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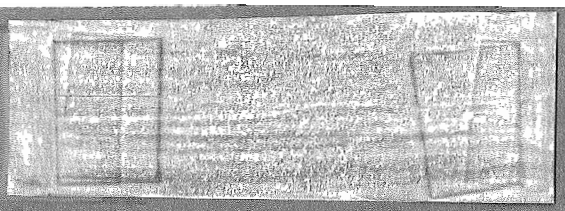
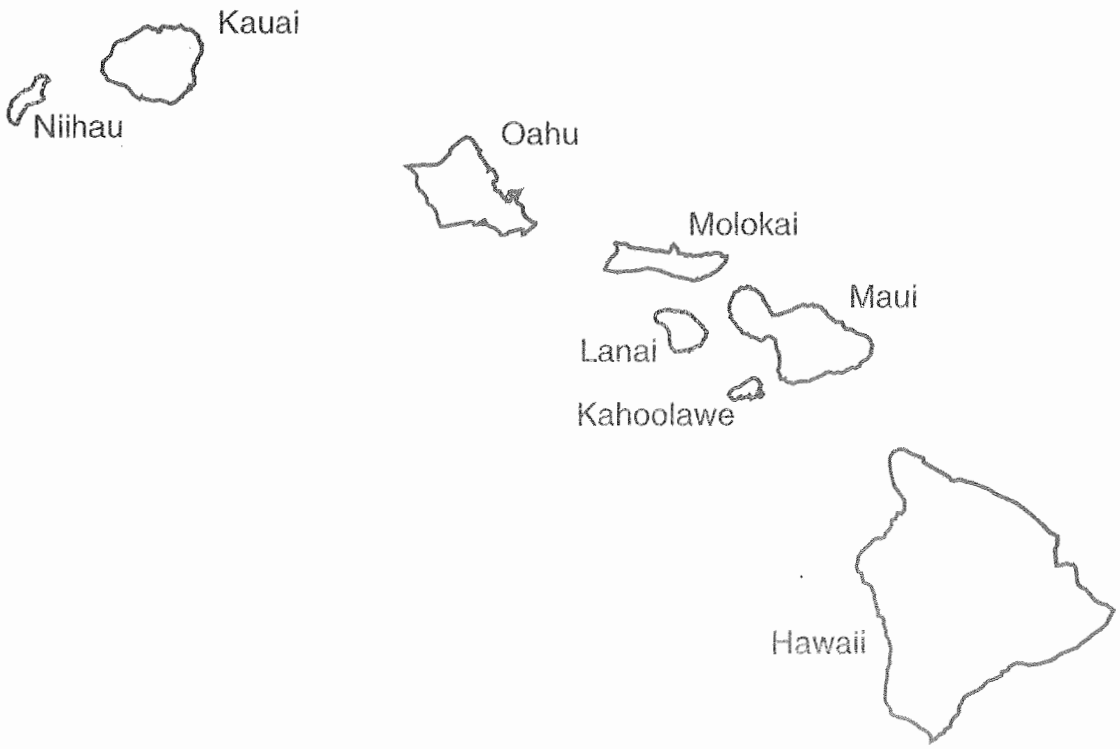


Water Resources Data Hawaii and other Pacific Areas Water Year 2000

Volume 1. Hawaii

Water-Data Report HI-00-1



U.S. Department of the Interior
U.S. Geological Survey

Prepared in cooperation with the State of Hawaii Department of Land and Natural Resources, Commission on Water Resource Management and with other agencies

CALENDAR FOR WATER YEAR 2000

1999

OCTOBER

S	M	T	W	T	F	S
					1	2
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2000

JANUARY

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JUNE

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JULY

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AUGUST

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6	7	8	9	10	11	12
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SEPTEMBER

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10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

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GALE A. NORTON, Secretary

U.S. GEOLOGICAL SURVEY

Charles G. Groat, Director

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Honolulu, Hawaii 96813

2001

PREFACE

This annual hydrologic data report of Hawaii is one of a series of annual reports that document hydrologic data gathered from the U.S. Geological Survey's surface and ground-water data collection networks in each State, Puerto Rico, American Virgin Islands, selected islands in the Caribbean, Commonwealth of the Northern Mariana Islands, Guam, American Samoa, Republic of Palau, and selected islands in the Pacific. These records of streamflow, ground-water levels, and quality of water provide the hydrologic information needed by State, local, and Federal agencies, and the private sector for developing and managing our Nation's land and water resources.

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

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Water resources data for the 2000 water year for Hawaii consist of records of stage, discharge, and water quality of streams and springs; and water levels and quality of water wells.

- Water discharge for 72 gaging stations on streams, springs, and ditches.
- Discharge data for 92 crest-stage partial-record stations.
- Water-quality data for 5 streams, 24 partial-record stations, and 103 wells.
- Water levels for 87 observation wells.
- Rainfall data for 37 rainfall stations.

These data represent that part of the National Water Data System operated by the U.S. Geological Survey and cooperating Federal, State, and other local agencies in Hawaii.

14. SUBJECT TERMS
*Hawaii, *Hydrologic data, *Surface water, *Water quality, *Ground water, Gaging stations, Flow rate, Chemical analyses, Sediment, Water temperature, Sampling sites, Water analyses, Water levels, Rainfall accumulation.

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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

NOTE.--Data for partial-record and miscellaneous sites are published in separate sections of the data report. See references at the end of this list of page numbers for these sections.

Letters after station name designate type of data: (d) discharge, (c) chemical, (m) microbiological, (t) water temperature, (w) water level or gage height

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Kawaikoi Stream (head of Waimea River) near Waimea (d)	16010000	36
Waimea River:		
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SURFACE-WATER STATIONS, IN DOWNSTREAM ORDER, FOR WHICH RECORDS ARE PUBLISHED IN THIS VOLUME

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

HAWAII

ISLAND OF KAUAI

			Page
(2-0021-01)	220057159210301	(w)	257
(2-0022-01)	220013159224001	(w)	257
(2-0023-01)	220051159231801	(w)	258
(2-0044-14)	220019159444801	(w)	259
(2-0120-01)	220136159205501	(ct)	316
(2-0120-02)	220134159205401	(w)	260
(2-0121-01)	220131159214701	(w)	261
(2-0124-01)	220133159242001	(w)	262
(2-0126-01)	220126159261501	(w)	263
(2-0320-01)	220354159205601	(ct)	316
(2-0320-03)	220354159205602	(ctw)	263, 316
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(2-0818-01)	220827159185401	(ct)	316
(2-0818-02)	220826159185401	(ct)	316
(2-0818-03)	220825159185301	(w)	263
(2-1020-03)	221038159203801	(ctw)	264, 317
(2-1125-01)	221141159252501	(ct)	317
(2-1126-01)	221150159264501	(ctw)	264, 317
(2-1229-03)	221201159293401	(ct)	317
(2-1232-01)	221247159324801	(ctw)	265, 317
(2-1333-01)	221318159335901	(ctw)	265, 317
(2-5426-03)	215434159263301	(ctw)	266, 317
(2-5427-01)	215454159274201	(ctw)	266, 318
(2-5427-02)	215455159274201	(ct)	318
(2-5530-03)	215535159302601	(ct)	318
(2-5534-03)	215522159342601	(ctw)	267, 318
(2-5534-06)	215509159340401	(w)	268
(2-5626-01)	215630159265101	(w)	269
(2-5634-01)	215607159344301	(w)	270
(2-5824-02)	215856159243201	(w)	271
(2-5840-01)	215803159401201	(ctw)	272, 318
(2-5843-01)	215857159430101	(ctw)	272, 318
(2-5921-01)	215958159214301	(ctw)	273, 319
(2-5923-07)	215901159235201	(ctw)	273, 319
(2-5923-08)	215950159231601	(w)	274
(2-5939-01)	215906159395601	(ctw)	275, 319

ISLAND OF OAHU

(3-1646-01)	211646157465201	(ct)	320
(3-1646-02)	211646157465202	(w)	277
(3-1851-19A)	211832157515501	(ctw)	277, 320
(3-1851-19B)	211832157515502	(ctw)	278, 320
(3-1851-22)	211828157515801	(w)	278
(3-1959-05)	211907157594701	(w)	279
(3-2006-12)	212038158061501	(w)	280
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(3-2101-03)	212154158015201	(w)	281
(3-2103-01)	212132158035701	(w)	281
(3-2103-03)	212133158035501	(ctw)	282, 320
(3-2153-02)	212106157533701	(ctw)	282, 320

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			Page
(3-2153-08)	212117157534601	(w)	283
(3-2256-10)	212238157561101	(w)	284
(3-2256-12)	212238157561102	(ctw)	285, 320
(3-2300-11)	212343158001001	(ct)	321
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(3-2301-09,10)	212358158010901	(ct)	321
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(3-2448-01)	212422157485601	(ct)	322
(3-2550-01)	212556157500301	(ct)	322
(3-2558-10)	212506157582301	(ct)	322
(3-2603-01)	212617158033801	(ct)	322
(3-2607-01)	212656158071801	(ct)	322
(3-2659-01)	212614157594301	(w)	286
(3-2800-01)	212803158000701	(ct)	322
(3-2808-01)	212813158080201	(w)	287
(3-2809-06)	212828158092001	(ct)	323
(3-2812-01)	212859158124301	(ct)	323
(3-2901-07)	212927158014801	(ctw)	288, 323
(3-2901-09)	212945158014301	(ct)	323
(3-3213-06)	213224158135901	(ctw)	289, 323
(3-3352-01)	213327157524401	(ctw)	289, 323
(3-3405-01)	213429158055501	(ct)	324
(3-3405-02)	213427158055501	(ct)	324
(3-3407-25)	213411158074501	(ct)	324
(3-3409-16)	213438158091101	(w)	290
(3-3410-08)	213446158104901	(ctw)	290, 324
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The following continuous record streamflow or stage-only stations in Hawaii have been discontinued or converted to partial-record stations. Daily records were collected and are stored in NWIS for the period of record shown for each station.

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF KAUAI			
16011000	Waikoali Str nr Waimea	1.58	1909-13, 1919-25
16012000	Kauaikinana Str nr Waimea	0.84	1919-25
16013000	Mohihi Str at alt 3,420 ft nr Waimea	1.68	1920-26, 1936-71
16014000	Kokee Ditch nr Waimea	--	1926-82
16015000	Mohihi Str nr Waimea	2.20	1909-17
16016000	Waimea River at alt 840 ft nr Waimea	20.0	1916-18, 1925-68
16017000	Koaie Str at alt 3,770 ft nr Waimea	1.68	1919-32, 1954-68
16018000	Koaie Str nr Waimea	9.97	1916-18
16020000	Waialae Str nr Waimea	2.81	1910-16
16021000	Waialae Str at alt 800 ft nr Waimea	7.87	1917-21
16022000	Kekaha Ditch at Camp 1 nr Waimea	--	1908-68
16024000	Kekaha Ditch at siphon nr Waimea	--	1910-12
16025000	Kekaha Ditch at flume 2 nr Waimea	--	1910-12
16027000	Kekaha Ditch below tunnel 12 nr Waimea	--	1908-34
16028000	Waimea River below Kekaha Ditch intake near Waimea	44.2	1921-55
16029000	Waimea Ditch nr Waimea	--	1912-14 1916-21
16029100	Waimea Ditch below wasteway nr Waimea	--	1960-72
16031000	Waimea River nr Waimea	57.8	1910-18, 1919, 1943-68, 1969-72, 1975-96
16033000	Olokele Ditch at weir nr Makaweli	--	1912-17
16034000	Olokele River nr Waimea	4.85	1915-16
16035000	Halekua Str nr Waimea	0.56	1912-14
16037000	Poowaiomahaihai Ditch nr Waimea	--	1911-13
16037100	Makaweli R bl Poowaiomahaihai Ditch nr Waimea	25.0	1911-17
16039000	Hiloa Ditch nr Eleele	--	1911-15
16042000	Hanapepe Ditch at Hanapepe Falls nr Eleele	--	1911-15
16043000	Hanapepe Ditch below intake	--	1930-38
16044000	Hanapepe Ditch at Koula nr Eleele	--	1910-21, 1927-49
16045000	Hanapepe Ditch below makai siphon nr Eleele	--	1929-32
16046000	Hanapepe Ditch at weir nr Hanapepe	--	1912-13, 1915-17
16047000	Koula River at Koula nr Eleele	12.6	1910-16
16048000	Manuahi Str at Koula nr Eleele	5.44	1917-20
16050000	G Ditch at makai siphon nr Eleele	--	1929-32
16051000	Hanapepe River at makai siphon nr Eleele	20.5	1929-32
16053000	Kamoolao Str nr Koloa	1.30	1939-41
16053400	Upper Haiku Ditch nr Puhi	--	1963-71
16053600	Lower Haiku Ditch nr Puhi	--	1963-71
16053800	Kamooloa Str nr Puhi	5.79	1963-70
16054000	Kuia Str nr Puhi	0.40	1939-41
16054200	Koloa Ditch nr Koloa	--	1964-71
16054400	Koloa tunnel nr Koloa	--	1966-71
16054500	Kuia Str nr Puhi	5.09	1963-66
16056000	Hanamaulu Str at Kapaia nr Lihue	6.41	1911-13
16056800	Waiahi-Kuia aqueduct nr Puhi	--	1964-71
16057000	Lihue Ditch nr Lihue	--	1910-19
16058000	Hanamaulu Ditch nr Lihue	--	1910-20
16058500	S F Wailua River nr rock quarry nr Lihue	20.2	1974-83
16061000	North Wailua Ditch nr Lihue	--	1932-85
16063000	N F Wailua River at alt. 650 ft nr Lihue	5.29	1914-85
16064000	Kanaha Ditch nr Lihue	--	1910-55
16068700	North Fork Wailua River nr Lihue	14.6	1910-14
16070000	Aahoaka Ditch nr Kapaa	--	1966-72
16072000	Konohiki Str at Makakualele mka weir nr Kapaa	0.65	1911-13

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF KAUAI--Continued			
16073000	Konohiki Str at Makakualele mki weir nr Kapaa	0.89	1912
16074000	N F Kaehulua Str at Kainahola weir nr Kapaa	1.39	1911-13
16075000	S F Kaehulua Str at Wainamuamu weir nr Kapaa	0.04	1911-13
16076000	Kaehulua Str at Kuhinoa weir nr Kapaa	1.90	1911-13
16077000	Makaleha ditch near Kealia	--	1936-98
16078000	Kapaa Str nr Kealia	3.05	1910-20
16079200	Tunnel Ditch at Kapahi nr Kapaa	--	1909-11
16079400	Pipe Ditch at Kapahi nr Kapaa	--	1909-11
16079600	Kapaa Ditch at Kapahi nr Kapaa	--	1909-11
16082000	Kaneha Ditch nr Kealia	--	1909-13
16086000	Anahola Ditch above wasteway nr Kealia	--	1915-21
16087000	Anahola Ditch wasteway nr Kealia	--	1936-85
16089000	Anahola Str nr Kealia	4.27	1910, 1913-85
16090000	Lower Anahola Ditch at Kiokala nr Kealia	--	1909-14
16091000	Lower Anahola Ditch nr Kealia	--	1937-83, 1985-95
16092000	Lower Anahola Ditch at makai weir nr Kealia	--	1909-10
16093000	Anahola Str at Kiokala Dam nr Kealia	4.27	1910-12
16093200	Anahola Str at Anahola	9.24	1962-65
16094200	Ka Loko Ditch nr Kilauea	--	1932-68
16095000	Puu Ka Ele Ditch nr Kilauea	--	1932-67
16095200	Ross Ditch nr Kilauea	--	1955-67
16095900	Kalihiwai Ditch above wasteway nr Kilauea	--	1960-68
16096000	Kalihiwai Ditch nr Kilauea	--	1934-67
16097000	Pohakuhonu Str nr Kilauea	1.73	1957-72
16097300	Halaulani Str nr Kilauea	0.12	1922-25
16098000	Kalihiwai River nr Hanalei	3.64	1914-23
16099000	Kalihiwai River nr Kilauea	4.12	1912-13
16099500	Hanalei Ditch nr Kilauea	--	1956-62
16100000	Hanalei tunnel outlet nr Lihue	--	1932-85
16101000	Hanalei River at alt. 625 ft. nr Hanalei	7.17	1914-55
16102000	China Ditch nr Hanalei	--	1911-19
16104000	Kuna Ditch nr Hanalei	--	1912-14, 1917-20
16105000	Waioli Str nr Hanalei	1.81	1914-32
16106000	Lumahai River nr Hanalei	6.95	1914-33
16109000	Wainiha River above intake nr Hanalei	11.6	1914-16
16110000	Wainiha Canal at intake nr Wainiha	--	1910-16
16111000	Wainiha Canal at tunnel 18 nr Wainiha	--	1911
16113000	Wainiha River nr Wainiha	20.6	1912-16
16115000	Hanakapiai Str nr Hanalei	2.73	1931-52
16116000	Hanakoa Str nr Hanalei	0.50	1931-52
16117000	Kalalau Str nr Hanalei	1.55	1931-55
ISLAND OF OAHU			
16201000	RB of NF Kaukonahua Str nr Wahiawa	1.17	1913-53
16203000	Mauka Ditch nr Wahiawa	--	1947-68
16204000	North Fork Kaukonahua Str nr Wahiawa	4.86	1946-68
16206000	South Fork Kaukonahua Str nr Wahiawa	1.93	1913-14, 1915-16,1944-50
16206500	Koolau Ditch at reservoir nr Wahiawa	4.00	1914-15
16207000	SF Kaukonahua Str bl U.S. Army res nr Wahiawa	0.86	1914-17
16208500	RB of South Fork Kaukonahua Str nr Wahiawa	5.26	1957-72
16209000	SF Kaukonahua Str ab Wahiawa res nr Wahiawa	--	1946-58
16210900	Poamoho Tunnel nr Wahiawa	1.79	1958-79
16211000	Poamoho Str nr Wahiawa	--	1947-73
16211850	Puea Mauka Ditch nr Waianae	4.39	1960-67
16211900	Kaupuni Str nr Waianae	0.60	1957-60
16212000	Puhawai Str at Lualualei nr Waianae	1.16	1930-44
16212400	Awanui Gulch nr Barbers Point NAS	13.80	1957-58
16212900	Kipapa Str nr Waipahu	--	1966-68
16217000	Pearl Harbor Spr at Puukapu nr Pearl City	--	1931-35

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF OAHU--Continued			
16218000	Pearl Harbor Springs at Loko Kukona	--	1931-35, 1936-45
16218500	Pearl Harbor Spr at Kaluaoopu nr Pearl City	--	1931-37
16219000	Hawn Elec. Co. tunnel at Waiau nr Pearl City	--	1939-42
16220000	Hawn Elec. Co. wasteway at Waiau nr Pearl City	--	1953-59
16222000	Pearl Harbor Springs at Waiau	--	1913-39, 1942-47
16224000	Pearl Harbor Springs at Kalauoa	--	1931-62, 1964-65, 1966-68, 1970-88
16224500	Kalauao Str at Moanalua Road at Aiea	2.59	1957-82
16225000	Kalauao Str at Aiea	2.61	1953-57
16225800	North Halawa Stream near Kaneohe	1.64	1991-99
16227500	Moanalua Str nr Kaneohe	0.94	1968-78
16227700	Moanalua Str tributary nr Kaneohe	0.62	1968-78
16227900	Moanalua Str tributary nr Aiea	0.03	1972-78
16228900	Kalihi Str nr Kaneohe	0.60	1966-71
16230000	Lulumahu Dit at upper Nuuanu Res nr Honolulu	--	1911-13
16231000	Luakaha weir in upper Nuuanu Valley nr Hon	--	1910-13
16231500	Moole Ditch mauka station nr Honolulu	--	1917-20
16231700	Moole Ditch makai station nr Honolulu	--	1918-23
16232000	Nuuanu Stream below res 2 wasteway, nr Honolulu	3.35	1913-96
16235000	Nuuanu Str at Kuakini Street nr Honolulu	4.39	1911-12
16236000	Kahuawai Spring nr Honolulu	--	1912-14
16237000	Pauoa Str at upper Pauoa Valley nr Honolulu	0.79	1911-13
16238500	Waihi Str at Honolulu	1.14	1913-21, 1925-83
16239500	East Manoa Ditch nr Honolulu	--	1915-16, 1918-20, 1926-39
16241000	Manoa Str at upper Manoa Valley nr Honolulu	2.62	1910-13
16242000	Manoa Str at College of Hawaii nr Honolulu	4.99	1909-10, 1912-18
16243000	Manoa Str at Waialae Road nr Honolulu	5.38	1910-12
16244000	Pukele Str nr Honolulu	1.18	1926-82
16245000	Waiomao Str at upper Palolo Valley nr Hon	0.35	1911-13
16246000	Waiomao Str nr Honolulu	1.04	1911, 1912, 1926-71
16247000	Palolo Str nr Honolulu	3.63	1952-79
16248900	Waimanalo Ditch below main res nr Waimanalo	--	1912-13
16249000	Waimanalo Str at Waimanalo	2.16	1967-70
16249200	Maunawili Str nr Waimanalo	1.28	1912-16
16249400	Main Spring nr Kailua	--	1914-16
16249600	Makawao Spring nr Kailua	--	1914-16
16249800	Makawao Ditch nr Kailua	--	1912-15
16250000	Maunawili Ditch nr Waimanalo	--	1954-68
16256000	Kamakalepo Str nr Kailua	0.82	1912, 1913-16
16257000	Pohakea Str nr Kailua	0.21	1912-14
16258000	Maunawili Str ab Wong Leongs Ditch nr Kailua	4.60	1922-23
16260000	Maunawili Str nr Kailua	4.60	1912, 1913-16
16260500	Maunawili Str at highway 61 nr Kailua	5.34	1922, 1956-67, 1971-96
16261000	North Branch Kahanaiki Str nr Kailua	0.34	1913-14
16262000	South Branch Kahanaiki Str nr Kailua	0.21	1913-14
16263000	Kahanaiki Str nr Kailua	0.58	1912, 1914-16
16264400	Kawainui Swamp drain canal at Kailua Rd at Kailua	--	1961-65
16264500	Kawainui Swamp canal at Wanaao Rd at Kailua	--	1961-64
16265600	Right Branch Kamooalii Stream	1.11	1983-97
16266000	Kamooalii Str nr Kaneohe	1.48	1914-16
16267000	Hooleinaiwa Str nr Kaneohe	0.61	1914-16
16268000	Piho Str nr Kaneohe	0.43	1914-16
16269000	Kuou Ditch nr Kaneohe	--	1914-16
16270000	Kuou Str nr Kaneohe	0.37	1914-16
16270500	Kamooalii Str below Kuou Str nr Kaneohe	3.21	1967-70, 1971,1972-76
16270900	Luluku Str at alt. 220 ft nr Kaneohe	0.44	1960-63, 1965-98
16271000	North Luluku Ditch nr Kaneohe	--	1914-16
16272000	Luluku Str nr Kaneohe	0.46	1914-16
16273000	Young Mau Ditch nr Kaneohe	--	1914-16

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF OAHU--Continued			
16273900	Kamooalii Str at Kaneohe	4.38	1959-63, 1965-80
16273950	SF Kapunahala Str at Kaneohe	0.40	1983-98
16274000	Ahlo Ditch nr Kaneohe	--	1914-16
16276000	Reservoir Ditch nr Heeia	--	1914-16
16277000	Waipio Ditch nr Heeia	--	1914-16
16278000	Iolekaa Str mauka nr Heeia	0.29	1940-70
16279000	Iolekaa Str nr Heeia	0.52	1914-16
16280000	Wing Wo Tai Ditch nr Heeia	--	1914-16
16281000	Hop Tuck Ditch nr Heeia	--	1914-16
16282000	Lee Ditch nr Heeia	--	1914-16
16283000	Kahaluu Str nr Heeia	0.28	1935-71
16283600	South Fork Waihee Stream near Heeia	0.03	1962-96
16283700	North Fork Waihee Stream near Heeia	0.03	1962-96
16283800	Waihee Str at alt. 260 ft nr Heeia	0.31	1961-66
16284000	Waihee Str nr Heeia	0.93	1935-82
16284500	Waihee Str at Kahaluu	2.26	1966-71
16285000	Waiahole tunnel at Waianu nr Waiahole	--	1950-69
16286000	Waiahole tunl wasteway at intk 31 nr Waiahole	--	1951-69
16287000	Waiahole tunnel at north portal nr Waiahole	--	1951-69
16287200	Waiahole tunnel at adit 8 nr Waipahu	--	1956-69
16288000	Halona Str nr Waikane	0.08	1911
16289000	Waihi Str nr Waikane	0.11	1911
16290000	Waiahole Str below powerhouse nr Waiahole	0.46	1915
16291000	Waiahole Str at alt. 250 ft. nr Waiahole	0.99	1955-68
16292000	Waiahole Str nr Waiahole	1.22	1911-16
16293000	Waianu Str nr Waikane	1.28	1911
16294000	Waiahole Str at Waiahole nr Waikane	3.60	1911-12
16295000	Waikane Str nr Waikane	2.35	1912
16296000	Kahana Str nr Kahana	3.20	1914-17
16297000	Kawa Str nr Kahana	2.09	1914-17
16299000	Punaluu Str at alt. 539 ft. nr Punaluu	0.98	1915-18
16300000	Waihoi Str nr Punaluu	0.50	1915-17
16301000	Punaluu Str at alt. 250 ft. nr Punaluu	2.78	1914-18
16304000	Kaluanui Str nr Hauula	0.50	1915-17
16305000	Kaipapau Str nr Hauula	0.21	1906-07
16306000	Koloa Gulch nr Laie	0.90	1914-18
16307000	Wailele Gulch nr Laie	0.50	1914-15, 1916-18
16308000	East Branch Kahawainui Str nr Laie	0.53	1914-18
16308990	Malaekahana Str nr Laie	0.64	1963-71
16309000	Malaekahana Str nr Kahuku	1.66	1914-18
16310000	Middle Branch Malaekahana Str nr Kahuku	0.69	1914-18
16329000	Kaiwikoele Str tributary nr Maunawai	0.97	1967-71
16340500	Anahulu River tributary nr Haleiwa	0.83	1967-71
16343000	Helemano Str at Haleiwa	14.20	1967-82
ISLAND OF MOLOKAI			
16401000	Papalaua Str nr Pukoo	2.00	1919-29
16402000	Pulena Str nr Wailau	4.38	1919-28, 1937-57
16403000	Waiakeakua Str nr Wailau	1.41	1919-29, 1937-57
16403900	Kawainui Stream near Pelekunu	1.17	1968-79, 1980-96
16404000	Pelekunu Str nr Pelekunu	2.59	1919-29, 1937-47,1948-57, 1971-82
16404200	Pilipililau Str nr Pelekunu	0.49	1968-97
16405000	Lanipuni Str nr Pelekunu	1.09	1919-29, 1937-57
16406000	Waikolu Str at alt. 650 ft nr Kalaupapa	2.99	1920-23
16408000	Waikolu Str bl pipeline crossing nr Kalaupapa	3.68	1919-32, 1937-96
16409000	Waihanau Str nr Kalaupapa	1.18	1930-32
16410000	Keolewa Str nr Kalae	0.18	1940-44
16411000	Waialala Spring nr Kalae	--	1940-60
16412000	Mokomoko Gulch nr Kalae	0.23	1940-45

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MOLOKAI--Continued			
16411300	Kakaako Gulch at Hwy 46 nr Mauna Loa	0.18	1964-85
16415000	EF Kawela Gulch	0.45	1946-71
ISLAND OF MAUI			
16416000	Punaula Gulch nr Pukoo	0.24	1947-72
16501000	Palikea Str bl diversion dam nr Kipahulu	6.29	1927-29, 1931-35,1935-38, 1939-83
16501200	Oheo Gulch at dam nr Kipahulu	8.06	1988-97
16502000	Hahalawe Gulch nr Kipahulu	0.43	1927-37, 1938-69
16503000	Kaeluku flume nr Kaeleku	--	1940-45
16504000	Hana flume nr Hana	--	1940-45
16506000	Makapipi Ditch nr Nahiku	--	1948-66
16506500	West Makapipi Spring nr Nahiku	--	1932-45
16507000	Makapipi Str nr Nahiku	1.93	1932-45
16509000	Hanawi Str below government road, nr Nahiku	5.03	1932-47, 1992-95
16510000	Kapaula Gulch nr Nahiku	0.69	1921-63
16511000	Kapaula Gulch below government road nr Nahiku	0.93	1932-47
16512000	Koolau Ditch at Nahiku weir nr Nahiku	--	1919-85
16513000	Waiaaka Str nr Nahiku	0.10	1932-47
16514000	Paakea Gulch nr Nahiku	0.34	1932-47
16515000	Waiohue Gulch nr Nahiku	0.32	1921-63
16516000	Kopiliula Str nr Keanae	4.31	1914-17, 1921-58
16517000	East Wailuaiki Str nr Keanae	3.11	1913-17, 1922-58
16519000	West Wailuanui Str nr Keanae	1.93	1913-17, 1922-58
16520000	East Wailuanui Str nr Keanae	0.51	1914-17, 1921-58
16521000	Wailuanui Str nr Keanae	2.51	1932-36, 1938-47
16522000	Taro patch feeder ditch at Keanae	--	1934-68
16523000	Koolau Ditch nr Keanae	--	1910-12, 1917-85
16524000	Honomanu Str at Haiku-uka boundry nr Kaili	2.54	1919-27, 1932-34,1962-68
16525000	Sevth Br Honomanu Str at Haiku-uka nr Kailiili	0.30	1932-33
16526000	Fourth Br Honomanu Str at Haiku-uka nr Kailiili	0.10	1932-33
16527000	Honomanu Str nr Keanae	3.17	1913-64
16528000	Spreckels Ditch at station 1 nr Huelo	--	1910-13
16529000	Spreckels Ditch at station 2 nr Kuelo	--	1911-13
16530000	Spreckels Ditch at station 3 nr Kuelo	--	1910-13
16531000	Kula diversion from Haipuaena Str nr Olinda	--	1945-85
16531100	Haipuaena Str at Kula pipeline intake nr Olinda	0.27	1946-68
16532000	Haipuaena Str at Haiku-uka bdy nr Kailiili	0.63	1919-26, 1932-34
16533000	Third Br Haipuaena Str at Haiku-uka nr Kailiili	0.06	1932-33
16534000	First Br Haipuaena Str at Haiku-uka nr Kailiili	0.05	1932-33
16535000	Haipuaena div ditch at Kolea Gulch nr Keanae	--	1938-60
16536000	Haipuaena Str above Spreckels Ditch nr Huelo	1.16	1913-67
16537000	Haipuaena Str nr Huelo	1.10	1910-13
16538000	Spreckels Ditch at Haipuaena weir nr Huelo	--	1922-85
16539000	Spreckels Ditch at station 4 nr Huelo	--	1910-13
16541000	Koolau Ditch at Haipuaena nr Huelo	--	1932-87
16541500	Manuel Luis Ditch at Puohokamoa Gulch nr Huelo	--	1917-24
16542000	E Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.14	1919-27, 1932-33
16543000	M Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.48	1919-27, 1932-34,1962-69
16544000	W Br Puohokamoa Str at Haiku-uka bdry nr Kailiili	0.45	1919-28, 1932-34
16545000	Puohokamoa Str above Spreckels Ditch nr Huelo	2.35	1913-71
16546000	Puohokamoa Str nr Huelo	2.60	1910-13
16547000	Puohokamoa intake of Koolau Ditch nr Huelo	--	1922-30
16551000	Koolau Ditch at Wahinepee nr Huelo	--	1922-29
16552000	Spreckels Ditch at Wahinepee nr Huelo	--	1929-30, 1931-38
16552200	Spreckels Ditch at station 5 nr Huelo	--	1911-13
16552500	Manuel Luis Ditch W of Puohokamoa Str nr Huelo	--	1930-35
16552600	Waikamoi Str at Puuluau nr Olinda	2.10	1949-66
16552800	Waikamoi Str ab res at Kula pl intake nr Olinda	2.50	1953-68
16553000	Waikamoi Str bl res at Kula pl intake nr Olinda	2.52	1945-49

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI--Continued			
16554000	Waikamoi Str at Haiku-uka boundary nr Kailiili	3.46	1918,19-28, 1932-34
16554500	E Br Waikamoi Str at Haiku-uka bdry nr Kailiili	0.07	1918-28, 1932-33
16555000	Waikamoi Str above Wailoa Ditch nr Huelo	3.93	1922-57
16556000	Waikamoi Str nr Huelo	3.98	1910-22
16557000	Alo Str nr Huelo	0.47	1910-57
16558000	Koolau Ditch at Alo diversion weir nr Huelo	--	1908-11
16560000	Spreckels Ditch at station 6 nr Huelo	--	1911-13
16561000	Center Ditch below Kolea reservoir nr Huelo	--	1918, 1919, 1920-24,1925-30
16562000	Center Ditch nr Huelo	--	1910-12
16565000	Kaaiea Gulch nr Huelo	0.58	1921-62
16565500	Spreckels Ditch below Kaaiea Gulch nr Huelo	--	1917-30
16566000	Oopuola Str nr Huelo	0.20	1930-57
16567000	Oopuola Str ab Spreckels Dt crossing nr Huelo	0.58	1910-15
16567500	Spreckels Ditch at station 7 nr Huelo	--	1911-12
16568000	Spreckels Ditch at station 8 nr Huelo	--	1911-13
16569000	Second Branch Nailiilihaele Str at Haiku-uka	0.20	1932-33
16570000	Nailiihaele Str nr Huelo	3.49	1910-11, 1913-18,1919-24, 1925-75
16571000	Nailiilihaele Str bl new Hamakua Dt nr Huelo	3.60	1912
16572000	New Hamakua Ditch at Nailiilihaele weir nr Huelo	--	1910-12
16573000	New Hamakua Ditch at station 1 nr Kailiili	--	1912-13
16574000	Kailua Str at Haiku-uka boundary nr Kailiili	0.80	1918-28, 1932-34
16574500	Kailua Str nr Kailiili	1.10	1963-71
16575000	Tenth Br Kailua Str at Haiku-uka nr Kailiili	0.10	1932-33
16576000	Ninth Br Kailua Str at Haiku-uka nr Kailiili	0.20	1932-33
16577000	Kailua Str nr Huelo	2.41	1910-11, 1912-18,1919-58
16578000	New Hamakua Ditch at station 2 nr Huelo	--	1912-13
16579000	New Hamakua Ditch at station 3 nr Huelo	--	1912-13
16579500	New Hamakua Ditch at station 4 nr Huelo	--	1912-13
16580000	Oanui Str nr Huelo	0.90	1910-11, 1913-16
16582000	New Hamakua Ditch at station 5 nr Huelo	--	1912-13
16583000	Old Hamakua Ditch at Kailua nr Huelo	--	1919-22
16584000	Kailua Str nr Huelo	3.69	1912-13
16585000	Hoolawanui Str nr Huelo	1.34	1910-71
16586000	Hoolawaliilii Str nr Huelo	0.55	1911-57
16588000	Wailoa Ditch at Honopou nr Huelo	--	1922-87
16589000	New Hamakua Ditch at Honopou nr Huelo	--	1918-85
16590000	Old Hamakua Ditch at Honopou nr Huelo	--	1918-22, 1936-65
16591000	Honopou Str at Lowrie Ditch siphon nr Huelo	2.00	1932-47
16592000	Lowrie Ditch at Honopou Gulch nr Huelo	--	1910-27
16593000	Honopou Str above Haiku Ditch nr Huelo	2.20	1930-85
16594000	Haiku Ditch at Honopou Gulch nr Kailua	--	1910-28, 1930-85
16595000	Honopou Str below Haiku Ditch nr Huelo	2.30	1932-47
16596000	New Hamakua Ditch at Halehaku weir nr Huelo	--	1910-14, 1915-23
16596200	Halehaku Gulch nr Kailiili	0.13	1965-71
16597000	Halehaku Gulch weir at New Hamakua Dt nr Huelo	--	1910-12
16598000	Halehaku Gulch nr Huelo	1.40	1910-12
16599000	E Br Opana Gulch at Haiku-uka bdry nr Kailiili	0.60	1932-33
16600000	Opana Ditch nr Huelo	--	1910-12
16601000	Opana Str nr Huelo	3.30	1910-12
16602000	Kauhikoa Ditch at Opana weir nr Huelo	--	1910-13, 1913-15, 1916-28
16602400	Awalau Gulch nr Kailiili	0.23	1965-71
16603000	Kaluanui Ditch at Puuomalei nr Hamakuapoko	--	1910-12
16604000	Iao Str nr Wailuku	--	1910-15
16605000	Maniania Ditch nr Wailuku	--	1910-13
16608000	North Waiehu Str nr Wailuku	0.90	1912-15
16609000	North Waiehu Ditch nr Wailuku	--	1910-11, 1916-17
16609500	North Waiehu Str bl N Waiehu Ditch nr Wailuku	0.90	1910-11
16610000	South Waiehu Str nr Wailuku	0.70	1910-17

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF MAUI--Continued			
16611000	South Waiehu Ditch nr Wailuku	--	1913
16612000	Waihee River nr Waihee	3.90	1913-17
16613000	Waihee Canal nr Waihee	--	1910-12
16613500	Waihee Canal at Waiale weir nr Wailulu	--	1911-12
16615000	Spreckels Ditch nr Waihee	--	1910-13
16616000	Spreckels Ditch at Waiale weir nr Wailuku	--	1910-11
16617000	Left Branch Makamakaole Str nr Waihee	0.40	1939-52
16617700	Kahakuloa Str at alt. 1,380 ft. nr Honokohau	1.50	1913-14
16619000	Kahakuloa Str at Kahaluloa nr Waihee	4.00	1912-13
16621000	Honokohau Ditch intake nr Honokohau	--	1907-13
16622000	Honokohau Ditch above Honolua Str nr Honolohau	--	1910-11
16623000	Honolua Str nr Honokohau	2.90	1913-17
16624000	Honokohau Ditch at Honokowai weir nr Lahaina	--	1910-12
16625000	Honolua Ditch nr Honokohau	--	1911-12
16626000	Honolua Str at Honolua Ranch nr Honokahau	3.96	1911
16627000	Kapaloa Str at weir 1 nr Lahaina	1.00	1901
16628000	Kapaloa Str nr Lahaina	1.00	1911-12
16629000	Honokowai Ditch nr Lahaina	--	1912-17, 1918-67
16630000	Honokowai Str nr Lahaina	1.10	1913-17
16633000	Kahoma development tunnel nr Lahaina	--	1911-17
16634000	Kahoma Str nr Lahaina	1.19	1911-12, 1913-17
16635000	Lahainaluna Str at weir 1 nr Lahaina	0.54	1901
16635500	Lahainaluna Str at weir 2 nr Lahaina	0.19	1901
16636000	Kahana Str above pipeline intake nr Lahaina	1.51	1916-25, 1926-32
16637000	Lahainaluna Ditch nr Lahaina	--	1913-14
16638000	Kahana Str nr Lahaina	1.83	1911-16
16638500	Kahoma Str at Lahaina	5.22	1962-89
16639000	North Fork Kauaula Str nr Lahaina	0.52	1901
16640000	South Fork Kauaula Str nr Lahaina	0.18	1901
16641000	Kauaula Str nr Lahaina	1.84	1912, 1914-17
16643000	Kauaula Ditch nr Lahaina	--	1911-17
16644000	Launiupoko Str nr Lahaina	1.13	1911-18
16645000	Olowalu Ditch nr Olowalu	--	1911-16, 1916-20, 1920-58, 1958-67
16646000	Olowalu Str nr Olowalu	4.00	1913-16
16647000	Ukumehame Gulch nr Olowalu	3.75	1911-12, 1913-19
16647100	Ukumehame Gulch at mouth nr Olowalu	4.03	1964-71
16648000	South side Waikapu Ditch nr Waikapu	--	1910-17
16649000	Palolo Ditch nr Waikapu	--	1910-17
16650000	Waikapu Str nr Waikapu	2.76	1910-17
ISLAND OF HAWAII			
16700000	Waiakea Stream nr Mountain View	17.4	1930-95
16700950	Lyman Springs no. 2 nr Piihonua	--	1981-95
16701000	Olaa Flume at Kaumana nr Hilo	--	1917-20
16701200	Waiakea Str nr Hilo	33.60	1957-67
16701700	Wailuku River nr Pua Akala	10.20	1964-65
16701750	Wailuku River nr Humuula	34.80	1965-82
16701800	Wailuku River nr Kaumana	43.40	1966-82
16703000	Wailuku River at Pukamaui nr Hilo	97.20	1923-28, 1929-40
16705000	Hilo Boarding School Ditch at intake nr Hilo	--	1931-40
16706000	Hilo Boarding School Ditch nr Hilo	--	1918-19
16707000	Kapehu Ditch diversion nr Hilo	--	1954-62
16708000	Kapehu Ditch nr Hilo	--	1938-41, 1942-48, 1948-51, 1951-62
16709000	Kapehu Str at Piihonua nr Hilo	4.84	1928-37
16710000	Wailuku River nr Hilo	150.00	1911-13, 1918-19
16713000	Wailuku River at Hilo	256	1977-79, 1980-95
16716000	Honolii Str nr Hilo	8.00	1924-32
16717500	Kawainui Str nr Pepeekeo	9.20	1912
16717820	Manowaiopae Str nr Laupahoehoe	1.04	1965-71

DISCONTINUED SURFACE-WATER OR STAGE-ONLY STATIONS--Continued

Station number	Station name	Drainage area (mi^2)	Period of record
ISLAND OF HAWAII--Continued			
16718000	Upper Hamakua Ditch at Puualala nr Kukuihaele	--	1913-20
16720300	Kawaiki Stream near Kamuela	0.45	1968-99
16721000	Kawainui Str at alt. 2,120 ft nr Waipio	3.48	1901-02
16721500	Br 3 Kawainui Str at alt. 1,700 ft nr Waipio	3.90	1901-02
16722000	Kawainui Str at alt. 1,435 ft nr Waipio	4.43	1901-02
16722300	Br 3 Kawainui Str at alt. 1,405 ft nr Waipio	0.47	1901-02
16722600	Br 1 Kawainui Str at alt. 1,380 ft nr Waipio	5.19	1901-02
16723000	Kawainui Str nr Waipio	5.55	1901-02
16724000	Kawainui Str at alt. 775 ft nr Waipio	6.00	1901-02
16728000	Alakahi Str at alt. 1,200 ft nr Waipio	1.49	1901-02
16729000	Alakahi Str at alt. 730 ft. nr Waipio	3.14	1901-02
16730000	Koiawe Str at alt. 1,120 ft. nr Waipio	1.65	1901-02
16731000	Koiawe Str at alt. 610 ft. nr Waipio	2.23	1901-02
16732000	Waipio Str below Koiawe Str nr Waipio	11.70	1901-02
16732100	Waima Str at alt. 790 ft. nr Waipio	0.51	1901-02
16732150	Waima Str at alt. 385 ft nr Waipio	0.77	1901-02
16732200	Wailoa Str nr Waipio	14.30	1901-02, 1911-12, 1964-69
16732300	Upper Hamakua Ditch at Puualala and Res No. 3	--	1913-20
16732600	Lower Hamakua Ditch at Waima flume nr Kukuihaele	--	1910-13
16732900	Lower Hamakua Ditch at main weir nr Kukuihaele	--	1910-20
16733000	Lower Hamakua Ditch wasteway nr Kukuihaele	--	1964-73
16733100	Lower Hamakua Ditch bl main weir nr Kukuihaele	--	1964-73
16733200	Honokaa diversion at Honokaa	--	1964-73
16733300	Lower Hamakua Ditch bl Honokaa div at Honokaa	--	1964-73
16737000	Waiilikahi Str nr Waimanu	0.76	1939-60
16738000	Kaimu Str nr Waimanu	0.90	1939-47, 1950-52
16739000	Punalulu Str nr Waimanu	0.66	1939-52
16740000	Waiaalala Str nr Waimanu	0.12	1939-52
16741000	Paopao Str nr Waimanu	0.32	1939-52
16742000	Kukui Str nr Waimanu	0.22	1939-52, 1959-66
16743000	Awini Ditch at E Honokane iki Gulch nr Niulii	--	1927-38, 1938-49, 1950-72
16744000	E Honokane iki intake to Awini Ditch nr Niulii	--	1927-36, 1937-38, 1939-40, 1940-49, 1951-72
16745000	Awini Ditch above Honokane Gulch nr Kohala	--	1918
16745500	Awini Ditch at Awini Weir nr Kohala	--	1907-17, 1963-72
16747000	E Br Honokane nui Str at alt 1,300 ft nr Honokane	4.53	1901
16747500	East Branch Honokane nui Str nr Niulii	4.96	1963-69
16748000	E Br Honokane nui Str at alt 770 ft nr Honokane	5.41	1901
16749000	W Br Honokane nui Str at alt 1,370 ft nr Honokane	1.81	1901
16749500	W Br Honokane nui Str at alt 775 ft nr Honokane	2.40	1901
16750000	Kohala Ditch at Honokane weir nr Kohala	--	1907-12
16750900	Kohala Ditch at Honokane nr Niulii	--	1963-72
16751000	Kohala Ditch at Pololu nr Niulii	--	1927-38, 1938-72
16752000	Kohala Ditch at Niulii weir nr Kohala	--	1907-17
16755000	Kehena Ditch nr Kohala	--	1917-19, 1928-66
16757000	Waikoloa Str nr Kamuela	0.78	1947-71
16759200	Right Branch Waiaha Str nr Holualoa	1.89	1960-82
16759500	Waiaha Str nr Holualoa	9.35	1957-68
16759800	Kiilae Str nr Honaunau	0.67	1958-82
16761200	Kahilipali nui Gulch at Waiohinu	0.47	1962-65
16764000	Hilea Gulch tributary nr Honuapo	9.17	1966-97
16765000	Hilea Gulch tributary 2 nr Honuapo	1.86	1966-82
16767000	Ninole Gulch nr Punaluu	15.5	1966-82

DISCONTINUED SURFACE-WATER-QUALITY STATIONS

The following continuous water-quality stations in Hawaii have been discontinued. Daily records were collected and are stored in NWIS for the period of record shown for each station.

[Type of record: C (specific conductance), S (sediment), T (temperature).]

Station number	Station name	Drainage area (mi^2)	Type of record	Period of record
ISLAND OF OAHU				
16212800	Kipapa Str nr Wahiawa	4.29	S	1973-82
16213000	Waikele Str nr Waipahu	45.70	C,T	1973-81
			S	1972-93
16227500	Moanalua Str nr Kaneohe	0.94	S	1971-78
16270500	Kamooalii Str blw Kuou Str nr Kaneohe	3.21	S	1972-76
ISLAND OF HAWAII				
16704000	Wailuku River at Piihonua, Hawaii, HI	125.00	C	1975-78
			T	1975-79
16713000	Wailuku River at Hilo, Hawaii, HI	256.00	S	1977-79, 1980-83
			C,T	1982-84, 1984-85

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INTRODUCTION

The U.S. Geological Survey (USGS), in cooperation with State, local, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Hawaii each water year. These data, accumulated during many water years, constitute a valuable data base for developing an improved understanding of the water resources of the State. To make these data readily available to interested parties outside the U.S. Geological Survey, the data are published annually in this report series entitled "Water Resources Data - Hawaii."

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 72 stream-gaging stations and 92 crest-stage partial-record streamflow stations; (2) water-quality records for 5 streamflow-gaging stations, and 28 partial-record streamflow stations; (3) water-level records for 87 observation wells; (4) water-quality records for 103 observation wells; and (5) accumulated rainfall records for 37 rainfall stations.

This series of annual reports for Hawaii began with the 1961 fiscal year (State of Hawaii) with a report that contained only data relating to the quantities of surface water. For the 1964 fiscal year, a similar report was introduced that contained only data relating to water quality. Beginning with the 1975 water year, the report format was changed to include, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels. Beginning with the 1993 water year, accumulated rainfall data were included in the report.

Prior to introduction of this series (through June 30, 1960, for Hawaii) and for several water years concurrent with it, water-resources data for Hawaii were published in U.S. Geological Survey Water-Supply Papers. Data on stream discharge and stage and on lake or reservoir contents and stage, through September 1960, were published annually under the title "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." For the 1961 through 1970 water years, the data were published in two 5-year reports. Data on chemical quality, temperature, and suspended sediment for the 1941 through 1970 water years were published annually under the title "Quality of Surface Waters of the United States," and water levels for the 1935 through 1974 water years were published under the title "Ground-Water Levels in the United States." These Water-Supply Papers may be consulted in the libraries of the principal cities in the United States, or if not out of print, may be purchased from the U.S. Geological Survey, Branch of Information Services, Box 25286, Denver, Colorado 80225-0286. For further ordering information, telephone (303) 202-4700.

Publications similar to this report are published annually by the U.S. Geological Survey for all states. These official Survey reports have 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-00-1." For archiving and general distribution, the reports for 1971-74 water years also are 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. For further ordering information, the Customer Inquires telephone number is (703) 487-4650.

Additional information, including current prices, for ordering specific reports may be obtained from the District office at the address given on the back of the title page or by telephone at (808) 587-2400.

COOPERATION

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

Hawaii Department of Land and Natural Resources, Commission on Water Resource Management, Linnel Nishioka, Deputy Director.

Hawaii Board of Land and Natural Resources, Land Division, Dean Uchida, Administrator.

Hawaii Department of Transportation, Bryan Minaai, Director.

Hawaii Department of Agriculture, Paul Matsuo, Administrator.

City and County of Honolulu, Board of Water Supply, Clifford Jamile, Manager and Chief Engineer.

City and County of Honolulu, Department of Planning and Permitting, Randall Fujiki, Director and Chief Engineer.

National Tropical Botanical Garden, Charles Wichman Jr., Assistant Director.

Maui County Board of Water Supply, Dave Craddick, Director.

Kauai County Department of Water, Ernest Lau, Director.

Hawaii County Department of Water Supply, Milton Pavao, P.E., Manager.

Assistance in the form of funds or services was given by the U.S. Army Corps of Engineers, U.S. Army Hawaii Garrison, National Weather Service, and Hawaii County Department of Public Works.

The following organizations aided in collecting records:

East Kauai Water Co., Ltd. and East Maui Irrigation Co., Ltd.

SUMMARY OF HYDROLOGIC CONDITIONS

The generally dry trend of 1998 and 1999 was continued in most parts of the Hawaiian Islands during the 2000 water year the Hawaiian Islands during the water year. Heavy rains in December produced localized flooding on Oahu. A storm in August resulted in flooding along the south shore of Molokai.

Surface Water

Substantial variations in streamflow during the 2000 water year were recorded at four index stations (figure 1; table 1). These stations are all on streams that are undiverted and unregulated, so that increases or decreases in streamflow can be considered to be primarily the result of rainfall fluctuations. Annual mean discharges at stations 1606800, 16229000, and 16587000 were 78 percent, 76 percent, and 84 percent of the 1961–2000 median annual mean discharges at those stations, respectively (figure 1). Annual mean discharge at station 16717000 was 107 percent of the 1967–2000 median annual mean discharge at that station (figure 1). Monthly mean flows at all four index stations were below the long-term median monthly mean flows in October, November, February, March, and May and above the long-term median monthly mean flows in December, January, and September (figure 1).

Instantaneous peak flows at stations 16068000, 16229000, and 16587000 were much lower than the peak flows for the periods of record at these stations (table 1). The instantaneous peak flow at station 16717000 was about half of the peak of record (table 1).

Table 1.--Comparison of peak discharge for 2000 water year with the peak discharge for the period of record at four representative stations

Station Number	Station name	Water year 2000		Period of record	
		Date	Peak discharge (ft^3/s)	Date	Peak discharge (ft^3/s)
16068000	East Branch of North Fork Wailua River near Lihue, Kauai	Nov. 4	2,770	Nov. 12, 1955	18,400
16229000	Kalihi Stream near Honolulu, Oahu	Dec. 2	1,150	Nov. 18, 1930	12,400
16587000	Honopou Stream near Huelo, Maui	Dec. 2	312	Nov. 18, 1930	5,710
16717000	Honolii Stream near Papaikou, Hawaii	Dec. 11	11,500	May 23, 1978	22,600

Ground Water

Ground-water levels are affected by several factors, including rainfall, pumping, evapotranspiration, and, in coastal areas, tides. Ground-water levels at three continuously-monitored observation wells in Hawaii did not change much from the levels recorded the previous year. At well 2-5634-01 (station number 215607159344301) near Hanapepe on Kauai, water levels generally were about the same as those measured in 1999. At well 3-2256-10 (station number 212238157561101) near Pearl Harbor on Oahu, mean monthly water levels increased in the first 5 months of the year, and then declined for the rest of the year. At well 6-5431-01 (station number 205437156310501) near Wailuku, Maui, water levels increased from record lows in 1999. Many of the observation wells throughout the State for which records are published in this report reached record low water levels during the 2000 water year.

Rainfall

The Hawaiian Islands have extreme variability in annual rainfall amounts owing to strong orographic effects. The wettest location is considered to be Mount Waialeale on Kauai, with an average rainfall of approximately 433 inches per year (Giambelluca and others, 1986). Areas of very low rainfall are found on the leeward side of the larger islands, particularly Maui and Hawaii.

In water year 2000, rainfall amounts remained below long-term normal amounts. Rainfall at the USGS-National Weather Service gage on Mount Waialeale totalled 361 inches, or about 83 percent of the mean annual rainfall. The Poamoho 1 rain gage at the crest of the Koolau Range on Oahu recorded 150.4 inches, about 55 percent of the long-term average annual rainfall of about 275 inches (Giambelluca and others, 1986). The Kepuni Gulch rain gage on the leeward side of Haleakala on Maui recorded 23.2 inches, or about 77 percent of the mean annual rainfall of about 30 inches (Giambelluca and others, 1986).

References

Giambelluca, T.W., Nullet, M.A., and Schroeder, T.A., 1986, Rainfall atlas of Hawaii: State of Hawaii, Department of Land and Natural Resources, Division of Water and Land Development Report R76, 267 p.

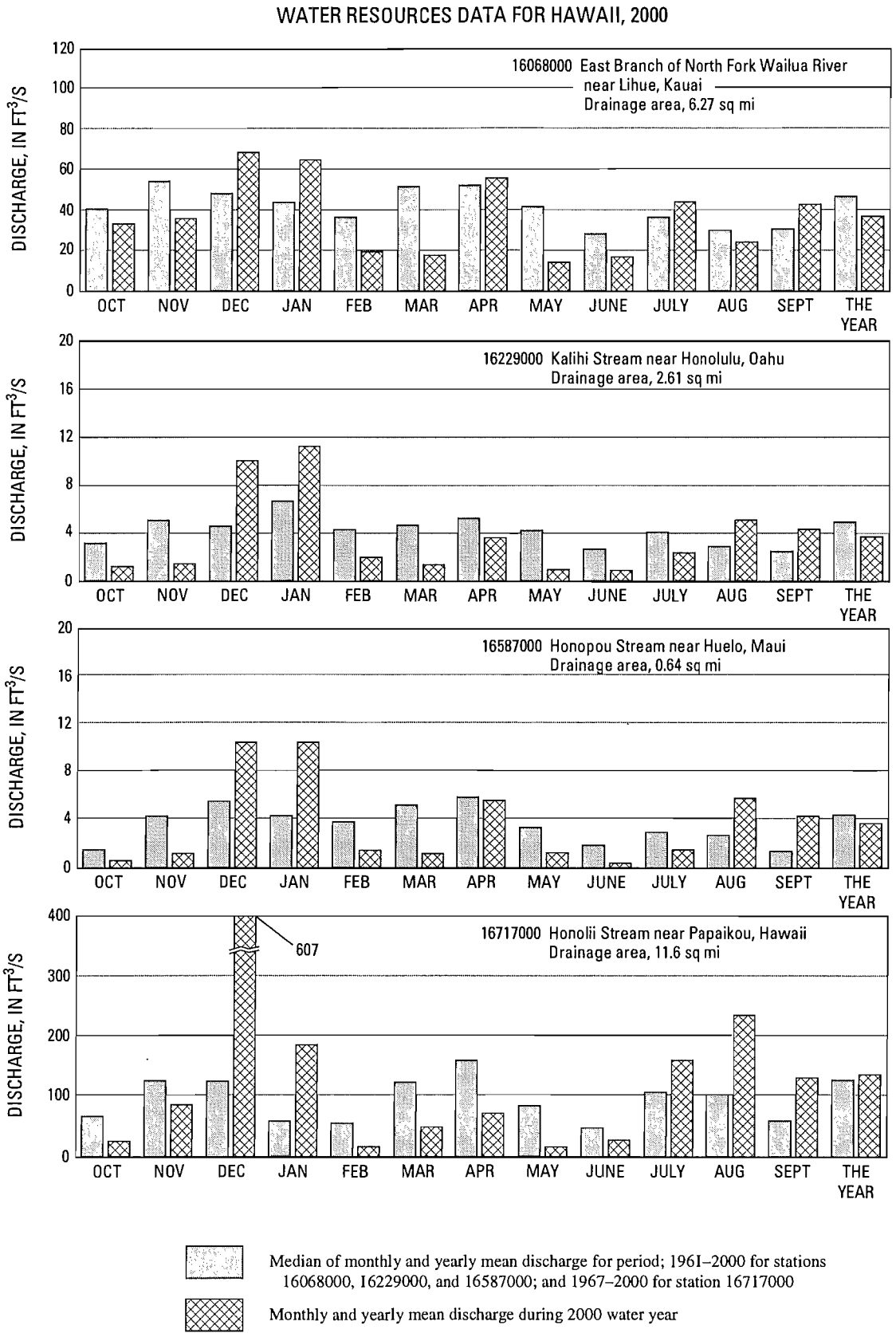

Figure 1. Discharge during 2000 water year compared with median discharge for four representative gaging stations.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Benchmark Network is a network of 50 sites in small drainage basins around the country whose purpose is to provide consistent data on the hydrology, including water quality, and related factors in representative undeveloped watersheds nationwide, and to provide analyses on a continuing basis to compare and contrast conditions observed in basins more obviously affected by human activities.

National Stream-Quality Accounting Network (NASQAN) monitors the water quality of large rivers within four of the Nation's largest river basins--the Mississippi, Columbia, Colorado, and Rio Grande. The network consists of 39 stations. Samples are collected with sufficient frequency that the flux of a wide range of constituents can be estimated. The objective of NASQAN is to characterize the water quality of these large rivers by measuring concentration and mass transport of a wide range of dissolved and suspended constituents, including nutrients, major ions, dissolved and sediment-bound heavy metals, common pesticides, and inorganic and organic forms of carbon. This information will be used (1) to describe the long-term trends and changes in concentration and transport of these constituents; (2) to test findings of the National Water-Quality Assessment Program (NAWQA); (3) to characterize processes unique to large-river systems such as storage and re-mobilization of sediments and associated contaminants; and (4) to refine existing estimates of off-continent transport of water, sediment, and chemicals for assessing human effects on the world's oceans and for determining global cycles of carbon, nutrients, and other chemicals.

The National Atmospheric Deposition Program/National Trends Network (NADP/NTN) provides continuous measurement and assessment of the chemical climate of precipitation throughout the United States. As the lead federal agency, the USGS works together with over 100 organizations to accomplish the following objectives; (1) Provide a long-term, spatial and temporal record of atmospheric deposition generated from a network of 191 precipitation chemistry monitoring sites. (2) Provide the mechanism to evaluate the effectiveness of the significant reduction in SO2 emissions that began in 1995 as implementation of the Clean Air Act Amendments (CAAA) occurred. (3) Provide the scientific basis and nationwide evaluation mechanism for implementation of the Phase II CAAA emission reductions for SO2 and NOx scheduled to begin in 2000.

Data from the network, as well as information about individual sites, are available through the world wide web at:

http://nadp.nrel.colostate.edu/NADP

The National Water-Quality Assessment (NAWQA) Program of the U.S. Geological Survey is a long-term program with goals to describe the status and trends of water-quality conditions for a large, representative part of the Nation's ground- and surface-water resources; provide an improved understanding of the primary natural and human factors affecting these observed conditions and trends; and provide information that supports development and evaluation of management, regulatory, and monitoring decisions by other agencies.

Assessment activities are being conducted in 53 study units (major watersheds and aquifer systems) that represent a wide range of environmental settings nationwide and that account for a large percentage of the Nation's water use. A wide array of chemical constituents will be measured in ground water, surface water, streambed sediments, and fish tissues. The coordinated application of comparative hydrologic studies at a wide range of spatial and temporal scales will provide information for decision making by water-resources managers and a foundation for aggregation and comparison of findings to address water-quality issues of regional and national interest.

Communication and coordination between USGS personnel and other local, State, and federal interests are critical components of the NAWQA Program. Each study unit has a local liaison committee consisting of representatives from key federal, State, and local water resources agencies, Indian nations, and universities in the study unit. Liaison committees typically meet semiannually to discuss their information needs, monitoring plans and progress, desired information products, and opportunities to collaborate efforts among the agencies.

Additional information about the NAWQA Program is available through the world wide web at:

http://wwwrvares.er.usgs.gov/nawqa/nawqa_home.html

Additional information about the island of Oahu NAWQA Program is available through the world wide web at:

http://hi.usgs.gov/nawqa

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 2000 water year that began October 1, 1999 and ended September 30, 2000. A calendar of the water year is provided on the inside of the front cover. The records contain streamflow data, water-quality data for surface water, ground-water, and reservoirs, ground-water level data, and rainfall accumulation data. The locations of the stations and wells where the data were collected are shown in figures 5–25. The following sections of the introductory text are presented to provide users with a more detailed explanation of how the hydrologic data published in this report were collected, analyzed, computed, and arranged for presentation.

Station Identification Numbers

Each data station, whether a streamgage, well, or rain gage, in this report is assigned a unique identification number. This number is unique in that it applies specifically to a given station and to no other. The number usually is assigned when a station is first established and is retained for that station indefinitely. The systems used by the U.S. Geological Survey to assign identification numbers for surface-water stations and for ground-water wells differ, but both are based on geographic location. The "downstream order" system is used for regular surface-water stations and the "latitude-longitude" system is used for wells and, in Hawaii and other Pacific areas, for surface-water stations where only miscellaneous measurements are made, and for rainfall stations.

Downstream Order System

Since October 1, 1950, the order of listing hydrologic-station records in U.S. Geological Survey reports is in a downstream direction along the main stream. All stations on a tributary entering upstream from a mainstream station are listed before that station. A station on a tributary that enters between two mainstream stations is listed between them. A similar order is followed in listing stations on first rank, second rank, and other ranks of tributaries. The rank of any tributary with respect to the stream to which it is immediately tributary is indicated by an indention in the "List of Stations" in the front of this report. Each indention represents one rank. This downstream order and system of indention show which stations are on tributaries between any two stations and the rank of the tributary on which each station is situated.

The station-identification number is assigned according to downstream order. In assigning station numbers, no distinction is made between partial-record stations and other stations; therefore, the station number for a partial-record station indicates downstream-order position in a list made up of both types of stations. Gaps are left in the 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 two-digit number "16" plus the six-digit downstream order number "200000."

Latitude-Longitude System

The identification numbers for wells, miscellaneous surface-water sites, and rainfall stations are assigned according to the grid system of latitude and longitude. The number consists of 15 digits. The first six digits denote the degrees, minutes, and seconds of latitude, the next seven digits denote degrees, minutes, and seconds of longitude, and the last two digits (assigned sequentially) identify the wells or other sites within a one-second grid. This site-identification number, once assigned, is a pure number, and has no locational significance. In the rare instance where the initial determination of latitude and longitude are found to be in error, the station will retain its initial identification number; however, its true latitude and longitude will be listed in the LOCATION paragraph of the station description (see figure 2).

Local Identifier Well-Numbering System

In addition to the latitude-longitude based site identification number, wells in the State of Hawaii are assigned local well numbers. Beginning in 1971, the local well-numbering system was restructured to contain seven digits based on a non-arbitrary, unique one-minute grid system. One-minute parallel lines for both latitude and longitude are drawn on the map resulting in one-minute grids. Each grid is designated by a four-digit number. The first two digits represent minutes of latitude for the grid and the second two digits represent minutes of longitude for that grid. This establishes unique minute-grid numbers within each of the islands in the state except for the island of Hawaii where it encompasses an area more than one degree (60 minutes) of latitude and longitude. To establish unique minute-grid numbers for this island, 30 was added to the minutes of latitude in areas less than 19°00″ of latitude, and 60 was added to the minutes of latitude in areas more than 20°00″ of latitude. For the same reason, 30 was added to the minutes of longitude in areas less than 155°00″ of longitude, and 60 was added to the minutes of longitudes more than 156°00″ longitude (see figures 3 and 4).

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

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

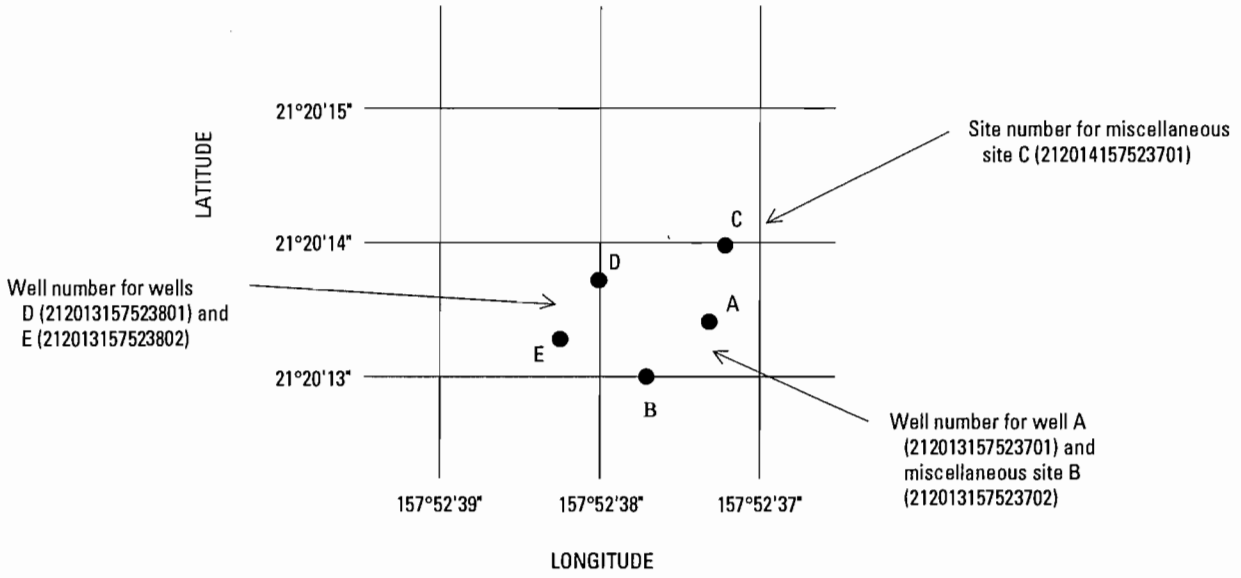

Figure 2. System for numbering wells and miscellaneous sites.

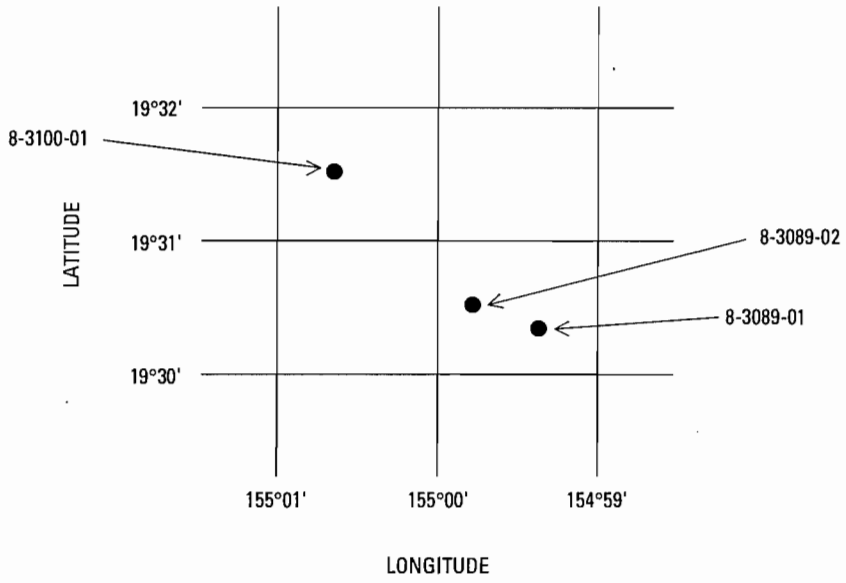

Figure 3. Local well numbering system.

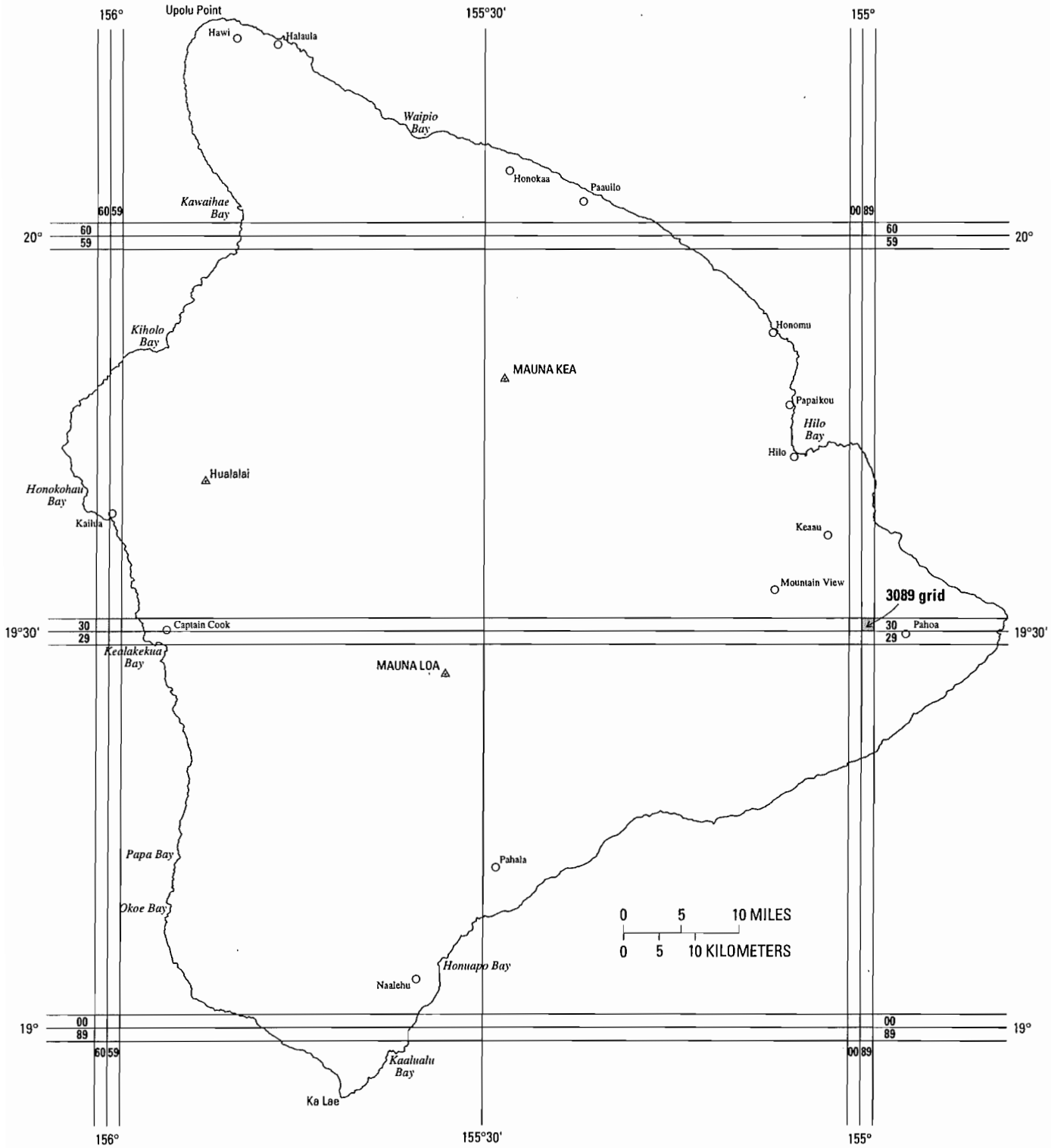

Figure 4. Map of Hawaii showing system for determining local well numbers.

Local State Key Numbering System

In addition to the latitude-longitude based site identification number, rainfall stations in the State of Hawaii are assigned State key numbers. The numbering system was devised in 1948 by the authors of "A Key to Rain Gages in Hawaii." The numbers run from 1 to 1145, proceeding from south to north up the island chain. However, within each five-minute latitude band, numbers proceed from west to east. Following are the blocks of numbers assigned to each island.

Island	State Key Number
Hawaii	1-223
Maui	248-497
Molokai	500-563
Lanai	650-696
Oahu	700-912
Kauai	925-1145

Records of Stage and Water Discharge

Records of stage and water discharge may be complete or partial. Complete records of discharge are those obtained using a continuous stage-recording device through which either instantaneous or mean discharges may be computed for any time, or any period of time, during the period of record. Complete records of lake or reservoir content, similarly, are those for which stage or content may be computed or estimated with reasonable accuracy for any time, or period of time. They may be obtained using a continuous stage-recording device, but need not be. Because daily mean discharges and end-of-day contents commonly are published for such stations, they are referred to as "daily stations."

By contrast, partial records are obtained through discrete measurements without using a continuous stage-recording device and pertain only to a few flow characteristics, or perhaps only one. The nature of the partial record is indicated by table titles such as "Crest-stage partial records," or "Low-flow partial records." Records of miscellaneous discharge measurements or of measurements from special studies, such as low-flow seepage studies, may be considered as partial records, but they are presented separately in this report. Location of all complete-record and crest-stage partial-record stations for which data are given in this report are shown in figures 5–14.

Data Collection and Computation

The data obtained at a complete-record gaging station on a stream or canal consist of a continuous record of stage, individual measurements of discharge throughout a range of stages, and notations regarding factors that may affect the relations between stage and discharge. These data, together with supplemental information, such as weather records, are used to compute daily discharges. The data obtained at a complete-record gaging station on a lake or reservoir consist of a record of stage and of notations regarding factors that may affect the relations between stage and lake content. These data are used with stage-area and stage-capacity curves or tables to compute water-surface areas and lake storage.

Continuous records of stage are obtained with electronic data loggers, with digital recorders that punch stage values on paper tapes at selected time intervals, or with analog recorders that trace continuous graphs of stage. Measurements of discharge are made with current meters, using methods adapted by the U.S. Geological Survey as a result of experience accumulated since 1880. These methods are described in standard textbooks, Water-Supply Paper 2175, and the U.S. Geological Survey Techniques of Water-Resources Investigations (TWRI), Book 3, Chapter A1 to A19 and Book 8, Chapters A2 and B2. The methods are consistent with the American Society for Testing and Materials (ASTM) standards and generally follow the standards of the International Organization for Standards (ISO).

In computing discharge records, results of individual measurements are plotted against corresponding stages, and stage-discharge relation curves are then constructed. From these curves, rating tables indicating the approximate discharge for any stage within the range of the measurements are prepared. If it is necessary to define extremes of discharge outside the range of the current-meter measurements, the curves are extended using: (1) logarithmic plotting; (2) velocity-area studies; (3) results of indirect measurements of peak discharge, such as slope-area or contracted-opening measurements, and computations of flow-over-dams or weirs; or (4) step-backwater techniques.

Daily mean discharges are computed by applying the stages (gage heights) to the stage-discharge curves or tables. If the stage-discharge relation is subject to change because of frequent or continual change in the physical features that form the control, the daily mean discharge is determined by the shifting-control method, in which correction factors based on individual discharge measurements and notes of the personnel making the measurements are applied to the gage heights before the discharges are determined from the curves or tables. This shifting-control method also is used if the stage-discharge relation is changed temporarily because of aquatic growth or debris on the control.

