Water Resources Data for Hawaii and other Pacific Areas

Volume 1. Hawaii

U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-80-1

WATER YEAR 1980

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

CALENDAR FOR WATER YEAR 1980

1979

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WATER YEAR 1980

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

UNITED STATES DEPARTMENT OF THE INTERIOR

JAMES G. WATT, Secretary

GEOLOGICAL SURVEY

Doyle G. Frederick, Acting Director

For information on the water program in Hawaii
and other Pacific Areas write to
District Chief, Water Resources Division
U.S. Geological Survey
6th Floor, Room 6110
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Honolulu, Hawaii 96850

1981

PREFACE

This report was prepared by personnel of the Hawaii district of the Water Resources Division of the U.S. Geological Survey under the supervision of Benjamin L. Jones, District Chief, and J. D. Bredehoeft, Regional Hydrologist, Western Region. It was done in cooperation with the State of Hawaii and with other agencies.

This report is one of a series issued by State. General direction for the series is by Philip Cohen, Chief Hydrologist, U.S. Geological Survey, and R. J. Dingman, Assistant Chief Hydrologist for Scientific Publications and Data Management.

Data for Hawaii and other Pacific Areas are in two volumes as follows:

Volume 1. State of Hawaii

Volume 2. Trust Territory of the Pacific Islands, Guam, Mariana Islands, Tutuila, American Samoa, and Saipan, Northern Mariana Islands

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

16. Abstract (Limit: 200 words)

Volume 1 of water resources data for the 1980 water year for Hawaii and other Pacific Areas consist of records of stage, discharge, and water quality of streams; and water levels and water quality in wells and springs. This report contains discharge records for 109 gaging stations; water quality for 10 gaging stations, 103 partial-record flow stations, and 156 wells; and water levels for 22 observation wells. Also included are 109 crest-stage partial-record stations and 19 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. 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.

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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1980

Volume 1

INTRODUCTION

Water resources data for the 1980 water year for Hawaii and other Pacific areas consist of records of stage, discharge, and water quality of streams; and water-levels and water quality of wells and springs. This report contains discharge records for 109 gaging stations; water quality for 10 gaging stations, 103 partial-record flow stations, and 156 wells; and water levels for 22 observation wells. Also included are data for 109 crest-stage partial-record stations and 19 low-flow partial-record stations. Additional water data were collected at various sites, not part of the systematic data collection program, and are published as miscellaneous measurements. These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating State, Territorial, and Federal agencies in Hawaii and other Pacific areas.

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 basis. 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-80-1." For archiving and general distribution, the reports for water years 1971-74 are also identified 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 including current prices, 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) 546-8331.

COOPERATION

The U.S. Geological Survey and organizations of the State of Hawaii have had cooperative agreements for the systematic collection of streamflow 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, R. T. Chuck, manager-chief engineer.
Hawaii Department of Transportation, Ryokichi Higashionna, director.
City and County of Honolulu, Board of Water Supply, Kazuyoshi Hayashida, manager and chief engineer.
City and County of Honolulu, Division of Engineering, Wallace Miyahira, director and chief engineer.

Assistance in the form of funds or services are given by the Corps of Engineers, U.S. Army in collecting records for 10 gaging stations, 4 water-quality stations and 5 partial-record stations, and the U.S. Forest Service for 1 water-quality station published in this report.

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.

HYDROLOGIC CONDITIONS

Runoff during the 1980 water year was above normal (in the upper 75 percent of record) at the index stations on the islands of Oahu and Maui and in the normal range on the islands of Kauai and Hawaii. The relation to the median of yearly mean discharges for the period 1941-70 for the four index stations ranged between 102 and 195 percent of the annual median. Monthly mean flow at the index stations on the islands of Kauai, Oahu, and Maui was predominantly in the excessive range during March to July and varied between 165 and 542 percent of the monthly medians for each station. Deficient flow at the index stations occurred randomly throughout the year but mostly during the first five months of the year.

At the index station, East Branch of North Fork Wailua River near Lihue, Kauai, streamflow was deficient for 4 months and excessive for 5 months of the 12 months in 1980. Annual mean discharge was in the normal range and was 109 percent of the annual median. Streamflow at Kalihi Stream near Honolulu, Oahu, was deficient for only 2 months and excessive for 7 months of the 12 months during the year. Yearly mean discharge was excessive and 158 percent of the annual median. Monthly mean flow at Honopou Stream near Huelo, Maui, was in the normal range for 3 months and excessive for 8 months of the 12 months in 1980. Annual mean discharge was in the excessive range at 195 percent of the annual median. Streamflow at the index station Waiakea Stream near Mountain View, Hawaii, was variable throughout the year. Monthly mean flows were deficient for 4 months and normal for 5 months of the 12 months and annual mean discharge was in the normal range at 102 percent of the annual median.

On November 17 and 18, heavy rains caused extensive flooding in several areas on the island of Hawaii. During the 24-hour period on November 17, 11.30 inches (287 mm) of rain fell in the Hilo area on November 17, and resulted in new peaks of record at gaging stations on the Wailuku River, and Pohakupuka Stream basins. In the Waipio area, 8.64 inches (219 mm) of rain also caused severe flood damages and a three-day total of 9.63 inches (245 mm) of rain on November 18 resulted in new peaks of record at several gaging stations in the Kamuela area. Damage estimates to agricultural crops, private, and public property was nearly 4.5 million dollars. Severely affected flood damaged areas were declared major State disaster areas by the Governor on November 21, 1979.

Records at the two continuous recorder sites on Oahu showed a rise from the minimum ground water level for their respective periods of record. One of the two recorder sites which monitors the water table of the Schofield Plateau showed a substantial gain in ground-water level after the recorded minimum water level of December 5, 1978. The two continuous recorder sites on Maui showed a new maximum ground-water level for the period of record.

Analyses of water samples taken at more than 150 basal water-table wells did not in general show significant changes in the chloride contents.

Monthly and annual mean discharge is compared with medians at the four index stations in figure 1. Flood hydrographs at two selected stations on the island of Hawaii are shown in figure 2. Table 1 is a summary of flood stages, discharges, and recurrence intervals at 16 selected sites.

DEFINITION OF TERMS

Definition of terms related to streamflow, water-quality, and other hydrologic data, as used in this report, 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, rod-like, 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 within 24 hours when incubated at 35°C ± 1.0°C on M-Endomedium (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 warmblooded 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 medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal streptococcal bacteria are bacteria found also in the intestine of warmblooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria

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 ± 1.0°C on M-enterrococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

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

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.

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 mililiters (mL) 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. Chlorphyll a and b are the two most common pigments in plants.

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.

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.

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 "DISCHARGE (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. It is recognized that certain kinds of samples cannot be filtered; to provide for this, procedures that are considered equivalent to filtering through a 0.45 micrometer membrane filter will be identified and announced at a later date.

Suspended recoverable is the amount of a given constituent that is in solution after the part of a representative 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 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.

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 constituent.

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 different 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.)

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".

Diversity index is a numerical expression of evenness of distribution of aquatic organisms. The formula for diversity index is:

$$\bar{d} = \sum_{i=i}^{s} \frac{n_i}{n} \log_2 \frac{n_i}{n}$$

Where n_i is the number of individuals per taxon, n is the total number of individuals, and s is the total number of taxa in the sample of the community. Diversity index values range from zero, when all the organisms in the sample are the same, to some positive number, when some or all of the organisms in the sample are different.

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.

Metamorphic stage refers to the stage of development that an organism exhibits during its transformation from an immature form to an adult form. This developmental process exists for most insects, and the degree of difference from the immature stage to the adult form varies from relatively slight to pronounced, with many intermediates. Examples of metamorphic stages of insects are egg-larva-adult or egg-nymph-adult.

Micrograms per gram (µg/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.

Micrograms per liter (UG/L, µg/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.

Milligrams 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.

Organism is any living entity, such as an insect, phytoplankter, or zooplankter.

Organism count/area refers to the number of organisms collected and enumerated in a sample and adjusted to the number per area habitat, usually square meters (m^2), acres, or hectares. Periphyton benthic organisms, and macrophytes are expressed in these terms.

Organism count/volume refers to the number of organisms collected and enumerated in a sample and adjusted to the number per sample volume, usually milliliters (mL) or liters (L). Numbers of planktonic organisms can be expressed in these terms.

Total organism count is the total number of organisms collected and enumerated in any particular sample.

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} radioactive disintegrations per second. A picocurie yields 2.22 dpm (disintegrations per minute).

Plankton is the community of suspended, floating, or weakly swimming organisms that live in the open water of lakes and rivers.

Phytoplankton is the plant part of the plankton. They are usually microscopic and their movement is subject to the water currents. Phytoplankton growth is dependent upon solar radiation and nutrient substances. Because they are able to incorporate as well as release materials to the surrounding water, the phytoplankton have a profound effect upon the quality of the water. They are the primary food producers in the aquatic environment, and are commonly known as algae.

Blue-green algae are a group of phytoplankton organisms having a blue pigment, in addition to the green pigment called chlorophyll. Blue-green algae often cause nuisance conditions in water.

Diatoms are the unicellular or colonial algae having siliceous shell. Their concentrations are expressed as number of cells/mL of sample.

Green-algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algal mats or floating "moss" in lakes. Their concentrations are expressed as number of cells/mL of sample.

Zooplankton is the animal part of the plankton. Zooplankton are capable of extensive movements within the water column, and are often large enough to be seen with the unaided eye. Zooplankton are secondary consumers feeding upon bacteria, phytoplankton, and detritus. Because they are grazers in the aquatic environment, the zooplankton are a vital part of the aquatic feed web. The zooplankton community is dominated by small crustaceans and rotifers.

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.

Primary productivity is a measure of the rate at which new organic matter is formed and accumulated through photosynthetic and chemosynthetic activity of producer organisms (chiefly, green plants). The rate of primary production is estimated by measuring the amount of oxygen released (oxygen method) or the amount of carbon assimilated by the plants (carbon method).

Milligrams of carbon per area or volume per unit time [mg C/(m^2·time) for periphyton and macrophytes and mg C/(m^3·time)] for phytoplankton are units for expressing primary productivity. They define the amount of carbon dioxide consumed as measured by radioactive carbon (carbon 14). The carbon 14 method is of greater sensitivity than the oxygen light and dark bottle method, and is preferred for use in unenriched waters. Unit time may be either the hour or day, depending on the incubation period.

Milligrams of oxygen per area or volume per unit time [mg O_2/(m^2·time for periphyton and macrophytes and mg O_2/(m^3·time)] for phytoplankton are the units for expressing primary productivity. They define production and respiration rates as estimated from changes in the measured dissolved oxygen concentration. The oxygen light and dark bottle method is preferred if the rate of primary production is sufficient for accurate measurements to be made within 24 hours. Unit time may be either the hour or day, depending on the incubation period.

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 micromhos 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 micromhos). 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.

Substrate is the physical surface upon which an organism lives.

Natural substrate refers to any naturally occurring emersed or submersed solid surface, such as a rock or tree, upon which an organism lives.

Artificial substrate is a device which is purposely placed in a stream or lake for colonization of organisms. The artificial substrate simplifies the community structure by standardizing the substrate from which each sample is taken. Examples of artificial substrates are basket samplers (made of wire cages filled with clean streamside rocks) and multi-plate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

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.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchical scheme beginning with Kingdom and ending with Species at the base. The higher the classification level, the fewer features the organisms have in common. For example, the taxonomy of a particular mayfly, Hexagenia limbata, is the following:

Kingdom.....Animal
Phylum.....Arthropoda
Class.....Insecta
Order.....Ephemeroptera
Family.....Ephemeridae
Genus.....Hexageria
Species.....Hexagenia limbata

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 due to the presence of particulate matter. In this report it is expressed Jackson turbidity units (JTU).

WDR is used as an abbreviation for "Water-Data Reports" in the summary REVISIONS paragraph to refer to previously published State 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 station numbers, no distinction is made between partial-record stations and continuous-record gaging stations; therefore, the station number for a partial-record station indicates 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 station, 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.

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 13.

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 longitute 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 14 and 15.

To distinguish wells within a minute grid, two grids 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.

For continuity, the old well numbers are listed in parentheses after the new 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 be governed solely by natural 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.

Pesticide program is a network of regularly sampled water-quality stations where samples are collected to determine the concentration and distribution of pesticides in streams where potential contamination could result from the application of the commonly used insecticides and herbicides. Operation of the network is a Federal interagency activity.

Radiochemical program is a network of regularly sampled water-quality stations where samples are collected to be analyzed for radioisotopes. The streams that are sampled represent major drainage basins in the conterminous United States.

Tritium network is a network of stations which has been established to provide baseline information on the occurrence of tritium in the Nation's surface waters. In addition to the surface-water stations in the network, tritium data are also obtained at a number of precipitation stations. The purpose of the precipitation stations is to provide an estimate sufficient for hydrologic studies of the tritium input to the United States.

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 or 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 compute daily discharge or contents. This happens when the recorder stops 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 bases 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 stations 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. River mileage, given under "LOCATION" for some stations, is that determined and used by the Corps of Engineers or other agencies. 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 discharges 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 stations where changes in 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"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion, if the drainage area includes large noncontributing areas, or if the average annual rainfall over the drainage basin is usually less than 20 inches. 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 stations 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. The same rounding rules apply to discharge figures listed for partial-record stations.

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 temperatures, 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 anlyses 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 records 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 office.

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. In the rare case where an apparent inconsistency exists between a reported pH value and the relative abundance of carbon dioxide species (carbonate and bicarbonate), the inconsistency is the result of a slight uptake of carbon dioxide from the air by the sample between measurement of pH in the field and determination of carbonate and bicarbonate in the laboratory.

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. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. 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 at several verticals in the cross section, 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 times 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 longitude and (2) a local number that is provided for local needs. See figure 14.

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 reported 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 nations 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		

Thirty-four manuals by the U.S. Geological Survey have been published to date in the series on techniques describing procedures for planning and executing 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) is on 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, Branch of Distribution, 1200 South Eads Street, Arlington, VA 22202 (authorized agent of the Superintendent of Documents, Government Printing Office).

NOTE: When ordering 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. F. 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-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-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 text for self-instruction,* by G. D. Bennett: USGS--TWRI Book 3, Chapter B2. 1976. 172 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-C1. *Laboratory theory and methods for sediment analysis,* by H. P. Guy: USGS--TWRI Book 5, Chapter C1. 1969. 58 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.

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-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.

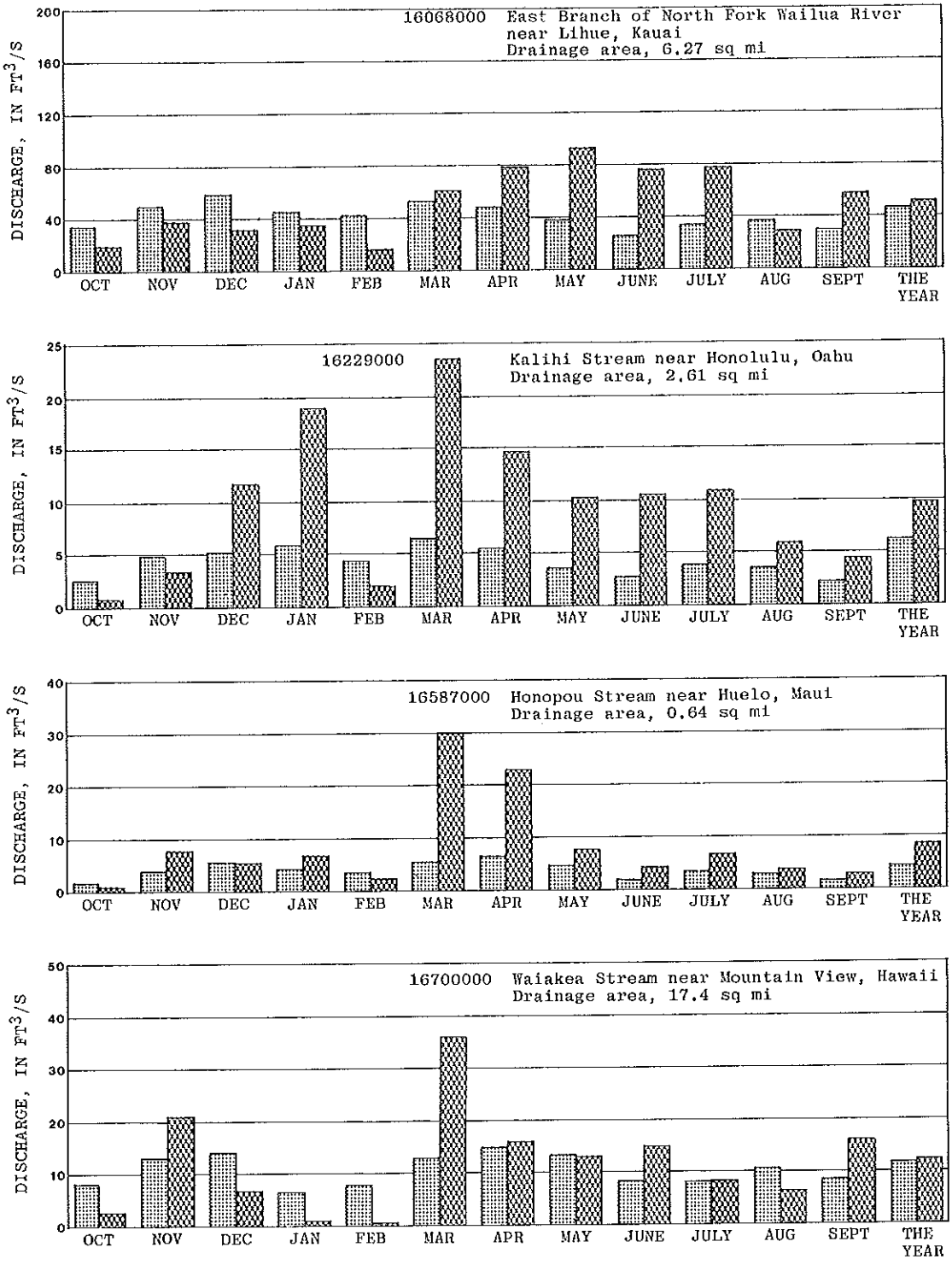

FIGURE 1.--DISCHARGE DURING 1980 WATER YEAR COMPARED WITH MEDIAN DISCHARGE FOR PERIOD 1941-70 FOR FOUR REPRESENTATIVE GAGING STATIONS.

SUMMARY OF FLOOD STAGE AND DISCHARGE

The following table contains the record of peak flows at selected sites for floods which occurred during November 1979. The sites are gaging and crest-gage stations. Nine indirect discharge measurements were made to determine peaks of the flood. Other peaks were determined from established or extended rating tables. Flood hydrographs of selected stations for the flood period appear on the following page.

Table 1.--Peak discharges at selected station sites, island of Hawaii

Station Number	Station name	Drainage area (mi^2)	Period of record	Maximum flood previously known: Date	Gage Height (ft)	Discharge (ft^3/s)	Peak flood in November 1979: Day	Time (hr)	Gage Height (ft)	Discharge (ft^3/s)
16700000	Waiakea Stream near Mountain View	17.4	1931-80	8-26-70	4.45	565	17	0115	4.40	530
16701300	Waiakea Stream at Hilo (CG)	35.8	1968-80	2-20-79	9.07	2,590	17	--	7.50	1,640
16701750	Wailuku River near Humuula	34.8	1965-80	11-20-73	11.00	3,180	17	a2300	11.87	8,300
16701800	Wailuku River near Kaumana	43.4	1967-80	8-08-67	13.35	9,580	17	2300	16.30	13,800
16704000	Wailuku River at Piihonua	230	1929-80	8-11-40	28.6	*ND	17	2330	26.16	60,200
16713000	Wailuku River at Hilo	256	1978-80	5-23-78	23.30	34,200	17	2330	34.57	65,500
16717000	Honolii Stream near Papaikou	11.6	1967-80	5-23-78	20.00	22,600	17	0230	18.00	14,500
16717650	Kapehu Stream near Pepeekeo (CG)	1.09	1963-80	2-20-79	29.93	3,320	17	--	10.27	1,120
16717800	Pohakupuka Stream near Papaaloa	2.76	1963-80	11-26-67	13.37	5,340		--	17.05	11,400
16717920	Ahualoa Gulch at Honokaa	2.27	1963-80	1-14-79	11.50	760	18	--	17.68	3,160
16720000	Kawainui Stream near Kamuela	1.58	1964-80	1-11-67	9.15	2,400	18	0215	10.03	3,160
16720300	Kawaiki Stream near Kamuela	0.45	1968-80	10-24-74	5.65	595	18	0200	8.32	1,470
16725000	Alakahi Stream near Kamuela	0.87	1964-80	1-11-67	8.65	1,420	18	0330	9.90	2,170
16756500	Keanuiomano Stream near Kamuela	4.30	1964-80	4-20-68	10.02	3,540	18	--	9.15	3,140
16756000	Kohakohau Stream near Kamuela	2.51	1956-80	8-07-58	10.76	3,880		0630	6.54	2,280
16758000	Waikoloa Stream at Marine Dam near Kamuela	1.18	1947-80	10-23-57	6.99	3,390	18	0630	6.84	3,410

(CG) Crest-gage station.

a About.

*ND Discharge not determined due to doubtful gage height.

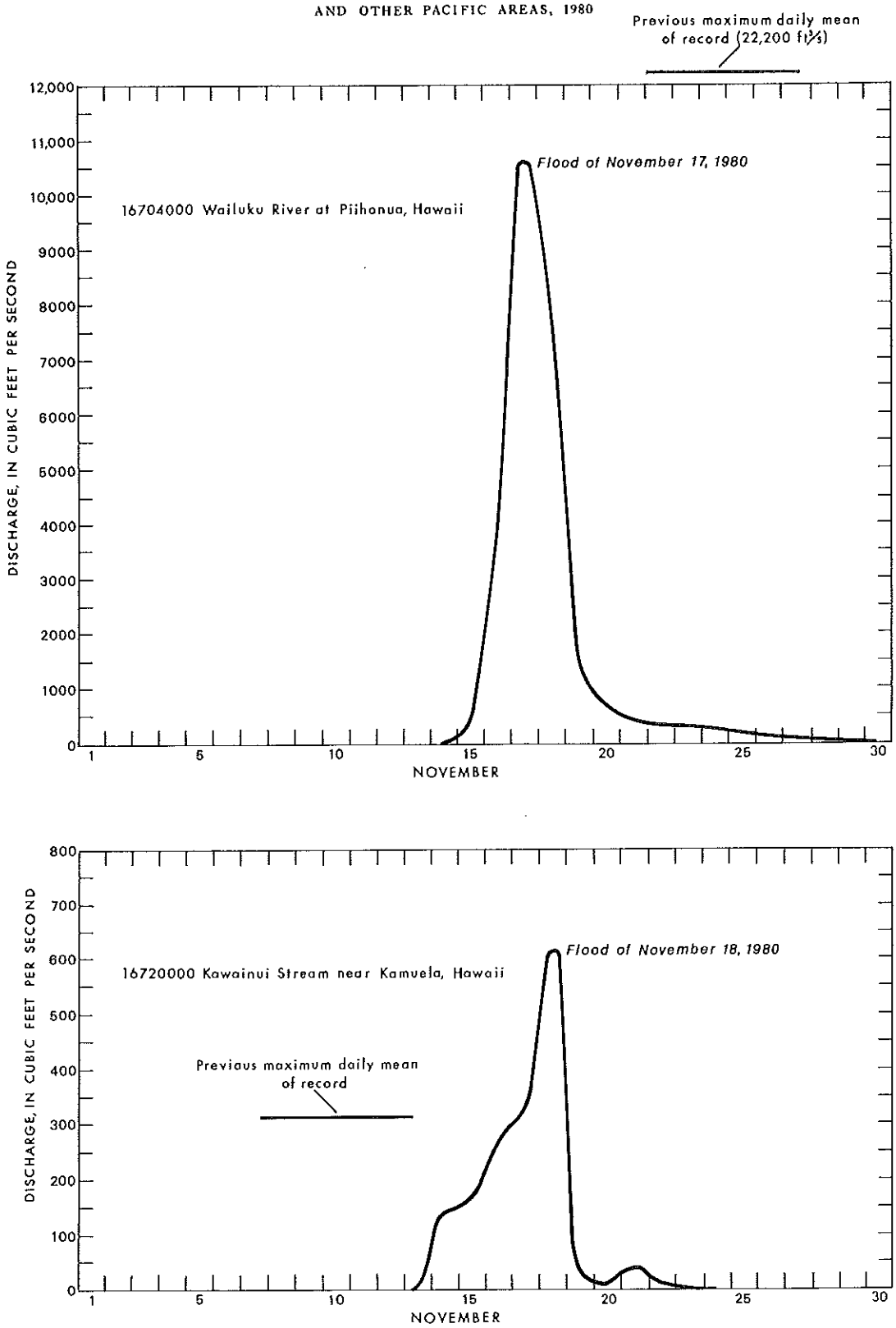

FIGURE 2.--DISCHARGE AT SELECTED GAGING STATIONS, FLOODS OF NOVEMBER 17-18.

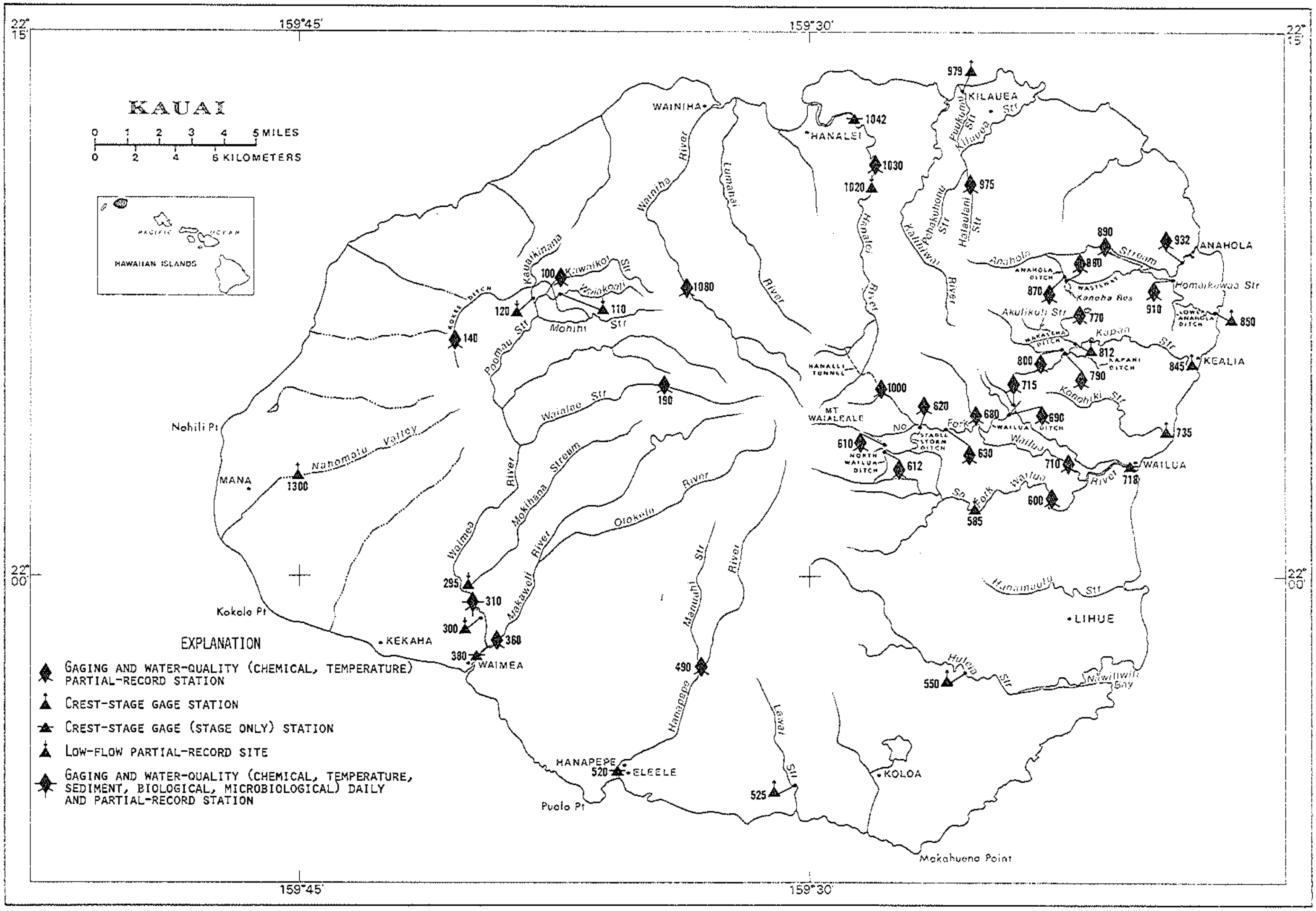

FIGURE 3.--MAP OF KAUAI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

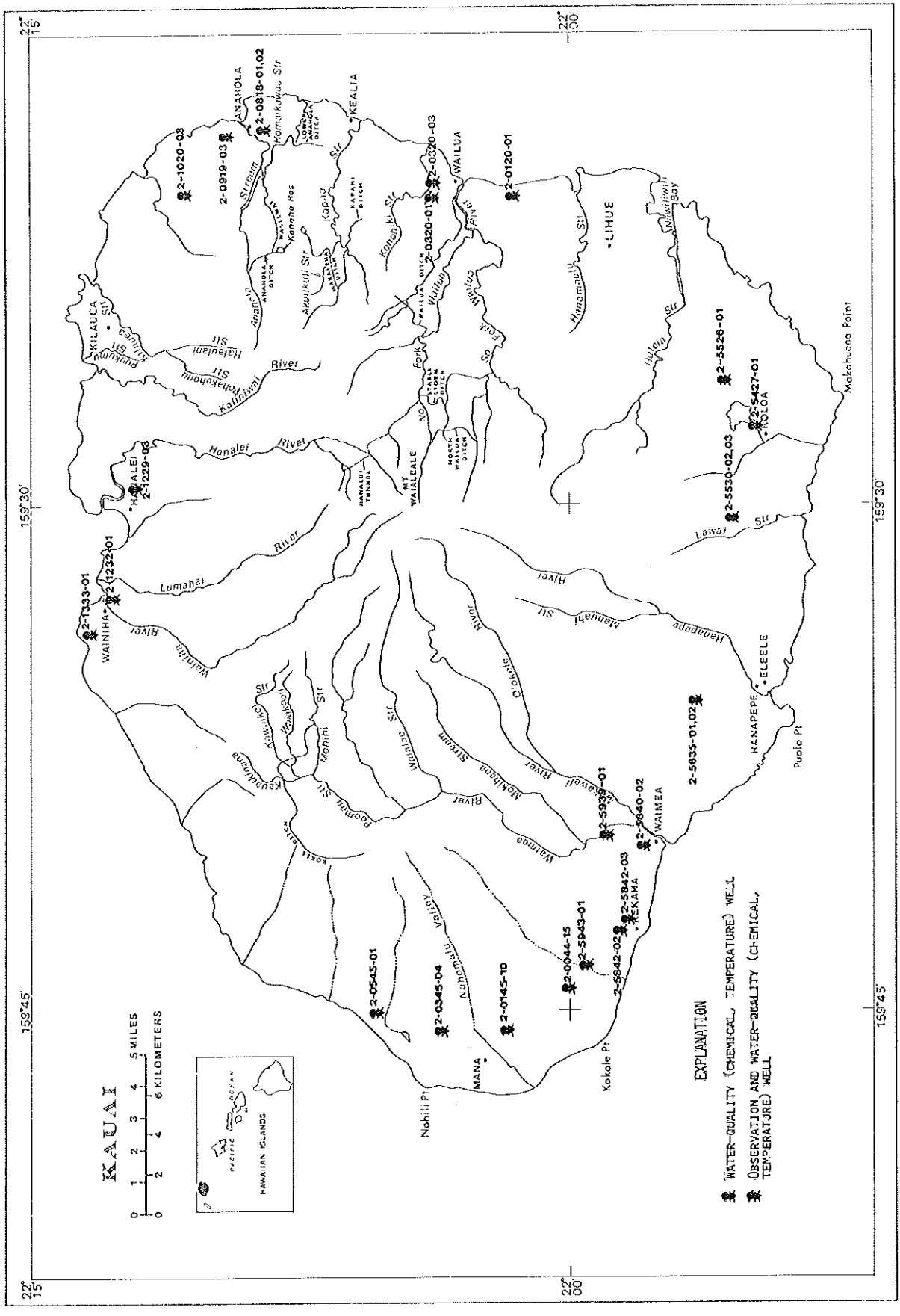

FIGURE 4.—MAP OF KAUAI SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

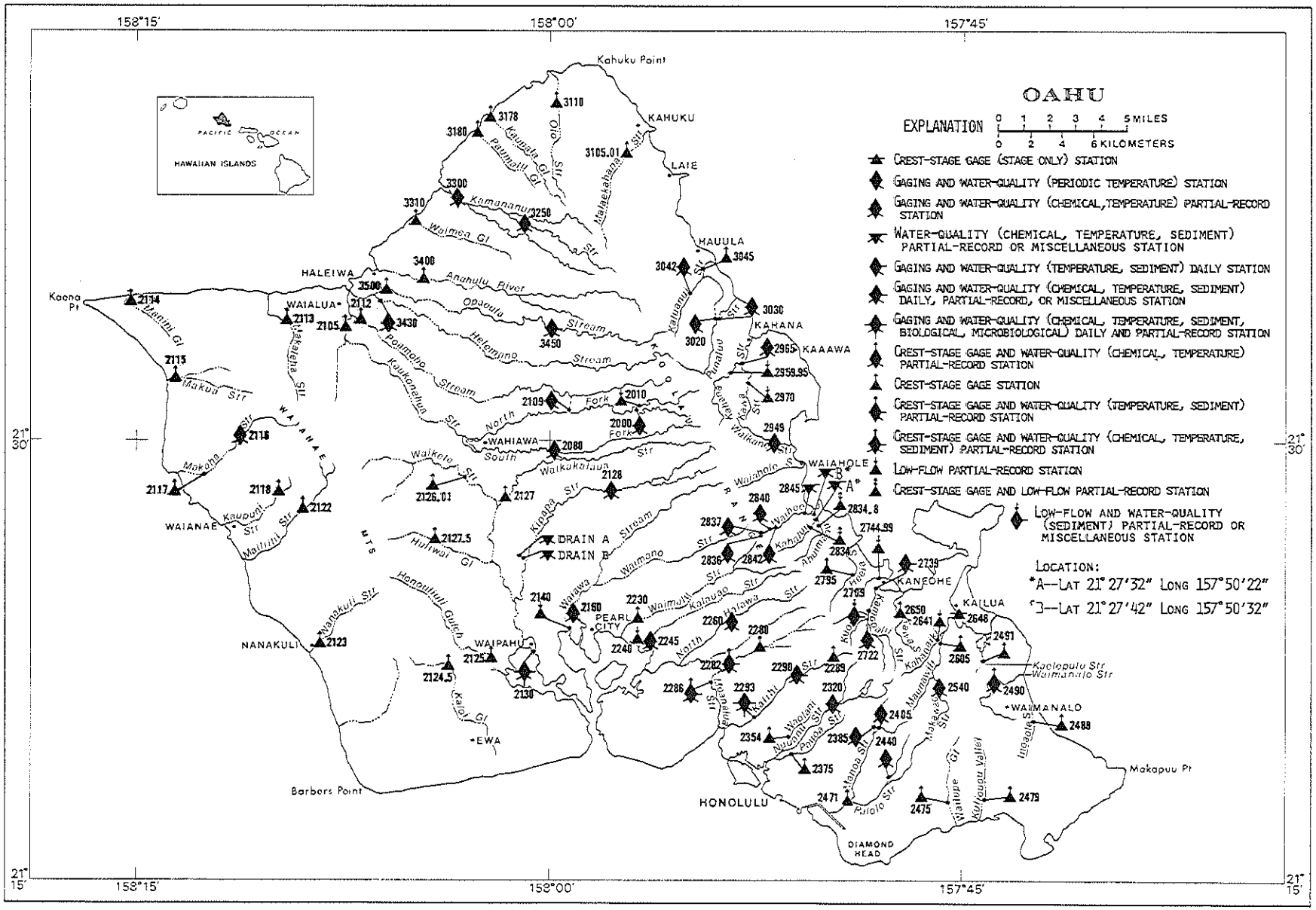

FIGURE 5.--MAP OF OAHU SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

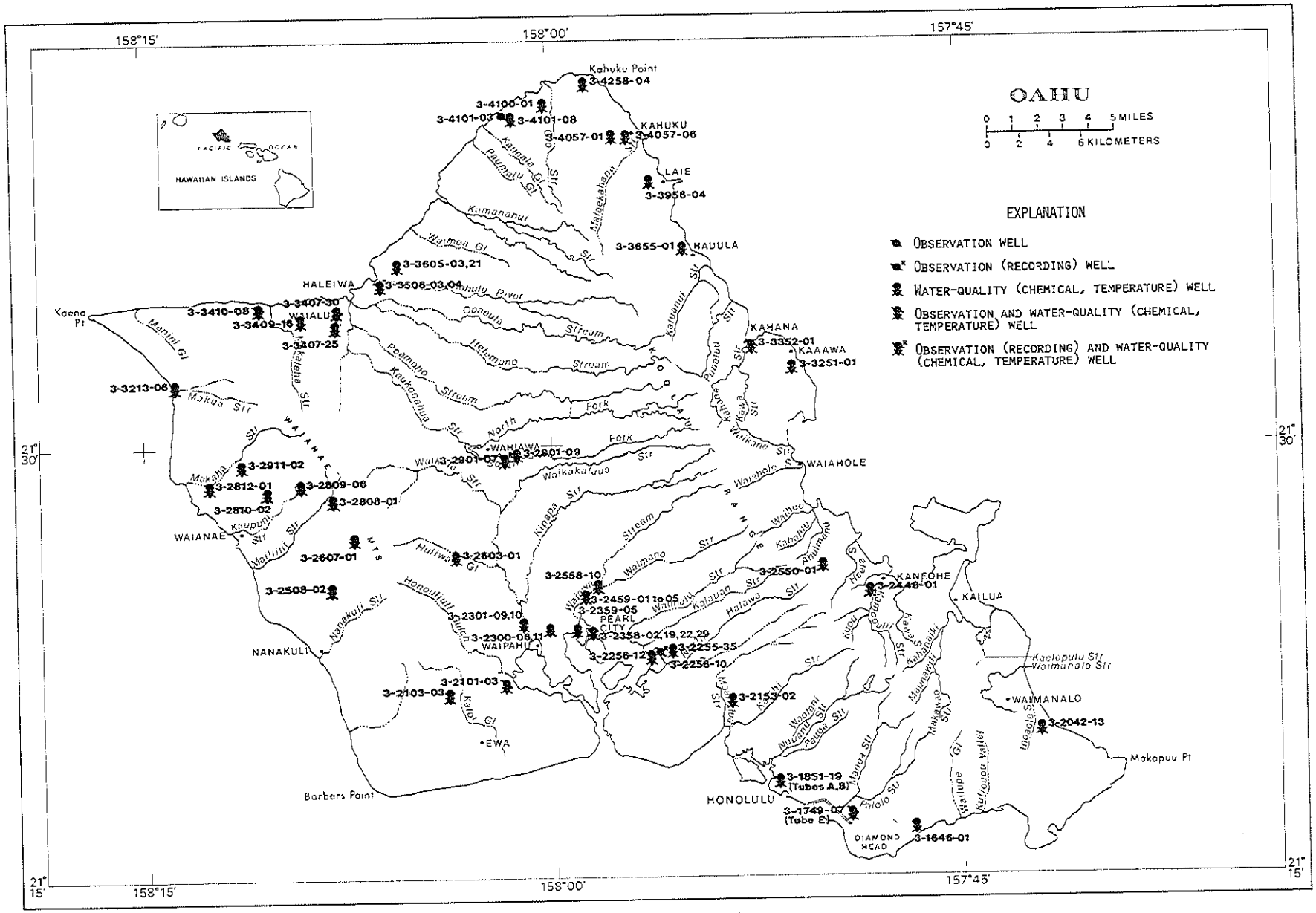

FIGURE 6.--MAP OF OAHU SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

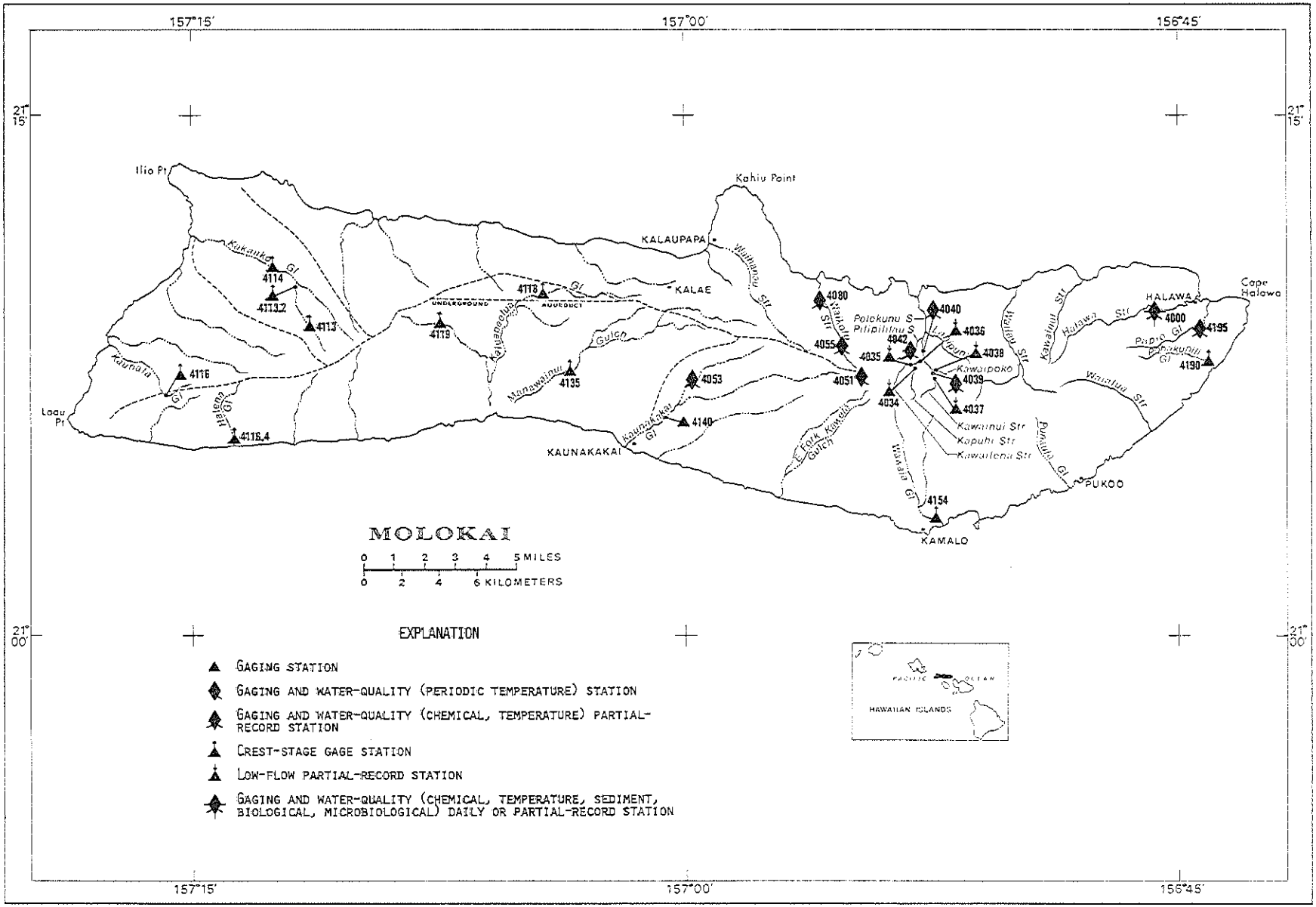

FIGURE 7.--MAP OF MOLOKAI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

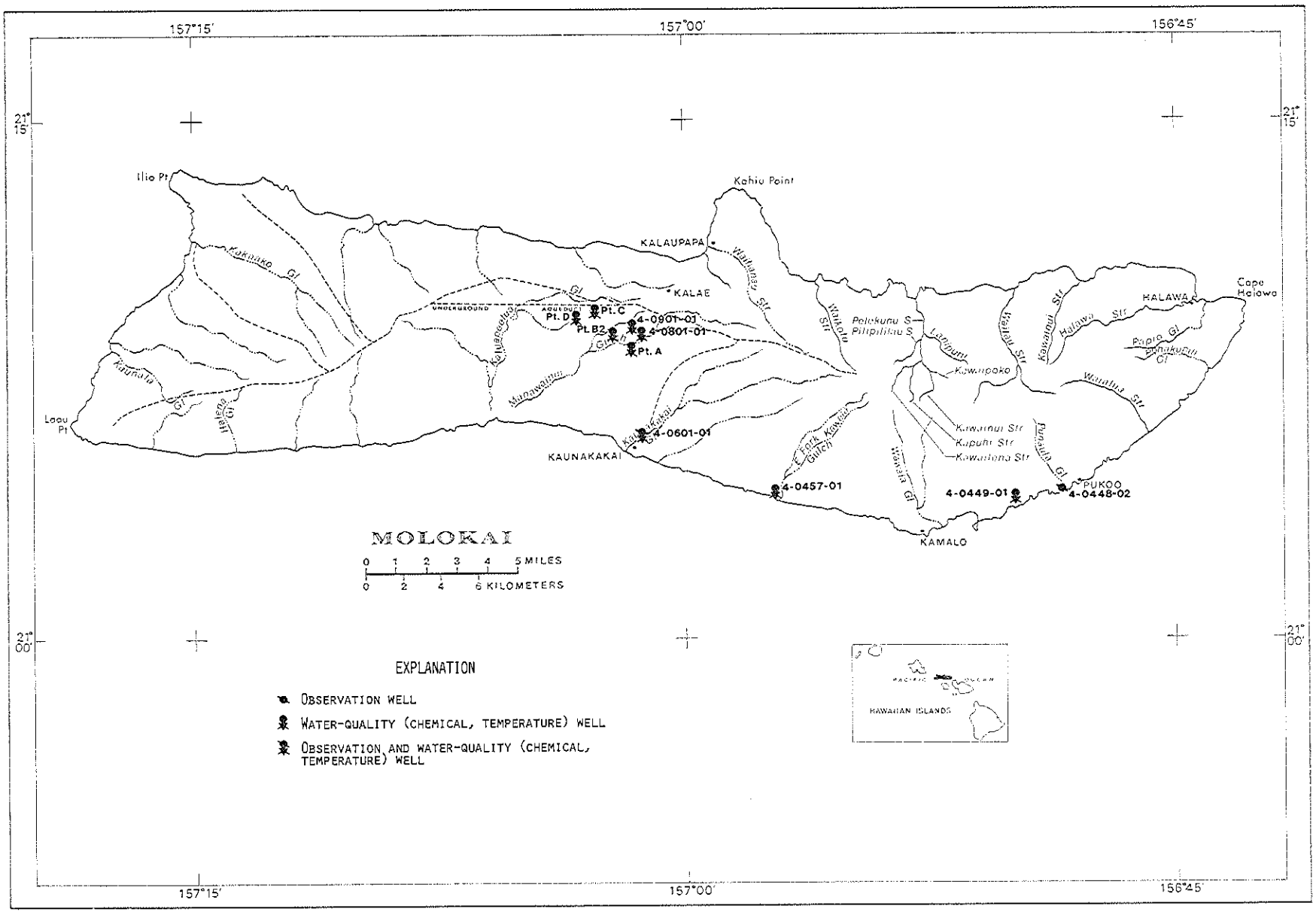

FIGURE 8.--MAP OF MOLOKAI SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

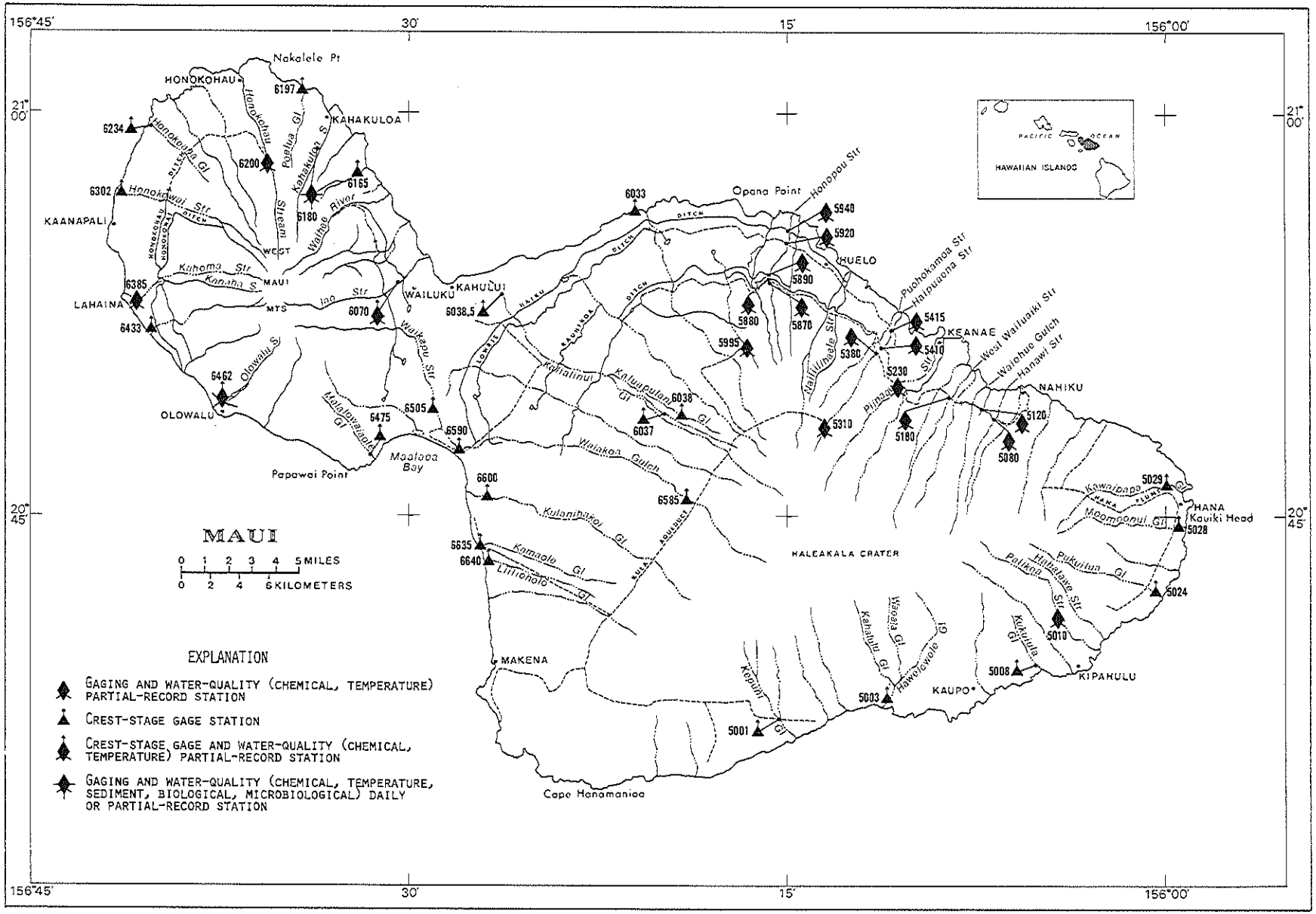

FIGURE 9.--MAP OF MAUI SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

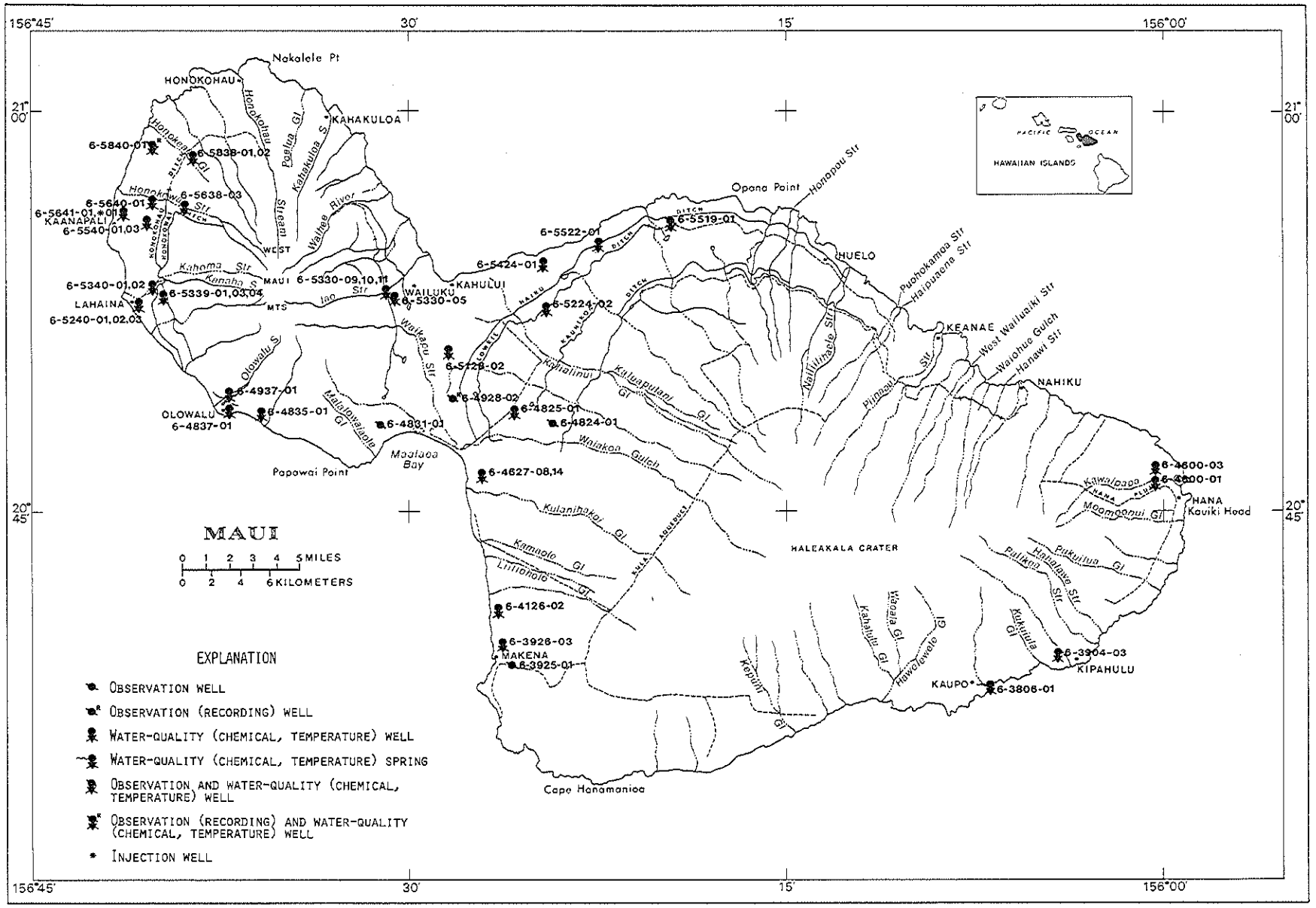

FIGURE 10.--MAP OF MAUI SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

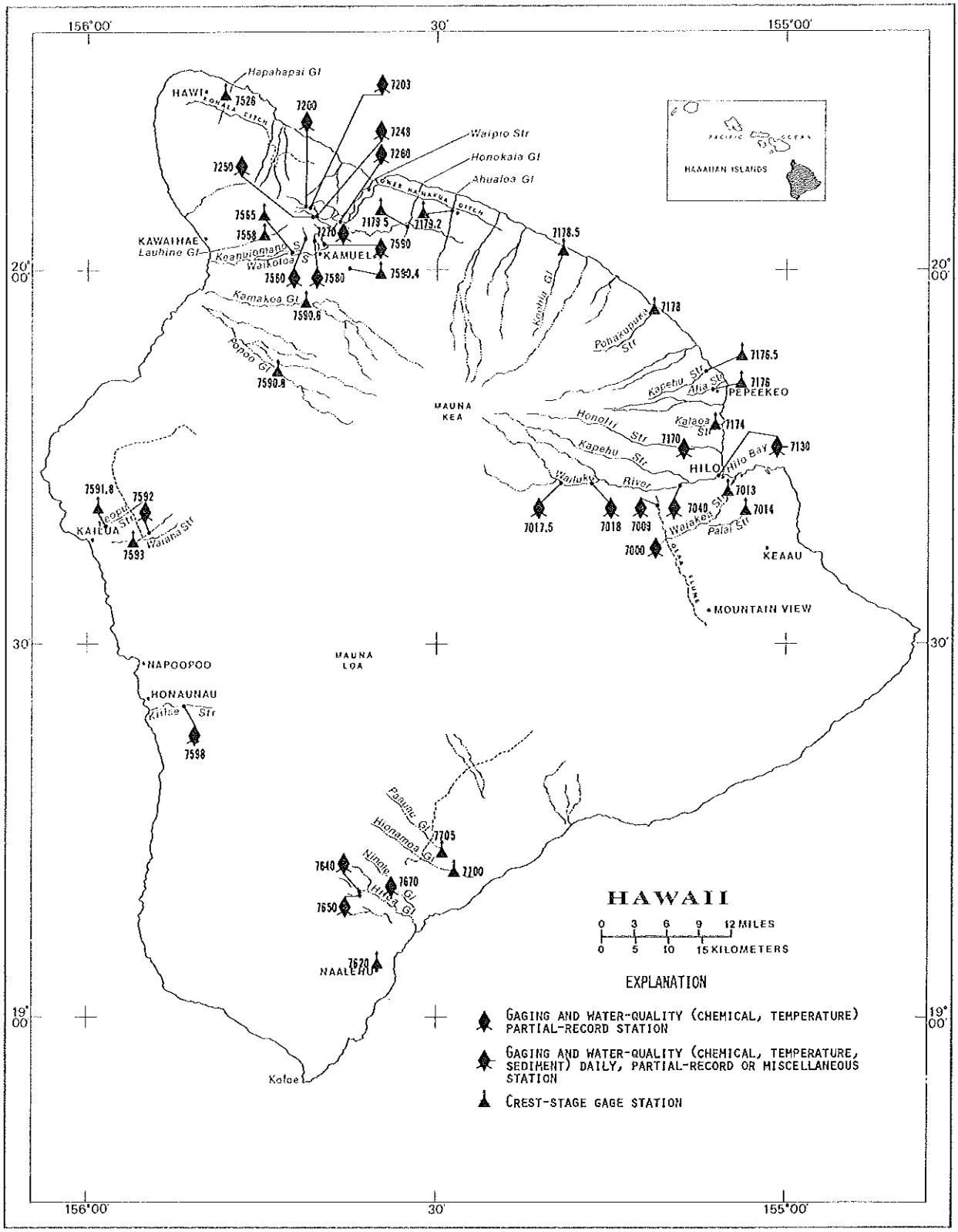

FIGURE 11.--MAP OF HAWAII SHOWING LOCATIONS OF GAGING, WATER-QUALITY, AND PARTIAL-RECORD STATIONS.

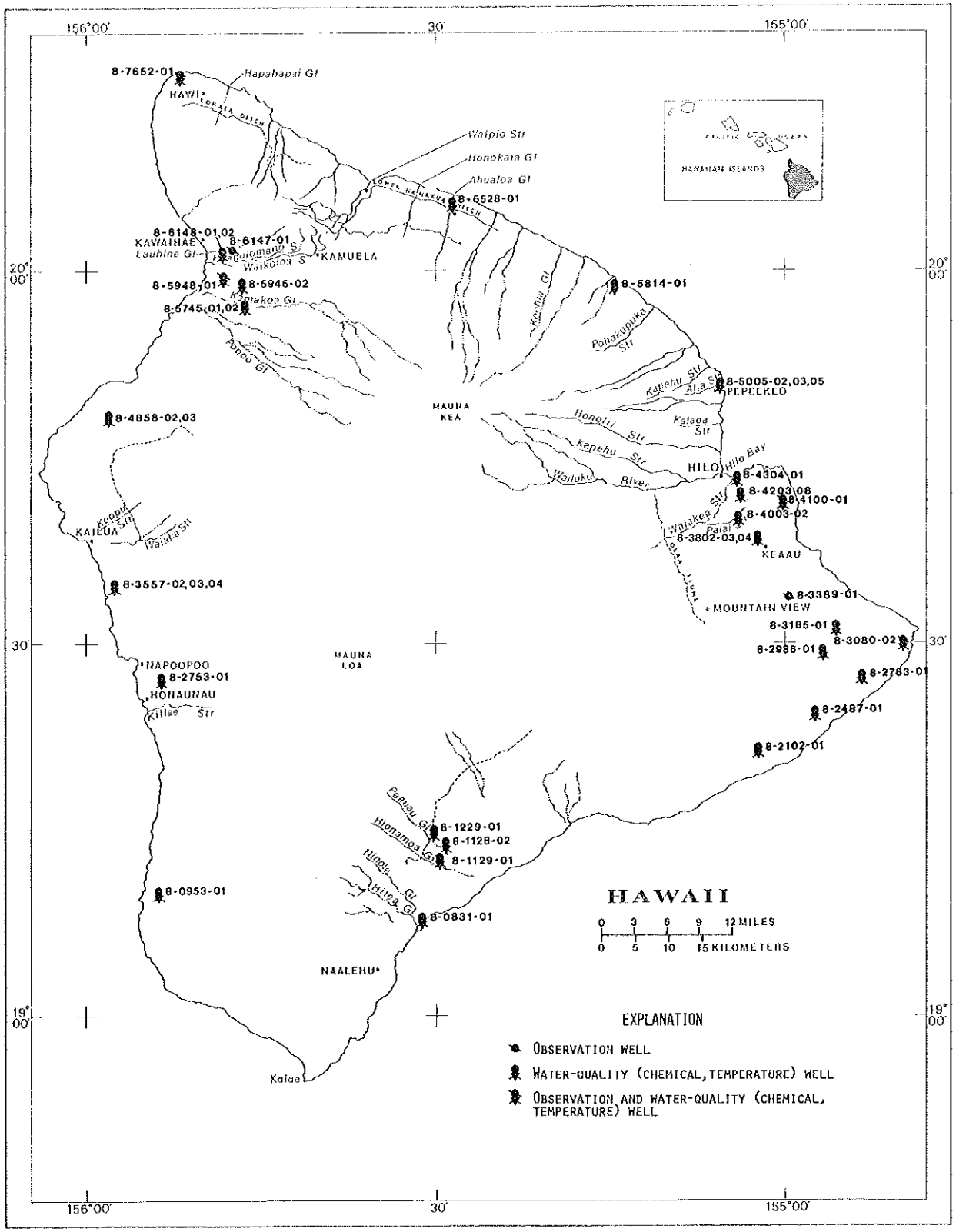

FIGURE 12.--MAP OF HAWAII SHOWING LOCATIONS OF OBSERVATION WELLS AND GROUND-WATER QUALITY SAMPLING SITES.

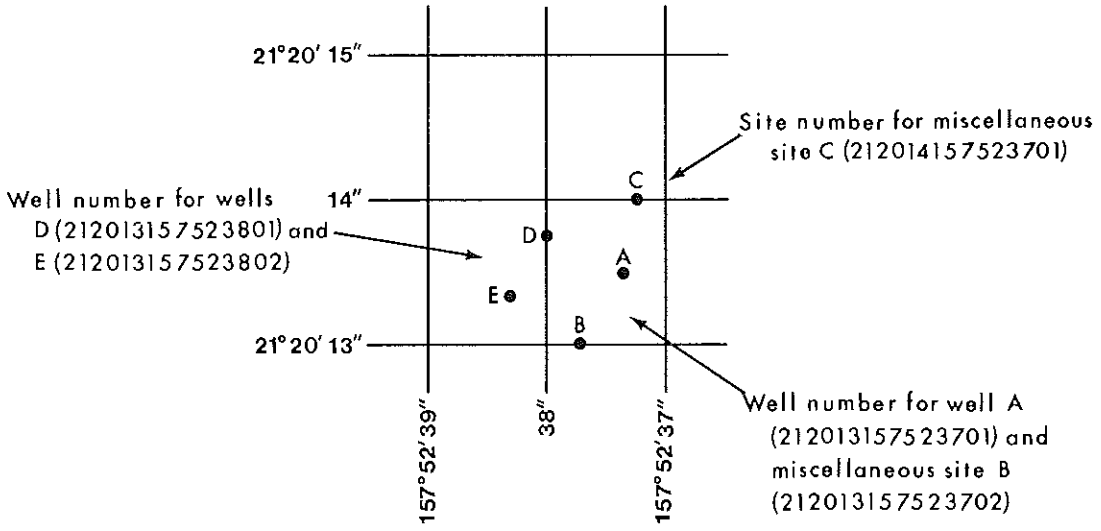

Figure 13. Sketch showing system for numbering wells and miscellaneous sites

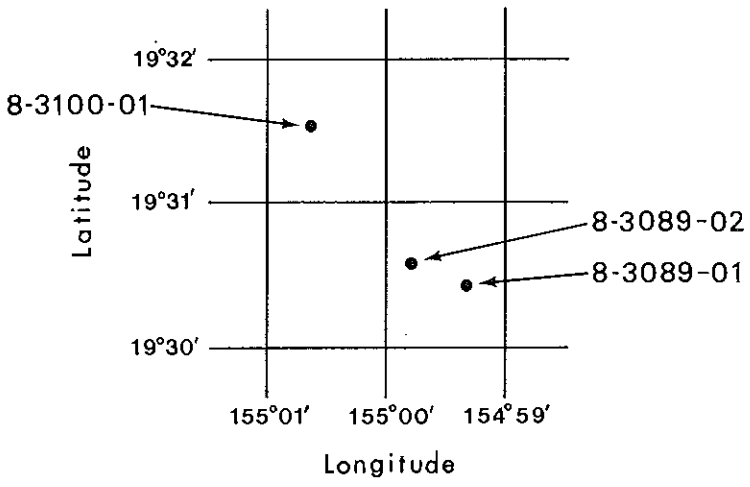

Figure 14. Sketch showing local well numbering system

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 (0.3 km) upstream from Kokee-Mohihi Road crossing, 2.5 mi (4.0 km) east of Kokee Lodge, and 12.5 mi (20.1 km) north of Waimea.

DRAINAGE AREA.--3.95 mi^2 (10.23 km^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. Altitude of gage is 3,420 ft (1,042 m) by barometer. Prior to May 26, 1910, nonrecording gage at site 300 ft (91 m) downstream at different datum.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report. The 1979 record is also published in this report.

AVERAGE DISCHARGE.--63 years (water years, 1912, 1914, 1920-80), 34.2 ft^3/s (0.969 m^3/s), 24,780 acreft/yr (30.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s (320 m^3/s) Jan. 13, 1967, gage height, 15.33 ft (4.673 m), from rating curve extended above 470 ft^3/s (13.3 m^3/s) on basis of slope-area measurements at gage heights 12.12 ft (3.694 m) and 13.43 ft (4.093 m); minimum, 1.14 ft^3/s (0.032 m^3/s) Sept. 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,100 ft^3/s (59.5 m^3/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Mar. 23	1500	2110	59.8	8.09	2.466
June 15	0900	*4000	113	*10.30	3.139

Minimum discharge, 1.9 ft^3/s (0.054 m^3/s) Oct. 7, 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.1	60	5.8	14	14	22	7.6	9.4	5.8	7.9	8.1	2.7
2	3.9	35	5.6	12	19	19	7.0	48	5.2	6.5	11	2.7
3	3.9	120	5.4	11	324	17	6.6	115	5.0	5.9	6.8	2.7
4	4.2	35	50	10	85	16	26	117	4.9	8.6	6.8	3.2
5	3.9	16	15	9.6	26	15	33	61	4.5	7.0	5.8	3.6
6	3.8	13	12	10	19	14	22	118	4.5	103	4.7	3.1
7	3.6	12	45	9.1	17	13	61	45	4.4	35	4.5	2.8
8	3.8	11	40	8.6	17	35	39	18	4.4	11	4.5	2.5
9	3.9	10	20	86	225	16	15	13	4.4	7.9	4.2	2.7
10	3.5	10	22	34	134	12	11	11	18	6.8	4.2	3.1
11	3.2	12	45	220	754	11	8.9	12	35	5.9	3.9	2.9
12	3.2	13	25	89	58	11	11	10	45	5.6	3.9	2.5
13	3.1	11	291	86	56	10	9.9	9.0	61	5.2	3.8	2.4
14	3.1	45	137	632	69	9.6	7.6	9.0	23	4.9	3.5	2.3
15	3.0	90	70	358	59	9.1	7.0	8.0	15	4.9	3.4	2.3
16	3.0	20	29	110	34	8.7	6.5	10	9.3	4.7	21	2.2
17	2.9	14	21	74	39	8.4	6.1	12	11	4.4	13	2.1
18	3.1	12	17	37	35	8.7	5.9	14	12	4.5	6.5	2.1
19	17	11	65	28	62	10	5.8	11	53	4.2	4.7	2.1
20	5.9	35	81	30	40	18	5.8	9.0	26	3.9	3.9	2.2
21	4.1	25	33	167	27	11	5.6	8.0	13	3.9	3.5	3.6
22	38	20	37	227	68	8.9	5.4	7.4	26	5.0	3.2	2.7
23	34	15	39	68	472	7.9	8.4	7.3	33	9.7	3.1	2.3
24	7.6	12	47	40	185	7.5	11	7.0	20	25	3.1	2.1
25	5.8	10	29	29	55	7.1	40	6.5	9.9	82	3.2	2.1
26	4.2	9.0	18	23	63	12	10	6.1	9.9	30	3.1	2.1
27	3.6	7.0	15	19	32	14	8.4	5.8	10	27	3.0	2.2
28	3.2	6.4	13	17	26	16	7.2	5.8	58	13	2.9	2.8
29	3.4	6.4	36	16	---	17	89	7.0	20	8.6	2.8	3.2
30	45	6.0	81	15	---	11	16	6.1	10	6.5	2.5	2.7
31	405	---	17	14	---	8.9	---	5.6	---	5.6	2.8	---
TOTAL	640.0	701.8	1366.8	2503.3	3014	404.8	503.7	732.0	557.2	434.1	161.8	77.6
MEAN	20.6	23.4	44.1	80.8	108	13.1	16.8	23.6	18.6	14.0	5.22	2.59
MAX	405	120	291	632	754	35	89	118	61	103	21	3.6
MIN	2.9	6.0	5.4	8.6	14	7.1	5.4	5.6	4.4	3.9	2.8	2.1
AC-FT	1270	1390	2710	4970	5980	803	999	1450	1110	861	321	154

CAL YR 1978 TOTAL 10014.8 MEAN 27.4 MAX 602 MIN 2.9 AC-FT 19860
WTR YR 1979 TOTAL 11097.1 MEAN 30.4 MAX 754 MIN 2.1 AC-FT 22010

NOTE.--No gage-height record Nov. 1 to Dec. 12.

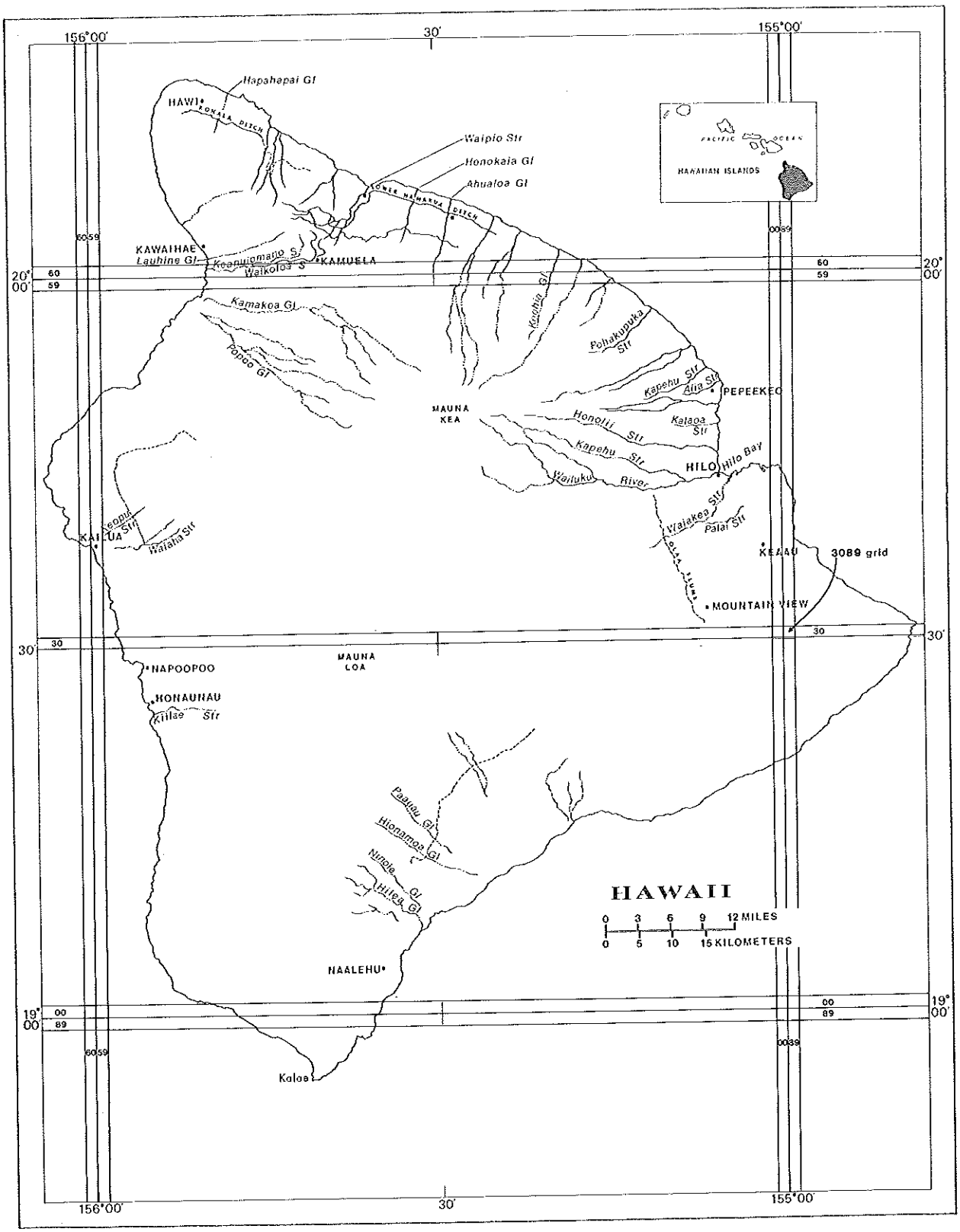

FIGURE 15.--MAP OF HAWAII SHOWING SYSTEM FOR NUMBERING LOCAL WELL NUMBERS.

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	195	15	28	9.9	11	44	50	35	11	8.8	6.7
2	2.2	29	246	14	8.9	8.8	223	39	32	28	18	6.7
3	2.1	17	46	10	8.3	8.0	68	64	26	45	20	12
4	2.1	8.5	92	9.1	8.4	12	28	43	83	20	22	27
5	2.1	6.6	55	8.8	7.6	49	20	23	26	30	13	14
6	2.0	5.7	24	10	7.4	29	17	20	53	50	13	9.6
7	1.9	5.1	17	9.7	7.1	31	16	18	35	100	9.6	8.8
8	2.2	72	14	539	6.8	20	14	52	19	17	8.3	6.3
9	4.4	31	14	56	6.5	69	13	44	17	14	11	5.8
10	4.1	51	13	174	41	66	12	55	47	12	16	5.4
11	2.9	15	11	64	19	41	247	73	38	20	9.1	5.2
12	2.3	9.2	9.8	27	11	42	84	56	27	30	7.6	5.0
13	2.0	30	9.6	20	12	64	68	32	81	50	7.2	4.8
14	2.0	151	16	18	11	124	125	20	171	20	7.9	4.6
15	2.1	100	20	16	52	83	262	17	524	13	33	4.6
16	2.5	66	14	16	86	254	458	16	64	20	16	7.2
17	25	61	24	15	16	90	171	15	34	25	9.1	8.6
18	7.2	65	11	65	11	181	113	13	29	30	22	5.9
19	3.8	29	8.7	21	9.4	140	44	43	30	13	28	5.0
20	4.2	19	7.7	14	8.6	33	31	65	28	15	12	4.5
21	7.4	14	7.1	68	7.9	32	51	59	31	20	10	4.2
22	8.6	11	6.8	24	7.5	62	389	25	24	14	8.1	4.1
23	6.1	9.1	31	16	7.1	485	422	29	17	20	7.0	4.1
24	6.5	8.1	36	13	7.2	232	135	44	15	16	6.3	4.1
25	4.6	20	100	12	45	241	152	24	16	13	6.3	3.9
26	3.1	52	56	11	11	56	110	90	19	15	64	3.8
27	2.5	47	46	10	14	35	40	63	14	12	21	3.8
28	2.5	26	16	10	47	29	31	38	13	11	9.9	3.8
29	5.2	34	12	11	16	28	26	58	12	10	8.1	3.9
30	4.8	43	13	33	---	25	23	185	11	9.4	7.4	3.8
31	223	---	36	13	---	18	---	45	---	9.1	7.9	---
TOTAL	353.8	1230.3	1027.7	1355.2	510.6	2558.8	3437	1418	1571	712.5	447.6	197.2
MEAN	11.4	41.0	33.2	43.7	17.6	82.5	115	45.7	52.4	23.0	14.4	6.57
MAX	223	195	246	539	86	485	458	185	524	100	69	27
MIN	1.9	5.1	6.8	8.4	6.5	8.0	12	13	11	9.1	6.3	3.8
AC-FT	702	2440	2040	2690	1010	5080	6820	2810	3120	1410	888	391

CAL YR 1979 TOTAL 11005.7 MEAN 30.2 MAX 754 MIN 1.9 AC-FT 21830
WTR YR 1980 TOTAL 14819.7 MEAN 40.5 MAX 539 MIN 1.9 AC-FT 29390

16014000 KOKEE DITCH NEAR WAIMEA

LOCATION.--Lat 22°06'42", long 159°40'43", Hydrologic Unit 20070000, on left bank, 0.3 mi (0.5 km) west of Highway 55, 1.9 mi (3.1 km) south of Kokee Lodge, and 10.5 mi (16.9 km) north of Waimea.

PERIOD OF RECORD.--September 1926 to current year.

GAGE.--Water-stage recorder and suppressed weir. Altitude of gage is 3,310 ft (1,009 m) by barometer. Prior to July 1, 1962, at datum 0.07 ft (0.021 m) higher.

REMARKS.--Records good. Ditch diverts at altitude 3,400 ft (1,040 m) from Mohihi Stream and all streams west which are tributary to Waimea River, for irrigation in vicinity of Kekaha. Records do not include waste water diverted at times at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--54 years, 24.5 ft³/s (0.694 m³/s), 17,750 acre-ft/yr (21.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 105 ft³/s (2.97 m³/s) Dec. 2, 1929, Mar. 4, 1933; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 86 ft³/s (2.44 m³/s) Apr. 16; minimum daily, 2.6 ft³/s (0.074 m³/s) Oct. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	77	29	41	27	26	38	62	21	26	16	11
2	3.1	43	57	25	25	21	83	66	54	47	22	11
3	2.9	30	66	18	23	19	79	64	51	80	30	13
4	2.9	14	62	16	23	21	52	70	50	53	30	33
5	2.9	10	70	14	21	55	39	47	45	37	21	23
6	2.8	8.5	42	17	20	40	34	41	60	61	20	16
7	2.6	6.4	30	17	19	49	32	37	42	85	17	15
8	5.1	56	24	31	18	27	29	67	52	51	15	11
9	12	37	23	21	17	71	27	64	40	37	16	10
10	6.2	59	22	37	48	75	26	55	62	31	23	9.0
11	7.5	25	18	42	38	61	64	77	67	51	15	8.5
12	4.3	14	16	36	24	57	76	72	49	56	14	8.5
13	3.8	27	16	34	27	63	74	58	67	40	13	8.0
14	3.6	62	26	38	23	81	81	39	72	35	13	7.8
15	3.4	80	41	41	62	59	85	34	51	33	29	7.5
16	3.6	70	29	39	83	85	86	33	35	37	25	9.0
17	18	72	41	34	43	67	78	30	48	55	16	13
18	15	72	23	56	30	44	68	27	57	70	22	9.2
19	6.2	48	17	44	26	55	54	46	56	47	39	8.2
20	5.3	27	15	36	24	60	49	70	52	38	20	7.3
21	9.0	21	13	66	22	50	52	76	52	60	17	7.0
22	11	15	12	56	21	72	85	46	48	36	14	6.6
23	7.8	13	33	41	20	72	72	42	38	30	12	6.6
24	8.7	11	25	35	20	56	58	66	35	29	11	6.8
25	6.8	29	70	32	61	69	58	47	33	24	11	6.8
26	4.7	51	60	29	26	64	64	49	37	26	12	6.4
27	4.0	63	68	28	29	54	56	84	31	26	38	6.2
28	3.4	39	30	27	59	55	54	60	29	22	17	6.0
29	6.2	34	21	30	35	49	53	64	28	20	14	6.2
30	4.9	65	20	66	---	48	50	45	26	18	12	6.0
31	66	---	44	35	---	38	---	16	---	17	12	---
TOTAL	247.1	1178.9	1063	1082	914	1663	1751	1654	1388	1278	616	303.6
MEAN	7.97	39.3	34.3	34.9	31.5	53.6	58.4	53.4	46.3	41.2	19.9	10.1
MAX	66	80	70	66	83	85	86	84	72	85	42	33
MIN	2.6	6.4	12	14	17	19	26	16	21	17	11	6.0
AC-FT	490	2340	2110	2150	1810	3300	3470	3280	2750	2530	1220	602

CAL YR 1979 TOTAL 9608.7 MEAN 26.3 MAX 88 MIN 1.3 AC-FT 19060
WTR YR 1980 TOTAL 13138.6 MEAN 35.9 MAX 86 MIN 2.6 AC-FT 26060

HAWAII, ISLAND OF KAUAI

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT (1,164 M), NEAR WAIMEA

LOCATION.--Lat 22°05'20", long 159°34'18", Hydrologic Unit 20070000, on left bank 5.0 mi (8.0 km) northeast of mouth, 6.4 mi (10.3 km) southeast of Kokee Lodge, and 11 mi (18 km) northeast of Waimea.

DRAINAGE AREA.--1.79 mi² (4.64 km²).

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 (1,128 m) near Waimea.

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

GAGE.--Water-stage recorder. Altitude of gage is 3,820 ft (1,164 m), from topographic map.

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

AVERAGE DISCHARGE.--39 years (water years, 1921-31, 1953-80), 22.2 ft³/s (0.629 m³/s), 16,080 acre-ft/yr (19.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,530 ft³/s (128 m³/s) Jan. 16, 1921, gage height, 8.44 ft (2.573 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurement at gage height 4.60 ft (1.402 m); minimum, 0.99 ft³/s (0.028 m³/s) May 17, 18, May 30 to June 2, 1966.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft³/s (36.8 m³/s) and maximum (*) from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	1230	1480	41.9	4.80	1.463
May 27	1600	*2030	57.5	*5.60	1.707

Minimum discharge, 1.6 ft³/s (0.045 m³/s) Oct. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	81	13	6.6	6.6	5.5	9.9	10	17	4.4	4.2	4.2
2	1.7	22	55	6.1	5.8	4.4	150	11	17	19	5.9	4.0
3	3.6	13	21	5.5	5.5	4.0	33	9.5	15	56	8.1	7.0
4	4.4	16	64	5.2	5.2	3.8	14	10	81	15	6.4	4.4
5	3.0	19	30	5.0	4.4	9.0	10	9.0	14	46	4.7	40
6	2.8	11	13	5.2	4.7	11	8.6	8.1	16	78	4.0	13
7	2.7	11	10	5.2	4.4	41	11	9.0	18	137	3.8	7.2
8	83	27	8.6	258	4.0	8.6	8.6	32	9.5	14	3.4	4.7
9	27	12	13	28	4.2	28	8.1	53	7.2	8.1	3.2	3.8
10	6.1	19	12	112	6.1	50	8.1	12	37	6.4	3.2	3.2
11	5.0	10	8.1	36	5.2	49	59	12	25	13	3.0	3.2
12	6.4	7.2	6.9	12	5.2	45	36	18	11	10	2.8	4.2
13	4.2	9.4	11	8.6	5.2	13	19	16	10	29	2.6	4.0
14	3.6	53	62	12	5.0	24	22	10	35	14	3.6	5.5
15	4.7	37	21	11	5.5	14	55	8.6	201	9.5	3.8	4.0
16	5.5	27	17	10	13	223	219	10	72	10	6.4	7.2
17	121	22	12	9.0	6.6	174	58	13	14	41	9.7	6.4
18	10	47	9.0	33	5.2	139	19	8.1	10	110	7.2	4.4
19	13	17	7.2	9.5	4.4	101	12	10	8.1	14	13	3.4
20	23	10	6.6	7.2	4.0	20	9.5	13	7.2	9.5	6.4	2.8
21	13	8.6	6.4	9.0	3.8	14	8.6	16	6.4	12	4.2	2.6
22	6.9	7.2	5.8	7.7	3.8	14	132	19	5.8	9.5	3.6	2.3
23	5.2	6.9	6.6	6.6	3.4	208	129	82	4.7	8.6	3.2	2.3
24	4.4	6.6	6.6	6.1	5.2	77	75	37	4.4	8.1	2.8	2.6
25	3.6	6.4	45	5.5	8.1	143	74	17	4.0	6.1	2.8	2.8
26	3.2	8.3	14	5.2	5.2	50	76	139	3.8	5.8	11	2.2
27	3.0	14	16	5.2	10	25	16	224	3.4	8.1	11	2.1
28	2.8	9.0	9.0	18	12	30	12	81	3.4	13	5.5	2.1
29	2.8	84	7.2	18	7.7	17	10	57	3.6	7.7	6.1	2.1
30	2.8	48	6.6	26	---	16	9.0	158	3.6	5.5	6.9	1.9
31	28	---	6.6	8.6	---	10	---	31	---	4.7	6.4	---
TOTAL	408.2	669.6	530.2	701.0	169.4	1571.3	1311.4	1143.3	668.1	733.0	168.9	199.2
MEAN	13.2	22.3	17.1	22.6	5.84	50.7	43.7	36.9	22.3	23.6	5.45	6.64
MAX	121	84	64	258	13	223	219	224	201	137	13	44
MIN	1.7	6.4	5.8	5.0	3.4	3.8	8.1	8.1	3.4	4.4	2.6	1.9
AC-FT	810	1330	1050	1390	336	3120	2600	2270	1330	1450	335	395

CAL YR 1979 TOTAL 6187.3 MEAN 17.0 MAX 299 MIN 1.7 AC-FT 12270
WTR YR 1980 TOTAL 8273.6 MEAN 22.6 MAX 258 MIN 1.7 AC-FT 16410

16019000 WAIALAE STREAM AT ALTITUDE 3,820 FT (1,164 M), NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
OCT									
26...	0940	3.2	34	6.8	16.5	7	6	1.1	1.0
DEC									
19...	1005	7.2	31	5.8	14.5	5	2	.9	.7
MAR									
28...	1000	35	34	5.6	14.0	5	4	.8	.7
JUN									
18...	1200	11	27	5.8	18.0	5	3	1.0	.6
AUG									
11...	0955	3.4	30	6.0	16.5	5	4	.8	.8

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT									
26...	3.6	52	.6	4.0	.4	1	5.5	6.2	.1
DEC									
19...	3.6	58	.7	4.0	.4	3	.8	5.9	.1
MAR									
28...	4.0	62	.8	--	.3	1	2.7	--	.0
JUN									
18...	3.0	56	.6	--	.2	2	3.8	5.6	.1
AUG									
11...	3.3	56	.6	--	.3	1	3.0	6.1	.1

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
OCT								
26...	4.7	24	.03	.21	.00	.010	350	4
DEC								
19...	4.7	20	.03	.39	.12	.010	280	4
MAR								
28...	2.5	--	--	--	.03	.010	220	20
JUN								
18...	4.7	20	.03	.59	.09	.010	230	4
AUG								
11...	5.8	21	.03	.19	.02	--	380	7

HAWAII, ISLAND OF KAUAI

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 (2.1 km) upstream from Makaweli River and 1.9 mi (3.1 km) north of Waimoa Post Office.

DRAINAGE AREA.--57.8 mi² (149.7 km²).

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 (6.10 m) above mean sea level (Department of Water, County of Kauai bench mark). Prior to Oct. 5, 1911, nonrecording gage at site 1.0 mi (1.6 km) downstream at different datum. Oct. 5, 1911, to Oct. 31, 1919, nonrecording gage at present site at different datum. Oct. 1, 1972, to Apr. 30, 1975, at site 60 ft (18.3 m) streamward at same datum.

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

AVERAGE DISCHARGE.--39 years (water years 1911-17, 1945-68, 1970-72, 1976-80), 128 ft³/s (3.625 m³/s), 92,740 acre-ft/yr (114 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 37,100 ft³/s (1,050 m³/s) Feb. 7, 1949, gage height, 19.3 ft (5.88 m), from rating curve extended above 5,200 ft³/s (147 m³/s) on basis of slope-area measurements at gage heights 10.28 ft (3.133 m) and 18.7 ft (5.70 m); 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 (5.806 m), from floodmarks, discharge, 29,100 ft³/s (824 m³/s), from rating curve extended above 2,200 ft³/s (62.3 m³/s) on basis of slope-area measurement at gage height 19.05 ft (5.806 m).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 8,460 ft³/s (240 m³/s) Jan. 8, gage height, 11.01 ft (3.356 m), from rating curve extended as explained above, no peak above base of 8,700 ft³/s (246 m³/s); minimum, 1.2 ft³/s (0.034 m³/s) Nov. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	580	35	4.5	19	5.5	47	7.7	217	6.1	3.9	5.4
2	3.9	62	265	4.3	13	5.5	545	23	168	7.1	3.7	2.9
3	4.2	45	140	4.2	11	5.0	164	17	115	162	5.0	2.6
4	4.2	6.4	118	4.0	9.0	5.2	48	38	261	80	8.5	30
5	5.4	8.7	195	3.8	8.5	5.2	17	16	91	21	5.9	120
6	4.4	11	33	3.7	9.6	15	8.2	11	40	23	4.6	17
7	5.0	4.0	5.6	4.2	8.5	65	7.1	9.6	102	874	3.3	15
8	123	59	2.9	2080	7.4	23	10	35	35	88	3.2	5.2
9	144	16	5.2	456	7.7	5.0	7.1	111	19	18	3.7	3.4
10	22	11	6.6	795	12	140	8.0	45	71	8.8	4.2	3.5
11	50	24	5.0	462	15	96	249	42	73	7.7	4.0	3.4
12	20	4.4	2.9	129	6.6	145	300	28	38	25	3.5	3.5
13	5.0	2.6	2.6	61	6.9	33	50	46	18	41	3.7	4.3
14	4.6	130	119	43	6.4	111	70	14	197	24	3.9	3.8
15	3.2	206	79	36	8.8	43	442	6.6	1360	22	3.7	4.4
16	2.9	280	57	24	123	674	1030	6.1	423	11	5.6	4.7
17	167	75	38	15	29	555	470	13	112	46	6.9	10
18	80	81	14	161	9.2	626	209	12	42	267	8.5	8.3
19	5.0	52	7.7	67	7.5	453	57	6.1	22	66	7.9	4.8
20	6.6	11	5.0	18	6.9	87	20	12	14	14	12	4.2
21	26	3.9	3.5	57	6.4	90	11	33	12	9.6	6.6	3.7
22	6.4	2.9	2.7	50	6.4	110	654	39	14	16	5.2	3.6
23	3.7	2.0	2.3	13	5.9	962	1060	63	9.3	8.8	4.0	3.6
24	2.9	2.4	4.0	12	5.2	684	339	154	8.2	8.8	3.5	3.7
25	2.7	2.4	70	9.0	5.2	721	207	75	7.4	7.4	2.9	3.8
26	3.0	2.0	30	7.7	5.2	335	424	208	6.6	4.6	3.7	3.9
27	2.9	7.5	20	8.0	5.2	142	73	786	6.9	4.8	65	3.5
28	3.5	9.9	10	29	5.5	137	32	452	7.1	7.4	10	3.4
29	4.2	16	7.2	48	5.5	103	16	447	7.7	16	3.9	3.5
30	3.7	290	5.6	138	---	97	9.9	1620	7.7	6.9	4.0	3.3
31	137	---	5.0	50	---	77	---	571	---	4.6	4.4	---
TOTAL	820.3	2008.1	1296.8	4797.4	378.5	6555.4	6579.3	4947.1	3504.9	1906.6	218.4	292.4
MEAN	26.5	66.9	41.8	155	12.9	211	219	160	117	61.5	7.05	9.75
MAX	167	580	265	2080	123	962	1060	1620	1360	874	65	120
MIN	2.7	2.0	2.3	3.7	5.2	5.0	7.1	6.1	6.6	4.6	2.9	2.6
AC-FT	1630	3980	2570	9520	745	13000	13050	9810	6950	3780	433	580

CAL YR 1979 TOTAL 25613.0 MEAN 70.2 MAX 2480 MIN 1.5 AC-FT 50800
WTR YR 1980 TOTAL 33302.2 MEAN 91.0 MAX 2080 MIN 2.0 AC-FT 66050

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 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
01...	1045	3.7	200	7.1	25.0	1.8	8.7	--	--	77	5
18...	1050	--	--	--	--	--	--	1200	9800	--	--
NOV											
05...	1020	5.0	140	7.1	23.0	5.5	8.5	140	K17000	53	3
DEC											
03...	1200	113	50	6.8	17.5	3.8	8.8	350	9300	17	5
JAN											
07...	1100	4.0	180	7.3	20.0	2.6	9.1	300	500	71	0
FEB											
04...	1100	9.0	140	7.7	19.5	1.1	9.3	270	450	58	5
MAR											
03...	1300	3.8	175	8.3	23.0	2.1	9.8	360	260	67	4
APR											
07...	1130	6.7	120	7.4	22.5	4.6	8.9	530	540	43	4
MAY											
05...	1300	12	110	7.3	28.0	4.6	9.0	320	170	35	4
JUN											
02...	1200	165	80	7.1	21.0	64	8.6	800	3100	26	5
JUL											
14...	1000	23	83	8.0	23.5	3.4	8.8	410	690	29	4
AUG											
11...	1330	3.5	155	7.8	27.0	4.1	8.7	210	490	58	7
SEP											
04...	1300	4.8	165	8.3	28.0	4.0	8.7	750	2200	60	3

DATE	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	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT											
01...	9.3	13	10	22	.5	11	.9	72	4.5	14	.1
18...	--	--	--	--	--	--	--	--	--	--	--
NOV											
05...	6.7	8.8	7.6	23	.5	8.4	.8	50	5.7	11	.1
DEC											
03...	3.4	2.6	4.6	37	.5	5.0	.4	12	8.0	7.5	.0
JAN											
07...	8.7	12	9.6	22	.5	11	.9	75	5.5	15	.1
FEB											
04...	6.9	9.8	9.2	26	.5	9.9	.7	53	.3	13	.0
MAR											
03...	8.5	11	10	24	.5	11	.8	63	1.0	15	.1
APR											
07...	5.2	7.2	7.1	26	.5	--	.6	39	2.8	12	.1
MAY											
05...	8.5	5.7	6.1	27	.5	--	.5	31	5.0	9.0	.1
JUN											
02...	3.8	4.2	6.0	33	.5	--	.5	21	2.3	9.3	.1
JUL											
14...	4.1	8.6	5.4	28	.4	--	.5	26	4.4	5.5	.2
AUG											
11...	7.1	9.7	8.8	25	.5	--	.9	51	5.1	16	.1
SEP											
04...	7.4	10	8.9	24	.5	--	1.1	57	.3	13	.1

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

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	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, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
OCT											
01...	28	120	123	.16	1.20	.01	.00	.00	.00	.00	.00
18...	--	--	--	--	--	--	--	--	--	--	--
NOV											
05...	23	97	94	.13	1.31	.00	.00	.00	.00	.00	.00
DEC											
03...	9.5	44	43	.06	13.4	.14	.14	.01	.01	.01	.01
JAN											
07...	27	116	124	.16	1.25	.01	.04	.02	.03	.02	.04
FEB											
04...	21	95	93	.13	2.31	.01	.01	.01	.01	.01	.01
MAR											
03...	22	103	107	.14	1.06	.05	.05	.03	.03	.04	.04
APR											
07...	20	80	79	.11	1.45	.01	.01	.01	.01	.01	.01
MAY											
05...	15	70	65	.10	2.38	.00	.01	.00	.01	.00	.01
JUN											
02...	17	63	57	.09	28.1	.28	.30	.01	.04	.01	.05
JUL											
18...	16	70	64	.10	4.35	.00	.00	.00	.01	.00	.01
AUG											
11...	22	105	100	.14	.99	.00	.00	.00	.00	.00	.00
SEP											
04...	24	117	99	.16	1.52	.00	.00	.00	.01	.00	.01

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG, SUSP, TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS, (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT											
01...	.67	.38	.38	.67	.29	.38	.68	3.0	.000	.00	.010
18...	--	--	--	--	--	--	--	--	--	--	--
NOV											
05...	.34	.31	.31	.34	.03	.31	.34	1.5	.020	.06	.010
DEC											
03...	.85	.84	.99	.86	.01	.85	1.0	4.4	.010	.03	.000
JAN											
07...	.70	.67	.74	.72	.02	.70	.73	3.2	.010	.03	.010
FEB											
04...	.09	.09	.11	.10	.00	.10	.11	.50	.010	.03	.010
MAR											
03...	.49	.49	.57	.52	.00	.52	.57	2.5	.010	.00	.010
APR											
07...	.28	.30	.32	.29	.00	.31	.30	1.3	.020	.06	.010
MAY											
05...	.24	.25	.27	.24	.00	.26	.24	1.1	.010	.03	.000
JUN											
02...	.44	.26	.60	.45	.15	.30	.73	3.2	.370	1.1	.020
JUL											
18...	.57	.51	.52	.57	.05	.52	.57	2.5	.030	.09	.010
AUG											
11...	.95	.27	.27	.95	.68	.27	.95	4.2	.020	.06	.010
SEP											
04...	.32	.27	.28	.32	.04	.28	.32	1.4	.010	.03	.000

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT											
01...	1045	1	0	1	10	0	10	<1	0	<1	10
JAN											
07...	1100	2	0	2	200	190	10	<1	0	<1	0
APR											
07...	1130	1	0	1	100	90	10	1	0	<1	0
JUL											
14...	1000	2	1	1	9	0	9	<1	0	<1	10

DATE	CHRO-MIUM, SUS-PENDED RECOV, (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
OCT											
01...	10	0	<3	0	<3	1	0	1	290	120	170
JAN											
07...	0	0	2	0	<3	0	0	0	340	150	190
APR											
07...	0	0	2	0	<3	1	0	1	470	350	120
JUL											
14...	0	10	<3	--	<3	4	0	4	560	420	140

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV, (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
OCT										
01...	0	0	0	40	20	20	.1	.0	.1	2
JAN										
07...	8	6	2	30	10	20	.0	.0	.0	7
APR										
07...	8	8	0	20	0	20	.0	.0	.0	7
JUL										
14...	21	21	0	20	10	7	.1	.1	.0	6

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
01...	2	0	0	0	0	0	0	<3	0	<3
JAN										
07...	7	0	0	0	0	0	0	20	17	<3
APR										
07...	7	0	0	0	0	0	0	20	14	6
JUL										
14...	3	3	0	0	0	0	0	40	35	5

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

HAWAII, ISLAND OF KAUAI

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)
OCT 01...	1045	0
DEC 03...	1200	0
JAN 07...	1100	0
MAR 03...	1300	0
APR 07...	1130	0
JUN 02...	1200	0
JUL 14...	1000	0
SEP 04...	1300	0

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)
OCT 01...	1045	--	4.6	.5
NOV 05...	1020	14	--	--
JAN 07...	1100	--	3.3	--
MAR 03...	1300	1.6	--	--
APR 07...	1130	--	3.5	.0
JUN 02...	1200	5.1	--	--
JUL 14...	1000	--	6.5	.0
AUG 11...	1330	2.6	--	--
SEP 04...	1300	3.5	--	--

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT 01...	1045	610	18.4	15.2	7.58	.330	422	27
NOV 05...	1020	900	--	--	--	--	--	--
DEC 03...	1200	220	--	--	--	--	--	--
JAN 07...	1100	130	.950	.710	.290	.010	828	31
FEB 04...	1100	400	--	--	--	--	--	--
MAR 03...	1300	60	--	--	--	--	--	--
APR 07...	1130	--	5.35	4.72	1.96	.200	321	35
09...	0915	10	--	--	--	--	--	--
MAY 05...	1300	340	--	--	--	--	--	--
JUN 02...	1200	960	--	--	--	--	--	--
JUL 14...	1000	470	9.21	7.17	1.64	.560	1244	36
AUG 11...	1330	680	--	--	--	--	--	--
SEP 04...	1300	250	--	--	--	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 01...	1045	3.7	4	.04	100
NOV 05...	1020	5.0	5	.07	100
DEC 03...	1200	113	15	4.6	100
JAN 07...	1100	4.0	4	.04	100
FEB 04...	1100	9.0	3	.07	100
MAR 03...	1300	3.8	4	.04	100
APR 07...	1130	6.7	3	.05	100
MAY 05...	1300	12	6	.20	100
JUN 02...	1200	165	110	49	100
JUL 14...	1000	23	2	.12	100
AUG 11...	1330	3.5	4	.04	100
SEP 04...	1300	4.8	5	.06	100

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	OCT 1,79	NOV 5,79	DEC 3,79	JAN 7,80	FEB 4,80	MAR 3,80
TIME	1045	1020	1200	1100	1100	1300
TOTAL CELLS/ML	610	900	220	130	400	60
DIVERSITY: DIVISION	0.7	0.7	1.0	0.0	0.9	0.9
.CLASS	0.7	0.7	1.0	0.0	0.0	0.9
..ORDER	0.7	0.8	1.0	0.0	0.0	0.9
...FAMILY	0.9	0.8	1.7	1.9	0.0	1.9
....GENUS	0.9	0.9	2.1	1.9	0.0	1.9

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)	--	-	--	-	--	-	--	-	91#	22	--	-
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	13	1	--	-	--	-	5	1	--	-
....DICTYOSPHAERIUM	--	-	--	-	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	5	1	5	8
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
..TETRASPORALES												
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	--	-	--	-	--	-	--	-	--	-
..ULOTRICHALES												
...PROTOCOCCACEAE												
....PROTOCOCCUS(PHYTOCONIS)	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	--	-	--	-	--	-	20	5	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	13	1	--	-	--	-	--	-	--	-
....MELOSIRA	--	-	52	6	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....COCCONEIS	--	-	--	-	--	-	--	-	5	1	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	5	2	5	4	10	2	15#	25
...DIATOMACEAE												
....DIATOMA	--	-	--	-	5	2	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	10	8	120#	30	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	--	-	20#	15	5	1	5	8
...NAVICULACEAE												
....NAVICULA	26	4	39	4	80#	37	55#	42	120#	30	5	8
...NITZSCHIACEAE												
....NITZSCHIA	90	15	13	1	35#	16	40#	31	20	5	30#	50
.CHRYSOPHYCEAE												
..CHRYSOMONADALES												
...OCHROMONADACEAE												
....OCHROMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
....COCCOCHLORIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	490#	81	770#	86	35#	16	--	-	--	-	--	-
....SCHIZOTHRIX	--	-	--	-	55#	26	--	-	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	APR 9,80	MAY 5,80	JUN 2,80	JUL 14,80	AUG 11,80	SEP 4,80
TIME	0915	1300	1200	1000	1330	1300
TOTAL CELLS/ML	10	340	960	470	680	250
DIVERSITY: DIVISION	0.0	1.7	0.4	1.4	1.2	1.7
.CLASS	0.0	1.7	0.4	1.5	1.2	1.7
..ORDER	0.0	2.6	0.4	2.3	1.5	2.4
...FAMILY	0.0	2.7	0.4	2.8	2.0	2.6
....GENUS	0.0	3.0	0.4	3.0	2.1	2.7

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)	--	-	--	-	--	-	--	-	--	-	--	-
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	28	8	--	-	--	-	--	-	13	5
....DICTYOSPHAERIUM	--	-	--	-	--	-	55	12	--	-	--	-
....KIRCHNERIELLA	--	-	28	8	--	-	--	-	29	4	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	--	-	13	5
..TETRASPORALES												
...COCCOMYXACEAE												
....ELAKATOTHRIX	--	-	55#	16	--	-	--	-	--	-	--	-
..ULOTRICHALES												
...PROTOCOCCACEAE												
....PROTOCOCCUS(PHYTOCONIS)	--	-	--	-	890#	93	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	14	4	--	-	--	-	14	2	26	11
..ZYGNEMATALES												
...DESMIDIACEAE												
....COSMARIUM	--	-	28	8	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	14	4	--	-	69	15	58	9	--	-
....MELOSTRA	--	-	--	-	--	-	--	-	29	4	--	-
..PENNALES												
...ACHNANTHACEAE												
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	14	2	--	-
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-	26	11
....SYNEDRA	--	-	--	-	--	-	27	6	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	10#	100	28	8	69	7	27	6	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	14	4	--	-	27	6	43	6	26	11
.CHRYSOPHYCEAE												
..CHRYSOMONADALES												
...OCHROMONADACEAE												
....OCHROMONAS	--	-	--	-	--	-	14	3	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	110#	32	--	-	27	6	--	-	52#	21
....COCCOCHLORIS	--	-	14	4	--	-	55	12	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	--	-	--	-	140#	29	400#	60	77#	32
....SCHIZOTHRIX	--	-	--	-	--	-	--	-	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	27	6	72	11	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	14	4	--	-	--	-	14	2	13	5

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58'31", long 159°38'55", Hydrologic Unit 20070000, on left bank 0.7 mi (1.1 km) upstream from mouth and 1.9 mi (3.1 km) northeast of Waimea.

DRAINAGE AREA.--26.0 mi² (67.3 km²).

PERIOD OF RECORD.--July 1943 to current year. Records for October 1911 to June 1917 at site 0.2 mi (0.3 km) downstream not equivalent owing to intervening diversion.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Datum of gage is 18.2 ft (5.55 m) above mean sea level (by stadia survey). Prior to June 16, 1959, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records good. Olokele ditch diverts all low flow from Olokele River 9 mi (14.5 km) above station for irrigation in vicinity of Makaweli. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--37 years, 86.7 ft³/s (2.455 m³/s), 62,810 acre-ft/yr (77.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft³/s (736 m³/s) Jan. 31, 1975, gage height, 15.51 ft (4.727 m), from rating curve extended above 3,200 ft³/s (90.6 m³/s) on basis of slope-area measurement at gage height 10.65 ft (3.246 m); minimum, 3.15 ft³/s (0.089 m³/s) July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4,680 ft³/s (133 m³/s) May 27, gage height, 6.74 ft (2.054 m), from rating curve extended as explained above, no peak above base of 4,700 ft³/s (135 m³/s); minimum, 9.5 ft³/s (0.27 m³/s) Oct. 2, 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	177	34	19	28	19	35	24	188	48	19	15
2	9.8	71	62	17	24	18	346	28	182	103	19	14
3	41	32	36	16	22	17	73	21	76	178	20	40
4	18	33	28	15	20	23	36	20	335	62	19	48
5	14	32	40	14	20	60	30	22	85	53	18	101
6	12	33	24	15	19	27	27	21	82	153	18	71
7	11	24	20	16	19	178	38	19	95	511	18	24
8	119	26	19	547	19	31	25	78	53	63	16	19
9	124	20	31	98	18	27	60	229	40	46	18	17
10	30	19	33	218	26	61	31	36	133	41	19	14
11	36	18	22	134	20	94	88	27	67	49	18	30
12	31	16	19	53	19	112	58	27	44	45	18	22
13	25	15	18	40	19	36	31	33	38	175	16	27
14	21	47	160	38	19	36	28	22	83	117	18	23
15	31	38	60	40	19	29	60	26	623	46	21	17
16	18	27	55	36	22	485	388	31	316	61	24	37
17	351	24	45	30	20	751	138	31	74	119	26	20
18	42	109	33	57	30	610	42	20	54	286	22	18
19	38	36	28	36	46	771	31	26	46	61	36	17
20	55	21	27	30	48	81	24	23	42	38	24	16
21	42	19	22	32	51	46	21	24	42	38	22	16
22	26	18	20	28	37	40	155	65	41	26	23	16
23	19	40	19	24	23	494	184	176	35	48	22	14
24	16	25	20	22	24	207	164	75	31	30	20	14
25	14	16	118	22	40	438	87	43	28	23	19	16
26	14	15	24	20	20	185	178	351	27	25	74	15
27	13	16	20	20	24	108	40	1100	30	45	96	15
28	16	15	19	38	41	98	31	884	60	75	23	16
29	16	142	17	36	22	48	27	459	38	39	20	16
30	13	145	16	66	---	44	25	866	37	21	25	15
31	25	---	19	36	---	36	---	270	---	19	20	---
TOTAL	1250.8	1269	1108	1813	759	5210	2501	5077	3025	2694	721	743
MEAN	40.3	42.3	35.7	58.5	26.2	168	83.4	164	101	85.3	23.3	24.8
MAX	351	177	160	547	51	771	388	1100	623	511	74	101
MIN	9.8	15	16	14	18	17	21	19	27	19	16	14
AC-FT	2480	2520	2200	3600	1510	10330	4960	10070	6000	5240	1430	1470

CAL YR 1979 TOTAL 19905.8 MEAN 54.5 MAX 1270 MIN 9.8 AC-FT 39480
WTR YR 1980 TOTAL 26120.8 MEAN 71.4 MAX 1100 MIN 9.8 AC-FT 51810

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 (61 m) downstream from Manuahi Stream and 4.0 mi (6.4 km) northeast of Eleele.

DRAINAGE AREA.--18.5 mi² (47.9 km²).

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 (0.8 km) 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 (67.67 m) 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 (0.305 m) higher.

REMARKS.--Records good. Hanapepe ditch diverts 3.0 mi (4.8 km) above station for irrigation in vicinity of Makaweli. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--56 years (water years, 1918-20, 1928-80), 86.0 ft³/s (2.436 m³/s), 62,310 acre-ft/yr (76.8 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 39,000 ft³/s (1,100 m³/s) Apr. 15, 1963, gage height, 14.87 ft (4.532 m), from rating curve extended above 7,600 ft³/s (215 m³/s) on basis of slope-area measurement of peak flow; minimum, 5.1 ft³/s (0.14 m³/s) May 21, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,600 ft³/s (102 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 19	0200	4900	139	6.87	2.094
May 28	2230	*7600	215	*8.28	2.524
June 15	1600	4110	116	6.34	1.932

Minimum discharge, 12 ft³/s (0.34 m³/s) Mar. 1-3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	61	18	14	17	13	42	35	190	37	24	17
2	20	45	27	14	16	13	230	30	180	104	30	19
3	60	24	17	15	16	12	62	22	90	199	30	50
4	21	19	16	15	16	14	34	20	350	63	26	50
5	31	18	16	15	16	50	25	24	90	70	27	55
6	20	21	14	16	16	36	23	27	82	340	23	84
7	22	17	14	17	16	200	31	20	100	411	20	27
8	101	19	14	293	16	19	22	65	60	93	19	19
9	65	17	45	56	16	16	73	249	50	60	19	19
10	24	17	21	155	17	27	34	45	173	40	27	18
11	33	17	16	56	28	115	61	32	107	61	20	64
12	28	17	15	22	40	74	35	38	67	101	19	24
13	23	19	15	18	40	23	23	32	60	236	19	27
14	22	24	35	18	38	20	20	22	136	174	24	21
15	44	18	19	17	30	17	34	46	998	53	24	24
16	23	17	19	16	14	543	370	60	379	134	27	78
17	361	19	19	16	14	911	106	25	105	247	22	26
18	40	121	17	19	14	873	38	24	63	275	22	18
19	40	29	16	16	14	996	27	17	46	73	31	18
20	62	18	15	15	14	106	22	22	40	48	21	24
21	49	16	15	17	14	57	21	33	56	40	22	21
22	29	16	16	16	14	36	49	79	32	30	18	18
23	24	100	19	15	14	348	62	89	27	80	17	17
24	24	41	62	14	19	140	99	48	26	31	17	17
25	22	15	106	15	16	271	116	35	24	25	17	17
26	22	14	17	15	14	108	127	191	24	46	97	17
27	22	17	15	16	19	91	38	681	24	83	55	17
28	22	14	14	22	16	75	29	1190	76	158	28	17
29	22	133	14	19	14	47	25	647	26	87	20	17
30	22	66	14	33	---	33	26	932	32	44	26	17
31	24	---	16	18	---	29	---	287	---	27	19	---
TOTAL	1342	989	696	1023	548	5313	1904	5063	3713	3470	810	857
MEAN	43.3	33.0	22.5	33.0	18.9	171	63.5	163	124	112	26.1	28.6
MAX	361	133	106	293	40	996	370	1190	998	411	97	84
MIN	20	14	14	14	14	12	20	17	24	25	17	17
AC-FT	2660	1960	1380	2030	1090	10540	3780	10040	7360	6880	1610	1700

CAL YR 1979 TOTAL 22499 MEAN 61.6 MAX 1180 MIN 14 AC-FT 44630
WTR YR 1980 TOTAL 25728 MEAN 70.3 MAX 1190 MIN 12 AC-FT 51030

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 (0.3 km) upstream from Wailua Falls and 4.3 mi (6.9 km) north of Lihue.

