	9.5	2.6	2.0	3.8	1.5	1.3	.99	.84	.80
27	.84	1.3	2.4	4.1	2.2	2.0	2.2	1.4	1.2	.94	.84	.99
28	.84	1.3	2.0	3.5	2.0	1.9	1.9	1.4	1.1	.94	.84	1.1
29	.84	2.6	2.0	4.3	2.0	1.8	1.7	1.4	1.1	.94	.89	.84
30	.89	2.6	1.9	3.1	---	2.3	1.9	1.3	1.1	.94	.89	.80
31	.84	---	1.8	3.3	---	1.9	---	1.3	---	.89	.89	---
TOTAL	27.35	56.19	84.6	146.6	74.3	70.2	60.0	55.5	37.2	33.11	29.04	25.26
MEAN	.88	1.87	2.73	4.73	2.56	2.26	2.00	1.79	1.24	1.07	.94	.84
MAX	1.0	6.5	10	16	8.4	5.8	3.8	3.4	1.6	1.8	1.3	1.1
MIN	.84	.80	1.3	2.2	1.9	1.6	1.6	1.3	1.1	.89	.84	.80
AC-FT	54	111	168	291	147	139	119	110	74	66	58	50

CAL YR 1987	TOTAL	915.91	MEAN	2.51	MAX	29	MIN	.80	AC-FT	1820
WTR YR 1988	TOTAL	699.35	MEAN	1.91	MAX	16	MIN	.80	AC-FT	1390

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft downstream from the east portal, 5.3 mi southeast of Kalaupapa, and 7.5 mi northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft, from tunnel plans.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal. Water is used for irrigation in west-central Molokai. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 4.09 ft^3/s (2,960 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 35 ft^3/s, Jan. 2; minimum daily, 1.2 ft^3/s, Mar. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.7	11	7.4	27	7.6	5.2	5.7	14	2.2	4.6	2.8	1.9
2	5.2	6.9	3.9	35	6.7	5.5	6.0	8.2	2.4	4.6	3.2	1.9
3	4.3	5.7	3.7	34	6.6	5.2	17	6.2	2.7	4.6	12	1.9
4	3.5	3.7	3.6	13	23	5.5	14	3.9	2.6	4.6	3.5	1.8
5	3.1	4.8	11	8.8	7.3	5.4	12	3.2	5.8	3.5	2.6	1.8
6	3.0	3.9	17	15	6.9	5.9	5.5	2.9	6.0	4.6	2.3	1.9
7	3.0	3.2	5.0	7.2	6.5	5.8	4.6	2.8	14	20	3.0	2.6
8	2.9	2.9	6.1	5.0	6.2	5.6	4.3	2.7	4.6	6.2	2.8	2.6
9	2.9	2.8	4.9	7.4	6.1	4.3	4.3	2.8	4.3	4.4	3.0	2.6
10	2.8	2.8	4.2	8.4	5.9	3.3	9.9	5.5	3.9	4.4	3.0	2.6
11	2.8	2.7	3.8	5.8	4.1	3.0	6.8	18	3.3	6.2	5.2	3.0
12	2.8	2.8	26	5.8	3.4	2.8	4.3	7.9	3.0	9.4	5.6	2.6
13	2.8	2.8	32	6.9	3.5	3.2	4.0	11	2.7	7.8	4.4	1.9
14	2.8	6.7	9.9	5.8	3.5	15	3.8	4.2	2.9	4.6	4.5	1.8
15	2.8	28	6.0	6.5	4.2	8.8	3.8	7.9	4.2	3.3	5.6	1.8
16	2.8	14	6.0	6.0	4.1	7.0	3.9	5.0	4.1	2.6	4.1	1.8
17	2.8	28	7.1	4.9	5.8	11	3.7	4.3	4.1	2.5	4.4	1.8
18	2.8	30	15	6.0	5.6	4.9	5.2	5.0	4.1	3.7	4.4	1.8
19	4.4	7.6	20	4.6	5.2	2.9	5.3	4.8	4.1	4.4	4.1	3.3
20	4.4	9.4	20	3.3	5.5	1.2	5.3	4.6	4.3	4.4	4.1	3.9
21	4.4	30	7.5	4.9	4.7	2.9	5.5	4.7	5.1	4.4	4.4	3.9
22	6.3	6.6	7.9	5.8	11	5.7	6.2	13	5.0	4.4	4.5	3.9
23	6.7	5.4	6.2	4.0	9.8	13	5.4	7.9	3.9	4.1	4.6	3.9
24	6.1	14	7.5	3.0	7.2	6.4	5.2	5.7	3.9	4.4	4.1	3.9
25	5.8	6.3	11	7.7	25	13	5.7	4.9	3.9	3.0	4.1	3.9
26	5.2	6.2	16	34	7.6	5.3	20	4.7	8.4	2.2	3.9	3.7
27	5.0	5.3	14	19	5.0	4.4	11	4.6	11	2.0	3.9	4.4
28	4.9	6.7	4.6	11	6.3	4.1	11	4.6	5.2	2.8	3.9	9.8
29	4.9	25	3.1	13	5.8	3.9	7.1	4.6	4.6	4.1	2.6	4.7
30	8.0	21	2.9	4.3	---	4.1	10	4.5	4.6	4.1	2.0	3.9
31	5.4	---	2.7	13	---	6.8	---	2.9	---	4.1	2.0	---
TOTAL	130.3	306.2	296.0	336.1	210.1	181.1	216.5	187.0	140.9	150.0	124.6	91.3
MEAN	4.20	10.2	9.55	10.8	7.24	5.84	7.22	6.03	4.70	4.84	4.02	3.04
MAX	8.0	30	32	35	25	15	20	18	14	20	12	9.8
MIN	2.8	2.7	2.7	3.0	3.4	1.2	3.7	2.7	2.2	2.0	2.0	1.8
AC-FT	258	607	587	667	417	359	429	371	279	298	247	181

CAL YR 1987	TOTAL	3011.1	MEAN	8.25	MAX	40	MIN	2.0	AC-FT	5970
WTR YR 1988	TOTAL	2370.1	MEAN	6.48	MAX	35	MIN	1.2	AC-FT	4700

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft upstream from the west portal, 2.5 mi northeast of Kaunakakai, and 4.7 mi south of Kalaupapa.

PERIOD OF RECORD.--July 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft, from tunnel plans.

REMARKS.--Records good. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 6.55 ft^3/s (4,750 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s Apr. 8, 9, 1986, and Jan. 2, 26, 1988; minimum daily, 1.8 ft^3/s, Oct. 15, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 39 ft^3/s Jan. 2, 26; minimum daily, 4.7 ft^3/s, Sept. 5-6, 14-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	14	11	28	12	10	10	19	6.6	8.6	6.1	4.9
2	8.6	10	7.2	39	11	10	10	13	6.9	8.6	5.8	4.9
3	8.2	9.6	6.9	38	11	9.7	22	11	7.2	8.3	16	4.9
4	7.0	7.2	6.4	19	27	11	18	8.6	7.2	8.3	7.2	4.9
5	6.7	8.3	13	11	12	11	16	7.4	10	7.2	5.8	4.7
6	6.7	7.4	22	18	11	11	9.6	7.2	10	7.2	5.8	4.7
7	6.7	6.6	8.0	11	11	11	8.6	7.2	19	26	6.4	5.5
8	6.7	6.4	8.9	8.6	11	11	8.3	7.2	9.7	11	6.1	5.6
9	6.7	6.4	8.4	11	10	9.3	8.0	7.2	8.6	7.9	6.6	5.5
10	6.7	6.1	7.5	13	10	8.0	14	9.5	8.4	8.2	6.5	5.6
11	6.7	5.8	6.9	9.4	8.4	7.4	11	22	7.6	10	8.9	6.2
12	6.7	5.8	27	9.2	7.7	7.2	8.6	14	7.0	12	10	5.8
13	6.7	5.8	37	11	7.7	7.2	7.7	17	6.8	13	8.0	4.7
14	6.7	7.2	14	9.4	7.7	19	7.7	9.3	6.5	8.3	8.6	4.7
15	6.7	31	9.6	10	8.3	13	7.7	13	8.6	6.9	10	4.7
16	6.5	18	9.6	9.6	8.0	12	7.7	10	8.6	5.8	8.0	4.7
17	6.5	32	10	8.3	10	15	7.7	8.9	8.6	5.8	8.6	4.7
18	6.4	36	17	9.3	9.6	10	9.6	10	8.3	7.2	8.6	4.7
19	7.7	11	24	8.5	9.3	7.7	10	10	8.3	8.3	8.3	6.1
20	8.0	10	26	6.5	9.3	5.6	10	9.6	8.6	8.3	8.3	7.2
21	8.0	36	11	8.0	8.9	7.2	10	9.3	8.9	8.0	8.3	7.2
22	9.6	11	12	9.3	14	10	10	18	9.3	8.0	8.6	7.2
23	11	8.6	10	7.7	15	17	10	12	7.7	8.0	8.3	7.2
24	9.6	17	11	6.4	12	12	9.6	11	8.0	8.0	8.0	7.2
25	10	10	13	8.8	29	17	10	9.6	7.4	6.4	7.7	7.2
26	8.6	10	20	39	13	10	22	9.3	11	5.4	7.7	7.2
27	8.6	9.3	19	23	9.0	9.4	17	9.3	17	5.4	7.7	7.4
28	8.6	11	8.0	15	11	8.8	15	8.9	10	6.1	7.7	13
29	8.3	28	6.1	18	11	8.5	12	9.3	8.9	8.0	5.8	8.6
30	12	15	5.8	8.1	---	8.5	14	9.3	8.6	8.0	5.2	7.4
31	9.3	---	5.6	16	---	11	---	7.2	---	8.0	5.2	---
TOTAL	246.2	400.5	401.9	447.1	334.9	325.5	341.8	334.3	269.3	266.2	239.8	184.3
MEAN	7.94	13.3	13.0	14.4	11.5	10.5	11.4	10.8	8.98	8.59	7.74	6.14
MAX	12	36	37	39	29	19	22	22	19	26	16	13
MIN	6.4	5.8	5.6	6.4	7.7	5.6	7.7	7.2	6.5	5.4	5.2	4.7
AC-FT	488	794	797	887	664	646	678	663	534	528	476	366

CAL YR 1987	TOTAL	4272.5	MEAN	11.7	MAX	38	MIN	4.5	AC-FT	8470
WTR YR 1988	TOTAL	3791.8	MEAN	10.4	MAX	39	MIN	4.7	AC-FT	7520

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft, from topographic map. Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

REMARKS.--Records fair. Since Nov. 16, 1960, water diverted upstream at times, either into or from Molokai tunnel. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--27 years (water years 1961, 1963-88), 6.75 ft^3/s (4,890 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s Jan. 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/s on basis of slope-area measurement at gage height 5.25 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	0900	*1,030	*4.43	Feb. 25	0430	726	3.96

Minimum discharge, 0.35 ft^3/s, July 3-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	2.5	1.7	152	1.9	1.9	2.2	4.4	1.6	.55	1.1	.90
2	1.2	1.2	1.1	131	1.8	1.6	2.5	2.4	1.6	.45	1.2	1.1
3	1.1	1.1	1.1	49	1.9	2.4	15	1.8	1.6	.43	3.6	1.1
4	1.1	.77	1.1	6.6	49	1.6	4.6	1.3	1.4	.35	1.1	1.1
5	1.1	.85	20	29	1.9	1.6	3.8	1.4	2.5	.41	1.1	1.1
6	1.0	.74	16	15	1.8	1.8	2.4	1.4	2.4	1.2	1.1	1.2
7	1.0	.72	1.2	1.8	1.8	1.8	2.1	1.4	5.1	8.4	1.1	1.2
8	1.0	.70	1.4	1.8	1.7	1.8	1.9	1.4	1.5	1.4	1.1	1.1
9	.92	.70	1.1	40	1.4	1.8	1.9	1.4	1.5	.91	1.1	1.1
10	.86	.75	.99	56	1.2	1.8	3.8	1.6	1.4	1.1	1.1	1.1
11	.87	.83	.95	4.7	1.6	1.8	2.4	22	1.4	1.9	1.3	1.1
12	.95	.77	103	3.3	1.5	1.8	1.9	26	1.4	3.1	1.1	1.1
13	.99	.89	33	1.4	1.6	1.8	1.8	18	1.4	2.5	1.1	1.1
14	1.1	2.1	1.7	1.9	1.6	45	1.8	5.2	1.3	1.5	1.1	.99
15	1.1	39	1.3	1.2	1.7	10	1.9	4.5	.97	1.1	1.1	.99
16	1.1	7.3	1.2	4.3	1.7	2.8	1.8	2.9	.79	1.1	1.3	1.1
17	1.1	74	1.5	7.8	1.6	54	1.8	2.2	.70	1.1	.78	1.1
18	1.1	40	23	3.1	1.7	27	1.7	.96	.65	1.1	.65	1.2
19	1.0	5.0	19	1.9	1.7	8.5	1.4	.88	.57	1.1	.65	1.4
20	.74	8.0	17	2.0	1.8	5.8	1.2	.75	.63	1.1	.65	1.1
21	.57	55	1.3	1.3	1.8	3.1	1.2	.75	.87	1.1	.57	1.1
22	.90	12	1.0	1.1	3.2	1.7	1.1	3.1	1.2	1.1	.65	1.2
23	.66	3.1	.76	3.0	2.0	2.8	1.1	1.6	1.2	1.1	.73	1.2
24	.54	4.8	.86	3.9	1.5	1.5	.90	1.2	1.2	1.1	.76	1.3
25	.53	1.0	4.5	16	106	13	1.0	1.1	1.3	1.1	.84	1.2
26	.50	1.1	3.8	103	9.4	1.6	25	1.2	3.3	1.1	.85	1.1
27	.65	.98	2.6	7.4	5.5	1.5	8.2	1.2	3.3	1.1	.90	.75
28	.71	1.3	.61	6.3	2.2	1.5	2.6	1.2	.84	1.1	1.1	1.6
29	.76	20	.86	28	2.2	1.6	1.7	1.7	.65	1.1	1.1	.58
30	1.7	10	.90	3.9	---	1.7	3.3	1.4	.57	1.1	1.2	.55
31	.90	---	1.0	7.7	---	3.6	---	1.5	---	1.1	1.0	---
TOTAL	29.05	297.20	265.53	695.4	214.7	210.2	104.00	117.84	44.84	42.90	33.03	32.76
MEAN	.94	9.91	8.57	22.4	7.40	6.78	3.47	3.80	1.49	1.38	1.07	1.09
MAX	1.7	74	103	152	106	54	25	26	5.1	8.4	3.6	1.6
MIN	.50	.70	.61	1.1	1.2	1.5	.90	.75	.57	.35	.57	.55
AC-FT	58	589	527	1380	426	417	206	234	89	85	66	65

CAL YR 1987	TOTAL	2888.20	MEAN	7.91	MAX	227	MIN	.50	AC-FT	5730
WTR YR 1988	TOTAL	2087.45	MEAN	5.70	MAX	152	MIN	.35	AC-FT	4140

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA

LOCATION.--Lat 21°09'45", long 156°55'54", Hydrologic Unit 20050000, on left bank 0.7 mi upstream from mouth and 4.4 mi southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi^2.

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), 1974-81(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted upstream both to and from Molokai tunnel. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--28 years (water years 1961-88), 16.1 ft^3/s (11,660. acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,740 ft^3/s Mar. 31, 1982, gage height, 7.63 ft, from rating curve extended above 59 ft^3/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft^3/s, Nov. 1, 2, 1926, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec, 12	0900	2,400	5.48	Jan. 26	0100	1,290	4.71
Jan. 1	0800	*2,820	*5.70	Feb. 25	0500	2,200	5.36
Jan. 9	2330	1,620	4.97				

Minimum discharge, 6.8 ft^3/s, on Sept. 25, 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	9.9	16	632	21	19	19	19	12	10	8.0	8.8
2	12	10	13	497	19	18	19	17	13	9.9	9.6	8.7
3	11	9.3	13	153	24	18	43	16	12	9.6	12	8.8
4	11	8.4	12	38	185	18	22	16	12	9.6	9.3	8.6
5	11	9.1	45	79	24	17	21	15	13	9.6	9.1	8.6
6	11	8.6	61	45	21	18	19	15	13	9.7	9.1	8.5
7	11	8.3	12	19	20	17	19	15	16	22	9.2	8.4
8	11	8.1	12	18	19	17	18	15	12	11	9.1	8.4
9	11	8.0	11	264	19	17	18	16	12	10	8.9	8.3
10	11	8.0	10	197	19	17	20	17	12	10	10	9.6
11	11	8.7	10	28	19	18	19	80	11	11	16	8.9
12	10	8.3	265	23	19	18	18	68	11	13	9.8	8.4
13	10	7.8	89	19	20	18	18	50	11	12	9.3	8.4
14	10	9.5	18	20	19	136	18	22	11	10	9.3	8.4
15	10	105	14	19	20	41	18	21	11	10	9.8	8.4
16	9.9	27	12	23	20	25	18	17	11	9.9	9.5	8.4
17	9.9	201	13	27	18	152	17	16	11	9.8	9.1	8.3
18	9.7	128	54	20	18	120	17	14	11	9.7	8.9	8.3
19	9.6	21	63	19	18	34	17	14	10	9.1	8.9	8.1
20	9.5	29	80	18	18	27	16	14	10	8.8	8.9	7.8
21	9.3	183	17	18	18	23	17	14	10	9.0	8.9	7.5
22	10	49	15	18	29	20	16	16	10	8.4	8.9	7.3
23	9.4	20	14	19	20	21	16	14	10	8.4	8.7	7.6
24	9.2	19	13	20	18	19	16	13	10	8.7	8.5	7.2
25	9.0	14	18	44	353	43	17	13	12	9.0	8.4	7.1
26	8.6	13	21	367	37	19	69	12	14	9.6	8.3	7.1
27	8.1	12	16	48	24	19	32	12	16	9.6	8.3	7.3
28	7.9	12	13	32	19	19	19	12	11	9.0	8.1	7.6
29	8.5	45	13	83	19	19	17	12	11	8.1	8.2	7.2
30	8.8	36	13	26	---	19	18	11	11	8.0	8.5	7.1
31	7.9	---	23	31	---	20	---	11	---	8.0	8.5	---
TOTAL	308.3	1036.0	999	2864	1097	1006	631	617	350	310.5	287.1	243.1
MEAN	9.95	34.5	32.2	92.4	37.8	32.5	21.0	19.9	11.7	10.0	9.26	8.10
MAX	12	201	265	632	353	152	69	80	16	22	16	9.6
MIN	7.9	7.8	10	18	18	17	16	11	10	8.0	8.0	7.1
AC-FT	612	2050	1980	5680	2180	2000	1250	1220	694	616	569	482

CAL YR 1987	TOTAL	12532.3	MEAN	34.3	MAX	920	MIN	7.1	AC-FT	24860
WTR YR 1988	TOTAL	9749.0	MEAN	26.6	MAX	632	MIN	7.1	AC-FT	19340

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi upstream from Molokai Ranch pipeline crossing, 1.3 mi northeast of Kaunakakai Post Office, and 1.7 mi upstream from mouth.

DRAINAGE AREA.--6.57 mi^2.

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft, from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--38 years (water years 1951-88), 1.72 ft^3/s (1,250 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s Oct. 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft^3/s on basis of slope-area measurements at gage heights 7.22 ft and 9.30 ft; no flow most of the time each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 12	1130	*488	*5.22	Jan. 2	0600	366	4.89

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.41	54	e.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	133	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	39	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	45	5.4	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	12	.34	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	10	23	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.04	2.6	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	55	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	2.7	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	97	.09	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	61	.00	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	13	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.02	.70	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	19	.00	.00	.00	.18	.00	.00	.00	.00	.00	.00
18	.00	43	.00	.00	.00	14	.00	.00	.00	.00	.00	.00
19	.00	2.0	28	.00	.00	.39	.00	.00	.00	.00	.00	.00
20	.00	.00	30	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	14	1.4	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	5.1	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	43	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	21	2.2	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	3.8	.00	.00	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	1.9	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	5.8	.00	e2.2	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	12	.00	e.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	e.00	---	.00	---	.00	---	.00	.00	---
TOTAL	.00	101.07	241.56	395.39	50.94	14.57	.00	.00	.00	.00	.00	.00
MEAN	.00	3.37	7.79	12.8	1.76	.47	.00	.00	.00	.00	.00	.00
MAX	.00	43	97	133	43	14	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	200	479	784	101	29	.00	.00	.00	.00	.00	.00

CAL YR 1987	TOTAL	2020.03	MEAN	5.53	MAX	212	MIN	.00	AC-FT	4010
WTR YR 1988	TOTAL	803.53	MEAN	2.20	MAX	133	MIN	.00	AC-FT	1590

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi^2.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft, from topographic map.

REMARKS.--Records fair. Diversion upstream for domestic use at Puu O Hoku Ranch. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years, 0.798 ft^3/s (578 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s Apr. 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 200 ft^3/s Jan. 1, gage height, 3.96 ft, no peak greater than base discharge of 210 ft^3/s; minimum, 0.08 ft^3/s, Sept. 7-8, 22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.64	.77	.32	51	1.5	.74	.84	.59	.39	.29	.14	.16
2	.86	.43	.26	18	1.4	.74	.79	.55	.51	.26	.23	.12
3	.51	.64	.26	5.5	1.4	.69	4.7	.51	.47	.23	2.2	.12
4	.39	1.1	.26	3.0	7.9	.69	2.0	.51	.35	.23	.43	.12
5	.35	.39	.29	2.4	1.5	.69	1.2	.47	.35	.23	.23	.12
6	.32	.32	.52	2.1	1.3	.74	.94	.47	.39	.23	.20	.16
7	.29	.23	.29	1.7	1.2	.69	.84	.43	.43	.39	.70	.14
8	.29	.20	.37	1.6	1.2	.64	.79	.43	.39	.77	.59	.12
9	.26	.18	.47	1.6	1.2	.64	.79	.43	.51	.35	.26	.12
10	.26	.18	.26	9.9	1.1	.64	.74	.47	.43	.29	.18	.44
11	.26	.26	.26	2.2	1.1	.64	.69	2.4	.32	.29	4.2	3.7
12	.26	.29	20	1.6	1.1	.64	.69	2.6	.29	.83	.55	.29
13	.26	.20	16	1.5	1.1	.64	.69	2.3	.26	.39	.35	.16
14	.23	.38	3.2	1.4	1.0	6.9	.64	1.0	.26	.50	.35	.16
15	.23	3.0	1.3	1.5	1.0	4.7	.64	.89	.26	.29	.70	.14
16	.26	.79	1.0	1.8	1.0	8.3	.74	.59	.26	.23	.32	.14
17	.23	3.2	.89	1.6	.94	2.4	.69	.51	.26	.20	.73	.14
18	.23	5.3	5.1	1.2	.89	1.6	.64	.47	.26	.20	.29	.14
19	.20	.89	11	1.1	.89	1.5	.64	.43	.26	.20	.20	.14
20	.18	1.4	7.6	1.1	.89	1.1	.59	.43	.29	.18	.16	.12
21	.18	1.8	2.0	1.1	.84	.89	.59	.43	.32	.29	.18	.12
22	.78	.64	1.7	1.0	.89	.89	.55	.43	.35	.26	.18	.10
23	.35	.47	1.1	1.0	.84	.84	.59	.43	.35	.18	.23	.23
24	.26	.59	1.0	1.0	.84	.84	.64	.39	.32	.18	.18	.20
25	.29	.47	.89	.89	4.5	4.2	.69	.39	.32	.14	.16	.14
26	.26	.47	1.2	3.0	1.2	1.6	.59	.39	.39	.14	.14	.14
27	.23	.32	1.1	5.6	.89	1.0	.79	.35	1.2	.14	.14	.46
28	.23	.26	.79	8.0	.79	.89	1.4	.39	.35	.14	.12	.39
29	.29	.32	.69	12	.74	.84	.74	.35	.29	.14	.14	.35
30	.26	3.2	.64	3.0	---	.84	.55	.35	.26	.16	.14	.26
31	.23	---	.64	1.7	---	1.1	---	.35	---	.14	.18	---
TOTAL	9.87	28.69	81.40	150.09	41.14	49.25	27.41	20.73	11.09	8.49	14.80	9.14
MEAN	.32	.96	2.63	4.84	1.42	1.59	.91	.67	.37	.27	.48	.30
MAX	.86	5.3	20	51	7.9	8.3	4.7	2.6	1.2	.83	4.2	3.7
MIN	.18	.18	.26	.89	.74	.64	.55	.35	.26	.14	.12	.10
AC-FT	20	57	161	298	82	98	54	41	22	17	29	18

CAL YR 1987	TOTAL	493.16	MEAN	1.35	MAX	52	MIN	.18	AC-FT	978
WTR YR 1988	TOTAL	452.10	MEAN	1.24	MAX	51	MIN	.10	AC-FT	897

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2.

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS.--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years 1923-88), 23.3 ft^3/s (16,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s Jan. 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s, Oct. 28 to Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 1	1000	1,700	6.70	Sept. 27	1630	*4,170	*10.03
Jan. 28	2000	2,270	7.52				

Minimum discharge, 1.9 ft^3/s, Sept. 18-19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	8.4	27	271	8.3	6.0	34	18	5.7	3.5	3.3	2.6
2	40	8.0	10	244	7.0	5.4	116	11	5.2	5.4	21	2.7
3	6.7	4.9	8.2	88	6.3	5.0	403	8.4	4.8	4.1	9.2	2.6
4	4.4	4.0	7.1	50	8.2	4.7	127	7.2	5.1	3.5	4.7	2.4
5	3.7	5.9	6.7	29	6.0	4.8	104	6.3	6.1	3.7	4.7	2.9
6	3.4	7.4	51	35	5.6	4.7	84	5.6	5.3	43	7.3	2.7
7	3.1	4.2	12	11	6.9	4.2	34	5.5	8.5	46	6.1	2.4
8	2.9	3.6	37	8.0	7.7	4.1	11	5.1	7.9	31	4.4	2.6
9	2.7	3.3	10	116	7.2	4.1	9.1	4.8	10	60	3.8	2.4
10	2.6	6.5	13	35	6.0	3.8	127	5.5	7.5	9.5	3.6	2.3
11	2.5	12	9.0	10	5.7	3.7	38	68	6.0	8.7	63	2.4
12	2.4	4.9	161	8.1	11	3.6	9.8	123	5.1	15	8.7	2.2
13	2.4	3.9	109	7.0	22	3.5	8.4	81	4.7	8.5	5.6	2.2
14	2.4	3.7	18	6.4	7.6	280	7.8	13	4.5	7.4	6.3	2.1
15	2.3	6.2	10	7.1	22	100	7.6	15	4.2	5.7	5.7	2.1
16	2.3	8.5	8.8	12	28	32	7.3	8.3	4.0	4.7	6.4	2.1
17	2.2	9.6	7.7	10	14	63	7.1	7.0	3.8	4.2	15	2.0
18	2.2	45	139	6.9	8.8	65	7.1	6.1	3.7	6.0	5.3	2.1
19	2.2	41	20	6.3	10	19	6.8	5.5	3.6	4.2	4.5	2.0
20	2.3	194	11	6.0	6.6	9.2	6.7	5.1	4.0	4.1	7.9	2.0
21	17	463	8.0	5.7	5.7	10	7.2	5.2	4.6	21	10	2.2
22	69	106	7.0	5.5	7.3	49	8.1	16	3.7	5.1	9.1	2.3
23	20	33	6.5	5.4	15	29	6.8	15	4.3	4.1	4.9	9.4
24	17	44	6.8	5.2	6.6	139	21	9.8	3.8	3.7	4.0	11
25	8.8	17	7.4	5.0	249	24	78	6.9	4.9	3.7	3.6	3.6
26	16	26	14	166	51	9.9	97	6.0	4.7	3.3	3.3	89
27	8.3	12	12	151	11	7.4	74	5.8	7.0	3.2	3.1	781
28	7.9	19	6.7	329	9.4	6.4	43	21	4.9	4.3	3.0	73
29	9.3	66	6.0	76	7.0	7.2	27	12	3.9	6.8	2.9	10
30	11	104	5.8	16	---	145	14	7.2	3.8	7.8	2.8	5.7
31	6.6	---	13	10	---	121	---	5.7	---	3.8	2.7	---
TOTAL	304.6	1275.0	768.7	1741.6	566.9	1173.7	1531.8	520.0	155.3	345.0	245.9	1034.0
MEAN	9.83	42.5	24.8	56.2	19.5	37.9	51.1	16.8	5.18	11.1	7.93	34.5
MAX	69	463	161	329	249	280	403	123	10	60	63	781
MIN	2.2	3.3	5.8	5.0	5.6	3.5	6.7	4.8	3.6	3.2	2.7	2.0
AC-FT	604	2530	1520	3450	1120	2330	3040	1030	308	684	488	2050

CAL YR 1987	TOTAL	11369.7	MEAN	31.1	MAX	587	MIN	2.2	AC-FT	22550
WTR YR 1988	TOTAL	9662.5	MEAN	26.4	MAX	781	MIN	2.0	AC-FT	19170

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi^2.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M), 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft above mean sea level (by vertical angles). Prior to Oct. 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records good. No diversion upstream. Water is diverted by Koolau ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--68 years (water years 1915, 1917, 1923-88), 35.2 ft^3/s (25,500 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s, July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,900 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 21	1000	2,230	8.13	Apr. 3	0530	2,590	8.57
Jan. 28	1930	1,990	7.82	Sept. 27	1700	*6,020	*11.62

Minimum discharge, 2.2 ft^3/s, Sept. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	28	14	44	351	12	10	43	14	7.2	3.2	4.0	3.8
2	50	14	24	341	11	9.2	140	10	6.6	6.0	34	4.4
3	11	11	17	105	9.8	8.6	552	9.4	6.3	3.8	12	3.4
4	7.7	8.4	14	68	14	8.0	138	8.8	6.4	3.2	6.9	3.2
5	6.3	9.6	12	40	9.0	8.4	120	7.5	6.8	3.7	6.3	3.8
6	5.4	10	60	44	8.2	7.8	84	6.9	6.0	42	9.0	3.4
7	4.9	7.2	19	22	10	6.8	41	6.3	9.4	55	9.8	3.0
8	4.4	6.4	43	16	9.8	6.4	20	5.9	9.2	40	9.0	3.2
9	4.0	5.7	16	172	8.8	6.0	16	5.7	12	91	5.7	2.7
10	3.7	11	17	62	7.6	5.6	134	7.0	7.8	17	5.2	2.6
11	3.6	17	12	23	7.8	5.1	45	91	6.4	11	85	3.1
12	3.4	7.8	139	17	12	4.6	17	145	5.7	17	16	2.6
13	3.2	6.4	120	14	25	4.5	13	106	5.2	10	9.0	2.4
14	2.9	5.8	30	12	12	251	11	20	5.1	9.2	8.8	2.4
15	2.9	11	17	12	24	120	9.7	21	4.4	7.8	7.8	2.4
16	2.8	19	14	18	39	52	8.8	11	3.9	6.6	8.0	2.2
17	2.6	20	12	14	19	122	7.8	9.8	3.8	6.0	19	2.2
18	2.9	70	66	10	12	92	7.5	8.8	3.8	8.2	7.8	2.4
19	2.9	52	27	9.4	12	27	6.6	7.8	3.5	5.6	6.8	2.4
20	3.0	242	19	8.6	9.8	16	6.3	7.2	4.8	6.0	11	2.7
21	21	650	14	7.8	8.6	15	7.4	8.8	5.2	22	18	3.0
22	92	118	11	7.4	12	48	7.4	19	3.7	6.9	17	3.4
23	30	43	9.6	7.0	19	26	7.1	16	4.2	5.7	8.6	19
24	25	39	9.4	7.0	9.8	57	20	11	3.2	5.0	6.8	12
25	14	27	10	6.6	330	32	84	8.8	5.2	4.6	6.0	4.5
26	20	36	17	251	63	17	110	7.8	5.1	4.0	5.2	123
27	14	23	14	227	20	12	85	7.8	7.2	5.1	4.8	1110
28	16	43	8.8	301	17	11	43	21	4.8	7.6	4.5	90
29	18	89	8.2	93	12	17	30	14	3.9	8.8	4.4	18
30	20	116	8.0	23	---	154	16	9.2	3.7	9.6	4.5	10
31	11	---	45	16	---	112	---	7.6	---	5.0	3.9	---
TOTAL	436.6	1732.3	877.0	2305.8	764.2	1272.0	1830.6	640.1	170.5	436.6	364.8	1451.2
MEAN	14.1	57.7	28.3	74.4	26.4	41.0	61.0	20.6	5.68	14.1	11.8	48.4
MAX	92	650	139	351	330	251	552	145	12	91	85	1110
MIN	2.6	5.7	8.0	6.6	7.6	4.5	6.3	5.7	3.2	3.2	3.9	2.2
AC-FT	866	3440	1740	4570	1520	2520	3630	1270	338	866	724	2880

CAL YR 1987	TOTAL	14341.5	MEAN	39.3	MAX	729	MIN	2.3	AC-FT	28450
WTR YR 1988	TOTAL	12281.7	MEAN	33.6	MAX	1110	MIN	2.2	AC-FT	24360

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft upstream from Wailoa ditch intake, 2.2 mi southwest of Huelo, and 2.5 mi west of Kailua.

DRAINAGE AREA.--0.64 mi^2.

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--77 years (water years 1912-88), 4.70 ft^3/s (3,410 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of model of station site; minimum, 0.02 ft^3/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 358 ft^3/s Apr. 3, gage height, 3.23 ft, no other peak greater than base discharge of 270 ft^3/s; minimum, 0.43 ft^3/s, for many days in September.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	1.9	9.8	60	8.7	3.3	3.9	3.4	1.9	.79	.69	.61
2	4.4	7.1	7.8	55	7.3	3.1	5.1	2.9	1.9	.79	2.3	.66
3	1.6	2.7	6.6	13	6.1	2.8	47	2.7	1.8	.71	1.2	.60
4	1.2	1.8	5.8	9.2	7.8	2.6	13	2.5	1.8	.70	.84	.60
5	1.0	1.6	5.8	7.8	4.9	2.5	12	2.4	1.8	.72	.87	.83
6	1.0	1.6	8.5	6.9	4.3	2.6	9.5	2.2	1.7	2.2	1.2	.67
7	.93	1.5	5.3	5.6	5.6	2.1	7.9	2.0	2.1	3.4	.95	.60
8	.90	1.4	12	4.8	4.0	2.0	5.9	2.0	2.5	1.9	.77	.58
9	.86	1.4	5.6	43	3.5	1.9	5.3	1.9	3.0	1.5	.69	.51
10	.79	2.3	5.6	17	3.2	1.8	7.8	1.9	1.7	1.0	.84	.52
11	.79	2.8	4.6	8.4	2.9	1.6	5.2	15	1.5	1.1	2.1	.66
12	.79	1.7	13	6.9	3.0	1.6	4.2	20	1.4	2.4	1.5	.51
13	.79	1.4	12	5.9	3.4	1.5	3.9	21	1.4	1.3	1.0	.51
14	.76	2.5	7.0	5.2	2.5	13	3.6	6.4	1.3	1.0	.85	.50
15	.76	6.3	6.0	5.6	3.2	28	3.3	5.9	1.2	.97	.91	.48
16	.69	2.9	5.3	9.0	4.6	9.1	3.1	4.4	1.1	.87	.88	.49
17	.69	5.7	4.8	5.3	3.5	14	2.8	4.2	1.1	.82	2.4	.46
18	.71	7.2	5.6	4.2	2.7	13	2.7	3.6	1.1	1.0	.89	.51
19	.69	6.7	5.4	3.8	2.3	8.4	2.5	3.3	1.0	.83	.82	.45
20	.68	27	6.4	3.5	2.1	5.5	2.3	3.1	1.2	.82	1.0	.53
21	.92	65	4.0	3.3	1.9	5.0	2.5	3.1	1.1	5.3	1.3	.50
22	3.5	26	3.6	3.1	3.5	5.7	2.2	4.5	.98	1.0	.95	.49
23	1.5	16	3.3	2.8	6.2	7.1	2.3	4.5	1.1	.90	.81	.70
24	2.2	15	3.2	2.8	2.6	5.2	4.0	4.1	.95	.84	.75	.73
25	1.3	12	3.3	2.5	32	4.0	8.1	2.7	1.1	.82	.69	.43
26	1.6	9.8	3.6	50	7.2	3.6	11	2.5	.97	.79	.69	4.7
27	1.1	8.0	3.3	82	4.6	3.3	5.7	2.3	1.2	.80	.69	6.8
28	1.2	7.8	2.6	89	4.0	3.1	4.9	4.8	.94	.83	.66	1.6
29	1.4	9.0	2.5	32	3.6	3.0	3.9	2.8	.88	.88	.67	.86
30	2.4	17	2.4	14	---	4.9	3.4	2.2	.83	1.1	.73	.68
31	1.3	---	2.3	11	---	5.3	---	2.0	---	.75	.64	---
TOTAL	40.45	273.1	177.0	572.6	151.2	170.6	199.0	146.3	42.55	38.83	31.28	28.77
MEAN	1.30	9.10	5.71	18.5	5.21	5.50	6.63	4.72	1.42	1.25	1.01	.96
MAX	4.4	65	13	89	32	28	47	21	3.0	5.3	2.4	6.8
MIN	.68	1.4	2.3	2.5	1.9	1.5	2.2	1.9	.83	.70	.64	.43
AC-FT	80	542	351	1140	300	338	395	290	84	77	62	57

CAL YR 1987	TOTAL	2213.79	MEAN	6.07	MAX	146	MIN	.57	AC-FT	4390
WTR YR 1988	TOTAL	1871.68	MEAN	5.11	MAX	89	MIN	.43	AC-FT	3710

16599500 OPANA TUNNEL AT KAILIILI

LOCATION.--Lat 20°51'04", long 156°16'17", Hydrologic Unit 20020000, on left bank at tunnel outlet, 0.3 mi north of Kailiili, and 2.7 mi east of Makawao.

PERIOD OF RECORD.--May 1965 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft, from topographic map.