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.

In computing records of lake or reservoir contents, it is necessary to have information available from surveys, curves, or tables that define the relation of stage and content. The application of stage to the stage-content curves or tables gives the contents from which daily, monthly, or yearly changes then are determined. If the stage-content relation changes because of deposition of sediment in a lake or reservoir, periodic resurveys may be necessary to redefine the relation. Discharges over lake or reservoir spillways are computed from stage-discharge relations much as other stream discharges are computed.

For some gaging stations there are periods when no gage-height record is obtained, or the validity of the recorded gage height is so questionable 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, or for various other reasons. For such periods, the daily discharges are estimated from the recorded range in stage, previous and following record, discharge measurements, weather records, and comparison with other station records from the same or nearby basins. Likewise, daily contents may be estimated from operator's logs, previous and following record, inflow-outflow studies, and other information. Information explaining how estimated daily-discharge values are identified in station records is included in the next two sections, "Data Presentation" (REMARKS paragraph) and "Identifying Estimated Daily Discharge."

Data Presentation

Streamflow data in this report are presented in a new format that is considerably different from the format in data reports prior to the 1992 water year. The major changes are that statistical characteristics of discharge now appear in tabular summaries following the water-year data table and less information is provided in the text or station manuscript above the table. These changes represent the results of a pilot program to reformat the annual water-data report to meet current user needs and data preferences. In addition, beginning with the 1992 water year, a graphical hydrograph is included for surface-water discharge stations.

The records published for each continuous-record surface-water discharge station (gaging station) now consist of five parts, the station manuscript; the data table of daily mean values of discharge for the current water year with summary data; a tabular statistical summary of monthly mean flow data for a designated period, by water year; a summary statistics table that includes statistical data of annual and daily flows as well as data pertaining to annual runoff, 7-day low-flow minimums, and flow duration; and a hydrograph of the daily mean values of discharge for the current water year. Summary statistics were not included for certain sites where these data would be misleading. Contact the U.S. Geological Survey Hawaii District office for information concerning summary statistics for these sites.

Station Manuscript

The manuscript provides, under various headings, descriptive information, such as station location; period of record; historical extremes outside the period of record; record accuracy; and other remarks pertinent to station operation and regulation. The following information, as appropriate, is provided with each continuous record of discharge or lake content.

LOCATION.--Information on locations is obtained from the most accurate maps available. The location of the gage with respect to the cultural and physical features in the vicinity and with respect to the reference place mentioned in the station name is given.

DRAINAGE AREA.--Drainage areas are measured using the most accurate maps available. Because the type of maps available varies from one drainage basin to another, the accuracy of drainage areas likewise varies. Drainage areas are updated as better maps become available.

PERIOD OF RECORD.--This indicates the period for which there are published records for the station or for an equivalent station. An equivalent station is one that was in operation at a time that the present station was not, and whose location was such that records from it can reasonably be considered equivalent with records from the present station.

REVISED RECORDS.--Published records, because of new information, occasionally are found to be incorrect, and revisions are printed in later reports. Listed under this heading are all the reports in which revisions have been published for the station and the water years to which the revisions apply. If a revision did not include daily, monthly, or annual figures of discharge, that fact is noted after the year dates as follows: "(M)" means the instantaneous maximum discharge was revised; "(m)" the instantaneous minimum was revised; and "(P)" the peak discharges were revised. If the drainage area has been revised, the report in which the most recently revised figure was first published is given.

GAGE.--The type of gage in current use, the datum of the current gage referred to mean sea level, and a condensed history of the types, locations, and datums of previous gages are given under this heading. In references to datum of gage, the phrase "mean sea level" denotes "Sea Level Datum of 1929" as used by the National Mapping Division of the U.S. Geological Survey unless otherwise qualified.

REMARKS.--All periods of estimated daily-discharge record will either be identified by date in this paragraph of the station manuscript for water-discharge stations or flagged in the daily-discharge table. (See next section, "Identifying Estimated Daily Discharge.") If a remark statement is used to identify estimated record, the paragraph will begin with this information presented as the first entry. The paragraph is also used to present information relative to the accuracy of the records, special methods of computation, conditions that affect natural flow at the station, and possibly other pertinent items. For reservoir stations, information is given on the dam forming the reservoir, the capacity, outlet works and spillway, and purpose and use of the reservoir.

COOPERATION.--Records provided by a cooperating organization or obtained for the U.S. Geological Survey by a cooperating organization are identified here.

AVERAGE DISCHARGE.--The discharge value given is the arithmetic average of the water-year mean discharges. Average discharge is computed only for stations having at least 5 water years of complete record; water years with incomplete record are not included in the computation. The mean-discharge value that uses all published data may differ from that given in the summary statistics data, which is based only on computer-stored data. The summary data do not include values of monthly or yearly data that were determined by various methods for the series of Water-Supply Papers entitled "Compilation of Records of Surface Water of the United States." The average-discharge value is not computed for stations where diversions, storage or other water-use practices cause the value to be meaningless. If water projects that significantly alter flow at a station are put into use after the station has been in operation for a period of years, the new average is computed as soon as 5 water years of record have accumulated after the project began.

EXTREMES FOR PERIOD OF RECORD.--Extremes may include maximum and minimum stages and maximum and minimum discharges or content. Unless otherwise qualified, the maximum discharge or content is the instantaneous maximum corresponding to the highest stage that occurred. The highest stage may have been obtained from a graphic or digital recorder, a crest-stage gage, or by direct observation of a nonrecording gage. If the maximum stage did not occur on the same day as the maximum discharge or content, it is given separately. Similarly, the minimum is the instantaneous minimum discharge, unless otherwise qualified, and was determined and is reported in the same manner as the maximum.

EXTREMES OUTSIDE PERIOD OF RECORD.--Included here is information concerning major floods or unusually low flows that occurred outside the stated period of record. The information may or may not have been obtained by the U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.--Extremes given here are similar to those for the period of record, except the peak discharge listing may include secondary peaks. For stations meeting certain criteria, all peak discharges and stages occurring during the water year and greater than a selected base discharge are presented under this heading. The peaks greater than the base discharge, excluding the highest one, are referred to as secondary peaks. Peak discharges are not published for any canals, ditches, drains, or streams for which the peaks are subject to substantial artificial control. The time of occurrence for peaks is expressed in 24-hour local standard time. For example, 12:30 a.m. is 0030, 1:30 p.m. is 1330. The minimum for the current water year appears below the table of peak data.

REVISIONS.--If a critical error in published records is discovered, a revision is included in the first report published following discovery of the error.

Although rare, occasionally the records of a discontinued gaging station may need revision. Because, for these stations, there would be no current or, possibly, future station manuscript published to document the revision in a "Revised Records" entry, users of data for these stations who obtained the record from previously published data reports may wish to contact the District Office (address given on the back of the title page of this report) to determine if the published records were ever revised after the station was discontinued. Of course, if the data were obtained by computer retrieval, the data would be current and there would be no need to check because any published revision of data is always accompanied by revision of the corresponding data in computer storage.

Manuscript information for lake or reservoir stations differs from that for stream stations in the nature of the "Remarks" and in the inclusion of a skeleton stage-capacity table when daily contents are given.

Data Table of Daily Mean Values

The daily table of discharge records for stream-gaging stations gives mean discharge for each day of the water year. In the monthly summary for the table, the line headed "TOTAL" gives the sum of the daily figures for each month. The line headed "MEAN" gives the average flow in cubic feet per second during the month, and the lines headed "MAX" and "MIN" give the maximum and minimum daily mean discharges, respectively, for the month. Discharge for the month also is usually expressed in acre-feet (line headed "AC-FT").

Statistics of Monthly Mean Data

A tabular summary of the mean (line headed "MEAN"), maximum (line headed "MAX"), and minimum (line headed "MIN") of monthly mean flows for each month for a designated period is provided below the mean values table. The water years of the first occurrence of the maximum and minimum monthly flows are provided immediately below those figures. The designated period will be expressed as "FOR WATER YEAR ___-___, BY WATER YEAR (WY)," and will list the first and last water years of the range of years selected from the PERIOD OF RECORD paragraph in the station manuscript. It will consist of all of the station record within the specified water years, inclusive, including complete months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript.

Summary Statistics

A table titled "SUMMARY STATISTICS" follows the statistics of monthly mean data tabulation. This table consists of four columns, with the first column containing the line headings of the statistics being reported. The table provides a statistical summary of yearly, daily, and instantaneous flows, not only for the current water year but also for the previous calendar year and for a designated period, as appropriate. The designated period selected, "WATER YEARS ___-___," will consist of all of the station record within the specified water years, inclusive, including months of record for partial water years, if any, and may coincide with the period of record for the station. The water years for which the statistics are computed will be consecutive, unless a break in the station record is indicated in the manuscript. All of the calculations for the statistical characteristics designated ANNUAL (See line headings below), except for the "ANNUAL 7-DAY MINIMUM" statistic, are calculated for the designated period using complete water years. The other statistical characteristics may be calculated using partial water years.

The date or water year, as appropriate, of the first occurrence of each statistic reporting extreme values of discharge is provided adjacent to the statistic. Repeated occurrences may be noted in the REMARKS paragraph of the manuscript or in footnotes. Because the designated period may not be the same as the station period of record published in the manuscript, occasionally the dates of occurrence listed for the daily and instantaneous extremes in the designated-period column may not be within the selected water years listed in the headings. When this occurs, it will be noted in the REMARKS paragraph or in footnotes. Selected streamflow duration curve statistics and runoff are also given. Runoff data may be omitted if there is extensive regulation or diversion of flow in the drainage basin.

The following summary statistics data, as appropriate, are provided with each continuous record of discharge. Comments to follow clarify information presented under the various line headings of the summary statistics table.

ANNUAL TOTAL.--The sum of the daily mean values of discharge for the year.

ANNUAL MEAN.--The arithmetic mean of the individual daily mean discharges for the year noted or for the designated period.

HIGHEST ANNUAL MEAN.--The maximum annual mean discharge occurring for the designated period.

LOWEST ANNUAL MEAN.--The minimum annual mean discharge occurring for the designated period.

HIGHEST DAILY MEAN.--The maximum daily mean discharge for the year or for the designated period.

LOWEST DAILY MEAN.--The minimum daily mean discharge for the year or for the designated period.

ANNUAL 7-DAY MINIMUM.--The lowest mean discharge for 7 consecutive days for a calendar year or a water year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1 - March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

INSTANTANEOUS PEAK FLOW.--The maximum instantaneous discharge occurring for the water year or for the designated period. Note that secondary instantaneous peak discharges above a selected base discharge are stored in District computer files for stations meeting certain criteria. Those discharge values may be obtained by writing to the District office (see address on back title page of this report).

INSTANTANEOUS PEAK STAGE.--The maximum instantaneous stage occurring for the water year or for the designated period. If the dates of occurrence for the instantaneous peak flow and instantaneous peak stage differ, the REMARKS paragraph in the manuscript or a footnote may be used to provide further information.

INSTANTANEOUS LOW FLOW.--The minimum instantaneous discharge occurring for the water year or for the designated period.

ANNUAL RUNOFF.--Indicates the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

Acre-foot (AC-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 about 326,000 gallons or 1,233 cubic meters.

Cubic feet per second per square mile (CFSM) is the average number of cubic feet of water flowing per second from each square mile area drained, assuming the runoff is distributed uniformly in time and area.

Inches (INCHES) indicates the depth to which the drainage area would be covered if all of the runoff for a given time period were uniformly distributed on it.

10 PERCENT EXCEEDS.--The discharge that has been exceeded 10 percent of the time for the designated period.

50 PERCENT EXCEEDS.--The discharge that has been exceeded 50 percent of the time for the designated period.

90 PERCENT EXCEEDS.--The discharge that has been exceeded 90 percent of the time for the designated period.

HYDROGRAPH.--The hydrograph gives a graphical presentation of the mean discharge for each day of the water year. Where possible, the same scale is used in order to facilitate visual comparison between gaging stations.

Data collected at miscellaneous sites are presented in a table following the information for continuous sites. This table summarizes discharge measurements made at sites other than continuous-record sites.

Identifying Estimated Daily Discharge

Estimated daily-discharge values published in the water-discharge tables of annual State data reports are identified either by flagging individual daily values with the letter symbol "e" and printing a table footnote, "e Estimated," or by listing the dates of the estimated record in the REMARKS paragraph of the station manuscript.

Accuracy of the Records

The accuracy of streamflow records 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 measurements of stage, measurements of discharge, and interpretations of records.

The accuracy attributed to the records is indicated under "REMARKS." "Excellent" means that about 95 percent of the published daily discharges are within 5 percent of their true values; "good," within 10 percent; and "fair" within 15 percent. Records that do not meet the criteria mentioned are rated "poor." Different accuracies may be attributed to different parts of a given record.

Daily mean discharges in this report are given to the nearest hundredth of a cubic foot per second for values less than 1 ft^3/s; the nearest tenths between 1.0 and 10 ft^3/s; to whole numbers between 10 and 1,000 ft^3/s; and to three significant figures for more than 1,000 ft^3/s. The number of significant figures used is based solely on the magnitude of the discharge figure. The same rounding rules apply to discharges listed for partial-record stations and miscellaneous sites.

Discharge at many stations, as indicated by the monthly mean, may not reflect natural runoff because of 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 to 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.

Other Records Available

Information used in the preparation of the records in this publication, such as discharge-measurement notes, gage-height records, temperature measurements, and rating tables are on file in the U.S. Geological Survey Hawaii District office. Also, most of the daily mean discharges are in computer readable form and have been analyzed statistically. Information on the availability of the unpublished information or on the results of statistical analyses of the unpublished records may be obtained from the U.S. Geological Survey Hawaii District office.

Records of Surface-Water Quality

Records of surface-water quality ordinarily are obtained at or near stream-gaging stations because interpretation of records of surface-water quality nearly always requires corresponding discharge data. Records of surface-water quality in this report may involve a variety of types of data and measurement frequencies.

Classification of Records

Water-quality data for surface-water sites are grouped into one of three classifications. A continuing-record station is a site where data are collected on a regularly scheduled basis. Frequency may be one or more times daily, weekly, monthly, or quarterly. A partial-record station is a site where limited water-quality data are collected systematically over a period of years. Frequency of sampling is usually less than quarterly. A miscellaneous sampling site is a location other than a continuing or partial-record station, where random samples are collected to give better areal coverage to define water-quality conditions in the river basin.

A careful distinction needs to be made between "continuing records" as used in this report and "continuous recordings," which refers to a continuous graph or a series of discrete values punched at short intervals on a paper tape or obtained via data collection platform. Some records of water quality, such as temperature and specific conductance, may be obtained through continuous recordings; however, because of costs, most data are obtained only monthly or less frequently. Locations of stations for which records on the quality of surface water appear in this report are shown in figures 5–9 and 15.

Arrangement of Records

Water-quality records collected at a surface-water daily record station are published immediately following that record, regardless of the frequency of sample collection. Station number and name are the same for both records. Where a surface-water daily record station is not available or where the water quality differs significantly from that at the nearby surface-water station, the continuing water-quality record is published with its own station number and name in the regular downstream-order sequence. Water-quality data for partial-record stations and for miscellaneous sampling sites appear in separate tables following the table of discharge measurements at miscellaneous sites.

On-Site Measurements and Sample Collection

In obtaining water-quality data, it is important that the data obtained represent the in situ quality of the water. To assure this, certain measurements, such as water temperature, pH, and dissolved oxygen, need to be made on site when the samples are taken. To assure that measurements made in the laboratory also represent the in situ water, carefully prescribed procedures need to be followed in collecting the samples, treating the samples to prevent changes in quality pending analysis, and shipping the samples to the laboratory. Procedures for on site measurements and for collecting, treating, and shipping samples are detailed in the TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapters A1, A3, and A4. These references are listed in the PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS section of this report. These methods are consistent with ASTM standards and generally follow ISO standards. Also, detailed information on collecting, treating, and shipping samples may be obtained from the U.S. Geological Survey Hawaii District office.

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. All samples obtained for the National Stream-Quality Accounting Network (see "DEFINITION OF TERMS") are obtained from at least five verticals. Whether samples are obtained from the centroid of flow or from several verticals, depends on flow conditions and other factors which must be evaluated by the collector.

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 measurements 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 U.S. Geological Survey office whose address is given on the back of the title page in this report.

Water Temperature

Water temperatures are measured at most of the water-quality stations. In addition, water temperatures are frequently taken at the time discharge measurements are made 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 diurnal 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, maximum, minimum, and mean temperatures for each day are published. Water temperatures measured at the time of water-discharge measurements are on file in the U.S. Geological Survey Hawaii District office.

Sediment

Suspended-sediment concentrations are determined from samples collected by one of the standard techniques discussed in TWRI, Book 3, Chapter C2, "Field methods for measurement of fluvial sediment," 1985 revision. Samples are obtained using standard depth- or point-integrating samplers, or by means of an approved pumping sampler. Mean concentrations for the sampled cross section are in turn determined from these samples.

For stations with daily suspended-sediment records, mean daily suspended-sediment concentrations and loads are computed and published for each day of the water year. During periods of unchanging flow and sediment concentration, daily suspended-sediment loads are computed as the product of daily mean streamflow, daily mean suspended-sediment concentrations, and 0.0027, a conversion factor. During periods of rapidly changing flow or rapidly changing suspended-sediment 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 discharges 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. Methods used in the computation of sediment records are described in the TWRI Book 3, Chapters C1 and C3. These methods are consistent with ASTM standards and generally follow ISO standards.

At other stations, suspended-sediment samples were collected periodically. 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 suspended-sediment discharge, periodic measurements of the particle-size distributions for the suspended-sediment, bed-load, and bed-material samples are included for stations where samples were obtained to measure this parameter.

Laboratory Measurements

Sediment samples, samples for indicator bacteria, and daily samples for specific conductance and chloride are analyzed locally. All other samples are analyzed in the U.S. Geological Survey National Water-Quality Laboratory in Arvada, Colorado. The USGS National Water-Quality Laboratory collects quality-control data on a continuing basis to evaluate selected analytical methods to determine long-term method detection levels (LT-MDL's) and laboratory reporting levels (LRL's). These values are re-evaluated each year on the basis of the most recent quality-control data and, consequently, may change from year to year.

This reporting procedure limits the occurrence of false positive error. The chance of falsely reporting a concentration greater than the LT-MDL for a sample in which the analyte is not present is 1 percent or less. Application of the LRL limits the occurrence of false negative error. The chance of falsely reporting a non-detection for a sample in which the analyte is present at a concentration equal to or greater than the LRL is 1 percent or less.

Accordingly, concentrations are reported as <LRL for samples in which the analyte was either not detected or did not pass identification. Analytes that are detected at concentrations between the LT-MDL and LRL and that pass identification criteria are estimated. Estimated concentrations will be noted with a remark code of "E." These data should be used with the understanding that their uncertainty is greater than that of data reported without the "E" remark code.

Methods used to analyze sediment samples and to compute sediment records are described in the TWRI Book 5, Chapter C1. Methods used by the U.S. Geological Survey laboratories are given in TWRI Book 1, Chapter D2; Book 3, Chapter C2; and Book 5, Chapter A1, A3, A4, and A5. These methods are consistent with ASTM standards and generally follow ISO standards.

In March 1989, the National Water-Quality Laboratory discovered a bias in the turbidimetric method for sulfate analysis, indicating that values below 75 mg/L have a median positive bias of 2 mg/L above the true value for the period between 1982 and 1989. Sulfate values in this report have not been corrected for this bias.

Data Presentation

For continuing-record stations, information pertinent to the history of station operation is provided in descriptive headings preceding the tabular data. These descriptive headings give details regarding location, drainage area, period of record, type of data available, instrumentation, general remarks, cooperation, and extremes for parameters currently measured daily. Tables of chemical, physical, biological, radiochemical data, and so forth, obtained at a frequency less than daily are presented first. Tables of "daily values" of specific conductance, pH, water temperature, dissolved oxygen, and suspended sediment then follow in sequence.

In the descriptive headings, if the location is identical to that of the discharge gaging station, neither the LOCATION nor the DRAINAGE AREA statements are repeated. The following information, as appropriate, is provided with each continuous-record station. Comments that follow clarify information presented under the various headings of the station description.

LOCATION.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

DRAINAGE AREA.--See Data Presentation under "Records of Stage and Water Discharge;" same comments apply.

PERIOD OF RECORD.--This indicates the periods for which there are published water-quality records for the station. The periods are shown separately for records of parameters measured daily or continuously and those measured less than daily. For those measured daily or continuously, periods of record are given for the parameters individually.

INSTRUMENTATION.--Information on instrumentation is given only if a water-quality monitor, sediment pumping sampler, or other sampling device is in operation at a station.

REMARKS.--Remarks provide added information pertinent to the collection, analysis, or computation of the records.

COOPERATION.--Records provided by a cooperating organization or obtained for the Geological Survey by a cooperating organization are identified here.

EXTREMES FOR PERIOD OF RECORD.--Maximums and minimums are given only for parameters measured daily or more frequently. None are given for parameters measured weekly or less frequently, because the true maximums and minimums may not have been sampled. Extremes, when given, are provided for both the period of record and for the current water year.

REVISIONS.--If errors in published water-quality records are discovered after publication, appropriate updates are made to the Water-Quality File in the U.S. Geological Survey's computerized data system, NWIS, and subsequently by monthly transfer of update transactions to the U.S. Environmental Protection Agency's STORET system. Because the usual volume of updates makes it impractical to document individual changes in the State data-report series or elsewhere, potential users of U.S. Geological Survey water-quality data are encouraged to obtain all required data from the appropriate computer file.

The surface-water-quality records for partial-record stations and miscellaneous sampling sites are published in separate tables following the table of discharge measurements at miscellaneous sites. No descriptive statements are given to these records. Each station is published with its own station number and name in the regular downstream-order sequence.

Remark Codes

The following remark codes may appear with the surface-water-quality data in this report:

PRINTED OUTPUT	REMARK
E	Estimated value.
>	Actual value is known to be greater than the value shown.
<	Actual value is known to be less than the value shown.
K	Results based on colony count outside the acceptance range (non-ideal colony count).
L	Biological organism count less than 0.5 percent (organism may be observed rather than counted).
D	Biological organism count equal to or greater than 15 percent (dominant).
V	Analyte was detected in both the environmental sample and the associated blanks
&	Biological organism estimated as dominant.

Dissolved Trace-Element Concentrations

*NOTE.--Traditionally, dissolved trace-element concentrations have been reported at the microgram per liter (µg/L) level. Recent evidence, mostly from large rivers, indicates that actual dissolved-phase concentrations for a number of trace elements are within the range of 10's and 100's of nanograms per liter (ng/L). Data above the µg/L level should be viewed with caution. Such data may actually represent elevated environmental concentrations from natural or human causes; however, these data could reflect contamination introduced during sampling, processing, or analysis. To confidently produce dissolved trace-element data with insignificant contamination, the U.S. Geological Survey began using new trace-element protocols at some stations in water year 1994.

Change in National Trends Network Procedures

*NOTE.--Sample handling procedures at all National Trends Network stations were changed substantially on January 11, 1994, in order to reduce contamination from the sample shipping container. The data for samples before and after that date are different and not directly comparable. A tabular summary of the differences based on a special intercomparison study, is available from the NADP/NTN Coordination Office, Colorado State University, Fort Collins, CO 80532 (Telephone: 303-491-5643).

Records of Ground-Water Levels

Only water-level data from a basic network of observation wells are given in this report. This basic network contains observation wells so located that the most significant data are obtained from the fewest wells in the most important aquifers. Locations of the observation wells in Hawaii listed in this report are shown in figures 16–20.

Although, in this report, records of water levels are presented for fewer than 100 wells, records are obtained through cooperative efforts of many Federal, State, and local agencies for several thousand observation wells throughout Hawaii and are placed in computer storage, published in reports, or kept in files. Information about the availability of ground-water data may be obtained from the District Chief, Hawaii District, U.S. Geological Survey, 677 Ala Moana Blvd., Suite 415, Honolulu, Hawaii, 96813.

Data Collection and Computation

Measurements of water levels are made in many types of wells, under varying conditions, but the method of measurement are standardized to the extent possible. The equipment and measuring techniques used at each observation well ensure that measurements at each well are of consistent accuracy and reliability.

Most methods for collecting and analyzing water samples are described in the U.S. Geological Survey TWRI publications referred to in the "On-site Measurements and Sample Collection" and the "Laboratory Measurements" sections in this data report. In addition, the TWRI Book 1, Chapter D2, describes guidelines for the collection and field analysis of ground-water samples for selected constituents. The values reported in this report represent water-quality conditions at the time of sampling as much as possible, consistent with available sampling techniques and methods of analysis. These methods are consistent with ASTM standards and generally follow ISO standards. All samples were obtained by trained personnel. The wells sampled were pumped long enough to assure that the water collected came directly from the aquifer and had not stood for a long time in the well casing where it would have been exposed to the atmosphere and to the material, possibly metal, comprising the casings.

Tables of water-level data are presented by islands. The prime identification number for a given well is the 15-digit number that appears in the upper left corner of the table. The secondary identification number is the local well number, a 7-digit number based on the local identifier well-numbering system (page 5).

Water-level records are obtained from direct measurements with a steel or electrical tape or from the graph, digital record, or electronic record of a water-stage recorder. The 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 every day. When complete water-level data for a day is not available, the day is noted with three dashes (---).

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.

Data Presentation

Each well record consists of three parts, the station description, the data table of mean daily water levels observed during the current water year, and a hydrograph of water levels observed during the past 5 years. The description of the well is presented first through use of descriptive headings preceding the tabular data. The comments to follow clarify information presented under the various headings.

LOCATION.--This paragraph follows the well-identification number and reports the latitude and longitude (given in degrees, minutes, and seconds); a landline location designation; the hydrologic unit number; the distance and direction from a geographic point of reference; and the owner's name.

AQUIFER.--This entry designates by name (if a name exists) and geologic age the aquifer(s) open to the well.

WELL CHARACTERISTICS.--This entry describes the well in terms of depth, diameter, casing depth and (or) screened interval, method of construction, use, and additional information such as casing breaks, collapsed screen, and other changes since construction.

INSTRUMENTATION.--This paragraph provides information on both the frequency of measurement and the collection method used, allowing the user to better evaluate the reported water-level extremes by knowing whether they are based on weekly, monthly, or some other frequency of measurement.

DATUM.--This entry describes the land-surface elevation at the well. The elevation of the land-surface datum is described is described in feet above (or below) mean sea level; it is reported with a precision depending on the method of determination.

REMARKS.--This entry describes factors that may influence the water level in a well or the measurement of the water level. It should identify wells that also are water-quality observation wells, and may be used to acknowledge the assistance of local (non-U.S. Geological Survey) observers.

PERIOD OF RECORD.--This entry indicates the period for which there are published records for the well. It reports the month and year of the start of publication of water-level records by the U.S. Geological Survey and the words "to current year" if the records are to be continued into the following year. Periods for which water-level records are available, but are not published by the U.S. Geological Survey, may be noted.

EXTREMES FOR PERIOD OF RECORD.--This entry contains the highest and lowest water levels of the period of published record, with respect to land-surface datum, and the dates of their occurrence.

A table of water levels follows the station description for each well. Water levels are reported in feet above mean sea level and all taped measurements of water levels are listed. For wells equipped with a recorder, only abbreviated tables are published; generally, only water-level lows are listed for every fifth day and at the end of the month (eom). Because all values are not published for wells with recorders, the extremes may be values that are not listed in the table. Missing records are indicated by dashes in place of the water level.

ACCESS TO USGS WATER DATA

Real-time streamflow, water level, and rainfall data collected by the USGS in Hawaii are available at:

http://hi.water.usgs.gov

Some water-quality and ground-water data also are available through the WWW. In addition, data can be provided in various machine-readable formats on magnetic tape or 3-1/2 inch floppy disk. Information about the availability of specific types of data or products, and user charges, can be obtained locally from each of the Water Resources Division district offices (see address on the back of the title page).

DEFINITION OF TERMS

Terms related to streamflow, water-quality, and other hydrologic data, as used in this report, are defined below. See also table for converting English units to International System (SI) Units on the inside of the back cover.

Acid neutralizing capacity (ANC) is the equivalent sum of all bases or base-producing materials, solutes plus particulates, in an aqueous system that can be titrated with acid to an equivalence point. This term designates titration of an "unfiltered" sample (formerly reported as alkalinity).

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, 325,851 gallons, or 1,233 cubic meters.

Adenosine triphosphate (ATP) is an organic, phosphate-rich, compound important in the transfer of energy in organisms. Its central role in living cells makes it an excellent indicator of the presence of living material in water. A measurement of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter.

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

Algal growth potential (AGP) is the maximum algal dry weight biomass that can be produced in a natural water sample under standardized laboratory conditions. The growth potential is the algal biomass present at stationary phase and is expressed as milligrams dry weight of algae produced per liter of sample.

Alkalinity is the capacity of solutes in an aqueous system to neutralize acid. This term designates titration of a "filtered" sample.

Annual runoff is the total quantity of water in runoff for a drainage area for the year. Data reports may use any of the following units of measurement in presenting annual runoff data:

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

Cubic foot per second per square mile [CFSM, $(ft^3/s)/mi^2$] is the average number of cubic feet of water flowing per second from each square mile of area drained, assuming the runoff is distributed uniformly in time and area.

Inch (IN., in.) as used in this report, refers to the depth to which the drainage area would be covered with water if all of the runoff for a given time period were uniformly distributed on it.

Bacteria are microscopic unicellular organisms, typically spherical, rodlike, or spiral and threadlike in shape, often clumped into colonies. Some bacteria cause disease, while 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. This group includes coliforms that inhabit the intestine of warm-blooded animals and those that inhabit soils. They are characterized as aerobic or facultative anaerobic, gram-negative, nonspore-forming, rod-shaped bacteria that ferment lactose with gas formation within 48 hours at 35°C. In the laboratory, these bacteria are defined as all the organisms that produce colonies with a golden-green metallic sheen within 24 hours when incubated at 35°C plus or minus 1.0°C on M-Endo medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Fecal coliform bacteria are bacteria that are present in the intestine or feces of warm-blooded animals. They are often used as indicators of the sanitary quality of the water. In the laboratory, they are defined as all organisms that produce blue colonies within 24 hours when incubated at 44.5°C plus or minus 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 in the intestine of warm-blooded animals. Their presence in water is considered to verify fecal pollution. They are characterized as gram-positive, cocci bacteria that are capable of growth in brain-heart infusion broth. In the laboratory, they are defined as all the organisms that produce red or pink colonies within 48 hours at 35°C plus or minus 1.0°C on KF-streptococcus medium (nutrient medium for bacterial growth). Their concentrations are expressed as number of colonies per 100 mL of sample.

Enterococcus bacteria are commonly found in the feces of humans and other warm-blooded animals. Although some strains are ubiquitous and not related to fecal pollution, the presence of enterococci in water is an indication of fecal pollution and the possible presence of enteric pathogens. Enterococcus bacteria are those bacteria that produce pink to red colonies with black or reddish-brown precipitate after incubation at 41°C on mE agar and subsequent transfer to EIA medium. Enterococci include *Streptococcus feacalis, Streptococcus feacium, Streptococcus avium,* and their variants.

Escherichia coli (E. coli) are bacteria present in the intestine and feces of warm-blooded animals. *E. coli* are a member species of the fecal coliform group of indicator bacteria. In the laboratory, they are defined as those bacteria that produce yellow or yellow-brown colonies on a filter pad saturated with urea substrate broth after primary culturing for 22 to 24 hours at 44.5°C on mTEC medium. Their concentrations are expressed as number of colonies per 100 mL of sample.

Base flow is flow in a channel sustained by ground-water discharge in the absence of direct runoff.

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

Benthic organisms (invertebrates) are the group of animals inhabiting the bottom of an aquatic environment. They include a number of types of organisms, such as bacteria, fungi, insect larvae and nymphs, snails, clams, and crayfish. They are useful as indicators of water quality.

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

Biomass is the amount of living matter present at any given time, expressed as mass 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. Ash mass of zooplankton and phytoplankton is expressed in grams per cubic meter (g/m^3), and periphyton and benthic organisms in grams per square meter (g/m^2).

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

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

Biomass pigment ratio is an indicator of the total proportion of periphyton which are autotrophic (plants). This is also called the Autotrophic Index.

Bottom material: See "Bed material."

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

Confined aquifer is a term used to describe an aquifer containing water between two relatively impermeable boundaries. The water level in a well tapping a confined aquifer stands above the top of the confined aquifer and can be higher or lower than the water table that may be present in the material above it. In some cases the water level can rise above the ground surface, yielding a flowing well.

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.

Continuous-record station is a site that meets either of the following conditions:

1. Stage or streamflow are recorded at some interval on a continuous basis. The recording interval is usually 15 minutes, but may be less or more frequent.
2. Water-quality, sediment, or other hydrologic measurements are recorded at least daily.

Control designates a feature in the channel downstream from a gaging station that physically influences the water-surface elevation and thereby determines the stage-discharge relation at the station. This feature may be a constriction of the channel, a bedrock outcrop, a gravel bar, 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 saltwater.

Cubic foot per second (CFS, ft^3/s) is the rate of discharge representing a volume of 1 cubic foot passing a given point in 1 second. It is equivalent to approximately 7.48 gallons per second; 448.8 gallons per minute, or 0.02832 cubic meters per second.

Cubic foot per second-day (CFS-DAY, Cfs-day, [(ft^3/s)/d]) 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, 646,317 gallons, or 2,447 cubic meters.

Daily record is a summary of streamflow, sediment, or water-quality values computed from data collected with sufficient frequency to obtain reliable estimates of daily mean values.

Daily record station is a site for which daily records of streamflow, sediment, or water-quality values are computed.

Datum, as used in this report, is an elevation above mean sea level to which all gage height readings are referenced.

Discharge, or flow, is the volume of water (or more broadly, volume of fluid including solid- and dissolved-phase material), that passes a given point in a given period of time.

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days in a year. Note that most low-flow frequency analyses of annual 7-day minimum flows use a climatic year (April 1-March 31). The date shown in the summary statistics table is the initial date of the 7-day period. (This value should not be confused with the 7-day 10-year low-flow statistic.)

Instantaneous discharge is the discharge at a particular instant of time.

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

Dissolved refers to that material in a representative water sample that 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.

Dissolved oxygen (DO) content of water in equilibrium with air is a function of atmospheric pressure, temperature, and dissolved-solids concentration of the water. The ability of water to retain oxygen decreases with increasing temperature or dissolved solids, with small temperature changes having the more significant offset. Photosynthesis and respiration may cause diurnal variations in dissolved-oxygen concentration in water from some streams.

Dissolved-solids concentration of water is determined either analytically by the "residue-on-evaporation" method, or mathematically by totaling the concentrations of individual constituents reported in a comprehensive chemical analysis. During that analytical determination of dissolved solids, the bicarbonate (generally a major dissolved component of water) is converted to carbonate. Therefore, in the mathematical calculation of dissolved-solids concentration, the bicarbonate value, in milligrams per liter, is multiplied by 0.4926 to reflect the change. Alternatively, alkalinity concentration (as mg/L $CaCO_3$) can be converted to carbonate concentration by multiplying by 0.60.

Drainage area of a site on a stream is that area, measured in a horizontal plane, that has a common outlet at the site for its surface runoff. Figures of drainage area given herein include all closed basins, or noncontributing areas, within the area unless otherwise specified.

Drainage basin is a part of the Earth's surface that is occupied by a drainage system with a common outlet for its surface runoff (see "Drainage area").

Dry weight refers to the weight of animal tissue after it has been dried in an oven at 65 °C until a constant weight is achieved. Dry weight represents total organic and inorganic matter in the tissue.

Flow-duration percentiles are values on a scale of 100 that indicate the percentage of time for which a flow is not exceeded. For example, the 90th percentile of river flow is greater than or equal to 90 percent of all recorded flow rates.

Gage datum is the elevation of the zero point of the reference gage from which gage height is determined as compared to sea level (see "Datum"). This elevation is established by a system of levels from known benchmarks, by approximation from topographic maps, or by geographical positioning system.

Gage height (G.H.) is the water-surface elevation referenced to the 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 site on a stream, canal, lake, or reservoir where systematic observations of stage, discharge, or other hydrologic data are obtained. When used in connection with a discharge record, the term is applied only to those gaging stations where a continuous record of discharge is computed.

Gas chromatography/flame ionization detector (GC/FID) is a laboratory analytical method used as a screening technique for semivolatile organic compounds that are extractable from water in methylene chloride.

Ground-water level is the elevation of the water table or another potentiometric surface at a particular location.

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 the equivalent concentration of calcium carbonate ($CaCO_3$).

High tide is the maximum height reached by each rising tide. The high-high and low-high tides are the higher and lower of the two high tides, respectively, of each tidal day. *See NOAA web site:*

http://www.co-ops.nos.noaa.gov/tideglos.html

Hydrologic benchmark 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 benchmark station may be used to separate effects of natural from human-induced changes in other basins that have been developed and in which the physiography, climate, and geology are similar to those in the undeveloped benchmark basin.

Hydrologic unit is a geographic area representing part or all of a surface drainage basin or distinct hydrologic feature as defined by the former Office of Water Data Coordination and delineated on the State Hydrologic Unit Maps by the U.S. Geological Survey. Each hydrologic unit is identified by an 8-digit number.

Land-surface datum (lsd) is a datum plane that is approximately at land surface at each ground-water observation well.

Low tide is the minimum height reached by each falling tide. The high-low and low-low tides are the higher and lower of the two low tides, respectively, of each tidal day. *See NOAA web site:*

http://www.co-ops.nos.noaa.gov/tideglos.html

Measuring point (MP) is an arbitrary permanent reference point from which the distance to water surface in a well is measured to obtain water level.

Membrane filter is a thin microporous material of specific pore size used to filter bacteria, algae, and other very small particles from water.

Micrograms per gram (UG/G, µg/g) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the element per unit mass (gram) of material analyzed.

Micrograms per kilogram (UG/KG, µg/kg) is a unit expressing the concentration of a chemical constituent as the mass (micrograms) of the constituent per unit mass (kilogram) of the material analyzed. One microgram per kilogram is equivalent to 1 part per billion.

Micrograms per liter (UG/L, µg/L) is a unit expressing the concentration of chemical constituents in water as mass (micrograms) of constituent per unit volume (liter) of water. One thousand micrograms per liter is equivalent to 1 milligram per liter.

Microsiemens per centimeter (US/CM, µS/cm) is a unit expressing the amount of electrical conductivity of a solution as measured between opposite faces of a centimeter cube of solution at a specified temperature. Siemens is the International System of Units nomenclature. It is synonymous with mhos and is the reciprocal of resistance in ohms.

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

Miscellaneous site, or miscellaneous station, is a site where streamflow, sediment, and/or water-quality data are collected once, or more often on a random or discontinuous basis.

National Geodetic Vertical Datum of 1929 (NGVD of 1929) is a geodetic datum derived from a general adjustment of the first order level nets of the United States and Canada. It was formerly called "Sea Level Datum of 1929" or "mean sea level" in this series of reports. Although the datum was derived from the average sea level over a period of many years at 26 tide stations along the Atlantic, Gulf of Mexico, and Pacific Coasts, it does not necessarily represent local mean sea level at any particular place. *See NOAA web site:*

http://www.ngs.noaa.gov/faq.shtml#WhatVD29VD88

Nephelometric turbidity unit (NTU) is the measurement for reporting turbidity that is based on use of a standard suspension of Formazin. Turbidity measured in NTU uses nephelometric methods that depend on passing specific light of a specific wavelength through the sample.

Open or screened interval is the length of unscreened opening or of well screen through which water enters a well, in feet below land surface.

Organic carbon (OC) is a measure of organic matter present in aqueous solution, suspension, or bottom sediments. May be reported as dissolved organic carbon (DOC), suspended organic carbon (SOC), or total organic carbon (TOC).

Organism is any living entity.

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 meter (m^2), acre, or hectare. 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 milliliter (mL) or liter (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.

Organochlorine compounds are any chemicals that contain carbon and chlorine. Organochlorine compounds that are important in investigations of water, sediment, and biological quality include certain pesticides and industrial compounds.

Parameter Code is a 5-digit number used in the U.S. Geological Survey computerized data system, National Water Information System (NWIS), to uniquely identify a specific constituent or property.

Partial-record station is a site where discrete measurements of one or more hydrologic parameters are obtained over a period of time without continuous data being recorded or computed. A common example is a crest-stage gage partial-record station at which only peak stages and flows are recorded.

Particle size is the diameter, in millimeters (mm), of a particle determined by sieve or sedimentation methods. The sedimentation method utilizes the principle of Stokes Law to calculate sediment particle sizes. Sedimentation methods (pipet, bottom-withdrawal tube, visual-accumulation tube, Sedigraph) 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 the recommendation 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	0.004-0.062	Sedimentation
Sand	0.062-2.0	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 matter 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 or **percent of total** 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, weight, or volume.

Periodic station is a site where stage, discharge, sediment, chemical, or other hydrologic measurements are made one or more times during a year, but at a frequency insufficient to develop a daily record.

Periphyton is the assemblage of microorganisms attached to and living upon submerged solid surfaces. While primarily consisting of algae, they also include bacteria, fungi, protozoa, rotifers, and other small organisms. Periphyton are useful indicators of water quality.

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

pH of water is the negative logarithm of the hydrogen-ion activity. Solutions with pH less than 7 are termed "acidic," and solutions with a pH greater than 7 are termed "basic." Solutions with a pH of 7 are neutral. The presence and concentration of many dissolved chemical constituents found in water are, in part, influenced by the hydrogen-ion activity of water. Biological processes including growth, distribution of organisms, and toxicity of the water to organisms are also influenced, in part, by the hydrogen-ion activity of water.

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. Concentrations are expressed as a number of cells per milliliter (cells/mL of sample).

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 (*Cyanophyta*) 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 a siliceous shell. Their concentrations are expressed as number of cells per milliliter (cells/mL) of sample.

Green algae have chlorophyll pigments similar in color to those of higher green plants. Some forms produce algae mats or floating "moss" in lakes. Their concentrations are expressed as number of cells per milliliter (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 the grazers in the aquatic environment, the zooplankton are a vital part of the aquatic food web. The zooplankton community is dominated by small crustaceans and rotifers.

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

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 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.

Recurrence interval, also referred to as return period, is the average time, usually expressed in years, between occurrences of hydrologic events of a specified type (such as exceedances of a specified high flow or non-exceedance of a specified low flow). The terms "return period" and "recurrence interval" do not imply regular cyclic occurrence. The actual times between occurrences vary randomly, with most of the times being less than the average and a few being substantially greater than the average. For example, the 100-year flood is the flow rate that is exceeded by the annual maximum peak flow at intervals whose average length is 100 years (that is, once in 100 years, on average); almost two-thirds of all exceedances of the 100-year flood occur less than 100 years after the previous exceedance, half occur less than 70 years after the previous exceedance, and about one-eighth occur more than 200 years after the previous exceedance. Similarly, the 7-day 10-year low flow ($7Q_{10}$) is the flow rate below which the annual minimum 7-day-mean flow dips at intervals whose average length is 10 years (that is, once in 10 years, on average); almost two-thirds of the non-exceedances of the $7Q_{10}$ occur less than 10 years after the previous non-exceedance, half occur less than 7 years after, and about one-eighth occur more than 20 years after the previous non-exceedance. The recurrence interval for annual events is the reciprocal of the annual probability of occurrence. Thus, the 100-year flood has a 1-percent chance of being exceeded by the maximum peak flow in any year, and there is a 10-percent chance in any year that the annual minimum 7-day-mean flow will be less than the $7Q_{10}$.

Replicate samples are a group of samples collected in a manner such that the samples are thought to be essentially identical in composition.

Runoff in inches (IN., in.) is the depth, in inches, to which the drainage area would be covered if all the runoff for a given time period were uniformly distributed on it.

Sea level refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment of the first-order level nets of the United States and Canada, formerly called Sea Level Datum of 1929. *See: http://www.co-ops.nos.noaa.gov/ glossary/gloss_n.html#NGVD*

Sediment is solid material that is transported by, suspended in, or deposited from water. It originates mostly from disintegrated rocks; it also 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.

Bed load is the sediment that is transported in a stream by rolling, sliding, or skipping along or very close to the bed. In this report, bed load is considered to consist of particles in transit from the bed to an elevation equal to the top of the bed-load sampler nozzle (usually within 0.25 ft of the streambed).

Bed-load discharge (tons per day) is the quantity of sediment moving as bed load, reported as dry weight, that passes a cross section in a given time.

Suspended sediment is the sediment that 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). The entire sample is used for the analysis.

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

Suspended-sediment discharge (tons/day) is the quantity of sediment moving in suspension, reported as dry weight, that passes a cross section in a given time. It is calculated in units of tons per day as follows: concentration (mg/L) × discharge (ft^3/s) × 0.0027.

Suspended-sediment load is a term that refers to material in suspension. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with either suspended-sediment discharge or concentration.

Total sediment discharge (tons/day) is the sum of the suspended-sediment discharge and the bed-load discharge. It is the total quantity of sediment, reported as dry weight, that passes a cross section in a given time.

Total sediment load or total load is a term that refers to the total sediment (bed load plus suspended-sediment load) that is in transport. The term needs to be qualified, such as "annual suspended-sediment load" or "sand-size suspended-sediment load," and so on. It is not synonymous with total sediment discharge.

Solute is any substance that is dissolved in water.

Specific conductance is a measure of the ability of a water to conduct an electrical current. It is expressed in microsiemens per centimeter at 25°C. Specific conductance is related to the type and concentration of ions in solution and can be used for approximating the dissolved-solids content of the water. Commonly, the concentration of dissolved solids (in milligrams per liter) is from 55 to 75 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

Stage: See "Gage height."

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

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.

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 multiplate samplers (made of hardboard) for benthic organism collection, and plexiglass strips for periphyton collection.

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

Surface area of a lake or impoundment is that area encompassed by the boundary of the lake or impoundment as shown on USGS topographic maps, or on other available maps or photographs. The computed surface areas reflect the water levels of the lakes or impoundments at the times when the information for the maps or photographs was obtained.

Surficial bed material is the top 0.1 to 0.2 ft of the bed material that is sampled using U.S. Series Bed-Material Samplers.

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

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

Synoptic Studies are short-term investigations of specific water-quality conditions during selected seasonal or hydrologic periods to provide improved spatial resolution for critical water-quality conditions. For the period and conditions sampled, they assess the spatial distribution of selected water-quality conditions in relation to causative factors, such as land use and contaminant sources.

Taxonomy is the division of biology concerned with the classification and naming of organisms. The classification of organisms is based upon a hierarchial 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	*Hexagenia*
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 is the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration of the constituent, in milligrams per liter, by 0.00136.

Tons per day (T/DAY, tons/d) is the rate representing a mass of 1 ton of a constituent in streamflow passing a cross section in 1 day. It is equivalent to 2,000 pounds per day, or 0.9072 metric tons per day.

Total is the total amount of a given constituent in a representative 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 suspended-sediment mixture and that the analytical method determined all of the constituent in the sample.)

Total discharge is the quantity of a given constituent, measured as dry mass or volume, that passes a stream cross section per unit of time. When referring to constituents other than water, this term needs to be qualified, such as "total sediment discharge," "total chloride discharge," and so on.

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."

Total load refers to all of a constituent in transport. When referring to sediment, it includes suspended load plus bed load.

Total recoverable is the amount of a given constituent that is in solution after a representative 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 are required of all laboratories performing such analyses because different digestion procedures are likely to produce different analytical results.

Turbidity is a measurement of the collective optical properties of a water sample that cause light to be scattered and absorbed rather than transmitted in straight lines; the higher the intensity of scattered light, the higher the turbidity. Turbidity is expressed in nephelometric turbidity units (NTU) or Formazin turbidity units (FTU) depending on the method and equipment used.

Volatile organic compounds (VOC's) are organic compounds that can be isolated from the water phase of a sample by purging the water sample with inert gas, such as helium, and subsequently analyzed by gas chromatography. Many VOC's are manmade chemicals that are used and produced in the manufacture of paints, adhesives, petroleum products, pharmaceuticals, and refrigerants. They are often components of fuels, solvents, hydraulic fluids, paint thinners, and dry cleaning agents commonly used in urban settings. VOC contamination of drinking-water supplies is a human health concern because many are toxic and are known or suspected human carcinogens (U.S. Environmental Protection Agency, 1996).

Water level is the water-surface elevation or stage of the free surface of a body of water above or below any datum (see "Gage height"), or the surface of water standing in a well, usually indicative of the position of the water table or other potentiometric surface.

Water table is the surface of a ground-water body at which the water is at atmospheric pressure.

Water-table aquifer is an unconfined aquifer within which is found the water table.

Water year in U.S. Geological Survey reports dealing with surface-water supply is the 12-month period October 1 through September 30. The water year is designated by the calendar year in which it ends and which includes 9 of the 12 months. Thus, the year ending September 30, 1999, is called the "1999 water year."

WDR is used as an abbreviation for "Water-Data Report" in the REVISED RECORDS paragraph to refer to State annual hydrologic-data reports. (WRD was used as an abbreviation for "Water-Resources Data" in reports published prior to 1976.)

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 the 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.

Well is an excavation (pit, hole, tunnel), generally cylindrical in form and often walled in, drilled, dug, driven, bored, or jetted into the ground to such a depth as to penetrate water-yielding geologic material and allow the water to flow or to be pumped to the surface.

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

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS

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

The reports listed below are for sale by the U.S. Geological Survey, Branch of Information Services, Box 25286, Federal Center, Denver, Colorado 80225 (authorized agent of the Superintendent of Documents, Government Printing Office). Prepayment is required. Remittance should be sent by check or money order payable to the U.S. Geological Survey. Prices are not included because they are subject to change. Current prices can be obtained by writing to the above address or calling (888) ASK-USGS. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

Book 1. Collection of Water Data by Direct Measurement

Section D. Water Quality

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.

Book 2. Collection of Environmental Data

Section D. Surface Geophysical Methods

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-D2. *Application of seismic-refraction techniques to hydrologic studies*, by F.P. Haeni: USGS--TWRI Book 2, Chapter D2. 1988. 86 pages.

Section E. Subsurface Geophysical Methods

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.

2-E2. *Borehole geophysics applied to ground-water investigations*, by W.S. Keys: USGS--TWRI Book 2, Chapter E2. 1990. 150 pages.

Section F. Drilling and Sampling Methods

2-F1. *Application of drilling, coring, and sampling techniques to test holes and wells*, by Eugene Shuter and W.E. Teasdale: USGS--TWRI Book 2, Chapter F1. 1989. 97 pages.

Book 3. Applications of Hydraulics

Section A. Surface-Water Techniques

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.

PUBLICATIONS ON TECHNIQUES OF WATER-RESOURCES INVESTIGATIONS--Continued

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.

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

3-A9. *Measurement of time of travel in streams by dye tracing*, by F.A. Kilpatrick and J.F. Wilson, Jr.: USGS--TWRI Book 3, Chapter A9. 1989. 27 pages.

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

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

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

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

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5-A1. *Methods for determination of inorganic substances in water and fluvial sediments*, by M.J. Fishman and L.C. Friedman, editors: USGS--TWRI Book 5, Chapter A1. 1989. 545 pages.

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

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6-A3. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 1: Model Description and User's Manual*, by L.J. Torak: USGS--TWRI Book 6, Chapter A3. 1993. 136 pages.

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6-A5. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 3: Design philosophy and programming details*, by L.J. Torak: USGS--TWRI Book 6, Chapter A5. 1993. 243 pages.

6-A6. *A coupled surface-water and ground-water flow model (MODBRANCH) for simulation of stream-aquifer interaction*, by Eric D. Swain and Eliezer J. Wexler: USGS--TWRI Book 6, Chapter A6. 1995. 125 pages.

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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.

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Book 8. Instrumentation

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

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Book 9. Handbooks for Water-Resources Investigations

Section A. National Field Manual for the Collection of Water-Quality Data

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Surface-Water Station Records for Kauai

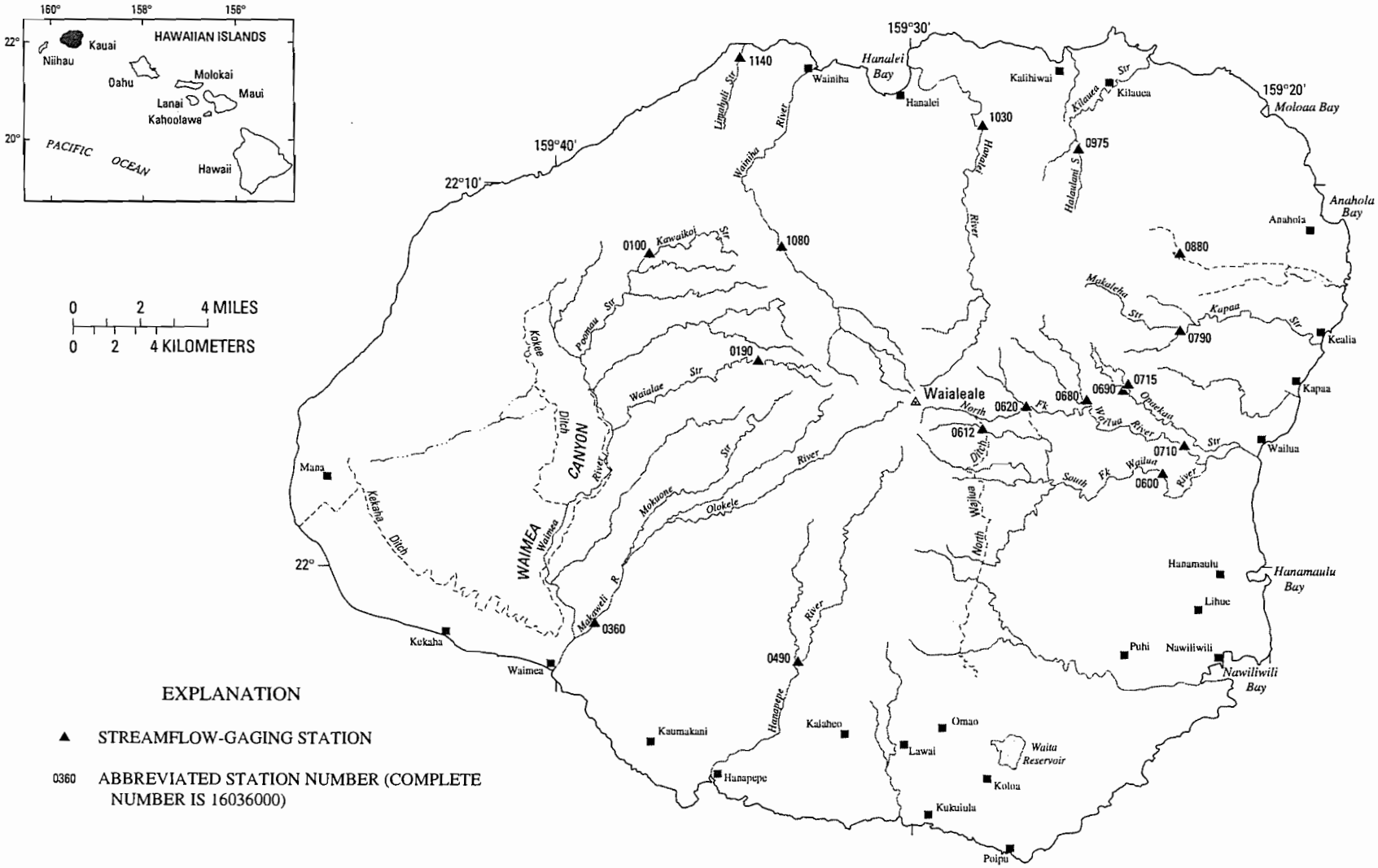


Figure 5. Locations of streamflow-gaging stations on Kauai.

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

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

DRAINAGE AREA.--3.95 mi^2.

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

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

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

REMARKS.--Records computed by Roy Taogoshi. Records good. No diversion upstream.

AVERAGE DISCHARGE.--83 years (water years 1912, 1914, 1920-2000), 34.2 ft^3/s (24,790 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Apr. 03	1200	*1,610	*7.02				

Minimum discharge, 1.6 ft^3/s, September 26, 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	5.5	163	16	11	3.9	139	7.4	3.0	4.9	5.6	3.8
2	4.6	7.1	37	13	9.9	3.7	611	7.0	2.9	4.6	4.9	3.3
3	4.4	5.6	27	12	9.5	3.7	946	6.6	2.9	54	4.2	3.0
4	6.5	26	25	11	9.1	3.6	592	6.4	3.4	11	3.7	2.8
5	11	20	17	10	8.6	3.4	129	6.0	14	6.4	3.6	2.8
6	7.4	9.2	19	9.7	8.0	3.4	63	5.7	5.2	54	4.2	3.4
7	8.1	39	28	9.6	7.4	3.3	38	5.4	77	33	5.1	3.6
8	9.5	18	18	11	7.2	3.3	95	5.3	20	10	3.8	3.7
9	8.0	37	49	13	7.0	3.1	114	5.2	7.2	6.5	3.4	3.8
10	33	14	209	15	6.7	3.1	58	5.0	5.0	5.4	3.1	3.4
11	9.1	7.9	98	22	6.5	3.1	29	5.0	4.0	5.3	3.1	2.9
12	7.8	30	46	11	6.3	3.0	21	6.7	3.6	13	3.0	2.7
13	14	12	41	21	6.1	3.0	18	15	3.3	13	2.9	3.4
14	8.1	7.8	31	115	6.1	2.9	15	7.1	3.2	7.0	3.0	3.2
15	5.8	6.4	22	289	7.0	2.9	14	5.5	3.0	8.2	2.9	2.7
16	4.8	5.4	15	58	6.1	2.7	24	4.9	2.9	12	2.9	2.5
17	4.6	5.1	13	25	5.9	2.7	31	4.7	21	9.8	2.9	2.3
18	30	6.9	11	86	5.5	2.7	24	4.5	39	6.1	8.6	2.2
19	55	5.3	10	273	5.3	4.6	15	4.3	13	5.1	5.4	2.2
20	42	6.0	40	161	5.1	3.9	12	4.1	6.4	4.5	35	2.1
21	31	5.6	28	207	4.9	3.6	11	3.9	4.7	4.2	19	2.0
22	31	4.9	60	49	4.9	5.6	10	3.7	12	4.1	7.1	1.9
23	9.5	4.5	26	26	4.9	6.0	9.9	3.7	25	4.4	4.7	1.8
24	7.0	4.1	48	20	4.7	13	10	3.7	34	11	3.9	1.7
25	6.1	3.9	26	17	4.4	7.2	11	3.6	13	45	3.8	1.7
26	5.5	3.9	171	64	4.4	50	16	3.5	8.0	32	4.0	1.7
27	5.2	103	31	24	4.2	80	29	3.4	5.8	18	3.2	1.6
28	5.0	150	20	15	4.1	25	16	3.3	4.8	23	3.4	2.5
29	4.7	62	23	13	3.9	10	9.7	3.2	4.6	8.8	38	4.0
30	4.5	44	71	12	---	17	8.2	3.1	6.4	6.2	10	4.3
31	4.4	---	23	11	---	127	---	3.1	---	5.1	5.1	---
TOTAL	392.3	660.1	1446	1639.3	184.7	410.4	3118.8	160.0	358.3	435.6	213.5	83.0
MEAN	12.7	22.0	46.6	52.9	6.37	13.2	104	5.16	11.9	14.1	6.89	2.77
MAX	55	150	209	289	11	127	946	15	77	54	38	4.3
MIN	4.4	3.9	10	9.6	3.9	2.7	8.2	3.1	2.9	4.1	2.9	1.6
AC-FT	778	1310	2870	3250	366	814	6190	317	711	864	423	165

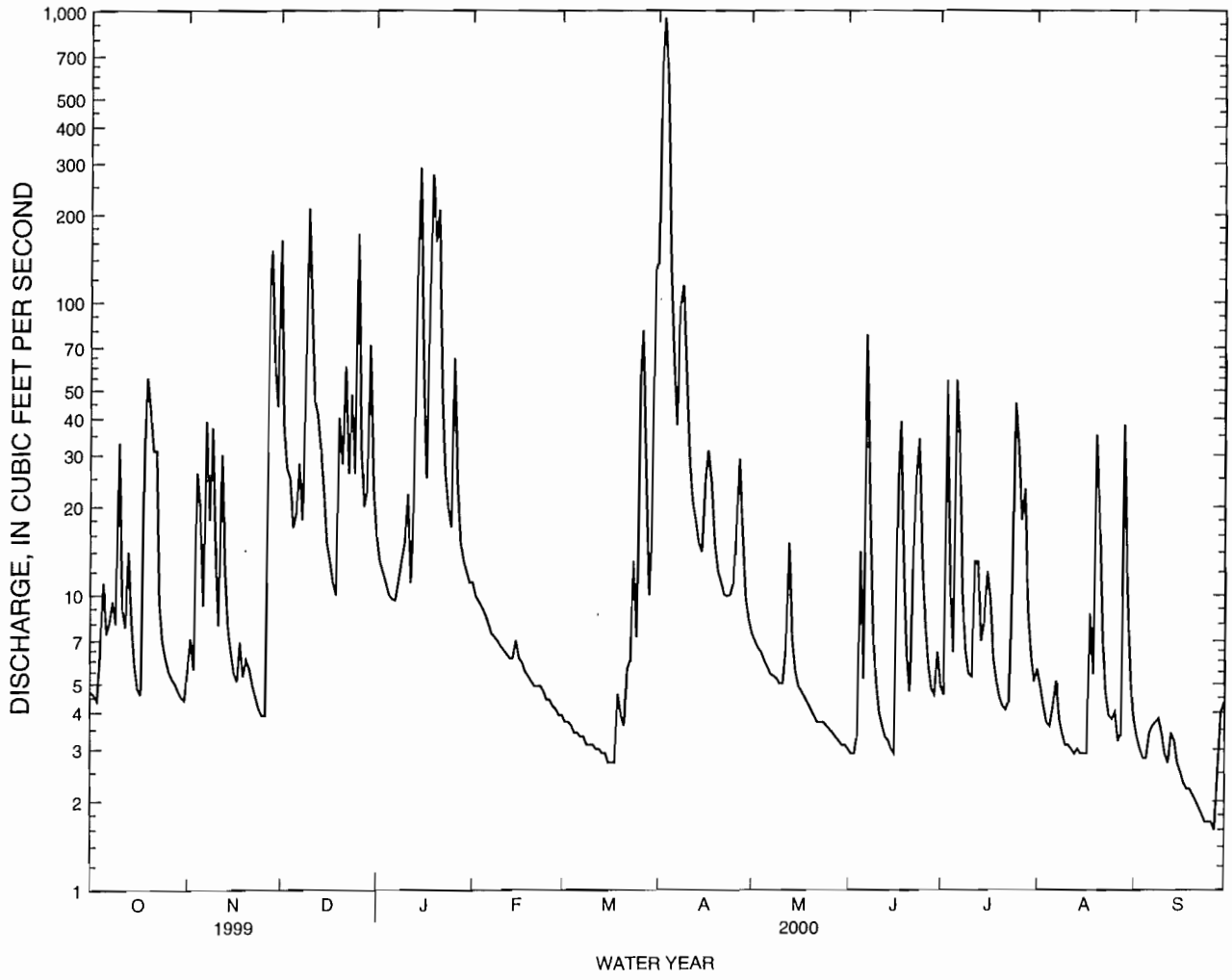
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 2000, BY WATER YEAR (WY)

MEAN	21.5	44.3	53.1	53.7	41.1	48.7	46.1	27.1	17.1	23.4	21.5	14.4
MAX	60.3	170	176	343	165	152	115	86.2	68.7	94.7	195	58.1
(WY)	1917	1929	1968	1921	1956	1951	1980	1927	1978	1989	1950	1992
MIN	3.34	4.16	11.9	3.23	4.26	6.15	5.74	3.38	3.58	5.18	2.54	1.86
(WY)	1985	1964	1923	1945	1945	1926	1992	1966	1951	1922	1984	1953

HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1911 - 2000	
ANNUAL TOTAL	8673.5		9102.0			
ANNUAL MEAN	23.8		24.9		34.2	
HIGHEST ANNUAL MEAN					60.7	1982
LOWEST ANNUAL MEAN					15.3	1945
HIGHEST DAILY MEAN	538	Jan 22	946	Apr 3	2620	Jan 15 1921
LOWEST DAILY MEAN	3.1	Jun 5	1.6	Sep 27	1.1	Sep 21 1953
ANNUAL SEVEN-DAY MINIMUM	3.4	May 30	1.8	Sep 21	1.2	Sep 17 1953
ANNUAL RUNOFF (AC-FT)	17200		18050		24790	
10 PERCENT EXCEEDS	54		47		74	
50 PERCENT EXCEEDS	10		6.8		13	
90 PERCENT EXCEEDS	4.6		3.0		4.4	



HAWAII, ISLAND OF KAUAI

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

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

DRAINAGE AREA.--1.79 mi^2.

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

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

GAGE.--Water-stage recorder. Elevation of gage is 3,820 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records good. No diversion upstream.

AVERAGE DISCHARGE.--59 years (water years 1921-31, 1953-2000), 21.3 ft^3/s (15,450 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1615	*1,970	*5.55	No other peak greater than base discharge.			

Minimum discharge, 1.9 ft^3/s, March 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	6.8	133	8.6	5.0	2.5	39	4.1	2.0	6.3	4.0	3.9
2	3.5	6.7	175	7.2	4.6	2.5	278	3.7	2.0	14	3.6	3.4
3	3.3	4.7	49	6.4	4.4	2.3	344	3.5	2.0	65	3.4	3.2
4	3.7	159	21	5.8	4.3	2.3	347	3.4	1.9	13	3.2	3.0
5	3.5	22	15	5.4	4.2	2.3	55	3.2	2.6	6.2	3.1	3.5
6	22	8.7	26	6.3	4.0	2.1	29	3.2	2.4	153	3.7	8.4
7	7.8	23	33	29	3.8	2.1	17	3.2	16	104	3.7	14
8	12	14	14	19	3.6	2.1	15	3.3	14	10	3.1	8.6
9	8.9	24	45	27	3.5	2.1	16	3.7	6.5	5.9	2.9	5.7
10	12	11	270	30	3.5	2.1	20	3.7	4.4	4.4	2.8	4.3
11	6.3	7.1	92	24	3.3	2.1	11	4.3	3.1	41	2.8	3.9
12	6.3	23	55	17	3.3	2.1	7.4	14	4.0	30	2.7	8.4
13	16	11	41	15	3.2	2.0	6.0	13	4.8	11	2.7	5.0
14	9.1	6.8	24	37	3.2	2.0	5.2	4.9	5.7	6.0	2.7	3.6
15	9.5	5.4	18	119	3.0	2.0	4.7	3.5	3.6	20	2.5	3.2
16	5.7	4.7	12	39	3.0	2.0	5.8	3.0	2.7	50	2.7	3.0
17	4.4	4.2	9.3	17	3.0	1.9	10	2.8	4.9	12	12	2.8
18	4.1	4.0	7.9	45	2.9	2.2	9.8	2.7	6.1	8.6	12	2.8
19	24	3.8	7.3	97	2.8	17	6.1	2.6	4.2	7.1	5.8	2.6
20	83	7.3	130	78	2.8	3.7	4.8	2.5	2.9	5.1	15	2.5
21	95	14	71	108	2.8	2.8	4.4	2.4	2.6	7.3	36	2.5
22	29	9.7	57	24	2.8	3.1	4.2	2.3	2.8	8.0	6.6	2.3
23	9.5	7.3	54	13	2.8	3.5	4.7	2.3	5.6	6.2	19	2.3
24	6.7	5.4	49	10	2.8	14	17	2.3	13	5.3	6.8	2.2
25	5.4	4.6	42	8.4	2.8	6.8	9.3	2.3	13	11	4.6	2.1
26	4.4	7.3	163	26	2.9	18	8.8	2.2	6.0	15	4.0	2.1
27	4.1	42	22	12	2.9	57	24	2.1	5.6	15	3.7	2.1
28	4.1	72	14	8.1	2.7	21	11	2.1	3.9	16	4.6	27
29	3.9	17	11	6.4	2.6	13	5.9	2.1	3.4	8.9	51	25
30	4.0	22	17	5.7	---	13	4.7	2.0	5.1	5.5	10	6.8
31	4.6	---	12	5.2	---	26	---	2.0	---	4.4	5.0	---
TOTAL	419.5	558.5	1689.5	859.5	96.5	237.6	1324.8	112.4	156.8	675.2	245.7	170.2
MEAN	13.5	18.6	54.5	27.7	3.33	7.66	44.2	3.63	5.23	21.8	7.93	5.67
MAX	95	159	270	119	5.0	57	347	14	16	153	51	27
MIN	3.3	3.8	7.3	5.2	2.6	1.9	4.2	2.0	1.9	4.4	2.5	2.1
AC-FT	832	1110	3350	1700	191	471	2630	223	311	1340	487	338

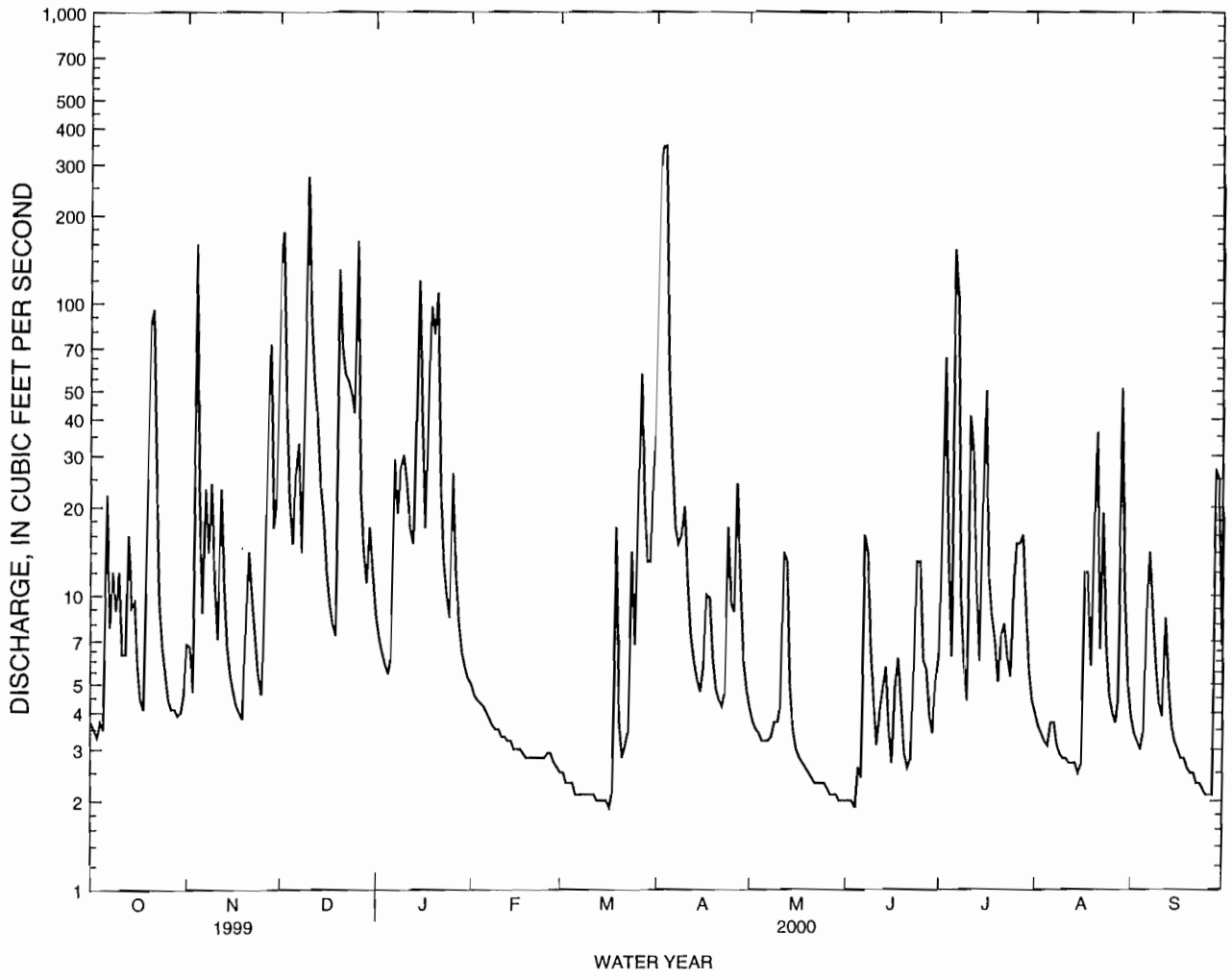
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 2000, BY WATER YEAR (WY)

MEAN	15.6	32.5	34.1	33.2	26.6	27.7	24.6	13.1	10.0	15.5	12.3	10.9
MAX	52.1	99.2	106	166	155	106	92.4	44.1	39.4	58.0	44.9	56.0
(WY)	1995	1968	1968	1921	1956	1982	1974	1927	1978	1989	1959	1922
MIN	2.49	5.58	4.16	4.48	2.44	2.15	1.87	1.81	1.89	2.56	2.86	1.67
(WY)	1927	1927	1923	1966	1983	1926	1966	1966	1975	1984	1952	1975

HAWAII, ISLAND OF KAUAI

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

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1920 - 2000	
ANNUAL TOTAL	7811.1		6546.2			
ANNUAL MEAN	21.4		17.9		21.3	
HIGHEST ANNUAL MEAN					40.9	1982
LOWEST ANNUAL MEAN					8.94	1926
HIGHEST DAILY MEAN	366	Jan 22	347	Apr 4	1440	Dec 1 1957
LOWEST DAILY MEAN	2.7	Jun 15	1.9	Mar 17	.99	May 17 1966
ANNUAL SEVEN-DAY MINIMUM	3.0	Jun 11	2.0	May 29	1.1	May 26 1966
ANNUAL RUNOFF (AC-FT)	15490		12980		15450	
10 PERCENT EXCEEDS	54		40		45	
50 PERCENT EXCEEDS	8.2		5.7		6.6	
90 PERCENT EXCEEDS	3.5		2.4		2.6	



HAWAII, ISLAND OF KAUAI

16036000 MAKAWELI RIVER NEAR WAIMEA

LOCATION.--Lat 21°58′31″, long 159°38′55″, Hydrologic Unit 20070000, on left bank 0.7 mi upstream from confluence to Waimea River, and 1.9 mi northeast of Waimea.

DRAINAGE AREA.--26.0 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makaweli. A 5 ft^3/s capacity ditch diverts water 0.1 mi upstream of station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--57 years (water years 1944-2000), 85.5 ft^3/s (61,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,000 ft^3/s, January 31, 1975, gage height, 15.51 ft, from rating curve extended above 3,200 ft^3/s on basis of slope-area measurement at gage height 10.65 ft; minimum, 3.2 ft^3/s, July 19, 1951.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 4,700 ft^3/s: and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1700	*9,090	*10.77	No other peak greater than base discharge.			