DRAINAGE AREA.--22.4 mi² (58.0 km²).

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. Altitude of gage is 240 ft (73 m), from topographic map. Prior to Nov. 18, 1918, at site 0.3 mi (0.5 km) upstream at different datum. Nov. 18, 1918, to June 30, 1957, at site 10 ft (3 m) downstream from present site at datum 2.50 ft (0.762 m) 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. Observations of specific conductance, pH, and water temperature made during the yoar are published elsewhere in this report.

AVERAGE DISCHARGE.--63 years (water years, 1913-18, 1920, 1922-24, 1926-56, 1959-80), 116 ft³/s (3.285 m³/s), 84,040 acre-ft/yr (104 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 87,300 ft³/s (2,470 m³/s) Apr. 15, 1963, gage height, 22.90 ft (6.980 m), from rating curve extended above 13,000 ft³/s (368 m³/s) on basis of slope-area measurement of peak flow; minimum, 1.69 ft³/s (0.048 m³/s) Sept. 21, 1953.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 9,690 ft³/s (274 m³/s) May 28, gage height 15.79 ft (4.813 m), from rating curve extended as explained above, no other peak above base of 5,800 ft³/s (164 m³/s); minimum, 4.2 ft³/s (0.119 m³/s) Mar. 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.7	90	12	35	6.3	5.9	10	38	854	52	42	7.1
2	6.5	69	40	30	6.1	5.0	372	58	510	154	39	23
3	35	80	25	23	5.9	4.3	136	27	271	362	42	91
4	12	66	7.3	8.4	5.9	4.5	57	27	398	170	29	79
5	36	33	6.9	7.3	5.7	33	54	19	220	123	26	74
6	9.1	7.7	6.7	7.7	5.5	10	48	22	238	213	33	100
7	6.5	8.2	7.1	7.7	6.5	150	64	16	286	601	22	33
8	39	6.7	7.3	368	5.7	13	31	63	161	226	15	13
9	50	6.5	25	189	5.7	6.3	60	283	139	148	14	9.1
10	8.4	6.3	37	256	5.5	5.7	106	98	296	106	53	6.9
11	6.3	6.1	16	179	5.7	59	160	75	171	116	32	36
12	6.3	5.7	12	109	5.7	78	103	56	105	146	15	29
13	5.9	7.1	9.3	91	5.9	9.5	61	63	81	434	10	7.7
14	6.1	17	46	83	5.7	5.1	36	31	204	743	12	20
15	44	26	26	65	9.4	4.8	62	46	1200	182	13	23
16	14	8.8	15	46	7.1	355	553	167	517	248	13	256
17	305	8.0	6.7	33	6.3	705	298	113	213	395	14	510
18	66	131	5.5	8.6	8.1	905	118	65	159	320	23	300
19	36	83	5.9	6.9	7.3	1220	66	64	137	151	74	124
20	46	22	5.5	6.3	7.1	227	48	58	106	118	49	132
21	53	12	5.7	6.1	6.9	81	32	70	150	104	31	97
22	19	21	5.7	6.5	6.7	38	59	196	96	72	31	77
23	8.4	132	15	5.9	6.5	213	129	219	56	170	10	48
24	5.9	129	10	5.9	6.5	129	129	174	43	86	8.0	30
25	5.9	50	671	5.7	8.0	179	104	378	34	62	18	21
26	5.9	19	72	5.7	6.5	91	195	779	18	73	90	15
27	5.9	8.0	51	5.7	7.3	67	63	442	16	148	69	15
28	5.7	6.3	41	9.2	9.1	57	48	2180	70	280	21	15
29	5.9	96	46	9.3	8.2	28	35	702	46	155	12	14
30	5.9	104	62	6.9	---	21	42	1130	48	108	8.3	10
31	8.2	---	68	6.9	---	13	---	816	---	72	15	---
TOTAL	874.5	1265.4	1369.6	1633.7	192.8	4723.1	3263	8475	6839	6334	883.3	2315.8
MEAN	28.2	42.2	44.2	52.7	6.65	152	109	273	228	204	28.5	77.2
MAX	305	132	671	368	9.4	1220	553	2180	1200	743	90	510
MIN	5.7	5.7	5.5	5.7	5.5	4.3	10	16	16	52	8.0	6.9
AC-FT	1730	2510	2720	3240	382	9370	6470	16810	13570	12560	1750	4590

CAL YR 1979 TOTAL 23386.9 MEAN 64.1 MAX 1830 MIN 4.3 AC-FT 46390
WTR YR 1980 TOTAL 38169.2 MEAN 104 MAX 2180 MIN 4.3 AC-FT 75710

16061000 NORTH WAILUA DITCH NEAR LIHUE

LOCATION.--Lat 22°03'56", long 159°28'14", Hydrologic Unit 20070000, on left bank 300 ft (91 m) downstream from intake, 7.9 mi (12.7 km) west of Wailua House Lots, and 8.8 mi (14.2 km) northwest of Lihue.

PERIOD OF RECORD.--July 1932 to current year.

REVISED RECORDS.--WSP 770: 1933.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,105.45 ft (336.941 m) above mean sea level (levels by Lihue Plantation Co.).

REMARKS.--Records good. Ditch diverts from North Fork Wailua River for power and irrigation in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--48 years, 18.8 ft^3/s (0.532 m^3/s), 13,620 acre-ft/yr (16.8 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 59 ft^3/s (1.67 m^3/s) Dec. 21, 1933, Apr. 24, 1934; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 29 ft^3/s (0.82 m^3/s) Mar. 16; minimum daily, 11 ft^3/s (0.31 m^3/s) July 8.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	23	20	17	16	14	19	17	18	20	17	16
2	19	23	23	17	16	14	22	16	23	21	17	16
3	19	22	20	17	16	14	20	17	26	19	17	18
4	16	21	21	16	15	21	19	17	22	14	16	18
5	17	20	20	16	15	24	18	18	18	16	17	18
6	16	20	19	17	15	24	19	17	20	17	17	18
7	16	20	19	17	16	26	19	17	20	15	16	16
8	17	21	19	25	15	22	18	19	18	11	17	16
9	17	20	20	18	15	21	21	20	19	13	17	16
10	16	20	18	22	16	23	19	18	20	15	17	16
11	19	19	18	19	15	26	21	17	19	20	16	17
12	19	19	18	16	16	24	20	18	19	22	16	16
13	18	20	18	15	15	22	19	17	20	25	16	17
14	18	21	20	16	15	23	20	17	20	20	17	16
15	21	20	18	16	15	23	20	16	23	17	17	18
16	19	20	18	15	16	29	19	19	21	20	17	20
17	23	20	17	14	14	27	16	17	19	19	17	18
18	20	23	17	14	14	24	18	17	18	18	17	17
19	20	20	17	13	14	24	17	17	18	16	17	17
20	21	20	16	13	14	20	17	17	19	16	17	17
21	20	19	16	13	14	19	17	17	20	17	17	17
22	19	21	18	12	14	18	20	20	19	17	16	17
23	19	22	18	12	14	22	19	19	18	19	16	16
24	18	23	20	14	16	20	20	18	18	17	16	17
25	18	20	20	16	15	15	19	17	18	17	16	16
26	18	20	19	16	14	18	18	20	17	18	19	16
27	18	20	19	16	16	20	17	20	19	19	18	16
28	19	20	18	16	16	19	17	21	20	20	18	16
29	18	24	18	16	15	19	17	17	19	19	17	16
30	19	21	18	18	---	18	17	20	19	17	17	16
31	21	---	18	16	---	18	---	18	---	17	16	---
TOTAL	576	622	578	498	437	651	562	555	587	551	521	504
MEAN	18.6	20.7	18.6	16.1	15.1	21.0	18.7	17.9	19.6	17.8	16.8	16.8
MAX	23	24	23	25	16	29	22	21	26	25	19	20
MIN	16	19	16	12	14	14	16	16	17	11	16	16
AC-FT	1140	1230	1150	988	867	1290	1110	1100	1160	1090	1030	1000

CAL YR 1979 TOTAL 6705.8 MEAN 18.4 MAX 24 MIN 6.8 AC-FT 13300
WTR YR 1980 TOTAL 6642.0 MEAN 18.1 MAX 29 MIN 11 AC-FT 13170

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 (116 m) downstream from Waikoko Stream, 8.1 mi (13.0 km) west of Wailua, and 8.4 mi (13.5 km) northwest of Lihue.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,070 ft (326 m), from topographic map.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 23.7 ft^3/s (0.671 m^3/s), 17,170 acre-ft/yr (21.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft^3/s (1.64 m^3/s) Oct. 11, 1966; no flow Jan. 1-18, 1965.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) June 15; minimum daily, 15 ft^3/s (0.42 m^3/s) Jan. 22, 23, Feb. 17-23, 26, Mar. 1-3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	25	20	19	17	15	19	18	24	21	19	19
2	20	26	21	18	17	15	23	18	26	24	20	19
3	23	23	20	18	17	15	20	18	24	26	19	22
4	20	22	21	18	16	18	19	18	27	20	19	22
5	23	21	20	18	16	20	18	19	22	21	20	22
6	20	22	20	18	17	20	19	19	23	24	19	23
7	19	21	19	18	17	22	19	18	23	28	19	20
8	23	21	19	24	16	19	18	20	21	23	18	19
9	22	21	20	19	16	18	20	22	20	21	21	19
10	20	21	20	22	17	19	19	19	25	20	20	19
11	21	20	19	19	16	21	20	18	22	22	19	21
12	20	20	19	18	17	20	19	18	20	24	18	19
13	20	20	19	18	16	19	18	19	21	29	18	20
14	20	21	21	18	16	19	18	18	24	28	19	19
15	23	20	20	18	16	19	19	19	31	22	19	23
16	21	20	19	17	16	24	22	21	24	24	19	27
17	26	20	19	17	15	26	19	19	21	27	19	24
18	22	25	19	17	15	25	18	19	20	26	19	21
19	21	22	18	16	15	26	18	19	20	21	20	20
20	23	20	18	16	15	20	18	18	20	20	19	20
21	22	20	18	16	15	19	17	19	23	20	20	20
22	21	21	19	15	15	19	19	21	20	20	19	19
23	20	22	19	15	15	23	19	20	20	23	18	19
24	20	24	21	16	16	21	19	20	19	21	18	19
25	20	21	23	17	16	20	19	20	19	20	18	18
26	20	20	20	17	15	19	19	24	19	21	24	18
27	20	20	20	17	16	19	18	24	19	24	22	18
28	20	20	19	17	17	19	18	29	22	26	20	18
29	20	25	19	17	16	19	18	22	20	22	19	18
30	20	22	19	18	---	18	18	27	20	21	20	17
31	22	---	20	17	---	18	---	25	---	20	19	---
TOTAL	652	646	608	548	464	614	567	628	659	709	600	602
MEAN	21.0	21.5	19.6	17.7	16.0	19.8	18.9	20.3	22.0	22.9	19.4	20.1
MAX	26	26	23	24	17	26	23	29	31	29	24	27
MIN	19	20	18	15	15	15	17	18	19	20	18	17
AC-FT	1290	1280	1210	1090	920	1220	1120	1250	1310	1410	1190	1190

CAL YR 1979 TOTAL 7375.7 MEAN 20.2 MAX 32 MIN 7.7 AC-FT 14630
WTR YR 1980 TOTAL 7297.0 MEAN 19.9 MAX 31 MIN 15 AC-FT 14470

16062000 STABLE STORM DITCH NEAR LIHUE

LOCATION.--Lat 22°04'09", long 159°26'46", Hydrologic Unit 20070000, on left bank 100 ft (30 m) downstream from intake, 7.8 mi (12.6 km) northwest of Lihue, and 7.9 mi (12.7 km) west of Kapaa.

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

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 710 ft (216 m) by barometer.

REMARKS.--Records good. Ditch diverts from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--43 years (water years 1938-80), 10.6 ft^3/s (0.300 m^3/s), 7,680 acre-ft/yr (9.47 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft^3/s (2.01 m^3/s) Apr. 3, 1948; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 47 ft^3/s (1.33 m^3/s) Oct. 31; minimum daily, 0.01 ft^3/s (0.0003 m^3/s) for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	24	.77	.62	25	23	.01	.05	.12	.01	.01	.12
2	32	1.6	.77	.62	25	22	.05	.05	.05	.01	.01	.12
3	41	1.4	.77	.50	21	21	.05	.05	.05	.01	.01	22
4	36	1.4	.77	17	18	32	.05	.05	.05	.01	.01	35
5	42	1.4	.77	28	18	32	.05	.12	.05	.01	.01	35
6	35	1.2	19	28	11	22	.05	.12	.05	.01	.01	36
7	32	1.2	30	28	16	24	.05	.12	.05	.01	.01	31
8	42	1.2	30	18	23	22	.05	.62	.05	.01	.01	12
9	39	1.2	31	.05	22	21	.05	.50	.05	.01	.01	.62
10	34	1.2	30	.12	29	22	.05	.38	.05	.01	.01	.62
11	36	1.1	30	.12	26	23	.05	.38	.05	.01	.01	.50
12	36	22	30	.05	26	12	.05	.28	.05	.01	.01	.38
13	34	40	30	.05	26	.77	.05	.28	.05	.01	.01	.38
14	34	43	18	.05	24	.77	.05	.28	.05	.14	.01	.28
15	40	43	.77	.05	24	.77	.05	.28	.30	.01	.01	.20
16	36	18	.77	.05	24	.77	.05	.28	.05	.01	.01	.20
17	27	1.8	16	.05	23	.38	.05	.28	.05	.01	.01	.20
18	.77	1.8	27	.01	22	.38	.05	.28	.05	.01	.01	.20
19	.62	1.6	28	.01	22	.53	.05	.28	.05	.01	.05	.20
20	.62	1.6	28	.01	22	.05	.05	.20	.05	.01	.05	.20
21	.50	1.6	28	.01	22	.01	.05	.20	.05	.01	.12	.20
22	.50	1.6	28	.01	22	.01	.12	.20	.01	.01	.05	.20
23	21	1.4	29	.01	22	.01	.12	.28	.01	.01	.05	.20
24	32	1.4	30	.01	24	.01	.12	.28	.01	.01	.05	.20
25	32	1.2	32	.01	24	.01	.12	.28	.01	.01	.05	.20
26	34	1.2	30	.01	22	.01	.12	.82	.01	.01	.12	4.4
27	33	1.1	30	.01	26	.01	.12	.12	.01	.01	.12	7.5
28	36	1.1	28	18	28	.01	.05	.50	.01	.01	.12	7.5
29	32	1.2	26	26	24	.01	.05	.12	.01	.01	.12	7.5
30	36	.92	22	28	---	.01	.05	.12	.01	.01	.12	7.5
31	47	---	.77	25	---	.01	---	.14	---	.01	.12	---
TOTAL	912.01	222.42	636.16	218.43	661	280.53	1.88	7.94	1.46	.44	1.32	210.62
MEAN	29.4	7.41	20.5	7.05	22.8	9.05	.063	.26	.049	.014	.043	7.02
MAX	47	43	32	28	29	32	.12	.82	.30	.14	.12	36
MIN	.50	.92	.77	.01	11	.01	.01	.05	.01	.01	.01	.12
AC-FT	1810	441	1260	433	1310	556	3.7	16	2.9	.9	2.6	418

CAL YR 1979 TOTAL 5989.23 MEAN 16.4 MAX 47 MIN .02 AC-FT 11880
WTR YR 1980 TOTAL 3154.21 MEAN 8.62 MAX 47 MIN .01 AC-FT 6260

16063000 NORTH FORK WAILUA RIVER AT ALTITUDE 650 FT (198 M), NEAR LIHUE

LOCATION.--Lat 22°04'02", long 159°26'21", Hydrologic Unit 20070000, on right bank 0.5 mi (0.8 km) downstream from intake of Stable storm ditch and 7.6 mi (12.2 km) northwest of Lihue.

DRAINAGE AREA.--5.29 mi² (13.70 km²).

PERIOD OF RECORD.--September 1914 to March 1915, May 1915 to October 1918, December 1918, March 1919, June 1919 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 555: 1921. WSP 1569: 1915-27(M), 1943-47(M), 1948-56(P). WSP 2137: Drainage area.

GAGE.--Water-stage recorder. Altitude of gage is 650 ft (198 m), from topographic map. Prior to Sept. 9, 1944, at datum 2.0 ft (0.61 m) higher.

REMARKS.--Records good. Since 1925, Hanalei tunnel (see sta 16100000) has diverted from Hanalei River basin into North Fork Wailua River above station; North Wailua and Stable storm ditches (see sta 16061000 and 16062000) divert water above station for power development and irrigation in vicinity of Lihue. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years, 1916-18, 1920-80), 73.2 ft³/s (2.073 m³/s), (53,030 acre-ft/yr (65.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,200 ft³/s (374 m³/s) Nov. 12, 1955, gage height, 13.53 ft (4.124 m), from rating curve extended above 2,300 ft³/s (65.1 m³/s) on basis of slope-area measurement at gage height 10.65 ft (3.246 m); minimum, 0.23 ft³/s (0.007 m³/s) June 5, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,800 ft³/s (79.4 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	1300	3930	111	8.42	2.566	May 26	1900	3810	108	8.33	2.539
Mar. 19	0230	3200	90.6	7.78	2.371	June 15	0600	*4100	116	*8.55	2.606

Minimum discharge, 0.85 ft³/s (0.026 m³/s) Feb. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	217	48	34	1.1	1.2	98	82	419	82	55	44
2	2.1	170	124	33	1.1	1.1	328	58	287	151	59	46
3	30	98	50	32	4.4	1.1	121	72	138	206	54	75
4	3.4	72	67	14	8.3	10	87	62	260	100	52	61
5	21	56	48	1.6	8.3	38	72	98	114	102	64	61
6	2.5	71	25	1.7	17	41	80	70	142	198	54	93
7	1.7	58	11	1.4	12	143	96	66	134	289	45	33
8	19	83	9.7	538	1.2	23	64	127	87	164	47	40
9	11	55	22	87	.99	22	177	338	89	125	53	49
10	2.5	59	10	254	4.0	28	75	94	167	87	53	48
11	25	39	7.7	90	1.6	74	230	82	106	93	45	97
12	4.9	16	6.9	48	1.1	67	104	82	84	148	43	49
13	2.4	9.5	6.9	50	1.2	44	75	80	87	267	41	68
14	2.5	21	32	49	1.1	52	90	70	160	388	52	48
15	37	15	37	47	1.1	58	140	114	539	112	54	105
16	4.6	34	32	47	.99	287	339	264	225	172	49	248
17	178	44	17	42	1.1	478	187	137	110	181	54	190
18	54	126	5.6	45	1.2	583	94	100	88	174	46	106
19	54	55	4.0	39	.99	639	75	107	84	92	62	84
20	73	44	3.4	37	1.1	155	66	94	80	90	47	74
21	64	39	3.0	38	.99	106	63	106	110	80	55	78
22	43	55	8.4	35	.99	78	172	205	74	69	44	62
23	18	85	11	34	.92	253	125	200	64	117	41	53
24	5.9	159	103	32	1.1	148	141	142	58	78	40	59
25	3.0	48	151	29	1.3	184	118	115	54	59	40	49
26	1.8	44	20	29	1.1	114	101	448	52	76	147	43
27	1.6	41	19	29	1.6	106	72	390	69	117	79	37
28	9.9	48	10	24	3.4	92	68	699	138	198	63	40
29	1.7	231	6.1	1.3	1.3	78	64	218	60	95	52	37
30	3.5	78	18	2.3	---	68	68	392	68	76	58	36
31	37	---	42	1.1	---	58	---	360	---	62	47	---
TOTAL	719.6	2166.5	958.7	1745.4	82.57	4030.4	3550	5472	4147	4248	1695	2113
MEAN	23.2	72.2	30.9	56.3	2.85	130	118	177	138	137	54.7	70.4
MAX	178	231	151	538	17	639	339	699	539	388	147	248
MIN	1.6	9.5	3.0	1.1	.92	1.1	63	58	52	59	40	33
AC-FT	1430	4300	1900	3460	164	7990	7040	10850	8230	8430	3360	4190

CAL YR 1979 TOTAL 21080.00 MEAN 57.8 MAX 832 MIN 1.1 AC-FT 41810
WTR YR 1980 TOTAL 30928.17 MEAN 84.5 MAX 699 MIN .92 AC-FT 61350

HAWAII, ISLAND OF KAUAI

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 (366 m) upstream from mouth and 7.2 mi (11.6 km) northwest of Lihue.

DRAINAGE AREA.--6.27 mi² (16.24 km²).

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. Altitude of gage is 500 ft (152 m), from topographic map. Prior to Dec. 31, 1914, nonrecording gage at site 725 ft (221 m) downstream at different datum. Dec. 31, 1914, to May 10, 1934, water-stage recorder at site 75 ft (23 m) upstream at present datum.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1913-14, 1916-17, 1920-80), 48.2 ft³/s (1.365 m³/s), 34,920 acre-ft/yr (43.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,400 ft³/s (521 m³/s) Nov. 12, 1955, gage height, 14.7 ft (4.48 m), from floodmarks, from rating curve extended above 2,700 ft³/s (76.5 m³/s); minimum, 6.8 ft³/s (0.19 m³/s) July 3, 13, 1926.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 3,590 ft³/s (102 m³/s) May 28, gage height, 7.28 ft (2.219 m), from rating curve extended above 2,700 ft³/s (76.5 m³/s), no other peak above base of 1,900 ft³/s (53.8 m³/s); minimum, 9.8 ft³/s (0.28 m³/s) Oct. 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	154	29	18	15	12	42	46	230	41	35	25
2	12	84	73	17	16	11	220	43	150	75	37	25
3	22	50	37	16	15	11	81	41	80	123	36	42
4	14	36	34	16	14	16	50	37	130	60	33	47
5	19	27	30	15	14	31	41	40	65	64	31	38
6	13	32	26	16	14	26	38	35	80	124	29	96
7	11	24	25	15	14	38	62	32	70	173	28	32
8	11	32	24	309	13	18	38	60	50	100	27	28
9	13	25	26	50	13	16	49	109	55	71	29	26
10	11	25	24	123	16	16	37	52	90	56	34	25
11	11	21	22	49	14	27	130	50	60	66	27	28
12	12	19	21	34	14	23	91	49	48	63	25	25
13	11	22	21	29	14	21	61	47	55	111	25	25
14	14	44	20	27	14	22	53	38	100	194	29	24
15	22	41	20	26	13	36	101	43	250	76	26	54
16	14	29	19	26	12	206	277	112	150	92	26	138
17	68	25	18	24	12	163	130	134	60	99	26	250
18	21	57	18	23	12	250	76	64	50	108	25	363
19	20	36	18	21	12	269	59	58	48	70	31	72
20	26	27	17	21	12	75	49	58	45	64	25	54
21	24	24	18	20	12	54	45	64	60	64	24	48
22	19	24	18	19	11	41	107	80	45	54	23	43
23	17	28	21	19	11	104	114	110	36	80	21	38
24	16	33	75	18	11	73	94	100	38	54	21	36
25	15	29	188	18	11	80	79	70	36	46	21	33
26	14	25	28	17	11	54	70	200	34	49	58	31
27	16	25	25	17	13	50	50	220	32	58	37	29
28	25	24	21	17	15	47	45	350	55	64	32	29
29	16	88	20	16	13	37	41	120	36	48	29	28
30	18	44	25	16	---	33	43	210	34	44	29	27
31	58	---	20	16	---	30	---	200	---	39	27	---
TOTAL	596	1154	981	1068	381	1890	2373	2872	2272	2430	906	1709
MEAN	19.2	38.5	31.6	34.5	13.1	61.0	79.1	92.6	75.7	78.4	29.2	57.0
MAX	68	154	188	309	16	269	277	350	250	194	58	363
MIN	11	19	17	15	11	11	37	32	32	39	21	24
AC-FT	1180	2290	1950	2120	756	3750	4710	5700	4510	4820	1800	3390

CAL YR 1979 TOTAL 14455 MEAN 39.6 MAX 625 MIN 11 AC-FT 28670
WTR YR 1980 TOTAL 18632 MEAN 50.9 MAX 363 MIN 11 AC-FT 36960

HAWAII, ISLAND OF KAUAI

16069000 WAILUA DITCH NEAR KAPAA

LOCATION.--Lat 22°04'34", long 159°24'04", Hydrologic Unit 20070000, on right bank 2,000 ft (610 m) downstream from Wailua Reservoir, 5.2 mi (8.4 km) west of Kapaa, and 7.0 mi (11.3 km) 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 (140.91 m) above mean sea level (by stadia survey).

REMARKS.--Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft (610 m) above station and thence to fields for irrigation of sugarcane in vicinity of Kapaa. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--43 years (water years 1938-80), 15.2 ft^3/s (0.430 m^3/s), 11,010 acre-ft/yr (13.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 63 ft^3/s (1.78 m^3/s) June 4, 1937; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 41 ft^3/s (1.16 m^3/s) Sept. 17; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	24	25	.00	23	13	34	30	.00	15	27	30
2	23	24	26	.00	22	11	35	30	.00	15	27	30
3	22	25	22	13	21	10	35	30	10	5.1	27	30
4	23	26	19	22	21	11	35	30	17	.11	27	31
5	24	26	19	22	21	19	35	30	18	.00	28	30
6	24	26	19	21	21	21	35	29	18	.00	34	28
7	23	27	19	21	22	23	35	29	18	.00	36	25
8	23	27	19	9.6	22	24	35	26	19	5.3	36	15
9	24	27	20	.00	20	24	35	21	19	16	36	.27
10	24	27	20	.00	18	25	35	21	19	16	36	.20
11	23	27	20	.00	18	26	35	20	20	22	36	.20
12	23	27	20	.00	17	27	35	19	20	26	36	19
13	22	27	20	.00	16	27	35	19	15	26	36	29
14	22	26	20	.00	15	28	35	20	10	26	36	34
15	22	26	20	.00	14	28	35	20	5.5	26	36	37
16	24	26	20	11	14	29	21	20	9.4	27	36	40
17	25	26	25	25	14	31	.00	12	15	28	36	41
18	27	27	31	22	13	32	.00	.05	15	18	36	19
19	31	27	30	16	12	32	.00	.00	14	.20	37	.11
20	35	27	29	16	11	33	.00	6.0	4.9	.14	32	.06
21	38	19	23	15	10	33	19	12	.14	.82	30	.02
22	40	7.1	15	15	10	33	29	11	.02	1.1	30	.00
23	40	7.3	15	22	9.9	34	29	11	4.8	1.1	30	.00
24	39	7.5	9.8	25	9.7	34	29	12	15	1.1	30	.00
25	30	7.5	.35	24	10	34	30	12	15	1.1	30	.00
26	25	20	.23	25	11	34	30	12	15	1.1	30	.00
27	24	25	.14	26	12	34	30	12	15	1.1	31	.00
28	24	25	.06	27	15	34	30	7.5	15	9.9	30	.00
29	23	25	.00	26	16	34	30	.18	15	18	30	21
30	23	25	.00	25	---	34	30	.00	15	19	30	19
31	23	---	.00	24	---	34	---	.00	---	24	30	---
TOTAL	817	693.4	506.58	452.60	458.6	846	831.00	501.73	376.76	350.17	1002	973.86
MEAN	26.4	23.1	16.3	14.6	15.8	27.3	27.7	16.2	12.6	11.3	32.3	15.8
MAX	40	27	31	27	23	34	35	30	20	28	37	41
MIN	22	7.1	.00	.00	9.7	10	.00	.00	.00	.00	27	.00
AC-FT	1620	1380	1000	898	910	1680	1650	995	747	695	1990	940

CAL YR 1979 TOTAL 7424.26 MEAN 20.3 MAX 50 MIN .00 AC-FT 14730
WTR YR 1980 TOTAL 7309.70 MEAN 20.0 MAX 41 MIN .00 AC-FT 14500

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 (1.8 km) upstream from confluence with South Fork, 3.7 mi (6.0 km) southwest of Kapaa, and 5.0 mi (8.0 km) north of Lihue.

DRAINAGE AREA.--17.9 mi² (46.4 km²).

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

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

GAGE.--Water-stage recorder. Altitude of gage is 18 ft (5.5 m), from topographic map.

REMARKS.--Records good. Wailua and Aahoaka ditches (see stas 16069000 and 16070000) divert above station for irrigation of sugarcane in vicinities of Kapaa and Wailua, respectively. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--28 years, 127 ft³/s (3.600 m³/s), 92,010 acre-ft/yr (113 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 53,200 ft³/s (1,510 m³/s) Nov. 12, 1955, gage height, 19.88 ft (6.059 m) in gage well, 20.8 ft (6.34 m), from floodmarks, from rating curve extended above 3,700 ft³/s (105 m³/s) on basis of slope-area measurement of peak flow; minimum, 2.12 ft³/s (0.060 m³/s) Oct. 28, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,100 ft³/s (116 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	1200	4380	124	7.22	2.201
May 28	0500	*5130	145	*7.72	2.353
June 15	0700	4170	118	7.08	2.158

Minimum discharge, 3.3 ft³/s (0.093 m³/s) Feb. 26.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	277	78	63	7.1	7.1	80	99	830	124	80	95
2	3.6	224	194	59	7.5	6.8	503	103	565	222	81	89
3	28	193	110	43	7.5	6.8	202	85	306	365	80	99
4	9.3	106	90	26	7.1	7.5	121	87	418	191	63	88
5	19	75	80	10	7.1	37	90	106	218	179	61	97
6	6.0	90	51	9.3	7.1	19	84	91	222	266	51	163
7	3.6	62	27	9.0	9.7	168	145	70	240	560	93	97
8	4.0	108	22	672	7.5	22	84	174	161	310	39	195
9	10	63	32	195	6.8	11	185	408	147	218	93	116
10	4.7	71	28	338	6.8	13	98	163	288	168	58	87
11	11	46	19	185	6.4	59	275	172	186	174	92	114
12	16	34	16	107	6.4	71	208	134	143	161	33	27
13	4.0	19	15	100	6.8	30	107	114	143	417	30	21
14	4.0	63	28	90	6.4	39	109	85	252	575	92	20
15	37	52	45	79	5.7	47	210	128	949	201	92	96
16	13	42	37	66	5.0	390	555	329	458	238	95	345
17	138	52	29	28	4.3	560	346	353	227	277	96	480
18	54	161	13	42	4.3	774	205	214	191	288	33	796
19	22	94	11	59	7.5	837	160	209	168	199	62	232
20	38	59	10	56	7.5	218	135	196	138	182	39	165
21	38	54	10	55	7.5	143	107	199	170	174	54	158
22	22	69	10	51	7.1	94	218	288	128	149	90	132
23	22	128	22	46	6.8	314	248	430	106	222	33	116
24	9.7	184	24	36	6.8	202	215	341	96	156	30	116
25	9.0	85	403	30	5.3	238	174	286	88	130	29	109
26	9.0	85	78	17	3.6	149	189	620	84	138	144	93
27	9.0	77	66	17	5.0	124	110	560	91	199	125	81
28	19	54	47	18	5.0	122	96	1810	194	266	75	85
29	14	266	39	9.0	4.3	88	88	746	101	163	66	90
30	9.7	161	52	7.8	---	75	94	865	103	114	62	186
31	42	---	77	7.5	---	63	---	725	---	91	59	---
TOTAL	632.9	3004	1763	2530.6	185.9	4935.2	5441	10185	7411	7117	1725	4343
MEAN	20.4	100	56.9	81.6	6.41	159	181	329	247	230	55.6	145
MAX	138	277	403	672	9.7	837	555	1810	949	575	144	796
MIN	3.6	19	10	7.8	3.6	6.8	80	70	84	91	29	20
AC-FT	1260	5960	3500	5020	369	9790	10790	20200	14700	14120	3420	8610

CAL YR 1979	TOTAL	35202.6	MEAN	96.4	MAX 1360	MIN 3.6	AC-FT	69820
WTR YR 1980	TOTAL	49273.6	MEAN	135	MAX 1810	MIN 3.6	AC-FT	97730

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 (0.6 km) upstream from mouth, 0.6 mi (1.0 km) northeast of Wailua Reservoir, and 4.9 mi (7.9 km) west of Kapaa.

DRAINAGE AREA.--0.65 mi² (1.68 km²).

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 (139.72 m) above mean sea level (by stadia survey).

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Observations of conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years, 2.62 ft³/s (0.074 m³/s), 1,900 acre-ft/yr (2.34 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 724 ft³/s (20.5 m³/s) Jan. 31, 1975, gage height, 5.58 ft (1.701 m), from rating curve extended above 415 ft³/s (11.8 m³/s); minimum, 0.09 ft³/s (0.003 m³/s) Sept. 27-30, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 70 ft³/s (1.98 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
May 28	2100	148	4.19	2.98	0.908
Sept. 18	0200	*292	8.27	*3.81	1.161

Minimum discharge, 0.47 ft³/s (0.013 m³/s) Oct. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.53	3.0	1.3	1.4	1.8	.75	1.4	2.4	14	2.8	2.7	1.7
2	.53	1.5	1.5	1.3	1.4	.75	3.6	2.3	10	2.9	2.5	1.6
3	.67	1.4	1.4	1.3	1.3	.75	2.3	2.3	8.6	3.9	2.5	1.7
4	.60	1.4	1.3	1.3	1.2	.91	1.9	2.3	8.6	3.1	2.5	1.9
5	.67	1.2	1.3	1.3	1.2	1.1	1.9	2.4	7.1	2.8	2.4	1.8
6	.60	1.1	1.2	1.3	1.2	.91	1.8	2.2	6.6	3.7	2.4	1.9
7	.60	1.0	1.3	1.3	1.2	1.0	2.8	2.1	6.4	5.7	2.3	1.8
8	.60	1.1	1.2	6.5	1.2	.75	2.2	2.4	5.7	4.1	2.2	1.8
9	.60	1.0	1.5	2.7	1.2	.75	1.9	3.1	5.5	3.4	2.2	1.7
10	.60	1.0	1.3	4.3	1.1	.75	1.9	2.4	5.7	3.1	2.2	1.6
11	.60	1.0	1.2	2.9	1.1	.75	2.7	2.3	5.0	3.1	2.2	1.6
12	.53	.91	1.1	2.4	1.1	.75	3.2	2.2	4.8	2.9	2.0	1.6
13	.47	.91	1.1	2.2	1.1	.75	2.4	2.2	4.6	3.2	2.0	1.6
14	.75	.91	1.1	2.1	1.1	.75	2.3	2.1	4.8	4.1	2.0	1.5
15	.91	1.1	1.0	2.1	1.0	.83	2.4	2.2	13	3.2	2.0	1.5
16	.75	1.0	1.0	2.1	.91	3.5	6.3	2.2	6.4	3.4	2.1	3.2
17	1.7	.91	1.0	2.0	.91	2.2	5.3	10	5.3	4.3	2.0	18
18	1.1	1.2	1.0	2.0	.91	2.4	4.1	3.4	4.6	4.3	1.9	52
19	.83	1.4	.91	1.9	.91	2.8	3.6	3.1	4.4	3.8	2.0	6.4
20	.75	1.1	.83	1.8	.91	2.0	3.4	2.9	4.3	3.6	1.9	4.8
21	1.0	.91	1.0	1.8	.91	1.7	3.2	2.8	4.4	3.4	1.9	4.3
22	.83	.83	1.0	1.6	.87	1.5	3.6	2.9	3.9	3.2	1.8	3.8
23	.75	.83	1.1	1.6	.83	2.1	3.2	9.5	3.8	3.8	1.7	3.2
24	.67	.83	1.9	1.6	.83	1.9	3.2	6.6	3.8	3.2	1.6	3.1
25	.67	.83	8.4	1.6	.75	1.9	3.2	8.0	3.6	3.2	1.6	2.9
26	.67	.83	2.0	1.6	.75	1.8	3.2	10	3.4	3.2	2.1	2.7
27	.67	.83	1.7	1.6	.91	1.7	2.9	7.4	3.1	3.2	1.9	2.7
28	.83	.83	1.6	1.6	.91	1.6	2.8	53	3.4	3.4	1.8	2.7
29	1.0	2.3	1.5	1.6	.83	1.6	2.7	26	2.9	2.9	1.7	2.5
30	.83	2.0	1.7	1.5	---	1.5	2.7	21	2.8	2.8	1.7	2.4
31	.91	---	1.5	1.5	---	1.4	---	14	---	2.8	1.7	---
TOTAL	23.22	35.16	46.94	61.8	29.94	43.85	88.1	217.7	170.5	106.5	63.5	190.0
MEAN	.75	1.17	1.51	1.99	1.03	1.41	2.94	7.02	5.68	3.44	2.05	6.67
MAX	1.7	3.0	8.4	6.5	1.8	3.5	6.3	53	14	5.7	2.7	52
MIN	.47	.83	.83	1.3	.75	.75	1.4	2.1	2.8	2.8	1.6	1.5
AC-FT	46	70	93	123	59	87	175	432	338	211	126	378

CAL YR 1979 TOTAL 795.35 MEAN 2.04 MAX 40 MIN .47 AC-FT 1980
WTR YR 1980 TOTAL 1027.21 MEAN 2.81 MAX 53 MIN .47 AC-FT 2040

HAWAII, ISLAND OF KAUAI

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 (6.3 km) northwest of Kealia, and 4.0 mi (6.4 km) northwest of Kapaa.

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

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 518 ft (158 m) above mean sea level (by stadia survey).

REMARKS.--Records good. Ditch diverts from Makaleha Stream for irrigation of sugarcane in vicinity of Kealia. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--43 years (water years 1938-80), 6.72 ft^3/s (0.190 m^3/s), 4,870 acre-ft/yr (6.00 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 31 ft^3/s (0.88 m^3/s) Aug. 1, 1961; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/a (0.68 m^3/s) Apr. 12, 15, May 17; minimum daily, 0.28 ft^3/s (0.008 m^3/s) Sept. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	21	2.0	1.3	5.6	7.9	9.3	16	3.6	1.4	8.0	.58
2	7.8	17	2.2	1.2	6.0	6.2	15	10	2.7	1.4	1.6	4.7
3	13	15	2.2	3.1	6.0	5.7	3.1	1.9	2.0	1.4	1.4	16
4	9.0	14	2.0	6.8	5.6	13	2.9	1.8	1.5	1.3	1.1	16
5	12	11	1.9	6.4	5.6	16	2.8	7.5	1.2	1.4	4.1	8.5
6	8.7	14	4.5	6.4	5.6	15	2.6	13	.99	1.4	9.6	.63
7	7.6	9.9	8.3	4.8	6.8	16	2.6	11	.93	2.0	9.3	.58
8	7.4	17	5.0	2.9	6.1	9.7	2.3	11	.74	5.4	7.2	.52
9	8.4	14	4.9	1.8	5.5	10	11	1.1	.74	18	1.5	5.8
10	7.3	17	4.6	2.2	9.2	12	12	1.1	5.3	15	1.2	9.3
11	6.9	10	5.8	1.9	8.0	17	22	1.1	7.5	8.8	3.3	13
12	7.3	8.4	7.5	1.1	6.5	13	24	1.1	6.1	1.9	9.6	11
13	6.8	14	7.3	.69	8.6	9.0	18	1.1	6.1	1.9	9.1	11
14	11	18	7.1	.52	6.2	10	14	1.1	7.7	2.1	9.4	7.3
15	14	18	6.9	3.8	5.8	2.6	24	1.2	12	1.8	7.8	5.3
16	8.6	9.7	6.6	8.3	5.6	2.6	14	13	2.6	1.8	1.8	15
17	18	3.0	6.6	6.9	5.3	2.5	4.4	24	2.2	1.8	1.4	1.2
18	11	3.0	6.4	5.3	3.5	2.1	2.9	18	1.9	2.1	4.4	4.3
19	13	9.3	6.3	2.3	3.0	2.2	2.2	9.1	1.8	1.8	14	1.1
20	17	11	6.4	2.2	5.0	2.1	2.0	3.8	1.8	1.8	9.8	.52
21	15	6.9	6.9	3.7	5.0	3.1	1.8	3.5	1.6	1.7	4.8	.33
22	10	2.4	8.1	6.1	5.0	1.8	1.8	3.4	1.5	1.5	.93	.33
23	9.9	2.2	11	6.1	5.0	1.8	8.0	3.9	1.3	1.4	.81	.28
24	8.3	2.2	6.4	6.0	5.0	1.8	18	4.3	3.0	1.3	.63	5.6
25	7.3	2.1	3.9	5.8	5.2	1.7	11	4.2	9.7	1.2	4.4	10
26	7.1	7.1	2.5	5.7	5.0	5.3	2.6	2.7	8.6	1.2	18	7.2
27	8.0	11	2.2	5.8	6.2	8.4	2.6	2.1	5.9	1.3	16	2.8
28	11	13	1.9	6.1	9.7	9.3	5.2	5.8	1.5	1.2	13	2.5
29	9.1	11	1.8	5.8	7.5	9.4	12	8.1	1.4	8.0	8.4	2.2
30	12	2.2	1.5	5.7	---	9.1	14	5.5	1.4	14	.69	3.9
31	21	---	1.4	5.6	---	8.4	---	4.4	---	12	.63	---
TOTAL	321.4	314.4	152.1	132.31	173.1	234.7	268.1	195.8	105.30	119.3	183.89	167.47
MEAN	10.4	10.5	4.91	4.27	5.97	7.57	8.94	6.32	3.51	3.85	5.93	5.58
MAX	21	21	11	8.3	9.7	17	24	24	12	18	18	16
MIN	6.8	2.1	1.4	.52	3.0	1.7	1.8	1.1	.74	1.2	.63	.28
AC-FT	637	624	302	262	343	466	532	388	209	237	365	332

CAL YR 1979	TOTAL	2772.65	MEAN 7.60	MAX 22	MIN .21	AC-FT 5500	
WTR YR 1980	TOTAL	2367.87	MEAN 6.47	MAX 24	MIN .28	AC-FT 4700	

16079000 KAPAHI DITCH NEAR KEALIA

LOCATION.--Lat 22°06'09", long 159°22'28", Hydrologic Unit 20070000, on right bank 500 ft (152 m) downstream from intake and 4.0 mi (6.4 km) 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 (114.94 m) above mean sea level (by stadia survey). Prior to Nov. 26, 1936, at site 61 ft (19 m) upstream at datum 2.52 ft (0.768 m) higher.

REMARKS.--Records good. Ditch diverts from Kapaa Stream for irrigation of sugarcane in vicinity of Kapaa. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--62 years (water years, 1918-20, 1922-80), 6.33 ft^3/s (0.179 m^3/s), 4,590 acre-ft/yr (5.66 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 138 ft^3/s (3.91 m^3/s) Feb. 6, 1913; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 30 ft^3/s (0.850 m^3/s) Oct. 31; minimum daily, 0.38 ft^3/s (0.011 m^3/s) for several days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	16	10	1.9	3.2	3.2	.45	9.9	7.2	20	8.6	9.2
2	2.3	10	6.8	8.2	3.3	2.9	.94	13	12	17	16	5.7
3	5.8	7.9	.66	7.9	3.2	2.8	.38	8.2	11	12	17	6.4
4	2.8	8.8	4.2	3.9	3.0	8.1	.38	8.2	11	.58	16	7.2
5	8.3	6.1	14	3.9	3.0	19	.38	8.0	8.2	.51	12	7.0
6	2.9	6.7	11	3.9	3.2	14	.45	7.0	.58	.82	5.0	7.2
7	2.3	3.3	7.0	4.9	3.2	12	5.3	3.0	.58	.90	4.9	7.0
8	2.2	11	8.2	5.8	3.0	4.1	8.4	.58	.51	.51	7.0	11
9	2.8	5.2	11	1.2	2.9	3.5	9.2	.74	.51	5.4	17	9.0
10	2.2	8.2	11	1.2	4.1	3.4	6.6	.51	.65	11	21	8.6
11	2.0	2.9	7.2	.58	3.4	7.7	17	.51	.45	15	13	6.7
12	2.2	2.3	8.1	.51	2.9	4.9	19	9.8	.38	18	8.6	4.7
13	1.9	7.8	3.9	.45	3.0	3.3	15	7.1	.38	26	8.8	8.6
14	6.2	22	3.6	.45	3.2	11	6.1	3.3	.45	2.8	5.2	6.6
15	8.2	15	3.3	2.3	2.9	19	2.1	5.8	1.4	7.5	5.0	16
16	2.9	8.0	3.2	5.7	2.8	15	2.1	3.0	.58	11	1.2	19
17	26	9.2	3.2	8.9	2.6	.90	.82	1.9	.51	11	1.1	17
18	8.6	15	3.0	5.2	8.0	.99	.51	.79	.51	5.0	7.1	1.7
19	3.8	10	3.0	5.6	5.0	.74	.51	.45	.58	.82	7.6	.38
20	8.3	5.7	3.0	6.0	2.6	.45	2.2	12	.66	.82	5.5	2.6
21	6.1	6.0	3.2	8.0	2.6	1.3	.51	21	4.7	8.3	12	12
22	3.8	10	4.2	3.9	2.5	.38	6.8	22	.82	24	9.0	21
23	3.0	11	4.9	3.6	2.5	.45	12	19	.58	27	5.9	18
24	3.5	13	1.1	3.6	2.6	.45	11	2.5	8.5	19	5.7	11
25	2.4	15	.67	3.5	2.6	.51	4.2	2.4	7.2	18	6.2	6.1
26	2.3	8.6	1.2	3.5	2.6	2.8	1.0	18	7.2	19	9.5	7.1
27	2.9	5.6	2.0	3.5	3.2	4.4	2.0	23	8.8	19	9.2	11
28	8.3	7.3	1.9	3.3	18	3.2	8.1	8.9	13	19	6.6	15
29	3.6	24	1.9	3.3	3.3	.85	8.6	1.5	16	13	8.3	12
30	7.8	12	2.0	3.3	---	.95	8.0	1.2	15	7.6	17	9.8
31	30	---	2.0	3.3	---	.85	---	.67	---	6.6	16	---
TOTAL	169.6	293.2	196.83	109.29	104.8	151.82	160.03	223.75	139.93	347.16	284.6	276.58
MEAN	5.47	9.77	6.72	3.53	3.60	4.90	5.33	7.22	4.66	11.2	9.18	9.22
MAX	30	24	14	7.9	18	19	19	23	16	27	21	21
MIN	1.9	2.3	.66	.45	2.5	.38	.38	.45	.38	.51	1.1	.38
AC-FT	336	582	290	217	207	301	317	444	278	689	565	549

CAL YR 1979 TOTAL 2021.78 MEAN 5.58 MAX 46 MIN .25 AC-FT 4010
WTR YR 1980 TOTAL 2806.79 MEAN 6.58 MAX 30 MIN .38 AC-FT 5770

16080000 KAPAA STREAM AT KAPAHI DITCH INTAKE, NEAR KAPAA

LOCATION.--Lat 22°06'15", long 159°22'29", Hydrologic Unit 20070000, on right bank at Kapahi ditch intake, 3.8 mi (6.1 km) northwest of Kapaa, and 4.3 mi (6.9 km) northwest of Wailua.

DRAINAGE AREA.--3.86 mi² (10.00 km²).

PERIOD OF RECORD.--July 1936 to current year. Prior to July 1959, published as Kapaa River at Kapahi ditch intake, near Kapaa.

REVISED RECORDS.--WSP 2137: Drainage area.

GAGE.--Water-stage recorder and concrete-masonry control. Datum of gage is 381.8 ft (116.37 m) above mean sea level (by stadia survey). Prior to July 1, 1962, at datum 0.07 ft (0.021 m) higher.

REMARKS.--Records good. Entire low flow is diverted above station at times for irrigation of sugarcane. Records do not include flow of Kapahi ditch (see sta 16079000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years, 20.3 ft³/s (0.575 m³/s), 14,710 acre-ft/yr (18.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,670 ft³/s (217 m³/s) Jan. 25, 1956, gage height, 5.41 ft (1.649 m), present datum, from rating curve extended above 2,800 ft³/s (79.3 m³/s); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,730 ft³/s (49.0 m³/s) May 23, gage height 2.86 ft (0.872 m), no peak above base of 1,900 ft³/s (53.8 m³/s); no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	53	9.4	7.7	.00	.00	15	2.5	89	1.2	.00	6.6
2	.00	14	81	4.5	.00	.00	117	5.0	56	41	.00	7.5
3	.00	8.4	20	.00	.00	.00	42	.00	28	70	.00	7.2
4	.00	1.3	12	.00	.00	.00	20	.00	36	34	.00	6.5
5	.00	.00	2.6	.00	.00	3.8	15	.00	21	32	.00	5.5
6	.00	.00	.00	.00	.00	4.0	15	.00	34	77	.00	22
7	.00	.07	.00	.00	.00	2.9	49	4.1	51	96	.00	7.7
8	.00	1.8	.00	206	.00	.00	12	30	26	42	.00	1.9
9	.00	.00	.00	27	.00	.00	4.6	55	24	13	6.5	.00
10	.00	.00	.00	70	.15	.00	.00	28	77	.00	1.1	.00
11	.00	.00	.00	24	.00	.00	124	24	32	11	.00	.58
12	.00	.00	.00	15	.00	.00	39	17	22	4.4	.00	.00
13	.00	.00	.00	13	.00	.00	.40	20	21	21	.00	.00
14	.00	14	.00	12	.00	.08	5.6	15	46	87	.00	.00
15	.00	.00	.00	5.4	.00	27	46	20	180	21	5.4	16
16	.00	1.4	.00	.00	.00	161	232	21	48	48	15	97
17	4.9	6.0	.00	.00	.00	89	75	81	30	37	15	216
18	.00	35	.00	.93	.00	154	34	16	29	58	4.4	243
19	.00	9.8	.00	3.2	.00	92	24	32	29	24	.00	29
20	.00	.00	.00	2.3	.00	32	14	20	26	36	.00	19
21	.00	.00	.00	2.6	.00	21	18	10	33	29	.05	6.0
22	.00	3.0	.42	.00	.00	22	57	19	24	.00	4.7	.25
23	.00	3.9	1.1	.00	.00	58	34	175	19	23	7.7	.00
24	.00	2.6	99	.00	.00	34	19	95	5.2	13	7.7	.00
25	.00	4.4	130	.00	.00	34	24	60	.00	3.6	2.5	.00
26	.00	4.2	15	.00	.00	16	28	54	.00	12	41	.00
27	.00	2.1	14	.00	.00	7.0	18	23	.00	21	4.9	.00
28	1.1	.13	9.3	.00	.07	7.0	4.3	397	9.1	16	.00	.00
29	.00	58	10	.00	.00	7.7	.00	98	.20	3.2	.54	.00
30	.00	15	24	.00	---	7.0	.00	126	.05	.00	1.4	.00
31	1.7	---	11	.00	---	6.5	---	92	---	.00	.11	---
TOTAL	7.70	238.10	433.82	393.63	.22	785.98	1085.90	1539.60	995.55	874.40	118.00	641.73
MEAN	.25	7.94	14.0	12.7	.008	25.4	36.2	49.7	33.2	28.2	3.81	21.4
MAX	4.9	58	130	206	.15	161	232	397	180	96	41	243
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	15	472	860	781	.4	1560	2150	3050	1970	1730	234	1270

CAL YR 1979 TOTAL 4624.20 MEAN 12.7 MAX 438 MIN .00 AC-FT 9170
WTR YR 1980 TOTAL 7114.63 MEAN 19.4 MAX 397 MIN .00 AC-FT 14110

16087000 ANAHOLA DITCH WASTEWAY NEAR KEALIA

LOCATION.--Lat 22°08'16", long 159°22'28", Hydrologic Unit 20070000, on right bank 300 ft (91 m) downstream from wasteway gates on Anahola ditch, 500 ft (152 m) north of Kaneha Reservoir, 3.8 mi (6.1 km) west of Anahola and 4.9 mi (7.9 km) northwest of Kealia.

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

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 825 ft (251 m) above mean sea level (by stadia survey).

REMARKS.--Records good. Water that passes station flows into Kaupaku Stream and thence into Anahola Stream 2 mi (3 km) below gaging station 16089000 on Anahola Stream. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years, 4.46 ft³/s (0.126 m³/s), 3,230 acre-ft/yr (3.98 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 84 ft³/s (2.38 m³/s) Nov. 12, 1955; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft³/s (0.71 m³/s) Jan. 8; no flow May 18-22.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.11	6.6	9.6	.11	.04	.19	.33	14	.11	3.1	.11
2	.04	.11	9.6	3.8	.11	.04	.21	.11	11	.11	.47	.19
3	.02	.11	7.4	3.3	.11	.04	2.1	.11	9.6	3.8	.33	.27
4	.04	.11	6.3	3.1	.11	.07	4.9	.11	10	7.4	.19	.47
5	.04	.04	3.8	2.8	.11	.11	4.4	.11	8.3	6.8	.14	.62
6	.04	.11	.47	2.8	.11	.11	4.1	.11	9.3	9.3	.11	.62
7	.04	.11	.47	2.6	.11	.19	5.4	.11	8.9	12	.19	.47
8	.04	.11	.33	25	.11	.11	4.4	.11	3.3	8.0	.47	.47
9	.04	.11	.33	14	.04	.11	2.6	1.9	.47	6.0	.47	.62
10	.11	.11	.47	14	.11	.11	.33	.11	.19	2.2	.47	.62
11	.11	.04	.33	11	.11	.33	.33	.04	4.5	.47	.47	.47
12	.11	.04	.19	8.9	.04	.53	.19	.04	6.3	.33	.47	.62
13	.04	.19	.19	7.4	.19	.47	.19	.11	7.1	.33	.47	.62
14	.11	.33	.33	6.8	.11	.47	.19	.11	12	3.7	.62	.62
15	.11	.11	.47	4.0	.19	.33	.33	.04	15	7.4	.62	.62
16	.11	.04	.47	.94	.04	.11	14	.04	9.9	7.7	.62	.33
17	.19	.04	.47	.62	.11	.04	17	.39	7.7	7.4	.62	.47
18	.04	.19	.47	.62	.11	.04	8.3	.00	7.4	8.2	.47	5.7
19	.04	.11	.47	.62	.11	.04	.47	.00	7.7	6.6	.47	6.6
20	.11	.19	.33	.47	.11	.11	.19	.00	7.7	6.3	.33	5.7
21	.11	.19	.47	.62	.19	.11	.33	.00	8.8	7.4	.19	5.1
22	.04	.19	.47	.47	.11	.11	.33	.00	6.6	6.3	.33	2.4
23	.04	.11	.47	.33	.11	.11	3.1	5.4	6.3	8.1	.47	.47
24	.04	.19	.47	.33	.11	.11	8.0	15	5.7	6.6	.47	.47
25	.04	3.1	6.7	.33	.33	.11	7.7	11	3.4	6.0	.33	.33
26	.04	2.9	7.4	.19	.19	.11	7.4	9.6	.47	1.8	.19	.19
27	.04	.47	6.6	.19	.33	.11	6.3	11	.33	.47	.33	.11
28	.11	.47	4.6	.19	.33	.11	6.0	18	.11	3.3	.33	.33
29	.04	4.4	4.1	.11	.11	.11	6.0	15	.11	6.3	.33	.11
30	.04	8.6	11	.19	---	.11	4.1	16	.11	6.0	.33	.11
31	.19	---	6.8	.19	---	.19	---	12	---	5.4	.19	---
TOTAL	2.15	22.93	88.57	120.51	3.96	4.69	119.08	116.88	192.29	161.82	14.59	35.83
MEAN	.069	.76	2.86	3.89	.14	.15	3.97	3.77	6.41	5.22	.47	1.19
MAX	.19	8.6	11	25	.33	.53	17	18	15	12	3.1	6.6
MIN	.02	.04	.19	.11	.04	.04	.19	.00	.11	.11	.11	.11
AC-FT	4.3	45	176	239	7.9	9.3	236	232	381	321	29	71

CAL YR 1979 TOTAL 696.51 MEAN 1.91 MAX 27 MIN .00 AC-FT 1380
WTR YR 1980 TOTAL 883.30 MEAN 2.41 MAX 25 MIN .00 AC-FT 1750

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 (152 m) below wasteway gates, and 4.8 mi (7.7 km) northwest of Kealia.

PERIOD OF RECORD.--December 1921 to current year. Records for May 1915 to December 1921 at site 520 ft (158 m) upstream not equivalent owing to intervening diversion.

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 821.8 ft (250.48 m) above mean sea level (Lihue Plantation bench mark). Dec. 9, 1921, to June 2, 1934, at site 480 ft (146 m) upstream at different datum.

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flow sometimes diverted above station by Anahola ditch wasteway (see sta 16087000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--56 years (water years, 1923-25, 1928-80), 4.16 ft^3/s (0.118 m^3/s) 3,010 acre-ft/yr (3.71 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 62 ft^3/s (1.76 m^3/s) Nov. 12, 1947; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s (0.59 m^3/s) May 17; minimum daily, 0.04 ft^3/s (0.001 m^3/s) Jan. 9.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	13	.88	.28	1.8	2.4	5.1	8.5	.44	7.2	2.9	5.0
2	2.2	12	2.0	.33	1.8	1.8	9.6	7.6	.44	12	6.2	5.7
3	6.4	9.3	1.2	.33	1.8	1.6	4.5	8.2	.44	9.1	6.6	8.7
4	2.3	8.2	.88	.33	1.9	3.3	.57	7.8	.44	1.8	6.6	8.5
5	3.0	5.5	3.0	.33	1.6	6.0	.50	8.6	.44	1.8	5.9	7.8
6	1.8	6.7	4.8	.33	3.1	4.4	.44	8.2	.50	3.4	5.0	8.2
7	1.4	4.1	4.4	.33	4.3	5.0	.64	7.0	1.7	4.7	4.6	6.2
8	1.4	7.6	3.8	.68	2.2	3.3	.44	8.7	5.4	3.4	4.8	5.7
9	1.2	5.3	4.6	.04	1.7	2.9	2.3	10	7.8	3.8	4.6	5.1
10	1.2	8.2	7.5	.19	5.6	3.0	4.1	8.9	14	7.1	6.2	4.8
11	1.0	4.1	4.1	.06	3.6	4.3	9.3	10	5.1	11	4.6	6.6
12	1.2	3.3	3.5	.06	2.4	3.8	8.7	9.1	1.4	8.9	3.8	5.5
13	.97	6.0	3.2	.46	3.9	2.9	6.8	8.0	1.6	11	3.6	5.3
14	2.3	10	2.9	.64	2.4	4.6	7.2	7.8	4.8	13	4.3	4.6
15	2.6	7.6	2.8	2.2	2.4	5.7	10	10	7.3	1.9	6.8	8.1
16	1.7	5.9	2.6	3.9	1.8	9.3	7.9	13	3.5	2.4	6.8	10
17	8.7	6.6	2.4	3.3	1.6	6.8	.24	21	2.0	2.2	5.0	16
18	2.8	10	2.2	3.9	1.4	8.7	4.6	9.3	1.9	2.7	4.4	12
19	3.5	8.0	2.2	3.2	1.4	7.8	9.8	11	2.2	1.7	6.6	1.7
20	6.1	6.8	1.9	2.9	1.4	6.2	8.5	10	2.4	1.8	6.1	1.4
21	3.2	4.8	2.3	3.8	1.4	5.7	7.8	9.3	2.9	1.9	7.6	1.2
22	2.2	6.1	2.7	2.9	1.4	5.7	14	11	1.8	1.4	4.8	4.5
23	3.9	4.1	6.0	2.6	1.2	6.6	9.1	12	1.4	2.5	4.1	5.9
24	2.4	5.7	6.4	2.3	1.2	6.4	1.9	1.2	1.2	1.6	4.1	5.3
25	1.7	8.3	9.7	2.2	2.2	5.9	1.8	.79	3.1	1.4	3.8	5.0
26	1.4	5.9	.28	2.2	1.4	5.7	1.4	3.6	6.2	6.0	11	4.6
27	1.4	7.6	.24	2.2	2.2	5.0	1.2	.79	6.1	9.6	8.7	4.4
28	4.2	9.5	.24	2.0	4.6	4.8	1.0	.90	8.2	7.0	6.6	6.1
29	2.4	8.9	.24	1.9	2.8	4.4	1.0	.50	5.9	1.4	6.2	4.6
30	4.3	1.4	.24	2.0	---	4.4	3.1	.50	5.7	1.4	6.1	3.9
31	11	---	.20	1.9	---	4.1	---	.38	---	1.2	6.2	---
TOTAL	91.77	210.5	89.40	49.79	66.5	152.5	143.53	233.66	106.30	146.3	174.6	182.4
MEAN	2.96	7.02	2.88	1.61	2.29	4.92	4.78	7.54	3.54	4.72	5.63	6.08
MAX	11	13	9.7	3.9	5.6	9.3	14	21	14	13	11	16
MIN	.97	1.4	.20	.04	1.2	1.6	.24	.38	.44	1.2	2.9	1.2
AC-FT	182	418	177	99	132	302	285	463	211	290	346	362

CAL YR 1979 TOTAL 1339.24 MEAN 3.67 MAX 18 MIN .02 AC-FT 2660
WTR YR 1980 TOTAL 1647.25 MEAN 4.50 MAX 21 MIN .04 AC-FT 3270

16089000 ANAHOLA STREAM NEAR KEALIA

LOCATION.--Lat 22°09'05", long 159°21'17", Hydrologic Unit 20070000, on right bank at intake of Lower Anahola ditch and 4.7 mi (7.6 km) northwest of Kealia.

DRAINAGE AREA.--4.27 mi² (11.06 km²).

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

REVISED RECORDS.--WSP 1719: 1915, 1916-18(M). WSP 2137: 1965(P), drainage area.

GAGE.--Water-stage recorder and combination concrete dam and orifice control. Datum of gage is 295.11 ft (89.950 m) above mean sea level (Highway Department bench mark). Prior to May 4, 1934, at site 0.1 mi (0.2 km) upstream at different datum.

REMARKS.--Records poor. Records include flow in Lower Anahola ditch (see sta 16091000). Anahola ditch (see sta 16088000) diverts 3 mi (5 km) above station for irrigation in vicinity of Kealia. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1914-17, 1920-80), 22.5 ft³/s (0.637 m³/s), 16,300 acre-ft/yr (20.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 19,600 ft³/s (555 m³/s) Jan. 25, 1956, gage height, 14.6 ft (4.45 m), from floodmarks, from rating curve extended above 590 ft³/s (16.7 m³/s); minimum, 1.9 ft³/s (0.054 m³/s) Oct. 30 to Nov. 1, Nov. 7-11, 1973.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 2,410 ft³/s (68.3 m³/s) Dec. 25, gage height, 6.10 ft (1.859 m), from rating curve extended above 240 ft³/s (6.80 m³/s) on basis of slope-area measurement at gage height 10.6 ft (3.23 m), no other peak above base of 2,200 ft³/s (62.3 m³/s); minimum, 2.3 ft³/s (0.065 m³/s) Oct. 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	49	13	11	6.5	6.5	26	31	57	14	12	8.9
2	2.5	38	49	10	6.5	5.6	137	23	36	46	12	9.1
3	7.6	12	15	9.4	6.3	5.2	38	21	29	56	12	22
4	4.1	8.9	11	9.1	9.1	8.5	18	20	33	30	12	28
5	3.9	5.1	9.4	9.1	6.5	43	13	24	21	25	11	17
6	3.4	5.6	8.5	9.1	6.8	14	12	21	24	84	9.6	24
7	2.8	3.7	10	8.7	9.1	20	37	16	29	118	9.1	11
8	2.7	7.3	7.8	403	7.3	7.3	14	27	17	44	9.4	8.3
9	2.7	3.8	7.8	48	5.9	5.4	12	54	15	30	9.4	7.4
10	2.7	8.0	19	50	19	5.4	12	21	45	25	9.8	7.0
11	2.6	4.1	10	28	13	8.9	89	26	21	42	8.9	11
12	2.7	3.1	8.0	20	7.0	8.0	52	19	15	25	7.6	10
13	2.6	7.1	6.9	17	9.6	5.4	18	15	17	40	7.4	7.8
14	5.0	42	6.5	16	7.4	11	17	13	73	134	8.7	8.0
15	3.9	13	6.0	15	7.4	34	74	21	201	25	14	20
16	2.8	8.0	5.7	15	5.6	137	302	48	53	35	14	62
17	14	8.7	5.5	13	4.8	43	118	186	31	29	8.9	197
18	5.1	30	5.1	12	4.8	101	63	38	26	57	7.8	286
19	3.3	15	5.0	11	4.8	58	36	58	27	25	12	90
20	6.5	9.1	4.8	10	4.8	30	29	46	29	21	10	25
21	4.2	7.8	6.0	12	4.8	21	25	38	44	30	16	20
22	3.4	8.3	5.1	11	4.8	22	70	49	25	20	8.9	17
23	5.0	7.6	7.1	9.6	4.7	34	61	201	20	42	7.3	14
24	3.9	7.6	25	8.9	4.6	26	47	93	18	22	7.0	13
25	2.8	68	252	8.7	6.5	19	39	51	17	17	6.6	12
26	2.5	13	21	8.5	4.8	16	37	75	16	21	70	11
27	2.4	11	18	8.0	5.9	12	25	44	16	40	26	10
28	8.7	15	15	7.8	22	10	22	191	21	32	13	12
29	6.9	70	12	7.4	7.6	9.8	21	84	15	18	10	10
30	4.8	29	29	7.3	---	9.4	21	103	13	14	9.6	9.6
31	17	---	15	6.8	---	8.9	---	58	---	13	11	---
TOTAL	145.3	518.8	619.2	820.4	217.9	745.3	1485	1715	1004	1174	391.0	938.1
MEAN	4.69	17.3	20.0	26.5	7.51	24.0	49.5	55.3	33.5	37.9	12.6	31.3
MAX	17	70	252	403	22	137	302	201	201	134	70	286
MIN	2.4	3.1	4.8	6.8	4.6	5.2	12	13	13	13	6.6	7.0
AC-FT	288	1030	1230	1630	432	1480	2950	3400	1990	2330	776	1860

CAL YR 1979 TOTAL 5906.1 MEAN 16.2 MAX 325 MIN 2.3 AC-FT 11710
WTR YR 1980 TOTAL 9774.0 MEAN 26.7 MAX 403 MIN 2.4 AC-FT 19390

16091000 LOWER ANAHOLA DITCH NEAR KEALIA

LOCATION.--Lat 22°08'14", long 159°19'31", Hydrologic Unit 20070000, on left bank 100 ft (30 m) downstream from last wasteway, 1.5 mi (2.4 km) southwest of mouth of Anahola Stream, and 2.8 mi (4.5 km) northwest of Kealia.

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

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 276.11 ft (84.158 m) above mean sea level (Highway Department bench mark).

REMARKS.--Records fair. Ditch diverts from Anahola Stream for irrigation of sugarcane in vicinity of Anahola. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--43 years (water years 1938-80), 3.01 ft^3/s (0.085 m^3/s), 2,180 acre-ft/yr (2.69 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18.6 ft^3/s (0.53 m^3/s) June 1, 1938; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 5.9 ft^3/s (0.167 m^3/s) Nov. 26; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	4.2	.38	.00	3.1	1.5	1.8	.00	.00	.00	.00	.00
2	2.4	3.5	.24	.00	3.0	1.6	.73	.00	.00	.00	.00	.00
3	2.6	3.0	.20	.00	3.0	1.4	.06	.00	.00	.00	.00	.00
4	2.6	2.8	.24	.00	3.5	1.6	.04	.00	.00	.00	.00	.00
5	2.2	4.0	1.8	.00	3.2	2.2	.04	.00	.00	.00	.00	.00
6	2.2	4.4	3.8	.00	3.2	1.6	.04	.00	.00	.00	.00	.00
7	1.9	3.0	4.3	.00	3.5	1.4	.06	.00	.02	.00	.00	.00
8	1.8	3.6	3.3	.03	4.9	1.4	.06	.00	.02	.00	.00	.00
9	1.9	3.1	1.9	.00	4.1	1.5	.06	.00	.02	.00	.00	.00
10	1.8	2.6	.56	.00	3.2	1.4	.04	.00	.04	.01	.00	.00
11	1.7	2.3	1.4	.00	1.2	1.4	.06	.00	.32	.46	.00	.00
12	1.6	3.8	3.2	.00	.50	1.4	.09	.09	.02	.01	.00	.00
13	1.5	4.1	3.8	.00	1.8	1.5	.06	.06	.02	.03	.00	.00
14	1.8	4.8	4.6	.00	1.5	1.5	.06	.04	.02	.01	.00	.00
15	2.1	3.2	3.9	.02	1.4	1.6	.04	.04	.00	.01	.00	.00
16	2.0	2.7	3.8	.00	1.5	4.5	.02	.11	.00	.01	.00	.00
17	2.4	2.6	4.1	.01	1.5	3.6	.00	.10	.00	.00	.00	.00
18	2.9	2.6	3.9	2.1	1.3	3.0	.00	.04	.00	.00	.00	.00
19	2.3	2.6	1.7	5.0	1.5	2.9	.00	.02	.00	.00	.00	.00
20	2.2	2.8	.42	5.0	1.8	2.3	.00	.02	.00	.00	.00	.00
21	2.0	2.6	.20	5.8	1.8	2.6	.00	.02	.00	.00	.00	.00
22	2.5	2.2	.20	4.8	1.8	2.4	.00	.02	.00	.00	.01	.00
23	2.3	2.0	.17	4.6	1.4	4.2	.00	.02	.00	.01	.01	.00
24	2.3	1.9	.17	4.5	1.5	5.8	.00	.02	.00	.01	.01	.00
25	1.8	2.7	.13	4.3	1.4	4.4	.00	.02	.00	.01	.00	.00
26	1.7	5.9	.17	3.8	1.4	2.5	.00	.02	.00	.01	.01	.00
27	1.6	4.0	.17	3.8	1.5	1.8	.00	.00	.00	.00	.00	.00
28	1.6	3.5	.09	4.0	2.3	1.8	.00	.00	.00	.00	.00	.00
29	2.3	5.0	.00	4.2	1.9	1.7	.00	.00	.00	.00	.00	.00
30	2.0	3.9	.06	3.9	---	1.6	.00	.00	.00	.00	.00	.06
31	2.7	---	.00	3.5	---	1.6	---	.00	---	.00	.00	---
TOTAL	65.5	99.4	48.85	59.36	63.70	69.7	3.26	.64	.48	.58	.04	.06
MEAN	2.11	3.31	1.58	1.91	2.20	2.25	.11	.021	.016	.019	.001	.002
MAX	2.9	5.9	4.6	5.8	4.9	5.8	1.8	.11	.32	.46	.01	.06
MIN	1.5	1.9	.00	.00	.50	1.4	.00	.00	.00	.00	.00	.00
AC-FT	130	197	97	118	126	138	6.5	1.3	1.0	1.2	.08	.1

CAL YR 1979 TOTAL 644.90 MEAN 1.77 MAX 6.1 MIN .00 AC-FT 1280
WTR YR 1980 TOTAL 411.57 MEAN 1.12 MAX 5.9 MIN .00 AC-FT 816

16093200 ANAHOLA STREAM AT ANAHOLA

LOCATION.--Lat 22°08'42", long 159°18'59", Hydrologic Unit 20070000, on downstream side of old highway bridge at Anahola, 0.1 mi (0.2 km) upstream from Highway 56, and 0.9 mi (1.4 km) upstream from mouth.

DRAINAGE.--9.24 mi² (23.93 km²).

PERIOD OF RECORD.--Annual maximum, water years 1962-65, November 1964 to current year.

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records fair. Anahola and Lower Anahola ditches (see sta 16088000 and 16091000) divert above station for irrigation of sugarcane in vicinities of Kealia and Anahola, respectively. Observations of specific conductance, pH, and water temperature are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years (water years 1966-80), 34.4 ft³/s (0.974 m³/s), 24,920 acre-ft/yr (30.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,400 ft³/s (379 m³/s) May 15, 1965, gage height, 15.84 ft (4.83 m), present site, from rating curve extended above 5,800 ft³/s (164 m³/s) on basis of contracted-opening measurement of peak flow; minimum, 2.1 ft³/s (0.059 m³/s) Oct. 25, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,200 ft³/s (62.3 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0100	*3,420	96.9	*10.92	3.328
Jan. 8	1430	2,750	77.9	10.25	3.124
Sept. 18	0300	2,930	83.0	10.43	3.179

Minimum discharge, 2.8 ft³/s (0.079 m³/s) Oct. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	64	25	25	8.6	6.7	21	26	103	17	20	12
2	4.1	53	103	21	9.0	5.7	130	25	67	47	17	12
3	6.4	17	47	18	9.0	5.7	45	18	55	66	20	26
4	6.4	11	23	17	12	7.4	25	23	58	49	17	28
5	4.8	6.7	17	17	8.6	44	17	25	40	35	17	20
6	5.1	7.4	8.6	18	9.0	12	14	24	42	90	14	27
7	4.1	4.8	14	18	10	19	38	17	64	188	13	14
8	4.1	8.8	8.2	597	10	9.0	19	26	36	66	13	12
9	4.1	5.1	9.8	98	8.6	7.0	14	75	26	39	12	12
10	3.8	8.7	31	87	19	6.4	12	21	58	34	14	11
11	3.8	5.4	14	55	16	9.4	84	31	54	43	13	14
12	3.8	4.1	7.4	31	9.4	9.0	88	24	32	28	12	14
13	3.6	7.0	6.4	25	9.4	7.0	24	17	31	43	11	11
14	5.1	58	5.4	26	8.2	10	17	14	119	183	12	12
15	5.7	16	4.8	22	7.8	23	77	21	319	42	14	24
16	4.8	5.7	4.4	18	7.0	193	381	56	100	43	18	65
17	16	6.4	4.8	16	7.0	53	176	330	50	37	12	243
18	6.4	34	4.4	13	7.8	137	87	49	39	78	11	413
19	3.6	17	6.4	9.8	7.0	104	38	65	39	35	14	52
20	5.4	7.4	7.8	9.0	6.4	34	28	58	41	30	14	32
21	5.4	5.7	9.8	12	6.4	21	24	47	60	42	18	27
22	3.8	5.7	8.6	12	6.4	23	91	49	41	27	14	23
23	4.1	6.0	11	11	6.4	36	88	283	32	48	12	18
24	4.4	5.7	17	11	6.4	41	54	153	26	28	11	16
25	3.2	101	324	10	8.2	21	42	100	24	25	11	16
26	3.2	24	29	9.4	7.4	18	45	98	20	23	76	15
27	3.0	11	22	9.4	8.6	14	31	81	19	43	33	14
28	6.8	14	18	9.8	26	12	25	268	26	46	16	16
29	7.4	102	20	10	8.6	12	22	178	20	28	14	14
30	3.6	54	65	10	---	11	22	176	17	23	12	14
31	14	---	43	8.6	---	10	---	104	---	21	14	---
TOTAL	164.8	676.6	919.8	1254.0	274.2	921.3	1779	2482	1658	1547	519	1227
MEAN	5.32	22.6	29.7	40.5	9.46	29.7	59.3	80.1	55.3	49.9	16.7	40.9
MAX	16	102	324	597	26	193	381	330	319	188	76	413
MIN	3.0	4.1	4.4	8.6	6.4	5.7	12	14	17	17	11	11
AC-FT	327	1340	1820	2490	544	1830	3530	4920	3290	3070	1030	2430

CAL YR 1979 TOTAL 8432.6 MEAN 23.1 MAX 607 MIN 3.0 AC-FT 16730
WTR YR 1980 TOTAL 13422.7 MEAN 36.7 MAX 597 MIN 3.0 AC-FT 26620

16097500 HALAULANI STREAM AT ALTITUDE 400 FT (122 M), NEAR KILAUEA

LOCATION.--Lat 22°10'54", long 159°25'17", Hydrologic Unit 20070000, on left bank 0.5 mi (0.8 km) upstream from confluence with Pohakuhonu Stream and 2.3 mi (3.7 km) south of Kilauea.

DRAINAGE AREA.--1.9 mi² (3.08 km²).

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 (119.42 m) above mean sea level (by stadia survey).

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years (water years 1959-80), 11.3 ft³/s (0.320 m³/s), 8,190 acre-ft/yr (10.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,070 ft³/s (58.6 m³/s) Aug. 6, 1959, gage height, 8.30 ft (2.530 m), from rating curve extended above 190 ft³/s (5.38 m³/s) on basis of slope-area measurement of peak flow; minimum, 1.8 ft³/s (0.051 m³/s) Sept. 6-8, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 580 ft³/s (16.4 m³/s) and maximum (*), from rating curve extended above 190 ft³/s (5.38 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 24	2400	*1080	30.6	*6.06	1.847
Sept. 18	0330	677	19.2	4.89	1.490

Minimum discharge, 4.5 ft³/s (0.13 m³/s) Oct. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.4	20	9.3	6.9	5.2	5.0	18	16	23	13	9.5	8.8
2	5.2	18	17	6.4	5.0	4.9	58	12	17	25	10	9.3
3	8.1	14	9.3	6.0	5.0	4.9	19	11	16	29	10	21
4	5.6	9.7	8.1	5.9	5.9	6.4	13	10	22	16	12	15
5	6.0	8.1	7.6	5.8	5.2	20	10	11	13	18	9.5	14
6	5.2	7.5	7.1	5.8	5.2	20	10	11	17	36	8.8	15
7	4.9	7.0	6.8	5.6	7.0	19	16	11	15	56	8.6	10
8	4.9	7.0	6.5	111	5.3	8.6	10	15	11	25	8.4	9.3
9	4.7	7.0	9.8	17	5.0	7.7	9.3	28	12	17	8.6	8.8
10	7.7	7.3	18	18	6.2	8.1	8.5	18	26	14	8.4	8.6
11	5.6	6.4	8.6	11	5.7	9.7	28	16	17	18	7.9	9.5
12	4.9	6.0	7.4	8.4	5.3	8.4	20	13	13	23	7.7	8.6
13	4.7	7.3	6.9	7.7	5.7	7.0	10	16	12	29	7.7	8.4
14	4.9	19	6.5	7.3	5.2	7.3	10	12	27	66	8.1	7.9
15	6.2	8.8	6.3	7.1	5.7	18	28	13	76	18	9.3	17
16	5.0	7.7	6.1	6.8	5.0	74	105	28	26	26	9.0	21
17	8.1	7.9	6.0	6.5	4.9	41	43	50	16	18	8.1	48
18	5.6	27	5.8	6.8	4.7	70	26	16	14	33	7.9	95
19	5.2	14	5.7	6.2	4.7	53	15	19	16	15	8.1	16
20	5.7	10	5.5	6.0	4.7	20	12	17	17	12	7.9	12
21	5.4	8.4	5.5	7.5	4.7	14	11	17	25	13	8.6	11
22	5.0	8.1	5.7	6.0	4.6	15	20	25	14	12	7.5	10
23	5.3	7.1	5.8	5.9	4.6	23	23	26	12	25	7.3	9.3
24	5.2	7.3	58	5.7	4.6	19	25	30	11	14	7.5	9.0
25	4.7	26	71	5.6	5.3	16	20	19	10	11	7.3	8.6
26	4.6	9.9	11	5.6	4.7	13	20	30	9.9	13	29	8.4
27	4.6	8.7	8.9	5.4	5.0	12	12	19	9.9	25	13	8.1
28	5.0	10	7.5	5.4	10	11	11	42	11	21	10	8.2
29	4.7	26	6.8	5.4	5.6	9.7	10	24	9.5	14	10	8.0
30	5.0	14	14	5.4	---	9.1	10	35	9.3	11	9.7	7.7
31	10	---	8.0	5.3	---	8.4	---	23	---	10	9.5	---
TOTAL	173.1	345.2	366.5	325.4	155.7	563.2	630.8	633	527.6	676	294.9	451.5
MEAN	5.58	11.5	11.8	10.5	5.37	18.2	21.0	20.4	17.6	21.8	9.51	15.1
MAX	10	27	71	111	10	74	105	50	76	66	29	95
MIN	4.6	6.0	5.5	5.3	4.6	4.9	8.5	10	9.3	10	7.3	7.7
AC-FT	343	685	727	645	309	1120	1250	1260	1050	1340	585	896

CAL YR 1979 TOTAL 3542.0 MEAN 9.70 MAX 83 MIN 4.3 AC-FT 7030
WTR YR 1980 TOTAL 5142.9 MEAN 14.1 MAX 111 MIN 4.6 AC-FT 10200

16100000 HANALEI TUNNEL OUTLET NEAR LIHUE

LOCATION.--Lat 22°05'03" (revised), long 159°27'51", Hydrologic Unit 2007000, on left bank at outlet of Hanalei tunnel, 2.2 mi (3.5 km) downstream from intake on Kaapoko Stream, and 9.4 mi (15.1 km) northwest of Lihue.

PERIOD OF RECORD.--July 1932 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,210 ft (369 m), from tunnel-profile.

REMARKS.--Records good. Tunnel diverts water from Kaapoko Stream and Hanalei River into North Branch of North Fork Wailua River, from which it is later diverted for irrigation in vicinity of Lihue and Kapaa. Prior to Feb. 24, 1976 records do not include water by-passing at times above station.

AVERAGE DISCHARGE.--48 years, 27.3 ft^3/s (0.773 m^3/s), 19,780 acre-ft (24.4 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 99 ft^3/s (2.80 m^3/s) Apr. 11, 25, 26, 1942; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 63 ft^3/s (1.78 m^3/s) Mar. 18, 19; minimum daily, 14.0 ft^3/s (0.396 m^3/s) Jan. 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	51	26	18	18	20	36	34	56	26	21	23
2	25	48	35	18	18	19	56	26	53	32	23	23
3	34	42	27	18	18	18	44	32	42	39	22	29
4	26	39	28	18	19	29	38	30	48	27	23	30
5	32	36	26	18	19	35	33	38	38	29	23	32
6	25	42	25	18	20	34	35	33	44	33	21	32
7	24	38	24	18	20	48	35	34	41	41	22	25
8	30	41	24	56	16	30	31	41	35	35	21	24
9	27	38	25	38	17	33	48	51	36	28	22	23
10	23	35	24	41	24	35	35	39	43	26	22	23
11	30	29	23	30	20	43	49	37	40	27	22	30
12	30	26	23	14	20	39	33	38	35	29	21	23
13	27	28	24	22	20	32	21	36	38	41	21	26
14	27	33	25	22	19	37	36	35	49	38	22	23
15	34	33	23	21	19	35	43	44	55	28	26	28
16	29	32	23	22	19	54	56	47	43	34	23	41
17	46	31	22	20	18	59	43	39	31	34	26	30
18	33	39	22	23	18	63	35	38	29	34	23	26
19	35	31	22	20	18	63	32	38	28	26	25	25
20	37	28	21	19	18	44	29	38	28	26	23	24
21	34	27	21	20	18	36	29	39	33	27	25	25
22	30	32	23	18	18	29	50	50	28	25	22	23
23	28	26	24	18	18	51	47	45	26	33	22	23
24	27	36	30	18	20	43	44	41	25	26	21	27
25	25	29	28	18	20	47	42	38	25	21	21	24
26	26	28	23	18	18	39	33	48	25	23	34	23
27	25	26	23	18	22	40	30	58	27	28	28	20
28	28	29	21	18	24	38	30	60	38	38	28	24
29	25	42	17	18	20	34	29	44	24	26	25	23
30	27	32	20	20	---	31	29	51	23	25	26	23
31	44	---	19	18	---	29	---	49	---	24	23	---
TOTAL	917	1027	741	676	556	1187	1131	1271	1086	929	727	775
MEAN	29.6	34.2	23.9	21.8	19.2	38.3	37.7	41.0	36.2	30.0	23.5	25.8
MAX	46	51	35	56	24	63	56	60	56	41	34	41
MIN	23	26	17	14	16	18	21	26	23	21	21	20
AC-FT	1820	2040	1470	1340	1100	2350	2240	2520	2150	1840	1440	1540

CAL YR 1979 TOTAL 10062.65 MEAN 27.6 MAX 60 MIN .25 AC-FT 19960
WTR YR 1980 TOTAL 11023.00 MEAN 30.1 MAX 63 MIN 14 AC-FT 21860

16103000 HANALEI RIVER NEAR HANALEI

LOCATION.--Lat 22°11'31", long 159°27'57", Hydrologic Unit 20070000, on right bank 2.6 mi (4.2 km) southeast of Hanalei School and 4.9 mi (7.9 km) upstream from mouth.

DRAINAGE AREA.--19.1 mi² (49.5 km²).

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 (10.91 m) above mean sea level (by stadia survey). Jan. 1, 1912, to Nov. 20, 1919, nonrecording gage at site 0.2 mi (0.3 km) upstream at different datum. Jan. 26 to Dec. 26, 1962, crest-stage gage at present site and datum.

REMARKS.--Records good. Since 1925, Hanalei tunnel (see sta 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream above station to North Branch of North Fork Wailua River for irrigation. China ditch above station diverts for irrigation of taro in vicinity of Hanalei. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--17 years (water years 1964-80), 217 ft³/s (6.145 m³/s) 157,200 acre-ft/yr (194 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 24,900 ft³/s (705 m³/s), Apr. 19, 1974, gage height, 14.28 ft (4.353 m), from rating curve extended above 9,600 ft³/s (272 m³/s); minimum, 31 ft³/s (0.88 m³/s) Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975 (revised).

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,200 ft³/s (261 m³/s) and maximum (*), from rating curve extended above 9,600 ft³/s (272 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	1400	10140	287	10.47	3.191
June 15	0700	*14040	398	*11.76	3.584

Minimum discharge, 40 ft³/s (1.13 m³/s) Oct. 13, 14, 26, 27, Mar. 2, 3.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	47	700	60	79	46	46	376	188	597	165	123	102
2	46	300	350	70	45	42	1760	158	381	359	130	110
3	96	200	120	66	45	41	486	168	215	579	130	229
4	54	150	200	65	45	68	229	150	437	258	124	253
5	81	90	150	63	44	307	155	175	169	267	116	302
6	55	100	100	63	45	449	135	150	230	595	102	243
7	44	80	86	61	51	534	172	170	209	1030	96	137
8	46	180	80	2110	44	129	109	300	128	370	90	114
9	49	100	90	318	48	147	207	700	120	223	130	105
10	46	150	85	489	275	165	115	180	284	177	137	91
11	60	70	79	187	99	318	1040	190	198	265	102	138
12	47	60	74	125	57	296	527	200	135	240	88	99
13	52	100	70	92	57	151	338	190	151	566	84	106
14	46	250	72	81	51	301	282	150	616	864	100	95
15	72	200	65	77	55	422	925	200	2230	242	117	136
16	49	170	62	74	48	1880	2070	300	585	299	105	463
17	289	150	60	69	46	1360	872	200	260	294	105	283
18	61	400	58	79	44	1880	628	150	219	417	98	390
19	67	120	56	63	44	1540	270	200	215	201	126	137
20	77	80	55	60	44	362	188	277	205	179	95	119
21	62	70	54	66	44	235	160	277	238	211	93	114
22	48	80	56	57	44	273	946	465	175	181	82	103
23	45	150	92	56	43	993	1410	482	139	389	77	92
24	44	80	428	54	43	706	812	509	124	195	75	104
25	42	70	792	53	49	612	524	296	116	155	74	87
26	41	100	137	52	42	322	435	893	107	187	438	79
27	40	90	135	52	48	340	214	676	109	262	210	80
28	50	80	90	51	92	256	172	828	262	354	161	80
29	45	250	77	48	53	168	141	292	120	185	144	73
30	50	120	130	47	---	135	141	561	120	155	138	69
31	400	---	95	46	---	110	---	502	---	132	123	---
TOTAL	2251	4740	4058	4873	1691	14588	15839	10177	9094	9996	3813	4533
MEAN	72.6	158	131	157	58.3	471	528	328	303	322	123	151
MAX	400	700	792	2110	275	1880	2070	893	2230	1030	438	463
MIN	40	60	54	46	42	41	109	150	107	132	74	69
AC-FT	4460	9400	8050	9670	3350	28940	31420	20190	18040	19830	7560	8990

CAL YR 1979 TOTAL 60229 MEAN 165 MAX 2000 MIN 40 AC-FT 119500
WTR YR 1980 TOTAL 85653 MEAN 234 MAX 2230 MIN 40 AC-FT 169900

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 (2.4 km) upstream from Wainiha powerplant intake, and 6.0 mi (9.6 km) southwest of Hanalei.

DRAINAGE AREA.--10.2 mi² (26.4 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 960 ft (293 m), from topographic map.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--25 years (water years, 1953-55, 1959-80), 139 ft³/s (3.936 m³/s), 100,700 acre-ft/yr (124 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 28,100 ft³/s (796 m³/s) Apr. 19, 1974, gage height, 9.47 ft (2.886 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurement at gage height 7.72 ft (2.353 m); minimum, 33.0 ft³/s (0.93 m³/s) Feb. 11, 12, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Feb. 17, 1956, which destroyed the station, reached a stage of 14.1 ft (4.30 m), from floodmarks, discharge, about 40,000 ft³/s (1,130 m³/s), from unit-discharge study.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,600 ft³/s (102 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Mar. 19	0230	3600	102	5.22	1.591
May 26	2030	*4590	130	*5.58	1.701

Minimum discharge, 35 ft³/s (0.99 m³/s) Feb. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	42	557	67	51	40	42	192	130	144	124	78	70
2	42	251	351	48	40	37	808	88	218	242	100	77
3	119	129	129	44	39	36	200	101	110	336	92	158
4	54	105	222	43	38	78	101	90	380	132	81	195
5	76	96	136	45	37	144	68	100	97	158	68	225
6	45	113	80	49	38	150	74	85	183	454	63	198
7	42	79	65	45	43	297	100	102	141	739	61	82
8	124	197	58	815	40	68	56	193	82	132	61	68
9	76	109	65	131	38	141	151	418	83	101	61	64
10	47	128	57	306	57	183	60	114	251	87	67	65
11	71	74	51	127	49	257	540	119	159	159	62	137
12	56	60	49	68	42	173	362	145	97	124	58	70
13	50	106	59	54	45	88	187	115	121	355	57	104
14	62	271	106	56	40	165	181	74	376	202	87	71
15	98	250	62	51	42	167	417	125	1080	94	108	94
16	57	195	57	55	51	891	1150	192	384	171	80	198
17	379	160	49	49	41	1080	318	96	119	210	108	92
18	67	324	45	82	38	886	138	83	101	215	82	69
19	102	126	43	49	36	856	86	131	97	105	113	67
20	134	88	42	46	36	144	68	133	89	109	74	69
21	88	68	42	49	36	108	82	150	107	132	76	87
22	59	86	50	45	36	103	863	266	78	94	62	69
23	53	161	84	43	35	953	673	267	70	161	61	58
24	50	84	182	42	46	390	357	146	65	101	58	70
25	46	73	224	40	47	487	319	97	65	76	60	58
26	45	106	100	40	37	188	242	660	67	102	324	55
27	46	94	103	40	56	177	94	885	90	134	138	54
28	44	78	63	49	68	140	82	569	185	153	122	64
29	43	221	55	51	45	99	75	166	80	113	92	56
30	51	121	56	66	---	72	82	320	90	86	124	53
31	302	---	57	42	---	60	---	138	---	75	81	---
TOTAL	2570	4510	2809	2721	1236	8660	8126	6298	5209	5476	2759	2797
MEAN	82.9	150	90.6	87.8	42.6	279	271	203	174	177	89.0	93.2
MAX	379	557	351	815	68	1080	1150	885	1080	739	324	225
MIN	42	60	42	40	35	36	56	74	65	75	57	53
AC-FT	5100	8950	5570	5400	2450	17180	16120	12490	10330	10860	5470	5550

CAL YR 1979 TOTAL 43138 MEAN 118 MAX 1200 MIN 40 AC-FT 85560
WTR YR 1980 TOTAL 53171 MEAN 145 MAX 1150 MIN 35 AC-FT 105500

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 (43 m) upstream from Mauka ditch intake and Right Branch, and 4.5 mi (7.2 km) northeast of Wahiawa.

DRAINAGE AREA.--1.38 mi² (3.57 km²).

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. Altitude of gage is 1,150 ft (351 m), from topographic map.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--57 years (water years, 1914-24, 1927-52, 1961-80), 16.5 ft³/s (0.467 m³/s), 11,950 acre-ft/yr (14.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,490 ft³/s (155 m³/s) Jan. 1, 1933, gage height, 11.7 ft (3.57 m), from floodmarks, from rating curve extended above 68 ft³/s (1.93 m³/s) by test of model of station site; maximum gage height, 12.46 ft (3.798 m) Apr. 15, 1963; minimum, 0.12 ft³/s (0.003 m³/s) Mar. 2, 13, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft³/s (36.8 m³/s) and maximum (*), from rating rating curve as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0145	1680	47.6	6.96	2.121	Mar. 16	0315	1480	41.9	6.61	2.015
Jan. 8	0930	2230	63.2	7.89	2.405	Mar. 18	1730	*3050	86.4	*9.25	2.819

Minimum discharge, 0.40 ft³/s (0.011 m³/s) Feb. 22, 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15	63	3.0	2.8	1.3	5.6	59	54	50	19	21	30
2	8.6	17	13	2.3	1.2	1.3	86	12	16	33	19	8.0
3	21	8.3	3.6	2.0	1.1	.85	14	41	11	18	17	10
4	3.8	9.9	2.8	1.7	1.0	1.4	13	12	29	12	11	19
5	37	4.0	2.6	1.6	1.0	2.6	11	32	10	13	40	12
6	6.7	3.4	2.3	1.6	.90	89	43	34	40	51	15	15
7	3.5	2.7	2.9	2.7	5.0	24	34	14	12	51	23	6.6
8	6.5	9.1	2.2	238	1.3	5.0	11	10	15	13	14	5.9
9	3.1	3.5	2.0	17	.90	4.0	13	31	24	15	12	5.1
10	2.2	4.3	2.0	102	.80	8.4	37	15	47	11	7.8	6.4
11	2.4	7.9	2.1	22	.85	63	26	11	13	10	6.8	31
12	1.7	3.0	1.7	6.8	1.4	12	18	10	10	72	6.4	6.4
13	1.6	7.9	1.6	4.9	1.9	27	34	22	26	34	6.3	34
14	1.5	30	1.6	4.4	1.2	67	66	9.8	130	17	28	7.6
15	4.1	19	1.5	4.1	.95	13	82	23	49	11	7.3	35
16	5.0	4.0	1.3	3.2	.80	263	35	46	16	11	9.5	14
17	20	9.2	1.3	3.0	.64	270	30	12	11	11	6.4	8.3
18	2.6	66	1.3	7.9	.52	444	31	11	9.8	45	7.7	7.9
19	11	31	1.1	2.7	.49	259	25	8.0	10	8.8	19	5.9
20	15	23	1.0	2.3	.46	33	14	7.3	14	7.6	14	5.7
21	5.9	6.6	1.0	2.4	.43	20	17	22	22	11	7.0	16
22	5.0	23	1.9	2.3	.40	30	60	40	7.6	43	5.1	5.1
23	2.8	29	3.0	1.9	.52	52	41	9.4	6.6	33	4.6	4.4
24	2.5	10	54	1.7	.68	23	37	30	5.9	15	13	4.0
25	2.0	5.3	123	1.6	.80	19	23	35	8.8	8.0	15	3.8
26	1.7	4.6	4.0	1.6	.52	62	17	33	5.5	30	47	6.1
27	1.8	4.1	4.7	1.4	7.2	124	12	40	27	88	18	3.8
28	1.6	3.6	2.5	1.6	30	25	11	75	11	27	18	3.2
29	1.7	3.4	13	2.3	13	16	18	23	8.8	50	9.2	3.1
30	1.7	3.1	26	3.2	---	13	15	11	11	26	52	3.0
31	35	---	4.4	1.7	---	12	---	12	---	12	19	---
TOTAL	234.0	418.9	288.4	459.7	77.26	1989.15	933	742.5	657.0	806.4	499.1	326.3
MEAN	7.55	14.0	9.30	14.7	2.66	64.2	31.1	24.0	21.9	26.0	16.1	10.9
MAX	37	66	123	238	30	444	86	75	130	88	52	35
MIN	1.5	2.7	1.0	1.4	.40	.85	11	7.3	5.5	7.6	4.6	3.0
AC-FT	464	831	572	902	153	3950	1850	1470	1300	1600	990	647

CAL YR 1979 TOTAL 4460.05 MEAN 12.2 MAX 189 MIN .85 AC-FT 8850
WTR YR 1980 TOTAL 7426.71 MEAN 20.3 MAX 444 MIN .40 AC-FT 14730

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 (3.7 km) east of Wahiawa Post Office, and 7.1 mi (11.4 km) north of Waipahu.

DRAINAGE AREA.--4.04 mi² (10.46 km²).

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 (262.235 m) above mean sea level. July 1, 1963, to June 30, 1964, crest-stage gage at same site and datum.

REMARKS.--Records fair except for the period of no gage-height record, which are poor. Prior to 1960, diversions from reservoirs above station for use at Schofield Barracks. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since termination of diversions to Schofield Barracks).--18 years (water years, 1961-62, (1965-80), 22.1 ft³/s (0.626 m³/s), 16,010 acre-ft/yr (19.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,460 ft³/s (155 m³/s) Apr. 15, 1963, gage height, 11.33 ft (3.453 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of computation of peak flow over dam; no flow Dec. 24, 25, 27, 28, 1960, Feb. 23, 24, 1963, and many days in 1977, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft³/s (31.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	1900	1540	43.6	5.85	1.783
Mar. 16	0530	1230	34.8	5.34	1.628
Mar. 18	2300	*2960	83.8	*7.98	2.432

Minimum discharge, 0.61 ft³/s (0.017 m³/s) Feb. 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	90	3.4	3.3	2.9	14	68	175	80	32	50	62
2	11	25	24	2.3	2.3	3.3	212	39	29	70	42	13
3	18	12	9.3	1.7	2.0	4.4	34	65	21	43	29	12
4	4.7	13	3.8	1.4	1.7	1.0	27	32	50	33	21	35
5	17	5.0	3.4	1.2	1.6	2.0	21	43	20	22	100	17
6	5.0	3.4	2.8	1.1	1.5	61	42	42	66	103	38	12
7	3.3	2.6	2.5	1.6	2.0	26	32	23	24	120	45	9.0
8	6.0	12	3.0	330	3.5	6.7	20	20	30	28	20	7.9
9	3.5	3.6	2.3	62	1.7	15	16	32	45	19	18	7.3
10	2.3	6.0	2.2	194	1.3	7.2	57	23	78	16	14	7.0
11	2.5	10	2.2	66	1.2	27	41	20	27	30	12	16
12	1.8	2.8	2.1	18	1.1	30	66	28	20	87	11	9.7
13	1.7	3.4	1.7	12	1.2	56	75	55	32	25	11	17
14	1.6	32	1.5	9.2	1.2	138	116	19	243	27	30	9.5
15	4.0	36	1.3	8.4	1.2	30	135	19	91	17	16	21
16	8.0	5.5	1.4	6.5	1.2	386	92	45	37	15	12	13
17	20	13	1.4	5.7	.94	340	117	21	27	16	9.9	11
18	2.6	96	1.1	16	.81	547	87	19	23	60	16	10
19	10	42	.99	6.0	.74	657	92	16	22	17	33	7.1
20	18	74	.91	4.6	.68	94	42	14	26	14	24	7.8
21	8.0	15	.87	4.3	.66	54	39	35	32	30	19	5.4
22	5.8	10	.89	4.3	.66	67	168	45	16	91	9.3	5.5
23	3.6	10	1.0	3.5	.72	137	129	20	14	30	8.0	4.3
24	3.2	11	14	3.5	.86	82	117	45	13	19	28	4.0
25	2.0	5.8	203	3.3	.98	68	92	56	21	14	27	3.8
26	1.8	4.9	7.8	3.1	.77	44	67	51	13	25	25	6.1
27	1.9	4.5	7.5	3.0	1.6	166	38	81	20	50	15	5.4
28	1.7	4.0	4.3	3.5	15	60	32	120	14	19	10	3.8
29	1.8	4.5	7.6	5.4	17	38	30	50	12	19	12	3.4
30	1.9	4.2	30	13	---	30	37	30	12	31	60	3.1
31	40	---	7.5	4.8	---	27	---	23	---	15	14	---
TOTAL	213.65	561.2	355.76	802.7	69.02	3215.6	2137	1306	1158	1137	779.2	349.1
MEAN	6.89	18.7	11.5	25.9	2.38	104	71.2	42.1	38.6	36.7	25.1	11.6
MAX	40	96	203	330	17	657	212	175	243	120	100	62
MIN	.95	2.6	.87	1.1	.66	1.0	16	14	12	14	8.0	3.1
AC-FT	424	1110	706	1590	137	6380	4240	2590	2300	2260	1550	692

CAL YR 1979 TOTAL 5791.03 MEAN 15.9 MAX 361 MIN .58 AC-FT 11490
WTR YR 1980 TOTAL 12084.23 MEAN 33.0 MAX 657 MIN .66 AC-FT 23970

NOTE.--No gage-height record Oct. 8 to Nov. 13.

16210900 POAMOHO TUNNEL NEAR WAHIAWA

LOCATION.--Lat 21°31'12", long 157°58'51", Hydrologic Unit 20060000, on left bank 5 ft (2 m) downstream from tunnel outlet and 3.6 mi (5.8 km) northeast of Wahiawa Post Office.

PERIOD OF RECORD.--July 1958 to December 1979 (discontinued).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (341 m), from topographic map.

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

AVERAGE DISCHARGE.--21 years, 4.85 ft^3/s (0.137 m^3/s), 3,510 acre-ft/yr (4.33 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 265 ft^3/s (7.50 m^3/s) Mar. 16, 1968; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge during period October to December 1979, 38 ft^3/s (1.08 m^3/s) Nov. 1; minimum daily, 0.23 ft^3/s (0.007 m^3/s) Oct. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1979 TO DECEMBER 1979
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.74	38	.88									
2	2.5	27	8.9									
3	7.1	2.0	3.0									
4	1.9	5.1	1.2									
5	17	2.0	1.1									
6	5.2	1.6	.93									
7	3.4	1.1	.93									
8	4.2	3.6	.98									
9	1.7	1.8	.88									
10	.98	1.3	.93									
11	.74	2.7	.70									
12	.62	1.4	.62									
13	.41	3.1	.54									
14	.34	13	.50									
15	.32	14	.47									
16	.62	2.1	.41									
17	7.2	3.1	.38									
18	1.1	10	.36									
19	1.1	15	.34									
20	1.2	8.3	.27									
21	2.3	3.0	.27									
22	1.4	6.4	.30									
23	1.0	3.6	.58									
24	.66	4.6	6.0									
25	.47	1.8	29									
26	.34	1.4	2.2									
27	.31	1.3	1.9									
28	.74	1.1	1.4									
29	.32	1.1	2.3									
30	.23	1.0	9.5									
31	6.3	---	2.5									
TOTAL	72.44	181.5	80.27									
MEAN	2.34	6.05	2.59									
MAX	17	38	29									
MIN	.23	1.0	.27									
AC-FT	144	360	159									

CAL YR 1979 TOTAL 1715.02 MEAN 4.70 MAX 52. MIN .09 AC-FT 3400

16211600 MAKAHA STREAM NEAR MAKAHA

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, on right bank 1.5 mi (2.4 km) northeast of Kaneaki Heiau and 3.4 mi (5.5 km) northeast of Makaha.

DRAINAGE AREA.--2.31 mi² (5.98 km²).

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 (286.097 m) above mean sea level (Waianae Plantation bench mark).

REMARKS.--Records good. Wells and water-development tunnels in the vicinity and above the station may affect low-flow records. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 1.91 ft³/s (0.054 m³/s), 1,380 acre-ft/yr (1.70 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,170 ft³/s (33.1 m³/s) Mar. 13, 1962, gage height, 6.50 ft (1.981 m), from floodmarks, from rating curve extended above 51 ft³/s (1.44 m³/s) on basis of slope-area measurement of peak flow; no flow at times.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum stage known since at least 1953, about 7.8 ft (2.38 m) Nov. 24, 1954, from information by local resident. Discharge, about 1,700 ft³/s (48.1 m³/s).

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 178 ft³/s (5.04 m³/s) Jan. 8, gage height, 3.29 ft (1.003 m), from rating curve extended as explained above, no peak above base of 200 ft³/s (5.66 m³/s); minimum, 0.02 ft³/s (0.001 m³/s), Oct. 1, 3, 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	4.0	.45	.85	3.1	4.2	1.6	3.1	5.7	.58	.62	.16
2	.04	1.4	1.5	.80	2.4	2.8	2.7	2.2	3.4	1.0	.73	.15
3	.03	.68	1.5	.69	1.9	2.2	1.6	2.4	2.3	1.0	.55	.16
4	.02	.54	.85	.57	1.7	1.8	1.3	2.2	2.0	.89	.46	.16
5	.03	.44	.72	.52	1.5	1.8	1.2	1.7	1.6	.81	.42	.16
6	.03	.38	.63	.49	1.3	1.8	1.1	1.5	1.4	1.2	.47	.14
7	.05	.33	.53	.58	1.2	1.6	1.1	1.4	1.4	1.6	.42	.14
8	.13	.46	.46	15	.99	1.2	1.0	1.2	1.2	.98	.42	.13
9	.18	.72	.43	4.1	.73	1.1	.97	1.5	1.0	.74	.41	.12
10	.30	1.4	2.8	7.8	.77	1.0	.92	1.3	.93	.63	.41	.12
11	.33	1.3	1.2	3.7	.91	.96	1.4	1.2	.86	.57	.37	.13
12	.32	.89	.80	4.2	.90	1.3	2.9	1.1	.83	.64	.37	.12
13	.31	.81	.68	3.9	1.0	1.1	2.1	.97	.89	.76	.33	.12
14	.28	1.2	.70	3.5	.93	1.4	2.7	.92	2.2	.85	.33	.12
15	.24	1.4	.77	3.2	.82	1.2	5.5	.94	8.4	.81	.33	.13
16	.21	.86	.66	2.3	1.3	6.6	5.0	1.1	2.4	.63	.31	.13
17	.17	.69	.92	1.9	.93	6.1	3.7	1.1	1.5	.60	.30	.18
18	.14	.85	.72	2.2	.76	11	3.5	.89	1.2	.88	.27	.22
19	.12	.84	.58	1.6	.69	11	3.1	.81	1.1	.65	.26	.31
20	.11	.74	.48	1.3	.63	6.7	2.1	.76	1.3	.52	.24	.29
21	.09	.63	.41	2.9	.60	4.0	2.4	.75	1.1	.52	.24	.26
22	.08	.53	.37	2.4	.57	3.3	11	.78	.97	.66	.23	.23
23	.08	.46	.33	1.6	1.9	5.5	12	.82	.88	.89	.22	.20
24	.06	.39	.34	1.3	3.3	5.1	6.7	.75	.81	.60	.20	.19
25	.06	.67	4.2	1.2	2.8	4.5	5.8	.70	.75	.48	.20	.18
26	.06	1.2	1.3	1.1	1.6	3.4	4.1	.78	.70	.45	.21	.18
27	.06	1.2	1.2	1.0	5.2	2.7	3.2	1.0	.67	.54	.20	.18
28	.05	.78	.87	1.7	7.0	2.3	2.7	1.7	.65	.61	.20	.17
29	.06	.66	1.1	3.8	6.3	1.9	2.4	8.5	.65	.49	.18	.16
30	.05	.64	1.5	5.3	---	1.7	2.1	3.8	.63	.42	.17	.14
31	.11	---	1.0	3.6	---	1.6	---	9.9	---	.42	.16	---
TOTAL	3.84	26.99	30.00	85.10	53.72	102.86	97.89	57.77	49.42	22.42	10.23	5.08
MEAN	.12	.90	.97	2.75	1.85	3.32	3.26	1.86	1.65	.72	.33	.17
MAX	.33	4.0	4.2	15	7.0	11	12	9.9	8.4	1.6	.73	.31
MIN	.02	.33	.33	.49	.57	.96	.92	.70	.63	.42	.16	.12
AC-FT	7.6	54	60	169	107	204	194	115	98	44	20	10

CAL YR 1979 TOTAL 803.03 MEAN 2.20 MAX 113 MIN .02 AC-FT 1590
WTR YR 1980 TOTAL 545.32 MEAN 1.49 MAX 15 MIN .02 AC-FT 1080

16212800 KIPAPA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°28'13", long 157°57'40", Hydrologic Unit 20060000, on left bank 1,700 ft (520 m) downstream from forest-reserve boundary, 4.9 mi (7.9 km) southeast of Wahiawa Post Office, and 6.3 mi (10.1 km) northeast of Waipahu.

DRAINAGE AREA.--4.29 mi² (11.11 km²).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder. Altitude of gage is 690 ft (210 m), from topographic map.

REMARKS.--Records 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.--23 years, 10.8 ft³/s (0.306 m³/s), 7,820 acre-ft/yr (9.64 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,680 ft³/s (161 m³/s) May 14, 1963, gage height, 12.29 ft (3.746 m), from rating curve extended above 300 ft³/s (8.50 m³/s) on basis of slope-area measurements at gage heights 7.96 ft (2.426 m) and 12.29 ft (3.746 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 930 ft³/s (26.3 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0200	1670	47.3	8.36	2.548	Mar. 16	0430	1910	54.1	8.76	2.670
Jan. 8	1730	2620	74.2	9.71	2.960	Mar. 19	0330	*5300	150	*12.08	3.682

Minimum discharge, 0.27 ft³/s (0.008 m³/s) Oct. 1, 2, 28, 29.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.33	86	.54	2.7	2.1	5.9	43	45	35	6.0	34	9.1
2	2.2	12	25	1.7	1.4	1.8	80	9.8	12	15	22	2.9
3	12	4.6	6.2	1.2	1.2	.82	12	28	6.5	8.0	7.4	3.6
4	2.2	2.9	1.8	.96	1.0	.59	7.7	9.4	20	8.6	4.3	27
5	6.2	1.8	2.1	.82	.89	.64	5.6	29	6.2	4.8	36	5.9
6	1.3	1.1	1.3	.76	3.4	14	40	26	12	41	8.5	5.9
7	.54	.76	1.2	3.2	12	6.9	17	8.0	13	54	3.9	2.5
8	18	7.4	1.2	327	2.2	2.0	8.0	6.2	4.3	12	4.6	1.7
9	2.1	2.2	.76	43	1.0	1.7	8.3	13	14	6.7	4.8	1.4
10	.70	.89	2.0	183	.76	2.0	30	7.0	48	4.3	2.9	1.3
11	1.8	5.6	2.0	48	.64	19	24	6.2	8.0	18	2.1	9.9
12	.64	2.5	1.0	13	.59	15	35	5.6	4.8	25	1.8	3.4
13	.37	3.4	.64	7.7	.76	8.8	42	6.2	26	17	1.8	6.2
14	.33	17	.54	5.4	.70	46	30	4.1	130	16	11	3.4
15	.37	30	.49	4.3	.59	8.8	77	5.6	48	7.0	3.4	38
16	.41	3.2	.41	3.4	.54	182	35	52	13	3.9	2.2	6.7
17	8.2	7.6	.37	2.9	.49	356	31	11	8.0	4.6	1.7	5.1
18	1.6	33	.37	28	.45	508	26	5.1	5.6	25	7.1	11
19	1.3	21	.37	3.8	.41	672	24	4.3	5.1	4.3	5.1	3.3
20	4.7	26	.37	2.7	.41	54	10	3.4	5.9	3.2	6.1	3.2
21	4.9	4.8	.37	2.7	.37	30	14	3.0	19	3.0	6.9	1.5
22	1.3	3.8	.45	2.4	.37	40	93	44	4.1	20	2.0	1.3
23	1.0	3.2	.59	1.7	.45	45	61	7.8	3.4	7.0	1.6	1.0
24	.54	2.7	40	1.6	1.0	20	23	13	3.0	8.1	2.1	.96
25	.37	2.0	176	1.5	2.2	25	23	7.2	2.9	3.9	15	.89
26	.33	1.2	8.7	1.4	.89	12	17	22	2.9	6.4	12	5.1
27	.30	1.0	6.2	1.4	9.3	28	8.0	9.5	7.1	33	5.0	2.5
28	.27	.82	2.9	2.9	13	18	6.7	34	3.4	6.5	5.1	1.1
29	.45	.76	8.3	7.4	8.6	9.8	6.2	44	2.9	5.9	8.0	.76
30	4.3	.64	33	21	---	7.4	7.0	8.4	2.7	33	29	.70
31	20	---	5.6	3.6	---	6.2	---	13	---	4.8	4.3	---
TOTAL	99.05	289.87	330.77	731.14	67.71	2147.35	844.5	490.8	472.8	416.0	261.7	167.31
MEAN	3.20	9.66	10.7	23.6	2.33	69.3	28.2	15.8	15.8	13.4	8.44	5.58
MAX	20	86	176	327	13	672	93	52	130	54	36	38
MIN	.27	.64	.37	.76	.37	.59	5.6	3.0	2.7	3.0	1.6	.70
AC-FT	196	575	656	1450	134	4260	1680	974	938	825	519	332

CAL YR 1979 TOTAL 3129.54 MEAN 8.57 MAX 254 MIN .17 AC-FT 6210
WTR YR 1980 TOTAL 6319.00 MEAN 17.3 MAX 672 MIN .27 AC-FT 12530

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1970-73, February 1973 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1973 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since February 1973.