REMARKS.--Records good. No estimated daily discharges. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao, and Pukalani areas. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 3.13 ft^3/s (2,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s Mar. 31, 1982, Apr. 12, 1986; minimum daily, 0.11 ft^3/s, Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft^3/s on Jan. 28, Apr. 3; minimum daily, 0.13 ft^3/s, Sept. 17, 19-20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.6	5.5	6.4	6.8	3.1	8.1	4.8	2.0	.58	.37	.20
2	3.6	3.4	4.8	8.6	6.5	3.0	11	4.1	2.0	.65	1.0	.20
3	2.3	3.8	4.5	7.3	6.0	2.8	12	3.9	1.8	.58	1.6	.20
4	1.6	2.0	4.4	6.3	5.5	2.6	9.0	4.1	1.8	.52	.79	.20
5	1.3	1.4	4.4	5.7	4.9	2.5	9.2	3.7	1.8	.52	.52	.20
6	1.1	1.2	5.1	6.0	4.8	2.5	9.6	3.4	1.6	1.5	.47	.20
7	1.4	.94	4.5	5.5	4.5	2.2	8.6	3.2	2.0	5.7	.42	.17
8	1.0	.72	4.5	5.8	4.2	2.0	7.5	3.2	1.8	4.7	.58	.17
9	.79	.58	4.4	8.6	3.9	2.0	7.0	3.0	1.8	5.3	.47	.17
10	.72	.65	4.2	9.2	3.7	1.8	9.8	3.2	1.6	3.2	.42	.37
11	.58	.94	4.1	7.7	3.4	1.8	8.8	5.6	1.6	1.6	2.4	.42
12	.52	.72	4.9	7.0	3.6	1.6	7.3	9.6	1.4	1.6	3.1	.23
13	.47	.52	6.3	6.5	3.8	1.6	6.8	9.6	1.4	1.3	1.1	.20
14	.42	.91	5.1	6.0	3.4	8.7	6.2	6.8	1.3	1.0	.79	.17
15	.42	4.8	4.5	5.5	3.8	9.2	5.7	5.7	1.2	.79	.65	.14
16	.42	7.2	4.4	5.7	5.4	6.8	5.2	4.5	1.1	.65	.52	.14
17	.37	5.2	4.2	5.4	4.1	6.2	4.9	4.1	1.1	.52	1.1	.13
18	.37	8.8	4.4	4.8	3.3	8.8	4.5	3.8	1.1	.47	.94	.14
19	.37	6.8	4.5	4.5	3.1	6.8	4.4	3.6	1.0	.42	.58	.13
20	.37	8.0	4.6	4.2	3.2	6.0	4.1	3.3	1.0	.42	.58	.13
21	.47	9.2	4.4	3.9	2.8	5.2	3.9	3.3	1.0	.79	.86	.14
22	2.3	6.3	3.8	3.7	2.8	6.8	3.7	3.7	.94	.65	1.3	.14
23	2.4	5.4	3.4	3.4	2.9	5.8	3.6	3.4	.94	.47	.79	.27
24	1.8	5.2	3.2	3.3	2.5	4.9	3.9	3.1	.86	.42	.52	.52
25	1.3	4.8	3.1	3.1	9.0	4.5	7.7	2.8	.94	.37	.37	.23
26	1.4	4.9	3.2	9.8	7.9	4.5	8.5	2.6	.86	.37	.32	1.0
27	1.4	4.6	3.2	11	5.4	3.9	8.4	2.5	.94	.42	.27	6.6
28	1.8	5.4	2.8	12	4.1	3.7	7.3	3.4	.86	.47	.23	3.3
29	2.4	6.3	2.5	9.2	3.4	3.3	7.0	3.9	.86	.58	.20	1.4
30	2.6	6.5	2.4	7.9	---	5.1	5.5	2.4	.72	.84	.20	.79
31	1.8	---	2.2	7.3	---	9.4	---	2.2	---	.47	.20	---
TOTAL	39.19	118.78	127.5	201.3	128.7	139.1	209.2	126.5	39.32	37.87	23.66	18.30
MEAN	1.26	3.96	4.11	6.49	4.44	4.49	6.97	4.08	1.31	1.22	.76	.61
MAX	3.6	9.2	6.3	12	9.0	9.4	12	9.6	2.0	5.7	3.1	6.6
MIN	.37	.52	2.2	3.1	2.5	1.6	3.6	2.2	.72	.37	.20	.13
AC-FT	78	236	253	399	255	276	415	251	78	75	47	36

CAL YR 1987	TOTAL	1444.76	MEAN	3.96	MAX	12	MIN	.37	AC-FT	2870
WTR YR 1988	TOTAL	1209.42	MEAN	3.30	MAX	12	MIN	.13	AC-FT	2400

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Hydrologic Unit 20020000, on left bank of Maniania and Waikapu ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi^2.

PERIOD OF RECORD.--May 1983 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 780 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. No appreciable diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--5 years (1984-88), 65.3 ft^3/s (47,310 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,250 ft^3/s Jan. 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft^3/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 11 ft^3/s, for several days in October and November 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft^3/s Dec. 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 21	0730	1,600	4.73	Feb. 25	0900	1,020	3.85
Jan. 28	2230	*6,250	*9.00				

Minimum discharge, 17 ft^3/s, Sept. 17-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	58	86	183	82	64	72	104	e51	e40	26	21
2	255	79	65	376	67	60	75	81	e66	e39	84	21
3	100	51	55	245	57	46	193	57	e47	e38	47	21
4	48	40	50	152	117	39	166	46	e49	e37	42	20
5	37	41	120	109	55	41	171	42	e54	e35	39	58
6	31	61	189	116	49	59	132	38	e52	e100	69	25
7	28	36	84	74	57	36	86	65	e78	e140	66	21
8	26	31	299	61	39	34	62	39	e49	e189	46	20
9	26	29	113	204	33	31	62	37	e48	89	36	19
10	25	89	102	157	35	29	202	32	e42	53	36	21
11	26	168	68	102	33	27	89	220	e41	72	40	20
12	24	78	238	81	41	26	60	368	e45	150	89	19
13	23	50	268	64	31	26	50	378	e41	90	51	19
14	22	124	136	60	26	159	45	160	e40	72	47	24
15	22	111	93	84	25	116	41	187	e39	49	40	19
16	22	58	73	115	38	87	38	89	e38	39	48	19
17	21	89	74	86	31	145	36	79	e36	41	86	18
18	29	218	90	61	30	224	34	61	e42	62	42	22
19	25	177	105	54	45	134	30	51	e41	41	34	17
20	28	299	91	48	34	180	27	48	e52	42	37	17
21	44	778	65	45	30	62	33	57	e64	47	65	17
22	148	357	58	41	48	70	29	85	e49	33	37	17
23	84	170	64	42	52	73	32	70	e71	31	34	35
24	136	120	50	41	61	50	38	53	e49	31	26	22
25	65	93	83	38	374	45	104	45	e69	29	26	22
26	55	84	84	270	188	41	208	45	e66	27	25	33
27	55	68	57	333	116	37	202	e44	e52	30	24	37
28	54	80	45	740	84	33	156	e46	e41	55	24	25
29	63	153	41	348	71	35	98	e56	e39	31	23	21
30	69	171	39	175	---	89	122	e46	e44	31	25	19
31	49	---	37	109	---	165	---	e48	---	26	22	---
TOTAL	1708	3961	3022	4614	1949	2263	2693	2777	1495	1789	1336	689
MEAN	55.1	132	97.5	149	67.2	73.0	89.8	89.6	49.8	57.7	43.1	23.0
MAX	255	778	299	740	374	224	208	378	78	189	89	58
MIN	21	29	37	38	25	26	27	32	36	26	22	17
AC-FT	3390	7860	5990	9150	3870	4490	5340	5510	2970	3550	2650	1370

CAL YR 1987	TOTAL	29388	MEAN	80.5	MAX	854	MIN	20	AC-FT	58290
WTR YR 1988	TOTAL	28296	MEAN	77.3	MAX	778	MIN	17	AC-FT	56130

e Estimated.

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--LAT 20°56'21", long 156°32'59", Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi^2.

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to Dec. 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 9,660 ft^3/s Jan. 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft^3/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 22 ft^3/s, Jan. 18-22, 24, 25, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*), from rating curve extended above 280 ft^3/s on basis as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 22	1000	2,440	4.63	Jan. 28	2100	*9,660	*8.95
Nov. 21	0400	3,670	5.26	Apr. 3	0400	4,620	5.67
Jan. 1	0800	5,220	5.91				

Minimum discharge, 47 ft^3/s, Oct. 17, 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	150	78	83	464	78	68	74	133	74	59	56	52
2	314	143	73	420	76	66	73	98	97	58	129	52
3	73	62	69	230	76	71	341	69	68	58	88	52
4	54	54	71	109	156	66	175	66	71	56	61	52
5	53	65	146	110	76	69	152	71	79	56	62	59
6	52	86	156	107	78	90	126	64	79	114	135	56
7	52	54	100	76	109	68	78	114	115	145	143	52
8	52	52	383	73	83	76	69	64	71	191	77	52
9	50	52	87	341	76	64	69	62	70	95	62	50
10	50	135	100	136	88	62	173	66	62	65	72	60
11	55	196	76	96	78	62	73	536	61	80	164	57
12	50	67	278	87	87	61	66	524	65	156	143	52
13	48	54	195	76	73	61	64	396	61	84	66	50
14	48	157	83	78	71	342	64	99	59	84	68	80
15	48	106	76	149	69	230	66	235	59	69	66	53
16	50	78	73	167	83	138	62	76	58	62	77	52
17	47	146	76	91	73	148	61	89	58	68	137	53
18	58	186	118	74	74	275	61	74	59	96	61	66
19	52	173	113	71	107	105	59	69	60	64	59	53
20	59	351	107	69	71	73	59	71	77	68	66	50
21	80	815	76	68	68	72	61	83	95	91	76	50
22	270	223	71	68	112	83	61	107	72	61	61	50
23	96	108	123	73	146	89	62	95	105	59	58	61
24	121	106	76	71	96	68	68	73	73	63	54	54
25	62	85	105	68	581	66	121	68	101	65	53	53
26	78	95	102	414	148	62	305	66	98	59	52	63
27	98	80	79	519	96	61	205	64	77	61	53	72
28	66	83	71	1160	74	61	141	68	61	80	53	59
29	78	142	68	126	69	66	78	82	61	61	53	53
30	79	155	68	89	---	119	113	69	65	59	58	50
31	61	---	69	83	---	91	---	69	---	56	52	---
TOTAL	2504	4187	3371	5763	3072	3033	3180	3820	2211	2443	2415	1668
MEAN	80.8	140	109	186	106	97.8	106	123	73.7	78.8	77.9	55.6
MAX	314	815	383	1160	581	342	341	536	115	191	164	80
MIN	47	52	68	68	68	61	59	62	58	56	52	50
AC-FT	4970	8300	6690	11430	6090	6020	6310	7580	4390	4850	4790	3310

CAL YR 1987	TOTAL	34852	MEAN	95.5	MAX	900	MIN	39	AC-FT	69130
WTR YR 1988	TOTAL	37667	MEAN	103	MAX	1160	MIN	47	AC-FT	74710

16618000 KAHAKULOA STREAM NEAR HONOKOHAU

(National stream-quality accounting network station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi^2.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream.

AVERAGE DISCHARGE.--39 years (1940-42, 1948-70, 1976-88), 17.5 ft^3/s (12,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s Jan. 28, 1988, gage height, 9.93 ft from flood-marks, from rating curve extended above 510 ft^3/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.98 ft; minimum, 2.7 ft^3/s, Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 1	0800	1,780	7.39	Feb. 25	0630	705	5.67
Jan. 28	2130	*4,220	*9.93	Apr. 3	0500	1,480	6.98

Minimum discharge, 5.6 ft^3/s, Sept. 19-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	52	17	19	256	16	12	17	14	12	7.8	7.0	6.4
2	132	66	13	194	14	11	14	13	31	7.5	30	6.4
3	14	18	11	114	14	12	170	11	11	7.5	21	6.3
4	9.3	10	11	42	41	11	69	10	10	7.3	9.1	6.2
5	7.7	15	34	48	15	10	53	9.7	10	7.2	8.2	6.3
6	7.4	28	57	38	16	18	37	9.4	13	9.5	44	6.4
7	7.3	9.7	17	18	30	12	21	9.7	24	47	39	6.1
8	6.8	8.6	148	15	15	11	14	9.6	11	57	15	6.1
9	6.7	8.1	19	124	12	11	14	9.0	10	27	9.0	6.0
10	6.5	26	26	71	12	10	59	12	9.3	10	11	20
11	6.5	59	13	20	12	10	17	179	8.9	10	35	14
12	6.4	17	124	18	16	9.9	12	202	8.6	32	16	6.7
13	6.3	9.5	98	15	14	9.9	11	128	8.5	24	10	6.2
14	6.1	52	22	15	10	172	11	24	8.3	12	10	6.0
15	6.1	57	15	40	9.9	154	10	60	8.2	10	15	6.0
16	6.8	21	13	59	14	52	11	15	8.1	9.1	8.9	5.8
17	6.3	109	12	23	10	47	10	15	7.9	11	48	5.7
18	6.1	118	30	14	9.5	110	9.9	13	8.0	23	9.7	6.1
19	6.2	64	55	12	12	27	9.7	11	8.0	9.0	8.2	5.7
20	6.3	149	68	12	10	15	9.6	10	12	11	9.5	5.6
21	14	196	15	11	9.1	13	9.6	15	11	22	17	5.6
22	95	82	12	11	19	17	9.6	19	11	9.6	8.7	5.6
23	29	23	14	11	42	15	9.3	22	16	8.0	7.6	8.1
24	23	23	14	11	30	13	9.2	13	14	11	7.1	6.8
25	11	17	13	11	199	12	37	10	26	17	6.9	5.9
26	15	18	21	169	54	11	64	9.9	11	8.7	6.8	6.1
27	15	21	16	250	19	10	47	9.5	14	7.6	6.6	17
28	20	14	11	452	14	10	40	9.8	8.8	16	6.7	9.7
29	14	36	10	90	12	10	16	9.7	8.3	9.1	6.4	7.7
30	17	48	9.9	24	---	16	11	12	8.0	7.7	7.7	6.5
31	11	---	13	18	---	23	---	9.3	---	7.2	6.6	---
TOTAL	576.8	1339.9	953.9	2206	700.5	874.8	831.9	903.6	355.9	462.8	451.7	223.0
MEAN	18.6	44.7	30.8	71.2	24.2	28.2	27.7	29.1	11.9	14.9	14.6	7.43
MAX	132	196	148	452	199	172	170	202	31	57	48	20
MIN	6.1	8.1	9.9	11	9.1	9.9	9.2	9.0	7.9	7.2	6.4	5.6
AC-FT	1140	2660	1890	4380	1390	1740	1650	1790	706	918	896	442

CAL YR 1987	TOTAL	9535.4	MEAN	26.1	MAX	496	MIN	6.0	AC-FT	18910
WTR YR 1988	TOTAL	9880.8	MEAN	27.0	MAX	452	MIN	5.6	AC-FT	19600

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
13...	1300	751	6.3	92	7.90	21.0	0.40	9.1	104	19
DEC										
01...	1300	756	17	68	6.90	20.0	1.3	9.2	102	36
FEB										
09...	1350	753	12	81	7.60	19.5	0.50	8.4	93	14
APR										
12...	1145	756	12	82	7.60	19.0	1.0	8.8	96	K19
JUN										
27...	1130	754	13	69	7.70	21.0	0.50	8.3	94	K8
AUG										
22...	1300	--	8.1	79	7.50	21.0	1.3	8.1	--	34

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
13...	1500	25	0	4.8	3.2	8.4	41	0.7	1.0	34
DEC										
01...	2800	15	1	2.7	1.9	6.9	49	0.8	0.80	16
FEB										
09...	310	21	0	3.8	2.7	8.1	44	0.8	1.1	25
APR										
12...	220	21	0	3.8	2.7	7.2	42	0.7	1.1	29
JUN										
27...	660	18	0	3.3	2.3	6.8	44	0.7	0.80	21
AUG										
22...	780	20	0	3.9	2.5	7.5	44	0.7	0.80	25

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
13...	0	28	28	2.7	11	0.20	24	67	73
DEC									
01...	0	14	13	4.7	10	0.10	13	54	49
FEB									
09...	0	22	21	3.3	9.6	0.10	20	60	63
APR									
12...	0	22	23	3.7	9.9	0.10	19	60	61
JUN									
27...	0	19	18	5.0	10	0.30	16	54	56
AUG									
22...	0	21	21	3.2	9.9	0.10	18	53	59

K Results based on colony count outside the acceptable range (non-ideal colony count).

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHOROUS TOTAL (MG/L AS P)	PHOS-PHOROUS DIS-SOLVED (MG/L AS P)	PHOS-PHOROUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT									
13...	0.09	0.110	<0.010	<0.010	--	<0.20	0.020	0.030	0.020
DEC									
01...	0.07	<0.100	0.010	0.030	--	<0.20	<0.010	<0.010	<0.010
FEB									
09...	0.08	0.120	<0.010	0.020	--	<0.20	0.030	0.020	0.010
APR									
12...	0.08	0.120	0.030	0.030	--	<0.20	0.020	0.020	0.020
JUN									
27...	0.07	--	0.010	--	0.19	0.20	0.020	0.020	--
AUG									
22...	0.07	<0.100	0.040	0.010	0.26	0.30	0.030	0.020	0.020

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)
OCT											
13...	1300	10	<1	3	<0.5	<1	2	<3	<1	6	<5
FEB											
09...	1350	30	<1	3	<0.5	<1	<1	<3	1	22	<5
APR											
12...	1145	30	<1	3	<0.5	<1	<1	<3	1	17	<5
AUG											
22...	1300	50	<1	4	<0.5	2	<1	<3	2	24	<5

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
13...	<4	<1	0.2	<10	<1	<1	<1.0	31	6	<3
FEB										
09...	<4	1	<0.1	<10	2	<1	<1.0	25	<6	<3
APR										
12...	<4	<1	0.2	<10	<1	<1	<1.0	24	<6	<3
AUG										
22...	<4	2	0.1	<10	<1	<1	<1.0	27	<6	<3

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
13...	1300	1	0.02	100
DEC				
01...	1300	6	0.28	100
FEB				
09...	1350	1	0.03	100
APR				
12...	1145	1	0.03	100
JUN				
27...	1130	1	0.03	100
AUG				
22...	1300	4	0.09	100

< Actual value is known to be less than the value shown.

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'48", long 156°35'22", Hydrologic Unit 20020000, on right bank 1,000 ft upstream from intake of Honokohau ditch and 4.1 mi southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2.

PERIOD OF RECORD.--September, November, and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1937: Drainage area. WDR HI-79-1: 1927-48(M), 1949-78(P).

GAGE.--Water-stage recorder and masonry control. Elevation of gage is 870 ft, from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum.

REMARKS.--Records good except for estimated daily discharges, which are poor. No diversion upstream. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau ditch. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--72 years (water years 1914-19, 1923-88) 39.6 ft^3/s (28,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,260 ft^3/s, Jan. 28, 1988, gage height, 8.38 ft, from rating curve extended above 3,200 ft^3/s, on basis of slope-area measurement at gage height 8.38 ft; minimum, 8.4 ft^3/s, May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 22	1030	1,490	5.55	Jan. 28	2200	*7,260	*8.38
Nov. 20	2000	1,720	5.76	Apr. 3	0500	2,410	6.28

Minimum discharge, 16 ft^3/s, Sept. 19-22, 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	66	50	36	200	e41	29	42	71	33	22	19	17
2	198	59	26	232	e37	28	40	45	33	22	66	17
3	36	26	25	127	e37	30	269	27	25	22	35	17
4	22	20	24	63	e110	28	129	24	31	21	21	17
5	20	24	57	59	e38	27	89	25	48	21	25	32
6	20	41	111	64	e40	45	89	24	46	54	51	19
7	19	20	32	32	e80	30	45	48	70	102	52	17
8	19	18	194	29	e39	30	29	25	31	103	30	17
9	19	18	33	170	e31	27	28	24	29	53	21	17
10	18	89	59	76	e31	26	103	26	25	25	21	24
11	21	119	26	47	e31	26	35	203	24	45	36	24
12	19	34	154	34	e42	26	27	311	27	92	72	18
13	18	20	112	30	e35	25	26	246	25	47	25	17
14	18	78	34	29	e27	144	25	45	23	43	26	25
15	18	71	29	55	e26	111	25	77	22	24	30	19
16	18	35	26	110	e37	40	24	28	22	22	29	19
17	17	68	27	50	e26	51	24	34	22	22	52	17
18	26	117	52	30	e25	163	24	28	22	33	20	23
19	20	110	65	29	e30	78	24	26	22	24	19	16
20	19	340	74	28	e27	33	23	25	36	28	26	16
21	38	646	28	27	e23	29	26	32	55	35	36	16
22	177	159	28	27	e45	55	26	70	35	21	23	16
23	49	67	48	32	110	61	26	50	48	20	19	26
24	96	65	32	33	e76	29	38	31	32	21	18	19
25	34	39	48	27	240	26	82	25	42	25	18	19
26	41	43	69	216	e87	26	135	25	57	20	18	30
27	32	38	44	193	e38	26	97	25	49	22	17	38
28	32	39	28	507	e31	25	91	33	24	39	17	22
29	37	89	26	e130	e29	34	39	33	26	22	17	17
30	43	105	26	e64	---	85	93	30	23	23	21	16
31	25	---	25	e48	---	67	---	25	---	19	18	---
TOTAL	1235	2647	1598	2798	1469	1460	1773	1741	1007	1092	898	607
MEAN	39.8	88.2	51.5	90.3	50.7	47.1	59.1	56.2	33.6	35.2	29.0	20.2
MAX	198	646	194	507	240	163	269	311	70	103	72	38
MIN	17	18	24	27	23	25	23	24	22	19	17	16
AC-FT	2450	5250	3170	5550	2910	2900	3520	3450	2000	2170	1780	1200

CAL YR 1987	TOTAL	18505	MEAN	50.7	MAX	779	MIN	17	AC-FT	36700
WTR YR 1988	TOTAL	18325	MEAN	50.1	MAX	646	MIN	16	AC-FT	36350

e Estimated.

16638500 KAHOMA STREAM AT LAHAINA

LOCATION.--Lat 20°53'10", long 156°40'36", Hydrologic Unit 20020000, on right bank 0.2 mi west of Kelawea, 0.6 mi northeast of Lahaina, 0.6 mi downstream from Kanaha Stream, and 0.9 mi upstream from mouth.

DRAINAGE AREA.--5.22 mi^2.

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2137: 1963-65(P).

GAGE.--Water-stage recorder. Elevation of gage is 90 ft, from topographic map.

REMARKS.--Records poor. Diversions upstream by Pioneer Mill Co. for irrigation of sugarcane and from Kanaha Stream by Maui County Board of Water Supply for domestic use. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years (water years 1964-88), 3.25 ft^3/s (2,350 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft^3/s July 11, 1965, gage height, 11.03 ft, from rating curve extended above 332 ft^3/s on basis of slope-area measurements at gage heights 7.39 ft, 7.58 ft, 8.07 ft, 9.12 ft, and 11.03 ft; no flow many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 13, 1960, discharge, 7,750 ft^3/s, by slope-area measurement, 0.6 mi upstream from station.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 950 ft^3/s Nov. 21, gage height, 7.82 ft, no other peak greater than base discharge of 590 ft^3/s; minimum daily, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	6.1	.00	.00	.00	3.8	.00	.00	.00	.00	.00
2	.00	.00	.10	3.8	.00	.00	5.2	.00	.00	.00	.14	.00
3	.00	.00	.00	.00	.00	.00	41	.00	.00	.00	.00	.00
4	.00	.00	.00	.45	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	1.2	.00	.00	.00	.00	12
6	.00	.00	17	3.1	.00	.00	.00	.00	.00	3.1	.00	.03
7	.00	.00	.00	.00	.00	.00	4.2	.00	.00	66	.00	.00
8	.00	.00	2.8	.00	.00	.00	.00	.00	.00	2.7	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	3.4	.00	.00	8.2	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.36	.00	.00	.02	.00	.00
12	.00	.00	44	.00	.00	.00	.00	1.1	.00	.69	.00	.00
13	.00	.00	1.4	.00	.00	.00	.00	12	.00	.05	.00	.00
14	.00	9.9	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	1.2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	2.0	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	8.2	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	89	2.5	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	403	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	38	.00	.00	.00	.00	.00	.17	.00	.00	.00	.00
23	.00	2.3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	4.6	.00	.00	.00	.00	5.7	.00	.00	.00	.00	.00
25	.00	.26	.00	.00	5.0	.00	19	.00	.00	.00	.00	.00
26	.00	3.3	.96	.23	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.48	1.4	.00	.00	.00	.00	.00	.12	.00	.00	.00
28	.00	12	.00	6.8	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	79	.00	7.8	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	63	.00	.00	---	14	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	5.4	---	.00	---	.00	.00	---
TOTAL	.00	706.04	86.49	25.58	5.00	19.40	88.66	13.27	.12	72.56	.14	12.03
MEAN	.00	23.5	2.79	.83	.17	.63	2.96	.43	.004	2.34	.005	.40
MAX	.00	403	44	7.8	5.0	14	41	12	.12	66	.14	12
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	1400	172	51	9.9	38	176	26	.2	144	.3	24

CAL YR 1987	TOTAL	1564.12	MEAN	4.29	MAX	403	MIN	.00	AC-FT	3100
WTR YR 1988	TOTAL	1029.29	MEAN	2.81	MAX	403	MIN	.00	AC-FT	2040

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

LOCATION.--Lat 19°38'30", long 155°10'28", Hydrologic Unit 20010000, on left bank 200 ft upstream from Olaa Flume Road, 7.3 mi northwest of Mountain View, and 8.0 mi southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 mi^2.

PERIOD OF RECORD.--September 1930 to current year. Prior to July 1960, published as "at middle flume house, near Mountain View."

REVISED RECORDS.--WSP 2137: 1939(M), 1942(M), 1944-45(M), 1947(M), 1949(P), 1950-51(M), 1952-53(P), 1955(P), 1956(M), 1957-58(P), 1960(M).

GAGE.--Water-stage recorder and combined Parshall flume and concrete-weir control. Datum of gage is 1,934 ft above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft lower.

REMARKS.--Records good except for estimated daily discharges, which are fair. No diversion upstream. Large part of flow comes from 3 tunnels. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--58 years, 11.6 ft^3/s (8,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft^3/s Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 ft^3/s; maximum gage height, 4.45 ft, Aug. 26, 1970; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 516 ft^3/s Dec. 13, gage height, 4.38 ft, no other peak greater than base discharge of 100 ft^3/s; minimum, 1.4 ft^3/s, Aug. 4, 5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	9.0	20	12	4.3	21	41	15	6.2	2.0	1.7	4.5
2	25	9.3	18	12	4.0	20	38	15	5.8	2.4	1.6	4.2
3	23	9.0	17	11	3.9	19	34	15	5.3	2.0	1.7	4.0
4	22	9.2	16	10	3.6	17	30	16	5.4	2.2	1.5	3.8
5	21	8.7	14	9.9	3.3	16	30	16	5.6	2.6	1.7	4.6
6	20	8.5	14	9.3	3.0	15	28	16	5.0	2.0	28	4.9
7	18	7.9	13	8.5	3.0	14	27	16	6.0	2.0	28	4.4
8	17	7.5	14	7.9	3.0	13	24	16	5.5	3.0	29	4.1
9	15	7.0	13	7.3	4.0	13	22	15	5.7	4.7	27	3.8
10	14	7.1	12	6.9	3.4	12	23	14	6.2	4.0	25	3.5
11	13	7.5	12	6.6	4.0	11	23	13	6.3	3.2	24	4.0
12	11	6.5	28	6.3	3.8	9.9	20	13	e6.0	3.1	25	3.8
13	10	6.6	85	6.0	4.0	9.3	18	12	e5.5	2.9	22	3.4
14	9.4	6.7	56	5.6	4.0	9.2	17	11	e5.0	3.0	20	3.2
15	8.7	6.4	56	5.2	9.7	10	16	9.9	e4.5	2.8	18	3.0
16	8.1	6.1	49	5.3	10	8.9	14	9.3	e4.0	2.5	17	e3.0
17	7.2	5.7	36	5.8	9.0	8.1	13	8.7	e5.0	2.4	16	e3.0
18	6.5	5.3	31	5.1	8.5	7.5	12	8.1	e4.5	2.4	14	e2.5
19	6.3	5.1	28	4.8	8.2	7.0	11	7.5	e4.0	2.3	13	e2.5
20	6.1	17	28	4.6	8.1	6.5	10	6.9	e4.0	2.5	12	e2.5
21	6.3	37	28	4.4	7.9	6.3	9.4	6.4	4.0	2.7	11	e2.0
22	9.4	28	27	4.2	9.0	6.3	8.9	6.0	3.8	2.3	10	e2.0
23	12	30	24	4.1	12	7.5	8.5	6.0	3.5	2.2	9.4	e2.5
24	11	28	21	3.9	11	13	8.1	5.3	3.3	2.0	8.8	e2.5
25	9.8	e25	19	4.0	13	14	7.3	4.9	3.0	2.0	7.9	e3.0
26	10	e25	17	3.9	30	20	7.5	4.6	2.9	1.8	7.2	e4.0
27	9.7	30	16	3.9	21	20	9.6	4.6	2.6	1.8	6.5	e5.5
28	9.7	29	14	5.7	23	20	11	10	2.4	2.0	6.1	e4.5
29	9.3	24	14	5.2	22	21	15	8.3	2.2	2.1	5.5	e4.0
30	9.2	22	13	4.9	---	29	13	7.0	2.0	2.0	5.2	e3.5
31	8.7	---	12	4.7	---	44	---	6.4	---	1.7	4.8	---
TOTAL	393.4	434.1	765	199.0	253.7	448.5	549.3	322.9	135.2	76.6	408.6	106.2
MEAN	12.7	14.5	24.7	6.42	8.75	14.5	18.3	10.4	4.51	2.47	13.2	3.54
MAX	27	37	85	12	30	44	41	16	6.3	4.7	29	5.5
MIN	6.1	5.1	12	3.9	3.0	6.3	7.3	4.6	2.0	1.7	1.5	2.0
AC-FT	780	861	1520	395	503	890	1090	640	268	152	810	211

CAL YR 1987	TOTAL	3778.80	MEAN	10.4	MAX	85	MIN	.12	AC-FT	7500
WTR YR 1988	TOTAL	4092.5	MEAN	11.2	MAX	85	MIN	1.5	AC-FT	8120

e Estimated

16700900 OLAA FLUME SPRING NEAR KAUMANA

LOCATION.--Lat 19°41'59", long 155°11'13", Hydrologic Unit 20010000, on left bank 58 ft downstream from tunnel entrance, 3.3 mi northwest of Kaumana School, and 6.5 mi southwest of Hilo Post Office.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,970 ft, from topographic map.

REMARKS.--Records good. County of Hawaii, Department of Water Supply, diverts by 16-in. pipeline 50 ft upstream for domestic use in the Kaumana and Piihonua areas since Oct. 2, 1978. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 6.89 ft^3/s (4,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft^3/s Jan. 8, 1975; minimum daily, 0.02 ft^3/s, Mar. 24, 26-30, Apr. 1, 1983, Sept. 19, 1984, and for many days in 1985.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/s, Dec. 15; minimum daily, 0.03 ft^3/s, Aug. 2, 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.8	.92	10	4.2	.60	7.9	13	8.1	2.6	.07	.04	.04
2	13	3.5	8.8	3.8	.60	6.7	9.4	8.8	1.9	.10	.03	.04
3	12	7.6	8.1	3.2	.52	5.2	7.9	8.6	1.3	.15	.03	.04
4	9.7	7.4	7.4	2.4	.44	4.1	8.6	8.3	.84	.10	.04	.04
5	9.4	5.6	6.3	3.2	.44	3.8	10	8.6	.76	.07	.04	.05
6	10	4.2	5.6	4.4	.44	3.0	10	7.9	.76	.05	.75	.05
7	8.6	3.2	6.5	3.6	.44	2.5	10	6.1	.84	.07	4.6	.15
8	6.3	2.7	6.0	3.2	.28	2.0	9.4	5.8	1.2	.10	5.2	.36
9	4.7	1.8	7.0	2.7	.20	3.6	6.5	6.5	1.3	.15	7.0	.44
10	3.8	1.1	7.0	2.0	.68	4.0	3.6	6.0	1.9	.36	7.2	.15
11	3.1	1.1	6.3	1.8	1.0	2.5	4.4	5.2	2.8	.44	4.6	.10
12	2.2	.60	6.5	1.7	1.5	1.5	4.6	4.0	2.6	.44	4.7	.10
13	1.4	1.9	16	1.2	1.0	1.0	4.4	3.6	1.8	.04	4.4	.10
14	.84	3.0	22	.76	1.8	.52	4.4	3.0	1.1	.04	3.5	.10
15	.68	3.0	24	.52	2.1	.36	3.6	2.4	.68	.05	3.0	.10
16	.52	2.0	20	.36	6.1	2.2	3.1	1.9	.52	.05	2.6	.10
17	.44	1.0	17	1.2	6.0	1.8	2.6	1.3	.44	.07	2.2	.10
18	.44	.52	17	2.7	4.1	1.9	2.4	.84	.36	.05	2.4	.10
19	.44	.36	19	1.5	3.6	1.3	2.1	.76	.28	.05	1.9	.10
20	.44	.84	19	.84	3.2	.60	1.9	.76	.20	.05	1.5	.10
21	.52	13	17	.60	2.5	.36	2.0	.68	.20	.05	1.3	.10
22	.60	20	15	.44	1.6	.28	1.8	.68	.20	.05	.92	.10
23	5.1	18	15	.36	1.5	.84	1.3	.68	.20	.04	.84	.10
24	7.9	14	12	.36	5.6	3.6	1.5	.68	.07	.05	.84	.10
25	7.2	12	9.4	.44	6.3	7.0	1.7	.68	.04	.04	.84	.10
26	6.1	10	7.4	.60	8.8	7.2	1.3	.60	.04	.04	.84	.15
27	6.1	10	7.4	.60	10	7.6	2.2	.60	.04	.04	.76	.15
28	4.6	11	7.4	.68	9.4	7.2	3.0	.68	.04	.04	.76	.36
29	3.6	11	6.1	.68	8.3	8.3	5.6	2.6	.04	.04	.68	.60
30	3.0	9.7	4.9	1.0	---	9.4	8.1	2.7	.05	.04	.28	.84
31	1.8	---	4.7	1.0	---	13	---	2.5	---	.04	.04	---
TOTAL	143.32	181.04	345.8	52.04	89.04	121.26	150.4	111.54	25.10	2.97	63.83	4.96
MEAN	4.62	6.03	11.2	1.68	3.07	3.91	5.01	3.60	.84	.10	2.06	.17
MAX	13	20	24	4.4	10	13	13	8.8	2.8	.44	7.2	.84
MIN	.44	.36	4.7	.36	.20	.28	1.3	.60	.04	.04	.03	.04
AC-FT	284	359	686	103	177	241	298	221	50	5.9	127	9.8

CAL YR 1987	TOTAL	1558.43	MEAN	4.27	MAX	24	MIN	.04	AC-FT	3090
WTR YR 1988	TOTAL	1291.30	MEAN	3.53	MAX	24	MIN	.03	AC-FT	2560

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

LOCATION.--Lat 19°42'02", long 155°10'36", Hydrologic Unit 20010000, on right bank 3 ft downstream from tunnel entrance, 2.7 mi southwest of Piihonua, and 5.8 mi southwest of Hilo Post Office.

PERIOD OF RECORD.--February 1981 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,700 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--7 years, 4.72 ft^3/s (3,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 23 ft^3/s, Apr. 10, 1986; minimum daily, 0.03 ft^3/s, Mar. 23, 24, 31, 1983.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s, Dec. 13; minimum daily, 1.6 ft^3/s, Aug. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	5.0	5.6	4.8	3.8	5.2	7.7	6.1	4.2	3.1	2.9	3.1
2	9.2	5.3	5.3	5.1	3.6	4.9	7.0	5.5	4.3	3.5	2.0	2.9
3	7.4	4.9	5.2	4.8	3.5	4.8	6.5	5.6	3.9	3.2	1.7	3.0
4	6.3	5.0	5.1	4.8	3.5	4.5	7.2	6.6	3.9	3.3	1.6	3.0
5	5.8	4.8	4.8	4.7	3.5	4.5	6.7	6.1	4.2	3.5	1.9	3.0
6	5.4	4.7	5.4	4.7	3.5	4.4	6.9	5.3	3.9	2.6	12	4.2
7	5.3	4.8	5.3	4.5	3.5	4.3	6.4	5.8	4.3	3.1	9.9	3.6
8	4.9	4.5	5.8	4.5	3.6	5.2	5.4	5.4	4.3	4.1	6.4	3.9
9	4.8	4.4	5.1	4.4	4.4	5.1	5.1	4.9	4.2	5.1	5.5	3.8
10	4.7	4.4	5.1	4.4	3.9	4.4	5.9	4.8	4.4	3.8	5.1	3.6
11	4.4	5.2	5.7	4.4	4.5	4.2	5.9	4.7	4.4	4.1	6.9	3.4
12	4.3	4.5	8.8	4.3	4.0	4.0	5.0	4.6	4.2	4.0	6.2	3.6
13	4.2	4.4	21	4.2	4.7	3.9	4.9	4.7	3.9	3.7	5.2	3.6
14	4.2	4.6	13	4.1	4.0	3.9	4.8	4.4	3.8	3.9	4.9	3.6
15	4.0	4.4	9.8	4.0	5.3	6.1	4.7	4.4	3.8	3.9	4.6	3.5
16	4.0	4.3	7.4	4.4	4.9	4.4	4.6	4.3	3.6	3.7	4.5	3.4
17	3.9	4.1	6.1	5.1	4.7	4.2	4.5	4.1	4.0	3.6	5.0	3.2
18	4.0	4.1	11	4.3	4.7	4.0	4.4	4.0	4.5	3.6	4.5	3.1
19	4.3	4.0	7.6	4.1	4.4	4.0	4.3	4.0	3.7	3.4	4.4	3.1
20	4.4	7.1	6.9	4.0	4.3	3.9	4.3	3.9	3.7	3.6	4.4	3.0
21	4.8	14	6.1	3.9	4.2	3.9	4.0	3.9	3.6	4.1	4.1	3.6
22	6.3	9.6	5.8	3.8	5.1	4.4	4.0	3.8	3.4	3.7	4.1	3.1
23	6.2	8.0	5.6	3.9	6.1	4.8	4.2	4.3	3.2	3.7	4.0	3.0
24	5.4	7.7	5.4	3.8	6.5	6.1	4.2	3.9	3.1	4.2	3.9	3.1
25	5.0	7.0	5.2	4.0	5.7	6.2	4.0	3.8	3.0	3.6	3.9	3.7
26	5.7	7.0	5.4	3.9	11	7.0	4.6	3.8	2.9	3.3	3.8	4.6
27	4.9	6.3	5.3	4.2	6.0	5.6	5.7	4.2	2.9	3.2	3.8	3.8
28	5.0	6.1	5.1	4.9	6.0	6.2	5.6	7.0	2.8	3.3	3.8	4.3
29	4.9	6.0	5.2	4.3	5.4	7.2	6.4	5.1	3.2	3.1	3.6	4.8
30	4.8	6.3	5.1	3.9	---	9.4	5.3	4.4	3.3	3.2	3.5	4.2
31	4.5	---	4.9	3.9	---	12	---	4.2	---	3.0	3.3	---
TOTAL	167.0	172.5	209.1	134.1	138.3	162.7	160.2	147.6	112.6	111.2	141.4	105.8
MEAN	5.39	5.75	6.75	4.33	4.77	5.25	5.34	4.76	3.75	3.59	4.56	3.53
MAX	14	14	21	5.1	11	12	7.7	7.0	4.5	5.1	12	4.8
MIN	3.9	4.0	4.8	3.8	3.5	3.9	4.0	3.8	2.8	2.6	1.6	2.9
AC-FT	331	342	415	266	274	323	318	293	223	221	280	210

CAL YR 1987	TOTAL	1762.4	MEAN	4.83	MAX	21	MIN	1.1	AC-FT	3500
WTR YR 1988	TOTAL	1762.5	MEAN	4.82	MAX	21	MIN	1.6	AC-FT	3500

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi downstream from Hookelekele Stream, 0.9 mi west of Piihonua, and 4.1 mi west of Hilo Post Office. Prior to Nov. 16, 1977, at opposite site on left bank.