Minimum discharge, 4.7 ft^3/s, September 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	12	20	321	47	19	11	45	13	9.2	29	12	12
2	12	14	580	41	18	11	419	12	9.1	25	11	9.9
3	12	13	205	32	18	11	856	12	8.8	202	11	9.6
4	13	731	87	29	17	10	1020	12	9.5	40	11	9.7
5	12	159	62	27	16	10	244	11	11	18	10	11
6	98	34	54	40	16	10	109	11	9.2	268	10	47
7	25	77	93	88	16	10	66	10	14	334	14	92
8	27	34	36	64	15	10	41	13	13	51	12	72
9	19	78	103	94	15	10	44	19	14	32	15	33
10	19	26	899	108	15	11	41	11	10	24	10	16
11	15	18	522	84	15	11	29	18	9.8	232	10	39
12	15	69	300	145	14	11	24	46	53	261	9.7	78
13	50	23	258	46	14	10	21	44	17	136	9.6	17
14	20	16	117	60	14	10	19	14	18	24	10	11
15	25	14	88	265	15	10	18	11	11	120	9.4	10
16	16	13	67	93	14	10	23	10	9.6	245	12	10
17	14	13	48	48	14	9.7	37	10	12	56	52	10
18	13	13	35	109	13	9.7	28	10	11	94	23	16
19	30	12	32	407	13	46	19	10	11	26	14	11
20	294	77	539	304	13	13	14	9.8	11	44	45	9.6
21	282	39	383	307	13	12	13	9.6	10	76	175	10
22	179	25	445	84	13	13	14	9.7	12	31	19	10
23	31	49	271	53	13	11	15	9.7	14	20	52	10
24	22	17	296	43	13	33	42	9.7	20	19	18	10
25	18	14	217	38	13	31	24	9.5	23	27	23	11
26	16	18	556	71	29	41	20	9.3	15	38	11	10
27	15	42	178	42	14	186	48	9.3	32	39	28	9.8
28	15	168	93	33	12	76	27	9.3	13	30	14	224
29	13	44	72	22	11	56	15	9.1	23	22	215	110
30	14	36	64	20	---	32	13	9.0	19	14	37	30
31	27	---	55	20	---	28	---	9.1	---	13	18	---
TOTAL	1373	1906	7076	2864	435	763.4	3348	410.1	492.2	2590	920.7	958.6
MEAN	44.3	63.5	228	92.4	15.0	24.6	112	13.2	16.4	83.5	29.7	32.0
MAX	294	731	899	407	29	186	1020	46	53	334	215	224
MIN	12	12	32	20	11	9.7	13	9.0	8.8	13	9.4	9.6
AC-FT	2720	3780	14040	5680	863	1510	6640	813	976	5140	1830	1900

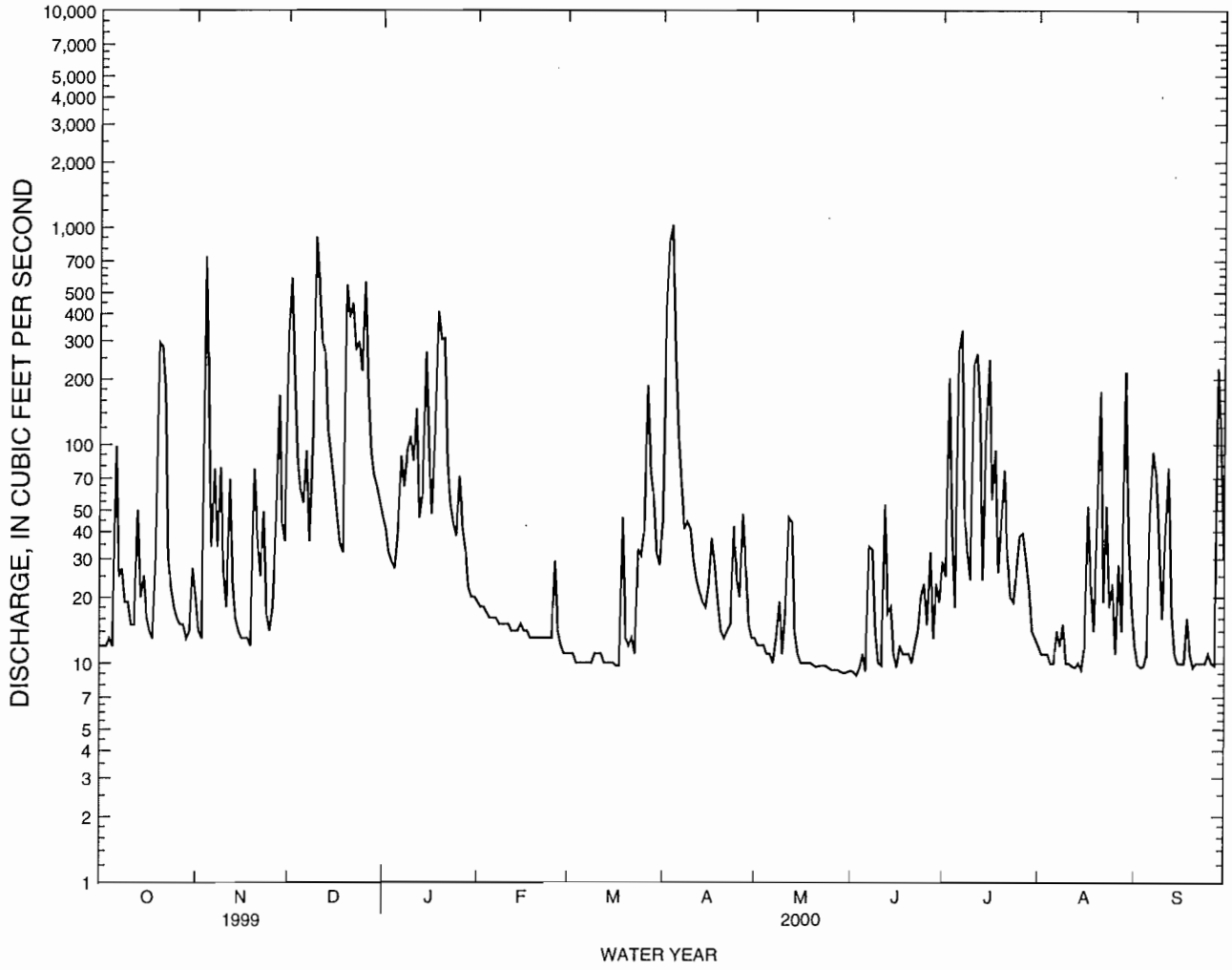
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 2000, BY WATER YEAR (WY)

MEAN	59.5	125	143	129	113	127	96.2	55.6	38.3	53.5	50.9	36.7
MAX	311	491	577	441	774	609	419	283	106	222	328	204
(WY)	1995	1991	1993	1989	1956	1982	1963	1965	1996	1989	1950	1994
MIN	11.7	15.2	18.0	9.49	12.0	10.6	11.6	13.2	9.56	10.0	14.2	9.54
(WY)	1960	1951	1977	1945	1978	1959	1992	2000	1951	1984	1944	1962

HAWAII, ISLAND OF KAUAI

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1943 - 2000	
ANNUAL TOTAL	26941		23137.0			
ANNUAL MEAN	73.8		63.2		85.5	
HIGHEST ANNUAL MEAN					204	1982
LOWEST ANNUAL MEAN					31.1	1984
HIGHEST DAILY MEAN	899	Dec 10	1020	Apr 4	5170	Dec 1 1957
LOWEST DAILY MEAN	12	Jan 20	8.8	Jun 3	4.3	Jul 19 1951
ANNUAL SEVEN-DAY MINIMUM	12	Sep 7	9.1	May 28	5.7	Oct 21 1944
ANNUAL RUNOFF (AC-FT)	53440		45890		61950	
10 PERCENT EXCEEDS	204		176		170	
50 PERCENT EXCEEDS	23		19		27	
90 PERCENT EXCEEDS	13		10		12	



HAWAII, ISLAND OF KAUAI

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE

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

DRAINAGE AREA.--18.5 mi^2.

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

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

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Koula ditch diverts water 3.0 mi upstream of station for irrigation in vicinity of Makaweli.

AVERAGE DISCHARGE.--76 years (water years 1918-20, 1928-2000), 83.8 ft^3/s (60,680 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1630	*3,910	*6.28	No other peak greater than base discharge.			

Minimum discharge, 12 ft^3/s, for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	17	285	73	19	14	27	15	13	29	15	16
2	14	16	364	69	18	14	167	15	12	20	15	15
3	14	15	169	66	18	14	839	15	12	143	15	15
4	15	309	75	64	18	14	1370	15	12	27	15	15
5	14	57	75	39	17	14	236	15	13	16	14	31
6	72	25	102	33	17	14	126	15	12	212	14	40
7	23	71	80	66	17	14	98	15	22	391	15	69
8	23	40	41	51	16	14	52	18	18	37	15	60
9	16	91	83	78	16	14	25	16	15	19	14	30
10	22	45	806	114	16	15	22	15	14	16	15	18
11	14	32	414	78	16	14	19	17	14	185	14	19
12	17	82	352	176	16	14	18	37	35	420	14	109
13	72	37	312	61	15	14	18	23	14	184	15	27
14	39	32	151	93	15	14	17	15	14	32	14	17
15	25	27	122	345	15	14	17	15	14	155	14	18
16	15	15	102	103	15	14	22	14	13	312	15	16
17	15	14	89	52	15	14	36	14	14	89	41	15
18	14	14	82	122	15	15	20	14	14	132	22	28
19	93	14	78	630	15	17	17	14	14	41	15	16
20	350	50	683	406	14	14	16	14	14	50	51	15
21	322	36	288	303	14	15	16	14	16	97	116	16
22	151	18	304	108	14	14	16	14	16	46	18	15
23	85	38	234	74	14	14	17	13	16	27	38	14
24	81	18	242	58	14	17	32	13	22	29	28	14
25	44	14	226	49	14	18	18	13	15	26	22	15
26	17	14	425	79	28	41	18	13	14	32	15	14
27	17	41	136	43	16	187	31	13	20	34	29	14
28	16	117	86	39	14	62	18	13	14	23	38	234
29	15	29	94	37	14	52	16	13	25	21	236	114
30	16	19	86	36	---	39	15	13	17	17	33	36
31	29	---	80	28	---	30	---	13	---	16	18	---
TOTAL	1674	1347	6666	3573	465	774	3359	476	478	2878	953	1075
MEAN	54.0	44.9	215	115	16.0	25.0	112	15.4	15.9	92.8	30.7	35.8
MAX	350	309	806	630	28	187	1370	37	35	420	236	234
MIN	14	14	41	28	14	14	15	13	12	16	14	14
AC-FT	3320	2670	13220	7090	922	1540	6660	944	948	5710	1890	2130

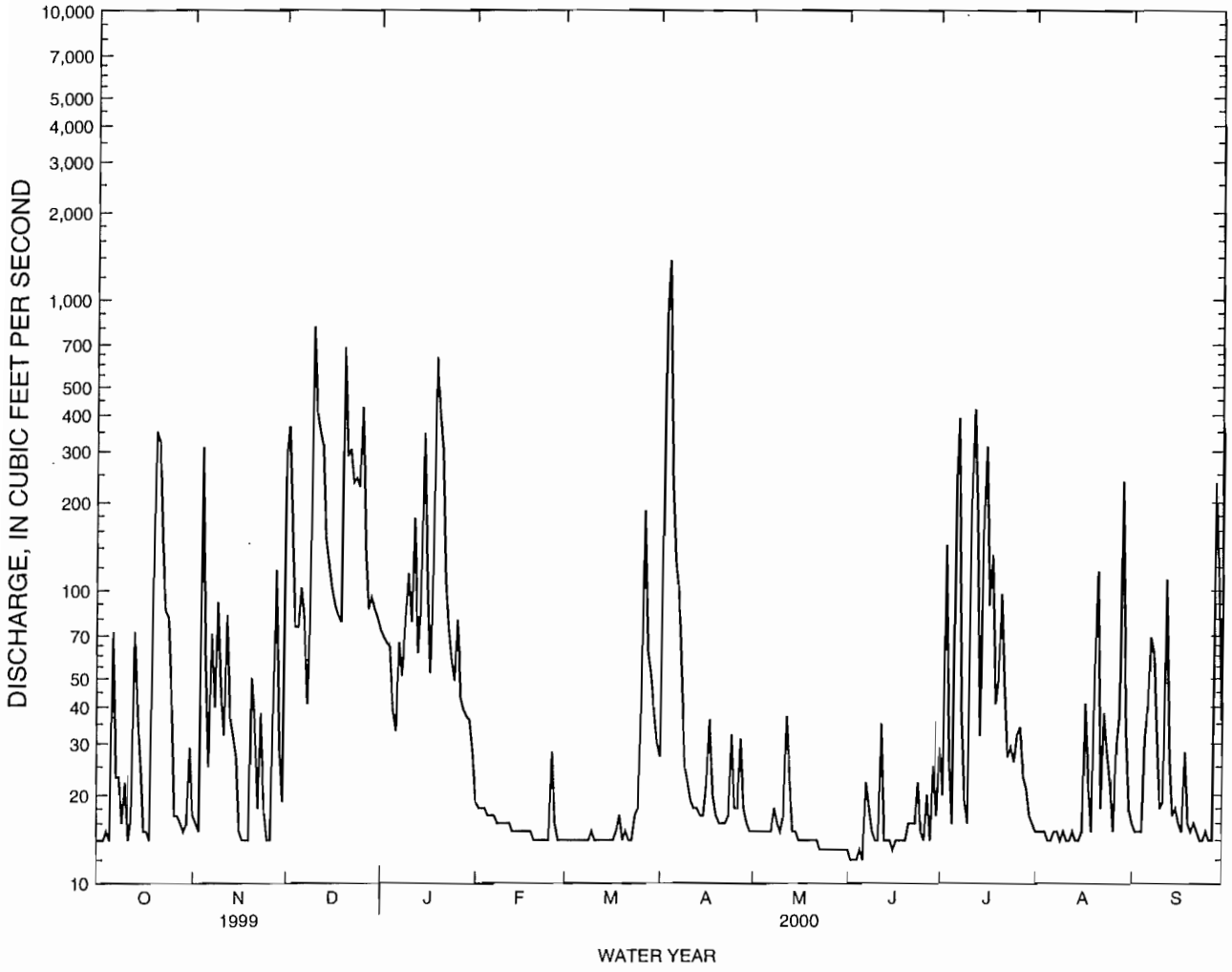
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 2000, BY WATER YEAR (WY)

MEAN	61.6	106	116	109	97.5	113	91.6	65.0	52.3	72.8	71.0	52.9
MAX	240	430	720	578	657	803	470	201	175	202	222	190
(WY)	1995	1991	1920	1920	1932	1918	1963	1965	1978	1989	1931	1994
MIN	11.5	15.3	13.0	11.7	15.0	8.84	13.2	12.9	12.1	13.6	18.4	11.7
(WY)	1954	1977	1986	1986	1986	1959	1941	1958	1959	1953	1953	1953

HAWAII, ISLAND OF KAUAI

16049000 HANAPEPE RIVER BELOW MANUAHI STREAM, NEAR ELEELE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1917 - 2000	
ANNUAL TOTAL	28792		23718			
ANNUAL MEAN	78.9		64.8		83.8	
HIGHEST ANNUAL MEAN					182	1918
LOWEST ANNUAL MEAN					30.6	1953
HIGHEST DAILY MEAN	806	Dec 10	1370	Apr 4	10900	Dec 3 1919
LOWEST DAILY MEAN	14	Jun 13	12	Jun 2	5.3	May 21 1954
ANNUAL SEVEN-DAY MINIMUM	14	Sep 28	12	May 31	6.4	May 10 1954
ANNUAL RUNOFF (AC-FT)	57110		47040		60680	
10 PERCENT EXCEEDS	235		152		172	
50 PERCENT EXCEEDS	31		18		29	
90 PERCENT EXCEEDS	15		14		15	



HAWAII, ISLAND OF KAUAI

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--22.4 mi^2.

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

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

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Lihue and Hanamaulu ditches divert water upstream of station for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--83 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-2000), 116 ft^3/s (84,130 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1830	*6,130	*14.68	No other peak greater than base discharge.			

Minimum discharge, 2.7 ft^3/s, May 29 to June 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.0	53	244	107	84	5.0	55	39	2.7	96	59	65
2	6.5	28	520	100	77	5.0	216	37	2.9	58	68	45
3	4.9	29	366	95	71	4.8	613	33	2.9	137	72	41
4	28	574	181	91	68	4.5	1120	7.0	2.9	53	46	36
5	6.6	203	178	83	64	4.4	351	4.7	3.7	25	22	34
6	133	84	154	95	60	4.2	233	4.4	3.3	159	18	93
7	74	119	175	133	39	4.1	245	4.6	3.5	319	17	132
8	68	74	118	122	9.5	4.0	160	4.8	21	100	19	143
9	35	148	156	150	8.8	4.0	169	20	4.9	63	10	88
10	34	69	689	180	8.5	4.0	142	5.8	3.3	49	9.2	48
11	20	45	546	157	8.1	3.9	97	8.1	3.1	191	7.4	37
12	23	86	415	415	7.8	3.8	68	40	7.6	950	6.3	219
13	135	51	653	156	7.5	3.8	58	79	9.3	424	4.9	122
14	89	36	348	179	7.3	3.6	49	33	3.6	126	6.1	75
15	102	30	253	602	7.3	3.6	42	25	12	271	5.7	141
16	47	21	195	235	7.0	3.6	49	21	20	336	6.5	93
17	41	7.5	129	140	6.8	3.5	71	20	26	200	44	88
18	38	6.6	143	224	6.6	3.7	72	19	22	271	22	179
19	204	6.6	109	1040	6.9	6.1	45	15	26	142	5.1	91
20	566	98	609	655	6.7	4.4	35	4.2	14	216	22	77
21	346	84	233	491	18	3.4	32	3.2	22	248	130	91
22	253	32	314	268	19	3.4	34	3.2	33	199	33	65
23	134	106	234	203	22	3.3	35	3.0	38	155	97	56
24	130	104	219	138	20	6.0	74	2.9	48	145	68	50
25	96	67	218	87	17	13	83	2.9	42	141	86	46
26	43	69	423	142	46	25	67	2.9	26	144	47	44
27	40	79	176	75	44	157	88	2.9	99	148	98	41
28	39	231	142	57	31	78	69	2.8	12	125	67	332
29	26	82	127	48	6.6	78	49	2.8	25	101	332	325
30	28	44	118	46	---	63	43	2.8	48	78	115	166
31	53	---	113	59	---	35	---	2.7	---	67	74	---
TOTAL	2849.0	2666.7	8498	6573	785.4	549.1	4464	456.7	587.7	5737	1617.2	3063
MEAN	91.9	88.9	274	212	27.1	17.7	149	14.7	19.6	185	52.2	102
MAX	566	574	689	1040	84	157	1120	79	99	950	332	332
MIN	4.9	6.6	109	46	6.6	3.3	32	2.7	2.7	25	4.9	34
AC-FT	5650	5290	16860	13040	1560	1090	8850	906	1170	11380	3210	6080

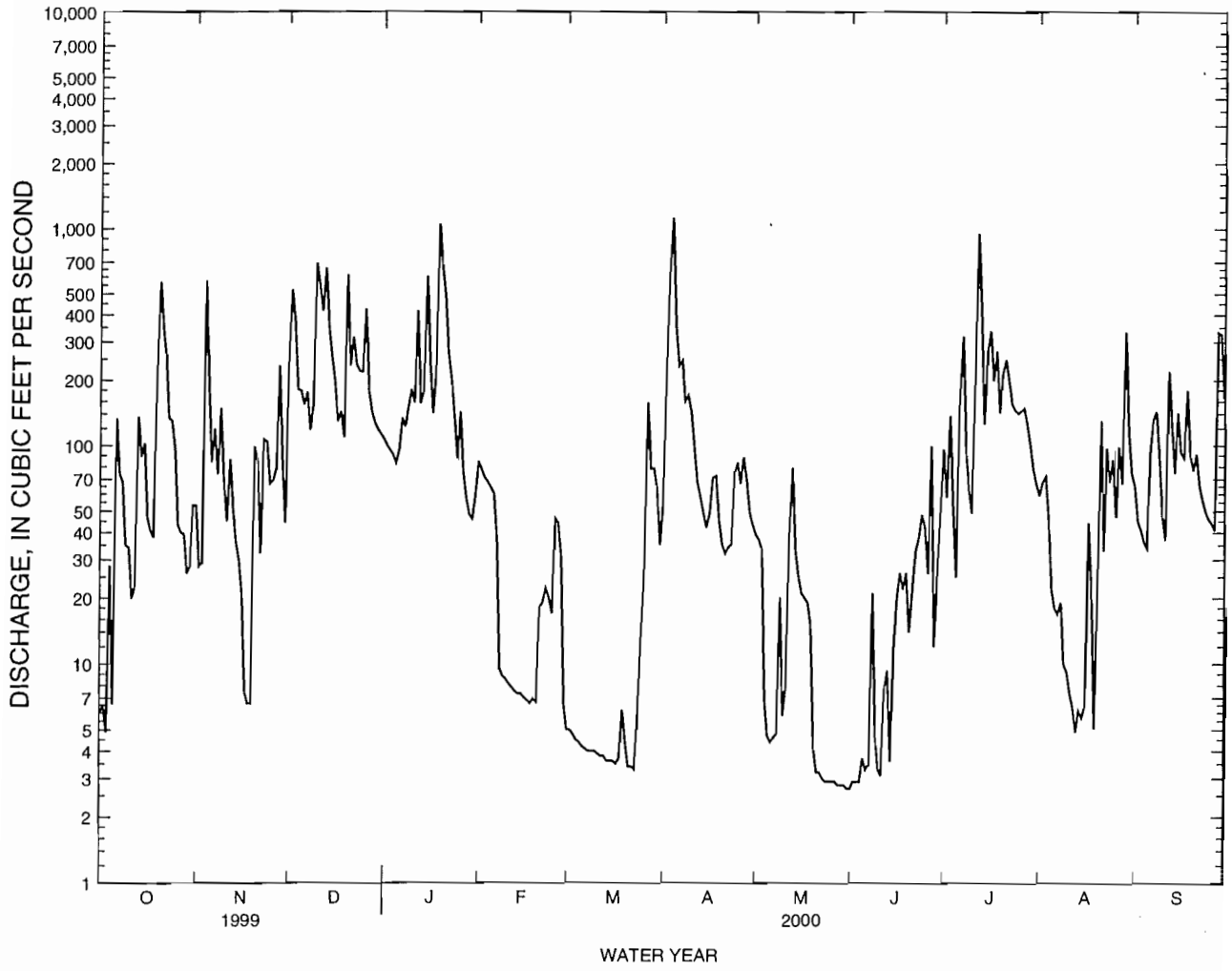
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2000, BY WATER YEAR (WY)

MEAN	92.8	173	173	175	125	146	133	97.3	56.3	77.9	83.2	76.1
MAX	339	866	696	1485	716	830	673	467	271	281	321	650
(WY)	1983	1991	1917	1921	1932	1982	1963	1927	1914	1989	1948	1914
MIN	2.58	3.13	6.61	4.66	3.15	3.46	3.84	3.29	2.82	3.27	4.76	2.59
(WY)	1954	1934	1977	1986	1947	1934	1931	1926	1957	1953	1973	1953

HAWAII, ISLAND OF KAUAI

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1912 - 2000	
ANNUAL TOTAL	42756.0		37846.8			
ANNUAL MEAN	117		103		116	
HIGHEST ANNUAL MEAN					284	1982
LOWEST ANNUAL MEAN					17.3	1984
HIGHEST DAILY MEAN	742	Jan 22	1120	Apr 4	13800	Jan 16 1921
LOWEST DAILY MEAN	4.9	Oct 3	2.7	May 31	1.8	Sep 17 1953
ANNUAL SEVEN-DAY MINIMUM	10	Sep 11	2.8	May 26	1.8	Sep 16 1953
ANNUAL RUNOFF (AC-FT)	84810		75070		84130	
10 PERCENT EXCEEDS	267		238		263	
50 PERCENT EXCEEDS	74		53		39	
90 PERCENT EXCEEDS	20		4.2		4.8	



HAWAII, ISLAND OF KAUAI

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

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

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,070 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records good. Ditch diverts water from North Fork Wailua River and Waikoko Stream for power and irrigation in vicinity of Lihue.

AVERAGE DISCHARGE.--35 years (water years 1966-2000), 21.9 ft^3/s (15,880 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 58 ft^3/s, October 11, 1966; no flow for many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 36 ft^3/s, December 10; minimum daily, 0.60 ft^3/s, July 31.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	21	23	30	21	22	20	23	19	16	26	9.0	20
2	21	22	34	21	21	20	28	19	16	25	20	19
3	22	21	31	21	20	19	31	19	16	27	20	19
4	22	25	26	21	20	19	32	19	18	23	19	19
5	21	14	26	21	20	18	26	19	19	22	19	20
6	28	7.9	27	24	20	17	26	19	17	26	19	23
7	25	13	26	25	20	18	26	19	21	27	18	23
8	25	9.7	24	27	19	18	23	21	20	23	18	24
9	22	14	27	27	19	18	25	21	19	22	12	22
10	22	7.5	36	28	19	18	23	19	18	21	6.4	21
11	21	5.9	31	27	19	17	22	22	18	27	18	21
12	23	11	31	33	19	17	21	23	20	34	18	26
13	27	6.0	35	26	19	17	21	21	20	25	18	22
14	25	4.8	30	29	19	17	20	20	23	20	18	15
15	23	4.2	27	31	19	17	20	19	21	27	18	14
16	23	4.0	25	27	19	17	20	19	19	28	19	17
17	22	10	24	24	19	17	22	18	21	22	22	18
18	23	20	26	28	19	18	21	18	20	25	20	19
19	29	22	24	35	18	18	20	18	19	22	19	17
20	31	26	32	32	18	16	19	18	18	28	23	17
21	29	27	28	30	18	19	20	18	20	28	24	17
22	26	25	27	25	18	17	20	18	20	27	20	16
23	23	26	27	24	19	18	20	18	20	25	23	16
24	24	26	25	23	18	21	24	17	21	25	21	16
25	23	24	25	22	18	22	23	17	22	25	22	16
26	22	23	30	24	22	23	21	17	21	25	20	16
27	23	25	24	22	21	27	23	17	25	25	18	16
28	22	29	23	21	19	23	21	17	21	16	17	21
29	22	24	22	21	19	25	20	17	25	4.3	25	19
30	22	23	22	21	---	22	20	17	24	.64	21	18
31	25	---	22	21	---	20	---	17	---	.60	21	---
TOTAL	737	523.0	847	782	560	593	681	580	598	701.54	585.4	567
MEAN	23.8	17.4	27.3	25.2	19.3	19.1	22.7	18.7	19.9	22.6	18.9	18.9
MAX	31	29	36	35	22	27	32	23	25	34	25	26
MIN	21	4.0	22	21	18	16	19	17	16	.60	6.4	14
AC-FT	1460	1040	1680	1550	1110	1180	1350	1150	1190	1390	1160	1120

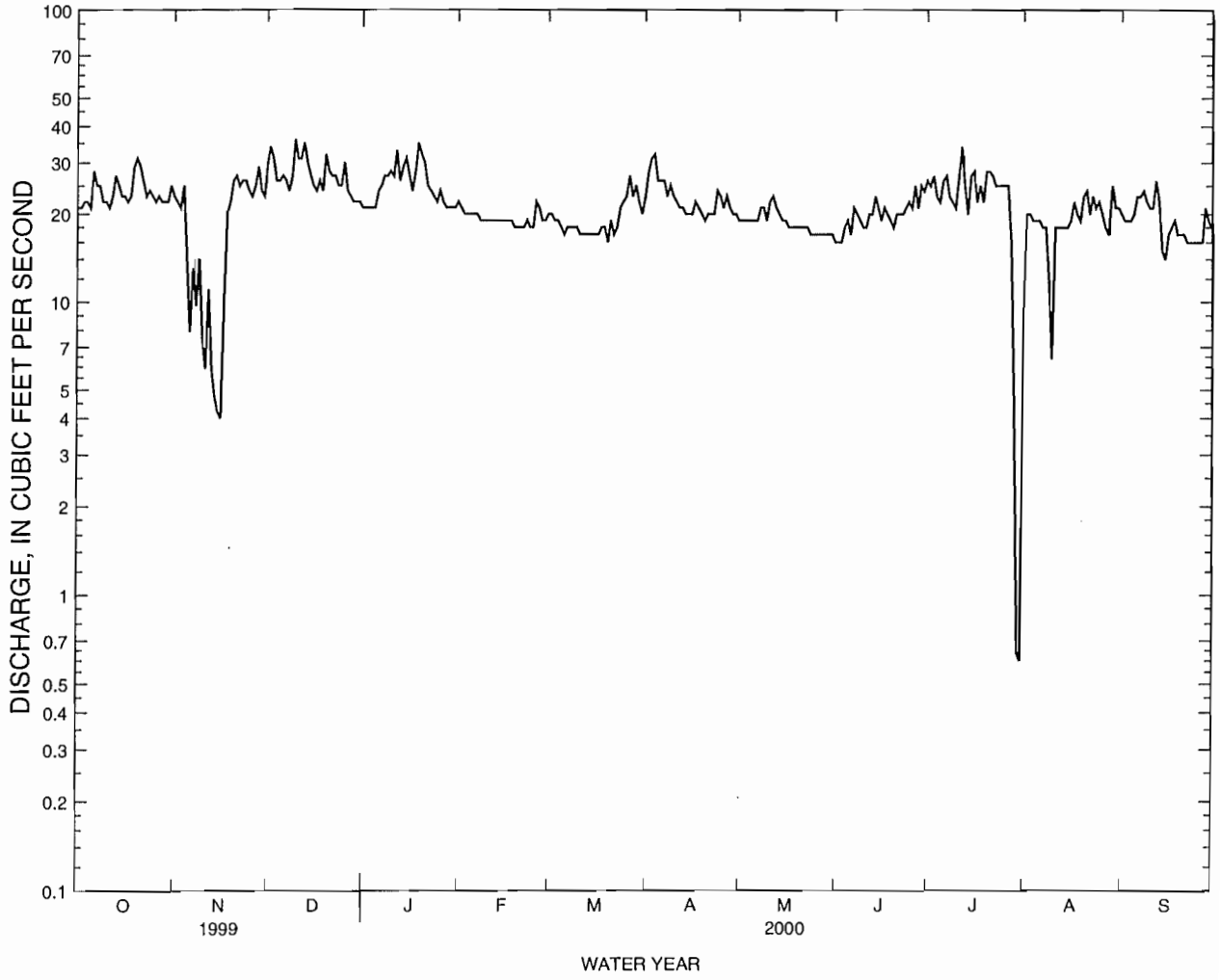
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2000, BY WATER YEAR (WY)

MEAN	22.6	22.8	21.5	20.5	20.7	21.6	22.7	22.1	22.0	22.8	22.5	21.8
MAX	29.7	34.0	33.4	30.1	34.4	32.0	31.8	31.3	28.5	34.0	31.7	30.5
(WY)	1969	1966	1969	1968	1969	1969	1986	1969	1986	1969	1966	1966
MIN	11.0	12.3	2.94	.42	.065	.21	.14	.097	.16	3.89	16.2	13.7
(WY)	1993	1983	1991	1993	1991	1991	1991	1991	1991	1991	1994	1991

HAWAII, ISLAND OF KAUAI

16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1965 - 2000	
ANNUAL TOTAL	8885.0		7754.94			
ANNUAL MEAN	24.3		21.2		21.9	
HIGHEST ANNUAL MEAN					30.3	1969
LOWEST ANNUAL MEAN					6.64	1991
HIGHEST DAILY MEAN	36	Jan 22	36	Dec 10	58	Oct 11 1966
LOWEST DAILY MEAN	4.0	Nov 16	.60	Jul 31	.00	Jan 1 1965
ANNUAL SEVEN-DAY MINIMUM	6.2	Nov 10	6.2	Nov 10	.00	Jan 1 1965
ANNUAL RUNOFF (AC-FT)	17620		15380		15880	
10 PERCENT EXCEEDS	29		27		29	
50 PERCENT EXCEEDS	24		21		22	
90 PERCENT EXCEEDS	22		17		16	



HAWAII, ISLAND OF KAUAI

16062000 STABLE STORM DITCH NEAR LIHUE

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

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

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

REMARKS.--Records computed by Roy Taogoshi. Records fair. Ditch diverts water from North Fork Wailua River for irrigation of sugarcane in vicinity of Lihue.

AVERAGE DISCHARGE.--63 years (water years 1938-2000), 9.20 ft^3/s (6,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 71 ft^3/s, April 3, 1948; no flow on many days.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 7.3 ft^3/s, November 4, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.77	.55	.33	.00	.00	.00	3.1	.83	.14	2.0	2.1	.00
2	.71	.51	2.3	.00	.00	.00	3.7	.74	.11	1.8	1.2	.00
3	1.1	.51	.10	.00	.00	.00	3.8	.74	.06	2.6	.81	.00
4	1.1	7.3	.00	.00	.00	.00	4.0	.74	.04	1.7	.90	.00
5	.77	.03	.00	.00	.00	.00	3.0	.67	.11	1.3	.90	.16
6	2.7	.00	.00	.00	.00	.00	2.9	.59	.00	2.5	.77	.44
7	1.5	.48	.00	.00	.00	.00	2.8	.59	.12	2.8	.47	.44
8	1.2	.15	.00	.00	.00	.00	2.8	.92	.14	1.9	.48	.30
9	.81	.06	.00	.00	.00	.00	2.8	.94	.03	1.6	.43	.18
10	.80	.00	2.4	.00	.00	.00	2.6	.65	.00	1.5	.35	.19
11	.69	.00	.35	.00	.00	.00	2.5	1.1	.02	2.3	.35	.21
12	.84	.24	.75	.18	.00	.00	2.5	1.6	.04	5.0	.35	1.3
13	2.3	.00	2.1	.00	.00	.00	2.5	1.3	.05	3.3	.35	.57
14	1.4	.00	.15	.00	.00	.65	2.5	.79	.20	2.6	.36	.39
15	1.1	.00	.00	.09	.00	1.7	2.5	.66	.10	3.0	.35	.67
16	.95	.00	.00	.00	.00	2.0	2.5	.59	.00	3.2	.35	.32
17	.80	.00	.00	.00	.00	2.2	2.5	.59	.07	2.6	.92	.47
18	1.4	.00	.24	.01	.00	2.5	2.4	.59	.10	2.7	.46	.81
19	3.1	.03	.00	.30	.00	3.4	2.2	.59	.25	2.3	.35	.23
20	4.7	.17	1.6	.16	.00	3.2	2.4	.54	.25	2.4	1.4	.19
21	2.9	.00	.00	.10	.00	3.0	2.7	.53	.34	2.4	.50	.18
22	1.3	.00	.00	.00	.00	2.6	2.5	.46	.45	2.1	.19	.18
23	.91	.00	.01	.00	.00	2.6	3.1	.74	.42	2.2	.28	.18
24	.90	.03	.00	.00	.00	3.8	4.9	.90	.48	2.5	.18	.14
25	.72	.00	.00	.00	.00	4.1	4.8	.90	.77	2.5	.24	.11
26	.59	.00	.08	.00	.00	4.4	4.5	.90	1.9	2.2	.14	.11
27	.54	.00	.00	.00	.00	4.5	4.1	.67	3.2	2.1	.28	.20
28	.51	.02	.00	.00	.00	3.2	1.7	.41	1.3	2.7	.49	2.8
29	.51	.00	.00	.00	.00	3.4	.99	.28	1.7	3.1	.43	2.2
30	.54	.00	.00	.00	---	2.8	.90	.18	1.6	2.8	.01	1.4
31	.88	---	.00	.00	---	2.9	---	.18	---	2.5	.00	---
TOTAL	39.04	10.08	10.41	0.84	0.00	52.95	86.19	21.91	13.99	76.2	16.39	14.37
MEAN	1.26	.34	.34	.027	.000	1.71	2.87	.71	.47	2.46	.53	.48
MAX	4.7	7.3	2.4	.30	.00	4.5	4.9	1.6	3.2	5.0	2.1	2.8
MIN	.51	.00	.00	.00	.00	.00	.90	.18	.00	1.3	.00	.00
AC-FT	77	20	21	1.7	.00	105	171	43	28	151	33	29

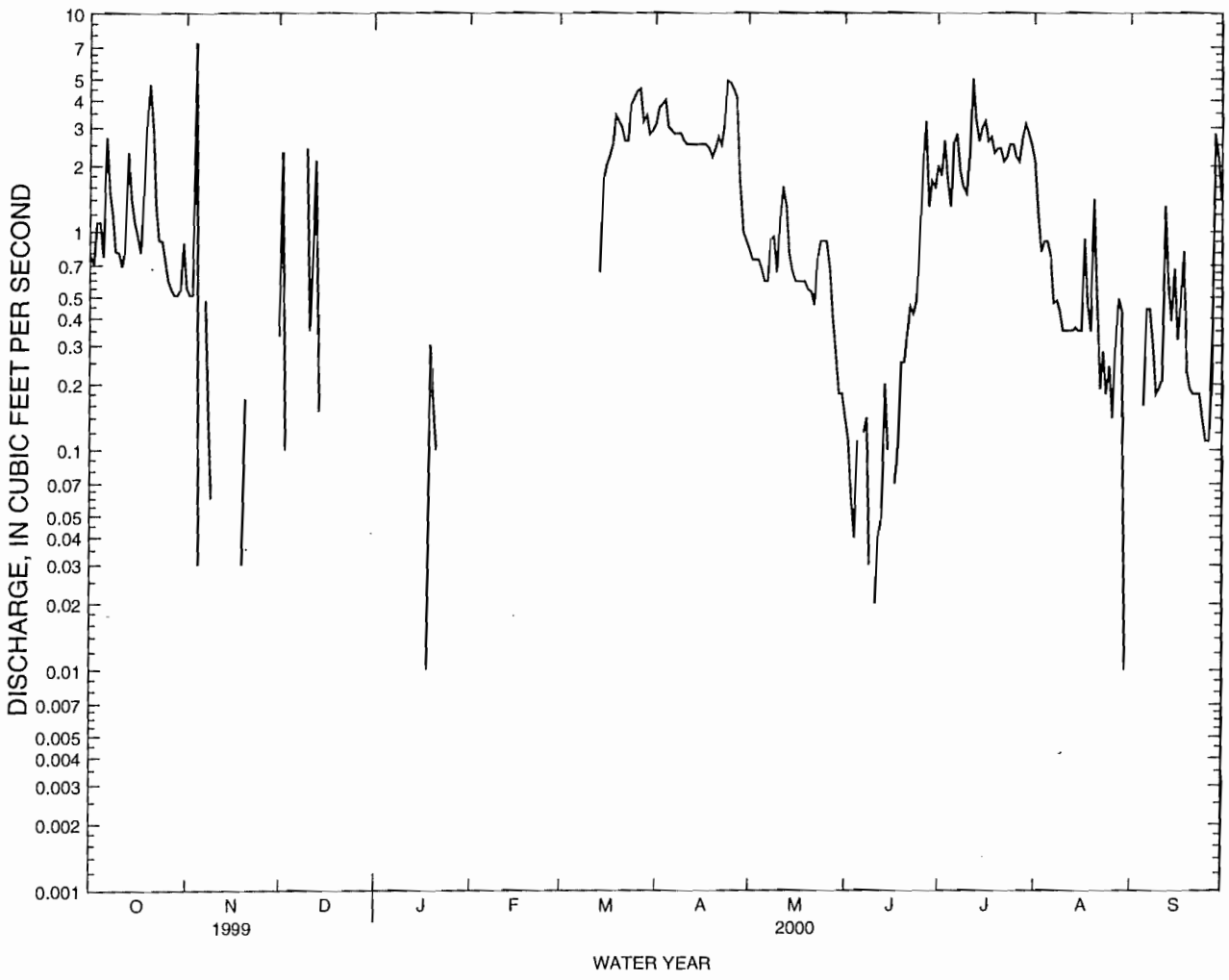
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 2000, BY WATER YEAR (WY)

MEAN	11.9	5.73	4.23	5.96	8.22	7.23	8.28	9.13	14.5	10.9	10.9	13.7
MAX	37.3	35.7	24.8	31.4	32.3	36.0	34.7	34.4	38.7	36.8	37.0	36.1
(WY)	1951	1951	1984	1946	1991	1947	1954	1954	1953	1953	1970	1950
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.014	.000	.000
(WY)	1999	1938	1991	1939	1938	1939	1939	1963	1938	1980	1964	1989

HAWAII, ISLAND OF KAUAI

16062000 STABLE STORM DITCH NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1938 - 2000	
ANNUAL TOTAL	570.54		342.37			
ANNUAL MEAN	1.56		.94		9.20	
HIGHEST ANNUAL MEAN					22.1	1984
LOWEST ANNUAL MEAN					.15	1994
HIGHEST DAILY MEAN	7.3	Nov 4	7.3	Nov 4	71	Apr 3 1948
LOWEST DAILY MEAN	.00	Nov 6	.00	Nov 6	.00	Oct 1 1937
ANNUAL SEVEN-DAY MINIMUM	.00	Nov 13	.00	Dec 27	.00	Oct 1 1937
ANNUAL RUNOFF (AC-FT)	1130		679		6660	
10 PERCENT EXCEEDS	3.4		2.8		33	
50 PERCENT EXCEEDS	1.3		.38		.29	
90 PERCENT EXCEEDS	.01		.00		.00	



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 upstream from mouth and 7.2 mi northwest of Lihue.

DRAINAGE AREA.--6.27 mi^2.

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

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

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

REMARKS.--Records computed by Clayton Yoshida. Records good. No diversion upstream.

AVERAGE DISCHARGE.--85 years (water years 1913-14, 1916-17, 1920-2000), 48.2 ft^3/s (34,890 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 4	1700	*2,770	*6.08	No other peak greater than base discharge.			

Minimum discharge, 11 ft^3/s, June 1-4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	18	23	54	25	28	15	67	16	11	28	25	23
2	17	21	153	24	26	15	166	16	11	24	23	20
3	19	19	82	23	26	15	244	16	11	45	22	20
4	27	182	51	22	25	14	283	15	12	24	21	19
5	18	59	54	21	24	14	92	15	13	18	20	26
6	34	37	44	24	23	14	68	15	12	48	19	39
7	25	65	41	29	21	14	67	14	15	41	21	41
8	22	40	34	31	21	14	57	15	16	25	20	55
9	19	53	45	24	21	14	71	18	14	21	18	39
10	19	34	130	32	20	13	51	15	12	19	17	29
11	17	28	102	30	20	13	39	17	12	33	17	33
12	19	39	227	82	19	13	34	19	13	132	16	102
13	31	28	151	41	19	13	30	23	13	51	16	50
14	23	25	153	67	19	13	27	15	13	33	16	36
15	22	23	70	180	18	13	25	14	12	60	15	45
16	21	22	56	69	18	13	26	14	11	84	16	34
17	19	21	49	46	17	13	31	14	13	52	27	30
18	54	20	51	81	17	13	27	13	16	61	21	35
19	63	21	42	322	17	15	23	13	13	41	17	29
20	199	36	128	184	16	13	21	13	11	62	34	31
21	70	35	47	184	16	13	20	12	12	59	33	29
22	44	30	41	77	16	13	20	12	14	53	19	25
23	32	25	42	59	16	13	19	12	14	44	20	23
24	31	23	36	51	15	16	26	12	18	42	19	22
25	28	21	33	45	15	17	26	12	19	48	43	21
26	25	21	51	66	19	24	23	12	69	46	21	20
27	24	27	33	39	20	45	24	11	52	44	27	20
28	23	48	29	35	17	22	20	11	17	38	56	188
29	21	29	28	33	15	22	18	11	23	33	60	126
30	23	25	30	31	---	20	17	11	21	28	31	65
31	27	---	27	29	---	68	---	11	---	26	26	---
TOTAL	1034	1080	2114	2006	564	547	1662	437	513	1363	756	1275
MEAN	33.4	36.0	68.2	64.7	19.4	17.6	55.4	14.1	17.1	44.0	24.4	42.5
MAX	199	182	227	322	28	68	283	23	69	132	60	188
MIN	17	19	27	21	15	13	17	11	11	18	15	19
AC-FT	2050	2140	4190	3980	1120	1080	3300	867	1020	2700	1500	2530

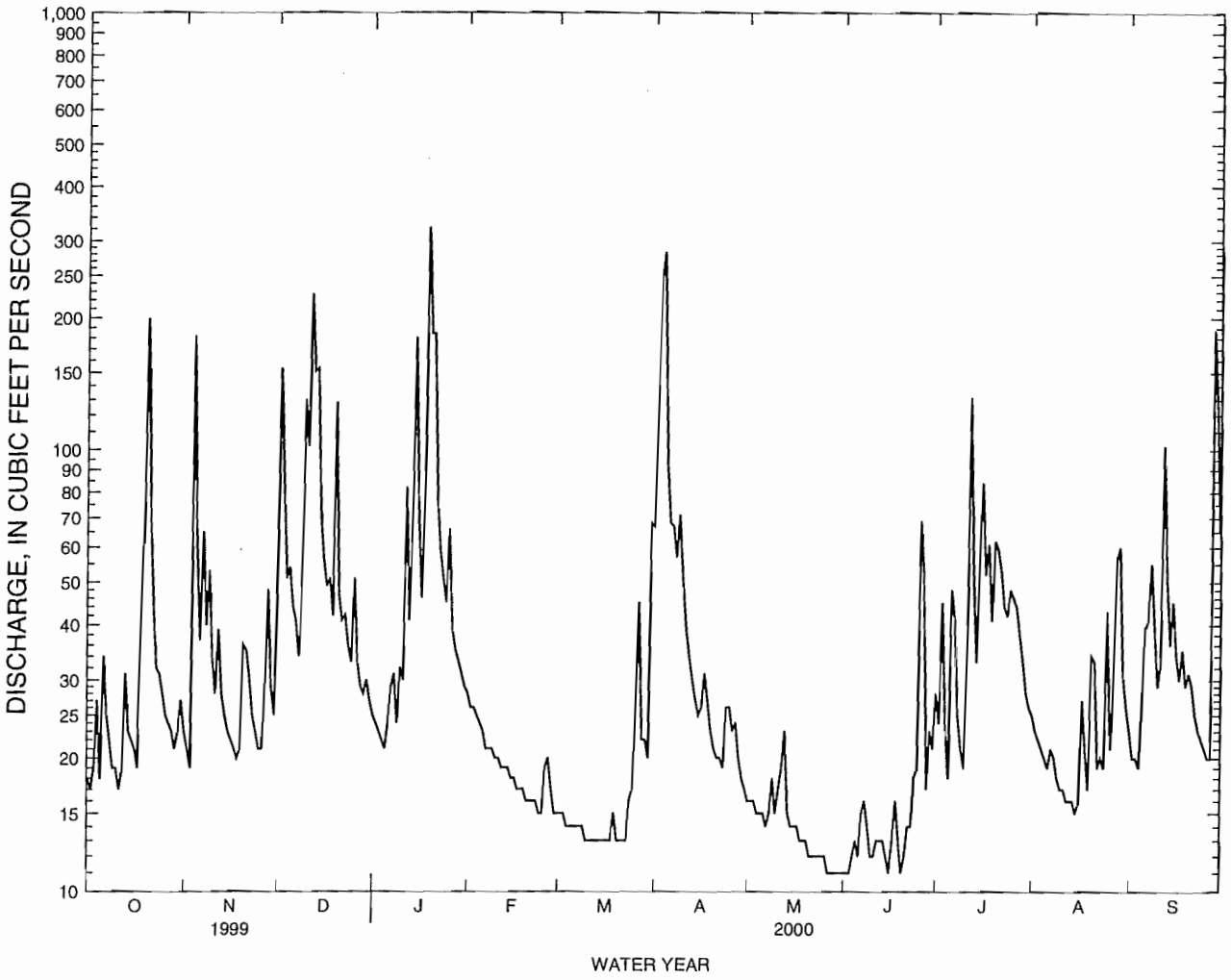
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2000, BY WATER YEAR (WY)

MEAN	41.5	60.8	60.2	59.4	47.8	55.7	56.6	46.6	32.9	38.8	39.6	37.0
MAX	94.6	226	157	392	197	270	173	144	84.9	78.4	111	112
(WY)	1983	1991	1988	1921	1994	1982	1927	1967	1978	1980	1948	1994
MIN	12.4	16.8	12.3	11.0	8.88	11.0	10.6	9.81	13.0	12.3	11.5	11.9
(WY)	1954	1934	1964	1986	1986	1970	1926	1926	1969	1926	1984	1953

HAWAII, ISLAND OF KAUAI

16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1912 - 2000	
ANNUAL TOTAL	14634		13351			
ANNUAL MEAN	40.1		36.5		48.2	
HIGHEST ANNUAL MEAN					95.5	1982
LOWEST ANNUAL MEAN					21.3	1984
HIGHEST DAILY MEAN	433	Jan 22	322	Jan 19	2570	Feb 13 1994
LOWEST DAILY MEAN	16	Jun 15	11	May 27	7.0	Jul 8 1926
ANNUAL SEVEN-DAY MINIMUM	18	May 5	11	May 27	8.2	Mar 5 1986
ANNUAL RUNOFF (AC-FT)	29030		26480		34890	
10 PERCENT EXCEEDS	70		66		84	
50 PERCENT EXCEEDS	28		24		31	
90 PERCENT EXCEEDS	19		13		16	



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 downstream from Wailua Reservoir, 5.2 mi west of Kapaa, and 7.0 mi north of Lihue.

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

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Ditch diverts water from North Fork Wailua River to reservoir, 2,000 ft upstream and thence to fields for irrigation of sugarcane in vicinity of Kapaa.

AVERAGE DISCHARGE.--63 years (water years 1938-2000), 15.9 ft^3/s (11,500 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 26 ft^3/s, October 2, 3, 19: minimum daily, 6.7 ft^3/s, August 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	18	19	21	21	18	19	18	11	17	17	14
2	26	18	20	21	21	18	20	18	10	18	16	14
3	26	18	21	21	20	17	21	18	10	19	15	14
4	25	18	22	21	20	17	21	18	9.8	19	14	14
5	25	19	22	20	20	17	21	18	10	19	14	14
6	25	20	22	20	19	17	21	18	10	20	13	14
7	24	20	22	20	19	16	21	18	10	20	12	14
8	24	20	22	20	19	16	21	17	11	20	11	14
9	24	18	22	20	19	16	20	18	11	20	9.6	15
10	24	17	22	20	19	15	20	18	11	20	7.5	15
11	23	16	22	20	19	15	20	18	11	20	7.1	14
12	23	15	23	20	19	15	19	18	11	20	6.9	14
13	23	15	24	21	19	14	19	18	11	21	6.7	14
14	24	15	24	21	19	14	18	18	11	21	10	14
15	23	15	24	21	19	14	18	18	11	21	11	14
16	23	15	24	21	19	13	18	18	11	22	12	14
17	23	15	23	21	19	13	19	18	11	22	12	14
18	e24	15	23	21	19	12	19	17	11	22	12	14
19	e26	16	23	22	19	12	19	17	11	22	12	14
20	e22	16	23	23	19	12	19	16	11	22	13	14
21	16	16	23	23	18	12	19	16	11	22	13	14
22	13	17	23	23	18	11	19	15	11	22	13	14
23	13	17	23	23	18	10	19	15	11	21	13	14
24	12	17	22	23	18	10	19	14	12	21	13	14
25	12	17	22	22	18	8.4	19	14	12	21	14	14
26	12	17	22	22	18	12	19	13	13	21	14	14
27	12	17	22	22	18	14	19	13	14	21	14	13
28	11	18	22	22	18	15	19	12	15	20	14	14
29	15	18	22	21	18	16	19	12	16	20	14	14
30	20	19	22	21	---	17	19	12	17	19	15	15
31	19	---	21	21	---	18	---	12	---	18	14	---
TOTAL	637	512	691	658	549	444.4	583	503	345.8	631	382.8	422
MEAN	20.5	17.1	22.3	21.2	18.9	14.3	19.4	16.2	11.5	20.4	12.3	14.1
MAX	26	20	24	23	21	18	21	18	17	22	17	15
MIN	11	15	19	20	18	8.4	18	12	9.8	17	6.7	13
AC-FT	1260	1020	1370	1310	1090	881	1160	998	686	1250	759	837

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 2000, BY WATER YEAR (WY)

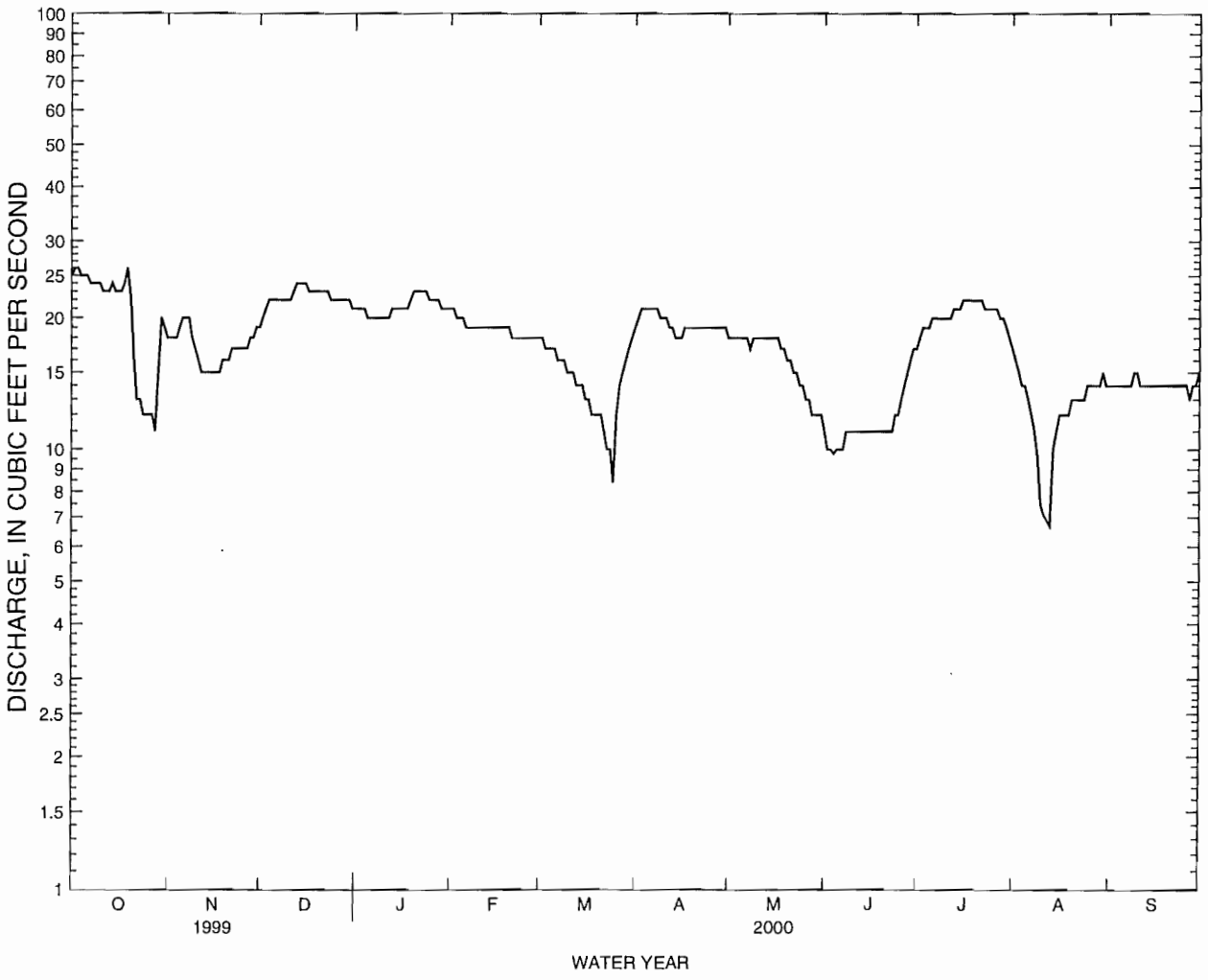
MEAN	18.6	12.2	9.25	10.7	11.8	12.4	13.4	16.3	20.7	21.8	21.7	22.4
MAX	35.2	28.5	33.3	35.3	37.8	27.3	28.8	40.5	40.0	46.5	48.6	53.5
(WY)	1958	1984	1938	1938	1940	1980	1938	1938	1937	1938	1939	1938
MIN	2.80	.19	.009	.20	.071	.41	.90	1.08	2.29	7.09	5.72	3.89
(WY)	1969	1965	1955	1968	1969	1956	1963	1965	1997	1997	1954	1946

e Estimated

HAWAII, ISLAND OF KAUAI

16069000 WAILUA DITCH NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1937 - 2000	
ANNUAL TOTAL	5786.3		6359.0			
ANNUAL MEAN	15.9		17.4		15.9	
HIGHEST ANNUAL MEAN					32.9	1938
LOWEST ANNUAL MEAN					5.95	1997
HIGHEST DAILY MEAN	26	Aug 17	26	Oct 2	63	Jun 4 1937
LOWEST DAILY MEAN	1.9	Jan 5	6.7	Aug 13	.00	May 15 1940
ANNUAL SEVEN-DAY MINIMUM	2.6	Jan 1	8.4	Aug 8	.00	May 15 1940
ANNUAL RUNOFF (AC-FT)	11480		12610		11500	
10 PERCENT EXCEEDS	25		22		30	
50 PERCENT EXCEEDS	12		18		15	
90 PERCENT EXCEEDS	9.0		12		.98	



HAWAII, ISLAND OF KAUAI

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

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

DRAINAGE AREA.--17.9 mi^2.

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

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

GAGE.--Water-stage recorder. Elevation of gage is 18 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Clayton Yoshida. Records good. Wailua ditch (station 16069000) diverts water upstream for irrigation of sugarcane in vicinities of Kapaa and Wailua.

AVERAGE DISCHARGE.--48 years (water years 1953-2000), 118 ft^3/s (85,810 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharge greater than base discharge of 4,100 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 04	1715	*6,790	*8.90	No other peak greater than base discharge.			

Minimum discharge, 5.2 ft^3/s, May 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	39	90	32	38	9.4	36	7.8	7.2	24	55	28
2	8.1	26	344	28	36	9.3	171	7.0	13	19	35	21
3	13	23	168	26	33	9.1	344	6.8	6.7	51	34	21
4	40	473	89	25	30	8.7	541	6.7	6.8	24	30	19
5	11	151	83	24	27	8.6	177	6.5	7.7	12	29	26
6	73	94	64	31	25	8.4	117	6.3	7.1	48	27	77
7	34	145	70	47	23	8.4	128	6.2	6.9	68	27	97
8	29	98	51	42	18	8.3	113	6.4	15	26	28	103
9	20	156	54	42	17	8.0	122	9.3	10	18	25	63
10	17	88	292	42	18	8.0	93	6.4	7.7	14	24	41
11	13	71	250	54	16	7.6	66	6.1	6.9	37	23	48
12	8.4	108	363	228	15	7.6	53	7.0	7.2	441	22	189
13	48	73	371	83	14	7.4	45	19	8.8	252	23	90
14	19	58	256	96	13	7.2	36	6.8	9.1	80	12	58
15	27	50	141	308	13	7.1	24	5.7	6.8	154	9.9	83
16	12	46	106	125	12	6.9	24	5.5	6.8	217	11	54
17	13	43	87	76	12	6.8	29	5.6	7.2	120	25	47
18	37	25	97	120	12	7.0	29	7.1	7.5	140	21	80
19	118	23	77	656	13	7.0	21	8.0	7.1	82	13	45
20	372	73	294	396	12	7.0	16	7.9	7.2	94	29	43
21	223	60	93	329	11	7.4	14	7.6	7.9	116	89	46
22	114	46	86	151	11	7.1	14	7.9	8.0	78	20	34
23	61	40	80	111	11	6.9	13	7.9	8.0	62	27	29
24	58	44	63	90	10	9.6	17	7.8	8.2	55	19	27
25	51	29	56	76	10	20	24	7.6	7.1	61	47	25
26	42	27	125	112	14	8.1	16	7.6	13	57	23	23
27	38	27	57	67	14	27	15	7.5	102	64	38	22
28	37	84	44	55	13	12	17	7.4	11	72	67	300
29	32	40	39	49	9.6	12	12	7.3	12	78	151	256
30	34	28	39	44	---	14	9.2	7.2	16	65	49	108
31	47	---	35	40	---	40	---	7.2	---	59	33	---
TOTAL	1657.7	2288	4064	3605	500.6	321.9	2336.2	231.1	355.9	2688	1065.9	2103
MEAN	53.5	76.3	131	116	17.3	10.4	77.9	7.45	11.9	86.7	34.4	70.1
MAX	372	473	371	656	38	40	541	19	102	441	151	300
MIN	8.1	23	35	24	9.6	6.8	9.2	5.5	6.7	12	9.9	19
AC-FT	3290	4540	8060	7150	993	638	4630	458	706	5330	2110	4170

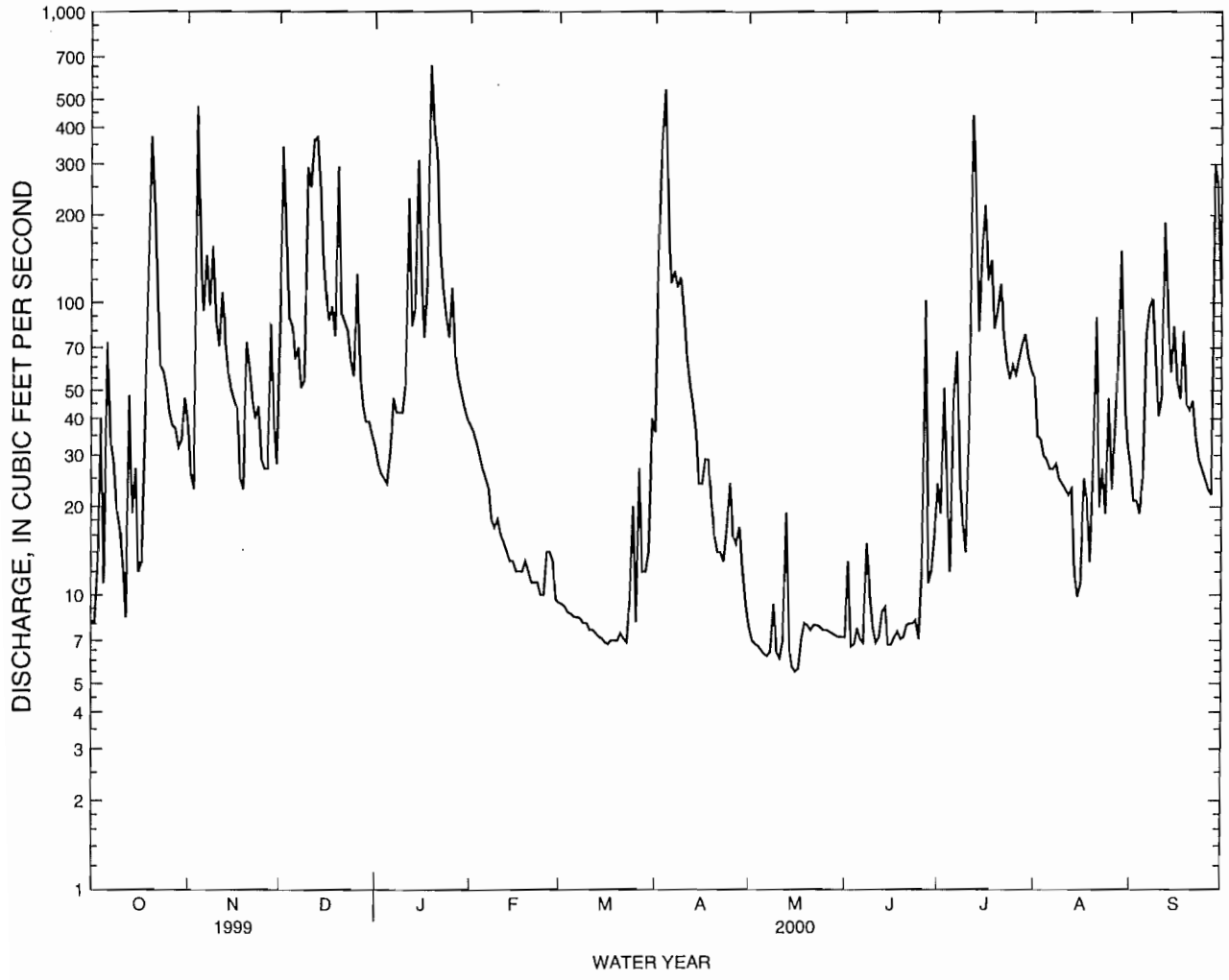
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2000, BY WATER YEAR (WY)

MEAN	97.7	184	165	146	127	140	148	114	61.9	89.3	84.2	63.2
MAX	255	591	459	529	522	730	474	418	247	230	223	273
(WY)	1983	1991	1993	1956	1979	1982	1971	1967	1980	1980	1958	1994
MIN	2.54	19.1	7.74	6.90	4.43	4.76	15.0	7.45	5.78	5.22	5.80	3.17
(WY)	1954	1977	1984	1986	1978	1978	1966	2000	1957	1953	1984	1953

HAWAII, ISLAND OF KAUAI

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1952 - 2000	
ANNUAL TOTAL	27541.7		21217.3			
ANNUAL MEAN	75.5		58.0		118	
HIGHEST ANNUAL MEAN					262	1982
LOWEST ANNUAL MEAN					25.7	1984
HIGHEST DAILY MEAN	922	Jan 22	656	Jan 19	7350	Jan 25 1956
LOWEST DAILY MEAN	8.1	Oct 2	5.5	May 16	2.2	Oct 21 1953
ANNUAL SEVEN-DAY MINIMUM	12	Sep 11	6.6	May 2	2.4	Oct 20 1953
ANNUAL RUNOFF (AC-FT)	54630		42080		85810	
10 PERCENT EXCEEDS	163		125		249	
50 PERCENT EXCEEDS	48		28		65	
90 PERCENT EXCEEDS	19		7.2		8.5	



HAWAII, ISLAND OF KAUAI

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA

LOCATION.--Lat 22°04'44", long 159°23'55", Hydrologic Unit 20070000, on left bank 0.4 mi upstream from mouth, 0.6 mi northeast of Wailua Reservoir, and 4.9 mi west of Kapaa.

DRAINAGE AREA.--0.65 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records computed by Roy Taogoshi. Records good. Recording rain gage located at station.

AVERAGE DISCHARGE.--40 years (water years 1961-2000), 2.58 ft^3/s (1,870 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,060 ft^3/s, December 14, 1991, gage height, 6.60 ft, from rating curve extended above 415 ft^3/s on basis of slope-area measurement at gage height 5.01 ft; minimum, 0.09 ft^3/s, September 27-30, 1968.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	1115	71	2.30	Nov. 4	1730	*94	*2.55

Minimum discharge, 0.42 ft^3/s September 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.83	1.1	1.6	2.0	2.2	1.2	.89	.82	.54	.65	.59	.46
2	.78	1.0	2.5	1.8	2.1	1.2	1.4	.81	.52	.59	.55	.46
3	.75	1.0	2.0	1.8	2.0	1.2	2.7	.80	.50	.54	.50	.46
4	.80	7.8	1.6	1.7	1.9	1.2	4.9	.78	.53	.50	.50	.46
5	.75	2.0	1.6	1.7	1.9	1.1	2.2	.76	.58	.47	.50	.47
6	.84	1.4	1.5	1.7	1.8	1.1	1.5	.75	.54	.64	.50	.55
7	.92	2.2	1.6	1.7	1.8	1.1	1.6	.72	.57	.67	.50	.52
8	.83	1.6	1.5	1.7	1.7	1.1	1.5	.71	.58	.51	.50	.60
9	.75	1.8	1.7	1.6	1.7	1.1	1.5	.71	.54	.50	.48	.54
10	.79	1.5	2.4	1.6	1.6	1.0	1.4	.69	.56	.50	.46	.50
11	.75	1.4	3.7	1.5	1.6	.97	1.3	.69	.56	.56	.46	.46
12	.78	1.5	9.1	2.2	1.6	.93	1.2	.70	.54	1.3	.46	.56
13	.83	1.4	8.0	1.9	1.6	.90	1.2	.72	.54	.76	.46	.51
14	.75	1.3	8.6	1.9	1.5	.87	1.1	.69	.54	.60	.46	.51
15	.74	1.3	4.6	5.7	1.5	.87	1.1	.66	.53	.73	.46	.66
16	.73	1.2	3.8	2.3	1.5	.87	1.1	.64	.50	.96	.50	.58
17	.70	1.2	3.3	1.9	1.4	.87	1.1	.64	.52	.78	.52	.54
18	1.6	1.2	3.1	2.7	1.4	.87	1.1	.64	.54	.68	.50	.57
19	2.2	1.2	2.9	17	1.4	.90	1.1	.64	.51	.62	.46	.51
20	12	1.5	6.1	6.6	1.4	.87	.94	.64	.50	.66	.50	1.5
21	2.4	1.4	3.0	5.6	1.3	.88	.96	.63	.53	.70	.52	1.2
22	1.7	1.4	2.7	3.9	1.3	.87	.94	.62	.56	.73	.46	.73
23	1.4	1.3	2.6	3.4	1.3	.85	.96	.60	.54	.67	.46	.64
24	1.3	1.2	2.5	3.1	1.3	.90	.97	.58	.57	.65	.46	.59
25	1.3	1.2	2.3	2.8	1.2	.87	.95	.54	.54	.68	.57	.59
26	1.2	1.1	2.9	3.8	1.4	.92	.92	.54	.66	.69	.48	.55
27	1.2	1.2	2.2	2.6	1.4	.92	.93	.54	.94	.69	.61	.56
28	1.1	1.5	2.1	2.4	1.3	.89	.87	.54	.55	.67	.56	1.6
29	1.1	1.3	2.0	2.4	1.2	.87	.87	.54	.61	.65	.55	2.5
30	1.2	1.2	2.0	2.3	---	.88	.87	.54	.60	.60	.51	2.7
31	1.1	---	2.0	2.2	---	1.0	---	.54	---	.59	.47	---
TOTAL	44.12	47.4	97.5	95.5	45.3	30.07	40.07	20.42	16.84	20.54	15.51	23.08
MEAN	1.42	1.58	3.15	3.08	1.56	.97	1.34	.66	.56	.66	.50	.77
MAX	12	7.8	9.1	17	2.2	1.2	4.9	.82	.94	1.3	.61	2.7
MIN	.70	1.0	1.5	1.5	1.2	.85	.87	.54	.50	.47	.46	.46
AC-FT	88	94	193	189	90	60	79	41	33	41	31	46

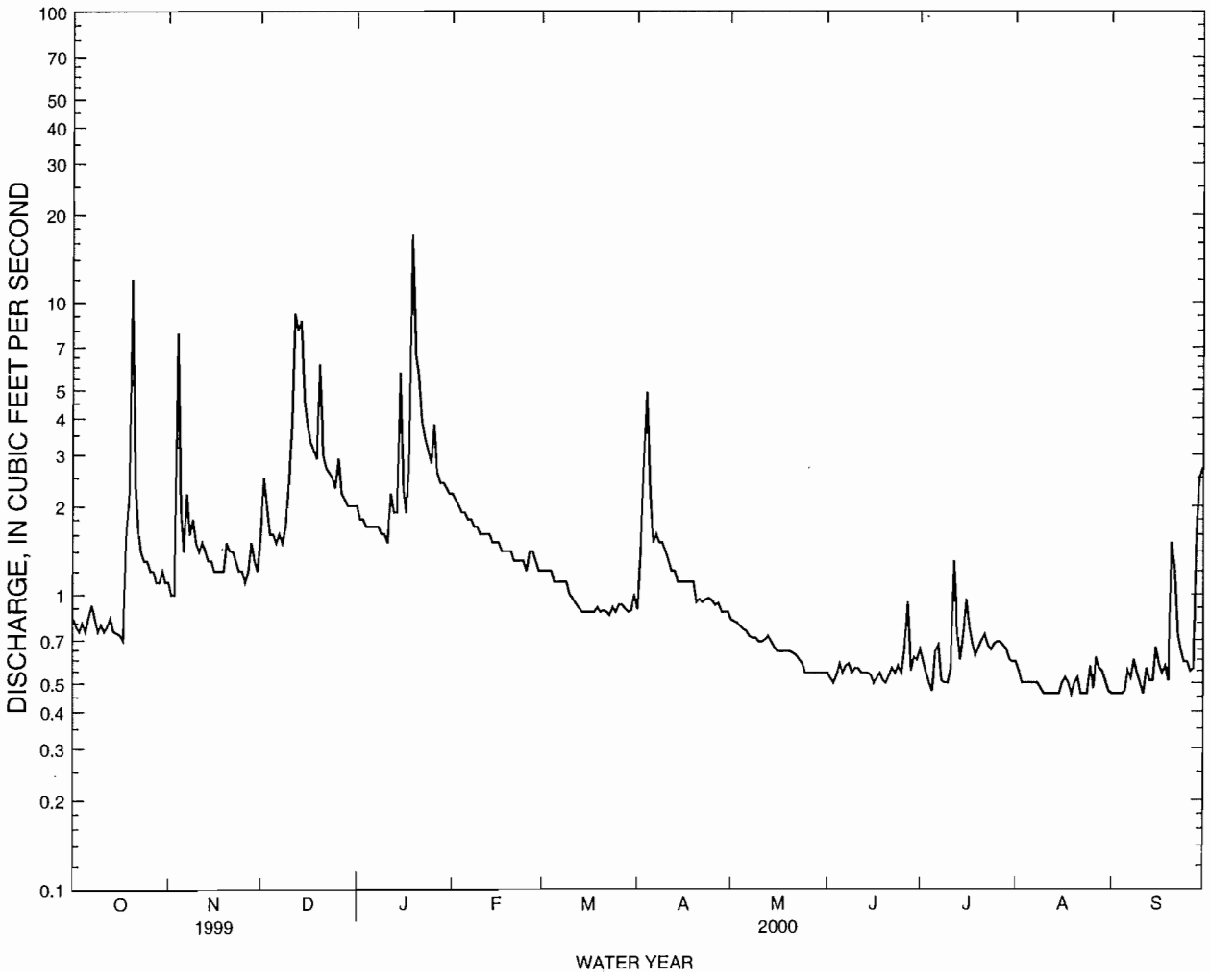
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2000, BY WATER YEAR (WY)

MEAN	2.21	3.89	3.80	3.23	2.56	2.77	3.13	2.73	1.79	1.68	1.62	1.55
MAX	8.29	14.3	11.0	12.4	10.8	14.7	11.8	9.66	5.68	3.80	4.24	4.67
(WY)	1961	1966	1992	1989	1994	1982	1982	1965	1980	1989	1982	1980
MIN	.42	.59	.56	.58	.50	.50	.73	.62	.29	.59	.36	.38
(WY)	1985	1964	1963	1977	1986	1978	1998	1966	1968	1968	1984	1975

HAWAII, ISLAND OF KAUAI

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1960 - 2000	
ANNUAL TOTAL	647.61		496.35			
ANNUAL MEAN	1.77		1.36		2.58	
HIGHEST ANNUAL MEAN					5.72	1982
LOWEST ANNUAL MEAN					.92	1984
HIGHEST DAILY MEAN	16	Jan 7	17	Jan 19	218	Dec 14 1991
LOWEST DAILY MEAN	.70	Oct 17	.46	Aug 10	.09	Sep 28 1968
ANNUAL SEVEN-DAY MINIMUM	.75	Oct 11	.46	Aug 9	.10	Jun 6 1968
ANNUAL RUNOFF (AC-FT)	1280		985		1870	
10 PERCENT EXCEEDS	2.7		2.4		4.4	
50 PERCENT EXCEEDS	1.3		.92		1.7	
90 PERCENT EXCEEDS	.93		.51		.67	



HAWAII, ISLAND OF KAUAI

16079000 KAPAHI DITCH NEAR KEALIA

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

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

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

REMARKS.--Records computed by Clayton Yoshida. Records good. Ditch diverts water from Kapaa Stream for irrigation of sugarcane in vicinity of Kapaa.