REMARKS.--In addition to the sediment sampler record, water-quality samples were collected at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,330 mg/L Mar. 19, 1980; minimum daily mean, 0 mg/L on many days each year.
SEDIMENT DISCHARGE: Maximum daily 5,580 tons (5,070 tonnes) Mar. 19, 1980; minimum daily, 0 ton (0 tonne) on many days in 1973 to 1979.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 1,330 mg/L Mar. 19; minimum daily mean, 2 mg/L on many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 5,580 tons (5,070 tonnes) Mar. 19; minimum daily, 0 ton (0 tonne) on many days during the year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
OCT					
24...	1310	.54	65	7.8	25.0
NOV					
01...	0200	2420	--	--	--
23...	1500	2.9	63	7.1	23.5
JAN					
03...	1350	1.3	60	6.7	19.5
FEB					
11...	1305	.69	55	7.0	22.5
MAR					
13...	1330	9.2	83	7.4	22.0
19...	0630	1380	--	--	--
27...	1345	9.7	75	6.7	22.0
MAY					
23...	1305	5.6	80	6.7	23.5
JUN					
25...	1430	2.7	70	6.7	26.5
JUL					
29...	1410	3.1	87	6.9	27.0
SEP					
25...	1230	.73	65	7.2	27.0

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM
OCT							
24...	1310	.54	--	--	--	--	--
NOV							
01...	0200	2420	1800	11800	32	50	--
23...	1500	2.9	--	--	--	--	--
JAN							
03...	1350	1.3	--	--	--	--	--
FEB							
11...	1305	.69	--	--	--	--	--
MAR							
13...	1330	9.2	--	--	--	--	--
19...	0630	1380	6760	25200	30	36	57
27...	1345	9.7	--	--	--	--	--
MAY							
23...	1305	5.6	--	--	--	--	--
JUN							
25...	1430	2.7	--	--	--	--	--
JUL							
29...	1410	3.1	--	--	--	--	--
SEP							
25...	1230	.73	--	--	--	--	--

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

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	.33	3	.00	86	442	177	.54	3	.00
2	2.2	6	.04	12	30	.97	25	53	9.7
3	12	30	.97	4.6	12	.15	6.2	12	.20
4	2.2	18	.11	2.9	8	.06	1.8	6	.03
5	6.2	15	.25	1.8	6	.03	2.1	10	.06
6	1.3	12	.04	1.1	5	.01	1.3	6	.02
7	.54	8	.01	.76	5	.01	1.2	8	.03
8	18	187	23	7.4	25	.50	1.2	8	.03
9	2.1	60	.34	2.2	12	.07	.76	5	.01
10	.70	25	.05	.89	8	.02	2.0	6	.03
11	1.8	20	.10	5.6	12	.18	2.0	5	.03
12	.64	15	.03	2.5	8	.05	1.0	3	.00
13	.37	8	.00	3.4	10	.09	.64	3	.00
14	.33	8	.00	17	45	2.1	.54	2	.00
15	.37	7	.00	30	57	7.4	.89	2	.00
16	.41	6	.00	3.2	12	.10	.41	2	.00
17	8.2	80	1.8	7.6	15	.31	.37	2	.00
18	1.6	20	.09	33	104	23	.37	2	.00
19	1.3	12	.04	21	40	2.3	.37	2	.00
20	4.7	12	.15	26	45	3.2	.37	2	.00
21	4.9	10	.13	4.8	15	.19	.37	3	.00
22	1.3	8	.03	3.8	15	.15	.85	5	.00
23	1.0	5	.01	3.2	8	.07	.59	5	.00
24	.54	5	.00	2.7	8	.06	40	94	69
25	.37	5	.00	2.0	8	.04	176	405	644
26	.33	5	.00	1.2	5	.02	8.7	12	.28
27	.30	5	.00	1.0	5	.01	6.2	8	.13
28	.27	5	.00	.82	3	.00	2.9	5	.04
29	.85	15	.02	.76	3	.00	8.3	12	.27
30	4.3	25	.29	.64	3	.00	33	25	2.2
31	20	116	17	---	---	---	5.6	10	.15
TOTAL	99.05	---	44.50	289.87	---	218.09	330.77	---	726.21
		JANUARY			FEBRUARY			MARCH	
1	2.7	7	.05	2.1	7	.04	5.9	6	.10
2	1.7	5	.02	1.4	5	.02	1.8	4	.02
3	1.2	4	.01	1.2	4	.01	.82	3	.00
4	.96	4	.01	1.0	3	.00	.59	3	.00
5	.82	4	.00	.89	3	.00	.64	3	.00
6	.76	4	.00	3.4	5	.05	14	12	.45
7	3.2	15	.13	12	20	.65	6.9	8	.15
8	327	1110	2250	2.2	8	.05	2.0	5	.03
9	43	66	18	1.0	6	.02	1.7	8	.04
10	183	157	109	.76	5	.01	2.0	8	.04
11	48	25	3.2	.64	4	.00	19	29	3.3
12	13	8	.28	.59	4	.00	15	25	1.0
13	7.7	6	.12	.76	4	.00	8.8	25	.59
14	5.4	6	.09	.70	4	.00	46	67	15
15	4.3	6	.07	.59	3	.00	8.8	15	.36
16	3.4	6	.06	.54	3	.00	182	570	459
17	2.9	6	.05	.49	3	.00	356	169	218
18	28	76	11	.45	3	.00	508	690	2960
19	3.8	12	.12	.41	2	.00	672	1330	5580
20	2.7	8	.06	.41	2	.00	54	80	12
21	2.7	6	.04	.37	2	.00	30	50	4.1
22	2.4	5	.03	.37	2	.00	40	60	6.5
23	1.7	4	.02	.45	3	.00	45	70	8.5
24	1.6	4	.02	1.0	5	.01	20	30	1.6
25	1.5	4	.02	2.2	8	.05	25	50	3.4
26	1.4	3	.01	.89	4	.00	12	20	.65
27	1.4	3	.01	9.3	12	.30	28	74	13
28	2.9	6	.05	13	15	.53	18	45	2.2
29	7.4	12	.24	8.6	8	.19	9.8	15	.40
30	21	73	6.5	---	---	---	7.4	8	.16
31	3.6	10	.10	---	---	---	6.2	6	.10
TOTAL	731.14	---	2395.31	67.71	---	1.93	2147.35	---	9290.69

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM
OCT						
24...	--	--	--	--	--	--
NOV						
01...	80	--	97	99	--	100
23...	--	--	--	--	--	--
JAN						
03...	--	--	--	--	--	--
FEB						
11...	--	--	--	--	--	--
MAR						
13...	--	--	--	--	--	--
19...	86	88	93	96	99	100
27...	--	--	--	--	--	--
MAY						
23...	--	--	--	--	--	--
JUN						
25...	--	--	--	--	--	--
JUL						
24...	--	--	--	--	--	--
SEP						
25...	--	--	--	--	--	--

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

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	43	133	68	45	90	11	35	210	46
2	80	215	66	9.8	15	.40	12	90	2.9
3	12	18	.58	28	35	2.6	6.5	25	.44
4	7.7	3	.06	9.4	15	.38	20	56	4.0
5	5.6	2	.03	29	39	6.1	6.2	20	.33
6	40	95	16	26	35	2.5	12	60	1.9
7	17	55	2.5	8.0	16	.35	13	50	1.8
8	8.0	15	.32	6.2	10	.17	4.3	25	.29
9	8.3	20	.45	13	26	1.1	14	43	5.8
10	30	84	10	7.0	18	.34	48	116	28
11	24	65	4.2	6.2	14	.23	8.0	22	.48
12	35	45	4.3	5.6	10	.15	4.8	10	.13
13	42	40	4.5	6.2	12	.20	26	128	21
14	30	20	1.6	4.1	10	.11	130	434	197
15	77	137	90	5.6	18	.27	44	170	29
16	35	114	14	52	170	38	13	35	1.2
17	31	50	4.2	11	80	2.4	8.0	10	.22
18	26	15	1.1	5.1	20	.28	5.6	6	.09
19	24	10	.65	4.3	12	.14	5.1	5	.07
20	10	8	.22	3.4	8	.07	5.9	4	.06
21	14	10	.38	3.0	6	.05	19	24	1.5
22	93	232	71	44	177	39	4.1	11	.12
23	61	127	26	7.8	70	1.5	3.4	7	.06
24	23	16	.99	13	100	3.5	3.0	5	.04
25	23	18	1.1	7.2	60	1.2	2.9	4	.03
26	17	22	1.0	22	150	8.9	2.9	4	.03
27	8.0	8	.17	9.5	80	2.1	7.1	12	.23
28	6.7	6	.11	34	505	67	3.4	4	.04
29	6.2	5	.08	44	303	45	2.9	4	.03
30	7.0	6	.11	8.4	25	.57	2.7	4	.03
31	---	---	---	13	40	1.4	---	---	---
TOTAL	844.5	---	389.65	490.8	---	233.01	472.8	---	342.82
		JULY			AUGUST			SEPTEMBER	
1	6.0	10	.16	34	84	11	9.1	40	.98
2	15	22	1.4	22	50	3.0	2.9	15	.12
3	8.0	16	.35	7.4	20	.40	3.6	12	.12
4	8.6	15	.35	4.3	10	.12	27	123	16
5	4.8	10	.13	36	35	3.8	5.9	30	.98
6	41	116	52	8.5	25	.57	5.9	25	.40
7	54	130	28	3.9	10	.11	2.5	12	.08
8	12	30	.97	4.6	8	.10	1.7	10	.05
9	6.7	15	.27	4.8	7	.09	1.4	8	.03
10	4.3	10	.12	2.9	6	.05	1.3	6	.02
11	18	80	3.9	2.1	6	.03	9.9	35	.94
12	25	110	7.4	1.8	6	.03	3.4	28	.26
13	17	80	3.7	1.8	6	.03	6.2	30	.50
14	16	65	2.8	11	18	.53	3.4	15	.14
15	7.0	20	.38	3.4	12	.11	38	360	77
16	3.9	15	.16	2.2	8	.05	6.7	50	.90
17	4.6	18	.22	1.7	6	.03	5.1	15	.21
18	25	100	6.8	7.1	22	.42	11	50	1.5
19	4.3	25	.29	5.1	24	.33	3.3	30	.27
20	3.2	20	.17	6.1	20	.33	3.2	20	.17
21	3.0	20	.16	6.9	15	.28	1.5	15	.06
22	20	93	8.9	2.0	12	.06	1.3	12	.04
23	7.0	60	1.1	1.6	12	.05	1.0	10	.03
24	8.1	30	.66	2.1	15	.09	.96	8	.02
25	3.9	18	.19	15	35	1.4	.89	6	.01
26	6.4	25	.43	12	30	.97	5.1	12	.17
27	33	184	31	5.0	25	.38	2.5	5	.03
28	6.5	35	.61	5.1	18	.25	1.1	4	.01
29	5.9	30	.48	8.0	20	.43	.76	4	.00
30	33	184	34	29	122	25	.70	4	.00
31	4.8	40	.52	4.3	35	.41	---	---	---
TOTAL	416.0	---	187.62	261.7	---	50.01	167.31	---	100.54
YEAR	6319.00		13980.38						

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 (91 m) upstream from bridge on Highway 90 and 0.3 mi (0.5 km) southwest of sugar refinery at Waipahu.

DRAINAGE AREA.--45.7 mi² (118.4 km²).

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 (0.418 m) above mean sea level. Prior to July 1, 1960, at site 300 ft (91 m) downstream at datum 1.30 ft (0.396 m) higher.

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

AVERAGE DISCHARGE.--27 years (water years, 1953-59, 1961-80), 38.5 ft³/s (1.090 m³/s), 27,890 acre-ft/yr (34.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,600 ft³/s (385 m³/s) Nov. 28, 1954, gage height, 14.82 ft (4.517 m), site and datum then in use, from rating curve extended above 730 ft³/s (20.7 m³/s) on basis of slope-area measurement of peak flow; no flow for part of Feb. 25, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft³/s (36.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0330	1450	41.1	4.91	1.497	Jan. 10	0530	1960	55.5	5.46	1.664
Jan. 8	2000	4700	133	7.85	2.393	Mar. 19	0600	*6220	176	*8.98	2.737

Minimum discharge, 4.2 ft³/s (0.12 m³/s) Dec. 17.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	153	21	24	40	38	31	92	130	22	34	39
2	9.0	61	29	19	30	33	234	51	67	37	81	27
3	9.7	26	42	20	29	27	54	70	25	40	36	13
4	18	21	15	16	31	24	46	61	37	37	26	36
5	11	14	11	17	28	23	40	57	33	44	68	30
6	14	10	10	17	28	24	63	58	31	37	43	21
7	11	9.3	11	25	34	37	51	39	41	186	26	20
8	24	10	11	1270	31	28	37	28	31	48	19	14
9	14	15	14	279	27	23	25	34	29	27	21	13
10	11	15	23	1090	26	21	63	31	95	22	21	11
11	6.8	14	16	329	26	24	35	31	41	34	15	22
12	6.2	15	9.3	82	23	46	117	27	30	50	12	29
13	8.5	11	9.6	58	21	34	107	30	33	41	11	15
14	11	12	10	48	23	120	85	27	246	46	14	20
15	12	60	8.9	44	24	56	126	24	146	26	18	33
16	13	18	8.2	38	26	252	146	62	77	20	19	31
17	15	16	7.8	34	26	547	141	51	52	16	20	88
18	15	54	10	98	24	719	77	28	43	42	15	28
19	13	72	13	44	23	2080	105	24	36	30	16	20
20	14	62	13	38	24	179	61	21	32	24	17	16
21	18	37	14	35	26	92	47	20	49	21	24	19
22	12	29	14	32	27	70	244	44	37	32	16	16
23	9.7	28	13	30	29	118	224	48	29	31	15	8.5
24	13	26	14	29	30	159	82	32	26	18	15	8.2
25	14	27	318	29	26	81	74	37	23	19	19	8.5
26	11	22	43	28	23	53	70	54	22	26	21	8.7
27	11	24	26	28	63	50	47	48	23	51	21	13
28	13	22	21	32	48	78	40	44	29	29	14	16
29	8.0	21	18	38	46	44	33	121	30	18	14	16
30	7.1	20	50	66	---	39	36	39	23	39	36	7.7
31	7.9	---	36	42	---	33	---	43	---	25	45	---
TOTAL	372.9	924.3	859.8	3979	862	5152	2541	1376	1546	1138	772	647.6
MEAN	12.0	30.8	27.7	128	29.7	166	84.7	44.4	51.5	36.7	24.9	21.6
MAX	24	153	318	1270	63	2080	244	121	246	186	81	88
MIN	6.2	9.3	7.8	16	21	21	25	20	22	16	11	7.7
AC-FT	740	1830	1710	7890	1710	10220	5040	2730	3070	2260	1530	1280

CAL YR 1979 TOTAL 13251.3 MEAN 36.3 MAX 1620 MIN 5.7 AC-FT 26280
WTR YR 1980 TOTAL 20170.6 MEAN 55.1 MAX 2080 MIN 6.2 AC-FT 40010

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 current year.
WATER TEMPERATURES: April 1973 to current year.
SUSPENDED SEDIMENT DISCHARGE: July 1972 to current year.

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

REMARKS.--In addition to the water-quality monitor record, water-quality samples were collected once a month.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 730 micromhos/cm June 25, 1979; 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, 10 mg/L many days in 1973, 1974, 1976, 1980.
SEDIMENT DISCHARGE: Maximum daily, 32,200 tons (29,200 tonnes) Apr. 19, 1974; minimum daily, 0.07 ton (0.06 tonne) Sept. 4, Oct. 1, 1975.

EXTREMES FOR CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 634 micromhos/cm Feb. 21; minimum recorded, 76 micromhos/cm Mar. 18.
WATER TEMPERATURES: Maximum recorded, 27.5°C June 21, July 4, 22, Sept. 1; minimum recorded, 18.5°C Dec. 25.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 2,430 mg/L Jan. 8; minimum daily mean 10 mg/L many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 23,700 tons (21,500 tonnes) Mar. 19; minimum daily, 0.32 ton (0.29 tonne) Dec. 17.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
15...	0910	14	580	6.9	24.5	2.8	5.5	780	880	87	33
NOV											
13...	0930	6.6	400	7.2	22.0	3.7	6.2	850	1700	63	18
DEC											
10...	1030	28	440	7.0	22.5	14	5.8	19000	76000	74	17
JAN											
22...	0915	31	400	6.7	20.5	9.0	7.1	1100	2000	66	17
FEB											
19...	0930	19	490	6.8	20.5	.90	7.5	3900	1200	78	16
MAR											
19...	1115	1100	68	6.9	20.0	760	9.8	>56000	K54000	14	6
APR											
29...	0930	31	310	6.8	23.0	3.5	8.2	--	--	52	11
29...	1025	--	--	--	--	--	--	26000	4800	--	--
MAY											
27...	0915	52	180	7.1	23.0	36	7.5	17000	6900	28	11
JUN											
30...	1030	18	480	6.8	24.5	3.9	7.6	7200	6800	71	8
JUL											
28...	1315	24	285	6.7	25.0	29	7.5	5600	9600	44	10
AUG											
25...	1030	10	430	7.1	24.0	5.0	7.3	55000	1900	70	11
SEP											
29...	0945	20	550	7.5	24.5	6.9	7.3	6600	21000	93	24

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	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	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT											
15...	15	12	74	63	3.5	79	4.5	54	27	120	.2
NOV											
13...	11	8.6	54	63	3.0	58	4.2	45	23	69	.2
DEC											
10...	13	10	65	64	3.3	70	5.2	57	23	83	.
JAN											
22...	12	8.8	56	63	3.0	60	3.7	49	23	70	.2
FEB											
19...	13	11	69	64	3.4	73	3.9	62	30	93	.2
MAR											
19...	3.1	1.6	7.8	52	.9	8.7	.9	8	5.4	11	.1
APR											
29...	9.2	7.0	39	58	2.4	--	7.0	41	18	48	.2
MAY											
27...	4.9	3.9	23	62	1.9	--	1.8	17	23	28	.1
JUN											
30...	12	10	60	63	3.1	--	3.8	63	5.7	90	.1
JUL											
28...	7.6	6.1	36	62	2.4	--	2.5	34	13	51	.2
AUG											
25...	12	9.7	60	64	3.1	--	4.0	59	29	79	.2
SEP											
29...	16	13	73	61	3.3	--	5.0	69	26	120	.2

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	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, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
OCT											
15...	59	352	355	.48	13.3	2.4	2.4	.52	.51	.63	.66
NOV											
13...	54	278	267	.39	5.10	3.6	3.5	.17	.18	.21	.23
DEC											
10...	60	307	311	.42	23.2	3.5	3.8	.05	--	.06	--
JAN											
22...	54	284	272	.39	23.8	3.4	3.4	.46	.63	.80	.81
FEB											
19...	62	317	333	.43	16.3	3.3	3.0	--	.14	--	.21
MAR											
19...	5.3	49	42	.07	146	.35	.34	.23	.13	.28	.17
APR											
29...	40	221	206	.30	18.5	3.0	2.9	.40	.39	.48	.50
MAY											
27...	22	118	123	.16	16.6	1.2	1.2	.22	.14	.27	.18
JUN											
30...	55	313	286	.43	15.6	2.3	2.5	.07	.05	.08	.06
JUL											
28...	36	187	180	.25	12.1	1.6	1.6	.10	.10	.08	.13
AUG											
25...	57	298	302	.41	8.05	3.7	3.5	.11	.07	.13	.09
SEP											
29...	59	353	362	.48	19.1	1.9	1.8	.38	.00	.46	.00

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	PHOSPHORUS, DISSOLVED (MG/L AS P)
OCT 15...	.68	.59	3.5	1.2	.10	1.1	3.6	16	1.700	5.2	1.500
NOV 13...	.69	.38	4.1	.81	.25	.56	4.4	20	1.300	4.0	1.400
DEC 10...	2.4	--	5.7	2.4	.50	1.9	5.9	26	3.800	12	.300
JAN 22...	.84	.19	4.2	1.5	.68	.82	4.9	22	1.300	4.0	.170
FEB 19...	--	.59	3.8	--	--	.75	--	--	1.400	4.2	1.400
MAR 19...	2.5	.15	.62	2.7	2.4	.28	3.1	14	.550	1.7	.020
APR 29...	.60	.61	3.9	1.0	.00	1.0	4.0	18	1.600	4.9	1.800
MAY 27...	.66	.68	2.0	.88	.06	.82	2.1	9.2	.690	2.1	.510
JUN 30...	.66	.64	3.2	.73	.04	.69	3.0	13	1.100	3.4	1.100
JUL 28...	1.0	.83	2.1	1.1	.57	.53	2.7	12	.830	2.5	.690
AUG 25...	1.1	.46	4.0	1.2	.67	.53	4.9	22	1.800	5.5	1.900
SEP 29...	1.3	.92	2.7	1.7	.78	.92	3.6	16	.880	2.7	.790

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUSPENDED TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, SUSPENDED RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CADMIUM SUSPENDED RECOVERABLE (UG/L AS CD)	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)
NOV 13...	0930	3	2	1	300	280	20	<1	0	<1	0
FEB 19...	0930	1	1	0	100	90	10	2	1	<1	0
MAY 27...	0915	0	0	0	5	0	5	2	2	0	10
AUG 25...	1030	2	1	1	100	80	20	<1	0	<1	20

DATE	CHROMIUM, SUSPENDED RECOV. (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, SUSPENDED RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, SUSPENDED RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)
NOV 13...	0	0	3	0	<3	3	0	3	630	550	80
FEB 19...	0	0	5	2	<3	4	1	3	160	110	50
MAY 27...	10	0	2	2	0	10	4	6	2900	2700	210
AUG 25...	10	10	2	0	<3	11	2	9	880	830	50

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
NOV										
13...	4	4	0	130	20	110	.1	.1	.0	6
FEB										
19...	2	0	2	110	0	110	.0	.0	.0	3
MAY										
27...	6	6	0	120	80	40	.1	.1	.0	12
AUG										
25...	12	12	0	80	10	70	.1	.0	.1	7

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV										
13...	6	0	1	0	1	0	0	190	180	10
FEB										
19...	0	3	1	0	1	0	0	10	7	<3
MAY										
27...	7	5	1	1	0	1	0	40	20	20
AUG										
25...	7	0	1	0	1	1	0	50	46	4

DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)
OCT			APR		
15...	0910	0	29...	0930	0
NOV			MAY		
13...	0930	0	27...	0915	1
JAN			JUL		
22...	0915	0	28...	1315	1
FEB			AUG		
19...	0930	0	25...	1030	1

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)
OCT					APR				
15...	0910	2.9	--	--	29...	0930	3.4	--	--
NOV					MAY				
13...	0930	--	7.6	.0	27...	0915	--	5.2	3.4
DEC					JUN				
10...	1030	100	--	--	30...	1030	3.2	--	--
JAN					JUL				
22...	0915	4.5	--	--	28...	1315	5.1	--	--
FEB					AUG				
19...	0930	--	2.5	.1	25...	1030	--	3.7	.2
MAR					SEP				
19...	1115	41	--	--	29...	0945	6.6	--	--

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

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	PCB, TOTAL (UG/L)	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTACHLOR, TOTAL (UG/L)
DEC 10...	1030	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 19...	0930	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)	METHYL TRITHION, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC 10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB 19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--

DATE	TIME	PHYTOPLANKTON, TOTAL (CELLS PER ML)	PERIPHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERIPHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2)	CHLOR-B PERIPHYTON CHROMOGRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERIPHYTON (UNITS)	LENGTH OF EXPOSURE (DAYS)
OCT 15...	0910	20	--	--	--	--	--	--
NOV 13...	0930	1300	1.42	1.02	40.0	13.5	10.0	29
DEC 10...	1030	100	--	--	--	--	--	--
JAN 22...	0915	35	--	--	--	--	--	--
FEB 19...	0930	330	7.01	5.67	23.7	4.23	56.5	28
APR 29...	0930	940	--	--	--	--	--	--
MAY 27...	0915	430	8.06	3.15	4.42	2.21	658	28
JUN 30...	1030	26	--	--	--	--	--	--
JUL 28...	1315	450	--	--	--	--	--	--
AUG 25...	1030	90	5.43	3.07	37.6	8.82	62.8	28
SEP 29...	0945	490	--	--	--	--	--	--

ND Material specifically analyzed for but not detected.

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM
OCT							
15...	0910	14	6	.23	--	--	--
NOV							
13...	0930	6.6	8	.14	--	--	--
DEC							
10...	1030	28	23	1.7	--	--	--
25...	0330	1100	1830	5440	34	45	58
JAN							
08...	1930	4320	4020	46900	38	46	58
10...	2130	1530	1900	7850	48	54	76
22...	0915	31	9	.75	--	--	--
FEB							
19...	0930	19	5	.26	--	--	--
MAR							
19...	0830	3920	4120	43600	31	38	52
19...	1115	1100	2100	6240	--	--	--
APR							
29...	0930	31	--	--	--	--	--
29...	1025	--	10	--	--	--	--
MAY							
27...	0915	52	58	8.1	--	--	--
JUN							
30...	1030	18	10	.50	--	--	--
JUL							
28...	1315	24	37	--	--	--	--
AUG							
25...	1030	10	11	.30	--	--	--
SEP							
29...	0945	20	14	.76	--	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM
OCT						
15...	--	--	100	--	--	--
NOV						
13...	--	--	100	--	--	--
DEC						
10...	--	--	100	--	--	--
25...	73	84	90	94	100	--
JAN						
08...	76	87	94	97	99	100
10...	77	86	95	98	100	--
22...	--	--	100	--	--	--
FEB						
19...	--	--	100	--	--	--
MAR						
19...	67	82	89	95	99	100
19...	--	--	92	--	--	--
APR						
29...	--	--	--	--	--	--
29...	--	--	100	--	--	--
MAY						
27...	--	--	100	--	--	--
JUN						
30...	--	--	100	--	--	--
JUL						
28...	--	--	100	--	--	--
AUG						
25...	--	--	100	--	--	--
SEP						
29...	--	--	100	--	--	--

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	558	473	502	465	104	161	537	463	508	377	314	348
2	490	456	468	240	132	167	533	317	515	439	379	410
3	496	451	468	308	246	274	397	220	282	483	431	453
4	464	365	398	369	308	354	400	335	364	469	439	452
5	453	409	429	407	359	387	455	416	437	459	447	454
6	515	400	436	425	402	412	461	443	453	467	455	458
7	506	424	448	437	421	430	489	445	462	473	378	426
8	451	265	405	448	418	434	475	454	464	422	106	294
9	380	268	340	448	348	386	478	459	467	280	167	224
10	461	363	423	528	381	420	611	470	526	296	219	255
11	466	437	453	460	434	445	542	448	478	270	214	235
12	485	458	468	439	367	416	468	436	452	338	273	302
13	471	459	465	451	375	415	470	449	461	386	341	362
14	602	460	556	447	389	422	509	470	488	398	336	370
15	571	520	549	387	148	214	505	457	479	358	336	349
16	510	468	481	334	210	278	485	464	475	394	350	369
17	602	476	521	413	338	362	485	470	477	419	394	409
18	538	417	456	429	218	349	484	467	476	415	186	238
19	468	418	438	317	178	251	495	471	484	360	264	318
20	504	463	474	421	158	277	487	468	479	384	362	372
21	533	364	469	334	180	250	482	473	479	416	385	402
22	480	369	455	516	330	420	481	463	473	439	405	423
23	460	439	450	543	441	486	474	464	470	447	429	437
24	491	446	463	490	454	473	475	468	472	461	439	448
25	499	467	483	500	478	490	472	101	174	463	448	454
26	478	458	469	490	445	465	396	250	326	466	458	463
27	484	473	479	592	442	518	439	363	397	470	461	466
28	564	461	498	563	462	520	413	381	403	470	445	457
29	486	466	475	532	463	505	428	393	409	433	388	406
30	483	464	475	537	459	504	427	189	298	407	257	304
31	484	463	473	---	---	---	310	226	266	365	292	346
MONTH	602	264	463	592	104	383	611	101	432	483	106	376
		FEBRUARY			MARCH			APRIL			MAY	
1	381	356	369	382	338	362	386	352	363	353	138	248
2	438	359	410	407	360	383	220	115	135	260	169	225
3	462	440	453	452	405	426	257	167	225	307	158	259
4	466	452	457	470	443	458	403	258	339	326	158	229
5	461	442	453	477	464	470	415	365	396	331	197	267
6	462	452	457	486	470	477	380	207	295	287	208	254
7	474	355	448	469	309	358	274	214	253	295	232	258
8	428	343	396	440	383	418	337	260	285	327	295	311
9	464	430	446	458	435	451	368	338	356	339	289	317
10	475	459	466	474	445	460	369	193	260	356	288	315
11	483	471	476	477	429	462	324	230	284	362	343	354
12	488	473	480	413	227	290	323	156	201	369	357	364
13	488	474	481	424	345	391	325	207	241	357	342	349
14	494	472	485	425	127	281	337	226	241	372	328	343
15	506	491	499	283	169	235	452	122	219	399	375	386
16	506	494	500	308	110	168	277	113	178	399	201	310
17	507	497	503	563	79	121	230	174	193	310	203	232
18	515	494	506	132	76	109	215	187	199	370	313	334
19	557	488	506	268	135	195	235	215	223	394	372	384
20	620	485	512	362	273	322	289	236	256	398	373	390
21	634	506	523	469	364	425	343	266	301	424	395	409
22	530	509	519	502	443	477	319	133	236	448	178	388
23	522	483	509	521	502	512	172	137	148	288	205	236
24	543	448	499	528	509	520	231	176	202	337	284	303
25	469	429	453	535	379	443	322	189	218	451	303	362
26	485	464	471	390	374	380	249	189	214	407	259	316
27	481	206	375	397	372	382	288	223	262	285	207	243
28	360	250	311	375	318	342	330	286	303	339	256	289
29	376	280	337	408	357	378	329	288	311	243	123	161
30	---	---	---	409	364	382	375	320	347	313	183	249
31	---	---	---	416	348	378	---	---	---	320	288	309
MONTH	634	206	459	563	76	370	452	113	256	451	124	303

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SPECIFIC CONDUCTANCE (MICROMHOS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	347	161	263	462	427	437	376	221	340	602	509	564
2	280	169	203	433	296	389	223	182	199	542	400	470
3	331	246	292	339	288	307	310	218	277	432	405	416
4	327	219	287	556	330	437	437	302	354	445	207	365
5	329	244	289	526	445	480	369	168	263	315	232	274
6	372	320	349	535	496	516	290	180	233	440	319	367
7	355	244	299	459	141	177	349	283	312	446	396	420
8	401	350	381	279	195	252	375	334	354	423	400	411
9	417	395	404	351	280	324	404	362	378	432	420	424
10	407	153	220	374	349	361	415	391	408	451	427	437
11	296	201	258	398	266	360	427	393	407	619	451	501
12	346	298	325	290	217	259	438	417	424	613	384	510
13	373	278	353	340	216	293	447	434	439	455	388	416
14	259	101	138	317	219	256	453	418	439	464	386	425
15	235	133	182	314	271	298	410	347	375	418	193	364
16	367	156	266	364	317	344	451	400	415	315	188	244
17	447	370	414	408	358	383	470	439	452	373	165	291
18	470	446	460	411	239	338	448	433	441	334	237	307
19	465	409	452	376	265	318	446	389	412	477	324	391
20	402	369	382	519	377	426	423	405	413	479	427	444
21	371	261	338	413	398	406	412	330	380	505	466	485
22	419	350	372	408	250	358	413	356	374	544	497	514
23	416	364	391	433	246	315	494	417	431	508	475	489
24	419	401	411	380	329	349	538	469	493	492	479	485
25	465	406	431	380	338	359	480	398	450	486	473	479
26	442	424	432	534	369	450	390	339	369	492	478	484
27	442	426	435	525	215	384	387	315	347	493	465	477
28	506	394	429	336	245	290	418	367	389	484	465	472
29	537	473	521	394	339	363	423	377	403	543	486	522
30	528	442	483	395	196	309	394	230	348	534	471	490
31	---	---	---	336	229	295	566	350	436	---	---	---
MONTH	537	101	349	556	141	349	566	168	379	619	165	431
YEAR	634	76	379									

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	26.0	23.0	24.5	23.5	22.0	22.5	23.0	21.5	22.0	22.0	21.0	21.5
2	24.0	22.5	23.0	23.0	21.5	22.5	23.0	21.5	22.0	22.5	21.0	21.5
3	25.0	22.5	23.5	24.0	22.0	23.0	22.5	21.0	21.5	22.5	21.0	21.5
4	25.5	23.5	24.5	24.0	22.5	23.5	22.5	21.0	22.0	22.5	21.0	21.5
5	24.5	23.5	24.0	24.0	22.0	23.0	22.5	21.5	22.5	22.0	21.0	21.5
6	26.0	24.0	24.5	24.0	22.5	23.0	22.5	21.0	22.0	22.0	21.0	21.5
7	24.5	23.0	23.5	24.0	22.0	23.0	24.0	21.5	22.5	22.5	21.0	22.0
8	26.0	23.0	24.5	23.5	22.0	22.5	23.0	21.5	22.5	22.5	21.0	22.0
9	25.0	23.5	24.5	22.5	22.0	22.5	23.0	22.0	22.5	22.5	21.0	21.5
10	26.5	23.5	25.0	24.5	21.5	22.5	25.5	22.5	23.5	22.0	20.5	21.0
11	25.5	23.5	24.5	23.0	22.5	22.5	24.0	22.5	23.0	22.0	20.5	21.0
12	25.0	23.5	24.0	23.5	22.0	22.5	23.0	22.0	22.5	23.0	20.5	21.5
13	24.0	23.0	23.5	23.5	21.5	22.5	23.0	22.0	22.5	22.5	20.5	21.5
14	26.0	24.0	25.0	23.0	21.5	22.5	23.5	22.5	22.5	22.5	21.0	22.0
15	25.5	24.0	24.5	22.0	20.5	21.5	23.5	22.0	22.5	23.0	22.0	22.5
16	24.5	23.0	23.5	22.5	21.0	21.5	23.0	22.0	22.5	23.5	22.0	22.5
17	26.5	23.0	24.0	23.0	21.5	22.5	23.0	22.0	22.5	23.0	22.0	22.5
18	24.5	23.0	23.5	23.5	21.5	23.0	23.0	21.5	22.0	23.0	21.5	22.0
19	24.0	22.5	23.0	22.5	21.5	22.0	22.5	21.5	22.0	22.0	20.0	21.0
20	24.0	22.5	23.0	23.0	21.5	22.0	22.5	21.5	22.0	21.5	20.5	21.0
21	25.0	22.5	23.5	22.5	21.0	21.5	22.5	21.5	22.0	22.0	21.0	21.5
22	24.5	23.5	24.0	23.0	21.5	22.0	22.5	21.5	22.0	21.5	20.5	21.0
23	23.5	22.5	23.0	23.0	22.0	22.5	22.5	22.0	22.0	22.0	20.5	21.0
24	24.0	22.0	22.5	23.0	22.0	22.5	22.5	22.0	22.0	22.0	20.0	21.0
25	24.0	22.5	23.5	23.0	21.5	22.0	22.0	18.5	20.0	22.5	20.5	21.5
26	24.0	22.0	23.0	22.5	21.5	22.0	21.5	20.0	21.0	22.5	20.5	21.5
27	23.0	22.0	22.5	22.0	21.0	21.5	22.5	21.0	21.5	22.5	21.0	21.5
28	25.5	22.0	23.0	22.0	21.0	21.5	22.0	21.5	22.0	22.5	21.5	22.0
29	23.0	22.5	22.5	22.5	21.5	22.0	22.5	21.0	22.0	23.0	22.0	22.5
30	24.0	22.5	23.0	23.0	21.5	22.0	22.0	21.0	21.5	23.0	21.5	22.0
31	23.0	22.0	22.5	---	---	---	22.5	21.0	21.5	22.0	21.5	22.0
MONTH	26.5	22.0	23.5	24.5	20.5	22.5	25.5	18.5	22.0	23.5	20.0	21.5

16213000 WAIKELE STREAM AT WAIPAHU--Continued

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	21.5	20.5	21.0	23.5	21.0	22.0	24.0	21.5	23.0	24.5	22.0	23.0
2	22.0	20.5	21.5	22.5	20.5	22.0	23.0	20.0	21.0	25.5	21.5	23.5
3	23.0	21.0	22.0	23.5	21.0	22.0	25.0	20.5	22.5	25.5	22.0	23.0
4	22.5	21.5	22.0	24.0	21.5	22.5	26.0	21.5	24.0	25.0	21.5	23.0
5	23.0	21.0	22.0	23.0	21.5	22.5	24.5	22.5	23.5	25.0	22.0	23.5
6	23.0	21.0	22.0	23.5	21.5	22.5	24.5	22.0	23.0	26.5	22.0	24.0
7	24.0	21.5	22.5	24.0	22.0	22.5	24.0	21.5	22.5	24.0	22.0	23.0
8	23.5	21.0	22.5	24.0	21.5	22.5	25.0	21.5	23.0	24.0	22.0	23.0
9	24.0	21.5	22.5	24.0	21.5	22.5	24.5	22.5	23.5	25.0	22.5	23.5
10	24.0	22.0	22.5	24.0	21.5	22.5	23.5	22.5	23.0	26.0	22.5	24.0
11	24.0	21.5	22.5	24.5	22.0	23.0	24.0	21.5	22.5	26.0	22.5	24.0
12	23.0	22.0	22.5	23.0	21.0	22.0	24.5	20.5	22.5	25.5	22.5	24.0
13	23.5	21.5	22.5	24.0	21.5	22.5	23.5	20.5	21.5	26.0	23.0	24.5
14	23.5	21.5	22.5	22.5	21.0	21.5	23.5	20.5	21.5	25.0	22.5	24.0
15	22.5	21.5	22.0	23.5	20.5	22.0	23.0	20.0	21.5	26.0	23.5	24.5
16	23.5	21.5	22.0	22.5	19.5	21.0	23.5	19.5	21.5	25.5	23.0	24.0
17	23.0	21.0	21.5	22.0	19.5	20.5	24.0	20.5	22.0	26.0	22.0	24.0
18	23.0	20.5	21.5	22.5	20.0	21.0	24.0	21.0	22.5	26.0	22.5	24.5
19	23.5	20.5	22.0	21.5	19.5	20.5	24.0	20.5	22.0	26.0	23.0	24.5
20	23.0	21.0	22.0	23.0	20.5	21.5	25.0	21.5	23.0	24.0	22.5	23.5
21	23.5	21.0	22.0	24.0	21.0	22.5	25.0	21.5	23.0	25.0	22.5	23.5
22	24.0	21.5	22.5	24.5	21.0	22.5	23.0	20.5	21.5	26.0	23.5	24.5
23	23.5	21.5	22.5	22.5	21.0	22.0	23.0	20.0	21.5	25.0	22.5	23.5
24	24.0	22.0	23.0	21.5	19.5	20.5	23.5	21.0	22.0	25.5	22.5	24.0
25	23.0	21.5	22.5	21.5	20.5	21.0	24.0	21.5	22.5	25.5	23.0	24.5
26	23.5	20.5	22.0	24.0	21.0	22.0	25.0	21.0	23.0	25.0	22.5	24.0
27	21.5	20.0	21.0	24.5	21.0	23.0	24.5	21.5	23.0	26.0	22.5	24.5
28	21.5	19.5	20.5	24.5	20.5	22.5	24.0	22.0	23.0	25.0	23.5	24.0
29	22.5	20.5	21.5	24.5	21.5	23.0	25.0	22.0	23.5	24.5	22.0	23.5
30	---	---	---	24.5	21.5	23.0	26.5	22.5	24.0	25.0	22.5	23.5
31	---	---	---	24.5	21.5	23.0	---	---	---	24.5	23.0	24.0
MONTH	24.0	19.5	22.0	24.5	19.5	22.0	26.5	19.5	22.5	26.5	21.5	24.0
		JUNE			JULY			AUGUST			SEPTEMBER	
1	24.5	22.5	23.0	26.0	23.0	24.0	26.0	23.0	24.0	27.5	25.0	26.0
2	25.0	21.5	23.5	26.0	23.5	24.5	25.5	22.0	23.5	26.0	24.0	25.0
3	24.0	22.5	24.0	25.5	23.0	24.0	25.5	22.5	24.0	26.0	23.0	24.0
4	26.5	23.0	24.5	27.5	22.5	24.0	24.0	22.5	24.5	26.0	22.5	24.0
5	25.5	22.5	24.0	24.0	22.0	23.0	26.0	23.5	24.5	25.0	23.0	24.0
6	25.5	23.0	24.0	24.0	22.0	23.0	25.0	22.5	24.0	25.0	23.0	24.0
7	26.5	22.5	24.5	24.5	21.5	23.0	24.0	22.5	24.0	25.0	23.5	24.0
8	25.5	23.0	24.0	26.5	22.5	24.5	25.0	23.0	24.0	25.0	22.5	23.5
9	26.5	22.5	24.5	26.5	23.5	25.0	25.5	23.0	24.0	24.0	22.5	23.0
10	25.5	21.0	23.5	26.0	23.5	24.5	24.5	23.0	23.5	24.0	22.5	23.0
11	26.0	22.5	24.0	26.5	23.5	24.5	25.5	22.5	23.5	24.0	22.5	23.0
12	25.5	22.5	24.0	26.5	22.5	24.0	25.5	22.5	24.0	25.5	22.5	23.5
13	24.5	23.0	24.0	26.0	22.5	24.5	25.5	22.5	24.0	24.5	23.0	24.0
14	23.5	21.0	22.0	24.0	23.5	24.5	26.0	23.0	24.5	25.5	23.0	24.0
15	23.5	22.0	22.5	26.0	22.5	24.5	25.5	23.0	24.0	24.0	23.0	24.0
16	25.5	22.0	24.0	26.0	23.5	24.5	24.5	23.0	24.5	23.5	22.5	23.0
17	26.0	24.0	24.5	25.5	23.0	24.0	26.0	23.5	24.5	24.5	22.5	23.0
18	24.5	23.0	24.0	26.5	23.0	24.5	25.5	23.0	24.0	24.0	22.0	23.0
19	24.5	22.5	23.5	26.0	23.0	24.5	24.0	23.5	24.5	25.0	22.5	23.5
20	26.0	23.0	24.5	25.5	23.0	24.0	25.0	23.5	24.0	26.0	23.0	24.0
21	27.5	23.5	25.0	26.0	23.0	24.5	25.5	22.5	24.0	25.5	23.5	24.5
22	26.0	23.0	25.0	27.5	23.5	25.0	26.0	22.5	24.0	25.5	23.0	24.0
23	26.0	22.5	24.0	26.0	23.5	24.5	25.0	23.0	24.0	24.5	23.0	23.5
24	26.0	22.5	24.0	26.0	23.5	24.5	25.5	23.0	24.0	25.0	23.0	23.5
25	26.0	23.0	24.5	26.5	23.5	24.5	25.5	23.0	24.0	23.5	22.5	23.0
26	26.0	23.0	24.5	26.5	23.0	25.0	24.0	23.0	23.5	24.5	22.5	23.5
27	26.5	23.0	24.5	26.5	24.5	25.0	25.5	22.5	24.0	25.5	22.5	23.5
28	26.5	23.0	24.5	26.5	23.0	24.5	25.0	23.0	24.0	24.5	23.0	23.5
29	26.0	24.0	25.0	26.5	23.5	25.0	25.5	22.5	24.0	25.0	23.0	24.0
30	26.0	24.0	24.5	24.5	23.5	24.5	27.0	23.0	24.5	24.5	22.0	23.0
31	---	---	---	24.5	23.0	24.0	27.0	24.0	25.5	---	---	---
MONTH	27.5	21.0	24.0	27.5	21.5	24.5	27.0	22.0	24.0	27.5	22.0	23.5
YEAR	27.5	18.5	23.0									

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

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	12	50	1.6	153	335	189	21	15	.85
2	9.0	20	.49	61	50	8.2	29	20	1.6
3	9.7	20	.52	26	25	1.8	42	35	4.0
4	18	25	1.2	21	18	1.0	15	20	.81
5	11	25	.74	14	18	.68	11	15	.45
6	14	25	.95	10	18	.49	10	10	.27
7	11	25	.74	9.3	15	.38	11	15	.45
8	28	50	3.2	10	15	.41	11	15	.45
9	14	40	1.5	15	15	.61	14	15	.57
10	11	25	.74	15	15	.61	23	25	1.6
11	6.8	20	.37	14	15	.57	16	20	.86
12	6.2	20	.33	15	15	.61	9.3	15	.38
13	8.5	20	.46	11	15	.45	9.6	15	.39
14	11	20	.59	12	15	.49	10	25	.68
15	12	15	.49	60	71	14	8.9	15	.36
16	13	20	.70	18	20	.97	8.2	15	.33
17	15	20	.81	16	15	.65	7.8	15	.32
18	15	20	.81	54	44	11	10	15	.41
19	13	20	.70	72	60	12	13	15	.53
20	14	20	.76	62	50	8.4	13	15	.53
21	18	20	.97	37	30	3.0	14	15	.57
22	12	20	.65	29	20	1.6	14	15	.57
23	9.7	15	.39	28	15	1.1	13	15	.53
24	13	20	.70	26	15	1.1	14	15	.57
25	14	20	.76	27	15	1.1	318	778	1320
26	11	25	.74	22	15	.89	43	60	7.0
27	11	25	.74	24	15	.97	26	30	2.1
28	13	25	.88	22	15	.89	21	20	1.1
29	8.0	20	.43	21	15	.85	18	15	.73
30	7.1	20	.38	20	15	.81	50	30	4.1
31	7.9	40	.85	---	---	---	36	20	1.9
TOTAL	372.9	---	25.19	924.3	---	264.63	859.8	---	1355.01
		JANUARY			FEBRUARY			MARCH	
1	29	15	.97	40	15	1.6	38	20	2.1
2	19	15	.77	30	10	.81	33	15	1.3
3	20	15	.81	29	10	.78	27	15	1.1
4	16	15	.65	31	10	.84	24	10	.65
5	17	15	.69	28	10	.76	23	10	.62
6	17	15	.69	28	10	.76	24	20	1.3
7	25	20	1.4	34	15	1.4	37	20	2.0
8	1270	2430	14700	31	15	1.3	28	15	1.1
9	279	917	664	27	10	.73	23	10	.62
10	1090	1180	4210	26	10	.70	21	10	.57
11	329	303	382	26	10	.70	24	10	.65
12	82	50	11	23	10	.62	46	20	2.5
13	58	30	4.7	21	10	.57	34	15	1.4
14	48	20	2.6	23	10	.62	120	60	19
15	44	15	1.8	24	10	.65	56	50	7.6
16	38	15	1.5	26	10	.70	252	609	752
17	39	15	1.4	26	10	.70	547	629	1190
18	98	145	47	24	10	.65	719	725	3110
19	44	20	2.4	23	10	.62	2080	2400	23700
20	38	15	1.5	24	10	.65	179	110	53
21	35	15	1.4	26	10	.70	92	45	11
22	32	15	1.3	27	10	.73	70	25	4.7
23	30	10	.81	29	10	.78	118	95	43
24	29	10	.78	30	15	1.2	159	191	129
25	29	10	.78	26	15	1.1	81	60	13
26	28	10	.76	23	10	.62	53	25	3.6
27	28	10	.76	63	100	28	50	20	2.7
28	32	15	1.3	98	35	9.5	78	45	9.5
29	38	25	2.6	46	25	3.1	44	25	3.0
30	64	42	7.5	---	---	---	39	15	1.6
31	42	20	2.3	---	---	---	33	15	1.3
TOTAL	3979	---	20056.17	862	---	56.89	5152	---	29069.91

16213000 WAIKELE STREAM AT WAIPAHU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	OCT 15,79	NOV 13,79	DEC 10,79	JAN 22,80	FEB 19,80	APR 29,80
TIME	0910	0930	1030	0915	0930	0930
TOTAL CELLS/ML	20	1300	100	35	330	490
DIVERSITY: DIVISION	0.0	0.7	1.0	0.6	0.0	0.6
.CLASS	0.0	0.7	1.0	0.6	0.0	0.6
..ORDER	0.0	0.7	1.0	0.6	0.6	0.8
...FAMILY	0.0	1.6	1.3	1.4	2.0	1.0
....GENUS	0.0	1.6	1.3	1.4	2.5	1.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	14	1	--	-	5	14	--	-	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	20#	100	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	*	--	*	--	-	--	-	--	-	13	3
..ZYGNEMATALES												
...DESMIDIACEAE												
....CLOSTERIUM	--	-	--	-	5	5	--	-	--	-	--	-
....COSMARIUM	--	-	14	1	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	45	14	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	10	10	--	-	81#	25	--	-
....RHOICOSPHENIA	--	-	--	*	--	-	--	-	81#	25	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	*	--	-	--	*	5	2	--	-
....SYNEDRA	--	-	27	2	5	5	10#	29	5	2	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	55	4	--	-	--	*	10	3	--	-
...NAVICULACEAE												
....NAVICULA	--	-	14	1	--	-	--	*	25	8	39	9
...NITZSCHIACEAE												
....NITZSCHIA	--	*	27	2	5	5	20#	57	75#	23	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	*	--	-
....DACTYLOCOCCOPSIS	--	*	--	*	--	-	--	*	--	*	13	3
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	*	--	*	--	-	--	*	--	*	--	-
....OSCILLATORIA	--	*	880#	65	--	-	--	*	--	*	360#	82
....SCHIZOTHRIX	--	*	--	*	75#	75	--	*	--	*	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	300#	22	--	*	--	*	--	*	13	3
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....TRACHELOMONAS	--	*	14	1	--	-	--	-	--	*	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

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	31	45	3.8	92	50	12	130	426	346
2	234	394	316	51	30	4.1	67	153	35
3	54	40	5.8	70	35	6.6	25	50	3.4
4	46	20	2.5	61	30	4.9	37	45	4.5
5	40	15	1.6	57	25	3.8	33	42	3.7
6	63	35	6.0	58	25	3.9	31	30	2.5
7	51	40	5.5	39	20	2.1	41	25	2.8
8	37	25	2.5	28	18	1.4	31	20	1.7
9	25	15	1.0	34	15	1.4	29	18	1.4
10	63	35	6.0	31	15	1.3	95	50	13
11	35	30	2.8	31	10	.84	41	25	2.8
12	117	100	32	27	10	.73	30	15	1.2
13	107	50	14	30	15	1.2	33	30	2.7
14	85	40	9.2	27	15	1.1	246	261	208
15	126	110	104	24	18	1.2	146	225	122
16	146	270	152	62	50	8.4	77	85	18
17	141	120	46	51	30	4.1	52	30	4.2
18	77	50	10	28	15	1.1	43	20	2.3
19	105	60	17	24	10	.65	36	20	1.9
20	61	30	4.9	21	15	.85	32	25	2.2
21	47	20	2.5	20	15	.81	49	25	3.3
22	244	295	256	44	35	4.2	37	20	2.0
23	224	190	115	48	35	4.5	29	15	1.2
24	82	30	6.6	32	25	2.2	26	15	1.1
25	74	25	5.0	37	35	3.5	23	15	.93
26	70	25	4.7	54	50	7.3	22	18	1.1
27	47	20	2.5	48	50	6.5	23	18	1.1
28	40	15	1.6	44	70	8.3	29	15	1.2
29	33	15	1.3	121	160	52	30	15	1.2
30	36	30	2.9	39	60	6.3	23	15	.93
31	---	---	---	43	60	7.0	---	---	---
TOTAL	2541	---	1140.7	1376	---	164.28	1546	---	793.36
		JULY			AUGUST			SEPTEMBER	
1	22	10	.59	34	60	5.5	39	15	1.6
2	37	20	2.0	81	100	22	27	15	1.1
3	40	25	2.7	36	30	2.9	13	10	.35
4	37	20	2.0	26	20	1.4	36	45	4.4
5	44	15	1.8	68	90	17	30	30	2.4
6	37	15	1.5	43	60	7.0	21	20	1.1
7	186	221	156	26	30	2.1	20	18	.97
8	48	40	5.2	19	25	1.3	14	15	.57
9	27	25	1.8	21	20	1.1	13	15	.53
10	22	20	1.2	21	18	1.0	11	15	.45
11	34	30	2.8	15	15	.61	22	20	1.2
12	50	35	4.7	12	15	.49	29	20	1.6
13	41	35	3.9	11	15	.45	15	15	.61
14	46	40	5.0	14	18	.68	20	10	.54
15	26	25	1.8	18	15	.73	33	55	4.9
16	20	40	2.2	19	15	.77	31	75	6.3
17	16	35	1.5	20	15	.81	88	378	367
18	42	50	5.7	15	15	.61	28	120	9.1
19	30	45	3.6	16	15	.65	20	50	2.7
20	24	30	1.9	17	15	.69	16	30	1.3
21	21	25	1.4	24	15	.97	19	20	1.0
22	32	45	3.9	16	15	.65	16	20	.86
23	31	45	3.8	15	10	.41	8.5	20	.46
24	18	20	.97	15	10	.41	8.2	25	.55
25	19	18	.92	19	15	.77	8.5	20	.46
26	26	15	1.1	21	20	1.1	8.7	15	.35
27	51	39	6.8	21	20	1.1	13	15	.53
28	29	45	3.5	14	18	.68	16	20	.86
29	18	20	.97	14	18	.68	16	20	.86
30	39	55	5.8	36	35	3.4	7.7	20	.42
31	25	40	2.7	45	30	3.6	---	---	---
TOTAL	1138	---	239.75	772	---	81.56	647.6	---	415.07
YEAR	20170.6		53662.52						

16213000 WAIKELE STREAM AT WAIPAHU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	MAY 27,80		JUN 30,80		JUL 28,80		AUG 25,80		SEP 29,80	
TIME	0915		1030		1315		1030		0945	
TOTAL CELLS/ML	430		26		450		90		490	
DIVERSITY: DIVISION	0.9		0.0		0.8		0.9		0.0	
.CLASS	0.9		0.0		0.8		0.9		0.0	
..ORDER	0.9		0.0		0.8		0.9		0.0	
...FAMILY	1.0		1.0		1.2		0.9		0.0	
....GENUS	1.0		1.0		2.0		0.9		0.0	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...OOCYSTACEAE										
....ANKISTRODESMUS	--	-	--	-	13	3	--	-	--	-
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES										
...CHLAMYDOMONADACEAE										
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-
..ZYGNEMATALES										
...DESMIDIACEAE										
....CLOSTERIUM	--	-	--	-	--	-	--	-	--	-
....COSMARIUM	13	3	--	-	--	-	--	-	--	-
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-
..PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE										
....CYMBELLA	--	-	--	-	26	6	--	-	--	-
...FRAGILARIACEAE										
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE										
....GOMPHONEMA	52	12	13#	50	13	3	--	-	--	-
...NAVICULACEAE										
....NAVICULA	--	-	--	-	13	3	26#	29	--	-
...NITZSCHIACEAE										
....NITZSCHIA	26	6	13#	50	26	6	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES										
...CHROOCOCCACEAE										
....ANACYSTIS	--	-	--	-	--	-	64#	71	--	-
....DACTYLOCOCCOPSIS	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES										
...OSCILLATORIACEAE										
....LYNGBYA	--	-	--	-	210#	46	--	-	--	-
....OSCILLATORIA	340#	79	--	-	150#	34	--	-	490#	100
....SCHIZOTHRIX	--	-	--	-	--	-	--	-	--	-
...RIVULARIACEAE										
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)										
.EUGLENOPHYCEAE										
..EUGLENALES										
...EUGLENACEAE										
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16216000 WAIAWA STREAM NEAR PEARL CITY

LOCATION.--Lat 21°23'57", long 157°58'51", Hydrologic Unit 20060000, on left bank 100 ft (30 m) upstream from lower bridge on Highway 90, 0.6 mi (1.0 km) northwest of Pearl City, and 2.0 mi (3.2 km) northeast of Waipahu.

DRAINAGE AREA.--26.4 mi² (68.4 km²).

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 (0.552 m) above mean sea level.

REMARKS.--Records good except those for the period of no gage-height record and those above 100 ft³/s (2.8 m³/s), which are poor. Low flow affected by effluent from sewage treatment plant and occasional small irrigation diversion and return flow above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--28 years, 33.6 ft³/s (0.952 m³/s), 24,340 acre-ft/yr (30.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 23,400 ft³/s (663 m³/s) Jan. 5, 1968, gage height, 20.56 ft (6.267 m), from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurements at gage heights 17.1 ft (5.21 m) and 20.56 ft (6.267 m); minimum, 1.7 ft³/s (0.048 m³/s) Nov. 8, 9, 1973, Jan. 26, Sept. 25, 27, 1977, Mar. 25, Apr. 2-4, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 2,300 ft³/s (65.1 m³/s) and maximum (*), from rating curve extended above 160 ft³/s (4.53 m³/s) on basis of slope-area measurements as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0300	11800	334	16.28	4.962	Mar. 18	2300	*19900	564	*19.67	5.995
Jan. 8	1900	13000	368	16.88	5.145	Apr. 15	2100	2320	65.7	8.81	2.685
Jan. 10	0600	4230	120	10.98	3.347	Aug. 5	0630	2790	79.0	9.42	2.871

Minimum discharge, 2.7 ft³/s (0.076 m³/s) Oct. 1, 2, 18, Sept. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	264	4.0	10	6.0	8.5	191	214	65	8.2	72	20
2	3.8	46	3.9	6.8	5.2	6.5	297	51	43	24	69	9.8
3	4.2	11	14	5.0	5.1	4.6	45	53	19	22	25	11
4	4.7	6.3	6.1	4.2	5.0	4.0	24	37	29	14	18	27
5	4.6	5.3	6.2	4.0	5.0	3.8	16	60	22	11	265	19
6	4.4	4.6	6.1	4.0	5.0	16	64	51	31	51	29	9.5
7	3.3	5.1	5.4	6.8	5.8	28	32	26	28	256	18	7.7
8	29	4.9	5.4	2580	4.9	9.3	23	16	13	51	11	5.3
9	14	5.1	5.1	355	4.7	6.3	14	21	9.7	20	14	4.3
10	6.6	5.3	15	1310	4.5	4.9	61	15	111	14	7.8	4.0
11	6.1	5.5	14	278	4.2	14	21	14	23	22	5.6	8.5
12	4.4	6.5	7.3	60	4.1	47	51	12	12	33	4.6	7.9
13	4.3	6.8	5.2	35	4.0	23	56	13	30	30	4.0	7.4
14	4.2	32	19	25	4.0	262	48	12	488	57	5.4	10
15	3.6	112	9.8	14	4.5	48	278	16	393	22	7.7	74
16	4.3	13	6.3	9.9	4.3	538	107	100	63	11	4.5	28
17	3.6	8.4	5.5	8.1	4.1	1060	167	32	30	9.7	4.2	15
18	3.3	55	4.7	29	4.0	2600	61	13	19	46	4.2	7.5
19	4.7	63	4.1	12	4.0	4870	105	9.6	14	17	4.6	5.6
20	4.1	156	3.8	7.6	4.1	214	47	6.2	16	10	5.2	5.2
21	4.2	25	3.6	6.5	4.1	67	32	5.6	30	7.8	5.6	4.3
22	4.4	11	3.5	5.7	4.3	58	428	43	13	102	4.6	4.0
23	4.7	8.2	3.5	5.1	4.8	119	210	25	8.0	36	3.9	3.7
24	5.0	5.9	60	4.5	5.2	59	105	9.8	6.2	15	3.1	3.6
25	5.2	5.5	1790	4.3	4.7	77	73	8.6	5.3	15	158	3.6
26	5.3	4.4	56	4.4	4.3	40	54	153	4.9	11	21	3.5
27	5.1	4.0	18	4.8	11	79	31	46	6.5	113	19	3.7
28	4.6	3.9	9.9	6.0	8.6	67	21	81	9.9	25	9.6	3.2
29	4.4	4.1	40	8.9	9.9	32	17	360	9.2	13	6.6	3.3
30	4.4	4.2	105	13	---	22	16	46	5.7	70	38	3.5
31	4.4	---	23	8.0	---	19	---	40	---	17	15	---
TOTAL	172.5	892.0	2263.4	4835.6	149.4	10406.9	2695	1589.8	1557.4	1153.7	862.7	323.1
MEAN	5.56	29.7	73.0	156	5.15	336	89.8	51.3	51.9	37.2	27.8	10.8
MAX	29	264	1790	2580	11	4870	428	360	488	256	265	74
MIN	3.3	3.9	3.5	4.0	4.0	3.8	14	5.6	4.9	7.8	3.1	3.2
AC-FT	342	1770	4490	9590	296	20640	5350	3150	3090	2290	1710	641

CAL YR 1979 TOTAL 11846.2 MEAN 32.5 MAX 1790 MIN 3.1 AC-FT 23500
WTR YR 1980 TOTAL 26901.5 MEAN 73.5 MAX 4870 MIN 3.1 AC-FT 53360

NOTE.--No gage-height record Jan. 27 to Feb. 28.

16224500 KALAUAO STREAM AT MOANALUA ROAD, AT AIEA

LOCATION.--Lat 21°23'07", long 157°56'22", Hydrologic Unit 20060000, on left bank at downstream side of Moanalua Road bridge, 0.4 mi (0.6 km) northwest of Aiea Post Office, and 2.3 mi (3.7 km) southeast of Pearl City Post Office.

DRAINAGE AREA.--2.59 mi² (6.71 km²).

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

GAGE.--Water-stage recorder and concrete control. Datum of gage is 11.71 ft (3.569 m) above mean sea level. Nov. 15, 1965, to June 16, 1966, at datum 0.04 ft (0.012 m) higher. Prior to Nov. 15, 1965, and June 17, 1966, to Sept. 30, 1970, at datum 1.04 ft (0.317 m) higher.

REMARKS.--Records fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--23 years, 2.95 ft³/s (0.084 m³/s), 2,140 acre-ft/yr (2.64 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,580 ft³/s (73.1 m³/s) May 14, 1963, gage height, 6.63 ft (2.021 m), datum then in use, from rating curve extended above 77 ft³/s (2.18 m³/s) on basis of slope-area measurements at gage heights 6.29 ft (1.917 m) and 6.63 ft (2.021 m); no flow for many days in 1970-74, 1977, 1978, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 300 ft³/s (8.50 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0215	780	22.1	4.50	1.372	Jan. 10	0500	650	18.4	4.26	1.298
Jan. 8	1800	1060	30.0	4.95	1.509	Mar. 18	2230	*1700	48.1	*5.83	1.777

No flow Sept. 19-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.18	.09	1.1	.85	4.0	1.4	13	3.6	.12	5.9	1.7
2	.05	.10	.28	.35	.38	1.1	16	4.4	2.3	1.5	4.2	.44
3	.05	.06	.09	.17	.26	.20	3.1	9.4	1.6	2.7	1.5	.15
4	.05	.06	.15	.13	.23	.14	1.2	4.5	7.2	3.6	.62	.99
5	.07	.06	.09	.12	.20	.11	.48	6.7	4.1	2.1	12	.95
6	.06	.06	.09	.16	.18	4.4	9.0	3.8	2.2	4.1	4.7	.20
7	.06	.07	.09	.26	3.2	3.6	4.2	1.6	2.8	18	1.4	.13
8	.16	.07	.09	201	.52	.82	2.5	.80	1.0	4.7	.50	.11
9	.08	.07	1.8	44	.20	.41	.92	.43	.48	1.6	.35	.10
10	.06	.08	5.4	216	.13	.16	4.3	.28	11	.88	.39	.09
11	.06	.09	1.8	68	.12	.99	2.7	.19	2.3	.85	.25	.10
12	.06	.07	.51	8.3	.11	5.8	8.6	.14	.89	5.5	.23	.16
13	.27	.12	.18	2.9	.11	1.9	5.9	.23	2.3	3.1	.18	.12
14	.15	.10	.15	1.5	.10	27	7.9	.10	27	4.8	.15	.09
15	.25	2.2	.10	1.5	.09	5.9	40	.16	42	2.3	.15	3.2
16	.23	.15	.09	.71	.09	27	16	11	8.0	.73	.15	3.5
17	.25	.07	.07	.37	.08	72	14	3.2	2.5	.38	.12	2.1
18	.19	.10	.07	.34	.07	204	9.5	.82	1.2	2.0	.12	.10
19	.06	1.5	.07	.24	.07	247	16	.19	.92	.81	.11	.00
20	.06	16	.07	.21	.07	12	5.9	.09	.92	.35	.12	.00
21	.06	2.5	.06	.20	.07	6.2	4.4	.08	.78	.36	.12	.00
22	.06	.30	.06	.16	.07	3.6	49	6.1	.44	1.4	.12	.00
23	.06	.70	.07	.15	.07	6.2	32	1.9	.23	4.7	.11	.00
24	.06	.16	.08	.14	.07	5.0	11	.23	.16	1.2	.17	.00
25	.05	.11	116	.13	.07	13	12	5.5	.13	.91	.15	.00
26	.05	.13	5.4	.14	.07	5.1	5.4	20	.16	.30	.18	.00
27	.07	.10	1.6	.12	.60	3.7	2.3	6.4	.20	7.1	.15	.00
28	.06	.07	.78	1.2	2.8	6.3	1.2	11	.28	1.3	.11	.00
29	.06	.07	18	.57	2.9	2.4	.58	47	.30	.70	.11	.00
30	.06	.07	26	7.8	---	1.2	.39	5.1	.28	.99	.13	.00
31	.21	---	3.3	2.5	---	.57	---	4.5	---	.54	.11	---
TOTAL	3.07	25.42	182.63	560.47	13.78	671.80	287.87	168.84	127.27	79.62	34.10	14.23
MEAN	.099	.85	5.89	18.1	.48	21.7	9.60	5.45	4.24	2.57	1.10	.47
MAX	.27	16	116	216	3.2	247	49	47	42	18	12	3.5
MIN	.05	.06	.06	.12	.07	.11	.39	.08	.13	.12	.11	.00
AC-FT	6.1	50	362	1110	27	1330	571	335	252	158	68	28

CAL YR 1979 TOTAL 1113.89 MEAN 3.05 MAX 145 MIN .05 AC-FT 2210
WTR YR 1980 TOTAL 2169.10 MEAN 5.93 MAX 247 MIN .00 AC-FT 4300

16226000 NORTH HALAWA STREAM NEAR AIEA

LOCATION.--Lat 21°23'46", long 157°53'37", Hydrologic Unit 20060000, on left bank 2.7 mi (4.3 km) upstream from confluence with South Halawa Stream and 2.7 mi (4.3 km) northeast of Aiea Post Office.

DRAINAGE AREA.--3.45 mi² (8.94 km²).

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. Altitude of gage is 320 ft (98 m), from topographic map.

REMARKS.--Records fair. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--30 years (water years, 1930-32, 1954-80), 4.98 ft³/s (0.141 m³/s), 3,610 acre-ft/yr (4.45 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,650 ft³/s (188 m³/s) Feb. 28, 1932, gage height, 13.36 ft (4.103 m), from rating curve extended above 420 ft³/s (11.9 m³/s); maximum gage height, 13.46 ft (4.103 m) May 14, 1963; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 570 ft³/s (16.1 m³/s) and maximum (*), from rating curve extended above 63 ft³/s (1.78 m³/s) on basis of slope-area measurements at gage heights 10.3 ft (3.14 m), 13.04 ft (3.975 m), and 13.46 ft (4.103 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0230	1060	30.0	10.24	3.121
Jan. 8	1800	1640	46.4	11.43	3.484
Mar. 18	2230	*5470	155	Unknown	

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.21	.02	2.4	1.3	4.1	11	11	8.4	1.1	13	10
2	.00	2.5	.02	1.1	.74	1.6	28	5.5	4.4	8.6	7.0	2.1
3	.00	.63	.02	.53	.48	.74	7.7	12	3.6	4.6	3.3	1.9
4	.00	.15	.03	.30	.25	.39	4.0	6.8	8.2	5.3	1.9	1.8
5	.00	.08	.02	.16	.15	.27	2.6	17	4.6	2.9	23	1.7
6	.00	.05	.02	.11	.11	7.7	14	8.1	5.3	13	11	1.3
7	.00	.02	.02	4.2	4.9	5.0	6.3	4.1	5.0	31	4.0	.68
8	.00	.02	.02	158	.48	1.8	3.3	3.1	3.0	8.9	2.6	.35
9	.00	.02	5.1	56	.21	.99	3.8	2.5	3.7	4.0	4.3	.23
10	.00	.02	3.8	132	.12	.68	11	2.0	20	2.3	1.5	.11
11	.00	.02	1.6	47	.07	5.1	5.2	1.8	5.4	3.3	.94	.99
12	.00	.02	.58	11	.05	9.2	8.6	1.4	3.1	8.7	.63	.68
13	.00	.02	.30	4.8	.03	4.0	7.9	1.3	9.1	7.5	.48	1.3
14	.00	.03	.18	2.9	.04	26	12	1.2	45	8.7	.68	.80
15	.00	4.1	.10	2.2	.05	1.5	54	4.6	37	3.6	.58	11
16	.00	.68	.07	1.5	.03	36	31	28	13	1.9	.35	7.7
17	.00	.27	.03	1.1	.02	92	25	7.2	6.1	1.6	.27	3.7
18	.00	.49	.02	.87	.02	360	18	3.3	3.6	5.5	.20	3.3
19	.00	4.4	.02	.63	.02	300	24	1.9	3.8	2.0	.48	1.8
20	.00	17	.02	.39	.01	32	12	1.5	3.3	1.2	.89	.68
21	.00	3.6	.02	.30	.01	13	8.3	1.9	4.6	1.4	1.2	.35
22	.00	2.0	.01	.21	.01	7.7	49	15	1.8	10	.35	.20
23	.00	1.3	.01	.14	.01	13	34	4.0	1.2	11	.20	.10
24	.00	.98	6.0	.11	.01	7.7	23	2.6	.99	4.6	.13	.06
25	.00	.30	120	.08	.01	13	22	15	.80	2.2	4.3	.04
26	.00	.16	11	.07	.00	7.7	13	32	.68	1.8	.99	.03
27	.00	.08	3.0	.05	.85	9.3	6.5	15	.68	15	1.2	.03
28	.00	.05	2.4	.11	3.6	8.1	4.3	19	.58	4.3	.39	.02
29	.00	.03	28	.18	4.2	4.4	3.1	49	.58	2.3	.27	.02
30	.00	.02	37	7.3	---	3.0	2.6	13	.53	1.7	4.0	.02
31	.00	---	6.2	2.8	---	2.3	---	13	---	1.0	2.6	---
TOTAL	.00	38.75	225.63	438.54	17.78	978.22	455.2	303.8	207.99	181.0	92.68	52.99
MEAN	.000	1.29	7.28	14.1	.61	31.6	15.2	9.80	6.93	5.84	2.99	1.77
MAX	.00	17	120	158	4.9	360	54	49	45	31	23	11
MIN	.00	.02	.01	.05	.00	.27	2.6	1.2	.53	1.0	.13	.02
AC-FT	.00	77	448	870	35	1940	903	603	413	359	184	105

CAL YR 1979 TOTAL 1535.05 MEAN 4.21 MAX 134 MIN .00 AC-FT 3040
WTR YR 1980 TOTAL 2992.58 MEAN 8.18 MAX 360 MIN .00 AC-FT 5940

16229000 KALIHI STREAM NEAR HONOLULU

LOCATION.--Lat 21°22'00", long 157°50'49", Hydrologic Unit 20060000, on right bank 1.9 mi (3.1 km) upstream from Kamanaiki Stream and 4.1 mi (6.6 km) north of Honolulu Post Office.

DRAINAGE AREA.--2.61 mi² (6.76 km²).

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 (141.549 m) above mean sea level. Prior to Oct. 12, 1923, at datum 2.00 ft (0.610 m) lower.

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

AVERAGE DISCHARGE.--66 years (water years 1915-80), 6.76 ft³/s (0.191 m³/s), 4,900 acre-ft/yr (6.04 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 12,400 ft³/s (351 m³/s) Nov. 18, 1930, gage height, 13.81 ft (4.209 m), from rating curve extended above 280 ft³/s (7.93 m³/s) on basis of indirect measurements at gage heights 8.9 ft (2.71 m), 10.96 ft (3.341 m), and 11.27 ft (3.435 m); minimum, 0.09 ft³/s (0.003 m³/s) Oct. 22, 1933, July 29, 1966.

EXTREMES FOR CURRENT YEAR.--Peak dicharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 9	1300	810	22.9	7.60	2.316	Jan. 8	1700	*2630	74.5	*10.24	3.121
Dec. 25	0200	1590	45.0	9.06	2.762	Mar. 18	2300	2600	73.6	10.21	3.112

Minimum discharge, 0.36 ft³/s (0.010 m³/s) Oct. 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	9.0	1.0	7.7	2.6	2.8	23	15	20	5.8	15	13
2	1.1	2.3	1.5	5.7	2.3	1.8	21	7.1	7.7	15	6.2	3.0
3	1.6	1.6	1.2	4.4	2.3	1.5	8.4	12	6.5	6.4	4.6	3.7
4	.91	1.2	1.2	4.0	2.0	1.4	7.1	7.1	7.7	9.4	4.8	11
5	1.8	.91	1.2	3.6	2.0	1.3	6.2	17	5.9	4.6	40	3.2
6	.91	1.0	1.1	3.0	1.9	6.2	13	11	9.4	28	7.9	2.8
7	.73	.82	1.3	5.4	4.0	3.6	10	6.8	6.5	46	12	2.4
8	1.6	.73	1.1	120	1.5	2.2	7.4	6.2	6.5	8.4	6.5	2.3
9	.91	.73	48	50	1.5	1.9	10	5.9	15	6.8	9.2	2.3
10	.73	.82	7.4	205	1.4	1.9	7.7	5.6	16	5.4	4.4	2.2
11	.73	1.5	4.7	60	1.2	4.2	10	5.1	6.8	6.5	4.2	4.0
12	.65	.91	2.8	20	1.3	4.9	8.4	4.9	5.6	20	3.6	2.2
13	.65	1.1	2.0	12	1.5	3.0	7.7	4.9	19	23	3.4	3.8
14	1.6	9.0	2.8	9.1	1.0	12	8.3	4.4	61	16	4.4	2.2
15	.80	7.2	2.0	9.0	1.0	6.8	57	12	33	7.4	3.4	5.0
16	.70	1.8	1.8	7.0	1.0	32	20	23	10	6.2	3.4	34
17	.80	1.8	1.5	6.8	.90	80	16	7.4	7.7	6.5	3.0	5.9
18	.50	5.9	1.3	6.7	.85	207	15	5.9	6.8	11	2.6	3.4
19	.55	5.9	1.2	4.8	.80	202	20	5.1	8.2	5.1	3.7	3.0
20	.50	15	1.2	4.5	.80	30	11	4.1	7.1	4.9	3.2	2.3
21	.50	3.8	1.2	4.4	.80	17	12	4.0	7.1	11	2.6	2.2
22	.50	2.4	1.4	3.6	1.2	15	39	9.0	5.6	13	2.3	2.2
23	.40	1.9	1.5	3.2	.95	16	24	5.2	5.6	6.8	2.3	2.0
24	.40	12	33	3.0	2.2	10	17	4.1	5.4	5.4	2.8	1.9
25	.40	2.3	124	2.9	1.2	13	18	18	4.4	4.6	2.4	1.9
26	.43	1.6	9.2	2.8	1.2	8.0	12	25	4.2	5.4	7.6	2.8
27	.43	1.4	5.4	2.5	7.7	18	9.1	7.0	4.9	25	2.8	2.0
28	.36	1.3	7.4	7.0	3.2	9.1	8.0	31	4.0	5.4	2.3	1.9
29	.36	1.2	37	3.2	2.8	7.4	7.4	24	4.2	5.4	2.3	1.8
30	.36	1.1	44	4.1	---	6.8	6.8	9.5	4.0	5.1	5.6	1.6
31	1.2	---	11	2.8	---	5.9	---	8.9	---	4.4	3.4	---
TOTAL	24.31	98.22	361.4	588.2	53.10	732.7	440.5	316.2	315.8	333.9	181.9	132.0
MEAN	.78	3.27	11.7	19.0	1.83	23.6	14.7	10.2	10.5	10.8	5.87	4.40
MAX	1.8	15	124	205	7.7	207	57	31	61	46	40	34
MIN	.36	.73	1.0	2.5	.80	1.3	6.2	4.0	4.0	4.4	2.3	1.6
AC-FT	48	195	717	1170	105	1450	874	627	626	662	361	262

CAL YR 1979 TOTAL 1998.80 MEAN 5.48 MAX 124 MIN .36 AC-FT 3960
WTR YR 1980 TOTAL 3578.23 MEAN 9.78 MAX 207 MIN .36 AC-FT 7100

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 (0.6 km) northwest of Bishop Museum, and 2.4 mi (3.9 km) northwest of Honolulu Post Office.

DRAINAGE AREA.--5.18 mi² (13.42 km²).

WATER-DISCHARGE RECORDS

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 70 ft (21 m), from topographic map. Aug. 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft (183 m) downstream at different datum.

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

AVERAGE DISCHARGE.--18 years, 11.1 ft³/s (0.314 m³/s), 8,040 acre-ft/yr (9.91 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft³/s (201 m³/s) Apr. 19, 1974, gage height, 9.98 ft (3.042 m), from rating curve extended above 180 ft³/s (5.10 m³/s) on basis of slope-area measurement at gage height 9.98 ft (3.042 m); minimum, 0.16 ft³/s (0.005 m³/s) June 24, 1966.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of May 14, 1960, reached a stage of 8.0 ft (2.44 m) from floodmarks, present site and datum, discharge, 6,350 ft³/s (180 m³/s), from slope-area measurement of peak flow.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft³/s (45.3 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0200	2080	58.9	5.58	1.701
Jan. 8	1730	3570	101	7.16	2.182
Mar. 18	2300	*5190	147	*8.50	2.591

Minimum discharge, 0.63 ft³/s (0.018 m³/s) Oct. 27, 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	18	2.4	8.4	3.2	4.0	35	32	25	9.7	29	19
2	1.7	4.0	6.0	6.2	3.1	2.8	42	12	11	24	12	4.1
3	2.4	2.0	2.0	5.1	3.0	2.4	15	22	11	12	7.5	5.2
4	1.4	1.9	2.6	4.4	3.0	2.4	11	12	14	15	7.0	14
5	2.2	1.3	2.2	4.0	2.8	2.7	9.7	21	8.6	8.6	48	4.8
6	1.2	1.9	1.5	3.8	2.8	12	17	14	17	52	9.7	4.1
7	.98	1.3	1.5	6.9	5.3	12	16	10	9.7	64	19	3.3
8	3.1	1.4	1.6	270	2.2	4.6	11	9.1	9.1	15	8.6	3.3
9	1.4	1.1	95	62	2.0	3.9	14	10	20	10	12	3.0
10	1.4	1.1	13	365	2.0	5.8	12	9.1	29	8.6	6.0	3.0
11	1.0	1.7	5.9	82	2.0	14	21	7.5	11	11	5.2	5.6
12	1.1	1.3	3.6	25	1.8	11	18	7.5	8.6	24	4.8	3.0
13	1.1	2.6	2.8	17	2.2	8.4	17	9.1	30	32	4.5	5.6
14	2.8	14	3.5	14	1.8	33	14	6.5	114	20	5.6	3.0
15	1.3	18	2.4	11	1.7	17	81	17	126	11	4.5	6.0
16	1.2	2.7	2.2	9.4	1.9	75	38	32	23	8.6	4.1	5.1
17	1.6	5.3	2.0	8.7	1.9	132	30	11	13	9.1	3.3	8.6
18	.93	15	1.7	8.7	1.8	342	30	8.6	11	18	3.5	4.5
19	1.2	9.5	1.4	5.8	1.7	370	50	7.5	11	7.5	4.1	3.8
20	1.1	28	1.4	5.3	1.7	46	22	6.5	9.7	7.0	4.1	3.3
21	1.1	6.1	1.6	5.1	1.7	24	26	6.5	9.7	17	3.8	3.0
22	1.0	3.8	1.7	4.3	3.0	24	126	17	7.5	21	3.8	2.8
23	.90	3.0	2.3	3.7	1.9	32	66	8.6	7.0	11	3.5	2.8
24	.95	13	42	3.5	3.8	21	34	8.6	7.0	8.0	4.5	3.0
25	.83	3.0	216	3.3	2.4	40	35	36	7.0	6.5	3.5	2.3
26	.74	2.4	14	3.2	1.7	18	20	51	6.5	7.0	9.7	3.3
27	.71	2.1	6.9	3.1	20	46	15	16	8.0	35	4.1	2.8
28	.75	2.2	8.0	10	5.4	22	12	110	6.0	8.0	3.5	2.5
29	.78	2.6	36	4.8	4.0	13	11	81	7.5	7.0	3.3	2.0
30	.76	2.6	53	6.5	---	11	10	17	6.5	7.5	9.7	2.0
31	4.1	---	14	3.6	---	9.1	---	14	---	5.6	4.5	---
TOTAL	46.23	168.9	550.2	973.8	91.8	1361.1	858.7	630.1	584.4	500.7	256.4	138.8
MEAN	1.49	5.63	17.7	31.4	3.17	43.9	28.6	20.3	19.5	16.2	8.27	4.63
MAX	4.5	28	216	365	20	370	126	110	126	64	48	19
MIN	.71	1.1	1.4	3.1	1.7	2.4	9.7	6.5	6.0	5.6	3.3	2.0
AC-FT	92	335	1090	1930	182	2700	1700	1250	1160	993	509	275

CAL YR 1979 TOTAL 3427.70 MEAN 9.39 MAX 298 MIN .71 AC-FT 6800
WTR YR 1980 TOTAL 6161.13 MEAN 16.8 MAX 370 MIN .71 AC-FT 12220

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 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT 15...	1100	1.2	280	7.3	25.0	1.6	8.3	4000	9300	70	1
NOV 13...	1100	1.0	270	7.7	22.5	1.9	7.8	22000	27000	75	0
DEC 10...	1330	12	255	7.7	21.0	10	8.5	24000	44000	65	15
JAN 22...	1115	4.4	228	7.5	19.0	1.3	9.4	1900	18000	59	9
FEB 19...	1115	1.5	265	7.6	19.0	2.4	10.8	3100	1600	80	8
MAR 19...	1300	162	180	7.1	21.5	15	8.8	12000	13000	43	17
APR 29...	1115	10	220	7.9	23.0	2.1	9.8	3500	25000	56	15
MAY 27...	1100	16	200	7.8	23.5	9.0	8.8	6300	9900	49	8
JUN 30...	1215	4.4	220	8.7	25.0	2.2	10.2	8000	2300	62	8
JUL 28...	1030	8.6	185	7.8	23.5	5.4	8.8	8000	3900	50	2
AUG 25...	1300	4.1	210	8.4	25.5	1.6	8.8	12000	5500	56	0
SEP 29...	1130	2.5	220	8.0	26.0	1.4	8.8	10000	9600	64	6

DATE	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	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT 15...	14	8.4	23	41	1.2	25	1.7	69	9.7	33	.1
NOV 13...	15	9.0	25	42	1.3	27	1.5	78	13	30	.0
DEC 10...	13	7.8	22	42	1.2	24	1.9	50	11	34	.1
JAN 22...	12	7.0	20	42	1.1	--	1.2	50	9.0	30	.1
FEB 19...	17	9.1	25	40	1.2	26	1.3	72	10	34	.1
MAR 19...	8.6	5.3	16	44	1.1	--	1.3	26	8.7	28	.0
APR 29...	11	6.9	21	44	1.2	--	1.0	41	19	28	.1
MAY 27...	9.5	6.2	18	44	1.1	--	1.3	41	18	23	.0
JUN 30...	14	6.5	20	41	1.1	--	.9	54	10	28	.0
JUL 28...	9.6	6.3	23	49	1.4	--	1.4	48	6.4	32	.2
AUG 25...	11	6.9	20	43	1.2	--	1.3	59	7.7	26	.1
SEP 29...	13	7.7	22	42	1.2	--	1.6	58	8.5	39	.1

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	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, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
OCT											
15...	18	--	151	.21	.49	.27	.26	.04	.05	.05	.06
NOV											
13...	18	151	160	.21	.41	.25	.25	.02	.02	.02	.03
DEC											
10...	18	151	141	.21	9.89	.77	.77	.05	.05	.06	.06
JAN											
22...	14	137	124	.19	--	.23	.21	.01	.04	.01	.05
FEB											
19...	19	144	155	.20	.58	3.0	.15	.18	.01	.22	.01
MAR											
19...	18	118	104	.16	51.6	.56	.52	.02	.02	.02	.03
APR											
29...	15	121	128	.16	3.53	.25	.21	.06	.06	.07	.08
MAY											
27...	16	114	118	.16	4.92	.15	.14	.02	.04	.01	.05
JUN											
30...	21	129	133	.18	1.53	.12	.01	.00	.03	.00	.04
JUL											
28...	16	134	125	.18	3.11	.19	.18	.00	.00	.00	.00
AUG											
25...	13	126	124	.17	1.39	.60	.51	.03	.00	.04	.00
SEP											
29...	13	145	140	.20	.98	.00	.00	.00	.00	.00	.00

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT											
15...	.53	.42	.73	.57	.10	.47	.84	3.7	.080	.24	.080
NOV											
13...	.95	.47	.74	.97	.48	.49	1.2	5.4	.060	.18	.060
DEC											
10...	.58	.46	1.3	.63	.12	.51	1.4	6.2	.080	.25	.060
JAN											
22...	.80	.17	.42	.21	.60	.81	1.0	4.6	.030	.09	.040
FEB											
19...	.40	.27	.43	.58	.30	.28	3.6	16	1.500	4.6	.040
MAR											
19...	.43	.35	.89	.45	.08	.37	1.0	4.5	.090	.28	.040
APR											
29...	.43	.29	.56	.49	.14	.35	.79	3.3	.050	.15	.040
MAY											
27...	.59	.38	.56	.61	.19	.42	.76	3.4	.050	.15	.050
JUN											
30...	1.4	.38	.42	1.4	.99	.41	1.5	6.7	.030	.09	.010
JUL											
28...	.54	.50	.68	.54	.04	.50	.73	3.2	.060	.18	.030
AUG											
25...	.60	.59	1.1	.63	.04	.59	1.2	5.4	.090	.28	.060
SEP											
29...	.49	.32	.32	.49	.17	.32	.49	2.2	.090	.28	.100

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
NOV 13...	1100	2	0	2	300	290	10	<1	0	<1	0
FEB 19...	1115	1	1	0	100	90	10	<1	0	<1	0
MAY 27...	1100	1	0	1	10	0	10	2	2	0	0
AUG 25...	1300	2	1	1	10	0	10	<1	0	<1	20

DATE	CHRO-MIUM, SUS-PENDED RECOV, (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
NOV 13...	0	0	2	0	<3	3	0	3	290	100	190
FEB 19...	0	0	6	3	<3	7	0	7	370	300	70
MAY 27...	0	0	1	0	1	10	0	10	630	420	210
AUG 25...	20	0	<3	0	<3	5	0	5	370	220	150

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV, (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
NOV 13...	4	2	2	30	10	20	.1	.1	.0	9
FEB 19...	3	0	3	100	90	10	.0	.0	.0	3
MAY 27...	1	1	0	30	20	10	.1	.1	.0	7
AUG 25...	5	2	3	10	5	5	.0	.0	.0	5

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NILM, DIS-SOLVED (UG/L AS SE)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
NOV 13...	9	0	0	0	0	0	0	80	70	10
FEB 19...	1	2	1	1	0	1	0	10	7	<3
MAY 27...	3	9	0	0	0	1	0	220	180	40
AUG 25...	5	0	0	0	0	0	0	20	17	<3

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

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)
OCT			MAY		
15...	1100	1	27...	1100	1
NOV			JUL		
13...	1100	0	28...	1030	9
FEB			AUG		
19...	1115	1	25...	1300	0
APR					
29...	1115	0			

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)
OCT					MAY				
15...	1100	5.6	--	--	27...	1100	--	4.1	.4
NOV					JUN				
13...	1100	--	3.1	.1	30...	1215	3.4	--	--
DEC					JUL				
10...	1330	3.9	--	--	28...	1030	2.3	--	--
FEB					AUG				
19...	1115	--	3.1	.0	25...	1300	--	2.6	.2
MAR					SEP				
19...	1300	4.3	--	--	29...	1130	5.4	--	--
APR									
29...	1115	3.2	--	--					

DATE	TIME	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)	ENDRIN, TOTAL (UG/L)	ETHION, TOTAL (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)
DEC												
10...	1330	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB												
19...	1115	N.0	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND

DATE	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)	PARA-THION, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC												
10...	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND	ND
FEB												
19...	ND	ND	ND	ND	ND	ND	ND	ND	ND	--	--	--

ND Material specifically analyzed for but not detected.

16229300 KALIHI STREAM AT KALIHI--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT 15...	1100	110	--	--	--	--	--	--
NOV 13...	1100	41	.310	.240	21.8	5.27	3.21	29
DEC 10...	1330	460	--	--	--	--	--	--
JAN 22...	1115	1300	--	--	--	--	--	--
FEB 19...	1115	190	7.09	5.83	55.7	16.4	22.6	28
MAR 19...	1300	41	--	--	--	--	--	--
APR 29...	1115	1500	--	--	--	--	--	--
MAY 27...	1100	1600	1.58	1.10	6.33	.540	75.8	28
JUN 30...	1215	810	--	--	--	--	--	--
JUL 28...	1030	13	--	--	--	--	--	--
AUG 25...	1300	210	2.13	1.58	5.25	.230	105	28
SEP 29...	1130	190	--	--	--	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 15...	1100	1.2	2	.01	100
NOV 13...	1100	1.0	5	.01	100
DEC 10...	1330	12	10	.32	100
JAN 22...	1115	4.4	1	.01	100
FEB 19...	1115	1.5	0	.00	100
MAR 19...	1300	162	25	11	100
APR 29...	1115	10	5	.15	100
MAY 27...	1100	16	6	.26	100
JUN 30...	1215	4.4	8	.10	100
JUL 28...	1030	8.6	5	--	100
AUG 25...	1300	4.1	3	.03	100
SEP 29...	1130	2.5	1	.01	100

16229300 KALIHI STREAM AT KALIHI--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	OCT 15,79		NOV 13,79		DEC 10,79		JAN 22,80		FEB 19,80		MAR 19,80	
TIME	1100		1100		1330		1115		1115		1300	
TOTAL CELLS/ML	110		41		460		1300		190		41	
DIVERSITY: DIVISION	0.8		0.9		0.5		1.0		0.0		0.9	
.CLASS	0.8		0.9		0.5		0.0		0.0		0.9	
..ORDER	0.8		0.9		0.5		0.0		0.5		0.9	
...FAMILY	0.9		0.9		0.8		0.0		2.1		0.9	
....GENUS	0.9		0.9		0.8		0.0		2.1		0.9	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	10	2	--	-	--	-	28#	67
....CHLORELLA	89#	83	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA	--	-	--	-	--	-	620#	49	--	-	--	-
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	20	11	--	-
....MELOSIRA	--	-	--	-	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	15	3	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	1	1	14#	33	--	-	14	1	10	5	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	6	5	--	-	--	-	--	-	70#	38	--	-
...NAVICULACEAE												
....NAVICULA	--	-	--	-	5	1	14	1	30#	16	--	-
....PLEUROSIGMA	--	-	--	-	--	-	--	-	5	3	--	-
....STAURONEIS	--	-	--	-	--	-	--	-	10	5	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	10	2	82	7	40#	22	--	-
.CHRYSOPHYCEAE												
..CHRYSOMONADALES												
...OCHROMONADACEAE												
....OCHROMONAS	--	-	--	-	--	-	55	4	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
....COCCOCHLORIS	--	-	--	-	--	-	270#	22	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	160	13	--	-	--	-
....OSCILLATORIA	12	11	--	-	400#	87	41	3	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	20	4	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	27#	67	--	-	--	-	--	-	14#	33

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16229300 KALIHI STREAM AT KALIHI--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	APR 29,80	MAY 27,80	JUN 30,80	JUL 28,80	AUG 25,80	SEP 29,80
TIME	1115	1100	1215	1030	1300	1130
TOTAL CELLS/ML	1500	1600	810	13	210	190
DIVERSITY: DIVISION	1.0	0.4	0.0	0.0	0.9	0.4
.CLASS	1.0	0.4	0.0	0.0	0.9	0.4
..ORDER	1.3	0.4	0.5	0.0	0.9	0.7
...FAMILY	1.9	1.3	0.5	0.0	1.7	1.9
....GENUS	1.9	1.3	0.6	0.0	1.7	1.9

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....CHLORELLA	13	1	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA	--	-	--	-	--	-	--	-	--	-	--	-
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	51	4	--	-	13	2	--	-	--	-	13	7
....MELOSIRA	--	-	--	-	720#	89	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	26	2	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	13	1	100	6	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	13	1	--	-	--	-	--	-	--	-	--	-
....SYNEDRA	--	-	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	13	1	--	-	--	-	--	-	13	6	39#	20
...NAVICULACEAE												
....NAVICULA	170	12	29	2	65	8	13#	100	26	13	26	13
....PLEUROSIGMA	--	-	--	-	--	-	--	-	--	-	--	-
....STAURONEIS	--	-	--	-	--	-	--	-	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	320#	22	--	-	13	2	--	-	130#	63	100#	53
.CHRYSOPHYCEAE												
..CHRYSOMONADALES												
...OCHROMONADACEAE												
....OCHROMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	13	1	--	-	--	-	--	-	26	13	13	7
....COCCOCHLORIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	--	-	--	-	--	-	--	-
....OSCILLATORIA	820#	57	1000#	64	--	-	--	-	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	430#	28	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	13	6	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

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 (0.3 km) downstream from reservoir 2 wasteway, and 3.5 mi (5.6 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--3.35 mi² (8.68 km²).

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 (192.545 m) above mean sea level. Prior to Sept. 7, 1915, nonrecording gage at same site at datum 0.03 ft (0.009 m) 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 (25,900 m³), 34 acre-ft (41,900 m³), and 1,630 acre-ft (2.01 hm³), respectively. Honolulu Board of Water Supply diverts ground water from tunnels in drainage area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years 1915-16, 1918-20, 1922-80), 7.09 ft³/s (0.201 m³/s), 5,140 acre-ft/yr (6.34 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,990 ft³/s (198 m³/s) Jan. 16, 1921, gage height, 8.74 ft (2.664 m), from floodmarks, from rating curve extended above 420 ft³/s (11.9 m³/s) by test of model of station site; minimum, 0.09 ft³/s (0.003 m³/s) Sept. 10, 11, 1925.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 240 ft³/s (6.80 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0200	758	21.5	4.98	1.518	Jan. 10	0330	500	14.2	4.51	1.375
Jan. 8	1730	*1220	34.6	*5.55	1.692	Mar. 19	0300	812	23.0	5.06	1.542

Minimum discharge, 0.55 ft³/s (0.016 m³/s) Oct. 25-27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	2.7	1.0	16	4.5	4.1	17	9.0	20	5.3	35	6.3
2	1.1	1.4	1.0	15	4.5	3.3	18	7.0	10	12	13	3.6
3	1.6	.85	.95	15	4.5	3.1	8.8	8.3	11	5.9	13	3.8
4	1.1	.75	1.0	14	4.4	3.0	8.6	6.7	10	9.4	18	5.6
5	2.6	.60	1.1	13	4.3	2.7	8.1	12	9.4	5.7	50	3.7
6	.95	.85	1.0	13	4.2	5.1	17	15	12	14	29	3.6
7	.90	.65	1.0	16	5.3	4.1	14	47	9.8	13	5.4	3.4
8	1.2	.75	1.0	120	3.8	3.3	9.0	45	9.4	7.0	6.1	3.0
9	1.2	.70	15	43	3.7	3.1	11	16	14	6.1	5.0	3.1
10	1.0	.65	5.0	159	3.8	2.7	13	6.3	18	5.7	4.6	3.1
11	.85	.85	2.1	92	3.7	4.7	13	6.3	11	7.2	4.4	4.3
12	.85	.70	1.5	82	3.6	4.5	13	6.1	10	8.8	4.2	3.2
13	.80	.80	1.6	75	3.7	4.5	12	6.3	18	10	4.1	4.2
14	.90	2.7	1.8	34	3.7	14	13	6.1	32	9.2	4.4	3.1
15	.85	2.2	1.6	8.5	3.7	6.4	31	8.8	23	7.2	4.4	3.7
16	.95	.85	1.4	7.9	3.6	23	10	20	6.7	7.2	4.3	10
17	1.0	1.0	1.4	7.9	3.4	63	21	7.9	6.4	7.2	4.0	3.8
18	.90	4.4	1.4	7.0	3.0	67	45	6.6	6.2	7.5	3.9	3.3
19	.80	3.9	1.3	5.9	2.8	146	44	5.5	6.3	7.2	4.1	3.1
20	.85	3.7	1.3	6.3	3.0	22	36	5.6	6.3	6.3	4.0	3.1
21	.80	1.6	1.3	5.8	3.0	13	28	6.8	6.6	7.3	3.8	3.0
22	.95	1.1	1.3	5.2	3.6	11	25	11	6.1	12	3.6	2.9
23	.85	1.0	1.3	5.0	3.0	12	16	5.2	6.0	7.9	3.6	2.8
24	.60	8.5	13	4.9	3.7	9.0	13	4.9	6.0	7.2	3.7	2.8
25	.60	1.9	108	4.6	3.3	12	13	12	5.8	6.3	4.0	2.9
26	.60	1.3	15	4.5	3.0	8.8	9.0	20	5.8	7.2	4.9	2.9
27	.60	1.0	13	4.5	6.8	16	8.1	11	5.9	18	3.8	2.8
28	.65	1.0	13	5.6	4.0	9.4	7.9	16	5.7	8.1	3.8	2.7
29	.65	1.0	25	4.6	4.2	8.8	7.5	21	5.4	7.7	3.5	2.8
30	.70	1.0	36	4.9	---	8.3	7.5	9.8	4.9	27	6.1	2.7
31	.85	---	17	4.5	---	8.1	---	12	---	53	3.9	---
TOTAL	30.16	50.40	287.35	804.6	111.8	506.0	493.5	381.2	307.7	323.6	265.6	109.3
MEAN	.97	1.68	9.27	26.0	3.86	16.3	16.5	12.3	10.3	10.4	8.57	3.64
MAX	2.6	8.5	108	159	6.8	146	45	47	32	53	50	10
MIN	.60	.60	.95	4.5	2.8	2.7	7.5	4.9	4.9	5.3	3.5	2.7
AC-FT	60	100	570	1600	222	1000	979	756	610	642	527	217

CAL YR 1979 TOTAL 2089.94 MEAN 5.73 MAX 108 MIN .60 AC-FT 4150
WTR YR 1980 TOTAL 3671.20 MEAN 10.0 MAX 159 MIN .60 AC-FT 7280

16238500 WAIHI STREAM AT HONOLULU

LOCATION.--Lat 21°19'55", long 157°48'12", Hydrologic Unit 20060000, on left bank 100 ft (30 m) upstream from bridge on Waaloa Way, 700 ft (210 m) upstream from confluence with Waiakeakua Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--1.14 mi² (2.95 km²).

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

REVISED RECORDS.--WSP 1319: 1930-32(M), 1939(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and combination Parshall flume and V-notch weir. Datum of gage is 289.84 ft (88.343 m) above mean sea level (Honolulu Board of Water Supply bench mark). Prior to June 17, 1914, non-recording gage at same site at different datum. June 17, 1914, to Jan. 16, 1921, water-stage recorder at site 150 ft (46 m) upstream at different datum, Aug. 4, 1925, to Mar. 15, 1928, at present site at datum 2.35 ft (1.021 m) lower and Mar. 16, 1928 to Mar. 23, 1977 at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records fair except for the period of no gage-height record, which are poor. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--62 years (water years, 1914-20, 1926-80), 3.62 ft³/s (0.103 m³/s), 2,620 acre-ft/yr (3.23 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,250 ft³/s (92.0 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 60 ft³/s (1.70 m³/s); minimum, 0.07 ft³/s (0.002 m³/s) Jan. 17, 18, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended above 60 ft³/s (1.70 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0130	532	15.1	4.82	1.469	Mar. 19	0200	407	11.5	4.44	1.353
Jan. 8	1715	*732	20.7	*5.38	1.640	June 1	1515	425	12.0	4.50	1.372
Jan. 10	0300	401	11.4	4.42	1.347						

Minimum discharge, 0.21 ft³/s (0.006 m³/s) Oct. 26, 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	13	.75	2.5	.91	1.4	17	16	26	2.9	6.6	8.6
2	1.6	2.9	2.5	2.0	.84	.69	15	4.3	4.8	25	2.6	1.7
3	2.9	1.4	1.0	1.7	.77	.48	4.9	10	6.4	4.0	2.4	3.9
4	1.2	1.0	1.0	1.5	.74	.46	3.7	4.1	3.9	11	2.2	5.6
5	4.8	.78	1.0	1.4	.68	.68	3.2	13	1.2	3.5	6.8	1.8
6	.94	.86	.87	1.3	.62	5.4	8.0	5.5	7.3	24	2.6	2.1
7	.78	.70	.94	2.9	1.4	2.0	16	4.0	3.4	9.0	2.2	1.4
8	1.8	.78	.83	44	.54	1.2	4.4	3.5	3.0	3.8	2.4	1.3
9	.94	.54	9.1	7.5	.46	1.0	13	3.9	15	3.6	2.1	1.4
10	.70	.54	3.1	68	.54	1.3	12	3.8	10	3.2	1.9	1.4
11	.54	1.2	1.3	13	.54	4.6	10	3.1	4.6	4.3	1.8	5.1
12	.54	.54	1.0	5.7	.54	3.3	6.2	3.5	3.3	7.2	1.9	1.5
13	.46	1.0	.86	4.1	.70	3.5	6.0	6.1	17	8.0	1.7	6.0
14	.46	4.5	.78	3.6	.54	17	8.0	2.9	33	7.6	3.3	1.6
15	.46	2.5	.72	3.1	.54	6.8	15	11	16	3.3	2.6	4.3
16	.67	.78	.68	2.7	.46	26	8.6	17	5.3	3.1	2.6	4.1
17	.81	1.6	.63	2.5	.38	95	12	4.3	4.1	3.6	1.9	1.6
18	.39	10	.60	2.5	.38	30	10	3.3	3.6	4.0	2.0	2.8
19	.70	5.4	.59	1.9	.38	73	19	3.0	6.0	3.0	2.9	1.2
20	.69	12	.53	1.8	.38	13	8.0	2.6	7.4	2.6	3.1	1.0
21	.48	2.6	.82	1.8	.32	7.4	10	5.3	7.9	4.5	1.8	.86
22	.71	2.0	.79	1.6	.70	6.8	33	11	3.2	6.6	1.5	1.0
23	.53	2.3	1.0	1.4	.38	7.5	17	3.1	2.9	3.1	1.4	1.0
24	.42	6.8	27	1.3	1.2	5.3	13	2.6	2.6	2.6	1.7	.94
25	.32	1.5	50	1.2	.78	8.3	13	13	2.5	2.3	2.3	.94
26	.27	1.3	4.1	1.1	.38	5.2	7.2	15	2.5	2.6	6.3	1.0
27	.28	1.2	2.5	1.1	4.5	13	5.5	14	3.2	3.7	1.7	.94
28	.28	1.0	2.9	2.1	1.3	5.2	4.8	16	2.2	2.4	1.4	.86
29	.26	1.1	11	1.2	2.2	3.9	4.3	11	2.6	2.5	1.3	.78
30	.24	.82	13	1.2	---	3.3	4.0	5.3	2.0	2.6	6.9	.78
31	1.9	---	3.4	1.0	---	3.5	---	5.8	---	2.4	5.1	---
TOTAL	31.37	82.64	145.29	188.7	29.10	306.16	311.8	227.0	218.9	172.0	87.0	72.50
MEAN	1.01	2.75	4.69	6.09	.83	9.88	10.4	7.32	7.16	5.55	2.81	2.42
MAX	4.8	13	50	68	4.5	73	33	17	33	25	6.9	9.1
MIN	.24	.54	.53	1.0	.32	.46	3.2	2.6	2.0	2.3	1.3	.78
AC-FT	62	164	288	374	58	607	618	450	426	341	173	144

CAL YR 1979 TOTAL 1153.36 MEAN 3.16 MAX 55 MIN .24 AC-FT 2290
WTR YR 1980 TOTAL 1863.86 MEAN 5.09 MAX 73 MIN .24 AC-FT 3700

16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19'53", long 157°48'12", Hydrologic Unit 20060000, on right bank 5 ft (2 m) downstream from bridge on Waaloa Way, 500 ft (152 m) upstream from confluence with Waihi Stream, and 4.2 mi (6.8 km) northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi² (2.75 km²).

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 (89.764 m) above mean sea level (Honolulu Board of Water Supply bench mark). Prior to May 20, 1914, nonrecording gage at site 200 ft (61 m) upstream at different datum. May 20, 1914, to Jan. 16, 1921, water-stage recorder at site 30 ft (9 m) upstream at different datum. Aug. 18, 1925, to Mar. 15, 1928, water-stage recorder at present site at datum 2.99 ft (0.911 m) lower, and Mar. 16, 1928, to Oct. 18, 1933, at datum 0.41 ft (0.125 m) higher than present datum.

REMARKS.--Records good except those above 15 ft³/s, which are fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel above station. Occasional small diversions for irrigation above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--62 years (water years, 1914-20, 1926-80), 5.08 ft³/s (0.144 m³/s), 3,680 acre-ft/yr (4.54 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft³/s (87.5 m³/s) Jan. 16, 1921, gage height, 10.4 ft (3.17 m), from floodmarks, site and datum then in use, from rating curve extended above 58 ft³/s (1.64 m³/s); minimum, 0.6 ft³/s (0.017 m³/s) June 7, 8, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0200	*520	14.7	*3.80	1.158
Jan. 8	1700	470	13.3	3.70	1.128
May 25	1430	480	13.6	3.72	1.134

Minimum discharge, 1.5 ft³/s (0.043 m³/s) Oct. 30, 31, Dec. 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	20	2.0	4.0	2.5	3.4	21	18	22	5.7	19	16
2	3.3	5.2	4.7	3.5	2.5	2.8	14	5.8	6.5	20	7.1	5.0
3	4.5	2.9	2.5	3.2	2.5	2.1	5.7	13	6.6	6.6	6.0	5.9
4	2.7	2.4	3.1	3.0	2.8	2.1	4.7	6.2	5.8	11	5.7	8.0
5	3.9	2.1	2.8	2.9	2.4	2.2	4.4	12	5.4	6.0	20	5.0
6	2.4	2.0	2.2	2.8	2.4	8.4	6.3	6.9	8.2	23	6.7	4.9
7	2.2	1.9	2.1	6.1	3.7	3.5	18	5.7	5.7	13	5.8	4.5
8	2.9	2.1	2.0	38	2.4	2.6	5.9	5.4	5.2	6.7	6.8	4.4
9	2.4	1.9	10	8.6	2.3	2.9	13	5.4	14	6.6	5.4	4.4
10	2.2	1.9	5.3	56	2.3	2.5	12	5.1	9.8	6.0	5.1	4.4
11	2.0	3.2	2.6	13	2.3	3.9	12	5.0	6.0	6.6	5.0	7.5
12	2.0	2.0	2.3	6.3	2.2	3.3	8.6	5.0	5.3	9.5	4.9	4.3
13	2.0	2.6	2.0	5.1	2.4	3.4	6.8	6.4	13	10	4.8	6.5
14	1.9	7.3	1.9	4.7	2.2	15	8.2	4.9	31	11	6.5	4.4
15	2.0	4.3	2.0	4.3	2.1	5.7	18	9.5	16	6.4	5.3	7.7
16	2.3	2.4	1.9	3.9	2.1	19	10	15	7.3	6.4	5.3	12
17	2.1	3.7	1.9	3.8	2.0	28	14	5.9	6.1	6.7	4.8	5.6
18	1.9	7.3	1.8	3.8	2.0	20	11	5.0	5.6	9.1	4.9	5.7
19	2.0	6.3	1.7	3.4	1.9	55	19	5.0	9.5	6.8	6.9	4.8
20	2.0	8.2	1.7	3.2	1.9	9.5	8.8	4.7	9.3	5.6	6.7	4.4
21	1.9	3.5	1.8	3.2	1.9	6.4	11	5.1	11	6.7	4.9	4.2
22	2.1	2.7	1.8	3.1	2.0	5.8	34	12	5.8	18	4.5	4.1
23	1.9	3.1	2.1	2.9	2.0	5.9	14	5.3	5.3	6.9	4.4	4.0
24	1.9	3.7	25	2.8	2.9	5.2	13	4.8	5.2	6.8	4.8	4.0
25	1.7	2.5	48	2.8	2.4	5.7	11	22	5.3	5.4	5.6	4.0
26	1.7	2.4	5.0	2.7	2.0	4.9	7.6	15	5.3	6.1	7.8	4.2
27	1.7	2.2	3.8	2.7	5.8	9.0	6.4	9.8	6.9	9.5	4.9	3.8
28	1.6	2.1	6.2	3.8	3.1	5.1	5.9	13	5.2	5.6	4.5	3.8
29	1.6	2.2	17	2.9	5.5	4.3	5.6	11	5.4	5.9	4.4	3.8
30	1.6	2.0	20	2.8	---	4.0	5.5	7.8	5.0	6.4	7.1	3.8
31	5.0	---	6.4	2.7	---	4.4	---	6.7	---	5.4	8.3	---
TOTAL	77.3	116.1	192.6	212.0	74.1	255.1	330.5	258.0	258.7	264.6	209.0	165.3
MEAN	2.49	3.87	6.21	6.84	2.56	8.23	11.0	8.32	8.62	8.54	6.58	5.51
MAX	7.9	20	48	56	5.8	55	34	22	31	23	20	16
MIN	1.6	1.9	1.7	2.7	1.9	2.1	4.4	4.7	5.0	5.4	4.4	3.8
AC-FT	153	230	382	421	147	506	656	512	513	525	405	328

CAL YR 1979 TOTAL 1774.9 MEAN 4.86 MAX 48 MIN 1.6 AC-FT 3520
WTR YR 1980 TOTAL 2408.3 MEAN 6.58 MAX 56 MIN 1.6 AC-FT 4780

16244000 PUKELE STREAM NEAR HONOLULU

LOCATION.--Lat 21°18'36", long 157°47'27", Hydrologic Unit 20060000, on right bank 200 ft (60 m) upstream from bridge on Palolo Avenue, 0.6 mi (1.0 km) upstream from confluence with Waiomao Stream, and 4.8 mi (7.7 km) east of Honolulu Post Office.