DRAINAGE AREA.--230 mi^2, of which 81 mi^2 probably is noncontributing.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS.--WSP 865: 1929-36(M). WSP 965: 1941. WDR HI-80-1: 1929-79(P). WDR HI-81-1: 1940(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,090 ft, from topographic map. Prior to Nov. 16, 1977, at opposite site on left bank at same datum.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Hawaii County Department of Water Supply diverts about 6 ft^3/s upstream for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River upstream 1938-63. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--57 years (water years 1929-39, 1942-47, 1949-88), 278 ft^3/s (201,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft^3/s, revised, Aug. 11, 1940, gage height, 28.6 ft, from floodmarks, from rating curve extended above 13,000 ft^3/s; minimum, 0.15 ft^3/s, Jan. 20, 1981.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 8,700 ft^3/s and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 21	0100	12,400	16.24	Dec. 13	0700	*66,400	*26.95

Minimum discharge, 14 ft^3/s, June 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2000	93	178	e60	39	202	827	524	69	22	26	28
2	e1000	306	144	e100	33	151	654	323	62	18	36	25
3	e700	139	119	e100	30	118	484	324	51	19	48	24
4	e400	106	94	e70	28	95	393	396	52	18	43	25
5	e200	79	76	e60	24	79	541	375	73	66	41	27
6	e150	68	100	e55	25	80	515	269	57	31	911	347
7	e120	63	150	e50	53	64	421	253	65	20	1330	181
8	e110	55	256	e45	91	118	283	247	68	36	599	73
9	e100	42	136	e40	115	187	219	181	65	204	336	54
10	e80	42	104	e45	73	86	288	141	95	74	227	49
11	e70	111	130	e50	107	66	452	118	93	64	352	42
12	e50	83	e1500	e45	68	57	219	117	74	51	324	35
13	e30	52	e9000	45	96	49	168	124	57	49	251	26
14	e35	70	e700	40	63	45	141	88	48	46	176	23
15	34	47	e400	37	173	191	116	82	41	45	142	24
16	26	39	e300	48	488	132	96	69	37	36	117	22
17	23	33	e250	139	172	77	81	62	40	31	172	26
18	21	28	e3000	65	151	59	70	54	62	33	123	25
19	26	25	e700	50	106	51	60	47	41	33	97	21
20	34	e3000	e300	42	83	44	54	42	33	32	101	19
21	42	e7000	e250	39	69	43	51	42	32	61	81	31
22	233	e1000	e200	36	78	106	91	41	27	42	71	30
23	289	e600	e150	37	255	147	63	58	24	33	65	22
24	197	e650	e140	39	423	623	79	48	22	35	55	19
25	182	463	e110	39	196	477	57	36	20	38	48	43
26	223	418	e100	36	1170	689	69	33	17	28	43	184
27	161	304	e200	42	637	392	203	37	16	24	39	429
28	128	248	e150	79	431	517	166	271	16	25	37	206
29	122	201	e100	106	287	800	441	373	15	25	34	141
30	102	253	e90	50	---	791	297	122	28	29	31	103
31	87	---	e80	40	---	1660	---	83	---	25	29	---
TOTAL	6975	15618	19207	1729	5564	8196	7599	4980	1400	1293	5985	2304
MEAN	225	521	620	55.8	192	264	253	161	46.7	41.7	193	76.8
MAX	2000	7000	9000	139	1170	1660	827	524	95	204	1330	429
MIN	21	25	76	36	24	43	51	33	15	18	26	19
AC-FT	13830	30980	38100	3430	11040	16260	15070	9880	2780	2560	11870	4570

CAL YR 1987	TOTAL	75629.7	MEAN	207	MAX	9000	MIN	2.2	AC-FT	150000
WTR YR 1988	TOTAL	80850	MEAN	221	MAX	9000	MIN	15	AC-FT	160400

e Estimated

16713000 WAILUKU RIVER AT HILO

(National stream-quality accounting network station)

LOCATION.--Lat 19°43'43", long 155°05'40", Hydrologic Unit 20010000, on right bank 500 ft upstream from Wailuku bridge and 0.2 mi west of Hilo Post Office.

DRAINAGE AREA.--256 mi^2, of which 81 mi^2 probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1977 to September 1979, June 1980 November 1987 (station destroyed by flood of December 13, 1987). Station reestablished Oct. 1, 1988.

GAGE.--Water-stage recorder. Elevation of gage is 80 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Hilo Electric Light Co. diverts upstream for Hydro-plant use.

AVERAGE DISCHARGE.--9 years (water years 1978, 1979, 1981-87), 386 ft^3/s (279,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 79,800 ft^3/s Dec. 13, 1987, gage height, 38.66 ft, from floodmarks and from rating curve extended above 6,840 ft^3/s on basis of slope-area measurements at gage heights 23.30 ft, 34.57 ft, and 38.66 ft; minimum, 4.6 ft^3/s July 17, 1981.

EXTREMES FOR PERIOD OCTOBER TO NOVEMBER 1987.--Peak discharges greater than base discharge of 9,500 ft^3/s and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 21	0130	25,000	19.45	Dec. 13	0730	*79,800	*38.66

Minimum discharge, 24 ft^3/s, Nov. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3160	158										
2	2310	632										
3	1200	286										
4	715	200										
5	488	144										
6	361	120										
7	260	103										
8	198	81										
9	164	52										
10	126	51										
11	97	210										
12	76	139										
13	61	71										
14	64	105										
15	69	61										
16	51	40										
17	38	28										
18	29	36										
19	38	39										
20	55	2720										
21	68	11500										
22	514	2480										
23	608	1410										
24	397	1230										
25	355	900										
26	470	775										
27	325	e650										
28	248	e500										
29	238	e400										
30	190	e300										
31	164	---										
TOTAL	13137	25421										
MEAN	424	847										
MAX	3160	11500										
MIN	29	28										
AC-FT	26060	50420										

e Estimated.

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT										
26...	0815	755	435	40	6.10	18.5	1.4	9.4	101	120
DEC										
28...	0815	755	272	43	6.60	18.0	0.70	9.3	99	K150
FEB										
29...	0830	755	560	40	6.10	17.5	0.50	9.4	99	72
APR										
26...	0900	755	55	63	7.10	19.0	0.40	9.0	98	310
JUN										
13...	0900	755	76	55	6.40	19.0	0.50	9.1	99	130
AUG										
16...	1015	760	105	53	6.60	20.5	0.50	9.1	101	K270

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
26...	1600	14	1	2.7	1.7	2.5	28	0.3	0.40	10
DEC										
28...	560	15	0	2.9	1.9	2.7	27	0.3	0.60	21
FEB										
29...	580	13	1	2.5	1.6	2.6	30	0.3	0.40	12
APR										
26...	520	22	0	4.3	2.7	3.8	27	0.4	0.50	26
JUN										
13...	560	21	0	4.1	2.5	3.3	25	0.3	0.50	23
AUG										
16...	520	20	2	3.8	2.5	3.7	28	0.4	0.40	21

K Results based on colony count outside acceptable range (non-ideal colony count).

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
26...	0	13	8	5.8	3.2	0.10	9.2	31	33
DEC									
28...	0	15	17	5.6	3.6	0.10	12	38	38
FEB									
29...	0	12	10	4.4	3.4	0.10	9.1	28	31
APR									
26...	0	22	21	3.4	4.2	0.10	14	44	47
JUN									
13...	0	21	19	3.5	4.1	0.40	13	41	45
AUG									
16...	1	18	17	2.8	4.1	<0.10	12	42	41

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT									
26...	0.04	<0.100	<0.010	0.020	--	<0.20	<0.010	<0.010	<0.010
DEC									
28...	0.05	<0.100	<0.010	<0.010	--	<0.20	0.010	<0.010	<0.010
FEB									
29...	0.04	<0.100	0.020	0.040	0.28	0.30	<0.010	0.020	0.010
APR									
26...	0.06	0.140	0.020	<0.010	0.18	0.20	0.010	<0.010	<0.010
JUN									
13...	0.06	0.110	0.020	<0.010	--	<0.20	0.010	<0.010	0.060
AUG									
16...	0.06	0.140	<0.010	0.040	--	0.40	0.010	0.010	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
DEC											
28...	0815	20	<1	<2	<0.5	<1	1	<3	4	38	<5
FEB											
29...	0830	<10	<1	<2	<0.5	<1	<1	<3	5	66	<5
JUN											
13...	0900	30	<1	<2	<0.5	<1	1	<3	2	56	<5
AUG											
16...	1015	30	<1	<2	<0.5	<1	<1	<3	1	46	<5

< Actual value is known to be less than the value shown.

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC										
28...	<4	3	<0.1	<10	1	2	<1.0	21	<6	<3
FEB										
29...	<4	3	<0.1	<10	7	<1	<1.0	17	<6	<3
JUN										
13...	<4	1	0.3	<10	<1	<1	<1.0	27	<6	<3
AUG										
16...	<4	3	<0.1	<10	<1	<1	<1.0	25	<6	7

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
26...	0815	3	3.5	100
DEC				
28...	0815	3	2.2	100
FEB				
29...	0830	1	1.5	100
APR				
26...	0900	1	0.15	100
JUN				
13...	0900	2	0.41	100
AUG				
16...	1015	1	0.28	100

< Actual value is known to be less than the value shown.

16717000 HONOLII STREAM NEAR PAPAIKOU

(Hydrologic bench-mark station)

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi downstream from Pohakupaa Stream, 4.1 mi west of Papaikou, and 4.8 mi northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi^2.

WATER- DISCHARGE RECORDS

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,540 ft, from topographic map. Prior to Aug. 27, 1911, nonrecording gage and Aug. 27, 1911 to Mar. 24, 1913, water-stage recorder, at site 0.5 mi upstream at different datum.

REMARKS.--Records good. No diversion upstream. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft^3/s upstream for fluming cane and domestic use.

AVERAGE DISCHARGE.--22 years, 125 ft^3/s (90,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft^3/s on basis of slope-area measurement at gage height 20.00 ft; minimum, 0.8 ft^3/s, Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 20	2230	10,400	16.44	Dec. 18	1230	5,180	12.65
Dec. 13	0745	*13,900	*17.80	Aug. 6	2000	5,280	12.75

Minimum discharge, 12 ft^3/s, Aug. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1400	128	78	36	27	73	219	273	45	20	15	16
2	783	236	64	66	25	57	200	147	43	15	16	15
3	195	94	54	64	24	45	155	141	31	18	43	15
4	97	74	52	49	24	41	132	169	32	28	28	15
5	71	53	38	52	24	37	216	146	59	79	27	28
6	60	50	76	42	24	43	253	109	41	28	1520	143
7	48	44	95	40	36	35	169	120	50	24	719	56
8	40	43	223	32	84	58	101	120	41	54	134	26
9	37	37	90	30	139	104	76	88	47	187	74	19
10	33	40	62	32	78	45	225	65	58	50	48	16
11	31	79	94	31	101	32	277	54	54	52	143	14
12	30	60	940	27	62	27	89	55	43	37	130	14
13	29	42	4530	25	69	23	69	67	29	29	81	14
14	33	67	208	25	51	21	60	49	24	40	52	12
15	36	41	145	25	156	134	50	46	21	31	44	14
16	30	35	127	28	343	85	43	42	20	23	44	14
17	27	31	103	106	95	45	38	37	29	20	106	19
18	26	30	1600	41	82	35	36	35	43	30	50	15
19	27	31	451	28	57	29	32	30	24	24	36	15
20	45	1660	151	25	43	26	29	27	23	27	46	13
21	54	3360	111	25	37	27	29	28	23	80	34	27
22	248	635	96	25	58	59	76	30	18	33	31	20
23	219	200	76	26	271	118	49	49	17	24	30	17
24	131	245	75	30	203	481	75	44	15	29	23	15
25	105	134	57	32	110	307	52	27	15	26	20	32
26	169	151	58	28	838	203	62	22	14	18	18	136
27	96	106	96	41	275	105	173	22	14	18	18	234
28	79	96	63	90	171	284	145	384	14	19	18	126
29	95	79	54	62	110	291	453	277	16	26	17	76
30	78	136	45	37	---	580	150	74	33	30	17	44
31	71	---	43	28	---	929	---	56	---	18	18	---
TOTAL	4423	8017	9955	1228	3617	4379	3733	2833	936	1137	3600	1220
MEAN	143	267	321	39.6	125	141	124	91.4	31.2	36.7	116	40.7
MAX	1400	3360	4530	106	838	929	453	384	59	187	1520	234
MIN	26	30	38	25	24	21	29	22	14	15	15	12
AC-FT	8770	15900	19750	2440	7170	8690	7400	5620	1860	2260	7140	2420

CAL YR 1987	TOTAL	49854	MEAN	137	MAX	4530	MIN	12	AC-FT	98890
WTR YR 1988	TOTAL	45078	MEAN	123	MAX	4530	MIN	12	AC-FT	89410

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	BARO-METRIC PRES-SURE (MM OF HG)	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (FTU)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
OCT										
07...	0930	--	46	--	--	17.0	--	--	--	--
26...	0715	724	157	25	5.60	17.0	3.3	9.1	99	220
NOV										
06...	0955	--	50	--	--	17.5	--	--	--	--
DEC										
28...	0630	724	59	35	6.30	17.0	1.3	9.1	99	230
28...	0815	--	56	--	--	17.0	--	--	--	--
FEB										
29...	0715	724	125	30	5.90	16.5	0.70	9.2	99	37
APR										
26...	0730	722	29	52	6.90	17.5	0.90	9.0	99	73
MAY										
18...	1030	--	35	--	--	19.5	--	--	--	--
JUN										
03...	1130	--	26	--	--	19.0	--	--	--	--
13...	0800	724	30	49	6.80	18.0	0.80	8.9	99	33
22...	1000	--	19	--	--	19.0	--	--	--	--
JUL										
25...	1450	--	22	--	--	19.0	--	--	--	--
AUG										
16...	0830	724	41	45	6.40	19.5	1.0	8.8	101	51
23...	1100	--	31	--	--	18.0	--	--	--	--

DATE	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3
OCT										
26...	1300	8	2	1.4	0.97	1.6	31	0.3	0.20	9
DEC										
28...	440	15	1	2.9	1.8	2.6	27	0.3	0.40	18
FEB										
29...	390	9	2	1.7	1.1	1.8	30	0.3	0.20	12
APR										
26...	180	20	0	3.9	2.4	2.8	23	0.3	0.20	23
JUN										
13...	920	19	0	3.9	2.3	2.6	22	0.3	0.30	22
AUG										
16...	330	18	0	3.6	2.1	2.6	24	0.3	0.50	19

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY LAB (MG/L AS CACO3)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)
OCT									
26...	0	6.0	7	7.2	2.5	0.10	4.3	20	22
DEC									
28...	0	14	15	6.6	3.0	0.10	9.2	29	35
FEB									
29...	0	7.0	10	5.9	2.6	0.10	5.2	22	23
APR									
26...	0	20	19	4.0	3.1	0.10	11	37	40
JUN									
13...	0	20	18	3.8	2.9	0.30	11	34	39
AUG									
16...	0	18	16	3.2	2.9	<0.10	11	32	37

DATE	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORTHO, DISSOLVED (MG/L AS P)
OCT									
26...	0.03	<0.100	<0.010	0.130	--	0.40	--	<0.010	<0.010
DEC									
28...	0.04	<0.100	0.030	0.090	--	<0.20	0.010	0.010	<0.010
FEB									
29...	0.03	<0.100	0.020	<0.010	0.28	0.30	<0.010	0.030	0.030
APR									
26...	0.05	<0.100	0.070	0.080	--	<0.20	0.020	0.020	<0.010
JUN									
13...	0.05	<0.100	0.030	0.080	0.17	0.20	0.020	0.010	<0.010
AUG									
16...	0.04	<0.100	0.050	0.070	0.25	0.30	0.020	0.020	<0.010

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, DISSOLVED (UG/L AS CU)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)
OCT											
26...	0715	110	<1	<2	<0.5	<1	1	<3	<1	240	<5
FEB											
29...	0715	40	<1	<2	<0.5	<1	<1	<3	3	110	<5
JUN											
13...	0800	60	<1	<2	<0.5	<1	<1	<3	5	120	<5
AUG											
16...	0830	60	1	<2	<0.5	<1	1	<3	5	84	<5

< Actual value is known to be less than the value shown.

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
26...	<4	3	<0.1	<10	1	<1	<1.0	11	<6	3
FEB										
29...	<4	4	<0.1	<10	6	<1	<1.0	12	<6	6
JUN										
13...	<4	2	<0.1	<10	3	<1	1.0	27	<6	<3
AUG										
16...	<4	2	<0.1	<10	3	<1	<1.0	23	<6	6

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT				
26...	0715	5	2.1	100
DEC				
28...	0630	2	0.32	100
FEB				
29...	0715	3	1.0	100
APR				
26...	0730	8	0.63	100
JUN				
13...	0800	2	0.16	100
AUG				
16...	0830	2	0.22	100

< Actual value is known to be less than the value shown.

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft upstream from Upper Hamakua ditch intake and 4.5 mi north of Kamuela.

DRAINAGE AREA.--1.58 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft, from topographic map.

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 14.8 ft^3/s (10,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s Nov. 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft^3/s, Jan. 20, 21, 24-28, Feb. 20-22, 1977, Dec. 16-20, 1977, Feb. 23, 24, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,420 ft^3/s, Nov. 21, gage height, 7.59 ft, no other peak greater than base discharge of 440 ft^3/s; minimum, 0.73 ft^3/s, Oct. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	58	22	7.5	45	1.8	2.8	20	19	5.4	13	2.9	1.3
2	27	40	12	110	1.6	2.0	28	17	10	6.0	5.2	1.6
3	7.1	5.0	12	52	1.4	2.1	32	8.1	12	5.0	4.5	1.6
4	3.2	2.9	5.0	29	1.3	2.8	23	3.9	47	6.3	15	1.4
5	2.1	2.4	6.1	7.8	1.2	3.7	27	11	32	25	34	54
6	1.8	6.0	105	11	1.1	7.0	57	5.7	7.4	23	94	20
7	5.2	9.5	68	6.6	1.7	3.0	16	6.9	15	30	36	6.1
8	2.9	5.4	48	3.2	8.0	5.9	4.8	18	7.1	71	17	3.4
9	2.3	3.0	6.8	75	7.0	4.6	23	5.1	5.3	48	6.3	2.5
10	1.8	27	5.9	22	5.0	2.3	69	3.2	3.4	9.8	3.4	18
11	1.5	52	3.3	16	28	1.8	39	3.1	3.2	27	2.9	20
12	1.3	13	24	9.6	9.9	1.5	6.4	28	3.7	65	6.8	7.3
13	1.2	5.2	109	4.3	18	1.3	3.3	30	5.8	15	11	3.2
14	1.1	10	14	2.7	4.7	18	2.4	5.8	3.3	30	5.6	2.4
15	.93	21	3.9	2.2	2.8	85	2.0	9.8	2.7	13	3.1	2.0
16	.86	20	2.7	48	8.6	11	1.7	4.8	11	6.1	4.5	1.7
17	.79	9.0	2.2	19	3.9	3.3	2.2	6.8	18	6.4	27	1.6
18	.86	53	2.7	3.9	2.7	2.3	3.5	3.1	7.7	30	4.4	2.0
19	5.2	34	2.9	2.8	2.2	2.1	3.4	2.4	7.4	17	2.8	1.8
20	12	100	3.2	2.2	1.8	2.0	2.3	2.3	48	11	2.8	1.6
21	10	290	2.3	1.8	1.6	1.7	25	13	24	18	2.5	9.3
22	34	91	1.9	1.6	2.0	2.2	31	35	20	6.7	3.8	4.9
23	49	44	1.8	6.8	19	3.3	4.2	46	17	3.4	2.6	6.6
24	26	27	1.5	4.8	5.2	3.2	3.9	7.7	27	2.8	2.0	6.2
25	24	13	2.3	9.4	38	2.1	12	3.6	22	2.6	1.8	4.8
26	24	29	11	49	83	1.7	39	2.7	14	2.2	1.6	10
27	9.9	16	6.4	65	25	1.5	30	2.4	41	2.0	1.8	9.5
28	14	15	2.7	30	9.9	1.4	57	30	18	28	2.0	4.9
29	27	11	2.0	7.0	4.8	1.8	63	21	16	18	1.8	3.9
30	17	12	1.8	3.2	---	1.6	21	5.9	14	31	1.6	2.6
31	18	---	1.5	2.2	---	26	---	3.7	---	4.8	1.5	---
TOTAL	390.04	988.4	479.4	653.1	301.2	211.0	652.1	365.0	468.4	577.1	312.2	216.2
MEAN	12.6	32.9	15.5	21.1	10.4	6.81	21.7	11.8	15.6	18.6	10.1	7.21
MAX	58	290	109	110	83	85	69	46	48	71	94	54
MIN	.79	2.4	1.5	1.6	1.1	1.3	1.7	2.3	2.7	2.0	1.5	1.3
AC-FT	774	1960	951	1300	597	419	1290	724	929	1140	619	429

CAL YR 1987	TOTAL	6616.46	MEAN	18.1	MAX	290	MIN	.67	AC-FT	13120
WTR YR 1988	TOTAL	5614.14	MEAN	15.3	MAX	290	MIN	.79	AC-FT	11140

16720300 KAWAIKI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'13", long 155°40'59", Hydrologic Unit 20010000, on right bank 0.2 mi upstream from Upper Hamakua ditch intake and 4.4 mi north of Kamuela.

DRAINAGE AREA.--0.45 mi^2.

PERIOD OF RECORD.--June 1968 to current year.

REVISED RECORDS.--WDR HI-80-1: 1969-79(P).

GAGE.--Water-stage recorder. Elevation of gage is 4,090 ft, from topographic map.

REMARKS.--Records good. No diversion upstream. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years, 4.25 ft^3/s (3,080 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft^3/s Nov. 18, 1979, gage height, 8.32 ft, from rating curve extended above 33 ft^3/s on basis of slope-area measurement at gage height 8.32 ft; minimum, 0.01 ft^3/s, Mar. 10-15, 1983.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Date	Time	(ft3/s)	(ft)	Date	Time	(ft3/s)	(ft)
Nov. 21	0130	*535	*5.34	Sept. 5	1730	109	2.77

Minimum discharge, 0.12 ft^3/s, Oct. 15-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	7.0	1.4	9.2	.34	.56	6.0	4.1	2.0	3.4	.47	.18
2	6.1	9.0	2.9	29	.30	.42	7.6	3.5	5.8	1.9	2.0	.25
3	1.6	.82	3.5	11	.27	.52	6.9	1.6	7.0	1.4	1.3	.22
4	.62	.41	1.2	6.5	.23	.78	5.7	.76	16	1.9	5.4	.19
5	.43	.31	1.8	2.2	.23	1.1	7.0	3.5	6.8	6.7	9.1	17
6	2.1	2.2	16	3.5	.23	1.7	16	1.3	1.4	5.7	26	4.0
7	1.8	3.1	16	2.0	.55	.84	3.7	2.0	2.8	6.0	7.9	1.2
8	.55	1.2	9.5	.59	2.4	2.2	.79	4.1	1.4	16	4.1	.53
9	.37	.55	1.2	21	2.1	1.6	4.4	.96	1.1	11	1.4	.33
10	.23	9.4	1.2	8.1	1.4	.59	15	.55	.70	2.2	.60	4.9
11	.18	14	.60	4.8	6.3	.44	9.7	.53	1.1	5.8	.54	4.2
12	.16	2.5	5.3	2.7	2.6	.35	1.1	9.3	.89	15	2.8	1.4
13	.15	.96	28	1.1	3.8	.31	.49	6.0	3.3	3.3	3.3	.45
14	.14	2.7	2.7	.53	.96	5.8	.34	1.3	1.1	6.8	1.4	.31
15	.14	3.3	.75	.42	.53	23	.26	2.6	.51	3.4	.61	.22
16	.12	3.5	.50	11	2.1	2.8	.22	1.2	4.8	1.6	1.3	.20
17	.12	2.0	.40	3.8	.73	.80	.54	1.5	5.9	2.3	5.6	.18
18	.16	11	.50	.76	.51	.55	.81	.52	2.3	7.5	.85	.25
19	2.6	7.5	.50	.59	.42	.56	.58	.39	1.8	4.1	.48	.20
20	4.0	31	.55	.42	.34	.57	.34	.47	11	2.9	.47	.19
21	3.2	71	.45	.34	.30	.46	7.5	6.3	3.9	5.0	.42	2.4
22	9.3	25	.35	.28	1.1	.63	6.2	7.1	5.0	1.8	1.0	1.1
23	12	7.2	.31	1.9	6.2	.69	.62	11	4.2	.65	.48	1.2
24	5.1	4.8	.27	1.3	1.6	.72	.59	1.8	7.0	.54	.35	1.1
25	7.4	2.9	.77	2.6	14	.49	1.8	.55	4.5	.50	.24	1.1
26	5.5	4.8	3.1	14	22	.40	10	.85	3.9	.41	.18	2.6
27	2.2	3.1	1.2	15	6.5	.36	6.6	1.0	9.0	.41	.28	2.7
28	3.7	4.0	.55	6.2	2.5	.36	14	9.2	3.5	7.0	.30	1.1
29	5.6	2.7	.35	1.8	1.2	.88	15	8.1	4.2	4.8	.27	.80
30	3.8	2.5	.31	.62	---	1.0	4.5	1.4	3.4	7.1	.22	.39
31	4.4	---	.27	.41	---	8.5	---	1.0	---	.91	.20	---
TOTAL	101.77	240.45	102.43	163.66	81.74	59.98	154.28	94.48	126.30	138.02	79.56	50.89
MEAN	3.28	8.01	3.30	5.28	2.82	1.93	5.14	3.05	4.21	4.45	2.57	1.70
MAX	18	71	28	29	22	23	16	11	16	16	26	17
MIN	.12	.31	.27	.28	.23	.31	.22	.39	.51	.41	.18	.18
AC-FT	202	477	203	325	162	119	306	187	251	274	158	101

CAL YR 1987	TOTAL	1583.32	MEAN	4.34	MAX	71	MIN	.12	AC-FT	3140
WTR YR 1988	TOTAL	1393.56	MEAN	3.81	MAX	71	MIN	.12	AC-FT	2760

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 mi north of Kamuela.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 4,020 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 7.17 ft^3/s (5,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s, Nov. 2, 1967; no flow Nov. 18, 1979 to Oct. 23, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 19 ft^3/s, Nov. 21, Dec. 13, Jan. 2; minimum daily, 0.67 ft^3/s, Oct. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	12	2.9	9.5	2.1	3.5	16	16	10	14	2.9	.89
2	16	16	6.0	19	1.7	1.9	14	16	14	10	7.2	1.4
3	9.7	7.4	6.5	18	1.4	2.3	17	11	12	9.0	7.4	1.2
4	3.6	3.2	2.6	18	1.3	3.8	17	6.0	18	7.7	15	.94
5	2.1	2.6	3.6	13	1.1	5.3	18	14	17	17	17	7.6
6	4.9	9.5	14	15	1.0	11	18	9.2	11	15	18	16
7	8.1	12	17	11	2.8	4.1	16	8.6	12	16	17	9.8
8	3.5	7.4	12	4.7	9.3	8.2	8.2	16	11	17	16	4.7
9	2.4	3.0	2.9	15	11	7.7	8.4	7.8	7.8	17	9.8	2.5
10	1.5	9.0	2.7	16	5.9	2.7	18	4.4	4.6	11	4.3	5.5
11	1.1	18	3.2	16	18	1.6	18	4.0	4.0	16	3.1	16
12	.94	13	9.1	14	14	1.2	10	14	5.3	17	8.6	11
13	.89	7.2	19	8.0	16	.89	4.7	17	9.5	16	13	3.9
14	.78	7.5	15	3.8	7.1	6.0	2.5	9.5	4.3	17	8.9	2.3
15	.72	15	6.6	2.9	3.8	18	1.5	13	2.9	15	3.6	1.5
16	.67	16	3.5	14	12	13	1.1	7.9	8.4	10	5.9	1.2
17	.67	9.8	2.7	16	5.6	4.8	2.6	9.6	15	11	16	.89
18	.84	18	3.4	6.4	3.5	2.7	6.2	3.8	12	16	5.9	1.6
19	8.8	17	3.6	4.1	2.9	2.5	5.2	2.3	8.0	16	2.7	1.2
20	14	18	4.8	2.9	2.1	2.4	2.4	2.4	18	14	2.9	1.0
21	13	19	2.9	2.1	1.7	1.6	13	16	16	16	2.3	10
22	16	17	2.1	1.7	3.5	2.6	16	17	17	12	5.5	7.6
23	16	14	1.7	9.5	16	4.9	6.6	18	11	8.9	2.5	10
24	16	10	1.4	8.6	8.8	4.4	5.0	11	14	5.9	1.4	9.6
25	16	5.2	2.4	12	9.2	2.1	15	4.7	11	3.8	1.0	7.9
26	16	9.3	15	13	18	1.4	16	2.7	9.4	2.1	.89	11
27	13	5.8	11	18	17	1.1	17	2.5	16	1.9	1.4	14
28	15	8.3	3.6	17	14	1.0	18	11	9.8	13	1.7	8.6
29	16	4.8	2.3	11	7.2	2.5	18	15	8.1	16	1.4	6.0
30	15	4.0	1.7	4.4	---	3.0	17	9.5	8.5	16	1.2	2.6
31	15	---	1.4	4.0	---	17	---	5.9	---	7.1	.94	---
TOTAL	264.21	319.0	186.6	328.6	218.0	145.19	346.4	305.8	325.6	384.4	205.43	178.42
MEAN	8.52	10.6	6.02	10.6	7.52	4.68	11.5	9.86	10.9	12.4	6.63	5.95
MAX	16	19	19	19	18	18	18	18	18	17	18	16
MIN	.67	2.6	1.4	1.7	1.0	.89	1.1	2.3	2.9	1.9	.89	.89
AC-FT	524	633	370	652	432	288	687	607	646	762	407	354

CAL YR 1987	TOTAL	2924.80	MEAN	8.01	MAX	20	MIN	.45	AC-FT	5800
WTR YR 1988	TOTAL	3207.65	MEAN	8.76	MAX	19	MIN	.67	AC-FT	6360

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155°40'26", Hydrologic Unit 20010000, on right bank 0.1 mi upstream from Alakahi Stream and 3.6 mi north of Kamuela.

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,890 ft, from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years, 4.89 ft^3/s (3,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s Aug. 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 18 ft^3/s Nov. 21; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	2.5	1.1	2.3	.30	.86	5.6	8.2	4.0	5.5	1.6	.01
2	3.5	3.8	1.9	9.7	.13	.33	5.1	8.0	5.4	4.2	2.6	.11
3	1.9	1.6	2.4	7.2	.03	.31	6.8	5.7	4.9	3.7	3.0	.08
4	.35	.45	.98	6.3	.00	.80	6.6	3.1	8.4	2.9	5.8	.02
5	.00	.22	.98	4.2	.00	.83	7.2	5.9	7.4	6.6	7.9	2.7
6	.03	1.6	8.3	4.4	.00	2.3	9.1	4.5	4.7	6.0	11	5.2
7	.06	2.2	7.7	3.5	.04	.98	6.1	3.7	4.8	7.2	8.5	3.3
8	.16	1.5	5.5	1.5	1.6	1.7	3.0	7.5	4.4	8.6	7.3	1.7
9	.01	.40	1.8	7.5	2.5	2.0	2.9	3.9	3.3	9.0	4.5	.77
10	.00	2.0	1.5	6.5	.93	.54	8.5	2.3	2.0	5.1	2.3	1.5
11	.00	4.5	1.2	6.1	4.4	.12	8.1	2.2	1.7	7.7	1.7	4.7
12	.00	3.1	2.7	4.9	3.4	.01	4.0	6.5	2.2	9.9	3.2	3.4
13	.00	1.5	9.9	2.9	3.9	.01	2.2	8.0	3.4	7.5	5.2	1.5
14	.00	1.8	5.6	1.4	1.8	1.2	1.6	4.3	2.0	8.5	3.6	.76
15	.00	3.5	2.8	.83	.65	7.7	1.0	5.7	1.3	7.2	1.9	.35
16	.00	3.6	1.6	4.5	2.2	3.7	.70	3.3	3.1	5.0	1.9	.20
17	.00	1.9	1.0	5.0	1.3	1.4	1.2	4.4	5.7	4.9	5.6	.09
18	.00	4.8	1.1	2.2	.46	.55	2.7	1.9	4.5	8.4	2.7	.19
19	.10	4.5	1.0	1.3	.20	.33	2.5	1.2	2.8	7.2	1.3	.14
20	1.2	6.3	1.4	.68	.04	.33	1.2	1.1	7.6	6.5	1.2	.06
21	1.1	18	.72	.33	.00	.08	5.5	5.5	6.7	8.0	.93	1.8
22	2.2	11	.36	.16	.13	.21	7.9	7.2	6.7	5.0	1.8	1.9
23	3.2	7.4	.19	1.6	3.6	.51	3.2	7.8	5.0	2.5	1.1	2.5
24	2.7	4.8	.08	2.0	1.9	.88	2.0	4.7	5.8	1.7	.47	2.5
25	3.0	2.9	.22	2.6	3.4	.19	5.8	2.2	5.2	1.4	.23	2.3
26	3.1	3.8	2.8	4.9	8.7	.03	8.1	1.3	3.5	.95	.11	2.7
27	2.4	2.6	2.5	7.4	5.1	.01	8.7	1.1	6.8	.82	.23	4.0
28	2.7	3.2	.78	5.6	3.9	.01	11	4.9	4.5	5.4	.35	2.5
29	3.0	2.2	.26	3.5	2.1	.03	11	6.4	3.4	6.8	.25	2.0
30	3.0	1.7	.09	1.5	---	.11	8.4	3.9	3.9	7.1	.14	.81
31	3.0	---	.01	.64	---	5.9	---	2.5	---	3.3	.06	---
TOTAL	40.51	109.37	68.47	113.14	52.71	33.96	157.70	138.9	135.1	174.57	88.47	49.79
MEAN	1.31	3.65	2.21	3.65	1.82	1.10	5.26	4.48	4.50	5.63	2.85	1.66
MAX	3.8	18	9.9	9.7	8.7	7.7	11	8.2	8.4	9.9	11	5.2
MIN	.00	.22	.01	.16	.00	.01	.70	1.1	1.3	.82	.06	.01
AC-FT	80	217	136	224	105	67	313	276	268	346	175	99

CAL YR 1987	TOTAL	1385.63	MEAN	3.80	MAX	22	MIN	.00	AC-FT	2750
WTR YR 1988	TOTAL	1162.69	MEAN	3.18	MAX	18	MIN	.00	AC-FT	2310

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Hydrologic Unit 20010000, on right bank 25 ft upstream from upper Hamakua ditch intake and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 3,900 ft, from topographic map.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 6.89 ft^3/s (4,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,170 ft^3/s Nov. 18, 1979, gage height, 9.90 ft, from rating curve extended above 28 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft; minimum, 0.03 ft^3/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 900 ft^3/s, Nov. 21, gage height, 7.65 ft, no other peak greater than base discharge of 120 ft^3/s; minimum, 0.95 ft^3/s, Oct. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	10	3.2	15	1.8	2.4	8.4	8.6	3.9	6.3	2.0	.77
2	13	17	5.5	48	1.5	1.9	9.7	8.2	5.8	4.0	2.8	.84
3	3.9	3.6	6.3	23	1.4	1.8	13	5.0	5.6	3.5	3.1	.83
4	2.7	2.7	3.5	14	1.3	1.7	13	2.8	21	3.1	8.2	.76
5	2.0	2.4	3.4	5.1	1.2	1.8	14	7.8	12	7.9	16	21
6	3.7	4.0	47	5.2	1.2	3.2	29	4.0	3.6	8.8	44	6.5
7	4.5	5.9	32	4.2	1.4	2.3	7.5	3.7	4.5	11	15	3.2
8	2.6	3.9	18	2.6	3.3	3.4	3.5	7.8	3.2	23	6.9	2.3
9	2.2	2.7	3.9	32	4.2	3.4	5.0	3.3	2.3	20	3.6	1.6
10	1.6	16	3.4	15	2.6	2.0	26	2.4	1.9	4.0	2.4	6.9
11	1.3	24	2.6	12	11	1.6	20	2.2	1.7	9.8	2.0	7.0
12	1.1	5.5	9.1	7.2	5.1	1.4	4.1	11	2.0	27	4.8	3.5
13	1.0	3.6	48	5.7	6.3	1.2	2.8	11	3.1	5.9	6.2	2.2
14	.99	9.9	6.8	4.4	3.2	6.4	2.3	3.6	2.2	12	2.9	1.6
15	.98	6.7	3.0	2.1	2.3	39	2.0	5.0	1.8	6.1	2.1	1.4
16	.90	5.6	2.4	18	3.2	6.0	1.7	3.0	7.1	3.8	2.1	1.2
17	.87	3.9	2.0	10	2.6	2.8	2.0	4.0	9.8	4.8	8.7	1.0
18	1.0	20	2.0	4.0	1.9	2.1	2.9	2.4	4.9	14	2.7	1.0
19	4.7	13	1.9	2.5	1.8	2.0	2.5	1.8	3.0	6.7	1.8	1.0
20	8.0	53	2.0	2.0	1.6	1.9	2.0	1.9	20	5.1	1.5	.95
21	5.8	106	1.8	1.8	1.4	1.6	11	6.3	7.6	8.9	1.4	2.3
22	16	44	1.7	1.5	1.6	1.6	14	12	8.8	4.1	1.8	2.2
23	24	18	1.5	2.6	9.1	1.6	3.3	14	7.2	2.6	1.5	2.8
24	9.5	8.8	1.3	3.2	4.5	1.6	2.5	3.9	13	2.2	1.3	2.5
25	15	5.3	1.6	4.7	18	1.4	4.0	2.4	9.6	2.2	1.0	3.9
26	12	8.0	5.1	20	39	1.2	17	1.9	6.1	1.7	.91	4.9
27	4.8	5.1	3.7	29	11	1.2	15	1.8	16	1.6	.94	4.9
28	6.8	7.5	2.1	12	4.9	1.1	28	14	7.1	11	1.2	3.4
29	9.0	5.3	1.7	5.5	3.2	1.7	32	7.3	6.7	9.7	1.1	2.4
30	6.8	3.8	1.5	2.7	---	2.5	9.4	3.0	6.2	12	.93	2.0
31	8.1	---	1.3	2.0	---	15	---	2.7	---	2.9	.84	---
TOTAL	201.84	425.2	229.3	317.0	151.6	118.8	307.6	168.8	207.7	245.7	151.72	96.85
MEAN	6.51	14.2	7.40	10.2	5.23	3.83	10.3	5.45	6.92	7.93	4.89	3.23
MAX	27	106	48	48	39	39	32	14	21	27	44	21
MIN	.87	2.4	1.3	1.5	1.2	1.1	1.7	1.8	1.7	1.6	.84	.76
AC-FT	400	843	455	629	301	236	610	335	412	487	301	192

CAL YR 1987	TOTAL	3104.46	MEAN	8.51	MAX	106	MIN	.87	AC-FT	6160
WTR YR 1988	TOTAL	2622.11	MEAN	7.16	MAX	106	MIN	.76	AC-FT	5200

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155°37'40", Hydrologic Unit 20010000, on left bank 120 ft upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft, from topographic map.