AVERAGE DISCHARGE.--82 years (water years 1918-20, 1922-2000), 6.23 ft^3/s (4,520 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 22 ft^3/s, December 2; minimum daily, 0.13 ft^3/s, October 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.5	11	17	7.2	7.9	7.5	13	5.8	5.9	9.6	2.2	8.2
2	6.8	9.9	22	7.0	9.5	6.8	15	6.7	6.1	9.4	1.5	7.4
3	6.8	7.2	15	7.0	8.5	5.8	12	7.3	6.2	9.8	1.4	7.3
4	8.7	11	10	6.7	7.9	5.6	11	7.2	6.7	9.2	4.7	7.5
5	7.1	17	10	6.1	7.6	5.5	9.5	7.0	7.3	8.3	6.6	8.2
6	9.5	14	9.9	5.6	7.4	5.3	9.4	7.0	6.6	9.0	6.4	9.6
7	10	17	9.8	5.2	7.1	5.3	9.4	7.0	7.3	9.6	6.7	9.4
8	9.3	16	9.2	5.0	6.3	6.1	9.3	7.0	7.5	9.0	6.5	9.4
9	6.9	19	9.5	4.8	7.3	6.5	9.7	8.4	7.2	8.6	6.2	9.0
10	8.7	11	6.8	4.9	6.8	5.1	9.1	5.6	6.7	8.5	6.0	8.8
11	6.5	8.2	3.8	9.0	5.9	5.4	8.8	9.1	6.6	8.6	6.2	8.8
12	9.3	8.6	3.8	14	5.8	5.4	9.8	10	8.8	9.0	6.2	9.5
13	16	8.3	2.3	12	4.8	5.7	11	10	8.1	8.1	6.3	8.7
14	7.2	8.3	2.5	13	4.7	6.1	9.1	6.2	8.7	7.6	6.2	8.6
15	6.2	7.7	1.5	13	5.6	6.8	7.5	5.6	7.1	8.2	6.0	9.3
16	6.0	6.8	1.4	11	5.5	6.5	9.7	5.2	7.5	8.5	6.9	8.6
17	5.7	6.6	1.4	10	5.5	6.7	12	5.7	11	8.1	7.6	8.6
18	4.6	6.4	1.3	9.9	6.6	6.7	10	5.1	14	8.2	7.3	8.9
19	.18	6.8	1.1	8.6	6.5	7.9	9.0	5.9	9.5	7.9	7.0	8.3
20	2.3	11	1.4	4.9	5.2	6.6	9.0	6.8	8.0	8.3	7.6	8.8
21	.13	12	.64	4.8	5.1	7.1	9.2	6.9	11	8.5	7.1	7.9
22	.57	11	3.8	4.3	4.9	6.7	9.2	7.0	11	8.5	6.4	6.3
23	1.4	11	7.3	4.3	5.1	6.7	9.7	6.9	11	8.2	6.9	5.9
24	1.3	13	7.3	4.2	5.8	11	14	6.7	15	8.3	6.6	5.7
25	1.2	11	7.3	4.1	6.8	10	13	6.6	14	5.7	7.1	5.7
26	1.5	9.9	7.8	4.3	11	14	9.6	6.3	12	1.3	6.5	5.6
27	2.8	12	7.4	3.9	12	20	11	5.0	15	1.7	6.8	5.8
28	2.7	19	7.2	3.9	8.5	10	7.6	4.8	11	2.4	7.1	7.4
29	5.4	12	7.2	4.0	6.3	12	6.4	4.7	11	2.7	8.4	6.6
30	11	10	7.3	3.9	---	9.7	6.1	5.2	10	2.6	9.2	6.3
31	12	---	7.3	3.8	---	18	---	5.4	---	2.5	8.8	---
TOTAL	185.28	332.7	210.24	210.4	197.9	248.5	299.1	204.1	277.8	225.9	196.4	236.1
MEAN	5.98	11.1	6.78	6.79	6.82	8.02	9.97	6.58	9.26	7.29	6.34	7.87
MAX	16	19	22	14	12	20	15	10	15	9.8	9.2	9.6
MIN	.13	6.4	.64	3.8	4.7	5.1	6.1	4.7	5.9	1.3	1.4	5.6
AC-FT	368	660	417	417	393	493	593	405	551	448	390	468

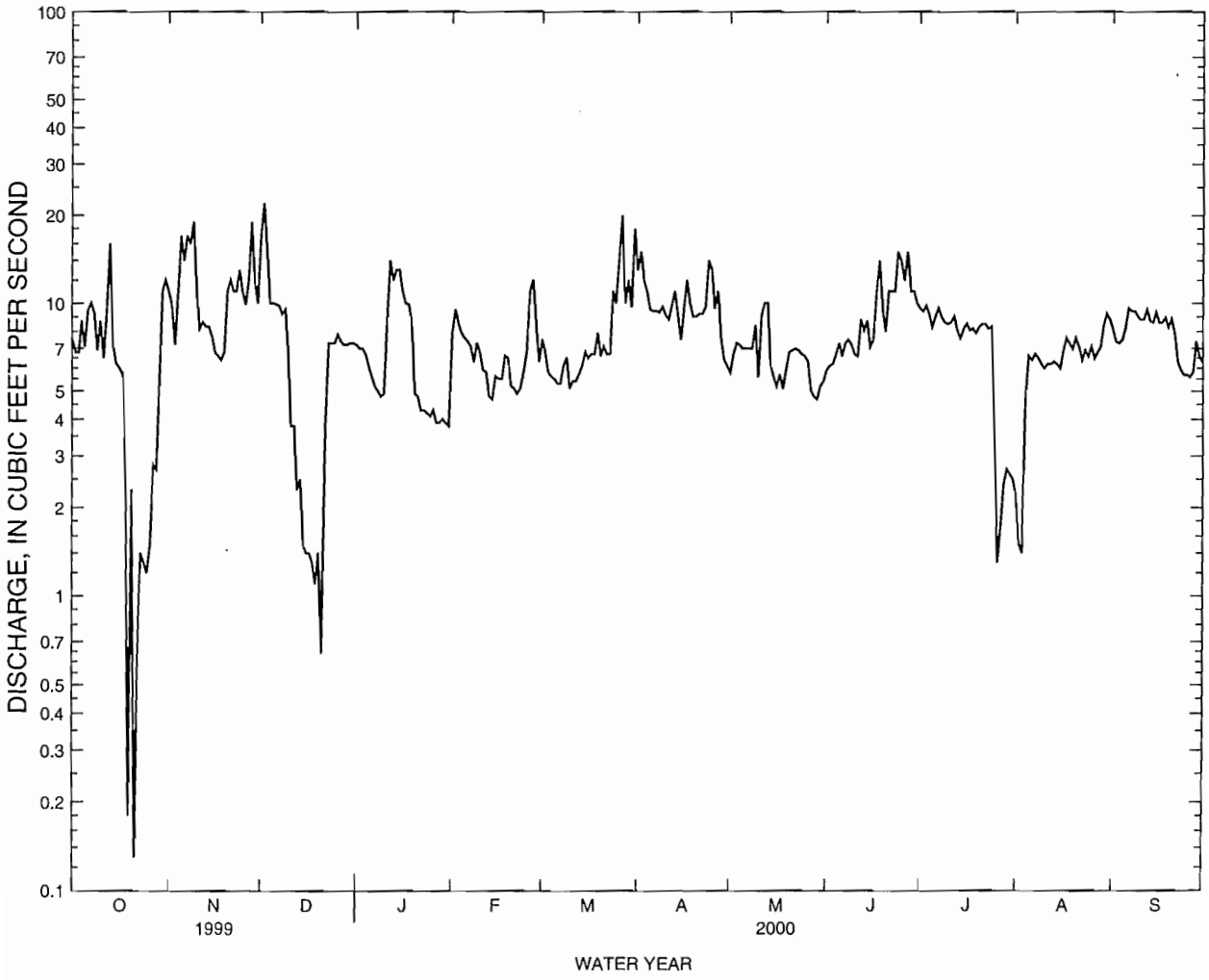
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 2000, BY WATER YEAR (WY)

MEAN	5.96	5.20	4.69	4.50	4.93	5.70	6.56	7.68	7.60	8.12	8.39	7.01
MAX	26.0	21.8	27.5	22.9	19.4	22.6	21.2	28.0	26.1	33.6	30.0	25.8
(WY)	1919	1919	1922	1918	1919	1919	1922	1918	1918	1918	1918	1920
MIN	.27	.044	.073	.012	.042	.22	.27	.32	1.57	1.66	1.88	.72
(WY)	1961	1952	1949	1943	1956	1968	1945	1965	1962	1987	1995	1946

HAWAII, ISLAND OF KAUAI

16079000 KAPAHI DITCH NEAR KEALIA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1918 - 2000	
ANNUAL TOTAL	2927.72		2824.42			
ANNUAL MEAN	8.02		7.72		6.23	
HIGHEST ANNUAL MEAN					21.0	1918
LOWEST ANNUAL MEAN					2.23	1965
HIGHEST DAILY MEAN	22	Dec 2	22	Dec 2	94	Oct 25 1926
LOWEST DAILY MEAN	.13	Oct 21	.13	Oct 21	.00	Jun 4 1922
ANNUAL SEVEN-DAY MINIMUM	1.0	Oct 19	1.0	Oct 19	.00	Nov 13 1925
ANNUAL RUNOFF (AC-FT)	5810		5600		4520	
10 PERCENT EXCEEDS	12		11		15	
50 PERCENT EXCEEDS	7.9		7.3		4.6	
90 PERCENT EXCEEDS	3.8		4.1		.25	



HAWAII, ISLAND OF KAUAI

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

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

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

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

REMARKS.--Records computed by Clayton Yoshida. Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Floods are sometimes diverted upstream by Anahola Ditch wasteway.

AVERAGE DISCHARGE.--76 years (water years, 1923-25, 1928-2000), 4.11 ft^3/s (2,980 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 24 ft^3/s, April 2-4; minimum daily, 0.14 ft^3/s, February 25, March 5, 6, 9.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.57	1.5	4.6	.95	1.0	.26	21	2.5	1.1	8.4	6.5	3.0
2	.43	1.2	8.5	.79	.92	.30	24	2.4	1.0	6.8	4.2	2.5
3	.63	.90	5.5	.74	.82	.22	24	2.3	.94	11	3.9	2.5
4	1.4	3.5	3.6	.66	.75	.19	24	2.2	1.8	4.4	3.5	2.3
5	.49	4.1	4.4	.62	.68	.14	15	2.0	2.5	3.1	3.2	4.9
6	1.9	2.2	1.8	2.2	.62	.14	12	2.0	1.2	9.9	2.9	9.4
7	1.9	4.7	1.7	2.0	.58	.15	12	1.9	4.3	12	2.7	8.4
8	.89	3.9	1.4	2.0	.55	.15	14	2.6	4.2	4.9	2.6	7.9
9	.52	4.6	2.9	1.2	.50	.14	13	4.1	3.8	3.8	2.4	6.1
10	1.3	1.8	8.5	2.5	.42	.39	8.9	2.1	1.8	3.2	2.3	3.5
11	.44	.94	6.4	2.0	.41	.75	7.5	3.4	1.3	11	2.5	3.4
12	1.1	3.4	10	6.1	.41	.82	6.2	2.9	1.7	16	2.2	7.9
13	4.4	1.2	10	4.3	.35	.75	5.3	3.7	1.7	8.3	2.1	4.4
14	.68	.86	8.6	8.4	.33	.75	4.5	2.0	e1.4	5.7	2.0	4.8
15	.50	.70	4.5	11	.31	.76	4.0	1.7	e1.2	13	1.9	8.2
16	.47	.58	2.9	6.1	.26	.75	5.7	1.6	e1.2	16	3.0	4.5
17	.41	.61	2.2	3.0	.26	.75	7.4	1.6	3.2	8.5	6.1	3.9
18	5.0	.56	4.3	6.8	.26	.81	6.2	1.5	5.8	8.3	4.9	6.6
19	8.9	.49	3.3	13	.26	1.1	4.0	1.4	2.7	5.8	2.5	3.7
20	11	4.2	5.7	11	.24	.85	3.3	1.4	1.5	11	7.9	3.2
21	8.3	2.9	2.5	11	.20	.88	3.1	1.4	3.5	12	6.0	3.0
22	4.0	3.6	2.0	5.9	.19	1.0	2.9	1.3	3.6	11	2.7	2.5
23	2.1	1.4	2.0	3.8	.20	.98	3.1	1.2	3.9	8.2	3.9	2.3
24	2.1	.80	1.5	2.8	.17	2.9	5.1	1.2	4.6	8.8	2.9	2.2
25	3.2	.78	1.2	2.1	.14	3.0	6.4	1.1	2.4	10	6.1	2.0
26	1.5	.78	4.3	5.2	1.1	6.6	7.4	1.1	5.4	11	2.6	1.9
27	1.3	4.0	2.0	2.0	1.8	12	6.9	1.1	8.7	11	3.1	2.0
28	1.0	6.9	1.4	1.5	.55	5.7	3.8	1.1	2.9	9.5	9.0	15
29	.84	2.0	1.1	1.3	.27	6.5	3.1	1.1	6.3	8.1	13	11
30	1.1	1.4	2.6	1.2	---	5.4	2.7	1.1	4.5	5.6	4.6	5.3
31	2.0	---	1.3	1.1	---	21	---	1.2	---	4.8	3.6	---
TOTAL	70.37	66.50	122.7	123.26	14.55	76.13	266.5	58.2	90.14	271.1	126.8	148.3
MEAN	2.27	2.22	3.96	3.98	.50	2.46	8.88	1.88	3.00	8.75	4.09	4.94
MAX	11	6.9	10	13	1.8	21	24	4.1	8.7	16	13	15
MIN	.41	.49	1.1	.62	.14	.14	2.7	1.1	.94	3.1	1.9	1.9
AC-FT	140	132	243	244	29	151	529	115	179	538	252	294

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 2000, BY WATER YEAR (WY)

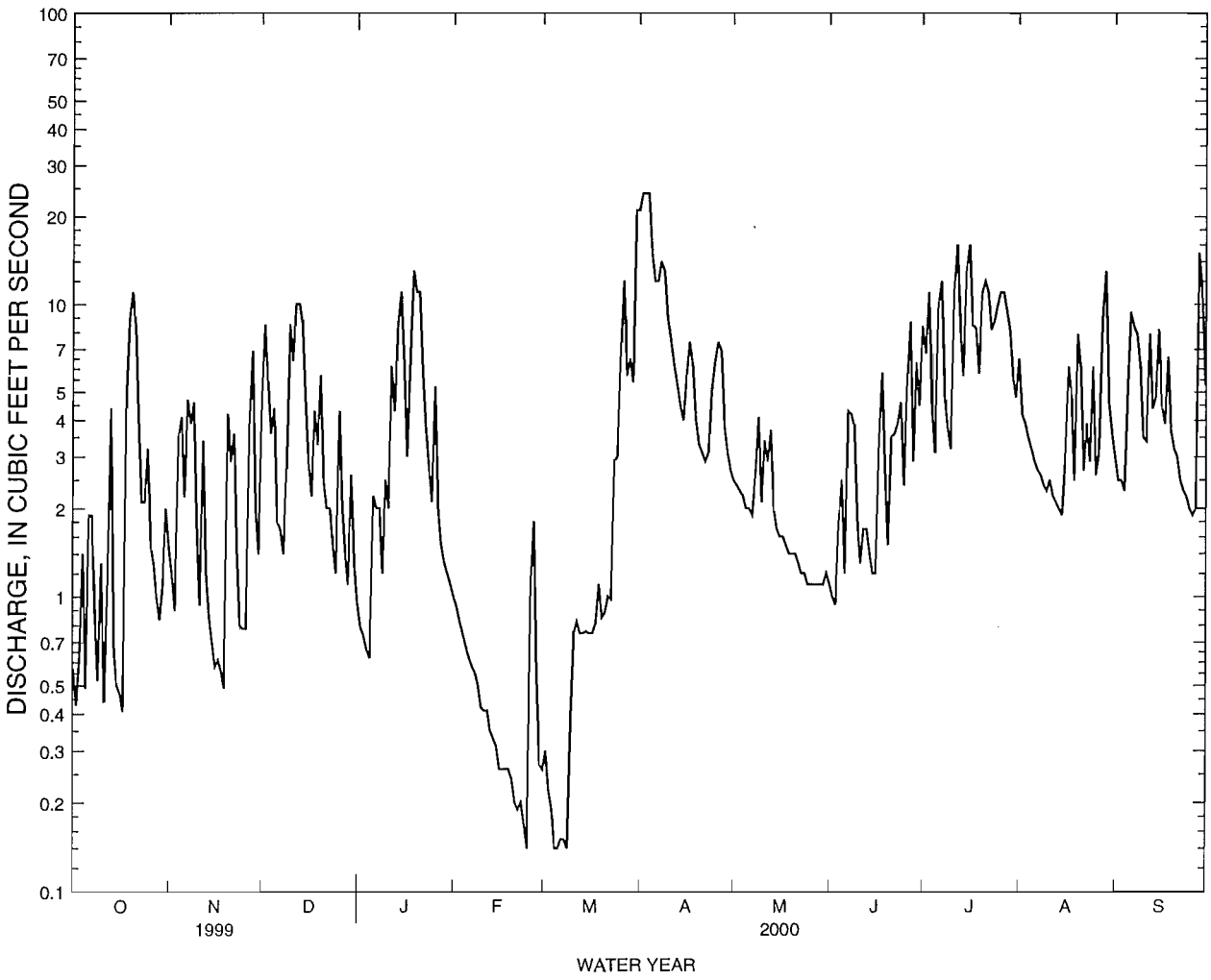
MEAN	4.41	3.37	2.16	2.29	3.10	3.49	4.56	4.69	4.64	6.13	5.35	4.76
MAX	12.1	9.93	7.96	10.8	16.1	11.1	12.5	11.1	11.5	11.4	11.8	10.0
(WY)	1987	1950	1987	1975	1989	1986	1986	1986	1952	1969	1951	1941
MIN	.007	.004	.002	.003	.004	.000	.001	.009	.000	.003	.005	.002
(WY)	1995	1992	1961	1933	1969	1993	1993	1993	1993	1993	1993	1991

e Estimated

HAWAII, ISLAND OF KAUAI

16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1922 - 2000	
ANNUAL TOTAL	969.01		1434.55			
ANNUAL MEAN	2.65		3.92		4.11	
HIGHEST ANNUAL MEAN					8.00	1987
LOWEST ANNUAL MEAN					.13	1992
HIGHEST DAILY MEAN	18	May 17	24	Apr 2	62	Nov 12 1947
LOWEST DAILY MEAN	.00	Apr 19	.14	Feb 25	.00	Dec 11 1923
ANNUAL SEVEN-DAY MINIMUM	.02	Apr 19	.16	Mar 3	.00	Dec 15 1923
ANNUAL RUNOFF (AC-FT)	1920		2850		2980	
10 PERCENT EXCEEDS	5.3		9.1		10	
50 PERCENT EXCEEDS	2.1		2.5		2.8	
90 PERCENT EXCEEDS	.58		.54		.03	



HAWAII, ISLAND OF KAUAI

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA

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

DRAINAGE AREA.--1.19 mi^2, revised (Drainage area of 1.9 mi^2 published in the data report for water years 1977-94 was in error; the correct figure is 1.19 mi^2).

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

REVISED RECORDS.--WSP 2137: Drainage area. WDR HI-95-1: Drainage area.

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

REMARKS.--Records computed by Clayton Yoshida. Records good.

AVERAGE DISCHARGE.--42 years (water years 1959-2000), 11.8 ft^3/s (8,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,140 ft^3/s, February 13, 1994, gage height, 9.76 ft; minimum, 1.8 ft^3/s, September 6-8, 1968.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	1030	*1,070	*5.66	No other peak greater than base discharge.			

Minimum discharge, 3.7 ft^3/s, March 17-23, June 3, 15, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.6	5.2	10	5.4	5.8	4.2	28	5.2	3.9	8.7	7.0	6.3
2	4.5	5.2	23	5.2	5.6	4.2	69	5.0	3.9	7.9	6.2	5.7
3	4.5	4.9	16	5.1	5.5	4.1	73	5.0	3.9	16	5.7	5.4
4	4.4	9.5	9.0	5.0	5.4	4.1	86	4.8	4.3	7.2	5.3	5.3
5	4.8	7.7	11	4.9	5.3	4.1	23	4.8	4.1	5.9	5.1	5.7
6	5.9	6.1	7.4	5.6	5.2	4.1	15	4.7	3.9	19	4.9	8.8
7	5.7	11	6.9	6.5	5.1	4.1	18	4.6	5.0	11	4.8	9.3
8	4.9	7.2	6.3	5.9	5.0	4.1	16	4.7	4.6	7.3	4.7	11
9	4.6	9.2	7.7	5.4	4.9	4.1	11	4.6	4.4	6.3	4.6	12
10	5.1	6.2	36	6.5	4.8	4.0	9.2	4.4	4.0	5.8	4.5	7.4
11	4.5	5.5	22	6.1	4.8	4.0	8.4	4.8	3.9	10	4.5	6.8
12	4.8	6.8	50	20	4.7	3.9	7.4	5.1	4.0	21	4.3	12
13	9.0	5.6	33	9.3	4.6	3.9	6.8	5.0	4.1	8.8	4.4	8.1
14	5.3	5.2	18	18	4.6	4.0	6.3	4.4	3.9	7.0	4.3	7.0
15	4.8	5.0	10	56	4.6	4.0	6.0	4.3	3.8	11	4.2	6.6
16	4.7	4.8	8.1	13	4.6	3.9	6.5	4.2	3.8	24	4.4	6.1
17	4.5	4.8	7.2	8.6	4.5	3.9	7.2	4.2	4.1	11	5.0	5.7
18	32	4.7	26	17	4.4	3.9	6.7	4.1	4.5	9.0	4.6	5.7
19	20	5.5	10	99	4.6	4.0	5.9	4.1	4.1	7.3	4.3	5.3
20	85	8.1	8.4	49	4.4	3.8	5.5	4.0	3.9	9.2	7.5	5.1
21	20	7.2	7.0	31	4.4	3.8	5.4	4.0	4.9	11	5.4	4.9
22	11	14	6.6	13	4.3	3.8	5.3	4.0	4.7	12	4.7	4.7
23	7.6	6.8	6.3	9.4	4.3	3.8	5.5	4.0	4.6	8.2	5.7	4.6
24	7.0	5.6	5.9	8.0	4.3	4.3	5.9	3.9	4.4	8.3	5.7	4.4
25	7.2	5.4	5.7	7.3	4.2	4.4	6.6	3.9	4.4	9.1	9.5	4.3
26	6.1	5.2	20	14	4.7	5.1	6.7	4.0	8.4	11	5.4	4.3
27	5.9	7.4	7.2	7.2	4.6	9.7	8.3	4.0	8.5	13	5.4	4.8
28	5.5	12	6.1	6.6	4.4	6.2	6.3	4.0	4.6	12	13	16
29	5.3	6.2	5.8	6.3	4.2	7.8	5.7	4.0	8.4	8.7	33	11
30	5.2	5.6	6.5	6.0	---	6.2	5.4	3.9	6.3	7.3	9.8	6.1
31	5.4	---	5.8	5.9	---	47	---	4.0	---	6.8	7.5	---
TOTAL	309.8	203.6	408.9	466.2	137.8	182.5	476.0	135.7	141.3	320.8	205.4	210.4
MEAN	9.99	6.79	13.2	15.0	4.75	5.89	15.9	4.38	4.71	10.3	6.63	7.01
MAX	85	14	50	99	5.8	47	86	5.2	8.5	24	33	16
MIN	4.4	4.7	5.7	4.9	4.2	3.8	5.3	3.9	3.8	5.8	4.2	4.3
AC-FT	614	404	811	925	273	362	944	269	280	636	407	417

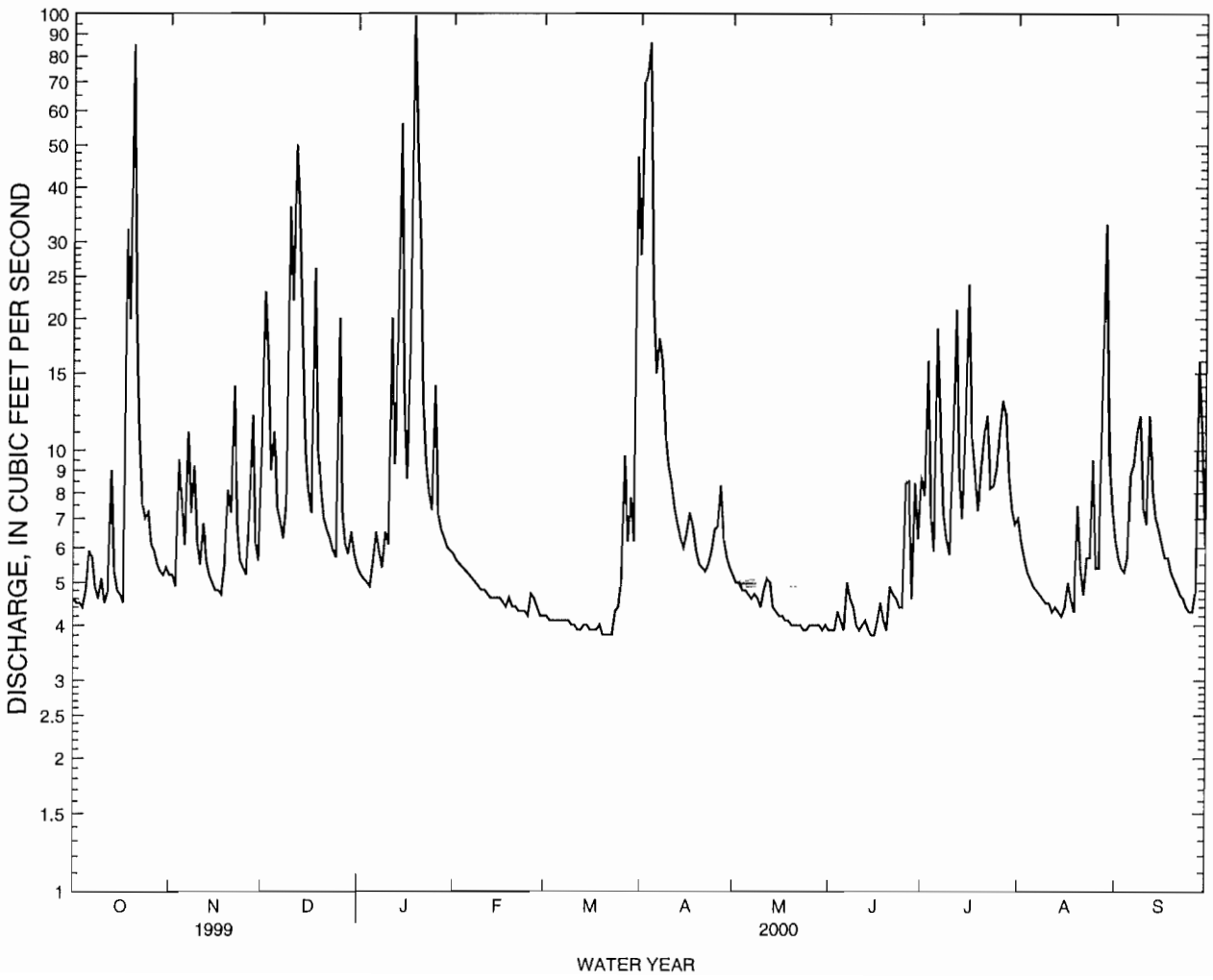
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 2000, BY WATER YEAR (WY)

MEAN	10.3	16.4	13.9	11.8	11.3	13.3	15.0	11.9	8.49	11.3	10.2	8.37
MAX	24.6	49.7	43.1	28.4	54.8	42.7	35.1	22.5	29.1	27.1	23.7	15.7
(WY)	1983	1996	1988	1989	1994	1982	1971	1965	1978	1989	1991	1994
MIN	4.40	5.73	3.79	3.45	3.20	4.15	5.06	4.38	4.27	5.05	3.95	3.93
(WY)	1985	1977	1986	1986	1986	1995	1992	2000	1959	1975	1973	1975

HAWAII, ISLAND OF KAUAI

16097500 HALAULANI STREAM AT ALTITUDE 400 FT, NEAR KILAUEA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1958 - 2000	
ANNUAL TOTAL	3092.6		3198.4			
ANNUAL MEAN	8.47		8.74		11.8	
HIGHEST ANNUAL MEAN					19.6	1982
LOWEST ANNUAL MEAN					7.01	1984
HIGHEST DAILY MEAN	89	Jan 22	99	Jan 19	879	Feb 13 1994
LOWEST DAILY MEAN	4.2	Jun 15	3.8	Mar 20	1.9	Sep 5 1968
ANNUAL SEVEN-DAY MINIMUM	4.4	Jun 12	3.9	Mar 17	2.4	Sep 2 1968
ANNUAL RUNOFF (AC-FT)	6130		6340		8580	
10 PERCENT EXCEEDS	14		14		20	
50 PERCENT EXCEEDS	6.1		5.6		7.4	
90 PERCENT EXCEEDS	4.8		4.0		4.6	



HAWAII, ISLAND OF KAUAI

16103000 HANALEI RIVER NEAR HANALEI

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

DRAINAGE AREA.--18.7 mi^2.

PERIOD OF RECORD.--January 1912 to November 1919, water years 1962-63 (annual maximum), 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 60.0 ft above mean sea level (from topographic map). January 1, 1912 to November 20, 1919, nonrecording gage at site 0.3 mi downstream at different datum. January 26 to December 26, 1962, crest-stage gage at site 0.5 mi downstream at different datum. Water-stage recorder and crest-stage gage at site 0.5 mi downstream at different datum from December 27, 1962 to May 10, 2000.

REMARKS.--Records computed by Clayton Yoshida. Records fair. No diversion upstream. Hanalei Tunnel diverted water upstream between 1925 and 1992.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel ended).--8 years (water years 1993-2000), 203 ft^3/s (147,300) acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 44,600 ft^3/s, November 3, 1995, gage height, 15.81 ft, from rating curve extended above 9,600 ft^3/s on basis of slope-area measurement at gage height 14.66 ft and two-section slope-area estimate at gage height 15.81 ft; minimum, 31 ft^3/s, September 30, October 1, 2, 5, 12, 13, November 3, 1975.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 04	1445	*13,000	*11.14	No other peak greater than base discharge.			

Minimum discharge, 57 ft^3/s, March 12-14, 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	87	110	353	94	110	70	412	99	69	154	124	131
2	83	101	882	89	102	68	1180	96	68	151	109	112
3	88	92	405	86	99	65	1320	95	68	292	103	107
4	103	1150	244	85	95	64	1100	93	79	132	98	101
5	98	280	242	82	93	61	421	92	82	105	94	183
6	188	169	184	106	89	60	330	92	71	379	91	246
7	125	266	191	128	86	61	315	92	100	370	92	247
8	116	180	151	156	86	60	340	101	95	159	91	245
9	97	227	205	155	83	59	371	108	79	125	86	174
10	115	143	850	186	80	59	279	86	72	109	87	140
11	91	120	518	164	78	59	211	114	71	365	88	203
12	99	183	614	394	78	59	178	139	84	962	82	380
13	157	121	548	195	77	58	157	129	76	377	82	189
14	108	107	352	413	76	58	141	86	89	183	80	143
15	104	98	231	883	75	59	130	80	75	327	78	152
16	95	94	179	364	73	59	137	78	70	415	86	124
17	89	92	155	216	73	59	147	77	90	215	137	118
18	314	88	168	341	72	63	141	76	104	264	103	148
19	355	87	144	1350	73	84	121	75	81	165	88	116
20	584	194	223	960	70	63	114	74	72	241	218	106
21	454	146	136	720	68	67	113	74	81	257	314	100
22	246	124	141	314	68	65	110	73	83	225	115	94
23	155	127	139	223	70	67	115	73	85	188	158	91
24	141	140	119	178	67	91	141	72	94	181	111	88
25	130	99	112	155	66	95	132	71	99	244	167	86
26	117	102	267	252	90	137	135	71	120	234	106	84
27	113	200	134	146	81	250	154	71	246	224	121	87
28	110	322	111	130	70	136	120	71	90	196	239	522
29	101	169	104	122	66	152	107	70	151	159	599	304
30	102	146	119	116	---	141	103	70	118	133	205	144
31	125	---	101	110	---	473	---	70	---	122	154	---
TOTAL	4890	5477	8322	8913	2314	2922	8775	2668	2762	7653	4306	4965
MEAN	158	183	268	288	79.8	94.3	292	86.1	92.1	247	139	166
MAX	584	1150	882	1350	110	473	1320	139	246	962	599	522
MIN	83	87	101	82	66	58	103	70	68	105	78	84
AC-FT	9700	10860	16510	17680	4590	5800	17410	5290	5480	15180	8540	9850

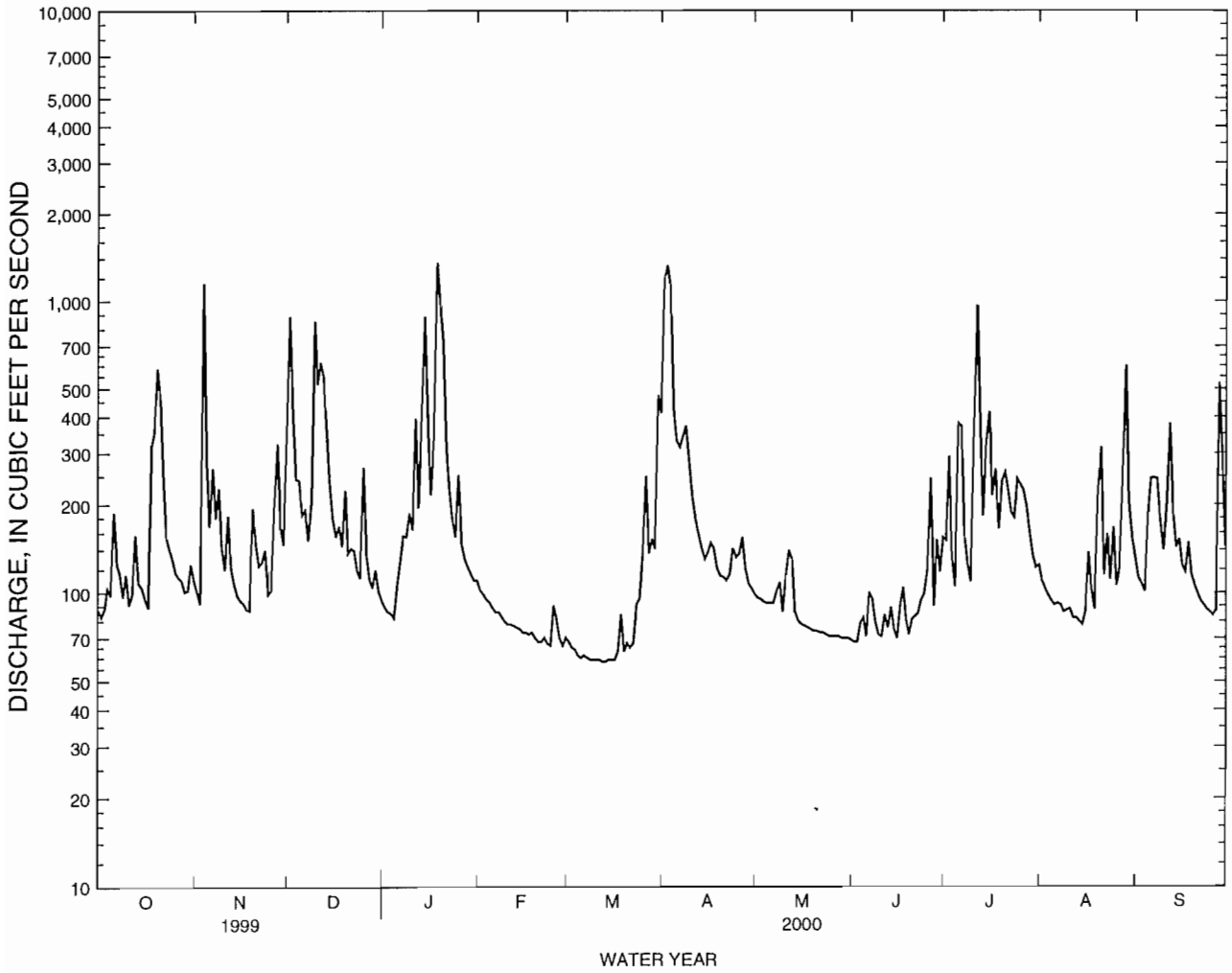
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1993 - 2000, BY WATER YEAR (WY)

MEAN	212	289	254	224	179	160	237	169	159	195	151	211
MAX	304	599	459	388	392	342	370	418	251	247	199	523
(WY)	1995	1996	1993	1997	1994	1997	1997	1997	1994	2000	1995	1994
MIN	138	143	185	117	79.8	88.0	76.6	84.6	71.5	138	136	77.5
(WY)	1994	1993	1996	1995	2000	1993	1993	1995	1993	1993	1993	1993

HAWAII, ISLAND OF KAUAI

16103000 HANALEI RIVER NEAR HANALEI--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1993 - 2000	
ANNUAL TOTAL	68907		63967			
ANNUAL MEAN	189		175		203	
HIGHEST ANNUAL MEAN					258	1997
LOWEST ANNUAL MEAN					152	1993
HIGHEST DAILY MEAN	1850	Jan 22	1350	Jan 19	7100	Nov 9 1995
LOWEST DAILY MEAN	81	May 8	58	Mar 13	54	Jul 8 1993
ANNUAL SEVEN-DAY MINIMUM	85	May 4	59	Mar 9	57	Jul 3 1993
ANNUAL RUNOFF (AC-FT)	136700		126900		147300	
10 PERCENT EXCEEDS	347		340		372	
50 PERCENT EXCEEDS	137		114		135	
90 PERCENT EXCEEDS	96		70		80	



HAWAII, ISLAND OF KAUAI

16108000 WAINIHA RIVER NEAR HANALEI

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

DRAINAGE AREA.--10.2 mi^2.

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

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

GAGE.--Water-stage recorder. Elevation of gage is 960 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Roy Taogoshi. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--45 years (water years 1953–55, 1959–2000), 138 ft^3/s (99,710 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 20,200 ft^3/s, April 19, 1974, gage height, 9.47 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurement at gage height 7.72 ft; minimum, 31 ft^3/s, September 29, 1965.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 04	1430	*7,430	*6.54	No other peak greater than base discharge.			

Minimum discharge, 41 ft^3/s, March 16, 17.

REVISIONS.--The maximum discharges and peak discharges above base of 3,600 ft^3/s for water years 1953–99 have been revised. These figures supercede those published in WSP 1289, 1349, 1399, 1449, 1569, 1639, 1719, and the Water Data Reports for 1961 to 1999.

EXTREMES FOR WATER YEARS 1953–99.--Peak discharges above base discharge of 3,600 ft^3/s and maximum(*):

MAXIMUM DISCHARGE AND GAGE HEIGHT FOR WATER YEARS 1953 THROUGH 1999

Water year	Date	Discharge (ft^3/s)	Gage height (ft)	Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1953	03/04/53	*3,360	*5.40	1972	12/19/71	*5,290	*6.05
1954	02/22/54	*4,930	*5.95	1973	10/04/72	*2,700	*5.10
1955	12/06/54	3,060	5.27	1974	11/19/73	3,190	5.33
	12/22/54	*4,480	*5.81		04/19/74	*20,200	*9.47
1956	11/11/55	7,480	6.55		04/22/74	13,200	7.65
	12/30/55	3,550	5.48		09/30/74	4,300	5.75
	01/25/56	3,170	5.32	1975	11/21/74	*9,160	*6.86
	02/17/56	*20,000	-		12/21/74	4,010	5.65
1957	No peak above base discharge.				01/31/75	7,730	6.60
1958	12/01/57	*13,600	*7.72	1976	11/26/75	*2,470	*4.98
1959	02/16/59	3,380	5.41	1977	06/28/77	*2,380	*4.92
	08/06/59	*15,300	*8.19	1978	07/02/78	*2,540	*5.02
1960	02/16/60	*3,380	*5.41	1979	10/31/78	*2,500	*5.00
1961	02/13/61	*4,420	*5.79	1980	03/19/80	2,950	5.22
1962	11/14/61	3,980	5.64		05/26/80	*3,810	*5.58
	01/28/62	*4,180	*5.71	1981	08/04/81	*3,240	*5.35
1963	03/16/63	*10,200	*7.04	1982	10/28/81	3,170	5.32
	04/15/63	6,720	6.39		11/01/81	9,630	6.94
	05/14/63	3,060	5.27		11/23/81	3,870	5.60
1964	03/08/64	4,550	5.83		12/25/81	2,970	5.23
	09/30/64	*5,800	*6.18		01/20/82	3,100	5.29
1965	12/16/64	3,430	5.43		03/13/82	3,100	5.29
	01/09/65	3,980	5.64		03/23/82	6,670	6.38
	03/30/65	3,260	5.36		03/27/82	*13,700	*7.77
	04/05/65	4,670	5.87		03/29/82	8,870	6.81
	04/13/65	7,480	6.55	1983	10/30/82	7,630	6.58
	05/03/65	*13,000	*7.60		11/23/82	*8,150	*6.68
1966	11/20/65	3,790	5.57	1984	10/20/83	*1,880	*4.57
	07/26/66	*7,630	*6.58	1985	11/27/84	3,010	5.25
1967	10/15/66	3,060	5.27		03/01/85	*3,330	*5.39
	05/22/67	*4,670	*5.87	1986	08/11/86	*2,990	*5.24
	07/21/67	3,240	5.35	1987	09/14/87	*2,820	*5.16
	08/09/67	3,170	5.32	1988	11/05/87	*3,190	*5.33
1968	11/26/67	3,950	5.63	1989	11/06/88	3,060	5.27
	12/17/67	3,760	5.56		01/13/89	*9,330	*6.89
	03/16/68	*4,640	*5.86		02/23/89	4,900	5.94
1969	11/29/68	6,050	6.24		03/01/89	3,360	5.40
	01/31/69	*6,310	*6.30		07/23/89	*9,330	*6.89
	02/19/69	4,210	5.72		08/21/89	2,990	5.24
	03/31/69	3,980	5.64	1990	10/22/89	3,060	5.27
	09/21/69	2,950	5.22		01/21/90	*6,140	*6.26
1970	01/13/70	*3,920	*5.62		03/06/90	4,420	5.79
	04/19/70	3,100	5.29	1991	11/18/90	3,520	5.47
	07/26/70	3,080	5.28		12/22/90	3,260	5.36
1971	11/26/70	2,950	5.22		03/26/91	*3,600	*5.50
	12/02/70	2,970	5.23		04/11/91	3,080	5.28
	12/19/70	2,950	5.22		08/06/91	3,040	5.26
	01/31/71	*11,000	*7.22	1992	12/14/91	4,520	5.82
	04/06/71	7,890	6.63		09/11/92	*7,940	*6.64

HAWAII, ISLAND OF KAUAI

16108000 WAINIHA RIVER NEAR HANALEI--Continued

MAXIMUM DISCHARGE AND GAGE HEIGHT FOR WATER YEARS 1953 THROUGH 1999--Continued

Water year	Date	Discharge (ft^3/s)	Gage height (ft)	Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1993	12/03/92	*4,640	*5.86	1996	11/03/95	*17,100	*8.61
	12/25/92	2,990	5.24		11/09/95	3,220	5.34
1994	09/01/94	*11,100	*7.23	1997	01/04/97	3,790	5.57
	09/04/94	3,040	5.26		04/11/97	*5,360	*6.07
	09/19/94	2,970	5.23	1998	08/23/98	*4,330	*5.76
1995	10/18/94	3,190	5.33	1999	01/22/99	*4,670	*5.87
	09/30/95	*3,220	*5.34				

HAWAII, ISLAND OF KAUAI

16108000 WAINIHA RIVER NEAR HANALEI--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	65	77	332	55	62	58	314	52	44	109	57	67
2	60	79	623	52	55	51	1310	52	43	109	52	54
3	64	60	218	50	53	46	1470	51	43	260	52	55
4	79	536	115	48	52	45	1080	51	64	90	49	52
5	82	150	120	47	52	44	258	48	79	67	48	96
6	209	82	134	97	52	44	194	48	51	403	47	159
7	110	191	122	139	52	44	146	54	144	299	47	147
8	122	122	86	152	52	44	146	80	96	99	52	146
9	73	158	178	147	51	44	185	82	67	77	49	90
10	109	78	851	196	51	43	152	56	53	67	58	87
11	67	59	333	168	50	43	97	96	55	414	58	142
12	93	152	228	241	50	42	76	130	84	454	49	197
13	158	70	211	102	49	42	70	83	66	154	57	79
14	81	62	124	241	49	42	63	55	78	90	51	61
15	73	52	89	620	49	42	58	50	51	255	47	72
16	68	48	69	205	48	42	87	48	50	332	71	57
17	61	46	60	112	47	42	117	48	98	113	127	53
18	83	46	59	257	47	63	90	47	90	180	87	79
19	135	44	56	709	47	102	65	46	63	81	70	53
20	292	164	198	497	47	52	58	46	51	140	230	49
21	433	126	102	529	46	65	64	45	67	156	239	49
22	166	104	107	140	46	59	64	45	72	111	76	46
23	84	95	100	88	51	67	76	45	77	96	142	45
24	78	64	81	73	49	122	134	45	108	93	73	44
25	72	68	86	65	47	94	79	44	91	121	98	44
26	69	82	236	156	106	158	99	45	60	144	61	44
27	81	157	78	77	59	244	141	45	107	136	103	63
28	72	262	62	64	49	133	76	44	57	115	104	339
29	65	131	64	60	47	140	61	45	104	89	284	123
30	77	121	98	57	---	77	55	45	81	63	99	62
31	125	---	64	55	---	182	---	44	---	57	86	---
TOTAL	3406	3486	5284	5499	1515	2316	6885	1715	2194	4974	2723	2654
MEAN	110	116	170	177	52.2	74.7	230	55.3	73.1	160	87.8	88.5
MAX	433	536	851	709	106	244	1470	130	144	454	284	339
MIN	60	44	56	47	46	42	55	44	43	57	47	44
AC-FT	6760	6910	10480	10910	3010	4590	13660	3400	4350	9870	5400	5260

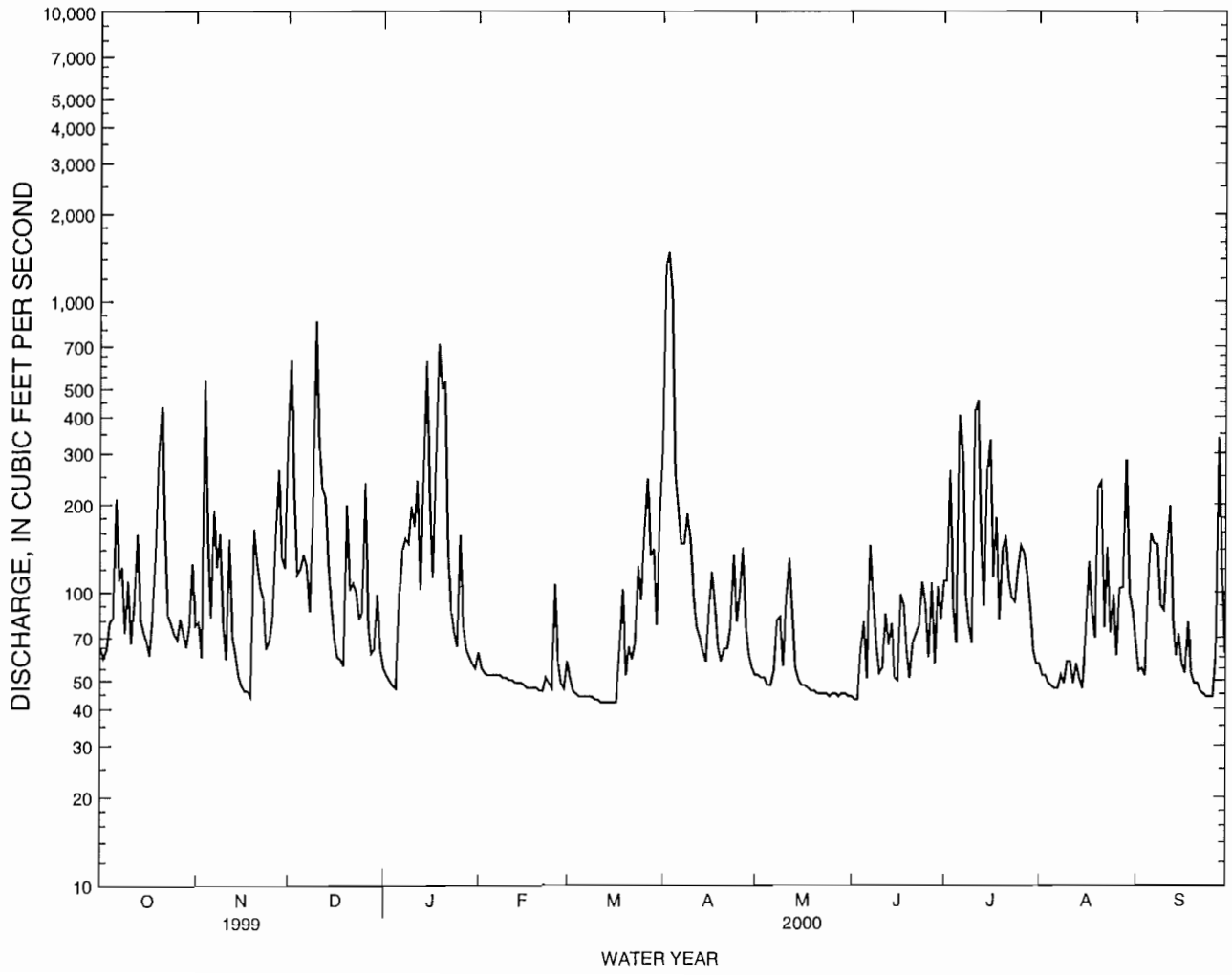
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2000, BY WATER YEAR (WY)

MEAN	113	186	166	144	140	167	175	121	102	132	113	95.5
MAX	228	414	384	371	492	611	504	238	187	315	272	249
(WY)	1983	1991	1968	1989	1969	1982	1971	1967	1978	1989	1982	1994
MIN	42.8	72.7	54.1	44.6	36.5	52.2	52.8	51.9	53.1	50.4	54.6	42.3
(WY)	1985	1964	1984	1986	1978	1970	1992	1966	1993	1984	1965	1965

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1952 - 2000	
ANNUAL TOTAL	46816		42651			
ANNUAL MEAN	128		117		138	
HIGHEST ANNUAL MEAN					243	1982
LOWEST ANNUAL MEAN					84.8	1984
HIGHEST DAILY MEAN	1230	Jan 22	1470	Apr 3	3650	Nov 21 1974
LOWEST DAILY MEAN	44	Nov 19	42	Mar 12	31	Sep 29 1965
ANNUAL SEVEN-DAY MINIMUM	53	Nov 13	42	Mar 11	33	Sep 24 1965
ANNUAL RUNOFF (AC-FT)	92860		84600		99710	
10 PERCENT EXCEEDS	240		210		261	
50 PERCENT EXCEEDS	85		73		79	
90 PERCENT EXCEEDS	59		46		49	

HAWAII, ISLAND OF KAUAI

16108000 WAINIHA RIVER NEAR HANALEI--Continued



HAWAII, ISLAND OF KAUAI

16114000 LIMAHULI STREAM NEAR WAINIHA

LOCATION.--Lat 22°13'15", long 159°34'48", Hydrologic Unit 20070000, on left bank 0.2 mi upstream from intersection with Kuhio Highway, and entrance to Haena State Park.

DRAINAGE AREA.--1.36 mi^2.

PERIOD OF RECORD.--October 1994 to current year.

GAGE.--Water-stage recorders and natural control. Elevation of gage is 160 ft above mean sea level, by altimeter.

REMARKS.--Records computed by Clayton Yoshida. Records good. Limahuli Gardens diverts water through a 4-inch pipe, upstream of station.

AVERAGE DISCHARGE.--6 years (water years 1995-2000), 9.43 ft^3/s (6,830 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 760 ft^3/s, January 4, 1997, gage height, 4.60 ft; minimum, 3.5 ft^3/s, June 30, July 1, 2, 1995.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 26	1230	*308	*3.24	No other peak greater than base discharge.			

Minimum discharge, 4.2 ft^3/s, on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	4.4	26	5.3	5.3	4.3	40	5.5	4.3	6.5	5.5	5.6
2	5.1	4.4	13	5.1	5.2	4.3	95	5.3	4.3	5.6	5.0	5.3
3	5.5	4.4	8.8	4.9	5.1	4.3	58	5.2	4.3	7.1	4.8	5.1
4	5.5	13	7.1	4.8	5.0	4.3	76	5.0	4.8	5.6	4.7	5.0
5	5.4	6.6	6.6	4.7	4.9	4.3	22	5.0	4.5	5.1	4.7	5.1
6	5.3	5.3	6.2	4.8	4.9	4.3	14	4.9	4.4	18	4.7	6.2
7	5.8	10	6.2	4.9	4.7	4.3	10	4.9	6.1	13	4.6	5.7
8	5.5	7.2	5.6	4.8	4.7	4.3	12	5.0	4.9	7.3	4.6	5.4
9	5.3	7.4	7.0	4.7	4.6	4.3	22	4.8	4.6	6.1	4.6	5.0
10	7.3	6.0	35	5.8	4.6	4.3	13	4.8	4.4	5.5	4.6	4.8
11	5.7	5.3	19	5.4	4.6	4.3	8.7	4.8	4.4	8.3	4.7	4.8
12	6.0	6.9	10	5.9	4.6	4.3	7.2	5.5	4.4	7.6	4.6	4.9
13	6.7	5.6	9.2	6.0	4.5	4.3	6.8	5.4	4.5	6.1	4.7	4.7
14	5.6	5.1	9.5	13	4.5	4.3	6.3	4.7	4.9	5.6	4.6	4.6
15	5.4	4.9	7.6	34	4.6	4.3	6.0	4.6	4.6	5.6	4.6	4.5
16	5.3	4.9	6.5	11	4.6	4.3	6.2	4.6	4.5	6.6	4.5	4.5
17	5.4	5.0	5.9	7.8	4.5	4.3	6.4	4.5	5.4	5.7	5.2	4.5
18	9.1	5.0	5.6	19	4.4	4.7	6.3	4.4	6.7	5.2	5.2	4.5
19	9.9	5.2	5.4	57	4.7	4.8	5.7	4.4	5.0	5.0	4.7	4.4
20	7.2	7.0	5.4	30	4.5	4.4	5.4	4.4	4.7	4.9	7.5	4.4
21	11	6.2	6.6	33	4.5	4.4	5.4	4.4	4.8	5.0	6.1	4.4
22	8.4	5.6	11	12	4.5	4.4	5.4	4.4	5.6	5.3	5.1	4.4
23	5.9	5.3	6.4	8.1	4.4	4.4	6.8	4.4	5.6	4.9	5.5	4.4
24	5.4	5.0	5.7	6.9	4.4	4.5	7.0	4.3	6.0	5.4	4.9	4.4
25	5.3	4.9	5.4	6.4	4.4	4.4	6.5	4.4	6.2	5.9	5.5	4.4
26	5.0	4.9	86	11	4.5	4.9	9.6	4.3	5.2	6.3	4.8	4.3
27	4.9	9.2	12	6.8	4.5	6.9	9.1	4.3	5.0	13	4.8	5.2
28	4.6	10	7.3	6.2	4.4	5.2	7.3	4.4	4.7	8.6	6.4	5.4
29	4.6	7.0	6.4	5.8	4.4	5.1	6.3	4.3	6.7	6.4	35	9.4
30	4.7	6.2	6.4	5.6	---	8.7	5.8	4.3	5.7	5.6	9.2	6.7
31	4.5	---	5.6	5.4	---	57	---	4.3	---	5.4	6.5	---
TOTAL	186.5	187.9	364.4	346.1	134.5	196.9	496.2	145.5	151.2	212.2	191.9	152.0
MEAN	6.02	6.26	11.8	11.2	4.64	6.35	16.5	4.69	5.04	6.85	6.19	5.07
MAX	11	13	86	57	5.3	57	95	5.5	6.7	18	35	9.4
MIN	4.5	4.4	5.4	4.7	4.4	4.3	5.4	4.3	4.3	4.9	4.5	4.3
AC-FT	370	373	723	686	267	391	984	289	300	421	381	301

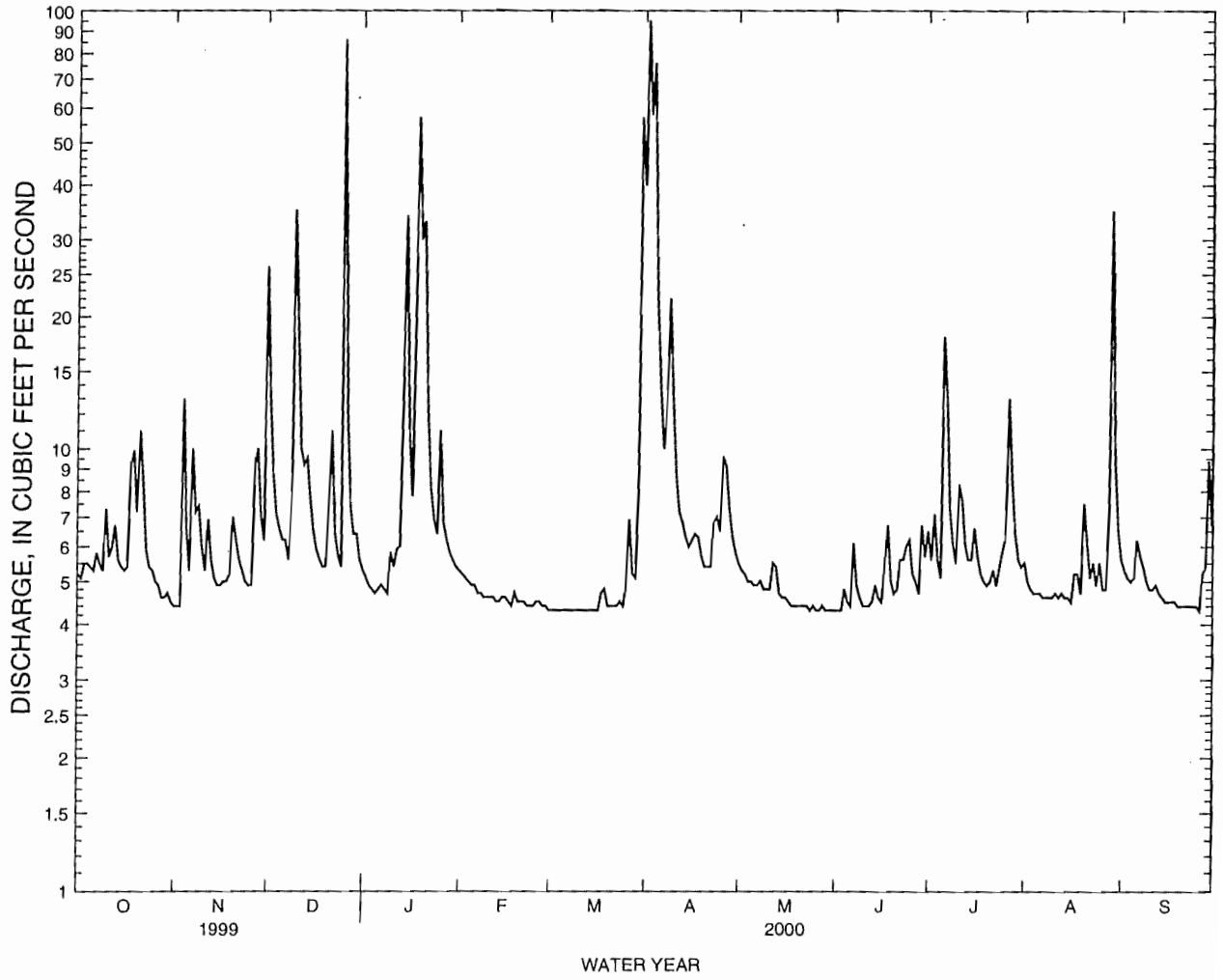
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1995 - 2000, BY WATER YEAR (WY)

MEAN	7.51	9.51	11.4	11.4	8.00	8.60	15.0	10.6	7.87	8.54	7.48	7.26
MAX	9.62	12.5	12.6	23.8	12.0	15.7	32.6	22.4	12.2	9.28	9.84	9.32
(WY)	1996	1996	1997	1997	1996	1997	1997	1997	1996	1998	1995	1996
MIN	6.02	6.26	7.43	6.04	4.64	5.63	8.67	4.69	5.04	6.85	5.96	5.07
(WY)	2000	2000	1995	1995	2000	1995	1999	2000	2000	2000	1996	2000

HAWAII, ISLAND OF KAUAI

16114000 LIMAHULI STREAM NEAR WAINIHA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1995 - 2000	
ANNUAL TOTAL	2905.4		2765.3			
ANNUAL MEAN	7.96		7.56		9.43	
HIGHEST ANNUAL MEAN					13.5	1997
LOWEST ANNUAL MEAN					7.56	2000
HIGHEST DAILY MEAN	86	Dec 26	95	Apr 2	238	Jan 4 1997
LOWEST DAILY MEAN	4.4	Nov 1	4.3	Mar 1	3.7	Jul 1 1995
ANNUAL SEVEN-DAY MINIMUM	4.5	Oct 28	4.3	Mar 1	3.9	Jun 26 1995
ANNUAL RUNOFF (AC-FT)	5760		5480		6830	
10 PERCENT EXCEEDS	11		9.9		14	
50 PERCENT EXCEEDS	6.5		5.3		6.7	
90 PERCENT EXCEEDS	5.4		4.4		4.9	



Surface-Water Station Records for Oahu

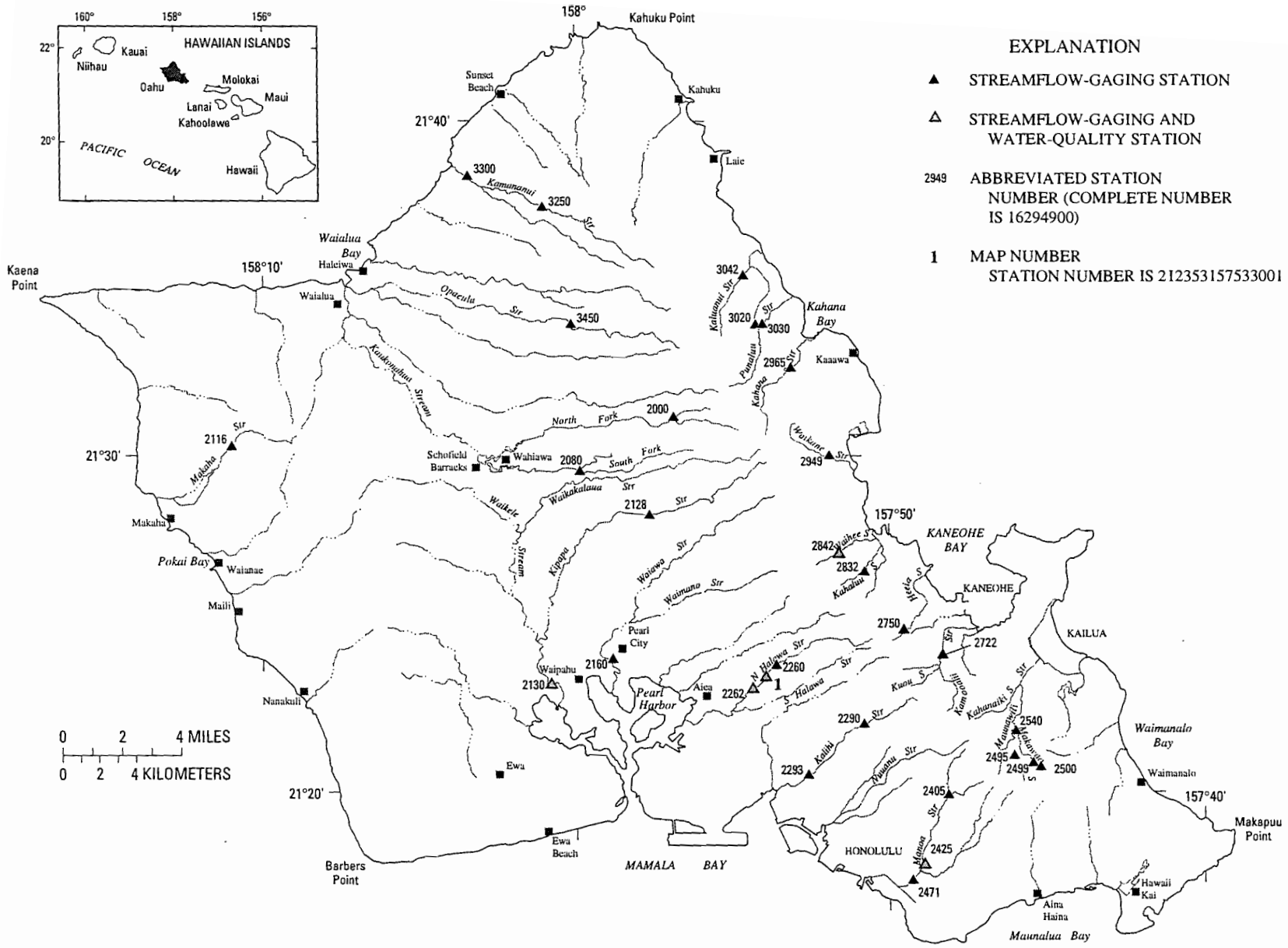


Figure 6. Locations of streamflow-gaging and water-quality stations on Oahu.

HAWAII, ISLAND OF OAHU

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

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

DRAINAGE AREA.--1.38 mi^2.

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

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,150 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records good except for discharges above 200 ft^3/s, which are fair.

AVERAGE DISCHARGE.--77 years (water years 1914-24, 1927-52, 1961-2000), 16.2 ft^3/s (11,760 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,640 ft^3/s, October 28, 1981, gage height, 13.2 ft, from rating curve extended above 110 ft^3/s on basis of slope-area measurement at gage height, 12.46 ft; minimum, 0.12 ft^3/s, March 2, 13, 1941.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0300	2,300	8.07	Aug. 20	1700	1,750	7.08
Jan. 19	1530	*2,420	*8.29				

Minimum discharge, 0.44 ft^3/s, March 17, 18, 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	5.5	61	3.6	20	1.5	85	2.5	2.2	24	8.3	9.5
2	3.5	5.7	238	3.3	5.3	1.4	66	2.3	1.3	13	12	8.4
3	2.0	11	17	3.2	4.6	1.2	28	2.9	1.0	35	6.8	7.5
4	1.6	45	9.4	3.0	4.3	1.0	10	2.3	.91	11	5.7	6.9
5	2.2	7.7	24	2.9	4.0	.98	7.5	2.0	.82	7.0	14	20
6	12	4.7	16	5.0	3.7	.86	4.9	2.2	.77	14	20	42
7	24	9.1	11	6.2	3.4	.90	6.5	2.3	10	7.9	50	89
8	3.6	9.5	7.1	9.3	3.3	.90	5.6	2.0	6.7	6.3	7.8	58
9	3.5	20	42	13	3.1	.77	28	1.9	4.7	7.8	6.1	19
10	4.4	5.4	83	15	2.9	.67	17	1.6	1.9	9.2	26	12
11	2.3	4.2	98	6.4	2.8	.63	5.1	5.3	3.6	48	6.9	77
12	4.1	42	36	6.7	2.7	.59	3.8	31	4.4	23	5.8	52
13	16	5.4	36	20	2.6	.57	9.0	12	2.0	7.2	6.3	36
14	3.8	5.4	15	36	2.4	.53	3.7	3.5	13	17	5.1	34
15	2.8	4.1	11	34	2.3	.52	3.0	2.6	2.5	54	13	14
16	2.7	3.7	9.4	48	2.2	.49	7.7	2.2	1.8	71	7.0	11
17	2.3	3.4	9.9	10	2.1	.46	18	2.0	3.2	48	38	12
18	2.0	4.5	16	41	2.1	.56	5.9	1.9	6.6	112	22	16
19	37	7.9	9.4	298	2.4	1.2	3.6	1.8	2.2	25	7.3	12
20	5.2	9.6	6.9	154	2.1	.63	3.0	1.7	2.0	58	120	12
21	16	16	6.8	34	1.8	.50	3.8	1.6	23	22	14	7.9
22	5.9	7.4	10	18	6.7	.46	2.8	1.7	4.6	23	10	7.0
23	3.1	49	11	15	2.3	1.7	2.7	1.6	5.7	16	40	6.4
24	25	12	6.3	13	1.7	2.4	6.0	1.4	6.4	14	35	5.9
25	36	6.3	5.3	12	1.6	1.3	9.1	1.4	11	11	12	5.5
26	8.0	5.2	12	15	4.9	26	5.6	2.1	18	13	8.8	5.1
27	8.3	6.0	5.9	10	4.4	29	11	2.3	5.2	46	84	130
28	4.4	4.5	4.6	8.6	2.2	6.4	4.0	2.4	3.2	11	53	39
29	5.6	5.6	4.3	7.0	1.6	16	3.1	2.2	7.0	12	65	11
30	3.5	6.7	4.2	6.3	---	3.7	2.7	1.4	14	7.8	13	8.0
31	17	---	3.8	5.9	---	13	---	4.0	---	11	13	---
TOTAL	269.6	332.5	830.3	863.4	105.5	116.82	372.1	108.1	169.70	785.2	735.9	774.1
MEAN	8.70	11.1	26.8	27.9	3.64	3.77	12.4	3.49	5.66	25.3	23.7	25.8
MAX	37	49	238	298	20	29	85	31	23	112	120	130
MIN	1.6	3.4	3.8	2.9	1.6	.46	2.7	1.4	.77	6.3	5.1	5.1
AC-FT	535	660	1650	1710	209	232	738	214	337	1560	1460	1540

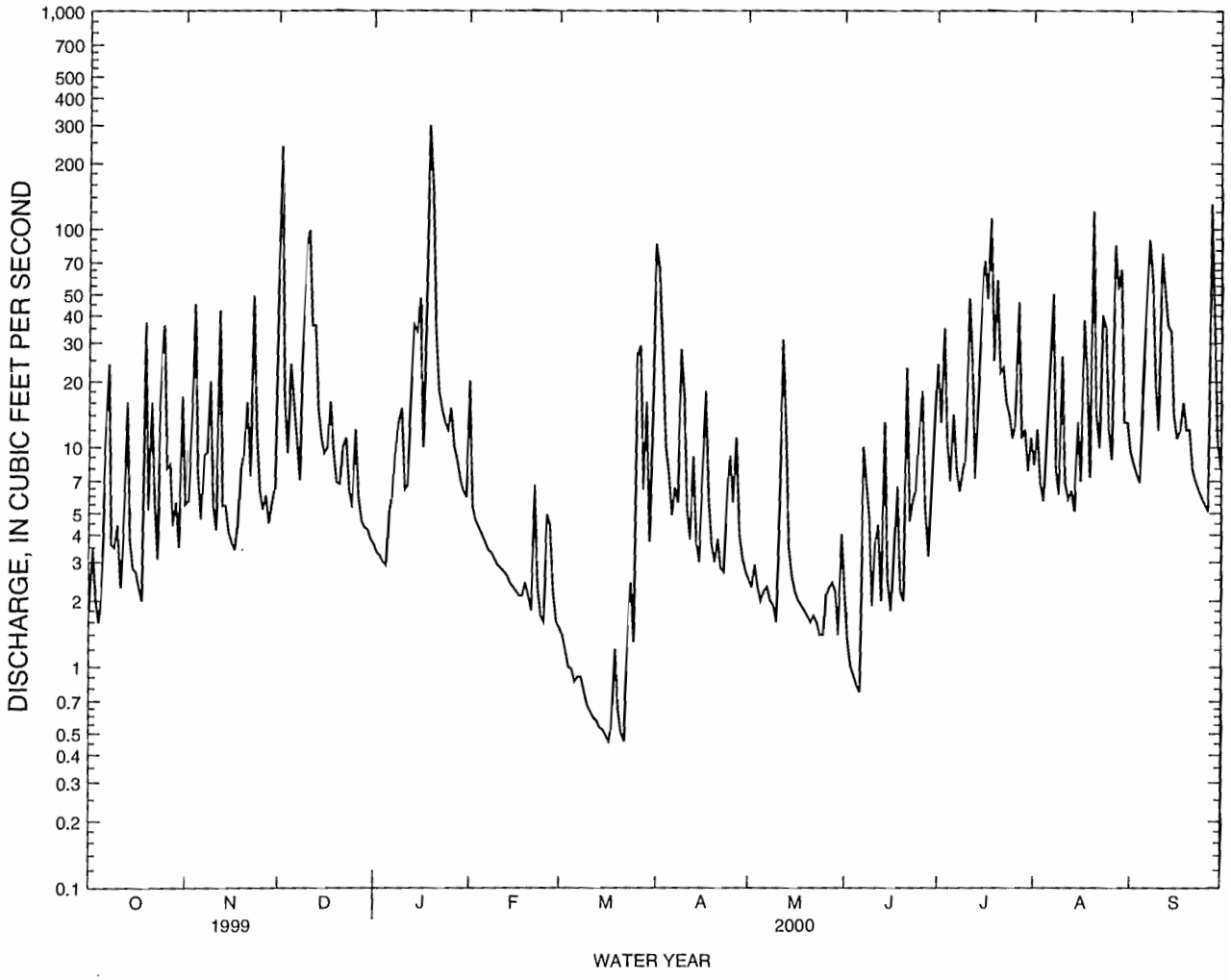
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2000, BY WATER YEAR (WY)

MEAN	13.1	17.4	15.2	14.6	12.6	18.7	19.7	15.9	13.4	18.6	18.1	15.2
MAX	32.7	76.5	48.9	126	117	74.4	58.6	53.3	31.3	48.0	50.1	79.1
(WY)	1942	1966	1988	1921	1932	1982	1963	1927	1963	1930	1931	1914
MIN	2.21	1.31	1.57	.36	.40	.28	1.38	.67	2.63	4.22	1.81	1.95
(WY)	1985	1934	1990	1986	1986	1983	1966	1992	1951	1951	1971	1975

HAWAII, ISLAND OF OAHU

16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1913 - 2000	
ANNUAL TOTAL	5013.1		5463.22			
ANNUAL MEAN	13.7		14.9		16.2	
HIGHEST ANNUAL MEAN					29.5	1932
LOWEST ANNUAL MEAN					9.11	1984
HIGHEST DAILY MEAN	238	Dec 2	298	Jan 19	975	Feb 27 1935
LOWEST DAILY MEAN	1.6	Oct 4	.46	Mar 17	.12	Mar 13 1941
ANNUAL SEVEN-DAY MINIMUM	2.2	Sep 29	.53	Mar 12	.13	Mar 5 1986
ANNUAL RUNOFF (AC-FT)	9940		10840		11760	
10 PERCENT EXCEEDS	28		36		36	
50 PERCENT EXCEEDS	7.0		6.4		7.1	
90 PERCENT EXCEEDS	3.0		1.6		1.6	



HAWAII, ISLAND OF OAHU

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

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

DRAINAGE AREA.--4.04 mi^2.

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

GAGE.--Water-stage recorder and Ogee-type dam control. Datum of gage is 860.35 ft above mean sea level (from U.S. Coast and Geodetic Survey trig station).

REMARKS.--Records computed by S.T.M. Young. Records fair except for periods of no gage height record which are poor. Prior to 1960, water was diverted from reservoirs upstream of station for use at Schofield Barracks.