DRAINAGE AREA.--1.18 mi² (3.06 km²).

PERIOD OF RECORD.--June 1926 to current year.

REVISED RECORDS.--WSP 835: 1930(M). WSP 1569: Drainage area. WSP 1639: 1927-29(M), 1931(M), 1932, 1933-34(M). WSP 1719: 1935(M), 1937-40(M), 1942(M), 1948-59(P).

GAGE.--Water-stage recorder and V-notch weir. Datum of gage is 344.78 ft (105.089 m) above mean sea level (Honolulu Board of Water Supply bench mark).

REMARKS.--Records poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--54 years, 1.94 ft³/s (0.055 m³/s), 1,410 acre-ft/yr (1.74 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,600 ft³/s (73.6 m³/s) Apr. 11, 1930, gage height, 7.75 ft (2.362 m), from rating curve extended above 71 ft³/s (2.01 m³/s) by test of model of station site; minimum, 0.08 ft³/s (0.002 m³/s) Oct. 31, 1929.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft³/s (3.96 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0200	*370	10.5	*4.40	1.341
Jan. 8	1800	155	4.39	3.40	1.036
June 1	1530	262	7.42	3.97	1.210

Minimum discharge, 0.30 ft³/s (0.008 m³/s) Oct. 1, 21-31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	10	.60	1.7	.81	1.2	6.5	6.5	6.8	1.4	6.8	4.2
2	.43	1.8	.87	1.2	.81	.70	9.6	3.1	3.1	6.1	2.3	.93
3	.75	.51	.60	1.1	.75	.70	2.9	4.6	2.2	2.2	1.7	.81
4	.43	.47	.93	1.1	.75	.70	1.9	2.8	1.9	2.9	1.4	1.2
5	.39	.43	.75	1.1	.70	.75	1.8	5.5	1.8	1.9	8.1	.81
6	.39	.43	.60	1.1	.70	2.0	1.9	2.9	2.0	7.0	2.2	.81
7	.39	.47	.60	2.6	.70	1.1	2.2	2.3	1.8	6.8	1.8	.75
8	.39	.51	.60	21	.65	.81	1.7	2.2	1.7	2.5	1.7	.75
9	.39	.47	3.7	9.1	.65	.87	3.5	2.1	3.5	2.0	1.6	.75
10	.39	.47	1.8	31	.65	.87	4.4	2.0	4.4	1.8	1.4	.75
11	.39	.47	.75	14	.65	.93	4.6	2.0	1.9	2.1	1.3	.87
12	.39	.47	.70	5.0	.65	.93	4.6	1.9	1.6	2.3	1.2	.75
13	.39	.47	.70	2.9	.60	1.0	3.9	1.9	4.4	3.7	1.1	.70
14	.39	2.0	.70	2.2	.60	5.9	2.6	1.8	12	4.0	1.1	.70
15	.36	1.8	.70	2.0	.55	2.3	7.0	3.1	8.0	2.1	1.1	1.0
16	.36	.51	.65	1.9	.55	8.1	5.0	6.5	3.5	1.6	1.1	3.7
17	.33	1.0	.60	1.8	.51	9.9	5.9	2.0	2.1	1.6	1.0	1.0
18	.33	1.1	.60	1.8	.51	7.8	4.6	1.5	1.7	2.1	.93	.75
19	.33	3.0	.55	1.6	.51	20	9.9	1.5	2.1	1.5	.93	.65
20	.33	3.5	.55	1.5	.51	5.2	4.8	1.5	2.5	1.5	1.0	.65
21	.33	1.2	.51	1.4	.51	2.8	4.6	1.6	3.5	1.6	.87	.65
22	.33	.87	.51	1.3	.51	2.1	16	3.1	1.7	7.3	.87	.65
23	.30	.87	.51	1.1	.51	2.1	8.1	1.5	1.6	2.8	.81	.60
24	.30	.81	3.5	1.1	.60	2.1	8.3	1.4	1.5	2.0	.87	.60
25	.30	.81	24	1.1	.55	2.8	8.3	5.9	1.5	1.5	1.2	.55
26	.30	.81	2.5	1.0	.51	2.6	4.4	4.8	1.4	1.4	.81	.55
27	.30	.75	1.3	.93	2.8	3.9	3.2	2.8	1.8	3.4	.81	.55
28	.30	.70	2.3	1.5	.75	2.6	2.8	5.2	1.3	1.5	.81	.51
29	.30	.65	8.1	.87	1.8	1.9	2.5	5.9	1.3	1.5	.81	.51
30	.30	.60	11	.87	---	1.8	2.3	5.9	1.3	1.6	.81	.47
31	.36	---	3.2	.81	---	1.8	---	4.6	---	1.3	1.7	---
TOTAL	12.67	37.95	78.98	117.68	21.35	98.26	149.8	100.4	85.9	83.0	50.13	28.17
MEAN	.41	1.27	2.42	3.80	.74	3.17	4.99	3.24	2.86	2.68	1.62	.94
MAX	1.7	10	24	31	2.8	20	16	6.5	12	7.3	8.1	4.2
MIN	.30	.43	.51	.81	.51	.70	1.7	1.4	1.3	1.3	.81	.47
AC-FT	25	75	149	233	42	195	297	199	170	165	99	56

CAL YR 1979 TOTAL 570.08 MEAN 1.56 MAX 26 MIN .29 AC-FT 1130
WTR YR 1980 TOTAL 860.29 MEAN 2.35 MAX 31 MIN .30 AC-FT 1710

16254000 MAKAWAO STREAM NEAR KAILUA

LOCATION.--Lat 21°21'49", long 157°46'02", Hydrologic Unit 20060000, on left bank 650 ft (198 m) upstream from mouth, 2.7 mi (4.3 km) southwest of Kailua, and 4.3 mi (6.9 km) southeast of Kaneohe Courthouse.

DRAINAGE AREA.--2.04 mi² (5.28 km²).

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. Altitude of gage is 80 ft (24 m), from topographic map. Prior to Jan. 1, 1958, nonrecording gage at sites about 200 ft (61 m) upstream at different datums.

REMARKS.--Records good. Maunawili ditch diverts 1.5 mi (2.4 km) above station for irrigation in vicinity of Waimanalo. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years (water years, 1914-15, 1959-80), 4.99 ft³/s (0.141 m³/s), 3,620 acre-ft/yr (4.46 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,000 ft³/s (170 m³/s) Feb. 4, 1965, gage height, 12.41 ft (3.783 m), from rating curve extended above 470 ft³/s (13.3 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.43 ft³/s (0.012 m³/s) Sept. 8-12, 14, 16-20, 22, 23, 1964.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 390 ft³/s (11.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0230	478	13.5	5.27	1.606	May 28	2300	455	12.9	5.18	1.579
Jan. 8	1730	*1410	39.9	*7.60	2.317	May 30	1930	1060	30.0	6.90	2.103
Jan. 10	0330	622	17.6	5.75	1.753						

Minimum discharge, 1.0 ft³/s (0.028 m³/s) Oct. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	6.5	1.4	9.1	6.5	4.2	12	5.1	29	4.4	3.7	4.0
2	1.3	2.3	1.4	8.1	6.3	3.9	6.1	4.7	10	5.7	3.5	2.8
3	1.3	1.7	1.3	6.5	6.1	3.5	4.7	5.9	7.8	4.7	3.5	2.7
4	1.2	1.5	1.4	4.9	6.0	3.5	4.5	4.6	7.0	5.7	3.8	2.7
5	1.2	1.3	1.3	4.5	5.6	3.4	4.4	7.4	6.5	4.6	16	2.6
6	1.2	1.2	1.5	4.2	5.3	3.6	8.0	4.6	6.4	5.6	4.1	2.5
7	1.2	1.2	1.5	12	6.1	3.4	19	4.4	6.0	13	3.5	2.6
8	1.6	1.2	1.3	131	5.7	3.4	5.6	4.3	5.9	5.7	5.6	2.6
9	1.3	1.3	21	30	5.6	3.3	4.8	4.3	6.2	4.7	3.6	2.5
10	1.4	1.4	6.0	170	5.9	3.2	4.7	4.1	6.1	4.3	3.3	2.5
11	1.4	2.2	3.7	50	5.6	3.5	6.6	4.0	5.6	4.2	3.7	2.4
12	1.2	1.6	3.2	23	5.7	3.3	5.2	4.0	5.3	4.1	3.2	2.2
13	1.2	1.5	2.4	16	7.5	3.4	4.7	4.0	6.5	5.4	3.3	2.2
14	1.5	1.6	1.6	13	5.8	3.6	4.8	3.9	12	8.5	3.2	2.1
15	1.3	1.4	1.5	11	5.5	3.4	9.8	4.0	11	4.8	3.2	2.4
16	1.3	1.3	1.4	9.7	5.3	8.7	6.0	4.6	5.7	4.4	3.2	4.3
17	1.2	1.4	1.4	8.5	5.1	7.0	9.4	3.9	5.1	4.3	3.0	2.7
18	1.2	1.4	1.4	7.7	4.8	13	7.4	3.8	4.9	4.3	3.0	2.5
19	1.2	1.4	1.4	6.7	3.6	17	7.1	3.7	5.4	4.2	3.4	2.7
20	1.4	1.5	1.4	6.3	3.2	5.8	5.4	3.6	5.0	3.8	3.2	2.3
21	1.9	1.4	1.4	6.1	3.1	5.0	5.4	3.7	5.0	4.3	3.0	2.3
22	1.3	1.4	1.4	5.6	3.3	4.8	12	3.8	4.6	5.0	2.9	2.2
23	1.4	1.7	1.4	6.0	3.3	5.1	6.1	3.8	4.5	4.6	2.8	2.3
24	1.4	2.4	5.1	6.9	4.2	5.2	6.3	3.7	4.5	4.3	2.9	2.3
25	1.2	1.6	40	6.8	3.5	4.7	5.9	5.1	4.7	3.6	2.9	2.3
26	1.2	1.5	5.0	6.8	3.2	4.5	5.3	7.9	4.6	3.6	3.2	2.6
27	1.2	1.5	3.4	6.8	21	4.9	5.0	4.5	4.5	4.6	2.9	2.3
28	1.4	1.6	4.7	9.1	6.5	4.3	4.9	24	4.7	3.6	2.7	2.3
29	1.3	1.9	21	7.1	4.9	4.2	4.8	23	4.5	3.6	2.7	2.3
30	1.2	1.9	65	7.8	---	4.1	4.8	53	4.4	3.6	2.7	2.2
31	1.4	---	13	6.7	---	4.1	---	17	---	3.5	2.8	---
TOTAL	40.9	51.8	218.9	607.9	164.2	155.0	200.7	238.4	203.4	150.7	114.5	76.4
MEAN	1.32	1.73	7.06	19.6	5.66	5.00	6.69	7.69	6.78	4.86	3.69	2.55
MAX	1.9	6.5	65	170	21	17	19	53	29	13	16	4.3
MIN	1.2	1.2	1.3	4.2	3.1	3.2	4.4	3.6	4.4	3.5	2.7	2.1
AC-FT	81	103	434	1210	326	307	398	473	403	299	227	152

CAL YR 1979 TOTAL 2098.5 MEAN 5.75 MAX 109 MIN 1.1 AC-FT 4160
WTR YR 1980 TOTAL 2222.8 MEAN 6.07 MAX 170 MIN 1.2 AC-FT 4410

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 (91 m) downstream from Luluku Stream, 1.0 mi (1.6 km) southwest of Castle High School and 1.9 mi (3.1 km) northwest of the intersection of State Highways 61 and 83.

DRAINAGE AREA.--3.81 mi² (9.87 km²).

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good except those above 400 ft³/s (11.3 m³/s), which are poor. Flow regulated to some extent by the construction of a dam upstream. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,500 ft³/s (42.5 m³/s) Mar. 18, 1980, gage height, 5.50 ft (1.676 m), minimum, 0.60 ft³/s (0.017 m³/s) Mar. 27, 1978.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,500 ft³/s (42.5 m³/s) Mar. 18, gage height, 5.50 ft (1.676 m), minimum, 3.6 ft³/s (0.10 m³/s) Oct. 19.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	8.7	4.5	11	10	9.2	15	12	79	12	12	11
2	5.1	5.8	4.5	9.5	10	8.8	15	11	18	13	10	9.0
3	5.2	5.2	4.4	8.4	9.9	8.4	11	12	14	11	9.9	9.6
4	5.5	4.8	4.5	8.1	9.9	8.5	11	11	13	11	9.5	10
5	5.6	4.5	4.4	7.7	15	8.1	11	15	13	11	24	8.8
6	5.5	4.4	4.4	7.7	10	9.2	18	12	13	11	11	8.6
7	5.4	4.4	4.7	13	12	8.1	19	11	12	21	13	8.6
8	6.8	4.4	4.3	171	9.9	7.7	12	11	12	12	12	8.6
9	5.7	4.5	96	146	9.5	7.7	12	11	12	11	12	8.8
10	5.4	4.6	19	253	9.2	7.7	11	11	13	11	10	8.6
11	5.1	6.4	7.4	135	9.2	8.1	12	10	12	11	10	8.9
12	4.7	4.9	6.1	24	9.2	8.1	12	10	12	13	9.9	8.4
13	4.6	4.8	5.5	20	9.9	7.7	11	10	18	14	9.5	8.4
14	7.0	5.6	7.7	18	9.2	8.1	11	10	37	15	9.9	8.1
15	4.9	5.7	5.5	16	8.8	8.4	41	12	23	12	9.9	9.8
16	4.8	4.8	5.2	15	8.8	21	16	22	14	11	9.9	28
17	4.8	4.8	4.9	14	8.4	22	13	11	13	11	9.5	11
18	4.7	5.1	4.9	14	8.4	237	13	10	13	12	9.5	9.2
19	4.6	5.1	4.9	13	8.4	182	13	9.9	13	11	9.9	9.2
20	4.7	7.1	4.7	13	8.1	19	11	9.9	12	10	8.8	8.8
21	4.5	5.1	4.7	13	8.1	15	12	9.9	13	12	9.5	8.8
22	4.7	4.9	4.7	12	8.1	14	18	12	12	12	9.5	8.6
23	4.7	4.8	4.9	12	8.4	15	15	13	12	11	8.8	8.5
24	4.7	6.9	15	12	10	13	13	11	12	11	10	8.4
25	4.6	5.1	97	12	12	13	14	17	12	10	10	8.5
26	4.6	4.7	12	11	17	12	12	16	12	11	10	9.2
27	4.5	4.7	7.4	11	45	14	12	12	12	15	9.3	8.6
28	5.0	4.8	9.9	13	13	12	12	58	11	11	9.0	8.3
29	4.9	5.1	41	11	10	11	11	29	11	11	8.6	8.2
30	4.7	4.6	84	13	---	11	11	21	11	10	9.1	8.2
31	5.1	---	15	11	---	11	---	50	---	9.9	8.8	---
TOTAL	157.6	156.3	503.1	1048.4	325.4	745.8	418	480.7	484	367.9	322.8	286.7
MEAN	5.08	5.21	16.2	33.8	11.2	24.1	13.9	15.5	16.1	11.9	10.4	9.56
MAX	7.0	8.7	97	253	45	237	41	58	79	21	24	28
MIN	4.5	4.4	4.3	7.7	8.1	7.7	11	9.9	11	9.9	8.6	8.1
AC-FT	313	310	998	2080	645	1480	829	953	960	730	640	569

CAL YR 1979 TOTAL 4429.3 MEAN 12.1 MAX 140 MIN 4.3 AC-FT 8790
WTR YR 1980 TOTAL 5296.7 MEAN 14.5 MAX 253 MIN 4.3 AC-FT 10510

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, 1981; minimum daily mean, 3 mg/L Apr. 14-17, 1977.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons (1,250 tonnes) Mar. 18, 1981; minimum daily, 0.05 ton (0.04 tonne) Apr. 14-17, 1977.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 879 mg/L Mar. 18; minimum daily mean, 20 mg/L for many days during the year.
SEDIMENT DISCHARGE: Maximum daily, 1,380 tons (1,250 tonnes) Mar. 18, 1981; minimum daily, 0.23 ton (0.21 tonne) Dec. 8.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTANTANEOUS (CFS)	SPECIFIC CONDUCTANCE (MICROMHOS)	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)
OCT					
10...	1440	5.6	190	7.5	25.5
26...	1120	4.9	200	7.6	23.0
JAN					
08...	1000	96	200	7.3	21.5
APR					
15...	1150	12	185	7.4	22.5
JUN					
04...	1600	14	190	6.6	24.0
JUL					
28...	1235	12	185	7.2	26.0
AUG					
27...	1430	10	220	7.0	25.0

DATE	TIME	STREAM-FLOW, INSTANTANEOUS (CFS)	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM	SED. SUSP. FALL DIAM. % FINER THAN .008 MM
JAN							
08...	1730	530	14700	21040	30	38	54
FEB							
27...	1430	126	8900	3030	47	53	66
JUN							
01...	1530	299	2960	2390	28	35	47

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .031 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .125 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .250 MM	SED. SUSP. SIEVE DIAM. % FINER THAN .500 MM
JAN						
08...	75	91	98	99	100	--
FEB						
27...	86	96	100	--	--	--
JUN						
01...	56	66	73	82	93	100

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

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	5.5	50	.74	8.7	150	3.5	4.5	20	.24
2	5.1	50	.69	5.6	60	.94	4.5	20	.24
3	5.2	30	.42	5.2	40	.56	4.4	20	.24
4	5.5	40	.59	4.8	40	.52	4.5	20	.24
5	5.6	30	.45	4.5	30	.36	4.4	20	.24
6	5.5	20	.30	4.4	40	.48	4.4	40	.48
7	5.4	20	.29	4.4	30	.36	4.7	20	.25
8	6.8	20	.37	4.4	30	.36	4.3	20	.23
9	5.7	30	.46	4.5	30	.36	96	750	194
10	5.4	40	.58	4.6	20	.25	19	150	7.7
11	5.1	30	.41	6.4	30	.52	7.4	80	1.6
12	4.7	40	.51	4.9	20	.26	6.1	50	.82
13	4.6	40	.50	4.8	20	.26	5.5	60	.89
14	7.0	60	1.1	5.6	30	.45	7.7	70	1.5
15	4.9	40	.53	5.7	30	.46	5.5	60	.89
16	4.8	40	.52	4.8	20	.26	5.2	60	.84
17	4.8	40	.52	4.8	20	.26	4.9	40	.53
18	4.7	60	.76	5.1	20	.28	4.9	30	.40
19	4.6	100	1.2	5.1	20	.28	4.9	40	.53
20	4.7	50	.63	7.1	40	.77	4.7	20	.25
21	4.5	30	.36	5.1	40	.55	4.7	20	.25
22	4.7	60	.76	4.9	30	.40	4.7	20	.25
23	4.7	70	.89	4.8	30	.39	4.9	30	.40
24	4.7	50	.63	6.9	40	.75	15	80	3.2
25	4.6	70	.87	5.1	40	.55	97	307	120
26	4.6	50	.62	4.7	50	.63	12	50	1.6
27	4.5	20	.24	4.7	30	.38	7.4	50	1.0
28	5.0	30	.41	4.8	30	.39	9.9	100	2.7
29	4.9	40	.53	5.1	30	.41	41	133	18
30	4.7	30	.38	4.6	30	.37	84	135	37
31	5.1	20	.28	---	---	---	15	60	2.4
TOTAL	157.6	---	17.59	156.3	---	14.31	503.1	---	398.91
		JANUARY			FEBRUARY			MARCH	
1	11	30	.89	10	20	.54	9.2	30	.75
2	9.5	20	.51	10	20	.54	8.8	30	.71
3	8.4	20	.45	9.9	20	.53	8.4	30	.68
4	8.1	30	.66	9.9	20	.53	8.5	40	.92
5	7.7	20	.42	15	160	15	8.1	30	.66
6	7.7	20	.42	10	60	1.6	9.2	30	.75
7	13	70	2.5	12	100	3.2	8.1	30	.66
8	171	875	934	9.9	40	1.1	7.7	30	.62
9	146	338	111	9.5	40	1.0	7.7	20	.42
10	253	493	318	9.2	30	.75	7.7	30	.62
11	135	212	70	9.2	20	.50	8.1	30	.66
12	24	140	9.1	9.2	20	.50	8.1	30	.66
13	20	100	5.4	9.9	40	1.1	7.7	30	.62
14	18	60	2.9	9.2	20	.50	8.1	30	.66
15	16	50	2.2	8.8	20	.48	8.4	40	.91
16	15	40	1.6	8.8	20	.48	21	140	7.9
17	14	30	1.1	8.4	20	.45	22	150	8.9
18	14	30	1.1	8.4	20	.45	237	879	1380
19	13	30	1.1	8.4	20	.45	182	417	225
20	13	30	1.1	8.1	30	.66	19	300	15
21	13	40	1.4	8.1	20	.44	15	100	4.1
22	12	30	.97	8.1	20	.44	14	200	7.6
23	12	30	.97	8.4	40	.91	15	300	12
24	12	30	.97	10	40	1.1	13	150	5.3
25	12	30	.97	12	50	1.6	13	100	3.5
26	11	30	.89	17	30	1.4	12	60	1.9
27	11	20	.59	45	173	39	14	150	5.7
28	13	20	.70	13	80	2.8	12	150	4.9
29	11	20	.59	10	40	1.1	11	110	3.3
30	13	60	2.1	---	---	---	11	60	1.8
31	11	30	.89	---	---	---	11	60	1.8
TOTAL	1048.4	---	1475.49	325.4	---	79.15	745.8	---	1699.00

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

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	15	170	6.9	12	20	.65	79	304	113
2	15	100	4.1	11	30	.89	18	100	4.9
3	11	40	1.2	12	30	.97	14	50	1.9
4	11	30	.89	11	40	1.2	13	40	1.4
5	11	30	.89	15	60	2.4	13	40	1.4
6	18	120	5.8	12	60	1.9	13	30	1.1
7	19	80	4.1	11	50	1.5	12	30	.97
8	12	40	1.3	11	30	.89	12	30	.97
9	12	150	4.9	11	20	.59	12	50	1.6
10	11	120	3.6	11	20	.59	13	40	1.4
11	12	40	1.3	10	30	.81	12	20	.65
12	12	30	.97	10	20	.54	12	30	.97
13	11	20	.59	10	20	.54	18	70	3.4
14	11	120	3.6	10	20	.54	37	160	16
15	41	271	60	12	40	1.3	23	90	5.6
16	16	250	11	22	220	13	14	40	1.5
17	13	40	1.4	11	80	2.4	13	40	1.4
18	13	20	.70	10	40	1.1	13	40	1.4
19	13	20	.70	9.9	40	1.1	13	40	1.4
20	11	20	.59	9.9	30	.80	12	40	1.3
21	12	20	.65	9.9	50	1.3	13	40	1.4
22	18	90	4.4	12	50	1.6	12	30	.97
23	15	40	1.6	13	50	1.8	12	30	.97
24	13	30	1.1	11	60	1.8	12	30	.97
25	14	30	1.1	17	150	6.9	12	30	.97
26	12	30	.97	16	90	3.9	12	40	1.3
27	12	20	.65	12	60	1.9	12	60	1.9
28	12	20	.65	58	351	94	11	50	1.5
29	11	40	1.2	29	140	11	11	50	1.5
30	11	30	.89	21	110	6.2	11	40	1.2
31	---	---	---	50	313	68	---	---	---
TOTAL	418	---	127.74	480.7	---	232.11	484	---	174.94
		JULY			AUGUST			SEPTEMBER	
1	12	40	1.3	12	60	1.9	11	30	.89
2	13	50	1.8	10	60	1.6	9.0	30	.73
3	11	50	1.5	9.9	50	1.6	9.6	30	.78
4	11	50	1.5	9.5	50	1.3	10	20	.54
5	11	50	1.5	24	140	9.1	8.8	20	.48
6	11	70	2.1	11	110	3.3	8.6	30	.70
7	21	180	10	13	90	3.2	8.6	40	.93
8	12	100	3.2	12	90	2.9	8.6	30	.70
9	11	100	3.0	12	90	2.9	8.8	50	1.2
10	11	140	4.2	10	60	1.6	8.6	50	1.2
11	11	150	4.5	10	60	1.6	8.9	50	1.2
12	13	120	4.2	9.9	60	1.6	8.4	60	1.4
13	14	250	9.5	9.5	60	1.5	8.4	60	1.4
14	15	200	8.1	9.9	60	1.6	8.1	50	1.1
15	12	150	4.9	9.9	50	1.3	9.8	60	1.6
16	11	140	4.2	9.9	50	1.3	28	250	19
17	11	90	2.7	9.5	50	1.3	11	40	1.2
18	12	60	1.9	9.5	40	1.0	9.2	50	1.2
19	11	50	1.5	9.9	50	1.3	9.2	50	1.2
20	10	50	1.4	8.8	50	1.2	8.8	60	1.4
21	12	60	1.9	9.5	40	1.0	8.8	50	1.2
22	12	60	1.9	9.5	40	1.0	8.6	50	1.2
23	11	50	1.5	8.8	30	.71	8.5	60	1.4
24	11	50	1.5	10	20	.54	8.4	40	.91
25	10	50	1.4	10	30	.81	8.5	40	.92
26	11	40	1.2	10	40	1.1	9.2	50	1.2
27	15	60	2.4	9.3	30	.75	8.6	50	1.2
28	11	60	1.8	9.0	30	.73	8.3	20	.45
29	11	60	1.8	8.6	30	.70	8.2	30	.66
30	10	70	1.9	9.1	20	.49	8.2	40	.89
31	9.9	70	1.9	8.6	20	.48	---	---	---
TOTAL	367.9	---	92.2	322.8	---	51.41	286.7	---	48.88
YEAR	5296.7		4813.68						

16273900 KAMOOALII STREAM AT KANEOHE

LOCATION.--Lat 21°24'51", long 157°48'13", Hydrologic Unit 20060000, on right bank 500 ft (150 m) upstream from Highway 83 and 0.2 mi (0.3 km) south of Parker School in Kaneohe.

DRAINAGE AREA.--4.38 mi² (11.34 km²).

PERIOD OF RECORD.--January 1959 to October 1963, November 1965 to January 1980 (discontinued).

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 38.75 ft (11.811 m) above mean sea level (levels by city and county of Honolulu). Prior to Oct. 5, 1963, at site 50 ft (15 m) downstream at datum 0.93 ft (0.283 m) lower.

REMARKS.--Records fair. Flow regulated to some extent by the construction of a dam upstream. Recording rain gage located at station. Observations of specific conductance, pH, water temperature and suspended sediment discharge made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years (water years 1960-63, 1967-79), 14.0 ft³/s (0.396 m³/s), 10,140 acre-ft/yr (12.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 12,000 ft³/s (340 m³/s) Feb. 1, 1969, gage height, 10.16 ft (3.097 m), from rating curve extended above 380 ft³/s (10.8 m³/s) on basis of slope-area measurements at gage heights 5.26 ft (1.603 m), 7.14 ft (2.176 m), 7.47 ft (2.277 m), and 10.16 ft (3.097 m); minimum, 1.0 ft³/s (0.028 m³/s) Mar. 27, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 23, 1958, reached a stage of 8.3 ft (2.53 m), from floodmarks, former site and datum, discharge, 6,610 ft³/s (187 m³/s), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of slope-area measurement at gage height 5.69 ft (1.734 m). Discharge for peaks of Feb. 4 and May 2, 1965, 6,190 ft³/s (175 m³/s) and 5,400 ft³/s (153 m³/s), respectively; results of slope-area measurements of peak flow.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October 1979 to January 1980, 1,200 ft³/s (34.0 m³/s) Jan. 8, gage height, 4.08 ft (1.244 m), no other peak above base of 950 ft³/s (26.9 m³/s); minimum, 4.8 ft³/s (0.14 m³/s) Oct. 19, Dec. 3.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1979 TO JANUARY 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.3	11	5.0	12								
2	6.3	6.9	5.0	11								
3	6.3	6.3	4.8	10								
4	6.3	5.8	5.2	9.3								
5	6.3	5.2	5.0	8.9								
6	6.3	5.2	5.9	8.9								
7	6.3	5.5	5.5	17								
8	9.4	5.8	5.2	200								
9	6.9	6.0	122	170								
10	7.2	6.1	23	320								
11	6.3	9.7	9.2	149								
12	5.8	6.0	7.5	25								
13	6.0	6.3	6.6	23								
14	11	6.9	10	19								
15	6.0	6.9	6.6	18								
16	6.0	5.8	6.3	16								
17	6.3	5.8	6.3	16								
18	5.5	6.3	6.0	16								
19	5.5	6.3	5.8	15								
20	5.8	9.5	5.8	14								
21	5.5	6.3	5.8	15								
22	5.5	5.8	5.8	14								
23	6.0	5.5	6.0	14								
24	5.2	7.6	15	13								
25	5.2	6.0	104	12								
26	5.2	5.5	15	12								
27	5.2	5.2	8.5	12								
28	6.9	6.0	12	14								
29	6.0	6.0	46	13								
30	5.5	5.2	100	14								
31	6.8	---	18	13								
TOTAL	196.8	192.4	592.8	1224.1								
MEAN	6.35	6.41	19.1	39.5								
MAX	11	11	122	320								
MIN	5.2	5.2	4.8	8.9								
AC-FT	390	382	1180	2430								

CAL YR 1979 TOTAL 5012.0 MEAN 13.7 MAX 145 MIN 4.8 AC-FT 9940

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 (0.3 km) upstream from confluence with North Fork, 3.0 mi (4.8 km) southwest of Waiahole School, and 4.0 mi (6.4 km) northwest of Heeia.

DRAINAGE AREA.--0.03 mi² (0.08 km²).

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 615.74 ft (187.678 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--18 years, 1.73 ft³/s (0.049 m³/s), 1,250 acre-ft/yr (1.54 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 279 ft³/s (7.90 m³/s) May 2, 1965, gage height, 3.96 ft (1.207 m), from rating curve extended above 3.9 ft³/s (0.11 m³/s); no flow July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 47 ft³/s (1.33 m³/s) and maximum (*), from rating curve extended above 3.9 ft³/s (0.11 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0200	60	1.70	2.33	0.710
Jan. 8	1700	*209	5.92	*3.56	1.085
Mar. 18	2100	197	5.58	3.48	1.061

Minimum discharge, 0.20 ft³/s (0.006 m³/s) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	1.1	.82	.88	.77	.43	1.2	.55	1.4	.88	.77	.59
2	.94	.94	.82	.82	.77	.39	1.0	.47	.63	1.2	.82	.55
3	1.0	.88	.82	.82	.77	.36	.68	.47	.59	.72	.82	.24
4	.94	.88	.82	.82	.72	.36	.58	.47	.59	.88	.82	.27
5	.94	.88	.82	.82	.72	.36	.54	.59	.59	.72	1.8	.95
6	.94	.88	.88	.82	.72	.67	1.0	.59	.63	.88	.82	1.1
7	.94	.88	.88	.88	.88	.39	.68	.47	.59	1.6	.77	1.1
8	1.0	.88	.82	12	.77	.36	.52	.47	.59	.72	.77	1.0
9	.94	.88	1.5	3.0	.72	.36	.47	.47	.63	.67	.77	.77
10	.94	.88	.94	9.0	.77	.36	.63	.47	.59	.67	.77	.77
11	.94	.94	.97	2.2	.77	.39	1.1	.47	.55	.67	.77	.77
12	.94	.88	.82	1.1	.77	.39	1.7	.47	.59	.82	.77	.77
13	.94	.88	.82	1.1	.77	.39	1.4	.47	.70	1.2	.77	.77
14	.94	.88	.88	1.1	.77	.70	1.7	.47	2.1	.82	.88	.77
15	.94	.88	.82	1.0	.77	.43	1.8	.51	1.7	.72	.88	.93
16	.94	.88	.77	.94	.77	1.1	1.0	1.4	.77	.63	.79	1.2
17	.94	.88	.77	.88	.77	1.1	.88	.72	.77	.63	.70	.94
18	.94	.88	.77	.88	.77	16	.55	.67	.77	.67	.68	.88
19	.94	.88	.77	.88	.77	8.0	.51	.67	.77	.63	.67	.88
20	.94	.94	.77	.88	.77	3.0	.47	.67	.77	.63	.72	.88
21	.94	.82	.77	.82	.77	.90	.47	.67	.77	.63	.67	.88
22	.94	.82	.77	.82	.77	.62	.73	.93	.77	1.4	.67	.88
23	.94	.82	.82	.82	1.1	.54	.58	.72	.77	.94	.72	.88
24	.94	.82	1.6	.80	.82	.50	.63	.80	.77	.82	.77	.88
25	.94	.82	5.1	.77	.88	.50	.63	.67	.77	.82	3.5	.88
26	.94	.82	.94	.77	.77	.48	.47	1.1	.77	.94	.88	.88
27	.94	.82	.88	.77	1.2	.46	.47	.77	.77	1.6	.82	.88
28	.94	.82	.82	.82	.88	.44	.47	.89	.77	.82	.82	.88
29	.94	.82	2.1	.82	.77	.44	.47	1.2	.77	.77	.77	.88
30	.94	.82	2.6	.88	---	.84	.47	.88	.82	.72	.88	.88
31	1.1	---	.94	.77	---	.70	---	.91	---	.72	.59	---
TOTAL	29.58	26.20	38.62	49.68	23.27	41.56	23.80	21.08	24.07	26.54	27.65	24.93
MEAN	.95	.87	1.12	1.60	.80	1.34	.79	.68	.80	.86	.89	.83
MAX	1.1	1.1	5.1	12	1.2	16	1.8	1.4	2.1	1.6	3.5	1.2
MIN	.94	.82	.77	.77	.72	.36	.47	.47	.55	.63	.59	.24
AC-FT	59	52	69	99	46	82	47	42	48	53	55	49

CAL YR 1979 TOTAL 384.05 MEAN 1.05 MAX 5.1 MIN .67 AC-FT 762
WTR YR 1980 TOTAL 352.98 MEAN .96 MAX 16 MIN .24 AC-FT 700

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 (0.5 km) upstream from confluence with South Fork, 2.8 mi (4.5 km) southwest of Waiahole School, and 4.3 mi (6.9 km) northwest of Heeia.

DRAINAGE AREA.--0.03 mi² (0.08 km²).

PERIOD OF RECORD.--September 1962 to current year.

GAGE.--Water-stage recorder. Datum of gage is 639.00 ft (194.767 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records good. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--18 years, 1.78 ft³/s (0.050 m³/s), 1,290 acre-ft/yr (1.59 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft³/s (10.6 m³/s) Feb. 4, 1965, gage height, 3.38 ft (1.030 m), from rating curve extended above 19 ft³/s (0.54 m³/s); no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 45 ft³/s (1.27 m³/s) and maximum (*), from rating curve extended above 19 ft³/s (0.54 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0130	56	1.59	1.85	0.564	Mar. 18	2100	*141	3.99	*2.48	0.756
Jan. 8	1630	118	3.34	2.35	.716	Aug. 25	0230	63	1.78	1.93	.588

Minimum discharge, 0.14 ft³/s (0.004 m³/s) Sept. 4.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	1.3	1.2	1.2	.93	1.6	.98	1.6	.98	1.2	1.3
2	1.5	1.4	1.3	1.2	1.2	.83	1.4	.88	.98	1.1	1.2	1.2
3	1.4	1.4	1.3	1.1	1.2	.83	1.0	.88	.98	1.0	1.2	.78
4	1.5	1.4	1.3	1.1	1.2	.86	.98	.88	.98	1.2	1.2	.68
5	1.4	1.4	1.3	1.2	1.2	.83	.93	.98	.98	1.0	2.0	1.9
6	1.4	1.4	1.3	1.2	1.2	1.0	1.5	.98	.98	1.2	1.2	1.6
7	1.4	1.4	1.3	1.2	1.3	.88	1.2	.88	.98	1.7	1.1	1.6
8	1.5	1.4	1.3	7.0	1.2	.88	1.0	.98	.98	1.1	1.2	1.5
9	1.4	1.6	1.9	1.9	1.2	.88	.98	.88	.98	1.1	1.2	1.2
10	1.4	1.6	1.3	4.5	1.2	.88	.98	.88	.98	1.1	1.1	1.2
11	1.4	1.4	1.4	1.8	1.2	.88	.98	.88	.98	1.1	1.1	1.2
12	1.4	1.3	1.2	1.3	1.2	.88	.98	.88	.98	1.2	1.1	1.2
13	1.4	1.3	1.2	1.3	1.2	.88	.98	.88	1.1	1.5	1.2	1.2
14	1.4	1.3	1.4	1.3	1.2	1.2	.98	.88	1.9	1.2	1.1	1.2
15	1.4	1.3	1.3	1.3	1.2	.88	2.1	.88	1.6	1.1	1.1	1.6
16	1.4	1.3	1.3	1.2	1.2	1.5	1.6	3.0	.98	1.1	1.1	1.7
17	1.4	1.3	1.2	1.2	1.2	1.5	1.6	.98	.98	1.2	1.1	1.3
18	1.4	1.3	1.2	1.2	1.2	12	1.1	.93	.98	1.2	1.2	1.3
19	1.4	1.4	1.2	1.2	1.2	6.0	1.0	.93	.98	1.2	1.2	1.3
20	1.4	1.5	1.2	1.2	1.2	1.1	1.0	.93	.98	1.2	1.2	1.3
21	1.4	1.3	1.2	1.2	1.2	1.0	.98	.93	.98	1.2	1.2	1.3
22	1.4	1.3	1.2	1.2	1.2	1.0	1.3	1.2	.98	1.7	1.3	1.3
23	1.4	1.3	1.2	1.1	1.4	1.0	.99	1.0	.98	1.3	1.3	1.3
24	1.4	1.3	2.4	1.1	1.3	1.0	1.0	1.0	.98	1.2	1.3	1.3
25	1.4	1.3	5.3	1.1	1.2	.98	1.1	.98	.98	1.2	3.1	1.3
26	1.4	1.3	1.3	1.1	1.2	.93	.88	1.2	.98	1.3	1.2	1.3
27	1.4	1.3	1.2	1.1	1.5	.93	.88	.98	.98	1.9	1.2	1.3
28	1.4	1.3	1.2	1.2	1.2	.93	.88	1.1	.98	1.2	1.2	1.3
29	1.4	1.3	2.5	1.2	1.1	.93	.88	1.5	.98	1.2	1.2	1.3
30	1.4	1.3	2.6	1.2	---	.93	.88	1.0	.98	1.2	1.5	1.3
31	1.6	---	1.2	1.2	---	.93	---	1.1	---	1.2	1.3	---
TOTAL	44.1	40.6	47.5	47.3	35.4	46.18	33.66	32.26	31.68	38.08	39.8	38.76
MEAN	1.42	1.35	1.53	1.53	1.22	1.49	1.12	1.04	1.06	1.23	1.28	1.29
MAX	1.6	1.6	5.3	7.0	1.5	12	2.1	3.0	1.9	1.9	3.1	1.7
MIN	1.4	1.3	1.2	1.1	1.1	.83	.88	.88	.98	.98	1.1	.68
AC-FT	87	81	94	94	70	92	67	64	63	76	79	77

CAL YR 1979 TOTAL 557.80 MEAN 1.53 MAX 5.3 MIN 1.2 AC-FT 1110
WTR YR 1980 TOTAL 475.32 MEAN 1.30 MAX 12 MIN .68 AC-FT 943

16284000 WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°27'01", long 157°51'38", Hydrologic Unit 20060000, on left bank 120 ft (37 m) downstream from forest-reserve boundary, 3.5 mi (5.6 km) northwest of Heeia, and 4.0 mi (6.4 km) northwest of Kaneohe Post Office.

DRAINAGE AREA.--0.93 mi² (2.41 km²).

PERIOD OF RECORD.--December 1935 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1719: 1956-57. WSP 1937: 1940-43(M), 1947(M), 1948(P), 1949-50(M), 1953(M), 1955(M), 1958(M), 1959(P). WRD Hawaii 1972: 1971(P).

GAGE.--Water-stage recorder and Parshall flume. Datum of gage is 193.44 ft (58.961 m) above mean sea level (levels by Honolulu Board of Water Supply).

REMARKS.--Records fair except for the peak flow, which is poor. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--44 years (water years 1937-80), 7.89 ft³/s (0.223 m³/s), 5,720 acre-ft/yr (7.05 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,110 ft³/s (145 m³/s) Feb. 4, 1965, gage height, 8.72 ft (2.658 m), from floodmarks, from rating curve extended above 77 ft³/s (2.18 m³/s) on basis of slope-area measurements at gage heights 6.06 ft (1.847 m) and 8.72 ft (2.658 m); no flow July 8, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 140 ft³/s (3.96 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0100	a320	9.06	Unknown		Mar. 18	a2150	a700	19.8	Unknown	
Jan. 8	1700	*770	21.8	*5.30	1.615	Aug. 25	a0230	a180	5.10	Unknown	
Jan. 10	a0400	a180	5.10	Unknown							

Minimum discharge, 1.4 ft³/s (0.040 m³/s) Mar. 2-6, 8-11.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	2.8	2.0	3.5	2.1	1.7	4.7	2.2	9.4	2.6	3.3	2.8
2	2.7	2.4	2.0	2.9	2.0	1.5	4.0	1.8	3.5	3.8	3.9	2.7
3	2.7	2.3	1.9	2.6	2.0	1.5	2.3	1.8	3.0	2.7	3.3	2.2
4	2.5	2.2	2.0	2.4	2.0	1.5	2.0	1.8	2.8	3.0	3.3	2.1
5	2.5	2.2	2.0	2.3	1.9	1.5	1.9	2.2	2.6	2.7	12	3.4
6	2.5	2.2	2.1	2.2	2.0	2.0	14	2.3	2.8	3.0	4.3	3.6
7	2.4	2.2	2.3	2.7	2.5	1.7	3.1	1.8	2.6	8.7	3.5	3.7
8	2.8	2.1	1.9	46	2.1	1.5	2.3	1.7	2.6	3.4	3.6	3.4
9	2.5	2.1	5.8	6.2	2.0	1.5	2.0	1.7	2.6	3.0	3.5	2.9
10	3.1	2.1	2.8	50	2.0	1.5	1.9	1.7	2.6	2.8	3.2	2.8
11	2.6	2.3	2.7	12	2.1	1.6	1.8	1.7	2.5	2.9	3.1	2.9
12	2.5	2.1	2.3	3.5	2.1	1.6	1.7	1.6	2.5	3.0	3.1	2.8
13	2.4	2.2	2.2	2.6	2.1	1.5	1.7	1.6	2.7	5.1	3.0	2.8
14	2.4	2.2	3.1	2.4	2.1	2.7	1.9	1.6	11	3.5	3.0	2.7
15	2.4	2.2	2.3	2.2	2.1	1.7	12	1.6	9.3	3.0	3.0	3.9
16	2.4	2.1	2.1	2.1	2.0	4.6	3.5	8.0	3.5	3.0	2.9	6.3
17	2.5	2.1	2.1	2.1	1.9	4.9	5.3	2.2	3.0	2.9	2.9	3.8
18	2.4	2.2	2.1	2.1	1.9	80	2.6	1.9	2.8	3.0	2.9	3.2
19	2.3	2.2	2.0	2.1	1.9	58	2.3	1.8	2.7	2.8	2.9	3.1
20	2.4	2.5	1.9	2.1	1.9	6.6	1.9	1.8	2.6	2.9	2.9	3.0
21	2.3	2.2	2.0	2.1	1.9	3.5	1.8	1.8	2.6	2.9	2.9	3.0
22	2.4	2.1	1.9	2.1	1.9	3.0	3.3	2.9	2.6	7.1	3.0	3.0
23	2.4	2.1	2.0	1.9	3.1	2.7	2.6	2.8	2.5	3.7	3.0	3.0
24	2.3	2.1	11	1.9	2.4	2.4	2.8	4.4	2.5	3.1	3.2	3.0
25	2.3	2.1	35	1.9	2.2	2.2	3.0	2.6	2.5	3.3	13	3.0
26	2.3	2.1	4.2	1.8	2.0	2.1	2.3	4.1	2.5	4.5	3.2	3.0
27	2.3	2.1	3.0	1.8	4.0	2.0	1.9	2.6	2.5	7.7	3.0	3.0
28	2.2	2.1	2.6	2.3	2.8	1.9	1.9	3.8	2.5	3.5	2.9	3.0
29	2.2	2.1	13	2.4	2.3	1.8	1.8	5.1	2.5	3.5	2.8	3.0
30	2.2	2.1	23	2.5	---	1.8	1.8	3.0	2.5	3.4	3.1	3.0
31	2.4	---	5.3	2.2	---	1.8	---	4.0	---	3.3	2.9	---
TOTAL	76.1	65.8	150.6	196.9	63.3	204.3	96.1	79.9	102.3	113.8	116.1	94.1
MEAN	2.45	2.19	4.86	6.35	2.18	6.59	3.20	2.58	3.41	3.67	3.75	3.14
MAX	3.1	2.8	35	66	4.0	80	14	8.0	11	8.7	13	6.3
MIN	2.2	2.1	1.9	1.8	1.9	1.5	1.7	1.6	2.5	2.6	2.8	2.1
AC-FT	151	131	299	391	126	405	191	158	203	226	230	187

CAL YR 1979 TOTAL 1326.7 MEAN 3.63 MAX 44 MIN 1.9 AC-FT 2630
WTR YR 1980 TOTAL 1359.3 MEAN 3.71 MAX 80 MIN 1.5 AC-FT 2700

16284200 WAIHEE STREAM NEAR KAHALUU

LOCATION.--Lat 21°27'04", long 157°51'36", Hydrologic Unit 20060000, on right bank 0.2 mi (0.3 km) downstream from forest-reserve boundary, 1.0 mi (1.6 km) south of Kahaluu School, and 1.6 mi (2.6 km) west of Ahuimanu sewage treatment plant.

DRAINAGE AREA.--0.97 mi² (2.51 km²).

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 170 ft (52 m), from topographic map.

REMARKS.--Records good. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--6 years, 5.12 ft³/s (0.145 m³/s), 3,710 acre-ft/yr (4.57 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 828 ft³/s (23.4 m³/s) Jan. 8, 1980, gage height, 6.72 ft (2.048 m) from rating curve extended above 10 ft³/s (0.28 m³/s); minimum, 1.1 ft³/s (0.031 m³/s) Apr. 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 150 ft³/s (4.25 m³/s) and maximum (*), from rating curve extended above 10 ft³/s (0.28 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0100	341	9.66	5.25	1.600	Mar. 18	2150	732	20.7	6.48	1.975
Jan. 8	1700	*828	23.4	*6.72	2.048	Aug. 25	0230	202	5.72	4.63	1.411
Jan. 10	0400	196	5.55	4.60	1.402						

Minimum discharge, 4.4 ft³/s (0.125 m³/s) Mar. 1-6, 8-14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	5.6	4.6	6.8	5.2	4.6	7.9	5.6	12	6.3	6.6	5.9
2	5.6	5.2	4.6	6.1	5.2	4.4	7.3	5.4	7.1	7.5	6.6	5.9
3	5.6	5.0	4.6	5.6	5.0	4.4	5.6	5.6	6.4	6.3	6.6	5.0
4	5.4	5.0	4.6	5.4	4.9	4.4	5.4	5.6	6.3	6.8	6.6	4.8
5	5.4	4.9	4.6	5.2	4.9	4.4	5.2	5.9	6.1	6.3	15	6.1
6	5.4	4.9	4.7	5.0	4.9	5.0	19	6.1	6.3	6.8	7.9	6.3
7	5.4	4.9	4.7	5.9	5.5	4.7	6.8	5.4	6.1	12	6.8	6.3
8	5.9	4.9	4.6	72	5.2	4.4	5.9	5.4	6.1	6.8	7.1	6.1
9	5.4	4.9	9.2	14	5.2	4.4	5.4	5.4	6.1	6.3	6.8	5.9
10	6.2	5.0	5.6	56	5.2	4.4	5.2	5.2	6.3	6.1	6.6	5.9
11	5.6	5.2	5.5	16	5.0	4.4	5.4	5.2	6.1	6.1	6.6	5.9
12	5.4	5.0	4.9	8.6	5.0	4.4	5.2	5.0	6.1	6.3	6.6	5.9
13	5.4	5.0	4.7	6.8	5.2	4.4	5.0	4.9	6.4	8.0	6.3	6.1
14	5.2	5.0	6.0	6.3	5.0	5.9	5.2	4.9	15	6.6	6.6	5.9
15	5.2	4.9	4.9	5.9	5.0	4.6	14	4.9	15	6.1	6.6	7.1
16	5.2	4.9	4.6	5.6	4.9	7.6	7.1	12	7.1	6.1	6.6	9.4
17	5.4	4.9	4.6	5.4	4.9	8.6	9.5	5.6	6.6	5.9	6.6	7.1
18	5.2	5.0	4.6	5.4	4.9	94	6.3	5.2	6.3	6.1	6.6	6.6
19	5.2	4.9	4.6	5.2	4.9	63	5.9	5.0	6.3	6.1	6.6	6.6
20	5.2	5.2	4.6	5.2	4.9	9.3	5.4	4.9	6.1	6.1	6.6	6.6
21	5.2	4.9	4.7	5.2	4.9	6.6	5.2	4.9	6.1	6.3	6.3	6.6
22	5.2	4.9	4.6	5.0	4.9	6.1	7.1	6.2	6.1	10	6.3	6.3
23	5.2	4.7	4.7	5.0	5.9	5.9	6.3	6.2	6.1	6.8	6.3	6.3
24	5.0	4.7	15	5.0	5.6	5.2	6.6	8.0	6.1	6.3	6.3	6.3
25	5.0	4.7	38	5.0	5.2	5.0	6.6	6.1	6.1	6.3	17	6.3
26	5.0	4.6	7.3	5.0	5.0	4.9	5.9	7.0	6.1	7.1	6.3	6.3
27	5.0	4.6	6.1	5.0	7.3	4.9	5.4	5.9	6.3	11	6.1	6.3
28	5.0	4.6	5.4	5.6	6.1	4.7	5.4	6.8	6.3	6.8	5.9	6.3
29	5.0	4.6	19	5.9	5.2	4.7	5.4	8.3	6.3	6.6	5.9	6.3
30	5.0	4.6	30	5.9	---	4.7	5.4	6.6	6.3	6.6	6.3	6.3
31	5.2	---	9.3	5.4	---	4.7	---	7.8	---	6.6	5.9	---
TOTAL	165.0	147.2	244.9	310.4	151.0	308.7	202.0	187.0	211.8	215.0	220.9	188.7
MEAN	5.32	4.91	7.90	10.0	5.21	9.96	6.73	6.03	7.06	6.94	7.13	6.29
MAX	6.2	5.6	38	72	7.3	94	19	12	15	12	17	9.4
MIN	5.0	4.6	4.6	5.0	4.9	4.4	5.0	4.9	6.1	5.9	5.9	4.8
AC-FT	327	292	486	616	300	612	401	371	420	426	438	374

CAL YR 1979 TOTAL 2564.1 MEAN 7.02 MAX 55 MIN 4.0 AC-FT 5090
WTR YR 1980 TOTAL 2552.6 MEAN 6.97 MAX 94 MIN 4.4 AC-FT 5060

16294900 WAIKANE STREAM AT ALTITUDE 75 FT (23 M), AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, on right bank 0.3 mi (0.5 km) downstream from Waikeekee Stream, 0.7 mi (1.1 km) west of Waikane, and 1.2 mi (1.9 km) northwest of Waiahole School.

DRAINAGE AREA.--2.22 mi² (5.75 km²).

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

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 75 ft (23 m), from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts from two tributaries above station for irrigation in vicinity of Waipahu. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years (water years 1961-80), 8.44 ft³/s (0.239 m³/s), 6,110 acre-ft/yr (7.53 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft³/s (249 m³/s) Feb. 4, 1965, gage height, 10.76 ft (3.280 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of slope-area measurements at gage heights 4.88 ft (1.487 m), 9.46 ft (2.883 m), and 10.76 ft (3.280 m); minimum, 0.76 ft³/s (0.022 m³/s) Oct. 27, 1975.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0130	1980	56.1	6.96	2.121	Mar. 19	a0300	4370	124	9.32	2.841
Jan. 8	a1700	*4880	138	*9.68	2.951	June 1	0430	758	21.5	4.97	1.515

Minimum discharge, 1.7 ft³/s (0.048 m³/s) several days in October.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.0	20	2.4	9.9	4.5	5.0	11	8.2	109	5.4	4.1	3.3
2	2.2	6.4	3.2	7.1	4.3	3.5	17	6.4	28	6.5	4.1	3.3
3	2.2	3.7	2.7	5.6	4.2	3.3	7.9	9.1	16	5.1	4.1	3.5
4	1.9	2.9	2.5	4.8	4.2	3.1	6.4	6.8	13	4.6	4.8	3.8
5	1.8	2.5	2.6	4.5	4.3	3.1	5.5	13	11	4.4	7.8	3.5
6	1.7	2.3	2.7	4.2	4.1	4.4	14	8.1	10	9.7	4.5	3.3
7	1.7	2.1	4.3	5.5	4.2	3.3	9.9	6.4	9.3	55	5.0	3.3
8	4.0	2.8	2.7	366	3.8	2.7	7.5	5.7	8.2	11	5.4	3.2
9	2.1	2.4	4.2	17	3.6	2.5	6.1	5.5	7.8	6.7	5.0	3.2
10	4.1	2.6	3.5	120	3.9	2.5	8.2	5.2	12	5.6	4.7	3.2
11	2.8	4.8	4.4	16	3.6	2.7	7.1	4.9	7.1	6.3	4.0	3.2
12	2.1	3.2	2.9	12	3.5	2.9	7.1	4.8	6.3	10	3.9	2.9
13	1.9	3.4	2.6	10	3.8	2.9	9.5	4.6	11	6.9	3.9	3.0
14	1.9	3.9	2.5	8.6	3.4	8.1	6.8	4.6	39	7.6	4.0	2.8
15	2.1	7.6	2.4	7.6	3.4	3.8	28	4.5	24	6.0	4.4	11
16	2.0	3.3	2.3	6.8	3.2	73	18	7.0	11	5.3	4.2	5.9
17	2.2	3.1	2.3	6.4	3.0	34	14	4.8	8.7	4.9	3.9	6.0
18	2.0	5.1	2.3	6.2	2.9	95	12	4.5	7.8	5.8	3.8	4.5
19	1.8	4.8	2.1	6.0	2.9	340	11	4.1	7.9	4.8	3.8	3.8
20	2.2	3.9	2.2	6.0	2.9	70	9.1	4.0	7.4	4.6	4.5	3.3
21	2.1	3.1	2.2	5.4	2.8	20	9.5	3.9	7.5	4.4	4.4	3.1
22	2.1	3.1	2.2	5.2	2.7	16	18	5.5	6.4	5.8	4.0	3.0
23	2.1	2.8	2.2	5.0	3.1	18	17	11	6.1	4.6	3.9	2.9
24	1.9	2.7	18	4.8	3.2	12	11	22	5.6	5.0	8.8	2.8
25	1.8	2.6	132	4.8	3.0	10	11	12	5.6	4.6	5.0	3.1
26	1.7	2.6	8.2	5.0	2.7	9.1	9.0	14	5.4	4.5	4.2	4.7
27	1.7	2.6	5.3	4.9	6.1	0.6	8.0	7.7	5.7	5.0	3.9	3.1
28	2.0	2.7	4.4	4.8	9.9	7.5	7.4	40	5.1	5.4	3.7	2.8
29	2.2	2.6	13	5.2	7.1	6.8	7.0	13	5.0	4.6	3.6	2.8
30	2.1	2.5	58	7.0	---	6.4	6.6	11	4.9	4.2	3.5	2.8
31	8.4	---	15	4.9	---	5.8	---	21	---	4.1	3.4	---
TOTAL	72.8	118.1	317.3	687.2	114.3	786.0	320.6	283.3	407.8	228.4	138.3	111.1
MEAN	2.35	3.94	10.2	22.2	3.94	25.4	10.7	9.14	13.6	7.37	4.46	3.70
MAX	8.4	20	132	366	9.9	340	28	40	109	55	8.8	11
MIN	1.7	2.1	2.1	4.2	2.7	2.5	5.5	3.9	4.9	4.1	3.4	2.8
AC-FT	144	234	629	1360	227	1560	636	562	809	453	274	220

CAL YR 1979 TOTAL 2718.9 MEAN 7.45 MAX 330 MIN 1.5 AC-FT 5390
WTR YR 1980 TOTAL 3585.2 MEAN 9.80 MAX 366 MIN 1.7 AC-FT 7110

NOTE.--No gage-height record July 25 to Sept. 11.

16296500 KAHANA STREAM AT ALTITUDE 30 FT (9.1 M), NEAR KAHANA

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank 600 ft (183 m) upstream from Kawa Stream, 1.1 mi (1.8 km) southwest of Kahana, and 2.2 mi (3.5 km) southwest of Swanzy Beach Park in Kaaawa.

DRAINAGE AREA.--3.74 mi² (9.69 km²).

PERIOD OF RECORD.--December 1958 to current year.

REVISED RECORDS.--WSP 1937: 1959-60.

GAGE.--Water-stage recorder and concrete-masonry control. Altitude of gage is 30 ft (9.1 m), from topographic map.

REMARKS.--Records fair. Approximately 9 ft³/s (0.25 m³/s) is diverted by Waiahole Water Co. at 800-ft (244-m) elevation, 2.3 mi (3.7 km) above station. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years (water years 1960-80), 35.8 ft³/s (1.014 m³/s), 25,940 acre-ft/yr (32.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,430 ft³/s (154 m³/s) Apr. 15, 1963, gage height, 8.10 ft (2.469 m), from rating curve extended above 530 ft³/s (15.0 m³/s) on basis of computation of peak flow over submerged weir; minimum, 10 ft³/s (0.28 m³/s) Sept. 17, 18, 20, 1961.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,600 ft³/s (45.3 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0115	2920	82.7	6.16	1.878	Mar. 19	0545	2740	77.6	6.00	1.829
Jan. 8	1730	*3460	98.0	*6.64	2.024	May 28	1445	3430	97.1	6.62	2.018
Mar. 16	0400	1710	48.4	4.91	1.497						

Minimum discharge, 14 ft³/s (0.40 m³/s) Dec. 14-23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	83	16	30	20	23	87	37	285	27	35	31
2	19	34	17	27	19	20	136	28	65	47	33	29
3	21	23	16	24	19	18	32	36	48	28	29	29
4	16	25	16	23	19	19	29	28	46	26	27	27
5	102	20	16	22	20	18	27	68	39	26	61	25
6	24	19	15	22	20	37	181	55	40	57	30	25
7	21	18	20	22	23	22	94	31	35	169	39	23
8	26	20	15	483	19	18	42	29	34	41	38	23
9	20	18	17	88	19	17	42	29	37	33	29	22
10	22	19	16	455	19	17	152	27	76	29	27	23
11	21	25	22	113	19	22	52	27	32	29	26	45
12	19	20	15	50	20	21	40	26	30	57	25	25
13	18	22	15	39	20	20	44	26	35	58	25	37
14	18	24	14	35	19	36	60	25	242	43	32	25
15	19	25	14	31	19	20	176	27	72	30	26	56
16	19	19	14	28	18	341	66	116	40	29	25	36
17	26	20	14	27	18	450	63	33	35	28	24	36
18	19	45	14	36	17	692	53	30	32	44	24	33
19	19	33	14	25	17	757	45	27	32	26	27	29
20	21	22	14	24	17	101	37	26	33	25	34	25
21	20	20	14	24	17	58	34	26	44	24	26	27
22	20	27	14	23	17	56	68	79	29	29	24	24
23	19	45	14	22	18	96	98	32	28	30	23	23
24	18	26	156	22	18	41	40	176	27	28	24	23
25	18	20	296	21	18	36	37	150	27	24	34	22
26	18	18	29	21	17	34	34	103	26	37	29	26
27	18	18	25	20	24	38	30	76	33	61	25	22
28	18	17	22	20	30	30	30	603	27	31	26	21
29	19	17	42	20	25	28	29	104	26	46	24	20
30	18	17	132	21	---	27	29	57	25	42	66	20
31	62	---	37	20	---	26	---	66	---	30	26	---
TOTAL	739	759	1095	1838	565	3139	1837	2203	1580	1234	943	822
MEAN	23.8	25.3	35.3	59.3	19.5	101	61.2	71.1	52.7	39.8	30.4	27.4
MAX	102	83	296	483	30	757	181	603	285	169	66	56
MIN	16	17	14	20	17	17	27	25	25	24	23	20
AC-FT	1470	1510	2170	3650	1120	6230	3640	4370	3130	2450	1870	1630

CAL YR 1979 TOTAL 13153 MEAN 36.0 MAX 446 MIN 14 AC-FT 26090
WTR YR 1980 TOTAL 16754 MEAN 45.8 MAX 757 MIN 14 AC-FT 33230

16302000 PUNALUU DITCH NEAR PUNALUU

LOCATION.--Lat 21°33'41", long 157°54'10", Hydrologic Unit 20060000, on right bank 800 ft (244 m) downstream from intake, 1.5 mi (2.4 km) west of Kahana, and 1.7 mi (2.7 km) southwest of Punaluu.

PERIOD OF RECORD.--May 1953 to current year.

REVISED RECORDS.--WSP 1719: 1954-55.

GAGE.--Water-stage recorder. Altitude of gage is 200 ft (61 m), from topographic map.

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

AVERAGE DISCHARGE.--27 years, 8.04 ft^3/s (0.228 m^3/s), 5,820 acre-ft/yr (7.18 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s (1.53 m^3/s) Oct. 31, 1964; no flow for several days in 1963, 1966, 1969, 1972, 1974, 1977, 1979, 1980.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft^3/s (0.62 m^3/s) Nov. 1; minimum daily, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	22	7.3	.14	.00	.07	.10	.00	1.9	.00	.00	.00
2	5.6	12	8.0	.12	.00	.05	.17	.00	.01	.00	.00	.00
3	6.9	9.6	7.4	.10	.00	.05	.00	.00	.00	.00	.00	.00
4	6.2	10	7.2	.09	.00	.04	.00	.00	.00	.00	.00	.00
5	1.7	7.9	7.4	.07	.00	.03	.00	.05	.00	.00	.04	.00
6	.78	7.7	7.2	.09	.00	.11	1.2	.07	.00	.02	.00	.00
7	.57	7.3	8.3	.14	.05	.05	.16	.00	.00	.06	.00	.00
8	2.2	8.1	7.3	9.4	.04	.03	.01	.00	.00	.00	.00	.00
9	4.0	7.8	7.3	.37	.03	.03	.03	.00	.00	.00	.00	.00
10	4.7	8.2	7.1	6.6	.04	.01	.03	.00	.01	.00	.00	.00
11	4.0	11	7.8	.49	.04	.00	.04	.00	.00	.00	.00	.00
12	3.7	8.1	6.5	.21	.05	.00	.01	.00	.00	.00	.00	.00
13	3.6	10	6.4	.10	.05	.00	.03	.00	.00	.00	.00	.00
14	3.7	10	6.3	.09	.04	.04	.01	.00	.32	.00	.00	.00
15	3.8	9.3	6.2	.09	.04	.00	1.1	.00	.00	.00	.00	.02
16	4.0	8.1	6.0	.07	.04	1.3	.04	.34	.00	.00	.00	.00
17	11	8.3	5.9	.07	.01	5.2	.03	.00	.00	.00	.00	.00
18	3.9	10	5.9	.10	.01	8.2	.04	.00	.00	.00	.00	.00
19	3.8	12	5.8	.03	.01	6.8	.00	.00	.00	.00	.00	.00
20	4.0	9.7	5.8	.01	.01	.15	.00	.00	.00	.00	.00	.00
21	3.9	8.8	5.9	.02	.01	.05	.00	.00	.00	.00	.00	.00
22	4.0	11	5.9	.01	.01	.07	.06	.34	.00	.00	.00	.00
23	4.2	9.6	5.9	.01	.01	.30	.01	.00	.00	.00	.00	.00
24	4.0	9.4	14	.01	.01	.00	.00	.25	.00	.00	.00	.00
25	4.0	8.7	7.8	.01	.01	.00	.00	.73	.00	.00	.02	.00
26	4.0	8.3	.07	.01	.01	.00	.00	.51	.00	.00	.00	.00
27	4.0	8.0	.07	.01	.08	.00	.00	.00	.00	.00	.00	.00
28	4.0	8.0	.05	.00	.13	.00	.00	1.7	.00	.00	.00	.00
29	4.4	7.8	.32	.00	.09	.00	.00	.00	.00	.00	.00	.00
30	4.4	7.6	2.5	.00	---	.00	.00	.00	.00	.00	.00	.00
31	9.9	---	.17	.00	---	.00	---	.03	---	.00	.00	---
TOTAL	135.35	284.3	179.78	18.46	.82	22.58	3.07	4.02	2.24	.08	.06	.02
MEAN	4.37	9.48	5.80	.60	.028	.73	.10	.13	.075	.003	.002	.001
MAX	11	22	14	9.4	.13	8.2	1.2	1.7	1.9	.06	.04	.02
MIN	.57	7.3	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	268	564	357	37	1.6	45	6.1	8.0	4.4	.2	.1	.04

CAL YR 1979 TOTAL 930.68 MEAN 2.55 MAX 22 MIN .00 AC-FT 1850
WTR YR 1980 TOTAL 650.78 MEAN 1.78 MAX 22 MIN .00 AC-FT 1290

HAWAII, ISLAND OF OAHU

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 (2.2 km) west of Kahana, and 1.8 mi (2.9 km) southwest of Punaluu.

DRAINAGE AREA.--2.78 mi² (7.20 km²).

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. Altitude of gage is 212 ft (65 m), from topographic map.

REMARKS.--Records fair. Records do not include flow of Punaluu ditch (see sta 16302000). Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--27 years, 17.2 ft³/s (0.487 m³/s), 12,460 acre-ft/yr (15.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,700 ft³/s (161 m³/s) July 17, 1974, gage height, 7.60 ft (2.316 m), from rating curve extended above 170 ft³/s (4.81 m³/s) on basis of slope-area measurements at gage heights 5.77 ft (1.759 m) and 7.60 ft (2.316 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 930 ft³/s (26.3 m³/s) and maximum (*), from rating curve extended above 30 ft³/s (0.85 m³/s) as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	0945	1400	39.6	4.16	1.268	Mar. 18	1900	1170	33.1	3.82	1.164
Dec. 25	0145	*1960	55.5	*4.90	1.494	May 28	1130	1460	41.3	4.24	1.292
Jan. 8	1645	1570	44.5	4.40	1.341	June 1	0600	1200	34.0	3.86	1.177

Minimum discharge, 5.3 ft³/s (0.15 m³/s) Dec. 22-24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	258	8.2	21	16	15	29	22	216	19	22	21
2	9.1	38	10	18	15	13	48	18	90	25	19	19
3	16	21	8.2	16	15	13	22	22	33	19	19	19
4	7.2	21	8.2	15	15	13	20	18	30	19	19	29
5	65	7.7	8.2	15	15	12	19	33	25	19	42	19
6	15	8.6	8.6	15	15	21	108	90	26	34	22	19
7	12	9.1	14	16	18	16	55	21	23	64	27	18
8	12	10	7.2	240	16	15	30	20	22	29	25	17
9	11	7.2	10	69	15	14	33	20	22	23	20	17
10	16	11	8.2	226	16	13	31	19	32	20	19	17
11	11	25	16	76	16	15	32	19	20	28	19	30
12	9.6	9.6	6.3	37	16	14	26	19	19	31	19	16
13	9.6	22	6.3	28	17	14	32	18	23	38	19	23
14	10	21	6.0	26	16	19	28	18	83	26	20	16
15	10	14	5.7	23	17	14	92	19	40	22	19	35
16	11	9.1	5.7	21	15	83	33	66	25	22	19	21
17	30	9.6	5.7	19	14	183	30	23	23	21	19	18
18	12	19	5.7	31	14	294	33	19	23	31	19	17
19	12	33	5.7	19	14	287	26	19	23	21	19	16
20	13	16	5.7	18	14	56	23	18	23	20	22	16
21	12	10	5.7	17	14	37	23	19	24	20	19	19
22	12	27	5.7	16	14	35	34	57	21	23	19	16
23	13	13	5.7	16	15	42	28	25	20	23	18	16
24	13	12	101	16	14	27	25	50	20	21	24	16
25	12	9.6	211	16	13	23	24	60	20	20	28	16
26	12	9.6	18	16	13	21	22	73	19	29	23	18
27	11	9.1	15	15	20	23	19	34	23	38	21	16
28	10	9.1	14	15	25	20	19	214	19	21	20	16
29	12	9.1	32	16	17	19	19	98	19	29	19	16
30	11	9.1	92	16	---	19	19	36	19	27	29	15
31	66	---	29	16	---	18	---	95	---	19	20	---
TOTAL	488.5	687.5	688.7	1119	454	1408	982	1132	975	796	668	567
MEAN	15.8	22.9	22.2	36.1	15.7	45.4	32.7	36.5	32.5	25.7	21.5	18.9
MAX	66	258	211	240	25	294	108	214	216	64	42	35
MIN	7.2	7.2	5.7	15	13	12	19	18	19	19	18	15
AC-FT	969	1360	1370	2220	901	2790	1950	2250	1930	1580	1320	1120

CAL YR 1979 TOTAL 7907.5 MEAN 21.7 MAX 258 MIN 5.7 AC-FT 15680
WTR YR 1980 TOTAL 9965.7 MEAN 27.2 MAX 294 MIN 5.7 AC-FT 19770

16304200 KALUANUI STREAM NEAR PUNALUU

LOCATION.--Lat 21°35'22", long 157°54'38", Hydrologic Unit 20060000, on right bank 0.8 mi (1.3 km) downstream from Sacred Falls, 1.6 mi (2.6 km) west of Punaluu Beach Park, and 1.7 mi (2.7 km) south of cemetery in Hauula.

DRAINAGE AREA.--1.11 mi² (2.87 km²).

PERIOD OF RECORD.--May 1967 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 110 ft (34 m), from topographic map.

REMARKS.--Records good except those above 50 ft³/s, which are fair and those for period of no gage-height record, which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--13 years, 3.96 ft³/s (0.112 m³/s), 2,870 acre-ft/yr (3.54 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,010 ft³/s (56.9 m³/s) Feb. 1, 1969, gage height, 10.0 ft (3.05 m), from rating curve extended above 14 ft³/s (0.40 m³/s) on basis of slope-area measurements at gage heights 8.85 ft (2.697 m) and 10.0 ft (3.05 m); maximum gage height, 10.84 ft (3.304 m) July 17, 1974; no flow for several days in July and August 1971, Sept. 14, 27, 1975, many days in January and February 1977, and Feb. 12-17, 27, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	0845	636	18.0	8.83	2.691	Mar. 19	0330	530	15.0	8.53	2.600
Dec. 25	0115	*720	20.4	*9.05	2.758	June 1	0415	636	18.0	8.83	2.691
Jan. 8	1645	646	18.3	8.86	2.701						

Minimum discharge, 0.10 ft³/s (0.003 m³/s) Feb. 2, 4-6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	47	.68	2.3	.34	2.8	25	11	62	2.0	3.2	2.3
2	2.5	3.3	9.9	1.6	.24	1.3	21	1.9	4.7	9.4	4.8	2.1
3	8.5	2.3	1.2	1.2	.20	1.0	2.6	8.3	2.9	2.1	2.4	7.9
4	1.2	3.1	.70	1.0	.27	.70	1.9	2.0	4.1	2.0	1.6	7.3
5	2.7	1.3	1.8	.86	.28	.68	1.4	11	2.0	4.9	3.5	2.4
6	2.0	1.1	2.4	.83	.24	7.0	33	11	3.7	12	1.4	3.0
7	1.1	.84	7.7	5.1	5.4	3.2	12	2.1	2.4	35	5.3	1.2
8	1.7	4.5	.97	97	.66	1.9	2.7	2.1	1.9	4.5	4.8	.97
9	.64	2.0	1.5	9.1	.51	1.5	6.7	4.0	2.0	3.3	2.3	.85
10	5.9	7.0	1.4	83	.94	1.4	3.6	1.9	10	1.7	1.2	.82
11	1.5	16	1.4	13	.50	3.2	10	2.4	2.2	3.6	1.0	12
12	.53	1.8	.68	3.1	.80	2.6	3.9	2.4	1.4	12	.89	1.2
13	.36	6.6	.53	2.1	.69	4.6	6.7	1.9	12	11	.79	5.6
14	.32	7.1	.46	1.8	.64	9.7	7.4	1.7	25	4.4	4.2	1.1
15	1.8	3.1	.43	1.6	.70	1.9	43	4.8	12	2.3	1.3	17
16	2.1	1.2	.35	1.1	.60	61	7.2	23	3.3	2.8	1.2	6.4
17	7.1	2.2	.53	.96	.54	53	9.1	2.9	2.0	2.8	1.3	2.7
18	.74	5.6	.51	3.8	.47	92	17	2.0	1.8	12	.94	1.7
19	.93	2.8	.30	.88	.40	92	5.1	1.6	4.6	1.9	5.4	1.2
20	3.5	4.2	.26	.71	.33	7.8	3.0	1.4	5.5	1.9	7.9	.94
21	1.6	1.3	.26	.95	.28	4.8	5.1	1.9	5.4	3.2	1.8	1.6
22	2.2	3.1	.39	.95	.23	11	9.3	28	1.5	9.8	.89	.88
23	4.5	1.5	1.7	.50	.23	11	4.5	8.9	1.3	8.0	.75	.69
24	.98	1.3	39	.41	.24	3.2	7.4	7.8	1.1	6.2	1.4	.60
25	.62	2.2	48	.36	.37	2.7	8.1	7.2	1.1	1.7	7.3	.55
26	.50	1.6	3.2	.33	.50	2.2	3.3	21	.93	13	7.0	2.0
27	.59	1.1	2.5	.31	.90	4.4	2.2	4.4	2.0	11	1.6	.69
28	.51	1.5	2.2	.30	6.0	2.0	1.9	31	1.1	3.5	1.7	.49
29	.38	2.2	30	.39	3.2	1.5	1.7	4.5	.95	5.4	.92	.80
30	.35	.90	40	1.6	---	1.5	1.9	2.7	1.1	3.5	8.2	.62
31	22	---	4.1	.72	---	1.3	---	6.8	---	2.0	1.9	---
TOTAL	82.85	139.74	205.05	237.86	26.70	394.88	269.7	223.6	181.98	198.9	88.88	87.60
MEAN	2.67	4.66	6.61	7.67	.92	12.7	8.99	7.21	6.07	6.42	2.87	2.92
MAX	22	47	48	97	6.0	92	43	31	62	35	8.2	17
MIN	.32	.84	.26	.30	.20	.68	1.4	1.4	.93	1.7	.75	.49
AC-FT	164	277	407	472	53	783	535	444	361	395	176	174

CAL YR 1979 TOTAL 1554.19 MEAN 4.26 MAX 108 MIN .06 AC-FT 3080
WTR YR 1980 TOTAL 2137.74 MEAN 5.84 MAX 97 MIN .20 AC-FT 4240

NOTE.--No gage-height record Feb. 11 to Mar. 11.

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on right bank 75 ft (23 m) upstream from Pupukea Military Road and 3.5 mi (5.6 km) southeast of Maunawai.

DRAINAGE AREA.--3.13 mi² (8.11 km²).

PERIOD OF RECORD.--Occasional low-flow measurements, water years 1961, 1963, June 1963 to current year.

GAGE.--Water-stage recorder and combination pipe culverts and paved road control. Altitude of gage is 590 ft (180 m), from topographic map.

REMARKS.--Records fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 10.7 ft³/s (0.303 m³/s), 7,750 acre-ft/yr (9.56 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,390 ft³/s (96.0 m³/s) Jan. 30, 1975, gage height, 10.06 ft (3.066 m), from rating curve extended above 42 ft³/s (1.19 m³/s) on basis of slope-area measurement at gage height 10.06 ft (3.066 m); no flow Aug. 26 to Sept. 1, Sept. 23, Oct. 15-25, 1971, many days in September 1975, Feb. 10-20, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 950 ft³/s (26.9 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0230	1450	41.1	8.11	2.472	Mar. 16	1930	1050	29.7	7.48	2.280
Jan. 8	1730	995	28.2	7.37	2.246	Mar. 19	0300	*2350	66.6	*9.10	2.774

Minimum discharge, 0.22 ft³/s (0.006 m³/s) Oct. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.44	100	.86	4.1	.58	11	27	32	32	7.0	4.7	13
2	.37	18	8.7	2.6	.44	3.0	55	13	15	16	9.3	3.2
3	8.3	3.0	5.3	1.9	.40	1.8	12	33	7.6	5.6	6.1	8.4
4	3.5	8.7	1.5	1.5	.37	1.7	8.3	13	22	4.5	3.9	26
5	2.8	2.9	1.3	1.3	.34	2.0	6.7	29	7.6	5.9	5.2	8.4
6	2.3	1.5	1.1	1.2	.37	26	29	25	10	25	4.7	5.4
7	1.6	1.1	1.0	1.2	12	12	15	10	8.3	51	17	4.1
8	1.5	2.3	1.1	181	3.0	3.7	9.2	8.5	5.9	12	8.2	3.0
9	3.3	3.6	3.0	33	1.3	2.2	7.2	11	7.6	6.7	7.8	2.6
10	2.8	1.9	7.5	151	2.3	1.9	11	7.6	35	5.4	4.4	2.4
11	1.2	23	1.6	46	2.2	5.8	11	7.8	9.5	5.0	3.4	11
12	.66	5.4	1.1	12	1.5	6.7	17	8.1	5.8	7.0	3.0	5.0
13	.51	9.9	.86	6.3	4.5	4.4	29	10	6.5	6.5	3.1	8.8
14	.66	18	.71	3.7	2.6	26	38	6.3	34	10	8.6	5.2
15	.26	17	.66	2.9	1.3	8.0	91	10	30	4.4	4.9	25
16	1.7	3.5	.62	1.9	1.2	160	42	28	14	3.9	4.4	7.8
17	22	1.9	.58	1.4	1.2	214	36	9.5	7.6	4.7	3.7	4.1
18	3.4	12	.62	1.2	.76	325	45	6.1	6.3	24	3.8	4.2
19	1.4	20	.58	.91	.62	346	29	5.2	5.8	5.0	10	3.0
20	1.0	16	.51	.76	.55	65	16	4.9	7.4	3.8	4.4	2.4
21	4.4	5.2	.44	1.7	.37	29	16	5.0	15	3.7	7.0	2.2
22	2.2	2.4	.47	3.0	.34	41	41	21	6.1	9.2	2.9	2.0
23	2.6	1.7	1.4	.66	.47	33	34	9.0	5.4	9.6	2.4	1.9
24	1.9	1.6	21	.55	.58	16	36	17	4.9	6.5	2.8	1.9
25	.96	1.6	160	.44	1.6	14	31	8.3	5.0	4.7	5.8	1.8
26	.55	2.6	9.8	.47	2.1	10	24	43	4.7	8.0	11	2.4
27	.40	1.9	3.1	.47	18	11	13	15	7.8	28	6.7	2.6
28	.31	1.4	4.7	.47	28	9.0	12	9.5	5.0	7.2	2.9	2.4
29	.26	1.1	25	.51	16	6.5	10	8.8	4.1	7.0	2.3	2.3
30	.24	.96	39	4.8	---	5.9	10	8.0	3.9	7.6	16	2.6
31	8.9	---	8.5	1.8	---	5.0	---	16	---	4.1	4.9	---
TOTAL	82.42	290.16	312.61	470.74	104.99	1406.6	761.4	438.6	339.8	309.0	185.3	175.1
MEAN	2.66	9.67	10.1	15.2	3.62	45.4	25.4	14.1	11.3	9.97	5.98	5.84
MAX	22	100	160	181	28	346	91	43	35	51	17	26
MIN	.24	.96	.44	.44	.34	1.7	6.7	4.9	3.9	3.7	2.3	1.8
AC-FT	163	576	620	934	208	2790	1510	870	674	613	368	347

CAL YR 1979 TOTAL 2580.93 MEAN 7.07 MAX 160 MIN .10 AC-FT 5120
WTR YR 1980 TOTAL 4876.72 MEAN 13.3 MAX 346 MIN .24 AC-FT 9670

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38'20", long 158°03'27", Hydrologic Unit 20060000, on right bank at Maunawai, 25 ft (7.6 m) upstream from Hlehaha Stream, 4.9 mi (7.9 km) northeast of Waialua School, and 7.3 mi (11.7 km) southwest of Kahuku School.

DRAINAGE AREA.--9.79 mi² (25.4 km²).

PERIOD OF RECORD.--February 1958 to current year.

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M).

GAGE.--Water-stage recorder. Altitude of gage is 20 ft (6.1 m), from topographic map. Prior to May 13, 1965, at datum 2.00 ft (0.610 m) higher and May 13, 1965, to May 17, 1966, at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 16.9 ft³/s (0.479 m³/s), 12,240 acre-ft/yr (15.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,540 ft³/s (242 m³/s) Mar. 18, 1980, gage height, 11.46 ft (3.493 m), from rating curve extended above 150 ft³/s (4.25 m³/s) on basis of slope-area measurement at gage height 11.46 ft (3.493 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,300 ft³/s (36.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 1	1100	1450	41.1	6.10	1.859	Jan. 10	2130	1550	43.9	6.26	1.908
Dec. 25	0300	2890	81.8	8.01	2.441	Mar. 18	2200	*8540	242	*11.46	3.493
Jan. 8	1830	2740	77.6	7.85	2.393						

Minimum discharge, 0.03 ft³/s (0.001 m³/s) Oct. 30, 31.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.50	372	.89	7.4	4.1	19	31	64	81	6.8	6.0	17
2	.29	48	3.6	5.1	3.0	6.6	185	32	35	20	12	6.2
3	2.3	8.0	9.2	3.9	2.5	3.6	30	78	17	13	11	4.9
4	4.4	7.0	2.8	3.2	2.2	2.9	18	38	45	6.8	7.1	42
5	2.1	4.8	1.7	2.8	2.1	2.9	14	56	18	6.0	7.1	15
6	2.7	2.8	1.2	2.6	2.0	62	62	48	20	27	7.8	5.8
7	1.3	1.9	.99	2.5	16	36	31	24	19	175	27	5.3
8	2.3	1.9	.82	541	7.5	8.0	20	17	12	26	10	3.7
9	.91	3.3	.96	217	3.2	4.2	13	20	11	12	14	2.9
10	2.6	2.5	6.4	664	2.5	3.1	17	15	81	8.9	7.0	2.6
11	1.2	22	2.7	322	3.1	5.3	14	14	20	7.6	4.6	9.9
12	.50	8.3	2.1	60	3.0	9.4	40	14	12	9.2	4.0	8.7
13	.24	5.7	1.2	25	4.1	6.6	38	17	9.4	11	3.8	7.6
14	.12	17	.81	17	6.0	75	89	12	56	16	12	8.9
15	.07	25	.57	13	2.9	23	232	16	56	7.6	8.5	43
16	.05	5.9	.41	9.8	2.1	535	144	59	35	6.0	5.2	15
17	48	3.3	.37	7.9	2.0	692	85	25	14	7.0	5.0	5.5
18	5.8	6.3	.34	7.2	1.8	990	107	13	11	44	4.4	5.8
19	2.2	20	.30	6.2	1.2	1080	70	9.9	9.7	12	13	4.2
20	1.1	15	.27	5.4	.98	160	38	9.2	10	6.4	7.6	3.2
21	2.3	9.1	.21	5.8	.85	84	32	8.7	19	5.5	8.5	2.6
22	2.6	3.9	.16	12	.75	88	92	30	9.9	8.9	4.9	2.3
23	2.6	2.7	.17	5.4	.73	86	81	22	7.3	14	3.7	2.2
24	1.8	2.1	9.1	4.3	.76	47	101	37	6.4	8.5	3.9	2.0
25	1.7	1.9	555	3.9	1.4	37	62	20	6.0	9.7	6.0	1.9
26	.76	3.3	20	3.6	3.2	26	54	119	6.0	8.9	11	2.0
27	.38	3.4	8.4	3.4	34	25	29	38	8.7	38	12	2.6
28	.20	2.1	5.9	3.2	75	24	23	17	8.0	16	4.6	2.1
29	.09	1.5	48	3.2	45	16	19	18	5.5	9.2	3.3	1.7
30	.04	1.1	126	9.0	---	13	18	12	5.0	11	21	1.7
31	3.6	---	17	9.2	---	12	---	52	---	8.0	8.9	---
TOTAL	94.75	611.8	827.57	1986.0	233.97	4182.6	1789	954.8	653.9	566.0	265.1	238.3
MEAN	3.06	20.4	26.7	64.1	8.07	135	59.6	30.8	21.8	18.3	8.55	7.94
MAX	48	372	555	664	75	1080	232	119	81	175	27	43
MIN	.04	1.1	.16	2.5	.73	2.9	13	8.7	5.0	5.5	3.3	1.7
AC-FT	188	1210	1640	3940	464	8300	3550	1890	1300	1120	526	473

CAL YR 1979	TOTAL	6677.86	MEAN 18.3	MAX 678	MIN .02	AC-FT 13250			
WTR YR 1980	TOTAL	12403.79	MEAN 33.9	MAX 1080	MIN .04	AC-FT 24600			

16343000 HELEMANO STREAM AT HALEIWA

LOCATION.--Lat 21°34'40", long 158°06'12", Hydrologic Unit 20060000, on left bank at upstream side of private road bridge, 0.3 mi (0.5 km) east of Weed Circle, and 1.1 mi (1.8 km) southeast of Waialua School at Haleiwa.

DRAINAGE AREA.--14.2 mi² (36.8 km²).

PERIOD OF RECORD.--November 1967 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1.57 ft (0.479 m) above mean sea level.

REMARKS.--Records poor. Minor regulation by reservoir on upstream tributary. Diversions into basin for irrigation of sugarcane; low flow affected by irrigation return flow and releases. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--12 years (1968-80), 11.0 ft³/s (0.312 m³/s), 7,970 acre-ft/yr (9.83 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 18,200 ft³/s (515 m³/s) Apr. 19, 1974, gage height, 22.5 ft (6.86 m), from floodmark, from rating curve extended above 300 ft³/s (8.50 m³/s) on basis of slope-area measurements at gage heights 10.54 ft (3.213 m), 14.2 ft (4.328 m), 15.34 ft (4.676 m), 17.63 ft (5.374 m), and 22.5 ft (6.86 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	2030	3420	96.9	11.94	3.639
Mar. 18	2400	*12100	343	*18.38	5.602

Minimum discharge, 0.01 ft³/s (<0.001 m³/s) Oct. 1-13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	2.0	.02	.03	.09	.06	2.7	6.5	38	.12	.10	.06
2	.01	13	.02	.03	.09	.05	61	15	32	.12	.10	.08
3	.01	1.6	.02	.03	.09	.06	16	5.0	4.5	.10	.09	.10
4	.01	4.2	.15	.03	.10	.06	5.3	11	2.4	.09	.09	.09
5	.01	4.6	.59	.03	.09	.06	3.2	5.3	2.0	.13	.08	.07
6	.01	3.9	.06	.04	.10	.06	25	12	1.3	.10	.09	.14
7	.01	5.6	.03	.06	.09	.05	12	13	.64	31	.12	.07
8	.01	1.2	.02	308	.09	.05	4.7	4.0	.35	9.8	.07	.14
9	.01	.23	.03	133	.09	.04	5.1	2.3	.29	2.4	.06	.08
10	.01	.04	.24	191	.08	.03	13	1.8	.26	.58	.06	.12
11	.01	.04	.07	129	.08	.03	4.5	1.3	1.0	.20	.08	.09
12	.01	.61	.12	15	.08	.03	25	.86	1.2	.14	.09	.49
13	.01	.07	.17	7.2	.08	.06	9.2	.77	.59	.10	.06	.14
14	.02	.58	.05	4.0	.09	14	20	.59	19	.09	.28	.06
15	.03	.10	.03	2.1	.07	17	17	.54	13	.08	.06	.08
16	.02	.03	.04	.98	.08	5.7	75	2.6	17	.07	.08	.08
17	.03	.02	.05	.38	.07	327	14	11	8.5	.08	.08	.10
18	.04	.02	.04	.20	.08	1250	9.6	2.6	1.8	.09	.08	.12
19	.02	.02	.03	.14	.08	1300	17	1.2	1.3	.09	.09	.16
20	.03	.30	.04	.12	.08	49	9.4	.86	1.0	.08	.08	.09
21	.04	.29	.05	.14	.07	19	5.3	.68	.50	.08	.80	.08
22	.05	.03	.05	.14	.08	12	33	.68	.32	.09	.09	.07
23	.07	.03	.06	.12	.08	21	55	10	.46	.09	.08	.06
24	.04	.02	.09	.10	.06	19	17	3.3	.32	.09	.08	.07
25	.03	.02	79	.10	.09	11	12	4.9	.29	.14	.09	.06
26	.03	.02	7.0	.10	.08	8.5	9.6	22	.26	.08	.10	.07
27	.03	.02	.59	.12	.12	6.9	6.5	28	.20	.06	.08	.06
28	.02	.03	.05	.14	.07	7.5	4.9	5.6	.14	.05	.07	.05
29	.02	.02	.03	.16	.06	5.6	3.5	11	.12	.06	.06	.14
30	.02	.09	.03	.29	---	4.1	2.6	4.1	.10	.08	.06	.16
31	.03	---	.03	.10	---	3.3	---	13	---	.09	.05	---
TOTAL	.70	38.73	88.80	792.88	2.43	3081.24	498.1	201.48	148.84	46.37	3.40	3.18
MEAN	.023	1.29	2.86	25.6	.084	99.4	16.6	6.50	4.96	1.50	.11	.11
MAX	.07	13	79	308	.12	1300	75	28	38	31	.80	.49
MIN	.01	.02	.02	.03	.06	.03	2.6	.54	.10	.05	.05	.05
AC-FT	1.4	77	176	1570	4.8	6110	988	400	295	92	6.7	6.3

CAL YR 1979 TOTAL 1879.05 MEAN 5.15 MAX 345 MIN .01 AC-FT 3730
WTR YR 1980 TOTAL 4906.15 MEAN 13.4 MAX 1300 MIN .01 AC-FT 9730

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 20060000, on left bank 4.3 mi (6.9 km) northeast of Leilehua High School in Wahiawa and 8.1 mi (13.0 km) east of Waialua School.

DRAINAGE AREA.--2.98 mi² (7.72 km²).

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

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,120 ft (341 m), from topographic map.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--21 years, 13.5 ft³/s (0.382 m³/s), 9,780 acre-ft/yr (12.1 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft³/s (157 m³/s) July 17, 1974, gage height, 11.94 ft (3.639 m), from rating curve extended above 110 ft³/s (3.12 m³/s) on basis of slope-area measurements at gage heights 6.74 ft (2.054 m) and 10.12 ft (3.085 m); minimum, no flow Jan. 24, 25, 1977, Feb. 18, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,200 ft³/s (34.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0300	2330	66.0	8.11	2.472
Jan. 8	1830	1820	51.5	7.38	2.249
Mar. 18	2130	*3870	110	*10.09	3.075

Minimum discharge, 0.33 ft³/s (0.009 m³/s) Feb. 23.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	139	2.1	5.4	2.5	20	56	49	110	4.8	17	9.3
2	4.0	18	26	3.9	1.5	5.1	111	13	22	21	17	4.7
3	14	5.6	10	3.1	1.2	2.5	13	34	8.8	8.0	8.3	4.3
4	5.7	5.4	3.6	2.5	1.1	1.8	8.1	13	11	6.5	5.5	39
5	17	4.7	2.7	2.2	.94	1.8	6.6	25	8.6	4.9	12	8.1
6	6.2	2.7	4.0	2.0	.90	42	67	31	9.5	42	6.6	7.7
7	5.9	2.1	6.3	6.8	8.9	18	20	11	9.9	92	11	5.0
8	4.4	9.4	4.1	257	4.9	5.1	11	7.8	6.1	20	6.3	3.2
9	4.8	7.0	3.1	51	2.0	3.4	20	13	6.0	7.1	8.3	2.7
10	2.1	6.3	4.9	178	1.2	2.7	15	7.7	35	6.6	4.7	2.4
11	4.4	22	3.2	64	.91	16	26	8.3	8.0	10	3.5	16
12	2.8	6.7	2.1	11	2.9	24	28	8.7	5.6	25	3.1	8.0
13	1.4	9.1	1.8	7.1	1.9	19	44	10	5.5	14	3.0	9.7
14	.87	42	1.4	5.6	1.6	85	37	6.6	70	16	10	7.6
15	.66	30	1.2	5.4	2.2	14	137	7.3	26	8.0	6.1	25
16	4.5	5.9	1.1	4.3	1.6	148	43	34	13	5.4	3.5	11
17	15	6.0	1.0	3.5	1.3	266	36	11	7.2	5.7	3.6	7.2
18	4.8	18	.99	8.1	1.3	685	49	7.1	5.7	28	3.6	4.4
19	2.2	18	.89	4.7	.90	462	34	5.6	5.4	6.7	6.7	3.3
20	2.2	16	.84	2.9	.63	37	15	5.0	14	4.8	5.5	2.6
21	7.6	6.5	.71	2.8	.48	20	16	4.9	15	6.8	13	2.5
22	4.0	4.3	.63	3.5	.38	29	67	46	6.1	13	3.9	4.7
23	4.3	6.7	.73	2.9	.40	51	41	12	4.6	17	2.7	2.5
24	5.2	3.9	6.7	2.0	.52	16	33	7.6	4.1	7.7	2.5	2.0
25	2.2	3.3	218	1.7	.92	14	32	46	3.9	7.2	18	1.8
26	1.3	2.9	10	1.6	.88	10	20	36	3.7	8.7	9.0	1.8
27	.95	3.2	10	1.5	13	14	12	18	11	27	9.6	3.2
28	.78	2.8	5.9	1.4	37	14	10	34	5.7	9.4	6.1	2.2
29	.86	2.2	20	1.6	24	7.1	9.1	16	4.1	15	4.0	1.6
30	.84	3.5	46	3.0	---	6.0	9.3	7.6	3.9	15	14	1.5
31	25	---	9.6	5.0	---	6.3	---	9.2	---	6.3	7.1	---
TOTAL	156.96	413.2	409.59	655.5	117.96	2045.8	1026.1	545.4	449.4	469.6	235.2	205.0
MEAN	5.06	13.8	13.2	21.1	4.07	66.0	34.2	17.6	15.0	15.1	7.59	6.83
MAX	25	139	218	257	37	685	137	49	110	92	18	39
MIN	.66	2.1	.63	1.4	.38	1.8	6.6	4.9	3.7	4.8	2.5	1.5
AC-FT	311	820	812	1300	234	4060	2040	1080	891	931	467	407

CAL YR 1979 TOTAL 3855.07 MEAN 10.6 MAX 218 MIN .15 AC-FT 7650
WTR YR 1980 TOTAL 6729.71 MEAN 18.4 MAX 685 MIN .38 AC-FT 13350

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 (183 m) downstream from Hipuapua Stream and 1.5 mi (2.4 km) west of Halawa.

DRAINAGE AREA.--4.62 mi² (11.97 km²).

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. Altitude of gage is 210 ft (64 m), from topographic map. Prior to June 25, 1923, at site 350 ft (107 m) 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 (0.610 m) higher.

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

AVERAGE DISCHARGE.--56 years (water years, 1918-31, 1939-80), 29.3 ft³/s (0.830 m³/s), 21,230 acre-ft/yr (26.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft³/s (762 m³/s) Feb. 4, 1965, gage height, 19.91 ft (6.069 m), from floodmarks, from rating curve extended above 105 ft³/s (2.97 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.76 ft³/s (0.022 m³/s) about Nov. 23, 1962.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,900 ft³/s (53.8 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0330	*2960	83.8	*9.70	2.957
Jan. 8	2100	2090	59.2	8.55	2.606

Minimum discharge, 4.3 ft³/s (0.12 m³/s) Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	117	7.3	26	9.0	38	182	90	37	28	143	16
2	37	25	100	16	6.0	12	125	18	19	58	25	9.1
3	34	11	19	11	5.5	9.8	18	78	26	29	27	18
4	7.0	10	23	9.5	6.1	9.5	13	14	52	19	184	102
5	9.5	8.8	18	8.5	7.5	37	11	71	16	29	80	27
6	6.1	21	15	8.2	7.9	73	43	99	18	171	105	20
7	5.9	9.1	73	112	5.7	20	19	20	12	121	22	11
8	6.4	91	26	582	5.2	17	11	24	20	18	63	9.2
9	5.0	19	38	324	6.7	27	17	35	56	29	16	8.5
10	5.2	12	56	382	224	58	15	34	25	26	12	18
11	9.3	59	12	114	29	31	11	29	20	53	11	84
12	4.8	15	12	28	9.0	13	61	44	11	198	12	10
13	4.7	32	8.7	18	13	49	99	31	29	49	14	30
14	4.3	204	7.8	14	8.2	211	179	31	110	127	51	11
15	5.0	121	7.2	12	7.1	41	194	51	44	26	14	95
16	9.8	24	6.7	10	6.8	296	46	165	19	17	20	153
17	6.6	39	7.5	9.0	5.9	302	36	20	12	18	29	20
18	11	27	7.6	13	5.5	254	18	14	10	39	15	12
19	22	55	6.0	9.0	5.3	261	67	12	15	44	11	10
20	13	41	5.7	7.8	5.1	51	20	13	17	15	39	11
21	12	14	23	72	5.0	27	22	15	18	116	11	9.3
22	14	23	10	16	5.0	23	97	187	9.1	58	8.8	8.4
23	9.0	12	28	9.0	7.6	55	28	43	8.4	23	23	7.7
24	7.1	9.5	70	7.9	26	32	31	139	8.4	40	23	7.9
25	5.6	86	379	7.1	87	48	19	35	13	14	9.6	6.9
26	8.9	63	108	6.6	12	35	12	33	9.1	86	33	6.7
27	4.7	17	69	6.2	125	17	10	18	24	60	10	6.4
28	97	15	67	5.9	115	20	13	27	9.0	21	14	9.5
29	48	10	165	5.8	168	13	56	59	8.5	36	9.8	35
30	35	8.2	211	7.6	---	14	28	101	31	45	62	7.8
31	23	---	54	14	---	11	---	99	---	19	30	---
TOTAL	477.9	1198.6	1638.5	1872.1	929.1	2105.3	1501	1649	706.5	1632	1127.2	780.4
MEAN	15.4	40.0	52.9	60.4	32.0	67.9	50.0	53.2	23.6	52.6	36.4	26.0
MAX	97	204	379	582	224	302	194	187	110	198	184	153
MIN	4.3	8.2	5.7	5.8	5.0	9.5	10	12	8.4	14	8.8	6.4
AC-FT	948	2380	3250	3710	1840	4180	2980	3270	1400	3240	2240	1550

CAL YR 1979 TOTAL 11224.6 MEAN 30.8 MAX 437 MIN 3.6 AC-FT 22260
WTR YR 1980 TOTAL 15617.6 MEAN 42.7 MAX 582 MIN 4.3 AC-FT 30980

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 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
16...	1215	13	52	7.3	22.5	6.8	8.6	210	1900	7	2
NOV											
13...	1320	32	48	7.4	21.0	7.5	9.4	110	1200	6	--
DEC											
11...	1215	11	53	7.0	21.0	27	9.1	300	1100	--	--
JAN											
07...	1200	800	46	6.5	19.0	72	9.7	7400	5900	9	5
FEB											
05...	1345	6.7	60	7.1	19.5	1.8	9.6	58	370	9	4
MAR											
03...	1200	10	55	7.0	19.5	1.8	9.3	45	600	9	3
21...	1130	22	51	6.6	20.5	--	--	--	--	--	--
APR											
01...	1230	80	56	6.6	19.5	9.1	9.0	500	1700	7	--
29...	1245	81	50	6.7	19.5	14	9.1	1600	2200	6	4
MAY											
27...	1230	17	50	6.9	22.0	8.4	9.2	81	350	6	2
JUL											
08...	1200	19	42	6.4	22.5	14	9.0	110	710	5	2
AUG											
04...	1200	82	30	6.3	21.5	34	8.5	1200	1300	4	0
SEP											
02...	1400	9.2	50	6.6	23.0	12	8.8	120	1100	10	--

DATE	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	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT											
16...	1.3	.8	6.4	65	1.1	7.1	.7	5	1.3	11	.1
NOV											
13...	1.1	.9	6.3	66	1.1	6.9	.6	--	0.7	9.5	.0
DEC											
11...	--	1.0	6.8	--	--	7.5	.7	2	5.3	12	.0
JAN											
07...	1.1	1.5	5.4	55	.8	6.1	.7	4	1.6	11	.1
FEB											
05...	1.3	1.3	7.4	63	1.1	8.1	.7	5	2.0	12	.0
MAR											
03...	1.7	1.1	7.7	63	1.1	8.6	.9	6	.8	15	.1
21...	--	--	--	--	--	--	--	--	--	--	--
APR											
01...	1.0	1.0	6.7	66	1.1	--	.7	--	5.3	14	.0
29...	.9	1.0	6.6	67	1.1	--	.6	2	--	12	.1
MAY											
27...	.9	1.0	5.9	64	1.0	--	.5	4	1.0	10	.0
JUL											
08...	1.2	.5	5.6	68	1.1	--	.5	3	7.8	8.3	.0
AUG											
04...	.5	.7	3.9	64	.8	--	.5	5	2.3	6.3	.2
SEP											
02...	2.2	1.2	6.6	56	.9	--	.6	--	6.1	12	.1

HAWAII, ISLAND OF MOLOKAI

16400000 HALAWA STRBAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	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, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
OCT											
16...	8.8	--	39	.05	1.20	.07	.07	.02	.07	.02	.09
NOV											
13...	5.8	36	29	.05	3.11	.06	.05	.02	.02	.02	.03
DEC											
11...	5.8	--	--	--	--	.08	.08	.05	.01	.06	.01
JAN											
07...	7.8	32	32	.04	69.1	.13	.13	.00	.00	.00	.00
FEB											
05...	8.2	47	36	.06	.85	.08	.08	.01	.01	.00	.01
MAR											
03...	6.5	80	39	.05	1.13	.36	.27	.04	.04	.05	.05
21...	--	--	--	--	--	--	--	--	--	--	--
APR											
01...	5.9	44	34	.06	9.50	.04	.04	.02	.02	.02	.03
29...	5.9	35	--	.05	7.65	.03	.03	.00	.02	.00	.03
MAY											
27...	5.9	80	28	.05	1.84	.03	.02	.01	.04	.01	.05
JUL											
08...	4.9	42	31	.06	2.15	.00	.00	.04	.01	.05	.01
AUG											
04...	2.4	27	20	.04	5.98	.03	--	.01	--	.01	--
SEP											
02...	6.0	39	--	.05	.97	.00	.00	.02	.05	.02	.06

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT											
16...	.62	.34	.48	.69	.23	.41	.71	3.1	.050	.15	.010
NOV											
13...	.64	.64	.72	.66	.00	.66	.71	3.2	.360	1.1	.030
DEC											
11...	.48	.50	.59	.53	.02	.51	.61	2.7	.070	.21	.000
JAN											
07...	2.2	1.1	1.2	2.2	1.1	1.1	2.3	10	.500	1.5	.010
FEB											
05...	.26	.16	.25	.27	.10	.17	.35	1.5	.030	.09	.020
MAR											
03...	.36	.27	.58	.40	.09	.31	.76	3.4	.010	.03	.010
21...	--	--	--	--	--	--	--	--	--	--	--
APR											
01...	1.3	.23	.29	1.3	1.1	.25	1.3	5.9	.060	.18	.010
29...	.50	.39	.44	.50	.09	.41	.53	2.3	.080	.25	.010
MAY											
27...	--	.36	.42	--	--	.40	--	--	.040	.12	.030
JUL											
08...	.63	.53	.54	.67	.13	.54	.67	3.0	.060	.18	.030
AUG											
04...	1.6	--	--	1.6	--	1.6	1.6	7.2	.100	.31	.030
SEP											
02...	.47	.42	.47	.49	.02	.47	.49	2.2	.050	.15	.020

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT											
16...	1215	2	1	1	200	190	8	<1	0	<1	0
JAN											
07...	1200	1	0	1	200	100	100	0	0	0	0
APR											
01...	1230	1	0	1	9	0	9	1	0	<1	0
JUL											
08...	1200	2	1	1	8	0	8	0	0	<1	20

DATE	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
OCT											
16...	0	0	<3	0	<3	3	0	3	610	380	230
JAN											
07...	0	0	4	4	0	1	1	0	13000	13000	120
APR											
01...	0	0	1	0	<3	3	0	3	640	570	70
JUL											
08...	20	0	<3	0	<3	6	1	5	750	450	300

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
OCT										
16...	2	2	0	20	15	5	--	--	.0	2
JAN										
07...	4	4	0	200	200	0	.1	.1	.0	5
APR										
01...	3	3	0	430	430	3	.0	.0	.0	3
JUL										
08...	5	5	0	10	7	3	.0	.0	.0	2

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
16...	0	2	0	0	0	0	0	<3	0	<3
JAN										
07...	5	0	1	1	0	0	0	40	30	10
APR										
01...	3	0	0	0	0	0	0	10	5	5
JUL										
08...	0	2	0	0	0	0	0	20	10	10

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)
OCT 16...	1215	0
DEC 11...	1215	0
JAN 07...	1200	0
MAR 03...	1200	0
APR 01...	1230	0
MAY 27...	1230	0
JUL 08...	1200	0
SEP 02...	1400	0

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)
OCT 16...	1215	--	4.8	.1
NOV 13...	1320	5.4	--	--
DEC 11...	1215	12	--	--
JAN 07...	1200	--	17	2.5
FEB 05...	1345	2.7	--	--
MAR 03...	1200	2.0	--	--
APR 01...	1230	--	2.4	.1
29...	1245	6.8	--	--
MAY 27...	1230	5.8	--	--
JUL 08...	1200	--	6.7	.0
SEP 02...	1400	6.1	--	--

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT 16...	1215	--	2.44	1.81	24.6	4.43	25.6	42
NOV 13...	1320	13	--	--	--	--	--	--
DEC 11...	1215	520	--	--	--	--	--	--
JAN 07...	1200	1100	--	--	--	--	--	--
FEB 05...	1345	180	--	--	--	--	--	--
MAR 03...	1200	250	.240	.160	.200	.000	800	27
21...	1130	0	--	--	--	--	--	--
APR 01...	1230	530	--	--	--	--	--	--
29...	1245	13	--	--	--	--	--	--
MAY 27...	1230	680	1.58	1.34	1.40	.200	171	28
JUL 08...	1200	150	2.21	.472	2.33	.490	746	42
AUG 04...	1200	140	--	--	--	--	--	--
SEP 02...	--	220	--	--	--	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 16...	1215	13	9	.32	100
NOV 13...	1320	32	6	.52	100
DEC 11...	1215	11	27	.80	100
JAN 07...	1200	800	268	579	77
FEB 05...	1345	6.7	4	.07	100
MAR 03...	1200	10	2	.06	100
21...	1130	22	--	--	--
APR 01...	1230	80	13	2.8	100
29...	1245	81	22	4.8	100
MAY 27...	1230	17	7	.32	100
JUL 08...	1200	19	11	.56	100
AUG 04...	1200	82	46	10	100
SEP 02...	1400	9.2	8	.20	100

16400000 HALAWA STREAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	NOV 13,79	DEC 11,79	JAN 7,80	FEB 5,80	MAR 3,80	MAR 21,80
TIME	1320	1215	1200	1345	1200	1130
TOTAL CELLS/ML	13	520	1100	180	250	0
DIVERSITY: DIVISION	0.0	0.9	1.1	0.8	1.4	0.0
.CLASS	0.0	0.9	1.1	0.8	1.4	0.0
..ORDER	0.0	1.2	1.3	1.2	1.7	0.0
...FAMILY	0.0	1.6	2.0	2.4	2.2	0.0
....GENUS	0.0	1.6	2.5	2.4	2.2	0.0

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....CHLORELLA	--	-	--	-	*	0	--	-	35	14	--	-
...SCENEDESMACEAE												
....ACTINASTRUM	--	-	--	-	20	2	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	56	11	30	3	20	11	35	14	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	5	1	15	1	20	11	10	4	--	-
....COCCONEIS	--	-	--	-	10	1	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	5	1	*	0	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	--	-	--	-	--	-	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	--	-	20	4	30	3	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	10	2	50	5	--	-	--	-	--	-
....SYNEDRA	--	-	5	1	*	0	--	-	10	4	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	13#	100	20	4	50	5	60#	33	10	4	--	-
...NAVICULACEAE												
....NAVICULA	--	-	10	2	110	10	15	8	5	2	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	10	2	65	6	25	14	15	6	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	--	-	--	-	580#	52	--	-	--	-	--	-
....OSCILLATORIA	--	-	370#	72	120	11	--	-	130#	52	--	-
....SCHIZOTHRIX	--	-	--	-	--	-	40#	22	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	--	-	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	5	1	10	1	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF MOLOKAI

16400000 HALAWA STREAM NEAR HALAWA--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	APR 1,80	APR 29,80	MAY 27,80	JUL 8,80	AUG 4,80	SEP 2,80
TIME	1230	1245	1230	1200	1200	0000
TOTAL CELLS/ML	530	13	680	150	140	220
DIVERSITY: DIVISION	1.2	0.0	0.5	0.9	0.0	1.2
.CLASS	1.2	0.0	0.5	0.9	0.0	1.2
..ORDER	1.2	0.0	0.5	0.9	0.0	1.5
...FAMILY	1.6	0.0	1.4	1.2	1.0	1.9
....GENUS	1.6	0.0	1.9	1.2	1.0	1.9

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	5	1	--	-	--	-	--	-	--	-	--	-
....CHLORELLA	--	-	--	-	--	-	--	-	--	-	--	-
...SCENEDESMACEAE												
....ACTINASTRUM	--	-	--	-	--	-	--	-	--	-	--	-
....SCENEDESMUS	--	-	--	-	--	-	100#	67	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	--	-	--	-	13	6
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	41	6	--	-	--	-	--	-
....COCCONEIS	--	-	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	5	1	--	-	--	-	--	-	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	20	4	13#	100	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	--	-	--	-	39#	25	--	-	13	6
....SYNEDRA	--	-	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	50	10	--	-	27	4	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	25	5	--	-	--	-	--	-	69#	50	26	12
...NITZSCHIACEAE												
....NITZSCHIA	10	2	--	-	--	-	13	8	69#	50	26	12
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	--	-	130#	59
..HORMOGONALES												
...OSCILLATORIACEAE												
....LYNGBYA	370#	70	--	-	110#	16	--	-	--	-	--	-
....OSCILLATORIA	--	-	--	-	270#	40	--	-	--	-	--	-
....SCHIZOTHRIX	--	-	--	-	--	-	--	-	--	-	--	-
...RIVULARIACEAE												
....RAPHIDIOPSIS	--	-	--	-	230#	34	--	-	--	-	--	-
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	13	6
....TRACHELOMONAS	40	8	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16403900 KAWAINUI STREAM NEAR PELEKUNU

LOCATION.--Lat 21°07'59", long 156°52'38", Hydrologic Unit 20050000, on right bank 900 ft (274 m) upstream from confluence with Kapuhi Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.7 mi (9.2 km) north of Kamalo.

DRAINAGE AREA.--1.17 mi² (3.03 km²).

PERIOD OF RECORD.--August 1968 to December 1979. Destroyed by flood of January 1980.

GAGE.--Water-stage recorder. Altitude of gage is 770 ft (235 m), from topographic map.

REMARKS.--Records fair except those above 90 ft³/s (2.55 m³/s), which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--11 years, 8.26 ft³/s (0.234 m³/s), 5,980 acre-ft/yr (7.37 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft³/s (46.2 m³/s) Jan. 8, 1969, gage height, 7.36 ft (2.243 m), from rating curve extended above 67 ft³/s (1.90 m³/s); minimum, 0.70 ft³/s (0.020 m³/s) Sept. 22, 1968.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October to December, 83 ft³/s (2.35 m³/s) Nov. 14, gage height 3.06 ft (0.932 m), no peak above base of 300 ft³/s (8.50 m³/s); minimum, 1.05 ft³/s (0.030 m³/s) Oct. 18.