REMARKS.--Records fair except for periods when the control was partially submerged and for estimated daily discharges, which are poor. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 11.5 ft^3/s (8,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 57 ft^3/s, Mar. 6, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 54 ft^3/s Jan. 2; minimum daily, 0.25 ft^3/s, July 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	26	22	22	2.4	9.9	28	e15	28	33	9.3	.69
2	32	39	25	54	1.8	2.5	27	e12	35	26	12	.63
3	8.2	13	31	49	1.4	2.1	36	8.0	32	25	20	.32
4	3.7	1.4	24	43	1.1	2.5	34	24	45	20	34	.26
5	2.1	1.2	23	30	1.1	4.8	38	23	39	34	44	10
6	7.9	8.0	48	32	.95	20	e35	23	28	30	48	26
7	14	25	49	27	1.1	11	e15	21	27	29	41	11
8	2.8	20	42	18	8.6	16	e8.0	20	26	38	36	4.5
9	1.9	5.3	27	43	16	16	e9.0	20	21	41	26	2.7
10	1.3	22	24	39	4.9	2.8	e30	19	17	29	18	11
11	.98	47	21	33	33	1.6	e25	19	14	17	16	26
12	.78	31	26	22	25	1.2	e7.0	34	17	1.7	28	24
13	.62	22	53	18	26	1.0	e5.0	41	22	.25	28	14
14	.57	22	35	14	16	15	e4.5	27	18	.31	21	3.9
15	.52	31	22	8.0	3.4	52	e4.0	31	13	13	11	2.1
16	.47	33	15	26	11	31	e3.0	24	18	18	22	1.5
17	.43	27	7.0	25	7.4	17	e3.5	27	36	23	28	1.2
18	.91	46	8.0	18	2.2	5.2	e4.0	18	28	41	11	1.2
19	16	39	7.7	17	1.6	2.6	e3.5	13	19	25	3.0	1.2
20	21	41	16	6.9	1.2	2.4	e3.0	11	43	6.4	2.7	1.0
21	9.8	49	6.8	2.5	1.0	1.8	e15	30	39	.27	3.8	4.8
22	25	43	2.6	1.9	10	1.6	e20	38	37	5.0	2.8	3.6
23	43	39	2.0	9.2	39	1.8	e7.0	39	33	5.5	1.9	4.7
24	32	38	1.5	18	24	2.1	e4.0	28	36	4.1	1.4	4.9
25	35	31	3.7	21	23	1.4	e8.0	19	35	3.8	1.2	6.8
26	35	32	25	35	51	1.1	e25	14	29	3.0	1.1	17
27	23	29	23	41	38	.86	e20	10	37	2.6	1.3	23
28	26	31	7.6	26	27	.78	e35	26	33	27	1.2	18
29	29	29	2.1	14	21	.95	e40	34	30	36	1.1	19
30	29	25	1.5	15	---	1.8	e20	25	32	36	.86	8.7
31	31	---	1.2	3.7	---	30	---	23	---	21	.71	---
TOTAL	475.98	845.9	602.7	732.2	400.15	260.79	516.5	716.0	867	594.93	476.37	253.70
MEAN	15.4	28.2	19.4	23.6	13.8	8.41	17.2	23.1	28.9	19.2	15.4	8.46
MAX	43	49	53	54	51	52	40	41	45	41	48	26
MIN	.43	1.2	1.2	1.9	.95	.78	3.0	8.0	13	.25	.71	.26
AC-FT	944	1680	1200	1450	794	517	1020	1420	1720	1180	945	503

CAL YR 1987	TOTAL	6191.10	MEAN	17.0	MAX	53	MIN	.30	AC-FT	12280
WTR YR 1988	TOTAL	6742.22	MEAN	18.4	MAX	54	MIN	.25	AC-FT	13370

e Estimated

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft downstream from pipe railed bridge and 4.0 mi northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,890 ft, from topographic map.

REMARKS.--Records good. Ditch diverts into Waimea Reservoir for use in vicinity of Kamuela. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--11 years, 2.75 ft^3/s (1,990 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s Apr. 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 34 ft^3/s MAR. 15; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	8.7	3.6	7.5	.27	1.0	8.2	.00	.00	.00	.00	.00
2	8.8	20	5.4	20	.08	.04	7.6	.00	.00	.00	.00	.00
3	.01	2.3	10	20	.10	.02	18	.00	.00	.00	.00	.00
4	.01	.01	5.4	18	.08	.41	16	.00	.00	.00	.00	.00
5	.01	.00	4.1	12	.00	.24	22	.00	.00	.00	.00	.00
6	1.9	.55	18	12	.00	3.5	16	.00	.00	.00	.00	.00
7	2.0	5.2	20	7.7	.00	1.2	3.8	.00	.00	.00	.00	.00
8	.02	2.5	15	3.0	.40	1.9	3.6	.00	.00	.00	.00	.00
9	.00	.30	7.3	9.3	1.3	2.1	2.9	.00	.00	.00	.00	.00
10	.00	11	5.2	10	.07	.81	18	.00	.00	.00	.00	.00
11	.00	30	3.2	8.6	14	.02	15	.00	.00	.00	.00	.00
12	.00	11	5.1	5.8	6.9	.00	6.8	.00	.00	.00	.00	.00
13	.00	4.0	14	3.8	6.9	.00	2.7	.00	.00	.00	.00	.00
14	.00	3.4	12	2.1	2.3	7.1	1.2	.00	.00	.00	.00	.00
15	.00	12	6.6	2.5	.84	34	.54	.00	.00	.00	.00	.00
16	.00	16	4.2	5.5	.71	14	.00	.00	.00	.00	.00	.00
17	.00	11	3.0	7.3	1.0	4.1	.00	.00	.00	.00	.00	.00
18	.00	32	2.8	4.1	.15	1.5	.00	.00	.00	.00	.00	.00
19	3.2	17	2.6	4.0	.00	.45	.00	.00	.00	.00	.00	.00
20	5.9	10	3.5	1.9	.00	.14	.00	.00	.00	.00	.00	.00
21	.00	8.6	2.4	.52	.00	.05	.00	.00	.00	.00	.00	.00
22	12	7.7	1.4	.01	5.7	.15	.00	.00	.00	.00	.00	.00
23	26	14	.60	.50	20	.02	.00	.00	.00	.00	.00	.00
24	14	18	.17	3.5	7.3	.00	.00	.00	.00	.00	.00	.00
25	18	11	.11	5.6	11	.13	.00	.00	.00	.00	.00	.00
26	15	12	6.8	7.5	24	.00	.00	.00	.00	.00	.00	.00
27	3.8	8.3	5.6	10	16	.00	.00	.00	.00	.00	.00	.00
28	5.8	11	.88	8.3	9.2	.00	.00	.00	.00	.00	.00	.00
29	7.5	8.9	.27	4.1	3.8	.00	.00	.00	.00	.00	.00	.00
30	8.9	5.3	.00	3.2	---	.00	.00	.00	.00	.00	.00	.00
31	11	---	.00	.88	---	8.2	---	.00	---	.00	.00	---
TOTAL	159.85	301.76	169.23	209.21	132.10	81.08	142.34	.00	.00	.00	.00	.00
MEAN	5.16	10.1	5.46	6.75	4.56	2.62	4.74	.00	.00	.00	.00	.00
MAX	26	32	20	20	24	34	22	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	317	599	336	415	262	161	282	.00	.00	.00	.00	.00

CAL YR 1987	TOTAL	1910.71	MEAN	5.23	MAX	32	MIN	.00	AC-FT	3790
WTR YR 1988	TOTAL	1195.57	MEAN	3.27	MAX	34	MIN	.00	AC-FT	2370

16756000 KOHAKOHAU STREAM NEAR KAMUELA

LOCATION.--Lat 20°02'38", long 155°41'10", Hydrologic Unit 20010000, on left bank 0.6 mi upstream from Oolamakapehu Gulch and 1.7 mi northwest of Kamuela.

DRAINAGE AREA.--2.51 mi^2.

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft above mean sea level (by stadia survey by State Department of Land and Natural Resources). Prior to Jan. 11, 1967, at site 0.5 mi upstream at different datum.

REMARKS.--Records good. Parker Ranch pipeline diverts upstream at elevation 4,250 ft. Hawaii Department of Water Supply diverts by pipeline 0.3 mi upstream at elevation 3,400 ft for domestic use in the Kamuela and Kawaihae areas since Aug. 20, 1973. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--32 years, 8.41 ft^3/s (6,090 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft^3/s, Aug. 7, 1958, gage height, 10.76 ft, site and datum then in use, from rating curve extended above 70 ft^3/s by test of model of station site; no flow at times in 1968, 1971-88.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 902 ft^3/s, Nov. 21, gage height, 5.28 ft, no other peak greater than base discharge of 310 ft^3/s; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	2.7	.24	16	.04	.00	.48	1.5	.00	2.4	.10	.00
2	5.3	24	.60	66	.03	.00	.42	3.2	2.0	.16	.00	.00
3	.00	.02	3.3	29	.03	.00	13	.76	2.1	.01	.03	.00
4	.00	.00	.74	16	.03	.00	3.3	.34	23	.00	3.2	.00
5	.00	.00	.22	.50	.02	.00	7.2	18	20	3.2	17	11
6	.00	.00	64	.07	.01	.00	35	1.1	2.0	7.1	61	3.3
7	.00	.00	58	.05	.02	.00	3.2	.13	1.9	22	28	.00
8	.00	.00	42	.04	.05	.00	.01	2.1	1.3	26	10	.00
9	.00	.00	5.6	43	.05	.00	.00	.13	.04	38	2.9	.00
10	.00	7.1	2.4	22	.05	.00	29	.02	.00	1.2	.64	4.9
11	.00	22	1.2	19	2.3	.00	28	.02	.00	4.0	.09	.92
12	.00	1.6	7.3	4.4	.47	.00	.10	5.9	.04	40	.10	.01
13	.00	.00	98	2.2	.56	.00	.00	15	.05	5.9	3.8	.00
14	.00	.08	20	.88	.11	.00	.00	.20	.02	8.4	.94	.00
15	.00	9.8	4.4	.22	.02	42	.00	.25	.01	3.9	.15	.00
16	.00	.01	2.5	12	.01	2.9	.00	.02	.36	.06	.01	.00
17	.00	.00	1.8	12	.01	.01	.00	.04	8.0	1.0	7.0	.00
18	.00	11	1.7	.06	.01	.00	.00	.05	1.5	16	1.4	.00
19	.00	5.3	1.5	.02	.00	.00	.00	.00	.04	3.7	.13	.00
20	.00	24	1.9	.01	.00	.00	.00	.00	22	1.8	.01	.00
21	.00	187	1.2	.01	.00	.00	2.3	.21	9.7	3.8	.00	.00
22	4.2	68	.92	.01	.00	.00	15	14	4.9	1.0	.00	.00
23	23	43	.73	.01	1.6	.00	.02	21	5.6	.02	.00	.00
24	.09	24	.60	.02	.10	.00	.00	2.5	8.8	.00	.00	.00
25	2.9	7.8	.61	.05	12	.00	.00	.04	12	.00	.00	.00
26	6.1	7.7	2.7	16	57	.00	9.7	.00	1.8	.00	.00	.00
27	.00	1.3	2.6	45	9.4	.00	16	.00	13	.00	.00	.00
28	.00	2.2	1.1	13	.07	.00	27	6.5	10	4.3	.00	.00
29	.71	1.4	.54	.17	.00	.00	50	8.1	1.3	7.9	.00	.00
30	.01	.11	.03	.06	---	.00	4.8	.25	3.7	14	.00	.00
31	1.3	---	.01	.05	---	1.5	---	.01	---	1.7	.00	---
TOTAL	54.61	450.12	328.44	317.83	83.99	46.41	244.53	101.37	155.16	217.55	136.50	20.13
MEAN	1.76	15.0	10.6	10.3	2.90	1.50	8.15	3.27	5.17	7.02	4.40	.67
MAX	23	187	98	66	57	42	50	21	23	40	61	11
MIN	.00	.00	.01	.01	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	108	893	651	630	167	92	485	201	308	432	271	40

CAL YR 1987	TOTAL	3070.18	MEAN	8.41	MAX	187	MIN	.00	AC-FT	6090
WTR YR 1988	TOTAL	2156.64	MEAN	5.89	MAX	187	MIN	.00	AC-FT	4280

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02'48", long 155°39'58", Hydrologic Unit 20010000, on right bank 160 ft upstream from Marine Dam, 0.4 mi east of Puu Ohu, and 1.6 mi north of Kamuela.

DRAINAGE AREA.--1.18 mi^2.

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,460 ft, from topographic map.

REMARKS.--Records good. Diversion upstream for livestock and domestic use. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--41 years, 9.04 ft^3/s (6,550 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft^3/s Nov. 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft^3/s on basis of computations of flow over dam at gage heights 5.46 ft and 5.96 ft; minimum, 0.59 ft^3/s Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 681 ft^3/s, Nov. 21, gage height, 4.54 ft, no other peak greater than base discharge of 180 ft^3/s; minimum 1.2 ft^3/s, Oct. 16, 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	8.3	4.5	16	3.7	3.9	6.9	14	8.4	14	5.1	3.2
2	18	20	5.5	73	3.3	3.5	7.0	17	13	9.1	6.0	3.3
3	6.1	4.7	9.0	34	3.1	3.6	12	12	13	8.3	6.2	3.2
4	4.1	1.6	5.4	24	2.9	3.4	13	8.3	34	7.3	15	3.2
5	2.8	3.1	5.9	9.5	2.7	3.9	14	18	21	13	29	12
6	2.0	3.8	54	9.0	2.8	5.3	35	9.6	9.0	15	63	12
7	2.0	6.4	48	6.6	3.4	4.4	11	8.3	9.4	17	24	7.4
8	1.9	4.6	34	4.6	4.0	4.4	6.0	11	7.5	32	14	5.0
9	1.7	3.0	8.5	57	4.5	3.5	5.7	7.1	5.9	29	8.7	4.1
10	1.6	19	6.3	25	3.6	3.1	26	6.8	5.3	10	6.5	15
11	1.8	29	4.9	18	11	3.1	29	7.0	5.2	15	6.0	14
12	1.5	9.6	8.1	9.4	7.0	3.0	8.0	20	5.3	36	7.6	7.8
13	1.3	4.7	72	6.6	6.0	2.6	5.6	20	6.3	12	11	4.9
14	1.3	4.3	13	4.8	4.5	11	4.6	8.6	5.5	18	7.2	4.1
15	1.4	6.7	6.5	4.2	3.6	63	4.1	9.1	4.9	12	5.5	3.8
16	1.4	9.8	5.1	18	3.5	12	3.9	7.0	9.2	8.5	5.7	3.5
17	1.4	6.1	4.4	13	3.3	5.6	4.3	7.8	17	12	13	3.4
18	1.8	30	4.4	5.9	3.0	4.3	4.2	5.6	8.8	27	6.0	3.6
19	7.1	15	4.2	5.0	2.9	3.9	3.8	5.1	6.7	12	4.9	3.3
20	9.1	25	4.6	4.1	2.9	3.7	3.6	5.2	25	10	4.5	3.1
21	5.1	155	3.8	3.6	3.0	3.4	13	9.0	12	14	4.3	3.4
22	14	52	3.4	3.1	4.6	3.1	17	18	15	8.7	4.4	3.2
23	28	28	3.1	4.0	18	3.2	5.7	16	13	6.3	4.0	3.3
24	9.0	14	2.8	4.0	7.0	3.1	4.9	8.5	19	5.4	4.0	3.6
25	15	9.4	3.2	6.5	24	2.9	5.7	6.1	17	4.9	3.8	4.9
26	11	7.9	6.4	31	61	3.0	27	5.3	11	4.5	3.6	7.0
27	4.7	6.5	5.3	41	15	3.1	24	5.1	16	4.3	3.7	8.8
28	5.0	7.5	3.5	16	7.5	3.0	45	16	14	15	3.6	5.9
29	5.3	6.6	2.9	7.1	5.0	2.9	45	12	13	15	3.5	6.1
30	6.5	5.1	2.7	5.0	---	3.1	16	7.3	13	16	3.3	5.3
31	8.7	---	2.7	4.2	---	10	---	6.8	---	6.8	3.3	---
TOTAL	222.6	506.7	348.1	473.2	226.8	192.0	411.0	317.6	363.4	418.1	290.4	171.4
MEAN	7.18	16.9	11.2	15.3	7.82	6.19	13.7	10.2	12.1	13.5	9.37	5.71
MAX	42	155	72	73	61	63	45	20	34	36	63	15
MIN	1.3	1.6	2.7	3.1	2.7	2.6	3.6	5.1	4.9	4.3	3.3	3.1
AC-FT	442	1010	690	939	450	381	815	630	721	829	576	340

CAL YR 1987	TOTAL	4587.3	MEAN	12.6	MAX	155	MIN	1.3	AC-FT	9100
WTR YR 1988	TOTAL	3941.3	MEAN	10.8	MAX	155	MIN	1.3	AC-FT	7820

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft downstream from small tributary and 1.8 mi northeast of Kamuela.

DRAINAGE AREA.--0.47 mi^2.

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

GAGE.--Water-stage recorder. Concrete control since Feb. 27, 1963. Datum of gage is 3,117.42 ft above mean sea level (Hawaii County Department of Water Supply bench mark).

REMARKS.--Records good. Diversion upstream for livestock and domestic use. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--32 years, 1.61 ft^3/s (1,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft^3/s, Nov. 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft^3/s on basis of slope-conveyance study; maximum gage height, 4.65 ft Oct. 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 78 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
NOV. 21	0300	*124	*2.87	Sept. 10	1830	84	2.62

Minimum discharge, 0.28 ft^3/s, Oct. 16-18.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	1.6	.74	2.9	.74	.75	.85	2.3	.84	2.0	.75	.32
2	3.0	3.9	.96	22	.70	.69	.91	3.5	1.6	1.2	.79	.28
3	1.0	.88	1.2	8.2	.67	.68	1.6	1.8	2.7	.97	.72	.28
4	.72	.66	.78	4.4	.64	.64	1.6	1.2	6.2	.94	2.2	.27
5	.59	.60	.77	1.7	.61	.68	2.0	1.8	4.1	2.0	6.3	1.3
6	.52	.61	16	1.9	.59	1.0	4.6	1.2	1.2	2.4	14	.89
7	.47	.85	12	1.2	.67	.77	1.5	1.0	1.0	2.3	4.1	.51
8	.46	.61	7.8	.93	.83	.80	.97	1.2	.82	6.6	2.2	.36
9	.44	.47	1.6	14	.82	.62	1.7	.77	.78	5.6	1.3	.31
10	.41	4.2	1.1	4.7	.68	.63	6.5	.71	.68	2.0	.95	5.6
11	.39	6.5	.87	2.8	1.2	.55	5.2	.68	.71	3.1	.92	2.1
12	.37	1.9	1.5	1.4	.85	.69	1.3	3.6	.60	8.7	1.4	.93
13	.36	1.0	18	1.1	.79	.50	.92	3.1	.66	2.0	1.4	.50
14	.34	.78	2.6	.89	.68	2.4	.79	1.0	.54	3.0	.89	.41
15	.31	.73	1.2	.81	.59	16	.72	1.0	.63	1.9	.74	.35
16	.30	1.2	.93	3.1	.60	2.0	.69	.87	1.6	1.2	.79	.31
17	.28	1.3	.82	2.0	.57	1.1	.78	.98	2.2	1.9	1.5	.29
18	.43	7.5	.84	.98	.55	.83	.68	.70	.74	5.0	.74	.31
19	1.5	2.6	.82	.89	.52	.73	.49	.62	.73	1.8	.65	.27
20	1.4	6.2	.88	.77	.50	.77	.33	.52	4.0	1.4	.58	.25
21	.77	34	.70	.70	.52	.61	1.6	.90	1.8	1.4	.54	.38
22	2.2	11	.63	.67	1.1	.61	2.2	2.3	2.3	1.1	.56	.30
23	5.1	5.6	.56	.73	3.1	.58	.51	2.0	1.3	.85	.48	.30
24	1.6	3.0	.52	.71	1.0	.55	.51	.88	3.3	.80	.45	.30
25	2.5	1.7	.61	.90	7.1	.52	.85	.64	2.1	.75	.45	.34
26	1.8	1.3	.80	9.2	16	.50	5.7	.55	1.5	.71	.43	.87
27	.85	1.0	.73	8.0	2.5	.50	3.1	.50	3.3	.68	.43	1.0
28	.73	1.4	.55	3.2	1.2	.58	8.5	1.7	2.0	1.7	.42	.55
29	.74	1.1	.50	1.3	.88	.50	11	1.3	2.4	1.7	.39	1.6
30	1.0	.82	.48	.93	---	.52	2.3	.77	2.1	2.7	.37	.81
31	1.4	---	.45	.80	---	1.1	---	.70	---	.92	.37	---
TOTAL	40.18	105.01	77.94	103.81	47.20	39.40	70.40	40.79	54.43	69.32	47.81	22.29
MEAN	1.30	3.50	2.51	3.35	1.63	1.27	2.35	1.32	1.81	2.24	1.54	.74
MAX	8.2	34	18	22	16	16	11	3.6	6.2	8.7	14	5.6
MIN	.28	.47	.45	.67	.50	.50	.33	.50	.54	.68	.37	.25
AC-FT	80	208	155	206	94	78	140	81	108	137	95	44

CAL YR 1987	TOTAL	896.85	MEAN	2.46	MAX	37	MIN	.28	AC-FT	1780
WTR YR 1988	TOTAL	718.58	MEAN	1.96	MAX	34	MIN	.25	AC-FT	1430

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, on right bank 0.5 mi upstream from mouth, 6.6 mi northwest of Honuapo, and 6.7 mi west of Punaluu.

DRAINAGE AREA.--9.17 mi^2.

PERIOD OF RECORD.--February 1966 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 2,940 ft, from topographic map.

REMARKS.--Records fair. No diversion upstream. Recording rain gage located at station. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 7.28 ft^3/s (5,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft^3/s Mar. 18, 1980, gage height, 8.00 ft, from rating curve extended above 75 ft^3/s; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 13	0030	1,000	5.93	Jan. 10	1730	850	5.60
Dec. 18	1100	*1,120	*6.17				

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY.	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.69	.04	.00	36	.00	.05	.67	1.8	.00	.00	.00	.00
2	.36	.11	.00	1.9	.00	.00	.06	4.8	.00	.00	.00	.14
3	.48	.09	.00	.33	.00	.00	21	4.7	.00	.00	.00	.12
4	.34	.75	.00	.15	.00	.00	16	5.7	.00	.00	.00	.00
5	.18	.47	.00	.08	.00	.00	4.0	4.2	.47	.00	.00	.05
6	.10	.19	.00	.04	.00	.00	1.3	3.9	.16	.00	.26	.42
7	.03	.11	.00	.00	.00	.00	.75	8.8	1.3	.00	.93	.57
8	.00	.05	.00	.00	.00	.00	.24	4.3	13	.74	.42	.32
9	.00	.00	.00	.00	8.4	.31	30	.94	5.3	.26	.06	.08
10	.00	.00	.00	74	.41	.06	1.9	.66	1.4	.00	.00	.00
11	.00	.00	.00	4.2	.06	.00	.11	.78	1.1	.00	.00	.02
12	.00	.00	168	.54	.04	.00	.00	.67	.61	.00	.74	.79
13	.00	.00	280	.07	.00	.00	.00	.58	.11	.00	.27	.16
14	3.4	.00	12	.04	.00	.00	.00	.44	.00	.00	.89	.00
15	.52	.00	6.7	.04	.00	.00	.00	.35	.00	.00	.24	.00
16	.35	.00	6.1	.05	.00	.00	.00	.30	.00	.00	.00	.03
17	.17	.00	4.1	.19	.00	.00	.00	.20	.00	.00	.01	.04
18	.06	.00	219	.04	4.8	.00	.00	.00	.00	.00	.00	.00
19	.01	.00	38	.05	.40	.00	.00	.00	.00	.00	.00	.01
20	.03	.00	4.3	.04	.04	.00	.00	.00	.00	.00	.00	.01
21	.09	.19	1.5	.00	.00	.00	.22	.00	.00	.00	.00	.00
22	.29	.00	.84	.00	.00	.00	.07	.00	.00	.00	.08	.00
23	.41	.00	.57	.00	.00	.00	.00	.00	.00	.00	.21	.00
24	.30	.00	.31	.00	.00	1.0	.00	.00	.00	.00	.05	14
25	.16	.00	.20	.00	.00	23	30	.00	.00	.00	.00	.94
26	.30	.00	.45	.00	.65	.60	11	.00	.00	.00	.00	.00
27	.21	.00	.46	.00	.30	.04	7.0	.18	.00	.00	.00	.43
28	.21	.00	.25	2.1	.76	30	20	.00	.00	.00	.00	.16
29	.13	.00	.31	.37	.34	19	8.2	.00	.00	.00	.00	.01
30	.19	.00	.24	.00	---	18	2.9	.49	.00	.00	.00	.00
31	.16	---	.16	.00	---	4.8	---	.02	---	.00	.00	---
TOTAL	9.17	2.00	743.49	120.23	16.20	96.86	155.42	43.81	23.45	1.00	4.16	18.30
MEAN	.30	.067	24.0	3.88	.56	3.12	5.18	1.41	.78	.032	.13	.61
MAX	3.4	.75	280	74	8.4	30	30	8.8	13	.74	.93	14
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	18	4.0	1470	238	32	192	308	87	47	2.0	8.3	36

CAL YR 1987	TOTAL	857.50	MEAN	2.35	MAX	280	MIN	.00	AC-FT	1700
WTR YR 1988	TOTAL	1234.09	MEAN	3.37	MAX	280	MIN	.00	AC-FT	2450

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1988

Station No.	Station name	Location	Drainage area mi^2	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Hawaii, Island of Oahu				
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'36", long 157°59'11", 0.7 mi west of Pearl City and 1.5 mi east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68, 1970-88	3-18-88 7-29-88	12.9 12.5
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'05", long 157°56'46", 300 ft downstream from Highway 90 and 0.8 mi west of Aiea Post Office.	-	1931-62≠, 1964-65≠, 1966-68, 1970-88	3-17-88 7-29-88	15.9 13.2
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft upstream from Kawailena Stream, 2.2 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.51	1968-88	11-12-87 2-08-88 5-05-88 8-04-88	.94 2.38 2.29 1.26
16403500	Kawailena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft upstream from mouth, 2.2 mi south of former village of Pelekunu, and 5.5 mi north of Kamalo.	.65	1968-88	11-12-87 2-08-88 5-05-88 8-04-88	1.56 3.20 2.72 1.62
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft downstream from Kawailena Stream, 2.1 mi south of former village of Pelekunu, and 5.6 mi north of Kamalo.	1.20	1968-70≠, 1974-88	11-12-87 2-08-88 5-05-88 8-04-88	2.44 5.69 5.29 2.97
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft upstream from Kawaipoko Stream, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.79	1968-88	11-12-87 2-08-88 5-05-88 8-04-88	2.26 4.29 5.51 2.90
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft upstream from mouth, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	.26	1968-88	11-12-87 2-08-88 5-05-88 8-04-88	.71 .86 2.04 .87
16403900	Kawainui Stream near Pelekunu	Lat 21°07'59", long 156°52'38", on right bank 900 ft upstream from confluence with Kapuhi Stream, 2.1 mi south of former village of Pelekunu, and 5.7 mi north of Kamalo.	1.17	1968-79≠, 1980-88	11-12-87 2-08-88 5-05-88 8-04-88	3.17 6.11 9.44 4.09

≠ Operated as a continuous-record gaging station.

Crest-stage partial-record stations

Prior to 1973, crest-stage partial-record station records for the State of Hawaii were published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements or peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1988

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Kauai					
16038000	Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-88b	12-13-87	5.09	-
16052000	Hanapepe River at Hanapepe	Lat 21°54'47", long 159°35'33", 400 ft upstream from bridge on Highway 50 and 0.5 mi upstream from mouth.	26.6	1950-88b	12-13-87	4.61	-
16052500	Lawai Stream near Koloa	Lat 21°54'11", long 159°30'21", on right bank at private road bridge, 0.9 mi upstream from mouth, and 2.4 mi southwest of Koloa.	6.62	1962-63, 1964-72≠, 1973-88	12-13-87	3.46	734
16055000	Huleia Stream near Lihue	Lat 21°57'20", long 159°25'23", at highway bridge, 3.7 mi southwest of Lihue, and 4.5 mi upstream from mouth.	17.6	1912-15≠, 1962-67, 1968-70≠, 1971-88	12-13-87	9.22	2,430
16071800	Wailua River near Kapaa	Lat 22°03'00", long 159°20'26", at State Park 600 ft upstream from highway bridge, 850 ft upstream from mouth, and 2.5 mi southwest of Kapaa.	52.6	1962-88b	11-04-87	5.92	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 mi upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-88	1-28-88	11.30	860
16080000	Kapaa Stream at Kapahi ditch intake, near Kapaa	Lat 22°06'15", long 159°22'29", on right bank at Kapahi ditch intake, 3.8 mi northwest of Kapaa, and 4.3 mi northwest of Wailua.	3.86	1936-85≠, 1986-88	1-28-88	3.73	3,270
16081200	Akulikuli Stream near Kapaa	Lat 22°06'25", long 159°22'07", at Kahuna road crossing, 800 ft upstream from mouth, and 3.5 mi northwest of Kapaa armory.	.40	1964-88	5-07-88	5.62	275
16084500	Kapaa Stream at old highway crossing, near Kealia	Lat 22°06'28", long 159°19'52", at abutment of old highway bridge, 100 ft upstream from road crossing, 1.4 mi northwest of Kealia, and 2.1 mi upstream from mouth.	14.0	1962-88	1-28-88	13.61	9,290
16085000	Homaikawaa Stream near Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi southeast of Anahola School, and 1.6 mi north of Kealia.	.85	1964-88	1-28-88	4.17	681
16097900	Puukumu Stream near Kilauea	Lat 22°13'01", long 159°25'18", at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	.91	1964-68, 1971-88	12-13-87	6.61	e400
16104200	Hanalei River at Highway 56 bridge near Hanalei	Lat 22°12'50", long 159°28'43", at highway bridge, 1.6 mi northeast of Hanalei, and 2.4 mi upstream from mouth.	21.0	1963-88b	12-13-87	11.72	-
16130000	Nahomalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi northeast of Mana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71≠, 1972-88	12-17-87	4.90	347

≠ Operated as a continuous-record gaging station.
b Gage height only.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1988-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Annual maximum Gage height (ft)	Annual maximum Discharge (ft^3/s)
		Hawaii, Island of Oahu					
16210500	Kaukonahua Stream at Waialua	Lat 21°33'56", long 158°07'26", 0.2 mi upstream from Highway 99, 0.4 mi southeast of Waialua High School, and 1.3 mi southwest of Weed Circle.	38.7	1963, 1968-88	12-31-87	21.89	3,760
16211200	Poamoho Stream at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	10.9	1967-88	1-01-88	20.65	e2,600
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi southwest of Dillingham Ranch and 1.9 mi southwest of sugar mill at Waialua.	4.15	1958-63, 1964-65≠, 1966-88	1-01-88	5.95	640
16211400	Manini Gulch at Kaena	Lat 21°34'50", long 158°15'12", 180 ft upstream from Highway 99, 1.7 mi west of Camp Erdman, and 2.0 mi east of Kaena Point.	1.08	1974-88	1-01-88	19.61	1,000
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'49", on left bank 20 ft upstream from old concrete highway ford, 140 ft downstream from Farrington Highway box culvert, 0.1 mi north of Makua cemetery, and 4.5 mi southeast of Kaena Point lighthouse.	4.24	1958-88	1-01-88	8.82	e120
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi upstream from Farrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-88	12-12-87	9.41	573
16211800	Kaupuni Stream at altitude 372 ft, near Waianae	Lat 21°28'20", long 158°09'26", at abandoned diversion dam, 2.6 mi northeast of Waianae cemetery, and 2.8 mi northeast of junction of Waianae Valley Road and Farrington Highway.	3.58	1961-72≠, 1973-88	1-01-88	5.53	e110
16212200	Mailiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery near Waianae.	1.51	1958-88	1-01-88	2.85	e105
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi upstream from Highway 90 and 0.6 mi northeast of Nanakuli Post Office.	3.98	1968-88	1-01-88	22.77	e375
16212450	Kaloi Gulch tributary near Honouliuli	Lat 21°22'41", long 158°03'45", at culvert on private road, 1.8 mi west of Honouliuli, and 2.8 mi northwest of Ewa Post Office.	1.70	1968-88	12-12-87	4.21	e222
16212500	Honouliuli Stream near Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington Highway and 1.8 mi west of Waipahu Post Office.	11.0	1956-88	12-31-87	2.95	532
16212601	Waikele Stream at Wheeler Field	Lat 21°28'44", long 158°03'07", at culvert 0.3 mi west of east-west runway at Wheeler Field and 1.9 mi southwest of Wahiawa Post Office.	6.35	1958, 1960-88	12-31-87	6.65	363
16212700	Waikakalaua Stream near Wahiawa	Lat 21°27'50", long 158°01'38", 0.2 mi downstream from Kamehameha Highway and 2.4 mi south of Wahiawa Post Office.	7.49	1958-88	12-31-87	10.12	1,690
16212750	Huliwai Gulch near Kunia Camp	Lat 21°26'43", long 158°03'47", 200 ft upstream from Highway 75 and 1.2 mi south of Kunia Camp.	.84	1974-88	12-31-87	5.10	e20

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1988-Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16223000	Waimalu Stream near Aiea	Lat 21°23'48", long 157°56'56", 1,300 ft upstream from bridge on Moanalua Road and 1.2 mi northwest of Aiea High School.	5.97	1952-70≠, 1973-88	12-31-87	4.56	3,750
16224500	Kalauao Stream at Moanalua Road, at Aiea	Lat 21°23'07", long 157°56'22", on left bank at downstream side of Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	2.59	1957-82≠, 1984-88	12-31-87	6.02	1,940
16228000	Moanalua Stream near Honolulu	Lat 21°22'53", long 157°52'22", on left bank 1.8 mi northeast of Tripler Hospital and 5.0 mi north of Honolulu Post Office.	2.73	1927-78≠, 1979-88	12-31-87	8.98	e1,000
16228200	Moanalua Stream near Aiea	Lat 21°22'37", long 157°53'03", on right bank 1.1 mi northeast of Tripler Hospital and 2.9 mi east of Aiea sugar refinery.	3.34	1969-88	12-31-87	5.82	e1,200
16228600	Moanalua Stream at Tripler Hospital	Lat 21°21'52", long 157°54'05", on right bank 0.5 mi west of Tripler Hospital and 1.6 mi northeast of Aliamanu School.	4.44	1971-88	12-31-87	15.85	1,620
16228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft downstream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	.60	1967-71≠, 1972-88	12-31-87	3.30	390
16235400	Waolani Stream at Honolulu	Lat 21°20'00", long 157°51'04", at Wyllie Street bridge and 1.8 mi northeast of Honolulu Post Office.	1.28	1958-88	12-31-87	2.93	752
16237500	Pauoa Stream at Honolulu	Lat 21°19'18", long 157°51'03", at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-88	12-31-87	.73	383
16247100	Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17'24", long 157°49'17", on left bank at Kaimuki High School, 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.	9.35	1968-88	12-31-87	88.73	4,480
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi upstream from Kalanianaole Highway in Aina Haina.	2.35	1958-88	12-31-87	2.96	949
16247900	Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft downstream of single-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-88	12-31-87	36.55	4,700
16248800	Inoaole Stream at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft upstream from culvert on Hihimanu Street and 0.8 mi northwest of Waimanalo Post Office.	1.21	1958-88	12-31-87	-	1,420
16249000	Waimanalo Stream at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft upstream from Highway 72 and 2.3 mi northwest of Waimanalo Post Office.	2.16	1967-70≠, 1971-88	12-31-87	9.40	e4,000
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft upstream from Kalanianaole Highway, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	.16	1963-88	12-31-87	7.53	467

≠ Operated as a continuous-record gaging station.
e Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1988--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued					
16260500	Maunawili Stream at Highway 61, near Kailua	Lat 21°22'51", long 157°45'48", on right bank at downstream side of bridge on Highway 61, 0.6 mi west of Maunawili School, and 1.6 mi southwest of Kailua Post Office.	5.34	1958-67, 1968-71≠, 1972-88	12-31-87	11.66	3,490
16264800	Kawainui Canal at Kailua	Lat 21°24'15", long 157°45'28", at head of canal and 1.2 mi northwest of Kailua Post Office.	11.0	1957-60, 1963-64, 1967-88b	12-31-87	2.49	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-88	12-31-87	9.11	1,460
16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 35 ft upstream from bridge on Kamehameha Highway in Kaneohe.	.62	1959-88	12-31-87	3.66	e600
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft downstream from culvert on Kahekili Highway, 0.7 mi west of Kaneohe Post Office, and 0.8 mi southwest of Heeia.	1.80	1965-66, 1968-88	12-31-87	4.58	e950
16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-88	12-31-87	-	e1,100
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-88	12-31-87	3.87	1,600
16310501	Malaekahana Stream at altitude 30 ft, near Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation railroad bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospital.	4.05	1958-88	12-31-87	7.94	1,070
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi southwest of junction of plantation road and Highway 83 and 2.7 mi west of Kahuku Hospital.	2.13	1958-88	12-31-87	-	e150
16317800	Kaunala Gulch near Sunset Beach	Lat 21°40'59", long 158°02'12", on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-88	12-31-87	4.26	e60
16318000	Paumalu Gulch at Sunset Beach	Lat 21°40'19", long 158°02'28", 0.4 mi upstream from Highway 83 at Sunset Beach and 2.2 mi northeast of Waimea.	2.59	1968-88	12-31-87	5.09	e300
16331000	Waimea Gulch near Kawailoa Camp	Lat 21°37'29", long 158°04'58", at culvert on Ashley Road, 0.1 mi upstream from Highway 83, and 1.1 mi north of Kawailoa Camp.	2.23	1968-88	12-31-87	6.95	548
16340000	Anahulu River near Haleiwa	Lat 21°35'28", long 158°04'45", 1.7 mi southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi east of Waialua School at Haleiwa.	13.5	1958-88	12-31-87	11.48	6,720
16350000	Opaeula Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.6 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-88	1-01-88	16.04	3,570

≠ Operated as a continuous-record gaging station.
e Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1988--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum		
					Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Molokai					
16411320	Kakaako Gulch above Kamakahi Gulch, near Mauna Loa	Lat 21°10'11", long 157°11'56", 0.1 mi upstream from Kamakahi Gulch, 1.7 mi downstream from Highway 46, and 2.5 mi northeast of Mauna Loa.	1.40	1964-88	12-12-87	-	<1
16411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72≠, 1973-88	12-12-87	2.82	130
16411600	Kaunala Gulch near Mauna Loa	Lat 21°07'01", long 157°15'43", at Sand Haul Road, 3.2 mi east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	.28	1964-88	12-12-87	1.35	22
16411640	Halena Gulch near Mauna Loa	Lat 21°05'53", long 157°13'47", 2.7 mi southwest of Mauna Loa and 5.5 mi east of Laau Point.	2.07	1965-88	12-12-87	3.29	532
16411800	Kaluapeelua Gulch at Hoolehua	Lat 21°09'55", long 157°04'22", 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-88	-	-	NO FLOW
16413500	Manawainui Gulch near Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-88	12-12-87	-	430
16415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 156°52'20", at Highway 45, 0.3 mi upstream from mouth, and 0.5 mi northeast of Kamalo.	2.12	1964-88	1-01-88	.85	105
16419000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi upstream from mouth, and 1.9 mi south of Halawa.	.48	1964-88	1-01-88	6.32	126
		Hawaii, Island of Maui					
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'16", on right bank 120 ft upstream from bridge on Highway 31, 400 ftr upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.5 mi west of Kaupo.	1.91	1963-72≠, 1973-88	3-24-88	4.28	167
16500300	Hawelewele Gulch near Kaupo	Lat 20°38'01", long 156°11'08", 700 ft upstream from Piilani Highway 31 and 3.9 mi west of Kaupo.	11.3	1967-88	3-24-88	7.57	1,770
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'18", long 156°04'44", at Highway 31, 1.3 mi west of Kipahulu, and 3.2 mi east of Kaupo.	.76	1963-68≠, 1969-88	1-28-88	12.4	4,080
16502400	Pukuilua Gulch near Hana	Lat 20°42'00", long 156°00'14", at Highway 31, 0.4 mi southwest of Puuiki, and 4.0 mi south of Hana.	.48	1963-88	3-17-88	7.24	533
16502800	Moomoonui Gulch at Hana	Lat 20°44'37", long 155°59'18", at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi south of Hana.	.90	1963-88	3-17-88	14.35	1,910
16502900	Kawaipapa Gulch at Hana	Lat 20°46'08", long 156°00'04", 1,000 ft upstream from Highway 36 and 0.3 mi northwest of Hana Hospital.	5.83	1965-88	3-17-88	11.69	14,040

≠ Operated as a continuous-record gaging station.
< Actual value is known to be less than the value shown.