AVERAGE DISCHARGE.--38 years (water years 1961-62, 1965-2000), 21.2 ft^3/s (15,390 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0415	*3,360	*8.59	Jan. 20	0545	1,130	5.10

Minimum discharge, 1.1 ft^3/s, March 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	8.1	119	6.7	35	2.6	e99	e2.5	e3.5	29	12	9.7
2	4.1	5.3	478	6.2	12	2.4	e80	e2.5	2.3	13	7.8	8.4
3	4.8	7.8	33	5.8	9.5	2.2	e50	e3.0	1.7	23	9.4	7.8
4	2.4	48	18	5.4	8.7	2.0	e22	e2.5	1.4	21	6.8	7.2
5	2.3	16	48	5.0	8.0	1.9	e10	e2.2	1.6	11	27	19
6	8.0	5.7	28	5.0	7.5	1.8	e6.0	e2.3	1.7	17	12	11
7	29	16	25	6.0	7.0	1.7	e7.0	e2.3	19	10	29	56
8	7.8	14	15	5.4	6.5	1.7	e6.0	e2.0	11	6.7	8.9	67
9	4.8	40	49	6.8	6.2	1.6	e40	e1.8	9.7	11	6.3	27
10	5.4	11	125	7.7	5.8	1.5	e20	e1.7	3.9	7.8	27	12
11	3.9	6.6	203	6.4	5.7	1.4	e10	e8.0	2.5	36	10	24
12	3.1	54	62	4.5	5.5	1.3	e7.0	e60	1.9	17	6.2	39
13	9.5	9.8	50	12	5.1	1.3	10	e20	1.8	8.0	6.1	32
14	4.8	8.4	30	59	4.8	1.3	7.6	e8.0	2.0	7.3	6.3	23
15	3.8	7.1	20	55	4.4	1.2	6.1	e5.0	3.1	32	5.3	16
16	3.0	5.5	16	157	4.2	1.1	6.9	e4.0	1.9	38	5.4	10
17	2.7	4.9	15	22	4.0	e1.1	25	e3.0	2.5	21	30	10
18	2.3	4.7	30	58	3.9	e1.2	17	e2.5	4.0	71	26	15
19	68	6.5	18	334	4.6	e1.5	8.7	e2.3	4.5	16	11	9.2
20	17	11	12	360	5.3	e1.3	6.3	e2.2	2.1	22	164	9.2
21	5.5	7.3	12	89	3.5	e1.2	7.1	e2.0	24	17	36	7.8
22	7.1	5.9	17	44	6.8	e1.2	6.4	e1.9	9.1	19	13	6.4
23	4.1	16	20	28	4.8	e1.8	5.0	e1.8	7.2	9.8	15	5.8
24	7.0	18	13	22	3.2	e3.0	4.6	e1.7	9.7	9.4	30	5.4
25	50	5.6	9.6	18	2.9	e2.0	5.1	e1.6	7.4	8.0	13	e5.0
26	9.5	4.4	17	33	3.1	e23	e8.0	e1.6	9.5	11	9.2	e4.6
27	25	12	14	21	3.3	e50	e12	e1.6	6.8	87	37	e230
28	6.4	10	8.9	14	2.7	e12	e6.0	e1.6	3.0	21	54	e64
29	5.0	10	8.0	12	2.4	e15	e3.7	e1.7	4.3	13	40	e18
30	4.2	6.4	7.7	11	---	e4.0	e3.0	e2.2	9.2	9.5	14	e11
31	7.3	---	7.2	10	---	e20	---	e4.0	---	8.2	11	---
TOTAL	320.2	386.0	1528.4	1429.9	186.4	165.3	505.5	159.5	172.3	630.7	688.7	770.5
MEAN	10.3	12.9	49.3	46.1	6.43	5.33	16.9	5.15	5.74	20.3	22.2	25.7
MAX	68	54	478	360	35	50	99	60	24	87	164	230
MIN	2.3	4.4	7.2	4.5	2.4	1.1	3.0	1.6	1.4	6.7	5.3	4.6
AC-FT	635	766	3030	2840	370	328	1000	316	342	1250	1370	1530

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2000, BY WATER YEAR (WY)

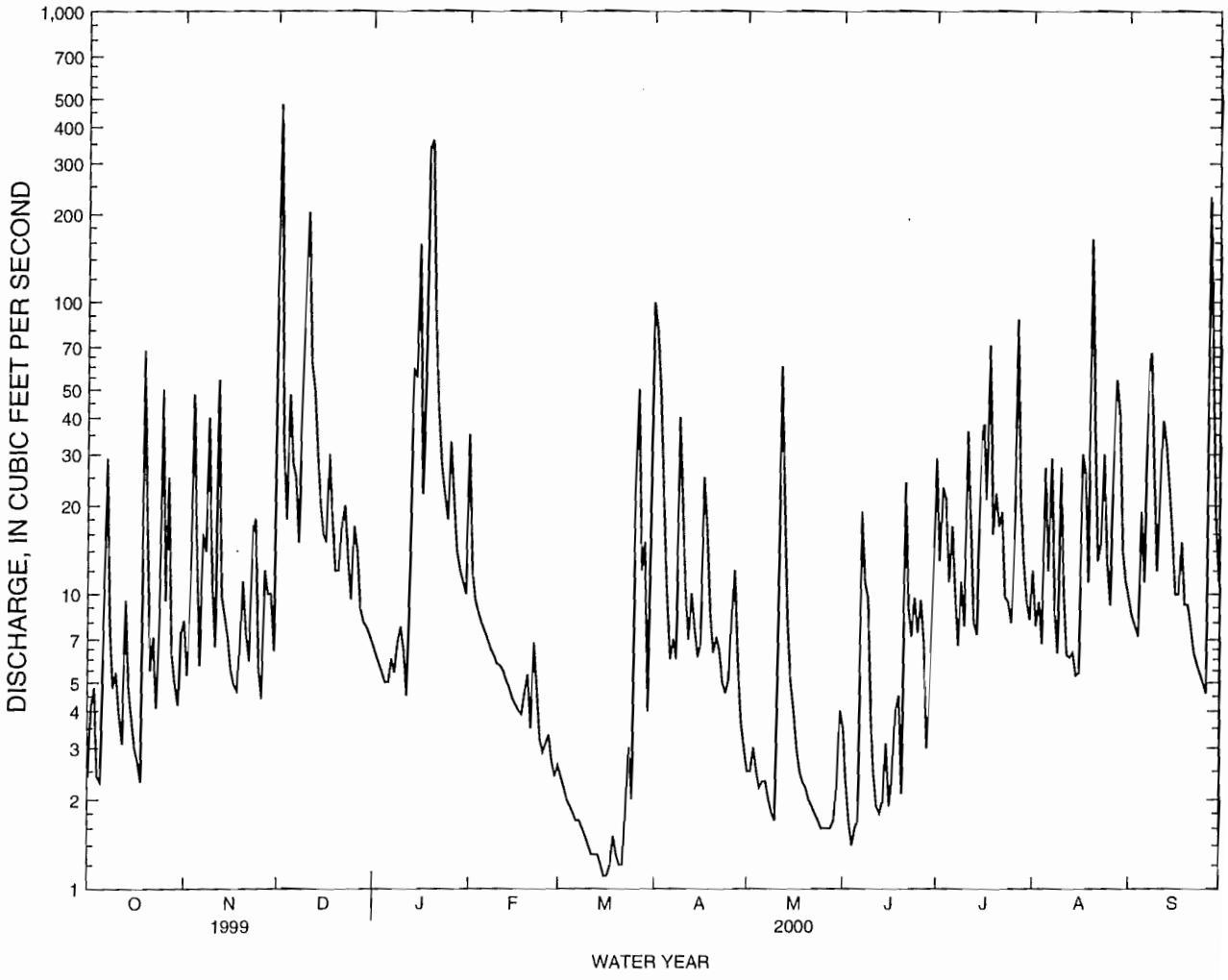
MEAN	17.0	27.7	22.6	20.3	16.4	26.0	30.0	20.2	17.0	26.2	18.3	14.8
MAX	38.0	107	61.7	55.2	99.7	104	90.1	64.9	46.2	60.9	53.7	35.7
(WY)	1967	1966	1988	1989	1969	1980	1963	1963	1987	1989	1967	1990
MIN	.32	3.54	2.07	.38	.11	.66	2.45	.51	3.40	4.25	3.04	1.43
(WY)	1985	1963	1990	1986	1986	1983	1992	1992	1968	1968	1971	1975

e Estimated

HAWAII, ISLAND OF OAHU

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

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1961 - 2000	
ANNUAL TOTAL	7924.9		6943.4			
ANNUAL MEAN	21.7		19.0		21.2	
HIGHEST ANNUAL MEAN					37.2	1982
LOWEST ANNUAL MEAN					11.1	1984
HIGHEST DAILY MEAN	478	Dec 2	478	Dec 2	1050	Feb 1 1969
LOWEST DAILY MEAN	2.2	Jun 15	1.1	Mar 16	.00	Dec 24 1960
ANNUAL SEVEN-DAY MINIMUM	3.2	Sep 29	1.2	Mar 12	.00	Jan 19 1977
ANNUAL RUNOFF (AC-FT)	15720		13770		15390	
10 PERCENT EXCEEDS	48		39		49	
50 PERCENT EXCEEDS	11		7.8		9.0	
90 PERCENT EXCEEDS	4.1		2.0		1.8	



HAWAII, ISLAND OF OAHU

16211600 MAKAHA STREAM NEAR MAKAHA

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

DRAINAGE AREA.--2.31 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records computed by Vaughn Kunishige. Records good. Honolulu Board of Water Supply wells upstream of station may influence flows at gage. Recording rain gage located at station.

AVERAGE DISCHARGE.--41 years (water years 1960-2000), 1.79 ft^3/s (1,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,680 ft^3/s, November 14, 1996, gage height, 9.54 ft, from high-water profile of slope-area measurement; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 19	1500	*92	*2.43				

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.82	.42	.00	15	.41	.00	.00	.00	.00
2	.00	.00	.00	.67	.40	.00	22	.35	.00	.00	.00	.00
3	.00	.00	.00	.59	.49	.00	13	.30	.00	.00	.00	.00
4	.00	.00	.00	.49	.46	.00	5.7	.23	.00	.00	.00	.00
5	.00	.00	.00	.41	.37	.00	3.5	.19	.00	.00	.00	.00
6	.00	.00	.00	.33	.31	.00	1.9	.15	.00	.00	.00	.00
7	.00	.01	.00	.28	.27	.00	1.3	.11	.00	.00	.00	.00
8	.00	.01	.00	.24	.25	.00	6.6	.09	.00	.00	.00	.00
9	.00	.00	.00	.17	.23	.00	4.3	.07	.00	.00	.00	.00
10	.00	.00	.36	.12	.19	.00	3.0	.05	.00	.00	.00	.00
11	.00	.00	5.0	.18	.15	.00	2.2	.04	.00	.00	.00	.00
12	.00	.00	1.0	.30	.11	.00	1.6	.04	.00	.00	.00	.00
13	.00	.00	.31	.33	.10	.00	1.3	.03	.00	.00	.00	.00
14	.00	.00	.10	.31	.10	.00	1.2	.02	.00	.00	.00	.00
15	.00	.00	.03	.52	.08	.00	1.0	.02	.00	.00	.00	.00
16	.00	.00	.02	.64	.06	.00	.94	.03	.00	.00	.00	.00
17	.00	.00	.00	.56	.06	.00	.89	.12	.00	.00	.00	.00
18	.00	.00	.00	.49	.05	.00	.99	.14	.00	.00	.00	.00
19	19	.00	.00	4.2	.04	.00	.91	.12	.00	.00	.00	.00
20	2.1	.00	.00	5.4	.03	.00	.82	.06	.00	.00	.00	.00
21	.89	.00	.00	2.9	.02	.00	.75	.03	.00	.00	.00	.00
22	.53	.00	3.4	2.0	.02	.00	.68	.02	.00	.00	.00	.00
23	.41	.00	3.7	1.1	.01	.00	.59	.01	.00	.00	.00	.00
24	.33	.00	1.6	1.5	.01	.00	.53	.00	.00	.00	.00	.00
25	.23	.00	1.2	.76	.00	.00	.48	.00	.00	.00	.00	.00
26	.10	.00	9.5	.89	.00	.00	.43	.00	.00	.00	.00	.00
27	.03	.00	3.4	1.2	.00	.00	.42	.00	.00	.00	.00	.00
28	.01	.00	1.7	.79	.00	.00	.36	.00	.00	.00	.00	.00
29	.00	.00	1.1	.67	.00	.00	.38	.00	.00	.00	.00	.00
30	.00	.00	2.5	.55	---	.00	.43	.00	.00	.00	.00	.00
31	.00	---	1.1	.47	---	16	---	.00	---	.00	.00	---
TOTAL	23.63	0.02	36.02	29.88	4.23	16.00	93.20	2.63	0.00	0.00	0.00	0.00
MEAN	.76	.001	1.16	.96	.15	.52	3.11	.085	.000	.000	.000	.000
MAX	19	.01	9.5	5.4	.49	16	22	.41	.00	.00	.00	.00
MIN	.00	.00	.00	.12	.00	.00	.36	.00	.00	.00	.00	.00
AC-FT	47	.04	71	59	8.4	32	185	5.2	.00	.00	.00	.00

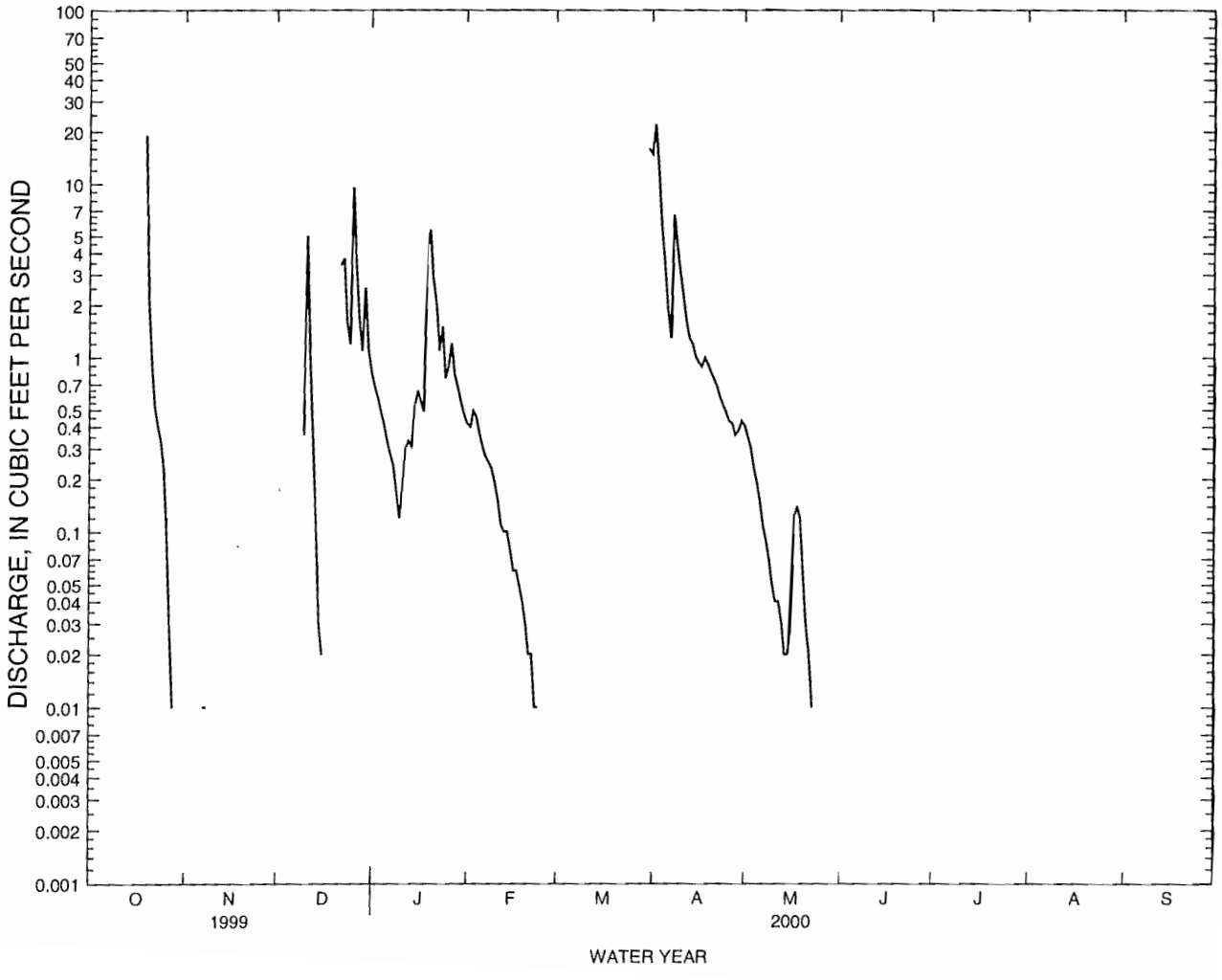
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2000, BY WATER YEAR (WY)

MEAN	.70	1.92	2.85	4.15	3.19	3.03	2.54	1.41	.60	.47	.35	.35
MAX	3.66	20.6	15.0	22.7	16.3	11.5	15.7	5.33	1.72	1.31	1.44	2.19
(WY)	1983	1997	1965	1982	1976	1962	1963	1965	1978	1986	1983	1974
MIN	.000	.000	.038	.058	.15	.18	.13	.085	.000	.000	.000	.000
(WY)	1976	1995	1995	1999	2000	1995	1993	2000	2000	2000	1995	1961

HAWAII, ISLAND OF OAHU

16211600 MAKAHA STREAM NEAR MAKAHA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1959 - 2000	
ANNUAL TOTAL	112.78		205.61			
ANNUAL MEAN	.31		.56		1.79	
HIGHEST ANNUAL MEAN					4.58	1997
LOWEST ANNUAL MEAN					.16	1999
HIGHEST DAILY MEAN	19	Oct 19	22	Apr 2	283	Feb 7 1976
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Sep 25 1960
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Aug 28 1961
ANNUAL RUNOFF (AC-FT)	224		408		1300	
10 PERCENT EXCEEDS	.53		1.0		3.4	
50 PERCENT EXCEEDS	.01		.00		.54	
90 PERCENT EXCEEDS	.00		.00		.03	



HAWAII, ISLAND OF OAHU

16212800 KIPAPA STREAM NEAR WAHIAWA

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

DRAINAGE AREA.--4.29 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 690 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Vaughn Kunishige. Records fair except for estimated period which is poor. At times, a small amount of water is diverted from the gage pool for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--43 years (water years 1958-2000), 10.7 ft^3/s (7,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,370 ft^3/s, March 21, 1991, gage height, 12.67 ft, from rating curve extended above 5,680 ft^3/s on basis of the shape of the rating; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0330	*2,470	*9.48	Aug. 20	1730	1,260	7.60
Dec. 10	2200	1,030	7.11				

Minimum discharge, no flow, June 4-7.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.47	4.4	32	2.5	3.5	.58	54	.91	.47	13	5.7	2.5
2	.41	1.9	250	2.2	3.4	.57	86	.80	.37	5.9	3.6	1.9
3	.50	2.3	19	2.0	2.4	.47	36	.77	.21	8.4	3.3	1.6
4	.38	53	8.7	1.9	2.1	.46	14	.66	.07	8.5	1.7	1.6
5	.36	12	15	1.8	1.8	.48	8.3	.58	.03	2.7	7.6	11
6	.98	4.1	9.0	1.8	1.7	.59	5.6	.60	.00	7.2	3.0	12
7	6.7	7.1	9.4	2.6	1.6	.53	4.1	.66	9.5	4.0	2.0	15
8	3.2	5.6	5.0	2.9	1.5	.46	3.4	.64	4.3	1.9	1.6	e9.0
9	1.2	16	7.3	3.4	1.4	.43	15	.65	2.0	1.3	1.1	e7.0
10	.64	5.3	99	5.5	1.3	.39	14	.57	.93	.94	1.5	e3.0
11	1.0	2.8	132	3.0	1.3	.36	5.8	1.1	.49	29	1.4	e14
12	.86	24	60	2.2	1.1	.33	4.0	12	.30	11	.85	e11
13	5.8	5.3	60	5.1	1.1	.31	3.2	12	.19	3.7	.70	e6.0
14	1.9	4.2	20	46	1.0	.30	3.1	3.8	.18	2.3	.70	e5.0
15	3.5	3.2	12	38	.94	.38	2.0	1.7	.27	14	.66	e8.0
16	1.2	2.1	8.5	56	.84	.45	1.9	1.1	.28	26	.74	e3.2
17	1.1	1.8	6.8	14	.80	.43	4.3	.77	.35	8.2	3.6	e2.5
18	.76	1.7	29	28	.74	.39	4.5	.58	.52	46	6.5	e1.8
19	38	5.6	10	146	.84	.60	2.1	.53	1.3	8.6	2.6	e1.6
20	9.8	2.2	5.6	143	.86	.63	1.6	.48	.59	16	110	e1.6
21	2.5	4.8	5.0	31	.70	.49	1.5	.48	.38	8.8	21	e1.5
22	1.4	3.7	10	19	.70	.49	1.5	.55	2.0	13	5.5	e1.4
23	.93	2.1	18	11	.96	1.1	1.3	.50	3.6	4.8	4.9	e1.3
24	4.3	2.1	8.3	7.6	.85	1.5	1.0	.39	3.6	3.6	3.3	e1.3
25	33	1.6	4.8	5.8	.66	1.0	1.0	.36	1.8	2.9	2.6	e1.3
26	4.3	1.3	16	17	.70	15	1.6	.33	1.3	4.1	1.7	e1.5
27	5.5	1.9	8.5	9.0	.69	20	7.6	.30	2.3	17	25	e20
28	2.6	3.4	4.4	4.7	.60	4.3	3.2	.25	.89	5.6	25	e40
29	1.8	2.0	3.5	3.8	.51	9.2	1.7	.30	.61	3.2	17	e9.0
30	1.5	1.8	3.2	3.1	---	5.7	1.2	.34	.68	2.5	5.2	e3.5
31	8.1	---	2.9	2.7	---	3.9	---	.40	---	1.8	3.3	---
TOTAL	144.69	189.3	882.9	622.6	36.59	71.82	294.5	45.10	39.51	285.94	273.35	200.1
MEAN	4.67	6.31	28.5	20.1	1.26	2.32	9.82	1.45	1.32	9.22	8.82	6.67
MAX	38	53	250	146	3.5	20	86	12	9.5	46	110	40
MIN	.36	1.3	2.9	1.8	.51	.30	1.0	.25	.00	.94	.66	1.3
AC-FT	287	375	1750	1230	73	142	584	89	78	567	542	397

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 2000, BY WATER YEAR (WY)

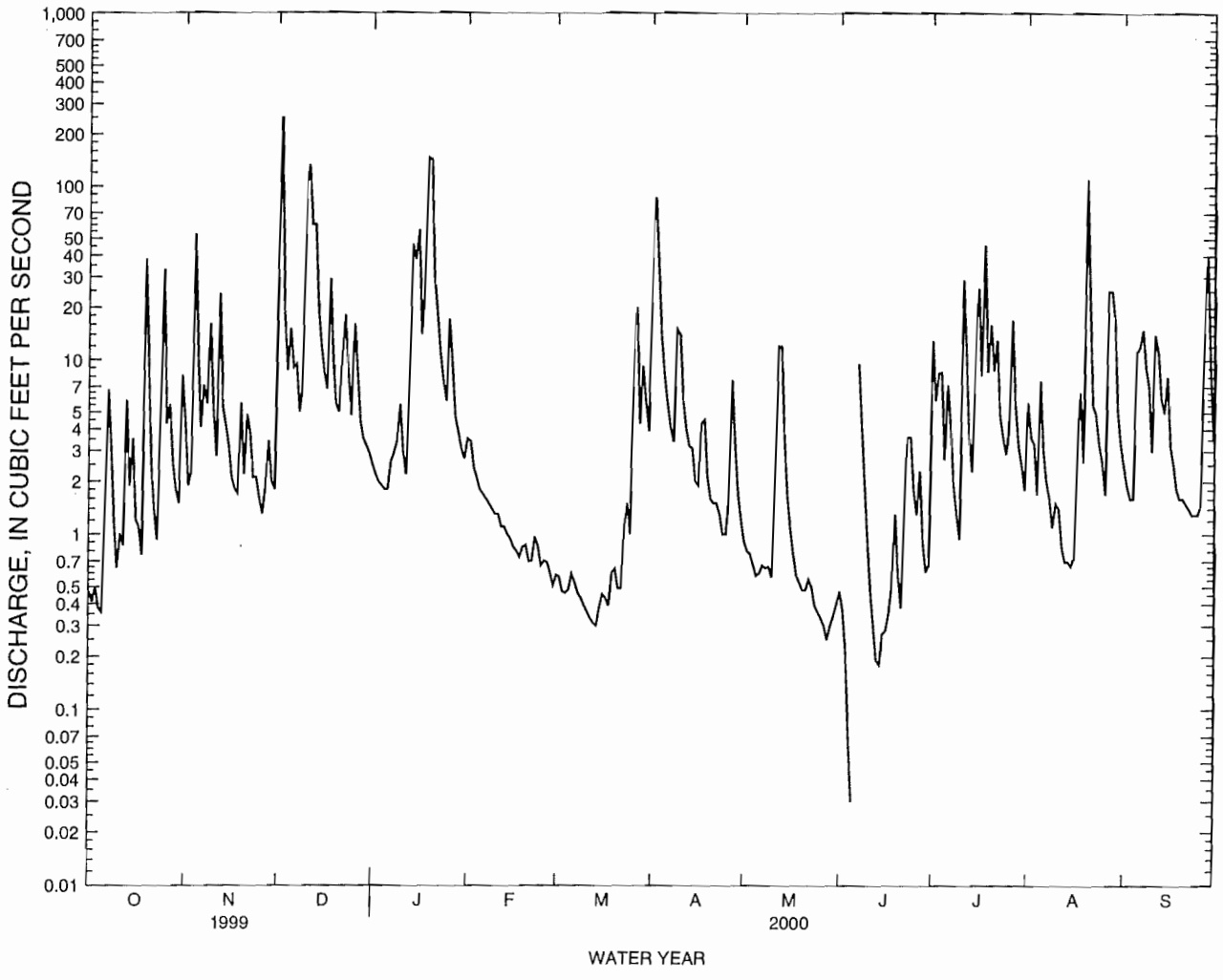
MEAN	9.74	14.9	12.7	11.3	9.78	15.7	14.8	8.86	5.68	9.93	8.15	6.01
MAX	49.6	61.8	42.2	32.1	54.4	98.4	60.9	34.0	21.9	28.1	37.5	23.6
(WY)	1982	1966	1988	1989	1969	1991	1963	1965	1978	1989	1958	1994
MIN	.84	.23	.83	.17	.19	.021	.33	.39	.16	.47	.30	.49
(WY)	1958	1963	1990	1977	1978	1983	1966	1992	1959	1968	1971	1998

e Estimated

HAWAII, ISLAND OF OAHU

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1957 - 2000	
ANNUAL TOTAL	3570.57		3086.40			
ANNUAL MEAN	9.78		8.43		10.7	
HIGHEST ANNUAL MEAN					25.2	1982
LOWEST ANNUAL MEAN					3.85	1998
HIGHEST DAILY MEAN	250	Dec 2	250	Dec 2	852	Apr 15 1963
LOWEST DAILY MEAN	.36	Oct 5	.00	Jun 6	.00	Jun 18 1959
ANNUAL SEVEN-DAY MINIMUM	.57	Sep 30	.22	May 31	.00	Jun 18 1959
ANNUAL RUNOFF (AC-FT)	7080		6120		7740	
10 PERCENT EXCEEDS	24		17		24	
50 PERCENT EXCEEDS	4.2		2.3		2.9	
90 PERCENT EXCEEDS	.91		.47		.36	



HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU

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

DRAINAGE AREA.--45.7 mi^2.

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

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

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

REMARKS.--Records computed by Vaughn Kunishige. Records poor.

AVERAGE DISCHARGE.--47 years (water years 1953-59, 1961-2000), 40.2 ft^3/s (29,120 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0600	*4,090	*7.38	Aug. 20	1920	1,740	5.23
Dec. 10	2340	2,240	5.74				

Minimum discharge, 11 ft^3/s, August 13-16, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	22	57	e18	e26	e20	56	16	16	15	17	19
2	16	19	715	e17	e25	20	321	16	16	23	17	18
3	16	19	85	e17	e23	20	148	15	15	19	17	17
4	15	51	42	e16	e23	20	59	15	15	23	16	17
5	15	66	39	e16	e22	20	40	15	16	20	15	18
6	16	25	40	e16	e22	20	29	15	16	19	22	e28
7	16	20	33	e17	e21	20	25	15	15	e20	17	29
8	17	27	29	e18	e20	20	22	16	16	e20	15	33
9	16	28	35	e19	e21	20	22	15	17	e20	14	37
10	16	30	196	e22	e20	18	43	15	15	e20	14	23
11	16	21	394	e19	e20	19	34	16	15	29	14	25
12	16	36	156	e18	e20	19	24	20	16	32	13	35
13	16	30	e100	e25	e20	19	21	27	e16	23	13	30
14	17	21	e50	e60	e20	19	21	24	e16	17	13	35
15	17	21	e30	e70	e20	19	21	19	e16	21	13	29
16	17	20	e23	e80	e20	18	20	17	e16	37	13	22
17	16	18	e20	e30	e19	17	20	16	15	34	13	19
18	16	18	e40	e55	e20	17	22	16	15	67	14	18
19	199	19	e25	e300	e20	17	22	15	15	34	14	19
20	63	19	e19	e260	e20	17	20	15	14	27	259	18
21	23	18	e18	e75	e20	17	19	16	14	37	131	17
22	19	22	e25	e40	e20	17	19	16	13	27	37	17
23	17	21	e35	e30	e20	18	19	16	13	24	28	17
24	17	19	e23	e26	e20	17	19	15	14	19	26	17
25	46	18	e18	e24	e20	17	18	15	14	18	23	16
26	30	18	e30	e31	e20	21	18	15	16	17	20	15
27	22	17	e23	e20	e21	50	24	15	15	27	33	27
28	23	17	e20	e24	e21	31	26	15	15	32	51	91
29	18	21	e19	e23	e20	21	19	15	15	22	39	51
30	18	19	e19	e22	---	29	17	16	15	19	29	28
31	17	---	e18	e22	---	21	---	16	---	17	21	---
TOTAL	802	720	2376	1430	604	638	1188	508	455	779	981	785
MEAN	25.9	24.0	76.6	46.1	20.8	20.6	39.6	16.4	15.2	25.1	31.6	26.2
MAX	199	66	715	300	26	50	321	27	17	67	259	91
MIN	15	17	18	16	19	17	17	15	13	15	13	15
AC-FT	1590	1430	4710	2840	1200	1270	2360	1010	902	1550	1950	1560

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2000, BY WATER YEAR (WY)

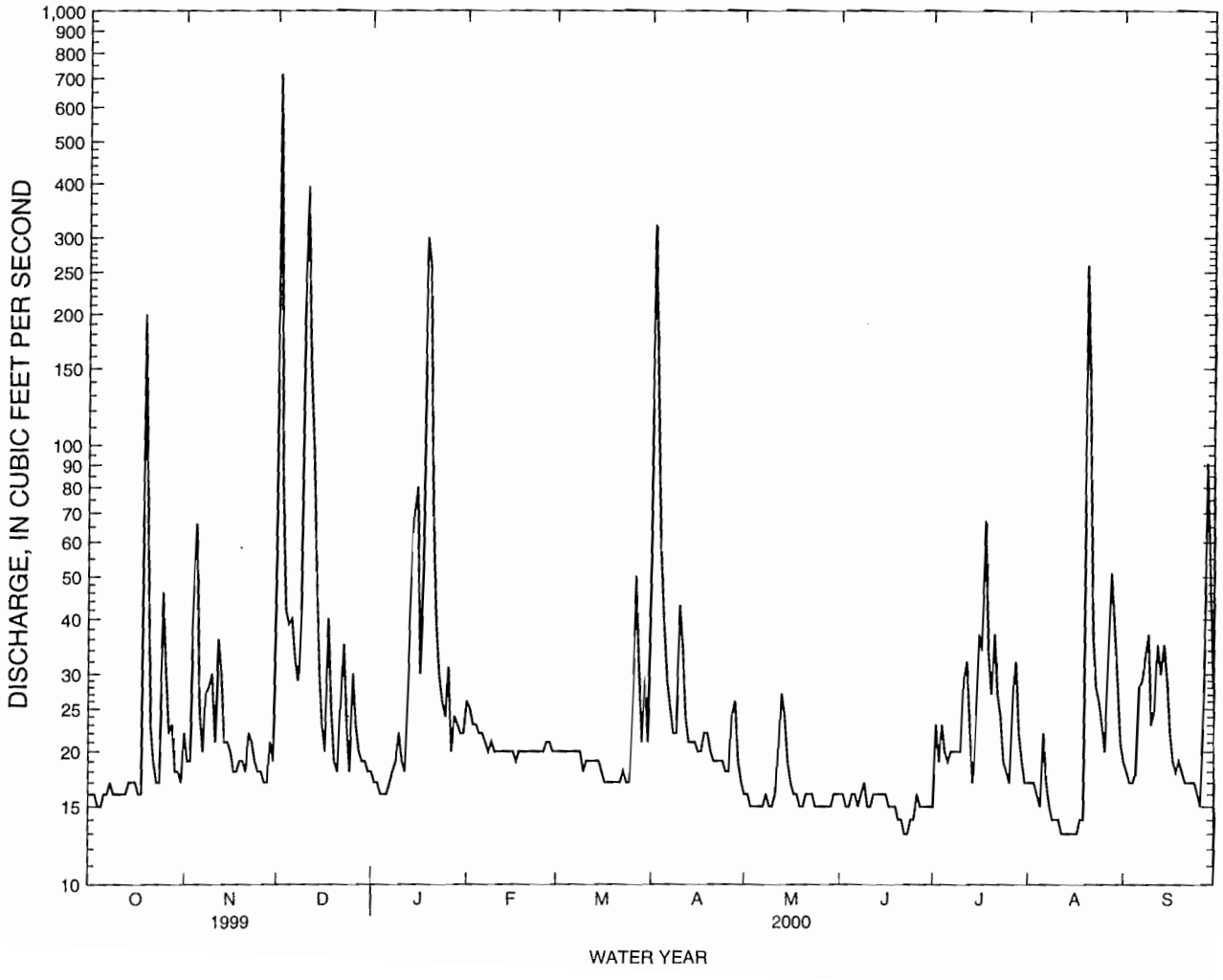
MEAN	32.5	49.8	49.9	60.0	53.4	53.2	49.3	32.3	24.0	29.5	26.1	22.6
MAX	97.8	198	146	222	179	195	235	99.3	51.5	76.8	90.0	68.1
(WY)	1992	1966	1966	1969	1955	1991	1963	1965	1980	1989	1958	1994
MIN	7.22	12.2	13.3	14.7	7.72	6.13	18.4	14.9	10.6	9.08	7.50	6.28
(WY)	1978	1954	1954	1986	1978	1978	1961	1954	1981	1985	1984	1975

e Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1953 - 2000	
ANNUAL TOTAL	12151		11266			
ANNUAL MEAN	33.3		30.8		40.2	
HIGHEST ANNUAL MEAN					77.3	1969
LOWEST ANNUAL MEAN					18.5	1954
HIGHEST DAILY MEAN	715	Dec 2	715	Dec 2	2590	Mar 21 1991
LOWEST DAILY MEAN	15	Sep 9	13	Jun 22	.61	Feb 25 1978
ANNUAL SEVEN-DAY MINIMUM	15	Sep 19	13	Aug 11	2.5	Feb 24 1978
ANNUAL RUNOFF (AC-FT)	24100		22350		29120	
10 PERCENT EXCEEDS	55		40		63	
50 PERCENT EXCEEDS	22		20		24	
90 PERCENT EXCEEDS	16		15		12	



HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1967-95, January 1999 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: April 1973 to September 1981. January 1999 to current year.

WATER TEMPERATURE: April 1973 to September 1981. January 1999 to current year.

SUSPENDED-SEDIMENT DISCHARGE: July 1972 to August 1993.

INSTRUMENTATION.--Water-quality monitor April 1973 to September 1981, January 1999 to current year. Automatic water-quality (point) sampler March 1999 to current year.

REMARKS.--City and County of Honolulu began pumping water from gage pool between Jan. and Mar. 2000 to irrigate soccer fields. Water-quality samples were collected monthly beginning in March 1999. Monthly samples were collected at the control near the centroid of flow using the open-bottle sampling method. Additional samples were collected during storm events (Oct. 19, Nov.4, Apr. 2, and Aug. 20.) using an automatic (point) sampler.

Missing daily water temperature and specific conductance record from Dec. 2 to Dec. 13 occurred because probe was destroyed by high water. Missing daily record from Dec. 13 through Mar. 2 caused by destruction of the gage house. Missing record June 13-16, July 7-10, and Sept. 6 caused by battery failure. Extremes for current water year were not reported because more than 20 percent of the record was missing.

EXTREMES FOR THE PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum recorded (water years 1974, 1976-81), 796 microsiemens per centimeter, Dec. 1, 1980; minimum (water years 1974, 1976-80), 30 microsiemens per centimeter, Apr. 19, 1974.

WATER TEMPERATURE: Maximum recorded (water years 1973-74, 1976-81), 30.0°C, May 6, 1973; minimum (water years 1974, 1976-81), 16.0°C, Mar. 16, 1976.

SEDIMENT CONCENTRATION: Maximum daily mean, 3,420 mg/L, Feb. 7, 1976; minimum daily mean, 1 mg/L, Mar. 16, 20-22, 1989, July 10, 1990.

SEDIMENT DISCHARGE: Maximum daily, 32,200 tons, Apr. 19, 1974; minimum daily, less than 0.01 ton, Aug. 29, 30, 1992.

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT									
07...	0920	16	77	6.8	7.2	521	22.0	14	14
19...	1135	256	--	--	--	116	21.0	4.6	2.7
NOV									
04...	1000	24	84	7.3	7.2	371	22.0	11	9.6
04...	2012	122	--	--	--	328	21.5	10	9.2
DEC									
09...	0950	52	88	7.8	7.1	347	21.5	12	9.8
JAN									
04...	1030	20	--	--	7.5	450	21.5	14	12
FEB									
10...	1000	19	94	8.3	7.3	483	21.5	14	12
MAR									
16...	0910	12	83	7.4	7.4	522	21.5	14	13
APR									
02...	0955	367	--	--	6.8	82	19.5	3.1	1.9
06...	1000	29	95	8.4	7.2	342	21.5	10	8.8
MAY									
11...	1000	17	123	10.6	7.3	498	23.0	14	13
JUN									
15...	1040	15	92	8.0	8.4	507	22.0	14	13
JUL									
13...	1030	22	95	8.2	7.7	345	23.0	9.7	8.5
AUG									
07...	1050	18	96	8.2	7.6	433	23.0	13	11
20...	1800	1340	--	--	7.0	89	25.0	4.2	1.9
SEP									
06...	0950	35	88	7.4	7.6	287	24.0	9.6	7.6

DATE	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)
OCT									
07...	2.7	63	61	74	--	100	.2	62	21
19...	5.2	10	22	27	--	15	<.1	8.4	5.4
NOV									
04...	2.3	42	48	59	--	73	<.1	43	13
04...	2.2	39	45	55	--	62	.1	38	14
DEC									
09...	2.2	43	51	62	--	70	.1	40	14
JAN									
04...	2.5	55	59	72	--	92	.1	52	18
FEB									
10...	2.6	56	58	71	--	94	.1	53	17
MAR									
16...	2.5	61	59	72	--	110	.1	58	19
APR									
02...	1.2	8.3	11	13	--	14	<.1	6.1	3.4
06...	1.9	39	43	52	--	64	.1	36	12
MAY									
11...	2.6	59	62	75	--	100	.1	56	20
JUN									
15...	2.6	62	62	71	2	100	.1	59	20
JUL									
13...	1.9	39	44	54	--	66	<.1	37	14
AUG									
07...	2.2	51	54	66	--	82	.1	50	16
20...	4.0	7.9	17	21	--	10	<.1	6.3	4.3
SEP									
06...	2.0	32	42	51	--	49	<.1	31	9.6

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	TIME	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N) (00608)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N) (00631)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS N) (00613)	PHOS-PHORUS DIS-SOLVED (MG/L AS P) (00666)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P) (00671)
OCT								
07...	0920	E.09	E.09	<.02	1.7	<.01	.19	.17
19...	1135	.4	4.1	.09	.46	.01	.15	.14
NOV								
04...	1000	.1	.1	<.02	1.1	<.01	.13	.11
04...	2012	E.08	.5	<.02	1.1	<.01	.12	.10
DEC								
09...	0950	E.06	.2	<.02	1.1	<.01	.11	.09
JAN								
04...	1030	<.1	E.10	.02	1.5	<.01	.14	.14
FEB								
10...	1000	E.06	E.08	<.02	1.4	<.01	.15	.14
MAR								
16...	0910	<.1	.1	<.02	1.6	<.01	.17	.17
APR								
02...	0955	E.08	.4	<.02	.15	<.01	.022	.02
06...	1000	<.1	.1	<.02	.99	<.01	.10	.09
MAY								
11...	1000	E.09	E.06	.04	1.6	<.01	.18	.24
JUN								
15...	1040	<.1	E.07	<.02	1.7	<.01	.18	.17
JUL								
13...	1030	E.07	.2	<.02	1.1	<.01	.12	.10
AUG								
07...	1050	<.1	E.09	<.02	1.4	<.01	.16	.13
20...	1800	.5	3.4	.16	.49	.01	.20	.17
SEP								
06...	0950	<.1	.1	<.02	.75	<.01	.088	.08

DATE	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	PH WATER FILTERED FIELD (STAND-ARD UNITS (99900)
OCT								
07...	.20	--	--	E.3	.3	333	1	--
19...	1.1	--	--	5.9	>6.3	79	434	7.4
NOV								
04...	.15	--	--	1.4	.2	231	8	--
04...	.25	--	--	2.3	2.5	214	76	7.8
DEC								
09...	.13	--	--	1.1	.2	228	--	--
JAN								
04...	.16	--	--	.8	.2	288	5	--
FEB								
10...	.17	--	--	.4	.2	300	4	--
MAR								
16...	.19	--	--	E.3	<.2	326	3	--
APR								
02...	.19	--	--	2.1	3.2	49	127	--
06...	.12	--	--	.8	<.2	213	5	--
MAY								
11...	.15	--	--	.4	<.2	319	10	--
JUN								
15...	.19	--	--	.4	<.2	323	3	--
JUL								
13...	.14	--	--	1.6	--	218	10	--
AUG								
07...	.16	.125	<.12	1.4	.125	278	3	--
20...	1.4	--	--	4.6	13	55	530	--
SEP								
06...	.11	.478	<.12	1.3	.478	176	7	--

E Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	TIME	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	BORON, DISSOLVED (UG/L AS B) (01020)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)
OCT										
07...	0920	2	<1	<2	7	<1	--	<1	1	<1
19...	1135	85	<1	2	5	<1	--	<1	1.4	<1
NOV										
04...	1000	4	<1	<2	6	<1	--	<1	E.8	<1
04...	2012	13	<1	<2	5	<1	--	<1	.9	<1
DEC										
09...	0950	5	<1	<2	7	<1	--	<1	<.8	<1
JAN										
04...	1030	3	<1	<2	7	<1	--	<1	<.8	<1
FEB										
10...	1000	2	<1	<.9	7	<1	104	<1	<.8	<1
MAR										
16...	0910	2	<1	<.9	7	<1	98.0	<1	<1	<1
APR										
02...	0955	29	<1	<.9	2	<1	23.6	<1	<1	<1
06...	1000	4	<1	<.9	5	<1	63.8	<1	E.6	<1
MAY										
11...	1000	<13	<1	<.9	7	<1	105	<1	.8	<1
JUN										
15...	1040	1	<1	E.8	7	<1	101	<1	E.6	<1
JUL										
13...	1030	--	--	--	--	--	--	--	--	--
AUG										
07...	1050	--	--	--	--	--	--	--	--	--
20...	1800	4	<1	2	5	<1	36.7	<1	E.7	<1
SEP										
06...	0950	--	--	--	--	--	--	--	--	--

DATE	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	LITHIUM DISSOLVED (UG/L AS LI) (01130)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	SILVER, DISSOLVED (UG/L AS AG) (01075)	STRONTIUM, DISSOLVED (UG/L AS SR) (01080)
OCT										
07...	<1	E5	<1	--	36	<1	<1	<2	<1	--
19...	3	120	<1	--	2	<1	2	<2	<1	--
NOV										
04...	<1	17	<1	--	31	<1	<1	<2	<1	--
04...	1	45	<1	--	17	<1	2	<2	<1	--
DEC										
09...	<1	17	<1	--	65	<1	<1	<2	<1	--
JAN										
04...	<1	36	<1	--	67	<1	2	E1	<1	--
FEB										
10...	<1	18	<1	.7	52	<1	1	1	<1	107
MAR										
16...	1	E7	<1	.7	45	<1	<1	E.6	<1	99.9
APR										
02...	1	150	<1	<.3	1	<1	<1	<.7	<1	22.5
06...	<1	E7	<1	.5	31	<1	<1	E.7	<1	73.9
MAY										
11...	<1	12	<1	.8	35	<1	<1	<.7	<1	109
JUN										
15...	<1	<10	<1	.7	29	<1	<1	4	<1	103
JUL										
13...	--	E9	--	--	21	--	--	--	--	--
AUG										
07...	--	E7	--	--	27	--	--	--	--	--
20...	2	29	<1	<.3	48	<1	2	<.7	<1	29.9
SEP										
06...	--	15	--	--	27	--	--	--	--	--

E Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	TIME	THALLIUM, DISSOLVED (UG/L AS TL) (01057)	VANADIUM, DISSOLVED (UG/L AS V) (01085)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DISSOLVED (UG/L AS U) (22703)
OCT					
07...	0920	--	--	<1	<1
19...	1135	--	--	1	<1
NOV					
04...	1000	--	--	1	<1
04...	2012	--	--	<1	<1
DEC					
09...	0950	--	--	<1	<1
JAN					
04...	1030	--	--	<1	<1
FEB					
10...	1000	<.9	30	<1	<1
MAR					
16...	0910	<.9	31	2	<1
APR					
02...	0955	<.9	2.1	<1	<1
06...	1000	<.9	19	<1	<1
MAY					
11...	1000	<.9	32	3	<1
JUN					
15...	1040	<.9	30	3	<1
JUL					
13...	1030	--	--	--	--
AUG					
07...	1050	--	--	--	--
20...	1800	<.9	9.9	1	<1
SEP					
06...	0950	--	--	--	--

DATE	TIME	2,6-DIETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETOCHLOR, WATER FLTRD REC (UG/L) (49260)	ALACHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DISSOLVED (UG/L) (34253)	ATRAZINE, WATER, DISS, REC (UG/L) (39632)	BENFLURALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYLATE, WATER, DISS, REC (UG/L) (04028)	CARBARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBOFURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)
OCT										
07...	0920	<.003	<.002	<.002	<.002	.0071	<.002	<.002	<.003	<.003
19...	1135	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.132	<.003
NOV										
04...	1000	<.003	<.002	.0233	<.002	.0054	<.002	<.002	E.0128	<.003
04...	2012	<.003	<.002	.0668	<.002	<.074	<.002	<.002	E.204	<.003
DEC										
09...	0950	<.003	<.002	<.002	<.002	.0057	<.002	<.002	E.0097	<.003
JAN										
04...	1030	<.003	<.002	<.002	<.002	.0064	<.002	<.002	<.003	<.003
FEB										
10...	1000	<.003	<.002	<.002	<.002	.0068	<.002	<.002	<.003	<.003
MAR										
16...	0910	<.003	<.002	<.002	<.002	.0064	<.002	<.002	<.003	<.003
APR										
02...	0955	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.0180	<.003
06...	1000	<.003	<.002	<.002	<.002	E.0034	<.002	<.002	<.003	<.003
MAY										
11...	1000	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
JUN										
15...	1040	<.003	<.002	<.002	<.002	.0071	<.002	<.002	<.003	<.003
AUG										
20...	1800	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.294	<.003

E Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)
OCT										
07...	<.004	<.004	<.002	E.0044	<.002	<.001	<.017	<.002	<.004	<.003
19...	.0109	<.004	<.002	<.002	.292	<.001	<.017	<.002	<.004	<.003
NOV										
04...	<.004	.0144	<.002	E.0041	.0420	<.001	<.017	<.002	<.004	<.003
04...	<.004	.0276	<.002	<.087	.293	<.001	<.017	<.002	<.004	<.003
DEC										
09...	<.004	<.004	<.002	E.0033	.0042	<.001	<.017	<.002	<.004	<.003
JAN										
04...	<.004	<.004	<.002	<.002	<.002	<.001	<.017	<.002	<.004	<.003
FEB										
10...	<.004	<.004	<.002	E.0031	<.002	<.001	<.017	<.002	<.004	<.003
MAR										
16...	<.004	<.004	<.002	E.0041	<.002	<.001	<.017	<.002	<.004	<.003
APR										
02...	.0044	<.004	<.002	<.002	.0118	<.001	<.017	<.002	<.004	<.003
06...	<.004	<.004	<.002	<.002	<.002	<.001	<.017	<.002	<.004	<.003
MAY										
11...	<.004	<.004	<.002	<.002	<.002	<.001	<.017	<.002	<.004	<.003
JUN										
15...	<.004	<.004	<.002	E.0058	<.002	<.001	<.017	<.002	<.004	<.003
AUG										
20...	.0200	<.004	<.002	<.002	.223	<.001	<.017	<.002	<.004	<.003

DATE	TIME	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)
OCT											
07...	0920	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
19...	1135	<.003	<.004	<.002	.0296	<.001	<.006	<.002	.0280	<.004	<.003
NOV											
04...	1000	<.003	<.004	<.002	E.0043	<.001	<.006	<.002	<.004	<.004	<.003
04...	2012	<.003	<.004	<.002	.0158	<.001	<.006	<.002	<.004	<.004	<.003
DEC											
09...	0950	<.003	<.004	<.002	E.0038	<.001	<.006	<.002	<.004	<.004	<.003
JAN											
04...	1030	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
FEB											
10...	1000	<.003	<.004	<.002	<.005	<.010	<.006	<.002	<.004	<.004	<.003
MAR											
16...	0910	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
APR											
02...	0955	<.003	<.004	<.002	<.010	<.001	<.006	<.002	<.004	<.004	<.003
06...	1000	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
MAY											
11...	1000	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
JUN											
15...	1040	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
AUG											
20...	1800	<.003	<.004	<.002	.184	<.010	<.006	<.002	<.010	<.004	<.003

E Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	P,P' DDE DISSOLV (UG/L) (34653)	PARA-THION, DIS-SOLVED (UG/L) (39542)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROPA-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)
OCT										
07...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
19...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
NOV										
04...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
04...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
DEC										
09...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
JAN										
04...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
FEB										
10...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
MAR										
16...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
APR										
02...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
06...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
MAY										
11...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
JUN										
15...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
AUG										
20...	<.006	<.004	<.004	.147	<.005	<.002	<.018	<.003	<.007	<.004

DATE	TIME	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)
OCT									
07...	0920	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
19...	1135	<.013	.379	<.010	<.007	<.013	<.002	<.001	<.002
NOV									
04...	1000	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
04...	2012	<.013	<.005	<.0767	<.007	<.013	<.002	<.001	<.002
DEC									
09...	0950	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
JAN									
04...	1030	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
FEB									
10...	1000	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
MAR									
16...	0910	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
APR									
02...	0955	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
06...	1000	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
MAY									
11...	1000	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
JUN									
15...	1040	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
AUG									
20...	1800	<.013	<.005	<.010	<.007	<.013	<.002	<.001	.0049

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	TIME	1,1,1-TRICHLOROETHANE TOTAL (UG/L) (34506)	1,1,2-TRICHLOROETHANE TOTAL (UG/L) (34511)	1,1-DICHLOROETHANE TOTAL (UG/L) (34496)	1,1-DICHLOROETHYLENE TOTAL (UG/L) (34501)	1,1-DICHLOROPROPENE, WAT, WH TOTAL (UG/L) (77168)	123-TRICHLOROPROPANE WATER WHOLE TOTAL (UG/L) (77443)	1,2-DIBROMOETHANE WATER WHOLE TOTAL (UG/L) (77651)	1,2-DICHLOROETHANE TOTAL (UG/L) (32103)	1,2-DICHLOROPROPANE TOTAL (UG/L) (34541)
JUN										
15...	1040	<.032	<.06	<.066	<.04	<.026	.178	<.036	<.13	<.068
SEP										
06...	0950	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	E.0136

DATE	TRANS-1,2-DICHLOROETHENE TOTAL (UG/L) (34546)	2,2-DICHLOROPROPANE WAT, WH TOTAL (UG/L) (77170)	2BUTENE TRANS-1 4-DICHLORO UNFLTRD RECOVER (UG/L) (73547)	2-HEXANONE WATER WHOLE TOTAL (UG/L) (77103)	ACETONE WATER WHOLE TOTAL (UG/L) (81552)	ACRYLONITRILE TOTAL (UG/L) (34215)	1,2,3-TRICHLORO BENZENE WAT, WH REC (UG/L) (77613)	BENZENE 123-TRIMETHYL- WATER UNFLTRD RECOVER (UG/L) (77221)	BENZENE 1,2,4-TRICHLORO- WAT UNF REC (UG/L) (34551)	BENZENE 124-TRIMETHYL UNFILT RECOVER (UG/L) (77222)
JUN										
15...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
SEP										
06...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056

DATE	BENZENE 135-TRIMETHYL WATER UNFLTRD REC (UG/L) (77226)	BENZENE 1,3-DICHLORO- WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DICHLORO- WATER UNFLTRD REC (UG/L) (34571)	ISOPROPYLBENZENE WATER WHOLE REC (UG/L) (77223)	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L) (77342)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L) (77224)	BENZENE O-DICHLORO- WATER UNFLTRD REC (UG/L) (34536)	BENZENE SEC BUTYL- WATER UNFLTRD REC (UG/L) (77350)	BENZENE TERT-BUTYL- WATER UNFLTRD REC (UG/L) (77353)	BENZENE TOTAL (UG/L) (34030)
JUN										
15...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
SEP										
06...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035

DATE	BROMOBENZENE WATER, WHOLE, TOTAL (UG/L) (81555)	BROMOETHENE WATER UNFLTRD RECOVER (UG/L) (50002)	BROMOFORM TOTAL (UG/L) (32104)	CARBON DISULFIDE WATER WHOLE TOTAL (UG/L) (77041)	CARBON TETRACHLORIDE TOTAL (UG/L) (32102)	CHLOROBENZENE TOTAL (UG/L) (34301)	CHLORODIBROMOMETHANE TOTAL (UG/L) (32105)	CHLOROETHANE TOTAL (UG/L) (34311)	CHLOROFORM TOTAL (UG/L) (32106)	CIS-1,2-DICHLOROETHENE WATER TOTAL (UG/L) (77093)
JUN										
15...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
SEP										
06...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	E.0128	<.038

DATE	CIS 1,3-DICHLOROPROPENE TOTAL (UG/L) (34704)	DIBROMOCHLOROPROPANE WATER WHOLE TOT.REC (UG/L) (82625)	DIBROMOMETHANE WATER WHOLE RECOVER (UG/L) (30217)	DICHLORODIFLUOROMETHANE TOTAL (UG/L) (32101)	DICHLORODIFLUOROMETHANE TOTAL (UG/L) (34668)	DI-ISOPROPYL-ETHER, WATER, UNFLTRD RECOVER (UG/L) (81577)	ETHANE, 1112-TETRACHLORO- WAT UNF REC (UG/L) (77562)	ETHANE, 1,1,2,2 TETRACHLORO- WAT UNF REC (UG/L) (34516)	ETHANE HEXACHLORO- WATER UNFLTRD RECOVER (UG/L) (34396)	ETHER ETHYL WATER UNFLTRD RECOVER (UG/L) (81576)
JUN										
15...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
SEP										
06...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17

E Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

DATE	ETHER TERT-BUTYL ETHYL UNFLTRD RECOVER (UG/L) (50004)	ETHER TERT-PENTYL METHYL UNFLTRD RECOVER (UG/L) (50005)	ETHYL-BENZENE TOTAL (UG/L) (34371)	FREON-113 WATER UNFLTRD REC (UG/L) (77652)	FURAN, TETRA-HYDRO-WATER UNFLTRD RECOVER (UG/L) (81607)	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	ISO-DURENE WATER UNFLTRD RECOVER (UG/L) (50000)	METHAC-RYLATE ETHYL-WATER UNFLTRD RECOVER (UG/L) (73570)	METHAC-RYLATE METHYL WATER UNFLTRD RECOVER (UG/L) (81597)	METH-ACRYLO-NITRITE WATER UNFLTRD RECOVER (UG/L) (81593)
JUN										
15...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
SEP										
06...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6

DATE	METHANE BROMO CHLORO-WAT UNFLTRD REC (UG/L) (77297)	METHYL ACRY-LATE WATER UNFLTRD RECOVER (UG/L) (49991)	METHYL IODIDE WATER UNFLTRD RECOVER (UG/L) (77424)	METHYL TERT-BUTYL ETHER WAT UNF REC (UG/L) (78032)	METHYL-BROMIDE TOTAL (UG/L) (34413)	METHYL-CHLO-RIDE TOTAL (UG/L) (34418)	METHYL ENE CHLO-RIDE TOTAL (UG/L) (34423)	METHYL-ETHYL-KETONE WATER WHOLE TOTAL (UG/L) (81595)	METHYL ISO-BUTYL KETONE WAT.WH. TOTAL (UG/L) (78133)	META/ PARA-XYLENE WATER UNFLTRD REC (UG/L) (85795)
JUN										
15...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
SEP										
06...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06

DATE	NAPHTH-ALENE TOTAL (UG/L) (34696)	O-CHLORO-TOLUENE WATER WHOLE TOTAL (UG/L) (77275)	O-XYLENE WATER WHOLE TOTAL (UG/L) (77135)	P-ISO-PROPYL-TOLUENE WATER WHOLE REC (UG/L) (77356)	1234-TETRA METHYL BENZENE UNFLTRD REC (UG/L) (49999)	1,3-DI-CHLORO-PROPANE WAT. WH TOTAL (UG/L) (77173)	PROPENE 3-CHLORO-WATER UNFLTRD RECOVER (UG/L) (78109)	STYRENE TOTAL (UG/L) (77128)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE O-ETHYL WATER UNFLTRD RECOVER (UG/L) (77220)
JUN										
15...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
SEP										
06...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06

DATE	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L) (77277)	TOLUENE TOTAL (UG/L) (34010)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34699)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L) (39180)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L) (34488)	VINYL CHLO-RIDE TOTAL (UG/L) (39175)
JUN						
15...	<.06	E.0161	<.09	<.038	<.09	<.11
SEP						
06...	<.06	E.0297	<.09	<.038	<.09	<.11

E Estimated

HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	533	492	521	507	360	418	486	142	317	---	---	---
2	534	527	531	487	415	453	---	---	---	---	---	---
3	535	528	533	507	449	480	---	---	---	---	---	---
4	537	533	535	449	65	292	---	---	---	---	---	---
5	537	519	532	260	67	160	---	---	---	---	---	---
6	538	521	533	375	260	325	---	---	---	---	---	---
7	538	525	533	431	375	403	---	---	---	---	---	---
8	536	458	514	428	281	339	---	---	---	---	---	---
9	517	478	496	376	216	338	---	---	---	---	---	---
10	526	510	517	353	220	287	---	---	---	---	---	---
11	533	516	525	424	353	393	---	---	---	---	---	---
12	532	525	529	444	159	323	---	---	---	---	---	---
13	532	525	529	363	198	292	---	---	---	---	---	---
14	530	467	498	422	363	399	---	---	---	---	---	---
15	514	480	501	445	410	427	---	---	---	---	---	---
16	516	479	497	481	438	454	---	---	---	---	---	---
17	527	506	519	495	457	473	---	---	---	---	---	---
18	532	527	530	507	463	483	---	---	---	---	---	---
19	531	75	219	507	434	489	---	---	---	---	---	---
20	313	104	206	477	433	458	---	---	---	---	---	---
21	416	313	378	491	477	487	---	---	---	---	---	---
22	482	414	452	488	393	435	---	---	---	---	---	---
23	502	475	489	472	434	449	---	---	---	---	---	---
24	516	502	510	501	460	475	---	---	---	---	---	---
25	523	151	326	502	491	496	---	---	---	---	---	---
26	382	215	308	519	480	501	---	---	---	---	---	---
27	434	382	408	528	515	522	---	---	---	---	---	---
28	430	380	399	530	484	508	---	---	---	---	---	---
29	473	430	458	494	405	439	---	---	---	---	---	---
30	491	473	482	498	470	487	---	---	---	---	---	---
31	507	491	500	---	---	---	---	---	---	---	---	---
MONTH	538	75	468	530	65	416	---	---	---	---	---	---
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	456	112	327	490	466	483
2	---	---	---	---	---	---	113	77	87	496	462	479
3	---	---	---	516	507	511	164	97	127	504	412	482
4	---	---	---	513	506	509	259	164	217	505	489	502
5	---	---	---	509	503	506	325	237	282	502	489	499
6	---	---	---	510	496	506	366	325	346	502	492	499
7	---	---	---	510	505	508	402	366	384	504	443	485
8	---	---	---	511	503	507	428	402	415	501	386	449
9	---	---	---	509	504	507	437	395	428	503	470	498
10	---	---	---	508	496	503	399	218	274	502	395	488
11	---	---	---	501	496	499	354	235	294	493	400	470
12	---	---	---	505	497	501	404	354	382	494	331	452
13	---	---	---	507	502	504	438	404	424	385	288	356
14	---	---	---	508	499	504	445	434	441	420	290	367
15	---	---	---	511	476	502	460	442	453	459	411	435
16	---	---	---	541	495	518	472	460	465	482	459	470
17	---	---	---	539	497	527	477	442	472	488	477	483
18	---	---	---	536	525	529	456	422	439	492	481	485
19	---	---	---	530	526	528	438	408	419	507	488	499
20	---	---	---	531	491	522	465	408	432	507	493	499
21	---	---	---	529	521	524	467	366	431	514	503	509
22	---	---	---	524	516	521	391	322	362	511	503	508
23	---	---	---	524	465	511	428	325	406	509	502	507
24	---	---	---	514	470	503	418	389	407	510	504	508
25	---	---	---	519	509	513	400	382	392	510	507	509
26	---	---	---	519	278	505	494	357	437	510	505	508
27	---	---	---	278	221	247	495	325	432	507	496	501
28	---	---	---	382	229	314	413	345	373	505	488	502
29	---	---	---	443	382	417	465	410	438	507	502	504
30	---	---	---	452	289	354	483	464	473	508	505	506
31	---	---	---	437	359	403	---	---	---	509	499	504
MONTH	---	---	---	---	---	---	495	77	375	514	288	482

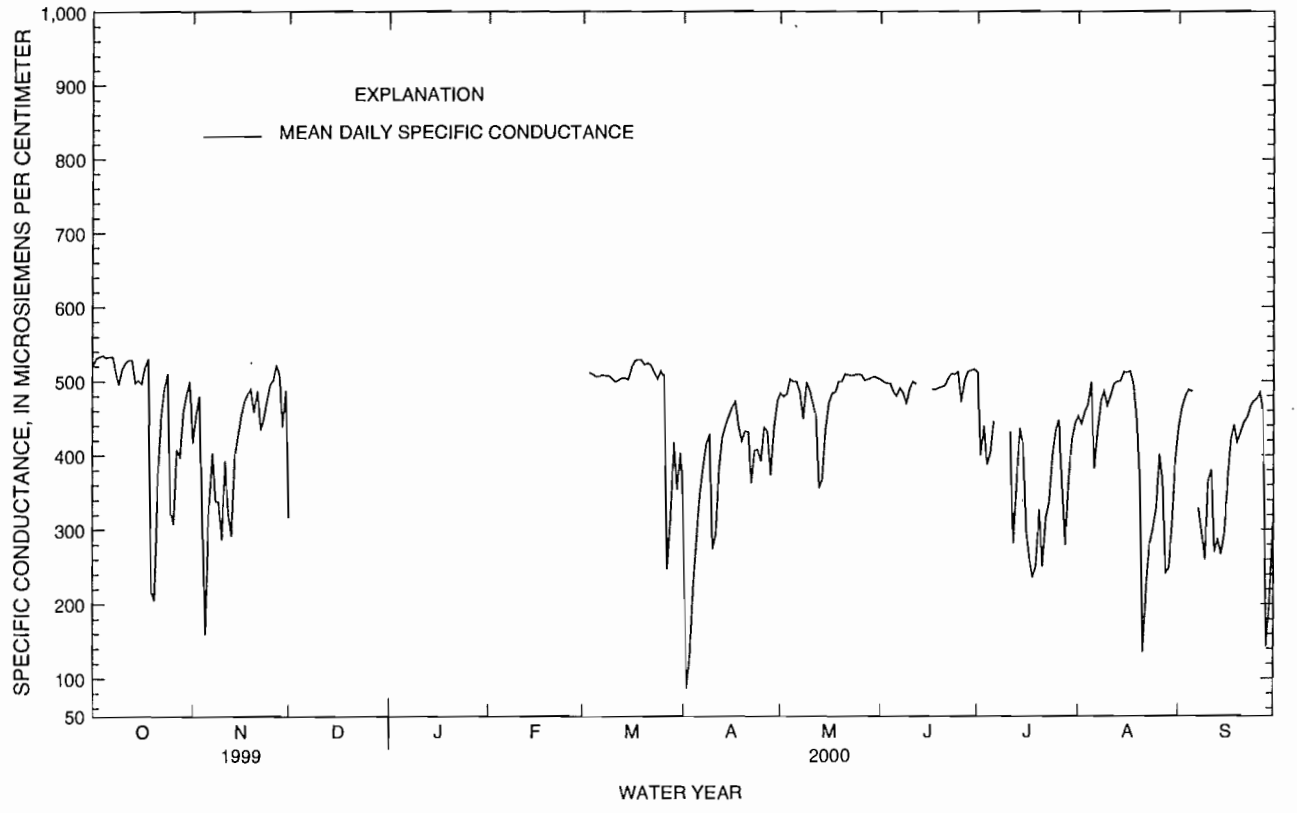
HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	505	498	502	517	503	512	468	402	452	452	423	438
2	502	484	499	515	332	400	465	404	442	473	452	464
3	503	467	497	459	426	439	477	425	458	484	472	479
4	503	485	497	458	346	388	488	432	468	489	484	488
5	499	455	485	430	352	403	504	488	498	499	462	486
6	484	473	480	476	399	445	504	339	383	---	---	---
7	501	462	490	---	---	---	463	403	434	390	284	329
8	504	445	484	---	---	---	482	463	474	378	259	294
9	489	451	469	---	---	---	492	481	486	318	216	260
10	503	472	490	---	---	---	493	459	467	402	313	364
11	504	491	499	512	186	431	488	462	481	433	233	380
12	501	490	496	324	207	282	502	485	496	332	224	270
13	---	---	---	410	295	355	501	495	499	330	249	288
14	---	---	---	460	409	436	520	476	500	325	212	267
15	---	---	---	473	288	413	519	509	512	330	254	295
16	---	---	---	380	184	299	514	507	511	402	330	370
17	500	474	489	329	192	262	516	507	513	438	402	421
18	498	474	488	366	121	236	518	415	495	445	432	441
19	500	472	491	312	170	251	467	418	447	440	407	418
20	496	485	492	357	217	327	484	77	369	446	413	430
21	497	492	494	309	180	251	174	83	136	456	427	444
22	509	497	504	366	255	316	267	174	229	463	437	451
23	512	508	510	378	301	337	299	267	280	472	463	466
24	511	505	509	423	378	398	314	288	300	477	470	472
25	515	510	512	444	423	434	344	314	329	479	473	476
26	513	355	472	457	437	447	464	342	401	488	476	484
27	515	453	501	458	232	364	475	200	367	492	151	456
28	518	510	513	323	241	280	328	146	242	160	120	143
29	519	508	514	403	323	367	311	191	248	289	143	202
30	520	512	516	436	403	421	365	248	311	349	273	309
31	---	---	---	453	424	443	423	365	396	---	---	---
MONTH	---	---	---	---	---	---	520	77	407	---	---	---



HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	23.5	21.5	22.0	23.0	21.5	22.0	21.5	20.0	21.0	---	---	---
2	23.0	21.5	22.0	23.0	21.5	22.0	---	---	---	---	---	---
3	23.5	21.0	22.0	22.5	21.0	22.0	---	---	---	---	---	---
4	23.0	21.0	22.0	22.0	21.0	21.5	---	---	---	---	---	---
5	23.0	21.5	22.0	22.0	20.5	21.5	---	---	---	---	---	---
6	22.5	21.5	21.5	22.5	21.5	21.5	---	---	---	---	---	---
7	22.5	21.5	21.5	22.0	21.5	21.5	---	---	---	---	---	---
8	23.0	21.5	22.0	22.0	21.0	21.5	---	---	---	---	---	---
9	23.5	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
10	23.0	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
11	23.0	21.0	22.0	22.5	21.0	21.5	---	---	---	---	---	---
12	22.5	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
13	22.5	21.5	22.0	22.0	20.5	21.0	---	---	---	---	---	---
14	22.5	21.0	22.0	22.5	21.0	21.5	---	---	---	---	---	---
15	22.5	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
16	23.0	21.0	22.0	22.5	21.0	21.5	---	---	---	---	---	---
17	22.5	21.0	22.0	22.5	21.0	21.5	---	---	---	---	---	---
18	22.5	21.0	21.5	22.5	21.0	21.5	---	---	---	---	---	---
19	21.5	21.0	21.5	22.0	21.0	21.5	---	---	---	---	---	---
20	21.0	20.0	20.5	22.5	21.0	21.5	---	---	---	---	---	---
21	22.5	21.0	21.5	22.5	21.0	21.5	---	---	---	---	---	---
22	23.5	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
23	23.0	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
24	23.0	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
25	23.0	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
26	22.5	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
27	23.0	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
28	23.0	21.5	22.0	22.5	21.0	21.5	---	---	---	---	---	---
29	23.0	21.5	22.0	22.0	21.0	21.5	---	---	---	---	---	---
30	22.5	21.5	22.0	22.0	21.0	21.5	---	---	---	---	---	---
31	22.5	21.5	22.0	---	---	---	---	---	---	---	---	---
MONTH	23.5	20.0	22.0	23.0	20.5	21.5	---	---	---	---	---	---
		FEBRUARY			MARCH			APRIL			MAY	
1	---	---	---	---	---	---	23.0	21.0	22.0	24.0	21.5	22.5
2	---	---	---	---	---	---	21.0	19.5	20.0	23.0	21.5	22.0
3	---	---	---	23.5	21.0	22.0	21.0	20.0	20.5	24.5	21.5	22.5
4	---	---	---	24.0	21.0	22.0	22.0	20.0	21.0	24.5	21.5	22.5
5	---	---	---	23.0	21.0	22.0	22.0	20.5	21.0	24.0	21.5	22.5
6	---	---	---	23.5	21.0	22.0	23.5	20.5	22.0	23.5	21.5	22.5
7	---	---	---	24.0	21.5	22.0	22.5	21.0	21.5	24.0	21.5	22.5
8	---	---	---	23.5	21.0	22.0	22.0	20.5	21.5	23.5	21.5	22.5
9	---	---	---	23.0	21.0	21.5	22.0	20.5	21.0	23.5	21.5	22.0
10	---	---	---	23.5	21.0	22.0	23.0	19.5	21.0	24.0	21.5	22.5
11	---	---	---	23.5	21.0	22.0	22.5	20.0	21.5	24.5	21.5	22.5
12	---	---	---	24.0	21.0	22.0	23.5	21.0	22.0	24.5	21.5	23.0
13	---	---	---	23.5	21.5	22.0	23.5	21.5	22.0	25.0	22.5	23.5
14	---	---	---	23.5	21.0	22.0	24.0	21.5	22.5	24.5	22.0	23.0
15	---	---	---	24.0	21.0	22.5	23.5	21.5	22.0	24.5	21.5	22.5
16	---	---	---	24.0	21.0	22.0	23.5	21.5	22.0	24.5	21.5	22.5
17	---	---	---	24.0	21.0	22.0	23.5	21.5	22.0	24.0	21.5	22.5
18	---	---	---	23.5	21.0	22.0	23.5	21.5	22.5	23.0	21.5	22.0
19	---	---	---	24.0	21.0	22.0	23.5	21.5	22.5	24.0	21.5	22.5
20	---	---	---	24.0	21.0	22.0	23.5	21.5	22.0	24.5	21.5	22.5
21	---	---	---	23.5	21.0	22.0	23.5	21.5	22.0	24.0	21.5	22.5
22	---	---	---	23.5	21.0	22.0	23.0	21.5	22.0	24.0	21.5	22.5
23	---	---	---	23.0	21.5	22.0	24.0	21.5	22.5	23.0	21.0	22.0
24	---	---	---	24.0	21.5	22.5	24.0	21.5	22.5	24.5	21.0	22.5
25	---	---	---	24.0	21.0	22.0	24.0	21.5	22.5	24.0	21.0	22.5
26	---	---	---	23.5	21.5	22.0	24.5	21.5	22.5	23.5	21.0	22.0
27	---	---	---	23.5	21.5	22.5	24.0	21.5	22.5	23.5	21.5	22.5
28	---	---	---	23.0	21.0	22.0	23.5	21.5	22.5	23.5	21.5	22.5
29	---	---	---	23.5	21.5	22.5	24.0	21.5	22.5	24.5	21.5	22.5
30	---	---	---	23.0	21.5	22.0	24.0	21.5	22.5	24.0	21.5	22.5
31	---	---	---	23.5	21.5	22.0	---	---	---	23.5	21.5	22.5
MONTH	---	---	---	---	---	---	24.5	19.5	22.0	25.0	21.0	22.5

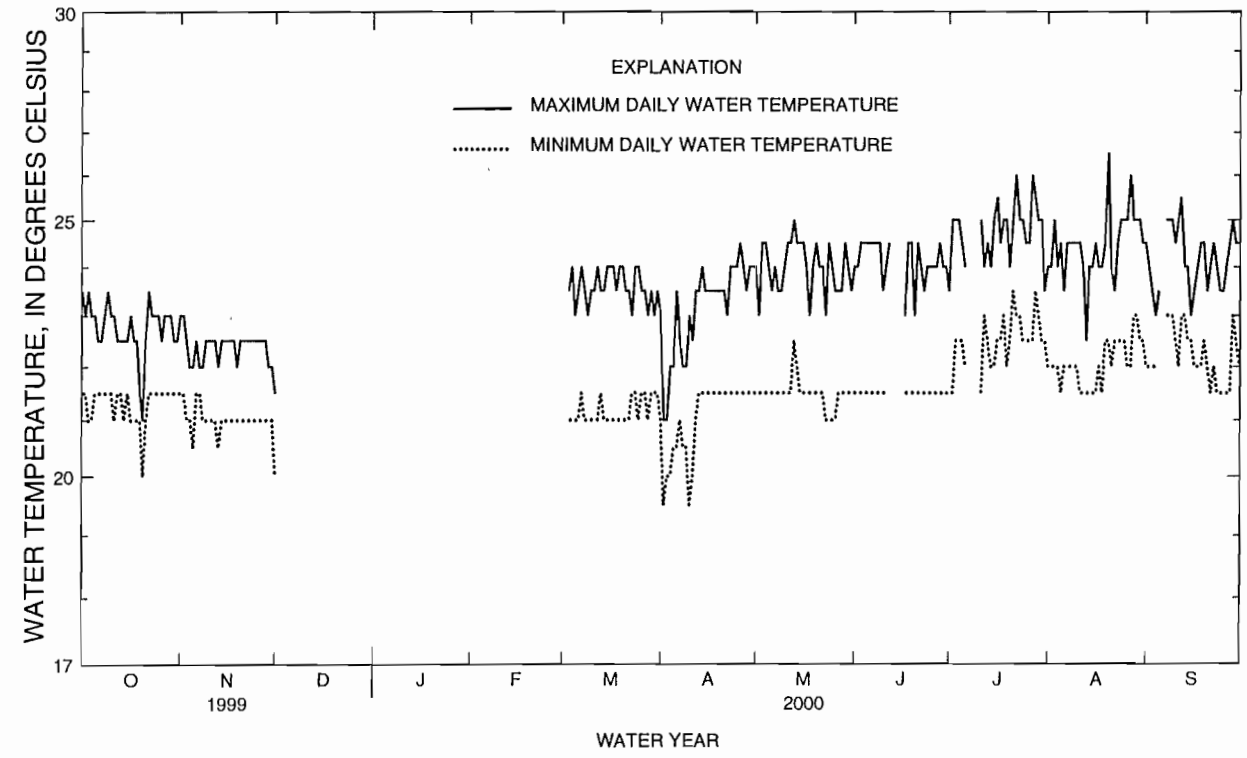
HAWAII, ISLAND OF OAHU

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

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



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HAWAII, ISLAND OF OAHU

16216000 WAIAWA STREAM NEAR PEARL CITY

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

DRAINAGE AREA.--26.4 mi^2.