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1979 TO DECEMBER 1979
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	6.4	3.5									
2	1.4	3.1	26									
3	2.4	2.0	16									
4	2.3	1.9	16									
5	2.8	1.6	13									
6	1.4	2.1	9.0									
7	1.4	1.5	7.8									
8	4.2	5.6	7.0									
9	1.8	4.2	22									
10	1.5	2.9	10									
11	1.3	3.8	7.3									
12	1.2	2.6	6.4									
13	1.2	7.6	5.9									
14	1.1	37	8.2									
15	1.2	41	9.4									
16	1.4	17	5.2									
17	1.5	23	6.4									
18	1.2	19	4.7									
19	4.5	19	4.3									
20	3.2	16	4.2									
21	2.4	11	4.4									
22	1.6	9.2	4.1									
23	2.3	7.5	5.0									
24	1.6	6.3	6.5									
25	1.3	7.0	33									
26	1.2	8.0	15									
27	1.2	6.0	12									
28	1.2	4.8	11									
29	1.1	4.2	14									
30	1.4	3.8	13									
31	2.1	---	13									
TOTAL	55.8	285.1	323.3									
MEAN	1.80	9.50	10.4									
MAX	4.5	41	33									
MIN	1.1	1.5	3.5									
AC-FT	111	565	641									

CAL YR 1979 TOTAL 3615.8 MEAN 9.91 MAX 158 MIN 1.1 AC-FT 7170

16404000 PELEKUNU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'11", long 156°52'43", Hydrologic Unit 20050000, on left bank 0.4 mi (0.6 km) upstream from Pilipililau Stream, 1.9 mi (3.1 km) south of former village of Pelekunu, and 5.8 mi (9.3 km) north of Kamalo.

DRAINAGE AREA.--2.59 mi² (6.71 km²).

PERIOD OF RECORD.--December 1919 to January 1929, September 1937 to November 1947, June 1948 to August 1957, August 1971 to current year. Occasional low-flow measurements and annual maximum, water years 1968-71.

REVISED RECORDS.--WSP 1569: 1940(M).

GAGE.--Water-stage recorder. Altitude of gage is 552 ft (168.250 m) above mean sea level (levels by Bureau of Reclamation). Prior to Aug. 25, 1957, at site 300 ft (91 m) downstream at different datum.

REMARKS.--Records fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--35 years (water years, 1921-28, 1938-47, 1949-56, 1972-80), 16.7 ft³/s (0.473 m³/s), 12,100 acre-ft/yr (14.9 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,120 ft³/s (117 m³/s) Nov. 20, 1940, gage height, 6.81 ft (2.076 m), from rating curve extended above 39 ft³/s (1.10 m³/s) by test on model of station site; minimum, 2.2 ft³/s (0.062 m³/s) Sept. 29, Oct. 3, 4, 6, 12-18, 1974.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of undetermined magnitude destroyed station on Jan. 26, 1948.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 460 ft³/s (13.0 m³/s) and maximum (*), from rating curve extended above 100 ft³/s (2.83 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	1900	*2100	59.5	*7.16	2.182
Feb. 24	2400	491	13.9	3.77	1.149

Minimum discharge, 2.3 ft³/s (0.065 m³/s) Oct. 26-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	9.7	5.5	17	13	46	105	72	15	11	32	8.1
2	3.3	5.2	49	12	11	29	77	39	13	25	17	7.9
3	4.3	3.3	31	9.6	11	23	40	31	15	19	14	8.5
4	4.2	2.9	26	8.3	11	20	30	24	41	14	40	16
5	4.6	2.9	20	7.5	10	27	24	30	22	13	29	12
6	3.3	3.3	14	7.5	9.3	39	22	26	17	40	20	14
7	3.3	2.7	12	12	9.3	32	20	22	14	35	15	8.9
8	7.9	9.0	11	289	9.3	33	17	25	13	20	14	7.8
9	3.8	6.1	40	414	8.9	48	17	27	15	18	12	7.9
10	3.5	4.6	17	435	12	36	15	22	14	15	11	7.8
11	3.1	5.6	12	175	12	33	17	23	22	22	10	13
12	2.7	4.3	10	69	9.3	26	103	23	18	12	9.7	7.9
13	2.7	14	9.1	50	13	34	61	22	33	20	9.3	13
14	2.7	70	13	40	9.7	82	53	17	37	21	11	8.5
15	2.9	76	14	30	9.3	64	73	18	24	16	8.9	10
16	3.1	31	8.7	27	18	155	46	33	18	15	9.3	13
17	3.3	55	11	26	9.7	234	47	20	15	14	12	10
18	3.1	44	7.9	40	8.9	135	33	16	13	35	9.3	8.9
19	7.9	38	7.1	26	8.9	206	30	17	14	25	8.5	8.1
20	6.1	30	6.9	22	8.5	68	23	17	13	18	10	7.8
21	4.6	18	7.1	59	8.1	38	28	14	12	28	8.5	7.9
22	3.5	13	6.9	27	9.7	34	55	24	10	27	7.8	6.7
23	4.9	11	8.3	18	29	81	37	15	9.3	19	8.5	6.9
24	3.3	8.7	10	16	43	90	37	25	9.3	18	9.3	6.9
25	2.7	10	62	15	78	59	31	21	9.7	14	7.8	6.1
26	2.5	13	20	14	27	39	23	17	8.9	17	8.1	6.1
27	2.5	8.7	19	14	67	37	20	14	8.5	15	7.9	5.8
28	2.3	7.1	18	13	65	40	18	13	8.1	13	8.1	6.9
29	2.3	6.1	24	13	90	32	28	13	7.8	12	7.9	7.9
30	2.7	5.8	22	15	---	24	46	15	9.3	12	14	6.1
31	3.8	---	22	16	---	21	---	29	---	12	8.1	---
TOTAL	113.7	519.0	543.5	1936.9	628.9	1865	1176	724	478.9	615	397.0	262.9
MEAN	3.67	17.3	17.5	62.5	21.7	60.2	39.2	23.4	16.0	19.8	12.8	8.75
MAX	7.9	76	62	435	90	234	105	72	41	40	40	16
MIN	2.3	2.7	5.5	7.5	8.1	20	15	13	7.8	11	7.9	5.8
AC-FT	226	1030	1080	3840	1250	3700	2330	1440	950	1220	787	520

CAL YR 1979 TOTAL 6353.1 MEAN 17.4 MAX 231 MIN 2.3 AC-FT 12600
WTR YR 1980 TOTAL 9260.3 MEAN 25.3 MAX 435 MIN 2.3 AC-FT 18370

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'08", long 156°53'09", Hydrologic Unit 20050000, on right bank 500 ft (152 m) downstream from left-bank tributary, 1.9 mi (3.1 km) south of former village of Pelekunu, and 5.8 mi (9.3 km) north of Kamalo.

DRAINAGE AREA.--0.49 mi² (1.27 km²).

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 1,000 ft (305 m), from topographic map.

REMARKS.--Records fair except those above 8 ft³/s (0.23 m³/s), which are poor. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--12 years, 1.45 ft³/s (0.041 m³/s), 1,050 acre-ft/yr (1.29 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 328 ft³/s (9.29 m³/s) Feb. 10, 1979, gage height, 3.96 ft (1.207 m), from rating curve extended above 6.2 ft³/s (0.18 m³/s); minimum, 0.50 ft³/s (0.014 m³/s) Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 307 ft³/s (8.69 m³/s) Jan. 8, gage height, 3.89 ft (1.186 m), from rating curve extended above 6.2 ft³/s (0.18 m³/s), no other peak above base of 80 ft³/s (2.27 m³/s); minimum, 0.52 ft³/s (0.015 m³/s) Oct. 16, 18, 22, Nov. 3-6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.58	.74	.70	1.8	1.8	3.7	6.8	5.3	1.8	1.6	3.3	1.2
2	.58	.58	2.6	1.4	1.7	2.9	4.8	3.4	1.6	2.3	1.7	1.2
3	.61	.55	1.6	1.2	1.7	2.6	3.7	3.3	1.7	1.7	1.5	1.2
4	.63	.55	1.1	1.1	1.7	2.4	3.4	3.0	4.1	1.6	4.5	1.5
5	.61	.55	.94	1.0	1.7	2.5	3.1	3.0	2.0	1.5	2.5	1.2
6	.58	.55	.78	1.0	1.6	2.8	3.0	2.8	1.7	3.7	1.8	1.2
7	.61	.55	.74	1.2	1.6	2.5	2.9	2.6	1.6	3.5	1.6	1.1
8	.71	.78	.78	25	1.6	2.8	2.8	2.6	1.6	1.9	1.6	1.1
9	.58	.70	2.8	38	1.6	3.3	2.8	2.8	1.6	1.7	1.5	1.1
10	.64	.61	1.1	39	2.1	2.5	2.6	2.5	1.6	1.7	1.5	1.1
11	.58	.64	.94	12	1.8	2.5	2.7	2.5	2.0	2.0	1.4	1.2
12	.58	.58	.90	6.1	1.6	2.3	7.6	2.5	1.8	2.9	1.4	1.1
13	.58	.88	.82	5.0	1.8	2.4	5.0	2.4	2.8	1.8	1.4	1.2
14	.58	3.8	.90	4.0	1.7	9.2	4.5	2.3	3.4	2.0	1.4	1.1
15	.58	3.1	.90	3.4	1.6	3.8	6.0	2.3	2.3	1.5	1.3	1.2
16	.55	1.1	.78	3.1	2.0	7.8	4.1	3.0	1.8	1.5	1.4	1.2
17	.58	3.6	.86	2.9	1.6	7.6	3.7	2.0	1.5	1.4	1.3	1.2
18	.58	1.9	.78	3.3	1.6	7.1	3.5	1.8	1.5	2.7	1.3	1.0
19	.67	1.5	.74	2.6	1.6	8.8	3.3	1.9	1.5	1.9	1.3	1.0
20	.61	1.1	.74	2.4	1.5	4.8	3.0	1.9	1.5	1.6	1.3	1.0
21	.58	.90	.74	4.2	1.5	4.1	4.0	1.7	1.5	2.5	1.2	.99
22	.58	.82	.70	2.8	1.7	4.0	4.3	2.1	1.5	2.0	1.2	.99
23	.61	.74	.78	2.5	2.4	8.0	3.3	1.7	1.5	1.6	1.3	.99
24	.58	.74	.75	2.3	2.6	7.7	3.4	2.3	1.6	1.6	1.3	.99
25	.58	.82	5.5	2.3	5.9	5.9	3.3	1.8	1.7	1.6	1.2	.99
26	.58	1.1	1.5	2.2	2.4	4.5	2.9	1.6	1.6	1.7	1.2	.99
27	.58	.82	1.7	2.1	5.0	4.1	2.8	1.6	1.5	1.5	1.2	.99
28	.58	.74	1.3	2.0	4.1	4.0	2.6	1.6	1.5	1.5	1.2	1.0
29	.58	.70	2.2	2.0	6.1	3.7	2.8	1.6	1.5	1.5	1.2	1.0
30	.61	.70	2.0	2.0	---	3.3	4.1	1.6	1.5	1.4	1.2	.94
31	.64	---	2.4	2.0	---	3.1	---	2.6	---	1.5	1.2	---
TOTAL	18.52	32.44	41.07	181.9	65.6	136.7	112.8	74.1	54.8	58.9	48.4	32.97
MEAN	.60	1.08	1.32	5.87	2.26	4.41	3.76	2.39	1.83	1.90	1.56	1.10
MAX	.71	3.8	5.5	39	6.1	9.2	7.6	5.3	4.1	3.7	4.5	1.5
MIN	.55	.55	.70	1.0	1.5	2.3	2.6	1.6	1.5	1.4	1.2	.94
AC-FT	37	64	81	361	130	271	224	147	109	117	96	65

CAL YR 1979 TOTAL 648.15 MEAN 1.78 MAX 29 MIN .55 AC-FT 1290
WTR YR 1980 TOTAL 858.20 MEAN 2.34 MAX 39 MIN .55 AC-FT 1700

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft (30 m) downstream from the east portal, 5.3 mi (8.5 km) southeast of Kalaupapa, and 7.5 mi (12.1 km) northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 989 ft (301.4 m), from tunnel plans.

REMARKS.--Records fair. 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 (221.9 m) in Waikolu Valley near the east portal. Periodic determinations of water temperature for the current year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 3.07 ft^3/s (0.087 m^3/s), 2,220 acre-ft/yr (2.73 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 29 ft^3/s (0.82 m^3/s) Jan. 27, May 18, 1973; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 20 ft^3/s (0.57 m^3/s) Nov. 17, minimum daily, 0.90 ft^3/s (0.025 m^3/s) Jan. 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	7.6	1.4	5.3	2.0	5.7	14	17	2.2	1.4	13	2.7
2	1.5	4.2	13	3.4	2.0	3.2	9.5	8.0	1.8	2.0	3.8	2.5
3	1.5	2.4	7.4	2.6	1.9	2.7	4.5	8.0	1.4	2.5	1.8	2.4
4	1.5	1.7	7.1	2.3	2.1	2.6	4.2	5.6	3.0	2.1	10	7.2
5	1.5	1.4	4.4	2.0	2.0	4.0	3.6	6.7	2.0	1.6	4.2	4.8
6	1.5	1.4	2.9	2.1	1.9	6.3	3.2	5.8	1.6	7.0	2.0	7.4
7	1.5	1.4	2.4	3.6	1.9	5.0	3.2	5.2	1.4	4.7	1.6	2.9
8	2.9	6.5	1.8	17	1.9	5.7	3.1	5.8	1.4	2.2	1.6	2.6
9	2.3	5.0	12	5.5	1.9	8.4	3.1	10	1.4	1.8	1.4	2.3
10	1.7	3.6	3.8	5.8	2.8	4.6	2.9	6.1	1.6	1.6	1.4	2.3
11	1.6	4.0	2.9	3.6	2.7	5.5	3.5	5.8	2.0	2.5	1.2	3.2
12	1.5	3.6	2.3	1.5	2.3	4.8	14	5.8	2.4	3.5	1.2	2.7
13	1.5	7.3	2.1	1.1	2.9	4.9	15	6.1	2.4	2.5	1.2	3.1
14	1.4	20	3.4	.99	2.6	15	10	4.7	2.6	2.0	1.6	2.8
15	1.4	18	5.5	.90	2.1	8.5	14	4.6	2.6	1.8	1.6	4.0
16	1.4	8.2	3.2	1.4	4.5	16	5.9	8.0	2.2	1.4	1.6	5.1
17	1.3	20	4.7	1.3	2.4	15	6.7	4.7	1.6	1.2	1.6	3.9
18	1.3	12	2.9	3.0	2.1	11	5.5	4.2	1.4	3.4	1.6	2.9
19	3.2	9.9	2.0	3.1	1.9	13	6.7	4.2	1.4	2.7	1.6	2.4
20	4.8	5.5	1.7	2.6	1.9	5.3	4.6	6.1	1.8	2.7	1.4	2.3
21	3.6	3.2	1.7	5.5	1.7	4.0	6.0	4.7	2.2	3.2	1.8	2.1
22	2.3	2.6	1.7	3.6	2.1	4.8	15	3.8	1.6	3.6	2.6	2.1
23	2.6	2.1	2.7	2.9	6.7	18	7.0	2.2	1.4	2.0	1.4	2.1
24	3.1	1.7	2.7	2.6	7.1	17	7.9	5.6	1.4	1.8	1.4	2.1
25	2.0	1.9	12	2.4	11	13	6.9	2.4	1.4	1.8	1.4	2.0
26	1.6	5.3	7.0	2.3	3.4	6.3	4.4	2.5	1.4	2.0	1.2	2.0
27	1.4	4.0	8.4	2.1	7.4	4.4	3.6	2.0	1.4	2.2	1.3	2.0
28	1.4	2.7	6.7	2.0	10	5.8	3.4	1.6	1.4	1.8	2.3	2.0
29	1.4	2.0	13	2.0	16	5.0	5.6	1.4	1.4	1.6	2.3	3.0
30	1.5	1.6	5.9	2.0	---	4.0	11	3.9	1.2	1.6	4.0	2.5
31	2.0	---	9.6	2.1	---	3.6	---	3.3	---	1.6	2.9	---
TOTAL	59.7	170.8	158.3	98.59	111.2	233.1	208.0	165.8	53.0	73.8	78.0	91.3
MEAN	1.93	5.69	5.11	3.18	3.83	7.52	6.93	5.35	1.77	2.38	2.52	3.05
MAX	4.8	20	13	17	16	18	15	17	3.0	7.0	13	7.4
MIN	1.3	1.4	1.4	.90	1.7	2.6	2.9	1.4	1.2	1.2	1.2	2.0
AC-FT	118	339	314	196	221	462	413	329	105	146	155	181

CAL YR 1979 TOTAL 1097.75 MEAN 3.01 MAX 20 MIN .04 AC-FT 2180
WTR YR 1980 TOTAL 1501.69 MEAN 4.10 MAX 20 MIN .90 AC-FT 2980

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft (15 m) upstream from the west portal, 2.5 mi (4.0 km) northeast of Kaunakakai, and 4.7 mi (7.6 km) south of Kalaupapa.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 970 ft (295.7 m), from tunnel plans.

REMARKS.--Records excellent. 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 (221.9 m) in Waikolu Valley near east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 5.40 ft^3/s (0.153 m^3/s), 3,910 acre-ft/yr (4.82 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 34 ft^3/s (0.96 m^3/s) Feb. 5, 1972; minimum daily, 1.8 ft^3/s (0.051 m^3/s) Oct. 15, 1967.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 25 ft^3/s (0.71 m^3/s) May 1, minimum daily, 3.3 ft^3/s (0.094 m^3/s) Jan. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	10	3.7	8.1	4.8	9.9	19	25	4.5	3.7	16	5.8
2	3.7	6.8	15	6.3	4.8	6.3	18	11	4.1	4.3	6.3	5.5
3	3.7	4.5	11	5.0	4.5	5.8	8.5	11	3.7	4.8	4.1	5.5
4	3.7	3.9	8.6	4.8	5.2	5.3	7.5	8.5	5.4	4.5	13	10
5	3.7	3.7	7.5	4.5	5.0	7.3	7.0	9.7	4.3	3.9	6.9	8.0
6	3.9	3.7	5.3	4.5	4.5	10	6.5	8.8	3.9	10	4.3	11
7	3.9	3.7	4.8	6.2	4.5	9.1	6.5	8.0	3.7	7.5	3.9	6.5
8	4.8	8.5	4.1	17	4.3	8.1	6.3	8.8	3.7	4.5	3.9	5.8
9	4.5	7.3	13	9.4	4.3	12	6.3	13	3.7	4.1	3.7	5.5
10	4.3	6.0	6.0	9.4	5.4	8.0	6.0	9.1	3.9	3.9	3.7	5.5
11	4.1	6.3	5.3	7.3	6.6	9.4	6.0	8.8	4.3	4.8	3.5	6.5
12	3.9	6.3	4.5	3.9	5.3	8.8	20	8.8	4.8	6.0	3.5	6.0
13	3.9	7.4	4.5	3.5	5.8	7.8	21	9.1	4.8	4.8	3.5	6.3
14	3.9	21	5.8	3.3	5.5	22	15	7.5	5.0	4.3	3.9	6.3
15	3.7	19	7.8	3.3	5.3	11	20	7.3	5.0	4.1	3.9	6.9
16	3.7	12	5.5	3.9	8.4	21	9.7	11	4.5	3.7	3.9	8.0
17	3.7	20	7.2	4.1	5.5	21	11	7.5	3.9	3.5	3.9	7.3
18	3.7	16	5.5	6.2	5.0	17	9.1	6.8	3.7	5.7	3.9	6.3
19	5.3	12	4.5	6.3	4.8	20	10	6.8	3.7	5.0	3.9	5.8
20	7.3	8.0	4.1	5.5	4.5	9.1	8.3	9.1	4.1	5.0	3.7	5.5
21	6.3	5.8	4.1	8.7	4.3	7.8	8.7	7.5	4.5	5.5	4.1	5.5
22	4.5	5.0	4.3	8.4	4.8	8.0	21	6.3	3.9	5.9	3.9	5.3
23	5.0	4.5	4.8	6.3	10	24	11	4.5	3.7	4.3	3.7	5.3
24	5.5	4.1	5.3	5.8	11	23	11	8.5	3.7	4.1	3.7	5.3
25	4.3	4.3	11	5.5	18	20	11	4.8	3.7	4.1	3.7	5.3
26	4.1	7.4	9.2	5.3	6.8	11	8.0	4.8	3.7	4.3	3.5	5.3
27	3.7	6.8	12	5.0	12	8.3	7.0	4.3	3.7	4.5	4.5	5.3
28	3.7	5.3	7.8	4.8	15	10	6.8	3.9	3.7	4.1	5.5	5.3
29	3.7	4.5	17	4.8	22	9.4	8.8	3.7	3.7	3.9	5.5	6.0
30	3.7	4.1	9.5	5.0	---	8.0	14	6.5	3.5	3.9	7.2	5.8
31	4.1	---	12	4.8	---	7.3	---	5.8	---	3.9	6.3	---
TOTAL	131.7	237.9	230.7	186.9	207.9	365.7	329.0	256.2	122.5	146.6	155.0	188.4
MEAN	4.25	7.93	7.44	6.03	7.17	11.8	11.0	8.26	4.08	4.73	5.00	6.28
MAX	7.3	21	17	17	22	24	21	25	5.4	10	16	11
MIN	3.7	3.7	3.7	3.3	4.3	5.3	6.0	3.7	3.5	3.5	3.5	5.3
AC-FT	261	472	458	371	412	725	653	508	243	291	307	374

CAL YR 1979 TOTAL 2166.3 MEAN 5.99 MAX 21 MIN 3.0 AC-FT 4300
WTR YR 1980 TOTAL 2558.5 MEAN 6.99 MAX 25 MIN 3.3 AC-FT 5070

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT (274 M), NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi (2.9 km) southwest of Haupu Bay, 2.3 mi (3.7 km) upstream from mouth, and 5.2 mi (8.4 km) southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2 (5.15 km^2).

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1963(P), 1964(M), 1965(P).

GAGE.--Water-stage recorder. Altitude of gage is 900 ft (274 m), from topographic map. Prior to July 1, 1962, at site 200 ft (61 m) upstream at datum 6.14 ft (1.871 m) higher.

REMARKS.--Records fair. Since Nov. 16, 1960, water diverted above station at times, either into or from Molokai tunnel. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--19 years (water years, 1961, 1963-80), 7.43 ft^3/s (0.210 m^3/s), 5,380 acre-ft/yr (6.63 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,090 ft^3/s (59.2 m^3/s) Jan. 8, 1980, gage height, 6.14 ft (1.872 m), from rating curve extended above 43 ft^3/s (1.22 m^3/s); minimum, 0.02 ft^3/s (0.001 m^3/s) Oct. 26, 27, 1978.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1961, reached a stage of 13.62 ft (4.151 m), from flood-marks, former site and datum, discharge, 6,220 ft^3/s (176 m^3/s), by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 590 ft^3/s (16.7 m^3/s) and maximum (*), from rating curve extended above 43 ft^3/s (1.22 m^3/s):

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Dec. 25	0400	860	24.4	4.40	1.341
Jan. 8	2100	*2090	59.2	*6.14	1.872

Minimum discharge, 1.1 ft^3/s (0.031 m^3/s) on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	18	1.1	5.6	1.8	7.8	71	42	8.6	6.6	42	1.8
2	1.1	2.4	62	3.0	1.8	1.8	18	8.2	5.2	11	7.0	1.8
3	1.1	1.1	9.3	1.9	1.7	1.5	3.5	10	5.2	8.6	4.6	1.8
4	1.1	1.1	8.4	1.4	2.2	1.4	2.4	3.3	26	6.6	67	3.3
5	1.1	1.1	4.5	1.4	1.8	4.3	2.0	5.9	6.6	5.5	12	2.4
6	1.1	1.1	1.6	1.4	1.7	12	2.0	3.8	5.2	43	3.5	3.3
7	1.1	1.1	1.1	2.4	1.5	6.6	2.0	2.6	4.9	20	2.8	1.8
8	1.1	13	1.6	248	1.5	8.6	2.0	4.3	4.9	5.9	2.8	1.7
9	1.1	6.3	25	224	1.5	19	2.2	9.5	5.2	4.9	2.4	1.7
10	1.1	2.1	2.7	300	5.5	5.5	2.2	3.8	6.6	4.6	2.4	1.7
11	1.1	4.5	1.6	53	5.9	7.4	2.6	4.6	12	7.8	2.4	2.0
12	1.1	2.1	1.4	9.0	1.5	5.9	113	5.5	11	17	2.4	1.8
13	1.1	11	1.1	6.2	2.6	7.4	28	5.5	17	5.2	2.4	2.0
14	1.1	80	2.4	5.2	1.8	93	19	2.8	20	6.2	2.8	1.8
15	1.1	51	3.9	4.6	1.5	13	65	3.5	7.4	5.2	2.6	2.4
16	1.1	9.3	1.6	3.3	6.2	71	9.0	8.6	6.2	4.3	2.6	2.6
17	1.1	44	2.7	3.3	1.8	49	9.5	2.8	5.9	4.6	3.3	2.2
18	1.1	20	1.9	7.8	1.5	24	7.0	2.8	5.9	22	2.8	1.8
19	1.4	13	1.4	2.8	1.5	59	9.0	4.6	7.0	12	2.8	1.8
20	1.6	5.9	1.4	2.0	1.5	4.6	3.3	7.0	8.2	5.5	3.3	1.7
21	1.1	2.1	1.1	23	1.5	2.8	8.6	3.5	8.2	16	3.5	1.8
22	1.1	1.4	1.4	5.5	1.7	3.8	35	9.5	6.6	11	3.3	1.8
23	1.9	1.1	2.1	3.5	8.2	84	8.6	5.9	6.6	4.9	3.3	1.8
24	1.1	1.1	1.6	2.2	19	40	14	41	6.6	4.9	3.8	1.8
25	1.1	1.1	68	1.8	43	29	11	12	6.6	4.6	3.8	1.8
26	1.1	4.2	13	1.8	2.4	7.0	2.8	5.9	6.2	5.9	3.8	2.0
27	1.1	3.6	16	1.8	42	3.0	2.2	4.9	6.2	5.5	2.4	1.8
28	1.1	1.4	12	1.8	31	6.2	2.0	4.9	6.2	5.2	1.7	1.8
29	1.1	1.1	26	1.8	62	5.5	3.5	4.9	5.5	5.2	2.0	2.0
30	1.1	1.1	9.3	1.8	---	2.8	38	16	5.5	5.9	2.4	1.8
31	1.4	---	14	1.8	---	2.2	---	30	---	6.6	1.8	---
TOTAL	36.0	306.3	301.2	933.1	257.6	609.1	494.4	279.6	243.2	282.2	205.7	59.8
MEAN	1.16	10.2	9.72	30.1	8.88	19.6	16.5	9.02	8.11	9.10	6.64	1.99
MAX	1.9	80	68	300	62	93	113	42	26	43	67	3.3
MIN	1.1	1.1	1.1	1.4	1.5	1.4	2.0	2.6	4.9	4.3	1.7	1.7
AC-FT	71	608	597	1850	511	1210	981	555	482	560	408	119

CAL YR 1979 TOTAL 3175.4 MEAN 8.70 MAX 204 MIN 1.1 AC-FT 6300
WTR YR 1980 TOTAL 4008.2 MEAN 11.0 MAX 300 MIN 1.1 AC-FT 7950

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 (1.1 km) upstream from mouth and 4.4 mi (7.1 km) southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi² (9.53 km²).

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), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft (76.810 m) above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft (152 m) 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 (0.454 m) higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records fair. Diversion above station for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted above station both to and from Molokai tunnel. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--20 years (water years 1961-80), 15.3 ft³/s (0.433 m³/s), 11,080 acre-ft/yr (13.7 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,600 ft³/s (187 m³/s) Oct. 31, 1961, gage height, 13.75 ft (4.191 m), present datum, from floodmarks, from rating curve extended above 39 ft³/s (1.10 m³/s) on basis of slope-area measurement of peak flow; minimum, 2.0 ft³/s (0.057 m³/s) Nov. 1, 2, 1925, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 700 ft³/s (19.8 m³/s) and maximum (*), from rating curve extended above 19 ft³/s (0.54 m³/s) on basis of slope-area measurement at gage height 7.81 ft (2.380 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0330	1450	41.1	5.60	1.707
Jan. 8	2030	*4930	140	*7.81	2.380
Mar. 14	0700	912	25.8	4.96	1.512

Minimum discharge, 6.6 ft³/s (0.19 m³/s) Oct. 25-31, Nov. 6.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	35	7.6	15	11	23	76	58	23	18	47	12
2	7.9	10	89	11	10	14	30	28	20	22	20	12
3	7.7	7.7	21	9.4	10	12	18	26	20	21	17	12
4	7.6	7.3	16	8.8	11	12	16	23	36	19	61	14
5	7.5	7.2	13	8.5	11	15	15	24	22	18	27	13
6	7.4	7.1	9.1	8.4	11	22	15	20	20	60	18	14
7	7.4	7.3	8.6	9.1	10	17	14	19	20	33	17	12
8	7.9	27	8.9	332	10	17	14	21	19	20	16	12
9	7.5	14	40	230	10	29	14	24	19	18	16	12
10	7.4	8.9	11	318	18	17	14	20	20	18	16	12
11	7.4	10	9.5	99	17	17	15	24	24	20	15	12
12	7.4	8.5	8.9	20	11	16	91	24	23	29	15	12
13	7.3	17	8.6	16	12	20	39	23	26	18	15	12
14	7.2	130	9.4	15	11	126	35	19	29	19	16	12
15	7.2	91	11	14	11	29	97	20	21	18	16	12
16	7.1	21	8.7	13	14	69	32	23	19	17	15	13
17	6.9	80	9.3	13	11	51	34	18	18	17	16	12
18	6.8	41	8.6	16	10	35	30	18	18	33	15	11
19	7.3	31	8.2	12	10	73	29	20	19	26	15	11
20	7.1	16	8.0	11	10	19	21	24	20	20	15	11
21	7.0	11	8.0	29	10	16	23	20	19	28	15	11
22	6.9	9.3	8.0	16	10	17	54	23	18	24	15	11
23	7.3	8.7	9.1	13	15	80	26	21	18	18	15	11
24	7.0	8.4	12	12	23	62	31	52	17	17	15	11
25	6.7	9.1	136	11	48	38	28	27	18	17	15	11
26	6.6	11	26	11	13	21	20	21	17	17	15	11
27	6.6	11	33	11	43	17	18	21	17	17	14	11
28	6.6	8.3	36	11	43	19	18	20	17	16	13	11
29	6.6	8.0	78	11	71	18	19	20	17	16	13	12
30	6.7	7.8	32	11	---	16	44	26	17	16	13	11
31	7.3	---	31	11	---	15	---	36	---	16	13	---
TOTAL	222.9	669.6	723.5	1276.2	505	952	930	763	611	666	569	359
MEAN	7.19	22.3	23.3	41.2	17.4	30.7	31.0	24.6	20.4	21.5	18.2	11.8
MAX	7.9	130	136	332	71	126	97	58	36	60	61	14
MIN	6.6	7.1	7.6	8.4	10	12	14	18	17	16	13	11
AC-FT	442	1330	1440	2530	1000	1890	1840	1510	1210	1320	1120	702

CAL YR 1979 TOTAL 6847.7 MEAN 18.8 MAX 261 MIN 6.6 AC-FT 13580
WTR YR 1980 TOTAL 8237.2 MEAN 22.5 MAX 332 MIN 6.6 AC-FT 16340

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi (1.0 km) upstream from Molokai Ranch pipeline crossing, 1.3 mi (2.1 km) northeast of Kaunakakai Post Office, and 1.7 mi (2.7 km) upstream from mouth.

DRAINAGE AREA.--6.57 mi^2 (17.02 km^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. Altitude of gage is 240 ft (73 m), from topographic map.

REMARKS.--Records fair. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--30 years (water years 1951-80), 1.54 ft^3/s (0.043 m^3/s), 1,120 acre-ft/yr (1.38 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s (86.7 m^3/s) Oct. 31, 1961, gage height, 9.30 ft (2.835 m), from rating curve extended above 620 ft^3/s (17.6 m^3/s) on basis of slope-area measurements at gage heights 7.22 ft (2.201 m) and 9.30 ft (2.835 m); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,500 ft^3/s (42.5 m^3/s) Jan. 8, gage height, 7.22 ft (2.201 m), from rating curve extended as explained above, no other peak above base of 280 ft^3/s (7.93 m^3/s); no flow most of time.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.17	.00	3.3	.13	.61	3.3	.00	.00	.00
2	.00	.00	.08	.00	.00	.06	9.5	1.1	.00	.00	.00	.00
3	.00	.00	8.2	.00	.00	.00	.29	.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	.85	.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	121	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	5.1	223	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.12	236	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	75	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	10	.00	.00	24	.00	.00	.00	.00	.00
13	.00	.00	.00	3.7	.00	.00	3.4	.00	.00	.00	.00	.00
14	.00	.92	.00	.63	.00	6.4	2.7	.00	.00	.00	.00	.00
15	.00	16	.00	.01	.00	1.3	7.5	.00	.00	.00	.00	.00
16	.00	1.4	.00	.00	.00	14	3.1	.00	.00	.00	.00	.00
17	.00	.20	.00	.00	.00	16	.01	.00	.00	.00	.00	.00
18	.00	5.1	.00	.00	.00	8.3	.00	.00	.00	.00	.00	.00
19	.00	.01	.00	.00	.00	18	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	1.6	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	1.2	.00	.01	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	4.5	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	8.2	.69	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	32	.00	.00	.00	.00	.00	.00
25	.00	.00	6.9	.00	31	11	.00	3.3	.00	.00	.00	.00
26	.00	.00	.02	.00	.43	4.2	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	7.8	.29	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	11	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	13	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	1.4	.00	---	.00	---	4.2	---	.00	.00	---
TOTAL	.00	23.63	21.82	675.21	63.23	129.66	51.32	11.21	3.30	.00	.85	.00
MEAN	.000	.79	.70	21.8	2.18	4.02	1.71	.36	.11	.000	.027	.000
MAX	.00	16	8.2	236	31	32	24	6.2	3.3	.00	.85	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	47	43	1340	125	247	102	22	6.5	.00	1.7	.00

CAL YR 1979 TOTAL 1091.28 MEAN 2.99 MAX 173 MIN .00 AC-FT 2160
WTR YR 1980 TOTAL 975.23 MEAN 2.66 MAX 236 MIN .00 AC-FT 1930

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft (61 m) downstream from wooden bridge on Highway 45 and 0.8 mi (1.3 km) south of Halawa.

DRAINAGE AREA.--0.94 mi² (2.43 km²).

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 640 ft (195 m), from topographic map.

REMARKS.--Records fair. Diversion above station for domestic use at Puu O Hoku Ranch. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years, 0.784 ft³/s (0.022 m³/s), 568 acre-ft/yr (700,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft³/s (77.0 m³/s) Apr. 13, 1965, gage height, 11.25 ft (3.429 m), from rating curve extended above 37 ft³/s (1.05 m³/s) on basis of slope-area measurements at gage heights 4.60 ft (1.402 m), 7.15 ft (2.179 m), and 11.25 ft (3.429 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 298 ft³/s (8.44 m³/s) Dec. 25, gage height, 4.54 ft (1.384 m), no other peak above base of 210 ft³/s (5.95 m³/s); no flow on many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	1.6	.00	.63	.18	.98	1.7	.95	.63	.46	2.9	.42
2	.00	.14	.00	.34	.13	.58	3.4	.42	.42	.46	.83	.34
3	.00	.04	.00	.18	.12	.46	.63	.73	.38	.42	.58	.50
4	.00	.01	.00	.12	.13	.34	.42	.42	.54	.34	7.4	3.0
5	.00	.00	.00	.07	.12	.34	.38	1.2	.42	.30	3.0	.73
6	.00	.00	.00	.07	.12	.91	.60	1.0	.46	2.1	4.1	.46
7	.00	.00	.05	2.2	.15	.55	.46	.42	.34	3.2	1.1	.38
8	.00	.31	.27	29	.15	.30	.38	.38	.27	.58	3.7	.34
9	.00	.15	.27	29	.12	.30	.34	.64	.27	.42	.93	.34
10	.00	.06	.29	19	4.5	.66	.34	.54	.63	.34	.73	.34
11	.00	.66	.05	6.6	1.3	.38	.34	.46	.27	.50	.63	1.4
12	.00	.15	.03	1.9	.50	.27	.54	.46	.27	9.3	.58	.46
13	.00	.04	.01	1.3	.76	.21	.42	.62	.27	1.2	.58	.38
14	.00	.53	.00	1.2	.38	3.8	1.7	.63	.80	3.7	1.2	.38
15	.00	.56	.00	1.1	.24	.64	5.7	.42	.54	1.1	.63	1.9
16	.00	.08	.00	1.1	.18	18	1.4	2.6	.42	.58	.68	5.3
17	.00	.04	.00	1.0	.15	6.7	.92	.54	.27	.46	.50	.93
18	.00	.05	.00	1.0	.12	8.8	.50	.34	.24	.84	.46	.61
19	.00	.04	.00	1.0	.12	6.0	.84	.30	.24	.97	.42	.42
20	.00	.08	.00	.98	.09	1.5	.58	.34	.27	.58	1.1	.38
21	.00	.11	.00	1.5	.09	1.0	.42	.38	.24	3.1	.50	.34
22	.00	.03	.00	.80	.28	.83	1.0	4.0	.21	1.5	.42	.34
23	.00	.01	.00	.19	.21	1.0	.54	.91	.21	.68	.73	.30
24	.00	.00	.00	.16	.68	.78	.50	2.0	.21	.73	.63	.30
25	.00	.00	23	.14	2.3	.78	.38	.88	.21	.50	.46	.27
26	.00	.15	1.4	.13	.38	.83	.34	.68	.21	2.5	.58	.27
27	.00	.05	.98	.12	3.9	.54	.30	.46	.27	1.5	.46	.27
28	.00	.02	.71	.12	5.5	.50	.34	.38	.24	.73	.38	.27
29	.00	.01	3.8	.12	5.9	.42	.47	.34	.21	.58	.38	.34
30	.00	.00	6.4	.17	---	.38	.46	.58	.30	.58	.58	.30
31	.00	---	2.1	.50	---	.38	---	3.7	---	.42	.38	---
TOTAL	.00	4.92	39.36	101.74	28.80	59.16	26.34	27.72	10.26	40.67	37.55	22.01
MEAN	.000	.16	1.27	3.28	.99	1.91	.88	.89	.34	1.31	1.21	.73
MAX	.00	1.6	23	29	5.9	18	5.7	4.0	.80	9.3	7.4	5.3
MIN	.00	.00	.00	.07	.09	.21	.30	.30	.21	.30	.38	.27
AC-FT	.00	9.8	78	202	57	117	52	55	20	81	74	44

CAL YR 1979 TOTAL 301.61 MEAN .83 MAX 23 MIN .00 AC-FT 598
WTR YR 1980 TOTAL 398.53 MEAN 1.09 MAX 29 MIN .00 AC-FT 790

16501000 PALIKEA STREAM BELOW DIVERSION DAM, NEAR KIPAHULU

LOCATION.--Lat 20°41'03", long 156°04'10", Hydrologic Unit 20020000, on left bank 50 ft (15 m) downstream from old diversion dam, 2 mi (3 km) northwest of Kipahulu, and 2.1 mi (3.4 km) upstream from mouth.

DRAINAGE AREA.--6.29 mi² (16.29 km²).

PERIOD OF RECORD.--February 1927 to September 1929, December 1931 to September 1935, December 1935 to February 1938, May to October, December 1938, January 1939, August 1939 to current year. Published as Oheo Stream at elevation 1,550 ft (472 m) near Kipahulu 1927-29 and as Oheo Stream below diversion dam, near Kipahulu 1930-56.

REVISED RECORDS.--WSP 1155: 1939(M). WSP 1569: Drainage area. WSP 1719: 1932-34, 1937-40, 1948, 1949-50(P), 1951, 1952-54(P), 1956-58(P). WSP 1937: 1932-38(M), 1940-47(M), 1948-49(P), 1950(M), 1951-53(P), 1956(P), 1957(M), 1958-59(P), 1960(M).

GAGE.--Water-stage recorder. Datum of gage is 1,546 ft (471 m) above mean sea level (by vertical angles). Prior to Sept. 6, 1929, at site 100 ft (30 m) upstream at different datum.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--45 years (water years, 1928, 1933-34, 1937, 1940-80), 57.8 ft³/s (1.637 m³/s), 41,880 acre-ft/yr (51.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,100 ft³/s (456 m³/s) Jan. 23, 1965, gage height, 18.3 ft (5.58 m), from floodmarks, from rating curve extended above 3,300 ft³/s (93.5 m³/s) on basis of computations of peak flow over dam at gage heights 12.68 ft (3.865 m) and 17.5 ft (5.33 m); no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 3,700 ft³/s (105 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 8	2330	*10150	287	*13.55	4.130
Mar. 19	Unknown	4950	140	9.65	2.941

Minimum discharge, 0.01 ft³/s (<0.001 m³/s) several days in December and February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	180	.24	9.1	.64	.03	29	870	113	177	54	47	38
2	30	.15	.56	.24	.02	1.4	400	17	70	106	8.4	4.9
3	82	.35	1.1	.07	.02	.24	90	54	44	148	13	2.3
4	50	6.3	.09	.03	.02	2.0	22	5.6	281	122	91	186
5	136	5.2	.05	.02	.02	100	7.9	57	55	92	27	149
6	4.8	63	.05	1.1	.02	190	4.0	145	35	94	7.2	71
7	.64	.86	.09	.15	.01	70	2.5	32	26	252	2.0	11
8	.24	.07	14	1140	.13	300	2.0	124	63	24	1.6	4.3
9	.05	.02	.91	1910	28	209	1.5	77	100	30	11	1.2
10	.09	.02	.41	1090	.29	230	1.0	18	135	5.6	22	4.9
11	.07	.02	.09	372	.03	100	12	21	261	48	1.4	64
12	.03	.02	.24	12	.02	79	270	98	131	145	.64	3.0
13	.02	.02	.09	10	4.2	260	500	110	243	52	.41	25
14	.02	25	.03	9.7	.81	520	230	10	347	83	.29	11
15	.15	71	.02	9.4	.12	330	150	12	155	12	.15	41
16	.15	111	.01	9.1	.03	670	15	166	65	5.9	.12	6.4
17	30	748	.01	9.1	.03	860	56	112	10	182	51	1.4
18	6.2	782	.01	11	.02	770	13	31	4.5	197	69	5.4
19	196	124	.01	1.8	.02	590	25	16	5.5	68	22	2.2
20	25	135	.01	.72	.02	160	6.7	37	10	18	69	271
21	6.4	15	.02	.64	.02	105	1.4	24	6.6	50	7.2	21
22	.19	78	.02	.81	.02	450	58	201	1.0	95	.81	5.6
23	.03	25	.02	.35	1.4	1000	131	28	.72	20	14	1.5
24	.02	2.7	.31	.15	1.8	660	205	76	.91	13	13	1.0
25	.02	1.4	196	.07	1.5	470	43	23	27	6.7	3.8	.35
26	.02	1.5	9.5	.03	1.8	250	15	87	15	70	12	.15
27	.02	.64	.64	.03	115	470	3.7	36	8.0	78	9.7	.07
28	18	.35	.29	.02	125	285	7.3	41	5.4	11	128	.03
29	5.0	.29	11	.02	160	180	113	133	22	45	30	.02
30	.41	.12	6.1	.37	---	70	42	170	13	41	261	.02
31	.09	---	9.8	.29	---	50	---	257	---	5.2	116	---
TOTAL	771.66	2193.27	260.58	4589.85	440.40	9460.64	3298.0	2331.6	2317.63	2173.4	1049.72	932.74
MEAN	24.9	73.1	8.41	148	15.2	305	110	75.2	77.3	70.1	33.9	31.1
MAX	196	782	196	1910	160	1000	870	257	347	252	261	271
MIN	.02	.02	.01	.02	.01	.24	1.0	5.6	.72	5.2	.12	.02
AC-FT	1530	4350	517	9100	874	18770	6540	4620	4600	4310	2080	1850

CAL YR 1979 TOTAL 20904.37 MEAN 57.3 MAX 1470 MIN .01 AC-FT 41460
WTR YR 1980 TOTAL 29819.49 MEAN 81.5 MAX 1910 MIN .01 AC-FT 59150

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft (61 m) upstream from Koolau ditch intake and trail, 1.9 mi (3.1 km) southwest of Nahiku, and 4.5 mi (7.2 km) southeast of Keanae.

DRAINAGE AREA.--3.49 mi² (9.04 km²).

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 (401.7 m) above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft (15 m) downstream at datum 0.12 ft (0.037 m) lower.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--58 years (water years 1923-80), 23.0 ft³/s (0.651 m³/s), 16,660 acre-ft/yr (20.5 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft³/s (158 m³/s) Jan. 18, 1916, gage height, 11.6 ft (3.54 m), present site and datum, from rating curve extended above 814 ft³/s (23.1 m³/s) by test model of station site; minimum, 1.2 ft³/s (0.034 m³/s) Oct. 17, 1974.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,700 ft³/s (48.1 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0530	1700	48.1	6.40	1.951	Mar. 19	0130	2810	79.6	8.44	2.573
Jan. 8	2200	*2990	84.7	*8.70	2.652	Apr. 1	2200	1740	49.3	6.47	1.972

Minimum discharge, 2.1 ft³/s (0.059 m³/s) Oct. 13-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.9	8.8	7.9	6.3	3.7	59	676	107	5.9	9.3	25	15
2	2.7	5.9	32	5.2	3.4	5.6	285	38	5.7	14	12	8.2
3	3.1	5.0	17	4.6	3.3	4.1	101	45	7.4	46	11	8.7
4	3.0	4.1	9.4	4.2	5.1	6.9	71	49	60	24	65	92
5	3.1	3.4	8.3	3.9	5.6	66	31	26	12	29	17	20
6	2.6	3.2	7.2	3.7	3.4	116	27	17	11	272	10	10
7	2.5	2.9	16	3.5	3.2	49	23	16	8.8	38	9.2	7.7
8	2.4	9.0	12	963	3.1	190	20	36	9.8	11	9.0	6.5
9	2.3	3.7	8.1	305	3.1	118	20	31	16	8.5	7.7	5.8
10	2.3	3.2	6.9	813	8.9	124	18	14	41	8.3	7.0	5.6
11	2.3	2.9	6.3	125	16	79	24	18	72	38	6.5	5.5
12	2.2	2.7	5.9	12	4.1	78	224	61	50	43	6.2	4.8
13	2.2	5.2	5.4	7.0	4.1	181	352	61	130	11	5.9	6.6
14	2.1	203	5.0	5.5	3.8	278	238	15	116	8.1	5.7	7.1
15	22	195	4.6	4.8	3.3	269	221	14	27	7.0	5.8	17
16	10	152	4.4	4.3	3.2	494	58	12	15	6.7	6.1	7.5
17	7.6	623	4.2	4.0	3.1	674	55	13	11	36	14	5.8
18	3.0	291	4.0	3.9	3.0	643	24	11	9.6	95	37	5.5
19	36	79	3.8	3.8	2.9	558	62	22	10	44	19	5.0
20	9.2	57	3.7	3.9	2.8	106	26	37	9.4	22	34	28
21	4.6	23	4.0	4.0	2.8	80	22	22	8.4	75	10	16
22	4.0	20	3.6	4.0	2.7	283	96	14	8.1	44	7.2	8.3
23	5.4	8.4	3.6	4.1	2.7	820	143	10	8.1	14	7.7	6.2
24	4.3	6.9	5.8	4.0	2.6	592	157	9.0	8.3	12	6.9	5.4
25	3.1	7.3	139	4.0	2.7	388	49	8.1	12	13	5.9	4.9
26	2.8	8.3	10	3.9	2.6	218	28	7.6	12	28	6.5	4.6
27	2.7	8.5	32	3.9	2.7	333	17	7.1	9.0	18	5.7	4.4
28	2.5	8.4	11	3.8	25	230	15	6.6	7.9	11	14	4.3
29	2.4	8.2	60	3.7	110	137	22	6.3	7.4	10	9.8	4.2
30	2.4	8.2	24	3.7	---	52	75	6.0	7.4	9.5	31	3.9
31	6.3	---	9.0	4.0	---	46	---	8.8	---	9.0	23	---
TOTAL	165.0	1767.2	474.1	2329.7	242.9	7277.6	3180	748.5	716.2	1014.4	440.8	284.5
MEAN	5.32	58.9	15.3	75.2	8.38	235	106	24.1	23.9	32.7	14.2	9.48
MAX	36	623	139	963	110	820	676	107	130	272	65	92
MIN	2.1	2.7	3.6	3.5	2.6	4.1	15	6.0	5.7	6.7	5.7	3.9
AC-FT	327	3510	940	4620	482	14440	6310	1480	1420	2010	874	564

CAL YR 1979	TOTAL	10248.9	MEAN 28.1	MAX 642	MIN 2.1	AC-FT	20330	
WTR YR 1980	TOTAL	18640.9	MEAN 50.9	MAX 963	MIN 2.1	AC-FT	36970	

16512000 KOOLAU DITCH AT NAHIKU WEIR, NEAR NAHIKU

LOCATION.--Lat 20°48'56", long 156°07'15", Hydrologic Unit 20020000, on right bank between Kapaula and Waiohue Gulches, 1.8 mi (2.9 km) southwest of Nahiku, and 3.8 mi (6.1 km) southeast of Keanae.

PERIOD OF RECORD.--February 1919 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,289.14 ft (392.930 m) above mean sea level. Prior to Apr. 28, 1922, nonrecording gage at same site and datum.

REMARKS.--Records good. Ditch diverts water from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--61 years, 34.2 ft^3/s (0.969 m^3/s), 24,780 acre-ft/yr (30.6 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 104 ft^3/s (2.95 m^3/s) Mar. 17, 1980; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 104 ft^3/s (2.95 m^3/s) Mar. 17; no flow Jan. 12-15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	40	27	34	16	73	98	96	28	38	70	60
2	13	26	53	29	15	29	95	90	26	49	50	41
3	15	30	55	27	14	23	91	90	31	62	47	38
4	14	24	38	24	17	28	86	88	77	68	85	84
5	16	19	33	22	21	83	68	82	51	71	66	73
6	13	18	30	21	15	97	65	70	44	79	49	49
7	12	16	66	19	13	93	57	63	39	78	44	39
8	11	34	53	62	13	93	62	86	43	52	42	35
9	11	22	37	68	13	96	75	79	57	43	37	32
10	10	18	32	88	24	96	70	59	86	42	34	30
11	9.8	16	29	42	50	93	70	65	90	74	31	30
12	9.4	15	28	.00	20	96	96	75	89	82	29	26
13	9.2	16	26	.00	20	100	98	88	93	52	28	31
14	9.0	80	24	.00	17	101	97	62	94	42	26	32
15	30	97	23	.00	15	99	97	60	87	39	26	58
16	36	93	21	13	14	103	92	54	72	36	28	37
17	27	100	21	25	14	104	89	54	57	72	44	30
18	14	100	20	22	13	100	80	49	52	90	74	29
19	58	96	19	21	13	45	92	55	52	88	52	26
20	36	94	18	20	12	8.7	83	78	47	71	78	65
21	22	79	19	19	12	29	72	75	41	87	44	66
22	19	77	17	19	11	93	93	63	38	65	35	41
23	21	47	17	18	11	95	94	49	36	64	36	33
24	20	38	22	17	11	95	94	44	35	55	34	29
25	16	35	83	17	11	95	89	40	43	53	30	26
26	15	34	44	16	10	94	82	38	46	77	31	24
27	14	33	72	16	12	94	65	35	37	70	29	23
28	13	31	43	15	32	95	59	33	34	51	52	22
29	13	29	96	15	95	93	75	31	32	47	44	21
30	13	28	77	16	---	86	87	29	32	44	77	20
31	15	---	44	17	---	75	---	38	---	42	76	---
TOTAL	554.4	1385	1187	722.00	554	2504.7	2471	1918	1589	1879	1428	1150
MEAN	17.9	46.2	38.3	23.3	19.1	80.8	82.4	61.9	53.0	60.6	46.1	38.3
MAX	58	100	96	88	95	104	98	96	94	90	85	84
MIN	9.0	15	17	.00	10	8.7	57	29	26	36	26	20
AC-FT	1100	2750	2350	1430	1100	4970	4900	3800	3150	3730	2830	2280

CAL YR 1979 TOTAL 11666.50 MEAN 32.0 MAX 100 MIN .00 AC-FT 23140
WTR YR 1980 TOTAL 17342.10 MEAN 47.4 MAX 104 MIN .00 AC-FT 34400

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft (152 m) upstream from Koolau ditch crossing and trail bridge and 2.8 mi (4.5 km) south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi² (9.48 km²).

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). WSP 2137: 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft (409.38 m) above mean sea level (by vertical angles). Prior to Oct. 3, 1974, at present site at datum 0.50 ft (0.15 m) higher.

REMARKS.--Records good. No diversion above station. Water is diverted by Koolau ditch, 500 ft (152 m) below station, for domestic supply and irrigation of sugarcane in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--60 years (water years, 1915, 1917, 1923-80), 35.4 ft³/s (1.003 m³/s), 25,650 acre-ft/yr (31.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft³/s (280 m³/s) Jan. 14, 1923, gage height, 13.5 ft (4.11 m), from floodmarks, from rating curve extended above 650 ft³/s (18.4 m³/s); minimum, 0.5 ft³/s (0.014 m³/s) July 26, 1922.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,900 ft³/s (53.9 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 17	1000	2080	58.9	7.94	2.420	Mar. 19	0130	3780	107	9.82	2.993
Dec. 25	0500	2450	69.4	8.40	2.560	Mar. 24	0200	2470	70.0	8.43	2.570
Jan. 8	1500	*3830	108	*9.86	3.005	Apr. 1	2000	2660	75.3	8.66	2.640
Mar. 15	1730	2680	75.9	8.68	2.646	July 6	1900	3130	88.6	9.18	2.798

Minimum discharge, 2.0 ft³/s (0.057 m³/s) Oct. 14, 15.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.3	24	6.2	10	6.8	101	1010	145	5.9	10	10	21
2	3.1	11	63	8.3	4.6	12	351	49	5.6	16	14	10
3	3.5	10	29	7.3	4.3	8.3	112	58	11	80	15	9.8
4	3.3	7.6	24	6.5	5.8	15	77	71	80	36	85	54
5	3.1	5.8	14	6.0	5.9	98	30	34	17	44	23	24
6	4.2	5.0	10	5.6	4.4	156	25	20	14	475	13	11
7	4.2	4.2	43	5.2	3.6	62	19	21	10	65	11	8.9
8	3.0	31	24	1220	3.3	227	16	46	11	17	11	7.5
9	2.8	11	13	275	3.3	174	14	37	27	12	8.4	6.6
10	2.6	7.3	13	788	8.7	151	19	17	71	13	7.8	6.3
11	2.5	6.1	9.5	213	26	81	37	24	108	56	6.7	6.9
12	2.3	5.3	12	24	5.0	86	333	80	68	58	6.2	5.5
13	2.2	19	9.3	15	8.6	234	466	81	194	16	5.9	11
14	2.0	314	6.9	11	6.0	448	300	21	150	11	5.6	10
15	73	326	6.2	9.4	4.2	393	354	19	38	9.2	6.6	32
16	28	254	5.7	8.2	3.7	606	89	15	20	8.7	9.1	12
17	15	900	5.5	7.3	3.3	682	79	17	15	49	23	8.2
18	5.5	509	5.1	7.1	3.1	422	37	14	13	119	66	7.8
19	57	106	4.6	6.3	3.0	730	76	33	13	64	35	6.3
20	21	100	4.3	5.7	2.9	115	35	49	11	34	69	43
21	9.8	44	4.8	5.5	2.8	96	30	32	8.8	99	17	23
22	8.2	32	4.1	6.1	2.8	367	125	17	7.9	67	10	11
23	12	17	7.4	5.5	2.9	1170	166	13	7.3	21	10	7.7
24	9.5	13	16	5.5	3.0	841	189	14	7.6	16	8.9	6.7
25	6.0	11	221	4.7	3.3	485	71	10	18	19	6.9	5.9
26	4.9	11	24	4.4	4.6	215	40	8.9	19	40	8.5	5.3
27	4.6	10	62	4.1	11	321	24	7.9	8.7	23	6.4	5.0
28	4.0	8.7	19	3.9	54	248	19	7.1	7.0	14	18	6.1
29	3.7	7.7	96	3.8	199	144	27	6.5	6.3	12	13	7.8
30	3.6	6.8	41	3.8	---	50	97	6.6	7.2	10	57	4.8
31	5.8	---	17	5.9	---	42	---	8.6	---	9.9	34	---
TOTAL	315.7	2817.5	820.6	2692.1	399.9	8780.3	4267	982.6	980.3	1523.8	651.0	385.1
MEAN	10.2	93.9	26.5	86.8	13.8	283	142	31.7	32.7	49.2	21.0	12.8
MAX	73	900	221	1220	199	1170	1010	145	194	475	85	54
MIN	2.0	4.2	4.1	3.8	2.8	8.3	14	6.5	5.6	8.7	5.6	4.8
AC-FT	626	5590	1630	5340	793	17420	8460	1950	1940	3020	1290	764

CAL YR 1979 TOTAL 15361.0 MEAN 42.1 MAX 1160 MIN 2.0 AC-FT 30470
WTR YR 1980 TOTAL 24615.9 MEAN 67.3 MAX 1220 MIN 2.0 AC-FT 48830

16523000 KOOLAU DITCH NEAR KEANAE

LOCATION.--Lat 20°49'53", long 156°10'30", Hydrologic Unit 20020000, on right bank on west side of Keanae Valley, 2.7 mi (4.3 km) southwest of Keanae School, and 5.1 mi (8.2 km) southeast of Kailua.

PERIOD OF RECORD.--January 1910 to December 1912, November 1917 to February 1918, April 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,237.7 ft (377.25 m) above mean sea level (by plane-table traverse). Jan. 1, 1910, to Dec. 31, 1912, nonrecording gage at same site and datum.

REMARKS.--Records good. Ditch diverts at altitude 1,260 ft (384 m) from nearly all streams from the Makapipi west to the Alo for power, domestic use, and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years, 1911-12, 1918-80), 102 ft^3/s (2.889 m^3/s), 73,900 acre-ft/yr (91.1 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 266 ft^3/s (7.53 m^3/s) Apr. 19, 1935; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 224 ft^3/s (6.34 m^3/s) Mar. 9, July 19; minimum daily, 25 ft^3/s (0.708 m^3/s) Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	73	136	71	102	51	172	208	217	73	120	211	179
2	37	101	127	83	41	50	213	222	70	153	148	116
3	44	121	171	75	39	60	223	220	99	175	149	98
4	39	80	149	68	51	117	211	219	204	195	220	216
5	43	60	112	62	66	215	192	216	162	200	193	205
6	37	54	89	58	41	222	186	199	139	209	141	145
7	36	47	198	54	36	222	170	194	115	217	119	110
8	31	129	187	152	34	222	162	217	128	164	121	94
9	30	77	119	213	34	224	176	210	159	124	96	83
10	29	59	107	217	55	221	171	178	218	132	87	79
11	28	52	88	183	142	215	172	203	222	209	79	88
12	26	47	89	96	53	218	214	203	221	217	75	70
13	26	70	79	62	71	223	211	217	221	160	71	117
14	25	220	68	49	52	221	213	193	220	123	68	135
15	118	210	63	43	42	222	212	187	214	106	73	193
16	132	221	59	52	38	218	221	166	194	101	89	126
17	106	209	57	65	36	216	221	169	161	200	160	90
18	47	209	54	64	38	214	216	151	150	222	215	85
19	167	218	50	58	33	191	221	159	149	224	160	73
20	152	218	48	54	32	144	218	212	129	216	221	178
21	80	220	53	53	31	121	207	213	108	201	199	205
22	66	212	46	53	30	201	221	186	98	217	102	128
23	83	163	60	50	30	222	217	195	91	193	111	91
24	73	127	74	48	30	222	216	133	94	170	97	80
25	50	110	216	45	33	219	222	115	150	171	80	72
26	45	112	163	43	33	175	219	103	165	212	93	66
27	43	101	208	42	36	156	202	94	100	204	76	62
28	40	88	136	41	122	176	188	85	85	150	149	65
29	37	80	219	40	220	153	203	79	79	133	139	75
30	37	75	217	40	---	82	217	78	86	122	216	56
31	54	---	150	51	---	149	---	108	---	113	215	---
TOTAL	1834	3826	3527	2316	1546	5683	6139	5291	4304	5353	4118	3380
MEAN	59.2	128	114	74.7	53.3	183	205	171	143	173	133	113
MAX	167	221	219	217	220	224	223	222	222	224	221	216
MIN	25	47	46	40	30	50	162	78	70	101	68	56
AC-FT	3640	7590	7000	4590	3070	11270	12180	10490	8540	10620	8170	6700

CAL YR 1979 TOTAL 33798.45 MEAN 92.6 MAX 221 MIN .00 AC-FT 67040
WTR YR 1980 TOTAL 47317.00 MEAN 129 MAX 224 MIN 25 AC-FT 93850

16531000 KULA DIVERSION FROM HAIPUAENA STREAM NEAR OLINDA

LOCATION.--Lat 20°48'24", long 156°13'27", Hydrologic Unit 20020000, on left bank of Haipuaena Stream, 3.4 mi (5.5 km) east of Olinda, and 6.2 mi (10.0 km) south of Kailua.

PERIOD OF RECORD.--July 1945 to current year.

GAGE.--Water-stage recorder and V-notch sharp-crested weir since Apr. 2, 1975. Altitude of gage is 4,320 ft (1,317 m), from topographic map.

REMARKS.--Records good except those above 6.6 ft^3/s (0.19 m^3/s), which are poor. Water is diverted from Haipuaena Stream at station for domestic use and irrigation of truck crops in the Olinda and Kula areas. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--35 years, 0.717 ft^3/s (0.020 m^3/s), 519 acre-ft/yr (640,000 m^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 10 ft^3/s (0.28 m^3/s) Nov. 6, 1976; no flow Nov. 4, 1964, Dec. 3, 5, 1970, Mar. 27 to Apr. 1, Apr. 10-14, 1975.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 9.7 ft^3/s (0.27 m^3/s) Apr. 12; minimum daily, 0.02 ft^3/s (0.001 m^3/s) Oct. 13, 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	1.0	.28	.40	.07	4.4	.54	8.9	.91	.66	4.1	1.8
2	.22	.25	4.1	.25	.07	.60	4.7	2.5	.66	1.3	1.1	.66
3	.19	.16	2.4	.19	.06	.32	2.4	3.4	.84	5.5	.78	.40
4	.14	.28	2.6	.16	.05	.28	1.7	2.2	6.3	3.7	6.3	1.9
5	.10	.12	1.0	.14	.11	2.5	.91	4.1	1.7	2.7	1.6	1.4
6	.08	.10	.60	.14	.10	7.5	1.3	2.4	.84	4.7	1.1	.66
7	.07	.07	1.5	.14	.05	3.4	3.2	.97	.72	2.3	.78	.36
8	.06	1.6	1.6	1.5	.03	7.2	1.2	1.1	.86	.97	.91	.28
9	.05	.60	.78	.44	.03	6.0	1.0	2.0	3.5	.60	.44	.22
10	.04	.40	.64	.32	.04	4.3	.91	.88	5.6	.92	.32	.69
11	.03	.25	.66	.16	.14	1.9	1.5	2.0	7.6	3.2	.22	1.0
12	.03	.16	.44	.40	.10	2.0	9.7	4.1	3.5	3.2	.19	.36
13	.02	2.9	.28	.66	.83	5.3	9.3	5.7	8.3	2.6	.16	1.3
14	.02	7.3	.22	.40	1.0	3.9	8.2	1.0	8.7	2.8	.14	.72
15	2.6	3.8	.16	.28	1.2	2.4	7.0	.91	1.8	1.4	1.7	5.1
16	1.4	2.7	.14	.22	1.0	1.0	4.7	.97	.91	.72	1.8	2.7
17	.91	.44	.12	.16	.44	.91	3.8	.60	.60	3.1	1.5	.97
18	.25	.19	.10	.56	.19	.91	1.0	.48	.39	4.2	5.0	.54
19	4.1	.12	.08	.48	.13	.91	6.3	1.6	.28	2.9	3.3	.40
20	1.2	.12	.07	.22	.22	.78	1.4	3.0	.22	1.5	6.6	1.1
21	.60	1.1	.07	.20	.07	.78	1.2	.91	.19	2.9	1.4	.66
22	.36	1.6	.06	.37	.05	1.0	6.8	4.0	.16	2.9	.60	.66
23	.32	.72	.09	.48	.07	1.0	6.6	1.1	.16	1.4	.44	.32
24	.36	.12	.30	.36	.10	.48	7.7	.60	.14	.78	.40	.22
25	.22	.36	5.4	.19	.12	.66	2.6	.44	.45	.78	.28	.19
26	.14	.66	2.8	.14	.14	.91	1.2	.32	.84	4.7	.40	.16
27	.14	.54	3.9	.12	1.1	.91	.72	.51	.48	2.9	1.8	.14
28	.14	.28	.99	.10	3.3	.66	.44	.60	.41	1.2	1.8	.19
29	.12	.22	5.7	.09	7.8	.54	.40	.32	.66	1.0	1.4	.40
30	.10	.19	2.6	.08	---	.48	4.4	.28	.44	1.4	5.4	.22
31	.16	---	.72	.07	---	.48	---	2.3	---	.66	3.7	---
TOTAL	14.39	28.35	40.40	9.42	18.61	64.41	102.82	60.19	58.16	69.59	55.66	25.72
MEAN	.46	.95	1.30	.30	.64	2.08	3.43	1.94	1.94	2.24	1.80	.86
MAX	4.1	7.3	5.7	1.5	7.8	7.5	9.7	8.9	8.7	5.5	6.6	5.1
MIN	.02	.07	.06	.07	.03	.28	.40	.28	.14	.60	.14	.14
AC-FT	29	56	80	19	37	128	204	119	115	138	110	51

CAL YR 1979 TOTAL 430.15 MEAN 1.18 MAX 9.8 MIN .02 AC-FT 853
WTR YR 1980 TOTAL 547.72 MEAN 1.50 MAX 9.7 MIN .02 AC-FT 1090

16538000 SPRECKELS DITCH AT HAIPUAENA WEIR, NEAR HUELO

LOCATION.--Lat 20°51'15", long 156°11'25", Hydrologic Unit 20020000, on right bank near Spreckels ditch trail between Haipuaena and Puohokamoa Streams, 2.7 mi (4.3 km) west of Keanae, and 4.5 mi (7.2 km) southeast of Huelo.

PERIOD OF RECORD.--April 1922 to current year. Published as "at Haipuaena, near Huelo" 1930-35.

REVISED RECORDS.--WSP 770: 1932-33.

GAGE.--Water-stage recorder and sharp-crested weir. Datum of gage is 1,470.96 ft (448.349 m) above mean sea level (East Maui Irrigation Co. bench mark). Apr. 29, 1922, to Feb. 19, 1930, at same site at different datum. Feb. 20, 1930, to Oct. 25, 1935, at site 100 ft (30 m) upstream at different datum.

REMARKS.--Records excellent. Spreckels ditch diverts from all streams between the Nuaailua and the Kailua above Koolau ditch east of the Puohokamoa, and below Koolau ditch west of the Puohokamoa. About 6 ft^3/s (0.17 m^3/s) was diverted above station to East Maui Irrigation Co. powerplant at Kolea Gulch prior to June 30, 1961, when the plant was abandoned. Water used for domestic supply and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE (since termination of powerplant diversion).--19 years (water years 1962-80), 29.7 ft^3/s (0.841 m^3/s), 21,520 acre-ft/yr (26.5 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 150 ft^3/s (4.25 m^3/s) Feb. 10, 1955, Feb. 18, 1956; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 102 ft^3/s (2.89 m^3/s) Nov. 17; minimum daily, 3.8 ft^3/s (0.11 m^3/s) Oct. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	44	10	19	12	65	82	79	12	27	80	48
2	8.7	34	43	15	9.4	19	63	73	10	40	30	23
3	7.8	28	49	13	6.0	19	63	64	20	59	28	18
4	6.7	18	27	12	13	35	58	68	79	50	86	79
5	6.9	12	18	11	32	86	36	48	35	54	43	55
6	6.6	11	15	9.9	18	90	32	35	29	67	24	27
7	10	8.9	59	9.3	6.6	81	31	29	19	58	21	19
8	7.5	43	45	32	5.6	82	25	55	23	28	24	16
9	5.4	15	20	66	5.1	85	25	44	52	20	16	14
10	4.8	11	18	61	16	85	25	23	83	30	14	14
11	4.4	9.8	15	36	41	74	27	38	85	72	12	27
12	4.0	9.4	16	33	9.6	82	74	46	83	69	11	13
13	4.0	27	12	27	26	88	74	46	88	32	11	44
14	3.8	96	10	19	13	81	73	14	87	30	10	30
15	59	96	9.4	14	13	76	79	30	59	21	17	74
16	43	93	8.7	12	8.0	70	72	36	34	17	26	40
17	32	102	8.4	11	6.8	65	67	40	27	80	50	22
18	11	98	8.1	13	6.0	68	57	30	29	92	82	17
19	68	87	7.2	12	5.6	82	75	39	27	85	46	13
20	43	89	6.8	8.7	5.2	77	69	64	21	74	87	53
21	21	75	8.3	9.7	4.9	76	57	68	17	86	33	69
22	17	58	6.7	12	4.9	79	76	50	16	78	19	25
23	23	30	19	8.7	5.4	80	77	29	15	40	25	16
24	17	23	27	9.2	5.2	78	76	26	16	35	22	14
25	11	21	77	7.3	6.5	77	72	20	40	45	15	12
26	9.3	33	41	6.7	7.9	74	61	17	38	75	24	11
27	8.8	22	74	6.3	15	72	40	14	17	67	15	10
28	7.7	15	29	6.0	42	69	32	13	14	32	48	19
29	7.0	13	92	5.7	88	68	57	12	12	26	32	20
30	6.8	11	73	5.7	---	64	72	14	16	28	86	10
31	15	---	29	8.1	---	58	---	20	---	22	75	---
TOTAL	501.2	1233.1	881.6	519.3	437.7	2205	1727	1184	1103	1539	1112	852
MEAN	16.2	41.1	28.4	16.8	15.1	71.1	57.6	38.2	36.8	49.6	35.9	28.4
MAX	68	102	92	66	88	90	82	79	88	92	87	79
MIN	3.8	8.9	6.7	5.7	4.9	19	25	12	10	17	10	10
AC-FT	994	2450	1750	1030	868	4370	3430	2350	2190	3050	2210	1690

CAL YR 1979 TOTAL 10773.2 MEAN 29.5 MAX 138 MIN 3.8 AC-FT 21370
WTR YR 1980 TOTAL 13294.9 MEAN 36.3 MAX 102 MIN 3.8 AC-FT 26370

16541000 KOOLAU DITCH AT HAIPUAENA, NEAR HUELO

LOCATION.--Lat 20°51'17", long 156°11'19", Hydrologic Unit 20020000, on right bank at Haipuaena Stream, 1,000 ft (305 m) upstream from intake at Puohokamoa Stream, 3.3 mi (5.3 km) southeast of Kailua, and 4.5 mi (7.2 km) southeast of Huelo.

PERIOD OF RECORD.--April 1932 to current year.

GAGE.--Water-stage recorder and Parshall flume. Altitude of gage is 1,240 ft (378 m), from topographic map. Prior to Mar. 21, 1933, at datum 1.94 ft (0.591 m) lower, and Mar. 21, 1933, to Mar. 20, 1935, at datum 0.25 ft (0.076 m) lower, than present datum.

REMARKS.--Records excellent. Ditch is extension of Wailoa ditch east of Alo Stream; it receives water from Makapipi ditch at Hanawi Stream and diverts from nearly all streams from there west to the Alo. Water is used for power, domestic supply, and irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--48 years, 116 ft^3/s (3.285 m^3/s), 84,040 acre-ft/yr (104 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 300 ft^3/s (8.50 m^3/s) July 1, 17, 1963; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 296 ft^3/s (8.38 m^3/s) Nov. 17; minimum daily, 1.3 ft^3/s (0.037 m^3/s) when flow was regulated on Mar. 30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	74	138	71	104	53	203	248	284	75	116	226	177
2	37	109	150	87	42	54	283	240	72	151	198	114
3	44	119	178	77	39	61	266	247	97	182	133	98
4	39	83	140	70	46	115	229	259	236	196	244	234
5	44	62	111	65	74	244	194	226	161	202	193	202
6	37	56	89	60	44	283	186	199	135	235	139	141
7	37	48	195	56	37	246	169	191	114	229	118	109
8	31	131	182	156	35	257	158	231	126	165	120	95
9	30	77	118	278	34	265	173	222	170	123	96	85
10	29	61	106	284	52	269	168	173	244	129	89	80
11	28	52	90	216	152	249	171	200	256	227	82	90
12	26	48	88	111	55	264	273	226	243	242	76	72
13	26	73	82	69	72	286	282	270	270	160	73	118
14	25	255	69	53	55	282	280	216	269	124	70	104
15	136	275	64	44	43	267	282	193	218	108	75	206
16	140	258	60	52	39	283	246	163	191	101	90	125
17	105	296	58	67	36	287	239	167	157	227	156	90
18	48	292	55	66	35	234	225	147	145	264	234	87
19	179	258	51	61	33	240	265	162	145	248	173	75
20	148	258	49	57	32	190	224	219	126	226	251	189
21	85	231	54	55	31	149	212	220	108	246	148	212
22	68	217	47	55	30	250	265	184	99	239	102	121
23	77	159	60	52	30	270	272	141	93	193	110	91
24	75	124	80	49	30	273	271	130	94	165	99	82
25	52	109	255	46	33	136	239	114	146	164	84	73
26	46	110	163	44	34	40	221	104	160	233	94	67
27	44	101	231	42	35	37	202	95	101	207	78	64
28	40	89	133	41	132	38	180	87	87	148	154	69
29	37	81	279	40	273	26	205	82	81	129	130	74
30	36	75	230	40	---	1.3	253	80	85	122	242	57
31	53	---	150	49	---	129	---	109	---	110	230	---
TOTAL	1876	4245	3688	2546	1636	5928.3	6881	5581	4504	5611	4257	3401
MEAN	60.5	142	119	82.1	56.4	191	229	180	150	181	137	113
MAX	179	296	279	284	273	287	283	284	270	264	251	234
MIN	25	48	47	40	30	1.3	158	80	72	101	70	57
AC-FT	3720	8420	7320	5050	3250	11760	13650	11070	8930	11130	8440	6750

CAL YR 1979 TOTAL 36498.45 MEAN 100 MAX 296 MIN .26 AC-FT 72390
WTR YR 1980 TOTAL 50154.30 MEAN 137 MAX 296 MIN 1.3 AC-FT 99480

16541500 MANUEL LUIS DITCH AT PUOHOKAMOA GULCH, NEAR HUELO

LOCATION.--Lat 20°51'48", long 156°10'49", Hydrologic Unit 20020000, on right bank at lower portal of tunnel between Haipuaena and Puohokamoa Streams, 2.2 mi (3.5 km) west of Keanae, and 4.4 mi (7.1 km) southeast of Huelo.

PERIOD OF RECORD.--December 1917 to November 1924, January 1925 to current year.

REVISED RECORDS.--WSP 1719: 1918-30.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 920 ft (280 m), from topographic map.

REMARKS.--Records good. Ditch is extension of Center ditch and picks up water from streams between the Kolea and the Waikamoi for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--61 years (water years, 1919-24, 1926-80), 8.29 ft^3/s (0.235 m^3/s), 6,010 acre-ft/yr (7.41 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 142 ft^3/s (4.02 m^3/s) Jan. 3, 1927; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 135 ft^3/s (3.82 m^3/s) Apr. 1; minimum daily, 0.16 ft^3/s (0.005 m^3/s) Oct. 12, 13.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	12	.89	4.2	.48	40	135	96	.79	.71	11	6.4
2	.46	4.4	36	3.1	.41	1.8	119	22	.69	1.9	2.1	2.1
3	.39	1.5	6.9	2.4	.34	1.5	84	41	.77	18	1.7	2.0
4	.33	1.2	1.1	2.0	.41	2.3	46	60	49	4.6	38	33
5	.37	.86	.95	1.7	1.3	29	4.7	35	3.6	6.7	5.0	9.2
6	.35	.78	.84	1.4	.64	90	4.0	25	1.4	50	2.4	4.2
7	.35	.62	16	1.2	.34	28	3.1	19	1.1	19	2.0	2.9
8	.28	8.4	6.0	15	.28	72	2.4	42	1.1	1.4	1.9	2.2
9	.24	1.1	2.6	104	.22	57	2.2	37	9.8	1.2	1.5	1.8
10	.22	.75	2.0	111	4.6	57	1.9	15	19	1.4	1.3	1.5
11	.22	.64	1.7	87	8.2	30	5.3	29	46	17	1.1	1.7
12	.16	.55	1.4	16	1.0	27	108	42	17	33	1.0	1.3
13	.16	2.0	1.2	3.7	3.5	107	125	44	85	3.5	.91	5.0
14	.17	61	1.1	2.6	1.2	100	112	2.4	87	2.3	.86	1.4
15	25	75	.95	2.1	.91	82	119	2.3	11	1.8	.95	20
16	6.8	54	.85	1.8	.73	125	38	2.6	4.1	1.6	.91	3.2
17	.63	134	.94	1.5	.64	133	32	4.6	2.6	22	2.5	1.4
18	.27	121	.89	1.4	.64	101	12	1.9	2.2	45	25	1.1
19	19	27	.67	1.2	.64	93	52	13	1.9	26	5.9	1.0
20	1.7	36	.58	1.0	.56	68	13	11	1.6	15	37	17
21	.75	14	.78	.96	.56	36	7.6	5.3	1.3	52	2.4	17
22	.48	8.9	.56	.77	.48	98	53	3.1	1.2	34	1.4	3.0
23	.35	3.1	.69	.67	.48	130	80	1.7	1.1	5.6	2.1	2.0
24	.33	2.3	11	.64	.48	123	83	1.5	1.1	3.8	1.5	1.8
25	.29	2.0	58	.68	.48	121	26	1.4	1.7	3.9	1.2	1.3
26	.25	2.3	7.1	.56	.48	105	7.5	1.3	1.2	17	1.8	1.1
27	.22	1.7	23	.48	.67	99	2.9	1.2	.82	7.6	1.2	1.0
28	.22	1.3	8.5	.41	21	112	2.1	1.0	.70	2.7	8.7	1.2
29	.21	1.1	89	.41	70	105	6.6	.93	.63	2.3	2.3	1.2
30	.20	1.0	26	.41	---	63	49	.91	.60	2.0	34	.76
31	.81	---	7.1	.48	---	27	---	1.7	---	1.6	16	---
TOTAL	64.01	580.50	315.29	370.73	121.67	2263.6	1336.3	564.84	356.00	404.61	215.63	138.76
MEAN	2.06	19.4	10.2	12.0	4.20	73.0	44.5	18.2	11.9	13.1	6.96	4.96
MAX	25	134	89	111	70	133	135	96	87	52	38	33
MIN	.16	.55	.56	.41	.22	1.5	1.9	.91	.60	.71	.86	.76
AC-FT	127	1150	625	735	241	4490	2650	1120	706	803	428	295

CAL YR 1979	TOTAL	2467.90	MEAN	6.76	MAX 134	MIN .16	AC-FT	4900
WTR YR 1980	TOTAL	6741.94	MEAN	18.4	MAX 135	MIN .16	AC-FT	13370

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft (23 m) upstream from Wailoa ditch intake, 2.2 mi (3.5 km) southwest of Huelo, and 2.5 mi (4.0 km) west of Kailua.

DRAINAGE AREA.--0.64 mi² (1.66 km²).

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 (368 m) above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records excellent. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--69 years (water years 1912-80), 4.70 ft³/s (0.133 m³/s), 3,410 acre-ft/yr (4.20 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft³/s (162 m³/s) Nov. 18, 1930, gage height, 7.28 ft (2.219 m), from rating curve extended above 110 ft³/s (3.12 m³/s) by test of model of station site; minimum, 0.02 ft³/s (0.001 m³/s) several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 270 ft³/s (7.65 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0530	376	10.6	3.26	0.994	Apr. 2	0100	*536	15.2	*3.47	1.058
Mar. 17	1030	318	9.01	3.16	.963	Apr. 15	0500	285	8.07	3.10	.945

Minimum discharge, 0.46 ft³/s (0.013 m³/s) Oct. 9-14, 28-30.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	3.9	2.8	5.8	1.7	9.5	117	24	2.3	2.1	6.0	2.8
2	.64	1.8	13	4.9	1.5	3.0	68	11	2.1	2.7	3.2	2.3
3	.64	1.2	5.1	4.3	1.3	3.2	36	12	2.1	2.5	3.3	2.1
4	.64	.84	3.7	3.7	2.6	3.3	28	19	9.0	2.3	14	7.8
5	.64	.74	3.2	3.3	2.0	5.8	16	13	3.0	2.3	4.1	4.1
6	.74	.64	3.0	3.0	1.3	19	13	9.5	2.8	37	3.3	2.8
7	.64	.64	3.2	2.8	1.2	11	10	8.3	2.3	6.8	3.2	2.7
8	.54	2.5	3.9	5.5	1.1	12	8.5	12	2.1	3.5	3.2	2.5
9	.46	.96	3.2	53	.96	15	7.6	11	3.7	3.0	2.8	2.3
10	.46	.84	2.7	23	2.2	18	6.2	7.6	5.2	3.2	2.7	2.1
11	.46	.74	2.5	22	2.5	16	5.6	7.3	8.7	3.9	2.5	2.4
12	.46	.64	2.4	8.8	1.4	14	18	8.9	8.5	5.7	2.4	2.1
13	.46	.84	2.1	7.1	3.8	39	45	12	14	3.3	2.3	3.1
14	.46	15	2.1	6.2	1.6	63	33	6.2	18	3.0	2.1	3.3
15	1.2	11	2.0	5.1	1.3	52	73	6.0	8.0	2.5	2.3	6.5
16	.84	5.4	1.9	4.7	1.3	66	23	5.6	6.2	2.5	2.1	2.5
17	.74	50	1.9	4.1	1.1	112	16	7.2	5.6	14	2.1	2.3
18	.46	45	1.7	3.7	.96	73	12	4.7	5.1	15	5.3	2.1
19	4.1	16	1.6	3.3	.84	57	15	7.4	4.5	9.5	2.7	2.0
20	1.5	13	1.5	3.0	.84	31	12	5.1	3.9	9.8	7.2	4.0
21	.84	11	1.7	3.2	.84	20	9.0	4.7	3.5	10	2.5	7.9
22	.64	8.5	1.5	2.8	.84	19	12	4.3	3.2	11	2.3	2.7
23	.54	6.9	2.4	2.5	.96	23	29	3.7	3.0	6.2	2.4	2.3
24	.54	5.8	3.5	2.4	.84	41	18	3.3	2.8	5.6	2.1	2.0
25	.54	6.4	27	2.1	1.9	40	12	3.2	3.2	5.1	1.9	1.9
26	.54	5.6	5.1	2.1	1.1	29	9.3	2.8	3.0	7.3	2.1	1.9
27	.54	4.3	7.2	1.9	5.1	42	7.8	2.8	2.4	6.0	1.7	1.7
28	.46	3.7	6.6	1.7	4.5	36	6.9	2.7	2.3	4.1	1.8	1.7
29	.46	3.3	28	1.6	13	19	8.7	2.5	2.1	3.7	2.7	1.7
30	.54	3.0	11	2.2	---	14	11	2.4	2.0	3.5	8.1	1.6
31	.96	---	7.3	2.0	---	12	---	3.9	---	3.3	3.2	---
TOTAL	24.48	230.18	164.8	201.8	60.58	917.8	686.6	234.1	144.6	200.4	110.6	87.2
MEAN	.79	7.67	5.32	6.51	2.09	29.6	22.9	7.55	4.82	6.46	3.57	2.91
MAX	4.1	50	28	53	13	112	117	24	18	37	14	7.9
MIN	.46	.64	1.5	1.6	.84	3.0	5.6	2.4	2.0	2.1	1.7	1.6
AC-FT	49	457	327	400	120	1820	1360	464	287	397	219	173

CAL YR 1979 TOTAL 1752.50 MEAN 4.80 MAX 63 MIN .46 AC-FT 3480
WTR YR 1980 TOTAL 3063.14 MEAN 8.37 MAX 117 MIN .46 AC-FT 6080

16588000 WAILOA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'19", Hydrologic Unit, 20020000, on right bank 100 ft (30 m) downstream from intake at Honopou Stream, 0.5 mi (0.8 km) west of Lupi, and 2.2 mi (3.5 km) southwest of Huelo.

PERIOD OF RECORD.--November 1922 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,208 ft (368.2 m) above mean sea level (by vertical angles).

REMARKS.--Records excellent. Wailoa ditch receives water from Koolau ditch at Alo Stream and from all streams from there west to Halehaku Gulch at altitude of about 1,200 ft (366 m). Water is used for domestic supply, power, and irrigation in Central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--57 years (water years 1924-80), 171 ft^3/s (4.843 m^3/s), 123,900 acre-ft/yr (153 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 326 ft^3/s (9.23 m^3/s) Apr. 1, 1967; no flow Jan. 24-27, 1923.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 300 ft^3/s (8.50 m^3/s) Apr. 13; minimum daily, 9.6 ft^3/s (0.27 m^3/s) when flow was regulated on Jan. 11.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	157	197	129	178	94	141	264	263	138	203	261	255
2	70	147	189	163	77	123	260	262	125	248	247	222
3	76	189	269	145	66	124	260	215	162	242	240	159
4	63	146	247	130	79	213	172	185	260	256	262	188
5	73	107	198	118	147	263	206	238	245	254	258	259
6	90	95	156	109	83	261	217	251	235	263	246	246
7	85	81	263	102	62	253	246	251	195	261	216	208
8	59	175	278	182	58	253	251	252	204	249	225	178
9	51	138	213	224	56	253	267	252	227	213	178	159
10	48	102	180	81	87	253	267	227	260	209	161	148
11	46	88	154	9.6	215	253	257	216	260	259	146	206
12	44	81	151	11	94	253	295	255	260	263	135	141
13	42	99	135	11	159	253	300	276	262	254	126	226
14	42	241	118	63	117	255	297	284	261	240	123	212
15	161	248	109	93	110	254	285	289	259	211	144	283
16	201	263	101	101	85	255	260	279	257	184	187	257
17	168	279	99	116	72	204	272	279	250	261	221	194
18	89	279	95	89	63	176	267	265	245	265	262	164
19	209	277	86	88	59	148	261	263	241	261	251	142
20	211	277	81	87	56	131	261	291	221	260	261	258
21	161	277	96	87	54	141	260	291	190	261	247	293
22	123	276	79	88	52	148	260	288	171	261	192	238
23	132	272	144	87	55	148	204	259	160	258	216	178
24	134	232	147	85	54	232	136	235	162	255	189	155
25	89	207	274	81	66	61	174	206	237	253	158	138
26	78	254	252	77	72	14	244	187	248	260	188	125
27	75	220	268	73	101	60	261	170	172	259	153	117
28	68	168	239	70	211	201	260	155	146	253	204	125
29	63	150	267	68	198	181	262	144	135	245	240	159
30	62	140	226	72	---	141	262	142	142	242	263	109
31	65	---	195	82	---	204	---	215	---	206	258	---
TOTAL	3035	5705	5438	2970.6	2702	5850	7488	7385	6330	7609	6458	5742
MEAN	97.9	190	175	95.8	93.2	189	250	238	211	245	208	191
MAX	211	279	278	224	215	263	300	291	262	265	263	293
MIN	42	81	79	9.6	52	14	136	142	125	184	123	109
AC-FT	6020	11320	10790	5890	5360	11600	14850	14650	12560	15090	12810	11390

CAL YR 1979 TOTAL 55718.0 MEAN 153 MAX 306 MIN 42 AC-FT 110500
WTR YR 1980 TOTAL 66712.6 MEAN 182 MAX 300 MIN 9.6 AC-FT 132300

16589000 NEW HAMAKUA DITCH AT HONOPOU, NEAR HUELO

LOCATION.--Lat 20°53'28", long 156°15'22", Hydrologic Unit 20020000, on right bank 15 ft (4.6 m) upstream from tunnel portal, 600 ft (183 m) downstream from Honopou Stream crossing, and 2.1 mi (3.4 km) southwest of Huelo.

PERIOD OF RECORD.--January 1918 to current year.

GAGE.--Water-stage recorder. Datum of gage is 1,170 ft (356.6 m) above mean sea level (by vertical angles). Prior to May 14, 1921, at site 300 ft (91 m) upstream at different datum. May 14, 1921, to Mar. 18, 1962, at present site at datum 1.00 ft (0.305 m) higher.

REMARKS.--Records excellent. Ditch diverts from streams between Waikamoi Stream and Halehaku Gulch above Center and Lowrie ditches for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--62 years, 36.3 ft³/s (1.028 m³/s), 26,300 acre-ft/yr (32.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 182 ft³/s (5.15 m³/s) Nov. 2, 1967; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 165 ft³/s (4.67 m³/s) June 14, July 18, 19, 21, 22; minimum daily, no flow Jan. 16-22 when flow was diverted.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	39	80	2.7	.05	1.6	47	150	91	1.9	2.0	142	107
2	.85	37	56	.04	1.2	30	32	33	1.7	59	62	6.6
3	.62	34	99	6.4	1.1	13	.04	.05	1.7	68	17	32
4	.52	1.3	8.6	5.7	1.0	28	.03	.04	119	125	149	159
5	.66	.87	4.4	5.0	3.6	125	.03	.05	88	89	135	149
6	4.7	.79	2.1	4.2	.97	147	.04	47	24	146	22	48
7	1.2	.69	82	3.7	.87	146	32	117	3.4	156	5.4	5.9
8	.49	70	102	19	.80	146	51	144	6.2	49	13	4.0
9	.41	4.5	8.1	53	.76	146	69	88	64	3.4	3.1	3.0
10	.37	.95	2.9	.09	14	146	22	.05	162	12	2.8	2.8
11	.32	.81	2.5	.06	73	146	16	.04	163	153	2.5	4.6
12	.35	.76	2.4	.03	1.3	146	74	65	163	161	2.4	2.5
13	.30	5.5	2.1	.03	36	146	.09	141	164	81	2.2	74
14	.27	154	1.9	.02	2.5	146	.06	102	165	21	1.9	19
15	70	158	1.8	.01	1.3	122	.14	70	162	7.9	2.2	148
16	84	156	1.7	.00	1.1	84	15	70	122	2.2	2.2	40
17	39	159	1.7	.00	.98	30	37	75	45	134	57	5.2
18	.65	159	1.8	.00	.93	4.6	16	24	35	165	153	2.3
19	102	157	1.4	.00	.92	4.6	.04	27	25	165	76	2.0
20	90	158	1.3	.00	.86	4.6	.03	135	6.1	164	159	92
21	15	157	1.9	.00	.80	4.6	25	137	2.9	165	70	141
22	.95	151	1.4	.00	.80	4.6	40	114	2.5	165	2.9	31
23	7.6	52	3.2	5.1	.81	4.6	41	30	2.3	135	8.3	3.4
24	1.7	5.3	16	4.5	.79	4.6	21	3.6	2.2	86	3.9	2.9
25	.67	5.8	156	2.0	1.1	4.4	.04	3.0	54	88	2.1	2.5
26	.53	45	80	1.5	.98	15	.04	2.8	50	162	8.3	2.3
27	.50	23	157	1.3	8.2	47	.04	2.5	2.2	157	1.9	2.1
28	.46	3.5	45	1.2	27	46	.04	2.3	1.7	67	77	2.0
29	.45	3.1	86	1.2	43	46	58	2.1	1.6	8.3	56	4.5
30	.44	3.0	34	1.6	---	40	90	1.9	1.5	14	155	1.8
31	51	---	18	1.6	---	90	---	36	---	3.5	150	---
TOTAL	515.01	1786.87	984.9	117.33	228.27	2114.6	789.66	1564.43	1642.9	2814.3	1545.1	1100.4
MEAN	16.6	59.6	31.8	3.78	7.87	68.2	26.3	50.5	54.8	90.8	49.8	36.7
MAX	102	159	157	53	73	147	150	144	165	165	159	159
MIN	.27	.69	1.3	.00	.76	4.4	.03	.04	1.5	2.0	1.9	1.8
AC-FT	1020	3540	1950	233	453	4190	1570	3100	3260	5580	3060	2180

CAL YR 1979 TOTAL 8996.54 MEAN 24.6 MAX 165 MIN .02 AC-FT 17840
WTR YR 1980 TOTAL 15203.77 MEAN 41.5 MAX 165 MIN .00 AC-FT 30160

16592000 LOWRIE DITCH AT HONOPOU GULCH, NEAR HUELO

LOCATION.--Lat 20°54'57", long 156°15'08", Hydrologic Unit 20020000, on left bank 0.2 mi (0.3 km) downstream from siphon across Honopou Stream, 1.6 mi (2.6 km) west of Huelo, and 2.7 mi (4.3 km) northwest of Kailua.

PERIOD OF RECORD.--January 1910 to March 1927, February 1930 to current year. Published as "at Opana weir, near Huelo" 1910-27.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 598.0 ft (182.27 m) above mean sea level. Jan. 1, 1910, to Mar. 31, 1927, at site 1.5 mi (2.4 km) downstream at different datum.

REMARKS.--Records good. Lowrie ditch receives water from Center ditch at Nailiilihaele Stream and diverts from additional stream westward to Maliko Gulch for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--66 years (water years, 1911-26, 1931-80), 37.2 ft^3/s (1.054 m^3/s), 26,950 acre-ft/yr (33.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 116 ft^3/s (3.29 m^3/s) Oct. 31, 1921; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 96 ft^3/s (2.72 m^3/s) Dec. 25; minimum daily, 1.6 ft^3/s (0.045 m^3/s) Jan. 24-26 when flow was regulated.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	54	19	3.6	12	3.3	53	2.9	23	27	80	67
2	15	33	36	6.2	10	2.8	7.2	2.2	21	31	49	31
3	6.8	38	61	38	8.8	2.7	4.4	2.2	22	36	34	33
4	5.9	24	24	32	22	2.7	3.8	2.1	67	55	81	93
5	7.6	17	20	28	30	2.6	3.3	2.2	51	43	76	86
6	5.6	9.3	25	25	25	2.6	3.1	2.1	21	61	43	55
7	6.3	7.1	60	24	21	2.3	17	1.9	20	80	37	39
8	5.3	32	61	44	14	2.2	40	2.0	24	30	38	33
9	4.8	26	27	46	8.2	2.3	41	2.0	51	32	30	32
10	4.4	22	29	7.8	14	2.1	34	2.0	91	26	28	32
11	4.1	12	31	4.5	47	2.2	32	2.0	92	48	27	33
12	3.9	7.5	30	3.2	20	2.2	88	2.0	91	91	41	30
13	3.8	7.3	26	3.0	59	2.5	93	2.3	92	51	49	44
14	3.7	77	17	2.7	20	4.1	93	1.9	93	32	39	24
15	22	91	12	2.5	13	4.7	44	25	89	31	23	79
16	54	89	12	2.4	11	7.8	5.5	38	58	30	17	38
17	23	91	23	2.2	10	13	4.2	52	41	65	22	32
18	22	90	22	2.0	22	19	3.8	27	36	75	84	35
19	62	87	18	1.9	22	7.4	3.7	29	33	74	51	33
20	31	87	16	1.8	24	5.5	3.5	74	29	74	91	64
21	23	86	14	1.9	20	5.2	3.0	70	26	74	51	79
22	22	81	11	1.8	14	5.0	2.8	53	26	74	34	39
23	22	42	12	1.7	8.2	4.2	2.8	27	38	68	34	29
24	22	29	13	1.6	8.5	4.2	2.9	23	34	62	32	30
25	18	29	96	1.6	12	4.6	2.5	21	34	55	33	32
26	5.6	39	65	1.6	8.8	3.8	2.4	20	23	87	33	31
27	5.2	29	79	6.4	18	3.8	2.3	19	23	86	24	23
28	5.0	25	51	13	49	3.7	2.3	22	15	51	49	19
29	4.8	27	44	14	66	3.1	2.2	28	17	40	42	20
30	5.0	28	6.2	16	---	3.1	2.3	27	26	35	87	18
31	11	---	4.7	37	---	27	---	40	---	31	84	---
TOTAL	465.8	1312.2	964.9	377.4	617.5	163.7	603.0	628.8	1307	1655	1433	1233
MEAN	15.0	43.7	31.1	12.2	21.3	5.28	20.1	20.2	43.6	53.4	46.2	41.1
MAX	62	91	96	46	66	27	93	74	93	91	91	93
MIN	3.7	7.1	4.7	1.6	8.2	2.1	2.2	1.9	15	26	17	18
AC-FT	924	2600	1910	749	1220	325	1200	1240	2590	3280	2840	2450

CAL YR 1979 TOTAL 8304.31 MEAN 22.8 MAX 104 MIN .81 AC-FT 16470
WTR YR 1980 TOTAL 10757.30 MEAN 29.4 MAX 96 MIN 1.6 AC-FT 21340

16594000 HAIKU DITCH AT HONOPOU GULCH, NEAR KAILUA

LOCATION.--Lat 20°55'07", long 156°14'58", Hydrologic Unit 20020000, on right bank on west side of Honopou Gulch, 160 ft (49 m) below new Government Road, 2.5 mi (4.0 km) northwest of Kailua, and 5.0 mi (8.0) east of Haiku.

PERIOD OF RECORD.--January 1910 to December 1928, February 1930 to current year. Published as "at Peahi weir, near Huelo" prior to July 1919, as "at Manawai Gulch, near Peahi" July 1919 to December 1928, and as "at Kapalalaea Gulch, near Huelo" February 1930 to January 1940. Monthly discharge only for some periods, published in WSP 1319.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 421.54 ft (128.485 m) above mean sea level. Prior to Oct. 7, 1914, at site at Peahi weir on old Haiku ditch at different datum. Oct. 7, 1914, to Dec. 31, 1928, at site 2.9 mi (4.7 km) downstream at different datum. Feb. 19, 1930, to Feb. 20, 1940, at site 0.9 mi (1.4 km) downstream at different datum.

REMARKS.--Records excellent. Ditch diverts from all streams between Nailiilihaele Stream and Maliko Gulch for irrigation in central Maui. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--65 years (water years, 1911, 1914, 1916-28, 1931-80), 24.9 ft^3/s (0.705 m^3/s), 18,040 acre-ft/yr (22.2 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 209 ft^3/s (5.92 m^3/s) Nov. 13, 1934, Jan. 8, 9, Feb. 25-27, 1935, Jan. 27, 1938; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 103 ft^3/s (2.92 m^3/s) Mar. 6; minimum daily, 0.22 ft^3/s (0.006 m^3/s) Mar. 1, 2.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	25	1.7	2.9	3.2	.22	87	94	2.4	2.5	66	91
2	.87	2.7	22	3.7	2.6	.22	51	73	2.4	3.0	8.6	3.5
3	.80	2.3	49	8.5	2.4	22	32	41	2.5	9.9	4.4	7.2
4	.80	1.9	2.0	4.4	2.3	40	32	41	60	24	76	93
5	.87	1.0	1.9	3.8	2.3	76	32	41	31	15	35	52
6	.74	.80	1.6	3.4	2.2	103	44	40	2.7	37	4.9	7.9
7	.68	.74	27	3.2	2.1	101	68	38	2.5	61	4.3	5.1
8	.68	4.3	15	7.9	2.1	54	17	70	2.8	3.8	4.8	4.7
9	.63	1.1	2.7	2.1	1.9	.58	10	77	19	2.6	3.8	4.2
10	.63	.80	2.2	1.3	1.8	79	7.4	77	94	2.5	3.5	4.0
11	.63	1.0	2.0	.74	28	76	7.2	79	102	22	3.3	4.3
12	.48	.80	2.0	.53	2.0	77	58	72	99	90	3.2	3.5
13	.31	.80	1.8	.53	13	73	47	80	96	6.4	3.1	11
14	.31	56	1.7	.48	3.4	59	77	56	84	3.3	3.1	3.7
15	15	100	1.5	.48	1.3	56	76	18	64	2.8	3.0	66
16	28	96	1.5	.43	.35	55	87	5.0	6.6	2.8	2.8	5.8
17	2.4	99	1.5	.39	.31	58	91	22	4.5	65	2.8	3.6
18	2.0	91	1.5	.39	1.7	56	79	4.3	3.9	96	76	3.5
19	46	75	1.5	.39	2.0	53	56	7.0	3.6	96	22	3.4
20	4.7	75	1.5	.39	1.9	52	67	56	3.3	80	94	40
21	2.5	61	1.7	.39	1.8	51	75	38	3.0	75	19	73
22	2.1	50	1.5	.39	1.7	52	75	9.2	2.9	81	3.9	7.0
23	1.6	2.7	1.5	.39	1.7	51	76	3.7	2.8	37	6.6	3.3
24	.80	2.2	2.2	.39	1.6	50	76	3.5	2.9	5.9	3.8	3.2
25	.68	2.3	83	.39	2.1	45	76	3.0	3.9	5.0	3.3	3.0
26	.63	2.7	24	.39	1.7	53	75	2.9	2.8	62	4.4	2.8
27	.58	2.0	78	.39	1.5	49	74	2.8	2.6	60	3.3	2.6
28	.58	1.8	6.0	2.7	.39	43	82	2.6	2.4	7.8	30	2.5
29	.43	1.6	19	2.6	.43	35	88	2.5	2.3	4.8	7.4	2.5
30	.35	1.8	3.5	4.0	---	14	92	2.3	2.5	4.2	81	2.4
31	.68	---	3.2	3.5	---	34	---	4.9	---	3.9	63	---
TOTAL	118.66	763.34	365.2	61.48	89.78	1568.02	1814.6	1066.7	714.3	972.2	650.3	469.7
MEAN	3.83	25.4	11.8	1.98	3.10	50.6	60.5	34.4	23.8	31.4	21.0	15.7
MAX	46	100	83	8.5	28	103	92	94	102	96	94	93
MIN	.31	.74	1.5	.39	.31	.22	7.2	2.3	2.3	2.5	2.8	2.4
AC-FT	235	1510	724	122	178	3110	3600	2120	1420	1930	1290	932

CAL YR 1979 TOTAL 3381.92 MEAN 9.27 MAX 105 MIN .11 AC-FT 6710
WTR YR 1980 TOTAL 8654.28 MEAN 23.6 MAX 103 MIN .22 AC-FT 17170

HAWAII, ISLAND OF MAUI

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 (0.5 km) north of Kailiili, and 2.7 mi (4.3 km) east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,340 ft (713 m), from topographic map.

REMARKS.--Records excellent. Tunnel diverts from Opana Gulch for domestic use in the Kokomo, Makawao and Pukalani areas. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 3.09 ft^3/s (0.088 m^3/s), 2,240 acre-ft/yr (2.76 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 14 ft^3/s (0.40 m^3/s) Mar. 23, Apr. 1, 15, 1980; minimum daily, 0.11 ft^3/s (0.003 m^3/s) Nov. 5-10, 1973, Oct. 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 14 ft^3/s (0.40 m^3/s) Mar. 23, Apr. 1, 15; minimum daily, 0.31 ft^3/s (0.009 m^3/s) Nov. 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.42	.86	3.6	3.2	1.1	5.4	14	8.8	2.9	2.5	4.2	2.5
2	.39	.55	5.1	2.8	1.0	2.6	13	5.9	2.8	2.6	3.5	1.9
3	.36	.42	6.7	2.4	1.0	2.1	8.0	5.9	2.8	3.5	3.1	1.7
4	.32	.38	5.7	2.2	.98	2.0	5.9	5.6	4.3	4.4	4.7	2.6
5	.32	.36	5.1	2.0	1.0	3.1	5.0	5.7	3.9	3.3	4.1	3.0
6	2.7	.32	4.1	1.9	1.0	5.2	4.5	5.3	3.1	6.1	3.3	1.9
7	3.6	.31	3.6	1.9	1.0	4.0	4.2	4.7	2.8	6.7	2.9	1.6
8	1.6	1.6	4.1	2.8	.95	7.7	3.8	4.5	2.7	4.0	2.8	1.5
9	1.0	1.1	3.5	11	.95	7.9	3.5	4.7	3.0	3.3	2.6	1.4
10	.79	.61	3.1	8.6	.97	6.1	3.3	4.0	5.2	3.1	2.4	1.3
11	.57	.47	2.9	6.5	1.1	4.6	3.3	4.0	8.2	3.8	2.3	1.4
12	.49	.40	2.7	2.8	.99	4.4	12	4.9	5.9	4.3	2.2	1.2
13	.40	.66	2.5	2.2	1.2	7.1	13	6.0	8.2	3.7	2.1	1.5
14	.36	8.5	2.3	2.0	1.8	9.7	10	4.3	9.1	3.8	2.0	1.4
15	2.6	10	2.1	1.8	2.2	8.2	14	3.9	5.6	3.5	2.1	2.2
16	5.0	10	2.0	1.7	2.5	11	7.9	3.7	4.7	3.0	2.1	2.2
17	3.4	13	1.9	1.6	1.7	12	9.1	3.8	4.2	5.4	2.1	1.8
18	1.5	11	1.8	1.5	1.3	11	6.0	3.9	3.9	9.3	3.0	1.4
19	4.9	8.4	1.6	1.6	1.1	10	6.8	3.9	3.7	5.9	3.1	1.2
20	4.1	8.2	1.6	1.4	1.1	7.3	5.5	4.9	3.5	4.7	5.9	1.5
21	2.1	6.8	1.6	1.5	1.0	6.4	5.1	4.0	3.4	5.0	3.6	1.3
22	1.3	6.3	1.5	1.5	1.0	11	6.4	3.9	3.3	5.3	2.6	1.1
23	1.1	5.7	1.7	1.4	1.1	14	8.9	3.8	3.1	4.2	2.2	1.0
24	1.3	5.3	2.1	1.3	1.2	13	9.0	3.5	3.1	3.7	2.0	.95
25	.84	5.1	7.2	1.3	1.4	12	6.4	3.3	3.2	3.7	1.8	.90
26	.63	6.2	4.2	1.2	1.5	11	5.4	3.2	3.0	4.6	1.7	.86
27	.53	6.0	6.2	1.2	2.3	9.5	4.8	3.1	2.8	4.2	1.8	.83
28	.46	5.1	4.0	1.1	3.4	12	4.4	3.0	2.7	3.7	2.1	.88
29	.42	4.5	5.5	1.1	4.0	10	4.2	3.0	2.5	3.3	2.1	.94
30	.39	4.0	6.1	1.1	---	6.7	5.8	2.9	2.5	3.2	4.7	.81
31	.39	---	4.3	1.1	---	5.7	---	3.7	---	3.1	3.2	---
TOTAL	44.28	132.14	110.4	75.7	41.84	242.7	213.2	135.8	120.1	130.9	88.3	44.77
MEAN	1.43	4.40	3.56	2.44	1.44	7.83	7.11	4.38	4.00	4.22	2.85	1.49
MAX	5.0	13	7.2	11	4.0	14	14	8.8	9.1	9.3	5.9	3.0
MIN	.32	.31	1.5	1.1	.95	2.0	3.3	2.9	2.5	2.5	1.7	.81
AC-FT	88	262	219	150	83	481	423	269	238	260	175	89

CAL YR 1979 TOTAL 1167.63 MEAN 3.20 MAX 13 MIN .31 AC-FT 2320
WTR YR 1980 TOTAL 1380.13 MEAN 3.77 MAX 14 MIN .31 AC-FT 2740

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 (0.8 km) downstream from Kapuna Stream, 1.3 mi (2.1 km) south of Kahakuloa, 2.0 mi (3.2 km) west of Puu Makawana, and 4.3 mi (6.9 km) southeast of Honokohau.

DRAINAGE AREA.--3.47 mi² (8.99 km²).

WATER-DISCHARGE RECORDS

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 (1.6 km) 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. Altitude of gage is 330 ft (101 m), from topographic map.