Annual maximum discharge at crest-stage partial-record stations during water year 1988--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Maui--Continued					
16603300	Unnamed gulch at Maliko Bay	Lat 20°56'26", long 156°21'04", at Hana Highway, 0.5 mi west of Maliko Bay, and 1.3 mi north of Hamakuapoko.	0.43	1963-88	4-03-88	3.79	62
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-88	12-18-87	-	<1
16603800	Kaluapulani Gulch tributary near Pukalani	Lat 20°48'52", long 156°18'32", at Haleakala Highway, 1.5 mi west of Olinda Prison Camp, and 2.3 mi southeast of Pukalani.	.45	1963-88	12-18-87	1.26	16
16603850	Kalialinui Gulch near Kahului	Lat 20°52'47", long 156°26'06", 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital, and 2.5 mi southeast of Kahului Post Office.	17.9	1967-88	12-18-87	3.75	18
16607000	Iao Stream at Wailuku	Lat 20°53'38", long 156°30'27", 560 ft upstream from Market Street bridge at Wailuku and 1.9 mi upstream from mouth.	8.24	1951≠, 1952-88	1-28-88	6.16	5,570
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi east of Maluhia Camp, and 1.8 mi northwest of Waihee.	.12	1964-88	1-01-88	-	e2
16619700	Poelua Gulch near Kahakuloa	Lat 21°00'58", long 156°34'58", at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse, and 2.2 mi northwest of Kahakuloa.	1.18	1965-88	1-28-88	10.17	392
16630200	Honokowai Stream at Honokowai	Lat 20°56'58", long 156°41'07", 0.5 mi southeast of Honokowai, and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-88	11-21-87	4.18	430
16643300	Kauaula Stream near mouth, near Lahaina	Lat 20°52'09", long 156°39'43", 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960, 1962, 1964-88	11-21-87	3.36	222
16646200	Olowalu Stream at Olowalu	Lat 20°49'23", long 156°37'15", on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.	4.08	1962-72≠, 1973-88	11-21-87	4.18	591
16647500	Malalowaiaole Gulch near Maalaea	Lat 20°46'56", long 156°31'32", at Honoapiilani Highway, 200 ft upstream from mouth, 0.2 mi north of McGregor Point, and 1.2 mi southwest of Maalaea.	.64	1964-88	11-21-87	-	<1
16650500	Waikapu Stream near Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi northeast of Maalaea, and 2.5 mi northwest of Kihei.	6.97	1963-88	1-28-88	7.11	1,010

≠ Operated as a continuous-record gaging station.
< Actual value is known to be less than the value shown.

Annual maximum discharge at crest-stage partial-record stations during water year 1988--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Maui--Continued					
16658500	Waiakoa Gulch tributary near Waiakoa	Lat 20°44'56", long 156°19'22", at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads.	0.98	1964-88	12-18-87	-	<1
16659000	Waiakoa Gulch at Kihei	Lat 20°47'14", long 156°27'41", 0.3 mi northeast of Kihei and 0.4 mi upstream from mouth.	10.1	1963-88	-	-	NO FLOW
16660000	Kulanihakoi Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70≠, 1971-88	-	-	NO FLOW
16663500	Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft upstream from mouth, and 0.2 mi south of Kamaole.	4.28	1972-88	-	-	NO FLOW
16664000	Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft upstream from mouth, and 0.8 mi south of Kamaole.	4.12	1972-88	-	-	NO FLOW
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi upstream from Kinoole Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1968-88	12-13-87	5.18	623
16701400	Palai Stream at Hilo	Lat 19°40'56", long 155°04'04", at Highway 11, 300 ft south of Palai Street intersection, and 3.5 mi southeast of Hilo Post Office.	5.08	1965-88	12-13-87	3.54	216
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi north of Papaikou, and 5.1 mi north of Hilo Post Office.	.24	1963-88	12-13-87	8.28	189
16717600	Alia Stream near Hilo	Lat 19°50'38", long 155°06'21", on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	.58	1962-72≠, 1973-88	12-13-87	4.77	685
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-88	12-13-87	11.15	1,290
16717800	Pohakupuka Stream near Papaaloa	Lat 19°57'20", long 155°11'20", on right bank 200 ft downstream from Highway 19, 2.8 mi northwest of Honohina, and 3.0 mi southwest of Papaaloa.	2.76	1963-80≠, 1983-88	12-13-87	6.17	780
16717850	Keehia Gulch near Ookala	Lat 20°01'08", long 155°18'45", at culvert on Highway 19, 1.7 mi west of Ookala, and 4.1 mi southeast of Paauilo.	.62	1963-88	12-13-87	6.30	268
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	2.27	1963-88	-	-	NO FLOW
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert 4.8 mi southwest of Honokaa Hospital, and 5.5 mi southeast of Kukuihaele.	2.42	1963-88	-	-	NO FLOW
16752600	Hapahapai Gulch at Kapaau	Lat 20°14'00", long 155°48'00", at Highway 27, 300 ft east of Kapaau Post Office.	1.52	1963-88	11-21-87	6.68	140

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< Actual value is known to be less than the value shown.

Annual maximum discharge at crest-stage partial-record stations during water year 1988--Continued

Station no.	Station name	Location	Drainage area mi^2	Period of record	Annual maximum Date	Gage height (ft)	Discharge (ft^3/s)
		Hawaii, Island of Hawaii--Continued					
16755800	Luahine Gulch near Waimea	Lat 20°03'11", long 155°44'35", on culvert 5.1 mi northwest of Waimea and 5.7 mi east of Kawaihae.	0.32	1963-88	11-21-87	2.62	77
16756500	Keanuiomano Stream near Kamuela	Lat 20°01'48", long 155°42'05", on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 mi west of Kamuela.	4.3	1964-72≠, 1973-88	11-21-87	6.75	1,460
16759040	Paiakuli Reservoir tributary near Waimea	Lat 20°02'16", long 155°38'08", at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.6 mi northeast of Waimea.	.27	1963-88	11-21-87	3.26	131
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi north of Saddle Road Junction, and 4.5 mi south of Waimea.	50.6	1963-88	-	-	NO FLOW
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi north of Keamuku, and 5.2 mi west of Waikii.	33.1	1963-88	-	-	NO FLOW
16759180	Keopu Stream near Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi east of Kailua, and 2.3 mi northwest of Holualoa Post Office.	2.61	1962, 1965-88	5-31-88	-	e50
16759300	Waiaha Stream at Luawai, near Holualoa	Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 mi northeast of Holualoa School, and 4.2 mi southeast of Honokohau School.	8.74	1961-71≠, 1972-88	5-31-88	3.25	118
16762000	Alapai Gulch at Naalehu	Lat 19°04'00", long 155°35'19", at debris catchment outlet of Naalehu Watershed Protection Project and 0.2 mi upstream from Highway 11 at Naalehu.	2.87	1963-88	12-18-87	5.93	892
16767000	Ninole Gulch near Punaluu	Lat 19°10'44", long 155°33'46", on right bank 300 ft downstream from forest-reserve boundary, 4.6 mi northwest of Punaluu, and 6.0 mi north of Honuapo.	15.5	1966-82≠, 1983-88	12-18-87	4.76	426
16770000	Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi southwest of Pahala, and 4.1 mi north of Punaluu.	9.41	1963-88	12-13-87	14.11	5,210
16770500	Paauau Gulch at Pahala	Lat 19°12'39", long 155°28'48", on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mi north of Pahala.	1.74	1962-79≠, 1980-88	12-18-87	4.87	442

≠ Operated as a continuous-record gaging station.
e Estimated

Discharge measurements made at miscellaneous sites during water year 1988

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements	
					Date	Discharge (ft^3/s)
		Hawaii, Island of Oahu				
Kahana (formerly 16295995)	Pacific Ocean	Lat 21°32'17", long 157°53'29", 1.8 mi upstream from main bridge on Kamahamaha Highway and 2.8 mi southwest of Kaaawa School.	3.20	1960-62, 1966, 1971-72, 1974-81, 1983-85	4-21-88 8-24-88 9-16-88	18.8 22.6 22.6
Kawa (formerly 16297000)	Kahana Stream	Lat 21°32'35", long 157°53'51", 0.1 mi upstream from mouth and 1.0 mi south of Kahana.	2.10	1914-17≠ 1958b, 1961-62, 1966, 1971-72, 1974-81, 1983-85	4-21-88 8-24-88 9-16-88	3.27 3.84 2.47
Kaluanui	Pacific Ocean	Lat 21°34'51", long 157°54'59", 1.9 mi west of Punaluu Beach Park and 2.3 mi south of cemetary in Hauula.	.85	--	3-08-88 7-07-88 9-09-88	.46 .90 .24
Kaluanui	Pacific Ocean	Lat 21°34'14", long 157°54'44", 1.5 mi west of Punaluu Beach Park and 1.6 mi south of cemetary in Hauula.	1.96	--	3-08-88 7-07-88 9-09-88	.49 .68 .20
Makawao	Maunawili Stream	Lat 21°21'20", long 157°45'52", 1.8 mi southwest of Maunawili School and 2.2 mi southeast of Hawaii Loa College.	0.84	--	2-17-88 7-06-88 9-14-88	2.10 1.63 1.11
Ainoni	Maunawili Stream	Lat 21°21'26", long 157°45'55", 1.7 mi southwest of Maunawili School and 2.1 mi southeast of Hawaii Loa College.	.60	--	2-17-88 7-06-88 9-14-88	3.08 1.06 .66
Maunawili	Pacific Ocean	Lat 21°21'28", long 157°46'13", 1.9 mi southwest of Maunawili School and 1.9 mi southeast of Hawaii Loa College.	1.09	--	2-17-88 7-06-88 9-14-88	4.77 1.40 1.06
Maunawili	Pacific Ocean	Lat 21°21'51", long 157°46'05", 1.4 mi southwest of Maunawili School and 1.6 mi southeast of Hawaii Loa College.	1.19	--	2-17-88 7-06-88 9-14-88	5.43 1.41 1.10
Omao	Maunawili Stream	Lat 21°21'56", long 157°46'06", 1.3 mi southwest of Maunawili School and 1.5 mi southeast of Hawaii Loa College.	.94	--	2-18-88 7-06-88 9-14-88	2.81 .99 .92
Kahanaiki	Pacific Ocean	Lat 21°22'22", long 157°46'27", 1.4 mi southwest of Maunawili School and 0.9 mi southeast of Hawaii Loa College.	.36	--	2-18-88 7-06-88 9-14-88	1.57 .61 .39
Kahanaiki (formerly 16263000)	Pacific Ocean	Lat 21°22'20", long 157°46'25", 1.3 mi southwest of Maunawili School and 0.9 mi southeast of Hawaii Loa College.	.61	1912b, 1914-16	2-18-88 7-06-88 9-14-88	2.26 .84 .61
Kahanaiki (formerly 16264100)	Pacific Ocean	Lat 21°22'49", long 157°46'46", 0.9 mi west of Maunawili School and 1.0 mi east of Hawaii Loa College.	1.43	1960-63, 1965-66, 1971-81, 1983-85	7-06-88 9-14-88	1.03 .79
Punaluu	Pacific Ocean	Lat 21°33'12", long 157°54'05", 1.4 mi west of Kahana and 2.1 mi southwest of Punaluu.	1.80	--	3-08-88 7-07-88 9-09-88	19.2 17.4 17.7
Waiaohi	Punaluu Stream	Lat 21°33'15", long 157°54'06", 1.4 mi west of Kahana and 2.1 mi southwest of Punaluu.	.52	--	3-08-88 7-07-88 9-09-88	6.18 5.14 4.69
Punaluu	Pacific Ocean	Lat 21°34'41", long 157°53'21", 1.4 mi north of Kahana and 0.3 mi south of Punaluu.	3.51	--	3-08-88 7-07-88 9-09-88	23.4 14.2 12.9
Waiahole	Pacific Ocean	Lat 21°28'29", long 157°52'39", 1.7 mi southwest of Waiahole School and 2.8 mi northwest of Kahaluu.	.92	--	4-27-88 7-08-88 8-25-88	5.76 3.87 4.35

≠ Operated as a continuous-record gaging station.
b Gage height only.

Discharge measurements made at miscellaneous sites during water year 1988

Stream	Tributary to	Location	Drainage area mi^2	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Oahu--Continued				
Waiahole	Pacific Ocean	Lat 21°28'59", long 157°51'43", 0.6 mi southwest of Waiahole School and 2.2 mi northwest of Kahaluu.	1.65	--	4-27-88 7-08-88 8-25-88	7.61 4.48 4.80
Waiahole	Pacific Ocean	Lat 21°29'05", long 157°50'57", 0.4 mi southwest of Waiahole School and 1.8 mi northwest of Kahaluu.	2.12	--	4-27-88 7-08-88 8-25-88	17.2 7.76 10.8
Waiahole (formerly 16291000)	Pacific Ocean	Lat 21°28'35", long 157°52'30", on left bank, 1.5 mi southwest of Waiahole School and 2.7 mi northwest of Kahaluu.	1.05	1955-68≠ 1970	7-08-88 8-25-88	5.34 6.35
Waianu (formerly 16293100)	Waiahole Stream	Lat 21°28'59", long 157°51'47", 0.6 mi southwest of Waiahole School and 2.3 mi northwest of Kahaluu.	1.64	1961-66	4-27-88	7.44
Waikane	Pacific Ocean	Lat 21°30'21", long 157°52'42", 1.7 mi west of Waikane, and 2.0 mi northwest of Waiahole School.	.58	--	4-20-88 7-05-88 8-25-88	1.11 1.67 1.24
Waikane	Pacific Ocean	Lat 21°30'17", long 157°52'43", 1.7 mi west of Waikane, and 1.8 mi northwest of Waiahole School.	.67	--	4-20-88 7-05-88 8-25-88	.88 .33 .67
Waikane	Pacific Ocean	Lat 21°30'07", long 157°52'12", 1.1 mi west of Waikane, and 1.4 mi northwest of Waiahole School.	1.57	--	4-20-88 7-05-88 8-25-88	2.66 1.51 2.61
Waikeekee	Waikane Stream	Lat 21°30'02", long 157°52'14", 1.1 mi west of Waikane, and 1.4 mi northwest of Waiahole School.	.43	--	4-20-88 7-05-88	.56 e.25
Waikane	Pacific Ocean	Lat 21°29'56", long 157°51'15", 0.1 mi west of Waikane, and 0.7 mi north of Waiahole School.	2.50	--	4-20-88 7-05-88 8-25-88	4.66 2.51 3.41

≠ Operated as a continuous-record gaging station.
e Estimated

Water-quality partial-record stations are particular sites where chemical-quality, biological and or sediment data are collected systematically over a period of years for use in hydrologic analyses. A schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu is shown in figure 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU

16265700 - KAMOOALII STREAM AT ALTITUDE 200 FT, NEAR KANEOHE (LAT 21°23'12" LONG 157°47'56")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)	OXYGEN, DISSOLVED (MG/L)
MAY								
10...	1355	758	1.9	210	6.80	22.0	0.50	8.3
JUN								
28...	1045	759	1.4	205	7.10	22.5	0.40	8.2

DATE	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
MAY							
10...	96	370	<1	0.300	<0.20	--	0.020
JUN							
28...	95	--	6	0.200	0.20	0.40	0.030

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'06" LONG 157°48'16")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)
MAY							
10...	1230	757	0.38	123	7.00	23.0	0.50
JUN							
28...	1235	759	0.37	117	6.90	23.5	0.30

DATE	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
MAY							
10...	8.0	94	230	<1	<0.100	<0.20	<0.010
JUN							
28...	8.5	101	290	6	<0.100	<0.20	--

< Actual value is known to be less than the value shown.

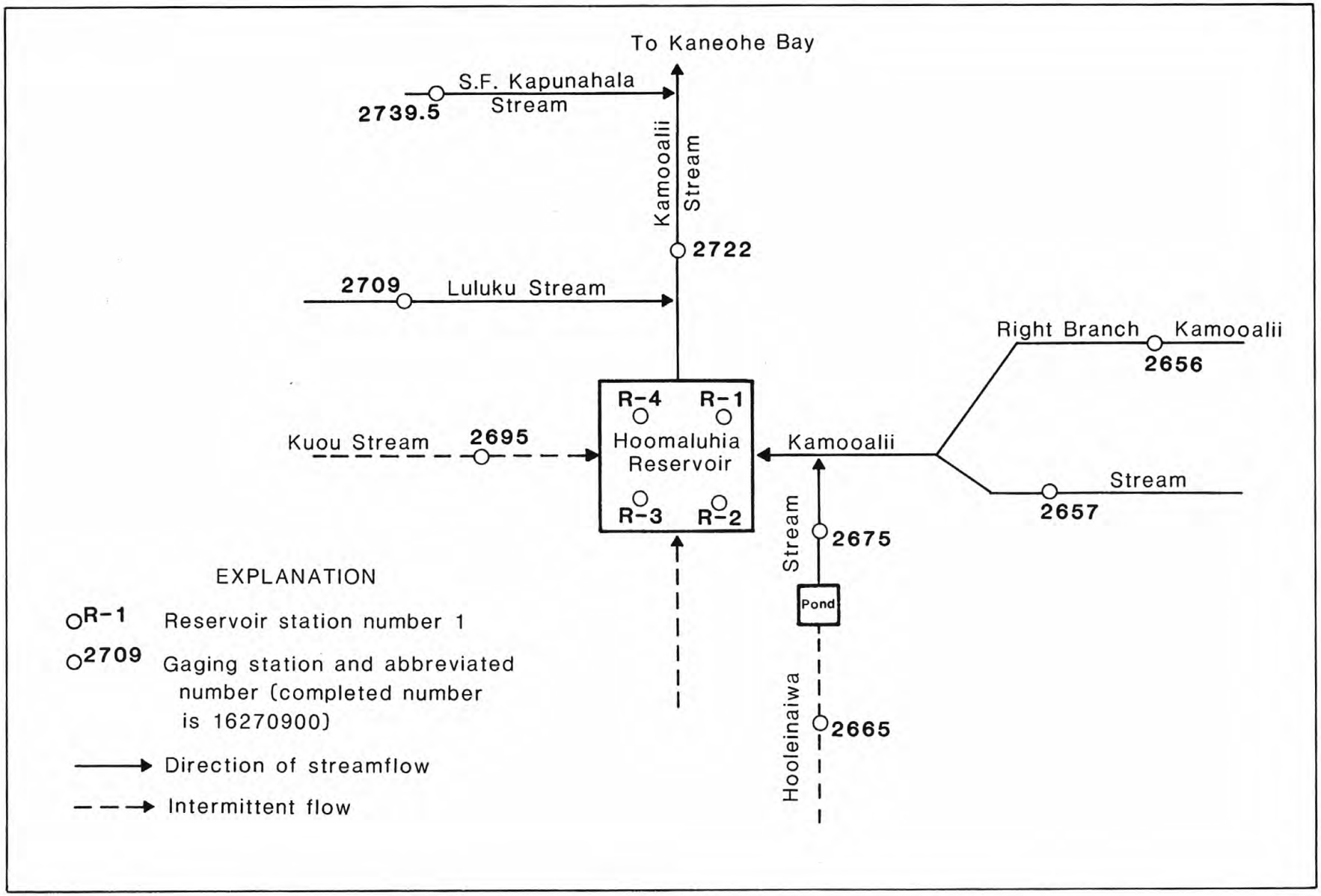

Figure 15.--Schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

16267500 - HOOLEINAIWA STREAM AB CONFLUENCE WITH KAMOOALII STR, NR KANEOHE (LAT 21°23'18" LONG 157°48'18")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)
MAY							
10...	1104	760	1.2	165	7.40	24.5	2.8
JUN							
28...	1240	760	1.0	138	7.40	25.0	2.9

DATE	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
MAY							
10...	7.6	91	120	1	0.100	<0.20	0.010
JUN							
28...	6.9	84	--	10	<0.100	<0.20	<0.010

16269500 - KUOU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'30" LONG 157°48'44")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (FTU)
MAY							
10...	1405	756	0.17	282	7.40	23.0	--
JUN							
27...	1350	758	0.12	280	7.00	23.0	2.6

DATE	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)
MAY							
10...	7.8	91	150	<1	0.400	<0.20	0.200
JUN							
27...	5.6	65	K10	6	0.200	<0.20	<0.010

< Actual value is known to be less than the value shown.
K Results based on colony count outside the acceptable range (non-ideal colony count).

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

212335157482601 HOOMALUHIA RESERVOIR SEC 1-1 NEAR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
NOV								
02...	1315	760	1.00	185	--	25.1	6.6	80
02...	1317	760	3.00	185	--	25.0	6.6	80
02...	1319	760	5.00	185	--	24.9	6.6	80
02...	1320	760	7.00	185	--	24.8	6.2	75
02...	1322	760	9.00	185	--	24.7	5.8	70
MAY								
03...	1025	--	1.00	191	7.49	25.2	7.3	--
03...	1027	--	3.00	192	7.50	24.5	7.4	--
03...	1028	--	5.00	192	7.47	24.0	7.3	--
03...	1029	--	7.00	192	7.44	24.0	7.0	--
03...	1030	--	9.00	194	7.30	23.8	6.1	--
JUN								
27...	1215	--	1.00	187	7.55	26.8	7.0	--
27...	1216	--	3.00	187	7.55	26.7	7.1	--
27...	1217	--	5.00	186	7.48	26.3	6.3	--
27...	1218	--	7.00	188	7.38	26.2	5.7	--
27...	1219	--	9.00	189	7.22	25.7	4.7	--
SEP								
06...	1115	--	1.00	185	7.81	27.5	6.7	--
06...	1116	--	3.00	185	7.74	27.2	6.5	--
06...	1117	--	5.00	185	7.71	27.0	6.2	--
06...	1118	--	7.00	185	7.68	26.9	6.0	--
06...	1119	--	9.00	186	7.57	26.8	4.6	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

212335157482602 HOOMALUHIA RESERVOIR SEC 1-2 NEAR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
NOV								
02...	1300	760	1.00	185	--	25.1	6.9	84
02...	1302	760	3.00	186	--	25.1	6.7	82
02...	1304	760	5.00	185	--	24.8	6.3	76
02...	1306	760	7.00	185	--	24.8	6.1	74
02...	1308	760	9.00	185	--	24.7	6.0	72
MAY								
03...	1033	--	1.00	192	7.47	25.0	7.4	--
03...	1034	--	3.00	192	7.47	24.5	7.3	--
03...	1035	--	5.00	192	7.45	24.1	7.3	--
03...	1036	--	7.00	192	7.43	24.0	7.1	--
03...	1037	--	9.00	194	7.32	23.8	6.5	--
JUN								
27...	1203	--	1.00	186	7.55	26.6	7.1	--
27...	1204	--	3.00	187	7.55	26.5	7.0	--
27...	1206	--	5.00	187	7.49	26.5	6.5	--
27...	1207	--	7.00	189	7.36	26.4	5.2	--
27...	1208	--	9.00	189	7.18	25.7	4.4	--
SEP								
06...	1122	--	1.00	185	7.85	27.5	6.8	--
06...	1123	--	3.00	185	7.79	27.2	6.5	--
06...	1124	--	5.00	185	7.74	27.1	6.2	--
06...	1125	--	7.00	186	7.66	27.0	5.3	--
06...	1140	--	9.00	186	7.59	26.8	4.8	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

212335157482603 HOOMALUHIA RESERVOIR SEC 1-3 NEAR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV, 1987										
02...	1220	760	1.00	197	--	25.1	0.70	8.1	99	35
02...	1222	760	3.00	187	--	24.6	--	6.9	83	--
02...	1224	760	5.00	187	--	24.5	--	6.6	79	--
02...	1225	760	7.00	187	--	24.4	0.80	6.3	76	22
02...	1228	760	9.00	187	--	24.3	--	6.3	76	--
02...	1230	760	11.0	189	--	24.2	2.3	5.5	66	98
02...	1232	760	12.0	192	--	23.6	--	5.4	64	--
MAY, 1988										
03...	1043	760	1.00	192	7.50	25.0	0.80	7.3	89	K1
03...	1044	--	3.00	192	7.47	24.6	--	7.3	--	--
03...	1045	--	5.00	191	7.46	24.2	--	7.2	--	--
03...	1046	760	7.00	192	7.40	24.9	1.2	6.9	84	K9
03...	1047	--	9.00	194	7.30	23.9	--	6.2	--	--
03...	1048	760	11.0	196	7.20	23.5	1.7	5.8	69	66
03...	1049	--	12.0	198	7.13	23.2	--	5.2	--	--
JUN										
27...	1138	761	1.00	187	7.50	26.6	0.60	7.2	90	K17
27...	1140	--	3.00	187	7.54	26.6	--	7.0	--	--
27...	1142	--	5.00	187	7.50	26.6	--	6.6	--	--
27...	1144	761	7.00	189	7.30	26.2	0.60	4.3	53	21
27...	1145	--	9.00	190	7.13	25.7	--	3.6	--	--
27...	1146	761	11.0	189	7.10	25.2	2.2	4.6	56	280
27...	1148	--	12.0	188	7.09	24.7	--	5.2	--	--
SEP										
06...	1150	759	1.00	184	7.80	27.5	1.5	6.9	88	--
06...	1151	--	3.00	185	7.84	27.3	--	6.7	--	--
06...	1200	--	5.00	185	7.72	27.1	--	6.4	--	--
06...	1201	759	7.00	e185	7.70	27.0	1.2	6.0	76	--
06...	1202	--	9.00	186	7.63	26.8	--	5.1	--	--
06...	1203	759	11.0	187	7.60	25.8	1.9	4.6	57	--

K Results based on colony count outside the acceptable range (non-ideal colony count).
e Estimated.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

212335157482603 HOOMALUHIA RESERVOIR SEC 1-3 NEAR KANEOHE--Continued

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)
MAY											
03...	1100	57	3	8.8	8.5	15	36	0.9	1.2	19	54
JUN											
27...	1152	58	5	8.5	8.9	16	37	0.9	0.90	19	53

DATE	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)
MAY											
03...	7.8	0.10	20	110	113	0.15	60	<10	1	1	<100
JUN											
27...	6.7	0.10	21	118	113	0.16	50	<10	1	<1	<100

DATE	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)
MAY											
03...	5	<10	<0.5	<1	<1	<1	<1	<1	<3	8	1
JUN											
27...	4	<10	<0.5	<1	<1	1	<1	2	<3	3	1

DATE	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)
MAY											
03...	170	14	<5	<5	<10	9	100	26	<0.10	0.3	4
JUN											
27...	180	13	<5	<5	<10	<4	190	92	<0.10	<0.1	3

< Actual value is known to be less than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

212335157482603 HOOMALUHIA RESERVOIR SEC 1-3 NEAR KANEOHE--Continued

DATE	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
MAY											
03...	<10	4	2	<1	<1	<1	<1.0	77	<6	<10	6
JUN											
27...	<10	6	1	<1	<1	1	<1.0	77	<6	<10	4

DATE	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)
MAY										
03...	2.4	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010
JUN										
27...	2.3	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010	<0.01	<0.010

DATE	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)
MAY										
03...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01
JUN										
27...	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
MAY										
03...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
JUN										
27...	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

212336157482601 HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
NOV								
02...	1322	760	1.00	185	--	25.0	6.8	83
02...	1323	760	3.00	185	--	25.0	6.7	81
02...	1325	760	5.00	185	--	24.9	6.7	81
02...	1327	760	7.00	185	--	24.8	6.5	79
02...	1328	760	9.00	186	--	24.8	6.1	74
02...	1330	760	11.0	186	--	24.6	5.8	70
02...	1332	760	13.0	188	--	24.5	4.6	55
02...	1334	760	15.0	189	--	24.3	3.9	47
02...	1335	760	17.0	189	--	24.3	3.8	46
NOV								
04...	1411	758	1.00	186	7.50	25.7	7.5	93
04...	1413	758	3.00	186	7.60	25.3	7.7	94
04...	1415	758	5.00	185	7.50	25.0	7.4	90
04...	1417	758	7.00	186	7.50	24.9	7.1	86
04...	1419	758	9.00	186	7.40	24.8	6.4	78
04...	1420	758	11.0	186	7.30	24.6	6.3	76
04...	1422	758	13.0	188	7.20	24.5	5.1	62
04...	1424	758	15.0	189	7.00	24.1	3.8	46
04...	1425	758	17.0	189	7.00	24.0	3.7	44
MAY								
03...	1006	--	1.00	191	7.54	25.6	7.3	--
03...	1008	--	3.00	191	7.53	24.4	7.3	--
03...	1010	--	5.00	191	7.53	24.2	7.2	--
03...	1011	--	7.00	192	7.48	24.1	6.9	--
03...	1012	--	9.00	195	7.37	23.9	6.0	--
03...	1013	--	11.0	197	7.24	23.6	4.4	--
03...	1015	--	13.0	198	7.11	23.4	2.7	--
03...	1016	--	15.0	199	7.01	23.2	1.9	--
03...	1017	--	17.0	200	6.97	23.2	1.5	--
JUN								
27...	1055	--	1.00	186	7.30	26.5	6.9	--
27...	1056	--	3.00	187	7.35	26.3	6.7	--
27...	1057	--	5.00	188	7.27	26.2	5.7	--
27...	1059	--	7.00	189	7.20	26.0	5.3	--
27...	1100	--	9.00	190	7.10	25.5	3.9	--
27...	1102	--	11.0	190	7.00	25.2	3.1	--
27...	1103	--	13.0	193	6.94	24.8	1.9	--
27...	1105	--	15.0	193	6.90	24.7	1.5	--
27...	1107	--	17.0	193	6.87	24.6	0.8	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE (LAT 21°24'21" LONG 157°48'31")

DATE	TIME	BAROMETRIC PRESSURE (MM OF HG)	STREAMFLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
MAY										
03...	1000	762	2.8	198	7.70	22.5	3.8	8.0	92	6300
JUN										
28...	1050	761	2.1	190	7.90	23.0	2.4	7.8	91	--
AUG										
03...	1220	761	2.5	200	7.70	23.0	2.6	7.6	89	10000

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY											
03...	1000	57	12	6.6	17	39	1	1.3	60	4.8	20
AUG											
03...	1220	57	12	6.6	16	37	0.9	1.6	57	7.8	20

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
MAY										
03...	1000	0.10	30	125	128	0.17	3	<0.100	<0.20	0.030
JUN										
28...	1050	--	--	--	--	--	11	<0.100	0.20	0.020
AUG										
03...	1220	0.20	28	125	127	0.17	--	<0.100	0.20	0.040

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
MAY												
03...	1000	200	10	2	1	<100	3	<10	<0.5	<1	<1	1
AUG												
03...	1220	320	20	2	1	<100	4	<10	<0.5	<1	1	4

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WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU--Continued

16273950 - SF KAPUNAHALA STREAM AT KANEOHE--Continued

DATE	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
MAY												
03...	<1	1	<3	4	2	1900	320	<5	<5	<10	<4	70
AUG												
03...	<1	1	<3	6	2	740	210	5	<5	<10	<4	90

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MERCURY DISSOLVED (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)
MAY												
03...	64	<0.10	0.2	5	<10	1	<1	<1	<1	<1	<1.0	67
AUG												
03...	50	<0.10	<0.1	2	<10	5	3	--	<1	<1	<1.0	72

DATE	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)
MAY											
03...	<6	<10	<3	1.9	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010
AUG											
03...	<6	<10	<3	1.7	<1	<0.1	<0.010	<0.1	<0.010	<0.010	<0.010

DATE	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
MAY											
03...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	0.05	<0.01	<0.01
AUG											
03...	<0.01	<0.010	<0.010	<0.010	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
MAY											
03...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01
AUG											
03...	<0.01	<0.01	<0.10	<0.01	<0.1	<1	<0.01	<0.01	<0.01	<0.01	<0.01

< Actual value is known to be less than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF KAUAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22 08 09 LONG 159 37 22)							
OCT, 1987				APR, 1988			
09...	1000	8.3	17.5	13...	0945	11	16.5
NOV				JUN			
24...	0920	25	16.0	09...	0920	13	19.0
JAN, 1988				AUG			
07...	0945	29	13.0	01...	0930	4.5	20.0
MAR				SEP			
03...	0920	8.2	15.0	02...	0905	7.3	18.5
16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21 58 31 LONG 159 38 55)							
OCT, 1987				APR, 1988			
07...	1145	16	22.5	12...	1205	16	22.0
NOV				JUN			
13...	1255	15	23.5	08...	1200	26	21.0
JAN, 1988				JUL			
05...	1220	60	17.0	29...	1155	9.3	22.0
FEB				SEP			
23...	1140	14	22.0	01...	1325	10	24.0
16049000 - HANAPEPE RIVER BL MANUAHI STR NR ELEELE, KAUAI, HI (LAT 21 57 29 LONG 159 33 13)							
OCT, 1987				APR, 1988			
07...	0945	19	20.5	12...	0945	21	20.0
NOV				JUN			
13...	1020	16	22.0	08...	0945	37	19.5
JAN, 1988				JUL			
05...	1000	21	17.5	29...	0940	17	21.0
FEB				SEP			
23...	0945	14	20.0	01...	1000	18	24.0
16060000 - SF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 02 24 LONG 159 22 58)							
OCT, 1987				APR, 1988			
01...	1150	40	22.5	14...	1200	14	24.0
NOV				JUN			
17...	1235	70	21.0	07...	0835	20	20.0
JAN, 1988				JUL			
14...	1200	32	22.0	07...	1210	30	25.0
FEB				AUG			
25...	1315	164	20.0	23...	1430	26	25.0
16061200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE, KAUAI, HI (LAT 22 03 34 LONG 159 28 00)							
OCT, 1987				APR, 1988			
01...	1005	21	19.0	14...	0950	22	22.0
NOV				MAY			
17...	1350	19	20.0	23...	1020	23	20.0
JAN, 1988				JUL			
14...	0940	21	18.5	07...	1050	22	20.0
FEB				AUG			
25...	1045	28	18.0	08...	1140	22	20.5
16062000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22 04 09 LONG 159 26 46)							
OCT, 1987				MAY, 1988			
01...	0945	0.11	20.0	23...	1310	0.24	22.0
NOV				JUL			
17...	1450	0.05	21.0	07...	0925	34	20.5
FEB, 1988				AUG			
25...	0915	9.8	18.5	25...	0900	0.29	21.0
APR							
14...	0830	0.16	19.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 04 19 LONG 159 25 05)							
OCT,1987				MAY, 1988			
29...	0930	40	21.0	27...	1020	34	23.0
NOV				JUN			
30...	1010	39	20.0	29...	0925	17	23.5
JAN, 1988				JUL			
28...	0920	430	20.0	28...	0920	20	21.5
FEB				AUG			
26...	1155	33	19.0	30...	0910	27	21.5
MAR				SEP			
30...	0955	116	20.5	29...	0910	40	23.0
APR							
28...	1015	90	20.0				
16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22 04 34 LONG 159 24 04)							
OCT, 1987				APR, 1988			
05...	1135	22	24.5	18...	1235	23	25.0
NOV				MAY			
18...	1110	22	22.0	17...	1055	17	25.0
JAN, 1988				JUL			
06...	1050	20	19.5	25...	0920	24	26.5
FEB				AUG			
29...	1150	18	22.0	25...	1355	23	26.0
16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22 03 08 LONG 159 22 22)							
OCT, 1987				APR, 1988			
05...	0950	161	22.0	18...	0945	48	22.0
NOV				JUN			
18...	0845	76	20.5	03...	0945	43	22.0
JAN, 1988				JUL			
06...	0905	135	19.0	19...	1005	42	24.0
FEB				AUG			
29...	0920	74	20.0	25...	1000	54	23.0
16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22 04 44 LONG 159 23 55)							
OCT, 1987				APR, 1988			
05...	1245	2.0	22.5	18...	1335	2.1	20.0
NOV				MAY			
18...	1210	3.1	20.5	17...	1400	3.5	22.5
JAN, 1988				JUL			
06...	1140	6.4	19.5	25...	1015	1.1	23.0
FEB				AUG			
29...	1250	2.3	20.0	26...	0840	1.7	22.0
16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22 07 06 LONG 159 22 04)							
OCT, 1987				APR, 1988			
02...	0915	12	22.0	19...	0915	4.4	19.5
NOV				MAY			
16...	0940	0.60	20.0	24...	1125	0.34	21.0
JAN, 1988				AUG			
11...	1105	0.36	21.0	04...	1325	10	22.0
FEB				24...	1140	8.5	20.0
22...	0920	0.44	20.0				
16079000 - KAPAHI DITCH NR KEALIA, KAUAI, HI (LAT 22 06 09 LONG 159 22 28)							
OCT, 1987				APR, 1988			
02...	1215	1.0	21.0	19...	1215	0.26	24.0
NOV				JUN			
16...	1345	10	20.0	06...	1350	7.3	23.0
JAN, 1988				JUL			
11...	0845	2.0	20.0	26...	1415	10	22.0
FEB				AUG			
22...	1220	0.51	19.5	24...	0905	0.32	23.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE WATER (DEG C)
16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA, KAUAI, HI (LAT 22 08 10 LONG 159 22 28)							
OCT, 1987				APR, 1988			
02...	1055	1.0	21.0	19...	1115	3.8	21.0
NOV				MAY			
16...	1230	8.8	19.0	24...	0825	5.2	20.0
JAN, 1988				JUL			
11...	1255	1.5	20.0	26...	0840	3.3	21.0
FEB				AUG			
26...	1000	9.9	18.5	24...	1315	3.7	22.0
16097500 - HALAULANI STR AT ALT 400 FT NR KILAUEA, KAUAI, HI (LAT 22 10 54 LONG 159 25 17)							
OCT, 1987				APR, 1988			
05...	1315	13	21.5	11...	1205	11	22.0
NOV				JUN			
12...	1210	14	22.5	02...	1110	8.0	20.0
JAN, 1988				JUL			
04...	1225	15	18.5	27...	1205	6.8	21.0
MAR				AUG			
01...	1215	8.1	21.0	31...	1215	7.2	22.0
16103000 - HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22 11 31 LONG 159 27 57)							
OCT, 1987				APR, 1988			
06...	1015	233	21.0	11...	1005	169	20.0
NOV				JUN			
12...	0955	171	22.0	01...	0910	116	21.0
JAN, 1988				JUL			
04...	0950	262	18.0	27...	1015	93	22.0
MAR				AUG			
01...	1010	131	20.0	31...	1025	99	20.5
16108000 - WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22 08 20 LONG 159 33 38)							
OCT, 1987				MAY, 1988			
08...	1045	82	19.0	09...	1230	95	19.0
JAN, 1988				SEP			
12...	1120	69	19.0	08...	0845	56	19.5
MAR							
02...	1205	62	18.0				