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

REVISED RECORDS.--WSP 1569: Drainage area, WDR HI-90-1: 1982-89 (M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 1.81 ft above mean sea level (State of Hawaii benchmark).

REMARKS.--Records computed by V.E. Kunishige. Records poor. Occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--48 years (water years 1953-2000), 33.4 ft^3/s (24,200 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft^3/s, October 28, 1981, gage height, 22.46 ft, from rating curve extended above 1,100 ft^3/s on basis of slope-area measurements at gage heights 17.1 ft and 20.56 ft; minimum, 1.1 ft^3/s on several days in 1984, 1985, 1999, and 2000.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0430	*11,600	*18.38	Aug. 20	1815	7,210	15.46
Dec. 10	2245	5,550	14.08				

Minimum discharge, 1.1 ft^3/s, March 27, 28, 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	5.1	82	e2.8	3.0	1.6	5.5	1.4	1.5	2.3	2.0	4.1
2	1.5	2.4	1450	e2.4	3.6	1.6	209	1.4	1.6	2.3	2.0	3.3
3	1.5	1.9	57	e2.2	2.4	1.6	97	1.3	1.6	2.4	2.2	2.7
4	1.5	76	24	e2.0	2.2	1.6	28	1.4	1.6	2.4	2.3	2.6
5	1.5	28	41	e1.9	2.1	1.6	13	1.4	1.6	2.5	2.2	5.0
6	1.5	5.5	20	e1.8	2.1	1.5	6.7	1.4	1.7	2.7	2.3	7.3
7	1.5	2.9	19	e2.4	2.0	1.5	4.0	1.4	1.7	2.7	7.3	10
8	1.5	7.5	11	e2.8	1.9	1.5	2.8	1.3	1.7	2.7	3.5	13
9	1.6	20	19	e3.8	2.0	1.5	2.9	1.4	1.7	2.7	2.4	11
10	1.6	11	475	e6.5	1.9	1.5	11	1.3	1.7	2.7	2.2	4.8
11	1.6	4.1	455	e3.5	1.9	1.5	7.8	1.4	1.7	29	2.2	24
12	1.7	22	113	e2.0	1.9	1.5	3.6	1.4	1.7	42	2.2	22
13	1.7	8.3	82	2.2	1.9	1.5	2.3	1.4	1.8	7.7	2.2	10
14	1.7	3.9	33	29	1.9	1.5	1.8	1.4	1.8	3.1	2.2	8.6
15	1.7	3.1	19	40	1.9	1.5	1.7	1.4	1.8	5.5	2.2	12
16	1.8	2.3	12	59	1.9	1.5	1.6	1.4	1.8	62	2.2	5.2
17	1.7	2.0	8.8	19	1.8	1.4	1.5	1.4	1.8	51	2.2	3.8
18	1.6	1.8	7.3	19	1.9	1.4	1.5	1.5	1.9	74	2.1	2.8
19	100	4.7	13	420	1.8	1.4	1.4	1.5	1.9	25	2.3	2.6
20	28	2.7	6.2	362	1.8	1.4	1.4	1.5	1.9	54	797	2.6
21	3.5	2.0	4.7	74	1.8	1.4	1.4	1.5	1.9	49	91	2.5
22	2.0	3.0	6.8	35	1.6	1.6	1.4	1.5	2.0	26	19	2.4
23	1.7	2.4	23	15	1.6	1.4	1.4	1.5	2.0	12	10	2.3
24	1.7	2.3	15	8.5	1.6	1.2	1.4	1.5	2.1	7.9	7.9	2.3
25	75	2.1	6.9	5.7	1.6	1.2	1.4	1.5	2.0	4.0	5.5	2.3
26	9.9	1.9	12	15	1.6	1.4	1.4	1.5	2.1	2.6	3.9	2.5
27	5.0	1.8	15	12	1.7	1.3	1.4	1.5	2.1	19	45	33
28	3.2	1.8	5.8	4.8	1.7	1.1	1.4	1.5	2.1	17	29	68
29	2.2	1.7	e4.0	3.4	1.6	1.2	1.4	1.5	2.2	5.8	22	16
30	1.8	1.7	e3.7	2.8	---	1.1	1.4	1.5	2.2	3.3	10	5.7
31	1.7	---	e3.3	2.3	---	1.2	---	1.6	---	2.4	5.6	---
TOTAL	264.4	235.9	3047.5	1162.8	56.7	44.2	418.5	44.6	55.2	527.7	1094.1	294.4
MEAN	8.53	7.86	98.3	37.5	1.96	1.43	13.9	1.44	1.84	17.0	35.3	9.81
MAX	100	76	1450	420	3.6	1.6	209	1.6	2.2	74	797	68
MIN	1.5	1.7	3.3	1.8	1.6	1.1	1.4	1.3	1.5	2.3	2.0	2.3
AC-FT	524	468	6040	2310	112	88	830	88	109	1050	2170	584

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 2000, BY WATER YEAR (WY)

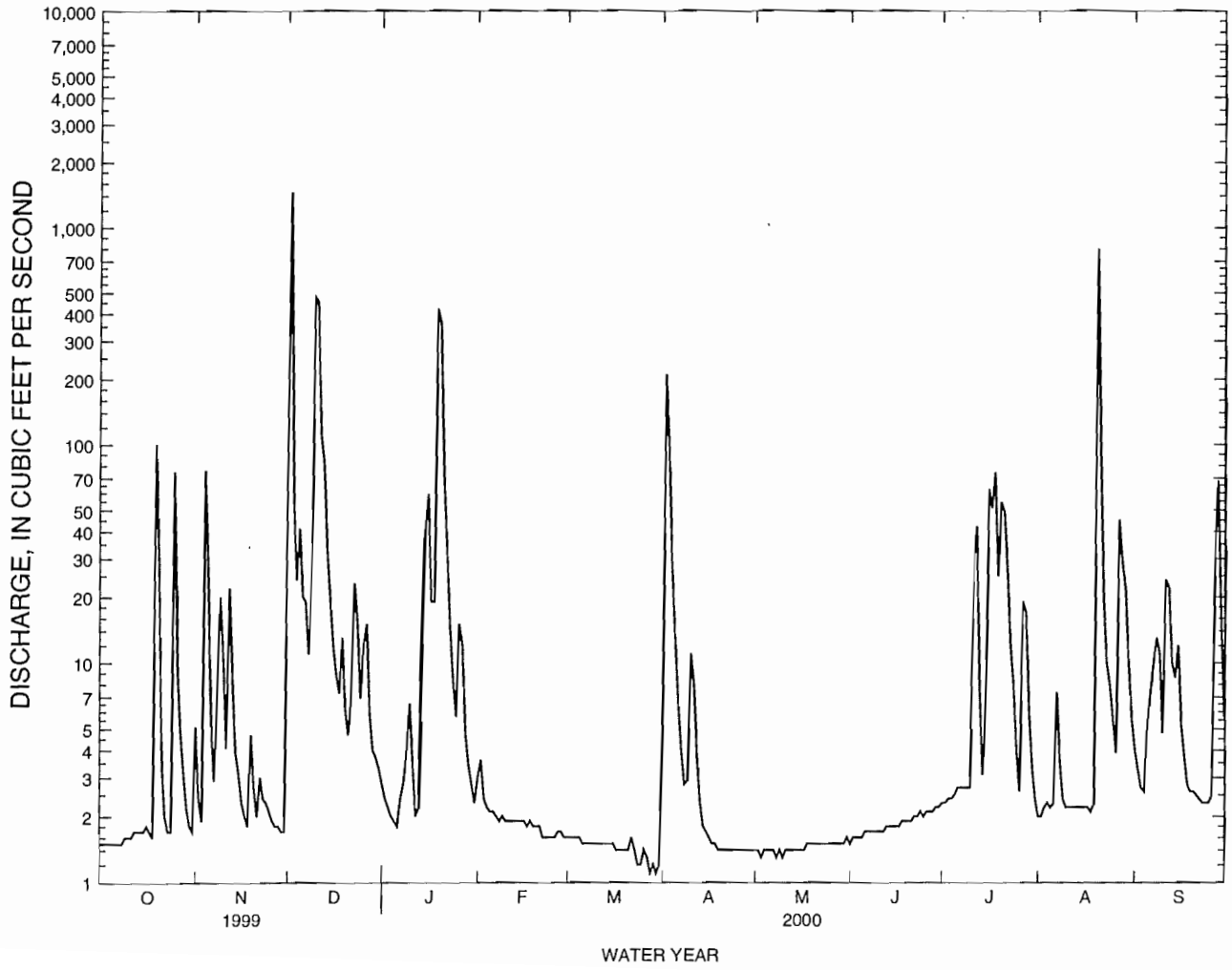
MEAN	28.3	53.6	44.6	44.9	37.0	51.5	40.5	22.8	15.2	26.6	21.2	14.2
MAX	131	295	351	199	208	336	241	131	72.9	149	128	104
(WY)	1967	1997	1988	1969	1955	1980	1974	1965	1987	1970	1982	1992
MIN	1.55	2.54	1.92	1.65	1.66	1.43	1.75	1.44	1.43	1.40	1.28	1.28
(WY)	1985	1990	1984	1986	1986	2000	1992	2000	1984	1984	1984	1984

e Estimated

HAWAII, ISLAND OF OAHU

16216000 WAIAWA STREAM NEAR PEARL CITY

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1952 - 2000	
ANNUAL TOTAL	8635.8		7246.0			
ANNUAL MEAN	23.7		19.8		33.4	
HIGHEST ANNUAL MEAN					80.8	1982
LOWEST ANNUAL MEAN					7.56	1984
HIGHEST DAILY MEAN	1450	Dec 2	1450	Dec 2	5150	Mar 24 1994
LOWEST DAILY MEAN	1.2	Sep 30	1.1	Mar 28	1.1	May 18 1993
ANNUAL SEVEN-DAY MINIMUM	1.3	Sep 24	1.2	Mar 24	1.1	May 25 1993
ANNUAL RUNOFF (AC-FT)	17130		14370		24200	
10 PERCENT EXCEEDS	46		28		47	
50 PERCENT EXCEEDS	3.4		2.2		6.3	
90 PERCENT EXCEEDS	1.5		1.4		2.0	



HAWAII, ISLAND OF OAHU

16226000 NORTH HALAWA STREAM NEAR AIEA

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

DRAINAGE AREA.--3.45 mi^2.

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

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

GAGE.--Water-stage recorder. Elevation of gage is 320 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Vaughn Kunishige. Records fair. Recording rain gage located at station.

AVERAGE DISCHARGE.--50 years (water years 1930-32, 1954-2000), 5.25 ft^3/s (3,800 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0345	621	8.95	Aug. 20	1715	*1,090	*10.18
Dec. 10	2100	846	9.58				

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.17	13	.01	.76	.00	36	.00	.00	.23	.03	.18
2	.04	.04	75	.00	.32	.00	62	.00	.00	.27	.00	.08
3	.00	.37	.59	.00	.24	.00	30	.00	.00	.39	.00	.07
4	.04	10	.01	.00	.18	.00	6.9	.00	.00	.19	.01	.05
5	.39	.83	.35	.00	.11	.00	3.3	.00	.00	.04	.29	4.1
6	.14	.12	.00	.24	.07	.00	1.7	.01	.01	.27	.00	1.3
7	.22	.34	.00	.06	.00	.00	.87	.01	.48	.00	.00	4.0
8	.03	.26	.00	.09	.17	.00	2.0	.00	.22	.02	.00	3.0
9	.07	1.7	.15	.30	.00	.00	7.3	.00	.09	.00	.00	.83
10	.00	.40	80	.17	.00	.00	2.5	.00	.00	.25	.05	.29
11	.00	.16	63	.08	.00	.00	1.2	.07	.00	8.6	.00	.58
12	.17	2.2	35	.02	.00	.00	.51	.36	.00	.71	.00	.54
13	.29	.44	24	.30	.00	.00	.33	.20	.02	.04	.00	1.5
14	.17	.36	21	3.1	.00	.00	.16	.00	.17	.36	.00	3.9
15	.00	.07	6.2	16	.00	.00	.07	.00	.00	.50	.00	1.2
16	.11	.00	2.3	18	.00	.00	.31	.00	.16	2.9	.00	.30
17	.01	.00	1.6	3.8	.00	.00	.36	.00	.09	1.2	.80	.43
18	.00	.20	4.8	6.7	.00	.00	.13	.00	.04	1.3	.13	.97
19	14	.16	1.3	99	.07	.00	.01	.00	.00	.38	.00	.37
20	1.4	.19	.58	137	.00	.00	.03	.00	.26	9.9	116	.19
21	.28	.16	.23	39	.06	.00	.22	.00	.28	2.8	20	.07
22	.12	.32	1.4	14	.09	.00	.00	.00	.01	1.3	3.8	.05
23	.00	.04	5.0	4.9	.00	.35	.00	.00	.12	.27	1.3	.02
24	5.7	.01	1.9	2.6	.00	.00	.00	.00	.00	.10	.57	.00
25	10	.10	1.0	1.7	.00	.30	.02	.00	.08	.12	.20	.00
26	1.3	.00	3.1	7.4	.02	.86	.19	.01	.00	.11	.16	.00
27	.48	.15	1.6	2.8	.05	1.2	.45	.00	.00	.55	5.4	8.7
28	.23	.05	.70	1.5	.00	.10	.00	.00	.00	.01	7.9	12
29	.18	.05	.29	1.0	.00	1.5	.00	.00	.00	.01	6.6	2.2
30	.09	.06	.26	.69	---	.43	.00	.00	.33	.00	1.6	.52
31	.53	---	.07	.49	---	20	---	.08	---	.00	.58	---
TOTAL	35.99	18.95	344.43	360.95	2.14	24.74	156.56	0.74	2.36	32.82	165.42	47.44
MEAN	1.16	.63	11.1	11.6	.074	.80	5.22	.024	.079	1.06	5.34	1.58
MAX	14	10	80	137	.76	20	62	.36	.48	9.9	116	12
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	71	38	683	716	4.2	49	311	1.5	4.7	65	328	94

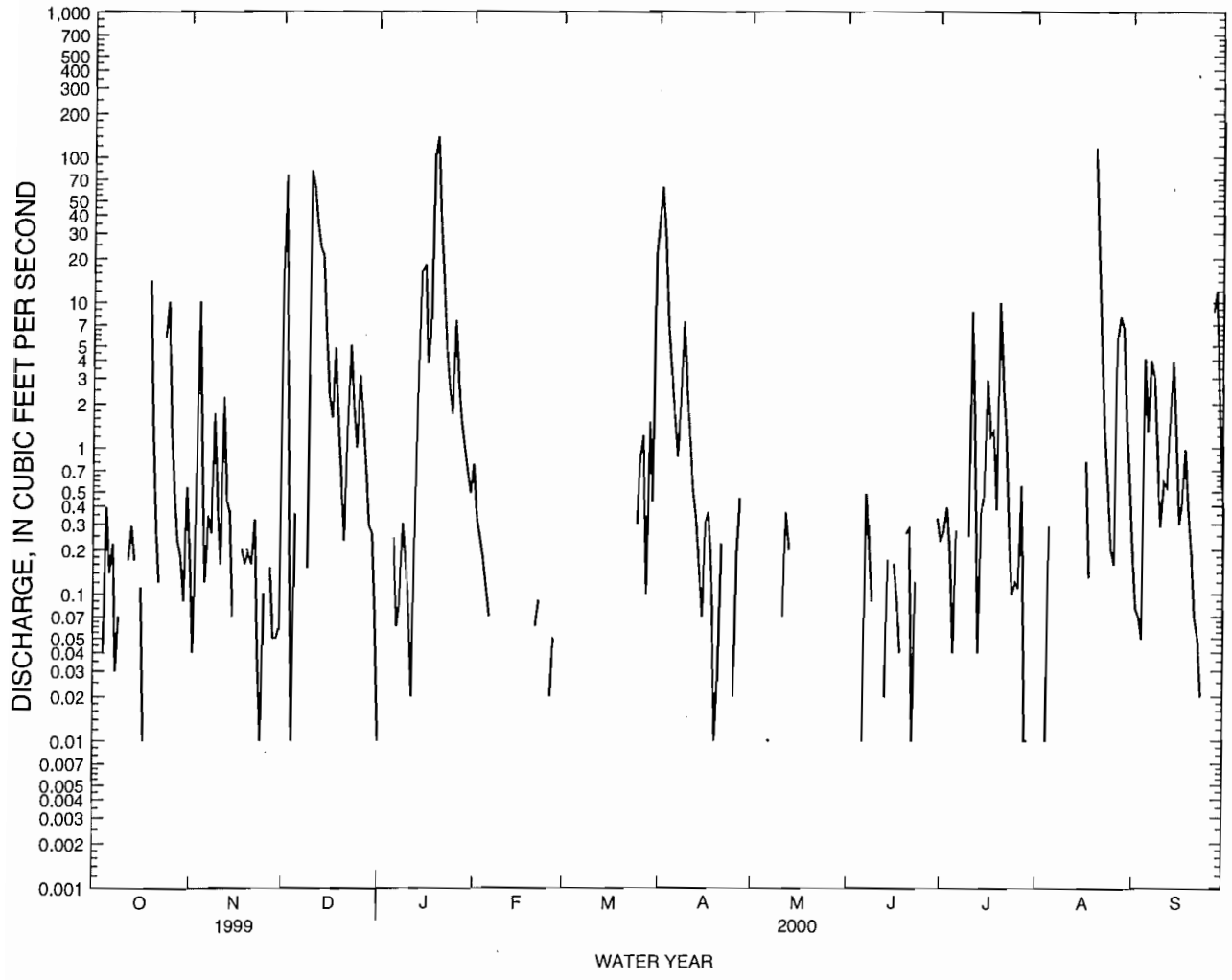
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 2000, BY WATER YEAR (WY)

MEAN	3.39	7.76	7.62	6.62	7.54	7.89	7.01	4.56	1.81	3.61	3.60	2.12
MAX	16.3	50.6	35.0	26.0	76.3	37.8	33.2	30.1	7.86	23.0	21.6	17.1
(WY)	1959	1966	1930	1988	1932	1968	1932	1965	1932	1954	1982	1931
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1933	1954	1990	1977	1931	1931	1931	1931	1931	1953	1962	1953

HAWAII, ISLAND OF OAHU

16226000 NORTH HALAWA STREAM NEAR AIEA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1929 - 2000	
ANNUAL TOTAL	1246.00		1192.54			
ANNUAL MEAN	3.41		3.26		5.25	
HIGHEST ANNUAL MEAN					15.7	1932
LOWEST ANNUAL MEAN					1.41	1984
HIGHEST DAILY MEAN	80	Dec 10	137	Jan 20	956	Nov 18 1930
LOWEST DAILY MEAN	.00	Jan 19	.00	Oct 1	.00	Sep 14 1929
ANNUAL SEVEN-DAY MINIMUM	.00	May 8	.00	Feb 9	.00	Sep 14 1929
ANNUAL RUNOFF (AC-FT)	2470		2370		3800	
10 PERCENT EXCEEDS	6.9		4.9		11	
50 PERCENT EXCEEDS	.30		.11		.37	
90 PERCENT EXCEEDS	.00		.00		.00	



HAWAII, ISLAND OF OAHU

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA

LOCATION.--Lat 21°23′53″, long 157°53′30″, Hydrologic Unit 2006000, on manhole 6.1 mi west of Kaneohe Elementary School, 1.65 mi northeast of Halawa Prison, and 1.05 mi east of Keaiwa Heiau.

PERIOD OF RECORD.--September 1998 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 336.22 ft from Hawaii State Department of Transportation levels.

REMARKS.--Records computed by A.H.M. Okihara. Records fair except for discharges greater than 15 ft^3/s and estimated days which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 36 ft^3/s, November 18, 1998, gage height, 4.56 ft, no flow at times during the year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 30 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 10	2025	33	4.28	Aug. 20	1545	*33	*4.33

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.05	1.1	.00	.23	.06	1.5	.00	.00	.27	.06	e.10
2	.09	.07	1.1	.00	.00	.00	1.6	.06	.02	.25	.03	e.10
3	.00	.18	.01	.00	.00	.00	.51	.07	.00	.39	.00	e.10
4	.07	.40	.03	.00	.00	.03	.37	.00	.00	.12	.10	e.16
5	.29	.00	.18	.01	.00	.01	.01	.00	.08	.06	.45	e.31
6	.09	.02	.05	.36	.00	.00	.02	.11	.11	.29	.04	e.22
7	.17	.30	.08	.06	.00	.00	.01	.05	.46	.02	.00	e.28
8	.05	.22	.26	.15	.10	.00	.21	.01	.27	.04	.00	e.16
9	.09	.36	.58	.35	.00	.00	.51	.00	.04	.02	.02	e.10
10	.00	.02	3.0	.18	.00	.00	.27	.03	.05	.33	.14	e.10
11	.06	.09	1.2	.12	.00	.00	.01	.23	.02	1.1	.01	e.20
12	.21	.52	1.1	.10	.00	.00	.02	.34	.00	.09	.00	.18
13	.17	.02	.43	.35	.00	.00	.09	.24	.08	.00	.02	.27
14	.11	.14	.35	.47	.00	.00	.04	.00	.18	.34	.00	.24
15	.03	.00	.00	1.3	.00	.00	.00	.00	.01	.43	.06	.00
16	.09	.00	.00	.68	.00	.00	.25	.00	.22	.61	.05	.04
17	.03	.01	.10	.08	.00	.00	.29	.00	.15	.11	.88	.25
18	.00	.22	.10	.69	.02	.08	.09	.00	.04	.25	.18	.27
19	1.1	.17	.01	2.9	.19	.00	.00	.11	.00	.04	.07	.12
20	.03	.17	.08	3.2	.00	.00	.08	.00	.29	.78	e3.0	.03
21	.06	.10	.01	1.1	.15	.03	.19	.01	.27	.15	e.00	.02
22	.01	.27	.34	.18	.06	.01	.02	.10	.06	.01	e.10	.00
23	.04	.04	.39	.01	.02	.33	.04	.00	.14	.04	e.00	.00
24	.82	.00	.00	.00	.00	.02	.05	.01	.00	.04	.08	.00
25	.35	.10	.00	.00	.04	.31	.12	.00	.09	.16	.00	.00
26	.06	.00	.30	.68	.11	.54	.24	.12	.01	.15	.05	.00
27	.08	.15	.00	.00	.09	.76	.34	.01	.00	.54	e.29	1.5
28	.05	.09	.00	.00	.00	.05	.00	.00	.02	.03	e.30	.22
29	.01	.02	.02	.00	.00	.68	.00	.01	.06	.01	e.20	.04
30	.03	.11	.08	.00	---	.00	.00	.00	.34	.00	e.00	.00
31	.32	---	.00	.08	---	1.3	---	.23	---	.07	e.14	---
TOTAL	4.52	3.84	10.90	13.05	1.01	4.21	6.88	1.74	3.01	6.74	6.27	5.01
MEAN	.15	.13	.35	.42	.035	.14	.23	.056	.10	.22	.20	.17
MAX	1.1	.52	3.0	3.2	.23	1.3	1.6	.34	.46	1.1	3.0	1.5
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	9.0	7.6	22	26	2.0	8.4	14	3.5	6.0	13	12	9.9

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2000, BY WATER YEAR (WY)

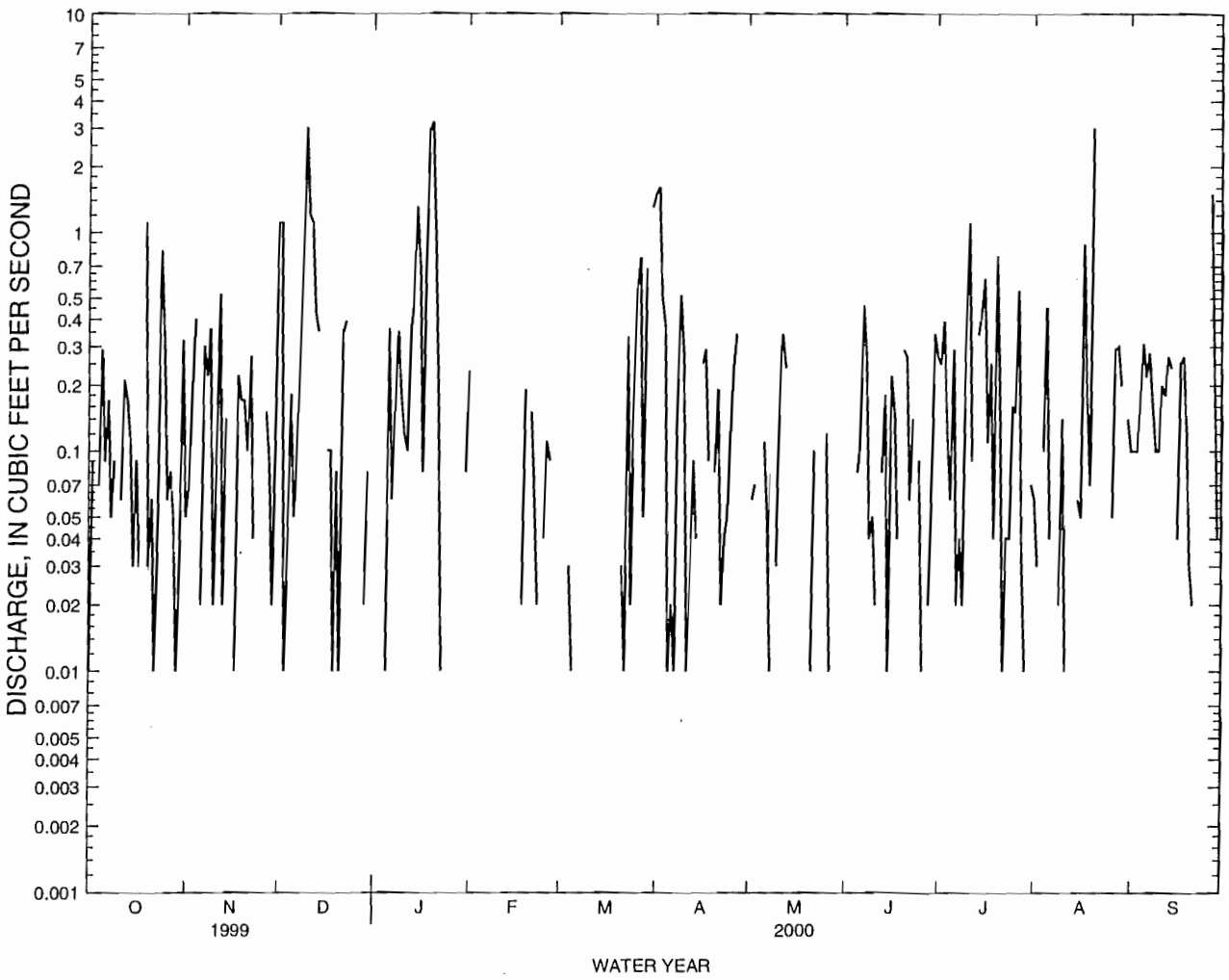
MEAN	.12	.25	.33	.37	.11	.21	.28	.077	.12	.21	.16	.13
MAX	.15	.37	.35	.42	.19	.28	.32	.099	.14	.22	.20	.17
(WY)	2000	1999	2000	2000	1999	1999	1999	1999	1999	2000	2000	2000
MIN	.088	.13	.31	.31	.035	.14	.23	.056	.10	.21	.12	.095
(WY)	1999	2000	1999	1999	2000	2000	2000	2000	2000	1999	1999	1999

e Estimated

HAWAII, ISLAND OF OAHU

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1998 - 2000	
ANNUAL TOTAL	72.91		67.18			
ANNUAL MEAN	.20		.18		.20	
HIGHEST ANNUAL MEAN					.21	1999
LOWEST ANNUAL MEAN					.18	2000
HIGHEST DAILY MEAN	3.0	Dec 10	3.2	Jan 20	3.2	Jan 20 2000
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 3	.00	Sep 23 1998
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 24	.00	Feb 9	.00	Feb 24 1999
ANNUAL RUNOFF (AC-FT)	145		133		143	
10 PERCENT EXCEEDS	.54		.41		.52	
50 PERCENT EXCEEDS	.09		.05		.07	
90 PERCENT EXCEEDS	.00		.00		.00	



HAWAII, ISLAND OF OAHU

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--September 1998 to current year.

INSTRUMENTATION.--Automatic water-quality (point) sampler since September 1998.

DATE	TIME	GAGE HEIGHT (FEET) (00065)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 1999							
16...	0329	1.65	2.5	--	--	--	--
16...	0704	1.67	2.7	--	--	--	--
19...	0102	2.05	9.5	760	--	--	--
19...	0842	2.09	10	760	--	--	--
19...	0948	1.48	.88	760	10	7.6	81
19...	1529	2.37	18	--	--	--	--
19...	1559	1.69	2.9	--	--	--	--
NOV							
04...	0842	1.29	.28	760	8.3	7.6	104
04...	0855	1.30	.30	760	8.3	--	--
04...	1028	1.70	3.1	--	--	--	--
04...	1253	1.89	4.7	--	--	--	--
04...	1528	1.75	3.5	--	--	--	--
04...	1533	1.98	5.5	--	--	--	--
07...	1233	1.70	3.0	--	--	--	--
09...	0733	1.69	2.9	--	--	--	--
11...	2148	1.83	5.0	--	--	--	--
30...	2043	2.38	18	--	--	--	--
DEC							
01...	0920	1.66	2.6	750	--	7.1	58
JAN 2000							
13...	2100	2.30	8.6	--	--	--	--
26...	0947	1.36	.43	760	--	7.8	93
26...	1108	1.64	2.4	--	--	--	--
26...	1150	1.80	4.6	--	--	--	--
26...	1300	1.71	3.2	--	--	7.2	65
MAR							
23...	0113	1.67	2.9	--	--	--	--
25...	0110	1.69	3.0	--	--	--	--
26...	1333	1.89	4.7	--	--	--	--
27...	0528	2.53	11	--	--	--	--
27...	0850	1.49	1.6	--	--	7.8	82
JUN							
07...	0230	1.39	1.0	--	--	--	--

DATE	TEMPER-ATURE WATER (DEG C) (00010)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL) (00940)	SULFATE DIS-SOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	TUR-BID-ITY (NTU) (00076)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L) (00556)
OCT 1999							
16...	--	--	--	58	--	1.9	--
16...	--	--	--	203	--	2.0	--
19...	--	--	--	30	--	1.4	--
19...	--	2.2	1.3	33	--	4.9	3
19...	22.0	3.8	3.3	12	--	3.1	--
19...	--	.7	.9	17	--	2.5	--
19...	--	--	--	9	--	3.9	--
NOV							
04...	22.5	1.7	6.2	1	66	16	2
04...	--	10	42	16	69	14	3
04...	--	--	--	71	--	7.1	--
04...	--	--	--	75	--	5.9	--
04...	--	--	--	113	--	3.4	--
04...	--	--	--	47	--	2.9	--
07...	--	--	--	10	--	1.6	--
09...	--	--	--	74	--	3.4	--
11...	--	--	--	65	--	3.2	--
30...	--	--	--	322	--	22	--
DEC							
01...	20.5	3.8	1.3	19	--	3.7	<1
JAN 2000							
13...	--	--	--	95	--	2.8	--
26...	18.0	5.3	4.2	47	--	21	5
26...	--	--	--	41	--	1.3	--
26...	--	3.0	1	50	--	4.7	2
26...	--	5.7	1.6	32	--	5.6	--
MAR							
23...	--	--	--	560	--	--	--
25...	--	--	--	96	--	--	--
26...	--	--	--	81	--	5	--
27...	--	--	--	22	--	--	--
27...	20.0	6.5	2.5	45	--	--	2
JUN							
07...	--	1.5	1.1	61	--	2.9	--

HAWAII, ISLAND OF OAHU

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued

DATE	TIME	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L) (00340)
OCT 1999									
19...	0102	.9	--	--	--	--	.25	6.6	40
19...	0842	.6	.05	<.05	--	--	.24	6.4	40
19...	0948	.2	.04	.13	--	--	.06	--	--
NOV									
04...	0842	.3	<.02	.08	.02	<.05	.07	E7.8	40
04...	0855	.3	<.02	.08	.02	E.03	.07	E8.9	50
DEC									
01...	0920	.4	<.02	.06	<.01	<.05	.06	9.0	30
JAN 2000									
26...	0947	.6	.06	.16	.04	<.05	.13	9.9	50
26...	1150	.7	.03	<.05	<.01	<.05	.38	6.8	30
26...	1300	.3	.02	<.05	<.01	<.05	.13	5.6	10
MAR									
27...	0850	.8	<.02	.12	<.01	E.03	.14	7.5	30

DATE	TIME	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR) (01034)	COPPER, DISSOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOVERABLE (UG/L AS CU) (01042)
OCT 1999							
19...	0842	--	--	3.0	14	2	52
19...	0948	--	--	2.0	5.1	3	11
19...	1529	--	--	3.6	6.7	2	31
NOV							
04...	0842	--	--	3.1	6.0	5	13
04...	0855	--	--	3.0	6.3	5	15
DEC							
01...	0920	--	--	3.1	5.1	2	18
JAN 2000							
26...	0947	--	--	2.7	7.8	9	24
26...	1150	--	--	E.8	12	2	84
26...	1300	--	--	1.5	5.0	2	57
MAR							
26...	1333	--	--	2.8	16	3	87
27...	0850	--	--	4.7	9.8	3	29
JUN							
07...	0230	<1	<1	E.7	15	3	66.9

DATE	LEAD, DISSOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOVERABLE (UG/L AS PB) (01051)	NICKEL, DISSOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI) (01067)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN) (01092)
OCT 1999						
19...	<1	19	E.9	18	<20	165
19...	<1	5	<1	2	E11	46.1
19...	<1	9	<1	6	21	114
NOV						
04...	<1	6	<1	3	E15	86.7
04...	<1	6	<1	5	E14	97.1
DEC						
01...	<1	6	<1	4	39	104
JAN 2000						
26...	<1	9	<1	8	21	144
26...	<1	18	E.7	20	<20	161
26...	<1	44	<1	7	<20	86.7
MAR						
26...	<1	28	<1	21	<20	290
27...	<1	12	<1	8	<20	156
JUN						
07...	<1	34.5	<1	10.5	7	180

E Estimated

HAWAII, ISLAND OF OAHU

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued

DATE	TIME	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)
NOV 1999											
04...	0842	12	.93	1.0	8.9	34	<.1	4.2	86.4	933	8
04...	0855	13	.96	1.0	7.4	37	<.1	4.8	83.9	1220	8

DATE	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
NOV 1999										
04...	<13	E8	1130	<4	<2	<30	<2	<1	72	<10
04...	<13	21	1510	<4	<2	<30	<2	<1	78	<10

DATE	TIME	1,2,5,6 -DIBENZ -ANTHRA -CENE TOTAL (UG/L) (34556)	2,4-DI-NITRO-TOLUENE TOTAL (UG/L) (34611)	2,6-DI-NITRO-TOLUENE TOTAL (UG/L) (34626)	2-CHLORO-NAPH-THALENE TOTAL (UG/L) (34581)	4-BROMO-PHENYL PHENYL ETHER TOTAL (UG/L) (34636)	4-CHLORO-PHENYL PHENYL ETHER TOTAL (UG/L) (34641)	ACE-NAPHTH-ENE TOTAL (UG/L) (34205)	ACE-NAPHTH-YLENE TOTAL (UG/L) (34200)	ANTHRA-CENE TOTAL (UG/L) (34220)	BENZENE NITRO-WATER UNFLTRD RECOVER (UG/L) (34447)
OCT 1999											
19...	0102	<3	<3	<2	<2	<2	<2	<2	<2	E.06	<2
19...	0842	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2
NOV											
04...	0842	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2
04...	0855	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2
JAN 2000											
26...	0947	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2
26...	1150	<3	<3	<2	<2	<2	<2	<2	<2	E.02	<2
MAR											
27...	0850	<3	<3	<2	<2	<2	<2	<2	<2	E.02	<2

DATE	BENZO-A-PYRENE TOTAL (UG/L) (34247)	BENZO B FLUOR-AN-THENE TOTAL (UG/L) (34230)	BENZO K FLUOR-AN-THENE TOTAL (UG/L) (34242)	BENZ(A) ANTHRA-CENE WATER UNFLTRD REC (UG/L) (34526)	BENZO-[GHI]-PERY-LENE TOTAL (UG/L) (34521)	BIS(2-CHLORO-ETHOXY) METHANE TOTAL (UG/L) (34278)	BIS(2-CHLORO-ETHYL) ETHER UNFLTRD RECOVER (UG/L) (34273)	BIS(2-CHLORO-ISO-PROPYL) ETHER TOTAL (UG/L) (34283)	BIS(2-ETHYL HEXYL) PHTHAL-ATE TOTAL (UG/L) (39100)	CHRY-SENE TOTAL (UG/L) (34320)	CYCLOPE NTADIEN HEXA-CHLORO-UNFLTRD RECOVER (UG/L) (34386)
OCT 1999											
19...	E.4	E.5	E.2	E.3	E.4	<3	<2	<2	E6	E.4	<2
19...	E.1	E.3	E.1	E.2	E.2	<3	<2	<2	E10	E.3	<2
NOV											
04...	<3	<3	<3	<2	<3	<3	<2	<2	E9	<3	<2
04...	<3	<3	<3	<2	<3	<3	<2	<2	E4	<3	<2
JAN 2000											
26...	E.09	E.1	E.07	<2	E.2	<3	<2	<2	E9	E.2	<2
26...	E.2	E.2	E.1	E.1	E.3	<3	<2	<2	E7	E.2	<2
MAR											
27...	<3	<3	<3	E.07	E.1	<3	<2	<2	E9	E.1	<2

E Estimated

HAWAII, ISLAND OF OAHU

212353157533001 NORTH HALAWA VALLEY HIGHWAY STORM DRAIN C NEAR AIEA--Continued

DATE	DIETHYL PHTHALATE TOTAL (UG/L) (34336)	DI-METHYL PHTHALATE TOTAL (UG/L) (34341)	DI-N-BUTYL PHTHALATE TOTAL (UG/L) (39110)	DI-N-OCTYL PHTHALATE TOTAL (UG/L) (34596)	FLUORANTHENE TOTAL (UG/L) (34376)	FLUORENE TOTAL (UG/L) (34381)	HEXACHLOROBENZENE TOTAL (UG/L) (39700)	INDENO (1,2,3-CD) PYRENE TOTAL (UG/L) (34403)	ISOPHORONE TOTAL (UG/L) (34408)	N-BUTYL BENZYL PHTHALATE TOTAL (UG/L) (34292)	N-NITROSODIMETHYLAMINE TOTAL (UG/L) (34438)
OCT 1999											
19...	<2	<2	<3	<5	E.7	<2	<2	E.3	<2	<4	<3
19...	<2	<2	<3	E3	E.4	<2	<2	E.1	<2	<4	<3
NOV											
04...	<2	<2	<3	<5	E.2	<2	<2	<3	<2	<4	<3
04...	<2	<2	<3	<5	<2	<2	<2	<3	<2	<4	<3
JAN 2000											
26...	<2	<2	<3	<5	E.2	<2	<2	E.1	<2	<4	<3
26...	<2	<2	<3	<5	E.2	<2	<2	E.2	<2	<4	<3
MAR											
27...	<2	<2	<3	<5	E.2	E.01	<2	E.1	<2	<4	<3

DATE	N-NITROSODI-N-PROPYLAMINE TOTAL (UG/L) (34428)	N-NITROSODIPHENYLAMINE TOTAL (UG/L) (34433)	PHENANTHRENE TOTAL (UG/L) (34461)	PYRENE TOTAL (UG/L) (34469)	BENZENE 1,2,4-TRICHLORO-WAT UNF REC (UG/L) (34551)	BENZENE 1,3-DICHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DICHLORO-WATER UNFLTRD REC (UG/L) (34571)	BENZENE O-DICHLORO-WATER UNFLTRD REC (UG/L) (34536)	ETHANE HEXACHLORO-WATER UNFLTRD RECOVER (UG/L) (34396)	HEXACHLOROBUTADIENE TOTAL (UG/L) (39702)	NAPHTHALENE TOTAL (UG/L) (34696)
OCT 1999											
19...	<2	<3	E.2	E.7	<2	<2	<2	<2	<2	<3	<2
19...	<2	E.09	E.1	E.4	<2	<2	<2	<2	<2	<3	<2
NOV											
04...	<2	E.05	<2	E.2	<2	<2	<2	<2	<2	<3	<2
04...	<2	<3	<2	<2	<2	<2	<2	<2	<2	<3	<2
JAN 2000											
26...	<2	E.07	E.08	E.4	<2	<2	E.2	<2	<2	<3	<2
26...	<2	E.08	E.09	E.2	<2	<2	<2	<2	<2	<3	<2
MAR											
27...	<2	E.07	E.07	E.2	<2	<2	<2	<2	<2	<3	E.03

E Estimated

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU

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

DRAINAGE AREA.--4.01 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 160 ft above mean sea level (from topographic map).

REMARKS.--Records computed by A.H.M. Okihara. Records good.

AVERAGE DISCHARGE.--17 years (water years 1984-2000), 5.05 ft^3/s (3,660 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,780 ft^3/s, December 18, 1990, gage height, 12.02 ft; no flow at times each year.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0355	819	10.53	Aug. 20	1655	*1,440	*11.60
Dec. 10	2115	1,110	11.12				

Minimum discharge, no flow on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.01	.09	14	.20	.81	.01	36	.02	.00	.00	.03	.15
2	.01	.05	100	.17	.27	.01	67	.02	.00	.06	.02	.08
3	.00	.11	8.5	.13	.22	.01	30	.03	.00	.20	.03	.05
4	.00	9.5	3.0	.11	.19	.01	9.2	.02	.00	.16	.04	.04
5	.03	1.7	5.3	.08	.14	.01	4.5	.01	.00	.05	.05	3.6
6	.06	.11	1.7	.11	.10	.01	2.3	.01	.00	.29	.02	1.2
7	.01	.31	1.0	.13	.08	.01	1.1	.01	.00	.05	.01	3.6
8	.01	.11	.54	.13	.06	.00	1.8	.01	.00	.02	.01	3.3
9	.01	2.0	3.6	.26	.06	.01	7.9	.01	.00	.03	.00	.96
10	.01	.39	103	.38	.05	.00	3.3	.01	.00	.01	.01	.23
11	.00	.08	73	.20	.04	.00	1.7	.02	.00	8.9	.01	.31
12	.00	2.9	36	.16	.04	.00	.54	.11	.00	1.2	.00	.40
13	.04	.40	30	.21	.03	.00	.34	.10	.00	.15	.00	1.1
14	.01	.28	25	4.5	.03	.00	.18	.01	.01	.20	.00	3.7
15	.01	.08	11	19	.02	.00	.13	.01	.00	.53	.00	1.6
16	.01	.04	3.7	26	.02	.00	.22	.01	.01	2.9	.00	.30
17	.00	.02	1.9	8.3	.02	.00	.36	.01	.01	1.4	.55	.21
18	.00	.04	6.4	13	.02	.00	.16	.01	.00	1.4	.10	.85
19	13	.05	2.0	115	.05	.00	.10	.00	.00	.41	.02	.52
20	1.8	.05	.66	165	.02	.00	.09	.00	.00	12	129	.15
21	.11	.09	.38	38	.02	.00	.13	.00	.01	4.7	20	.12
22	.04	.84	1.5	17	.02	.00	.07	.00	.00	2.2	3.3	.09
23	.02	.11	8.3	6.9	.02	.00	.06	.00	.00	.59	1.3	.06
24	3.7	.05	2.9	3.6	.01	.00	.03	.00	.00	.23	.34	.04
25	12	.04	1.2	2.2	.01	.00	.04	.00	.00	.17	.09	.02
26	1.5	.02	5.0	8.6	.03	.07	.08	.00	.00	.19	.05	.02
27	.39	.07	2.5	3.9	.02	1.3	.61	.00	.00	1.3	4.4	8.1
28	.11	.03	.83	2.0	.01	.03	.06	.00	.00	.23	7.1	12
29	.07	.04	.43	1.2	.01	.96	.03	.00	.00	.14	5.9	2.6
30	.03	.06	.35	.62	---	.34	.02	.00	.00	.08	2.0	.54
31	.10	---	.27	.40	---	18	---	.00	---	.04	.51	---
TOTAL	33.09	19.66	453.96	437.49	2.42	20.78	168.05	0.43	0.04	39.83	174.89	45.94
MEAN	1.07	.66	14.6	14.1	.083	.67	5.60	.014	.001	1.28	5.64	1.53
MAX	13	9.5	103	165	.81	18	67	.11	.01	12	129	12
MIN	.00	.02	.27	.08	.01	.00	.02	.00	.00	.00	.00	.02
AC-FT	66	39	900	868	4.8	41	333	.9	.08	79	347	91

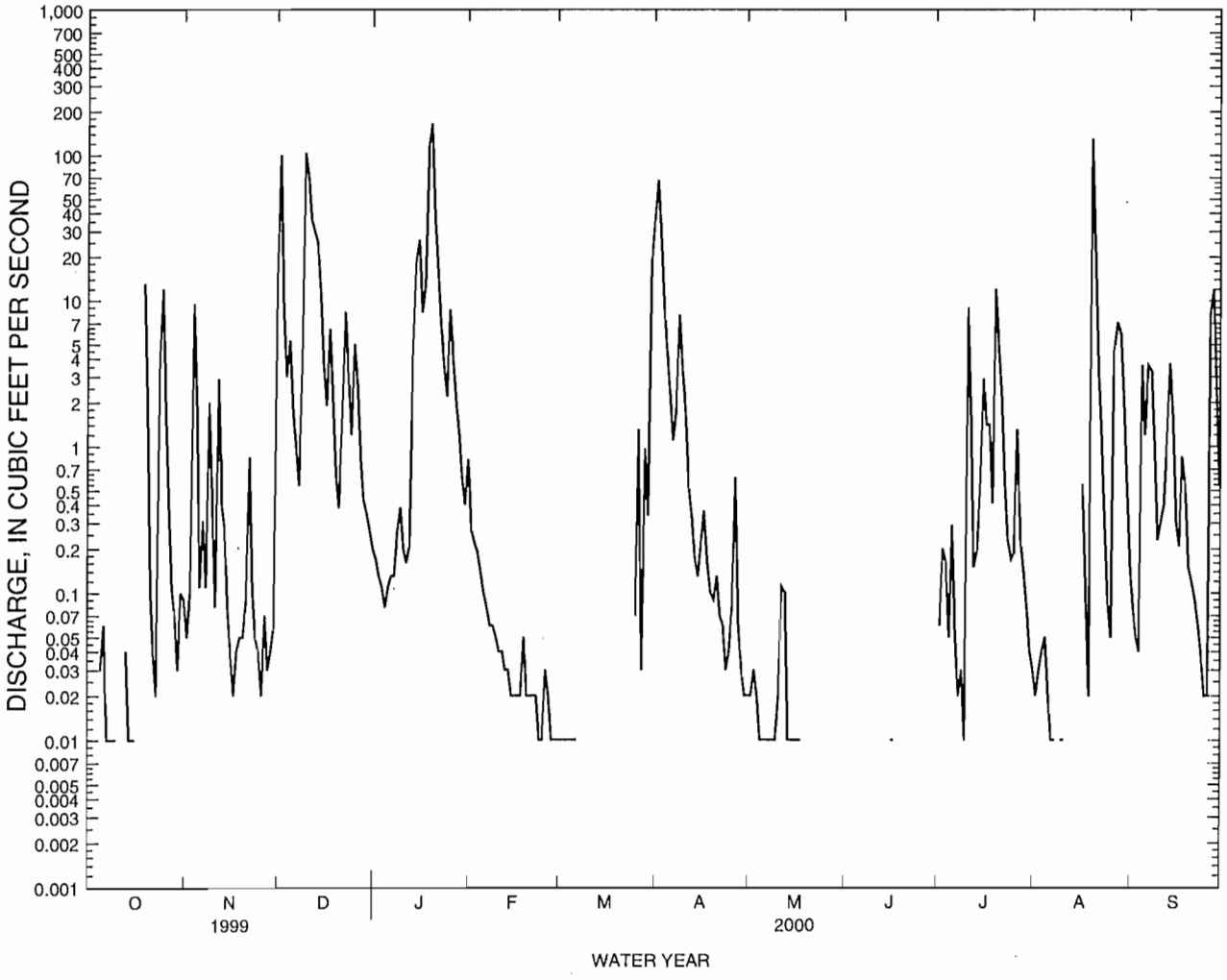
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2000, BY WATER YEAR (WY)

MEAN	3.54	7.68	8.30	7.10	3.91	7.66	6.46	2.60	1.93	4.14	2.85	2.82
MAX	9.71	29.1	40.6	29.6	17.4	31.0	35.3	15.5	7.84	15.0	10.0	12.6
(WY)	1992	1997	1988	1988	1989	1991	1989	1988	1987	1989	1991	1992
MIN	.000	.059	.008	.001	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1985	1990	1990	1986	1983	1983	1983	1992	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1983 - 2000	
ANNUAL TOTAL	1374.83		1396.58			
ANNUAL MEAN	3.77		3.82		5.05	
HIGHEST ANNUAL MEAN					10.1	1988
LOWEST ANNUAL MEAN					1.43	1984
HIGHEST DAILY MEAN	103	Dec 10	165	Jan 20	476	Mar 24 1994
LOWEST DAILY MEAN	.00	Oct 3	.00	Oct 3	.00	Feb 1 1983
ANNUAL SEVEN-DAY MINIMUM	.01	Sep 14	.00	Mar 10	.00	Feb 1 1983
ANNUAL RUNOFF (AC-FT)	2730		2770		3660	
10 PERCENT EXCEEDS	9.2		6.6		10	
50 PERCENT EXCEEDS	.24		.08		.45	
90 PERCENT EXCEEDS	.02		.00		.00	



HAWAII, ISLAND OF OAHU
16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued
WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: February 1983 to September 30, 1999 (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Sediment concentrations: maximum daily mean 5,360 mg/L (estimated), November 14, 1996; 0 mg/L on many days in 1983-86, 1988, 1990, 1992-95, 1997-98.
Sediment discharge: maximum daily, 5,310 tons, March 24, 1994; 0.0 tons on many days in 1983-88, 1990, 1992-99.

DATE	TIME	GAGE HEIGHT (FEET) (00065)	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)
OCT 1999							
19...	1548	7.13	32	--	--	--	--
19...	1758	7.65	63	--	--	--	--
19...	1858	7.27	38	--	--	--	--
19...	1943	7.08	30	--	--	--	--
20...	1127	6.20	1.2	760	8.5	8.3	175
NOV							
04...	1615	7.04	28	--	--	--	--
04...	1705	8.20	131	--	--	--	--
04...	1715	8.10	115	--	--	--	--
04...	1733	7.80	84	--	--	--	--
04...	1748	7.67	65	--	--	--	--
04...	1818	7.38	42	--	--	--	--
04...	1848	7.18	34	--	--	--	--
04...	1918	7.04	28	--	--	--	--
DEC							
01...	0845	7.11	31	--	--	--	--
01...	0940	7.44	46	--	--	--	--
01...	1110	7.21	35	--	--	--	--
01...	1210	7.23	36	--	--	--	--
01...	1240	6.97	25	760	--	6.7	107
JAN 2000							
26...	1700	6.91	22	760	9.4	7.00	142
MAR							
27...	1018	6.35	3.2	--	--	--	--
31...	1225	7.28	46	--	--	--	--
31...	1245	7.45	50	--	--	--	--
31...	1420	7.23	39	--	--	--	--
31...	1600	7.04	29	--	--	--	--
JUL							
31...	1235	5.89	.03	760	5.9	7.6	306
AUG							
20...	0940	7.28	38	--	--	--	--
20...	1040	7.78	77	--	--	--	--
20...	1155	7.53	52	--	--	--	--
20...	1255	7.31	39	--	--	--	--

HAWAII, ISLAND OF OAHU
16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued
WATER-QUALITY RECORDS

DATE	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	SULFATE DISSOLVED (MG/L AS SO4) (00945)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L) (00530)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L) (70300)	TURBIDITY (NTU) (00076)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L) (00556)
OCT 1999							
19...	--	6.8	2.8	89	--	25	<1
19...	--	--	--	306	--	62	--
19...	--	--	--	150	--	32	--
19...	--	--	--	83	--	26	--
20...	21.5	14	5.1	3	--	2.5	<1
NOV							
04...	--	--	--	79	--	23	--
04...	--	--	--	1430	--	260	--
04...	--	--	--	1700	--	260	--
04...	--	--	--	1930	--	380	--
04...	--	--	--	1660	--	320	--
04...	--	--	--	805	--	280	--
04...	--	--	--	780	--	320	--
04...	--	--	--	480	--	300	--
DEC							
01...	--	14	3.2	165	--	48	1
01...	--	14	2.8	270	--	88	<1
01...	--	16	2.9	124	--	49	<1
01...	--	15	2.9	52	--	46	<1
01...	20.5	16	3.0	75	64	32	<1
JAN 2000							
26...	19.0	18	4.3	13	89	15	<1
MAR							
27...	--	11	5.3	3	--	--	<1
31...	--	--	--	99	--	--	--
31...	--	--	--	76	--	--	--
31...	--	--	--	18	--	--	--
31...	--	--	--	9	--	--	--
JUL							
31...	25.5	--	--	<10	--	.9	E2
AUG							
20...	--	8.2	2.4	66	--	15	--
20...	--	9.2	2.4	95	--	25	--
20...	--	9.1	2.3	54	--	27	--
20...	--	9.2	2.5	<10	--	19	--

DATE	TIME	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS TOTAL (MG/L AS P) (00665)	CARBON, ORGANIC TOTAL (MG/L AS C) (00680)	OXYGEN DEMAND, CHEMICAL (HIGH LEVEL) (MG/L) (00340)
OCT 1999									
20...	1127	.1	<.02	<.05	--	--	<.05	2.6	<10
DEC									
01...	0845	2.4	<.02	.09	<.01	<.05	.40	27	90
01...	0940	3.6	<.02	.05	<.01	<.05	.79	26	80
01...	1110	1.3	<.02	.07	<.01	<.05	.22	25	90
01...	1210	1.1	<.02	.05	<.01	<.05	.20	21	70
01...	1240	1	<.02	<.05	<.01	<.05	.15	14	50
JAN 2000									
26...	1700	.2	<.02	.12	<.01	<.05	E.04	4.0	<10
MAR									
27...	1018	.1	<.02	.14	<.01	<.05	<.05	3.0	<10
JUL									
31...	1235	E.09	<.02	<.05	<.01	<.05	<.05	1.8	<10

E Estimated

HAWAII, ISLAND OF OAHU
16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued
WATER-QUALITY RECORDS

DATE	TIME	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CADMIUM WATER UNFLTRD TOTAL (UG/L AS CD) (01027)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR) (01034)	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU) (01042)
OCT 1999							
19...	1548	--	--	1.7	8.1	3	20
20...	1127	--	--	E.5	<1.0	2	2
DEC							
01...	0845	--	--	1	13	3	24
01...	0940	--	--	1.1	37	2	38
01...	1110	--	--	.9	8.9	2	12
01...	1210	--	--	.9	9.1	2	12
01...	1240	--	--	.8	6.0	2	8
JAN 2000							
26...	1700	--	--	<.8	E1	E1	2
MAR							
27...	1018	--	--	2.1	2.6	2	3
JUL							
31...	1235	<1	<1	<.8	<1.0	<1	1.0
AUG							
20...	0940	<1	<1	1.5	6.0	2	11.9
20...	1040	<1	<1	1.4	7.1	2	13.0
20...	1155	<1	<1	1.5	6.3	2	6.5
20...	1255	<1	<1	1.5	4.2	2	7.4

DATE	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB) (01051)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI) (01067)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN) (01092)
OCT 1999						
19...	<1	7	<1	9	<20	73.6
20...	<1	<1	<1	<2	<20	<31
DEC						
01...	<1	6	<1	11	<20	63.9
01...	<1	8	<1	21	<20	84.2
01...	<1	1	<1	7	<20	E19.6
01...	<1	1	<1	6	<20	E26.8
01...	<1	E.9	<1	5	<20	E17.7
JAN 2000						
26...	<1	E.8	<1	<2	<20	<31
MAR						
27...	<1	E1	<1	E1	<20	<31
JUL						
31...	<1	<1	<1	1.3	<1	<2.9
AUG						
20...	<1	3.4	<1	4.2	10	49.4
20...	<1	3.1	<1	5.5	2	31.5
20...	<1	<1	<1	3.0	3	11.4
20...	<1	<1	<1	2.1	3	7.7

DATE	TIME	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)	POTAS-SIUM, DIS-SOLVED (MG/L AS K) (00935)	SODIUM, DIS-SOLVED (MG/L AS NA) (00930)	ANC UNFLTRD TIT 4.5 LAB (MG/L AS CACO3) (90410)	FLUO-RIDE, DIS-SOLVED (MG/L AS F) (00950)	SILICA, DIS-SOLVED (MG/L AS SIO2) (00955)
DEC 1999								
01...	1240	5.7	3.0	1.7	8.4	24	<.1	7.5
JAN 2000								
26...	1700	7.7	4.9	1.0	11	36	<.1	13

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL) (01105)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE) (01045)
DEC 1999							
01...	1240	181	2020	1	<13	140	1810

E Estimated

HAWAII, ISLAND OF OAHU
16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued
WATER-QUALITY RECORDS

DATE	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)
DEC 1999 01...	<4	4	<30	<2	<1	35	<10

DATE	TIME	1,2,5,6 -DIBENZ -ANTHRA -CENE TOTAL (UG/L) (34556)	2,4-DI-NITRO-TOLUENE TOTAL (UG/L) (34611)	2,6-DI-NITRO-TOLUENE TOTAL (UG/L) (34626)	2-CHLORO-NAPH-THALENE TOTAL (UG/L) (34581)	4-BROMO-PHENYL PHENYL ETHER TOTAL (UG/L) (34636)	4-CHLORO-PHENYL PHENYL ETHER TOTAL (UG/L) (34641)	ACE-NAPHTH-ENE TOTAL (UG/L) (34205)	ACE-NAPHTH-YLENE TOTAL (UG/L) (34200)	ANTHRA-CENE TOTAL (UG/L) (34220)	BENZENE NITRO-WATER UNFLTRD RECOVER (UG/L) (34447)
JAN 2000 26...	1700	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2
MAR 27...	1018	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2
JUL 31...	1235	<3	<3	<2	<2	<2	<2	<2	<2	<2	<2

DATE	BENZO-A-PYRENE TOTAL (UG/L) (34247)	BENZO B FLUOR-AN-THENE TOTAL (UG/L) (34230)	BENZO K FLUOR-AN-THENE TOTAL (UG/L) (34242)	BENZ(A) ANTHRA-CENE WATER UNFLTRD REC (UG/L) (34526)	BENZO-[GHI]-PERY-LENE TOTAL (UG/L) (34521)	BIS(2-CHLORO-ETHOXY) METHANE TOTAL (UG/L) (34278)	BIS(2-CHLORO-ETHYL) ETHER UNFLTRD RECOVER (UG/L) (34273)	BIS(2-CHLORO-ISO-PROPYL) ETHER TOTAL (UG/L) (34283)	BIS(2-ETHYL HEXYL) PHTHAL-ATE TOTAL (UG/L) (39100)	CHRY-SENE TOTAL (UG/L) (34320)	CYCLOPE NTADIEN HEXA-CHLORO-UNFLTRD RECOVER (UG/L) (34386)
JAN 2000 26...	<3	<3	<3	<2	<3	<3	<2	<2	<5	<3	<2
MAR 27...	<3	<3	<3	<2	<3	<3	<2	<2	<5	<3	<2
JUL 31...	<3	<3	<3	<2	<3	<3	<2	<2	<5	<3	<2

DATE	DIETHYL PHTHAL-ATE TOTAL (UG/L) (34336)	DI-METHYL PHTHAL-ATE TOTAL (UG/L) (34341)	DI-N-BUTYL PHTHAL-ATE TOTAL (UG/L) (39110)	DI-N-OCTYL PHTHAL-ATE TOTAL (UG/L) (34596)	FLUOR-ANTHENE TOTAL (UG/L) (34376)	FLUOR-ENE TOTAL (UG/L) (34381)	HEXA-CHLORO-BENZENE TOTAL (UG/L) (39700)	INDENO (1,2,3-CD) PYRENE TOTAL (UG/L) (34403)	ISO-PHORONE TOTAL (UG/L) (34408)	N-BUTYL BENZYL PHTHAL-ATE TOTAL (UG/L) (34292)	N-NITRO-SODI-METHYL-AMINE TOTAL (UG/L) (34438)
JAN 2000 26...	<2	<2	<3	<5	<2	<2	<2	<3	<2	<4	<3
MAR 27...	<2	<2	<3	<5	E.03	<2	<2	<3	<2	<4	<3
JUL 31...	<2	<2	<3	<5	<2	<2	<2	<3	E.02	<4	<3

DATE	N-NITRO-SODI-N-PROPYL-AMINE TOTAL (UG/L) (34428)	N-NITRO-SODI-PHENYL-AMINE TOTAL (UG/L) (34433)	PHENAN-THRENE TOTAL (UG/L) (34461)	PYRENE TOTAL (UG/L) (34469)	BENZENE 1,2,4-TRI-CHLORO-WAT UNF REC (UG/L) (34551)	BENZENE 1,3-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34571)	BENZENE O-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34536)	ETHANE HEXA-CHLORO-WATER UNFLTRD RECOVER (UG/L) (34396)	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	NAPHTH-ALENE TOTAL (UG/L) (34696)
JAN 2000 26...	<2	<3	<2	<2	<2	<2	<2	<2	<2	<3	<2
MAR 27...	<2	E.02	<2	E.02	<2	<2	<2	<2	<2	<3	<2
JUL 31...	<2	<3	<2	<2	<2	<2	<2	<2	<2	<3	<2

E Estimated

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU

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

DRAINAGE AREA.--2.61 mi^2.

PERIOD OF RECORD.--September 1913 to April 1914, July 1914 to current year. Monthly discharge only for some periods, published in WSP 1319.
CHEMICAL ANALYSES: Water years 1972, 1974-93, 1996, quarterly.

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

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

REMARKS.--Records computed by C.W. Yeung. Records fair.

AVERAGE DISCHARGE.--86 years (water years 1915-2000), 6.41 ft^3/s (4,640 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0330	*1,150	*8.34	Aug. 20	1615	1,060	8.15

Minimum discharge, 0.33 ft^3/s, June 1.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.52	.87	16	2.0	3.9	1.3	8.9	1.3	.72	1.6	1.3	2.6
2	.55	.74	84	1.8	3.1	1.3	24	1.3	.72	.95	1.1	2.2
3	.53	.93	4.7	1.7	3.0	1.3	12	1.2	.65	1.9	1.0	2.0
4	.57	1.9	2.8	1.7	2.8	1.3	5.6	1.2	.61	1.2	1.0	1.9
5	.74	1.1	4.3	1.6	2.7	1.2	3.8	1.1	.70	.79	1.2	7.1
6	1.3	.82	2.4	1.9	2.6	1.1	2.9	1.1	.77	1.3	1.1	4.6
7	.63	1.6	2.0	1.6	2.4	1.1	2.5	1.1	1.2	.85	1.1	6.1
8	.59	1.1	1.7	1.6	2.4	1.1	3.0	1.1	1.2	.79	.87	5.4
9	.56	2.5	2.5	1.8	2.1	1.1	3.8	1.0	.90	.78	.80	3.9
10	.62	1.3	58	2.3	2.0	1.1	4.4	.96	.75	.65	.94	3.3
11	.57	1.0	28	1.8	2.0	1.1	3.1	.97	.67	6.1	.81	3.5
12	.80	2.1	22	1.8	1.9	1.1	2.5	1.7	.62	2.4	.82	3.9
13	1.2	1.0	14	2.0	1.8	1.0	2.1	2.0	.80	1.3	.84	3.1
14	.65	1.0	7.0	9.9	1.7	1.0	1.9	1.1	2.3	1.4	.83	5.4
15	.58	.84	5.5	11	1.7	.99	1.7	.96	.80	1.7	.86	3.6
16	.93	.82	4.3	7.6	1.6	.95	2.1	.97	.82	4.7	.84	2.9
17	.64	.73	3.7	3.9	1.5	.92	1.9	.87	.93	3.0	2.3	2.8
18	.54	1.4	3.4	6.5	1.5	.93	1.8	.87	.78	3.6	1.4	3.0
19	5.1	1.1	3.1	96	2.0	.92	1.7	.90	.63	2.1	.91	3.2
20	1.6	2.7	2.8	106	1.5	.91	1.7	.83	.69	9.5	81	3.4
21	.89	2.5	2.6	24	1.5	.87	1.7	.94	.80	4.8	12	2.6
22	.75	6.2	3.5	12	1.6	.83	1.5	1.1	.69	2.8	4.3	2.3
23	.71	2.1	6.7	7.5	1.4	1.1	1.5	.93	.90	2.5	3.0	2.2
24	3.3	1.4	3.3	6.0	1.3	.91	1.6	.89	1.1	1.9	2.3	2.3
25	5.8	1.2	2.7	5.6	1.3	.89	1.6	.90	1.2	1.8	2.0	2.1
26	1.6	.99	6.7	7.1	1.4	1.3	1.5	.81	.90	1.7	1.8	2.0
27	1.1	1.6	3.2	5.0	1.4	1.9	2.0	.67	.84	2.9	7.0	16
28	.91	1.2	2.6	4.3	1.3	1.0	1.6	.65	.85	2.2	8.2	15
29	.84	.99	2.3	4.1	1.2	2.8	1.4	.58	.81	2.1	7.4	6.5
30	.70	.92	2.3	3.7	---	1.4	1.4	.59	.83	1.3	4.1	4.3
31	1.7	---	2.1	3.5	---	8.5	---	.80	---	1.3	3.1	---
TOTAL	37.52	44.65	310.2	347.3	56.6	43.22	107.2	31.39	26.18	71.91	156.22	129.2
MEAN	1.21	1.49	10.0	11.2	1.95	1.39	3.57	1.01	.87	2.32	5.04	4.31
MAX	5.8	6.2	84	106	3.9	8.5	24	2.0	2.3	9.5	81	16
MIN	.52	.73	1.7	1.6	1.2	.83	1.4	.58	.61	.65	.80	1.9
AC-FT	74	89	615	689	112	86	213	62	52	143	310	256

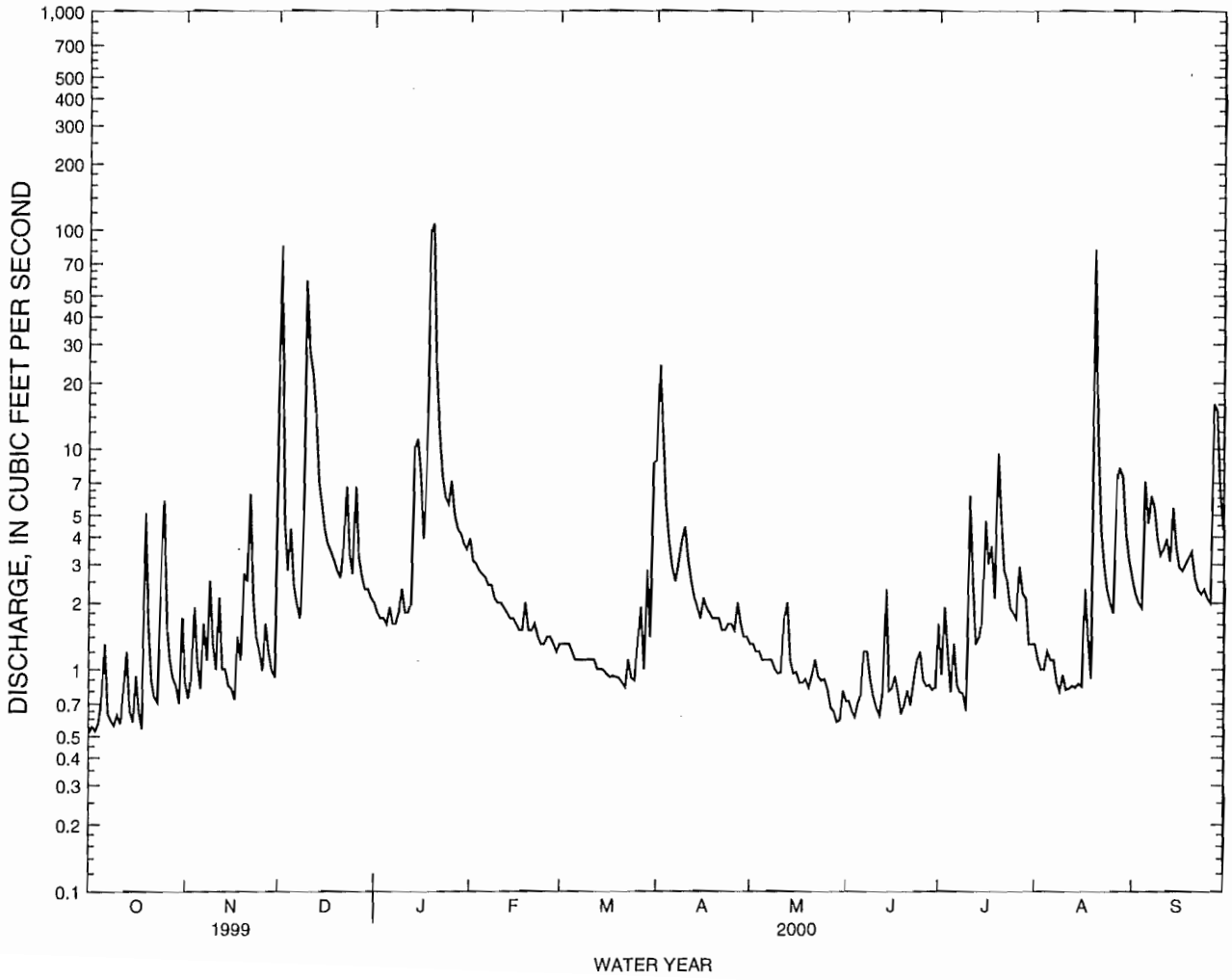
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2000, BY WATER YEAR (WY)

MEAN	4.55	7.26	8.37	9.02	7.09	8.44	8.31	6.36	3.67	4.51	5.03	4.49
MAX	18.9	35.0	35.0	65.7	48.6	40.6	36.0	37.5	12.9	16.6	26.7	31.3
(WY)	1937	1928	1930	1923	1932	1951	1989	1927	1934	1954	1958	1914
MIN	.29	.46	.74	.50	.34	.74	.63	.27	.32	.60	.43	.30
(WY)	1985	1954	1977	1977	1978	1926	1926	1926	1966	1984	1984	1984

HAWAII, ISLAND OF OAHU

16229000 KALIHI STREAM NEAR HONOLULU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1914 - 2000	
ANNUAL TOTAL	1409.46		1361.59			
ANNUAL MEAN	3.86		3.72		6.41	
HIGHEST ANNUAL MEAN					13.5	1923
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	84	Dec 2	106	Jan 20	951	Jan 19 1923
LOWEST DAILY MEAN	.49	Sep 30	.52	Oct 1	.11	Jul 29 1966
ANNUAL SEVEN-DAY MINIMUM	.54	Sep 27	.67	May 29	.15	May 15 1926
ANNUAL RUNOFF (AC-FT)	2800		2700		4640	
10 PERCENT EXCEEDS	7.3		6.0		11	
50 PERCENT EXCEEDS	2.0		1.6		2.8	
90 PERCENT EXCEEDS	.72		.78		.99	



HAWAII, ISLAND OF OAHU

16229300 KALIHI STREAM AT KALIHI

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

DRAINAGE AREA.--5.18 mi^2.

PERIOD OF RECORD.--Water year 1962 (annual maximum), July 1962 to current year.
CHEMICAL ANALYSES: Water years 1970-74, 1975-93, quarterly.
SUSPENDED-SEDIMENT DISCHARGE: Water years 1969-74, 1975-93, quarterly.

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. Elevation of gage is 70 ft above mean sea level (from topographic map). August 28, 1961, to June 30, 1962, crest-stage gage at site 600 ft downstream at different datum.

REMARKS.--Records computed by C.W. Yeung. Records fair.

AVERAGE DISCHARGE.--38 years (water years 1963-2000), 9.98 ft^3/s (7,230 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,110 ft^3/s, April 19, 1974, gage height, 9.98 ft from rating curve extended above 180 ft^3/s on basis of slope-area measurement at gage height 9.98 ft; minimum, 0 ft^3/s, October 13-14, 1999.