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

AVERAGE DISCHARGE.--31 years (1940-42, 1948-70, 1976-80), 17.2 ft³/s (0.487 m³/s) 12,460 acre-ft/yr (15.4 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,800 ft³/s (108 m³/s) Nov. 25, 1970, gage height, 10.57 ft (3.222 m), from floodmarks, from rating curve extended above 510 ft³/s (14.4 m³/s) on basis of slope-area measurements at gage heights 6.70 ft (2.042 m), 8.48 ft (2.585 m), and 10.57 ft (3.222 m); minimum, 3.0 ft³/s (0.085 m³/s) Feb. 9-11, 1954.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 500 ft³/s (14.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0430	1340	37.9	6.32	1.926	Apr. 1	2200	1790	50.7	6.89	2.100
Jan. 10	0500	*2280	64.6	*7.54	2.298	Apr. 15	0830	724	20.5	5.54	1.689
Feb. 5	1330	1300	36.8	6.28	1.914	June 14	0900	1050	29.7	5.98	1.823
Mar. 19	0700	1480	41.9	6.50	1.981	July 6	1800	1120	31.7	6.05	1.844

Minimum discharge, 5.1 ft³/s (0.14 m³/s) Oct. 11-15, 18, 19, 26, 27, 29, 30, Nov. 6, 7.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	19	6.3	11	6.2	68	498	53	9.6	11	37	15
2	8.1	16	59	9.2	5.8	11	205	25	9.0	24	14	9.7
3	6.2	7.3	16	8.2	5.7	9.3	45	31	9.4	13	11	9.1
4	5.8	6.1	8.9	7.6	5.6	9.0	35	17	76	14	102	15
5	6.4	5.6	15	7.2	92	10	15	34	15	9.3	19	14
6	5.8	5.3	7.8	7.2	9.5	67	17	21	11	207	12	10
7	5.7	5.5	27	6.9	6.6	23	14	15	9.5	50	10	9.0
8	5.5	37	9.4	136	7.8	20	12	18	11	14	12	8.5
9	5.3	8.7	7.8	280	7.4	26	13	13	36	11	9.4	10
10	5.3	6.9	12	280	6.4	15	12	11	25	14	9.0	9.3
11	5.3	10	7.3	52	16	9.8	13	14	21	24	8.7	13
12	5.1	12	9.7	14	7.2	11	57	54	13	41	8.4	8.5
13	5.1	14	6.7	11	11	48	111	55	29	19	9.4	30
14	5.1	97	6.3	9.3	7.8	136	107	13	126	32	15	11
15	6.6	99	6.0	8.4	11	135	214	18	25	13	15	65
16	6.8	18	5.9	7.9	23	242	27	16	12	11	15	20
17	5.4	80	5.9	7.5	7.9	269	23	24	11	16	10	11
18	5.2	111	5.8	7.5	6.7	121	16	11	10	21	19	11
19	13	53	5.6	7.0	6.3	139	20	20	15	35	11	10
20	9.6	45	5.4	6.7	6.1	38	17	23	12	35	53	17
21	7.4	23	11	12	6.0	19	15	12	11	27	13	57
22	9.8	14	6.7	9.3	6.3	23	41	26	9.4	26	9.5	13
23	6.2	11	15	7.5	21	39	38	12	9.1	12	10	9.2
24	5.8	9.1	27	6.7	15	40	38	21	11	13	9.7	8.7
25	5.5	8.0	195	6.3	23	33	21	12	26	10	9.2	8.2
26	5.3	13	26	6.2	9.8	18	13	10	11	34	12	7.9
27	5.1	9.7	31	6.1	43	21	12	11	9.7	36	10	8.1
28	5.5	7.5	15	6.1	60	25	11	11	8.9	13	43	8.5
29	5.1	7.0	206	5.9	144	22	12	9.3	8.7	13	13	18
30	6.0	6.6	46	6.4	---	13	31	9.1	8.5	14	73	8.9
31	12	---	15	6.3	---	16	---	23	---	9.8	21	---
TOTAL	211.0	765.3	827.5	963.4	584.1	1691.1	1703	642.4	598.8	822.1	623.3	453.6
MEAN	6.81	25.5	26.7	31.1	20.1	54.6	56.8	20.7	20.0	26.5	20.1	15.1
MAX	16	111	206	280	144	269	498	55	126	207	102	65
MIN	5.1	5.3	5.9	5.9	5.6	9.0	11	9.1	8.5	9.3	8.4	7.9
AC-FT	419	1520	1640	1910	1160	3350	3380	1270	1190	1630	1240	900

CAL YR 1979 TOTAL 7707.9 MEAN 21.1 MAX 357 MIN 5.1 AC-FT 15290
WTR YR 1980 TOTAL 9885.6 MEAN 27.0 MAX 498 MIN 5.1 AC-FT 19610

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--December 1974 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
09...	1230	5.3	94	8.0	21.0	2.5	9.4	38	1000	23	0
NOV											
05...	1145	3.5	85	7.8	20.5	.30	9.4	7	590	21	1
DEC											
03...	1100	14	62	7.3	18.0	2.6	9.5	53	390	13	5
JAN											
07...	1300	6.8	79	7.7	18.0	1.0	9.4	2	100	18	0
FEB											
11...	1345	14	61	7.4	19.0	2.5	8.5	27	430	14	2
MAR											
10...	1300	16	63	7.1	18.0	29	9.5	8	240	16	5
APR											
07...	1330	13	70	7.2	20.5	1.0	9.2	12	130	15	4
18...	1100	18	62	7.2	20.0	--	--	--	--	--	--
MAY											
12...	1300	12	67	7.6	20.0	2.1	9.5	15	60	15	0
JUN											
09...	1300	11	76	7.3	20.5	.40	9.3	14	78	18	0
JUL											
14...	1200	52	55	6.2	20.5	11	9.1	500	2700	10	0
AUG											
11...	1300	8.6	83	7.1	22.0	1.7	9.7	10	170	20	5
SEP											
08...	1100	8.3	80	6.8	21.0	.30	9.1	29	310	20	0

DATE	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	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT											
09...	4.6	2.9	8.5	43	.8	9.5	1.0	23	3.2	8.8	.1
NOV											
05...	4.1	2.6	7.7	43	.7	8.7	1.0	20	.6	10	.2
DEC											
03...	2.2	1.8	6.2	49	.8	6.9	.7	8	3.4	12	.0
JAN											
07...	3.6	2.2	7.7	47	.8	7.9	.9	20	4.2	10	.0
FEB											
11...	2.8	1.7	6.3	48	.7	7.1	.8	12	2.4	9.2	.0
MAR											
10...	3.4	1.9	6.2	44	.7	7.0	.8	11	3.0	11	.0
APR											
07...	2.7	1.9	6.1	46	.7	--	.8	11	1.8	10	.0
18...	--	--	--	--	--	--	--	--	--	--	--
MAY											
12...	2.9	1.8	6.9	49	.8	--	.8	15	3.0	9.2	.1
JUN											
09...	3.3	2.3	6.9	45	.7	--	.8	21	.4	9.5	.0
JUL											
14...	1.7	1.3	5.0	51	.7	--	.7	10	4.2	7.5	.1
AUG											
11...	3.8	2.6	7.3	43	.7	--	.9	15	1.9	10	.1
SEP											
08...	3.7	2.5	6.8	42	.7	--	.9	20	3.2	11	.1

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	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, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
OCT											
09...	24	63	68	.09	.90	.13	.14	.03	.06	.04	.08
NOV											
05...	22	63	60	.09	.60	.13	.13	.00	.00	.00	.00
DEC											
03...	10	37	42	.05	1.40	.12	.12	.01	.01	.01	.01
JAN											
07...	20	63	61	.09	1.16	.13	.13	.00	.00	.00	.00
FEB											
11...	13	48	44	.07	1.81	.11	.11	.01	.01	.00	.01
MAR											
10...	11	42	45	.06	1.81	.06	--	.01	--	.01	--
APR											
07...	15	47	46	.06	1.65	.16	.16	.22	.22	.28	.28
18...	--	--	--	--	--	--	--	--	--	--	--
MAY											
12...	15	47	49	.06	1.52	.05	.08	.02	.06	.02	.08
JUN											
09...	18	55	54	.07	1.63	.07	.03	.01	.01	.01	.01
JUL											
14...	9.8	--	37	.05	5.19	.16	.14	.00	.00	.00	.00
AUG											
11...	20	58	56	.08	1.35	.05	.03	.00	.02	.00	.03
SEP											
08...	20	71	61	.10	1.59	.08	--	.00	.00	.00	.00

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, AMM + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT											
09...	.46	.32	.52	.49	.11	.38	.62	2.7	.020	.06	.020
NOV											
05...	.31	.24	.37	.31	.07	.24	.44	1.9	.020	.06	.020
DEC											
03...	.76	.48	.61	.77	.28	.49	.89	3.9	.010	.03	.010
JAN											
07...	1.3	1.2	1.3	1.3	.10	1.2	1.4	6.3	.010	.03	.010
FEB											
11...	.37	.37	.49	.38	.00	.38	.49	2.2	.010	.03	.010
MAR											
10...	.19	--	--	.20	.00	--	.26	1.2	.010	.03	.010
APR											
07...	3.1	.88	1.3	3.3	2.2	1.1	3.5	15	.040	.12	.030
18...	--	--	--	--	--	--	--	--	--	--	--
MAY											
12...	.40	.11	.25	.42	.25	.17	.47	2.1	.040	.12	.040
JUN											
09...	.27	.25	.29	.28	.02	.26	.35	1.6	.020	.06	.020
JUL											
14...	.92	.82	.96	.92	.10	.82	1.1	4.8	.050	.15	.030
AUG											
11...	.24	.22	.27	.24	.00	.24	.29	1.3	.040	.12	.030
SEP											
08...	.59	--	--	.59	--	--	.67	3.0	.040	.12	.010

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
OCT 09...	1230	1	0	1	10	0	10	<1	0	<1	10
FEB 11...	1345	1	0	1	10	0	10	<1	0	<1	10
APR 07...	1330	2	1	1	9	0	9	1	0	<1	0
JUL 14...	1200	1	0	1	8	0	8	<1	0	<1	10

DATE	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
OCT 09...	10	0	<3	0	<3	2	0	2	20	0	20
FEB 11...	10	0	2	0	<3	0	0	0	190	110	80
APR 07...	0	0	2	0	<3	0	0	0	80	40	40
JUL 14...	0	10	<3	0	<3	8	4	4	540	370	170

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
OCT 09...	1	1	0	4	3	<1	.0	.0	.0	2
FEB 11...	3	3	0	10	8	2	.1	.1	.0	0
APR 07...	12	12	0	2	0	2	.0	.0	.0	6
JUL 14...	5	5	0	10	8	2	.1	.1	.0	3

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT 09...	0	2	0	0	0	0	0	10	7	<3
FEB 11...	0	0	0	0	0	0	0	40	35	5
APR 07...	6	0	0	0	0	0	0	40	36	4
JUL 14...	1	2	0	0	0	0	0	20	16	4

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

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)
OCT			APR		
09...	1230	0	07...	1330	0
DEC			JUN		
03...	1100	0	09...	1300	0
FEB			JUL		
11...	1345	0	14...	1200	0
MAR			SEP		
10...	1300	0	08...	1100	0

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)	DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)
OCT					APR				
09...	1230	--	.7	.0	07...	1330	--	.0	.0
NOV					MAY				
05...	1145	2.1	--	--	12...	1300	2.6	--	--
DEC					JUN				
03...	1100	3.1	--	--	09...	1300	1.0	--	--
JAN					JUL				
07...	1300	1.0	--	--	14...	1200	--	6.1	.0
FEB					AUG				
11...	1345	--	3.4	.1	11...	1300	1.3	--	--
MAR					SEP				
10...	1300	1.1	--	--	08...	1100	1.7	--	--

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
09...	1230	--	1.57	1.18	29.2	3.70	13.4	29
NOV								
05...	1145	13	--	--	--	--	--	--
DEC								
03...	1100	200	--	--	--	--	--	--
JAN								
07...	1300	91	--	--	--	--	--	--
FEB								
11...	1345	210	.390	.320	.400	.150	175	35
MAR								
10...	1300	260	--	--	--	--	--	--
APR								
07...	1330	420	--	--	--	--	--	--
18...	1100	320	--	--	--	--	--	--
MAY								
12...	1300	52	.157	.079	1.86	.340	81.9	35
JUN								
09...	1300	140	--	--	--	--	--	--
JUL								
14...	1200	86	.945	.472	7.97	.370	59.3	35
AUG								
11...	1300	150	--	--	--	--	--	--
SEP								
08...	1100	280	--	--	--	--	--	--

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 09...	1230	5.3	0	.00	100
NOV 05...	1145	3.5	0	.00	100
DEC 03...	1100	14	3	.11	100
JAN 07...	1300	6.8	1	.02	100
FEB 11...	1345	14	3	.11	100
MAR 10...	1300	16	1	.04	100
APR 07...	1330	13	0	.00	100
APR 18...	1100	18	--	--	--
MAY 12...	1300	12	20	.65	100
JUN 09...	1300	11	0	.00	100
JUL 14...	1200	52	11	1.5	100
AUG 11...	1300	8.6	0	.00	100
SEP 08...	1100	8.3	0	.00	100

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	NOV 5,79	DEC 3,79	JAN 7,80	FEB 11,80	MAR 10,80	APR 7,80
TIME	1145	1100	1300	1345	1300	1330
TOTAL CELLS/ML	13	200	91	210	260	420
DIVERSITY: DIVISION	0.0	0.3	1.4	0.9	1.4	0.7
.CLASS	0.0	0.3	1.4	0.9	1.4	0.7
..ORDER	0.0	1.1	1.4	1.2	1.4	0.7
...FAMILY	0.0	1.4	1.4	2.5	2.1	0.9
....GENUS	0.0	1.4	1.6	2.6	2.4	0.9

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	5	2	--	-	5	2	5	2	--	-
....CHLORELLA	--	-	--	-	40#	44	30	14	30	12	--	-
....CHODATELLA	--	-	--	-	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	5	6	--	-	--	-	--	-
....TROCHISCIA	--	-	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	5	2	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	150#	72	--	-	10	5	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	25	10	--	-
....RHOICOSPHENIA	13#	100	--	-	--	-	45#	21	15	6	27	6
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	10	5	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	--	-	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	10	5	--	-	30	14	10	4	--	-
...NAVICULACEAE												
....NAVICULA	--	-	30	15	35#	39	71#	33	65#	25	55	13
....PINNULARIA	--	-	--	-	--	-	--	-	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	5	2	--	-	--	-	5	2	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	10	11	--	-	--	-	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	--	-	--	-	--	-	110#	40	340#	81
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	5	2	--	-	--	-
....TRACHELOMONAS	--	-	5	2	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	APR 18,80	MAY 12,80	JUN 9,80	JUL 14,80	AUG 11,80	SEP 8,80
TIME	1100	1300	1300	1200	1300	1100
TOTAL CELLS/ML	320	52	140	86	150	280
DIVERSITY: DIVISION	1.5	1.0	0.4	0.9	0.4	0.4
.CLASS	1.5	1.0	0.4	0.9	0.4	0.4
..ORDER	1.5	1.0	0.4	1.3	0.8	0.4
...FAMILY	1.7	1.0	0.4	1.3	0.8	0.5
....GENUS	1.7	1.0	0.4	1.8	0.8	0.5

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	14#	17	--	-	--	-
....CHLORELLA	85#	27	--	-	--	-	--	-	--	-	--	-
....CHODATELLA	--	-	26#	50	--	-	--	-	--	-	--	-
....KIRCHNERIELLA	--	-	--	-	--	-	--	-	--	-	--	-
....TROCHISCIA	--	-	--	-	--	-	43#	50	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-	--	-	--	-	14#	17	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	--	-	--	-	--	-	--	-	--	-	--	-
....RHOICOSPHENIA	--	-	--	-	--	-	--	-	--	-	13	5
...DIATOMACEAE												
....DIATOMA	--	-	--	-	--	-	--	-	--	-	--	-
...EUNOTIACEAE												
....EUNOTIA	5	2	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	5	2	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	75#	24	26#	50	13	9	--	-	--	-	--	-
....PINNULARIA	--	-	--	-	--	-	14#	17	--	-	--	-
...NITZSCHIACEAE												
....NITZSCHIA	--	-	--	-	--	-	--	-	13	8	13	5
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	13	8	--	-
..HORMOGONALES												
...OSCILLATORIACEAE												
....OSCILLATORIA	150#	46	--	-	130#	91	--	-	130#	83	260#	91
EUGLENOPHYTA (EUGLENOIDS)												
.EUGLENOPHYCEAE												
..EUGLENALES												
...EUGLENACEAE												
....EUGLENA	--	-	--	-	--	-	--	-	--	-	--	-
....TRACHELOMONAS	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'48", long 156°35'22", Hydrologic Unit 20020000, on right bank 1,000 ft (305 m) upstream from intake of Honokohau ditch and 4.1 mi (6.6 km) southeast of Honokohau.

DRAINAGE AREA.--4.11 mi² (10.64 km²).

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. Altitude of gage is 870 ft (265 m), from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum.

REMARKS.--Records good. No diversion above station. All medium and low flow, together with the inflow from two development tunnels below station, is diverted into Honokohau ditch. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--64 years (water years, 1914-19, 1923-80), 39.5 ft³/s (1.119 m³/s), 28,620 acre-ft/yr (35.3 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,120 ft³/s (202 m³/s) revised, Dec. 14, 1942, gage height, 8.40 ft (2.560 m), from rating curve extended above 547 ft³/s (15.5 m³/s), on basis of slope-area measurement at gage height 6.76 ft (2.060 m); minimum, 8.4 ft³/s (0.24 m³/s) May 1, 1945, Jan. 5, 1946.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,100 ft³/s (31.2 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Dec. 25	0130	1260	35.7	5.31	1.619	Mar. 19	0700	*2630	74.5	*6.42	1.957
Jan. 8	2130	2220	62.9	6.16	1.878	Apr. 1	2200	1500	42.5	5.56	1.695
Mar. 16	1800	1650	46.7	5.70	1.737						

Minimum discharge, 14 ft³/s (0.40 m³/s) several days in October, November, and December.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	39	16	20	18	83	694	170	49	51	113	48
2	18	34	123	18	17	21	309	69	36	71	35	29
3	18	24	36	17	17	20	99	78	38	51	32	28
4	20	15	26	17	17	27	95	74	210	39	139	54
5	19	14	22	16	39	53	43	108	43	37	39	49
6	16	14	17	17	19	189	88	60	44	323	31	40
7	15	14	18	16	17	99	61	47	34	68	29	30
8	24	42	16	236	17	102	41	69	36	34	31	27
9	15	17	18	320	17	64	48	67	132	32	28	31
10	16	15	16	302	17	58	37	75	69	62	28	28
11	16	14	16	61	18	40	43	75	98	79	28	38
12	14	15	16	23	17	42	198	127	63	116	28	26
13	14	33	15	21	21	168	276	99	125	75	37	66
14	14	165	15	20	20	273	171	43	187	69	48	43
15	33	158	15	19	27	287	313	68	65	34	45	73
16	24	82	15	19	46	293	66	58	37	34	61	64
17	16	272	15	19	18	512	76	64	34	58	36	28
18	15	316	15	25	17	290	60	39	33	87	74	27
19	44	102	15	19	17	267	94	59	44	78	33	26
20	22	90	14	18	16	126	52	56	48	66	87	54
21	18	37	21	31	16	54	46	48	36	79	31	101
22	18	35	17	22	20	76	95	56	32	96	29	30
23	15	25	40	19	59	148	106	38	33	36	32	26
24	15	19	55	18	34	148	102	44	41	46	32	26
25	14	18	214	18	61	102	54	38	74	39	29	25
26	14	22	42	17	20	68	43	46	40	88	39	24
27	14	20	51	17	61	112	39	59	34	65	46	25
28	14	17	25	17	66	74	39	39	33	33	91	26
29	14	17	160	17	162	58	73	34	38	47	48	33
30	15	16	35	17	---	34	133	38	36	42	135	24
31	22	---	21	18	---	41	---	61	---	32	78	---
TOTAL	572	1701	1140	1434	911	3929	3594	2006	1822	2063	1572	1149
MEAN	18.5	56.7	36.8	46.3	31.4	127	120	64.7	60.7	66.5	50.7	38.3
MAX	44	316	214	320	162	512	694	170	210	323	139	101
MIN	14	14	14	16	16	20	37	34	32	32	28	24
AC-FT	1130	3370	2260	2840	1810	7790	7130	3980	3610	4090	3120	2280

CAL YR 1979 TOTAL 15795 MEAN 43.3 MAX 485 MIN 14 AC-FT 31330
WTR YR 1980 TOTAL 21893 MEAN 59.8 MAX 694 MIN 14 AC-FT 43420

HAWAII, ISLAND OF MAUI

16638500 KAHOMA STREAM AT LAHAINA

LOCATION.--Lat 20°53'10", long 156°40'36", Hydrologic Unit 20020000, on right bank 0.2 mi (0.3 km) west of Kelawea, 0.6 mi (1.0 km) northeast of Lahaina, 0.6 mi (1.0 km) downstream from Kanaha Stream, and 0.9 mi (1.4 km) upstream from mouth.

DRAINAGE AREA.--5.22 mi² (13.52 km²).

PERIOD OF RECORD.--October 1962 to current year.

REVISED RECORDS.--WSP 2137: 1963-65(P).

GAGE.--Water-stage recorder. Altitude of gage is 90 ft (27 m), from topographic map.

REMARKS.--Records poor. Diversion above station by Pioneer Mill Co. for irrigation of sugarcane. Diversion from Kanaha Stream above station by Maui County Board of Water Supply for domestic use. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--17 years (water years 1964-80), 3.60 ft³/s (0.102 m³/s), 2,610 acre-ft/yr (3.22 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,490 ft³/s (70.5 m³/s) July 11, 1965, gage height, 11.03 ft (3.362 m), from rating curve extended above 206 ft³/s (5.83 m³/s) on basis of slope-area measurements at gage heights 7.58 ft (2.310 m), 8.07 ft (2.460 m), and 11.03 ft (3.362 m); no flow many days each year.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge of flood of May 13, 1960, 7,750 ft³/s (219 m³/s), by slope-area measurement at site 0.5 mi (0.8 km) upstream.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 590 ft³/s (16.7 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 10	0530	*1640	46.4	*9.20	2.804	Mar. 23	2100	830	23.5	7.60	2.316
Mar. 18	1730	1160	32.9	8.18	2.493	Apr. 1	2300	758	21.5	7.48	2.280

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	2.5	178	38	.09	5.1	29	.41
2	.00	.00	.00	.00	.00	.02	124	.16	.39	.00	1.2	.00
3	.00	.00	.00	.00	.00	.00	3.1	10	.00	10	.00	.00
4	.00	.00	.00	.00	.00	.00	3.3	.92	26	7.3	4.9	.01
5	.00	.00	.00	.00	.00	14	1.6	2.2	.43	3.2	.65	.35
6	.00	.00	.00	.00	.00	110	1.8	.00	.00	41	.00	.00
7	.00	.00	.00	.00	.00	20	.87	.00	.00	8.1	.00	.00
8	.00	.00	.00	72	.00	63	.00	10	.00	.00	.00	.00
9	.00	.00	.00	148	.00	24	.17	18	2.0	.00	.00	.00
10	.00	.00	.00	236	.00	5.9	.08	4.5	.00	.00	.00	.00
11	.00	.00	.00	26	.00	12	.00	8.5	30	10	.00	.00
12	.00	.00	.00	3.6	.00	10	41	5.6	16	15	.00	.00
13	.00	.00	.00	2.4	.00	10	7.6	2.7	28	2.3	.00	.00
14	.00	.00	.00	1.8	.00	55	1.4	.00	27	.92	.00	.00
15	.00	.00	.00	.35	.00	60	5.3	.00	1.6	.68	.00	.00
16	.00	.00	.00	.01	.00	113	9.3	.00	3.2	5.4	.00	1.3
17	.00	70	.00	.00	.00	77	25	.05	.00	35	.00	.00
18	.00	53	.00	2.7	.00	99	.00	.00	.00	103	.00	.00
19	1.1	.00	.00	.04	.00	163	1.6	1.5	.00	8.2	.00	.00
20	.00	1.6	.00	.00	.00	69	.09	8.7	.00	5.6	1.7	.00
21	.00	.00	.00	2.1	.00	16	.00	.00	.00	7.2	.18	.00
22	.00	.00	.00	.29	.09	58	4.9	.00	.00	14	.00	.00
23	.00	.00	.00	.00	6.2	365	15	.00	.00	.01	.00	.00
24	.00	.00	.00	.00	2.4	222	22	.00	.00	.00	.00	.00
25	.00	.00	.38	.00	26	179	4.1	.00	.90	.00	.00	.00
26	.00	.00	.00	.00	.06	148	.22	1.6	.76	.00	.00	.00
27	.00	.00	.00	.00	3.9	83	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	1.7	43	.00	.00	.00	.01	3.3	.00
29	.00	.00	.00	.00	2.4	12	9.7	.00	.00	.00	.41	.00
30	.00	.00	.00	.00	---	8.4	13	.00	3.5	.00	4.5	.00
31	.00	---	.00	.00	---	2.4	---	.38	---	.00	.19	---
TOTAL	1.10	124.60	.38	495.29	42.75	2000.22	473.13	112.81	139.87	282.02	46.03	2.07
MEAN	.035	4.15	.012	16.0	1.47	64.5	15.8	3.64	4.66	9.10	1.48	.069
MAX	1.1	70	.38	236	26	365	178	38	30	103	29	1.3
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	2.2	247	.8	982	85	3970	938	224	277	559	91	4.1

CAL YR 1979 TOTAL 730.14 MEAN 2.00 MAX 170 MIN .00 AC-FT 1450
WTR YR 1980 TOTAL 3720.27 MEAN 10.2 MAX 365 MIN .00 AC-FT 7380

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

LOCATION.--Lat 19°38'30", long 155°10'28", Hydrologic Unit 20010000, on left bank 200 ft (61 m) upstream from Olaa Flume Road, 7.3 mi (11.7 km) northwest of Mountain View, and 8.0 mi (12.9 km) southwest of Hilo Post Office.

DRAINAGE AREA.--17.4 mi² (45.1 km²).

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 (589 m) above mean sea level (by stadia survey). Prior to Jan. 21, 1938, at datum 0.23 ft (0.070 m) lower.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Large part of flow comes from 3 tunnels. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--50 years, 11.9 ft³/s (0.337 m³/s), 8,620 acre-ft/yr (10.6 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 565 ft³/s (16.0 m³/s) Mar. 14, 1942, Aug. 26, 1970, from rating curve extended above 160 ft³/s (4.53 m³/s); maximum gage height, 4.45 ft (1.356 m) Aug. 26, 1970; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft³/s (2.83 m³/s) and maximum (*), from rating curve extended above 160 ft³/s (4.53 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 17	0115	*530	15.0	*4.40	1.341	Mar. 17	1345	516	14.6	4.38	1.335
Mar. 6	1730	151	4.28	3.67	1.119	Mar. 24	1430	154	4.36	3.68	1.122

Minimum discharge, 0.16 ft³/s (0.005 m³/s) Feb. 26, 27.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	3.0	14	2.6	.32	4.1	20	16	8.3	8.3	6.5	13
2	.56	2.8	13	2.4	.32	.36	20	15	8.4	7.6	6.9	12
3	.85	2.7	12	2.2	.28	.28	19	15	8.7	8.3	6.4	11
4	.52	2.8	11	2.0	.28	.56	19	14	15	7.5	6.6	15
5	.75	2.5	11	1.9	.28	4.4	19	15	13	6.9	7.9	15
6	.56	2.4	9.6	1.9	.28	30	18	16	13	7.1	8.3	14
7	2.5	2.2	9.6	1.7	.24	22	18	16	12	8.7	7.5	14
8	1.5	2.1	10	1.7	.24	22	18	16	12	7.6	7.0	14
9	3.5	2.0	8.9	1.7	.20	24	17	15	13	7.9	6.7	13
10	2.4	2.0	8.2	1.5	.20	29	17	15	13	7.9	6.5	13
11	1.7	1.9	7.6	1.4	.28	33	16	15	21	8.9	6.0	13
12	1.5	1.7	7.2	1.2	.28	34	16	17	20	9.3	5.5	12
13	1.4	1.7	6.7	1.1	.24	39	16	16	23	8.8	5.2	12
14	1.3	3.9	6.3	1.0	.24	34	16	16	25	8.7	4.9	13
15	1.2	13	5.8	.90	.24	44	16	15	26	9.0	4.7	13
16	2.3	27	5.4	.80	.20	53	16	15	24	8.7	4.4	13
17	3.9	72	5.0	.70	.20	195	15	14	23	8.7	6.5	13
18	2.8	98	4.7	.60	.20	175	15	14	22	9.7	7.0	12
19	4.7	69	4.3	.56	.20	30	15	13	20	9.2	6.5	12
20	4.4	60	4.2	.52	.20	25	15	13	18	8.8	6.0	14
21	4.4	46	4.0	.48	.18	22	14	12	17	9.3	7.5	35
22	4.1	35	3.9	.44	.18	20	14	12	16	9.3	6.5	27
23	4.0	29	3.8	.40	.18	30	14	11	14	8.7	6.0	26
24	3.9	28	3.7	.40	.18	50	18	11	13	8.1	5.6	24
25	3.7	28	3.4	.36	.18	35	16	10	13	7.6	5.2	22
26	3.5	26	3.2	.36	.16	30	15	10	12	7.2	4.7	20
27	3.6	21	3.0	.32	.16	25	15	9.8	11	7.3	4.5	19
28	3.4	19	2.8	.24	.18	25	15	9.7	10	7.3	4.9	19
29	3.3	17	3.0	.24	.52	23	14	9.3	9.6	7.1	5.4	18
30	3.4	16	3.6	.24	---	22	15	8.7	8.9	7.5	13	17
31	3.1	---	2.9	.28	---	21	---	8.3	---	6.6	13	---
TOTAL	79.14	637.7	201.8	32.14	6.84	1101.70	491	412.8	462.9	253.6	203.3	388
MEAN	2.55	21.3	6.51	1.04	.24	35.5	16.4	13.3	15.4	8.18	6.56	16.3
MAX	4.7	98	14	2.6	.52	195	20	17	26	9.7	13	35
MIN	.40	1.7	2.8	.24	.16	.28	14	8.3	8.3	6.6	4.4	11
AC-FT	157	1260	400	64	14	2190	974	819	918	503	403	968

CAL YR 1979 TOTAL 5366.72 MEAN 14.7 MAX 132 MIN .40 AC-FT 10640
WTR YR 1980 TOTAL 4370.92 MEAN 11.9 MAX 195 MIN .16 AC-FT 8670

NOTE.--No gage-height record Mar. 18 to May 20.

HAWAII, ISLAND OF HAWAII

16700900 OLAA FLUME SPRING NEAR KAUMANA

LOCATION.--Lat 19°41'59", long 155°11'13", Hydrologic Unit 20010000, on left bank 58 ft (18 m) downstream from tunnel entrance, 3.3 mi (5.3 km) northwest of Kaumana School, and 6.5 mi (10.5 km) southwest of Hilo Post Office.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 1,970 ft (600 m), from topographic map.

REMARKS.--Records good. County of Hawaii, Department of Water Supply, diverts by 16 inch (41 cm) pipeline 50 ft (15 m) above station for domestic use in the Kaumana and Piihonua areas since Oct. 2, 1978. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--6 years, 10.6 ft³/s (0.300 m³/s), 7,680 acre-ft/yr (9.47 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 43 ft³/s (1.22 m³/s) Jan. 8, 1975; minimum daily, 0.26 ft³/s (0.007 m³/s) Aug. 17, 18, 1980 during period when tunnel caved in and diverted part of flow.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 15 ft³/s (0.42 m³/s) Nov. 18, 19; minimum daily, 0.26 ft³/s (0.007 m³/s) Aug. 17, 18 during period when tunnel caved in and diverted part of flow.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.7	3.6	5.0	3.9	.58	.66	.66	.50	.60	.60	.38	5.8
2	2.7	3.6	4.7	3.9	.58	.66	.66	.46	.60	.60	.38	5.4
3	2.8	3.6	4.6	3.9	.58	.66	.66	.46	.60	.60	.38	4.7
4	3.2	3.6	4.5	3.8	.58	.70	.66	.54	.65	.60	.38	4.6
5	3.2	3.6	4.5	3.8	.58	.70	.62	.54	.65	.60	.38	7.2
6	3.2	3.5	4.4	3.8	.58	5.0	.62	.58	.60	.60	.42	7.7
7	5.2	3.5	4.4	3.8	.54	11	.62	.58	.60	.60	.42	6.8
8	5.0	3.5	4.6	3.8	.50	11	.62	.58	.60	.60	.42	5.9
9	4.4	3.5	4.8	3.8	.46	10	.62	.58	.60	.60	.42	5.6
10	7.2	3.5	4.6	3.8	.46	9.0	.62	.58	.60	.60	.42	5.2
11	5.8	3.5	4.5	3.8	.50	6.2	.58	.50	.65	.65	.38	4.8
12	4.2	3.5	4.4	3.8	.50	1.3	.62	.54	.65	.65	.38	4.7
13	3.7	3.5	4.4	3.7	.50	.50	.62	.58	.65	.65	.34	4.6
14	3.6	3.1	4.4	3.6	.46	.50	.62	.58	.65	.65	.30	4.7
15	3.5	3.4	4.3	3.6	.46	.46	.62	.58	.65	.65	.30	4.6
16	3.5	4.7	4.3	3.4	.46	.50	.70	.54	.65	.65	.28	4.7
17	3.6	12	4.3	3.0	.46	.62	.50	.54	.65	.65	.26	4.7
18	3.9	15	4.3	2.9	.46	1.2	.50	.54	.65	.65	.26	4.8
19	3.9	15	4.2	2.8	.42	.62	.50	.54	.65	.65	2.2	4.8
20	4.0	13	4.2	2.7	.34	.62	.50	.50	.65	.65	4.5	4.8
21	4.0	11	4.0	2.6	.34	.62	.50	.46	.65	.60	4.3	4.3
22	4.0	9.3	4.0	2.5	.34	.62	.46	.54	.60	.50	4.4	12
23	3.9	9.1	3.9	2.4	.42	.66	.46	.50	.60	.46	4.4	11
24	4.0	8.5	3.9	2.3	.38	.86	.54	.50	.60	.46	4.2	10
25	3.9	8.7	3.9	2.3	.38	.78	.54	.50	.60	.46	4.0	9.9
26	3.9	9.5	3.9	2.2	.38	.70	.54	.50	.60	.42	3.9	9.3
27	3.7	7.7	3.9	2.1	.38	.78	.54	.50	.60	.42	3.8	8.9
28	3.7	6.4	3.9	2.0	.38	.78	.54	.54	.60	.42	3.6	8.5
29	3.7	5.6	3.9	1.1	.54	.70	.54	.54	.60	.42	3.8	7.7
30	3.7	5.2	3.9	.58	---	.70	.50	.54	.60	.42	4.5	7.5
31	3.6	---	3.9	.58	---	.66	---	.54	---	.42	5.8	---
TOTAL	121.4	193.2	132.5	92.26	13.54	69.76	17.28	16.50	18.65	17.50	59.90	200.2
MEAN	3.92	6.44	4.27	2.98	.47	2.25	.58	.53	.62	.56	1.93	6.67
MAX	7.2	15	5.0	3.9	.58	11	.70	.58	.65	.65	5.8	12
MIN	2.7	3.1	3.9	.58	.34	.46	.46	.46	.60	.42	.26	4.6
AC-FT	241	383	263	183	27	138	34	33	37	35	119	397

CAL YR 1979 TOTAL 2110.70 MEAN 5.78 MAX 17 MIN 2.4 AC-FT 4190
WTR YR 1980 TOTAL 952.69 MEAN 2.60 MAX 15 MIN .26 AC-FT 1890

NOTE.--No gage-height record May 29 to July 11.

16701750 WAILUKU RIVER NEAR HUMUULA

LOCATION.--Lat 19°42'55", long 155°18'36", Hydrologic Unit 20010000, on right bank 300 ft (91 m) upstream from trail terminus, 10 mi (16 km) east of Humuula, and 14 mi (22 km) west of Hilo.

DRAINAGE AREA.--34.8 mi^2 (90.1 km^2).

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

GAGE.--Water-stage recorder. Altitude of gage is 4,250 ft (1,295 m), from topographic map.

REMARKS.--Records good except those for periods of no gage-height record and those above 40 ft^3/s (1.13 m^3/s), which are fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--15 years, 3.25 ft^3/s (0.092 m^3/s), 2,360 acre-ft/yr (2.91 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,300 ft^3/s (235 m^3/s) Nov. 17, 1979, gage height, 11.87 ft (3.618 m), from rating curve extended above 18 ft^3/s (0.51 m^3/s) on basis of slope-area measurement at gage height 11.87 ft (3.618 m); no flow at times in 1965, 1969-80.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft^3/s (8.78 m^3/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft^3/s)	Discharge (m^3/s)	Gage height (ft)	Gage height (m)
Nov. 17	a2300	*8300	235	*11.87	3.618
Mar. 18	a0700	3350	94.9	9.12	2.780
Mar. 23	a1400	2570	72.8	8.50	2.591

No flow for many days.

a About.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.09	.30	.01	.00	.10	3.0	.25	.04	.01	.01	.01
2	.00	.05	.25	.00	.00	.05	40	.20	.03	.02	.01	.01
3	.05	.04	.25	.00	.00	.05	10	.20	.03	.01	.01	.01
4	.01	.11	.20	.00	.00	.05	5.0	.15	.35	.03	.01	.70
5	.01	.09	.20	.00	.00	.10	3.0	.15	.35	.01	.01	.45
6	.01	.11	.15	.00	.00	10	2.5	.10	.05	1.0	.01	.05
7	.21	.05	.15	.00	.00	5.0	2.0	.05	.04	2.0	.01	.01
8	.21	.03	.15	.00	.00	3.0	2.0	.05	.04	.10	.01	.01
9	.04	.03	.10	.59	.00	3.5	1.5	.07	.10	.04	.01	.01
10	.03	.02	.10	1.2	.00	4.0	1.5	.03	.25	.03	.01	.01
11	.02	.01	.10	.01	.00	3.5	1.0	.05	1.3	.05	.01	.01
12	.01	.01	.07	.00	.00	3.0	1.5	.50	2.2	.04	.01	.01
13	.01	.01	.06	.00	.00	3.5	2.5	.60	1.8	.04	.01	.01
14	.00	.01	.05	.00	.00	10	3.0	.04	1.1	.03	.01	.00
15	.00	.24	.03	.00	.00	5.0	10	.02	.94	.02	.01	.00
16	.26	37	.02	.00	.00	25	5.0	.02	.86	.01	.00	.00
17	.19	803	.02	.00	.00	200	4.0	.02	.35	.03	.00	.00
18	.30	50	.02	.00	.00	400	3.5	.01	.25	.45	.00	.00
19	.57	10	.01	.00	.00	30	3.0	.01	.16	.04	.00	.00
20	.39	5.0	.01	.00	.00	10	2.0	.01	.13	.02	.00	.50
21	.39	2.0	.01	.00	.00	5.0	1.5	.01	.13	.01	.00	5.0
22	.21	1.5	.01	.00	.00	25	1.5	.02	.07	.01	.00	1.0
23	.13	1.0	.01	.00	.00	500	1.0	.01	.05	.01	.00	.75
24	.07	.90	.01	.00	.00	600	10	.01	.04	.01	.00	.60
25	.05	.70	.01	.00	.00	300	3.0	.01	.05	.01	.00	.50
26	.04	.60	.01	.00	.00	100	2.0	.20	.03	.01	.00	.40
27	.05	.50	.01	.00	.00	30	1.5	.13	.03	.01	.00	.30
28	.05	.40	.01	.00	.00	20	1.0	.03	.01	.01	.00	.20
29	.07	.35	.01	.00	.00	10	.75	.01	.01	.01	.01	.15
30	.13	.30	.01	.00	---	5.0	.35	.01	.01	.01	.05	.10
31	.11	---	.01	.00	---	4.0	---	.03	---	.01	.03	---
TOTAL	3.62	918.15	2.35	1.81	.00	2314.85	128.60	3.00	10.80	4.09	.24	10.80
MEAN	.12	30.5	.076	.058	.000	74.7	4.29	.097	.36	.13	.008	.36
MAX	.57	803	.30	1.2	.00	600	40	.60	2.2	2.0	.05	5.0
MIN	.00	.01	.01	.00	.00	.05	.35	.01	.01	.01	.00	.00
AC-FT	7.2	1810	4.7	3.6	.00	4590	255	6.0	21	8.1	.5	21

CAL YR 1979 TOTAL 1550.15 MEAN 4.25 MAX 803 MIN .00 AC-FT 3070
WTR YR 1980 TOTAL 3394.31 MEAN 9.27 MAX 803 MIN .00 AC-FT 6730

NOTE.--No gage-height record Nov. 18 to Dec. 21, Mar. 1 to May 8.

HAWAII, ISLAND OF HAWAII

16701800 WAILUKU RIVER NEAR KAUMANA

LOCATION.--Lat 19°43'15", long 155°16'08", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) upstream from Waipahoehoe Gulch and 8.4 mi (13.5 km) west of Kaumana.

DRAINAGE AREA.--43.4 mi² (112.4 km²).

PERIOD OF RECORD.--October 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,520 ft (1,073 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 31.3 ft³/s (0.886 m³/s), 22,680 acre-ft/yr (28.0 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,800 ft³/s (391 m³/s) Nov. 17, 1979, gage height, 16.30 ft (4.968 m), from rating curve extended above 2,200 ft³/s (62.3 m³/s); no flow Mar. 13, 14, 1970, Jan. 13-18, Feb. 6, 7, 12, 13, 25-28, Mar. 1, 2, 4-8, 1978, Jan. 22 to Feb. 10, Feb. 15-29, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,500 ft³/s (42.5 m³/s) and maximum (*), from rating curve extended above 2,200 ft³/s (62.3 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 17	2330	*13800	391	*16.30	4.968	Mar. 23	1500	6370	180	11.20	3.414
Mar. 18	0730	6650	188	11.40	3.475	Apr. 2	0700	2540	71.9	7.67	2.338

No flow for many days January and February.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.28	.91	3.7	.85	.00	1.3	41	4.0	9.7	2.8	1.6	15
2	.22	.79	6.3	.82	.00	.43	602	3.4	8.1	3.1	1.7	10
3	1.0	.76	2.6	.82	.00	.09	96	3.5	6.3	3.9	1.7	5.0
4	.43	1.2	2.2	.82	.00	.07	60	2.6	32	6.3	2.3	7.0
5	.40	.79	2.2	.79	.00	.71	31	5.4	16	3.4	5.0	10
6	6.1	1.1	2.2	.79	.00	202	25	11	8.3	15	8.0	5.0
7	26	.70	2.3	.76	.00	176	17	5.2	6.5	62	5.0	4.0
8	4.9	.61	6.3	.76	.00	29	14	4.1	7.0	5.7	4.0	3.5
9	23	.58	2.7	.82	.00	50	11	5.7	9.2	4.6	3.5	3.0
10	6.4	.55	1.9	2.4	.00	134	8.3	3.7	13	4.3	3.0	2.5
11	1.2	.52	1.6	.97	.01	85	7.6	4.3	53	5.5	2.0	3.5
12	.82	.52	1.5	.82	.06	25	4.9	19	51	5.4	1.5	3.0
13	.73	.49	1.4	.76	.05	43	47	22	33	4.1	1.2	2.5
14	.64	.52	1.2	.58	.01	229	49	5.1	23	4.0	1.1	2.0
15	.52	4.3	1.2	.43	.00	75	107	4.7	21	3.8	1.0	1.5
16	11	613	1.2	.28	.00	487	23	5.2	16	3.1	1.1	1.5
17	56	2040	1.1	.15	.00	1830	13	4.3	10	3.8	1.8	1.0
18	2.3	3680	1.0	.06	.00	2080	11	3.1	8.3	20	1.6	1.0
19	10	216	.97	.02	.00	339	8.8	3.1	6.6	5.4	1.3	3.0
20	4.9	80	.94	.02	.00	220	6.6	3.0	5.4	3.8	1.1	5.0
21	4.4	39	.97	.02	.00	120	5.4	3.0	4.7	3.7	1.5	150
22	2.2	29	.94	.00	.00	301	5.7	3.5	4.4	3.4	1.1	30
23	1.8	18	1.1	.00	.00	3620	4.9	4.0	4.1	3.0	1.1	15
24	1.4	12	1.2	.00	.00	4140	105	3.5	3.4	2.4	1.0	10
25	1.2	11	.97	.00	.00	2580	10	3.0	4.6	2.1	1.0	9.0
26	1.0	7.6	.91	.00	.00	1430	7.8	12	3.8	2.1	.94	8.0
27	1.1	6.3	.88	.00	.00	342	6.5	7.5	3.3	2.5	.95	7.0
28	1.1	5.2	.88	.00	.00	285	5.1	6.3	2.6	2.4	1.5	6.0
29	1.3	4.7	.88	.00	.00	220	4.6	5.4	2.2	2.0	5.0	3.5
30	1.7	4.1	1.0	.00	---	120	4.9	5.2	2.2	2.4	25	3.0
31	1.1	---	.94	.00	---	70	---	9.0	---	1.7	20	---
TOTAL	175.14	6780.24	55.18	13.74	.13	19234.60	1348.1	184.8	378.7	197.7	108.59	330.5
MEAN	5.65	226	1.78	.44	.004	620	44.9	5.96	12.6	6.38	3.50	11.0
MAX	56	3680	6.3	2.4	.06	4140	602	22	53	62	25	150
MIN	.22	.49	.88	.00	.00	.07	4.6	2.6	2.2	1.7	.94	1.0
AC-FT	347	13450	109	27	.3	38150	2670	367	751	392	215	656

CAL YR 1979 TOTAL 13582.30 MEAN 37.2 MAX 3680 MIN .15 AC-FT 26940
WTR YR 1980 TOTAL 28807.42 MEAN 78.7 MAX 4140 MIN .00 AC-FT 57140

NOTE.--No gage-height record Aug. 27 to Sept. 30.

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) downstream from Hookelekele Stream, 0.9 mi (1.4 km) west of Piihonua, and 4.1 mi (6.6 km) west of Hilo Post Office. Prior to Nov. 16, 1977, at opposite site on left bank.

DRAINAGE AREA.--230 mi² (596 km²), of which 81 mi² (210 km²) 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.

GAGE.--Water-stage recorder. Altitude of gage is 1,090 ft (332 m), from topographic map. Prior to Nov. 16, 1977, at opposite site on left bank at same datum.

REMARKS.--Records good. Hawaii County Board of Water Supply diverts about 6 ft³/s (0.17 m³/s) above station for domestic supply. Kapehu ditch diverted from Kapehu Stream into Wailuku River above station 1938-63. Station discontinued as a National stream-quality accounting network station.

AVERAGE DISCHARGE.--49 years (water years, 1929-39, 1942-47, 1949-80), 287 ft³/s (8.1300 m³/s), 207,900 acre-ft/yr (256 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum gage height 28.6 ft (8.72 m), from floodmarks, Aug. 11, 1940 (discharge not determined); minimum, 0.25 ft³/s (0.007 m³/s) Mar. 9, 1941.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 8,700 ft³/s (246 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 17	2330	*60200	1700	*26.16	7.974	Mar. 23	a1530	24800	702	20.0	6.10
Mar. 18	a0800	31300	886	21.5	6.55	Apr. 2	0730	11700	331	16.0	4.88

Minimum discharge, 0.26 ft³/s (0.007 m³/s) Feb. 25.

a About.

REVISIONS.--Some peak discharges and annual maximum (*) for the years 1929-35, 1937, 1939-42, 1945-53, 1955-58, 1960-64, 1967-68, 1970-71, 1974-76, 1979 have been revised, superseding figures published in WSP 695, 710, 740, 755, 770, 795, 815, 835, 865, 885, 935, 965, 985, 1045, 1065, 1095, 1125, 1155, 1185, 1219, 1249, 1289, 1399, 1449, 1569, 1639, 1739, 1937 and 2137; WRD Hawaii 1971, 1974, WDR-HI-1975-76-1 and WDR HI-1979-1.

Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1929	Feb. 15, 1929	0630	*16200	459	*17.5	5.334
1930	Nov. 18, 1929	--	*8930	253	*15.07	4.593
1931	July 21, 1931	--	*24800	702	a*20.01	6.099
1933	Dec. 2, 1932	--	*22400	634	*19.35	5.898
1934	Jan. 23, 1934	--	*10200	289	*15.50	4.724
1935	Apr. 17, 1935	--	*14000	396	*16.78	5.115
	July 25, 1935	--	10000	283	15.44	4.706
1937	Feb. 17, 1937	--	*35000	991	*22.2	6.767
	Aug. 2, 1937	--	32300	915	21.70	6.614
1939	Feb. 10, 1939	--	*15900	450	*17.41	5.307
1940	Aug. 11, 1940	--	* ND	--	*28.6	8.717
1941	Sept. 6, 1941	--	*33600	952	*21.95	6.690
1942	Sept. 15, 1942	--	*22300	632	*19.32	5.889
1945	Oct. 31, 1944	--	*19500	552	*18.50	5.639
1946	Nov. 13, 1945	--	*10900	309	*15.74	4.798
1947	Dec. 20, 1946	--	*15800	447	*17.38	5.297
1948	Between Dec. 1 and Apr. 17, 1948	--	*20500	581	*18.81	5.733
1949	Nov. 11, 1948	1130	*18900	535	*18.35	5.593
1950	Nov. 27, 1949	0430	*17300	490	*17.88	5.450
1951	Mar. 1, 1951	1530	*16000	453	*17.44	5.316
1952	Nov. 20, 1951	0700	*27200	770	*20.60	6.279
1953	Nov. 11, 1952	0600	*11500	326	*15.93	4.856
1955	Dec. 14, 1954	1700	*15600	442	*17.31	5.276
1956	Feb. 18, 1956	2300	14100	348	16.80	5.121
	Aug. 17, 1956	0600	*46800	1330	*24.17	7.367
1957	Aug. 24, 1957	0200	*32600	923	*21.76	6.632
1958	July 17, 1958	1000	*31100	881	*21.45	6.538
1960	Nov. 2, 1959	--	13200	374	16.5	5.029
	Dec. 18, 1959	0600	*14400	408	*16.9	5.151
1961	Nov. 11, 1960	2000	*11500	326	*15.94	4.859
1962	Oct. 28, 1961	2230	17500	496	17.94	5.468
	Nov. 23, 1961	0430	*24400	691	*19.90	6.066
	Dec. 14, 1961	0530	22700	643	19.43	5.922
1963	Apr. 18, 1963	0330	19500	552	18.50	5.639
	July 22, 1963	0300	*20700	589	*18.87	5.752
1964	Mar. 8, 1964	0930	*25200	714	*20.10	6.127
1967	Aug. 8, 1967	0600	*32900	932	*21.81	6.648
1968	Nov. 26, 1967	1945	*33600	952	*21.95	6.690
1970	Aug. 26, 1970	0530	*24600	697	*19.96	6.084
1971	Dec. 2, 1970	1915	*22000	623	*19.22	5.858
1974	Nov. 20, 1973	0600	*21000	595	*18.93	5.770
1975	Jan. 8, 1975	1330	*34600	980	*22.13	6.745
1976	Jan. 5, 1976	2215	*25600	725	*20.20	6.157
1979	Jan. 23, 1979	0130	*18200	515	*18.15	5.532
	Feb. 20, 1979	0930	17100	484	17.80	5.425

*ND Discharge not determined due to doubtful gage height.

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.7	30	38	23	2.1	85	300	175	295	66	72	340
2	14	24	28	18	2.0	25	2500	153	255	80	91	190
3	64	21	24	15	1.9	12	800	257	202	132	74	133
4	29	54	19	14	1.9	14	700	174	609	201	88	574
5	36	28	17	13	2.0	204	600	270	456	108	103	643
6	681	29	17	12	1.9	2320	300	555	240	117	195	320
7	325	22	45	12	1.8	1150	200	305	198	713	107	202
8	175	18	264	12	1.7	1020	150	226	176	169	86	136
9	410	17	105	16	3.1	894	100	292	207	183	78	106
10	295	16	68	17	2.0	1150	150	186	359	159	73	88
11	143	15	55	14	4.5	787	175	207	963	174	61	106
12	77	13	51	8.6	3.4	446	500	387	868	207	55	97
13	62	11	55	8.3	3.1	700	2000	520	715	150	99	88
14	47	16	45	7.5	2.4	1700	1000	245	516	142	95	79
15	38	345	40	7.1	2.0	926	1390	189	447	151	92	70
16	52	8100	36	6.6	1.8	1010	687	206	397	117	90	62
17	499	10600	33	5.9	1.6	8000	424	238	230	123	87	54
18	87	8000	33	5.3	1.5	5000	361	177	207	351	99	97
19	206	1600	27	4.9	1.4	2500	289	129	150	159	96	106
20	121	791	25	4.5	1.3	1500	223	125	120	120	37	296
21	109	430	25	3.2	1.1	800	189	120	98	117	61	1920
22	69	359	23	2.9	.58	2000	179	131	79	122	24	790
23	60	329	27	2.8	.66	5000	215	133	78	120	22	390
24	46	257	50	2.7	.39	8500	300	133	60	91	18	238
25	38	187	32	2.5	.36	5000	309	111	161	78	18	172
26	32	135	25	2.5	.35	4000	369	292	135	71	17	134
27	40	98	22	2.4	.36	1500	294	240	102	81	15	104
28	31	69	20	2.4	.38	2500	215	184	82	94	21	86
29	36	62	22	2.3	1.2	1000	202	160	71	75	56	70
30	46	49	42	2.2	---	800	231	143	64	107	470	64
31	35	---	33	2.2	---	600	---	208	---	84	950	---
TOTAL	3911.7	27675	1396	252.8	48.78	61143	15152	6871	8536	4662	2605	7655
MEAN	126	923	43.4	8.15	1.68	1972	505	222	285	150	84.0	255
MAX	681	10600	264	23	4.5	8500	2500	555	963	713	470	1920
MIN	8.7	11	17	2.2	.35	12	100	111	60	66	15	47
AC-FT	7760	54890	2670	501	97	121300	30050	13630	16930	9250	5170	15180

CAL YR 1979 TOTAL 132064.10 MEAN 362 MAX 10600 MIN 5.8 AC-FT 261900
WTR YR 1980 TOTAL 139858.28 MEAN 382 MAX 10600 MIN .35 AC-FT 277400

HAWAII, ISLAND OF HAWAII

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 (152 m) upstream from Wailuku bridge and 0.2 mi (0.3 km) west of Hilo Post Office.

DRAINAGE AREA.--256 mi² (663 km²), of which 81 mi² (210 km²) probably is noncontributing.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--March 1977 to September 1979. Station destroyed by flood of November 17, 1979. Re-established June 1, 1980.

GAGE.--Water-stage recorder. Altitude of gage is 80 ft (24 m), from topographic map.

REMARKS.--Records good. Hilo Electric Light Co. diverts above station for Hydro-plant use.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 65,500 ft³/s (1,850 m³/s) Nov. 17, 1979, gage height 34.57 ft (10.54 m) from floodmarks and from rating curve extended above 6,840 ft³/s (194 m³/s) on basis of slope-area measurements at gage heights 23.30 ft (7.102 m) and 34.57 ft (10.54 m); minimum, 6.9 ft³/s (0.20 m³/s) Jan. 18, 1978.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 9,500 ft³/s (269 m³/s) and maximum (*) during period November 1979, June to September 1980, from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 17	2330	*65500	1850	*a34.57	10.54
Sept. 21	0930	19300	547	a17.00	5.182

Minimum discharge, 15.0 ft³/s (0.42 m³/s) Aug. 26, 27.

a Floodmark.

DISCHARGE, IN CUBIC FEET PER SECOND, JUNE 1980 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1									729	76	52	600
2									680	105	81	298
3									580	267	57	194
4									1390	580	87	1020
5									1100	280	93	1000
6									700	220	268	522
7									588	1470	105	319
8									560	370	64	222
9									600	310	51	167
10									950	255	59	128
11									2130	295	35	179
12									1960	340	28	157
13									1800	210	24	242
14									1380	190	22	260
15									1220	230	20	275
16									1100	144	21	280
17									775	139	22	206
18									750	474	30	190
19									560	220	32	180
20									488	120	25	536
21									418	112	51	4550
22									355	128	44	1500
23									325	112	22	760
24									268	61	19	505
25									540	45	20	370
26									340	45	15	265
27									136	61	16	206
28									97	99	26	164
29									78	54	99	125
30									71	112	760	103
31									---	76	800	---
TOTAL									22666	7200	3048	15523
MEAN									756	232	98.3	517
MAX									2130	1470	800	4550
MIN									71	45	15	103
AC-FT									44960	14280	6050	30790

16713000 WAILUKU RIVER AT HILO--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: March 1977 to September 1979. June to September 1980.

INSTRUMENTATION.--Automatic pumping sediment sampler since March 1977.

REMARKS.--In addition to the sediment sampler record, water-quality samples were collected at this station.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 292 mg/L Sept. 21, 1980; minimum daily mean, 1 mg/L on several days in April, July, August, September 1978, and Sept. 17, 1979.
SEDIMENT DISCHARGE: Maximum daily, 14,100 tons (12,800 tonnes) Feb. 20, 1979; minimum daily, 0.03 ton (0.03 tonne) Sept. 17, 1979.

EXTREMES FOR PERIOD JUNE TO SEPTEMBER 1980.--
SEDIMENT CONCENTRATIONS: Maximum daily mean, 292 mg/L Sept. 21; minimum daily mean, 2 mg/L Aug. 14-17, Sept. 26, 27.
SEDIMENT DISCHARGE: Maximum daily, 5,510 tons (5,000 tonnes) Sept. 21, minimum daily, 0.11 ton (0.10 tonne) Aug. 15, 16.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
OCT												
23...	0825	15	45	7.2	18.0	2.6	8.6	140	580	18	5	4.4
DEC												
05...	1000	38	64	7.0	17.0	.40	8.9	100	560	20	0	4.1
17...	1000	43	64	7.5	18.5	.50	9.0	230	360	23	1	4.6
JAN												
14...	1030	24	60	7.2	18.0	--	--	--	--	--	--	--
29...	0900	27	80	7.6	16.0	1.3	8.9	K8	73	33	2	6.2
MAR												
31...	0815	1160	31	7.1	15.0	1.6	8.9	70	130	9	2	1.7
APR												
07...	0830	875	40	7.2	17.0	.90	8.9	120	65	11	3	2.2
22...	0815	340	50	7.1	17.0	.60	8.9	69	66	16	0	3.1
MAY												
13...	0945	850	24	7.0	18.0	2.7	8.9	300	2000	8	2	1.5
JUN												
17...	0945	790	40	7.3	18.0	1.4	9.0	49	58	12	4	2.4
JUL												
23...	1030	130	52	7.2	19.0	1.1	9.0	120	180	18	2	3.6
AUG												
13...	1230	27	56	7.1	21.0	--	--	--	--	--	--	--
27...	0945	16	73	7.3	19.0	2.3	8.9	32	74	28	2	5.7
SEP												
24...	0930	526	45	7.2	18.5	1.3	9.0	76	440	14	0	2.8

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)
OCT											
23...	1.7	3.1	25	.3	5.0	1.9	13	--	9.7	9.5	.0
DEC											
05...	2.3	3.8	28	.4	6.6	.8	20	--	.3	9.9	.0
17...	2.8	3.9	26	.4	6.5	.6	22	--	1.1	9.8	.1
JAN											
14...	--	--	--	--	--	--	--	--	--	--	--
29...	4.2	3.8	20	.3	--	.6	31	--	1.7	6.0	.1
MAR											
31...	1.1	2.5	37	.4	--	.3	7	--	.4	3.7	.1
APR											
07...	1.3	2.4	32	.3	--	.4	8	--	2.3	3.8	.1
22...	1.9	3.1	29	.3	--	.5	16	--	2.1	3.8	.1
MAY											
13...	1.0	2.1	36	.3	--	.3	6	--	1.7	2.3	.1
JUN											
17...	1.5	2.4	29	.3	--	.3	8	--	.4	3.1	.0
JUL											
23...	2.2	3.1	27	.3	--	.3	16	--	1.5	4.0	.2
AUG											
13...	--	--	--	--	--	--	--	--	--	--	--
27...	3.4	4.6	26	.4	--	.6	26	--	1.3	5.4	.0
SEP											
24...	1.7	2.5	27	.3	--	.4	14	--	.4	4.0	.1

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	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, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS NH4)
OCT											
23...	11	39	45	.05	1.58	.12	.14	.03	.03	.00	.04
DEC											
05...	14	43	43	.06	4.41	.18	.23	.04	.04	.05	.05
17...	15	48	47	.07	5.57	.22	.22	.01	.01	.01	.01
JAN											
14...	--	--	--	--	--	--	--	--	--	--	--
29...	17	61	59	.08	4.45	.19	.19	.01	.01	.01	.01
MAR											
31...	7.9	26	22	.04	81.4	.09	.09	.03	.03	.04	.04
APR											
07...	9.5	31	27	.04	73.2	.10	.10	.01	.01	.01	.01
22...	12	38	37	.05	34.9	.13	.13	.02	.02	.02	.03
MAY											
13...	5.8	17	19	.02	39.0	.03	.04	.00	.02	.00	.03
JUN											
17...	8.5	31	24	.04	66.1	.08	.10	.00	.03	.00	.04
JUL											
23...	12	47	40	.06	16.5	.08	--	.00	--	.00	--
AUG											
13...	--	--	--	--	--	--	--	--	--	--	--
27...	17	62	54	.08	2.68	.15	.13	.02	.02	.03	.03
SEP											
24...	10	34	31	.05	48.3	.12	.13	.00	.00	.00	.00

DATE	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)
OCT											
23...	.40	.30	.47	.43	.10	.33	.55	2.4	.010	.03	.010
DEC											
05...	.88	.52	.79	.88	.32	.56	1.1	4.7	.030	.09	.030
17...	.22	.22	.45	.23	.00	.23	.45	2.0	.010	.03	.000
JAN											
14...	--	--	--	--	--	--	--	--	--	--	--
29...	.38	.38	.58	.39	.00	.39	.58	2.6	.020	.06	.000
MAR											
31...	.29	.29	.41	.32	.00	.32	.41	1.8	.010	.03	.030
APR											
07...	.28	.28	.39	.29	.00	.29	.39	1.7	.020	.06	.000
22...	.20	.21	.36	.22	.00	.23	.35	1.6	.010	.03	.010
MAY											
13...	2.0	.56	.62	2.0	1.4	.58	2.0	9.0	.020	.06	.020
JUN											
17...	.39	.25	.38	.39	.11	.28	.47	2.1	.010	.03	.010
JUL											
23...	.85	--	--	.85	.00	.85	.93	4.1	.010	.03	.010
AUG											
13...	--	--	--	--	--	--	--	--	--	--	--
27...	.15	.16	.31	.17	.00	.18	.32	1.4	.020	.06	.020
SEP											
24...	.31	.25	.38	.31	.06	.25	.43	1.9	.020	.06	.010

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)
DEC 17...	1000	1	0	1	200	200	10	<1	0	<1	12
APR 07...	0830	1	1	0	9	0	9	1	0	<1	0
JUN 17...	0945	1	0	1	8	0	8	2	0	2	0
SEP 24...	0930	1	0	1	9	0	9	<1	0	<1	0

DATE	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, SUS-PENDED RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)
DEC 17...	12	0	<3	0	<3	2	2	0	130	70	60
APR 07...	0	0	2	0	<3	1	0	1	160	130	30
JUN 17...	0	0	<3	0	<3	4	3	1	400	370	30
SEP 24...	0	0	<3	0	<3	7	6	1	280	230	50

DATE	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
DEC 17...	3	3	0	10	7	3	.0	.0	.0	2
APR 07...	11	11	0	10	6	4	.0	.0	.0	6
JUN 17...	1	1	0	10	7	3	.0	.0	.0	2
SEP 24...	10	10	0	10	6	4	.0	.0	.0	10

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, SUS-PENDED RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
DEC 17...	0	2	0	0	0	0	0	30	27	<3
APR 07...	6	0	0	0	0	0	0	20	17	<3
JUN 17...	0	2	0	0	0	0	0	20	17	<3
SEP 24...	9	1	0	0	0	0	0	20	17	<3

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

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)
DEC		
05...	1000	0
17...	1000	0
MAR		
31...	0815	0
APR		
07...	0830	0
MAY		
13...	0945	0
JUN		
17...	0945	0
AUG		
27...	0945	0
SEP		
24...	0930	0

DATE	TIME	CARBON, ORGANIC TOTAL (MG/L AS C)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED (MG/L AS C)
OCT				
23...	0825	4.2	--	--
DEC				
05...	1000	.9	--	--
17...	1000	--	.7	.0
JAN				
29...	0900	1.0	--	--
MAR				
31...	0815	1.0	--	--
APR				
07...	0830	--	.0	.0
22...	0815	1.2	--	--
MAY				
13...	0945	6.6	--	--
JUN				
17...	0945	--	2.3	.0
JUL				
23...	1030	2.8	--	--
AUG				
27...	0945	.9	--	--
SEP				
24...	0930	--	2.1	.0

16713000 WAILUKU RIVER AT HILO--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	PHYTO-PLANK-TON, TOTAL (CELLS PER ML)	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)	LENGTH OF EXPO-SURE (DAYS)
OCT								
23...	0825	26	--	--	--	--	--	--
DEC								
05...	1000	200	--	--	--	--	--	--
17...	1000	120	--	--	--	--	--	--
JAN								
14...	1030	--	1.57	.950	13.7	4.28	45.3	40
29...	0900	1400	--	--	--	--	--	--
MAR								
31...	0815	50	--	--	--	--	--	--
APR								
07...	0830	130	--	--	--	--	--	--
22...	0815	260	--	--	--	--	--	--
MAY								
13...	0945	450	--	--	--	--	--	--
JUN								
17...	0945	120	--	--	--	--	--	--
JUL								
23...	1030	340	.315	.236	.000	.000	--	40
AUG								
13...	1230	--	--	--	14.1	.870	--	25
27...	0945	410	--	--	--	--	--	--
SEP								
24...	0930	620	--	--	--	--	--	--

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT					
23...	0825	15	1	.04	100
DEC					
05...	1000	38	4	.41	100
17...	1000	43	3	.35	100
JAN					
14...	1030	24	--	--	--
29...	0900	27	0	.00	100
MAR					
31...	0815	1160	5	16	100
APR					
07...	0830	875	0	.00	100
22...	0815	340	0	.00	100
MAY					
13...	0945	850	6	14	100
JUN					
17...	0945	790	1	2.1	100
JUL					
23...	1030	130	2	.70	100
AUG					
13...	1230	27	--	--	--
27...	0945	16	1	.04	100
SEP					
24...	0930	526	1	1.4	--

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO--Continued

SEDIMENT DISCHARGE, SUSPENDED (TONS/DAY), JUNE TO SEPTEMBER 1980

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							729	10	20
2							680	8	15
3							580	5	7.8
4							1390	12	45
5							1100	10	30
6							700	8	15
7							588	8	13
8							560	5	7.6
9							600	5	8.1
10							950	10	26
11							2130	12	69
12							1960	10	53
13							1800	5	24
14							1380	8	30
15							1220	6	20
16							1100	5	15
17							775	4	8.4
18							750	5	10
19							560	5	7.6
20							488	4	5.3
21							418	4	4.5
22							355	4	3.8
23							325	5	4.4
24							268	4	2.9
25							540	6	8.7
26							340	6	5.5
27							136	6	2.2
28							97	5	1.3
29							76	4	.82
30							71	3	.58
31							---	---	---
TOTAL							22666	---	963.50

		JULY			AUGUST			SEPTEMBER	
1	76	4	.82	52	3	.42	600	6	9.7
2	105	3	.85	81	4	.87	298	4	3.2
3	267	7	5.0	57	4	.62	194	4	2.1
4	580	7	11	87	3	.70	1020	39	279
5	280	5	3.8	93	3	.75	1000	40	108
6	220	4	2.4	268	5	3.6	522	18	25
7	1470	28	111	105	4	1.1	319	12	10
8	370	15	15	64	3	.52	222	10	6.0
9	310	12	10	51	3	.41	167	8	3.6
10	255	8	5.5	59	3	.48	128	8	2.8
11	295	8	6.4	35	3	.28	179	6	2.9
12	340	7	6.4	28	3	.23	157	5	2.1
13	210	6	3.4	24	3	.19	242	4	2.6
14	190	5	2.6	22	2	.12	260	4	2.8
15	230	4	2.5	20	2	.11	275	4	3.0
16	144	4	1.6	21	2	.11	280	4	3.0
17	139	3	1.1	22	2	.12	206	5	2.8
18	474	10	13	30	3	.29	190	5	2.6
19	220	8	4.8	32	4	.35	180	6	2.9
20	120	5	1.6	25	3	.20	536	45	65
21	112	5	1.5	51	4	.55	4550	292	5510
22	128	5	1.7	44	3	.36	1500	40	162
23	112	4	1.2	22	3	.18	760	6	12
24	61	3	.49	19	3	.15	505	5	6.8
25	45	3	.36	20	3	.16	370	4	4.0
26	45	4	.49	15	3	.12	265	3	2.1
27	61	3	.49	16	3	.13	206	4	2.2
28	99	4	1.1	26	3	.21	164	2	.89
29	54	4	.58	99	5	1.3	125	2	.68
30	112	4	1.2	760	15	31	103	3	.83
31	76	3	.62	800	12	26	---	---	---
TOTAL	7200	---	218.50	3048	---	71.58	15523	---	6240.60
YEAR	48437		6995.18						

NOTE: NUMBER OF MISSING DAYS OF RECORD EXCEEDED 20% OF YEAR

16713000 WAILUKU RIVER AT HILO--Continued

QUALITATIVE AND ASSOCIATED QUANTITATIVE ANALYSES OF BIOLOGICAL DATA

PHYTOPLANKTON ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

DATE	APR 22,80	MAY 13,80	JUN 17,80	JUL 23,80	AUG 27,80	SEP 24,80
TIME	0815	0945	0945	1030	0945	0930
TOTAL CELLS/ML	260	450	120	340	410	620
DIVERSITY: DIVISION	0.8	1.5	0.5	0.4	0.6	0.3
.CLASS	0.8	1.5	0.5	0.4	0.6	0.3
..ORDER	1.1	1.7	0.5	0.4	1.2	0.5
...FAMILY	1.6	2.2	0.5	0.4	1.2	0.5
....GENUS	1.6	2.2	0.5	0.4	1.2	0.5

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)												
.CHLOROPHYCEAE												
..CHLOROCOCCALES												
...MICRACTINIACEAE												
....MICRACTINIUM	--	-	--	-	--	-	--	-	--	-	--	-
...OOCYSTACEAE												
....ANKISTRODESMUS	--	-	--	-	--	-	--	-	--	-	--	-
....CHLORELLA	--	-	--	-	--	-	--	-	--	-	--	-
....SELENASTRUM	--	-	--	-	--	-	--	-	13	3	--	-
...SCENEDESMACEAE												
....SCENEDESMUS	--	-	--	-	--	-	--	-	--	-	--	-
..CLADOPHORALES												
...CLADOPHORACEAE												
....CLADOPHORA	--	-	130#	29	--	-	--	-	--	-	--	-
..ULOTRICHALES												
...CHAETOPHORACEAE												
....STIGEOCLONIUM	180#	70	--	-	--	-	--	-	--	-	--	-
..VOLVOCALES												
...CHLAMYDOMONADACEAE												
....CHLAMYDOMONAS	13	5	--	-	--	-	--	-	--	-	--	-
CHRYSOPHYTA												
.BACILLARIOPHYCEAE												
..CENTRALES												
...COSCINODISCACEAE												
....CYCLOTELLA	--	-,	13	3	--	-	--	-	--	-	--	-
..PENNALES												
...ACHNANTHACEAE												
....ACHNANTHES	13	5	39	9	13	11	--	-	--	-	--	-
...CYMBELLACEAE												
....CYMBELLA	--	-	13	3	--	-	--	-	--	-	--	-
...FRAGILARIACEAE												
....FRAGILARIA	--	-	13	3	--	-	--	-	--	-	--	-
....SYNEDRA	13	5	--	-	--	-	--	-	--	-	--	-
...GOMPHONEMATACEAE												
....GOMPHONEMA	--	-	--	-	--	-	--	-	--	-	--	-
...NAVICULACEAE												
....NAVICULA	13	5	26	6	--	-	--	-	39	9	39	6
...NITZSCHIACEAE												
....NITZSCHIA	26	10	13	3	--	-	26	8	--	-	--	-
CRYPTOPHYTA (CRYPTOMONADS)												
.CRYPTOPHYCEAE												
..CRYPTOMONADALES												
...CRYPTOMONADACEAE												
....CRYPTOMONAS	--	-	--	-	--	-	--	-	--	-	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)												
.CYANOPHYCEAE												
..CHROOCOCCALES												
...CHROOCOCCACEAE												
....ANACYSTIS	--	-	--	-	--	-	--	-	69#	16	13	2
..HORMOGONALES												
...NOSTOCACEAE												
....ANABAENA	--	-	--	-	--	-	--	-	--	-	--	-
...OSCILLATORIACEAE												
....OSCILLATORIA	--	-	210#	46	100#	89	310#	92	300#	72	570#	92
PYRRHOPHYTA (FIRE ALGAE)												
.DINOPHYCEAE												
..PERIDINIALES												
...GLENODINIACEAE												
....GLENODINIUM	--	-	--	-	--	-	--	-	--	-	--	-

NOTE: # - DOMINANT ORGANISM; EQUAL TO OR GREATER THAN 15%
* - OBSERVED ORGANISM, MAY NOT HAVE BEEN COUNTED; LESS THAN 1/2%

HAWAII, ISLAND OF HAWAII

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 (1.1 km) downstream from Pohakupaa Stream, 4.1 mi (6.6 km) west of Papaikou, and 4.8 mi (7.7 km) northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi² (30.0 km²).

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. Altitude of gage is 1,540 ft (469 m), 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 (0.8 km) upstream at different datum.

REMARKS.--Records good. No diversion above station. During period 1911-13, Honolii ditch diverted an average of about 3.2 ft³/s (0.091 m³/s) above station for fluming cane and domestic use.

AVERAGE DISCHARGE.--14 years, 131 ft³/s (3.710 m³/s), 94,910 acre-ft/yr (117 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft³/s (640 m³/s) May 23, 1978, gage height, 20.00 ft (6.096 m), from floodmarks and from rating curve extended above 4,610 ft³/s (131 m³/s) on basis of slope-area measurement at gage height 20.00 ft (6.096 m); minimum, 0.8 ft³/s (0.023 m³/s) Jan. 31, 1912.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 4,400 ft³/s (125 m³/s) and maximum (*), from rating curve as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 17	0230	*14500	411	*18.00	5.486	Mar. 23	2330	10800	306	16.64	5.072
Mar. 6	1530	4700	133	12.11	3.691	Sept. 21	0800	8420	238	15.46	4.712
Mar. 17	1430	12600	357	17.37	5.294						

Minimum discharge, 1.0 ft³/s (0.03 m³/s) Feb. 22-28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	13	37	16	1.4	214	147	50	97	23	28	149
2	5.0	9.4	36	12	1.4	34	1390	50	85	38	46	54
3	23	8.1	39	10	1.4	16	462	91	101	97	31	34
4	13	33	35	9.0	1.3	27	376	47	356	102	50	369
5	34	14	23	8.4	5.0	280	147	105	162	42	43	218
6	567	21	23	8.0	3.8	2220	145	210	64	106	73	70
7	103	11	37	7.8	2.0	970	78	85	58	449	33	40
8	53	7.8	176	7.5	1.7	667	54	53	68	51	26	32
9	258	6.1	49	7.6	2.6	534	45	104	97	59	28	29
10	70	5.3	29	14	4.7	889	51	47	177	48	28	26
11	30	5.0	22	9.2	55	480	82	66	592	80	20	51
12	18	4.7	26	7.8	20	251	347	162	374	82	17	35
13	14	4.7	24	11	8.9	586	1070	178	410	41	15	84
14	10	30	16	8.9	4.8	1200	764	56	198	39	13	60
15	7.8	509	14	7.3	2.9	450	536	41	163	49	12	92
16	15	2900	13	6.6	2.3	1160	185	51	141	31	11	64
17	204	4410	12	5.5	2.0	5190	71	101	73	40	12	43
18	38	3190	17	4.7	1.7	3870	76	55	75	194	14	41
19	112	285	10	4.1	1.5	1400	63	38	49	46	21	37
20	59	97	9.2	3.5	1.3	625	44	53	42	30	14	194
21	56	146	10	2.9	1.2	384	38	51	39	34	26	1810
22	29	143	9.4	2.3	1.1	1160	48	78	33	35	17	249
23	23	115	21	2.0	1.0	3690	147	61	39	35	17	65
24	16	54	42	1.9	1.0	5590	579	51	31	26	16	44
25	13	50	33	1.8	1.0	3730	86	44	117	23	16	35
26	11	43	19	1.7	1.0	2630	136	198	59	22	11	28
27	23	42	17	1.6	1.0	734	81	101	35	34	8.9	24
28	12	41	17	1.5	1.0	1460	48	79	27	40	29	21
29	58	42	22	1.5	5.5	709	54	61	23	27	47	19
30	29	38	41	1.3	---	388	73	80	21	44	399	18
31	17	---	27	1.5	---	273	---	106	---	31	252	---
TOTAL	1927.2	12278.1	905.6	188.9	139.1	41811	7423	2553	3806	1998	1373.9	4030
MEAN	62.2	409	29.2	6.09	4.80	1349	247	82.4	127	64.5	44.3	134
MAX	567	4410	176	16	55	5590	1390	210	592	449	399	1810
MIN	5.0	4.7	9.2	1.3	1.0	16	38	38	21	22	8.9	18
AC-FT	3820	24350	1800	375	276	82930	14720	5060	7550	3960	2730	7990

CAL YR 1979 TOTAL 52052.3 MEAN 143 MAX 4410 MIN 2.6 AC-FT 103200
WTR YR 1980 TOTAL 78433.8 MEAN 214 MAX 5590 MIN 1.0 AC-FT 155600

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY RECORDS

PERIOD OF RECORD.--September 1969 to current year.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, TOTAL, IMMED. (COLS. PER 100 ML)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
23...	0845	24	50	7.2	17.0	8.6	1800	60	200	14	3
DEC											
05...	0845	19	58	7.2	15.0	8.8	780	56	180	18	2
18...	0845	14	49	7.2	16.0	8.9	>1600	>300	>1000	19	2
JAN											
29...	1045	1.5	103	7.9	17.0	8.8	K11	K4	K6	45	0
MAR											
31...	0745	234	23	6.9	13.0	8.9	67	53	53	6	2
APR											
07...	0730	80	28	7.2	15.0	9.0	240	18	21	7	0
22...	0730	47	38	7.0	16.0	8.9	K150	51	79	13	1
MAY											
13...	0900	187	18	6.8	17.0	8.9	2400	250	400	5	0
JUN											
17...	0845	71	30	7.2	17.0	9.0	72	37	K11	10	3
JUL											
23...	0900	37	48	7.1	17.0	9.0	1000	180	770	14	2
AUG											
27...	0830	8.5	70	7.3	17.0	9.0	180	10	33	29	0
SEP											
24...	0845	45	35	6.7	17.0	9.0	100	75	280	11	0

DATE	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	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (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)
OCT											
23...	2.8	1.6	2.3	26	.3	2.6	.3	11	3.0	2.9	.1
DEC											
05...	3.9	2.1	2.9	25	.3	3.2	.3	16	4.0	3.2	.0
18...	3.8	2.2	2.7	24	.3	3.1	.4	17	6.3	3.0	.0
JAN											
29...	9.3	5.4	3.8	15	.2	--	.4	45	.5	4.1	.1
MAR											
31...	1.4	.7	2.2	42	.4	--	.2	4	2.0	3.8	.0
APR											
07...	1.5	.9	2.2	38	.4	--	.3	7	2.4	3.6	.0
22...	2.5	1.7	2.4	28	.3	--	.2	12	1.8	2.9	.1
MAY											
13...	.9	.6	1.5	40	.3	--	.2	5	2.3	2.0	.0
JUN											
17...	1.9	1.3	1.9	29	.3	--	.2	7	1.4	2.4	.1
JUL											
23...	2.8	1.7	2.2	25	.3	--	.3	12	1.5	2.8	.2
AUG											
27...	6.0	3.3	3.3	20	.3	--	.4	30	3.0	3.4	.0
SEP											
24...	2.2	1.3	1.8	26	.2	--	.3	12	1.6	2.7	.0

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

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	PHOS-PHORUS, ORTHOPH OSPHATE DISSOL. (MG/L AS P)	PHOS-PHORUS, ORTHOPH OSPHATE DISSOL. (MG/L AS PO4)
OCT											
23...	8.2	28	36	.04	1.81	.09	.03	.000	.00	.00	.00
DEC											
05...	12	43	38	.06	2.21	.05	.05	.010	.03	.00	.00
18...	12	33	41	.04	1.25	.08	.08	.020	.06	.00	.00
JAN											
29...	29	76	75	.10	.31	.06	.03	.010	.03	.01	.03
MAR											
31...	3.3	15	16	.02	9.48	.04	.04	.010	.03	.01	.03
APR											
07...	6.1	24	21	.03	5.18	.02	.02	.020	.06	.00	.00
22...	8.9	--	28	.04	3.50	.02	.03	.070	.21	.07	.21
MAY											
13...	2.8	--	13	.02	6.56	.03	.03	.040	.12	.04	.12
JUN											
17...	6.2	29	26	.04	5.56	.04	.04	.010	.03	.00	.00
JUL											
23...	8.7	42	27	.06	4.20	.00	.00	.020	.06	.00	.00
AUG											
27...	15	59	52	.08	1.35	.00	.00	.020	.06	.00	.00
SEP											
24...	7.9	24	25	.03	2.92	.05	.02	.030	.09	.02	.06

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CADMIUM SUS-PENDED RECOV-ERABLE (UG/L AS CD)	CADMIUM DIS-SOLVED (UG/L AS CD)
OCT											
23...	0845	2	0	2	200	190	8	<1	<1	0	<1
DEC											
05...	0845	1	1	0	200	190	8	<1	<1	0	<1
JUN											
17...	0845	1	0	1	5	0	5	<1	2	0	2

DATE	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT										
23...	4	2	2	<3	<10	<10	400	200	200	31
DEC										
05...	0	0	0	<3	<10	<10	400	340	58	15
JUN										
17...	0	0	0	<3	<10	<10	680	440	240	1

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
OCT										
23...	0	31	<4	8	4	4	.0	.0	.0	<10
DEC										
05...	0	15	<4	2	0	2	.0	.0	.0	<10
JUN										
17...	1	0	5	10	5	5	.0	.0	.0	12

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, SUSPENDED TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, SUSPENDED RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
23...	0	0	0	0	0	0	21	<6.0	10	4
DEC										
05...	0	0	0	0	0	0	28	<6.0	10	<3
JUN										
17...	0	0	0	0	0	0	0	<10	50	<3

DATE	TIME	CYANIDE TOTAL (MG/L AS CN)	PCB, TOTAL (UG/L)	PCB, TOTAL IN BOTTOM MATERIAL (UG/KG)	ALDRIN, TOTAL (UG/L)	ALDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	CHLORDANE, TOTAL (UG/L)	CHLORDANE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDD, TOTAL (UG/L)	DDD, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDE, TOTAL (UG/L)
DEC											
05...	0845	.00	--	--	--	--	--	--	--	--	--
18...	0845	--	.0	0	.00	.0	.0	0	.00	.0	.00
JUN											
17...	0845	.00	--	--	--	--	--	--	--	--	--

DATE	DDE, TOTAL IN BOTTOM MATERIAL (UG/KG)	DDT, TOTAL (UG/L)	DDT, TOTAL IN BOTTOM MATERIAL (UG/KG)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DIELDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN, TOTAL (UG/L)	ENDRIN, TOTAL IN BOTTOM MATERIAL (UG/KG)	ETHION, TOTAL (UG/L)
DEC										
05...	--	--	--	--	--	--	--	--	--	--
18...	.0	.00	.0	.00	.00	.0	.00	.00	.0	.00
JUN										
17...	--	--	--	--	--	--	--	--	--	--

DATE	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR, TOTAL IN BOTTOM MATERIAL (UG/KG)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOT. IN BOTTOM MATL. (UG/KG)	LINDANE TOTAL (UG/L)	LINDANE TOTAL IN BOTTOM MATERIAL (UG/KG)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHOXYCHLOR, TOT. IN BOTTOM MATL. (UG/KG)	METHYL PARATHION, TOTAL (UG/L)
DEC										
05...	--	--	--	--	--	--	--	--	--	--
18...	.00	.0	.00	.0	.00	.0	.00	.00	.0	.00
JUN										
17...	--	--	--	--	--	--	--	--	--	--

DATE	METHYL TRITHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOXAPHENE, TOTAL IN BOTTOM MATERIAL (UG/KG)	TOTAL TRITHION (UG/L)	2,4-D, TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	SILVEX, TOTAL (UG/L)
DEC										
05...	--	--	--	--	--	--	--	--	--	--
18...	.00	.00	.00	.00	0	0	.00	.00	.00	.00
JUN										
17...	--	--	--	--	--	--	--	--	--	--

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

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS ALPHA, DIS-SOLVED (PCI/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (PCI/L AS U-NAT)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)	RADIUM 226, DIS-SOLVED, RADON METHOD (PCI/L)	URANIUM DIS-SOLVED, EXTRAC-TION (UG/L)
DEC											
18...	0845	<.5	<.6	<.3	<.4	.8	<.5	.8	<.6	.04	.02

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT				
23...	0845	24	1	.06
DEC				
05...	0845	19	1	.05
18...	0845	14	3	.11
JAN				
29...	1045	1.5	0	.00
MAR				
31...	0745	239	2	1.3
APR				
07...	0730	80	1	.22
22...	0730	47	2	.25
MAY				
13...	0900	187	4	2.0
JUN				
17...	0845	71	1	.19
JUL				
23...	0900	37	3	.30
AUG				
27...	0830	8.5	1	.02
SEP				
24...	0845	45	0	.00

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

16717800 POHAKUPUKA STREAM NEAR PAPAALOA

LOCATION.--Lat 19°57'20", long 155°11'20", Hydrologic Unit 20010000, on right bank 200 ft (61 m) downstream from Highway 19, 2.8 mi (4.5 km) northwest of Honohina, and 3.0 mi (4.8 km) southeast of Papaaloa.

DRAINAGE AREA.--2.76 mi² (7.15 km²).

PERIOD OF RECORD.--April 1962 to September 1979. Station destroyed by flood of November 17, 1979. Discontinued as a continuous-record station; converted to a crest-stage partial-record station.

GAGE.--Water-stage recorder. Datum of gage is 250 ft (76.2 m) above mean sea level (by stadia survey).

REMARKS.--Station published to show revised peak discharges and annual maximums.

AVERAGE DISCHARGE.--17 years, 27.1 ft³/s (0.767 m³/s), 19,630 acre-ft/yr (24.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,400 ft³/s (323 m³/s) Nov. 17, 1979, gage height, 17.05 ft (5.197 m), from floodmarks, from rating curve extended above 1,100 ft³/s (31.2 m³/s) on basis of slope-area measurement of peak flow; minimum, 0.28 ft³/s (0.008 m³/s) Nov. 9, 1962.

EXTREMES FOR CURRENT YEAR.--Maximum discharge during period October 1 to November 17, 11,400 ft³/s (323 m³/s) Nov. 17, gage height 17.05 ft (5.197 m), from floodmarks, from rating curve extended as explained above; no other peak above base of 1,400 ft³/s (39.6 m³/s); minimum, 1.4 ft³/s (0.040 m³/s) Nov. 2.

REVISIONS.--Some peak discharges and annual maximum (*) for the years 1964-65, 1968, 1969-71, 1974-77, 1979 have been revised, superseding figures published in WSP 1937, 2137; WRD Hawaii 1971, 1974, WDR-HI-1975-1977-1 and WDR-HI-1979-1.

Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1964	Feb. 15, 1964	0600	2540	71.9	9.60	2.926
	Mar. 1, 1964	1900	*3160	89.5	*10.42	3.176
1965	Nov. 7, 1964	0200	*5720	162	*13.06	3.981
	Apr. 6, 1965	0830	3310	93.7	10.60	3.231
1968	Nov. 26, 1967	1000	*6090	172	*13.37	4.075
1969	Mar. 5, 1969	0715	2650	75.0	9.76	2.975
	Mar. 31, 1969	0130	*3350	94.9	*10.64	3.243
1970	Aug. 26, 1970	0330	*2400	68.0	*9.38	2.859
1971	Mar. 26, 1971	0345	*2330	66.0	*9.27	2.825
1974	Nov. 12, 1973	0900	*5580	158	*12.94	3.944
	Mar. 19, 1974	2100	2800	79.3	9.97	3.039
	Apr. 19, 1974	1845	2260	64.0	9.15	2.789
1975	Dec. 20, 1974	2030	2370	67.1	9.34	2.847
	Jan. 8, 1975	1015	*2580	73.1	*9.66	2.944
1976	Oct. 19, 1975	0015	*3440	97.4	*10.74	3.274
1977	Feb. 27, 1977	0515	*2230	63.2	*9.10	2.774
1979	Jan. 15, 1979	0645	*3760	106	*11.10	3.383
	Jan. 22, 1979	1845	2220	62.9	9.09	2.771

DISCHARGE, IN CUBIC FEET PER SECOND, OCTOBER 1979

DAY	OCT	DAY	OCT	DAY	OCT	DAY	OCT	DAY	OCT	DAY	OCT
1	1.8	6	2.4	11	2.9	16	7.8	21	5.3	26	2.4
2	1.8	7	7.5	12	2.2	17	54	22	3.2	27	2.3
3	1.8	8	6.4	13	1.9	18	4.9	23	8.5	28	2.3
4	1.7	9	35	14	1.7	19	15	24	8.6	29	6.4
5	2.0	10	7.2	15	1.7	20	5.9	25	3.2	30	6.2
										31	2.9

TOTAL	216.9
MEAN	7.00
MAX	54
MIN	1.7
AC-FT	430

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft (76 m) upstream from Upper Hamakua ditch intake and 4.5 mi (7.2 km) north of Kamuela.

DRAINAGE AREA.--1.58 mi² (4.09 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 4,060 ft (1,237 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 14.8 ft³/s (0.419 m³/s), 10,720 acre-ft/yr (13.2 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft³/s (89.5 m³/s) Nov. 18, 1979, gage height, 10.03 ft (3.057 m), from rating curve extended above 53 ft³/s (1.50 m³/s) on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft (3.057 m); minimum, 0.01 ft³/s (<0.001 m³/s) Jan. 20, 21, 24-28, Feb. 20-22, 1977, Dec. 16-20, 1979, Feb. 23, 24, 1980.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 440 ft³/s (12.5 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 14	2000	520	14.7	5.30	1.615	Mar. 17	0630	1420	40.2	7.55	2.301
Nov. 18	0215	*3160	89.5	*10.03	3.057	Mar. 24	0830	1590	45.0	7.89	2.405
Jan. 9	1300	1990	56.4	8.57	2.612	Apr. 2	0430	758	21.5	6.08	1.853

Minimum discharge, 0.01 ft³/s (<0.001 m³/s) Dec. 16-20, Feb. 23, 24.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.9	.12	4.8	1.0	55	99	46	.29	.55	39	20
2	1.3	1.3	29	1.9	1.0	4.4	241	44	.25	3.0	13	3.5
3	1.1	1.0	45	1.1	1.5	3.1	81	18	2.5	4.6	7.2	1.5
4	.88	.91	23	.91	1.0	17	47	73	42	4.7	23	5.1
5	.72	1.0	8.0	.69	1.0	98	17	39	7.8	1.5	9.5	25
6	.82	.86	2.6	.40	.95	125	19	24	8.0	25	8.5	4.8
7	.60	3.7	1.4	.17	.90	59	12	15	3.1	14	3.2	3.0
8	.60	5.5	.81	.08	.85	81	6.4	14	1.3	2.1	11	1.8
9	9.9	2.0	.41	548	.80	131	3.9	20	11	2.6	1.9	1.2
10	2.3	1.3	.18	98	.75	68	1.8	10	21	9.8	.87	2.6
11	1.2	1.0	.26	150	1.0	14	24	20	82	29	.43	12
12	.90	.09	.45	15	.80	8.6	180	36	57	12	.21	3.8
13	.75	11	.11	10	3.5	82	116	31	69	9.0	.10	54
14	.72	140	.06	5.0	45	155	74	5.5	24	6.4	.06	22
15	1.7	166	.03	4.5	22	44	69	7.4	18	6.4	.18	28
16	13	263	.01	4.5	29	35	19	12	17	4.2	4.8	7.6
17	31	327	.01	4.0	6.0	191	5.9	11	15	4.0	4.1	4.2
18	12	612	.01	4.5	1.5	11	6.6	3.3	19	5.2	4.1	1.7
19	12	35	.01	4.5	.55	38	11	28	8.9	7.6	10	1.1
20	9.2	24	.02	4.0	.14	59	7.4	37	4.0	2.1	44	6.2
21	8.8	43	.07	3.5	.05	26	14	14	2.5	6.6	19	80
22	3.6	16	.02	3.0	.03	239	26	5.4	2.5	12	2.7	18
23	6.9	6.5	27	6.0	.01	431	75	2.5	3.5	7.9	1.4	2.8
24	4.0	2.5	16	4.0	.01	539	56	1.3	2.3	13	2.0	1.2
25	1.7	1.3	42	3.5	.05	183	19	1.1	11	21	1.2	.65
26	6.9	.90	24	3.0	.08	147	49	3.8	13	29	.55	.32
27	4.1	1.2	28	2.5	1.8	20	24	2.0	3.9	29	.24	.34
28	1.9	1.3	7.8	2.0	36	31	7.4	.89	1.3	12	20	2.3
29	11	.60	31	2.0	33	94	31	.45	.81	5.1	14	1.6
30	5.3	.31	12	1.5	---	21	61	.21	.53	12	63	1.1
31	4.1	---	3.5	1.5	---	23	---	.49	---	5.2	34	---
TOTAL	160.39	1673.07	302.88	894.55	190.27	3037.1	1403.4	526.34	452.48	306.55	343.24	317.41
MEAN	5.17	55.8	9.77	28.9	6.56	98.0	46.8	17.0	15.1	9.89	11.1	10.6
MAX	31	612	45	548	45	539	241	73	82	29	63	80
MIN	.60	.31	.01	.08	.01	3.1	1.8	.21	.25	.55	.06	.32
AC-FT	318	3320	601	1770	377	6020	2780	1040	897	608	681	630

CAL YR 1979 TOTAL 7520.08 MEAN 20.6 MAX 612 MIN .01 AC-FT 14920
WTR YR 1980 TOTAL 9607.68 MEAN 26.3 MAX 612 MIN .01 AC-FT 19060

NOTE.--No gage-height record Jan. 11 to Feb. 3.

16720300 KAWAIKI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'13", long 155°40'59", Hydrologic Unit 20010000, on right bank 0.2 mi (0.3 km) upstream from Upper Hamakua ditch intake and 4.4 mi (7.1 km) north of Kamuela.

DRAINAGE AREA.--0.45 mi² (1.17 km²).

PERIOD OF RECORD.--June 1968 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 4,090 ft (1,247 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--12 years, 4.38 ft³/s (0.124 m³/s), 3,170 acre-ft/yr (3.91 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,470 ft³/s (41.6 m³/s) Nov. 18, 1979, gage height, 8.32 ft (2.536 m), from rating curve extended above 33 ft³/s (0.94 m³/s) on basis of slope-area measurement at gage height 8.32 ft (2.536 m); minimum, 0.03 ft³/s (0.001 m³/s) Nov. 12-15, 1968.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 100 ft³/s (2.83 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 18	0200	*1470	41.6	*8.32	2.536	Mar. 17	0400	436	12.3	4.93	1.503
Jan. 9	1200	730	20.7	6.10	1.859	Mar. 23	2230	462	13.1	5.05	1.539
Mar. 14	0700	145	4.11	3.15	.960	Apr. 2	0130	203	5.75	3.62	1.103

Minimum discharge, 0.08 ft³/s (0.002 m³/s) Feb. 13, 20, 25-27.

REVISIONS.--The peak discharges and annual maximum (*) for the years 1969-79 have been revised, superseding figures published in WSP 2137, WRD Hawaii 1971-74, WDR HI-1975-79-1. The revised figures are as follows:

Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Water Year	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
1969	Dec. 16, 1968	1415	148	4.19	3.18	0.969	1974	Nov. 12, 1973	0845	172	4.87	3.42	1.042
	Mar. 17, 1969	2315	*217	6.14	*3.71	1.130		Jan. 7, 1974	1400	166	4.70	3.36	1.024
	Aug. 15, 1969	0300	121	3.43	2.90	.884		Jan. 26, 1974	1545	330	9.35	4.40	1.341
1970	Dec. 5, 1969	0145	227	6.42	3.78	1.152		Mar. 19, 1974	1500	*573	16.2	*5.49	1.673
	Jan. 6, 1970	1315	190	5.38	3.53	1.076		Apr. 16, 1974	0415	131	3.71	3.01	.917
	Apr. 23, 1970	1330	*245	6.94	*3.90	1.189	1975	Oct. 20, 1974	1500	*613	17.4	*5.65	1.722
	July 10, 1970	0100	178	5.04	3.48	1.061		Nov. 11, 1974	1945	130	3.68	3.00	.914
	Aug. 25, 1970	2300	144	4.08	3.14	.957		Nov. 21, 1974	1600	193	5.47	3.55	1.082
1971	Nov. 5, 1970	1430	*416	11.8	*4.83	1.472	1976	Oct. 18, 1975	2015	148	4.19	3.18	.969
	Dec. 5, 1970	0915	148	4.19	3.18	.969		Jan. 16, 1976	0530	*306	8.67	*4.17	1.271
	Dec. 19, 1970	2230	194	5.49	3.56	1.085							
	Dec. 27, 1970	2230	156	4.42	3.26	.993	1977	Apr. 20, 1977	1830	*178	5.04	*3.45	1.052
	Jan. 5, 1971	1530	147	4.16	3.17	.966		Aug. 6, 1977	1400	127	3.60	2.97	.905
	Jan. 19, 1971	1645	160	4.53	3.30	1.006		Aug. 11, 1977	2400	129	3.65	2.99	.911
	Apr. 18, 1971	2045	193	5.47	3.55	1.082							
							1978	Jan. 1, 1978	1830	*122	3.46	*2.91	.887
1972	Mar. 4, 1972	2300	163	4.62	3.33	1.015		May 21, 1978	1430	121	3.43	2.90	.884
	Apr. 10, 1972	0100	169	4.79	3.39	1.033							
	Aug. 18, 1972	2215	120	3.40	2.89	.881	1979	Dec. 6, 1978	0130	*613	17.4	*5.65	1.722
	Aug. 31, 1972	1500	*370	10.5	*4.60	1.402		Jan. 13, 1979	2300	203	5.75	3.62	1.103
								Jan. 22, 1979	1100	302	8.55	4.26	1.298
1973	Mar. 7, 1973	--	*103	2.91	*2.70	.823		Feb. 10, 1979	a1330	260	7.36	a4.00	1.219
								Feb. 25, 1979	a1700	450	12.7	a5.00	1.524

a About.

16720300 KAWAIKI STREAM NEAR KAMUELA--Continued

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	1.3	.58	2.4	.36	14	30	15	.95	.90	12	6.1
2	1.3	.95	9.8	1.5	.36	1.9	62	12	.90	1.5	3.4	1.5
3	1.5	.76	12	1.0	.48	2.7	23	8.0	1.5	2.4	3.7	1.1
4	1.0	.61	6.8	1.0	.32	5.5	12	25	20	2.0	7.5	2.5
5	1.2	.61	2.7	.95	.32	35	6.4	15	5.0	1.1	3.5	6.7
6	1.0	.68	1.3	.85	.28	33	7.2	10	5.5	9.7	2.7	1.9
7	.95	.61	.97	.68	.24	12	4.3	6.0	3.0	4.2	2.5	1.3
8	1.2	1.6	.76	.61	.24	26	3.7	5.5	2.0	1.0	4.2	1.1
9	4.3	1.9	.65	135	.24	34	2.4	8.0	4.0	1.7	1.1	.78
10	2.4	1.0	.60	24	.24	13	1.8	6.0	7.0	3.6	.88	1.7
11	1.2	.85	.73	49	1.9	3.7	18	7.5	30	8.8	.76	4.2
12	.85	.76	.81	3.3	.6P	4.7	46	12	20	3.3	.71	1.9
13	.76	3.4	.65	1.5	2.6	23	28	10	25	4.0	.69	16
14	.68	30	.55	.95	11	46	24	2.5	12	2.3	.67	7.0
15	1.0	37	.50	.76	5.9	15	17	3.5	10	3.2	.78	8.0
16	.95	61	.48	.76	7.9	16	5.3	5.0	8.0	2.0	3.0	2.7
17	10	144	.48	.68	1.5	33	2.7	4.5	6.0	1.8	2.5	2.0
18	4.1	242	.42	.76	.67	4.3	4.7	2.0	7.5	1.8	2.0	1.5
19	3.3	9.1	.42	.76	.43	13	4.3	10	4.0	2.5	5.0	1.0
20	2.5	7.5	.58	.61	.20	20	4.1	12	2.0	1.1	20	3.4
21	2.5	15	.58	.54	.27	8.1	8.1	7.0	1.5	4.3	10	20
22	1.6	3.9	.49	.61	.24	74	8.5	4.0	1.5	5.5	1.3	5.0
23	1.9	2.8	11	1.9	.21	120	24	2.0	2.0	3.3	.80	1.3
24	2.2	1.2	5.0	.85	.21	107	13	1.5	1.5	4.8	1.5	.81
25	1.0	.85	11	.76	.23	37	6.9	1.0	4.0	6.5	.95	.75
26	1.5	.68	8.2	.61	.26	28	19	2.5	5.0	8.7	.77	.68
27	2.7	.76	8.4	.54	.39	8.5	5.3	2.0	2.0	9.7	.66	.79
28	1.6	.85	3.1	.54	9.5	14	4.0	1.5	1.0	3.9	8.2	1.7
29	3.0	.68	12	.48	12	22	10	1.0	.95	2.7	4.7	1.6
30	2.2	.63	4.1	.48	---	5.8	20	.9C	.90	4.9	18	1.1
31	2.1	---	2.1	.42	---	13	---	1.0	---	2.5	11	---
TOTAL	64.29	572.58	107.75	238.80	59.17	793.2	425.7	203.90	194.70	115.70	135.47	106.06
MEAN	2.07	19.1	3.48	7.57	2.04	25.6	14.2	6.58	6.49	3.73	4.37	3.54
MAX	10	242	12	135	12	120	62	25	30	9.7	20	20
MIN	.68	.61	.42	.42	.20	1.9	1.8	.9C	.90	.90	.66	.68
AC-FT	128	1140	214	466	117	1570	844	404	386	229	269	210

CAL YR 1979 TOTAL 2383.88 MEAN 6.53 MAX 242 MIN .25 AC-FT 4730
WTR YR 1980 TOTAL 3013.32 MEAN 8.23 MAX 242 MIN .20 AC-FT 5980

NOTE.--No gage-height record Apr. 28 to June 30.

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 (0.2 km) upstream from Alakahi Stream and 3.6 mi (5.8 km) north of Kamuela.

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,890 ft (1,186 m), from topographic map.

REMARKS.--Records good. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--12 years, 5.38 ft^3/s (0.152 m^3/s), 3,900 acre-ft/yr (4.81 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s (1.16 m^3/s) Aug. 18, 1972; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 30 ft^3/s (0.85 m^3/s) Mar. 23; no flow for many days October to March.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.96	1.4	.40	.06	.00	.01	11	3.5	.60	.20	1.5	.96
2	.66	.60	1.6	.02	.00	.00	16	2.2	.22	.17	.64	.23
3	.52	.30	2.2	.01	.00	.14	10	3.5	.60	.23	.65	.16
4	.33	.13	1.2	.00	.00	.17	5.2	3.4	.22	.26	1.0	.24
5	.49	.02	.79	.00	.00	4.7	3.7	3.5	.22	.14	.75	.82
6	.16	.02	.57	.00	.00	2.0	3.0	2.2	1.2	.86	.53	.20
7	.01	.00	.49	.00	.00	.66	2.2	1.6	1.2	1.3	.39	.12
8	.00	.30	.41	.00	.00	.45	1.8	1.2	1.2	.16	.72	.09
9	3.5	.84	.33	14	.00	3.1	1.2	1.2	.60	.25	.17	.05
10	1.7	.72	.30	3.5	.06	1.1	1.2	1.2	.60	.67	.09	.33
11	.42	.26	.35	7.9	.00	.84	7.0	2.2	.60	.86	.07	.19
12	.07	.05	.29	2.4	.00	1.0	10	2.2	1.2	.34	.04	.85
13	.00	.20	.18	1.5	.00	5.7	8.7	1.2	.60	.50	.02	.88
14	.00	11	.12	.99	.35	4.3	10	1.2	1.2	.36	.03	1.5
15	.26	19	.05	.74	.04	4.0	6.1	1.2	.60	.42	.08	.55
16	.13	25	.02	.55	.05	7.2	3.4	1.2	.55	.21	.05	.21
17	8.3	28	.01	.45	.00	4.0	2.2	.60	.50	.13	.17	.15
18	8.5	28	.01	.39	.00	3.1	2.1	.60	.50	.09	.91	.10
19	7.2	10	.00	.31	.00	2.3	1.7	2.2	.45	.11	1.9	.90
20	5.6	4.8	.02	.25	.00	3.1	1.7	1.2	.40	.07	1.6	3.6
21	6.8	4.5	.00	.20	.00	4.0	2.2	.60	.33	.99	.78	.78
22	2.4	2.8	.00	.18	.00	13	1.2	.60	.36	.63	.20	.25
23	4.0	1.8	.57	.15	.00	30	5.0	.60	.39	.33	.07	.13
24	1.6	1.3	.36	.02	.00	23	2.2	.60	.33	.47	.10	.08
25	.67	.98	.82	.04	.00	17	2.2	.60	.53	.81	.05	.03
26	3.4	.85	.56	.01	.00	10	3.5	.22	.63	1.0	.02	.01
27	1.9	.71	.80	.00	.14	6.3	2.2	.22	.22	1.4	.01	.01
28	6.1	.60	.31	.00	.06	4.1	1.2	.22	.11	.58	.75	.01
29	2.0	.53	1.0	.00	1.1	4.7	2.2	.22	.20	.49	.42	1.3
30	4.1	.46	.37	.00	---	3.0	3.5	.22	.19	.73	2.3	1.4
31	2.6	---	.12	.00	---	4.7	---	.22	---	.42	1.5	---
TOTAL	74.38	145.17	14.25	33.67	1.80	169.67	133.6	41.62	16.55	15.18	17.11	15.63
MEAN	2.40	4.84	.46	1.09	.062	5.47	4.45	1.34	.55	.49	.55	.52
MAX	8.5	28	2.2	14	1.1	30	16	3.5	1.2	1.4	2.3	3.6
MIN	.00	.00	.00	.00	.00	.00	1.2	.22	.11	.07	.01	.01
AC-FT	148	288	28	67	3.6	337	265	83	33	30	34	31

CAL YR 1979 TOTAL 1720.01 MEAN 4.71 MAX 33 MIN .00 AC-FT 3410
WTR YR 1980 TOTAL 678.63 MEAN 1.85 MAX 30 MIN .00 AC-FT 1350

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155°40'25", Hydrologic Unit 20010000, on right bank 25 ft (8 m) upstream from upper Hamakua ditch intake and 3.5 mi (5.6 km) north of Kamuela.

DRAINAGE AREA.--0.87 mi² (2.25 km²).

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

GAGE.--Water-stage recorder. Altitude of gage is 3,900 ft (1,189 m), from topographic map.

REMARKS.--Records good. Parker Ranch pipeline diverts from tributary 0.4 mi (0.6 km) above station for ranch use in Kamuela area. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--16 years, 6.87 ft³/s (0.195 m³/s), 4,980 acre-ft/yr (6.14 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,170 ft³/s (61.4 m³/s) Nov. 18, 1979, gage height, 9.90 ft (3.018 m), from rating curve extended above 28 ft³/s (0.79 m³/s) on basis of computations of peak flow over dam and slope-area measurement at gage height 9.90 ft (3.018 m); minimum, 0.03 ft³/s (0.001 m³/s) on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 120 ft³/s (3.40 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 18	0330	*2170	61.5	*9.90	3.018	Mar. 17	0630	800	22.7	7.40	2.256
Jan. 9	1330	1280	36.2	8.42	2.566	Mar. 24	0130	900	25.5	7.65	2.332
Mar. 14	0830	153	4.33	4.72	1.439	Apr. 2	0430	360	10.2	5.95	1.814

Minimum discharge, 0.15 ft³/s (0.004 m³/s) Dec. 19, 20.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	1.6	1.5	2.6	4.0	29	32	15	.50	1.3	23	11
2	2.9	1.0	18	1.5	4.0	5.3	78	10	.45	1.5	6.8	3.5
3	2.8	.80	16	1.1	4.0	5.1	34	6.0	1.5	2.4	6.4	2.8
4	2.5	.65	10	.95	4.0	10	19	35	12	3.3	13	3.6
5	2.8	.55	5.6	.75	3.9	41	6.0	40	6.0	1.9	6.3	12
6	2.4	.55	5.0	.50	3.9	50	6.1	8.0	6.5	14	4.6	3.5
7	2.1	.46	4.5	.40	3.9	23	3.7	5.0	2.5	9.4	4.3	2.8
8	1.8	.75	4.0	.26	3.9	30	2.0	5.0	1.0	2.5	6.8	2.2
9	2.8	2.1	3.5	315	3.9	51	1.3	6.0	5.0	2.6	2.6	1.9
10	2.1	1.1	3.0	65	3.9	20	.82	4.0	7.0	4.2	1.8	2.8
11	1.0	.75	3.5	107	5.0	6.3	9.7	5.0	35	13	1.4	6.0
12	.65	.55	2.2	7.6	4.5	5.0	66	10	20	5.9	1.2	3.1
13	.55	3.3	1.5	5.6	6.5	30	82	10	25	6.3	1.2	25
14	.43	40	1.0	5.1	17	58	25	3.0	8.0	4.9	1.0	12
15	.75	50	.75	4.8	14	15	20	3.5	6.0	4.9	.95	16
16	.95	74	.50	4.7	16	11	4.1	5.0	6.0	3.3	2.7	4.5
17	11	91	.32	4.6	5.6	70	.49	4.5	5.5	2.6	2.8	3.3
18	5.2	387	.22	4.5	4.6	4.0	1.2	2.0	6.5	2.3	3.0	2.8
19	3.5	12	.18	4.5	4.3	12	1.1	10	5.0	2.9	4.3	2.4
20	2.8	9.2	.22	4.4	4.2	20	.67	12	3.9	2.0	24	5.0
21	2.8	18	.40	4.3	4.0	7.3	13	6.0	2.6	6.8	9.4	38
22	1.8	6.9	.29	4.3	4.0	75	36	4.0	3.0	7.9	2.9	9.1
23	1.6	5.5	16	4.3	3.9	127	19	1.5	5.0	5.3	2.4	3.1
24	2.1	5.2	6.2	4.4	3.9	244	11	1.0	2.6	6.8	2.2	2.4
25	1.2	5.0	17	4.3	3.9	50	15	.90	5.7	11	2.1	1.8
26	1.2	4.9	12	4.2	4.0	40	20	2.0	8.3	16	1.4	1.5
27	3.0	4.8	13	4.2	4.0	11	15	1.0	3.9	19	1.2	1.4
28	2.1	4.8	4.5	4.1	15	9.2	12	.75	2.2	7.1	13	2.4
29	2.8	4.6	18	4.1	16	30	10	.50	1.9	4.2	7.8	2.6
30	2.5	3.5	5.4	4.1	---	6.1	20	.30	1.5	7.9	37	2.1
31	2.2	---	2.3	4.0	---	8.1	---	.60	---	3.9	22	---
TOTAL	75.83	740.56	176.58	587.16	179.8	1103.4	524.18	187.55	200.05	187.1	218.55	190.6
MEAN	2.45	24.7	5.70	18.9	6.20	35.6	17.5	6.05	6.67	6.04	7.05	6.35
MAX	11	387	18	315	17	244	78	35	35	19	37	38
MIN	.43	.46	.18	.26	3.9	4.0	.49	.30	.45	1.3	.95	1.4
AC-FT	150	1470	350	1160	357	2190	1040	372	397	371	433	378

CAL YR 1979 TOTAL 3544.07 MEAN 9.71 MAX 387 MIN .18 AC-FT 7030
WTR YR 1980 TOTAL 4371.36 MEAN 11.9 MAX 387 MIN .18 AC-FT 8670

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 (37 m) upstream from diversion intake leading to Waimea Reservoir and 3.7 mi (6.0 km) northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1974 to current year.

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,020 ft (920 m), from topographic map.

REMARKS.--Records good except those for period of no gage-height record, which are fair. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--6 years, 10.1 ft^3/s (0.286 m^3/s), 7,320 acre-ft/yr (9.03 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s (1.36 m^3/s) Apr. 6, 1977, and Jan. 13, 1979; no flow Oct. 1-21, 1974 and July 18, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 45 ft^3/s (1.27 m^3/s) Nov. 18; minimum daily, 0.14 ft^3/s (0.004 m^3/s) Feb. 14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	2.0	2.5	11	.52	19	22	20	2.9	2.1	19	17
2	2.5	1.5	12	5.4	.46	4.8	27	22	2.3	2.7	12	6.5
3	2.0	1.5	10	2.9	.44	4.6	23	17	2.7	3.7	10	4.9
4	3.0	1.0	8.0	2.5	.41	11	19	25	12	6.0	17	5.3
5	3.5	.95	5.0	2.0	.40	18	10	20	8.3	3.2	15	13
6	3.0	.95	3.0	1.6	.37	24	9.9	18	9.7	12	10	5.8
7	2.5	.90	3.0	1.4	.35	13	11	14	6.3	14	7.6	4.7
8	2.0	1.5	3.6	1.2	.34	16	11	11	2.9	5.1	12	3.8
9	3.5	2.5	2.9	18	.32	25	9.3	14	7.5	5.8	5.2	3.4
10	2.5	1.5	3.1	6.1	.48	14	6.5	10	13	9.8	3.8	4.8
11	2.0	1.0	4.7	8.3	7.5	5.0	14	17	20	19	3.0	10
12	1.5	.95	5.3	4.7	1.5	2.9	28	17	21	11	2.5	5.7
13	1.5	3.5	2.8	4.6	.28	13	24	16	24	11	2.2	18
14	1.0	20	2.0	3.2	.14	30	23	9.9	17	10	1.9	16
15	1.5	25	1.6	1.7	1.5	18	23	10	13	9.6	2.6	19
16	2.0	30	1.4	1.5	11	14	17	17	8.4	6.5	3.7	7.9
17	10	35	1.3	1.4	6.8	25	12	14	7.7	4.8	5.0	5.4
18	6.0	45	1.2	1.3	3.8	14	11	6.8	9.6	4.0	3.9	4.5
19	4.0	10	1.1	1.1	2.0	19	13	11	7.2	4.3	6.9	4.3
20	3.5	10	1.2	1.0	.53	16	11	24	5.3	3.7	19	8.9
21	3.0	12	1.3	.96	.58	16	15	14	4.1	11	16	25
22	2.5	8.0	1.2	.91	.53	26	15	8.2	4.0	13	5.4	16
23	2.5	6.0	8.0	1.3	.48	29	19	6.5	5.3	9.5	4.2	5.6
24	3.0	5.5	9.6	1.1	.43	31	20	5.0	4.5	9.0	3.8	4.2
25	2.0	5.0	12	.90	.44	22	15	4.2	5.1	13	3.7	3.5
26	2.0	4.5	11	.77	.80	18	20	5.0	8.9	21	2.7	2.8
27	3.5	5.0	12	.70	1.0	8.9	16	5.2	6.6	23	2.1	2.6
28	3.0	5.0	8.5	.63	11	7.2	9.7	3.6	3.1	13	11	5.4
29	3.0	4.5	12	.59	15	15	13	2.7	2.3	8.6	12	5.6
30	2.5	4.0	8.8	.56	---	7.3	21	2.3	1.9	13	23	4.2
31	2.0	---	7.5	.53	---	9.0	---	3.0	---	7.6	22	---
TOTAL	90.0	254.25	167.6	89.85	69.40	495.7	488.4	373.4	246.6	290.0	268.2	243.8
MEAN	2.90	8.48	5.41	2.90	2.39	16.0	16.3	12.0	8.22	9.35	8.65	8.13
MAX	10	45	12	18	15	31	28	25	24	23	23	25
MIN	1.0	.90	1.1	.53	.14	2.9	6.5	2.3	1.9	2.1	1.9	2.6
AC-FT	179	504	332	178	138	983	969	741	489	575	532	483

CAL YR 1979 TOTAL 2273.62 MEAN 6.23 MAX 48 MIN .00 AC-FT 4510
WTR YR 1980 TOTAL 3077.20 MEAN 8.41 MAX 45 MIN .14 AC-FT 6100

NOTE.--No gage-height record Oct. 1 to Dec. 6.