PERIODIC DETERMINATIONS OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF MOLOKAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 08 LONG 156 53 09)							
NOV, 1987				MAY, 1988			
12...	0930	0.88	21.0	05...	0925	1.5	20.5
FEB, 1988							
08...	1040	2.3	19.0				
16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 16)							
OCT, 1987				MAY, 1988			
21...	0940	4.4	19.0	12...	1205	3.2	19.0
DEC				JUN			
09...	1020	4.1	18.0	15...	0950	4.5	18.5
FEB, 1988				JUL			
03...	1005	6.5	17.0	26...	1415	2.1	18.5
MAR				AUG			
17...	1215	36	18.0	31...	0900	2.0	19.0
APR							
27...	1535	13	17.5				
16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21 07 27 LONG 156 59 50)							
OCT, 1987				MAY, 1988			
22...	0755	7.9	18.5	12...	0650	22	19.0
DEC				JUN			
09...	1610	7.2	18.0	15...	1550	8.8	19.0
FEB, 1988				JUL			
03...	1545	11	18.0	26...	1640	5.3	18.0
MAR				AUG			
14...	0740	41	17.5	31...	1530	5.3	19.0
APR							
27...	0840	16	17.5				
16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLOKAI, HI (LAT 21 08 43 LONG 156 55 18)							
OCT, 1987				MAY, 1988			
21...	1110	0.50	19.5	09...	1145	1.3	20.0
DEC				12...	1515	29	19.0
09...	1320	1.0	19.5	JUN			
FEB, 1988				15...	1250	0.94	23.0
03...	1250	1.7	18.5	JUL			
MAR				27...	1150	1.0	19.0
15...	1405	4.0	18.0	28...	1000	1.0	19.0
18...	1510	22	18.5	AUG			
APR				31...	1210	0.92	23.0
27...	1345	8.4	18.0				
16408000 - WAIKOLU STR BL PIPE CROSS NR KALAUPAPA, MOLOKAI, HI (LAT 21 09 45 LONG 156 55 54)							
OCT, 1987				APR, 1988			
21...	1235	9.6	21.0	27...	1445	25	19.5
DEC				JUN			
09...	1110	10	19.5	15...	1215	11	22.0
FEB, 1988				JUL			
03...	1315	19	20.0	26...	1135	10	20.5
MAR				AUG			
18...	1345	74	19.5	31...	1100	7.9	20.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF MOLOKAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)		DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	
16419500 - PAPIO GULCH AT HALAWA, MOLOKAI, HI (LAT 21 08 55 LONG 156 44 16)									
OCT, 1987					APR, 1988				
20...		1455	0.17	22.0	26...		1405	0.59	20.5
DEC					JUN				
08...		1515	0.53	21.0	13...		1405	0.27	22.0
FEB, 1988					JUL				
02...		1505	1.4	20.0	25...		1530	0.12	22.5
MAR					AUG				
23...		1550	0.85	20.0	29...		1150	0.14	21.5

PERIODIC DETERMINATIONS OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF MAUI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20 48 37 LONG 156 07 00)							
OCT, 1987				MAR, 1988			
07...	1440	3.1	21.0	29...	1300	7.9	18.0
NOV				MAY			
17...	1315	5.3	18.5	10...	1220	5.1	19.0
JAN, 1988				JUN			
05...	1305	15	17.0	28...	1315	5.0	21.0
FEB				AUG			
17...	1255	16	18.0	16. .	1340	8.5	20.0
16518000 - WEST WAILUAIKI STREAM NEAR KEANAE, MAUI, HI (LAT 20 49 16 LONG 156 08 37)							
OCT, 1987				MAR, 1988			
07...	1050	5.1	21.0	29...	0910	19	18.5
NOV				MAY			
17...	0905	8.3	17.0	10...	0935	5.7	19.5
JAN, 1988				JUN			
05...	1105	28	15.5	28...	0900	5.1	20.5
FEB				AUG			
17...	1005	22	17.0	16...	1025	9.4	19.5
16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 20)							
OCT, 1987				JUN, 1988			
29...	1025	1.4	20.0	29...	1045	0.78	21.5
DEC				JUL			
30...	1000	2.3	18.0	28...	1105	0.80	22.0
JAN, 1988				SEP			
28...	1245	82	18.0	29...	1210	0.83	23.0
MAR							
30...	1035	4.1	19.0				
16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)							
OCT, 1987				APR, 1988			
09...	1100	0.72	19.0	01...	1040	8.5	16.0
NOV				MAY			
23...	1055	5.1	18.0	13...	1000	11	18.0
JAN, 1988				AUG			
07...	1040	5.3	15.5	23...	1105	0.76	19.5
FEB							
22...	1105	2.5	17.0				
16604500 - IAO STREAM AT KEPANIWAI PARK NR WAILUKU, MAUI, HI (LAT 20 53 08 LONG 156 32 32)							
NOV, 1987				APR, 1988			
03...	1040	52	20.0	23...	1310	29	19.5
16...	0905	64	18.5	MAY			
19...	0915	181	18.5	23...	1425	63	19.5
JAN, 1988				AUG			
04...	1435	135	18.0	24...	1355	26	22.5
FEB				SEP			
16...	1105	50	19.0	28...	1120	22	21.5
MAR							
07...	1220	37	19.5				
10...	1510	29	21.0				

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16614000 - WAIHEE RIVER AT DAM NR WAIHEE, MAUI, HI (LAT 20 56 20 LONG 156 32 58)							
OCT, 1987				APR, 1988			
02...	1120	221	20.5	21...	1130	57	19.0
NOV				MAY			
16...	1325	68	19.0	23...	1150	126	19.0
JAN, 1988				JUL			
04...	0945	89	17.0	06...	1100	53	20.5
FEB				AUG			
12...	1220	72	20.0	25...	1245	50	19.5
16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20 57 48 LONG 156 35 22)							
OCT, 1987				APR, 1988			
15...	1040	18	20.0	14...	1020	26	18.0
NOV				MAY			
25...	1300	33	19.0	17...	1005	39	18.5
JAN, 1988				JUL			
08...	1200	30	18.0	07...	1025	118	20.0
FEB				SEP			
23...	1210	33	20.0	02...	1050	18	20.0
16638500 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20 53 10 LONG 156 40 36)							
NOV, 1987				MAR, 1988			
24...	1040	7.7	22.0	31...	0910	9.0	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16700000 - WAIAKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19 38 30 LONG 155 10 28)							
OCT, 1987				MAY, 1988			
29...	1420	9.4	17.0	27...	1350	4.2	17.0
DEC				JUN			
29...	1050	14	17.0	20...	1035	4.3	17.0
JAN, 1988				JUL			
28...	1255	3.7	17.0	28...	1330	2.0	17.0
FEB				AUG			
26...	1335	29	16.5	30...	0920	5.3	17.0
APR				SEP			
28...	1340	9.5	17.0	30...	0815	3.7	17.0
16700900 - OLAA FLUME SPRING NR KAUMANA, HAWAII, HI (LAT 19 41 59 LONG 155 11 13)							
OCT, 1987				JUN, 1988			
01...	1340	14	17.0	13...	1400	1.6	17.0
NOV				16...	1010	0.42	17.0
02...	1000	2.9	17.0	JUL			
DEC				18...	1210	0.05	17.0
07...	1430	6.9	16.5	AUG			
JAN, 1988				09...	1000	9.7	16.5
05...	1110	5.0	16.5	SEP			
APR				08...	0955	0.09	17.0
21...	1205	2.1	17.0				
MAY							
16...	1240	1.7	17.0				
16700950 - LYMAN SPRINGS NO. 2 NEAR PIIHONUA, HAWAII, HI (LAT 19 42 02 LONG 155 10 36)							
OCT, 1987				APR, 1988			
15...	1345	4.0	17.0	21...	0915	4.0	17.0
NOV				JUN			
17...	1345	4.2	17.0	15...	0945	3.9	17.0
JAN, 1988				JUL			
08...	0815	4.5	16.0	25...	0935	3.5	17.0
MAR				AUG			
22...	1345	5.2	16.5	17...	1420	4.7	17.0
16704000 - WAILUKU RIVER AT PIIHONUA, HAWAII, HI (LAT 19 42 56 LONG 155 09 12)							
OCT, 1987				MAY, 1988			
14...	1040	34	18.0	16...	1215	71	18.5
JAN, 1988				JUN			
05...	0845	83	17.0	15..	1145	40	18.0
FEB				JUL			
08...	1300	75	19.0	18...	1250	33	18.5
MAR				SEP			
17...	0745	84	18.5	08...	1120	73	18.5
16720000 - KAWAINUI STREAM NR KAMUELA, HAWAII, HI (LAT 20 05 18 LONG 155 40 58)							
OCT, 1987				MAY, 1988			
06...	1105	1.7	15.0	19...	1215	2.3	15.0
NOV				JUN			
05...	1105	2.3	14.0	17...	1230	15	15.0
JAN, 1988				JUL			
07...	1105	6.6	13.0	26...	1230	2.1	15.0
MAR				AUG			
01...	1125	2.7	14.0	25...	1115	1.7	15.0
16720300 - KAWAIKI STREAM NEAR KAMAUELA, HAWAII, HI (LAT 20 05 13 LONG 155 40 59)							
OCT, 1987				APR, 1988			
06...	1010	0.17	14.0	07...	1120	3.9	15.0
NOV				MAY			
05...	1005	0.29	14.0	19...	1050	0.41	15.0
JAN, 1988				JUN			
07...	1025	1.8	14.0	17...	1130	3.5	15.0
MAR				AUG			
01...	1040	0.53	14.0	25..	1020	0.21	15.0

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA, HAWAII, HI (LAT 20 05 15 LONG 155 40 42)							
OCT, 1987				MAY, 1988			
06...	0915	1.3	14.0	19...	1035	2.5	15.0
NOV				JUL			
05...	0910	2.3	15.0	26...	1040	2.0	15.0
JAN, 1988				AUG			
07...	0920	13	13.0	25...	0930	1.1	15.0
MAR							
01...	0955	3.3	14.0				
16724800 - UP HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA, HAWAII, HI (LAT 20 04 31 LONG 155 40 26)							
NOV, 1987				APR, 1988			
04...	0915	0.52	15.0	19...	0945	2.8	15.0
DEC				MAY			
23...	0910	0.21	13.0	25...	1145	2.2	15.0
JAN, 1988				JUL			
07...	1140	3.6	13.0	26...	1350	0.84	15.0
FEB				AUG			
23...	0845	4.6	14.0	25...	1200	0.24	15.0
16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 04 27 LONG 155 40 25)							
OCT, 1987				MAY, 1988			
05...	1020	2.0	15.0	25...	1110	2.6	15.0
NOV				JUN			
04...	0950	2.7	14.0	23...	1020	7.5	15.0
DEC				JUL			
23...	0840	1.4	14.0	26...	1430	1.6	15.0
JAN, 1988				AUG			
07...	1215	4.0	12.0	25...	0920	1.2	15.0
APR							
19...	1025	2.8	14.0				
16726000 - UP HAMAKUA DITCH AB WAIMEA RES DIV NR KAMUELA, HAWAII, HI (LAT 20 03 31 LONG 155 37 40)							
OCT, 1987				JUN, 1988			
05...	1355	2.0	15.0	08...	1210	24	15.0
NOV				JUL			
04...	1355	1.3	14.5	06...	1155	27	15.0
DEC				AUG			
23...	1255	2.0	14.0	02...	1400	13	15.0
JAN, 1988				SEP			
27...	1115	34	14.0	01...	1235	0.70	15.0
MAR							
23...	0955	1.7	14.5				
16727000 - UPPER HAMAKUA D AB PUUKAPU RES NR KAMUELA, HAWAII, HI (LAT 20 02 53 LONG 155 37 17)							
OCT, 1987				JAN, 1988			
05...	1410	0.01	15.0	27...	1145	10	13.0
DEC				MAR			
23...	1325	0.49	15.0	23...	1210	0.01	15.0
16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 02 38 LONG 155 41 10)							
DEC, 1987				MAY, 1988			
23...	1010	0.72	15.0	25...	1230	0.02	15.0
FEB, 1988				JUN			
23...	1020	4.7	15.0	23...	1115	5.4	15.0
16758000 - WAIKOLOA STR AT MARINE DAM NR KAMUELA, HAWAII, HI (LAT 20 02 48 LONG 155 39 58)							
OCT, 1987				APR, 1988			
05...	1220	2.3	15.0	07...	1420	9.8	15.0
NOV				JUN			
04...	1205	3.2	15.0	08...	1000	7.3	15.0
DEC				JUL			
23...	1055	2.9	14.0	06...	1010	8.7	15.0
JAN, 1988				AUG			
27...	0910	31	13.0	10...	1130	6.5	15.0

PERIODIC DETERMINATIONS OF TEMPERATURES

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)
16759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20 02 28 LONG 155 39 05)							
OCT, 1987				APR, 1988			
05...	0810	0.64	15.0	19...	1205	0.33	15.0
NOV				JUN			
04...	0810	0.66	15.0	23...	1250	1.2	15.0
DEC				AUG			
23...	1220	0.58	14.0	02...	1255	0.80	15.0
FEB, 1988				SEP			
23...	1135	3.4	14.0	01...	1130	0.28	15.0
16764000 - HILEA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19 10 27 LONG 155 35 58)							
OCT, 1987				MAR, 1988			
20...	0955	0.07	17.0	29...	1030	1.9	16.5
DEC				APR			
17...	1020	4.3	16.0	28...	1025	1.1	16.0

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01.

LOCATION.--Lat 22°00'57", long 159°21'04", Hydrologic Unit 20070000, 1.0 mi south southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table, depth 276 ft, casing diameter 8 in., cased to 196 ft.

DATUM.--Elevation of land surface datum is 166 ft. Measuring point: Top of 4-in. galvanized coupling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1980 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.71 ft above mean sea level, Nov. 19, 1982; lowest measured, 13.39 ft above mean sea level, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	14.42	JAN 19	14.78	APR 15	15.02	MAY 26	14.90	JUL 7	14.62	AUG 25	14.74
NOV 19	14.52	FEB 26	15.16								

HAWAII, ISLAND OF KAUAI--Continued

220018159444702. Local number 2-0044-13

LOCATION.--Lat 22°00'18", long 159°44'47", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 206 ft, casing diameter 12 in., cased to 165 ft.

DATUM.--Elevation of land surface datum is 8 ft. Measuring point: Top of standpipe 10.61 ft above mean sea level. From July 27, 1977 to Sept. 10, 1981, before standpipe was extended, measuring point elevation at top of standpipe was at 9.11 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, July 27, 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.19 ft above mean sea level, Nov. 9, 1983; lowest measured, 8.33 ft above mean sea level, Mar. 29, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	8.95	JAN 11	9.81	APR 25	8.99	JUN 6	8.77	JUL 18	8.70	AUG 29	8.81
NOV 16	8.92	FEB 29	9.37								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
07...	1330	530	22.5	94	28...	1430	570	25.5	91
NOV					JUN				
17...	1000	500	24.0	92	10...	1430	a562	25.5	94
JAN					JUL				
14...	1400	570	24.0	130	20...	0900	570	22.0	94
MAR					SEP				
03...	1300	550	25.5	90	02...	1320	540	22.0	95

a Laboratory conductance.

HAWAII, ISLAND OF KAUAI--Continued

220019159444801. Local number 2-0044-14.

LOCATION.--Lat 22°00'19", long 159°44'48", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 12 in., cased to 164 ft.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point: Top of standpipe, 11.49 ft above mean sea level. Prior to June 1979 nonrecording gage at datum 0.25 ft lower.

PERIOD OF RECORD.--Occasional measurements, 1937 to 1962 (measured by Kekaha Sugar Co.).
Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.07 ft above mean sea level, Dec. 20, 1937; lowest measured, 7.52 ft above mean sea level, Aug. 15, 1947.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	8.99	9.28	8.94	9.73	9.74	9.02	9.43	9.02	8.79	8.66	9.00	9.12
10	8.78	9.42	8.91	9.78	9.77	8.93	9.46	9.46	8.76	8.76	8.70	8.85
15	9.17	8.97	9.43	9.71	9.36	8.87	9.19	9.46	8.82	8.71	9.03	8.96
20	9.39	8.87	9.62	9.77	9.22	8.87	9.05	9.20	8.77	8.66	8.75	9.06
25	9.43	9.26	9.66	9.75	9.07	9.33	9.02	8.95	8.71	8.65	8.83	9.18
EOM	8.93	9.37	9.77	9.79	9.30	9.08	8.88	8.85	8.69	8.65	8.82	8.85

WTR YEAR 1988 MAX 9.99 JAN 29, 30 MIN 8.38 JUL 27

HAWAII, ISLAND OF KAUAI--Continued

220016159442701. Local number, 2-0044-15.

LOCATION.--Lat 22°00'16", long 159°44'27", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.5 mi northwest from Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 63.1 ft, 12-ft concrete casing, cased to 63.1 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point: South top of concrete ring at 57.84 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1973 to current year.
WATER QUALITY: Occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.73 ft above mean sea level, Jan. 24, 1978; lowest measured, 4.16 ft above mean sea level, May 10, 1977.

REMARKS.--Water used for irrigation of sugarcane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	9.24	JAN 11	9.94	APR 25	6.44	JUN 6	4.64	JUL 18	5.08	AUG 29	4.84
NOV 16	9.22	FEB 29	9.76								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
05...	0930	4860	25.0	1400	25...	0950	2100	23.0	520
NOV					JUN				
16...	0930	3130	25.0	860	06...	0920	a2940	26.0	780
JAN					JUL				
11...	0935	900	25.0	160	18...	0930	3250	23.0	900
FEB					AUG				
29...	0935	1200	25.0	300	29...	0900	3000	23.5	920

a Laboratory conductance.

HAWAII, ISLAND OF KAUAI--Continued

220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, 0.3 mi southwest of Wailua County Golf Course, and 1.6 mi south southwest of Wailua River mouth. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 312 ft, casing diameter 6 in., cased to 60 ft.

DATUM.--Elevation of land-surface datum is 11 ft. Measuring point: Top of 10-in. plastic pipe, 11.36 ft above mean sea level. Prior to June 24, 1980, measuring point was the top of 6-in. steel casing, 11.93 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1973 to 1980, 1987 to current year.
WATER QUALITY: Occasional measurements, 1982 to 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.79 ft above mean sea level, Feb. 21, 1974; lowest measured, 8.08 ft above mean sea level, Oct. 12, 1978.

REMARKS.--Well affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	10.31	MAY 25	10.57	JUL 8	9.76	AUG 26	9.56

220148159453502. Local number, 2-0145-11.

LOCATION.--Lat 22°01'48", long 159°43'35", Hydrologic Unit 20070000, 1.0 mi southeast from Mana Camp, and 3.3 mi north of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 31.5 ft, probably obstructed, casing diameter 12 in., cased depth unknown.

DATUM.--Elevation of land-surface datum is 29 ft. Measuring point: Top of steel pipe 29.23 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.82 ft above mean sea level, July 22, 1981 and Jan. 18, 1982; lowest measured, 17.52 ft above mean sea level, Sept. 6, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	21.81	JAN 11	22.09	APR 25	23.01	JUN 6	23.31	JUL 18	23.37	AUG 29	23.36
NOV 16	21.76										

HAWAII, ISLAND OF KAUAI--Continued

221141159252501. Local number, 2-1125-01.

LOCATION.--Lat 22°11'41", long 159°25'25", Hydrologic Unit 20070000, 1.4 mi west northwest of Puu Ka Ele Reservoir, and 2.3 mi south of Kapukaamoi Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 790 ft, casing diameter 12 in., cased to 390 ft.

DATUM.--Elevation of land-surface datum is 390 ft. Measuring point: Top of hole on pump base after removing nipple and elbow, 391.37 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1973 to current year.
WATER QUALITY: Occasional measurements, 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.37 ft above mean sea level, Jan. 9, 1980; lowest water level measured, 8.77 ft above mean sea level, Mar. 11, 1986.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 19	10.95	APR 15	11.19	MAY 26	11.69

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					FEB				
07...	1400	150	24.5	14	26...	1225	180	24.0	19
NOV					APR				
19...	1200	170	24.0	16	15...	1220	200	24.0	24
JAN					JUL				
19...	1220	170	24.0	--	08...	1055	190	25.0	14

HAWAII, ISLAND OF KAUAI--Continued

221150159264501. Local number, 2-1126-01.

LOCATION.--Lat 22°11'50", long 159°26'45", Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal, and 4.0 mi east southeast of Puupoa Point. Owner: Princeville Hanalei.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 763 ft, casing diameter 14 in., cased to 435 ft.

DATUM.--Elevation of land-surface datum 348 ft. Measuring point: Top of pump opening 0.40 ft above 1-in. hole on southside of pump base, 349.31 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.36 ft above mean sea level, June 3, 1974; lowest water level measured, 9.24 ft below mean sea level, Aug. 10, 1983.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	11.20	JAN 13	12.57	APR 21	9.66	JUN 9	9.81	AUG 2	7.87	AUG 31	5.86
NOV 25	11.86	FEB 26	9.76								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
08...	0820	190	23.5	16
JAN				
13...	0840	180	23.5	16
FEB				
26...	0805	210	23.5	16
JUN				
09...	0820	170	24.0	14
AUG				
02...	0900	205	24.0	16
31...	0835	210	24.0	15

HAWAII, ISLAND OF KAUAI--Continued

220354159205601. Local number, 2-0320-01

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 240 ft, casing diameter 8 in., cased to 193 ft.

DATUM.--Elevation of land-surface datum is 155 ft. Measuring point: Top edge of steel pump base at breather hole, 155.98 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, February 1960, June 1973 to current year.
WATER QUALITY: 1960, 1966, 1972-80, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft above mean sea level, Feb. 17, 1960; lowest measured, 3.31 ft below mean sea level, May 27, 1977.

REMARKS.--Water used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	7.30	JAN 19	7.86	APR 15	8.08	MAY 26	8.51	JUL 8	7.40	AUG 26	7.26
NOV 19	7.39	FEB 26	8.20								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
02...	0950	400	24.0	47	15...	1025	330	24.0	32
NOV					MAY				
19...	0950	a426	24.0	60	26...	0830	300	25.0	35
JAN					JUL				
19...	1030	330	24.0	--	08...	0850	440	25.0	43
FEB					AUG				
26...	1030	400	24.0	42	26...	0850	380	24.0	37

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HAWAII, ISLAND OF KAUAI--Continued

220354159205602. Local number, 2-0320-03.

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, 0.6 mi east of Sleeping Giant mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 302 ft, casing diameter 14 in., cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point: Top edge of steel pump base at breather hole, 156.94 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVER: Occasional measurements, August 1976 to current year.
WATER QUALITY: Occasional measurements, 1972, 1976 to current.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, Nov. 19, 1982; lowest measured, 0.35 ft below mean sea level, Sept. 22, 1979.

REMARKS.--Water is used for public supply. Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	8.68	JAN 19	8.04	APR 15	8.26	MAY 26	8.76	JUL 8	8.46	AUG 26	8.32
NOV 19	7.77	FEB 26	8.38								

HAWAII, ISLAND OF KAUAI--Continued

220341159453901. Local number, 2-0345-04.

LOCATION.--Lat 22°03'41", long 159°43'39", Hydrologic Unit 20070000, 1.7 mi north northeast from Mana Camp, and 1.7 mi east southeast from Nohili Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artisian well, depth 66 ft, concrete casing, diameter 12 ft, cased to 66 ft.

DATUM.--Elevation of land-surface datum 57 ft. Measuring point: Top of concrete ring (south side) at 60.80 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current.
WATER QUALITY: Occasional measurements, 1972 to current.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.90 ft above mean sea level, Jan. 31, 1974; lowest measured, 1.42 ft below mean sea level, Jan. 22, 1985.

REMARKS.--Water is used for irrigation of sugarcane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	4.30	JAN 11	4.72	FEB 29	4.56	JUN 6	3.40	JUL 18	3.55	AUG 29	2.75
NOV 16	4.22										

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
05...	1120	1400	25.5	320	25...	1045	1020	23.0	220
NOV					JUN				
16...	1120	1200	25.0	280	06...	1030	815	26.0	180
JAN					JUL				
11...	1120	870	25.0	160	18...	1114	950	22.5	190
FEB					AUG				
29...	1120	900	26.0	150	29...	1000	900	23.0	200

HAWAII, ISLAND OF KAUAI--Continued

220827159185401. Local number, 2-0818-01.

LOCATION.--Lat 22°08'27", long 159°18'54", Hydrologic Unit 20070000, 0.2 mi south from Anahola School, and 1.3 mi southwest from Kahala Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 433 ft, casing diameter 10 in., cased to 295 ft.

DATUM.--Elevation of land-surface datum 270 ft. Measuring point: Top of hole on pump base at 272.80 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1973 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.14 ft above mean sea level, Feb. 17, 1983; lowest water level measured, 0.34 ft below mean sea level, Aug. 16, 1978.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	11.22	JAN 18	11.58	APR 15	11.61	MAY 26	11.92	JUL 8	9.07	AUG 26	8.81
NOV 19	11.36	FEB 26	11.72								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					FEB				
02...	1105	300	24.0	24	26...	1110	240	24.0	21
NOV					APR				
19...	1105	340	24.0	44	15...	1105	250	24.0	17
JAN					AUG				
19...	1110	310	24.0	--	26...	1010	230	24.0	18

HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit 20070000, 2.6 mi south of Kulikoa Point, and 2.6 mi northwest of Kuaehu Point. Owner: Amfac Properties Development Corp.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 700 ft.

DATUM.--Elevation of land-surface datum 358 ft. Measuring point: Top of airvent pipe after removing 2-in. elbow on the southwest side of base, elevation 359.04 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 133.59 ft above mean sea level, July 27, 1988; lowest water level measured, 42.69 ft above mean sea level, Oct. 4, 1973.

REMARKS.--Water is used for public supply and truck farming irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	110.62	NOV 19	110.42	FEB 26	110.74	JUN 17	132.56	JUL 27	133.59

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
02...	1140	220	24.0	20	15...	1200	240	24.0	17
NOV					MAY				
19...	1140	200	24.0	24	26...	0910	200	22.0	18
JAN					JUL				
19...	1155	220	24.0	30	08...	1030	218	25.0	18
FEB					AUG				
26...	1200	240	24.0	20	26...	1040	230	24.5	18

HAWAII, ISLAND OF KAUAI--Continued

221247159324801. Local number, 2-1232-01.

LOCATION.--Lat 22°12'47", long 159°32'48", Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point, and 1.5 mi southeast of Haena Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 188 ft, casing diameter 6 in., cased to 140 ft.

DATUM.--Elevation of land-surface datum is 65 ft. Measuring point: Top of 1-in. pipe 0.06 ft above flange, 66.56 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level, June 3, 1974; lowest water level measured, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	8.18	JAN 19	8.56	APR 15	8.85	MAY 26	9.18	JUL 8	10.35	AUG 26	10.55
NOV 19	8.32	FEB 26	8.98								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
02...	1325	190	24.0	19	15...	1330	180	24.0	20
NOV					MAY				
19...	1330	170	24.0	16	26...	1200	a131	25.0	18
JAN					JUL				
19...	1330	160	24.0	20	08...	1200	140	25.0	18
FEB					AUG				
26...	1330	160	24.0	19	26...	1210	180	24.5	18

a Laboratory conductance.

HAWAII, ISLAND OF KAUAI--Continued

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13'18", long 159°33'59", Hydrologic Unit 20070000, 0.6 mi south southwest of Haena Point, and 1.2 mi east southeast of Kailiu Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 159 ft, casing diameter 8 in., cased to 104 ft.

DATUM.--Elevation of land-surface datum 83 ft. Measuring point: Top of unthreaded hole after removing 1-in. pipe, 0.22 ft above hole on pump base, 82.45 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.24 ft above mean sea level, Nov. 16, 1982; lowest water level measured, 4.37 ft below mean sea level, Jan. 13, 1975.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	4.27	JAN 19	4.71	APR 15	4.85	MAY 26	5.31	JUL 8	4.27	AUG 26	4.09
NOV 19	4.41	FEB 26	4.99								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
02...	1400	210	24.0	18	15...	1400	240	24.0	16
NOV					MAY				
19...	1400	230	24.0	19	26...	1215	200	24.0	20
JAN					JUL				
19...	1400	220	24.0	29	08...	1245	210	24.0	20
FEB					AUG				
26...	1400	250	24.0	26	26...	1245	210	24.0	20

HAWAII, ISLAND OF KAUAI--Continued

215434159263301. Local number, 2-5426-03.

LOCATION.--Lat 21°54'34", long 159°26'33", Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill, and 2.6 mi north of Makahuena Point. Owner: Grove Farm Co. Inc.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 318 ft, casing diameter 12 in., cased to 176 ft.

DATUM.--Elevation of land-surface datum is 221 ft. Measuring point: Top of 1-in. hole on southwest side of flange, 222.30 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, Jan. 10, 1974; lowest water level measured, 5.05 ft above mean sea level, Mar. 10, 1975.

REMARKS.--Water used for irrigation and washing of sugarcane at mill.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	23.28	JAN 11	27.12	APR 25	23.70	JUN 13	25.70	JUL 18	25.86	SEP 6	26.00
NOV 30	26.36	FEB 29	27.26								

HAWAII, ISLAND OF KAUAI--Continued

215454159274201. Local number, 2-5427-01.

LOCATION.--Lat 21°54'54", long 159°27'42", Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir, and 2.7 mi northeast of Kaulala Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 456 ft, casing diameter 12 in., cased to 263 ft.

DATUM.--Elevation of land surface datum is 245 ft. Measuring point: Top of 1/2-in. pipe on pump base 246.07 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.04 ft above mean sea level, July 15, 1974; lowest water level measured, 22.07 ft above mean sea level, Mar. 3, 1983.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	34.53	FEB 25	35.07	APR 14	34.99	MAY 25	33.99	JUL 7	28.01	AUG 25	28.29
JAN 14	35.03										

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					FEB				
01...	0825	220	24.0	26	25...	0830	220	24.0	25
NOV					APR				
18...	0825	250	24.0	29	14...	0830	140	23.5	23
JAN					AUG				
14...	0840	220	24.0	25	25...	0730	195	23.5	23

HAWAII, ISLAND OF KAUAI--Continued

215536159263501. Local number, 2-5526-01.

LOCATION.--Lat 21°55'36", long 159°26'35", Hydrologic Unit 20070000, 2.5 mi southeast of Knudsen Gap, and 3.7 mi north of Makahuena Point. Owner: McBryde Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,010 ft, casing diameter 20 in., cased to 400 ft.

DATUM.--Elevation of land-surface is 355 ft. Measuring point: Top of 1-in. hole on top of pipe flange, southeast side, 355.28 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1977 to current year.
WATER QUALITY: Occasional measurements, 1977 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 73.65 ft above mean sea level, Dec. 10, 1982; lowest water level measured, 22.67 ft below mean sea level, July 27, 1978.

REMARKS.--Water used for sugarcane irrigation.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	65.48	JAN 14	65.92	FEB 25	66.08	APR 14	65.96	MAY 25	44.88	JUL 7	34.53
NOV 18	65.52										

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
09...	0750	260	22.5	22	25...	0820	220	23.0	22
NOV					JUN				
30...	0820	230	23.5	22	13...	0815	240	23.0	20
JAN					JUL				
11...	0800	260	23.5	22	18...	0800	250	23.5	21
FEB					SEP				
29...	0810	240	24.5	22	06...	0840	230	23.5	21

HAWAII, ISLAND OF KAUAI--Continued

215522159342601. Local number, 2-5534-03.

LOCATION.--Lat 21°55'22", long 159°34'26", Hydrologic Unit 20070000, 1.9 mi north from Weli Point, and 2.9 mi northeast from Puolo Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 108 ft, casing diameter 9 in., cased to 108 ft.

DATUM.--Elevation of land surface datum 78 ft. Measuring point: Top of pump base, east side, 78.97 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.39 ft above mean sea level, Nov. 9, 1983; lowest water level measured, 9.19 ft above mean sea level, Oct. 13, 1978.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	17.31	JAN 14	17.77	APR 14	17.77	MAY 25	19.29	JUL 7	14.48	AUG 25	14.69
NOV 18	17.25	FEB 25	17.89								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
01...	0945	450	24.0	43	14...	1040	480	24.0	140
NOV					MAY				
18...	0945	500	24.0	91	25...	1005	250	26.0	26
JAN					JUL				
14...	1050	250	24.0	31	07...	0945	300	27.0	29
FEB					AUG				
25...	1050	550	24.0	100	25...	0945	500	24.0	96

HAWAII, ISLAND OF KAUAI--Continued

215607159344301. Local number 2-5634-01.

LOCATION.--Lat 21°56'07", long 159°34'43", Hydrologic Unit 20070000, 2.7 mi north of Weli Point, and 3.3 mi northeast of Puolo Point. Owner: State of Hawaii.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 508 ft, casing diameter 8 in., cased to 507 ft.

DATUM.--Elevation of land-surface datum is 439 ft. Measuring point: Top of casing 440.62 ft above mean sea level.

PERIOD OF RECORD.--Water level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 16.78 ft above mean sea level, Dec. 31, 1987; lowest, 15.78 ft above mean sea level, Oct. 2, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.86	16.20	16.30	16.68	16.57	16.16	16.18	16.25	16.33	16.17	16.14	16.24
10	15.92	16.26	16.27	16.69	16.51	16.07	16.19	16.35	16.33	16.20	16.18	16.19
15	15.87	16.27	16.37	16.66	16.45	16.08	16.20	16.42	16.30	16.20	16.30	16.19
20	15.99	16.27	16.52	16.64	16.45	16.03	16.14	16.47	16.27	16.15	16.36	16.12
25	16.15	16.31	16.59	16.65	16.33	16.13	16.07	16.48	16.20	16.12	16.37	16.05
EOM	16.13	16.34	16.72	16.61	16.24	16.14	16.15	16.40	16.18	16.12	16.31	16.09

WTR YEAR 1988 MAX 16.78 DEC 31 MIN 15.78 OCT 2

HAWAII, ISLAND OF KAUAI--Continued

215803159401201. Local number, 2-5840-01.

LOCATION.--Lat 21°58'03", long 159°40'12", Hydrologic Unit 20070000, 0.7 mi north of Waimea Recreational Pier State Park, and 2.4 mi east northeast of Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal-table well, depth 190 ft, casing diameter 8 in., cased to 167 ft.

DATUM.--Elevation of land surface is 167 ft. Measuring point: Top of 1/2-in. hole above pump base, 168.08 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1973 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.82 ft above mean sea level, Nov. 7, 1975; lowest water level measured, 5.26 ft above mean sea level, July 24, 1985.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	8.36	JAN 14	9.18	FEB 25	9.23	APR 14	9.13	MAY 25	9.53	AUG 25	8.94
NOV 18	8.50										

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT				APR			
01...	1215	700	24.0	14...	1240	680	24.0
NOV				MAY			
18...	1215	690	24.0	25...	1205	620	27.0
JAN				JUL			
14...	1240	710	24.0	07...	1150	710	27.0
FEB				AUG			
25...	1235	700	24.0	25...	1155	690	24.5

HAWAII, ISLAND OF KAUAI--Continued

215857159430101. Local number, 2-5843-01.

LOCATION.--Lat 21°58'57", long 159°43'01", Hydrologic Unit 20070000, 1.4 mi north northwest of Oomano Point, and 2.7 mi east northeast from Kokole Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 53 ft, casing diameter 15 ft, cased to 10 ft.

DATUM.--Elevation of land surface is 57 ft. Measuring point: Top west side of concrete shaft 57.70 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972, 1985 to current year.
WATER QUALITY: One measurement in 1972.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.22 ft above mean sea level, Aug. 27, 1986; lowest water level measured, 8.32 ft below mean sea level, Dec. 16, 1985 and June 19, 1986.

REMARKS.--Well used as a standby for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	8.40	JAN 11	8.90	APR 25	7.82	JUN 6	8.57	JUL 18	8.51	AUG 29	8.32
NOV 16	8.35	FEB 29	8.68								

215958159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59'58", long 159°21'43", Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park, and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 540 ft, casing diameter 14 in., cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point: Top of tee flange, elevation 303.77 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.69 ft above mean sea level, Nov. 26, 1985; lowest measured, 13.39 ft above mean sea level, Aug. 25, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.96	15.82	15.70	15.81	e16.15	16.47	16.44	16.35	16.21	15.90	15.55	15.37
10	15.90	15.76	15.78	15.90	e16.25	16.46	16.38	16.35	16.17	15.84	15.52	15.35
15	15.88	15.78	15.74	15.88	e16.35	16.47	16.44	16.32	16.09	15.81	15.49	15.29
20	15.89	15.77	15.73	15.97	e16.40	16.42	16.40	16.33	16.06	15.76	15.49	15.24
25	15.83	15.77	15.70	15.98	e16.43	16.48	16.35	16.22	16.01	15.68	15.42	15.09
EOM	15.80	15.74	15.83	16.05	16.44	16.42	16.30	16.29	15.96	15.63	15.43	15.13

WTR YEAR 1988 MAX 16.53 MAR 6 MIN 15.07 SEP 30

e Estimated

HAWAII, ISLAND OF KAUAI--Continued

215901159235301. Local number, 2-5923-01.

LOCATION.--Lat 21°59'01", long 159°23'53", Hydrologic Unit 20070000, 3.4 mi west from Lihue Airport terminal, and 4.2 mi northwest of Ninini Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 920 ft, casing diameter 14 in., cased to 341 ft.

DATUM.--Elevation of land surface is 371 ft. Measuring point: Top of 1-in. hole northside of pump base after removing elbow. Elevation of measuring point is at 372.42 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1974 to current year.
WATER QUALITY: Occasional measurements, 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 50.42 ft above mean sea level, Sept. 12, 1983; lowest water level measured, 29.24 ft above mean sea level, Mar. 15, 1978.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	42.64	JAN 19	43.52	APR 15	43.92	MAY 26	44.44	JUL 8	35.64	AUG 26	44.27
NOV 18	42.73	FEB 26	44.04								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
02...	0800	200	24.0	18	15...	0800	240	24.0	17
NOV					MAY				
18...	0800	260	24.0	18	26...	0750	260	23.0	16
JAN					JUL				
19...	0800	160	24.0	19	08...	0735	270	24.5	16
FEB					AUG				
26...	0800	180	24.0	24	26...	0735	185	24.0	20

HAWAII, ISLAND OF KAUAI--Continued

215901159235201. Local number, 2-5923-07.

LOCATION.--Lat 21°59'01", long 159°23'52", Hydrologic Unit 20070000, 3.4 mi west of Lihue Airport terminal, and 4.2 mi northwest of Ninini Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled perch water-table well, depth 200 ft, casing diameter 12 in., cased to 200 ft.