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 980 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0500	*4,080	*7.68	Aug. 20	1645	1,050	4.12
Dec. 10	2100	1,410	4.70				

Minimum discharge, 0 ft^3/s, October 13-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.90	2.3	28	3.1	6.8	1.8	18	2.1	1.3	2.1	1.9	3.5
2	.97	1.4	303	2.8	4.5	1.8	58	2.3	1.0	2.3	1.5	3.1
3	.70	1.8	13	2.8	4.1	1.8	27	2.1	1.0	4.0	1.5	2.9
4	.61	2.6	7.9	2.8	4.3	1.8	10	1.5	.93	2.7	1.4	2.6
5	.96	2.0	8.7	2.7	4.1	1.8	6.1	1.4	1.1	1.4	1.8	9.0
6	3.5	1.3	7.1	3.1	3.7	2.0	4.3	1.4	.92	6.4	1.2	5.4
7	1.3	3.6	6.8	2.8	3.6	1.8	3.6	1.5	1.5	1.8	1.3	8.6
8	1.6	2.5	6.4	2.8	3.4	1.6	3.6	1.6	2.2	1.3	1.3	7.0
9	1.6	4.1	8.4	3.3	3.1	1.7	4.9	1.9	1.9	1.8	1.1	5.7
10	2.1	2.1	120	4.4	2.8	1.7	5.9	1.8	.97	.97	1.3	4.5
11	1.4	1.4	63	2.9	2.8	1.7	4.1	2.6	1.0	7.9	.98	4.0
12	2.2	4.7	34	2.9	2.8	2.1	3.3	5.1	1.1	4.0	1.1	5.2
13	3.0	1.8	21	3.0	2.6	1.9	3.1	5.9	1.2	2.4	1.3	3.9
14	.05	1.6	11	13	2.6	1.9	2.8	1.9	5.4	2.9	1.1	6.1
15	.50	1.3	8.0	18	2.6	1.4	2.6	1.4	1.4	4.9	1.2	4.4
16	1.0	1.3	6.4	15	2.5	1.1	3.2	1.3	1.7	9.2	1.3	3.6
17	.93	1.3	e6.2	6.9	2.3	1.3	3.0	1.2	1.7	4.8	4.5	3.8
18	.92	1.6	e5.1	13	2.3	1.5	2.6	1.1	1.2	5.4	2.4	4.0
19	17	2.3	e4.6	158	3.4	2.4	2.3	1.1	.91	3.3	1.3	4.4
20	3.3	2.7	e4.2	248	2.3	2.1	2.1	1.1	1.1	11	97	5.0
21	1.4	5.9	3.7	54	2.4	2.2	2.2	1.1	1.5	7.3	17	3.1
22	1.1	13	6.5	25	2.9	2.5	2.2	1.1	1.1	4.3	6.1	2.8
23	1.0	4.5	12	14	2.8	3.7	2.2	1.2	.99	4.0	4.4	2.6
24	2.6	3.2	5.3	11	3.0	1.4	2.3	1.5	1.2	2.7	3.2	2.6
25	9.8	2.8	4.1	8.6	3.3	1.3	2.6	1.9	1.2	2.7	2.7	2.5
26	3.3	2.6	12	16	2.5	4.2	2.6	1.5	1.0	2.3	2.4	2.2
27	2.1	5.1	5.4	8.8	2.5	6.7	5.2	.99	.91	4.1	8.6	13
28	1.6	3.1	4.0	7.0	1.8	2.4	2.4	1.4	1.1	2.5	14	16
29	1.7	2.6	3.5	6.2	1.8	4.8	2.1	1.1	.93	2.6	9.8	6.8
30	1.3	2.6	3.5	5.6	---	2.7	2.3	1.0	.86	1.9	5.6	4.6
31	2.4	---	3.2	5.2	---	7.2	---	1.3	---	1.7	4.4	---
TOTAL	72.84	89.1	736.0	672.7	89.6	74.3	196.6	54.39	40.32	116.67	204.68	152.9
MEAN	2.35	2.97	23.7	21.7	3.09	2.40	6.55	1.75	1.34	3.76	6.60	5.10
MAX	17	13	303	248	6.8	7.2	58	5.9	5.4	11	97	16
MIN	.05	1.3	3.2	2.7	1.8	1.1	2.1	.99	.86	.97	.98	2.2
AC-FT	144	177	1460	1330	178	147	390	108	80	231	406	303

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 2000, BY WATER YEAR (WY)

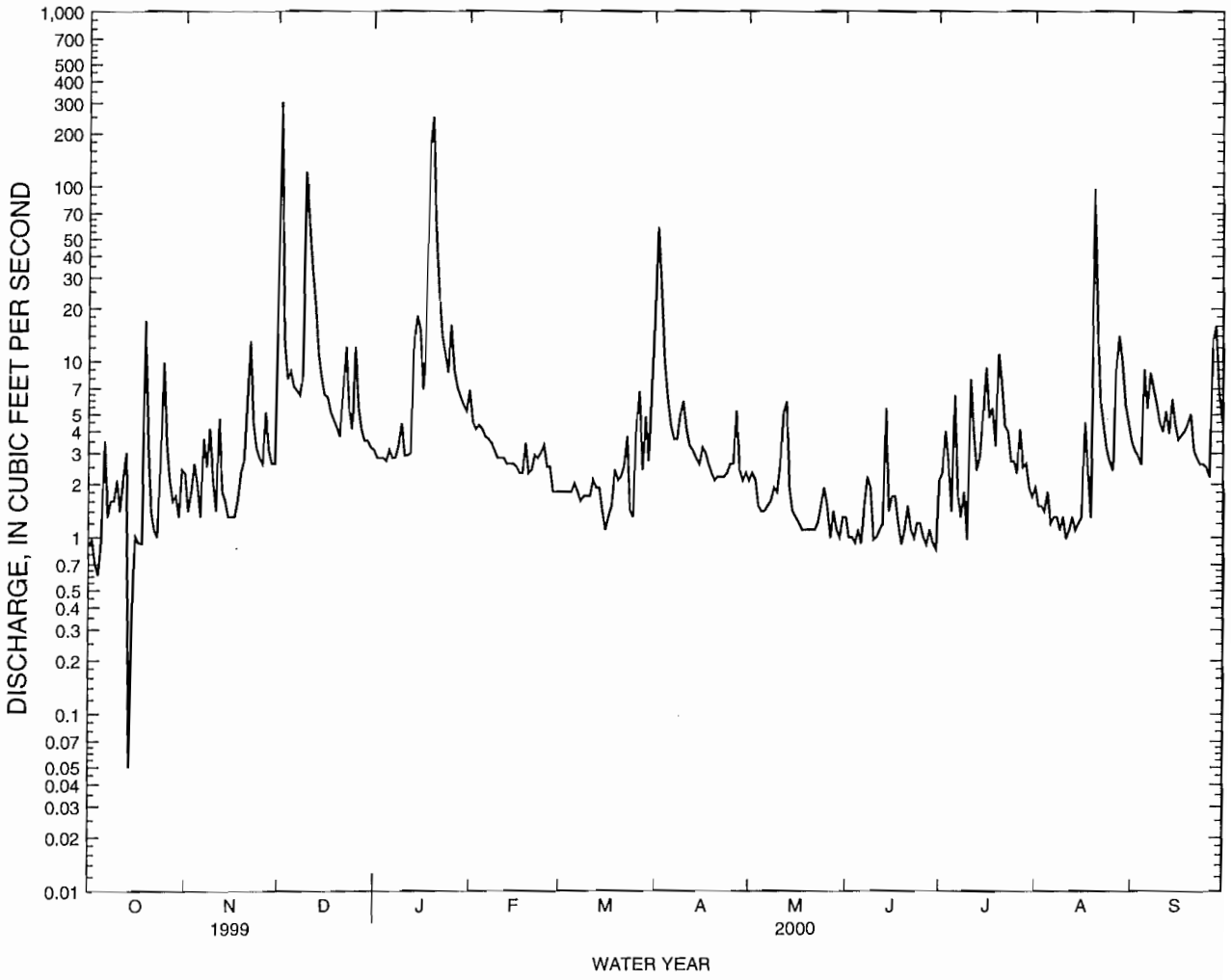
MEAN	6.63	13.6	14.7	13.4	10.6	15.2	13.2	9.11	5.23	7.67	5.94	4.65
MAX	22.2	49.2	56.6	45.8	60.3	73.2	57.6	40.9	19.5	29.3	35.7	20.4
(WY)	1964	1966	1988	1982	1969	1968	1989	1965	1980	1970	1982	1992
MIN	.95	2.15	1.15	.82	.78	1.15	1.65	1.49	.87	1.17	.83	.64
(WY)	1985	1981	1977	1977	1978	1983	1992	1966	1966	1984	1984	1984

e Estimated

HAWAII, ISLAND OF OAHU

16229300 KALIHI STREAM AT KALIHI--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1962 - 2000	
ANNUAL TOTAL	2649.01		2500.10			
ANNUAL MEAN	7.26		6.83		9.98	
HIGHEST ANNUAL MEAN					21.3	1982
LOWEST ANNUAL MEAN					3.13	1984
HIGHEST DAILY MEAN	303	Dec 2	303	Dec 2	781	Feb 1 1969
LOWEST DAILY MEAN	.05	Oct 14	.05	Oct 14	.05	Oct 14 1999
ANNUAL SEVEN-DAY MINIMUM	.77	Sep 29	1.0	Jun 24	.36	Oct 14 1984
ANNUAL RUNOFF (AC-FT)	5250		4960		7230	
10 PERCENT EXCEEDS	14		9.1		17	
50 PERCENT EXCEEDS	3.1		2.6		3.7	
90 PERCENT EXCEEDS	1.0		1.1		1.3	



HAWAII, ISLAND OF OAHU

16240500 WAIAKEAKUA STREAM AT HONOLULU

LOCATION.--Lat 21°19′52″, long 157°48′08″, Hydrologic Unit 20060000, on right bank 5 ft downstream from bridge on Waaloa Way, 500 ft upstream from confluence with Waihi Stream, and 4.2 mi northeast of Honolulu Post Office.

DRAINAGE AREA.--1.06 mi^2.

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

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

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

REMARKS.--Records computed by S.T.M. Young. Records fair. Honolulu Board of Water Supply at times diverts a small amount of ground water from tunnel upstream of station. Occasional small diversions for irrigation upstream of station.

AVERAGE DISCHARGE.--82 years (water years 1914-20, 1926-2000), 4.88 ft^3/s (3,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,090 ft^3/s, January 16, 1921, gage height, 10.4 ft, from floodmarks, site and datum then in use, from rating curve extended above 58 ft^3/s; minimum, 0.6 ft^3/s, June 7, 8, 1926.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0500	345	3.23	Jan. 19	2315	*356	*3.26

Minimum discharge, 1.6 ft^3/s, October 11, 19, June 29-30, August 15-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.8	2.2	10	2.4	8.0	2.2	12	2.2	1.8	2.5	2.6	2.5
2	2.3	2.1	24	2.2	3.3	2.1	30	2.2	1.8	2.2	2.1	2.4
3	2.0	3.5	3.5	2.2	3.1	2.1	8.4	2.2	1.7	2.6	1.9	2.4
4	1.7	2.4	2.8	2.2	3.0	2.1	4.2	2.1	1.7	3.1	1.8	2.5
5	2.2	2.1	8.9	2.2	2.9	2.0	3.5	2.1	1.7	2.0	2.0	11
6	3.4	2.0	3.2	2.4	2.8	2.0	3.0	2.1	1.7	2.4	4.2	4.9
7	3.0	8.2	2.9	2.3	2.7	2.0	2.8	2.0	3.0	2.1	3.2	8.8
8	2.0	2.9	2.7	2.3	2.8	2.0	3.4	2.0	2.4	1.9	1.9	4.7
9	1.8	4.1	3.4	3.0	2.7	2.0	5.6	2.0	1.9	2.2	1.8	3.5
10	1.8	2.5	35	3.2	2.6	2.0	5.1	2.0	1.7	2.4	1.8	3.0
11	1.7	2.2	12	2.4	2.6	2.0	3.2	2.0	1.7	7.1	1.7	4.5
12	2.0	3.9	12	2.7	2.5	2.0	2.7	2.3	1.7	4.2	1.7	3.9
13	2.5	2.3	12	4.9	2.4	2.0	2.6	3.2	2.0	2.5	1.7	5.1
14	3.7	2.4	4.7	9.3	2.4	1.9	2.6	2.0	4.1	2.4	1.7	7.9
15	2.0	2.1	4.2	7.4	2.4	1.9	2.4	1.9	1.9	2.7	1.7	3.6
16	2.4	2.1	3.5	9.6	2.4	1.9	2.6	1.9	2.2	6.3	1.7	3.1
17	1.8	2.0	3.3	3.7	2.3	1.9	3.3	1.8	2.2	3.0	4.0	4.6
18	1.7	3.0	3.2	12	2.4	2.1	2.6	1.8	1.9	3.8	2.2	3.6
19	4.5	2.7	3.0	59	4.3	2.1	2.4	1.9	1.7	2.5	1.8	3.8
20	2.4	4.2	2.9	33	2.4	1.9	2.4	1.8	1.7	13	20	4.2
21	2.1	2.8	3.0	13	2.3	2.0	2.4	1.8	2.4	4.0	3.5	3.1
22	2.0	12	3.8	6.8	2.5	2.0	2.3	2.0	1.9	2.9	2.4	2.8
23	2.0	4.3	7.3	4.8	2.3	2.8	2.2	1.8	2.0	3.0	2.1	2.7
24	7.4	2.8	3.2	4.2	2.3	2.1	2.4	1.8	1.9	2.4	2.0	2.6
25	12	2.4	2.9	3.8	2.2	2.1	2.5	1.8	2.2	2.8	1.8	2.5
26	3.3	2.2	5.4	9.9	2.4	3.4	2.5	1.8	1.8	2.2	1.8	2.4
27	2.6	2.8	2.9	4.4	2.4	3.5	4.0	1.7	1.7	5.3	7.9	17
28	2.3	2.2	2.6	3.6	2.2	2.3	2.7	1.7	1.7	2.7	15	9.1
29	2.4	2.1	2.5	3.3	2.1	5.2	2.4	1.7	1.7	2.6	5.4	4.2
30	2.2	2.2	2.5	3.1	---	2.6	2.3	1.7	2.1	2.1	3.2	3.4
31	2.9	---	2.4	3.0	---	9.7	---	2.3	---	4.2	2.8	---
TOTAL	87.9	94.7	195.7	228.3	80.7	77.9	130.5	61.6	59.9	105.1	109.4	139.8
MEAN	2.84	3.16	6.31	7.36	2.78	2.51	4.35	1.99	2.00	3.39	3.53	4.66
MAX	12	12	35	59	8.0	9.7	30	3.2	4.1	13	20	17
MIN	1.7	2.0	2.4	2.2	2.1	1.9	2.2	1.7	1.7	1.9	1.7	2.4
AC-FT	174	188	388	453	160	155	259	122	119	208	217	277

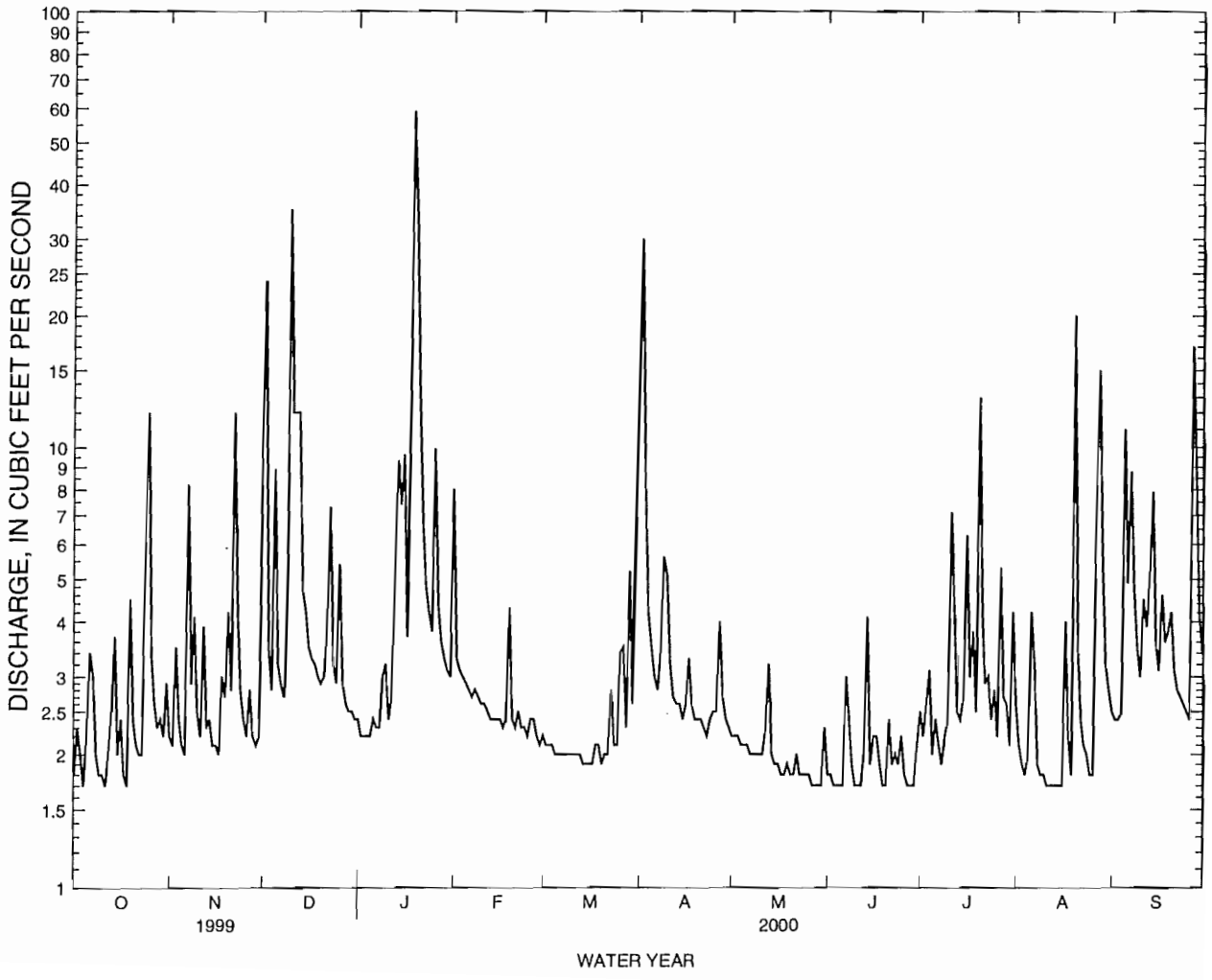
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2000, BY WATER YEAR (WY)

MEAN	4.17	5.24	5.34	4.93	4.45	5.40	5.66	5.11	4.16	4.94	4.81	4.17
MAX	10.7	18.1	15.5	14.8	15.6	19.5	17.5	13.3	10.3	12.3	13.6	13.3
(WY)	1915	1928	1988	1988	1955	1942	1989	1988	1938	1958	1958	1914
MIN	1.18	1.17	1.42	1.28	1.03	1.14	1.16	.87	1.27	.87	1.31	1.27
(WY)	1946	1934	1920	1977	1920	1926	1926	1926	1920	1926	1984	1984

HAWAII, ISLAND OF OAHU

16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1913 - 2000	
ANNUAL TOTAL	1532.8		1371.5			
ANNUAL MEAN	4.20		3.75		4.88	
HIGHEST ANNUAL MEAN					8.23	1988
LOWEST ANNUAL MEAN					1.94	1920
HIGHEST DAILY MEAN	35	Dec 10	59	Jan 19	183	Mar 24 1994
LOWEST DAILY MEAN	1.7	Oct 4	1.7	Oct 4	.62	Feb 26 1920
ANNUAL SEVEN-DAY MINIMUM	1.9	Sep 28	1.7	Aug 10	.75	May 23 1926
ANNUAL RUNOFF (AC-FT)	3040		2720		3540	
10 PERCENT EXCEEDS	7.3		6.5		8.0	
50 PERCENT EXCEEDS	3.1		2.4		3.5	
90 PERCENT EXCEEDS	2.2		1.8		1.8	



HAWAII, ISLAND OF OAHU

16242500 MANOA STREAM AT KANEWAI FIELD

LOCATION.--Lat 21°17'47", long 157°48'56", Hydrologic Unit 20060000, on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream from confluence with Palolo Stream.

DRAINAGE AREA.--5.99 mi^2.

PERIOD OF RECORD.--January 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 22 ft above mean sea level, from topographic map.

REMARKS.--Records computed by Lisa Miller. No estimated daily discharges. Records fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,150 ft^3/s, Dec. 2, 1999, gage height, 13.27 ft. Minimum discharge, 2.1 ft^3/s, Jun. 28, 2000, gage height, 8.91 ft; minimum gage height, 8.83 ft., Mar. 10, 11, 2000.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 1,150 ft^3/s, Dec. 2, gage height, 13.27 ft. Minimum discharge, 2.1 ft^3/s, Jun. 28, gage height, 8.91 ft; minimum gage height, 8.83 ft., Mar. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	4.6	45	5.3	23	3.4	43	4.7	4.3	5.9	6.0	6.5
2	3.2	3.9	104	5.1	7.3	3.2	157	4.6	4.2	5.2	4.8	5.9
3	2.9	6.0	12	4.8	6.6	3.1	50	4.8	4.0	6.4	4.2	5.6
4	2.7	4.9	8.1	4.6	6.1	3.1	20	4.5	3.8	7.1	4.3	6.4
5	3.8	3.8	29	4.7	5.6	3.0	13	4.5	4.3	4.8	5.1	30
6	5.7	3.5	9.8	5.7	5.3	2.8	9.7	4.7	4.3	7.9	8.2	15
7	5.4	27	8.4	6.5	5.0	2.9	8.0	4.5	6.4	4.5	11	29
8	3.2	7.3	8.1	5.6	4.9	2.8	8.6	4.4	6.1	3.6	4.4	17
9	2.8	13	10	8.0	4.6	3.0	17	4.4	4.9	6.1	3.8	11
10	3.0	5.8	116	9.2	4.3	2.7	13	4.4	4.3	4.2	5.1	7.5
11	2.8	4.5	45	5.7	4.1	2.7	8.0	4.8	3.4	16	3.4	11
12	3.8	15	41	6.6	4.0	2.8	6.9	6.4	3.1	12	3.4	11
13	5.4	5.3	35	11	4.4	2.8	6.7	8.5	4.3	5.8	3.9	10
14	7.9	5.4	15	25	4.9	2.7	6.0	5.2	8.5	6.0	3.7	17
15	3.6	4.2	13	24	4.8	2.9	5.6	5.0	3.9	11	3.9	7.8
16	5.7	3.9	9.6	32	4.6	3.0	6.5	4.8	4.9	20	3.8	8.1
17	3.1	3.7	8.6	11	4.5	2.8	9.4	4.7	4.5	9.4	13	11
18	2.8	5.6	8.0	44	4.6	3.3	7.1	4.7	3.5	18	5.8	11
19	22	5.9	7.5	202	12	3.3	5.8	5.2	2.7	8.1	4.0	12
20	5.5	11	7.3	168	4.4	2.7	5.9	5.2	2.6	43	59	16
21	3.9	9.0	7.0	71	4.5	2.9	6.1	4.8	5.8	12	11	11
22	3.6	33	11	29	4.9	3.1	5.3	5.1	3.9	8.1	7.1	10
23	3.4	11	21	18	3.9	8.3	5.0	4.8	3.7	8.6	6.8	9.6
24	17	7.4	7.7	14	3.7	3.4	5.3	4.6	3.2	6.3	6.5	9.7
25	35	5.3	6.8	11	3.5	4.0	6.1	4.5	3.4	7.8	5.8	9.2
26	8.8	4.6	18	48	3.9	7.6	6.6	4.4	2.6	5.7	4.7	8.6
27	6.4	7.5	7.3	15	4.4	10	13	4.3	2.4	17	28	45
28	4.7	5.0	6.3	11	3.6	4.4	6.3	4.5	2.4	6.6	55	25
29	5.4	5.0	5.9	8.9	3.3	11	5.5	4.5	3.3	6.8	17	8.6
30	4.1	5.8	6.0	8.0	---	5.4	5.0	4.4	4.3	5.2	8.8	7.0
31	6.4	---	5.5	7.4	---	19	---	5.2	---	9.3	7.4	---
TOTAL	196.8	237.9	642.9	830.1	160.7	138.1	471.4	151.1	123.0	298.4	318.9	392.5
MEAN	6.35	7.93	20.7	26.8	5.54	4.45	15.7	4.87	4.10	9.63	10.3	13.1
MAX	35	33	116	202	23	19	157	8.5	8.5	43	59	45
MIN	2.7	3.5	5.5	4.6	3.3	2.7	5.0	4.3	2.4	3.6	3.4	5.6
AC-FT	390	472	1280	1650	319	274	935	300	244	592	633	779

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--January 1999 to current year.

PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: January 1999 to current year.

WATER TEMPERATURE: January 1999 to current year.

INSTRUMENTATION.--Specific conductance and water temperature monitor from January 1999 to current year. Automatic water-quality (point) sampler from March 1999 to current year.

REMARKS.--Water-quality samples were collected monthly beginning in March 1999. Monthly samples were collected with a hand-held sampler using the equal-width-increment sampling method. Additional samples were collected during storms (Oct. 19, Oct. 25, Nov. 7, Dec. 10, Jan. 18, Jan. 19, and Apr. 2) using an automatic (point) sampler. All samples analyzed for VOCs were collected near the centroid of flow using a hand-held VOC sampler.

EXTREMES FOR PERIOD OF DAILY RECORD.--

SPECIFIC CONDUCTANCE: Maximum, 1,190 microsiemens per centimeter, May 25, 2000; minimum, 37 microsiemens per centimeter, January 19, 2000.

WATER TEMPERATURE: Maximum, 26.5°C, June 11, 12, 27, 2000, July 31, 2000; minimum, 17.5°C, January 18, 2000.

EXTREMES FOR CURRENT YEAR.--

SPECIFIC CONDUCTANCE: Maximum, 1,190 microsiemens per centimeter, May 25; minimum, 37 microsiemens per centimeter, January 19.

WATER TEMPERATURE: Maximum, 26.5°C, June 11, 12, 27, July 31; minimum, 17.5°C, January 18.

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT									
05...	1000	6.7	92	7.9	8.0	213	23.0	10	8.9
19...	1550	107	--	--	--	97	22.5	5.8	2.8
25...	0629	86	--	--	--	86	22.0	4.6	3.1
NOV									
02...	1020	3.9	94	8.1	--	193	22.5	11	9.5
07...	1400	132	--	--	--	96	23.0	4.7	2.9
DEC									
10...	2050	387	--	--	7.6	64	21.0	2.8	1.9
20...	0945	7.2	95	8.3	8.2	188	22.0	11	9.0
JAN									
18...	0930	56	96	9.0	7.9	103	18.5	5.7	3.5
18...	0935	52	--	--	7.5	102	18.0	5.6	3.4
19...	2323	628	--	--	7.4	81	18.5	4.1	2.4
20...	1440	116	--	--	--	162	20.0	--	--
FEB									
16...	1120	4.7	88	7.9	8.3	223	21.0	11	9.5
MAR									
14...	0940	2.8	89	7.8	8.0	228	22.0	11	9.9
APR									
02...	1600	138	91	8.1	7.3	157	21.0	8.8	5.7
02...	1610	132	--	--	7.3	160	21.0	8.8	5.7
11...	1010	8.1	97	8.9	8.0	183	19.5	10	8.1
MAY									
24...	1030	5.0	92	7.9	8.0	204	23.0	11	9.6
JUN									
20...	1030	2.5	93	7.9	8.0	198	23.5	11	9.3
JUL									
17...	1030	8.3	97	8.4	7.4	194	22.5	10	7.7
AUG									
09...	1030	3.9	96	8.3	8.0	193	22.5	10	9.0
SEP									
13...	1020	7.2	96	8.3	8.0	176	22.5	9.5	7.9

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CARBONATE WATER DIS IT FIELD MG/L AS CO3 (00452)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
OCT									
05...	1.2	14	59	72	--	21	<.1	20	6.4
19...	1.9	7.0	27	33	--	9.3	<.1	5.8	3.6
25...	1.3	7.1	25	30	--	9.2	<.1	9.0	2.5
NOV									
02...	1.1	16	60	73	--	23	<.1	21	5.9
07...	1.6	7.4	21	26	--	12	<.1	8.0	3.0
DEC									
10...	1.2	5.6	14	16	--	8.0	<.1	6.0	2.4
20...	1.1	14	62	75	--	19	<.1	20	4.6
JAN									
18...	1.4	9.0	24	29	--	14	<.1	7.4	3.6
18...	1.4	8.8	24	29	--	14	<.1	7.3	3.5
19...	1.4	6.6	18	22	--	10	<.1	6.1	3.3
20...	--	--	--	--	--	--	--	--	--
FEB									
16...	1.1	17	64	75	1	25	<.1	19	6.5
MAR									
14...	1.2	17	66	81	--	23	<.1	22	6.0
APR									
02...	1.2	12	33	40	--	21	<.1	15	7.0
02...	1.7	12	34	41	--	23	<.1	15	7.0
11...	.9	14	57	68	--	19	<.1	17	6.4
MAY									
24...	1.2	15	65	79	--	22	<.1	19	6.3
JUN									
20...	1.3	15	63	76	--	19	<.1	20	6.3
JUL									
17...	1.2	16	52	64	--	25	<.1	18	6.1
AUG									
09...	1.1	14	60	73	--	18	<.1	19	5.2
SEP									
13...	.9	13	53	65	--	17	.1	18	5.3

DATE	TIME	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)
OCT								
05...	1000	.2	.2	<.02	.09	<.01	.027	.02
19...	1550	.3	6.5	.06	.28	<.01	.12	.12
25...	0629	.4	2.1	<.02	.08	<.01	.027	.02
NOV								
02...	1020	E.10	.1	<.02	.13	<.01	.018	.01
07...	1400	.2	2.8	<.02	.19	<.01	.032	.02
DEC								
10...	2050	.1	5.0	<.02	.12	<.01	.023	.02
20...	0945	<.1	.1	<.02	.18	<.01	.01	<.01
JAN								
18...	0930	.1	1.3	<.02	.20	<.01	.031	.03
18...	0935	.1	1.3	.03	.20	<.01	.031	.03
19...	2323	E.07	4.5	.02	.18	<.01	.035	.02
20...	1440	--	--	--	--	--	--	--
FEB								
16...	1120	.1	.2	<.02	.2	<.01	.017	.02
MAR								
14...	0940	E.05	.2	<.02	.09	.01	.024	.01
APR								
02...	1600	E.08	.4	<.02	.44	<.01	.029	.02
02...	1610	.1	.4	<.02	.46	<.01	.030	.02
11...	1010	E.09	.1	<.02	.16	<.01	.016	<.01
MAY								
24...	1030	.1	.3	<.02	.08	<.01	.022	.01
JUN								
20...	1030	.2	.3	.04	.14	<.01	.035	.03
JUL								
17...	1030	.1	.3	<.02	.18	<.01	.017	.01
AUG								
09...	1030	.1	.3	<.02	.13	<.01	.019	.01
SEP								
13...	1020	E.08	.2	<.02	.14	<.01	.013	<.01

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	PHOS-PHORUS TOTAL (MG/L AS P) (00665)	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	SEDI-MENT, SUS-PENDED (MG/L) (80154)	PH WATER FILTERED FIELD (STAND-ARD UNITS) (99900)
OCT								
05...	.11	--	--	4.3	2.6	137	28	--
19...	1.6	--	--	4.8	>6.9	59	608	7.6
25...	.54	--	--	3.6	>5.3	58	275	7.8
NOV								
02...	.056	--	--	1.6	1.3	143	--	7.8
07...	1.1	--	--	4.9	>18	63	500	7.5
DEC								
10...	1.7	--	--	3.9	52	47	982	--
20...	.029	--	--	1.3	--	122	8	--
JAN								
18...	.34	--	--	3.7	3.9	72	116	--
18...	.32	--	--	3.5	3.8	74	102	--
19...	1.3	--	--	2.3	34	52	608	--
20...	--	--	--	--	--	--	--	--
FEB								
16...	.039	--	--	1.0	.3	136	7	--
MAR								
14...	.013	--	--	1.5	.7	148	8	--
APR								
02...	.10	--	--	2.4	2.1	95	36	--
02...	.10	--	--	2.3	2.4	98	33	--
11...	.022	--	--	1.2	<.2	120	3	--
MAY								
24...	.044	--	--	1.4	.3	131	9	--
JUN								
20...	.070	--	--	1.6	.2	129	12	--
JUL								
17...	.057	1.63	<.12	1.2	1.63	117	15	--
AUG								
09...	.051	--	--	1.3	--	126	13	--
SEP								
13...	.043	--	--	1.3	--	114	10	--

DATE	TIME	ALUM-INUM, DIS-SOLVED (UG/L AS AL) (01106)	ANTI-MONY, DIS-SOLVED (UG/L AS SB) (01095)	ARSENIC DIS-SOLVED (UG/L AS AS) (01000)	BARIUM, DIS-SOLVED (UG/L AS BA) (01005)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE) (01010)	BORON, DIS-SOLVED (UG/L AS B) (01020)	CADMIUM DIS-SOLVED (UG/L AS CD) (01025)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR) (01030)	COBALT, DIS-SOLVED (UG/L AS CO) (01035)
OCT										
05...	1000	12	1	<2	3	<1	--	<1	<.8	<1
19...	1550	9	<1	3	4	<1	--	<1	1.2	<1
25...	0629	45	<1	<2	2	<1	--	<1	E.6	<1
NOV										
02...	1020	9	<1	<2	3	<1	--	<1	<.8	<1
07...	1400	39	<1	3	2	<1	--	<1	E.6	<1
DEC										
10...	2050	54	<1	<2	1	<1	--	<1	E.5	<1
20...	0945	8	<1	<2	3	<1	--	<1	<.8	<1
JAN										
18...	0930	42	<1	<2	2	<1	--	<1	E.8	<1
18...	0935	36	<1	<2	2	<1	--	<1	E.6	<1
19...	2323	30	<1	<2	2	<1	--	<1	E.5	<1
FEB										
16...	1120	7	<1	E.7	3	<1	20.3	<1	<1	<1
MAR										
14...	0940	7	<1	.9	4	<1	21.5	<1	<1	<1
APR										
02...	1600	10	<1	E.5	3	<1	24.5	<1	<1	<1
02...	1610	11	<1	E.5	3	<1	23.8	<1	<1	<1
11...	1010	<16	<1	<.9	3	<1	21.5	<1	<.8	<1
MAY										
24...	1030	<15	<1	E.5	4	<1	24.1	<1	<.8	<1
JUN										
20...	1030	4	<1	E.7	4	<1	23.5	<1	<.8	<1
JUL										
17...	1030	--	--	--	--	--	--	--	--	--

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	COPPER, DIS-SOLVED (UG/L AS CU) (01040)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	LEAD, DIS-SOLVED (UG/L AS PB) (01049)	LITHIUM DIS-SOLVED (UG/L AS LI) (01130)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO) (01060)	NICKEL, DIS-SOLVED (UG/L AS NI) (01065)	SELE-NIUM, DIS-SOLVED (UG/L AS SE) (01145)	SILVER, DIS-SOLVED (UG/L AS AG) (01075)	STRON-TIUM, DIS-SOLVED (UG/L AS SR) (01080)
OCT										
05...	3	99	<1	--	18	<1	<1	<2	<1	--
19...	4	39	<1	--	4	<1	1	<2	<1	--
25...	2	68	<1	--	2	<1	<1	<2	<1	--
NOV										
02...	<1	82	<1	--	12	<1	<1	<2	<1	--
07...	2	84	<1	--	9	<1	2	<2	<1	--
DEC										
10...	2	120	<1	--	1	<1	<1	<2	<1	--
20...	<1	70	<1	--	20	<1	<1	<2	<1	--
JAN										
18...	2	94	<1	--	11	<1	<1	<2	<1	--
18...	2	98	<1	--	7	<1	<1	<2	<1	--
19...	1	84	<1	--	1	<1	<1	<2	<1	--
FEB										
16...	<1	90	<1	<.3	14	<1	<1	E.6	<1	87.9
MAR										
14...	<1	82	<1	<.3	13	<1	<1	<.7	<1	86.0
APR										
02...	1	19	<1	<.3	11	<1	<1	E.5	<1	58.3
02...	1	33	<1	<.3	13	<1	6	E.5	<1	57.2
11...	<1	98	<1	E.2	18	<1	<1	<.7	<1	75.2
MAY										
24...	<1	30	<1	E.2	15	<1	<1	<.7	<1	85.1
JUN										
20...	1	19	<1	E.2	12	<1	<1	E.5	<1	73.1
JUL										
17...	--	50	--	--	10	--	--	--	--	--

DATE	TIME	THAL-LIUM, DIS-SOLVED (UG/L AS TL) (01057)	VANA-DIUM, DIS-SOLVED (UG/L AS V) (01085)	ZINC, DIS-SOLVED (UG/L AS ZN) (01090)	URANIUM NATURAL DIS-SOLVED (UG/L AS U) (22703)
OCT					
05...	1000	--	--	3	<1
19...	1550	--	--	6	<1
25...	0629	--	--	<1	<1
NOV					
02...	1020	--	--	<1	<1
07...	1400	--	--	1	<1
DEC					
10...	2050	--	--	<1	<1
20...	0945	--	--	2	<1
JAN					
18...	0930	--	--	<1	<1
18...	0935	--	--	<1	<1
19...	2323	--	--	<1	<1
FEB					
16...	1120	<.9	2.3	<1	<1
MAR					
14...	0940	<.9	1.6	2	<1
APR					
02...	1600	<.9	1.4	1	<1
02...	1610	<.9	1.4	<1	<1
11...	1010	<.9	1.3	<4	<1
MAY					
24...	1030	<.9	1.9	<3	<1
JUN					
20...	1030	<.9	2.1	<1	<1
JUL					
17...	1030	--	--	--	--
AUG					
09...	1030	--	--	--	--
SEP					
13...	1020	--	--	--	--

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	TIME	2,6-DI-ETHYL ANILINE WAT FLT 0.7 U GF, REC (UG/L) (82660)	ACETO-CHLOR, WATER FLTRD REC (UG/L) (49260)	ALA-CHLOR, WATER, DISS, REC, (UG/L) (46342)	ALPHA BHC DIS-SOLVED (UG/L) (34253)	ATRA-ZINE, WATER, DISS, REC (UG/L) (39632)	BEN-FLUR-ALIN WAT FLD 0.7 U GF, REC (UG/L) (82673)	BUTYL-ATE, WATER, DISS, REC (UG/L) (04028)	CAR-BARYL WATER FLTRD 0.7 U GF, REC (UG/L) (82680)	CARBO-FURAN WATER FLTRD 0.7 U GF, REC (UG/L) (82674)
OCT										
05...	1000	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.239	<.003
19...	1550	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.370	<.003
25...	0629	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
NOV										
02...	1020	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
07...	1400	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.238	<.003
DEC										
10...	2050	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.0591	<.003
20...	0945	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
JAN										
18...	0930	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
18...	0935	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
19...	2323	<.003	<.002	<.002	<.002	<.001	<.002	<.002	E.0131	<.010
FEB										
16...	1120	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
MAR										
14...	0940	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
APR										
02...	1600	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
02...	1610	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
11...	1010	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
MAY										
24...	1030	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003
JUN										
20...	1030	<.003	<.002	<.002	<.002	<.001	<.002	<.002	<.003	<.003

DATE	CHLOR-PYRIFOS DIS-SOLVED (UG/L) (38933)	CYANA-ZINE, WATER, DISS, REC (UG/L) (04041)	DCPA WATER FLTRD 0.7 U GF, REC (UG/L) (82682)	DEETHYL ATRA-ZINE, WATER, DISS, REC (UG/L) (04040)	DI-AZINON, DIS-SOLVED (UG/L) (39572)	DI-ELDRIN DIS-SOLVED (UG/L) (39381)	DISUL-FOTON WATER FLTRD 0.7 U GF, REC (UG/L) (82677)	EPTC WATER FLTRD 0.7 U GF, REC (UG/L) (82668)	ETHAL-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82663)	ETHO-PROP WATER FLTRD 0.7 U GF, REC (UG/L) (82672)
OCT										
05...	<.004	<.004	<.002	<.002	<.002	.0635	<.017	<.002	<.004	<.003
19...	<.020	<.004	<.002	<.002	.0275	<.001	<.017	<.002	<.004	<.003
25...	<.004	<.004	<.002	<.002	.0238	.0322	<.017	<.002	<.004	<.003
NOV										
02...	<.004	<.004	<.002	<.002	<.002	.0501	<.017	<.002	<.004	<.003
07...	<.010	<.004	<.002	<.002	.0176	.0400	<.017	<.002	<.004	<.003
DEC										
10...	<.004	<.004	<.002	<.002	.0305	.0155	<.017	<.002	<.004	<.003
20...	<.004	<.004	<.002	<.002	<.002	.0759	<.017	<.002	<.004	<.003
JAN										
18...	<.004	<.004	<.002	<.002	.0136	.0293	<.017	<.002	<.004	<.003
18...	<.004	<.004	<.002	<.002	.0145	.0370	<.017	<.002	<.004	<.003
19...	<.004	<.004	<.002	<.002	.0066	.0246	<.017	<.002	<.004	<.003
FEB										
16...	<.004	<.004	<.002	<.002	<.002	.0559	<.017	<.002	<.004	<.003
MAR										
14...	<.004	<.004	<.002	<.002	<.002	.0466	<.017	<.002	<.004	<.003
APR										
02...	<.004	<.004	<.002	<.002	<.002	.0501	<.017	<.002	<.004	<.003
02...	<.004	<.004	<.002	<.002	E.0027	.0540	<.017	<.002	<.004	<.003
11...	<.004	<.004	<.002	<.002	<.002	.0772	<.017	<.002	<.004	<.003
MAY										
24...	<.004	<.004	<.002	<.002	<.002	.0623	<.017	<.002	<.004	<.003
JUN										
20...	<.004	<.004	<.002	<.002	<.002	.0449	<.017	<.002	<.004	<.003

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	TIME	FONOFOS WATER DISS REC (UG/L) (04095)	LINDANE DIS-SOLVED (UG/L) (39341)	LIN-URON WATER FLTRD 0.7 U GF, REC (UG/L) (82666)	MALA-THION, DIS-SOLVED (UG/L) (39532)	METHYL AZIN-PHOS WAT FLT 0.7 U GF, REC (UG/L) (82686)	METHYL PARA-THION WAT FLT 0.7 U GF, REC (UG/L) (82667)	METO-LACHLOR WATER DISSOLV (UG/L) (39415)	METRI-BUZIN SENCOR WATER DISSOLV (UG/L) (82630)	MOL-INATE WATER FLTRD 0.7 U GF, REC (UG/L) (82671)	NAPROP-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82684)
OCT											
05...	1000	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
19...	1550	<.003	<.004	<.002	.0514	<.001	<.006	<.002	.0436	<.004	<.003
25...	0629	<.003	<.004	<.002	<.010	<.001	<.006	<.002	<.004	<.004	<.003
NOV											
02...	1020	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
07...	1400	<.003	<.004	<.002	.0306	<.001	<.006	<.002	.0172	<.004	<.003
DEC											
10...	2050	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
20...	0945	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
JAN											
18...	0930	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
18...	0935	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
19...	2323	<.003	<.004	<.002	E.0034	<.001	<.006	<.002	<.004	<.004	<.003
FEB											
16...	1120	<.003	<.004	<.002	<.005	<.010	<.006	<.002	<.004	<.004	<.003
MAR											
14...	0940	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
APR											
02...	1600	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
02...	1610	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
11...	1010	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
MAY											
24...	1030	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003
JUN											
20...	1030	<.003	<.004	<.002	<.005	<.001	<.006	<.002	<.004	<.004	<.003

DATE	P,P' DDE DISSOLV (UG/L) (34653)	PARA-THION, DIS-SOLVED (UG/L) (39542)	PEB-ULATE WATER FILTRD 0.7 U GF, REC (UG/L) (82669)	PENDI-METH-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82683)	PER-METHRIN CIS WAT FLT 0.7 U GF, REC (UG/L) (82687)	PHORATE WATER FLTRD 0.7 U GF, REC (UG/L) (82664)	PRO-METON, WATER, DISS, REC (UG/L) (04037)	PRON-AMIDE WATER FLTRD 0.7 U GF, REC (UG/L) (82676)	PROPA-CHLOR, WATER, DISS, REC (UG/L) (04024)	PRO-PANIL WATER FLTRD 0.7 U GF, REC (UG/L) (82679)
OCT										
05...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
19...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
25...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
NOV										
02...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
07...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
DEC										
10...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
20...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
JAN										
18...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
18...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
19...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
FEB										
16...	<.006	<.004	<.004	<.004	<.005	<.002	E.0047	<.003	<.007	<.004
MAR										
14...	<.006	<.004	<.004	<.004	<.005	<.002	E.0033	<.003	<.007	<.004
APR										
02...	<.006	<.004	<.004	<.004	<.005	<.002	E.0044	<.003	<.007	<.004
02...	<.006	<.004	<.004	<.004	<.005	<.002	E.0049	<.003	<.007	<.004
11...	<.006	<.004	<.004	<.004	<.005	<.002	E.0064	<.003	<.007	<.004
MAY										
24...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004
JUN										
20...	<.006	<.004	<.004	<.004	<.005	<.002	<.018	<.003	<.007	<.004

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	TIME	PRO-PARGITE WATER FLTRD 0.7 U GF, REC (UG/L) (82685)	SI-MAZINE, WATER, DISS, REC (UG/L) (04035)	TEBU-THIURON WATER FLTRD 0.7 U GF, REC (UG/L) (82670)	TER-BACIL WATER FLTRD 0.7 U GF, REC (UG/L) (82665)	TER-BUFOS WATER FLTRD 0.7 U GF, REC (UG/L) (82675)	THIO-BENCARB WATER FLTRD 0.7 U GF, REC (UG/L) (82681)	TRIAL-LATE WATER FLTRD 0.7 U GF, REC (UG/L) (82678)	TRI-FLUR-ALIN WAT FLT 0.7 U GF, REC (UG/L) (82661)
OCT									
05...	1000	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
19...	1550	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
25...	0629	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
NOV									
02...	1020	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
07...	1400	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
DEC									
10...	2050	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
20...	0945	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
JAN									
18...	0930	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
18...	0935	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
19...	2323	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
FEB									
16...	1120	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
MAR									
14...	0940	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
APR									
02...	1600	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
02...	1610	<.013	<.005	<.010	<.007	<.013	<.002	<.001	E.0037
11...	1010	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
MAY									
24...	1030	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002
JUN									
20...	1030	<.013	<.005	<.010	<.007	<.013	<.002	<.001	<.002

DATE	TIME	1,1,1-TRI-CHLORO-ETHANE TOTAL (UG/L) (34506)	1,1,2-TRI-CHLORO-ETHANE TOTAL (UG/L) (34511)	1,1-DI-CHLORO-ETHANE TOTAL (UG/L) (34496)	1,1-DI-CHLORO-ETHYL-ENE TOTAL (UG/L) (34501)	1,1-DI CHLORO-PRO-PENE, WAT, WH TOTAL (UG/L) (77168)	123-TRI CHLORO-PROPANE WATER WHOLE TOTAL (UG/L) (77443)	1,2-DIBROMO ETHANE WATER WHOLE TOTAL (UG/L) (77651)	1,2-DI-CHLORO-ETHANE TOTAL (UG/L) (32103)	1,2-DI-CHLORO-PROPANE TOTAL (UG/L) (34541)
OCT										
05...	1000	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
NOV										
02...	1020	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
DEC										
10...	2050	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
20...	0945	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
JAN										
18...	0930	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
20...	1440	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
FEB										
16...	1120	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
MAR										
14...	0940	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
APR										
02...	1600	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
11...	1010	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
MAY										
24...	1030	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068
JUN										
20...	1030	<.032	<.06	<.066	<.04	<.026	<.16	<.036	<.13	<.068

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	TRANS-1,2-DI-CHLORO-ETHENE TOTAL (UG/L) (34546)	2,2-DI CHLORO-PRO-PANE WAT, WH TOTAL (UG/L) (77170)	2BUTENE TRANS-1 4-DI-CHLORO UNFLTRD RECOVER (UG/L) (73547)	2-HEXA-NONE WATER WHOLE TOTAL (UG/L) (77103)	ACETONE WATER WHOLE TOTAL (UG/L) (81552)	ACRYLO-NITRILE TOTAL (UG/L) (34215)	1,2,3-TRI-CHLORO BENZENE WAT, WH REC (UG/L) (77613)	BENZENE 123-TRI METHYL-WATER UNFLTRD RECOVER (UG/L) (77221)	BENZENE 1,2,4-TRI-CHLORO-WAT UNF REC (UG/L) (34551)	BENZENE 124-TRI METHYL UNFILT RECOVER (UG/L) (77222)
OCT										
05...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
NOV										
02...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
DEC										
10...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
20...	<.032	<.05	<.7	<.7	E.872	<1.2	<.27	<.12	<.19	<.056
JAN										
18...	<.032	<.05	<.7	<.7	E1.66	<1.2	<.27	<.12	<.19	<.056
20...	<.032	<.05	<.7	<.7	E1.35	<1.2	<.27	<.12	<.19	<.056
FEB										
16...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
MAR										
14...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
APR										
02...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
11...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
MAY										
24...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056
JUN										
20...	<.032	<.05	<.7	<.7	<7	<1.2	<.27	<.12	<.19	<.056

DATE	BENZENE 135-TRI METHYL WATER UNFLTRD REC (UG/L) (77226)	BENZENE 1,3-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34566)	BENZENE 1,4-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34571)	ISO-PROPYL-BENZENE WATER WHOLE REC (UG/L) (77223)	BENZENE N-BUTYL WATER UNFLTRD REC (UG/L) (77342)	BENZENE N-PROPY WATER UNFLTRD REC (UG/L) (77224)	BENZENE O-DI-CHLORO-WATER UNFLTRD REC (UG/L) (34536)	BENZENE SEC BUTYL-WATER UNFLTRD REC (UG/L) (77350)	BENZENE TERT-BUTYL-WATER UNFLTRD REC (UG/L) (77353)	BENZENE TOTAL (UG/L) (34030)
OCT										
05...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
NOV										
02...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
DEC										
10...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
20...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
JAN										
18...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
20...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
FEB										
16...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	E.00522
MAR										
14...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	E.0118
APR										
02...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
11...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
MAY										
24...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035
JUN										
20...	<.044	<.054	<.05	<.032	<.19	<.042	<.048	<.032	<.06	<.035

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	BROMO-BENZENE WATER, WHOLE, TOTAL (UG/L) (81555)	BROMO-ETHENE WATER UNFLTRD RECOVER (UG/L) (50002)	BROMO-FORM TOTAL (UG/L) (32104)	CARBON DI-SULFIDE WATER WHOLE TOTAL (UG/L) (77041)	CARBON TETRA-CHLO-RIDE TOTAL (UG/L) (32102)	CHLORO-BENZENE TOTAL (UG/L) (34301)	CHLORO-DI-BROMO-METHANE TOTAL (UG/L) (32105)	CHLORO-ETHANE TOTAL (UG/L) (34311)	CHLORO-FORM TOTAL (UG/L) (32106)	CIS-1,2-DI-CHLORO-ETHENE WATER TOTAL (UG/L) (77093)
OCT										
05...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
NOV										
02...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
DEC										
10...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
20...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
JAN										
18...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
20...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	E.0114	<.038
FEB										
16...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
MAR										
14...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
APR										
02...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
11...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
MAY										
24...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038
JUN										
20...	<.036	<.1	<.06	<.07	<.06	<.028	<.18	<.12	<.052	<.038

DATE	CIS 1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34704)	DIBROMO CHLORO-PROPANE WATER WHOLE TOT.REC (UG/L) (82625)	DI-BROMO-METHANE WATER WHOLE RECOVER (UG/L) (30217)	BROMO-DI-CHLORO-METHANE TOTAL (UG/L) (32101)	DI-CHLORO-DI-FLUORO-METHANE TOTAL (UG/L) (34668)	DI-ISO-PROPYL-ETHER, WATER, UNFLTRD RECOVER (UG/L) (81577)	ETHANE, 1112-TETRA-CHLORO-WAT UNF REC (UG/L) (77562)	ETHANE, 1,1,2,2 TETRA-CHLORO-WAT UNF REC (UG/L) (34516)	ETHANE HEXA-CHLORO-WATER UNFLTRD RECOVER (UG/L) (34396)	ETHER ETHYL WATER UNFLTRD RECOVER (UG/L) (81576)
OCT										
05...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
NOV										
02...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
DEC										
10...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
20...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
JAN										
18...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
20...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
FEB										
16...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
MAR										
14...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
APR										
02...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
11...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
MAY										
24...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17
JUN										
20...	<.09	<.21	<.05	<.048	<.27	<.1	<.03	<.09	<.19	<.17

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	ETHER TERT-BUTYL ETHYL UNFLTRD RECOVER (UG/L) (50004)	ETHER TERT-PENTYL METHYL UNFLTRD RECOVER (UG/L) (50005)	ETHYL-BENZENE TOTAL (UG/L) (34371)	FREON-113 WATER UNFLTRD REC (UG/L) (77652)	FURAN, TETRA-HYDRO-WATER UNFLTRD RECOVER (UG/L) (81607)	HEXA-CHLORO-BUT-ADIENE TOTAL (UG/L) (39702)	ISO-DURENE WATER UNFLTRD RECOVER (UG/L) (50000)	METHAC-RYLATE ETHYL-WATER UNFLTRD RECOVER (UG/L) (73570)	METHAC-RYLATE METHYL WATER UNFLTRD RECOVER (UG/L) (81597)	METH-ACRYLO-NITRITE WATER UNFLTRD RECOVER (UG/L) (81593)
OCT										
05...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
NOV										
02...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
DEC										
10...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
20...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
JAN										
18...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
20...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
FEB										
16...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
MAR										
14...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
APR										
02...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
11...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
MAY										
24...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6
JUN										
20...	<.054	<.11	<.03	<.06	<2.2	<.14	<.2	<.18	<.35	<.6

DATE	METHANE BROMO CHLORO-WAT UNFLTRD REC (UG/L) (77297)	METHYL ACRY-LATE WATER UNFLTRD RECOVER (UG/L) (49991)	METHYL IODIDE WATER UNFLTRD RECOVER (UG/L) (77424)	METHYL TERT-BUTYL ETHER WAT UNF REC (UG/L) (78032)	METHYL-BROMIDE TOTAL (UG/L) (34413)	METHYL-CHLO-RIDE TOTAL (UG/L) (34418)	METHYL ENE CHLO-RIDE TOTAL (UG/L) (34423)	METHYL-ETHYL-KETONE WATER WHOLE TOTAL (UG/L) (81595)	METHYL ISO-BUTYL KETONE WAT.WH. TOTAL (UG/L) (78133)	META/ PARA-XYLENE WATER UNFLTRD REC (UG/L) (85795)
OCT										
05...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
NOV										
02...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	E.0202
DEC										
10...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	E.0181
20...	<.044	<1.4	<.12	<.17	<.26	E.0836	<.38	<1.6	<.37	E.0183
JAN										
18...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
20...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
FEB										
16...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	E.0226
MAR										
14...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
APR										
02...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
11...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
MAY										
24...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06
JUN										
20...	<.044	<1.4	<.12	<.17	<.26	<.5	<.38	<1.6	<.37	<.06

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

DATE	NAPHTHALENE TOTAL (UG/L) (34696)	O-CHLORO-TOLUENE WATER WHOLE TOTAL (UG/L) (77275)	O-XYLENE WATER WHOLE TOTAL (UG/L) (77135)	P-ISO-PROPYL-TOLUENE WATER WHOLE REC (UG/L) (77356)	1234-TETRA METHYL BENZENE UNFLTRD REC (UG/L) (49999)	1,3-DI-CHLORO-PROPANE WAT. WH TOTAL (UG/L) (77173)	PROPENE 3-CHLORO-WATER UNFLTRD RECOVER (UG/L) (78109)	STYRENE TOTAL (UG/L) (77128)	TETRA-CHLORO-ETHYL-ENE TOTAL (UG/L) (34475)	TOLUENE O-ETHYL WATER UNFLTRD RECOVER (UG/L) (77220)
OCT										
05...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	E.0257	<.1	<.06
NOV										
02...	<.25	<.042	<.038	E.0144	<.23	<.12	<.2	E.00728	<.1	<.06
DEC										
10...	<.25	<.042	<.038	E.0489	<.23	<.12	<.2	<.042	<.1	<.06
20...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
JAN										
18...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
20...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
FEB										
16...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
MAR										
14...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
APR										
02...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
11...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
MAY										
24...	<.25	<.042	<.038	<.07	<.23	<.12	<.2	<.042	<.1	<.06
JUN										
20...	<.25	<.042	<.038	E.00655	<.23	<.12	<.2	<.042	<.1	<.06

DATE	TOLUENE P-CHLOR WATER UNFLTRD REC (UG/L) (77277)	TOLUENE TOTAL (UG/L) (34010)	TRANS-1,3-DI-CHLORO-PROPENE TOTAL (UG/L) (34699)	TRI-CHLORO-ETHYL-ENE TOTAL (UG/L) (39180)	TRI-CHLORO-FLUORO-METHANE TOTAL (UG/L) (34488)	VINYL CHLORIDE TOTAL (UG/L) (39175)
OCT						
05...	<.06	E.0302	<.09	<.038	<.09	<.11
NOV						
02...	<.06	E.0468	<.09	<.038	<.09	<.11
DEC						
10...	<.06	E.0270	<.09	<.038	<.09	<.11
20...	<.06	E.0472	<.09	<.038	<.09	<.11
JAN						
18...	<.06	E.0271	<.09	<.038	<.09	<.11
20...	<.06	E.00996	<.09	<.038	<.09	<.11
FEB						
16...	<.06	E.0372	<.09	<.038	<.09	<.11
MAR						
14...	<.06	E.0864	<.09	<.038	<.09	<.11
APR						
02...	<.06	<.05	<.09	<.038	<.09	<.11
11...	<.06	E.0149	<.09	<.038	<.09	<.11
MAY						
24...	<.06	E.0576	<.09	<.038	<.09	<.11
JUN						
20...	<.06	E.0530	<.09	<.038	<.09	<.11

E Estimated

HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	263	208	222	224	177	195	171	68	128	222	207	214
2	241	189	209	236	200	210	199	59	127	220	206	213
3	208	186	195	228	136	202	287	199	248	222	206	214
4	213	203	208	549	133	171	315	287	302	233	214	221
5	232	180	203	584	188	206	337	209	249	229	207	219
6	183	144	158	221	204	212	266	239	256	264	201	216
7	175	151	159	226	82	164	283	259	271	320	186	236
8	191	160	181	194	122	173	286	271	277	266	229	243
9	201	186	195	198	123	152	284	239	257	243	192	230
10	230	201	218	205	154	192	266	44	160	202	172	190
11	247	218	228	216	198	207	142	45	100	227	202	216
12	235	149	211	237	128	160	149	101	121	289	214	230
13	154	136	144	219	182	202	114	81	96	228	177	203
14	171	112	149	224	193	204	152	114	133	192	128	161
15	171	115	151	223	204	211	165	151	156	212	165	186
16	190	124	156	276	207	225	178	159	169	215	137	184
17	182	142	172	236	202	217	180	166	173	225	195	216
18	194	180	185	533	175	216	191	174	181	205	67	151
19	204	79	149	214	171	187	192	185	188	192	37	108
20	181	99	147	212	114	171	218	189	195	216	79	172
21	205	181	197	180	114	141	220	194	198	248	192	216
22	213	198	205	196	64	131	344	129	182	245	221	240
23	220	203	207	190	123	170	189	102	145	241	235	238
24	234	70	166	312	122	163	202	164	192	238	232	234
25	215	75	118	197	185	192	217	200	204	234	229	231
26	383	168	186	450	156	203	212	85	164	232	135	193
27	201	175	190	217	139	185	238	135	179	243	201	232
28	564	201	215	224	140	178	208	198	201	237	233	234
29	226	179	198	427	186	207	734	203	257	234	230	232
30	639	201	219	228	166	202	234	203	214	231	227	228
31	220	150	184	---	---	---	215	207	212	228	225	226
MONTH	639	70	185	584	64	188	734	44	191	320	37	211
		FEBRUARY			MARCH			APRIL			MAY	
1	231	145	180	213	198	204	166	106	135	200	188	194
2	222	202	214	219	201	207	185	78	144	202	191	196
3	250	218	221	341	205	217	230	158	189	206	188	197
4	227	217	222	219	205	211	220	182	204	222	191	197
5	222	217	220	220	207	213	220	201	214	206	193	198
6	221	216	218	224	209	216	285	209	217	206	189	198
7	223	217	219	244	214	226	240	211	216	204	191	197
8	220	214	217	242	213	226	216	173	202	206	191	199
9	249	216	219	290	216	228	189	118	161	209	192	199
10	221	214	218	231	211	222	185	149	166	220	193	202
11	251	218	222	229	210	220	199	175	188	217	187	201
12	222	218	220	230	210	221	198	182	187	202	140	172
13	220	213	217	261	212	230	222	182	191	198	125	157
14	222	215	218	233	212	224	198	184	191	194	170	185
15	222	213	218	275	209	226	200	183	192	246	190	199
16	231	217	221	239	209	224	204	165	188	205	194	200
17	264	214	222	240	209	226	191	126	166	216	196	204
18	238	218	223	300	210	228	181	144	170	210	195	202
19	223	155	181	231	203	212	201	181	189	212	193	202
20	220	195	210	259	204	233	239	184	192	205	193	199
21	226	214	219	243	217	231	205	174	188	211	191	200
22	225	208	214	252	218	230	194	182	189	205	183	193
23	220	213	217	240	143	186	199	183	191	204	183	195
24	217	210	214	225	203	216	204	183	193	207	184	198
25	217	209	212	236	205	220	200	180	188	1190	190	440
26	215	207	212	241	131	187	194	163	178	217	189	202
27	219	196	208	194	130	167	191	116	149	209	189	199
28	218	198	204	207	177	198	208	167	180	218	190	204
29	236	182	206	224	133	172	193	186	188	210	189	200
30	---	---	---	227	162	185	197	188	193	212	187	199
31	---	---	---	208	98	162	---	---	---	208	150	183
MONTH	264	145	214	341	98	212	285	78	185	1190	125	204

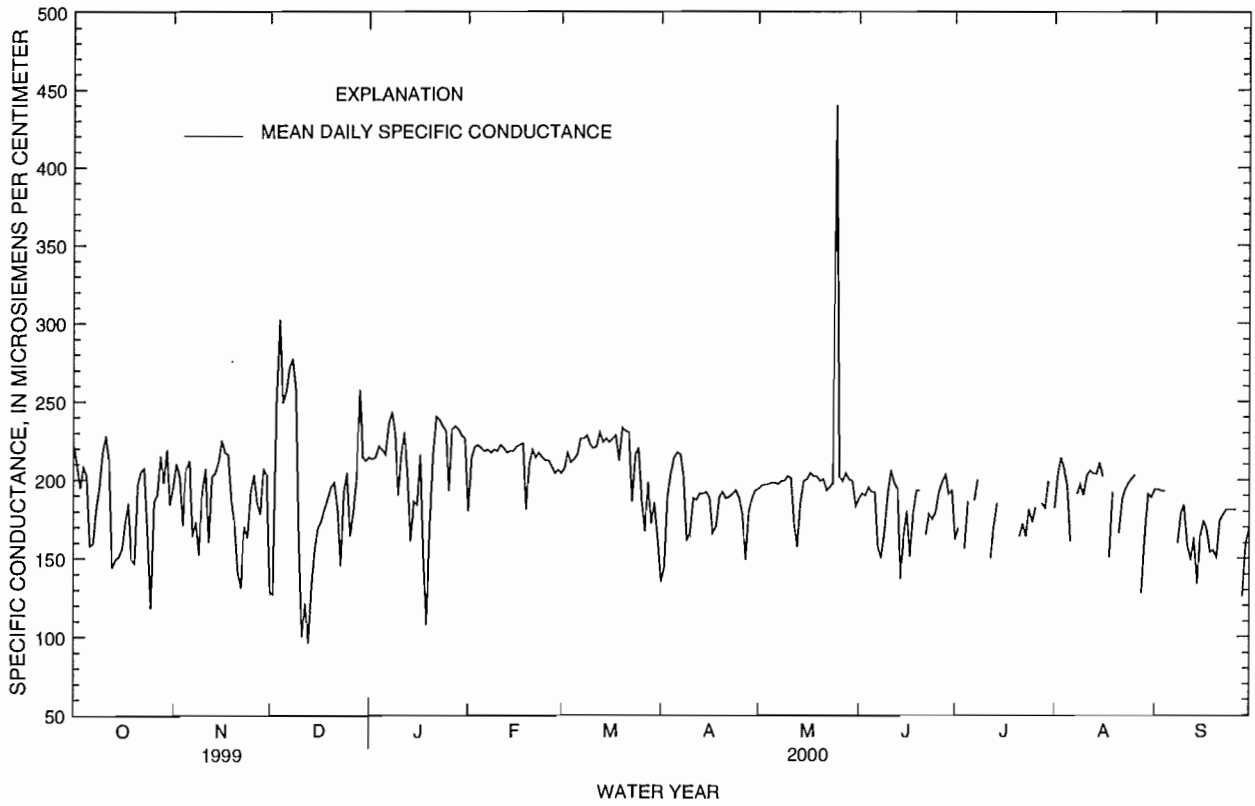
HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	379	162	188	181	146	162	200	144	182	198	191	194
2	205	176	191	184	155	169	207	198	203	201	188	194
3	201	176	190	---	---	---	308	203	214	197	187	193
4	205	182	195	171	144	156	215	199	207	196	189	193
5	210	164	192	197	170	186	204	179	196	---	---	---
6	203	163	192	---	---	---	190	125	161	174	131	162
7	207	131	157	199	170	187	---	---	---	---	---	---
8	258	130	150	206	196	200	200	181	191	169	143	160
9	180	154	167	---	---	---	201	195	197	255	162	179
10	217	180	191	204	174	200	256	167	190	188	177	184
11	231	187	206	---	---	---	206	191	203	177	134	158
12	208	187	198	183	132	150	218	195	206	172	125	149
13	219	172	194	208	141	170	212	195	204	182	127	163
14	194	102	137	191	165	185	212	195	204	152	104	134
15	247	137	164	---	---	---	224	196	211	173	137	164
16	203	110	180	---	---	---	210	194	202	178	171	174
17	185	106	151	203	143	178	---	---	---	183	128	168
18	183	172	179	---	---	---	179	121	151	178	128	154
19	204	181	193	193	176	185	198	179	192	176	139	155
20	206	178	193	---	---	---	---	---	---	180	122	151
21	---	---	---	173	139	164	182	129	166	178	164	174
22	291	131	165	291	154	172	193	182	188	183	175	178
23	191	137	178	191	140	164	204	190	194	187	176	181
24	189	166	175	188	173	181	203	193	198	185	177	181
25	206	164	179	203	128	173	204	196	201	187	176	181
26	218	177	192	190	167	182	207	197	203	187	176	181
27	211	185	199	---	---	---	---	---	---	---	---	---
28	216	194	203	196	164	185	188	49	128	149	83	126
29	267	170	191	197	166	182	186	137	163	166	149	159
30	218	146	193	203	195	199	237	180	191	176	165	169
31	---	---	---	---	---	---	192	183	189	---	---	---
MONTH	---	---	---	---	---	---	---	---	---	---	---	---



HAWAII, ISLAND OF OAHU

162425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	25.0	23.0	23.5	23.5	22.0	22.5	21.5	19.5	20.5	21.0	20.0	20.5
2	24.5	22.5	23.5	23.5	22.0	22.5	23.0	20.0	21.5	21.5	19.5	20.5
3	25.0	22.5	23.5	23.5	22.0	22.5	22.5	21.0	21.5	22.0	20.0	21.0
4	25.0	22.5	23.5	22.5	21.5	22.0	22.5	21.0	21.5	22.5	21.0	22.0
5	24.5	22.5	23.5	23.0	22.0	22.5	22.0	20.5	21.5	22.0	21.0	21.5
6	23.5	22.0	22.5	23.0	21.5	22.0	22.0	20.5	21.5	22.0	21.0	21.5
7	23.0	22.0	22.5	24.0	21.0	22.0	22.0	20.5	21.0	22.0	20.5	21.0
8	24.0	22.0	23.0	23.0	21.0	22.0	21.5	20.5	21.0	22.5	20.5	21.5
9	24.5	22.0	23.0	23.0	21.5	22.0	22.0	20.5	21.0	22.0	20.5	21.0
10	24.5	22.5	23.5	23.0	21.0	22.0	22.0	21.0	21.5	22.0	20.0	21.0
11	25.0	23.0	23.5	23.0	21.5	22.0	22.0	21.0	21.5	22.0	20.5	21.0
12	24.0	23.0	23.5	22.5	21.0	21.5	22.5	21.5	22.0	22.0	20.5	21.5
13	24.5	22.5	23.5	21.5	20.5	21.0	23.0	21.5	22.0	22.0	20.0	21.0
14	24.5	22.5	23.5	22.0	21.0	21.5	23.5	21.0	22.0	21.5	19.5	20.5
15	24.0	22.0	23.0	22.0	20.5	21.5	23.0	21.0	22.0	22.0	19.5	20.5
16	24.5	22.5	23.5	22.5	21.0	21.5	23.0	20.5	21.5	21.0	19.0	19.5
17	24.0	22.5	23.0	22.5	21.0	22.0	23.0	21.0	22.0	21.0	18.5	19.5
18	23.5	22.0	22.5	23.0	21.5	22.5	23.0	21.0	22.0	20.5	17.5	19.0
19	23.0	21.0	22.0	23.0	20.5	21.5	22.5	20.5	21.5	20.5	18.0	19.0
20	22.5	21.0	21.5	24.0	21.5	22.0	23.0	21.5	22.0	21.0	18.0	19.5
21	23.5	22.0	23.0	23.0	21.5	22.0	23.0	22.0	22.5	21.0	20.0	20.0
22	24.5	23.0	23.5	23.5	21.0	22.0	23.5	21.0	22.5	21.0	19.0	20.0
23	24.0	22.5	23.0	23.5	21.5	22.0	22.5	21.0	21.5	21.0	18.5	19.5
24	24.5	22.0	23.0	23.5	21.5	22.5	23.0	21.5	22.0	21.0	18.5	19.5
25	23.5	21.5	22.5	23.0	21.5	22.0	23.5	21.5	22.5	21.0	18.5	19.5
26	23.0	21.5	22.5	22.5	21.5	22.0	24.0	20.5	22.0	21.0	19.0	19.5
27	23.5	22.0	22.5	23.0	21.0	22.0	21.0	19.0	20.0	20.5	18.5	19.5
28	23.5	22.0	23.0	22.0	21.0	21.5	20.0	18.5	19.5	21.0	18.5	20.0
29	23.5	22.0	23.0	21.5	20.5	21.0	20.5	19.0	19.5	22.0	19.5	20.5
30	23.5	22.0	22.5	21.0	20.0	20.5	21.5	19.5	20.5	22.0	19.5	20.5
31	23.5	22.0	23.0	---	---	---	21.5	19.5	20.5	23.0	19.5	21.0
MONTH	25.0	21.0	23.0	24.0	20.0	22.0	24.0	18.5	21.5	23.0	17.5	20.5

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		FEBRUARY			MARCH			APRIL			MAY	
1	22.5	20.0	21.5	23.0	21.0	22.0	21.5	19.0	20.0	23.5	21.0	22.5
2	22.5	20.0	21.0	22.5	21.0	22.0	22.0	20.0	20.5	23.0	21.5	22.5
3	21.5	19.5	20.5	23.0	21.0	22.0	22.5	20.5	21.0	24.0	21.5	23.0
4	23.0	19.5	21.0	23.0	21.0	22.0	22.5	20.0	21.0	23.5	21.5	22.5
5	22.0	20.0	21.0	23.5	21.0	22.0	21.5	19.5	20.5	24.0	21.5	23.0
6	22.0	20.0	21.0	23.5	21.5	22.5	22.5	19.5	21.0	24.0	22.0	23.0
7	22.0	20.0	21.0	23.0	21.5	22.0	23.5	19.5	21.5	24.5	22.0	23.5
8	22.0	20.0	21.0	23.5	21.0	22.0	21.5	19.5	20.5	24.0	22.0	23.0
9	22.0	20.0	21.0	22.0	20.5	21.5	21.5	19.0	20.0	23.5	22.0	22.5
10	22.0	20.0	21.0	23.5	20.5	21.5	22.0	18.5	20.0	24.0	21.5	23.0
11	22.0	20.0	21.0	23.5	20.5	22.0	22.5	19.0	20.5	24.0	21.5	23.0
12	22.0	20.0	21.0	24.0	21.5	22.5	22.5	20.0	21.5	24.0	21.5	22.5
13	22.5	20.0	21.0	24.0	22.0	22.5	22.5	20.5	21.5	23.5	21.0	22.5
14	22.5	20.5	21.5	23.0	21.5	22.0	23.0	20.5	22.0	24.0	21.0	22.5
15	22.5	20.5	22.0	23.5	21.5	22.5	22.5	20.0	21.5	24.0	21.5	23.0
16	22.5	21.0	22.0	24.0	22.0	22.5	23.0	20.5	21.5	24.5	22.0	23.5
17	23.0	21.0	22.0	24.0	22.0	22.5	23.0	20.5	21.5	24.0	22.5	23.5
18	23.5	21.5	22.5	24.0	21.0	22.5	22.5	20.0	21.5	24.5	22.5	23.5
19	22.5	21.0	22.0	23.0	20.5	21.5	22.5	20.0	21.5	25.0	23.0	24.0
20	21.5	19.5	20.5	23.0	20.5	21.5	22.5	20.5	21.5	24.5	22.5	23.5
21	22.0	20.5	21.0	23.5	21.0	21.5	22.5	20.5	21.5	24.5	22.5	23.5
22	22.0	20.5	21.5	22.0	20.5	21.0	23.0	20.5	22.0	24.5	22.5	23.5
23	21.5	20.5	21.0	22.5	20.0	21.0	24.0	21.0	22.5	24.5	22.5	23.0
24	21.5	20.5	21.0	23.5	20.5	22.0	24.0	21.0	22.5	25.0	22.5	23.5
25	22.5	20.5	21.5	23.5	20.5	22.0	24.0	21.5	22.5	24.5	22.5	23.5
26	23.0	21.0	22.0	23.0	21.0	22.0	23.0	21.5	22.5	24.5	22.0	23.0
27	23.0	21.5	22.5	23.0	20.5	22.0	23.5	21.0	22.0	25.0	22.5	23.5
28	22.5	21.0	22.0	23.0	20.5	21.5	23.5	20.5	22.0	24.0	22.5	23.0
29	23.0	21.0	22.0	22.5	20.5	21.5	23.5	21.0	22.5	24.5	22.0	23.0
30	---	---	---	23.0	20.5	22.0	23.5	21.0	22.5	24.5	22.0	23.0
31	---	---	---	23.0	19.0	21.5	---	---	---	24.5	22.5	23.5
MONTH	23.5	19.5	21.5	24.0	19.0	22.0	24.0	18.5	21.5	25.0	21.0	23.0

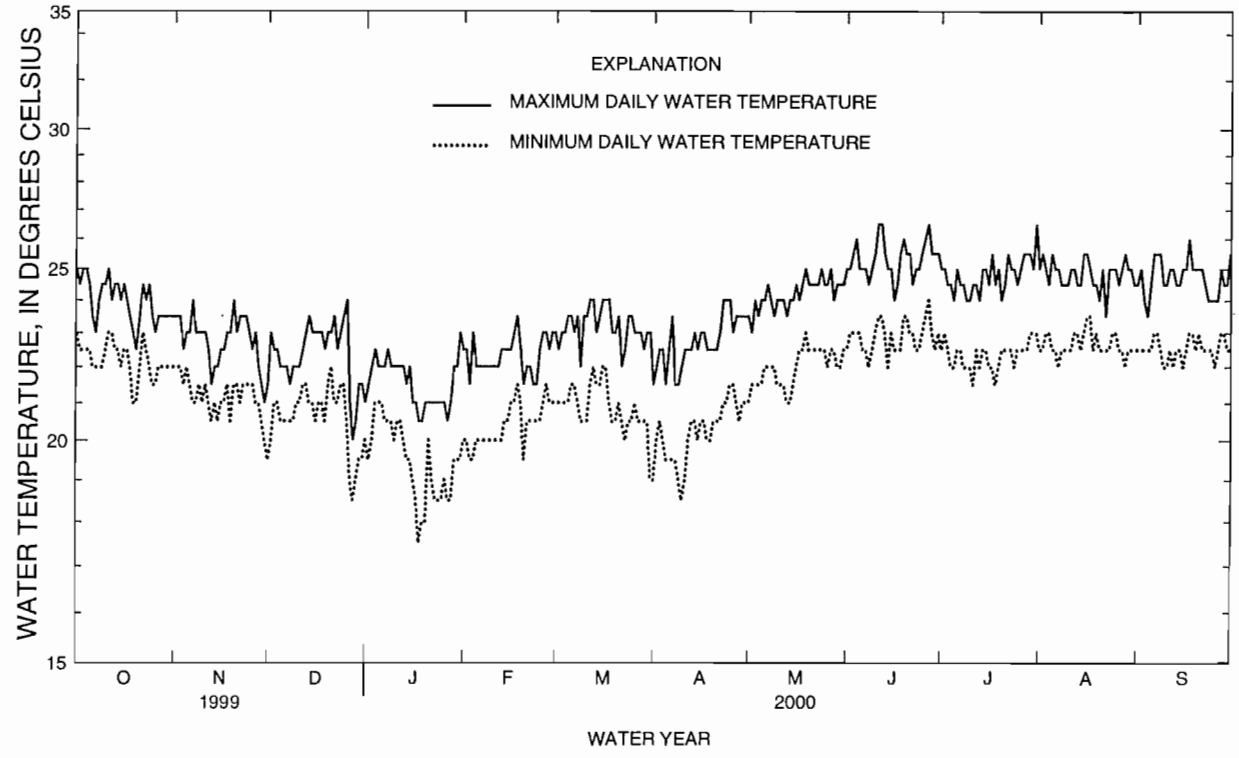
HAWAII, ISLAND OF OAHU

I62425000 MANOA STREAM AT KANEWAI FIELD--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	25.0	22.5	24.0	25.0	22.5	24.0	25.0	22.5	24.0	24.5	22.5	23.5
2	25.0	23.0	24.0	25.0	23.0	24.0	25.5	22.5	24.0	25.0	22.5	23.5
3	25.5	23.0	24.0	24.5	22.5	23.0	25.0	23.0	24.0	24.0	22.5	23.5
4	26.0	23.0	24.0	24.5	22.0	23.0	24.5	23.0	24.0	23.5	22.5	23.0
5	25.0	23.0	24.0	24.0	22.0	23.0	25.5	22.5	24.0	24.5	22.5	23.5
6	25.0	22.5	23.5	25.0	22.5	23.5	25.0	22.5	23.5	25.5	23.0	24.0
7	25.0	22.5	24.0	24.5	22.5	23.5	25.0	22.0	23.5	25.5	23.0	24.0
8	24.5	22.0	23.5	24.5	22.0	23.5	24.5	22.5	23.5	25.5	22.5	23.5
9	25.0	22.5	24.0	24.0	22.0	23.0	24.5	22.5	23.5	24.5	22.0	23.0
10	25.5	23.0	24.0	24.0	22.0	23.0	24.5	22.5	24.0	24.5	22.0	23.5
11	26.5	23.5	24.5	24.5	21.5	23.0	25.0	22.5	24.0	25.0	22.5	23.5
12	26.5	23.5	24.5	24.5	22.5	23.5	25.0	23.0	24.0	25.0	22.0	23.5
13	25.5	23.0	24.5	24.0	22.0	23.0	24.5	23.0	23.5	24.5	22.5	23.5
14	25.0	22.0	24.0	25.0	22.5	23.5	24.5	22.5	23.5	24.5	22.5	23.0
15	25.0	23.0	24.0	25.0	22.5	23.5	25.5	23.0	24.0	25.0	22.0	23.5
16	24.0	22.5	23.5	24.5	22.0	23.0	25.5	23.5	24.5	25.0	22.5	24.0
17	24.5	22.5	23.5	25.5	22.0	23.5	25.0	23.5	24.5	26.0	23.0	24.0
18	25.5	22.5	24.0	24.5	21.5	23.0	24.5	22.5	23.5	25.0	23.0	24.0
19	26.0	23.5	24.5	25.0	22.0	23.5	24.5	23.0	24.0	25.0	22.5	24.0
20	25.5	23.5	24.5	24.0	22.5	23.0	24.0	22.5	23.0	25.0	23.0	24.0
21	25.5	23.0	24.5	24.5	22.5	23.5	25.0	22.5	23.5	25.0	22.5	23.5
22	24.5	23.0	23.5	25.5	22.5	23.5	23.5	22.5	23.0	24.5	22.5	24.0
23	25.0	22.5	23.5	25.0	22.5	23.5	25.0	22.5	24.0	24.0	22.5	23.5
24	25.0	22.5	24.0	25.0	22.0	23.5	25.0	23.0	24.0	24.0	22.5	23.5
25	25.5	23.0	24.5	24.5	22.5	23.0	25.0	23.0	24.0	24.0	22.0	23.5
26	26.0	23.5	24.5	25.0	22.5	23.5	24.5	22.5	24.0	24.0	22.5	23.5
27	26.5	24.0	24.5	25.5	22.5	23.5	25.0	22.5	23.5	25.0	23.0	23.5
28	25.5	23.0	24.0	25.5	22.5	24.0	25.5	22.0	23.5	24.5	23.0	23.5
29	25.5	22.5	24.0	25.5	23.0	24.0	25.0	22.5	23.5	24.5	22.5	23.5
30	25.5	23.0	24.0	25.0	23.0	24.0	25.0	22.5	23.5	25.5	22.5	24.0
31	---	---	---	26.5	23.0	24.0	24.5	22.5	23.5	---	---	---
MONTH	26.5	22.0	24.0	26.5	21.5	23.5	25.5	22.0	24.0	26.0	22.0	23.5
YEAR	26.5	17.5	22.5									



HAWAII, ISLAND OF OAHU

16247100 MANOA-PALOLO DRAINAGE CANAL AT MOILIILI

LOCATION.--Lat 21°17′24″, long 157°49′17″, on left bank at Kaimuki High School, and 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.