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 (7.6 m) downstream from pipe railed bridge and 4.0 mi (6.4 km) northeast of Kamuela Post Office.

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

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 2,890 ft (881 m), from topographic map.

REMARKS.--Records good. Ditch diverts above into 60 mg Waimea Reservoir for use in vicinity of Kamuela. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 12 ft^3/s (0.34 m^3/s) Dec. 29, 1979; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 12 ft^3/s (0.34 m^3/s) Dec. 29; no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.5	.05	.15	4.6	.01	7.3	.00	.00	.00	.00	.00	.00
2	1.8	.01	.15	2.6	.00	1.6	.05	.00	.00	.00	.00	.95
3	1.4	.00	.10	2.4	.00	.70	.00	.61	.00	.00	.00	1.4
4	.30	.00	2.1	2.1	.00	4.1	.00	.04	4.0	.00	.00	1.4
5	.02	.00	4.1	1.8	.00	4.8	.00	.00	1.0	.00	.00	2.3
6	.00	.00	2.4	1.4	.00	6.2	.00	.00	2.0	.00	.00	.00
7	.00	.00	2.1	.35	.01	5.6	.00	7.3	.50	.00	.00	.00
8	.00	.03	2.4	.01	.17	4.8	.00	7.3	.10	.00	.00	.00
9	.00	.08	2.3	.67	.03	5.6	.00	8.6	.05	.00	.00	.00
10	.00	.08	2.1	.08	.03	5.3	.00	6.9	.05	.00	.00	.00
11	.00	.08	2.4	.15	.04	3.0	.00	9.5	.03	.00	.00	5.0
12	.00	.03	2.9	.02	.00	2.4	.15	10	.03	.00	.00	3.0
13	.00	.04	1.4	.00	.00	4.8	.00	9.2	2.8	.00	.00	1.0
14	.00	.08	1.0	.00	.01	11	.04	5.8	6.2	.00	.00	.50
15	.00	5.6	.96	.00	.03	8.9	.02	1.2	6.6	.00	.00	.10
16	.00	9.2	.75	.00	.02	8.3	.00	.03	4.8	.00	.00	.05
17	3.4	8.6	.70	.00	.04	3.6	.00	.02	2.6	.00	.00	.00
18	5.4	10	.41	.00	.00	.01	.00	.01	1.4	.00	.00	.00
19	4.8	1.3	.06	.00	.00	.01	.00	.00	.88	.00	.00	.00
20	4.4	.04	.10	.00	.00	.01	.00	7.0	.28	.00	.00	.50
21	4.6	.06	.00	.00	.00	.10	.00	4.0	.00	.00	.00	7.0
22	2.9	.06	.00	.00	.00	.30	.00	1.0	.00	.00	.00	3.0
23	2.9	.04	.02	.00	.00	3.0	.00	.50	.00	.00	.00	1.0
24	3.0	.06	.02	.00	.00	.00	.00	.80	.00	.00	.00	.50
25	1.2	.08	.05	.00	.00	.00	.00	.10	.00	.00	.00	.90
26	.21	.08	.05	.00	.00	.00	.00	.50	.00	.00	.00	.10
27	.05	.10	5.1	.00	.00	.00	.00	.40	.00	.00	.00	.05
28	.06	.10	6.2	.00	2.3	.00	.00	.10	.00	.00	.00	.00
29	.03	.05	12	.00	5.2	.00	.00	.05	.00	.00	.16	.00
30	.05	.02	6.2	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.05	---	4.6	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	39.07	35.87	62.82	16.18	7.89	91.43	.26	80.56	33.32	.00	.16	28.25
MEAN	1.26	1.20	2.03	.52	.27	2.95	.009	2.60	1.11	.000	.005	.94
MAX	5.4	10	12	4.6	5.2	11	.15	10	6.6	.00	.16	7.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	77	71	125	32	16	181	.5	160	66	.00	.3	56

CAL YR 1979 TOTAL 328.13 MEAN .90 MAX 12 MIN .00 AC-FT 651
WTR YR 1980 TOTAL 395.81 MEAN 1.08 MAX 12 MIN .00 AC-FT 785

16756000 KOHAKOHAU STREAM NEAR KAMUELA

LOCATION.--Lat 20°02'38", long 155°41'10", Hydrologic Unit 20010000, on left bank 0.6 mi (1.0 km) upstream from Oolamakapehu Gulch and 1.7 mi (2.7 km) northwest of Kamuela.

DRAINAGE AREA.--2.51 mi² (6.50 km²).

PERIOD OF RECORD.--March 1956 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,273 ft (997.6 m) 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 (0.8 km) upstream at different datums.

REMARKS.--Records good. Parker Ranch pipeline diverts above station at altitude 4,250 ft (1,295 m). Hawaii Division of Water and Land Development diverts by pipeline 0.3 mi (0.5 km) above station at altitude 3,400 ft (1,036 m) for domestic use in the Kamuela and Kawaihae areas since Aug. 20, 1973. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--24 years, 8.88 ft³/s (0.252 m³/s), 6,430 acre-ft/yr (7.93 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,880 ft³/s (110 m³/s) Aug. 7, 1958, gage height, 10.76 ft (3.280 m), site and datum then in use, from rating curve extended above 70 ft³/s (1.98 m³/s), by test of model of station site; no flow at times in 1968, 1971-80.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended above 46 ft³/s (1.30 m³/s) on basis of computation of flow over dam at gage height 6.20 ft (1.890 m):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 18	0630	*2280	64.6	*6.54	1.993	Mar. 24	0130	1250	35.4	5.60	1.707
Jan. 9	1330	1920	54.4	6.05	1.844	Apr. 2	0430	425	12.0	4.63	1.411
Mar. 17	0700	625	17.7	4.95	1.509						

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	1.2	7.7	.00	45	65	46	2.3	1.5	33	29
2	.00	.01	3.8	2.8	.00	5.1	158	48	1.6	.89	14	9.7
3	.00	.01	41	1.9	.00	2.5	77	25	1.5	.00	5.7	2.6
4	.00	.01	21	1.5	.00	11	52	59	17	.00	20	2.3
5	.00	.01	7.2	1.3	.00	53	20	40	7.9	.00	9.7	13
6	.00	.01	3.3	1.1	.00	81	20	26	4.4	7.4	8.2	9.1
7	.00	.01	2.2	.94	.00	47	15	18	3.9	15	3.3	2.6
8	.00	.01	1.7	.84	.00	39	9.5	8.7	2.2	3.1	9.0	1.9
9	.00	.01	1.5	339	.00	83	6.6	22	3.1	3.0	3.0	1.4
10	.00	.01	1.6	69	.00	48	3.8	6.6	14	4.2	2.1	1.2
11	.00	.01	1.6	147	.00	15	8.9	12	48	19	1.6	3.2
12	.00	.00	1.6	29	.00	6.4	112	29	42	11	1.3	2.4
13	.00	.09	1.2	7.0	2.8	43	83	31	55	5.0	1.1	32
14	.00	49	1.0	3.5	23	104	59	7.9	25	4.7	.88	17
15	.00	83	.87	2.2	15	41	68	5.2	18	5.1	.01	25
16	.00	181	.78	1.6	12	30	26	9.3	15	3.5	.00	7.6
17	.02	253	.72	1.3	3.8	127	7.4	8.5	11	2.5	.00	4.2
18	.11	324	.59	1.9	.66	19	3.5	4.4	23	2.1	.00	2.3
19	.06	40	.03	1.4	.27	34	13	11	9.9	2.0	.11	1.8
20	.03	17	.02	1.1	.10	42	4.1	39	4.2	1.7	25	2.8
21	.02	19	.03	1.0	.04	26	9.7	14	3.1	2.2	19	42
22	.01	13	.03	1.1	.00	150	17	5.7	2.5	4.1	3.5	21
23	.01	3.7	2.5	.94	.00	278	47	3.9	3.3	5.5	2.3	3.7
24	.01	3.8	14	.80	.00	411	96	3.0	2.6	6.4	1.8	2.3
25	.00	2.6	25	.55	.00	105	19	2.6	3.7	12	1.6	1.7
26	.00	2.3	9.2	.03	.00	73	37	2.6	9.0	27	1.2	1.3
27	.00	1.9	31	.00	.00	22	30	2.3	4.7	27	.96	1.2
28	.00	1.6	8.5	.00	11	24	8.7	2.0	2.5	12	7.3	1.2
29	.00	1.5	27	.00	25	67	20	1.8	2.0	4.1	9.1	1.4
30	.00	1.3	12	.00	---	24	48	1.7	1.7	5.4	47	1.0
31	.01	---	3.4	.00	---	20	---	3.0	---	3.6	34	---
TOTAL	.28	997.90	225.52	626.50	93.67	2076.0	1089.2	499.2	348.1	202.99	265.76	232.9
MEAN	.009	33.3	7.27	20.2	3.23	67.0	36.3	16.1	11.5	6.55	8.57	7.76
MAX	.11	324	41	339	25	411	158	59	55	27	47	42
MIN	.00	.00	.02	.00	.00	2.5	3.5	1.7	1.5	.00	.00	1.0
AC-FT	.6	1980	447	1240	186	4120	2160	990	683	403	527	462

CAL YR 1979 TOTAL 4962.51 MEAN 13.6 MAX 324 MIN .00 AC-FT 9840
WTR YR 1980 TOTAL 6654.02 MEAN 18.2 MAX 411 MIN .00 AC-FT 13200

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 (49 m) upstream from Marine Dam, 0.4 mi (0.6 km) east of Puu Ohu, and 1.6 mi (2.6 km) north of Kamuela.

DRAINAGE AREA.--1.18 mi² (3.06 km²).

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. Altitude of gage is 3,460 ft (1,055 m), from topographic map.

REMARKS.--Records good except those for periods of no gage-height record, which are fair. Diversion above station for livestock and domestic use. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--33 years, 8.95 ft³/s (0.254 m³/s), 6,480 acre-ft/yr (7.99 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft³/s (96.6 m³/s) Nov. 18, 1979, gage height, 6.84 ft (2.085 m), from rating curve extended above 120 ft³/s (3.40 m³/s) on basis of computations of flow over dam at gage heights 5.46 ft (1.664 m) and 5.96 ft (1.817 m); minimum, 0.59 ft³/s (0.017 m³/s) Oct. 3-6, 1965.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 180 ft³/s (5.10 m³/s) and maximum (*):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 14	2300	184	5.21	3.32	1.012	Mar. 23	1600	1020	28.9	5.10	1.554
Nov. 18	0630	*3410	96.6	*6.84	2.085	Apr. 3	1030	311	8.81	3.77	1.149
Jan. 9	1830	1990	56.4	5.88	1.792	Apr. 13	0830	204	5.78	3.40	1.036
Mar. 16	2230	485	13.7	4.19	1.277						

Minimum discharge, 1.7 ft³/s (0.048 m³/s) Feb. 7, 9, 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	2.9	2.6	6.0	1.9	30	12	35	4.3	3.2	40	15
2	2.7	2.8	25	4.3	1.8	5.1	51	40	3.5	3.0	20	6.4
3	2.6	2.1	26	3.5	1.9	8.6	128	20	3.3	3.5	8.0	5.3
4	2.3	2.0	19	2.9	1.8	11	97	60	9.8	4.0	30	6.0
5	2.2	1.9	8.1	2.8	1.8	76	55	35	6.2	3.5	15	10
6	2.1	1.9	5.1	2.5	1.8	50	20	25	7.5	6.0	10	5.3
7	2.0	1.9	3.8	2.4	1.7	17	17	15	5.3	10	5.0	4.6
8	1.9	2.3	3.3	2.3	1.9	34	16	7.0	3.8	5.0	12	4.3
9	2.0	3.0	2.9	171	1.7	54	11	15	6.4	5.0	5.0	3.3
10	1.9	2.2	3.8	60	1.7	19	10	5.0	8.9	6.0	4.5	4.0
11	1.9	2.0	4.3	157	2.6	8.1	7.2	7.0	20	25	4.0	7.3
12	1.8	1.9	4.6	15	2.3	5.8	23	20	21	15	4.0	5.0
13	1.8	6.8	3.2	6.4	3.3	31	120	30	30	8.0	3.5	21
14	1.8	67	2.6	5.1	12	78	80	6.0	16	9.0	3.0	32
15	2.9	98	2.4	4.1	12	30	65	5.0	10	7.0	3.3	22
16	3.6	166	2.3	3.5	12	72	61	7.0	8.1	5.0	3.8	8.1
17	5.6	190	2.3	3.2	5.5	37	28	6.0	9.8	4.5	4.1	5.5
18	4.8	641	2.2	3.1	3.0	22	11	5.0	14	4.0	4.0	4.4
19	3.2	28	2.2	2.8	2.4	26	14	7.0	8.4	3.5	5.1	4.3
20	3.2	17	2.0	2.6	2.2	31	12	40	5.5	3.5	17	6.3
21	3.1	21	2.3	2.4	2.0	17	18	10	4.4	4.5	14	65
22	2.8	13	2.2	2.4	1.9	142	14	7.0	4.8	6.0	5.3	20
23	2.4	7.8	3.2	2.5	1.8	351	37	6.5	6.0	7.5	4.3	6.3
24	3.0	5.5	12	2.3	1.8	135	22	6.0	4.6	8.0	4.1	4.7
25	2.8	4.3	18	2.3	2.0	94	17	5.5	6.2	15	3.6	9.6
26	2.3	4.1	8.6	2.2	2.4	76	25	5.0	8.9	30	3.3	3.6
27	3.3	4.0	22	2.2	2.2	59	20	4.5	5.3	30	3.0	3.4
28	2.7	3.8	12	2.0	15	27	10	4.0	4.1	15	13	4.9
29	6.0	3.2	21	1.9	23	17	12	3.5	3.5	6.0	11	6.2
30	5.2	2.9	12	1.9	---	33	30	3.5	3.3	7.5	28	4.5
31	3.5	---	5.3	1.9	---	19	---	5.1	---	5.0	24	---
TOTAL	89.9	1309.9	286.3	484.5	127.4	1615.6	1039.2	450.6	252.9	268.2	314.9	308.3
MEAN	2.90	43.7	7.95	15.6	4.39	52.1	34.6	14.5	8.43	8.65	10.2	10.3
MAX	6.0	641	26	171	23	351	128	60	30	30	40	65
MIN	1.8	1.9	2.0	1.9	1.7	5.1	7.2	3.5	3.3	3.0	3.0	3.3
AC-FT	178	2600	489	961	253	3200	2060	894	502	532	625	612

CAL YR 1979 TOTAL 5173.8 MEAN 14.2 MAX 641 MIN 1.8 AC-FT 10260
WTR YR 1980 TOTAL 6507.7 MEAN 17.8 MAX 641 MIN 1.7 AC-FT 12910

NOTE.--No gage-height record Apr. 26 to May 30, July 4 to Aug. 14.

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02'28", long 155°39'05", Hydrologic Unit 20010000, on left bank 800 ft (244 m) downstream from small tributary and 1.8 mi (2.9 km) northeast of Kamuela.

DRAINAGE AREA.--0.47 mi² (1.22 km²).

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 (950.190 m) above mean sea level (Hawaii County Board of Water Supply bench mark).

REMARKS.--Records good except those for period of no gage-height record, which are fair. Diversion above station for livestock and domestic use. Observations of specific conductance, pH, and water temperature made during the year are published elswehere in this report.

AVERAGE DISCHARGE.--24 years, 1.59 ft³/s (0.045 m³/s), 1,150 acre-ft/yr (1.42 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft³/s (23.3 m³/s) Nov. 18, 1979, gage height, 4.56 ft (1.390 m), from rating curve extended above 11 ft³/s (0.31 m³/s) on basis of slope-conveyance study; maximum gage height, 4.65 ft (1.417 m) Oct. 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 78 ft³/s (2.21 m³/s) and maximum (*), from rating curve extended above 54 ft³/s (1.53 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Nov. 15	0530	89	2.52	2.66	0.811	Mar. 14	0730	91	2.58	2.67	0.814
Nov. 18	0600	*822	23.3	*4.56	1.390	Mar. 17	0600	296	8.38	3.54	1.079
Jan. 9	1200	720	20.4	4.40	1.341	Mar. 24	0030	672	19.0	4.32	1.317
Mar. 5	1730	104	2.95	2.76	.841	Apr. 2	0330	116	3.29	2.83	.863

No flow Nov. 11, 12.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.13	.08	.22	.74	.16	12	17	3.0	.50	.31	2.2	2.3
2	.10	.04	4.7	.45	.14	1.3	60	4.5	.45	.30	1.2	.79
3	.09	.02	7.0	.35	.13	.87	20	2.0	.40	.36	.88	.62
4	.08	.02	3.3	.30	.12	3.4	10	6.0	2.0	.39	1.8	.60
5	.08	.04	.99	.26	.12	25	5.0	2.0	.90	.28	2.0	1.2
6	.08	.05	.53	.22	.10	20	3.0	1.0	.70	3.6	1.2	.55
7	.07	.05	.38	.20	.10	5.3	2.5	.80	.60	1.9	.70	.42
8	.05	.07	.32	.18	.09	7.2	2.0	.60	.50	.52	1.1	.38
9	.05	.11	.28	40	.08	17	1.5	.75	.55	.73	.48	.33
10	.04	.02	.30	15	.08	5.6	1.0	.40	1.0	1.0	.38	.34
11	.03	.00	.36	37	.38	1.5	.80	.50	5.0	2.2	.33	.80
12	.02	.00	.40	2.7	.17	.89	3.5	.65	4.0	1.1	.30	.38
13	.02	.30	.25	.94	.32	6.6	20	1.0	6.0	.79	.31	3.8
14	.01	16	.21	.58	1.6	39	10	.40	3.0	.81	.32	2.0
15	.01	27	.19	.43	2.9	12	5.0	.35	2.0	.85	.43	3.0
16	.01	51	.18	.32	1.7	6.9	4.0	.50	1.0	.55	.47	.80
17	.06	57	.18	.24	.46	34	1.0	.45	1.6	.41	.46	.48
18	.15	79	.17	.33	.22	2.9	.80	.40	2.0	.36	.36	.39
19	.06	5.1	.16	.29	.16	5.7	1.0	1.0	.99	.33	.54	.33
20	.06	3.2	.18	.25	.13	10	.60	5.0	.67	.30	2.5	.84
21	.03	4.4	.18	.24	.12	2.9	.65	1.5	.55	.75	2.2	7.8
22	.01	2.1	.15	.26	.12	34	1.5	.90	.56	.73	.58	2.7
23	.01	.87	1.7	.36	.10	74	5.0	.80	.78	.55	.46	.63
24	.01	.60	1.4	.30	.09	108	4.0	.70	.63	.53	.43	.43
25	.01	.44	3.4	.23	.12	20	1.0	.65	.63	1.3	.37	.36
26	.01	.38	3.7	.20	.12	9.4	2.0	.60	.76	2.4	.31	.31
27	.04	.41	3.9	.19	.14	3.7	1.5	.55	.52	3.6	.28	.29
28	.04	.34	1.4	.18	1.7	2.7	.90	.50	.39	1.5	2.2	.42
29	.70	.29	4.8	.17	4.2	5.7	2.0	.45	.36	.79	1.2	.45
30	.32	.24	1.3	.16	---	2.4	5.0	.40	.34	.86	6.3	.32
31	.10	---	.60	.16	---	5.5	---	.70	---	.69	3.9	---
TOTAL	2.48	249.17	42.83	103.23	15.83	485.46	192.25	39.05	39.38	30.79	36.19	34.06
MEAN	.080	8.31	1.38	3.33	.55	15.7	6.41	1.26	1.31	.99	1.17	1.14
MAX	.70	79	7.0	40	4.2	108	60	6.0	6.0	3.6	6.3	7.8
MIN	.01	.00	.15	.16	.08	.87	.60	.35	.34	.28	.28	.29
AC-FT	4.9	494	85	205	31	963	381	77	78	61	72	68

CAL YR 1979 TOTAL 1127.92 MEAN 3.09 MAX 79 MIN .00 AC-FT 2240
WTR YR 1980 TOTAL 1270.72 MEAN 3.47 MAX 108 MIN .00 AC-FT 2520

NOTE.--No gage-height record Apr. 3 to June 16.

16759200 RIGHT BRANCH WAIAHA STREAM NEAR HOLUALOA

LOCATION.--Lat 19°38'41", long 155°54'55", Hydrologic Unit 20010000, on right bank 1,000 ft (305 m) upstream from reservoir, 1.0 mi (1.6 km) northeast of Holualoa Makai Camp, and 2.9 mi (4.7 km) northeast of Holualoa School.

DRAINAGE AREA.--1.89 mi² (4.90 km²).

PERIOD OF RECORD.--April 1960 to current year.

REVISED RECORDS.--WSP 2137: 1963-65(M).

GAGE.--Water-stage recorder and concrete control. Altitude of gage is 3,280 ft (1,000 m), from topographic map.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--20 years, 0.321 ft³/s (0.009 m³/s), 233 acre-ft/yr (287,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,630 ft³/s (46.2 m³/s) Oct. 3, 1968, gage height, 5.78 ft (1.762 m), from rating curve extended above 9.1 ft³/s (0.26 m³/s) on basis of slope-area measurements at gage heights 4.07 ft (1.241 m) and 5.78 ft (1.762 m); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 115 ft³/s (3.26 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 9	1230	*442	12.5	*4.82	1.469
Sept. 1	1630	420	11.9	4.78	1.457

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.00	.00	.00	.00	.25	.04	.02	4.4	.30	.21	20
2	.03	.00	.00	.00	.00	.25	.02	.02	4.5	.30	.64	1.4
3	.04	.00	.00	.00	.00	.10	.01	.04	1.1	.27	.39	.68
4	.11	.00	.03	.00	.00	.06	.02	.09	.45	.12	.39	.36
5	.06	.00	.02	.00	.00	.03	.09	.11	.55	.09	.27	.16
6	.04	.00	.00	.00	.00	.02	.12	.06	.55	.06	1.0	.19
7	.02	.00	.00	.00	.00	.01	.51	.04	.30	.04	.45	.16
8	.02	.00	.00	.00	.00	.01	.19	.05	.30	.04	.17	.19
9	.02	.00	.00	68	.00	.00	.08	.06	.23	.03	.09	.30
10	.01	.00	.00	2.4	.00	.02	.04	.04	.19	.11	.98	.25
11	.02	.00	.00	6.9	.00	.10	.11	.06	.14	.38	.45	.68
12	.01	.00	.00	.72	.00	.04	.25	.05	.16	.25	.16	.42
13	.01	.00	.00	.17	.00	.02	.12	.05	.11	.10	.11	.30
14	.01	.00	.00	.08	.00	.04	.11	.07	.72	.07	.12	.23
15	.00	.00	.00	.02	.00	.07	.19	.08	.33	.06	.11	4.3
16	.00	.19	.00	.02	.01	.07	.33	.14	.21	.08	.08	3.0
17	.00	.01	.00	.01	.00	3.1	.11	.16	.30	.12	2.1	.42
18	.00	.19	.00	.03	.00	.59	.06	.11	.16	.05	.51	.30
19	.00	.06	.00	.02	.00	1.7	.04	.09	.11	.09	.17	.23
20	.00	.01	.00	.01	.00	1.3	.02	.07	.10	3.7	.10	.10
21	.00	.00	.00	.00	.00	.45	.02	.06	.11	1.3	.19	.08
22	.00	.00	.00	.00	.00	.16	.02	.06	.12	.45	.16	.08
23	.00	.00	.00	.00	.00	.08	.01	.05	.09	.16	.09	.33
24	.00	.00	.00	.00	.00	.06	.01	.04	.09	.10	.07	.19
25	.00	.00	.00	.00	.00	.05	.02	.06	1.1	.17	.05	.11
26	.00	.00	.00	.00	.00	.04	.02	.05	1.4	.16	.04	.12
27	.00	.00	.00	.00	.14	1.4	.02	.04	.63	.19	.09	.14
28	.00	.00	.00	.00	.91	.48	.02	.11	.39	.21	.08	.09
29	.00	.00	.00	.00	.39	.19	.02	.14	.30	.25	.05	.06
30	.00	.00	.00	.00	---	.08	.02	.09	.30	.87	.12	.08
31	.00	---	.00	.00	---	.04	---	.08	---	.48	3.5	---
TOTAL	.45	.46	.05	78.38	1.45	10.81	2.69	2.19	19.44	10.60	12.94	34.95
MEAN	.015	.015	.002	2.53	.050	.35	.088	.071	.65	.34	.42	1.17
MAX	.11	.19	.03	68	.91	3.1	.51	.16	4.5	3.7	3.5	20
MIN	.00	.00	.00	.00	.00	.00	.01	.02	.09	.03	.04	.06
AC-FT	.9	.9	.10	155	2.9	21	5.2	4.3	39	21	26	69

CAL YR 1979 TOTAL 50.11 MEAN .14 MAX 7.4 MIN .00 AC-FT 99
WTR YR 1980 TOTAL 174.36 MEAN .48 MAX 68 MIN .00 AC-FT 346

16759800 KIILAE STREAM NEAR HONAUNAU

LOCATION.--Lat 19°24'52", long 155°50'56", Hydrologic Unit 20010000, on right bank 2.4 mi (3.9 km) northeast of Kealia and 3.0 mi (4.8 km) southeast of Honaunau Post Office.

DRAINAGE AREA.--0.67 mi² (1.74 km²).

PERIOD OF RECORD.--April 1958 to current year.

GAGE.--Water-stage recorder. Datum of gage is 2,898 ft (883.3 m) above mean sea level (by stadia traverse).

REMARKS.--Records good except those for period of no gage-height record, which are fair. No diversion above station. Banks overflow at high stage and part of overflow is lost in lava. Recording rain gage located at station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--22 years, 0.210 ft³/s (0.006 m³/s), 152 acre-ft/yr (187,000 m³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 104 ft³/s (2.95 m³/s) Jan. 13, 1959, gage height, 2.32 ft (0.707 m), from rating curve extended above 5.7 ft³/s (0.161 m³/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 25 ft³/s (0.71 m³/s) and maximum (*), from rating curve extended above 17 ft³/s (0.48 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Jan. 9	1030	*35	0.99	*1.68	0.512
Mar. 28	1430	25	.71	1.58	.482

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	.00	.01	.00	.00	1.0	.01	.01	.51	.04	.06	4.8
2	.02	.00	.01	.00	.00	.11	.00	.06	2.7	.06	.40	.85
3	.05	.00	.02	.00	.00	.00	.00	1.2	1.5	.10	.61	.24
4	.02	.00	.05	.00	.00	.00	.52	.92	.12	.04	.52	.10
5	.02	.00	.02	.00	.00	.00	1.6	.22	.42	.06	.37	.04
6	.01	.00	.00	.00	.00	.00	.28	.08	.34	.01	.61	.96
7	.00	.00	.00	.00	.00	.00	.11	.03	.06	.00	.26	.78
8	.00	.00	.00	.00	.00	.00	.04	.02	.01	.00	.07	.40
9	.00	.00	.00	6.6	.00	.08	.01	.02	.01	.02	.07	.34
10	.00	.00	.00	1.8	.00	.24	.04	.03	.07	.78	.11	.15
11	.00	.00	.00	3.9	.00	.08	.02	.04	.59	.92	.11	.34
12	.00	.00	.00	.16	.00	.00	.05	.02	.07	.40	.52	.66
13	.00	.00	.00	.02	.00	.00	.43	.00	.04	.11	.26	.52
14	.00	.00	.00	.00	.00	.00	.14	.11	.77	.07	.24	.66
15	.00	.00	.00	.00	.01	1.2	4.2	.09	.50	.04	.06	5.1
16	.00	1.0	.00	.00	.00	.26	1.2	.04	.40	.04	.25	1.3
17	.00	.10	.00	.00	.00	3.1	.13	.71	.45	.14	2.4	.44
18	.00	.80	.00	.00	.00	.61	.04	.78	.25	.10	.78	.26
19	.00	.30	.00	.00	.00	2.4	.14	.26	.20	.10	.15	.11
20	.00	.05	.00	.00	.00	.15	.13	.34	.15	.07	.22	.03
21	.00	.03	.00	.00	.00	.04	.07	.16	.10	1.3	.48	.01
22	.00	.02	.00	.00	.00	.00	.13	.06	.10	.22	.98	.07
23	.00	.01	.00	.00	.00	1.0	.04	.02	.05	.04	.28	.31
24	.00	.00	.00	.00	.00	.78	1.8	.36	.05	.00	.06	.37
25	.00	.00	.00	.00	.00	.48	.16	.34	.30	.20	.02	.18
26	.00	.00	.00	.00	.00	.10	.06	.09	.40	.10	.01	.14
27	.00	.00	.00	.00	.00	.86	.52	.06	.14	.11	.07	.06
28	.00	.00	.00	.00	.03	2.2	.13	.08	.10	.24	.04	.02
29	.00	.00	.00	.00	.00	.78	.02	.11	.09	.18	.01	.01
30	.00	.00	.00	.00	---	.20	.01	.04	.12	.26	.00	.00
31	.00	---	.00	.00	---	.04	---	.02	---	.11	.50	---
TOTAL	.14	2.31	.11	12.48	.04	15.71	12.03	6.32	10.61	5.86	10.02	19.25
MEAN	.005	.077	.004	.40	.001	.51	.40	.20	.35	.19	.32	.64
MAX	.05	1.0	.05	6.6	.03	3.1	4.2	1.2	2.7	1.3	2.4	5.1
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.00
AC-FT	.3	4.6	.2	25	.08	31	24	13	21	12	20	38

CAL YR 1979 TOTAL 91.99 MEAN .25 MAX 6.4 MIN .00 AC-FT 182
WTR YR 1980 TOTAL 94.88 MEAN .26 MAX 6.6 MIN .00 AC-FT 188

NOTE.--No gage-height record Oct. 7 to Dec. 5.

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, on right bank 0.5 mi (0.8 km) upstream from mouth, 6.6 mi (10.6 km) northwest of Honuapo, and 6.7 mi (10.8 km) west of Punaluu.

DRAINAGE AREA.--9.17 mi² (23.75 km²).

PERIOD OF RECORD.--February 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,940 ft (896 m), from topographic map.

REMARKS.--Records good. No diversion above station. Recording rain gage located at station.

AVERAGE DISCHARGE.--14 years, 9.10 ft³/s (0.258 m³/s), 6,590 acre-ft/yr (8.13 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,400 ft³/s (68.0 m³/s) Mar. 18, 1980, gage height, 8.00 ft (2.438 m), from rating curve extended above 75 ft³/s (2.12 m³/s); no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 600 ft³/s (17.0 m³/s) and maximum (*), from rating curve extended as explained above:

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 2	1630	1760	49.8	7.15	2.179	Mar. 18	0800	*2400	68.0	*8.00	2.438
Nov. 18	0730	726	20.6	5.29	1.612	July 7	0030	694	19.7	5.21	1.588
Jan. 9	1000	690	19.5	5.20	1.585	Aug. 17	1730	650	18.4	5.10	1.555

No flow Feb. 22-27, Mar. 2-5, 11-14.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.6	5.1	1.3	.08	.01	.03	.70	1.2	37	16	31	13
2	88	37	.66	.06	.01	.00	.70	12	27	15	28	7.3
3	5.3	3.3	.38	.05	.01	.00	27	5.0	11	64	36	2.7
4	11	.77	.27	.04	.44	.00	11	19	41	38	33	29
5	4.6	.55	.19	.03	.11	.00	1.1	31	24	15	67	3.8
6	1.6	.89	1.0	.03	.02	.14	.50	31	33	18	36	2.1
7	.98	.40	1.6	.02	.02	.16	.30	2.0	31	42	17	1.9
8	.93	.34	2.8	19	.28	1.6	.30	1.1	22	3.5	4.1	6.9
9	4.0	.31	.76	165	4.8	.12	1.5	1.5	32	8.1	5.7	11
10	2.7	.29	.28	26	.23	.01	3.5	1.1	8.6	42	2.0	32
11	1.9	.27	29	17	1.6	.00	.70	48	17	27	2.5	31
12	1.2	.55	2.4	.68	1.2	.00	.70	24	9.0	21	1.8	6.4
13	.96	.95	.91	.31	.17	.00	18	13	31	8.6	1.4	77
14	.85	2.6	.26	.17	.04	.00	3.0	22	32	7.9	1.3	18
15	55	.87	.17	.09	.02	20	22	36	17	6.1	1.3	27
16	10	.35	.13	.05	.02	54	5.9	4.2	4.0	2.3	39	7.6
17	8.5	2.9	.11	.03	.02	613	2.5	1.5	1.2	1.7	82	4.3
18	.82	239	.40	.03	.01	580	2.5	.82	.75	1.7	49	35
19	1.2	4.5	.25	.03	.01	57	2.0	.38	.67	12	4.5	3.5
20	1.5	1.1	.13	.02	.01	19	1.1	.34	2.9	23	43	6.6
21	15	5.6	.11	.02	.01	2.8	1.1	12	5.8	49	6.7	30
22	2.8	5.4	.09	.02	.00	2.0	1.0	4.2	2.2	3.6	11	15
23	2.6	4.9	.06	.02	.00	121	1.0	3.5	1.2	1.5	7.8	6.4
24	1.0	9.0	.05	.02	.00	131	.95	1.5	.70	1.3	3.4	6.7
25	.58	4.0	.04	.02	.00	27	.90	5.0	12	2.3	2.8	7.2
26	7.6	.82	.05	.02	.00	24	.85	17	41	1.5	7.8	3.3
27	8.5	.56	2.8	.02	.00	67	1.2	25	5.3	4.6	11	2.5
28	2.2	3.6	.50	.02	.01	27	1.1	15	2.8	6.0	56	2.3
29	18	5.9	1.9	.02	.08	3.0	12	3.0	9.3	32	16	2.3
30	5.5	1.4	.82	.02	---	.50	3.0	19	8.4	49	41	2.3
31	16	---	.14	.02	---	.50	---	10	---	3.8	21	---
TOTAL	288.38	342.81	49.06	228.94	9.13	1750.86	128.10	369.94	470.82	527.5	470.1	403.9
MEAN	9.30	11.4	1.58	7.39	.31	56.5	4.27	11.9	15.7	17.0	21.6	13.5
MAX	88	239	29	165	4.8	613	27	48	41	64	82	77
MIN	.58	.27	.04	.02	.00	.00	.30	.34	.67	1.3	1.3	1.9
AC-FT	572	680	97	454	18	3470	254	734	934	1050	1330	801

CAL YR 1979 TOTAL 4565.32 MEAN 12.5 MAX 575 MIN .01 AC-FT 9060
WTR YR 1980 TOTAL 5239.54 MEAN 14.3 MAX 613 MIN .00 AC-FT 10390

16765000 HILEA GULCH TRIBUTARY NO. 2 NEAR HONUAPO

LOCATION.--Lat 19°10'17", long 155°36'05", Hydrologic Unit 20010000, on right bank 0.5 mi (0.8 km) upstream from mouth, 6.3 mi (10.1 km) northwest of Honuapo, and 6.6 mi (10.6 km) west of Punaluu.

DRAINAGE AREA.--1.86 mi² (4.82 km²).

PERIOD OF RECORD.--February 1966 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 2,880 ft (878 m), from topographic map.

REMARKS.--Records good. No diversion above station. Observations of specific conductance, pH, and water temperature made during the year are published elsewhere in this report.

AVERAGE DISCHARGE.--14 years, 3.09 ft³/s (0.088 m³/s), 2,240 acre-ft/yr (2.76 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 915 ft³/s (25.9 m³/s) Mar. 18, 1980, gage height, 8.75 ft (2.667 m), from rating curve extended above 41 ft³/s (1.16 m³/s); no flow many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 310 ft³/s (8.78 m³/s) and maximum (*), from rating curve extended above 41 ft³/s (1.16 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 2	1700	590	16.7	7.50	2.286
Nov. 18	0700	333	9.43	6.09	1.856
Mar. 18	0800	*915	25.9	*8.75	2.667

No flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.58	.00	.00	.00	.00	.00	.00	8.8	.70	9.0	.00
2	46	14	.00	.00	.00	.00	.00	.38	2.6	3.8	5.4	.00
3	1.0	.40	.00	.00	.00	.00	5.6	.00	.00	25	11	.00
4	.78	.00	.00	.00	.00	.00	.12	.27	12	11	9.6	.50
5	.28	.00	.00	.00	.00	.00	.00	1.9	1.3	3.0	22	.00
6	.01	.00	.00	.00	.00	.00	.00	4.0	5.6	.92	10	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	4.2	18	3.7	.00
8	.00	.00	.00	3.6	.00	.00	.00	.00	1.9	.00	.90	.00
9	.28	.00	.00	68	.00	.00	.08	.00	4.2	.18	.00	.00
10	.02	.00	.00	16	.00	.00	.00	.00	.00	8.9	.00	.75
11	.00	.00	9.0	12	.00	.00	.00	7.9	.65	8.9	.00	.00
12	.00	.00	.44	.06	.00	.00	.00	1.3	.08	3.8	.00	.00
13	.00	.00	.00	.00	.00	.00	2.6	.17	5.6	.67	.00	1.5
14	.00	.00	.00	.00	.00	.00	.00	3.0	9.8	.38	.00	.30
15	20	.00	.00	.00	.00	7.0	5.5	1.3	.50	.23	.00	.00
16	2.8	.00	.00	.00	.00	22	.00	.00	.00	.01	11	.00
17	1.9	2.5	.00	.00	.00	318	.00	.00	.00	.00	39	.00
18	.00	105	.00	.00	.00	386	.00	.00	.00	.00	.62	2.0
19	.03	.60	.00	.00	.00	11	.00	.00	.00	2.1	.00	.00
20	.12	.00	.00	.00	.00	2.7	.00	.00	.00	8.0	1.0	.00
21	3.3	1.6	.00	.00	.00	.00	.00	.88	.06	19	.00	1.5
22	.22	1.9	.00	.00	.00	.00	.00	.00	.00	.40	.00	.00
23	.03	.72	.00	.00	.00	44	.00	.00	.00	.00	.00	.00
24	.00	1.3	.00	.00	.00	37	.00	.00	.00	.00	.00	.00
25	.00	.33	.00	.00	.00	5.9	.00	.01	.60	.00	.00	.00
26	.74	.00	.00	.00	.00	1.7	.00	1.9	9.3	.00	.00	.00
27	.87	.00	.38	.00	.00	14	.00	3.4	.00	.00	.00	.00
28	.13	.00	.02	.00	.00	1.9	.00	.12	.00	.00	1.0	.00
29	3.9	.19	.00	.00	.00	.00	.38	.00	.08	8.2	.00	.00
30	.68	.02	.00	.00	---	.00	.00	1.1	.41	16	.50	.00
31	3.9	---	.00	.00	---	.00	---	.00	---	.16	.00	---
TOTAL	87.09	129.14	9.84	99.66	.00	851.20	14.28	27.63	67.68	139.35	125.22	6.55
MEAN	2.81	4.30	.32	3.21	.000	27.5	.48	.89	2.26	4.50	4.04	.22
MAX	46	105	9.0	68	.00	386	5.6	7.9	12	25	39	2.0
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	173	256	20	198	.00	1690	28	55	134	276	248	13

CAL YR 1979 TOTAL 1387.63 MEAN 3.80 MAX 264 MIN .00 AC-FT 2750
WTR YR 1980 TOTAL 1557.64 MEAN 4.26 MAX 386 MIN .00 AC-FT 3090

HAWAII, ISLAND OF HAWAII

16767000 NINOLE GULCH NEAR PUNALUU

LOCATION.--Lat 19°10'44", long 155°33'46", Hydrologic Unit 20010000, on right bank 300 ft (91 m) downstream from forest-reserve boundary, 4.6 mi (7.4 km) northwest of Punaluu, and 6.0 mi (9.6 km) north of Honuapo.

DRAINAGE AREA.--15.5 mi² (40.1 km²).

PERIOD OF RECORD.--March 1966 to current year.

GAGE.--Water-stage recorder and sharp-crested weir. Altitude of gage is 2,080 ft (634 m), from topographic map.

REMARKS.--Records good except those above 60 cfs, which are fair. No diversion above station.

AVERAGE DISCHARGE.--14 years, 3.99 ft³/s (0.113 m³/s), 2,890 acre-ft/yr (3.56 hm³/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,610 ft³/s (73.9 m³/s) June 1, 1979, gage height, 6.74 ft (2.054 m), from rating curve extended above 30 ft³/s (0.85 m³/s); no flow for many days each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges above base of 1,000 ft³/s (28.3 m³/s) and maximum (*), from rating curve extended above 30 ft³/s (0.85 m³/s):

Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)	Date	Time	Discharge (ft³/s)	Discharge (m³/s)	Gage height (ft)	Gage height (m)
Oct. 2	1700	1240	35.1	5.80	1.768	Mar. 18	0330	*1700	48.1	*6.13	1.868
Nov. 18	1400	1100	31.2	5.65	1.722	Sept. 16	1530	1350	38.2	5.90	1.798

Minimum discharge, no flow for many days.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	1.8	.00	.00	.00	.00	.00	.00	3.3	.00	2.1	.04
2	56	34	.00	.00	.00	.00	.00	.00	.01	.00	1.2	.00
3	.34	.24	.00	.00	.00	.00	.47	.00	.00	7.3	.36	.00
4	.00	.00	.00	.00	.00	.00	.01	.00	4.3	.03	2.2	1.4
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	36	.05
6	.00	.00	.00	.00	.00	.00	.00	.00	2.1	.00	6.4	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	5.0	20	.59	.00
8	.00	.00	.00	1.3	.00	.00	.00	.00	.02	.00	.09	.00
9	3.2	.00	.00	13	.00	.00	.00	.00	.58	.00	.00	.20
10	1.2	.00	.00	.48	.00	.00	.00	.00	.02	11	.00	4.9
11	.00	.00	3.3	.05	1.1	.00	.00	3.8	.00	1.6	.00	2.7
12	1.1	.00	.06	.00	.00	.00	.00	.01	.00	.73	.00	.25
13	.00	.00	.00	.00	.00	.00	1.3	.00	.00	.10	.00	25
14	.00	.02	.00	.00	.00	.00	.00	4.8	.45	.00	.00	.34
15	39	.00	.00	.00	.00	.00	.68	.40	.00	.00	.00	.00
16	.42	.00	.00	.00	.00	3.1	.01	.05	.00	.00	15	45
17	.02	.01	.00	.00	.00	452	.00	.00	.00	.00	31	.17
18	.00	196	.00	.00	.00	502	.00	.00	.00	.00	37	5.9
19	.00	.21	.00	.00	.00	6.8	.00	.00	.00	5.5	.16	.16
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	5.6	13	1.3
21	.96	.00	.00	.00	.00	.00	.00	.49	.00	33	.24	9.2
22	.05	.00	.00	.00	.00	.00	.00	.00	.00	.13	.00	.36
23	.05	.00	.00	.00	.00	24	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	47	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	3.8	.00	.00	.00	.00	.00	.07
26	.00	.00	.00	.00	.00	.59	.00	.00	6.6	.00	.00	.00
27	.00	.00	.00	.00	.00	33	.00	2.1	.11	.00	.00	.00
28	.00	.00	.00	.00	.00	.66	.00	.00	.00	.00	12	.00
29	2.5	.00	.00	.00	.00	.00	.00	.00	.00	1.3	2.1	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	14	4.5	.00
31	1.2	---	.00	.00	---	.00	---	.00	---	.05	1.6	---
TOTAL	106.04	232.28	3.36	14.83	1.10	1072.95	2.47	11.65	22.45	100.34	165.54	97.04
MEAN	3.42	7.74	.11	.48	.038	34.6	.082	.38	.75	3.24	5.34	3.23
MAX	56	196	3.3	13	1.1	502	1.3	4.8	6.6	33	37	45
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	210	461	6.7	29	2.2	2130	4.9	23	45	199	328	192

CAL YR 1979 TOTAL 2865.12 MEAN 7.85 MAX 854 MIN .00 AC-FT 5680
WTR YR 1980 TOTAL 1830.05 MEAN 5.00 MAX 502 MIN .00 AC-FT 3630

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 floodflow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to those events. Those measurements and others collected for some special reason are called measurements at miscellaneous sites.

Records collected at partial-record stations are presented in two tables. The first is a table of discharge measurements at low-flow partial-record stations, and the second is a table of annual maximum stage and discharge at crest-stage stations. Discharge measurements made at miscellaneous sites for both low flow and high flow are given in a third table.

Low-flow partial-record stations

Measurements of streamflow in the area covered by this report made at low-flow partial-record stations are given in the following table. Most of these measurements were made during periods of base flow when streamflow is primarily from ground-water storage. These measurements, when correlated with the simultaneous discharge of a nearby stream where continuous records are available, will give a picture of the low-flow potentiality of the stream. The column headed "Period of record" shows the 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 1980

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Kauai				
16011000	Waiakoali Stream near Waimea	Lat 22°07'42", long 159°37'27", 0.3 mi (0.5 km) upstream from mouth and 12 mi (19 km) northeast of Waimea	1.58 (4.09)	1909-13≠, 1914-17, 1919-25≠, 1961-62, 1964, 1966-70, 1972-80	6-27-80 7-29-80 9-11-80	5.7 4.2 1.6
16012000	Kauaikinana Stream near Waimea	Lat 22°08'12", long 159°37'58", 0.6 mi (1.0 km) upstream from mouth and 12 mi (19 km) northeast of Waimea.	.84 (2.18)	1911-13, 1915-17, 1919-25≠, 1961-62, 1964, 1966-80	6-27-80 7-29-80 9-11-80	2.2 1.3 .67
16029500	Mokihana Stream near Waimea	Lat 21°59'38", long 159°40'07", 500 ft (152 m) upstream from mouth and 2.5 mi (4.0 km) north of Waimea.	4.83 (12.51)	1962, 1964-80	3- 3-80 8-11-80 9- 4-80	.91 .74 .25
16030000	Peekauai ditch near Waimea	Lat 21°58'43", long 159°39'37", on right bank, 0.8 mi (1.3 km) upstream from Makaweli River and 1.6 mi (2.6 km) north of Waimea.	-	1911-19, 1978-80	10- 1-80 11- 5-80 12- 3-80 1- 7-80 4- 7-80 5- 5-80 6- 2-80 7-14-80 8-11-80 9- 4-80	1.4 3.1 2.5 1.8 3.0 4.1 .92 3.4 2.2 2.4
16058500	South Fork Wailua River near rock Quarry	Lat 22°01'44", long 159°25'03", 7.5 mi (12.1 km) upstream from mouth and 4.6 mi (7.4 km) northwest of Lihue.	20.2 (52.3)	1974-80	12- 5-79 2-29-80 4- 1-80 7- 1-80	4.1 6.0 5.2 8.5
16102000	China ditch near Hanalei	Lat 22°11'10", long 159°28'00", on left bank just below intake and 3.0 mi (4.8 km) southeast of Hanalei.	-	1913-19≠, 1977-80	2-21-80 7-15-80 8-28-80	12 16 21
		Hawaii, Island of Oahu				
16201000	Right Branch of North Fork Kaukonahua Stream near Wahiawa	Lat 21°31'11", long 157°56'53", 200 ft (61 m) above confluence with Left Branch and 4.5 mi (7.2 km) east of Leilehua High School in Wahiawa.	1.17 (3.03)	1913-53≠, 1960-62, 1966, 1968-80	11- 9-79 12- 9-79 2- 5-80 9-17-80	2.8 .84 .81 2.9
16214000	Pearl Harbor Springs at Waiawa, near Pearl City	Lat 21°23'36", long 157°59'11", 0.7 mi (1.1 km) west of Pearl City and 1.5 mi (2.4 km) east of Waipahu Post Office.	-	1931-34≠, 1937-64≠, 1967-68, 1970-80	4-17-80	14
16224000	Pearl Harbor Springs at Kalauao, near Aiea	Lat 21°23'05", long 157°56'46", 300 ft (91 m) downstream from Highway 90 and 0.8 mi (1.3 km) west of Aiea Post Office.	-	1931-62≠, 1964-65≠, 1966-68, 1970-80	4-18-80	14

≠ Operated as a continuous-record gaging station.

Discharge measurements made at low-flow partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Measurements Date	Measurements Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued				
16264100	Kahanaiki Stream at Highway 61, near Kailua	Lat 21°22'49", long 157°46'06", at bridge on Highway 61 and 1.9 mi (3.1 km) southwest of Kailua Post Office.	1.45 (3.76)	1960-63, 1965-66, 1971-80	8-11-80	1.2
16283400	Kahaluu Stream near Kahaluu	Lat 21°27'14", long 157°50'17", 600 ft (183 m) above Ahuimanu Stream and 0.6 mi (1.0 km) south of Kahaluu.	1.29 (3.34)	1962-63, 1966, 1972-80	8-11-80	1.7
16295995	Kahana Stream at Mauka trail crossing, near Kahana	Lat 21°32'17", long 157°53'29", 1.8 mi (2.9 km) upstream from main bridge on Kamehameha Highway and 2.8 mi (4.5 km) southwest of Kaaawa School.	3.18 (8.24)	1960-62, 1966, 1971-72, 1974-80	9- 3-80	19
16297000	Kawa Stream near Kahana	Lat 21°32'33", long 157°53'00", 0.1 mi (0.2 km) above confluence with Kahana Stream and 1.0 mi (1.6 km) south of Kahana.	2.09 (5.41)	1914-17≠, 1958a, 1961-62, 1966, 1971-72, 1974-80	9- 5-80	2.2
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft (305 m), near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft (152 m) upstream from Kawailena Stream, 2.2 mi (3.5 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.51 (1.32)	1968-80	10-23-79 12- 5-79 5-15-80 7-15-80 9-11-80	.81 3.0 2.6 2.4 2.4
16403500	Kawailena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft (244 m) upstream from mouth, 2.2 mi (3.5 km) south of former village of Pelekunu, and 5.5 mi (8.8 km) north of Kamalo.	.65 (1.68)	1968-80	10-23-79 12- 5-79 5-15-80 7-15-80 9-11-80	1.3 2.2 2.7 2.3 2.4
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft (122 m) downstream from Kawailena Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.6 mi (9.0 km) north of Kamalo.	1.20 (3.11)	1968-70≠, 1974-80	10-23-79 12- 5-79 5-15-80 7-15-80 9-11-80	2.2 5.1 6.0 4.7 5.3
16403700	Kawainui Stream at altitude 1,000 ft (305 m) near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft (122 m) upstream from Kawaipoko Stream, 2.4 mi (3.9 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.79 (2.05)	1968-80	10-23-79 12- 5-79 5-14-80 7-15-80 9-11-80	1.8 7.2 5.4 5.5 6.2
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft (91 m) upstream from mouth, 2.4 mi (3.9 km) south of former village of Pelekunu, and 5.4 mi (8.7 km) north of Kamalo.	.26 (.67)	1968-80	10-23-79 12- 5-79 5-14-80 7-15-80 9-11-80	.58 2.7 1.4 1.8 .96
16403900	Kawainui Stream near Pelekunu	Lat 21°07'59", long 156°52'38", on right bank 900 ft (274 m) upstream from confluence with Kapuhi Stream, 2.1 mi (3.4 km) south of former village of Pelekunu, and 5.7 mi (9.2 km) north of Kamalo.	1.17 (3.03)	1969-79≠, 1980	1-30-80 5-14-80 7-15-80 9-11-80	3.3 9.2 9.5 12

≠ Operated as a continuous-record gaging station.
a Previously published with discharge measurements at miscellaneous sites.

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 1980

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum: Date	Annual maximum: Gage height (feet)	Annual maximum: Discharge (ft³/s)
		Hawaii, Island of Kauai					
16038000	Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft (46 m) upstream from highway bridge at Waimea and 0.2 mi (0.3 km) upstream from mouth.	86.5 (224.0)	1944-80b	1- 8-80	5.89	-
16052000	Hanapepe River at Hanapepe	Lat 21°54'47", long 159°35'33", 400 ft (122 m) upstream from bridge on Highway 50 and 0.5 mi (0.8 km) upstream from mouth.	26.6 (68.9)	1950-80b	5-28-80 /	4.29	-
16052500	Lawai Stream near Koloa	Lat 21°54'11", long 159°30'21", on right bank at private road bridge, 0.9 mi (1.4 km) upstream from mouth and 2.4 mi (3.9 km) southwest of Koloa.	6.62 (17.15)	1962-63, 1964-72≠, 1973-80	5-28-80	5.60	1,910
16055000	Huleia Stream near Lihue	Lat 21°57'20", long 159°25'23", at highway bridge, 3.7 mi (6.0 km) southwest of Lihue, and 4.5 mi (7.2 km) upstream from mouth.	17.6 (45.6)	1912-15≠, 1962-67, 1968-70≠, 1971-80	5-28-80	15.66	10,000
16071800	Wailua River near Kapaa	Lat 22°03'00", long 159°20'26", at State Park 600 ft (183 m) upstream from highway bridge, 850 ft (259 m) upstream from mouth, and 2.5 mi (4.0 km) southwest of Kapaa.	52.6 (136.2)	1962-80b	3-19-80	5.23	-
16073500	Konohiki Stream near Kapaa	Lat 22°04'01", long 159°20'21", at culvert on private road, 1.8 mi (2.9 km) upstream from mouth and 2.4 mi (3.9 km) southwest of Kapaa High School.	3.38 (8.75)	1964-67, 1970-80	5-28-80	6.82	66
16081200	Akulikuli Stream near Kapaa	Lat 22°06'25", long 159°22'07", at Kahuna road crossing, 800 ft (244 m) upstream from mouth and 3.5 mi (5.6 km) northwest of Kapaa armory.	.40 (1.04)	1964-80	5-23-80	4.68	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 (30 m) upstream from road crossing, 1.4 mi (2.2 km) northwest of Kealia and 2.1 mi (3.4 km) upstream from mouth.	14.0 (36.3)	1962-80	5-23-80	9.78	3,200
16085000	Homaikawaa Stream near Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi (2.6 km) southeast of Anahola School and 1.6 mi (2.6 km) north of Kealia.	.85 (2.20)	1964-80	5-23-80	-	a130
16097900	Puukumu Stream near Kilauea	Lat 22°13'01", long 159°25'18", at culvert on Highway 56, 0.8 mi (1.3 km) northwest of Kilauea School and 0.9 mi (1.4 km) upstream from mouth.	.91 (2.36)	1964-68, 1971-80	6-15-80	3.88	70

≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi^2 (km^2)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft^3/s)
		Hawaii, Island of Kauai--Continued					
16104200	Hanalei River at Highway 56 Bridge near Hanalei	Lat 22°12'50", long 159°28'43", at highway bridge, 1.6 mi (2.6 km) northeast of Hanalei and 2.4 mi (3.9 km) upstream from mouth.	21.0 (54.4)	1963-80b	1 -8-80	8.96	-
16130000	Nahomalu Valley near Mana	Lat 22°02'41", long 159°45'17", on left bank 1.1 mi (1.8 km) northeast of Mana and 5.3 mi (8.5 km) northwest of Kekaha School.	3.81 (9.87)	1962-63, 1964-71≠, 1972-80	5-30-80	4.06	466
		Hawaii, Island of Oahu					
16210500	Kaukonahua Stream at Waialua	Lat 21°33'56", long 158°07'26", 0.2 mi (0.3 km) upstream from Highway 99, 0.4 mi (0.6 km) southeast of Waialua High School and 1.3 mi (2.1 km) southwest of Weed Circle.	38.7 (100.2)	1963, 1968-80	3-18-80	22.23	a3,700
16211200	Poamoho Stream at Waialua	Lat 21°34'00", long 158°06'40", at culvert crossing of Kaheaka Road, 0.2 mi (0.3 km) upstream from Highway 83 and 1.1 mi (1.8 km) east of Waialua High School.	10.9 (28.2)	1967-80	3-18-80	22.20	a1,800
16211300	Makaleha Stream near Waialua	Lat 21°33'49", long 158°09'21", 1.0 mi (1.6 km) southwest of Dillingham Ranch and 1.9 mi (3.1 km) southwest of sugar mill at Waialua.	4.15 (10.75)	1958-63, 1964-65≠, 1966-80	1- 8-80	5.98	652
16211400	Manini Gulch at Kaena	Lat 21°34'50", long 158°15'12", 180 ft (55 m) upstream from Highway 99, 1.7 mi (2.7 km) west of Camp Erdman and 2.0 mi (3.2 km) east of Kaena Point.	1.08 (2.80)	1974-80	3-18-80	13.04	a259
16211500	Makua Stream at Makua	Lat 21°31'59", long 158°13'49", on left bank, 20 ft (6 m) upstream from old concrete highway ford, 140 ft (43 m) downstream from Farrington Highway box culvert, 0.1 mi (0.2 km) north of Makua cemetery, and 4.5 mi (7.2 km) southeast of Kaena Point lighthouse.	4.28 (11.09)	1958-80	3-18-80	6.67	a300
16211700	Makaha Stream at Makaha	Lat 21°28'47", long 158°12'31", 0.9 mi (1.4 km) upstream from Farrington Highway and 1.1 mi (1.8 km) north of junction of Farrington Highway and Makaha Valley Road.	5.25 (13.60)	1966-80	1- 8-80	8.31	340
16211800	Kaupuni Stream at altitude 372 ft (144 m), near Waianae	Lat 21°28'20", long 158°09'26", at abandoned diversion dam, 2.6 mi (4.2 km) northeast of Waianae cemetery and 2.8 mi (4.5 km) northeast of junction of Waianae Valley Road and Farrington Highway.	3.58 (9.27)	1961-72≠, 1973-80	1- 8-80	5.65	570
16212200	Mailiilii Stream near Waianae	Lat 21°27'34", long 158°08'05", at bridge at Lualualei Naval Reservation and 3.4 mi (5.5 km) east of cemetery near Waianae.	1.51 (3.91)	1958-80	1- 8-80	2.14	a160
16212300	Nanakuli Stream at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi (1.1 km) upstream from Highway 90 and 0.6 mi (1.0 km) northeast of Nanakuli Post Office.	3.98 (10.31)	1968-80	3-18-80	23.14	640

≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16212450	Kaloi Gulch tributary near Honouliuli	Lat 21°22'41", long 158°03'45", at culvert on private road, 1.8 mi (2.9 km) west of Honouliuli and 2.8 mi (4.5 km) northwest of Ewa Post Office.	1.70 (4.40)	1968-80	1- 8-80	7.45	724
16212500	Honouliuli Stream near Waipahu	Lat 21°22'40", long 158°02'10", at bridge on Farrington Highway and 1.8 mi (2.9 km) west of Waipahu Post Office.	11.0 (28.5)	1956-80	1- 8-80	4.95	1,310
16212601	Waikele Stream at Wheeler Field	Lat 21°28'44", long 158°03'07", at culvert 0.3 mi (0.5 km) west of east-west runway at Wheeler Field, and 1.9 mi (3.1 km) southwest of Wahiawa Post Office.	6.35 (16.45)	1958, 1960-80	1- 8-80	5.83	278
16212700	Waikakalaua Stream near Wahiawa	Lat 21°27'50", long 158°01'38", 0.2 mi (0.3 km) downstream from Kamehameha Highway and 2.4 mi (3.9 km) south of Wahiawa Post Office.	7.49 (19.40)	1958-80	3-18-80	12.28	2,420
16212750	Huliwai Gulch near Kunia Camp	Lat 21°26'43", long 158°03'47", 200 ft (61 m) upstream from Highway 75 and 1.2 mi (1.9 km) south of Kunia Camp.	.84 (2.18)	1974-80	1- 8-80	6.45	a50
16223000	Waimalu Stream near Aiea	Lat 21°23'48", long 157°56'56", 1,300 ft (400 m) upstream from bridge on Moanalua Road and 1.2 mi (1.9 km) northwest of Aiea High School.	5.97 (15.46)	1952-70≠, 1973-80	3-18-80	5.60	5,600
**16228200	Moanalua Stream near Aiea	Lat 21°22'37", long 157°53'03", on right bank 1.1 mi (1.8 km) northeast of Tripler Hospital and 2.9 mi (4.7 km) east of Aiea sugar refinery.	3.34 (8.65)	1969-80	3-18-80	9.97	4,860
**16228600	Moanalua Stream at Tripler Hospital	Lat 21°21'52", long 157°54'05", on right bank 0.5 mi (0.8 km) west of Tripler Hospital and 1.6 mi (2.6 km) northeast of Aliamanu School.	4.44 (11.50)	1971-80	3-18-80	21.00	6,200
16228900	Kalihi Stream near Kaneohe	Lat 21°22'35", long 157°49'32", on right bank 800 ft (244 m) downstream from Likelike Highway, and 2.8 mi (4.5 km) southwest of Castle High School in Kaneohe.	.60 (1.55)	1967-71≠, 1972-80	1- 8-80	5.60	1,700
16235400	Waolani Stream at Honolulu	Lat 21°20'00", long 157°51'04", at Wyllie Street bridge and 1.8 mi (2.9 km) northeast of Honolulu Post Office.	1.28 (3.32)	1958-80	1- 8-80	3.59	1,040
16237500	Pauoa Stream at Honolulu	Lat 21°19'18", long 157°51'03", at Lusitana Street bridge and 1.1 mi (1.8 km) northeast of Honolulu Post Office.	1.43 (3.70)	1958-80	1- 8-80	1.71	1,050
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 (0.5 km) downstream from confluence of Manoa and Palolo Stream and 0.6 mi (1.0 km) upstream from point of discharge into Ala Wai Canal.	9.35 (24.22)	1968-80	1- 8-80	8.89	4,670
16247500	Wailupe Gulch at Aina Haina	Lat 21°17'46", long 157°45'29", at Ani Street bridge and 1.0 mi (1.6 km) upstream from Kalanianaole Highway in Aina Haina.	2.35 (6.09)	1958-80	5-30-80	2.13	630

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16247900	Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft (91 m) downstream of single-lane wooden bridge and 0.6 mi (1.0 km) upstream from Highway 72.	1.18 (3.06)	1958-59, 1970-80	5-30-80	31.4	970
16248800	Inoaole Stream at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft (9 m) upstream from culvert on Hihimanu Street and 0.8 mi (1.3 km) northwest of Waimanalo Post Office.	1.21 (3.13)	1958-80	1- 8-80	6.25	a630
16249000	Waimanalo Stream at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft (12 m) upstream from Highway 72 and 2.3 mi (3.7 km) northwest of Waimanalo Post Office.	2.16 (5.59)	1967-70≠, 1971-80	1- 8-80	7.13	a1,200
16249100	Kaelepulu Stream tributary at Kailua	Lat 21°21'44", long 157°44'22", 30 ft (9 m) upstream from Kalanianaole Highway, 1.6 mi (2.6 km) northwest of Waimanalo School and 2.4 mi (3.9 km) south of Kailua Post Office.	.16 (.41)	1963-80	1- 8-80	5.07	247
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 (1.0 km) west of Maunawili School and 1.6 mi (2.6 km) southwest of Kailua Post Office.	5.34 (13.83)	1958-67, 1968-71≠, 1972-80	1- 8-80	12.25	4,050
16264800	Kawainui Canal at Kailua	Lat 21°24'15", long 157°45'28", at head of canal and 1.2 mi (1.9 km) northwest of Kailua Post Office.	11.0 (28.5)	1957-60, 1963-64, 1967-80b	12- 9-79	2.33	-
16265000	Kawa Stream at Kaneohe	Lat 21°24'32", long 157°47'36", 50 ft (15 m) upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi (0.3 km) northeast of Castle High School, and 0.6 mi (1.0 km) upstream from mouth.	1.19 (3.08)	1965, 1968-74, 1977-80	1- 8-80	10.45	1,930
16270900	Luluku Stream at altitude 220 ft (67 m), near Kaneohe	Lat 21°23'42", long 157°48'46", on left bank 0.5 mi (0.8 km) upstream from mouth, 1.4 mi (2.2 km) southwest of Castle High School, and 1.9 mi (3.1 km) south of Kaneohe Post Office.	.44 (1.14)	1967-71≠, 1972-75, 1977-80	3-18-80	5.30	400
*16274499	Keaahala Stream at Kamehameha Highway, at Kaneohe	Lat 21°25'12", long 157°48'15", 35 ft (11 m) upstream from bridge on Kamehameha Highway in Kaneohe.	.62 (1.61)	1959-80	1- 8-80	5.61	a1,200
16279500	Heeia Stream at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft (18 m) downstream from culvert on Kahekili Highway, 0.7 mi (1.1 km) west of Kaneohe Post Office and 0.8 mi (1.3 km) southwest of Heeia.	1.80 (4.66)	1965-66, 1968-80	1- 8-80	8.39	4,290
*16283480	Ahuimanu Stream near Kahaluu	Lat 21°27'04", long 157°50'13", at bridge on Ahuimanu Road and 0.8 mi (1.3 km) south of Kahaluu.	2.31 (5.98)	1963-80	1- 8-80	-	a4,000
16304500	Kaluanui Stream at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi (1.9 km) southeast of cemetery in Hauula and 1.4 mi (2.2 km) northeast of Sacred Falls.	2.12 (5.49)	1958-80	12-25-79	2.46	a850

* Also a low-flow partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.
b Gage height only.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Oahu--Continued					
16310501	Malaekahana Stream at altitude 30 ft (9 m), near Kahuku	Lat 21°39'47", long 157°57'11", at abandoned plantation railroad bridge, 1.1 mi (1.8 km) southwest of junction of plantation road and Highway 83, and 1.2 mi (1.9 km) south of Kahuku Hospital.	4.05 (10.49)	1958-80	3-18-80	7.46	830
16311000	Oio Stream near Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi (1.0 km) southwest of junction of Plantation Road and Highway 83 and 2.7 mi (4.3 km) west of Kahuku Hospital.	2.13 (5.52)	1958-80	3-18-80	7.42	a100
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 (4.7 km) northeast of Waimea.	1.98 (5.13)	1973-80	3-18-80	3.69	a250
16318000	Paumalu Gulch at Sunset Beach	Lat 21°40'19", long 158°02'28", 0.4 mi (0.6 km) upstream from Highway 83 at Sunset Beach and 2.2 mi (3.5 km) northeast of Waimea.	2.59 (6.71)	1968-80	3-18-80	3.47	a130
16331000	Waimea Gulch near Kawailoa Camp	Lat 21°37'29", long 158°04'58",at culvert on Ashley Road, 0.1 mi (0.2 km) upstream from Highway 83 and 1.1 mi (1.8 km) north of Kawailoa Camp.	2.23 (5.78)	1968-80	3-18-80	11.20	2,030
16340000	Anahulu River near Haleiwa	Lat 21°35'28", long 158°04'45", 1.7 mi (2.7 km) southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi (4.0 km) east of Waialua School at Haleiwa.	13.5 (35.0)	1958-80	3-18-80	12.71	8,520
16350000	Opaeula Stream near Haleiwa	Lat 21°35'09", long 158°06'01", 0.6 mi (1.0 km) upstream from Kamehameha Highway and 2.1 mi (3.4 km) northeast of Waialua.	5.96 (15.44)	1956-80	3-18-80	17.47	5,010
		Hawaii, Island of Molokai					
16411300	Kakaako Gulch at Highway 46, near Mauna Loa	Lat 21°08'49", long 157°11'36", at Highway 46, 1.6 mi (2.6 km) northeast of Mauna Loa, and 1.8 mi (2.9 km) upstream from Kamakahi Gulch.	.55 (1.42)	1964-80	1- 8-80	2.09	37
16411320	Kakaako Gulch above Kamakahi Gulch, near Mauna Loa	Lat 21°10'11", long 157°11'56", 0.1 mi (0.2 km) upstream from Kamakahi Gulch, 1.7 mi (2.7 km) downstream from Highway 46, and 2.5 mi (4.0 km) northeast of Mauna Loa.	1.40 (3.63)	1964-80	1- 8-80	3.00	310
16411400	Kakaako Gulch near Mauna Loa	Lat 21°10'39", long 157°12'31", on left bank 1.0 mi (2.0 km) downstream from Kamakahi Gulch and 3.0 mi (4.8 km) north of Mauna Loa School.	5.34 (13.83)	1963-72≠, 1973-80	1- 8-80	6.10	1,690
16411600	Kaunala Gulch near Mauna Loa	Lat 21°07'01", long 157°15'43", at Sand Haul Road, 3.2 mi (5.2 km) east of Laau Point lighthouse, and 3.3 mi (5.3 km) southwest of Mauna Loa.	.28 (.73)	1964-80	1- 8-80	2.70	76

≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Molokai--Continued					
16411640	Halena Gulch near Mauna Loa	Lat 21°05'53", long 157°13'47", 2.7 mi (4.3 km) southwest of Mauna Loa and 5.5 mi (8.8 km) east of Laau Point.	2.07 (5.36)	1965-80	1- 8-80	5.10	1,280
16411800	Kaluapeelua Gulch at Hoolehua	Lat 21°09'55", long 157°04'22", 0.4 mi (0.6 km) south of Hoolehua and 2.1 mi (3.4 km) west of Kualapuu.	1.46 (3.78)	1964-80	1- 8-80	.57	7
16411900	Kaluapeelua Gulch tributary near Molokai Airport	Lat 21°08'57", long 157°07'12", 1.7 mi (2.7 km) southwest of Molokai Airport and 5.1 mi (8.2 km) west of Kualapuu.	1.56 (4.04)	1964-80	1- 8-80	11.3	-
16413500	Manawainui Gulch near Kualapuu	Lat 21°07'42", long 157°03'25", at bridge on Highway 46, 0.5 mi (0.8 km) south of Holomua School and 2.3 mi (3.7 km) southwest of Kualapuu.	10.4 (26.9)	1965-80	1- 8-80	6.90	545
16415400	Wawaia Gulch at Kamalo	Lat 21°03'25", long 156°52'20", at Highway 45, 0.3 mi (0.5 km) upstream from mouth, and 0.5 mi (0.8 km) northeast of Kamalo.	2.12 (5.49)	1964-80	1- 8-80	2.00	805
16419000	Pohakupili Gulch near Halawa	Lat 21°07'59", long 156°44'15", at Highway 45, 0.5 mi (0.8 km) upstream from mouth and 1.9 mi (3.1 km) south of Halawa.	.48 (1.24)	1964-80	12-25-79	6.81	219
		Hawaii, Island of Maui					
16500100	Kepuni Gulch near Kahikinui House	Lat 20°37'21", long 156°15'16", on right bank 120 ft (37 m) upstream from bridge on Highway 31, 400 ft (122 m) upstream from Kamole Gulch, 1.1 mi (1.8 km) east of Kahikinui House, and 8.5 mi (13.7 km) west of Kaupo.	1.19 (4.95)	1963-72≠, 1973-80	1- 8-80	8.69	1,110
16500300	Hawelewele Gulch near Kaupo	Lat 20°38'01", long 156°11'08", 700 ft (213 m) upstream from Piilani Highway 31 and 3.9 mi (6.3 km) west of Kaupo.	11.3 (29.3)	1967-80	1- 8-80	13.2	13,600
16500800	Kukuiula Gulch near Kipahulu	Lat 20°39'18", long 156°04'44", at Highway 31, 1.3 mi (2.1 km) west of Kipahulu and 3.2 mi (5.2 km) east of Kaupo.	.76 (1.97)	1963-68≠, 1969-80	1- 8-80	3.76	830
16502400	Pukuilua Gulch near Hana	Lat 20°42'00", long 156°00'14", at Highway 31, 0.4 mi (0.6 km) southwest of Puuiki, and 4.0 mi (6.4 km) south of Hana.	.48 (1.24)	1963-80	1- 8-80	4.29	225
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 (1.6 km) south of Hana.	.90 (2.33)	1963-80	3-16-80	11.98	762
16502900	Kawaipapa Gulch at Hana	Lat 20°46'08", long 156°00'04", 1,000 ft (305 m) upstream from Highway 36 and 0.3 mi (0.5 km) northwest of Hana Hospital.	5.83 (15.10)	1965-80	1- 8-80	9.87	11,300
16603300	Unnamed gulch at Maliko Bay	Lat 20°56'26", long 156°21'04", at Hana Highway, 0.5 mi (0.8 km) west of Maliko Bay, and 1.3 mi (2.1 km) north of Hamakuapoko.	.43 (1.11)	1963-80	1- 9-80	1.72	11

≠ Operated as a continuous-record gaging station.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Annual maximum Discharge (ft³/s)
		Hawaii, Island of Maui--Continued					
16603700	Kalialinui Gulch tributary near Pukalani	Lat 20°49'02", long 156°19'44", at Lower Kula Road and 1.4 mi (2.3 km) south of Pukalani.	1.17 (3.03)	1967-80	1- 9-80	7.35	414
16603800	Kaluapulani Gulch tributary near Pukalani	Lat 20°48'52", long 156°18'32", at Haleakala Highway, 1.5 mi (2.4 km) west of Olinda Prison Camp, and 2.3 mi (3.7 km) southeast of Pukalani.	.45 (1.17)	1963-80	1- 9-80	3.80	118
16603850	Kalialinui Gulch near Kahului	Lat 20°52'47", long 156°26'06", 600 ft (183 m) upstream from Hansen Road, 0.5 mi (0.8 km) northeast of Puunene Hospital, and 2.5 mi (4.0 km) southeast of Kahului Post Office.	17.9 (46.4)	1967-80	1- 9-80	-	1,020
**16607000	Iao Stream at Wailuku	Lat 20°53'38", long 156°30'27", 560 ft (171 m) upstream from Market Street bridge at Wailuku and 1.9 mi (3.1 km) upstream from mouth.	8.24 (21.4)	1951≠, 1952-80	1- 8-80	5.38	a4,300
16616500	Unnamed gulch at Maluhia Camp	Lat 20°57'26", long 156°31'41", at Kahekili Highway, 0.6 mi (1.0 km) east of Maluhia Camp and 1.8 mi (2.9 km) northwest of Waihee.	.12 (.31)	1964-80	1- 8-80	6.21	86
16619700	Poelua Gulch near Kahakuloa	Lat 21°00'58", long 156°34'58", at Highway 30 (bypass), 1.3 mi (2.1 km) southeast of Nakalele Point lighthouse, and 2.2 mi (3.5 km) northwest of Kahakuloa.	1.18 (3.06)	1965-80	1- 8-80	8.07	267
16623400	Honokeana Gulch near Honokahua	Lat 20°59'39", long 156°40'13", at Honoapiilani Highway, 1.1 mi (1.8 km) southwest of Honokahua and 1.1 mi (1.8 km) south of Hawea Point.	.59 (1.53)	1964-80	1- 8-80	3.51	31
16630200	Honokowai Stream at Honokowai	Lat 20°56'58", long 156°41'07", 0.5 mi (0.8 km) southeast of Honokowai and 1.1 mi (1.8 km) northwest of Puukolii.	5.59 (14.48)	1962-63, 1965-80	1-10-80	4.54	592
16643300	Kauaula Stream near mouth, near Lahaina	Lat 20°52'09", long 156°39'43", 0.7 mi (1.1 km) upstream from Honoapiilani Highway (bypass) and 1.3 mi (2.1 km) southeast of Lahaina lighthouse.	4.12 (10.67)	1960, 1962, 1964-80	1-10-80	4.97	741
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 (1.0 km) northeast of Olowalu, and 5.5 mi (8.8 km) southeast of Lahaina.	4.08 (10.57)	1962-72≠, 1973-80	1-10-80	4.94	1,020
16647500	Malalowaiaole Gulch near Maalaea	Lat 20°46'56", long 156°31'32", at Honoapiilani Highway, 200 ft (61 m) upstream from mouth, 0.2 mi (0.3 km) north of McGregor Point, and 1.2 mi (1.9 km) southwest of Maalaea.	.64 (1.66)	1964-80	1-10-80	12.95	350
16650500	Waikapu Stream near Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi (4.0 km) northeast of Maalaea, and 2.5 mi (4.0 km) northwest of Kihei.	6.97 (18.05)	1963-80	1- 8-80	7.29	1,030

** Also a water-quality partial-record station.
≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/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 (1.6 km) southeast of Waiakoa and 1.0 mi (1.6 km) northeast of junction of Lower and Upper Kula Roads.	.98 (2.54)	1964-80	1- 8-80	-	a150
16659000	Waiakoa Gulch at Kihei	Lat 20°47'14", long 156°27'41", 0.3 mi (0.5 km) northeast of Kihei and 0.4 mi (0.6 km) upstream from mouth.	10.1 (26.2)	1963-80	1- 8-80	8.65	1,020
16660000	Kulanihakoi Gulch near Kihei	Lat 20°46'06", long 156°27'03", on right bank 0.5 mi (0.8 km) northeast of Lihue Cemetery, 0.8 mi (1.3 km) upstream from mouth and 1.3 mi (2.1 km) southeast of Kihei.	14.4 (37.3)	1963-70≠, 1971-80	1-10-80	4.14	2,750
16663500	Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft (107 m) upstream from mouth, and 0.2 mi (0.3 km) south of Kamaole.	4.28 (11.09)	1972-80	1-10-80	7.80	207
16664000	Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft (91 m) upstream from mouth, and 0.8 mi (1.3 km) south of Kamaole.	4.12 (10.67)	1972-80	1-10-80	-	403
		Hawaii, Island of Hawaii					
16701300	Waiakea Stream at Hilo	Lat 19°42'38", long 155°05'02", 0.3 mi (0.5 km) upstream from Kinoole Street bridge and 1.3 mi (2.1 km) southeast of Hilo Post Office.	35.8 (92.7)	1968-80	3-17-80	7.50	1,640
16701400	Palai Stream at Hilo	Lat 19°40'56", long 155°04'04", at Highway 11, 300 ft (91 m) south of Palai Street intersection and 3.5 mi (5.6 km) southeast of Hilo Post Office.	5.08 (13.16)	1965-80	3-17-80	7.45	1,070
16717400	Kalaoa Mauka Stream near Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi (1.6 km) north of Papaikou and 5.1 mi (8.2 km) north of Hilo Post Office.	.24 (.62)	1963-80	11-17-79	6.01	123
16717600	Alia Stream near Hilo	Lat 19°50'38", long 155°06'21", on left bank 10 ft (3.0 m) downstream from culvert on Highway 19 at Pepeekeo, 2.0 mi (3.2 km) south of Honomu, and 8.0 mi (12.9 km) north of Hilo.	.58 (1.50)	1962-72≠, 1973-80	11-17-79	4.81	664
16717650	Kapehu Stream near Pepeekeo	Lat 19°51'52", long 155°06'11", at culvert on Highway 19, 1.0 mi (1.6 km) southeast of Honomu, 2.2 mi (3.5 km) north of Pepeekeo, and 9.4 mi (15.1 km) north of Hilo.	1.09 (2.82)	1963-80	11-17-79	10.27	1,120
16717850	Keehia Gulch near Ookala	Lat 20°01'08", long 155°18'45", at culvert on Highway 19, 1.7 mi (2.7 km) west of Ookala, and 4.1 mi (6.6 km) southeast of Paauilo.	.62 (1.61)	1963-80	3-18-80	9.10	500
16717920	Ahualoa Gulch at Honokaa	Lat 20°05'12", long 155°29'17", at Highway 24, 1.1 mi (1.8 km) northwest of Honokaa Hospital, and 1.5 mi (2.4 km) upstream from mouth.	2.27 (5.88)	1963-80	11-18-79	17.68	3,160

≠ Operated as a continuous-record gaging station.
a Estimated.

Annual maximum discharge at crest-stage partial-record stations during water year 1980--Continued

Station No.	Station name	Location	Drainage area mi² (km²)	Period of record	Annual maximum Date	Gage height (feet)	Discharge (ft³/s)
		Hawaii, Island of Hawaii--Continued					
16717950	Honokaia Gulch tributary near Honokaa	Lat 20°02'58", long 155°32'19", at culvert, 4.8 mi (7.7 km) southwest of Honokaa Hospital, and 5.5 mi (8.8 km) southeast of Kukuihaele.	2.42 (6.27)	1963-80	11-18-79	5.61	258
16752600	Hapahapai Gulch at Kapaau	Lat 20°14'00", long 155°48'00", at Highway 27, 300 ft (91 m) east of Kapaau Post Office.	1.52 (3.94)	1963-80	1- 9-80	11.42	426
16755800	Luahine Gulch near Waimea	Lat 20°03'11", long 155°44'35", at culvert 5.1 mi (8.2 km) northwest of Waimea and 5.7 mi (9.2 km) east of Kawaihae.	.32 (.83)	1963-80	1- 9-80	4.69	230
16756500	Keanuiomano Stream near Kamuela	Lat 20°01'48", long 155°42'05", on left bank 150 ft (46 m) upstream from Highway 25 at Waiaka and 2.0 mi (3.2 km) west of Kamuela.	4.30 (11.14)	1964-72≠, 1973-80	11-18-79	9.15	3,140
16759040	Paiakuli Reservoir tributary near Waimea	Lat 20°02'16", long 155°38'08", at Highway 19, 2.1 mi (3.4 km) west of Puukapu Reservoir, and 2.6 mi (4.2 km) northeast of Waimea.	.27 (.70)	1963-80	11-18-79	5.40	289
16759060	Kamakoa Gulch near Waimea	Lat 19°57'32", long 155°41'02", at bridge, 1.4 mi (2.2 km) north of Saddle Road Junction and 4.5 mi (7.2 km) south of Waimea.	50.6 (131.1)	1963-80	11-18-79	4.74	342
16759080	Popoo Gulch near Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi (3.2 km) north of Keanuku and 5.2 mi (8.4 km) west of Waikii.	33.1 (85.7)	1963-80	1- 9-80	4.89	896
16759180	Keopu Stream near Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi (3.1 km) east of Kailua, and 2.3 mi (3.7 km) northwest of Holualoa Post Office.	2.61 (6.76)	1962, 1965-80	9- 1-80	8.64	479
16759300	Waiaha Stream at Luawai, near Holualoa	Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 mi (2.9 km) northeast of Holualoa School, and 4.2 mi (6.8 km) southeast of Honokohau School.	8.74 (22.64)	1961-80	1- 9-80	7.40	2,190
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 (0.3 km) upstream from Highway 11 at Naalehu.	2.87 (7.43)	1963-80	3-18-80	8.00	1,400
16770000	Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi (1.0 km) southwest of Pahala, and 4.1 mi (6.6 km) north of Punaluu.	9.41 (24.37)	1963-80	3-18-80	-	a10,000
16770500	Paauau Gulch at Pahala	Lat 19°12'39", long 155°28'48", on right bank 100 ft (30 m) downstream from bridge on Wood Valley Road and 0.7 mi (1.1 km) north of Pahala.	1.74 (4.51)	1962-79≠ 1980	3-18-80	-	a2,500

≠ Operated as a continuous-record gaging station.
a Estimated.

DISCHARGE MEASUREMENTS MADE AT MISCELLANEOUS SITES DURING WATER YEAR 1980

Stream	Tributary to	Location	Drainage area mi^2 (km^2)	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, Island of Maui				
Ukumehame Gulch	Pacific Ocean	Lat 20°48'19", long 156°35'38", 800 ft upstream from Highway 30 and 2.1 mi east of Olowalu.	4.03 (10.4)	1965, 1967, 1971, 1980	1-10-80	1,140
Pulehu Gulch	Kealia Pond	Lat 20°50'35", long 156°27'24", 800 ft upstream from South Firebreak road and 0.7 mi upstream from Puunene Airport road (Highway 35), 1.8 mi south of Puunene Sugar Mill.	19.58 (50.7)	1963, 1967, 1980	1-10-80	1,420
Kalaloa Gulch	Kealia Pond	Lat 20°48'42", long 156°27'43", 0.6 mi upstream from Highway 35 and 1.8 mi north of Kihei Post Office.	9.96 (25.8)	1963, 1967, 1980	1-10-80	864

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU

16228200 MOANALUA STREAM NEAR AIEA (LAT 21°22'37" LONG 157°52'58")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
DEC				
24...	2230	153	572	236
24...	2330	176	374	178
25...	0030	250	445	300
25...	0130	1480	2500	9990
25...	0230	920	1080	2680
25...	0330	250	571	385
25...	0430	160	278	120
JAN				
08...	1730	1750	152	718
08...	1830	815	164	361
08...	1930	335	87	79
JAN				
08...	2030	1150	490	1520
MAR				
16...	2230	250	368	246
16...	2330	143	477	184
17...	1730	160	158	68
MAY				
29...	0130	358	931	900
29...	0230	176	342	163
AUG				
01...	0940	40	156	17

16229000 KALIHI STREAM NEAR HONOLULU (LAT 21°22'00" LONG 157°50'49")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE, WATER (DEG C)
OCT					
25...	1450	.31	130	7.5	21.5
NOV					
26...	1050	1.6	160	7.3	19.5
DEC					
26...	1040	8.4	160	7.4	19.5
FEB					
25...	1100	1.2	130	7.0	20.0
25...	1210	1.2	130	7.0	20.0

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY (MG/L AS CACO3)
FEB												
25...	1100	1.2	33	7	5.6	4.6	13	45	1.0	19	.9	26

DATE	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)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB											
25...	9.9	18	.1	13	81	.11	.26	.08	.010	190	5

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU

16273900 KAMOOALII STREAM AT KANEOHE (LAT 21°24'51" LONG 157°48'13")

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT				
10...	1045	6.3	8	.14
10...	1125	6.3	--	--
30...	1540	5.2	12	.17
NOV				
06...	1700	5.2	12	.17
DEC				
07...	1030	5.2	9	.13
07...	1250	5.0	--	--
10...	1100	19	229	12
DEC				
10...	1230	16	20	8.9
26...	1345	10	17	.46
30...	1020	125	108	36
JAN				
08...	1335	108	154	45
09...	1345	125	648	219
18...	1700	15	21	.85

16284500 WAIHEE STREAM AT KAHALUU (LAT 21°17'32" LONG 157°50'26")

DATE	TIME	TEMPER-ATURE, WATER (DEG C)	TUR-BID-ITY (NTU)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)
NOV							
08...	1110	22.0	5.5	.43	.00	.00	.42
JAN							
21...	1110	22.5	9.4	.33	.08	.10	.69
FEB							
27...	1000	21.5	4.2	.23	.18	.22	.07
MAY							
01...	1040	21.0	7.3	.19	.31	.38	.33
JUL							
17...	1045	21.5	5.5	.12	.17	.21	.93

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS NO3)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, TOTAL (MG/L AS PO4)	SEDI-MENT, SUS-PENDED (MG/L)
NOV						
08...	.42	.85	3.8	.100	.31	17
JAN						
21...	.77	1.1	4.9	.090	.28	18
FEB						
27...	.25	.48	2.1	.070	.21	18
MAY						
01...	.64	.83	3.7	.110	.34	19
JUL						
17...	1.1	1.2	5.4	.100	.31	14

NOTE.--Water-quality samples collected by Soil Conservation Service.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

212604158012700 DRAIN A NEAR MILILANI TOWN (LAT 21°26'04" LONG 158°01'27")

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TURBIDITY (NTU)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
SEP									
11...	0830	183	82	100	54	3	18	2.1	14
11...	0830	211	96	160	72	6	24	2.9	14
17...	1307	190	110	330	79	0	27	2.8	11
17...	1315	100	88	59	45	2	16	1.2	3.9
17...	1323	93	82	46	40	1	14	1.2	3.6
17...	1330	80	190	36	32	0	11	1.1	4.1
17...	1337	76	130	50	29	0	9.8	1.0	3.4
17...	1345	72	290	32	25	0	8.5	1.0	4.0
17...	1352	67	130	39	24	0	8.0	.9	3.5

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (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)
SEP									
11...	35	.8	2.3	51	8.2	14	.1	16	137
11...	29	.7	2.8	66	10	15	.2	21	164
17...	23	.5	2.3	79	11	8.3	.3	15	147
17...	15	.3	1.2	43	3.2	2.8	.2	7.4	73
17...	16	.2	1.4	39	3.3	2.8	.2	6.6	72
17...	21	.3	1.5	37	3.3	2.9	.2	5.9	70
17...	19	.3	1.7	30	3.0	2.6	.2	4.8	61
17...	24	.3	1.6	26	1.1	2.6	.2	--	67
17...	23	.3	1.6	25	4.0	2.7	.2	3.7	51

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)
SEP									
11...	112	.19	309	1.5	20	10	80C	0	.8
11...	132	.22	512	.69	20	30	86C	0	1.7
17...	127	.20	1950	.30	30	30	130C	10	1.0
17...	64	.10	750	.50	20	40	40C	0	.3
17...	58	.10	720	.37	20	50	10C	0	.3
17...	59	.10	704	.48	20	70	20C	10	.3
17...	47	.08	636	.52	20	50	C	0	.3
17...	39	.09	590	.78	20	50	10C	0	.3
17...	43	.07	412	.79	20	50	C	0	.2

ANALYSES OF SAMPLES COLLECTED AT WATER-QUALITY PARTIAL-RECORD STATIONS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

212553158011000 DRAIN B NEAR MILILANI TOWN (LAT 21°25'53" LONG 158°01'10")

DATE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TURBIDITY (NTU)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)
SEP									
17...	1422	110	64	130	90	0	18	1.3	9.8
17...	1430	78	64	33	27	2	9.4	.9	3.6
17...	1438	65	160	29	18	3	5.4	1.2	2.9

DATE	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (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)
SEP									
17...	20	.3	1.0	41	1.6	3.1	.1	7.4	74
17...	22	.3	1.1	25	---	2.4	.1	4.2	48
17...	23	.3	1.7	15	4.7	3.4	.1	3.8	43

DATE	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, RESIDUE AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)
SEP									
17...	60	.10	759	.53	0	30	1000	0	.4
17...	40	.07	238	.62	0	50	200	0	.2
17...	35	.06	432	.64	20	60	100	10	.1

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

212732157502200 KAHALUU STREAM AT ALTITUDE 10 FT AT KAHALUU (LAT 21°27'32" LONG 157°50'22")

DATE	TIME	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)
NOV							
08...	1125	24.0	2.5	.97	.00	.00	.50
JAN							
21...	1135	23.0	5.5	.77	.42	.51	.78
FEB							
27...	0945	22.0	4.1	.94	.48	.58	.48
MAY							
01...	1015	22.0	7.4	.33	.10	.12	.36
JUL							
17...	1100	22.0	10	.85	.08	.10	.83

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	SEDIMENT, SUSPENDED (MG/L)
NOV						
08...	.50	1.5	6.5	.560	1.7	1
JAN						
21...	1.2	2.0	8.7	.380	1.2	7
FEB						
27...	.96	1.9	8.4	.480	1.5	11
MAY						
01...	.46	.79	3.5	.180	.55	12
JUL						
17...	.91	1.8	7.8	.690	2.1	21

NOTE.--Water-quality samples collected by Soil Conservation Service.

212742157503200 KAHALUU STREAM AT HIGHWAY 83 AT KAHALUU (LAT 21°27'42" LONG 157°50'32")

DATE	TIME	TEMPERATURE, WATER (DEG C)	TURBIDITY (NTU)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)
NOV							
08...	1345	25.0	10	.12	.11	.13	.28
JAN							
21...	1200	26.0	15	.06	.06	.07	.65
FEB							
27...	0920	24.5	15	.07	.09	.11	.07
MAY							
01...	0930	25.0	18	.16	.09	.11	.52
JUL							
17...	1030	24.5	--	.00	.02	.02	.58

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	SEDIMENT, SUSPENDED (MG/L)
NOV						
08...	.39	.51	2.3	.050	.15	23
JAN						
21...	.71	.77	3.4	.100	.31	42
FEB						
27...	.16	.23	1.0	.050	.15	37
MAY						
01...	.61	.77	3.4	.100	.31	83
JUL						
17...	.60	.60	2.7	.070	.21	12

NOTE.--Water-quality samples collected by Soil Conservation Service.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF KAUAI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16010000 - KAWAIKOI STREAM NR WAIMEA, KAUAI, HI (LAT 22 08 09 LONG 159 37 22)					
OCT , 1979					
17...	1135	3.1	32	5.8	20.0
DEC					
17...	1310	23	42	5.8	16.0
JAN , 1980					
30...	1200	42	32	6.2	15.0
MAR					
07...	1130	32	33	5.8	16.0
APR , 1980					
29...	0955	28	29	5.2	16.0
JUN					
10...	1155	60	26	5.7	18.5
JUL					
29...	1230	11	26	5.6	21.0
SEP					
11...	1110	5.0	27	6.5	19.5
16014000 - KOKEE DITCH NR WAIMEA,KAUAI, HI (LAT 22 06 42 LONG 159 40 43)					
OCT , 1979					
17...	1415	4.7	42	6.4	18.5
DEC					
17...	1410	38	37	6.3	15.0
JAN , 1980					
30...	1400	80	35	6.2	15.5
MAR					
07...	1350	44	35	5.8	16.0
APR , 1980					
29...	1505	52	33	5.9	16.5
JUN					
10...	1500	88	28	5.6	18.0
JUL					
28...	1415	20	33	6.4	19.0
SEP					
11...	1400	8.4	38	6.7	18.5
16019000 - WAIALAE STR AT ALT 3820 FT NR WAIMEA,KAUAI,HI (LAT 22 05 20 LONG 159 34 18)					
OCT , 1979					
26...	0940	3.2	34	6.8	16.5
DEC					
19...	1005	7.2	31	5.8	14.5
MAR , 1980					
28...	1000	35	34	5.6	14.0
JUN , 1980					
18...	1200	11	27	5.8	18.0
AUG					
08...	0955	3.4	30	6.0	16.5
11...	0955	3.4	30	6.0	16.5
16036000 - MAKAWELI RIVER NR WAIMEA, KAUAI, HI (LAT 21 58 31 LONG 159 38 55)					
OCT , 1979					
16...	1335	16	120	7.3	22.0
DEC					
13...	1320	18	120	6.8	21.0
JAN , 1980					
17...	1240	30	108	8.0	22.0
MAR					
05...	1410	62	63	7.3	20.0
APR , 1980					
28...	1330	32	88	7.3	22.5
JUN					
09...	1350	37	72	6.9	24.5
JUL					
29...	1400	39	85	7.6	24.5
SEP					
10...	1325	14	135	7.6	24.5
16049000 - HANAPEPE RIVER BL MANUAHI STR NR ELEELE,KAUAI,HI (LAT 21 57 29 LONG 159 33 13)					
OCT , 1979					
16...	1040	22	105	7.1	22.0
DEC					
13...	1025	15	130	6.9	20.5
JAN , 1980					
17...	0850	15	130	7.3	20.0
MAR					
05...	1100	129	80	7.2	19.5
APR , 1980					
28...	0950	29	130	7.6	20.5
JUN					
09...	1015	72	65	6.8	22.0
JUL					
29...	1020	85	73	7.4	21.5
SEP					
10...	1055	19	128	7.4	23.0
16060000 - SF WAILUA RIVER NR LIHLE,KAUAI, HI (LAT 22 02 28 LONG 159 22 58)					
OCT , 1979					
02...	1405	6.3	120	7.1	27.0
31...	1350	7.9	120	7.1	24.0
DEC					
05...	1310	6.7	--	7.1	18.0
JAN , 1980					
02...	1300	30	105	7.1	20.0
31...	1400	6.5	170	7.3	22.0
FEB					
29...	1415	7.8	130	7.1	21.0
APR					
01...	1405	9.7	116	7.2	24.5
MAY , 1980					
01...	1320	29	130	7.0	21.0
JUN					
03...	1405	245	84	6.8	19.0
JUL					
01...	1430	54	100	7.0	25.0
AUG					
04...	1410	31	110	7.4	25.0
SEP					
02...	1355	6.5	125	6.9	27.0

OBSERVATIONS OF PHYSICAL PARAMBTERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16061000 - NORTH WAILUA DITCH NR LIHUE, KAUAI, HI (LAT 22 03 56 LONG 159 28 14)					
OCT , 1979					
04...	1215	16	68	7.0	20.5
NOV					
01...	1120	23	43	6.7	19.0
DEC					
04...	1320	22	56	7.0	16.5
JAN , 1980					
03...	1410	16	72	7.4	18.0
FEB					
01...	1340	15	72	7.9	17.0
MAR					
04...	1005	25	90	7.0	17.5
APR , 1980					
02...	1130	23	50	6.9	18.0
MAY					
01...	1215	17	75	6.9	18.5
JUN					
04...	1210	17	46	6.8	19.5
30...	1435	20	66	7.1	20.0
AUG					
01...	1320	16	71	7.8	21.0
SEP					
03...	1355	17	56	7.7	21.0
16061200 - N WAILUA DITCH BL WAIKOKO STR NR LIHUE,KAUAI,HI (LAT 22 03 34 LONG 159 28 00)					
NOV , 1979					
19...	1110	22	69	7.0	19.0
DEC					
18...	1115	19	75	7.1	18.0
JAN , 1980					
18...	1255	16	71	7.5	19.0
FEB					
15...	1110	16	75	7.5	17.0
MAR					
17...	1125	27	62	6.5	18.5
APR					
21...	1055	18	78	7.4	18.5
MAY , 1980					
19...	1105	19	70	7.0	19.5
JUN					
23...	1125	20	72	6.7	20.5
JUL					
21...	1105	20	70	7.7	20.0
AUG					
20...	1105	19	73	7.6	20.5
SEP					
22...	1100	20	68	7.2	20.0
16062000 - STABLE STORM DITCH NR LIHUE, KAUAI, HI (LAT 22 04 09 LONG 159 26 46)					
NOV , 1979					
19...	0940	1.6	75	7.0	19.5
DEC					
18...	0940	27	87	6.9	18.0
JAN , 1980					
18...	0945	.20	97	6.6	21.0
FEB					
15...	0925	24	90	7.2	17.0
MAR					
17...	0950	.35	71	6.2	19.0
APR					
21...	0920	.05	97	6.1	20.5
MAY , 1980					
19...	0925	.34	85	7.0	20.5
JUN					
23...	0930	.01	100	6.2	25.0
JUL					
21...	0935	.01	135	6.6	24.0
AUG					
20...	0935	.05	80	7.7	23.0
SEP					
22...	0920	.25	89	7.0	22.0
16063000 - NF WAILUA R AT ALT 650 FT NR LIHUE, KAUAI, HI (LAT 22 04 02 LONG 159 26 21)					
OCT , 1979					
04...	0930	3.6	80	7.3	22.0
NOV					
01...	0920	155	60	6.6	21.0
DEC					
05...	1010	47	65	7.0	17.5
JAN , 1980					
02...	1030	33	88	6.7	17.5
FEB					
01...	1035	.97	102	7.4	19.0
MAR					
04...	0845	1.5	92	7.1	19.5
APR , 1980					
02...	0930	530	48	6.5	18.5
MAY					
01...	0845	58	90	6.8	19.0
JUN					
04...	1005	390	48	6.9	20.0
JUL					
01...	1025	118	71	7.1	21.5
AUG					
04...	1030	50	85	7.6	20.5
SEP					
03...	1040	71	63	7.6	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16068000 - EB OF NF WAILUA RIVER NR LIHUE, KAUAI, HI (LAT 22 04 19 LONG 159 25 05)					
OCT , 1979					
25...	0910	15	102	7.0	20.0
NOV					
26...	1025	24	62	7.0	20.0
DEC					
21...	0905	18	100	7.1	19.5
JAN , 1980					
25...	1030	17	100	7.3	17.5
FEB					
25...	1030	11	117	7.6	20.0
MAR					
25...	1035	89	80	7.2	19.5
APR , 1980					
24...	1040	98	85	6.6	21.0
MAY					
22...	1025	73	83	6.8	20.5
JUN					
24...	0935	40	92	6.2	22.0
JUL					
25...	0905	46	90	7.3	21.5
AUG					
25...	1110	21	110	7.5	22.0
16069000 - WAILUA DITCH NR KAPAA, KAUAI, HI (LAT 22 04 34 LONG 159 24 04)					
NOV , 1979					
19...	1440	28	83	7.0	24.5
DEC					
18...	1430	32	90	7.1	25.0
JAN , 1980					
22...	1300	16	92	6.7	20.0
FEB					
15...	1435	15	110	7.3	24.0
MAR , 1980					
17...	1440	32	87	6.7	21.0
APR					
21...	1425	29	79	6.8	23.5
JUL					
21...	1445	1.3	78	6.1	25.0
AUG					
20...	1430	31	88	7.4	26.0
16071000 - NF WAILUA RIVER NR KAPAA, KAUAI, HI (LAT 22 03 08 LONG 159 22 22)					
OCT , 1979					
11...	1015	3.6	115	7.2	22.5
DEC					
12...	1030	16	110	6.9	20.5
JAN , 1980					
15...	1040	82	120	6.9	19.0
FEB					
22...	1020	7.4	155	7.4	20.5
APR , 1980					
10...	1145	95	70	7.3	21.0
MAY					
21...	1000	158	87	6.9	21.0
JUL					
17...	1025	368	74	7.4	21.5
AUG					
27...	0930	101	63	7.4	22.0
16071500 - LEFT BRANCH OPAEKAA STREAM NR KAPAA, KAUAI, HI (LAT 22 04 44 LONG 159 23 55)					
OCT , 1979					
11...	1405	.65	102	6.3	24.0
DEC					
12...	1245	1.1	100	6.7	21.0
JAN , 1980					
14...	1015	2.1	105	6.8	19.0
FEB					
22...	1345	.91	110	7.5	22.5
APR , 1980					
10...	1435	1.8	95	6.9	22.5
MAY					
21...	1445	2.9	87	6.5	22.0
JUL					
17...	1305	4.3	74	7.0	23.0
AUG					
27...	1350	1.9	91	7.1	23.0
16077000 - MAKALEHA DITCH NR KEALIA, KAUAI, HI (LAT 22 07 06 LONG 159 22 04)					
NOV , 1979					
19...	1210	14	70	6.5	20.5
DEC					
18...	1320	6.2	55	6.8	19.5
JAN , 1980					
18...	1305	6.7	60	7.0	18.5
FEB					
19...	1210	4.8	49	7.1	19.0
MAR					
17...	1350	2.4	50	7.0	20.0
APR					
21...	1300	1.8	55	7.1	20.0
MAY , 1980					
19...	1325	4.2	55	7.2	19.5
JUN					
23...	1305	1.3	58	7.0	21.5
JUL					
21...	1435	1.7	55	7.0	21.5
AUG					
20...	1250	11	58	7.2	21.5
SEP					
22...	1315	.34	58	7.0	21.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16079000 - KAPAHI DITCH NR KEALIA, KAUAI, HI (LAT 22 06 09 LONG 159 22 28)											
NOV , 1979						MAY , 1980					
19...	1330	11	73	7.2	21.0	19...	1450	.51	62	7.2	19.5
DEC						JUN					
18...	1510	2.9	75	7.3	20.0	23...	1520	.55	70	6.9	22.0
JAN , 1980						JUL					
18...	1515	4.8	65	7.0	19.5	22...	1010	25	72	7.0	22.0
FEB						AUG					
19...	1400	3.0	75	7.3	19.0	20...	1420	4.7	60	7.0	22.0
MAR						SEP					
17...	1450	.83	55	7.0	20.0	22...	1445	24	60	7.2	21.0
APR											
21...	1440	.48	65	7.3	20.5						
16080000 - KAPAA STR AT KAPAHI DITCH INTK NR KAPAA, KAUAI, HI (LAT 22 06 15 LONG 159 22 29)											
NOV , 1979						JUN , 1980					
01...	0930	49	100	6.0	18.0	04...	1415	30	65	7.2	19.5
29...	1010	28	45	6.9	19.0	JUL					
JAN , 1980						02...	1045	37	63	6.5	20.5
08...	1300	355	40	6.8	18.5						
APR											
02...	1430	84	60	7.3	18.5						
16087000 - ANAHOLA DITCH WASTEWAY NR KEALIA, KAUAI, HI (LAT 22 08 16 LONG 159 22 28)											
OCT , 1979						MAY , 1980					
03...	0935	.14	73	7.1	23.0	06...	1230	.19	67	7.1	27.5
NOV						JUN					
01...	1125	.04	150	7.3	18.5	04...	1200	12	68	7.1	19.5
29...	1135	.40	65	7.1	20.5	JUL					
JAN , 1980						02...	1235	.17	59	5.9	21.0
08...	1105	29	45	6.9	18.5	AUG					
FEB						05...	1030	.20	70	6.6	21.5
01...	1125	.11	95	7.1	21.0	SEP					
MAR						03...	1135	.21	70	6.5	22.5
04...	1330	.20	90	6.8	20.0						
APR											
02...	1125	.18	55	7.5	19.0						
16088000 - ANAHOLA DITCH AB KANEHA RES NR KEALIA, KAUAI, HI (LAT 22 08 10 LONG 159 22 28)											
NOV , 1979						MAY , 1980					
19...	0925	8.6	70	7.5	20.5	19...	0920	8.3	78	7.2	19.0
DEC						JUN					
18...	0915	2.3	70	7.0	18.5	23...	0930	1.4	66	6.9	21.5
JAN , 1980						JUL					
18...	0945	3.5	65	7.1	18.5	21...	1000	1.8	60	6.9	22.5
FEB						AUG					
19...	0815	1.4	65	7.0	18.5	20...	0905	6.2	65	7.4	21.0
MAR						SEP					
17...	1000	6.2	55	7.1	20.5	22...	0900	6.4	62	6.9	20.0
APR											
21...	0910	7.6	68	7.3	20.5						
16089000 - ANAHOLA STREAM NR KEALIA, KAUAI, HI (LAT 22 09 05 LONG 159 21 17)											
OCT , 1979						MAY , 1980					
03...	1100	4.7	118	7.1	22.0	06...	1035	17	70	7.3	28.0
NOV						JUN					
01...	1300	90	110	7.2	17.5	04...	1040	51	72	7.1	19.0
29...	1400	48	50	6.8	19.0	JUL					
JAN , 1980						02...	1425	39	65	6.2	22.0
08...	0950	368	50	7.0	18.5	AUG					
FEB						05...	1220	10	100	7.4	23.0
01...	1345	6.5	105	6.1	22.0	SEP					
MAR						03...	1415	13	53	6.8	23.0
04...	1430	7.8	120	7.0	21.0						
APR											
02...	0930	291	55	7.4	19.0						

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF KAUAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16091000 - LOWER ANAHOLA DITCH NR KEALIA, KAUAI, HI (LAT 22 08 14 LONG 159 19 31)					
NOV , 1979					
19...	1040	2.6	85	7.3	21.5
DEC					
18...	1135	4.4	110	7.2	19.0
JAN , 1980					
18...	1110	.02	80	7.2	18.5
FEB , 1980					
19...	1010	1.6	78	7.2	18.5
MAR					
17...	1130	3.8	80	7.2	21.0
MAY					
19...	1105	.05	86	7.3	19.5
16093200 - ANAHOLA STREAM AT ANAHOLA, KAUAI, HI (LAT 22 08 42 LONG 159 18 59)					
OCT , 1979					
03...	1415	4.7	155	7.3	26.5
NOV					
02...	0910	16	100	7.2	21.5
DEC					
10...	1035	37	130	7.0	22.0
JAN , 1980					
11...	1105	47	95	7.2	18.5
FEB					
20...	0910	6.2	120	7.3	19.0
APR , 1980					
03...	1040	37	95	7.3	18.0
MAY					
06...	1510	20	125	7.4	28.0
JUN					
11...	0940	56	88	7.0	22.0
JUL					
18...	0920	144	71	6.8	22.5
AUG					
28...	1045	15	105	7.4	24.0
16097500 - HALAULANI STR AT ALT 400 FT NR KILAUEA KAUAI, HI (LAT 22 10 54 LONG 159 25 17)					
OCT , 1979					
09...	1020	4.6	85	7.1	22.0
DEC					
12...	1040	7.2	75	7.1	20.0
JAN , 1980					
09...	1105	17	65	7.0	18.5
FEB					
22...	1140	4.6	67	7.0	19.5
APR , 1980					
11...	1055	22	68	7.4	19.0
MAY					
21...	1040	15	70	7.3	19.5
JUL					
16...	1010	21	85	7.4	22.0
AUG					
28...	0940	11	70	7.4	22.0
16100000 - HANALEI TUNNEL OUTLET NR LIHUE, KAUAI, HI (LAT 22 05 02 LONG 159 27 50)					
OCT , 1979					
02...	1025	24	79	7.1	18.5
31...	1115	41	61	6.8	18.5
DEC					
04...	1040	29	66	6.8	17.5
JAN , 1980					
03...	1020	19	80	7.0	16.5
31...	1055	18	93	7.1	16.0
FEB					
29...	1040	20	85	7.1	16.5
APR					
01...	1010	27	80	7.2	17.5
MAY , 1980					
02...	1120	1.2	80	6.9	18.0
JUN					
03...	1055	40	70	7.1	19.5
30...	1035	22	72	7.1	19.0
AUG					
01...	1020	24	78	7.2	19.0
SEP					
02...	1025	24	77	6.6	19.5
16103000 - HANALEI RIVER NR HANALEI, KAUAI, HI (LAT 22 11 31 LONG 159 27 57)					
OCT , 1979					
05...	1005	123	87	6.8	22.0
DEC					
11...	1140	80	95	7.1	19.0
JAN , 1980					
10...	1005	240	50	6.9	18.0
FEB					
21...	1055	43	108	7.5	19.0
APR , 1980					
08...	1025	111	94	7.6	21.5
MAY					
20...	1015	221	78	7.1	21.0
JUL					
15...	1030	234	85	7.2	22.0
AUG					
26...	1315	948	56	7.2	22.0
16108000 - WAINIHA RIVER NEAR HANALEI, KAUAI, HI (LAT 22 08 20 LONG 159 33 38)					
OCT , 1979					
26...	1245	43	68	6.9	20.5
DEC					
19...	1235	42	70	6.8	18.5
MAR , 1980					
28...	1215	126	37	7.3	17.0
JUN , 1980					
12...	1030	103	55	6.3	19.0
AUG					
08...	1305	62	67	7.4	21.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16200000 - NF KAUKONAHUA STR AB RB NR WAHIAWA, OAHU, HI (LAT 21 31 09 LONG 157 56 53)					
NOV , 1979					
09...	1540	3.6	52	6.8	20.5
DEC					
19...	1600	1.1	57	7.0	20.0
FEB , 1980					
05...	1520	.95	55	7.0	19.5
MAR					
28...	1400	22	49	6.7	19.0
MAY , 1980					
06...	1520	29	34	6.8	20.0
JUN					
20...	1700	8.6	46	6.8	22.0
AUG					
05...	1410	44	32	6.6	21.0
SEP					
17...	1520	7.5	48	6.9	22.5
16208000 - S F KAUKONAHUA STR AT E PUMP RE WAHIAWA,OAHU,HI (LAT 21 29 32 LONG 157 59 54)					
NOV , 1979					
13...	1110	2.9	57	6.7	20.5
DEC					
18...	1700	1.0	65	6.5	21.0
FEB , 1980					
15...	1620	1.2	57	6.9	21.0
MAR					
31...	1545	25	58	6.2	20.5
MAY , 1980					
07...	0815	22	46	6.9	21.0
JUN					
13...	1135	22	81	6.6	20.5
AUG					
01...	1730	55	51	7.0	21.5
SEP					
19...	1630	6.2	51	6.7	23.0
16211600 - MAKAHA STREAM NR MAKAHA, OAHU, HI (LAT 21 30 16 LONG 158 10 59)					
OCT , 1979					
01...	1610	.02	185	6.8	21.5
NOV					
16...	1530	.69	120	7.6	20.0
DEC					
27...	1550	1.0	102	7.3	19.5
FEB , 1980					
14...	1645	.89	110	7.3	19.0
MAR					
25...	1530	4.9	92	7.0	19.5
MAY , 1980					
05...	1550	1.7	98	7.6	20.0
JUN					
18...	1630	1.1	100	7.2	20.5
AUG					
07...	1615	.37	120	6.9	21.0
SEP					
11...	1530	.11	135	7.2	21.5
16212800 - KIPAPA STREAM NR WAHIAWA, OAHU, HI (LAT 21 28 13 LONG 157 57 40)					
OCT , 1979					
29...	1310	.54	65	7.8	25.0
NOV					
23...	1500	2.9	63	7.1	23.5
JAN , 1980					
03...	1350	1.3	50	6.7	19.5
FEB					
11...	1305	.69	55	7.0	22.5
MAR					
13...	1330	9.2	83	7.4	22.0
27...	1345	9.7	75	6.7	22.0
MAY , 1980					
23...	1305	5.6	90	6.7	23.5
JUN					
25...	1430	2.7	70	6.7	26.5
JUL					
29...	1410	3.1	47	6.9	27.0
SEP					
25...	1230	.73	65	7.2	27.0
16216000 - WAIAWA STREAM NR PEARL CITY, OAHU, HI (LAT 21 23 57 LONG 157 58 51)					
OCT , 1979					
19...	1215	4.2	2300	7.0	24.0
NOV					
28...	1105	3.4	1000	7.1	22.0
JAN , 1980					
17...	1220	8.4	900	7.0	23.0
FEB					
28...	1610	8.6	940	7.1	21.5
29...	1130	10	940	7.0	21.0
APR , 1980					
03...	1100	46	240	7.1	22.0
MAY					
20...	1555	6.1	520	7.0	25.0
JUL					
02...	1000	7.5	540	7.0	24.0
AUG					
15...	1315	6.5	580	7.1	26.0
16224500 - KALAUAO STREAM AT MOANALUA RD,AT AIEA,OAHU, HI (LAT 21 23 07 LONG 157 56 22)					
JUN , 1980					
09...	1000	.32	300	7.1	24.5
30...	1615	.42	580	6.9	27.5
AUG , 1980					
13...	1545	.39	600	7.1	27.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16226000 - NORTH HALAWA STREAM NR AIEA, OAHU, HI (LAT 21 23 46 LONG 157 53 37)					
NOV , 1979					
27...	1120	.08	180	7.2	20.5
JAN , 1980					
16...	1245	1.5	140	7.3	21.0
FEB					
28...	1110	2.4	105	7.4	19.0
MAY , 1980					
20...	1215	1.4	120	6.8	22.0
JUN					
30...	1240	.52	130	6.9	23.5
AUG					
13...	1200	.52	130	6.9	23.0
16232000 - NUUANU STR BL RES 2 WSTEWY NR HONOLULU, OAHU, HI (LAT 21 20 57 LONG 157 49 30)					
OCT , 1979					
19...	1445	.67	130	7.5	23.0
NOV					
26...	1120	1.0	130	7.6	20.0
JAN , 1980					
14...	1610	8.0	130	7.6	22.0
FEB					
29...	1510	5.4	120	7.6	20.5
APR , 1980					
10...	1520	10	120	6.7	23.0
MAY					
14...	1445	5.7	125	7.1	23.0
JUN					
26...	1545	5.5	130	6.9	23.5
AUG					
06...	1230	18	80	7.2	23.5
16238500 - WAIHI STREAM AT HONOLULU, OAHU, HI (LAT 21 19 55 LONG 157 48 12)					
OCT , 1979					
15...	1400	.48	170	7.4	23.0
NOV					
23...	1230	1.6	155	7.4	22.5
JAN , 1980					
15...	1340	3.1	160	7.4	22.0
FEB					
26...	1510	.34	160	7.3	21.0
APR , 1980					
08...	1315	4.2	140	7.2	21.0
MAY					
13...	1345	3.4	130	6.8	21.5
JUN					
25...	1230	2.3	140	7.1	21.5
AUG					
15...	1045	3.6	120	7.3	22.5
16240500 - WAIAKEAKUA STREAM AT HONOLULU, OAHU, HI (LAT 21 19 53 LONG 157 48 08)					
OCT , 1979					
15...	1115	2.1	130	7.7	22.5
NOV					
23...	1030	2.7	130	7.6	22.5
JAN , 1980					
15...	1115	4.2	120	7.5	21.5
FEB					
26...	1140	2.0	130	7.7	20.0
APR , 1980					
08...	1155	5.6	120	7.2	21.0
MAY					
13...	1010	6.3	120	7.3	20.5
JUN					
25...	1245	5.4	125	7.2	21.5
AUG					
11...	1230	5.2	125	7.3	22.0
16244000 - PUKELE STREAM NEAR HONOLULU, OAHU, HI (LAT 21 18 36 LONG 157 47 27)					
OCT , 1979					
16...	1430	.35	220	6.8	22.5
NOV					
26...	1105	.81	220	7.1	22.0
JAN , 1980					
14...	1120	2.1	230	7.2	22.0
FEB					
27...	1145	.86	225	6.8	22.0
APR , 1980					
10...	1130	3.2	180	6.8	21.5
MAY					
16...	1135	9.5	140	6.9	22.0
JUN					
26...	1200	1.5	220	6.8	22.0
AUG					
12...	1130	1.2	210	6.9	22.5
16254000 - MAKAWAO STREAM NEAR KAILUA, OAHU, HI (LAT 21 21 49 LONG 157 46 02)					
OCT , 1979					
31...	1500	1.9	190	7.5	23.0
DEC					
10...	1450	6.9	175	7.4	22.5
MAR , 1980					
13...	1415	3.6	240	7.4	21.5
APR					
16...	1100	6.0	200	7.5	22.5
JUN , 1980					
06...	1035	6.4	200	7.2	22.5
JUL					
24...	1110	4.9	200	7.3	23.0
AUG					
28...	1400	2.6	220	7.3	24.0
16273900 - KAMOOALII STREAM AT KANEOHE, OAHU, HI (LAT 21 24 51 LONG 157 48 13)					
OCT , 1979					
10...	1125	6.3	195	8.4	27.0
DEC , 1979					
07...	1250	5.0	220	7.8	24.5