DATUM.--Elevation of land surface is 364 ft. Measuring point: Top of pump base opening, after removing copper fittings, 365.48 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1985 to current year.
WATER QUALITY: Occasional measurements, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 224.98 ft above mean sea level, Apr. 26, 1985; lowest water level measured, 217.26 ft above mean sea level, July 8, 1988.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	217.30	JAN 19	217.68	APR 15	218.10	MAY 26	218.56	JUL 8	217.26	AUG 26	218.34
NOV 19	217.39	FEB 26	218.20								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
02...	0810	190	24.0	20
NOV				
19...	0810	200	24.0	19
JAN				
19...	0810	170	24.0	20
FEB				
26...	0820	160	24.0	18
APR				
15...	0820	180	24.0	20
MAY				
26...	0715	190	22.0	18
JUL				
08...	0800	222	23.5	18
AUG				
26...	0800	180	24.0	18

HAWAII, ISLAND OF KAUAI--Continued

215906159395601. Local number, 2-5939-01.

LOCATION.--Lat 21°59'06", long 159°39'56", Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea Recreational Pier State Park, and 3.2 mi northeast from Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 40 ft, 6.5 ft diameter, uncased.

DATUM.--Elevation of land surface is 42 ft. Measuring point: Top west side of concrete base 41.61 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOS OF RECORD.--Highest water level measured, 10.43 ft above mean sea level, Jan. 14, 1988; lowest water level measured 6.05 ft below mean sea level, Sept. 8, 1980.

REMARKS.--Water is used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	9.14	JAN 14	10.43	FEB 29	10.31	APR 14	10.23	JUL 7	8.95	AUG 25	9.19
NOV 18	9.19										

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
01...	1140	1020	24.5	240	14...	1400	---	24.5	130
NOV					MAY				
18...	1145	680	24.0	150	25...	1140	610	24.0	120
JAN					JUL				
14...	1300	580	24.0	130	07...	1230	580	25.5	110
FEB					AUG				
25...	1310	550	24.5	98	25...	1225	505	24.5	97

HAWAII, ISLAND OF KAUAI--Continued

215937159434201. Local number, 2-5943-01.

LOCATION.--Lat 21°59'37", long 159°43'42", Hydrologic Unit 20070000, 2.2 mi northeast of Kokole Point, and 2.4 mi northwest of Oomano Point. Owner: Kekaha Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well. Well is a 45 degree inclined Maui type shaft from 59 ft to 16 ft elevation and a vertical pump sump 10 ft in diameter and 15 ft deep, with a lateral tunnel extending into the hillside at the bottom of the shaft.

DATUM.--Elevation of land surface is 60 ft. Measuring point: Top of 2-in. galvanized pipe plug on the pump platform, 16.19 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1972 to current year.
WATER QUALITY: Occasional measurements, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.27 ft above mean sea level, Jan. 8, 1974; lowest water level measured, 0.07 ft above mean sea level, Sept 17, 1979.

REMARKS.--Water used for irrigation of sugarcane.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	8.91	JAN 11	9.39	APR 25	8.89	JUN 6	8.77	JUL 18	8.68	AUG 29	9.74
NOV 16	8.87	FEB 29	9.79								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
05...	1230	1200	25.0	240	25...	0930	950	25.0	180
NOV					JUN				
16...	1235	1000	25.0	230	06...	0900	925	27.0	190
JAN					JUL				
11...	1250	970	25.0	170	18...	0910	1090	24.5	200
FEB					AUG				
29...	1250	920	25.5	180	29...	0840	1000	24.5	210

HAWAII, ISLAND OF OAHU

211907157594701. Local number, 3-1959-05.

LOCATION.--Lat 21°19'06", long 157°59'46", Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: Hawaii Institute of Geophysics.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land surface datum is 6 ft. Measuring point: Top of 5-in. PVC casing, 6.40 ft above mean sea level.

REMARKS.--Geophysical log and water-quality records are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, December 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.38 ft above mean sea level, Jan. 17, 1969; lowest, 2.81 ft below mean sea level, Aug. 25, 1977.

WATER LEVEL IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	-0.75	-0.62	-0.26	1.55	1.50	1.47	1.80	1.56	1.31	1.06	0.85	0.77
10	-.84	-.62	-.19	1.67	1.51	1.45	1.72	1.60	1.27	1.20	.81	.78
15	-.87	-.60	.38	1.39	1.62	1.47	1.70	1.60	1.22	1.07	.79	.88
20	-.72	-.49	.84	1.72	1.57	1.57	1.63	1.52	1.17	.94	.75	.87
25	-.67	-.45	1.13	1.59	1.51	1.64	1.56	1.47	1.09	.91	.71	.87
31	-.70	-.10	1.43	1.65	1.55	1.74	1.53	1.42	1.05	.85	.77	.82

WTR YEAR 1988 MAX 1.99 APR 3 MIN -1.03 OCT 7

212154158015201. Local number, 3-2101-03.

LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, 0.4 mi southeast of Honouliuli, and 0.5 mi north of Ewa Hospital. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 355 ft, 6-in. PVC casing, cased to 165 ft. Well was modified in January 1958 and May 1982.

DATUM.--Elevation of land-surface datum is 15 ft. Measuring point: Top of horizontal flange below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, 1978-81, are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft above mean sea level, April 1918; lowest observed, less than 11.2 ft, above mean sea level (below petcock then in use), Sept. 2, and Oct. 19, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 10	14.51	FEB 11	17.13	MAR 31	16.97	JUN 2	15.98	AUG 9	15.13

HAWAII, ISLAND OF OAHU--Continued

212123157535501. Local number, 3-2153-05.

LOCATION.--Lat 21°21'23", long 157°53'55", Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 6-in. PVC casing, cased to 24 ft, perforated from 24 to 1,246 ft. Well was modified and deepened August 1980.

DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-in. PVC casing, 37.90 ft, revised, above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, March 1981 to current year.
WATER QUALITY: 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.53 ft above mean sea level Jan. 9, 1983; lowest 16.56 ft above mean sea level, July 24, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	16.94	17.11	17.31	18.58	19.03	19.09	19.45	19.29	19.05	18.79	18.53	18.40
10	16.75	17.16	17.27	18.65	18.96	19.07	19.33	19.35	19.04	18.81	18.48	18.29
15	16.72	17.22	17.70	18.71	19.14	19.20	19.34	19.32	18.95	18.71	18.52	18.39
20	16.99	17.27	18.14	18.88	19.05	19.24	19.28	19.25	18.93	18.65	18.56	18.34
25	17.02	17.15	18.24	18.98	19.15	19.24	19.25	19.19	18.80	18.58	18.44	18.41
EOM	17.11	17.36	18.43	19.07	19.15	19.30	19.33	19.18	18.77	18.52	18.47	18.46

WTR YEAR 1988 MAX 19.59 APR 5 MIN 16.68 OCT 13

212238157561101. Local number, 3-2256-10.

LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 173 ft, casing diameter 12 in., cased to 143 ft.

DATUM.--Elevation of land-surface datum is 10 ft. Measuring point: Top of 10-in. stilling pipe for water-level recorder, 26.15 ft above mean sea level.

REMARKS.--Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, January 1928 to February 1931, September 1934 to August 1966. Water-level recorder, September 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft above mean sea level, Jan. 16, 1928; lowest, 12.97 ft above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.02	14.13	14.47	16.04	16.33	16.55	16.98	16.70	16.44	16.11	15.81	15.76
10	13.84	14.13	14.48	16.24	16.37	16.54	16.98	16.75	16.30	16.19	15.78	15.72
15	13.82	14.18	14.86	16.13	16.52	16.59	16.85	16.83	16.33	16.05	15.80	15.76
20	14.06	14.23	15.27	16.32	16.48	16.67	16.78	16.64	16.25	15.95	15.73	15.81
25	14.08	14.32	15.60	16.37	16.59	16.67	16.73	16.57	16.16	15.91	15.68	15.86
EOM	14.10	14.50	15.92	16.45	16.59	16.92	16.73	16.55	16.08	15.86	15.69	15.69

WTR YEAR 1988 MAX 17.08 APR 3 MIN 13.76 OCT 9

HAWAII, ISLAND OF OAHU--Continued

212340158001901. Local number, 3-2300-18.

LOCATION.--Lat 21°23'40", long 158°00'19", Hydrologic Unit 20060000, 700 ft south of August Ahrens School, and 1,400 ft northeast of L'Orange Park, Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal-water table well, depth 1,090 ft, casing diameter 12 in., cased to 38 ft. Well was deepened May 1980 and modified February 1984. Prior to May 1980, well depth 205 ft.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point: Top of casing, 27.73 ft above mean sea level.

REMARKS.--Geophysical logs are available in files of district office. Recorder removed November 30, 1987.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, November 1982 to July 1983, March 1984 to November 30, 1987.
WATER QUALITY: 1930, 1942-45, 1947-49, 1951-54, 1968, 1983, 1985-86.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 22.40 ft above mean sea level, Jan. 4, 1983; lowest 14.01 ft above mean sea level, Sept. 14, 1985.

WATER LEVELS, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV
5	14.93	14.86
10	14.74	14.85
15	14.72	14.94
20	14.90	15.10
25	14.86	15.22
EOM	14.83	15.84

WATER LEVELS, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	14.76	DEC 1	15.74	FEB 11	18.16	MAR 31	18.12	JUN 1	17.53	AUG 9	16.71
NOV 20	15.10										

HAWAII, ISLAND OF OAHU--Continued

212659158004102. Local number, 3-2600-04.

LOCATION.--Lat 21°26'59", long 158°00'41", Hydrologic Unit 20060000, 30 ft south of Waiahole ditch, and 1.1 mi east southeast of Kipapa School in Mililani. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 815 ft, casing diameter 16 in., cased to 705 ft.

DATUM.--Elevation of land-surface datum is 665 ft. Measuring point: Top of 16-inch casing, 666.62 ft. revised, above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, October 1983 to September 10, 1987.
Occasional measurements, October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.22 ft above mean sea level, Apr. 13, 1988; lowest 16.74 ft above mean sea level, Sept.14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	18.14	FEB 12	21.86	APR 13	22.22	AUG 8	20.80

HAWAII, ISLAND OF OAHU-Continued

212927158014801. Local number, 3-2901-07.

LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, across the main gate of Wheeler AFB, and 1,200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point: Top of pump chamber floor at recorder, 287.00 ft above mean sea level.

REMARKS.--Water-level recorder is located on the pump chamber floor at the bottom of shaft. Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, November 1938 to current year.
WATER QUALITY: 1966-72, 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft above mean sea level, May 12, 1969; lowest, 269.52 ft above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	272.67	272.34	272.26	272.53	273.08	273.85	274.63	275.27	275.89	276.12	276.14	276.05
10	272.38	272.26	272.35	272.65	273.15	273.97	274.68	275.44	275.95	276.12	275.46	276.35
15	272.39	272.38	272.32	272.65	273.39	274.16	274.84	275.55	275.24	275.44	276.17	276.15
20	272.41	272.23	272.41	272.78	273.63	274.23	274.93	275.57	276.02	276.13	276.22	276.03
25	272.32	272.22	272.37	272.88	273.63	274.39	275.05	275.72	275.33	275.44	276.18	276.13
EOM	272.24	272.19	272.60	272.60	273.71	274.45	274.60	275.84	276.09	275.44	276.27	276.02

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT				
06...	0845	170	22.5	19
DEC				
01...	1430	168	22.0	18
FEB				
12...	1210	165	22.0	19
APR				
13...	1130	170	22.0	18
MAY				
24...	0930	168	22.0	18
AUG				
05...	1455	170	22.0	18

HAWAII, ISLAND OF OAHU--Continued

213327157524401. Local number, 3-3352-01.

LOCATION.--Lat 21°33'27", long 157°52'44", Hydrologic Unit 20060000, at mouth of Kahana Valley, and 700 ft southwest of Kamehameha Highway, Kahana. Owner: Mary E. Foster Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICES.--Drilled artesian well, depth 441 ft, casing diameter 10 in., cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1935 to current year.
WATER QUALITY: 1935 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, Mar. 29, 1966; lowest measured, 12.61 ft above mean sea level, July 5, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
MAY 13	17.49

WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
SEP 14...	1500	250	22.5	37

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAY 13...	1515	260	22.5	34

HAWAII, ISLAND OF OAHU--Continued

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Company, Inc.

AQUIFER.--Basalt of Waianae Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 447 ft, casing diameter 1 inch, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top of 12-inch stilling well, 20.53 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, January 1963 to February 1972.
Occasional measurements, January 1929 to December 1962, March 1972 to current year.
WATER QUALITY: 1929 to 1985.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 19.98 ft above mean sea level, Jan. 5, 1969; lowest 16.08 ft above mean sea level, Aug.6, 1929.

REVISIONS,-- The dates and water levels for water year 1987 has been revised. These water levels supersede those published in the report for 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 30	18.37	DEC 29	18.52	FEB 10	18.54	APR 14	18.09	JUN 3	17.75	JUL 29	18.04

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	18.25	DEC 3	18.38	FEB 23	18.42	APR 15	18.47	MAY 24	18.50

HAWAII, ISLAND OF OAHU--Continued

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1,500 ft northeast of UH Agriculture Experiment Station in Waialee, and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, casing diameter 8 in., cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point: Top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, February 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft above mean sea level, Nov. 14, 1932; lowest measured, 10.97 ft above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL
NOV 10	13.25

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.

LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 22 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point: Top of 2 x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

REMARKS.-- Water-quality records for 1970-1973 are available in files of district office.

PERIOD OF RECORD.-- Water-level recorder, August 1970 to January 1973.
Occasional measurements, February 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	3.99	FEB 1	4.72	APR 25	4.32	JUN 13	4.31	JUl 24	4.45	AUG 29	4.39
DEC 7	4.39	MAR 23	4.37								

HAWAII, ISLAND OF MOLOKAI--Continued

210402156495801. Local number, 4-0449-01.

LOCATION.--Lat 21°04'02", long 156°49'58", Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point: Top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1938-39, 1941-63, November 1972 to current year.
WATER QUALITY: 1948, 1952-56, 1970 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, Jan. 19, 1950; lowest measured, 2.09 ft above mean sea level, Sept. 16, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	3.14	FEB 1	3.70	APR 25	3.45	JUN 13	3.48	JUL 24	3.61	AUG 29	3.55
DEC 7	3.44	MAR 24	3.53								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT				APR			
19...	1100	330	20.5	25...	1115	320	20.5
DEC				JUN			
07...	1140	300	20.5	13...	1545	330	20.5
FEB				JUL			
01...	1210	320	20.5	24...	1445	320	20.5
MAR				AUG			
24...	0655	320	20.5	29...	1350	320	20.5

HAWAII, ISLAND OF MOLOKAI--Continued

210419156570501. Local number, 4-0457-01.

LOCATION.--Lat 21°04'19", long 156°57'05", Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 229 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point: Top of steel plate, 37.37 ft, above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year.
WATER QUALITY: 1948, 1954-56, 1960, 1962, 1971, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.66 ft above mean sea level, Dec. 5, 1950; lowest measured, 1.47 ft above mean sea level, June 24, 1955.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	1.89	FEB 1	2.24	APR 25	2.14	JUN 13	2.16	JUL 24	2.24	AUG 29	2.21
DEC 7	2.17	MAR 24	2.28								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)
OCT 19...	1225	320	23.0	APR 25...	1245	280	23.0
DEC 07...	1235	240	23.0	JUN 13...	1700	250	22.5
FEB 01...	1325	250	23.0	JUL 24...	1600	250	23.0
MAR 24...	0805	230	23.0	AUG 29...	1510	270	23.5

HAWAII, ISLAND OF MOLOKAI--Continued

210605157012001. Local number, 4-0601-01.

LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony. Owner: Molokai Ranch.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, casing diameter 12 in., cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point: Top of 15-in. surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, May 1954 to current year.
WATER QUALITY: 1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, Jan. 20, 1969; lowest measured, 1.60 ft above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	2.69	FEB 1	3.00	APR 28	2.92	JUN 16	2.83	JUL 27	2.91	SEP 1	3.05
DEC 7	2.82	MAR 24	3.00								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
19...	1455	330	24.0	26	28...	0940	330	23.5	19
DEC					JUN				
07...	1335	215	23.5	13	16...	0930	330	23.5	22
FEB					JUL				
01...	1400	170	22.5	11	27...	1045	340	24.0	25
MAR					SEP				
24...	0830	300	23.5	14	01...	0745	350	24.0	27

HAWAII, ISLAND OF MOLOKAI--Continued

210711157000501. Local number, 4-0700-01.

LOCATION.--Lat 21°07'11", long 157°00'05", Hydrologic Unit 20050000, 2.3 mi northeast of Kaunakakai, and 2.4 mi north of Kamiloloa. Owner: Kaluakoi Corporation.

AQUIFER.--East Molokai Volcanic Series.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,080 ft, casing diameter 20 in., cased to 956 ft, perforated from 956 to 1056 ft.

DATUM.--Measuring point: Top of casing, 979.00 ft, land-surface datum.

REMARKS.--Water-quality records for 1973-75 are available in files of district office.

PERIOD OF RECORD.--Occasional meassurements, July 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 975.25 ft below land-surface datum, Apr. 27, 1988; lowest measured, 976.23 ft below land-surface datum, Sept. 10, 1986.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	975.90	FEB 3	975.30	APR 27	975.25	JUL 27	975.26

HAWAII, ISLAND OF MAUI

203908156041201. Local number, 6-3904-01.

LOCATION.--Lat 20°39'08", long 156°04'12", Hydrologic Unit 20020000, 1,300 ft northwest of Kakanoni Point, and 0.7 mi west of Kipahulu School. Owner: Cordelia May.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4 in.

DATUM.--Elevation of land-surface datum is 133 ft. Measuring point: Top of 1-in. pipe nipple, 133.61 ft above mean sea level.

REMARKS.--Water-quality records for 1978 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.97 ft above mean sea level, Jun. 29, 1988; lowest measured, 0.70 ft above mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	2.12	JAN 6	2.41	MAR 30	2.22	MAY 11	2.17	JUN 29	2.97	AUG 17	1.83
NOV 18	1.88	FEB 18	2.48								

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, casing diameter 8 in., cased to 343 ft. perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 352 ft. Measuring point: Top of 2-in. pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	0.10	JAN 7	0.13	APR 18	-0.09	SEP 12	0.10

HAWAII, ISLAND OF MAUI--Continued

204827156242201. Local number, 6-4824-01.

LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa Gulch, and 4 mi east of Kihei. Owner: State of Hawaii.

AQUIFER.--Kula Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 647 ft, casing diameter 12 in., cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point: Top of 3-in. pipe attached to the steel casing cover, 594.75 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971 and May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	4.05	JAN 12	4.88	APR 19	4.77	MAY 20	4.65	JUL 22	4.28	SEP 14	4.14
NOV 30	4.52	FEB 24	4.81								

204818156310301. Local number, 6-4831-01.

LOCATION.--Lat 20°48'18", long 156°31'03", Hydrologic Unit 20020000, on sugar plantation road 0.7 mi north of Maalaea, and 0.9 mi southwest of intersection of Honoapoolani Highway and Kihei Road. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, casing diameter 8 in., cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point: Top of 8-in. casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974.
Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, Nov. 30, 1983; lowest measured, 4.74 ft above mean sea level, Mar. 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	5.30	JAN 8	5.67	APR 13	5.66	MAY 18	5.56	JUL 19	5.49	SEP 7	5.45
NOV 20	5.52	FEB 23	5.72								

HAWAII, ISLAND OF MAUI--Continued

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft vertical shaft, depth 53 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point: Top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984.
Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.09 ft above mean sea level, Jan. 12, 1980; lowest measured, 3.05 ft above mean sea level, Mar. 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	3.68	JAN 7	4.39	APR 19	4.30	MAY 18	4.17	JUL 19	3.98	SEP 12	3.82
NOV 20	4.02	FEB 26	4.32								

205140156304501. Local number, 6-5130-01.

LOCATION.--Lat 20°51'40", long 156°30'45", Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 757 ft, casing diameter 8 in., cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point: Top of 6-in. pipe coupling, 551.33 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.90 ft above mean sea level, Oct. 13, 1982; lowest measured, 11.36 ft above mean sea level, Jan. 27, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	17.62	JAN 12	18.95	APR 19	17.46	MAY 20	17.42	JUL 22	16.12	SEP 14	15.95
NOV 30	17.66	FEB 24	19.45								

HAWAII, ISLAND OF MAUI--Continued

205154156303801. Local number, 6-5130-02.

LOCATION.--Lat 20°51'54", long 156°30'38", Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,020 ft, casing diameter 20 in., cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point: Top of casing, 519.33 ft above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984.
Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, Jul. 15, 1987; lowest measured, 13.48 ft above mean sea level, Apr. 8, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	14.41	JAN 12	14.39	APR 19	14.27	MAY 20	14.23	JUL 22	13.98	SEP 14	13.90
NOV 30	14.40	FEB 24	14.29								

205412156193801. Local number, 6-5419-01.

LOCATION.--Lat 20°54'12", long 156°19'38", Hydrologic Unit 20020000, 0.9 mi south of Haiku Cannery, and 2 mi north west of Kaupakulua between the Haiku-Kokomo road and Maliko Gulch. Owner: State of Hawaii

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4 in., cased to 829 ft, perforated from 829 to 859 ft.

DATUM.--Elevation of land-surface datum is 828 ft. Measuring point: Top of 6-in. pipe coupling, 828.44 ft above mean sea level.

REMARKS.--Water level readings are affected by oil floating on top of the water.

PERIOD OF RECORD.--Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.40 ft above mean sea level, Feb. 24, 1988; lowest measured, 4.36 ft above mean sea level, July 9, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	4.70	JAN 12	5.29	APR 19	5.36	MAY 20	5.28	JUL 22	5.01	SEP 14	4.90
DEC 2	5.06	FEB 24	5.40								

HAWAII, ISLAND OF MAUI--Continued

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54'19", long 156°30'44", Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 580 ft, 1.5-in. PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point: Top of 1-in. galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984.
Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, Dec. 31, 1982; lowest measured, 14.67 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	17.12	JAN 11	18.58	APR 18	18.77	MAY 18	18.73	JUL 20	18.18	SEP 13	17.93
NOV 23	17.58	FEB 23	19.04								

HAWAII, ISLAND OF MAUI--Continued

205405156305401. Local number, 6-5430-05.

LOCATION.--Lat 20°54'59", long 156°30'56", Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,400 ft, casing diameter 10 in., cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point: Top of 10-in. casing, 380.84 ft, revised, above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, August 1983 to MAY 1986. Water-level recorder, June 1986 to current year.
WATER QUALITY: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.09 ft above mean sea level, Feb. 26, 29, 1988, Apr. 5, 1988; lowest measured, 13.04 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.85	15.33	15.85	16.44	16.90	17.00	17.03	16.80	e16.75	16.49	16.39	16.15
10	14.97	15.36	15.91	16.51	16.88	16.98	16.98	16.80	e16.68	16.46	16.32	16.10
15	15.10	15.50	16.19	16.55	16.94	16.93	16.95	16.83	e16.64	16.38	16.35	16.03
20	15.13	15.57	16.40	16.67	16.96	17.02	16.85	16.84	16.67	16.40	16.27	15.99
25	15.22	15.70	16.46	16.71	17.03	16.96	16.83	16.76	16.56	16.41	16.20	15.97
EOM	15.24	15.79	16.46	16.84	17.03	16.92	16.81	16.74	16.52	16.38	16.16	15.91

WTR YEAR 1988 MAX 17.09 FEB 26, 29, APR 5 MIN 14.73 OCT 2

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE LAB (US/CM)	CHLORIDE, DISSOLVED (MG/L AS CL)
DEC				
02...	j1020	200	221	13
02...	j1045	400	597	150
02...	j1105	500	563	140
02...	j1135	600	715	180
02...	j1230	675	---	---
02...	j1250	750	3840	1100
02...	j1315	800	35900	14000
02...	j1345	825	44400	17000
02...	j1415	850	47400	18000
02...	j1435	900	49300	19000
02...	j1520	1000	50900	19000
APR				
13...	j0905	200	220	12
13...	j0922	400	581	130
13...	j0945	500	572	130
13...	j1012	600	693	170
13...	j1042	675	1690	450
APR				
13...	j1110	750	38900	14000
13...	j1135	800	36600	14000
13...	j1200	825	44600	16000
13...	j1305	850	46400	17000
13...	j1345	900	49200	18000
13...	j1430	1000	50300	19000
JUL				
20...	j1130	400	621	150
20...	j1150	500	626	150
20...	j1220	600	754	180
20...	j1250	675	1780	480
20...	j1330	750	4130	1200
20...	j1355	800	37200	14000
20...	j1430	825	44500	16000
20...	j1455	850	46800	17000
20...	j1530	900	48800	18000
20...	j1610	1000	50200	19000

e Estimated.
j Collected by non-USGS agency .

HAWAII, ISLAND OF MAUI--Continued

205437156310501. Local number, 6-5431-01.

LOCATION.--Lat 20°54'37", long 156°31'05", Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 555 ft, 1.5-in. PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point: Top of 1.5-in. PVC casing, 492.51 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, Jan. 2, 1983; lowest measured, 12.63 ft above mean sea level, Oct. 14, 15, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	14.50	15.02	15.56	16.24	16.71	16.78	16.79	16.43	16.37	16.13	15.91	15.69
10	14.68	e15.10	15.65	16.35	16.64	16.75	16.70	16.43	16.33	16.10	15.84	15.64
15	14.82	e15.25	16.01	16.36	16.71	16.68	16.62	16.50	16.27	15.99	15.90	15.58
20	14.81	e15.30	16.29	16.49	16.72	16.81	16.49	16.49	e16.30	15.94	15.80	15.55
25	14.92	15.41	16.34	16.52	16.85	16.70	16.47	16.40	16.21	15.93	15.71	15.54
EOM	14.92	15.50	16.31	16.67	16.84	16.64	16.45	16.40	16.17	15.89	15.69	15.47

WTR YEAR 1988 MAX 16.90 FEB 28, 29 MIN 14.34 OCT 1, 2

e Estimated.

205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56'17", long 156°31'11", Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-in. PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point: Top of 1.5-in. PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984.
Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, Dec. 6, 1982; lowest measured, 14.51 ft above mean sea level, Oct. 11, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	16.29	JAN 11	17.29	APR 18	17.85	MAY 19	17.85	JUL 20	17.68	SEP 13	17.42
NOV 23	16.75	FEB 23	17.75								

HAWAII, ISLAND OF MAUI--Continued

205651156313201. Local number, 6-5631-02.

LOCATION.--Lat 20°56'51", long 156°31'32", Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, casing diameter 16 in., cased to 290 ft, perforated from 290 to 310 ft.

DATUM.--Elevation of land-surface datum is 281 ft. Measuring point: Top of 16-in. casing, 284.78 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder installed Apr. 15, 1988.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.53 ft above mean sea level, Apr. 16, 1988; lowest measured, 10.99 ft above mean sea level, Sept. 30, 1988.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5							---	11.46	11.43	11.40	11.35	11.21
10							---	11.45	11.41	11.40	11.33	11.15
15							---	11.44	11.37	11.38	11.31	11.11
20							11.45	11.48	11.37	11.39	11.28	11.07
25							11.46	11.46	11.36	11.37	11.26	11.08
EOM							11.47	11.45	11.39	11.35	11.26	11.03

WTR YEAR 1988 MAX 11.53 APR 16 MIN 10.99 SEP 30

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, casing diameter 8 in., cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point: Top of 9-in. casing, 257.34 ft above mean sea level.

REMARKS.--Water-quality records for 1964, 1980 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975.
Water-level recorder, August 1975 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, Sept. 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.00	3.26	3.11	3.33	3.36	3.34	3.48	3.34	3.25	3.36	3.41	3.37
10	3.10	3.32	3.19	3.27	3.39	3.30	3.40	3.33	3.23	3.40	3.40	3.26
15	3.04	3.32	3.38	3.26	3.37	3.31	3.47	3.36	3.19	3.38	3.40	3.30
20	3.09	3.29	3.38	3.28	3.45	3.41	3.35	3.34	3.20	3.38	3.33	3.29
25	3.14	3.25	3.30	3.39	3.29	3.43	3.34	3.32	3.25	3.38	3.36	3.36
EOM	3.13	3.18	3.38	3.42	3.24	3.41	3.39	3.32	3.30	3.38	3.45	3.28

WTR YEAR 1988 MAX 3.57 APR 4,16 MIN 2.84 OCT 1

HAWAII, ISLAND OF HAWAII

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06'02", long 155°32'59", Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 140 ft, casing diameter 14 in., cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point: 1-in. hole in pump base, 103.26 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.39 ft above mean sea level, Oct. 19, 1978; lowest measured, 0.50 ft below mean sea level, July 27, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 23	1.51	MAR 1	1.08	APR 27	1.15	JUN 15	0.35	JUL 26	0.95	SEP 7	1.32
JAN 11	1.52										

HAWAII, ISLAND OF HAWAII--Continued

192728154530101. Local number, 8-2783-01.

LOCATION.--Lat 19°27'28", long 154°53'01", Hydrologic Unit 20010000, 0.8 mi southeast of Pawai crater in Keahialaka, and 1.9 mi north of Opihikao road junction, south Pahoa. Owner: State of Hawaii.

AQUIFER.--Hilina Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 319 ft, casing diameter 8 in., cased to 279 ft, perforated from 279 to 319 ft.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point: Top of casing, 273.00 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1972 to current year.
WATER QUALITY: 1962, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.87 ft above mean sea level, Sept. 17, 1985, and Nov. 5, 1986; lowest measured, 0.97 ft above mean sea level, July 26, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	2.45	JAN 5	2.26	APR 15	1.84	JUN 7	2.10	AUG 3	2.64	SEP 23	1.84
NOV 19	2.63	FEB 24	2.63								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
NOV				
18...	1000	--	53.0	--
19...	1025	6960	53.0	2200
JAN				
05...	1435	7380	53.0	2200
FEB				
24...	0950	11000	53.0	3800
APR				
15...	1130	10500	53.0	3500
JUN				
07...	1240	15000	54.0	4600
AUG				
03...	1400	17000	54.5	5200
SEP				
23...	0955	18000	55.0	5800

HAWAII, ISLAND OF HAWAII--Continued

193017154502101. Local number, 8-3080-02.

LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi south of intersection of Highway 132 and Highway 137 near Pahoa. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, depth 46 ft, casing diameter 66 in., with two horizontal infiltration tunnels 2 x 50 ft extending in opposite directions from 3 ft above bottom of well.

DATUM.--Elevation of land-surface datum is 39 ft. Measuring point: Top of steel manhole cover at 1-in. hole, 39.50 ft above mean sea level.

REMARKS.--Water from this well is used for public supply and at times, water level affected by pumping.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1972 to current year.
WATER QUALITY: 1972-81, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.65 ft above mean sea level, Nov. 18,1987; lowest measured, 1.18 ft above mean sea level, June 3, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	4.65	JAN 4	4.49

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB				
23...	1450	1050	25.5	180
APR				
15...	1305	1050	25.5	160
JUN				
07...	1150	1100	25.5	180
AUG				
03...	1450	1500	25.5	310
SEP				
23...	0825	1200	25.0	230

HAWAII, ISLAND OF HAWAII--Continued

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 3.5 mi northwest of Pahoa airstrip, and 5.5 mi southeast of Keaau. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 475 ft, casing diameter 8 in., cased to 403 ft, perforated from 403 to 475 ft.

DATUM.--Elevation of land-surface datum is 427 ft. Measuring point: Top of casing, 428.14 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, September 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.37 ft above mean sea level, Mar. 26, 1979; lowest measured, 15.99 ft above mean sea level, Apr. 25, 1978, Mar. 10, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 18	18.48	FEB 24	18.82	APR 26	18.37	JUN 14	17.97	AUG 4	17.55	SEP 27	17.63
JAN 6	20.22	MAR 29	18.25								

194134155005601. Local number, 8-4100-01.

LOCATION.--Lat 19°41'34", long 155°00'56", Hydrologic Unit 20010000, 5.5 mi southeast of Hilo Post Office, and 5.0 mi northeast of Keaau. Owner: Hawaiian Paradise Park Corporation.

AQUIFER.--Kau Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 55 ft, casing diameter 10 in., cased to 39 ft, perforated from 39 to 55 ft.

DATUM.--Elevation of land-surface datum is 45 ft. Measuring point: Top of casing, 46.84 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973-1986 are available in files of the district office.

PERIOD OF RECORD.--WATER LEVEL: Occasional measurements, November 1971 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.99 ft above mean sea level, Oct. 10, 1986; lowest measured, 2.24 ft above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 16	5.39	JAN 5	5.63	MAR 4	5.06	MAY 2	4.22	JUN 27	3.95	AUG 30	5.26

HAWAII, ISLAND OF HAWAII--Continued

194222155035101. Local number, 8-4203-04.

LOCATION.--Lat 19°42'22", long 155°03'51", Hydrologic Unit 20010000, 0.5 mi east of Hawaii Technical School, and 1.0 mi south of Hilo airport terminal. Owner: Hawaii Electric Light Company.

AQUIFER.--Kahuku Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 201 ft, casing diameter 16 in., cased to 63 ft.

DATUM.--Elevation of land-surface datum is 47 ft. Measuring point: Top of 3-in. nipple above casing; 46.54 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office. Water level affected by pumping of nearby industrial wells.

PERIOD OF RECORD.--Occasional measurements, July 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.67 ft above mean sea level, Mar. 11, 1979; lowest measured, 5.80 ft above mean sea level, Mar. 12, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	7.09	JAN 21	6.69	APR 18	6.74	JUN 8	6.71	AUG 4	6.66	SEP 27	6.94
DEC 8	7.36	FEB 25	7.19	MAY 2	6.82						

HAWAII, ISLAND OF HAWAII--Continued

195947155485801. Local number, 8-5948-01.

LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 268 ft, casing diameter 10 in., cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point: Hole in pumpbase, 246.47 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1970, March 1973 to current year.
WATER QUALITY: 1970, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.50 ft above mean sea level, Sept. 26, 1984; lowest measured, 1.40 ft, above mean sea level, June 22, 1973, June 3, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	a4.24	JAN 13	a4.11	MAY 9	a4.04	JUN 17	a3.95	AUG 2	a4.40	SEP 28	a4.31
NOV 30	a4.32	MAR 9	a4.23								

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					MAY				
21...	0945	1780	26.0	480	09...	1400	1700	26.0	460
NOV					JUN				
30...	1100	1750	26.0	480	17...	0900	1700	26.0	460
JAN					AUG				
13...	1245	1750	26.0	470	02...	1120	1700	26.5	470
MAR									
09...	1230	1750	26.5	480					

a Well being pumped.

HAWAII, ISLAND OF HAWAII--Continued

200132155471001. Local number, 8-6147-01.

LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi east of Kawaihae, and 2.8 mi northeast of Hapuna Beach Park. Owner: State of Hawaii.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,008 ft, casing diameter 8 in., cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point: Top of pipe coupling on casing cover 982.8 ft, revised, above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, June to July 1963, June 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.23 ft above mean sea level, May 1, 1987, lowest measured, 4.82 ft above mean sea level Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	5.64	JAN 13	5.91	MAR 30	5.98	JUN 17	5.67	AUG 2	5.87	SEP 28	5.88
NOV 20	6.11	MAR 9	5.90	MAY 9	5.88						

HAWAII, ISLAND OF HAWAII--Continued

201603155521801. Local number, 8-7652-01.

LOCATION.--Lat 20°16'03", long 155°52'18", Hydrologic Unit 20010000, 0.3 mi west of Upolu Point Airfield, 3.1 mi northwest of Hawi, and 1.9 mi west of Hoea Camp. Owner: Kohala Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, with horizontal infiltration tunnels from pump sump.

DATUM.--Elevation of land-surface datum is 33 ft. Measuring point: Top of 4-in. steel I-beam placed across sump, 7.75 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1973 to current year.
WATER QUALITY: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.83 ft above mean sea level, Sept. 21, 1988; lowest measured, 1.45 ft above mean sea level, July 9, 1975, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 9	2.45	JAN 7	2.40	APR 29	1.93	JUL 21	2.75	AUG 24	2.60	SEP 21	2.92
NOV 25	2.95	MAR 3	2.59	MAY 11	2.40	JUL 28	1.90				

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
OCT					APR				
09...	1225	2250	22.0	600	29...	0935	2100	21.0	---
NOV					JUL				
25...	1240	2200	22.0	610	21...	1045	2100	21.0	580
JAN					SEP				
07...	1225	2200	22.0	610	21...	1220	2300	21.5	590
MAR									
03...	0940	2150	22.0	580					

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI					
220136159205501	2-0120-01 W7 WAILUA	22 01 36 N	159 20 55 W	10-02-87	0925	1030	26.5	240
				11-23-87	1430	800	26.0	160
				01-19-88	0955	1000	26.0	110
				02-26-88	0940	820	26.0	200
				04-15-88	0940	640	26.0	140
				05-25-88	1440	800	26.0	140
				07-08-88	0830	700	25.5	140
220148159453501	2-0145-10 W45F MANA	22 01 48 N	159 45 35 W	10-05-87	0940	1100	26.0	230
				11-16-87	0940	960	26.0	200
				02-29-88	0950	700	26.0	130
				09-02-88	1330	1030	23.5	320
220530159450401	2-0545-01 W59 KAULAU	22 05 30 N	159 45 07 W	10-05-87	1115	740	25.0	150
				11-16-87	1115	970	25.0	200
				01-11-88	1145	900	25.0	160
				02-29-88	1145	700	26.0	130
				04-25-88	1115	650	25.0	150
				06-06-88	1100	800	26.0	150
				07-18-88	1145	890	26.5	150
				08-29-88	1030	750	26.0	140
220826159185401	2-0818-02 W90B ANAHO	22 08 26 N	159 18 54 W	05-26-88	0950	195	27.0	19
				07-08-88	0950	300	26.0	20
221141159252502	2-1125-02 N2 KILAUEA	22 11 41 N	159 25 25 W	05-26-88	1030	160	24.0	14
				08-26-88	1055	175	24.5	15
221151159265001	2-1126-02 KALIHIWAI	22 11 51 N	159 26 50 W	11-25-87	0840	190	24.0	26
				04-21-88	0845	150	24.0	15
				08-02-88	0900	205	24.0	--
221201159293401	2-1229-03 W73 HANALE	22 12 01 N	159 29 34 W	10-02-87	1250	205	24.0	19
				11-19-87	1250	180	24.0	20
				01-19-88	1255	180	24.0	25
				02-26-88	1255	180	24.0	19
				04-15-88	1250	210	24.0	27
				06-09-88	1145	180	24.0	14
				07-08-88	1145	240	24.0	25
				08-26-88	1145	185	24.0	19
215528159303001	2-5530-02 W23 LAWAI	21 55 28 N	159 30 30 W	10-01-87	0930	225	24.0	26
				11-18-87	0930	250	24.0	28
				01-14-88	1000	220	24.0	26
				02-25-88	1000	220	24.0	24
				04-14-88	0845	200	24.0	24
				05-25-88	0925	250	23.0	26
				07-07-88	0820	245	22.0	27
				08-25-88	0820	260	23.5	26
215535159302601	2-5530-03 W22 LAWAI	21 55 35 N	159 30 26 W	10-01-87	0925	220	24.0	26
				11-18-87	0925	210	24.0	24
				01-14-88	1000	220	24.0	26
				02-25-88	1005	220	24.0	20
				04-14-88	0850	190	24.0	24
				05-25-88	0930	240	24.0	24
				07-07-88	0805	270	22.0	23
				08-25-88	0810	230	23.5	24

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued								
215635159355001	2-5635-01 S7 HANAPEP	21 56 35 N	159 35 50 W	10-01-87	1040	700	24.0	140
				11-18-87	1045	690	24.0	160
				01-14-88	1140	580	24.0	140
				02-25-88	1130	690	24.0	130
				04-14-88	0925	490	24.0	140
				05-25-88	1110	640	23.0	130
				07-07-88	1045	700	24.0	120
				08-25-88	1055	605	24.0	130
215854159424601	2-5842-02 S11 KEKAHA	21 58 54 N	159 42 46 W	10-05-87	1310	735	25.5	140
				11-16-87	1310	550	25.0	110
				01-11-88	1320	570	24.5	100
				02-29-88	1315	530	25.0	88
				04-26-88	1035	680	26.0	190
				06-06-88	1210	650	26.0	100
				07-18-88	1316	650	24.5	99
				08-29-88	1145	650	24.5	120
215843159422901	2-5842-03 S10 KEKAHA	21 58 43 N	159 42 29 W	10-05-87	1330	1100	25.0	220
				11-16-87	1330	1050	25.0	240
				01-11-88	1325	870	24.5	160
				02-29-88	1335	1050	25.0	250
				04-26-88	1005	a775	25.0	100
				06-06-88	1240	a1080	26.0	260
				07-18-88	1335	1650	24.5	410
				08-29-88	1200	1000	24.5	220

a Laboratory conductance.