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16283600 - SF WAIHEE STR NR HEEIA, OAHU, HI (LAT 21 26 47 LONG 157 52 12)					
NOV , 1979					
01...	1300	1.1	120	7.6	20.0
DEC					
11...	1030	.90	120	7.5	20.0
JAN , 1980					
24...	1045	.78	120	7.4	18.0
MAR					
06...	1400	.40	120	7.3	19.0
APR , 1980					
23...	1210	.49	130	7.4	20.5
JUN					
02...	1230	.57	140	7.7	20.0
JUL					
16...	1200	.63	135	7.4	20.5
AUG					
29...	1500	.66	140	7.6	20.5
16283700 - NF WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 26 48 LONG 157 52 18)					
NOV , 1979					
01...	1450	1.6	110	7.0	19.5
DEC					
11...	1200	1.2	120	7.6	19.0
JAN , 1980					
24...	1230	1.0	110	7.2	18.0
MAR					
06...	1255	.79	110	7.5	19.0
APR , 1980					
23...	1410	.91	140	7.0	20.5
JUN					
02...	1150	.91	110	7.9	19.5
JUL					
16...	1305	1.1	110	7.5	19.5
AUG					
29...	1125	1.2	110	7.4	20.0
16284000 - WAIHEE STREAM NR HEEIA, OAHU, HI (LAT 21 27 01 LONG 157 51 38)					
NOV , 1979					
01...	0920	2.5	130	7.4	20.5
DEC					
11...	1430	2.3	130	7.0	20.5
JAN , 1980					
25...	1000	1.8	130	7.4	18.5
APR					
23...	1640	2.6	165	6.8	21.0
JUN , 1980					
03...	1400	3.0	155	6.8	21.0
JUL					
17...	1130	3.0	140	7.0	22.0
SEP					
04...	1540	2.7	140	7.0	21.0
16284200 - WAIHEE STREAM NR KAHALUU,OAHU,HI (LAT 21 27 04 LONG 157 51 36)					
NOV , 1979					
01...	1630	5.6	150	7.2	20.5
DEC					
11...	1620	5.2	150	7.2	20.5
JAN , 1980					
24...	1240	5.0	160	7.0	19.0
MAR					
06...	1815	5.1	130	7.1	19.0
APR , 1980					
22...	1400	6.8	180	--	20.5
JUN					
03...	1140	6.8	155	7.0	21.0
JUL					
17...	1300	6.1	150	7.1	21.5
16284500 - WAIHEE STREAM AT KAHALUU, OAHU, HI (LAT 21 27 32 LONG 157 50 26)					
NOV , 1979					
08...	1110	--	--	--	22.0
JAN , 1980					
21...	1110	--	--	--	22.5
FEB					
27...	1000	--	--	--	21.5
MAY , 1980					
01...	1040	--	--	--	21.0
JUL					
17...	1045	--	--	--	21.5
16294900 - WAIKANE STREAM AT ALT 75 FT AT WAIKANE,OAHU,HI (LAT 21 30 00 LONG 157 51 54)					
NOV , 1979					
05...	1700	2.4	180	7.4	22.5
DEC					
12...	1000	3.1	165	6.8	21.5
MAR , 1980					
13...	1135	3.2	180	7.6	21.5
APR					
22...	1135	40	155	7.2	22.0
JUN , 1980					
03...	1005	17	158	7.0	21.5
JUL					
17...	1530	4.8	195	7.0	23.0
SEP					
11...	1220	3.2	160	7.1	22.5

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16296500 - KAHANA STR AT ALT 30 FT NR KAHANA, OAHU, HI (LAT 21 32 37 LONG 157 53 07)											
NOV , 1979						APR , 1980					
06...	1440	18	140	6.7	22.0	25...	1215	37	120	6.8	21.5
DEC						JUN					
13...	1540	15	130	6.8	21.0	05...	1440	36	120	6.5	22.0
JAN , 1980						JUL					
22...	1550	22	140	6.8	19.5	22...	1145	29	115	6.7	22.5
MAR						SEP					
11...	1545	17	130	7.1	21.0	03...	1630	22	130	6.7	21.5
16303000 - PUNALUU STREAM NR PUNALUU, OAHU, HI (LAT 21 33 33 LONG 157 54 06)											
NOV , 1979						APR , 1980					
05...	1610	7.6	110	7.3	21.5	21...	1230	23	120	7.4	21.5
DEC						JUN					
12...	1610	6.4	120	7.2	21.5	04...	1115	29	105	7.2	21.0
JAN , 1980						JUL					
21...	1520	17	120	7.1	20.5	18...	1325	23	120	7.2	21.5
MAR						SEP					
10...	1420	13	130	7.3	20.0	05...	1215	20	130	7.4	21.0
16304200 - KALUANUI STREAM NR PUNALUU, OAHU, HI (LAT 21 35 22 LONG 157 54 38)											
NOV , 1979						APR , 1980					
06...	1130	1.2	60	6.0	23.0	24...	1345	12	60	6.8	21.5
DEC						JUN					
13...	1030	.53	68	6.7	20.5	05...	1015	2.0	60	6.6	21.5
JAN , 1980						JUL					
22...	1100	.91	60	7.0	18.0	21...	1255	4.3	60	6.7	23.0
MAR						SEP					
11...	1200	2.8	60	7.0	19.5	05...	1500	2.4	60	6.7	24.0
16325000 - KAMANANUI STR AT PUPUKEA MIL RD NR WAIANAE, OAHU (LAT 21 37 25 LONG 158 01 09)											
NOV , 1979						JUN , 1980					
08...	1130	1.7	61	6.7	22.5	17...	1200	7.6	60	6.9	22.0
DEC						JUL					
26...	1300	9.1	58	6.8	19.0	31...	1055	4.0	63	6.9	24.0
FEB , 1980						SEP					
07...	1615	19	56	7.0	21.0	15...	1210	57	58	7.0	23.5
MAR						19...	1200	2.6	58	7.0	23.0
21...	1200	24	71	6.6	20.0						
MAY											
12...	1600	8.4	76	6.6	23.0						
16330000 - KAMANANUI STREAM AT WAIANAE, OAHU, HI (LAT 21 38 20 LONG 158 03 27)											
NOV , 1979						MAY , 1980					
08...	1440	1.8	85	6.8	23.0	12...	1230	14	90	7.2	23.0
DEC						JUN					
21...	1530	.18	120	6.8	22.0	17...	1630	13	70	6.8	23.0
FEB , 1980						JUL					
12...	1445	3.0	76	7.1	22.0	31...	1520	7.1	72	6.9	24.5
MAR						SEP					
26...	1450	25	96	6.6	21.5	12...	1350	6.9	78	6.9	26.0
16343000 - HELEMANO STREAM AT HALEIWA, OAHU, HI (LAT 21 34 40 LONG 158 06 12)											
OCT , 1979						APR , 1980					
04...	1410	.01	740	6.9	24.5	30...	1700	2.5	140	6.4	24.0
NOV						JUN					
20...	1625	.38	1200	7.2	23.0	13...	1630	.45	240	6.4	24.5
DEC						JUL					
26...	1745	2.8	130	6.9	21.5	30...	1700	.07	430	6.8	24.0
FEB , 1980						SEP					
13...	1320	.08	680	6.6	22.0	10...	1510	.13	1100	6.9	23.0
MAR											
17...	1630	48	55	6.8	22.0						
26...	1100	8.7	120	6.8	22.5						

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)	DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16345000 - OPAEULA STREAM NR WAHIAWA, OAHU, HI (LAT 21 33 55 LONG 158 00 10)											
NOV , 1979						JUN , 1980					
07...	1410	2.0	40	6.7	23.5	16...	1120	12	42	6.5	22.0
DEC						AUG					
20...	1245	.80	65	6.8	20.0	01...	1310	9.4	40	6.4	23.0
FEB , 1980						SEP					
06...	1045	.86	46	7.5	19.0	10...	1100	2.3	48	6.5	24.5
APR											
30...	1200	9.1	50	6.8	23.0						

ISLAND OF MOLOKAI

16403900 - KAWAINUI STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 07 59 LONG 156 52 38)											
OCT , 1979						MAY , 1980					
03...	1125	1.5	150	8.0	20.5	14...	1140	9.3	110	7.6	20.5
DEC						JUL					
05...	1145	12	122	7.4	17.0	15...	1225	9.1	112	7.4	20.0
JAN , 1980						SEP					
30...	1330	3.3	132	7.7	19.0	11...	1100	12	95	7.2	21.0
16404000 - PELEKUNU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 11 LONG 156 52 43)											
OCT , 1979						MAY , 1980					
23...	1700	7.5	146	7.9	20.5	14...	1430	15	112	7.9	21.5
DEC						JUL					
05...	1650	17	126	7.6	18.0	15...	1610	14	114	7.5	21.0
JAN , 1980						SEP					
30...	1730	14	122	7.8	19.5	11...	1545	11	102	7.3	23.0
MAR											
27...	0900	28	112	7.8	18.0						
16404200 - PILIPILILAU STREAM NR PELEKUNU, MOLOKAI, HI (LAT 21 08 08 LONG 156 53 09)											
OCT , 1979						MAY , 1980					
23...	1235	.86	154	7.9	20.5	15...	1010	2.2	142	8.0	19.5
DEC						JUL					
05...	1135	.90	157	7.6	17.5	15...	1200	1.6	146	7.6	21.0
JAN , 1980						SEP					
31...	1230	1.6	136	7.9	20.0	11...	1135	1.1	142	7.2	21.5
MAR											
26...	1330	4.3	132	7.7	18.5						
16405100 - MOLOKAI TUNNEL AT EAST PORTAL, MOLOKAI, HI (LAT 21 08 38 LONG 156 55 17)											
OCT , 1979						MAY , 1980					
17...	1635	1.3	--	--	19.5	28...	1355	.29	--	--	21.0
DEC						JUL					
12...	1250	2.1	--	--	18.0	09...	1505	1.0	--	--	23.0
FEB , 1980						SEP					
06...	1800	1.9	--	--	18.0	03...	1130	2.1	--	--	19.5
APR											
03...	1730	4.5	--	--	18.0						
16405300 - MOLOKAI TUNNEL AT WEST PORTAL, MOLOKAI, HI (LAT 21 07 28 LONG 156 59 42)											
OCT , 1979						MAY , 1980					
17...	1900	3.7	112	8.0	19.0	28...	1610	3.9	111	7.7	18.5
DEC						JUL					
12...	1530	4.5	99	7.7	18.5	09...	1800	4.3	102	7.5	18.5
FEB , 1980						SEP					
08...	1250	4.3	110	7.9	18.5	03...	1700	5.5	108	7.2	19.0
APR											
03...	1840	8.0	83	7.6	18.0						

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF MOLOKAI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16405500 - WAIKOLU STR AT ALT 900 FT NR KALAUPAPA, MOLO, HI (LAT 21 08 45 LONG 156 55 18)					
OCT , 1979					
17...	1535	1.1	110	8.0	19.0
DEC					
12...	1030	1.1	104	7.6	18.5
FEB , 1980					
06...	1610	1.7	100	7.8	19.5
APR					
03...	1530	3.1	77	7.4	19.0
MAY , 1980					
28...	1200	4.4	89	7.5	20.0
JUL					
09...	1445	5.6	80	7.3	21.0
SEP					
03...	1550	1.6	104	7.1	20.0
16408000 - WAIKOLU STR BL PIPE CROSS NR KALAUPAPA, MOLO, HI (LAT 21 09 45 LONG 156 55 53)					
OCT , 1979					
07...	1315	--	--	8.1	--
17...	1315	6.9	118	8.4	21.0
DEC					
12...	1130	8.8	118	7.6	20.5
FEB , 1980					
06...	1245	10	112	7.8	20.0
APR					
03...	1145	18	104	7.5	19.5
MAY , 1980					
28...	1345	19	110	7.6	21.0
JUL					
09...	1340	19	110	7.2	22.5
SEP					
03...	1240	12	118	7.1	20.5
16419500 - PAPIO GULCH AT HALAWA, MOLOKAI, HI (LAT 21 08 56 LONG 156 44 16)					
DEC , 1979					
11...	1500	.04	140	6.2	21.5
FEB , 1980					
05...	1630	.12	148	6.6	20.5
APR					
01...	1435	.50	142	6.9	20.0
MAY , 1980					
27...	1410	.38	122	6.9	22.0
JUL					
08...	1415	.50	106	6.6	23.0
SEP					
02...	1310	.34	132	6.6	23.0

ISLAND OF MAUI

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16501000 - PALIKEA STREAM BL CIV DAM NR KIPAHULU, MAUI, HI (LAT 20 41 03 LONG 156 04 10)					
OCT , 1979					
03...	1030	85	18	7.1	19.0
NOV					
20...	1050	80	20	7.3	17.5
JAN , 1980					
18...	1200	30	32	7.0	18.5
FEB					
28...	1125	20	28	6.7	17.0
APR , 1980					
16...	1115	15	30	6.9	18.5
JUN					
12...	1055	92	25	6.5	17.0
AUG					
07...	1040	2.1	32	6.9	20.0
16508000 - HANAWI STREAM NEAR NAHIKU, MAUI, HI (LAT 20 48 37 LONG 156 07 00)					
OCT , 1979					
02...	1545	2.6	41	7.9	20.5
NOV					
21...	0905	14	27	6.3	17.5
JAN , 1980					
17...	1510	4.1	42	7.4	18.0
FEB					
27...	1630	2.6	47	7.3	18.0
APR , 1980					
17...	0930	35	25	6.7	18.0
JUN					
11...	1340	36	28	6.3	17.0
AUG					
06...	1340	10	32	6.7	20.0
16512000 - KOOLAU DITCH AT NAHIKU WEIR NR NAHIKU, MAUI, HI (LAT 20 48 56 LONG 156 07 15)					
OCT , 1979					
02...	1310	12	46	8.5	20.5
NOV					
19...	1600	96	31	7.1	18.0
JAN , 1980					
17...	1300	28	46	7.4	18.5
FEB					
27...	1440	10	50	8.3	19.5
APR , 1980					
15...	1630	95	30	6.9	19.0
JUN					
11...	1630	86	30	6.6	19.0
AUG					
06...	1430	89	41	6.8	21.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16518000 - WEST WAILUAIKI STREAM NEAR KEANAE, MAUI, HI (LAT 20 49 16 LONG 156 08 37)					
OCT , 1979					
02...	1040	3.0	38	7.6	20.5
NOV					
19...	1500	111	21	7.4	17.5
FEB , 1980					
27...	1100	7.2	36	7.4	17.0
APR , 1980					
15...	1240	2.9	49	7.5	17.0
JUN					
11...	1140	87	23	6.3	18.0
AUG					
06...	0945	14	27	6.7	19.0
16523000 - KOOLAU DITCH NR KEANAE, MAUI, HI (LAT 20 49 53 LONG 156 10 30)					
OCT , 1979					
04...	1000	39	47	7.4	20.0
NOV					
19...	1110	212	25	7.4	18.5
FEB , 1980					
19...	1300	34	51	7.2	19.0
APR , 1980					
15...	1125	211	19	6.6	18.0
JUN					
11...	1400	222	26	6.4	19.5
AUG					
06...	1150	139	41	6.6	20.0
16531000 - KULA DIV FROM HAIPUAENA STR NR OLINDA,MAUI,HI (LAT 20 48 24 LONG 156 13 27)					
OCT , 1979					
11...	1035	.03	16	6.2	17.0
NOV					
28...	1245	.28	13	6.2	12.5
JAN , 1980					
15...	1100	.25	12	6.3	12.0
MAR					
07...	1130	4.1	18	5.5	12.0
APR , 1980					
22...	1120	3.5	14	5.5	14.5
JUN					
18...	1105	.40	13	5.7	15.5
AUG					
14...	1000	.12	14	6.6	16.0
16538000 - SPRECKELS DI AT HAIPUAENA W NR HUELA, MAUI, HI (LAT 20 51 15 LONG 156 11 25)					
OCT , 1979					
05...	1450	6.3	41	7.8	23.0
NOV					
23...	1055	29	32	7.1	19.5
JAN , 1980					
23...	1345	12	37	7.1	16.0
FEB					
26...	1150	7.8	39	7.1	19.0
APR , 1980					
18...	1400	43	28	6.9	19.5
JUN					
16...	1400	33	32	6.9	21.0
AUG					
08...	1015	22	31	6.8	20.0
16541000 - KOOLAU DITCH AT HAIPUAENA NR HUELO, MAUI, HI (LAT 20 51 17 LONG 156 11 19)					
OCT , 1979					
03...	1205	43	48	7.7	20.0
NOV					
23...	1000	159	37	7.3	18.0
JAN , 1980					
23...	1230	52	50	7.2	16.0
FEB					
26...	1410	33	51	7.1	18.5
APR , 1980					
18...	1300	213	25	7.0	18.5
JUN					
16...	1240	192	38	6.9	20.0
AUG					
08...	1100	119	42	6.6	20.5
16541500 - MANUEL LUTS DI AT PUOHOKAMOA GL NR HUELO,MAUI (LAT 20 51 48 LONG 156 10 59)					
OCT , 1979					
04...	1205	.28	59	7.2	22.0
NOV					
21...	1230	6.2	46	6.0	19.0
JAN , 1980					
24...	1300	.56	62	6.9	18.0
FEB					
29...	1210	22	25	6.6	18.0
APR , 1980					
17...	1400	12	34	6.8	21.0
JUN					
11...	1050	54	26	6.2	19.5
AUG					
08...	0925	2.0	57	6.6	21.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16587000 - HONOPOU STREAM NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 20)					
OCT , 1979					
10...	1550	.46	58	7.6	22.5
NOV					
26...	1445	5.1	51	7.9	19.0
JAN , 1980					
16...	1025	4.7	54	6.9	18.5
MAR					
06...	1435	8.5	44	6.6	21.0
APR , 1980					
24...	1455	12	48	6.8	20.5
JUN					
09...	1345	2.7	52	7.1	21.0
AUG					
25...	1220	1.7	51	6.8	22.5
16588000 - WAILOA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 20 LONG 156 15 19)					
OCT , 1979					
10...	1445	51	50	7.5	21.0
NOV					
26...	1315	222	41	7.4	17.5
JAN , 1980					
16...	1250	110	43	6.9	18.0
MAR					
06...	1350	258	24	6.4	19.0
APR , 1980					
24...	1310	136	24	6.5	19.0
JUN					
09...	1325	255	38	7.1	19.5
AUG					
25...	1030	159	43	6.8	20.0
16589000 - NEW HAMAKUA DITCH AT HONOPOU NR HUELO, MAUI, HI (LAT 20 53 28 LONG 156 15 22)					
OCT , 1979					
10...	1200	.36	60	7.6	23.0
NOV					
26...	1100	8.3	46	6.9	18.0
MAR , 1980					
06...	1130	143	30	6.5	19.0
APR , 1980					
24...	1050	42	26	6.5	18.5
JUN					
09...	1500	84	46	6.9	20.0
AUG					
25...	1445	1.8	54	6.6	21.5
16592000 - LOWRIE DITCH AT HONOPOU GULCH NR HUELO, MAUI, HI (LAT 20 54 57 LONG 156 15 08)					
OCT , 1979					
10...	1415	4.2	76	8.2	24.5
NOV					
27...	1130	27	61	7.2	19.5
JAN , 1980					
16...	1230	2.4	63	7.2	21.5
MAR					
05...	1410	2.5	49	7.5	22.0
APR , 1980					
21...	1245	2.8	57	7.2	24.5
JUN					
13...	1520	98	34	6.6	21.5
AUG					
13...	1120	39	54	6.5	23.0
16594000 - HAIKU DITCH AT HONOPOU GULCH NR KAILUA,MAUI,HI (LAT 20 55 07 LONG 156 14 58)					
OCT , 1979					
10...	1150	.58	110	8.0	24.5
NOV					
21...	1540	61	40	6.2	19.5
JAN , 1980					
16...	1100	.36	72	6.3	20.0
MAR					
05...	0950	98	45	7.2	19.0
APR , 1980					
21...	1100	71	43	6.8	20.0
JUN					
13...	1300	104	36	6.6	21.0
AUG					
13...	0920	3.2	102	6.5	22.0
16599500 - OPANA TUNNEL NR KAILIILI, MAUI, HI (LAT 20 51 04 LONG 156 16 17)					
OCT , 1979					
11...	1435	.58	52	6.8	21.0
NOV					
28...	0945	5.2	35	6.5	14.5
JAN , 1980					
31...	1210	1.1	60	6.7	16.5
MAR					
07...	1400	3.8	31	6.5	14.0
APR , 1980					
22...	1410	5.4	39	6.5	18.0
JUN					
18...	1445	3.7	42	6.3	20.0
AUG					
14...	1300	2.2	49	6.4	20.0
16607000 - IAO STREAM AT WAILUKU, MAUI, HI (LAT 20 53 38 LONG 156 30 27)					
JAN , 1980					
08...	1005	1630	64	7.4	20.0
JAN , 1980					
08...	1600	1500	67	7.3	20.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF MAUI--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16620000 - HONOKOHAU STREAM NR HONOKOHAU, MAUI, HI (LAT 20 57 48 LONG 156 35 22)					
OCT , 1979					
11...	1130	15	67	8.3	19.5
NOV					
29...	1115	17	67	7.9	18.5
JAN , 1980					
22...	1240	20	63	7.4	17.5
MAR					
12...	1215	53	53	7.2	17.0
APR , 1980					
25...	1305	52	56	7.0	19.0
JUN					
20...	1225	34	66	7.3	19.0
AUG					
19...	1100	32	60	6.9	20.0
16638500 - KAHOMA STREAM AT LAHAINA, MAUI, HI (LAT 20 53 10 LONG 156 40 38)					
JAN , 1980					
09...	1340	26	31	7.1	20.0
MAR					
11...	1340	2.1	82	7.2	22.0
APR , 1980					
23...	1420	8.2	49	7.1	22.5

HAWAII, ISLAND OF HAWAII

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16700000 - WAIAKEA STREAM NR MOUNTAIN VIEW, HAWAII, HI (LAT 19 38 30 LONG 155 10 28)					
OCT , 1979					
25...	0855	3.7	40	7.3	17.0
NOV					
26...	0920	26	37	7.2	17.0
DEC					
21...	1015	9.0	38	7.5	17.0
JAN , 1980					
28...	0935	.24	38	7.4	17.0
FEB					
25...	0940	.18	48	7.5	17.0
MAY , 1980					
20...	1355	13	41	7.2	17.0
JUN					
23...	1135	14	38	7.1	17.0
JUL					
25...	1400	7.6	42	7.2	17.0
SEP					
24...	1435	24	38	7.3	17.0
16700900 - OLAA FLUME SPRING NR KAUMANA, HI (LAT 19 41 59 LONG 155 11 13)					
OCT , 1979					
02...	1140	3.5	41	6.8	17.0
NOV					
14...	1140	3.2	42	6.9	16.5
JAN , 1980					
29...	1045	1.8	40	6.7	17.0
FEB					
08...	0845	.59	44	7.0	17.0
MAR , 1980					
14...	0945	.50	32	6.9	17.0
MAY					
09...	0925	.58	30	6.9	17.5
JUL					
21...	1400	.66	35	6.8	17.0
AUG					
20...	1030	4.5	40	6.9	17.0
16701750 - WAILUKU RIVER NR HUMUULA, HAWAII, HI (LAT 19 42 55 LONG 155 18 36)					
DEC , 1979					
21...	1305	.01	38	6.7	16.0
MAY , 1980					
21...	1215	.01	40	6.5	16.0
16701800 - WAILUKU RIVER NR KAUMANA, HAWAII, HI (LAT 19 43 15 LONG 155 16 08)					
OCT , 1979					
02...	1000	.22	31	6.5	19.5
NOV					
21...	1210	32	35	6.6	17.0
MAY , 1980					
27...	1200	7.4	26	6.5	18.0
JUL					
17...	1020	4.7	35	6.8	17.0
16704000 - WAILUKU RIVER AT PIIHONUA HAWAII HI (LAT 19 42 58 LONG 155 09 13)					
NOV , 1979					
02...	1200	22	40	7.2	19.0
JAN , 1980					
21...	1745	3.1	48	7.0	19.0
FEB					
19...	1145	1.3	42	7.1	19.0
AUG , 1980					
22...	1110	26	35	7.1	18.0
SEP					
19...	1405	103	34	7.0	19.0

OBSERVATIONS OF PHYSICAL PARAMETERS

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16720000 - KAWAINUI STREAM NR KAMUELA, HAWAII (LAT 20 05 18 LONG 155 40 58)					
OCT , 1979					
09...	1130	5.1	25	6.0	14.0
FEB , 1980					
13...	1135	.06	26	6.0	13.0
JUN , 1980					
30...	1235	.48	26	6.6	14.0
AUG					
22...	1220	2.3	25	6.2	14.0
16720300 - KAWAIKI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 05 13 LONG 155 40 59)					
OCT , 1979					
09...	1100	2.1	24	6.0	15.0
FEB , 1980					
13...	1005	.36	26	5.9	13.0
JUN , 1980					
30...	1140	.85	25	6.5	14.0
AUG					
22...	1140	1.3	25	6.2	14.0
16720500 - UPPER HAMAKUA DITCH BL KAWAIKI STR NR KAMUELA HI (LAT 20 05 15 LONG 155 40 42)					
NOV , 1979					
14...	1120	17	22	6.0	13.0
16724800 - UPPER HAMAKUA DITCH AB ALAKAHI STR NR KAMUELA (LAT 20 04 31 LONG 155 40 26)					
OCT , 1979					
09...	0930	3.5	25	5.9	15.0
NOV					
14...	1200	12	24	6.0	14.0
JUN , 1980					
19...	1315	.52	39	6.6	17.0
JUN , 1980					
30...	0955	.22	25	6.2	14.0
AUG					
06...	1135	.89	24	5.8	14.0
22...	1025	.13	24	6.0	14.0
16725000 - ALAKAHI STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 04 27 LONG 155 40 25)					
OCT , 1979					
09...	1145	1.8	29	6.2	15.0
NOV					
14...	1225	38	22	5.8	13.0
DEC					
19...	0915	.18	28	5.7	14.0
FEB , 1980					
13...	1400	4.2	25	5.8	13.0
JUN , 1980					
30...	0900	1.4	27	6.0	14.0
AUG					
06...	1150	4.7	25	5.9	13.0
22...	1420	2.7	24	6.0	13.0
16726000 - UPPER HAMAKUA D AB WAIMEA RES DIV NR KAMUELA HI (LAT 20 03 31 LONG 155 37 40)					
OCT , 1979					
03...	1610	1.8	22	7.1	15.0
DEC					
06...	1045	2.9	30	6.5	15.0
JAN , 1980					
16...	1355	1.5	24	6.5	13.0
FEB					
27...	1120	.60	26	6.4	14.0
JUN , 1980					
10...	1340	11	22	6.6	15.0
AUG					
13...	1320	2.3	25	6.5	15.0
SEP					
10...	1155	2.6	24	6.2	18.0
16727000 - UPPER HAMAKUA DITCH AB PUUKAPU RES NR KAMUELA HI (LAT 20 02 53 LONG 155 37 17)					
OCT , 1979					
03...	1505	1.4	28	6.8	16.0
NOV					
20...	1205	.05	23	6.4	16.0
FEB , 1980					
28...	1255	4.8	23	6.0	15.0
JUN					
10...	1340	.03	25	6.2	16.0
16756000 - KOHAKOHAU STREAM NEAR KAMUELA, HAWAII, HI (LAT 20 03 02 LONG 155 40 58)					
NOV , 1979					
20...	1000	22	27	6.5	14.0
JAN , 1980					
17...	1145	1.3	27	6.1	14.0
FEB					
28...	1125	38	20	6.0	15.0
JUN , 1980					
16...	1555	19	22	5.8	15.0
AUG					
14...	1005	.95	28	6.2	15.0
SEP					
09...	1255	1.3	27	6.2	15.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF HAWAII--Continued

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, WATER (DEG C)
16758000 - WAIKOLOA STR AT MARINE OM NR KAMUELA, HAWAII, HI (LAT 20 02 48 LONG 155 39 58)					
OCT , 1979					
04...	0950	2.2	50	7.1	14.0
NOV					
20...	1055	17	23	6.6	14.0
JAN , 1980					
17...	1045	3.0	35	6.3	14.0
FEB					
28...	1040	21	25	6.5	15.0
MAY , 1980					
30...	1245	3.3	47	6.9	20.0
AUG					
19...	0900	3.2	30	6.9	16.0
SEP					
09...	1045	4.0	32	6.5	16.0
16759000 - HAUANI GULCH NEAR KAMUELA, HAWAII, HI (LAT 20 02 28 LONG 155 39 05)					
OCT , 1979					
03...	1355	.10	31	7.0	16.0
DEC					
06...	0930	.56	30	6.4	14.0
JAN , 1980					
16...	1255	.37	26	6.2	15.0
FEB					
27...	1345	.16	28	6.0	15.0
JUN , 1980					
16...	1125	1.1	29	6.0	15.0
AUG					
13...	1220	.34	30	6.2	15.0
SEP					
10...	1025	.28	29	6.1	15.0
16759200 - R BR WAIAHA STREAM NEAR HOLUALOA, HAWAII, HI (LAT 19 38 41 LONG 155 54 55)					
OCT , 1979					
02...	1450	.02	45	7.1	17.0
DEC					
05...	1125	.01	40	6.8	17.0
JAN , 1980					
15...	1500	.02	35	6.8	16.0
APR , 1980					
24...	1310	.01	30	6.7	17.0
JUL					
02...	1115	.27	30	6.6	17.0
AUG					
12...	1135	.16	32	6.2	17.0
16759800 - KIILAE STREAM NEAR HONAUNAU, HAWAII, HI (LAT 19 24 52 LONG 155 50 56)					
OCT , 1979					
03...	0900	.07	22	6.7	15.0
DEC					
05...	0815	.02	23	6.6	18.0
APR , 1980					
22...	0900	.02	23	6.5	15.0
JUN , 1980					
25...	0900	.28	20	6.9	18.0
AUG					
13...	0745	.02	25	6.6	16.0
16764000 - HILEA GULCH TRIBUTARY NEAR HONUAPO, HAWAII, HI (LAT 19 10 27 LONG 155 35 58)					
OCT , 1979					
02...	0930	.48	39	7.2	18.0
DEC					
04...	1100	.33	40	7.0	15.0
JAN , 1980					
15...	0930	.10	45	6.2	13.0
APR , 1980					
24...	1215	1.1	48	7.0	18.0
MAY					
29...	1330	1.7	39	6.9	17.0
JUL					
02...	1305	1.5	41	6.8	16.5
16765000 - HILEA GULCH TRIB NO 2 NEAR HONUAPA, HAWAII, HI (LAT 19 10 17 LONG 155 36 05)					
OCT , 1979					
02...	0955	.09	37	7.0	16.0

HAWAII, ISLAND OF KAUAI

220354159205601. Local number, 2-0320-01.
LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, in Wailua Houselots, Wailua. Owner: Kauai County, Department of Water.
AQUIFER.--Koloa Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled basal water-table well, diameter 8 in (0.2 m), depth 240 ft (73.2 m), cased to 193 ft (58.8 m), open end.
DATUM.--Land-surface datum is 155 ft (47.2 m) above mean sea level. Measuring point: Top edge of steel pumpbase at breather hole, 155.98 ft (47.543 m) above mean sea level.
REMARKS.--Water-quality records for 1960, 1966, 1972-79 are available in files of district office; those for 1980 are published elsewhere in this report. Water pumped from this well is used frequently for public supply.
PERIOD OF RECORD.--February 1960, June 1973 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.04 ft (6.108 m) above mean sea level, Feb. 17, 1960; lowest measured, 3.31 ft (1.009 m) below mean sea level, May 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	8.88	JAN 14	9.96	APR 10	8.84	MAY 23	a4.75	JUL 18	9.57	AUG 29	4.99
DEC 20	7.90	FEB 25	5.01								

a Well being pumped.

HAWAII, ISLAND OF OAHU

211718157491001 (Formerly 211718157490801). Local number, 3-1749-07 tube E.
LOCATION.--Lat 21°17'18", long 157°49'08", Hydrologic Unit 20060000, at Kaimuki High School grounds near Olokele Street, Honolulu. Owner: State of Hawaii.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 0.5 in (0.01 m), depth 378 ft (115 m), cased to 378 ft (115 m), open end.
DATUM.--Land-surface datum is 14 ft (4.3 m) above mean sea level. Measuring point: Top of iron cover 0.5 ft (0.2 m) above ground, 14.85 ft (4.526 m) above mean sea level.
REMARKS.--Tube E is one of five sampling tubes installed on Sept. 7, 1951 in existing 8 in (0.2 m) well. The bottom of each tube is at different depths to obtain water samples for determining vertical distribution of the chloride concentration. Water-quality records for 1951-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--July 1951, October 1955 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 28.88 ft (8.803 m) above mean sea level, Feb. 6, 1957; lowest measured, 19.51 ft (5.947 m) Aug. 31, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 22	24.92	NOV 23	25.31	JAN 17	26.56	MAR 3	25.40	APR 8	25.31	MAY 13	24.44

2121541580152O1. Local number, 3-2101-03.
LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, in Honouliuli. Owner: Hawaii Meat Co.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 10 in (0.25 m), depth 355 ft (108 m), cased to 165 ft (50.3 m), open hole. Water overflows casing at 13.53 ft (4.124 m) above mean sea level since 1978.
DATUM.--Land-surface datum is 11 ft (3.4 m) above mean sea level. Measuring point: Top of lowest horizontal flange, 11.16 ft (3.402 m) above mean sea level.
REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, 1978-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--April 1910 to June 1921, September 1923 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft (8.888 m) above mean sea level, April 1918; lowest measured, less than 11.16 ft (3.402 m) above mean sea level, Sept. 2, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 23	13.86	JAN 18	18.25	APR 11	15.44	JUL 3	16.12	AUG 19	15.91	SEP 26	15.57
NOV 29	15.34	MAR 4	16.54	MAY 22	15.41						

HAWAII, ISLAND OF OAHU--Continued

212238157561101. Local number, 3-2256-10.
LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, in Pearl Harbor Navy Reservation near Kamehameha Highway, Aiea. Owner: U.S. Navy.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled artesian basal water-table well, diameter 12 in (0.30 m), depth 173 ft (52.7 m), cased to 143 ft (43.0 m), open hole.
DATUM.--Land-surface datum is 10 ft (3.0 m) above mean sea level. Measuring point: Top of 10 in (0.25 m) stilling pipe for water-level recorder, 26.15 ft (7.971 m) above mean sea level (since Sept. 9, 1968).
REMARKS.--Recording gage installed Sept. 9, 1968. Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.
PERIOD OF RECORD.--January 1928 to February 1931, September 1934 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft (7.894 m) above mean sea level, Jan. 16, 1928; lowest, 12.97 ft (3.953 m) above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	15.14	15.08	15.28	15.42	16.64	16.65	16.56	16.44	*	16.96	16.84	16.79
10	15.17	14.98	15.16	15.75	16.70	16.63	16.46	16.39	*	16.99	16.92	16.58
15	15.13	14.99	15.13	16.02	16.54	16.53	16.40	16.27	*	16.95	16.87	16.58
20	15.10	15.07	15.04	16.29	16.40	*	16.39	16.27	*	16.95	16.91	16.53
25	15.03	15.28	15.22	16.39	16.60	*	16.39	16.33	*	16.89	16.93	16.46
EOM	15.00	15.20	15.43	16.58	16.62	*	16.37	16.45	16.84	16.87	16.99	16.39

WTR YEAR 1980 MAX 17.09 SEPT 1-2, 1980 MIN 14.94 NOV 16, 1979

* No record.

212927158014807. Local number, 3-2901-07.
LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, at Kamehameha Highway and Wilikina Drive, Wahiawa. Owner: U.S. Army.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Dug domestic high-level water-table well, size 8 x 8 ft (2 x 2 m), length of 30-degree inclined shaft 1,148 ft (349.9 m).
DATUM.--Land-surface datum is 850 ft (259 m) above mean sea level. Measuring point: Top of pump chamber floor at recorder, 287.00 ft (87.478 m) above mean sea level.
REMARKS.--Recorder is located on the pump chamber floor at the bottom of shaft. Recording gage installed November 1938. Water-quality records for 1966-72, 1975-79 are available in files of district office; those for 1980 are published elsewhere in this report. Water pumped from this well is used continually for public supply.
PERIOD OF RECORD.--August 1936 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft (86.685 m) above mean sea level, May 12, 1969; lowest, 269.52 ft (82.150 m) above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	273.10	272.99	272.85	272.74	272.65	272.65	272.76	273.17	273.85	274.73	275.67	276.22
10	273.21	273.04	272.75	272.96	272.69	272.64	272.83	273.20	274.00	274.87	275.67	276.61
15	272.93	272.91	272.81	272.66	272.77	272.70	272.96	273.31	274.20	275.00	275.90	276.46
20	273.07	272.87	272.69	272.69	272.62	272.67	272.91	273.36	274.29	275.16	276.06	276.52
25	273.08	272.90	272.77	272.74	272.65	272.77	272.96	273.49	274.44	275.28	276.14	276.56
EOM	272.95	272.88	272.84	272.72	272.68	272.81	273.02	273.66	274.56	275.40	276.31	276.67

Note:--Well being pumped throughout the year.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
NONPUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	273.28	JAN 3	272.77	FEB 2	272.87	APR 1	272.96	JUN 1	273.84	AUG 1	275.65
NOV 2	273.17	8	273.15	MAR 1	272.76	MAY 1	273.24	JUL 2	274.75	SEP 1	276.50
DEC 1	272.88	9	273.10								

Note.--Water levels are measured after all pumps being shut off for 2 hours.

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 (180 m) southwest of Kamehameha Highway (Highway 83), Kahana. Owner: Mary B. Foster Estate.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled artesian basal water-table well, diameter 10 in (0.25 m), depth 441 ft (134 m), cased to 177 ft (53.9 m), open hole.
DATUM.--Land-surface datum is 6 ft (2 m) above mean sea level. Measuring point: Top of "T", 7.31 ft (2.228 m), revised, above mean sea level.
REMARKS.--Water-quality records for 1935-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--April 1935 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft (6.49 m) above mean sea level, Mar. 29, 1966; lowest measured, 14.39 ft (4.386 m), revised, above mean sea level, Sept. 9, 1977.
REVISIONS.--Water levels for 1978-79 published in WDR HI-78-1 and WDR-79-1 have been revised as follows:

Water Year	Date	Water Level (ft)
1978	June 2, 1978	15.22
1978	July 13, 1978	15.26
1978	Aug. 25, 1978	15.21
	Corrected measuring point: Top of petcock, 6.60 ft (2.012 m) above mean sea level.	
1979	Oct. 6, 1978	15.22
1979	Feb. 14, 1979	17.22
1979	Apr. 2, 1979	19.11
1979	May 16, 1979	17.85
1979	June 27, 1979	18.14

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	17.24	MAR 13	17.22	APR 25	16.56	JUN 10	17.09	JUL 22	16.81	SEP 11	16.62
DEC 14	17.30										

213446158104901. Local number, 3-3410-08.
LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, near Dillingham Air Force Base south of Farrington Highway, Mokuleia. Owner: Waialua Sugar Co., Inc.
AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 1.0 in (0.03 m), depth 447 ft (136 m), cased to 447 ft (136 m), perforated 410 to 447 ft (125 to 136 m).
DATUM.--Land-surface datum is 16 ft (4.9 m) above mean sea level. Measuring point: Top of 12 in (0.30 m) stilling well 20.53 ft (6.258 m) above mean sea level.
REMARKS.--Recording gage was operated January 1963 to February 1972. Present one-inch galvanized pipe was installed inside of existing 6-inch well and space between the two casings grouted on Sept. 13, 1948. Water-quality records for 1929-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--January 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 19.98 ft (6.090 m) above mean sea level, Jan. 5, 1969; lowest measured, 16.08 ft (4.901 m) above mean sea level, Aug. 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 2	18.41	DEC 31	18.84	MAY 8	18.30	JUN 23	18.73	AUG 11	18.56	SEP 15	18.69
NOV 20	18.27	FEB 13	18.98								

HAWAII, ISLAND OF OAHU--Continued

2141251580134O1. Local number, 3-4101-03.
LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, on Kamehameha Highway at Waialee. Owner: State of Hawaii.
AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation artesian basal water-table well, diameter 8 in (0.2 m), depth 61 ft (19 m), cased to 36 ft (11 m), open hole.
DATUM.--Land-surface datum is 22 ft (6.7 m) above mean sea level. Measuring point: Top of 4-inch (0.1 m) pipe, 21.89 ft (6.672 m) above mean sea level.
REMARKS.--Water-quality records for 1929-74 are available in files of district office.
PERIOD OF RECORD.--February 1929 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft (4.755 m) above mean sea level, Nov. 14, 1932; lowest measured, 10.97 ft (3.344 m) above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 2	12.87	JAN 28	13.24	APR 25	12.79	JUN 9	12.87	JUL 25	12.91	AUG 29	12.81
DEC 14	13.06	MAR 7	12.84								

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.
LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft (30 m) north of Highway 45, and 0.8 mi (1 km) west of Pukoo. Owner: P. Friel.
AQUIFER.--East Molokai Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Dug observation basal water-table well, 4 x 6 ft (1 x 2 m), depth 22 ft (6.7 m).
DATUM.--Land-surface datum is 19 ft (5.8 m) above mean sea level. Measuring point: Top of 2 x 2 in (0.05 x 0.05 m) steel plate bolted to top of concrete well wall, 21.23 ft (6.471 m) above mean sea level.
REMARKS.--Recording gage was operated Aug. 8, 1970 to Jan. 22, 1973. Water-quality records for 1970 to 1973 are available in files of district office.
PERIOD OF RECORD.--August 1970 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft (1.862 m) above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft (1.119 m) above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 16	4.08	FEB 5	4.46	MAR 31	4.74	MAY 27	4.53	JUL 7	4.44	SEP 2	4.49
DEC 10	4.34										

210605157012001. Local number, 4-0601-01.
LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, in Kaunakakai Gulch, Kaunakakai. Owner: State of Hawaii.
AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 12 in (0.30 m), depth 59 ft (18 m), cased to 20 ft (6.1 m), open hole.
DATUM.--Land-surface datum is 51 ft (16 m) above mean sea level. Measuring point: Top of 15 in (0.38 m) surface casing 51.95 ft (15.834 m) above mean sea level.
REMARKS.--Water-quality records for 1954-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--May 1954 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft (1.006 m) above mean sea level, Jan. 20, 1969; lowest measured, 1.6 ft (0.49 m) above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	2.65	DEC 14	2.68	APR 4	2.68	MAY 30	2.63	JUL 11	2.70	SEP 5	2.77

203912156255901. Local number, 6-3925-01.
LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.75 mi (1.2 km) east of Makena. Owner: State of Hawaii.
AQUIFER.--Hana Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 382 ft (116 m), cased to 363 ft (111 m), open hole.
DATUM.--Land-surface datum is 352 ft (107 m) above mean sea level. Measuring point: Top of 2 in (0.05 m) pipe attached to the casing cover, 352.29 ft (107.378 m) above mean sea level.
REMARKS.--Water-quality records for 1964 are available in files of district office.
PERIOD OF RECORD.--August 1964, June 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft (0.143 m) above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft (0.125 m) below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	0.24	JAN 30	0.10	MAR 13	-0.10	APR 29	-0.29	JUN 23	-0.33	AUG 21	0.35
NOV 30	0.07										

204827156242201. Local number, 6-4824-01.
LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft (305 m) south of intersection with Kalaloa Gulch, and 4 mi (6 km) east of Kihei, Owner: State of Hawaii.
AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 12 in (0.30 m), depth 647 ft (197 m), cased to 598 ft (182 m), screened 598 to 638 ft (182 to 194 m), open hole.
DATUM.--Land-surface datum is 593 ft (181 m) above mean sea level. Measuring point: Top of 3 in (0.08 m) pipe attached to the steel casing cover, 594.75 ft (181.280 m) above mean sea level.
REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.
PERIOD OF RECORD.--March 1971, May 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft (1.585 m) above mean sea level, Jan. 17, 1974; lowest measured, 3.65 ft (1.113 m) above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	3.98	JAN 30	4.98	MAR 12	4.57	APR 28	4.58	JUN 17	4.48	AUG 22	4.58
NOV 27	4.15										

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 (1.1 km) north of Maalaea and 0.9 mi (1.4 km) southwest of intersection of Honoapiilani Highway and Kihei Road. Owner: State of Hawaii.
AQUIFER.--Wailuku Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 219 ft (66.8 m), cased to 187 ft (57.0 m), open hole.
DATUM.--Land-surface datum is 166 ft (50.6 m) above mean sea level. Measuring point: Top of 8 in (0.2 m) casing, 166.60 ft (50.780 m) above mean sea level.
REMARKS.--Water-quality records for 1965-67 are available in files of district office. Recording gage was operated January to July 1974.
PERIOD OF RECORD.--September 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.57 ft (1.698 m) above mean sea level, Jan. 16, 1974; lowest measured, 4.74 ft (1.445 m) above mean sea level, Mar. 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	5.28	NOV 30	5.27	MAR 12	5.39	APR 28	5.38	JUN 25	5.29	AUG 20	5.56

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 2.5 mi (4.0 km) north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.
AQUIFER.--Honomanu Volcanic Series.
WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft (2 x 3 m) vertical shaft, depth 53 ft (16 m).
DATUM.--Land-surface datum is 50 ft (15 m) above mean sea level. Measuring point: Top of angle iron at well, 50.08 ft (15.264 m) above mean sea level.
REMARKS.--Recording gage installed Mar. 22, 1972. Water-quality records for 1973 are available in files of district office.
PERIOD OF RECORD.--March 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.09 ft (1.551 m) above mean sea level, Jan. 12, 1980; lowest, 3.05 ft (0.930 m) above mean sea level, Mar. 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.68	3.59	3.75	3.92	4.47	4.12	4.11	4.14	4.12	4.11	4.36	4.19
10	3.73	3.54	3.80	4.72	4.41	4.15	4.20	4.17	4.08	4.13	4.34	4.17
15	3.67	3.51	3.77	4.98	4.41	4.15	4.23	4.18	4.12	4.10	4.25	4.16
20	3.65	3.63	3.72	4.86	4.25	4.26	4.21	4.18	4.09	4.15	4.24	4.15
25	3.63	3.81	3.75	4.74	4.24	4.21	4.20	4.19	4.02	4.27	4.23	4.19
EOM	3.63	3.77	4.01	4.52	4.17	4.14	4.18	4.10	4.05	4.30	4.18	4.18

WTR YEAR 1980 MAX 5.09 JAN 12, 1980 MIN 3.49 NOV 14, 1979

205552156193101. Local number, 6-5519-01.
LOCATION.--Lat 20°55'52", long 156°19'31", Hydrologic Unit 20020000, at Haiku School 1.0 mi (1.6 km) north of Haiku and 2.7 mi (4.3 km) northeast of Paia. Owner: State of Hawaii.
AQUIFER.--Kula Volcanic Series, Pleistocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 400 ft (122 m), cased to 363 ft (111 m), perforated 363 to 383 ft (111 to 117 m).
DATUM.--Land-surface datum is 365 ft (111 m) above mean sea level. Measuring point: Top of 2.5 in (0.06 m) coupling pipe attached to the casing cover, 366.26 ft (111.636 m) above mean sea level.
REMARKS.--Water-quality records for 1967 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--May 1967, December 1970, May 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.85 ft (1.783 m) above mean sea level, Jan. 16, 1980; lowest measured, 4.75 ft (1.448 m) above mean sea level, Mar. 7, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 10	5.50	JAN 16	5.85	APR 21	5.52	JUN 24	5.60	JUL 3	5.59	AUG 13	5.75
NOV 27	5.43	MAR 5	5.42								

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 (1.4 km) east of Kahana and 1.5 mi (2.4 km) southwest of Honokahua. Owner: State of Hawaii.
AQUIFER.--Honolua Volcanic Series, Pliocene (?) age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 274 ft (83.5 m), cased to 274 ft (83.5 m), perforated 264 to 274 ft (80.5 to 83.5 m). Hole was drilled to depth of 284 ft (86.6 m) but plugged back 10 ft (3.0 m) with cement.
DATUM.--Land-surface datum is 257 ft (78.3 m) above mean sea level. Measuring point: Top of 2.2 in (0.06 m) coupling pipe attached to casing cover 257.46 ft (78.474 m) above mean sea level.
REMARKS.--Recording gage installed Aug. 6, 1975. Water-quality records for 1964 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--June 1964 to July 1964, March 1972 to September 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.64 ft (1.109 m) above mean sea level, August 10, 1980; lowest, 2.43 ft (0.741 m) above mean sea level Mar. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	3.20	3.07	3.17	3.10	*	3.10	3.06	3.07	3.17	3.29	3.52	3.42
10	3.25	3.05	3.11	*	3.39	3.09	3.24	3.11	3.09	3.27	3.54	3.44
15	3.12	3.00	3.16	*	3.46	3.10	3.25	3.14	3.15	3.31	3.46	3.42
20	3.12	2.99	3.07	*	3.27	3.22	3.16	3.18	3.10	3.37	3.40	3.41
25	3.12	3.10	3.11	*	3.26	3.18	3.14	3.22	3.11	3.38	3.46	3.44
EOM	3.16	3.16	3.23	*	3.12	3.13	3.12	3.14	3.20	3.42	3.40	3.48

WTR YEAR 1980 MAX 3.64 AUG 10, 1980 MIN 2.86 NOV 20, 1979

* No record.

HAWAII, ISLAND OF HAWAII

193017154502101. Local number, 8-3080-02.
LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi (0.8 km) 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, diameter 66 in (1.7 m), depth 46 ft (14 m), with two horizontal infiltration tunnels 2 x 50 ft (0.6 x 15 m) extending in opposite directions from 3 ft (0.9 m) above bottom of well.
DATUM.--Land-surface datum is 39 ft (12 m) above mean sea level. Measuring point: Top of steel manhole cover at 1-inch (0.03 m) hole, 39.50 ft (12.040 m) above mean sea level.
REMARKS.--Water-quality records for 1972-79 are available in files of district office; those for 1980 are published elsewhere in this report. Water pumped from this shaft is used frequently for public supply.
PERIOD OF RECORD.--March 1972 to August 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.10 ft (1.250 m) above mean sea level, Apr. 18, 1979; lowest measured, 1.71 ft (0.521 m) above mean sea level, July 11, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 17	2.87	MAR 4	3.74	MAY 22	3.67	SEP 11	3.27

193339154594801. Local number, 8-3389-01.
LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 4.9 mi (7.9 km) southeast of Keaau on Orchid Land Estate subdivision. Owner: County of Hawaii.
AQUIFER.--Puna Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 475 ft (145 m), cased to 403 ft (123 m), perforated 403 to 475 ft (123 to 145 m).
DATUM.--Land-surface datum is 427 ft (130 m) above mean sea level. Measuring point: Top of casing, 428.14 ft (130.497 m) above mean sea level.
REMARKS.--Water-quality records for 1961 are available in files of district office.
PERIOD OF RECORD.--September 1974 to September 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.37 ft (8.038 m) above mean sea level, Mar. 26, 1979; lowest measured, 15.99 ft (4.874 m) above mean sea level, Apr. 25, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	17.44	DEC 26	18.79	FEB 26	17.39	APR 25	22.31	JUL 28	19.84	SEP 25	19.46
NOV 26	19.49	JAN 28	18.10	MAR 24	19.42	MAY 27	22.30	AUG 26	19.04		

194134155005601. Local number, 8-4100-01.
LOCATION.--Lat 19°41'34", long 155°00'56", Hydrologic Unit 20010000, 5.5 mi (8.9 km) southeast of Hilo Post Office and 5.0 mi (8.0 km) northeast of Keaau. Owner: Hawaiian Paradise Corporation.
AQUIFER.--Kau Volcanic Series, Holocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 55 ft (17 m), cased to 39 ft (12 m), perforated 39 to 55 ft (12 to 17 m).
DATUM.--Land-surface datum is 45 ft (14 m) above mean sea level. Measuring point: Top of casing, 46.84 ft (14.277 m) above mean sea level.
REMARKS.--Water-quality records for 1971, 1973-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--November 1971 to August 1975 records available in files of district office; November 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.73 ft (1.746 m) above mean sea level, Apr. 9, 1980; lowest measured, 2.24 ft (0.683 m) above mean sea level, Mar. 9, 1972.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	4.44	FEB 5	5.01	APR 9	5.73	JUN 27	4.34	SEP 16	5.35

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 (1.1 km) east of Hapuna Beach Park and 3.1 mi (5.0 km) southeast of Kawaihae. Owner: State of Hawaii.
AQUIFER.--Hamakua Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 10 in (0.25 m), depth 268 ft (81.7 m), cased to 246 ft (75.0 m), screened 246 to 266 ft (75.0 to 81.1 m).
DATUM.--Land-surface datum is 244 ft (74.4 m) above mean sea level. Measuring point: Hole in pumpbase, 245.0 ft (74.7 m) above mean sea level.
REMARKS.--Water-quality records for 1970, 1973-79 are available in files of district office; those for 1980 are published elsewhere in this report. Water pumped from this well is used frequently for irrigation.
PERIOD OF RECORD.--April 1970, March 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.11 ft (0.948 m) above mean sea level, Oct. 23, 1978; lowest measured, 1.4 ft (0.43 m), revised, above mean sea level, June 22, 1973, June 3, 1974.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	2.55	JAN 6	2.78	FEB 27	2.60	APR 18	2.55	JUN 17	2.19	SEP 15	a0.3B

a Well being pumped.

200132155471001. Local number, 8-6147-01.
LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi (5.0 km) east of Kawaihae and 2.8 mi (4.5 km) northeast of Hapuna Beach Park. Owner: State of Hawaii.
AQUIFER.--Pololu Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Drilled observation basal water-table well, diameter 8 in (0.2 m), depth 1,008 ft (307.2 m), cased to 997 ft (304 m), perforated 997 to 1,008 ft (304 to 307.2 m). Hole was drilled to 1,040 ft (317.0 m) but was finally plugged back to 1,008 ft (307.2 m).
DATUM.--Land-surface datum is 982 ft (299 m) above mean sea level. Measuring point: Top of pipe coupling on casing cover 983.1 ft (299.6 m).
REMARKS.--Water-quality records for 1963-64 are available in files of district office.
PERIOD OF RECORD.--June to July 1963, June 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.2 ft (1.9 m), above mean sea level, Aug. 23, 1978, lowest measured, 4.4 ft (1.3 m) above mean sea level Sept. 20, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 11	5.49	JAN 6	5.43	FEB 27	5.83	APR 18	5.28	JUN 17	5.30	SEP 15	6.00

201603155521801. Local number, 8-7652-01.
LOCATION.--Lat 20°16'03", long 155°52'18", Hydrologic Unit 20010000, 0.3 mi (0.5 km) west of Upolu Point Airfield, 3.1 mi (5.0 km) northwest of Hawi, and 1.9 mi (3.1 km) west of Hoea Camp. Owner: Kohala Corporation.
AQUIFER.--Pololu Volcanic Series, Pleistocene age.
WELL CHARACTERISTICS.--Dug observation basal water-table well.
DATUM.--Land-surface datum is 7.43 ft (2.265 m) above mean sea level. Measuring point: Top of 4 in (0.1 m) steel I-beam placed across sump, 7.75 ft (2.362 m) above mean sea level.
REMARKS.--Water-quality records for 1973-79 are available in files of district office; those for 1980 are published elsewhere in this report.
PERIOD OF RECORD.--March 1973 to August 1975 records available in files of district office; October 1975 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft (0.942 m) above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft (0.442 m) above mean sea level, July 9, 1975, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 6	2.37	JAN 16	1.45	MAR 11	2.38	MAY 16	2.15	AUG 13	2.66	SEP 18	1.80

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI						
220018159442701	2-0044-15 S14 KSC	22 00 16	159 44 27	01	79-10-15	1000	2500	23.0	760
					79-12-14	1000	1250	22.0	330
					80-01-23	1030	2200	22.0	660
					80-03-06	0945	1850	22.5	490
					80-04-23	0950	2000	22.5	500
					80-06-06	1015	1490	22.5	340
					80-07-30	1015	3250	23.0	920
					80-09-08	0945	5100	22.5	1500
220136159205501	2-0120-01 W7 CNTY	22 01 36	159 20 55	01	79-10-12	1500	800	25.0	170
					79-12-12	1500	800	25.0	160
					80-02-25	1450	900	25.0	160
					80-05-22	0830	860	25.0	150
					80-07-18	1515	870	25.5	160
					80-08-27	1520	880	25.5	160
220148159453501	2-0145-10 W45F KSC	22 01 48	159 45 35	01	79-10-15	1100	1800	21.0	500
					79-12-14	1045	1200	22.0	300
					80-03-06	1020	1450	21.5	360
					80-04-23	1025	790	21.5	190
					80-06-06	1105	970	22.0	200
					80-07-30	1100	2400	21.5	620
					80-09-08	1015	2700	21.5	690
220354159205601	2-0320-01 W9-1A WAILUA	22 03 54	159 20 56	01	80-05-23	1200	280	24.0	45
					80-08-29	1330	395	24.5	48
220354159205602	2-0320-03 W9-1B CNTY	22 03 54	159 20 56	02	80-02-25	1430	390	25.0	50
					80-08-28	1340	395	24.5	--
220341159453901	2-0345-04 S16 KSC	22 03 41	159 45 39	01	79-10-15	1330	1700	23.0	490
					79-12-14	1115	1700	22.0	470
					80-01-23	1230	900	21.5	210
					80-03-06	1045	1650	22.0	440
					80-04-23	1045	1900	22.0	480
					80-06-06	1310	670	23.0	120
					80-07-30	1120	1700	22.5	410
					80-09-08	1130	1800	22.0	400
220530159450401	2-0545-01 W59 SAKIMANA	22 05 30	159 45 04	01	79-10-15	1300	830	24.0	170
					79-12-14	1145	800	23.5	170
					80-01-23	1300	810	23.5	160
					80-03-06	1105	860	23.5	160
					80-04-23	1105	910	24.0	170
					80-06-06	1230	1000	26.0	180
					80-07-30	1130	950	27.5	170
					80-09-08	1105	940	26.0	180
220827159185401	2-0818-01 W90A ANAHOLA	22 08 27	159 18 54	01	80-04-10	1240	255	23.5	22
220826159185401	2-0818-02 W90B CNTY	22 08 26	159 18 54	01	80-07-18	1335	225	23.0	19
220903159192901	2-0919-03 STATE, ANAHOLA	22 09 03	159 19 29	01	79-11-16	1100	105	--	47
221038159203801	2-1020-03 W78 LPC	22 10 38	159 20 38	01	80-07-18	1010	220	22.5	20
221201159293401	2-1229-03 W73 HANALEI	22 12 01	159 29 34	01	79-10-05	1320	220	23.5	22
					79-12-11	1420	215	23.5	25
					80-02-21	1440	255	23.0	24
					80-04-08	1430	225	23.0	24
					80-05-20	1410	225	23.0	22
					80-07-18	1200	225	23.0	22

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI--Continued						
221247159324801	2-1232-01 W67 CNTY	22 12 47	159 32 48	01	80-01-10	1330	120	23.0	20
					80-05-20	1340	140	23.0	19
					80-07-15	1510	145	23.0	20
					80-08-27	0955	120	23.0	18
221318159335901	2-1333-01 W66 HAENA	22 13 18	159 33 59	01	79-10-05	1235	205	22.0	21
					79-12-11	1345	205	22.0	20
					80-02-21	1355	220	21.5	19
					80-04-08	1330	210	22.0	20
					80-05-20	1315	210	22.0	20
					80-07-15	1450	220	22.5	20
					80-08-27	0915	215	22.5	20
215454159274201	2-5427-01 W16A KOLOA	21 54 54	159 27 42	01	79-12-07	1145	230	22.5	26
					80-01-24	1115	230	22.0	25
					80-03-10	1045	230	22.5	25
					80-06-13	1405	240	23.5	24
					80-07-28	1100	250	22.5	25
					80-09-09	1100	245	23.0	24
215536159263501	2-5526-01 GRV FRM, KOLOA	21 55 36	159 26 35	01	79-10-12	1100	230	23.0	22
					80-09-09	1200	230	23.0	20
215528159303001	2-5530-02 W23 MSCO	21 55 28	159 30 30	01	79-10-18	0900	240	23.0	28
					80-03-10	1000	235	22.5	26
					80-09-08	1405	260	23.0	27
215535159302601	2-5530-03 W22 LAWAI	21 55 35	159 30 26	01	79-10-18	0850	210	23.0	24
					79-12-07	1055	220	22.5	25
					80-01-24	1045	210	22.5	23
					80-06-13	1120	230	23.0	23
					80-07-24	1030	235	23.0	24
					80-09-08	1400	230	23.0	24
215635159355001	2-5635-01 S7 KAUMAKANI	21 56 35	159 35 50	01	79-10-18	0945	700	23.0	140
					79-12-07	0955	680	22.5	150
					80-01-24	0930	670	22.0	130
					80-03-10	0845	750	22.5	160
					80-06-13	1000	750	23.0	140
					80-07-24	0915	770	24.0	150
					80-09-09	0945	780	23.0	150
215635159355002	2-5635-02 W25-3 OLKL SGR	21 56 35	159 35 50	02	80-04-25	0905	850	22.5	200
215803159401201	2-5840-02 W26 WAIMEA	21 58 03	159 40 12	01	79-10-15	1405	630	24.0	120
					79-12-14	1300	570	24.5	110
					80-01-23	1500	500	24.0	86
					80-03-06	1310	530	24.0	110
					80-04-23	1310	705	24.0	130
					80-06-06	1410	700	24.5	130
					80-07-30	1310	690	24.0	120
					80-09-08	1235	700	24.0	130
215854159424601	2-5842-02 S11 KSC	21 58 54	159 42 46	01	79-10-15	0915	700	24.0	130
					79-12-14	0925	670	24.5	120
					80-01-23	0945	640	23.5	110
					80-03-06	0910	700	23.5	120
					80-04-23	0910	745	24.0	120
					80-06-13	0840	750	24.5	120
					80-07-30	0900	750	24.0	130
					80-09-09	0855	750	24.5	120

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
HAWAII, ISLAND OF KAUAI--Continued									
215843159422901	2-5842-03 S10 KSC	21 58 43	159 42 29	01	79-10-15	0855	900	24.0	210
					79-12-14	0900	650	24.0	110
					80-01-23	0900	570	23.0	98
					80-03-06	0845	810	23.5	160
					80-04-23	0845	1090	24.0	240
					80-06-13	0915	1350	24.0	310
					80-07-30	0840	1200	24.5	260
					80-09-08	0910	1025	24.0	220
215906159395A01	2-5939-01 S9 CNTY	21 59 06	159 39 56	01	79-10-15	1430	410	23.0	47
					79-12-07	0920	553	23.5	94
					80-01-24	0900	415	23.0	60
					80-03-06	1345	470	23.5	74
					80-04-23	1345	550	23.5	86
					80-06-06	1450	500	23.5	71
					80-07-30	1400	580	23.5	97
					80-09-08	1300	570	23.5	89
215937159434201	2-5943-01 S13 WAIAWA	21 59 37	159 43 42	01	79-10-15	0950	1350	24.0	340
					79-12-14	0950	1300	24.5	340
					80-01-23	1015	1150	24.0	290
					80-03-06	0930	1300	24.0	270
					80-04-23	0925	1320	24.5	290
					80-06-06	0945	1200	24.5	250
					80-07-30	0935	1300	24.0	270
					80-09-08	0930	1350	24.0	280
HAWAII, ISLAND OF OAHU									
211646157465201	3-1646-01 W18 WAIALAE GC	21 16 46	157 46 52	01	80-01-17	0845	630	22.5	140
					80-03-03	1105	650	23.0	150
					80-04-10	1340	650	23.5	160
					80-05-16	1420	725	22.5	180
					80-07-07	0920	750	23.0	180
					80-08-12	1315	750	23.5	190
					80-09-25	1020	700	23.0	200
211718157491001	3-1749-07 W25 TUBE E	21 17 18	157 49 08	01	79-10-22	0950	900	24.5	230
					79-11-23	1445	875	25.0	220
					80-01-17	0950	750	25.0	180
					80-03-03	1145	760	24.0	200
					80-04-08	1510	750	25.0	200
					80-05-13	1445	750	25.0	200
211832157515501	3-1851-19 W102 TUBE A	21 18 32	157 51 55	01	79-10-23	1400	21000	23.5	7800
					79-11-28	1515	18500	23.5	7500
					80-01-17	1600	19000	24.0	7500
					80-03-03	1650	19000	23.5	7800
					80-05-22	1445	18500	24.0	7900
					80-09-26	1515	22600	24.0	8200
211832157515502	3-1851-19 W102 TUBE B	21 18 32	157 51 55	02	79-10-23	1410	1620	23.5	500
					79-11-28	1525	1750	23.5	500
					80-01-17	1610	1700	24.0	500
					80-03-03	1700	1800	23.5	520
					80-05-22	1440	1800	24.0	540
					80-09-26	1520	2020	23.5	580

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212038157422501	3-2042-13 W420-1A PAC CO	21 20 02	157 42 07	01	79-10-31	1000	4900	25.5	1700
					79-12-17	0950	6000	25.5	1700
					80-01-23	1000	4700	25.5	1500
					80-08-28	0930	5800	25.0	1700
212154158015201	3-2101-03 W266 HAW MEAT	21 21 54	158 01 52	01	79-10-23	1020	1020	22.5	270
					79-11-29	1025	1020	22.5	250
					80-01-18	1025	900	22.5	210
212133158035501	3-2103-03 S14 NAVY	21 21 33	158 03 55	01	79-10-23	0900	1000	23.5	230
					80-01-18	0905	1050	23.5	220
					80-03-04	0915	1050	23.0	220
					80-05-22	0920	960	23.5	230
					80-07-03	0910	975	23.5	220
					80-09-26	0910	975	23.5	230
212106157533701	3-2153-02 W153 DAMON EST	21 21 06	157 53 37	01	79-10-22	1050	380	22.0	74
					79-11-28	1410	380	22.0	74
					80-01-17	1505	380	22.0	72
					80-03-03	1220	380	22.0	76
					80-04-11	1425	380	22.0	75
					80-05-21	1435	380	22.0	76
					80-07-07	1100	380	22.0	76
					80-09-25	1215	360	22.0	72
212259157554201	3-2255-35 W189-3A C&H SG	21 22 59	157 55 42	01	80-01-18	1440	850	22.0	220
					80-03-04	1450	850	22.5	210
					80-04-11	1400	900	22.0	240
					80-07-03	1435	875	25.0	240
					80-09-25	1235	960	22.0	240
212238157561102	3-2256-12 W187C NAVY	21 22 38	157 56 11	02	79-10-18	1420	600	26.5	170
					79-11-21	1425	600	25.0	160
					80-01-17	1440	610	24.5	170
					80-03-03	1620	640	23.5	170
					80-04-03	1520	610	26.0	170
					80-05-21	1400	610	26.0	170
					80-06-27	1515	600	27.0	160
					80-08-19	1525	600	27.0	170
					80-09-25	1545	600	27.0	170
212300158004801	3-2300-06 W253 CNTY	21 23 00	158 00 48	01	79-11-29	1045	610	23.0	150
					80-01-18	1145	550	21.5	130
					80-03-04	1130	490	21.5	110
					80-04-11	1040	560	22.0	140
					80-07-03	1115	520	22.5	120
					80-08-19	1215	600	22.0	150
					80-09-26	1350	570	22.0	140
212343158001001	3-2300-11 W238 WATANABE	21 23 43	158 00 10	01	79-10-23	1330	800	22.5	190
					79-11-29	1130	800	22.5	200
					80-01-18	1340	800	22.5	200
					80-03-04	1320	775	22.5	200
					80-04-11	1125	800	22.5	200
					80-05-22	1305	800	22.5	200
					80-07-03	1240	800	22.5	200
					80-08-19	1320	750	22.5	200
					80-09-26	1215	850	22.5	200
212358158010901	3-2301-09, 10 W247J,I	21 23 58	158 01 09	01	80-01-18	1315	560	23.0	110
					80-03-04	1310	580	23.5	120
					80-04-11	1105	580	23.0	120
					80-05-22	1135	580	24.0	120
					80-07-03	1140	560	23.5	120
					80-08-19	1235	520	24.5	110
					80-09-26	1330	520	24.5	110

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

HAWAII, ISLAND OF OAHU--Continued

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
212332157582201	3-2358-02 W201 NAVY	21 23 32	157 58 22	01	79-10-22	1430	1800	20.5	540
					79-11-28	1220	2200	20.5	640
					80-01-17	1400	3800	20.5	1200
					80-03-03	1335	4100	20.5	1300
					80-04-11	1300	2800	20.5	820
					80-05-21	1240	2500	20.5	780
					80-07-03	1405	3600	20.5	1100
					80-08-19	1420	4400	20.5	1400
					80-09-25	1445	3600	20.5	1100
212318157583401	3-2358-19 W205-1 NAVY	21 23 18	157 58 34	01	79-10-22	1410	1120	26.5	330
					79-11-28	1200	1180	25.0	350
212342157584301	3-2358-22 W204-4	21 23 42	157 58 43	01	79-10-22	1330	825	20.5	220
					79-11-29	1145	860	20.5	240
					80-01-18	1350	975	20.5	260
					80-03-04	1355	1050	20.5	300
					80-04-11	1140	975	20.5	280
					80-05-22	1340	950	20.5	280
					80-07-03	1305	1000	20.5	280
					80-08-19	1350	950	20.5	280
					80-09-25	1415	900	20.5	270
212343157584701	3-2358-29 W204-9	21 23 43	157 58 47	01	79-10-22	1340	1420	20.5	420
					79-11-29	1155	1600	20.5	470
					80-01-18	1400	2700	20.5	820
					80-03-04	1400	3600	20.5	1100.
					80-04-11	1145	3000	20.5	950
					80-05-22	1345	2800	20.5	850
					80-07-03	1310	3200	20.5	1000
					80-08-19	1400	3100	20.5	1000
					80-09-25	1420	3000	20.5	900
212336157591801	3-2359-05 W204-11 OSHITA	21 23 36	157 59 18	01	79-10-22	1350	1600	22.0	460
					79-11-29	1210	1650	22.5	480
					80-01-18	1410	2000	22.0	560
					80-03-04	1415	2400	22.0	750
					80-04-11	1155	2400	22.0	740
					80-05-22	1325	2300	22.0	720
					80-07-03	1255	2300	22.0	740
					80-08-19	1340	2350	22.0	710
					80-09-25	1400	2400	22.5	740
212422157485601	3-2448-01 W416 STATE	21 24 22	157 48 56	01	79-10-31	0800	190	21.0	20
					79-12-17	1420	190	20.5	21
					80-01-29	0810	190	20.5	19
					80-03-13	1300	190	21.0	19
					80-07-25	0920	190	20.5	20
212436157590111	3-2459-01 TO 05 W239 A-E	21 24 36	157 59 01	11	80-06-04	1130	1780	--	500
					80-07-09	1140	3600	--	1100
					80-08-14	1400	4160	--	1300
212501158080701	3-2508-02 S2 CNTY	21 25 01	158 08 07	01	79-10-03	1000	1300	28.0	280
					79-11-19	1450	1310	27.5	270
					79-12-28	1000	1300	27.5	270
					80-02-15	1150	1400	28.0	270
					80-05-09	1225	1340	27.5	280
					80-06-20	1010	1330	27.5	280
					80-08-08	1450	1280	27.5	280
					80-09-18	1445	1280	27.5	280
212556157500301	3-2550-01 W407-16	21 25 56	157 50 03	01	79-10-31	0745	140	23.0	19
					79-12-17	0800	140	23.0	18
					80-03-12	0745	140	22.5	18
					80-07-25	0945	140	23.0	18
					80-08-28	0730	145	23.0	16

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued						
212506157582301	3-2558-10 S16 NAVY	21 25 06	157 58 23	01	79-10-22	1145	900	22.0	240
					80-03-04	1340	900	21.5	250
					80-05-21	1125	850	22.0	240
					80-09-26	1420	850	21.5	240
212617158033801	3-2603-01 W330-8 HAW CC	21 26 17	158 03 38	01	79-10-23	1055	340	22.5	51
					80-09-26	1115	330	22.5	50
212658158071801	3-2607-01 W277-97 NAVY	21 26 56	158 07 18	01	79-10-03	0755	340	24.5	46
					79-11-19	1315	350	24.0	46
					79-12-28	0800	345	24.0	46
					80-02-15	1130	360	24.0	46
					80-05-09	1045	355	24.0	48
					80-06-20	0845	355	24.0	46
					80-08-08	1330	350	24.0	46
					80-09-18	1400	350	24.0	47
212813158080201	3-2808-01 W277-92 NAVY	21 28 13	158 08 02	01	79-10-03	0900	1250	26.5	180
					79-11-19	1340	1290	26.0	170
					79-12-28	0830	1300	26.0	160
					80-02-15	1030	1310	26.0	150
					80-05-09	1115	1350	26.0	180
					80-06-20	0930	1350	26.0	180
					80-08-08	1400	1260	26.0	180
					80-09-18	1410	1230	26.0	180
212828158092001	3-2809-06 CNTY, WAIANAE	21 28 28	158 09 20	01	79-10-01	1145	310	22.0	27
					79-11-16	1055	315	22.0	27
					79-12-27	1030	335	22.0	30
					80-02-14	1010	300	22.0	27
					80-03-25	0945	310	22.0	26
					80-05-05	0945	350	22.0	30
					80-06-18	0940	335	22.0	28
					80-08-07	1025	320	22.0	26
					80-09-11	1000	345	22.0	23
212815159102301	3-2810-02 STATE, WAIANAE	21 28 15	158 10 23	01	80-06-20	1100	--	--	36
212859158124301	3-2812-01 S1 CNTY	21 28 59	158 12 43	01	79-10-01	1315	560	24.0	100
					79-11-16	1215	570	25.0	100
					79-12-27	1200	580	24.5	100
					80-02-14	1145	610	24.5	100
					80-03-25	1200	600	24.5	100
					80-05-05	1135	610	24.5	110
					80-06-18	1130	580	25.0	98
					80-08-07	1200	580	25.0	100
					80-09-11	1210	580	25.0	98
212927158014801	3-2901-07 S4 ARMY	21 29 27	158 01 48	01	79-11-09	0935	165	21.5	19
					80-03-28	0850	175	21.5	19
					80-05-09	1510	180	22.0	18
					80-06-19	1000	170	22.0	18
					80-08-05	0830	170	21.5	18
					80-09-17	0910	175	21.5	19
212945158014301	3-2901-09 W330-6 CNTY	21 29 45	158 01 43	01	79-10-09	1505	185	21.5	22
					79-11-07	1615	195	21.5	21
					79-12-21	1700	187	21.5	20
					80-02-16	1545	198	21.0	20
					80-05-08	1715	200	21.5	19
					80-08-08	1540	195	21.5	20
					80-09-19	1730	198	21.5	19

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF OAHU--Continued									
212939158112301	3-2911-02 WOC9, MAKAHA	21 29 39	158 11 23	01	79-10-01	1630	265	21.0	27
					79-11-16	1610	260	21.0	27
					79-12-27	1620	265	20.5	26
					80-02-14	1700	275	21.0	26
					80-03-25	1615	250	21.0	26
					80-05-05	1620	280	21.0	26
					80-06-18	1700	265	21.0	25
					80-08-07	1640	260	21.0	25
					80-09-11	1300	260	21.0	25
213224158135901	3-3213-06 W277-101 PAGE	21 32 24	158 13 59	01	79-10-01	1250	850	25.0	210
					79-11-16	1125	850	24.0	200
					79-12-26	1115	870	23.5	200
					80-02-14	1045	900	23.5	210
					80-03-25	1100	900	23.0	210
					80-05-05	1025	900	23.5	210
					80-06-18	1015	850	23.0	200
					80-08-07	1115	880	23.5	200
					80-09-11	1100	830	23.5	200
213243157510001	3-3251-01 W406 SWANZY	21 32 43	157 51 00	01	79-11-06	1520	950	22.5	240
					79-12-14	1430	950	24.0	240
					80-01-28	1630	950	23.0	240
					80-03-13	0910	1000	22.5	240
					80-04-29	1510	900	23.0	240
					80-06-10	1845	900	22.5	240
					80-07-22	1400	900	23.0	240
					80-08-29	1500	900	23.5	240
213327157524401	3-3352-01 W405 FOSTER	21 33 27	157 52 44	01	79-11-06	1500	280	22.5	38
					79-12-14	1410	270	23.0	38
					80-01-28	1600	270	23.0	36
					80-03-13	0845	280	22.5	36
					80-04-25	1300	260	24.0	35
					80-06-10	1425	260	23.0	36
					80-07-22	1310	260	23.0	37
					80-09-11	0830	260	22.5	36
213411158074501	3-3407-25 W320 CNTY	21 34 11	158 07 45	01	79-12-31	0955	2600	22.5	740
					80-02-13	1645	2300	22.5	720
					80-05-08	1445	2350	22.5	640
					80-06-23	1245	2200	22.5	660
					80-08-11	1130	2200	22.0	700
					80-09-22	1145	2000	23.0	640
213444158075501	3-3407-30 W318-2 WSCO	21 34 44	158 07 55	01	79-10-02	1205	5600	25.0	1800
					79-11-19	1120	5500	24.5	1600
					80-05-08	1045	3900	24.5	1100
					80-06-16	1700	14000	27.0	5000
					80-08-04	1600	4900	25.0	1400
213438158091101	3-3409-16 W30A MENDONCA	21 34 38	158 09 11	01	79-10-02	1120	810	22.5	190
					79-11-20	1230	825	22.5	190
					79-12-31	1020	820	22.5	190
					80-02-13	1500	825	22.0	190
					80-05-08	1145	850	22.0	190
					80-06-23	1025	875	21.5	190
					80-08-11	1045	800	21.5	190
					80-09-15	1355	850	22.0	180

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued						
213446158104901	3-3410-08 W286 WSCO	21 34 46	158 10 49	01	79-10-02	1040	1020	21.5	260
					79-11-20	1250	1010	21.5	260
					79-12-31	1050	1010	21.0	250
					80-02-13	1530	900	21.5	250
					80-05-08	1230	1010	21.5	250
					80-06-23	1055	990	22.0	240
					80-08-11	1015	950	21.5	240
					80-09-15	1530	950	21.5	240
213512158061601	3-3506-03 TO 04 W329 A-8	21 35 12	158 06 16	01	79-11-07	1500	580	21.5	120
					79-12-20	1450	570	21.5	120
					80-08-04	1235	570	21.5	120
					80-09-22	0930	560	21.5	120
213636158053701	3-3605-03 W334C WSCO	21 36 36	158 05 37	01	79-11-08	1540	2100	21.0	610
					79-12-20	1700	1600	21.5	440
					80-02-12	0900	1500	21.5	420
					80-05-01	1600	1650	21.5	440
					80-06-16	1520	1680	21.0	440
					80-08-04	1110	2100	21.0	560
					80-09-12	1615	2000	21.0	640
213636158053702	3-3605-21 W334U WSCO	21 36 35	158 05 40	02	79-11-08	1515	1370	21.0	380
					79-12-20	1720	1400	21.5	380
					80-02-12	0930	1400	21.5	380
					80-05-01	1620	1400	21.5	380
					80-06-16	1535	1480	21.5	390
					80-08-04	1130	1520	21.0	400
					80-09-12	1430	1400	21.0	410
213656157550401	3-3655-01 W394 CNTY	21 36 56	157 55 04	01	79-11-02	1355	240	22.0	35
					79-12-14	1350	250	21.5	35
					80-01-28	1545	240	21.5	34
					80-03-07	1430	240	21.5	33
					80-06-10	1405	230	21.5	32
					80-07-25	1500	225	21.5	33
					80-08-29	1400	230	21.5	32
213902157561601	3-3956-04 W366 KAHAWAI	21 39 02	157 56 16	01	79-11-02	1335	460	21.5	88
					79-12-14	1330	460	21.5	92
					80-01-28	1515	440	22.0	84
					80-03-07	1400	440	21.5	90
					80-04-10	1345	420	21.5	79
					80-07-25	1440	400	21.5	79
					80-08-29	1235	420	21.5	82
214050157573301	3-4057-01 W353A KAHUKU	21 40 50	157 57 33	01	79-11-02	0810	400	21.5	82
					79-12-14	0800	400	21.5	78
					80-08-29	0815	410	21.5	82
214029157570101	3-4057-06 W357 CMPRL EST	21 40 29	157 57 01	01	79-12-14	1300	1500	22.0	410
					80-01-28	1450	1500	22.0	420
214157158000101	3-4100-01 W338 DEL WEBB	21 41 57	158 00 01	01	79-11-02	0900	390	21.0	68
					79-12-14	0850	380	21.0	68
					80-08-29	0930	400	21.0	69
214131158011601	3-4101-08 W337-6 CNTY	21 41 31	158 01 16	01	79-12-14	1015	240	20.5	35
					80-07-25	1145	220	21.0	33
					80-08-29	1040	230	21.0	32
214233157583501	3-4258-04 W385 RCA	21 42 33	157 58 35	01	79-11-02	0820	1850	24.5	520
					79-12-14	0815	1900	24.0	540
					80-01-28	0800	1800	23.0	540
					80-03-07	0815	1950	22.5	560
					80-06-09	1400	1700	22.0	560
					80-07-25	1045	1700	24.5	570
					80-08-29	0840	1900	24.0	560

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
		HAWAII, ISLAND OF MOLOKAI							
210402156495801	4-0449-01 S6 CNTY	21 04 02	156 49 58	01	79-12-10	1520	330	21.0	56
					80-03-31	1610	320	21.0	60
					80-07-07	1410	310	20.0	56
210419156570501	4-0457-01 S4 CNTY	21 04 19	156 57 05	01	79-12-10	1435	370	23.0	78
					80-03-31	1455	235	23.0	43
					80-07-07	1455	210	23.0	37
210605157012001	4-0601-01 W11 MO RANCH	21 06 05	157 01 20	01	79-10-19	0820	370	24.0	58
					79-12-14	0735	360	24.0	53
					80-04-04	1210	210	24.0	14
					80-05-30	0815	230	24.0	17
					80-07-11	1025	250	24.0	20
					80-09-05	0900	290	24.0	27
210856157011201	4-0801-01 W16 HHC	21 08 56	157 01 12	01	79-12-11	0715	--	--	86
					80-05-30	0800	465	--	100
					80-09-03	1400	427	--	88
210903157013001	4-0901-01 W17 DEL MONTE	21 09 03	157 01 30	01	79-10-18	1050	350	--	72
					79-12-13	0935	345	--	72
					80-02-07	0940	370	--	83
					80-04-02	1540	360	--	82
					80-05-29	1045	370	--	82
					80-07-10	1000	360	--	77
					80-09-04	1035	350	--	74
210825157014501	SAMPLE PT. A STATE	21 08 25	157 01 45	01	79-10-18	1020	112	20.0	11
					79-12-13	0900	100	19.0	12
					80-02-07	0915	104	19.0	12
					80-04-02	1500	70	19.0	12
					80-05-29	1015	114	19.5	12
					80-07-10	1035	108	20.5	12
					80-09-04	1010	106	19.5	11
210855157021001	SAMPLE PT. B2 STATE	21 08 55	157 02 10	01	79-10-18	1105	330	22.0	64
					79-12-13	1000	320	22.0	64
					80-02-07	0955	350	20.5	76
					80-04-02	1555	370	21.0	80
					80-05-29	1100	340	22.0	72
					80-07-10	0945	370	21.5	76
					80-09-04	1045	320	22.0	66
210928157024801	SAMPLE PT. C STATE	21 09 28	157 02 48	01	79-10-18	1115	116	21.0	12
					79-12-13	1010	134	19.0	20
					80-02-07	1015	122	19.0	14
					80-04-02	1615	138	19.0	27
					80-05-29	1115	135	20.0	16
					80-07-10	0930	250	20.5	48
					80-09-04	1100	108	20.0	11
210923157031501	SAMPLE PT. D STATE	21 09 23	157 03 15	01	79-10-18	1125	144	25.0	19
					79-12-13	1025	122	22.0	16
					80-02-07	1030	108	21.5	14
					80-04-02	1630	94	21.0	13
					80-05-29	1130	100	23.5	14
					80-07-10	0920	102	24.5	14
					80-09-04	1120	114	25.0	16

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF MAUI						
203835156065001	6-3806-01 KAUPO RANCH	20 38 35	156 06 50	01	79-11-16	1105	600	--	150
					80-06-13	0950	810	19.0	210
203940156040301	6-3904-03 MAHINA AINA	20 39 40	156 04 03	01	79-11-15	1345	--	--	7.0
203947156261201	6-3926-03 WAILEA PUMP 8	20 39 47	156 26 12	01	80-04-29	1335	3800	19.0	1000
204126156262101	6-4126-02 W78-1 A&B INC	20 41 26	156 26 21	01	79-10-12	1230	1950	19.0	480
					79-11-30	1030	1880	19.5	480
					80-01-30	1245	1900	21.0	460
					80-03-13	1010	1700	20.5	460
					80-04-28	1315	1600	21.0	480
					80-06-23	1020	1900	18.5	470
					80-08-21	1030	2000	20.5	500
204601156001501	6-4600-01 W55 HANA RANCH	20 46 01	156 00 15	01	79-10-02	1635	450	21.5	69
					80-01-17	1600	480	21.0	75
					80-02-28	1550	480	22.0	76
					80-04-16	1600	460	21.5	66
					80-06-11	1615	440	22.0	60
					80-08-07	0810	400	21.5	73
204633156003201	6-4600-03 STATE WELL 8	20 46 33	156 00 32	01	79-10-03	1520	350	19.0	87
					79-11-20	1535	560	18.5	150
					80-01-17	1730	335	19.0	68
					80-02-28	1620	235	19.0	46
					80-04-16	1640	155	19.5	20
					80-06-11	1550	128	19.5	15
					80-08-07	0745	132	19.5	16
204634156271101	6-4627-08 W225 HASHIMOTO	20 46 34	156 27 11	01	79-10-12	1515	1800	23.0	360
					80-01-30	1355	1850	24.0	380
					80-03-13	1330	1950	22.5	380
					80-06-23	1320	1950	23.5	390
204635156270101	6-4627-14 W226 HASHIMOTO.	20 46 35	156 27 01	01	79-11-30	1330	1500	23.0	320
					80-04-28	1510	1500	23.0	330
					80-08-21	1000	1600	23.5	340
204845156255001	6-4825-01 S15 HC&S	20 48 45	156 25 50	01	79-10-29	0800	1600	--	320
					79-12-03	1240	1710	--	360
					80-01-07	1300	1720	--	360
					80-06-24	0750	1650	--	360
204847156355801	6-4835-01 S12 PNR MILL	20 48 47	156 35 58	01	80-02-28	1050	1700	32.0	430
204859156370901	6-4837-01 S11 PNR MILL	20 48 59	156 37 09	01	80-02-28	1030	2500	26.0	630
204931156371201	6-4937-01 S10 PNR MILL	20 49 31	156 37 12	01	79-10-26	1015	3930	--	1100
					80-02-28	0955	890	25.0	160
205102156282501	6-5128-02 S16 HC&S	20 51 02	156 28 25	01	79-10-29	0830	2150	--	480
					79-12-03	0545	2080	--	440
					80-01-08	0715	2290	--	500
					80-06-24	0730	1440	--	260
205243156243201	6-5224-02 S22 HC&S	20 52 43	156 24 32	01	79-10-29	0910	1760	--	400
					79-12-03	0600	1730	--	410
					80-06-24	0835	1660	--	390
205255156404401	6-5240-01 S7 PNR MILL	20 52 55	156 40 44	01	80-02-28	0925	570	18.5	120
205228156401701	6-5240-02 S8 PNR MILL	20 52 28	156 40 17	01	80-02-28	1130	1140	23.5	270
205227156401701	6-5240-03 S9 PNR MILL	20 52 27	156 40 17	01	80-02-28	1210	1500	24.0	390
205305156304401	6-5330-05 S33 WSCO	20 53 05	156 30 44	01	79-10-12	1025	315	22.0	48

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF MAUI--Continued									
205329156305502	6-5330-09 W15A CNTY	20 53 29	156 30 55	02	79-10-12	0905	650	22.0	140
					80-04-28	1420	670	23.0	140
205329156305501	6-5330-10 W15B CNTY	20 53 29	156 30 55	01	80-08-20	1325	520	23.0	100
205330156305401	6-5330-11 W15F CNTY	20 53 30	156 30 54	01	79-11-27	1530	450	22.0	76
					80-01-30	1020	345	23.0	42
					80-03-12	0910	430	22.5	72
					80-06-17	1330	430	23.5	68
205322156394501	6-5339-01 W291 CNTY	20 53 22	156 39 45	01	80-02-28	1420	900	23.0	180
205344156393001	6-5339-03 STATE, LAHAINA	20 53 44	156 39 30	01	80-02-28	1405	390	21.0	65
205341156392300	6-5339-04 STATE, LAHAINA	20 53 41	156 39 23	00	80-02-28	1350	290	21.5	51
205324156405701	6-5340-01 S6 PNR MILL	20 53 24	156 40 57	01	80-02-28	0920	400	23.0	82
205343156401101	6-5340-02 S5 PNR MILL	20 53 43	156 40 11	01	79-10-26	0800	2240	--	610
					80-02-28	1050	1180	22.0	280
					80-08-28	1345	236	--	44
205416156244301	6-5424-01 S24 HC&S	20 54 16	156 24 43	01	79-10-29	0925	2640	--	690
					79-12-03	0810	2570	--	680
					80-06-24	0900	2440	--	630
205552156193101	6-5519-01 W36 STATE	20 55 52	156 19 31	01	80-07-03	1345	530	--	120
205511156222101	6-5522-01 S31 HC&S	20 55 11	156 22 21	01	79-10-29	0955	1180	--	260
					79-12-03	0630	1160	--	260
					80-01-07	0630	1170	--	260
					80-06-24	1445	1130	--	260
205559156402801	6-5540-01 AMFAC	20 55 59	156 40 28	01	80-02-28	1400	1530	22.0	380
205503156401801	6-5540-03 AMER FAC	20 55 03	156 40 18	01	80-02-28	1420	890	21.0	190
205625156385001	6-5638-03 AMFAC	20 56 25	156 38 50	01	80-08-06	0900	460	--	100
205651156401001	6-5640-01 S36 PNR MILL	20 56 51	156 40 10	01	79-10-26	0930	1260	--	320
					80-08-28	1410	532	--	120
205655156412501	6-5641A01 LAHAINA STP 08	20 56 55	156 41 25	01	80-06-17	1030	5800	26.0	1800
205635156413101	6-5641-01 S3 PNR MILL	20 56 35	156 41 31	01	80-02-28	1000	3020	22.5	860
205837156384601	6-5838-01 STATE, KAPILI	20 58 37	156 38 46	01	80-03-11	1050	690	22.0	160
					80-04-23	1015	280	--	54
					80-06-19	1250	650	20.5	150
					80-08-18	1315	700	21.0	170
205838156383101	6-5838-02 STATE, KAPILI	20 58 38	156 38 31	01	79-10-12	1010	320	19.5	66
					79-12-04	1250	310	20.0	59
					80-01-21	1135	310	19.5	62
					80-06-19	1330	255	--	49
					80-08-18	1330	270	20.0	52
205856156400101	6-5840-01 W318 STATE	20 58 56	156 40 01	01	80-07-03	1545	950	--	260

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPECIFIC CONDUCTANCE (MICROMHOS)	TEMPERATURE (DEG C)	CHLORIDE, DISSOLVED (MG/L AS CL)
			HAWAII, ISLAND OF HAWAII						
190832155310801	B-0831-01	HWN INVEST CO	19 08 32	155 31 08	01	80-02-15	1055	610	18.5	130
						80-06-06	1320	600	18.0	130
190954155535201	B-0953-01	STATE, OKOE	19 09 54	155 53 14	01	80-09-18	1330	--	--	920
191108155281701	B-1128-02	MAUNA LOA MAC	19 11 08	155 28 17	01	80-09-10	0940	130	20.5	10
191114155294801	B-1129-01	MAUNA LOA MAC	19 11 14	155 29 48	01	80-01-08	1040	100	17.5	4.0
						80-02-15	1030	96	18.0	4.0
						80-09-10	1020	100	18.0	5.0
191219155291601	B-1229-01	CNTY, PAHALA	19 12 19	155 29 16	01	80-01-08	1010	95	17.0	4.0
						80-02-15	0940	90	18.0	4.0
192108155021201	B-2102-01	W9-10 STATE	19 21 08	155 02 12	01	80-01-08	1410	900	25.0	260
						80-03-04	1230	1120	25.0	280
						80-05-22	1405	1080	25.0	280
						80-09-11	1025	1170	25.0	300
192456154571901	B-2487-01	W9-7 CNTY	19 24 56	154 57 19	01	80-03-04	1335	460	25.0	97
						80-09-11	1110	450	25.0	96
192738155534201	B-2753-01	W12-4 CNTY	19 27 31	155 53 41	01	80-01-10	1230	675	19.0	170
						80-04-22	1130	700	19.0	160
						80-06-24	1440	700	19.0	160
						80-09-17	1455	680	19.0	150
192728154530101	B-2783-01	W9-9 STATE	19 27 28	154 53 01	01	80-01-17	1000	12500	54.0	4900
						80-03-04	1005	12200	54.0	4800
						80-05-22	1110	11500	53.5	4200
						80-09-11	1220	11000	53.5	4900
192924154564701	B-2986-01	W9-5B CNTY	19 29 24	154 56 47	01	80-09-11	0845	130	22.5	4.5
193017154502101	B-3080-02	S9 CNTY	19 30 17	154 50 21	01	80-09-11	1340	1050	25.5	140
193113154555A01	B-3185-01	W9-11 HAW BCH	19 31 13	154 55 58	01	80-09-11	1450	135	21.0	15
193505155570801	B-3557-02	W12-6 CNTY	19 35 05	155 57 08	01	80-01-10	1320	250	19.5	39
						80-03-12	0855	300	20.0	46
						80-06-24	1325	300	20.0	47
193508155570701	B-3557-03	CNTY, KAHALUU	19 35 08	155 57 07	01	80-04-21	1425	150	20.0	14
193505155570701	B-3557-04	CNTY, KAHALUU	19 35 05	155 57 07	01	80-09-18	0800	220	20.0	22
193805155020201	B-3802-03	PUNA SGR CO	19 38 05	155 02 02	01	80-03-05	1515	88	19.0	4.0
						80-06-26	1425	92	19.0	5.5
						80-09-12	0820	90	18.5	4.5
193806155020201	B-3802-04	PUNA SGR CO	19 38 06	155 02 02	01	80-01-09	1030	70	19.0	5.5
194040155035201	B-4003-02	CNTY, PANAEWA	19 40 40	155 03 52	01	80-01-09	1200	90	20.0	4.0
						80-03-05	1420	92	20.0	4.0
						80-05-28	1200	100	20.5	4.0
						80-06-26	1545	110	20.5	5.0
						80-09-12	0935	105	20.5	5.0
194134155005601	B-4100-01	HAW PROSE PARK	19 41 34	155 00 56	01	79-10-18	0920	1125	19.0	340
						80-02-05	0950	1350	19.0	370
						80-04-09	0910	1300	18.5	330
						80-06-27	1015	1250	18.5	320
						80-09-16	1020	1050	19.0	260
194222155034801	B-4203-06	WB-2B HELCO	19 42 22	155 03 48	01	80-01-09	1355	130	24.5	16
						80-03-05	1350	140	26.0	20
						80-09-12	1025	115	25.0	8.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

STATION NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	SEQ. NO.	DATE OF SAMPLE	TIME	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	TEMPER-ATURE (DEG C)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
194337155041801	B-4304-01 HELCO, WAIAKEA	19 43 37	155 04 18	01	80-01-09	1413	--	21.0	7200
					80-03-06	1400	--	20.0	16000
					80-05-28	1100	--	20.0	15000
					80-09-12	1105	13400	21.0	4200
194818155582301	B-4858-02 KONA VILLAGE	19 48 18	155 58 23	01	80-03-11	1350	2100	21.0	410
					80-06-25	1155	2000	21.0	410
194820155582401	B-4858-03 ISL COPRA	19 48 20	155 58 24	01	80-01-16	1130	3600	21.0	800
					80-04-22	1305	3000	21.0	780
					80-09-17	1140	2700	20.5	680
195043155053801	B-5005-02 PEPEEKEO SGR	19 50 43	155 05 38	01	80-01-14	1445	200	22.0	15
					80-03-06	0905	230	22.0	18
					80-05-21	0930	200	23.0	16
					80-09-16	1400	210	22.5	14
195048155051701	B-5005-03 HILO CST PROC	19 50 48	155 05 17	01	80-09-16	1435	7250	18.0	2600
195051155051501	B-5005-05 HILO CST PROC	19 50 51	155 05 15	01	80-01-14	1535	11000	18.0	3600
					80-03-06	0850	12700	18.0	4900
					80-09-16	1445	10000	18.0	4000
195724155455301	B-5745-01 BOISE CASCADE	19 57 24	155 45 53	01	79-10-08	1010	270	26.5	27
					79-10-30	1255	280	26.5	25
					79-12-11	1410	270	26.5	25
					80-06-13	1330	290	26.5	26
					80-07-11	1220	300	26.5	26
					80-09-08	1450	290	26.5	24
195722155455201	B-5745-02 BOISE CASCADE	19 57 22	155 45 52	01	79-12-11	1355	280	26.5	28
					80-09-08	1455	300	26.5	26
195857155142301	B-5814-01 CNTY	19 58 57	155 14 23	01	80-03-06	1030	560	19.0	120
					80-09-15	1445	520	19.0	110
195912155464201	B-5946-02 STATE	19 59 12	155 46 42	01	79-12-17	1215	260	26.0	27
					79-12-19	1155	--	--	28
					80-05-09	1200	--	27.0	31
195947155485801	B-5948-01 STATE, HAPUNA	19 59 47	155 48 58	01	79-12-11	1140	1550	25.0	450
					80-01-06	1135	1800	25.5	460
					80-02-27	1310	1800	25.5	460
					80-04-18	1415	1800	25.5	460
					80-06-17	1445	1800	25.5	460
					80-09-15	1150	1800	25.5	460
200122155480901	B-6148-01 W14 CNTY	20 01 22	155 48 09	01	80-02-27	1410	1550	27.0	380
					80-09-15	1105	1500	27.0	380
200121155480801	B-6148-02 CNTY, KAWAIHAE	20 01 21	155 48 08	01	80-04-18	1310	1560	27.0	390
					80-09-15	1100	1550	27.0	400
200518155281601	B-6528-01 STATE, HAINA	20 05 18	155 28 16	01	79-11-09	0800	--	--	71
201603155521801	B-7652-01 S1 KOHALA SGR	20 16 03	155 52 18	01	79-11-06	1120	1650	22.0	480
					80-01-16	1350	1650	22.0	480
					80-03-11	1120	1850	22.0	500
					80-05-16	1350	1800	22.0	480
					80-08-13	1510	1800	22.5	490
					80-09-18	1155	1900	22.0	490

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	DEPTH OF WELL, TOTAL (FEET)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (MICROMHOS)
HAWAII, ISLAND OF KAUAI									
2-0919-03 STATE, ANAHOLA	22 09 03	159 19 29	01	220903159192901	79-11-16	1100	--	--	--
HAWAII, ISLAND OF OAHU									
3-2459-01 TO 05 W239 A-E	21 24 36	157 59 01	11	212436157590111	80-08-14	1400	700	6250	4160
3-2810-02 STATE, WAIANAE	21 28 15	158 10 23	01	212815158102301	80-06-20	1100	--	--	--

LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	DEPTH OF WELL, TOTAL (FEET)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (MICROMHOS)
3-2459-01 TO 05 W239 A-E	21 24 36	157 59 01	11	212436157590111	80-06-04	1130	700	.00	1780
					80-07-09	1140	700	3500	3600

LOCAL IDENTIFIER	DATE OF SAMPLE	SODIUM + POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
HAWAII, ISLAND OF KAUAI										
2-0919-03 STATE, ANAHOLA	79-11-16	38	1.3	98	10	47	.3	49	236	.32
HAWAII, ISLAND OF OAHU										
3-2459-01 TO 05 W239 A-E	80-08-14	--	--	--	--	1300	--	49	--	--
3-2810-02 STATE, WAIANAE	80-06-20	--	2.8	97	11	36	.2	86	254	.35

LOCAL IDENTIFIER	DATE OF SAMPLE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS N)	NITROGEN, TOTAL (MG/L AS NO3)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	PHOSPHORUS, DISSOLVED (MG/L AS P)
3-2459-01 TO 05 W239 A-E	80-06-04	.48	2.3	10	.060	.18	.050
	80-07-09	.45	1.8	7.7	.070	.21	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

LOCAL IDENTIFIER	DATE OF SAMPLE	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
HAWAII, ISLAND OF KAUAI										
2-0919-03 STATE, ANAHOLA	79-11-16	--	--	110	7	14	17	34	31	1.0
HAWAII, ISLAND OF OAHU										
3-2459-01 TO 05 W239 A-E	80-08-14	6.9	--	--	--	--	--	--		--
3-2810-02 STATE, WAIANAE	80-06-20	--	--	92	0	12	15	32	42	1.5

LOCAL IDENTIFIER	DATE OF SAMPLE	PH FIELD (UNITS)	CHLORIDE, DISSOLVED (MG/L AS CL)	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 TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)
3-2459-01 TO 05 W239 A-E	80-06-04	6.8	500	1.8	.000	1.8	1.8	.000	.00	.48
	80-07-09	6.8	1100	1.3	.000	1.3	--	.000	.00	.85

LOCAL IDENTIFIER	DATE OF SAMPLE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
HAWAII, ISLAND OF KAUAI						
2-0919-03 STATE, ANAHOLA	79-11-16	--	.95	<10	<1	j 9999
HAWAII, ISLAND OF OAHU						
3-2459-01 TO 05 W239 A-E	80-08-14	--	--	--	--	--
3-2810-02 STATE, WAIANAE	80-06-20	--	1.4	<10	<3	j 9999

< Actual value is known to be less than the value shown.
j Collected by non-USGS agency.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

LOCAL IDENTIFIER	LATITUDE	LONGITUDE	SEQ. NO.	STATION NUMBER	DATE OF SAMPLE	TIME	DEPTH OF WELL, TOTAL (FEET)	FLOW RATE, INSTANTANEOUS (GPM)	SPECIFIC CONDUCTANCE (MICROMHOS)
HAWAII, ISLAND OF MAUI									
6-4937-01 S10 PNR MILL	20 49 31	156 37 12	01	204931156371201	80-02-28	0955	--	--	890
6-5339-01 W291 CNTY	20 53 22	156 39 45	01	205322156394501	80-02-28	1420	497	--	900
6-5340-02 S5 PNR MILL	20 53 43	156 40 11	01	205343156401101	80-02-28	1050	--	--	1180
6-5641*01 LAHAINA STP OB	20 56 55	156 41 25	01	205655156412501	80-06-17	1030	--	--	5800
6-5641-01 S3 PNR MILL	20 56 35	156 41 31	01	205635156413101	80-02-28	1000	--	--	3020
HAWAII, ISLAND OF HAWAII									
8-0953-01 STATE, OKOE	19 09 54	155 53 14	01	190954155535201	80-09-18	1330	--	--	--
8-5946-02 STATE	19 59 12	155 46 42	01	195912155464201	79-12-19	1155	--	--	--
					80-05-09	1200	--	--	--
8-6528-01 STATE, HAINA	20 05 18	155 28 16	01	200518155281601	79-11-09	0800	--	--	--

LOCAL IDENTIFIER	DATE OF SAMPLE	SODIUM+POTASSIUM DISSOLVED (MG/L AS NA)	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
HAWAII, ISLAND OF MAUI										
6-4937-01 S10 PNR MILL	80-02-28	100	4.6	140	31	160	.2	54	496	.67
6-5339-01 W291 CNTY	80-02-28	120	6.5	130	23	180	.2	64	523	.71
6-5340-02 S5 PNR MILL	80-02-28	170	8.4	97	38	280	.2	57	663	.90
6-5641*01 LAHAINA STP OB	80-06-17	--	19	170	250	1800	.1	30	3350	4.56
6-5641-01 S3 PNR MILL	80-02-28	460	17	94	130	860	.2	52	1700	2.31
HAWAII, ISLAND OF HAWAII										
8-0953-01 STATE, OKOE	80-09-18	--	21	45	160	920	.4	36	1780	2.42
8-5946-02 STATE	79-12-19	38	4.6	80	19	28	.3	60	218	.30
	80-05-09	--	4.5	71	16	31	.3	58	212	.29
8-6528-01 STATE, HAINA	79-11-09	47	3.7	68	14	71	.1	47	254	.35

QUALITY OF GROUND WATER

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

LOCAL IDENTIFIER	DATE OF SAMPLE	PH FIELD (UNITS)	TEMPERATURE, WATER (DEG C)	HARDNESS (MG/L AS CACO3)	HARDNESS, NONCARBONATE (MG/L CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO
HAWAII, ISLAND OF MAUI										
6-4937-01 S10 PNR MILL	80-02-28	7.5	25.0	170	31	32	22	100	55	3.3
6-5339-01 W291 CNTY	80-02-28	7.3	23.0	170	38	21	28	110	58	3.7
6-5340-02 S5 PNR MILL	80-02-28	7.8	22.0	170	77	22	29	160	65	5.3
6-5641*01 LAHAINA STP OB	80-06-17	--	26.0	980	810	160	140	840	65	12
6-5641-01 S3 PNR MILL	80-02-28	7.3	22.5	450	360	49	80	440	67	9.0
HAWAII, ISLAND OF HAWAII										
8-0953-01 STATE, OKOE	80-09-18	--	--	340	290	42	56	510	75	12
8-5946-02 STATE	79-12-19	--	--	67	0	8.5	11	33	50	1.8
	80-05-09	--	27.0	66	0	8.3	11	32	49	1.7
8-6528-01 STATE, HAINA	79-11-09	--	--	100	32	17	14	93	67	1.9

LOCAL IDENTIFIER	DATE OF SAMPLE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	IRON, DISSOLVED (UG/L AS FE)	MANGANESE, DISSOLVED (UG/L AS MN)	AGENCY COLLECTING SAMPLE (CODE NUMBER)
HAWAII, ISLAND OF MAUI						
6-4937-01 S10 PNR MILL	80-02-28	2.0	1.9	<10	<1	--
6-5339-01 W291 CNTY	80-02-28	2.8	2.7	10	2	--
6-5340-02 S5 PNR MILL	80-02-28	2.5	2.3	<10	<1	--
6-5641*01 LAHAINA STP OB	80-06-17	--	.96	90	140	--
6-5641-01 S3 PNR MILL	80-02-28	4.6	4.4	20	10	--
HAWAII, ISLAND OF HAWAII						
8-0953-01 STATE, OKOE	80-09-18	--	.84	0	0	j 9999
8-5946-02 STATE	79-12-19	--	1.3	30	<1	j 9999
	80-05-09	--	1.8	<10	<3	j 9999
8-6528-01 STATE, HAINA	79-11-09	--	.85	20	<1	j 9999

< Actual value is known to be less than the value shown.
j Collected by non-USGS agency.
* Injection well.

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