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU								
WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987								
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	09-15-87	1030	135	23.5	20
213243157510001	3-3251-01 W406	21 32 43 N	157 51 00 W	09-14-87	1520	820	22.5	240
WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988								
211646157465201	3-1646-01 W1-B WAIAL	21 16 46 N	157 46 52 W	10-07-87	1350	890	21.0	--
				12-03-87	1000	780	21.0	--
				03-31-88	1340	750	21.0	--
				05-31-88	1200	910	21.0	--
				07-25-88	1215	950	21.0	--
211832157515501	3-1851-19 W102 TUBEA	21 18 32 N	157 51 55 W	11-25-87	1510	30000	23.5	11000
				02-10-88	0815	30000	23.0	11000
				03-30-88	0840	31000	23.0	11000
				06-02-88	1500	32000	23.0	12000
				07-22-88	1505	32000	23.5	12000
211832157515502	3-1851-19 W102 TUBEB	21 18 32 N	157 51 55 W	10-09-87	0830	6600	23.5	--
				11-25-87	1515	6800	23.0	--
				02-10-88	0820	6900	23.0	--
				03-30-88	0835	7000	23.0	--
				06-02-88	1510	7400	23.0	--
				07-22-88	1510	7500	23.0	--
212038157422501	3-2042-13 W420-1A WA	21 20 02 N	157 42 06 W	05-16-88	1045	10000	25.0	3000
212133158035501	3-2103-03 S14 MAKAKI	21 21 33 N	158 03 55 W	12-10-87	0820	1130	23.0	240
				02-11-88	0815	1120	23.0	240
				03-31-88	0805	1130	23.0	230
				06-02-88	0815	1140	23.0	240
				08-09-88	0830	1130	23.0	240
212106157533701	3-2153-02 W153 MOANA	21 21 06 N	157 53 37 W	10-07-87	1125	425	21.5	82
				12-07-87	1400	425	21.5	82
				02-10-88	1020	430	21.5	82
				03-25-88	0905	440	21.5	68
				06-02-88	1340	440	21.5	82
				07-25-88	1435	440	21.5	83
212259157554201	3-2255-35 W189-3A	21 22 59 N	157 55 42 W	12-03-87	1340	1130	21.5	--
				03-25-88	1335	1130	21.5	--
				06-02-88	1225	1100	21.5	--
				07-26-88	0935	1070	21.5	--
212238157561102	3-2256-12 W187-C	21 22 39 N	157 56 09 W	10-06-87	1500	750	25.5	200
				12-01-87	1400	790	24.0	210
				02-02-88	1450	800	23.0	200
				03-30-88	1430	760	24.0	200
				06-01-88	1500	800	24.0	200
				07-26-88	1415	770	25.5	200
212343158001001	3-2300-11 W238 WAIPH	21 23 43 N	158 00 10 W	12-09-87	1105	930	22.0	--
				02-11-88	1135	900	22.0	--
				03-31-88	1015	910	22.0	--
				06-01-88	1200	920	22.0	--
				08-09-88	1115	950	22.0	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued					
212358158010901	3-2301-09,10 W247-IJ	21 23 58 N	158 01 09 W	12-09-87	1050	550	21.5	--
				02-11-88	1105	700	21.5	--
				03-31-88	1030	700	21.5	--
				08-09-88	1100	615	22.0	--
212342157584301	3-2358-22 W204-4	21 23 42 N	157 58 43 W	12-09-87	1255	1070	20.0	--
				02-11-88	1150	1420	20.0	--
				03-25-88	1445	1400	20.0	--
				06-01-88	1210	1320	20.0	--
				08-01-88	1410	1230	20.0	--
212343157584701	3-2358-29 W204-9	21 23 43 N	157 58 47 W	12-09-87	1250	1300	20.0	--
				02-11-88	1145	3700	20.0	--
				03-25-88	1440	3750	20.0	--
				06-01-88	1215	3450	20.0	--
				08-01-88	1415	2650	20.0	--
212336157591801	3-2359-05 W204-11	21 23 36 N	157 59 18 W	02-11-88	1200	2800	22.0	--
				03-25-88	1500	2800	22.0	--
				06-01-88	1230	2800	22.0	--
				08-01-88	1430	2700	22.0	--
212422157485601	3-2448-01 W416	21 24 22 N	157 48 56 W	05-16-88	0840	190	20.5	18
212556157500301	3-2550-01 W407-16	21 25 56 N	157 50 03 W	05-16-88	0810	150	23.5	17
212506157582301	3-2558-10 S16	21 25 06 N	157 58 23 W	12-03-87	1325	300	21.0	--
				02-11-88	1200	315	21.0	--
				03-31-88	1125	305	21.0	--
				06-20-88	1105	305	21.0	--
				08-01-88	1330	300	21.0	--
212617158033801	3-2603-01 W330-8	21 26 17 N	158 03 38 W	12-09-87	1015	355	22.0	48
				02-11-88	1015	355	22.0	49
				06-02-88	1010	360	22.0	46
212656158071801	3-2607-01 W277-97	21 26 56 N	158 07 18 W	10-07-87	1005	360	25.0	--
				12-09-87	0920	355	25.0	--
				02-24-88	0900	370	24.0	--
212803158000701	3-2800-01 W250-4A	21 28 03 N	158 00 06 W	02-26-88	1110	155	21.5	17
				05-27-88	0955	158	21.5	16
212813158080201	3-2808-01 W277-92	21 28 13 N	158 08 04 W	10-07-87	0905	1230	26.5	130
				04-15-88	0940	1320	26.5	160
				05-25-88	0950	1350	26.0	170
				08-09-88	1440	1250	26.0	160
212828158092001	3-2809-06 TU WAIANAE	21 28 27 N	158 09 20 W	12-09-87	1300	350	23.5	--
				04-15-88	1230	360	23.0	--
				08-09-88	1125	215	22.5	--
212859158124301	3-2812-01 S1	21 28 59 N	158 12 43 W	12-09-87	1445	650	25.0	--
				04-15-88	1030	640	25.0	--
				08-09-88	1430	655	25.0	--
212945158014301	3-2901-09 W330-6	21 29 45 N	158 01 43 W	12-01-87	1640	185	22.0	20
				04-13-88	1325	190	21.5	20
				08-15-88	1410	190	21.5	20
				09-29-88	1220	280	21.0	28

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued					
212939158112301	3-2911-02 TU MAKAHA	21 29 39 N	158 11 23 W	10-07-87	1240	250	21.5	26
				03-22-88	1440	245	21.0	25
				08-11-88	1110	260	21.0	20
				09-29-88	1220	280	21.0	28
213224158135901	3-3213-06 W277-101	21 32 24 N	158 13 59 W	12-09-87	1350	820	24.0	200
				02-24-88	1315	900	23.5	200
				04-15-88	1100	900	23.0	250
				05-25-88	1340	870	23.0	200
				08-11-88	1205	850	23.0	200
213429158055501	3-3251-01 W406	21 32 43 N	157 51 00 W	05-13-88	1610	940	22.5	210
213429158055501	3-3405-01 W323-1	21 34 29 N	158 05 55 W	04-15-88	1600	545	22.0	--
				08-15-88	0945	450	22.5	--
213427158055501	3-3405-02 W323-2	21 34 27 N	158 05 55 W	12-03-87	1715	510	22.5	--
				05-24-88	1335	485	22.0	--
213411158074501	3-3407-25 W320	21 34 11 N	158 07 45 W	10-08-87	0845	2400	22.5	--
				12-03-87	1130	2350	22.5	--
				02-26-88	1500	2250	22.5	--
				05-24-88	1500	2000	23.0	--
213444158075501	3-3407-30 W318-2	21 34 44 N	158 07 55 W	10-08-87	0935	6800	25.0	1900
				02-23-88	1500	3250	24.0	800
				04-15-88	1425	4900	24.5	1400
				05-24-88	1430	6700	24.5	1900
				08-15-88	1015	7000	24.5	1900
213512158061601	3-3506-03 TO 04 W329 A-B	21 35 12 N	158 06 16 W	05-20-88	0925	560	22.0	--
213636158053701	3-3605-03 W334-C	21 36 36 N	158 05 37 W	12-08-87	1650	1880	21.5	--
				02-23-88	1320	1850	21.5	--
				04-14-88	1035	1810	21.5	--
				05-23-88	0915	1750	21.5	--
				08-08-88	1320	1780	21.5	--
213636158053702	3-3605-21 W334-U	21 36 35 N	158 05 40 W	12-08-87	1710	1620	21.5	--
				02-23-88	1345	1720	21.5	--
				04-14-88	1055	1620	21.5	--
				05-23-88	0935	1600	21.5	--
				08-08-88	1335	1600	21.5	--
213656157550401	3-3655-01 W394	21 36 56 N	157 55 04 W	05-13-88	1450	250	21.5	34
213902157561601	3-3956-04 W366	21 39 02 N	157 56 16 W	05-13-88	1430	530	21.5	110
214233157583501	3-4258-04 W345	21 42 33 N	157 58 35 W	11-10-87	0950	2000	23.5	540
				05-13-88	0945	2000	22.5	530

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF MOLOKAI					
210856157011201	4-0801-01 W16	21 08 56 N	157 01 12 W	06-13-88	j1455	307	--	60
210857156010701	4-0801-02	21 08 57 N	157 01 07 W	10-21-87	j0825	340	--	71
				12-07-87	j1230	335	--	68
				02-02-88	j0930	342	--	70
				03-15-88	j0830	333	--	65
				04-26-88	j0945	342	--	68
				07-26-88	j0900	343	--	68
210903157013001	4-0901-01 W17	21 09 03 N	157 01 30 W	12-09-87	j0840	273	--	54
				02-02-88	j0845	278	--	52
				03-16-88	j0835	284	--	53
				04-29-88	j0830	285	--	54
				06-15-88	j0815	276	--	51
				09-01-88	j0835	262	--	48

j Collected by non - USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI								
203835156065001	6-3806-01 PUNAHOU SP	20 38 35 N	156 06 50 W	10-08-87	0930	700	--	200
				03-30-88	1050	750	20.0	210
				06-23-88	0855	870	21.0	220
203947156261201	6-3926-03 WAILEA 8	20 39 47 N	156 26 13 W	10-09-87	1220	2900	--	820
				02-26-88	1300	2900	19.5	820
				07-19-88	1000	3100	18.5	800
				09-12-88	1200	3000	19.5	850
204601156001501	6-4600-01 W55	20 46 01 N	156 00 15 W	10-08-87	0630	500	21.5	96
				11-17-87	1530	510	21.5	88
				01-05-88	1650	450	21.5	74
				02-17-88	1530	430	21.5	61
				03-29-88	1645	400	21.5	--
				05-10-88	1400	400	21.5	52
				06-29-88	0710	390	22.0	52
				08-16-88	1650	400	21.5	57
204633156003201	6-4600-03 WAKIU B	20 46 36 N	156 00 30 W	10-07-87	1630	240	19.5	50
				11-18-87	0650	180	19.0	33
				01-06-88	0710	140	19.0	23
				02-18-88	0700	116	19.5	12
				03-30-88	0705	120	19.5	15
				05-11-88	0725	114	19.5	11
				06-29-88	0650	120	20.0	16
				08-17-88	0710	190	19.5	43
204635156270101	6-4627-14 W226	20 46 35 N	156 27 01 W	10-09-87	0930	1700	23.5	360
				01-07-88	1325	1800	23.0	360
				04-18-88	1500	1750	23.0	340
				07-19-88	1210	1850	23.5	350
				09-12-88	1350	1850	23.5	360
204845156255001	6-4825-01 S15	20 48 45 N	156 25 50 W	10-14-87	1145	1550	23.5	--
				07-22-88	1120	1550	23.5	--
				09-14-88	1105	1550	24.0	--
204931156371201	6-4937-01 S10	20 49 31 N	156 37 12 W	10-08-87	1035	1600	24.0	420
				07-18-88	1100	1420	24.0	320
				09-07-88	1015	1600	24.5	380
205014156212701	6-5021-01 PUKALANI	20 50 14 N	156 21 27 W	10-09-87	1255	1950	21.5	530
				01-18-88	0800	a2050	--	560
				02-18-88	0820	1950	--	560
				06-17-88	0830	2000	--	550
205102156282501	6-5128-02 S16	20 51 02 N	156 28 25 W	09-14-88	1040	1500	23.5	--
205243156243201	6-5224-02 S22	20 52 43 N	156 24 32 W	10-14-87	1430	1420	23.5	300
				07-22-88	1345	1400	23.5	280
				09-14-88	1400	1420	23.0	310
205329156305502	6-5330-09 W15A	20 53 29 N	156 30 55 W	10-15-87	1410	700	22.0	--
				11-23-87	0915	590	22.0	--
				07-21-88	1400	1020	22.0	240
205330156305401	6-5330-11 W15F	20 53 30 N	156 30 54 W	11-23-87	0920	580	22.5	--
				01-27-88	1045	610	22.0	--
				02-23-88	1220	610	22.0	--
				04-13-88	1425	640	22.5	--
				05-13-88	1445	680	22.0	---
				07-21-88	1410	630	22.5	130
				09-07-88	1415	630	22.5	--

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WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF MAUI--Continued					
205322156394501	6-5339-01 W291	20 53 22 N	156 39 45 W	10-07-87	1220	890	22.0	--
				03-31-88	1250	750	21.5	140
				05-18-88	1145	870	22.5	--
205320156394501	6-5339-02 W292	20 53 20 N	156 39 45 W	11-17-87	1115	850	21.5	--
				05-18-88	1150	830	21.0	--
				07-05-88	1525	800	21.0	--
				08-26-88	1005	870	21.0	170
205343156401101	6-5340-01 S5	20 53 43 N	156 40 11 W	10-07-87	1245	1440	24.0	--
205416156244301	6-5424-01 S24	20 54 16 N	156 24 43 W	10-14-87	1300	2200	--	--
				10-14-87	1410	2300	23.0	--
				07-22-88	1325	2450	23.0	--
				09-14-88	1340	2300	23.0	--
205511156222101	6-5522-01 S31	20 55 11 N	156 22 21 W	10-14-87	1330	1200	22.5	260
				09-14-88	1330	1300	22.5	280
205837156384601	6-5838-01 NAPILI A	20 58 37 N	156 38 46 W	10-07-87	1420	730	21.0	180
				11-20-87	1105	700	20.5	180
				01-08-88	1105	710	20.5	180
				02-19-88	1320	700	20.5	160
				03-31-88	1405	660	20.5	170
				05-09-88	1125	690	21.0	160
				07-05-88	1415	690	20.5	160
				08-26-88	1230	680	21.0	160
205838156383101	6-5838-02 NAPILI B	20 58 38 N	156 38 31 W	05-09-88	1135	340	--	41
205848156383601	6-5838-04 NAPILI	20 58 48 N	156 38 36 W	10-07-87	1450	720	20.0	180
				01-08-88	1035	690	20.0	170
				02-19-88	1340	680	20.0	160
				05-09-88	1150	620	21.0	150
				07-05-88	1440	690	20.0	140

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII								
WATER QUALITY DATA, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987								
192923154564701	8-2986-02 W9-5A	19 29 23 N	155 56 47 W	11-05-86	1200	115	23.0	6.0
				01-08-87	0815	112	23.0	7.0
				02-09-87	1245	115	23.0	7.5
192924154564701	8-2986-01 W9-5B	19 29 24 N	154 56 47	01-08-87	0835	112	21.5	7.0
				02-09-87	1235	118	22.0	7.5
				04-06-87	1325	120	23.0	7.0
				05-26-87	1400	120	23.0	7.5
				07-23-87	0835	118	23.0	6.5
WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988								
190832155310901	8-0831-02	19 08 32 N	155 31 09 W	11-23-87	1200	680	18.5	170
				01-11-88	1050	680	18.5	170
				03-01-88	1025	680	18.5	180
				04-27-88	1100	730	18.5	180
				06-15-88	1010	710	18.5	180
				07-26-88	1010	750	18.5	190
				09-07-88	1035	670	18.5	180
191108155281701	8-1128-02 PALIMA	19 11 08 N	155 28 17 W	01-11-88	0935	115	19.0	12
				03-01-88	0940	118	19.0	13
				04-27-88	1005	118	19.0	11
				06-15-88	0920	116	19.0	12
				07-26-88	0920	119	19.0	13
				09-07-88	0900	116	19.0	12
191114155294801	8-1129-01 SISAL	19 11 14 N	155 29 48 W	11-23-87	1110	90	18.0	4.0
				01-11-88	1000	88	18.0	4.0
				03-01-88	1005	87	18.0	3.5
				04-27-88	1035	87	18.0	3.0
				06-15-88	0950	87	18.0	2.5
				07-26-88	0945	84	18.0	3.0
191219155291601	8-1229-01 PAHALA	19 12 25 N	155 29 22 W	03-01-88	0910	88	17.5	3.5
				07-26-88	0855	86	17.5	4.0
				09-07-88	0835	86	17.0	4.0
192108155021201	8-2102-01 W9-10	19 21 08 N	155 02 12 W	04-14-88	1015	970	25.5	240
				06-06-88	1055	950	25.5	--
				08-03-88	0930	955	25.5	--
192456154571901	8-2487-01 W9-7	19 24 57 N	154 57 18 W	01-04-88	1410	450	25.0	110
				04-15-88	1405	420	25.0	95
192646155532001	8-2653-01 KEEI C	19 26 46 N	155 53 20 W	11-23-87	1440	330	19.5	66
				01-11-88	1330	225	19.5	36
				04-27-88	1355	305	19.5	56
				06-15-88	1230	265	19.5	48
				07-26-88	1245	260	19.5	46
				09-20-88	0955	290	19.5	55
192738155534201	8-2753-01 W12-4	19 27 31 N	155 53 41 W	11-23-87	1520	690	19.5	180
				01-11-88	1405	750	19.5	190
				03-01-88	1455	750	19.5	190
				06-15-88	1310	550	19.5	130
				07-26-88	1340	730	19.5	190

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
192731155534101	8-2753-02 W12-8	19 27 22 N	155 53 38 W	01-11-88	1350	1100	19.0	300
				09-20-88	0935	825	19.0	230
192923154564701	8-2986-02 W9-5A	19 29 23 N	154 56 47 W	11-19-87	0930	118	23.0	6.0
				01-04-88	1320	115	23.0	6.0
				08-04-88	0830	115	23.0	5.5
				09-23-88	1145	115	23.0	6.0
192924154564701	8-2986-01 W9-5B	19 29 24 N	154 56 47 W	11-19-87	0940	118	22.5	6.5
				02-24-88	1045	118	22.5	7.0
				04-15-88	1015	118	23.0	7.0
				06-07-88	1050	118	23.0	6.5
				08-04-88	0840	116	23.5	5.5
193113154555801	8-3185-01 W9-11	19 31 13 N	154 55 58 W	01-06-88	1015	118	21.0	16
				02-24-88	1120	120	21.0	14
				04-15-88	1430	120	21.0	13
				08-04-88	0940	120	21.0	14
				09-26-88	0925	118	21.0	16
193510155570801	8-3557-01 W12-5	19 35 10 N	155 57 08 W	11-24-87	0830	245	20.0	38
				01-12-88	1230	340	20.0	62
				04-28-88	1335	300	20.0	54
				06-16-88	1115	300	20.0	54
				07-27-88	0730	305	20.0	58
				09-20-88	1315	245	20.0	42
193505155570801	8-3557-02 W12-6	19 35 05 N	155 57 08 W	03-02-88	1505	400	20.0	79
				07-27-88	0755	385	20.0	80
193508155570701	8-3557-03 KAHALUU C	19 35 08 N	155 57 07 W	11-24-87	0840	240	20.0	38
				01-12-88	1235	265	20.0	44
				04-28-88	1330	265	20.0	43
				06-16-88	1105	255	20.0	42
				07-27-88	0740	255	20.0	43
				09-20-88	1305	230	20.0	37
193505155570701	8-3557-04 KAHALUU D	19 35 05 N	155 57 07 W	09-20-88	1325	385	20.0	85
193502155572301	8-3557-05 KAH SHAFT	19 35 02 N	155 57 23 W	11-24-87	0805	830	20.0	220
				01-12-88	1320	760	20.0	190
				03-02-88	1415	850	20.0	210
				04-28-88	1305	900	20.0	220
				06-15-88	1400	820	20.0	200
				07-27-88	0935	700	20.0	180
				09-20-88	1245	840	20.0	230
193803155020201	8-3802-01 W9-B	19 38 03 N	155 02 02 W	02-24-88	1415	78	19.0	4.0
193805155020201	8-3802-03 KEAAU 1	19 38 05 N	155 02 02 W	11-18-87	1230	78	19.0	5.0
				01-06-88	1050	80	19.0	4.0
				02-24-88	1405	80	19.0	5.0
				04-15-88	0930	80	19.0	3.0
				06-07-88	1510	79	19.0	3.0
				09-26-88	1000	75	19.0	4.5
194037155035301	8-4003-01 W8-3	19 40 37 N	155 03 53 W	12-01-87	1005	80	20.0	5.0
				01-06-88	1235	80	20.0	5.5
				02-24-88	1445	82	20.0	5.0
				06-08-88	0855	80	20.0	4.0
				08-04-88	1050	80	20.0	4.0
				09-27-88	1020	78	20.0	4.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF HAWAII--Continued					
194040155035201	8-4003-02 PANAEWA 2	19 40 40 N	155 03 52 W	12-01-87	0950	82	20.0	5.0
				01-06-88	1225	80	20.0	5.0
				02-24-88	1440	82	20.0	5.0
				04-18-88	1300	83	20.0	4.0
				06-08-88	0850	80	20.0	4.5
				08-04-88	1055	80	20.0	4.5
				09-27-88	1030	78	20.0	5.0
194222155034801	8-4203-06 W8-2B	19 42 22 N	155 03 48 W	10-22-87	1325	110	23.0	14
				12-08-87	1100	110	23.0	14
				01-21-88	0830	110	23.0	11
				02-25-88	0940	102	23.0	12
				04-18-88	1410	100	23.0	10
				08-04-88	1130	108	23.5	14
				09-27-88	1105	105	23.5	14
194224155034701	8-4203-12 W6-A	19 42 23 N	155 03 47 W	06-08-88	0940	94	24.0	9.0
194216155033601	8-4203-15 WAIAKEA	19 42 16 N	155 03 36 W	12-11-87	0925	98	19.5	10
194337155041801	8-4304-01	19 43 37 N	155 04 18 W	10-22-87	1250	45000	20.5	16000
				12-08-87	1030	43000	21.0	16000
				01-21-88	0850	35000	21.0	12000
				02-25-88	1000	38000	20.0	15000
				04-18-88	1440	20500	21.5	6200
				06-08-88	1005	45000	21.0	16000
				08-04-88	1150	49000	21.0	16000
				09-27-88	1125	46000	21.0	16000
194818155582301	8-4858-02	19 48 18 N	155 58 23 W	01-12-88	1425	2300	20.5	470
				03-02-88	1620	2350	20.5	460
				04-28-88	1150	2300	20.5	560
				06-16-88	1325	2400	20.5	470
				07-27-88	1405	2400	20.5	460
				09-19-88	1225	2350	20.5	460
194820155582401	8-4858-03	19 48 20 N	155 58 24 W	07-27-88	1400	5750	22.0	--
195035155054501	8-5005-01 W7-1	19 50 35 N	155 05 45 W	10-21-87	1405	200	21.0	14
				12-07-87	1515	180	21.5	14
				01-21-88	0955	205	22.0	16
				02-25-88	1300	190	22.0	13
				04-19-88	0915	200	22.0	13
				06-08-88	1310	180	21.5	12
				08-02-88	0815	175	20.5	10
				09-27-88	1325	175	21.0	12
195043155053801	8-5005-02	19 50 43 N	155 05 38 W	10-21-87	1420	220	22.0	21
				12-07-87	1445	200	22.5	17
				01-21-88	0940	200	22.5	18
				02-25-88	1250	190	22.5	18
				04-19-88	0900	210	22.5	16
				06-08-88	1300	190	22.0	20
				08-02-88	0805	225	21.0	26
				09-27-88	1340	230	21.5	24
195051155051501	8-5005-05 SALT WTR 3	19 50 51 N	155 05 15 W	10-21-87	1430	15500	18.0	5200
				12-07-87	1530	16000	18.0	5400
				01-21-88	1010	16000	18.0	5400
				02-25-88	1320	15800	18.0	5200
				04-19-88	0930	15500	18.0	5100
				06-08-88	1250	14600	18.0	4200
				08-02-88	0830	15800	18.5	4900
				09-27-88	1355	16500	18.0	5000

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued								
195331155074201	8-5307-01 HAKALAU	19 53 31 N	155 07 42 W	01-26-88	1305	150	20.0	12
195456155525501	8-5452-01 WAIKOLOA	19 54 56 N	155 52 55 W	01-27-88	1050	3300	23.0	920
195449155524201	8-5452-02 WAIKOLOA	19 54 49 N	155 52 42 W	01-27-88	1035	2850	23.0	800
				04-20-88	1020	3200	23.5	880
195447155530801	8-5453-01 WAILOLOA	19 54 47 N	155 53 08 W	01-27-88	1105	4400	23.0	1200
195546155480301	8-5548-01 PARKER 1	19 55 46 N	155 48 03 W	06-21-88	1135	2150	28.5	580
195724155455301	8-5745-01 PARKER 5	19 57 24 N	155 45 53 W	10-08-87	1110	280	27.0	27
				11-25-87	0925	310	26.0	27
				03-11-88	1115	290	26.0	26
				05-09-88	1200	275	27.0	25
				06-21-88	1000	280	27.0	24
				08-01-88	1120	275	27.0	25
				09-19-88	1010	270	27.0	26
195722155455201	8-5745-02 PARKER 4	19 57 22 N	155 45 52 W	01-13-88	0925	290	26.5	27
				08-01-88	1135	275	26.5	26
				09-19-88	0955	275	26.5	27
195929155462501	8-5946-01 LALAMILO A	19 59 30 N	155 46 30 W	11-20-87	1235	470	26.0	86
				08-01-88	1345	475	26.0	85
				09-21-88	1010	460	26.5	89
195912155464201	8-5946-02 LALAMILO B	19 59 14 N	155 46 39 W	11-20-87	1255	360	26.5	54
				01-21-88	1250	365	26.0	52
				03-09-88	1135	370	26.0	51
				05-09-88	1325	360	26.0	51
				06-21-88	1355	370	26.0	52
				09-21-88	1025	330	26.0	48
195939155464201	8-5946-03 LALAMILO C	19 59 34 N	155 46 45 W	08-01-88	1335	470	26.0	84
200121155480801	8-6148-02 W14B	20 01 21 N	155 48 08 W	11-20-87	1120	1500	27.5	420
200337155233601	8-6323-01 KEMAU	20 03 37 N	155 23 36 W	03-09-88	1415	580	20.0	130
200505155503701	8-6550-01 KOHALA ESTATES	20 05 05 N	155 50 37 W	03-26-88	1400	930	24.0	240

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU

211828157515801 - 3-1851-22 W101 DWNTN, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	DENSITY (GM/ML AT 20 C)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
DEC										
18...	0935	9600	9.60	25.5	1.001	1100	1100	190	150	1400
18...	1050	9100	8.15	23.0	1.002	1200	1200	140	210	1300

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFIDE TOTAL (MG/L AS S)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	BROMIDE DISSOLVED (MG/L AS BR)	SILICA, DISSOLVED (MG/L AS SIO2)
DEC										
18...	72	19	69	2800	15	<0.5	64	0.10	1.5	1.0
18...	69	16	65	2700	32	<0.5	270	0.10	11	24

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NITRATE TOTAL (MG/L AS N)	NITROGEN, NITRITE TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
DEC										
18...	4690	6.37	--	0.020	<0.100	<0.100	0.110	0.130	0.59	0.70
18...	4740	6.45	0.270	0.030	0.300	0.260	0.040	0.040	0.16	0.20

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	PHOSPHOROUS TOTAL (MG/L AS P)	PHOSPHOROUS DISSOLVED (MG/L AS P)	PHOSPHOROUS ORGANIC TOTAL (MG/L AS P)	PHOSPHOROUS ORGANIC DISSOLVED (MG/L AS P)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	STRONTIUM, DISSOLVED (UG/L AS SR)	CARBON, ORGANIC TOTAL (MG/L AS C)
DEC										
18...	<0.20	--	<0.010	<0.010	--	--	20	20	2500	6.7
18...	<0.20	0.50	0.010	0.010	0.01	0.01	60	530	2100	0.1

< Actual value is known to be less than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU-Continued

211945158053401 - 3-1905-04 EWA DESALT PLANT, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE LAB (US/CM)	PH LAB (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBOANATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
JAN 08...	1315	2040	7.50	490	340	75	73	180	44	4

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER DAY)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)
JAN 08...	9.4	430	151	91	0.20	19	980	0.0	2.80	<10

DATE	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
JAN 08...	<1	<100	<10	<1	3	2	5	30	10	<5

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
JAN 08...	<10	<10	<10	<0.10	1	4	2	<1	<10

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WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU-Continued

211945158053501 - 3-1905-05 EWA DESALT PLANT, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE LAB (US/CM)	PH LAB (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARBONATE MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
FEB 19...	0855	3900	7.50	620	300	100	90	520	63	9

DATE	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER DAY)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)
FEB 19...	36	970	316	210	0.30	41	2160	0.0	0.300	<10

DATE	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
FEB 19...	<1	200	<10	1	3	2	14	50	20	<5

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
FEB 19...	20	<10	<10	<0.10	3	10	3	<1	<10

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WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU-Continued

213115158035701 - 3-3103-01 POAMOHO, OAHU

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	PH (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB WH WAT TOT FLD MG/L AS CACO3	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
JUL 07...	1030	180	6.70	22.5	43	0	7.6	5.8	20	49	1	1.4

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)
JUL 07...	17	44	13	0.30	81	176	0.24	0.900	0.870	0.20	0.290	520

DATE	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)
JUL 07...	<1	<100	<10	<1	2	1	13	70	23	<5	<10	10

DATE	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ALACHLOR TOTAL RECOVER (UG/L)	ALDRIN, TOTAL (UG/L)	AMETRYNE TOTAL	ATRAZINE, TOTAL (UG/L)	BENZENE TOTAL (UG/L)
JUL 07...	5	<0.10	5	3	<1	1	<10	<0.10	<0.001	<0.10	<0.10	<0.20

DATE	BROMOFORM TOTAL (UG/L)	CARBON TETRACHLORIDE TOTAL (UG/L)	CHLOROBENZENE TOTAL (UG/L)	CHLORODIBROMOMETHANE TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLOROETHANE TOTAL (UG/L)	2-CHLOROETHYLVINYLETHER TOTAL (UG/L)	CHLOROFORM TOTAL (UG/L)	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L)	CYANAZINE TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)
JUL 07...	<0.20	<0.20	<0.20	<0.20	<0.1	<0.20	<0.20	<0.20	<0.20	<0.10	<0.001	<0.001

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WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF OAHU-Continued

213115158035701 - 3-3103-01 POAMOHO, OAHU--Continued

DATE	DDT, TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L)	1,2-DIBROMO ETHYL-ENE TOTAL (UG/L)	1,2-DI-CHLORO-BENZENE TOTAL (UG/L)	1,3-DI-CHLORO-BENZENE TOTAL (UG/L)	1,4-DI-CHLORO-BENZENE TOTAL (UG/L)	DI-CHLORO-BROMO-METHANE TOTAL (UG/L)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L)
JUL 07...	<0.001	<0.01	<0.2	<0.2	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20

DATE	1,2-DI-CHLORO-PROPANE TOTAL (UG/L)	1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	ETHYL-BENZENE TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	LINDANE TOTAL (UG/L)
JUL 07...	<0.20	<0.20	<0.001	<0.01	<0.01	<0.001	<0.001	<0.01	<0.20	<0.001	<0.001	<0.001

DATE	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL-BROMIDE TOTAL (UG/L)	METHYL-CHLO-RIDE TOTAL (UG/L)	METHYL-ENE CHLO-RIDE TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)	METHYL TRI-THION, TOTAL (UG/L)	METOLA-CHLOR WATER WHOLE TOT.REC (UG/L)	METRI-BUZIN WATER WHOLE TOT.REC (UG/L)	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)
JUL 07...	<0.01	<0.01	<0.20	<0.20	<0.20	<0.01	<0.01	<0.1	<0.1	<0.01	<0.10	<0.01

DATE	PCB, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PROME-TONE TOTAL (UG/L)	PROME-TRYNE TOTAL (UG/L)	PRO-PAZINE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	SIMA-ZINE TOTAL (UG/L)	SIME-TRYNE TOTAL (UG/L)	STYRENE TOTAL (UG/L)	1,1,2,2 TETRA-CHLORO-ETHANE TOTAL (UG/L)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L)	TOLUENE TOTAL (UG/L)
JUL 07...	<0.1	<0.1	<0.1	<0.1	<0.10	<0.01	<0.10	<0.1	<0.2	<0.20	<0.20	<0.20

DATE	TOTAL TRI-THION (UG/L)	TOX-APHENE, TOTAL (UG/L)	1,2-TRANSDI CHLORO-ETHENE TOTAL (UG/L)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L)	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L)	TRI-FLURA-LIN TOTAL RECOVER (UG/L)	2,4,5-T TOTAL (UG/L)	VINYL CHLO-RIDE TOTAL (UG/L)	XYLENE TOTAL WATER WHOLE TOT REC (UG/L)
JUL 07...	<0.01	<1	<0.20	<0.20	<0.2	<0.20	<0.20	<0.20	<0.10	<0.01	<0.20	<0.2

< Actual value is known to be less than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF MOLOKAI

210850156552201 - 4-0855-06 WAIKOLU, MOLOKAI

DATE	TIME	SPECIFIC CONDUCTANCE LAB (US/CM)	PH LAB (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
MAR 18...	1400	108	8.10	30	6.6	3.3	9.0	38	0.7	1.4

DATE	CHLORIDE, DISSOLVED (MG/L AS CL)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)
MAR 18...	11	33	2.0	0.10	33	87	0.12	0.260	40	<1

DATE	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
MAR 18...	<100	<10	1	2	2	6	20	8	<5

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
MAR 18...	<10	<10	4	0.30	<1	12	<1	<1	10

< Actual value is known to be less than the value shown.

WATER QUALITY DATA, WATER YEAR OCTOBER 1987 TO SEPTEMBER 1988

HAWAII, ISLAND OF HAWAII

200325155374101 - 8-6337-01 PUUKAPU, HAWAII

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB				
09...	0930	108	17.0	7.0
26...	0945	88	17.0	7.5
MAR				
14...	0950	84	17.0	7.5

DATE	TIME	PH LAB (STANDARD UNITS)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB										
27...	0900	8.00	24	5.5	2.6	8.2	40	0.7	1.6	9.2

DATE	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)
FEB									
27...	33	2.6	0.20	30	80	0.11	0.180	60	<1

DATE	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)
FEB									
27...	<100	<10	<1	2	<1	3	10	5	<5

DATE	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
FEB									
27...	<10	30	3	0.30	<1	<1	<1	<1	<10

< Actual value is known to be less than the value shown.

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October 1, 1978

FACTORS FOR CONVERTING INCH-POUND UNITS TO INTERNATIONAL SYSTEM UNITS (SI)

The following factors may be used to convert the inch-pound units published herein to the International System of Units (SI).

Multiply inch-pound units	By	To obtain SI units
	Length	
inches (in)	2.54×10^{1}	millimeters (mm)
	2.54×10^{-2}	meters (m)
feet (ft)	3.048×10^{-1}	meters (m)
miles (mi)	1.609×10^{0}	kilometers (km)
	Area	
acres	4.047×10^{3}	square meters (m^2)
	4.047×10^{-1}	square hectometers (hm^2)
	4.047×10^{-3}	square kilometers (km^2)
square miles (mi^2)	2.590×10^{0}	square kilometers (km^2)
	Volume	
gallons (gal)	3.785×10^{0}	liters (L)
	3.785×10^{0}	cubic decimeters (dm^3)
	3.785×10^{-3}	cubic meters (m^3)
million gallons	3.785×10^{3}	cubic meters (m^3)
	3.785×10^{-3}	cubic hectometers (hm^3)
cubic feet (ft^3)	2.832×10^{1}	cubic decimeters (dm^3)
	2.832×10^{-2}	cubic meters (m^3)
cfs-days	2.447×10^{3}	cubic meters (m^3)
	2.447×10^{-3}	cubic hectometers (hm^3)
acre-feet (acre-ft)	1.233×10^{3}	cubic meters (m^3)
	1.233×10^{-3}	cubic hectometers (hm^3)
	1.233×10^{-6}	cubic kilometers (km^3)
	Flow	
cubic feet per second (ft^3/s)	2.832×10^{1}	liters per second (L/s)
	2.832×10^{1}	cubic decimeters per second (dm^3/s)
	2.832×10^{-2}	cubic meters per second (m^3/s)
gallons per minute (gal/min)	6.309×10^{-2}	liters per second (L/s)
	6.309×10^{-2}	cubic decimeters per second (dm^3/s)
	6.309×10^{-5}	cubic meters per second (m^3/s)
million gallons per day	4.381×10^{1}	cubic decimeters per second (dm^3/s)
	4.381×10^{-2}	cubic meters per second (m^3/s)
	Mass	
tons (short)	9.072×10^{-1}	megagrams (Mg) or metric tons

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