DRAINAGE AREA.--10.6 mi^2.

PERIOD OF RECORD.--October 1, 1999 to current year. Previously operated as a crest-stage gage 1968-99.

GAGE.--Water-stage recorder. Elevation of gage is 5 ft above mean sea level (from topographic map).

REMARKS.--Records computed by C.W. Yeung. Records poor due to tidal backwater.

EXTREMES FOR CURRENT YEAR.--Maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0530	1,300	4.83	Jan. 19	2345	*1,370	*4.93

Minimum discharge, 2.8 ft^3/s, June 12-13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	5.1	63	5.8	24	3.9	69	5.3	4.0	7.6	8.0	7.0
2	4.1	4.3	123	5.5	8.5	3.8	227	5.3	4.0	8.9	5.7	6.3
3	4.1	6.1	13	5.3	7.6	3.7	66	5.4	3.9	13	5.3	6.8
4	3.6	5.3	8.8	5.1	6.9	3.7	26	4.9	3.7	12	5.4	6.3
5	4.9	4.3	37	5.0	6.5	3.7	17	4.8	4.1	8.4	6.1	36
6	6.8	4.1	11	5.6	6.2	3.5	12	4.8	3.2	16	8.9	17
7	6.6	28	9.4	7.2	5.9	3.6	9.8	4.6	6.1	8.5	12	38
8	4.4	7.9	8.7	5.9	5.8	3.6	12	4.5	6.1	11	5.0	25
9	4.0	14	11	7.9	5.6	3.5	22	4.4	4.4	13	4.7	16
10	4.0	6.6	157	9.9	5.3	3.5	17	4.3	3.8	8.0	6.3	13
11	3.6	5.4	66	5.9	5.2	3.4	10	4.8	3.3	21	5.3	15
12	4.6	16	53	6.7	5.0	3.4	8.1	8.2	3.1	21	7.2	16
13	6.4	6.0	49	11	4.9	3.4	7.7	11	4.2	13	6.5	15
14	8.8	6.4	22	28	4.7	3.3	6.9	5.3	8.3	11	5.7	29
15	4.7	5.0	16	29	4.6	3.3	6.5	4.8	4.0	20	5.3	12
16	7.5	4.7	11	46	4.5	3.2	7.4	4.5	5.9	33	5.5	9.9
17	4.2	4.8	9.8	13	4.3	3.1	11	4.3	5.4	20	16	12
18	3.9	6.3	8.9	54	4.3	3.5	8.1	4.3	4.4	36	9.8	12
19	30	7.1	8.2	290	13	3.8	7.0	4.2	4.0	16	9.3	15
20	6.7	11	8.3	243	4.7	3.2	6.4	4.0	4.5	55	64	20
21	4.8	10	7.8	95	4.7	3.1	6.7	4.2	9.8	15	12	13
22	3.9	41	15	39	4.9	3.3	5.9	4.3	6.7	11	8.0	e12
23	3.6	13	36	22	4.3	8.6	5.6	4.0	7.6	15	10	e11
24	15	8.6	10	16	4.1	3.5	5.7	3.9	5.9	12	8.5	e11
25	39	6.2	7.6	13	4.1	3.8	6.4	3.9	6.8	13	8.0	e10
26	8.3	5.7	23	62	4.2	7.0	6.5	3.9	6.8	8.8	7.9	e9.8
27	6.4	8.2	9.7	19	4.6	9.6	16	3.7	6.2	17	36	e60
28	5.1	6.4	6.9	12	4.1	4.1	7.4	3.9	5.7	7.7	75	e33
29	5.6	6.4	6.5	10	3.9	10	6.2	3.7	5.3	7.5	21	e12
30	4.6	7.0	6.6	8.9	---	5.0	5.7	3.6	5.9	5.6	10	e9.0
31	8.2	---	6.2	8.0	---	32	---	4.6	---	15	8.1	---
TOTAL	231.2	270.9	829.4	1094.7	176.4	160.1	629.0	147.4	157.1	480.0	406.5	508.1
MEAN	7.46	9.03	26.8	35.3	6.08	5.16	21.0	4.75	5.24	15.5	13.1	16.9
MAX	39	41	157	290	24	32	227	11	9.8	55	75	60
MIN	3.6	4.1	6.2	5.0	3.9	3.1	5.6	3.6	3.1	5.6	4.7	6.3
AC-FT	459	537	1650	2170	350	318	1250	292	312	952	806	1010

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1999 - 2000, BY WATER YEAR (WY)

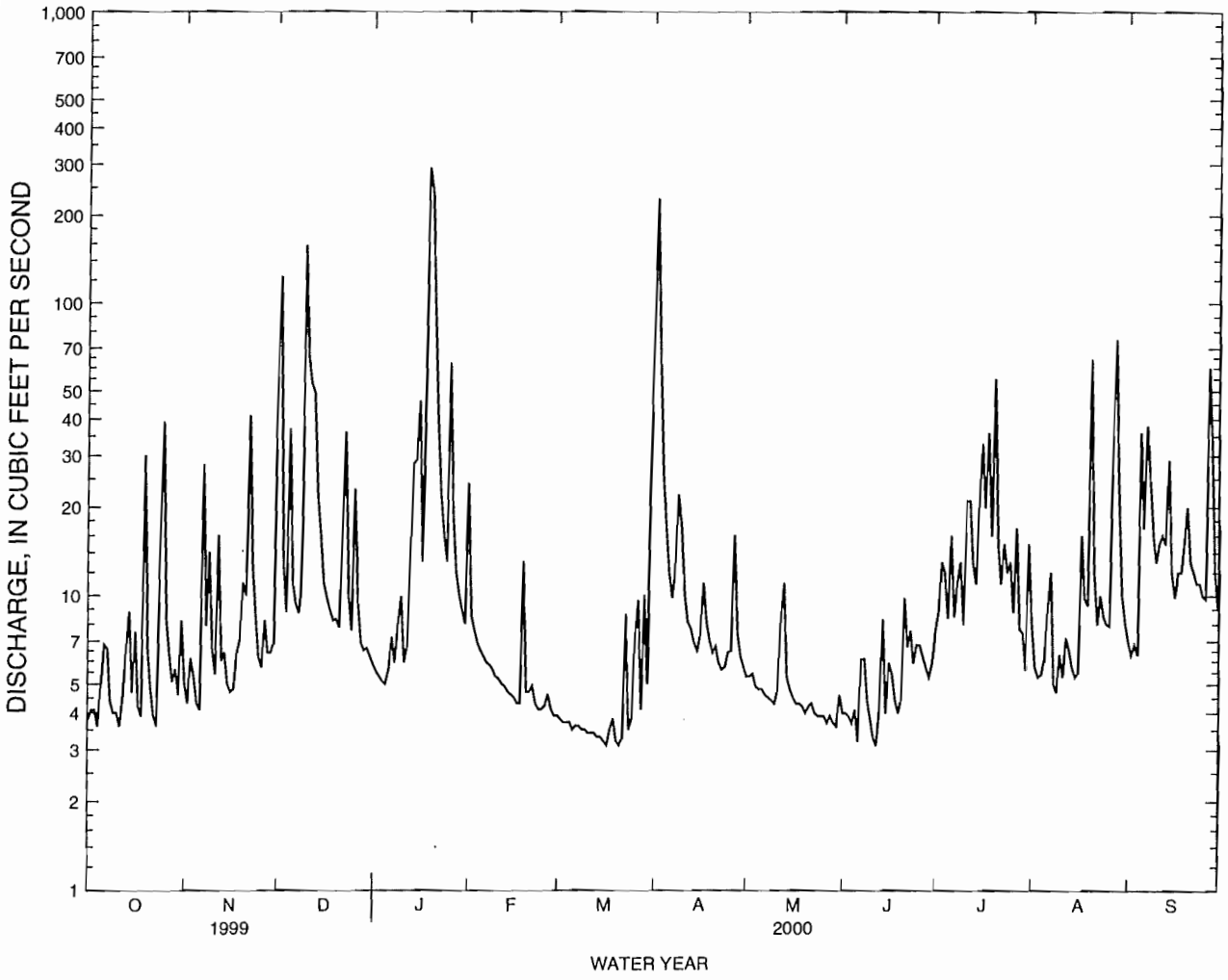
MEAN	7.46	9.03	26.8	35.3	6.08	5.16	21.0	4.75	5.24	16.5	13.1	16.9
MAX	7.46	9.03	26.8	35.3	6.08	5.16	21.0	4.75	5.24	17.5	13.1	16.9
(WY)	2000	2000	2000	2000	2000	2000	2000	2000	2000	1999	2000	2000
MIN	7.46	9.03	26.8	35.3	6.08	5.16	21.0	4.75	5.24	15.5	13.1	16.9
(WY)	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000	2000

e Estimated

HAWAII, ISLAND OF OAHU

16247100 MANOA-PALOLO DRAINAGE CANAL AT MOILIILI--Continued

SUMMARY STATISTICS	FOR 2000 WATER YEAR		WATER YEARS 1999 - 2000	
ANNUAL TOTAL	5090.8			
ANNUAL MEAN	13.9		13.9	
HIGHEST ANNUAL MEAN			13.9	2000
LOWEST ANNUAL MEAN			13.9	2000
HIGHEST DAILY MEAN	290	Jan 19	290	Jan 19 2000
LOWEST DAILY MEAN	3.1	Mar 17	3.1	Mar 17 2000
ANNUAL SEVEN-DAY MINIMUM	3.3	Mar 11	3.3	Mar 11 2000
ANNUAL RUNOFF (AC-FT)	10100		10080	
10 PERCENT EXCEEDS	27		23	
50 PERCENT EXCEEDS	6.8		7.5	
90 PERCENT EXCEEDS	3.9		4.0	



HAWAII, ISLAND OF OAHU

16249500 MAUNAWILI DITCH AT AINONI SPRING

LOCATION.--Lat 21°21′08″, long 157°46′03″, on left bank about 1,000 ft below Siphon 8, 3.2 mi east of Waimanalo Elementary School, and 3.8 mi northeast of Manoa Elementary School.

PERIOD OF RECORD.--June 1991 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 440 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records good. At times flow is diverted above gage by Waimanalo Irrigation System, State Department of Agriculture.

AVERAGE DISCHARGE.--9 years (water years 1992-2000) 1.15 ft^3/s (830 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2.9 ft^3/s, May 20, 1997; minimum daily, no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2.8 ft^3/s, January 19; minimum daily, 0.44 ft^3/s, August 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	.95	1.4	.93	1.5	1.4	1.9	1.3	1.4	.92	.83	1.2
2	1.0	1.1	1.3	.76	1.8	1.5	1.4	1.4	1.3	.61	1.0	.86
3	.80	1.2	1.2	1.2	1.8	1.5	1.8	1.5	1.2	.88	1.0	.57
4	.98	1.1	1.1	1.1	1.8	1.3	1.3	1.5	.97	.83	1.0	.45
5	1.1	1.1	.86	1.2	1.5	.94	1.6	1.5	1.0	1.0	.97	1.1
6	1.1	.93	.93	.97	1.1	1.2	1.8	1.2	1.2	.98	.80	1.5
7	1.1	.89	1.2	.94	1.4	1.3	1.9	.85	1.3	.94	.78	1.1
8	1.1	.97	1.2	.72	1.7	1.3	1.7	1.2	1.2	.96	.99	1.1
9	1.1	1.1	1.2	.95	1.8	1.1	1.3	1.4	1.2	.61	1.0	.90
10	.99	1.1	1.4	1.4	1.5	1.2	1.7	1.3	.87	.88	.98	.57
11	1.0	1.0	1.0	1.4	1.5	1.1	2.0	1.4	.56	1.1	1.0	.82
12	1.1	1.0	.76	1.3	1.5	.91	1.8	1.4	.46	1.0	.88	1.1
13	1.1	1.1	1.3	1.1	1.2	1.2	1.2	1.1	.82	1.0	.69	1.1
14	1.1	.94	1.9	1.6	1.4	1.4	1.4	.85	1.2	1.1	.81	1.4
15	1.1	1.0	1.8	1.3	1.5	1.4	1.1	1.1	1.2	.89	.99	1.2
16	1.0	1.1	1.6	.81	1.4	1.3	.75	1.2	1.3	.69	.98	1.2
17	.86	1.1	1.5	.53	1.6	1.1	1.3	.91	.80	.93	1.0	.76
18	.99	1.1	1.2	1.5	1.6	.73	1.3	1.1	.51	1.1	.84	.90
19	1.2	1.1	.86	2.8	.97	.48	.93	1.3	.94	1.1	.60	1.1
20	.99	1.0	1.2	1.2	.69	.88	1.3	1.1	.95	1.1	1.1	1.1
21	.93	.94	1.3	1.7	.60	1.2	1.4	.92	1.1	1.1	1.2	1.0
22	1.0	1.0	1.5	1.6	1.1	1.4	.80	1.2	1.3	.93	1.3	1.1
23	1.0	1.1	1.9	1.1	1.6	1.4	.60	1.3	1.2	.68	1.2	1.1
24	.90	1.1	1.3	1.6	1.5	1.5	1.1	1.3	1.1	.84	1.1	.83
25	.97	.93	.87	1.9	1.6	1.2	1.6	1.2	.75	1.0	1.0	.94
26	1.1	.98	.82	1.4	1.5	.91	1.5	1.2	.98	.85	.87	1.0
27	1.1	.99	.92	.66	1.3	.75	1.1	.89	1.1	.93	.44	1.5
28	1.0	.74	1.1	1.3	1.4	1.1	1.3	.70	1.1	1.0	1.4	1.5
29	1.1	.90	1.3	1.7	1.5	1.3	1.5	.54	1.0	.87	1.2	1.4
30	.99	1.1	1.4	1.4	---	1.4	1.3	.93	.98	.76	1.1	1.5
31	.78	---	1.3	1.4	---	2.0	---	1.3	---	.61	1.2	---
TOTAL	31.68	30.66	38.62	39.47	41.36	37.40	41.68	36.09	30.99	28.19	30.25	31.90
MEAN	1.02	1.02	1.25	1.27	1.43	1.21	1.39	1.16	1.03	.91	.98	1.06
MAX	1.2	1.2	1.9	2.8	1.8	2.0	2.0	1.5	1.4	1.1	1.4	1.5
MIN	.78	.74	.76	.53	.60	.48	.60	.54	.46	.61	.44	.45
AC-FT	63	61	77	78	82	74	83	72	61	56	60	63

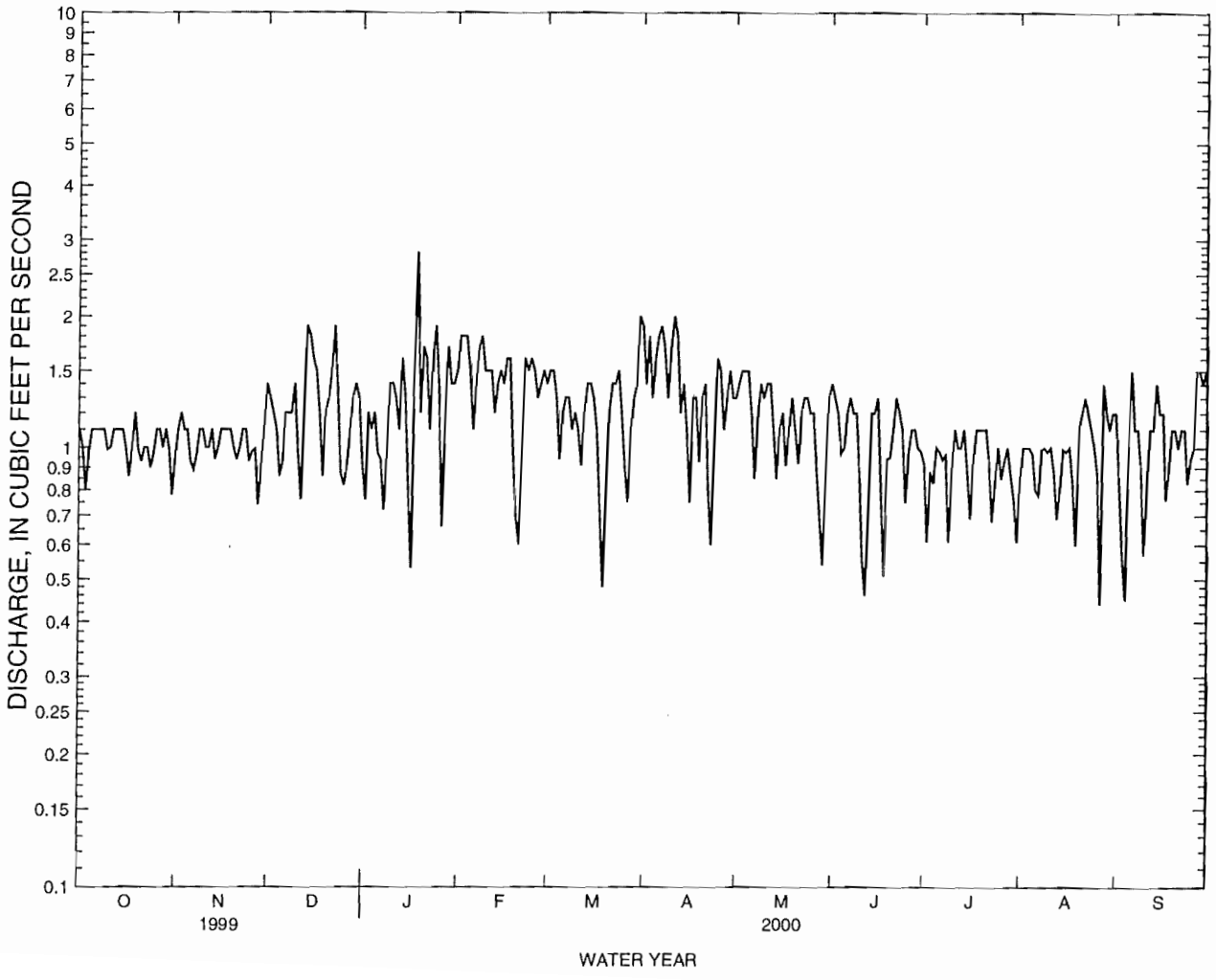
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2000, BY WATER YEAR (WY)

MEAN	1.20	1.24	1.05	.89	.94	1.10	1.09	1.35	1.27	1.23	1.30	1.27
MAX	2.01	1.84	1.86	1.89	1.60	1.76	1.63	1.64	1.80	1.76	1.76	1.90
(WY)	1992	1992	1992	1992	1995	1992	1992	1994	1994	1991	1991	1992
MIN	.81	.70	.44	.32	.24	.34	.56	1.02	.87	.83	.96	.78
(WY)	1997	1997	1997	1996	1999	1996	1999	1996	1997	1997	1998	1997

HAWAII, ISLAND OF OAHU

16249500 MAUNAWILI DITCH AT AINONI SPRING--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1991 - 2000	
ANNUAL TOTAL	318.49		418.29			
ANNUAL MEAN	.87		1.14		1.15	
HIGHEST ANNUAL MEAN					1.75	1992
LOWEST ANNUAL MEAN					.81	1996
HIGHEST DAILY MEAN	1.9	Jan 6	2.8	Jan 19	2.9	May 20 1997
LOWEST DAILY MEAN	.00	Jan 12	.44	Aug 27	.00	Jan 1 1993
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 12	.84	Jul 26	.00	Jan 12 1999
ANNUAL RUNOFF (AC-FT)	632		830		830	
10 PERCENT EXCEEDS	1.3		1.5		1.9	
50 PERCENT EXCEEDS	.99		1.1		1.1	
90 PERCENT EXCEEDS	.24		.80		.51	



HAWAII, ISLAND OF OAHU

16249900 MAUNAWILI DITCH ABOVE ANIANINUI TUNNEL NR KAILUA

LOCATION.--Lat 21°20′50″, long 157°46′26″, on left bank about 1,000 ft above Aniani Nui Tunnel, 2.5 mi east of Waimanalo Elementary School, and 3.6 mi north of Wailupe Valley Elementary School.

PERIOD OF RECORD.--December 3, 1990 to July 12, 2000.

GAGE.--Water-stage recorder and 3 ft semi-circular corrugated metal pipe control with concrete on upstream end. Elevation of gage is 400 ft above mean sea level (from topographic map).

REMARKS.--Records computed by C.W. Yeung. Records good. Station discontinued July 12, 2000

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 5.5 ft^3/s, March 24, 1994; no flow on March 22, 24, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge during period October 1999 to July 2000, 2.7 ft^3/s, January 19; minimum daily during period October 1999 to July 2000, 0.56 ft^3/s, March 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.6	1.8	1.4	1.5	1.7	1.3	1.6	1.6	1.4	---	---
2	1.5	1.7	1.8	1.2	2.0	1.8	.85	1.9	1.3	1.2	---	---
3	1.2	1.7	1.7	1.6	2.0	1.8	.93	1.9	1.4	1.3	---	---
4	1.3	1.7	1.6	1.6	1.9	1.7	1.2	1.9	1.4	1.2	---	---
5	1.6	1.6	1.2	1.6	1.8	1.4	1.2	1.6	1.4	1.3	---	---
6	1.6	1.5	1.3	1.5	1.5	1.5	1.6	1.2	1.5	1.4	---	---
7	1.6	1.3	1.7	1.4	1.8	1.6	1.9	1.4	1.8	1.2	---	---
8	1.6	1.5	1.7	.96	2.0	1.6	1.4	1.4	1.9	1.3	---	---
9	1.6	1.7	1.6	.77	2.0	1.3	.84	1.4	1.4	1.1	---	---
10	1.5	1.7	2.0	1.3	1.8	1.4	1.6	1.1	1.2	1.3	---	---
11	1.5	1.6	1.4	1.8	1.8	1.4	2.6	1.4	1.1	1.5	---	---
12	1.6	1.5	1.1	1.7	1.8	1.2	2.1	1.4	.98	---	---	---
13	1.6	1.5	1.7	1.4	1.7	1.4	1.3	1.3	1.2	---	---	---
14	1.6	1.3	2.5	1.9	1.7	1.6	1.6	1.2	1.4	---	---	---
15	1.6	1.4	2.6	1.9	1.8	1.6	1.5	1.5	1.4	---	---	---
16	1.5	1.6	2.4	1.6	1.7	1.5	1.1	1.7	1.2	---	---	---
17	1.3	1.6	2.2	1.2	1.9	1.3	1.4	1.4	1.2	---	---	---
18	1.5	1.5	1.8	1.9	1.9	1.1	1.7	1.5	1.1	---	---	---
19	1.7	1.6	1.3	2.7	1.5	.56	1.3	1.8	1.3	---	---	---
20	1.6	1.5	1.5	1.3	1.1	.72	1.5	1.6	1.4	---	---	---
21	1.5	1.4	1.7	1.1	.93	1.1	1.7	1.4	1.5	---	---	---
22	1.6	1.5	1.4	.91	1.3	1.1	1.3	1.5	1.6	---	---	---
23	1.5	1.6	1.6	.90	1.8	1.4	1.1	1.6	1.6	---	---	---
24	1.2	1.6	1.3	1.7	1.8	1.7	1.4	1.6	1.5	---	---	---
25	1.3	1.4	1.0	2.0	1.8	1.5	1.9	1.6	1.3	---	---	---
26	1.7	1.4	.88	1.7	1.8	1.2	2.0	1.6	1.4	---	---	---
27	1.7	1.3	1.4	.98	1.6	1.0	1.5	1.4	1.5	---	---	---
28	1.7	.94	1.7	1.2	1.7	1.2	1.7	1.3	1.5	---	---	---
29	1.9	1.3	1.1	1.7	1.8	e1.5	1.8	1.1	1.5	---	---	---
30	1.8	1.5	1.2	1.3	---	1.8	1.5	1.3	1.3	---	---	---
31	1.6	---	1.7	1.2	---	1.2	---	1.6	---	---	---	---
TOTAL	48.1	45.04	49.88	45.42	49.73	42.88	44.82	46.2	41.88	---	---	---
MEAN	1.55	1.50	1.61	1.47	1.71	1.38	1.49	1.49	1.40	---	---	---
MAX	1.9	1.7	2.6	2.7	2.0	1.8	2.6	1.9	1.9	---	---	---
MIN	1.2	.94	.88	.77	.93	.56	.84	1.1	.98	---	---	---
AC-FT	95	89	99	90	99	85	89	92	83	---	---	---

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 2000, BY WATER YEAR (WY)

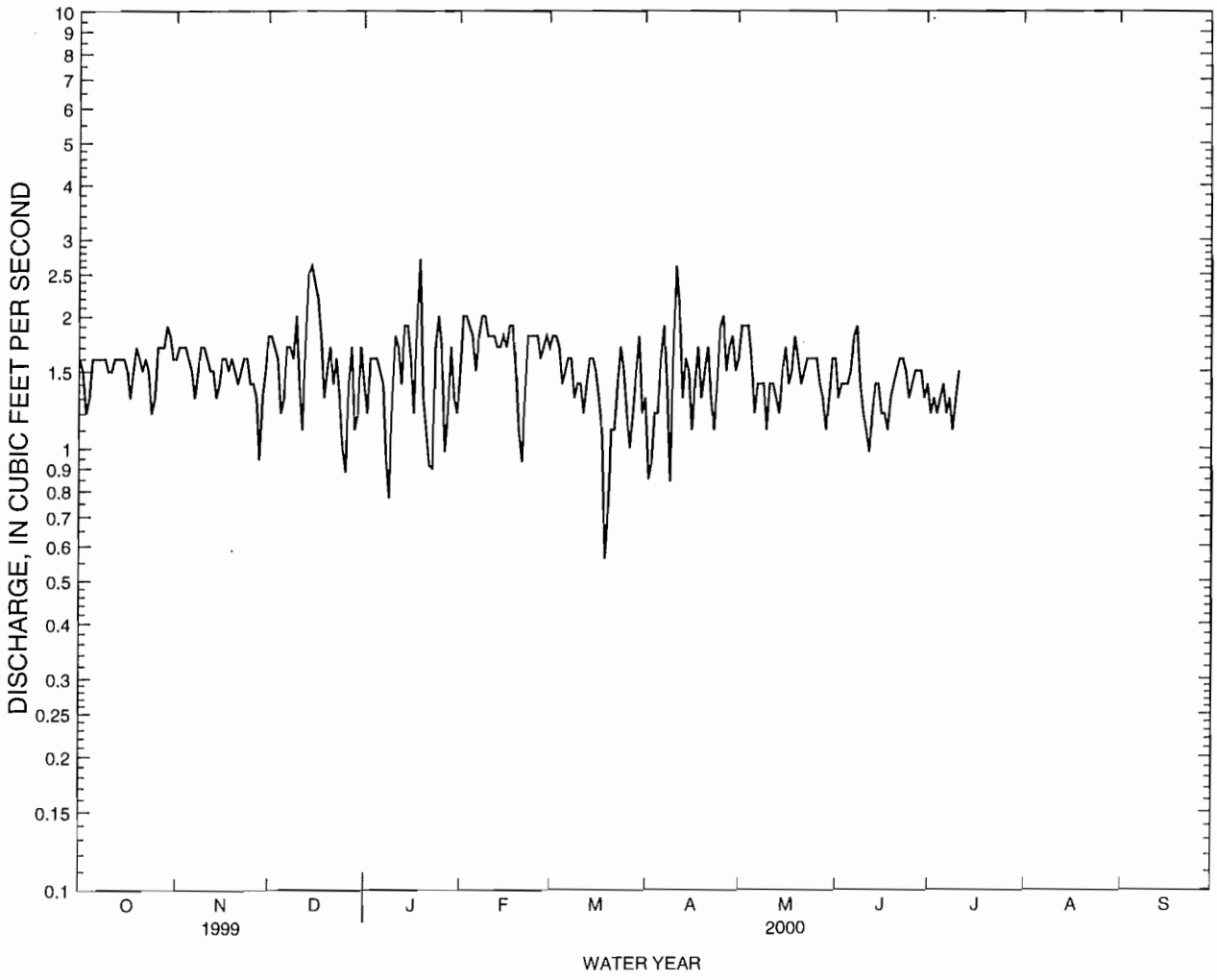
MEAN	1.75	1.78	1.44	1.28	1.47	1.50	1.56	1.80	1.80	1.72	1.80	1.87
MAX	2.69	2.99	2.57	2.22	2.46	2.23	2.26	2.38	2.39	2.80	2.75	3.22
(WY)	1992	1992	1992	1992	1991	1992	1991	1994	1991	1992	1992	1992
MIN	1.00	1.06	.72	.58	.66	.63	.96	1.39	1.36	1.03	1.09	.91
(WY)	1997	1998	1997	1996	1996	1996	1999	1998	1997	1997	1997	1996

e Estimated

HAWAII, ISLAND OF OAHU

16249900 MAUNAWILI DITCH ABOVE ANIANINUI TUNNEL NR KAILUA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		WATER YEARS 1991 - 2000	
ANNUAL TOTAL	463.24			
ANNUAL MEAN	1.27		1.60	
HIGHEST ANNUAL MEAN			2.48	1992
LOWEST ANNUAL MEAN			1.07	1997
HIGHEST DAILY MEAN	2.6	Jan 6	5.5	Mar 24 1994
LOWEST DAILY MEAN	.25	Jan 18	.00	Mar 22 1991
ANNUAL SEVEN-DAY MINIMUM	.31	Jan 13	.13	Jan 26 1996
ANNUAL RUNOFF (AC-FT)	919		1160	
10 PERCENT EXCEEDS	1.7		2.6	
50 PERCENT EXCEEDS	1.4		1.6	
90 PERCENT EXCEEDS	.65		.80	



HAWAII, ISLAND OF OAHU

16250000 MAUNAWILI DITCH NEAR WAIMANALO

LOCATION.--Lat 21°20'45", long 157°45'10", Hydrologic Unit 20060000, on left bank 80 ft downstream from Aniani Nui Ridge tunnel, and 3.5 mi west of Waimanalo Post Office.

PERIOD OF RECORD.--March 1954 to September 1968, October 1993 to current year.

GAGE.--Water-stage recorder with concrete Columbus type control. Altitude of gage is 390 ft above mean sea level (from topographic map). Prior to July 12, 1993, water stage recorder at same site with different datum.

REMARKS.--Records computed by C.W. Yeung. Records good except for period of estimated record which is poor. Ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--21 years (water years 1955-68, 1994-2000), 2.15 ft^3/s (1,560 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 11 ft^3/s, March 5, 1958; minimum, no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2.7 ft^3/s, January 19; minimum daily 0.52 ft^3/s, March 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.7	1.6	1.3	1.6	1.6	1.2	1.4	1.6	1.2	1.1	e1.7
2	1.4	1.6	1.7	1.1	2.0	1.8	.79	1.7	1.6	.91	1.3	e1.2
3	1.1	1.6	1.5	1.6	2.2	1.8	.79	1.8	1.5	1.0	1.3	e.95
4	1.3	1.5	1.4	1.6	2.1	1.7	.93	1.9	1.3	.97	1.3	e.80
5	1.6	1.5	1.1	1.6	1.8	1.4	.99	2.1	1.3	1.2	1.3	e1.4
6	1.6	1.3	1.1	1.5	1.4	1.5	1.4	1.5	1.4	1.3	1.1	e2.1
7	1.6	1.2	1.5	1.3	1.8	1.6	1.8	1.2	1.6	1.1	1.0	e1.5
8	1.5	1.3	1.5	.83	2.0	1.6	1.3	1.3	1.5	1.2	1.2	e1.5
9	1.5	1.5	1.5	.63	2.2	1.3	.71	1.6	1.6	.86	1.3	e1.3
10	1.4	1.5	1.9	1.2	2.0	1.4	1.5	1.6	1.3	1.1	1.3	e.90
11	1.4	1.4	1.2	1.7	1.9	1.4	2.5	1.6	.91	1.4	1.5	e1.2
12	1.5	1.4	.90	1.6	1.9	1.2	2.2	1.6	.74	1.2	1.4	e1.5
13	1.5	1.4	1.5	1.2	1.6	1.5	1.4	1.3	1.0	1.3	1.4	e1.5
14	1.5	1.2	2.5	1.7	1.7	1.7	1.6	.99	1.1	1.4	1.3	e2.0
15	1.5	1.3	2.6	1.8	1.9	1.6	1.5	1.3	1.2	1.3	1.4	e1.6
16	1.4	1.4	2.3	1.4	1.7	1.5	1.0	1.4	1.3	.98	1.4	e1.6
17	1.2	1.4	2.1	1.0	1.9	1.3	1.3	1.2	1.0	1.2	1.5	e1.0
18	1.4	1.5	1.7	1.8	1.9	1.0	1.6	1.2	.91	1.5	1.3	e1.2
19	1.6	1.5	1.2	2.7	1.4	.52	1.2	1.6	1.1	1.4	1.0	e1.5
20	1.4	1.4	1.4	1.2	1.0	.69	1.3	1.4	1.2	1.4	.78	e1.5
21	1.3	1.2	1.6	.99	.83	1.0	1.6	1.2	1.2	1.4	1.2	e1.3
22	1.5	1.3	1.3	.81	1.3	1.1	1.1	1.3	1.4	1.2	1.7	e1.5
23	1.4	1.4	1.4	.78	1.8	1.4	.85	1.6	1.4	.93	1.7	e1.5
24	1.1	1.4	1.1	1.7	1.9	1.7	1.2	1.6	1.3	1.1	1.5	e1.0
25	1.3	1.2	.88	2.2	1.9	1.5	1.7	1.5	.97	1.3	1.7	e1.1
26	1.6	1.3	.74	1.7	1.8	1.2	1.7	1.4	1.1	1.1	1.5	e1.3
27	1.6	1.2	1.4	.88	1.5	.99	1.4	1.3	1.3	1.2	.86	e2.1
28	1.5	.79	1.6	1.4	1.6	1.2	1.4	1.1	1.3	1.3	1.4	e2.0
29	1.5	1.1	1.6	1.7	1.8	1.4	1.6	.94	1.3	1.1	1.5	e1.8
30	1.4	1.3	1.7	1.3	---	1.7	1.2	1.1	1.2	.96	1.5	e2.2
31	1.2	---	1.7	1.2	---	1.8	---	1.6	---	.87	1.7	---
TOTAL	44.3	40.79	47.22	43.42	50.43	43.10	40.76	44.33	37.63	36.38	41.44	43.75
MEAN	1.43	1.36	1.52	1.40	1.74	1.39	1.36	1.43	1.25	1.17	1.34	1.46
MAX	1.6	1.7	2.6	2.7	2.2	1.8	2.5	2.1	1.6	1.5	1.7	2.2
MIN	1.1	.79	.74	.63	.83	.52	.71	.94	.74	.86	.78	.80
AC-FT	88	81	94	86	100	85	81	88	75	72	82	87

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 2000, BY WATER YEAR (WY)

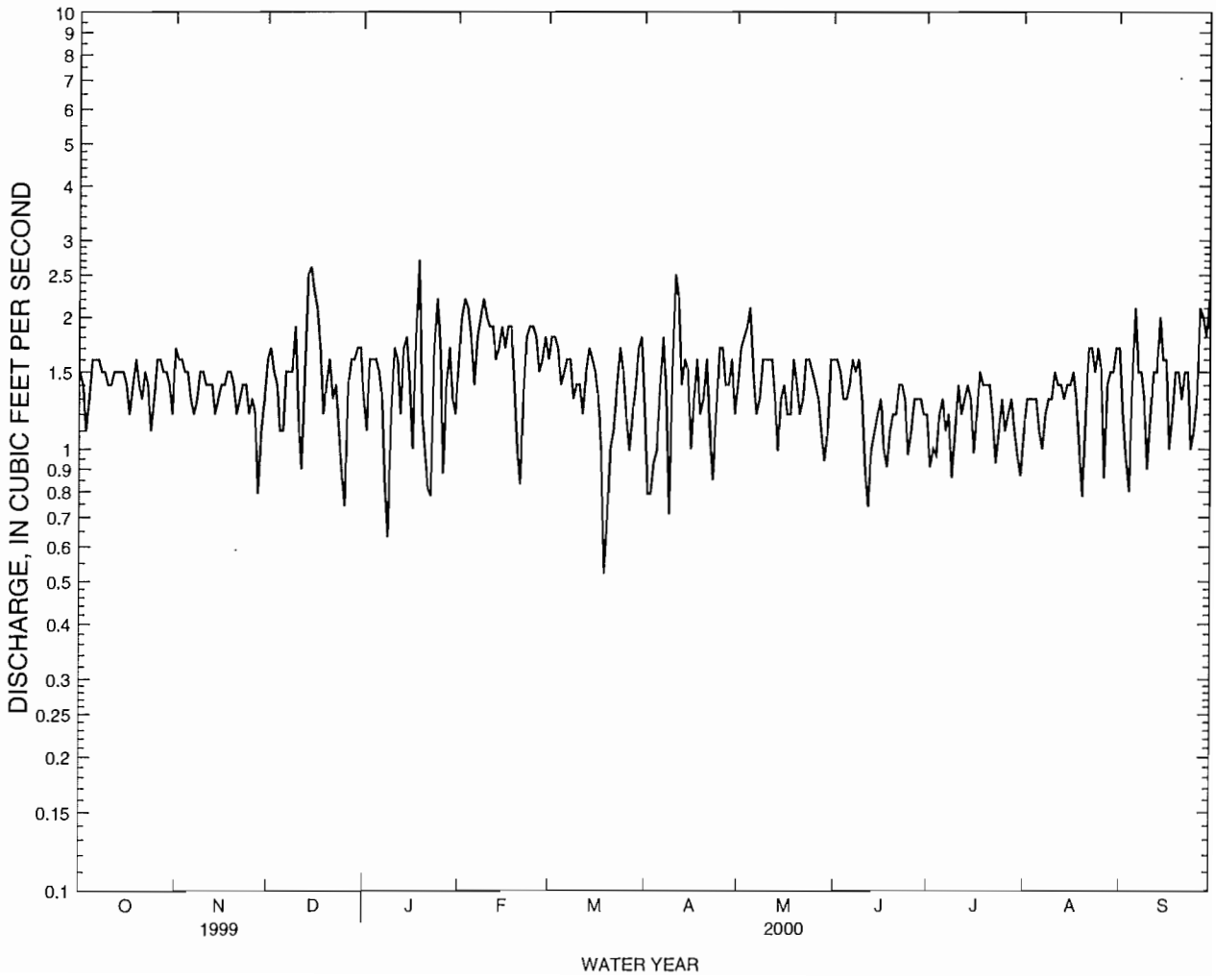
MEAN	2.52	2.21	1.53	1.49	1.37	1.64	2.21	2.75	2.78	2.59	2.57	2.55
MAX	4.36	3.87	3.24	3.22	2.67	3.89	4.07	4.90	4.52	4.02	4.74	4.61
(WY)	1955	1955	1961	1955	1957	1956	1966	1955	1955	1955	1954	1954
MIN	1.00	.85	.026	.000	.000	.097	.39	1.19	1.14	.92	1.22	.61
(WY)	1998	1998	1968	1968	1968	1968	1963	1965	1997	1997	1997	1968

e Estimated

HAWAII, ISLAND OF OAHU

16250000 MAUNAWILI DITCH NEAR WAIMANALO--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1954 - 2000	
ANNUAL TOTAL	455.92		513.55			
ANNUAL MEAN	1.25		1.40		2.15	
HIGHEST ANNUAL MEAN					3.43	1955
LOWEST ANNUAL MEAN					1.06	1997
HIGHEST DAILY MEAN	2.6	Dec 15	2.7	Jan 19	11	Mar 5 1958
LOWEST DAILY MEAN	.01	Jan 14	.52	Mar 19	.00	Dec 27 1955
ANNUAL SEVEN-DAY MINIMUM	.06	Jan 13	1.0	Mar 17	.00	Dec 27 1955
ANNUAL RUNOFF (AC-FT)	904		1020		1560	
10 PERCENT EXCEEDS	1.7		1.8		3.9	
50 PERCENT EXCEEDS	1.4		1.4		2.1	
90 PERCENT EXCEEDS	.55		.99		.61	



HAWAII, ISLAND OF OAHU

16254000 MAKAWAO STREAM NEAR KAILUA

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

DRAINAGE AREA.--2.04 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 80 ft above mean sea level (from topographic map). Prior to January 1, 1958, nonrecording gage at sites about 200 ft upstream at different datums.

REMARKS.--Records computed by C.W. Yeung. Records good. Maunawili ditch diverts water 1.5 mi upstream of station for irrigation in vicinity of Waimanalo. Records do not include flow of Maunawili ditch (stations 16249500, 16249900, and 16250000).

AVERAGE DISCHARGE.--44 years (water years 1914-15, 1959-2000), 4.98 ft^3/s (3,610 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 19	2345	*170	*3.76				

Minimum discharge, 0.89 ft^3/s, August 11, 12, 14-17; minimum daily discharge, 0.95 ft^3/s, August 11, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	1.4	1.6	2.2	4.1	1.7	10	2.3	1.3	1.5	1.7	1.2
2	1.1	1.0	1.3	2.3	2.5	1.5	16	2.0	1.4	1.7	1.3	1.3
3	1.3	1.1	1.0	2.1	2.2	1.4	8.4	1.9	1.3	1.7	1.2	1.8
4	1.4	1.2	1.0	1.8	2.2	1.5	5.7	1.8	1.5	1.8	1.2	2.1
5	1.1	1.2	2.1	2.0	2.3	1.8	4.5	1.8	1.6	1.5	1.2	3.1
6	1.1	1.2	1.7	1.9	2.6	1.7	3.6	2.0	1.5	1.4	1.3	2.1
7	1.1	1.7	1.2	1.6	2.2	1.5	3.2	2.3	1.6	1.6	1.7	1.9
8	1.0	1.5	1.2	2.3	2.0	1.3	4.1	2.1	1.6	1.2	1.2	1.6
9	1.0	1.2	1.3	2.5	1.8	1.6	4.7	1.7	1.4	1.6	1.1	1.5
10	1.1	1.1	8.8	2.3	1.9	1.7	4.2	1.8	1.5	1.5	1.0	2.0
11	1.1	1.1	5.0	1.6	2.1	1.5	2.7	1.8	1.9	2.0	.95	1.8
12	1.1	1.2	3.2	1.5	1.9	1.8	2.6	1.8	2.0	1.4	.98	1.3
13	1.1	1.2	2.4	2.4	2.0	1.6	3.1	2.1	1.9	1.3	1.2	1.1
14	1.1	1.4	2.9	4.3	1.9	1.4	3.1	2.3	1.7	1.3	1.2	2.3
15	1.1	1.4	2.7	2.9	1.7	1.4	2.8	2.1	1.7	1.3	.95	1.6
16	1.2	1.2	1.8	4.4	1.9	1.4	3.6	1.7	1.5	1.8	.96	1.5
17	1.3	1.1	1.8	3.4	1.7	1.7	3.3	1.9	2.0	1.6	1.2	1.9
18	1.3	1.2	2.2	3.3	1.7	1.9	2.5	1.9	2.0	1.1	1.1	1.8
19	1.5	1.3	2.4	19	2.5	2.4	2.9	1.6	1.7	1.1	1.3	1.3
20	1.4	1.3	2.3	22	2.5	2.4	2.8	1.6	1.5	1.4	9.0	1.4
21	1.6	1.3	2.0	7.8	2.7	1.9	2.4	1.9	1.7	1.3	3.1	1.5
22	1.3	1.4	3.6	6.5	2.4	1.9	2.8	1.9	1.3	1.2	1.7	1.1
23	1.2	1.2	6.9	5.3	1.7	2.0	2.9	1.5	1.4	1.6	1.4	1.1
24	1.9	1.2	3.5	4.1	1.5	1.4	2.8	1.4	1.4	1.5	1.5	1.3
25	2.3	1.2	2.9	3.0	1.5	1.5	2.2	1.4	1.7	1.3	1.3	1.3
26	1.3	1.3	5.6	3.9	1.5	2.1	2.1	1.6	1.6	1.2	1.2	1.2
27	1.3	1.3	3.6	4.0	1.8	2.1	2.4	1.6	1.3	1.9	2.6	3.5
28	1.2	1.5	2.3	3.5	1.8	1.9	2.3	1.8	1.3	1.2	4.1	5.3
29	1.2	1.3	2.1	2.9	1.5	2.0	2.0	2.0	1.3	1.3	2.3	3.5
30	1.1	1.0	2.6	3.2	---	1.5	2.3	1.8	1.5	1.4	1.8	2.1
31	1.6	---	2.0	3.2	---	9.9	---	1.5	---	2.0	1.5	---
TOTAL	39.4	37.7	85.0	133.2	60.1	61.4	118.0	56.9	47.1	45.7	54.24	56.5
MEAN	1.27	1.26	2.74	4.30	2.07	1.98	3.93	1.84	1.57	1.47	1.75	1.88
MAX	2.3	1.7	8.8	22	4.1	9.9	16	2.3	2.0	2.0	9.0	5.3
MIN	1.0	1.0	1.0	1.5	1.5	1.3	2.0	1.4	1.3	1.1	.95	1.1
AC-FT	78	75	169	264	119	122	234	113	93	91	108	112

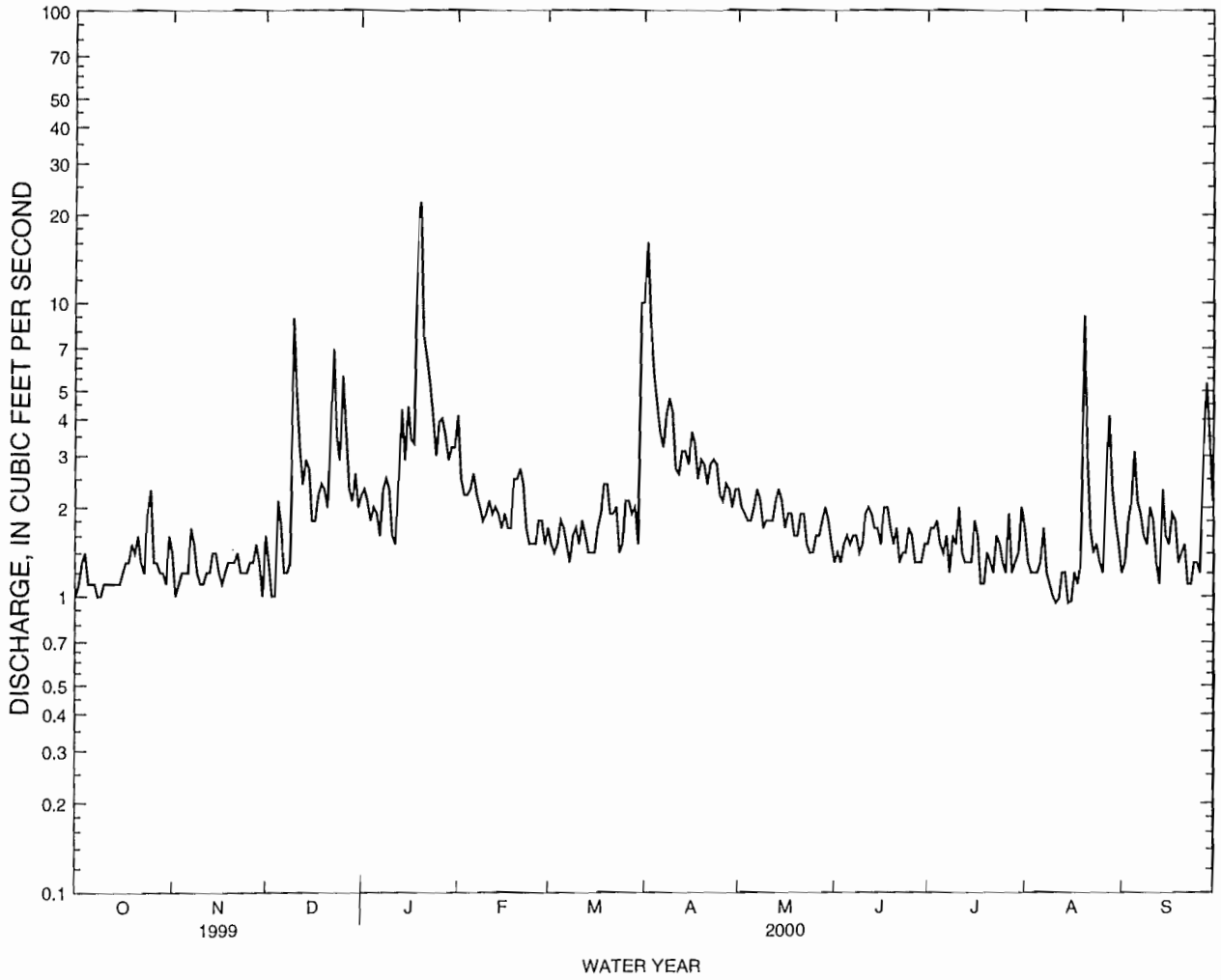
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2000, BY WATER YEAR (WY)

MEAN	2.96	5.52	6.83	8.28	6.84	7.43	6.50	5.23	3.28	2.69	2.54	2.46
MAX	8.43	38.2	34.8	39.2	27.2	24.3	31.4	17.2	11.3	6.66	8.52	15.1
(WY)	1966	1966	1988	1916	1979	1958	1963	1981	1982	1982	1982	1914
MIN	1.06	.99	1.22	1.24	1.11	1.25	1.55	1.40	1.15	1.25	1.18	1.00
(WY)	1976	1963	1978	1973	1978	1978	1973	1973	1973	1959	1984	1975

HAWAII, ISLAND OF OAHU

16254000 MAKAWAO STREAM NEAR KAILUA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1913 - 2000	
ANNUAL TOTAL	807.53		795.24			
ANNUAL MEAN	2.21		2.17		4.98	
HIGHEST ANNUAL MEAN					11.1	1982
LOWEST ANNUAL MEAN					1.31	1973
HIGHEST DAILY MEAN	28	Jan 7	22	Jan 20	518	Dec 31 1987
LOWEST DAILY MEAN	.93	Sep 15	.95	Aug 11	.50	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	1.1	Oct 5	1.0	Aug 10	.67	Sep 8 1964
ANNUAL RUNOFF (AC-FT)	1600		1580		3610	
10 PERCENT EXCEEDS	3.2		3.3		8.6	
50 PERCENT EXCEEDS	1.9		1.7		2.8	
90 PERCENT EXCEEDS	1.2		1.2		1.4	



HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

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

DRAINAGE AREA.--3.81 mi^2.

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

REVISED RECORDS.--WDR HI-92-1: 1991(M).

GAGE.--Water-stage recorder and concrete control. Datum of gage is 116.39 ft above mean sea level (levels by Corps of Engineers).

REMARKS.--Records computed by S.T.M. Young. Records good. Flow regulated by a flood-control dam upstream.

AVERAGE DISCHARGE.--23 years (water years 1977–2000), 10.5 ft^3/s (7,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,760 ft^3/s, January 25, 1996, gage height, 5.72 ft, from rating curve extended above 200 ft^3/s; minimum, 0.22 ft^3/s , September 25-26, 2000.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 19	2045	*281	*3.17				

Minimum daily discharge, 0.89 ft^3/s, November 17. Minimum discharge, 0.22 ft^3/s, September 25-26, result of maintenance work on dam upstream.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	3.3	8.7	4.8	6.2	4.9	11	4.3	3.2	5.4	3.3	2.7
2	2.5	5.3	6.0	4.6	5.8	4.7	11	4.1	3.0	3.6	3.1	2.5
3	2.5	3.1	4.1	4.5	5.7	5.0	10	4.1	2.8	3.8	2.9	2.7
4	2.6	7.1	3.5	4.5	5.6	5.1	6.7	3.9	2.7	3.3	2.9	2.6
5	2.9	2.5	3.8	4.3	5.3	4.9	6.1	3.9	2.8	3.0	3.2	4.1
6	3.4	1.8	3.3	4.7	5.3	4.4	6.3	3.7	2.6	3.3	3.0	4.1
7	2.9	3.0	3.2	4.4	5.3	4.6	5.5	3.7	3.7	3.0	2.8	3.9
8	2.8	3.1	3.0	4.5	5.5	4.6	8.5	3.6	3.5	2.9	2.7	4.0
9	2.7	3.3	3.4	4.5	5.4	4.7	7.1	3.6	2.9	2.8	2.5	3.3
10	2.7	3.2	20	4.4	5.3	4.3	6.8	3.4	2.8	2.8	2.7	3.0
11	2.6	2.9	20	4.7	5.3	4.1	6.1	3.4	2.7	6.0	2.6	3.1
12	2.9	3.1	8.7	4.6	5.0	4.2	5.8	4.1	2.5	3.6	2.7	3.3
13	3.2	3.0	6.7	5.0	5.0	4.2	5.5	4.1	2.6	3.1	2.8	3.0
14	2.7	3.1	15	9.7	5.0	5.7	5.2	3.7	2.3	3.3	2.7	6.4
15	2.8	2.8	13	7.3	5.0	4.1	4.8	3.4	2.3	3.7	2.4	4.1
16	2.9	5.9	6.2	6.4	5.0	3.9	5.4	3.4	2.3	3.7	2.1	3.3
17	2.7	.89	6.2	5.3	5.0	3.9	5.5	3.4	2.5	3.4	4.0	3.2
18	2.5	3.0	6.3	5.5	5.0	3.8	6.1	3.3	2.4	3.2	3.1	3.1
19	7.5	3.4	5.1	46	5.4	3.7	5.6	3.3	2.3	3.0	2.4	3.0
20	4.7	3.4	4.7	65	5.0	4.0	4.6	3.0	2.3	4.1	37	3.8
21	3.3	3.7	4.5	15	5.1	4.4	5.0	3.3	2.4	3.7	10	3.1
22	3.0	3.1	5.9	9.0	5.1	4.0	4.7	3.4	2.3	3.5	4.0	2.9
23	2.9	3.0	7.8	7.4	5.0	4.5	4.6	3.2	2.5	4.9	3.3	2.8
24	3.7	3.0	5.5	6.8	4.9	4.1	4.9	3.0	2.4	3.5	3.1	2.9
25	4.3	2.9	5.1	6.7	4.8	4.1	5.1	2.9	2.5	3.3	2.9	4.2
26	3.1	2.9	10	7.3	5.0	5.2	5.2	2.8	2.3	3.3	2.7	1.9
27	2.9	3.7	6.8	6.5	5.0	5.6	4.9	2.8	2.4	3.5	3.3	6.6
28	2.7	3.4	5.3	6.1	4.8	4.7	4.3	3.0	2.9	3.4	4.0	9.6
29	2.8	3.0	5.0	5.7	4.8	4.8	4.1	2.9	2.7	3.2	4.0	5.0
30	2.8	2.8	5.2	5.9	---	4.6	4.2	2.8	2.9	2.9	2.9	4.2
31	4.1	---	4.8	6.0	---	20	---	3.2	---	3.1	2.8	---
TOTAL	97.5	98.69	216.8	287.1	150.6	154.8	180.6	106.7	79.5	109.3	133.9	112.4
MEAN	3.15	3.29	6.99	9.26	5.19	4.99	6.02	3.44	2.65	3.53	4.32	3.75
MAX	7.5	7.1	20	65	6.2	20	11	4.3	3.7	6.0	37	9.6
MIN	2.4	.89	3.0	4.3	4.8	3.7	4.1	2.8	2.3	2.8	2.1	1.9
AC-FT	193	196	430	569	299	307	358	212	158	217	266	223

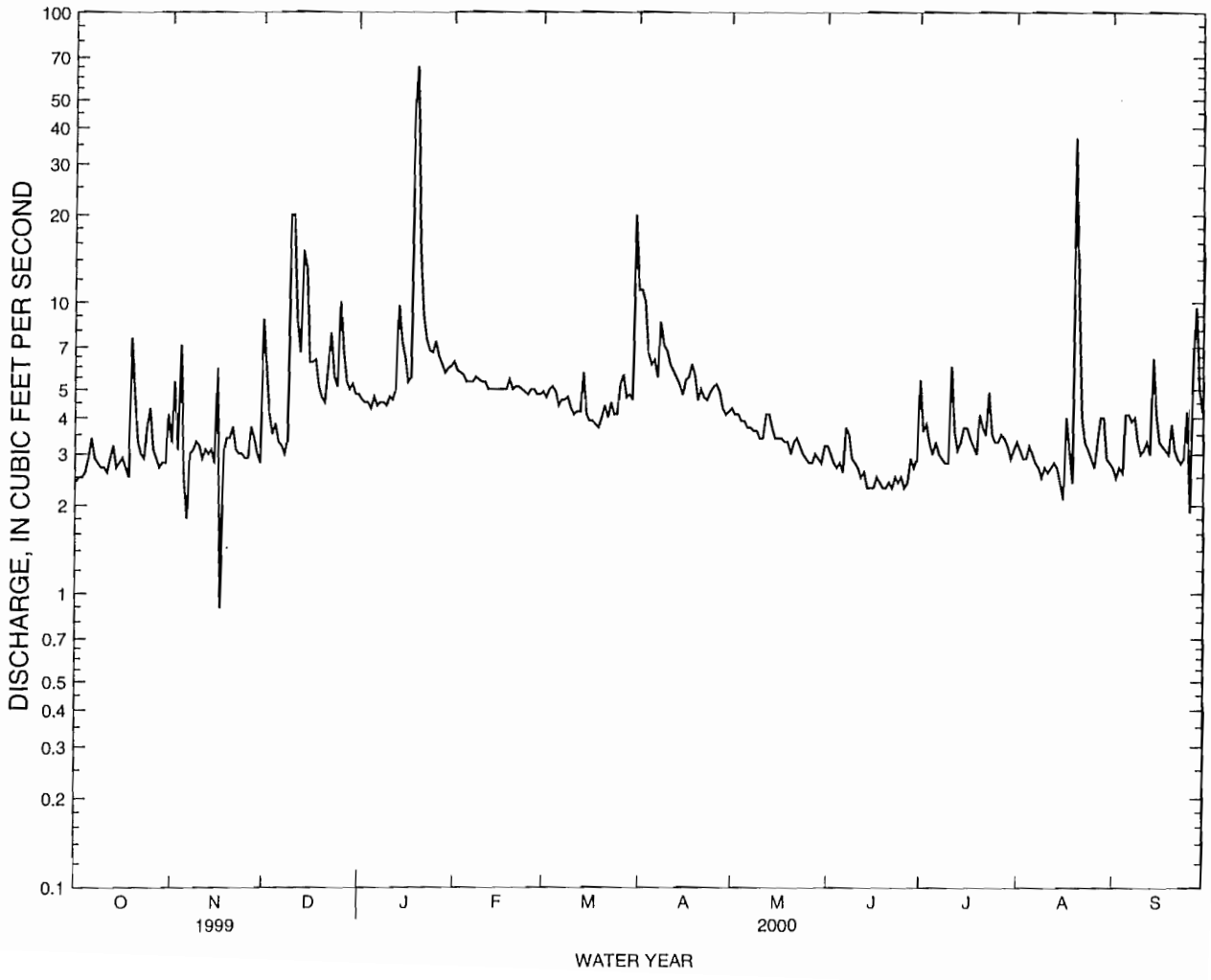
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 2000, BY WATER YEAR (WY)

MEAN	7.87	10.9	12.1	15.0	12.0	13.1	12.1	10.3	8.61	7.72	7.22	7.13
MAX	16.8	29.6	37.2	53.4	35.9	34.3	49.1	23.0	25.7	19.9	24.0	16.9
(WY)	1983	1987	1988	1988	1979	1982	1989	1981	1982	1982	1982	1982
MIN	2.91	3.29	4.56	4.05	3.83	4.03	5.32	3.44	2.65	3.19	2.91	2.89
(WY)	1985	2000	1978	1977	1978	1978	1985	2000	2000	1984	1984	1999

HAWAII, ISLAND OF OAHU

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1977 - 2000	
ANNUAL TOTAL	1740.69		1727.89			
ANNUAL MEAN	4.77		4.72		10.5	
HIGHEST ANNUAL MEAN					22.0	1982
LOWEST ANNUAL MEAN					4.36	1984
HIGHEST DAILY MEAN	39	Jan 7	65	Jan 20	723	Jan 1 1988
LOWEST DAILY MEAN	.89	Nov 17	.89	Nov 17	.29	Oct 10 1984
ANNUAL SEVEN-DAY MINIMUM	2.6	Sep 28	2.3	Jun 14	.30	Oct 10 1984
ANNUAL RUNOFF (AC-FT)	3450		3430		7600	
10 PERCENT EXCEEDS	6.4		6.4		16	
50 PERCENT EXCEEDS	4.1		3.8		7.2	
90 PERCENT EXCEEDS	2.8		2.7		4.1	



HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA

LOCATION.--Lat 21°24′45″, long 157°49′35″, Hydrologic Unit 20060000, on left bank, 1.7 mi west of Kaneohe Post Office, and 1.8 mi southwest of Heeia.

DRAINAGE AREA.--0.97 mi^2.

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

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

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

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

AVERAGE DISCHARGE (since diversion from tunnel began).--52 years (water years 1944-77, 1983-2000), 2.20 ft^3/s, (1,600 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 10	2030	*306	*2.97				

Minimum discharge, 1.2 ft^3/s, for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	1.3	1.6	1.5	1.5	1.4	4.0	1.5	1.5	1.3	1.3	1.3
2	1.2	1.3	2.8	1.5	1.5	1.4	2.9	1.4	1.4	1.3	1.3	1.2
3	1.2	1.3	1.7	1.4	1.5	1.4	3.0	1.4	1.4	1.3	1.3	1.2
4	1.2	2.5	1.5	1.4	1.5	1.4	2.1	1.4	1.4	1.3	1.2	1.2
5	1.3	1.7	1.5	1.4	1.5	1.4	1.8	1.3	1.4	1.3	1.3	1.3
6	1.2	1.5	1.5	1.5	1.4	1.3	1.7	1.4	1.4	1.3	1.2	1.4
7	1.3	1.4	1.5	1.4	1.4	1.3	1.6	1.4	1.5	1.3	1.2	1.4
8	1.2	1.4	1.4	1.4	1.4	1.3	1.8	1.4	1.5	1.4	1.2	1.4
9	1.2	1.4	1.4	1.4	1.4	1.3	2.8	1.4	1.4	1.4	1.2	1.4
10	1.2	1.4	11	1.5	1.4	1.3	2.4	1.4	1.4	1.4	1.2	1.3
11	1.2	1.4	7.5	1.4	1.4	1.3	1.9	1.4	1.4	1.5	1.2	1.3
12	1.2	1.3	3.9	1.5	1.4	1.3	1.8	1.4	1.5	1.4	1.2	1.3
13	1.3	1.3	3.1	1.5	1.4	1.3	1.7	1.4	1.4	1.3	1.2	1.3
14	1.2	1.3	5.6	1.8	1.4	1.3	1.6	1.4	1.4	1.2	1.2	1.3
15	1.3	1.3	3.1	2.2	1.4	1.4	1.6	1.4	1.4	1.3	1.2	1.3
16	1.3	1.3	2.1	2.1	1.4	1.4	1.6	1.4	1.4	1.3	1.2	1.3
17	1.2	1.3	1.8	1.8	1.4	1.4	1.6	1.4	1.4	1.5	1.5	1.3
18	1.2	1.4	2.8	1.8	1.4	1.4	1.6	1.4	1.4	2.2	1.5	1.3
19	2.4	1.4	1.9	14	1.4	1.5	1.6	1.4	1.4	1.5	1.5	1.3
20	1.6	1.4	1.7	13	1.4	1.6	1.6	1.4	1.3	1.4	10	1.3
21	1.5	1.3	1.6	3.4	1.4	1.6	1.6	1.4	1.3	1.4	3.2	1.3
22	1.4	1.3	1.8	2.3	1.4	1.5	1.6	1.5	1.3	1.4	1.7	1.2
23	1.4	1.3	2.3	1.9	1.4	1.9	1.6	1.5	1.3	1.3	1.4	1.2
24	1.7	1.3	1.9	1.8	1.4	1.5	1.6	1.5	1.3	1.3	1.3	1.2
25	2.3	1.3	1.7	1.7	1.4	1.4	1.6	1.5	1.4	1.3	1.3	1.2
26	1.6	1.3	2.3	1.9	1.4	1.4	1.6	1.5	1.3	1.3	1.2	1.2
27	1.4	1.3	1.8	1.6	1.4	1.5	1.6	1.4	1.3	1.3	1.3	1.9
28	1.4	1.3	1.6	1.6	1.4	1.4	1.6	1.4	1.3	1.3	1.3	4.7
29	1.3	1.3	1.6	1.6	1.4	1.4	1.5	1.4	1.2	1.3	1.5	2.6
30	1.3	1.3	1.6	1.6	---	1.4	1.5	1.4	1.3	1.3	1.4	1.8
31	1.3	---	1.5	1.5	---	3.3	---	1.5	---	1.3	1.4	---
TOTAL	42.7	41.6	79.1	76.4	41.1	45.7	56.5	44.0	41.3	42.4	51.1	44.4
MEAN	1.38	1.39	2.55	2.46	1.42	1.47	1.88	1.42	1.38	1.37	1.65	1.48
MAX	2.4	2.5	11	14	1.5	3.3	4.0	1.5	1.5	2.2	10	4.7
MIN	1.2	1.3	1.4	1.4	1.4	1.3	1.5	1.3	1.2	1.2	1.2	1.2
AC-FT	85	83	157	152	82	91	112	87	82	84	101	88

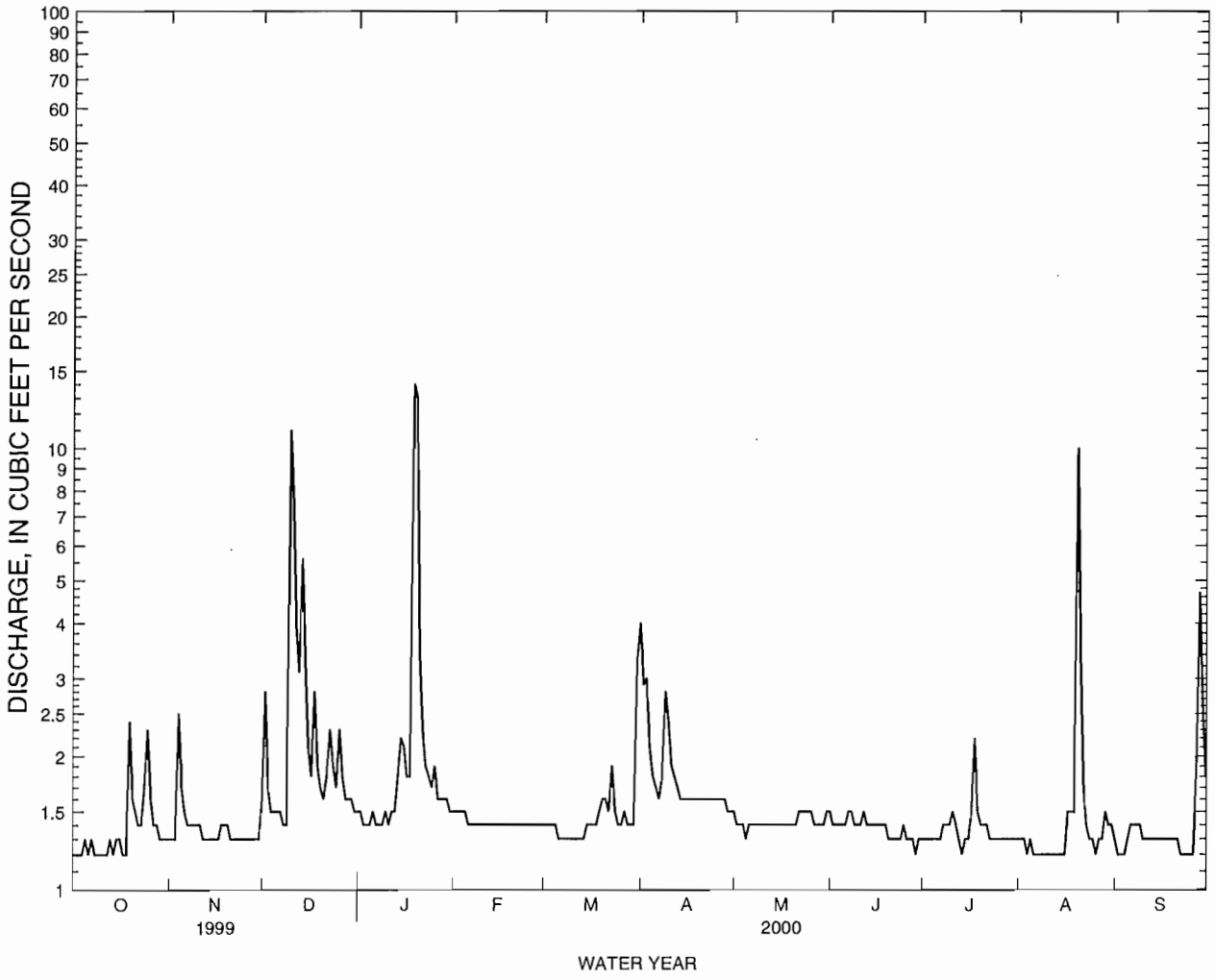
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 2000, BY WATER YEAR (WY)

MEAN	1.91	2.75	2.67	2.65	2.47	3.21	2.51	2.31	1.40	1.56	1.58	1.45
MAX	11.6	15.7	9.72	9.68	10.7	16.5	13.0	27.3	2.34	3.25	4.24	3.62
(WY)	1959	1966	1988	1949	1955	1958	1989	1965	1989	1989	1967	1992
MIN	.32	.33	.64	.94	.86	.60	.50	.51	.38	.41	.56	.36
(WY)	1946	1946	1960	1977	1963	1946	1946	1961	1946	1945	1961	1945

HAWAII, ISLAND OF OAHU

16275000 HAIKU STREAM NEAR HEEIA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1944 - 2000	
ANNUAL TOTAL	586.6		606.3			
ANNUAL MEAN	1.61		1.66		2.20	
HIGHEST ANNUAL MEAN					4.82	1965
LOWEST ANNUAL MEAN					.67	1946
HIGHEST DAILY MEAN	11	Jan 7	14	Jan 19	620	May 2 1965
LOWEST DAILY MEAN	1.2	Aug 1	1.2	Oct 1	.29	Jul 13 1945
ANNUAL SEVEN-DAY MINIMUM	1.2	Aug 1	1.2	Aug 6	.29	Oct 19 1945
ANNUAL RUNOFF (AC-FT)	1160		1200		1600	
10 PERCENT EXCEEDS	1.8		1.9		2.6	
50 PERCENT EXCEEDS	1.5		1.4		1.5	
90 PERCENT EXCEEDS	1.2		1.3		.93	



HAWAII, ISLAND OF OAHU

16283200 KAHALUU STREAM NEAR AHUIMANU

LOCATION.--Lat 21°26'32", long 157°50'47", Hydrologic Unit 20060000, on left bank, 1.1 mi west of Valley of the Temples Memorial Park, 1.3 mi south of Kahaluu School, and 2.7 mi northwest of Heeia Elementary School.

DRAINAGE AREA.--0.84 mi^2, revised, exclusion of drainage area from right bank tributary downstream of gage.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good except for discharges greater than 30 ft^3/s which are poor. Honolulu Board of Water Supply has diverted ground water from tunnel in drainage area since 1947. At times, farmers upstream of gage pump and/or divert small amounts of water from the stream.

AVERAGE DISCHARGE.--17 years (water years 1984-2000), 3.23 ft^3/s (2,340 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 728 ft^3/s, September 18, 1994, gage height, 6.05 ft; minimum, 0.58 ft^3/s on several days in September, October, November 1984.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0230	*146	*3.31				

Minimum discharge, 0.59 ft^3/s, July 13-14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.1	3.0	1.2	1.4	.97	1.7	.94	.87	.84	.64	.73
2	1.7	1.1	10	1.2	1.4	.97	3.4	.95	.87	.74	.69	.69
3	1.7	1.1	1.3	1.2	1.4	.97	2.5	.98	.88	.74	.67	.64
4	1.6	4.2	1.1	1.3	1.3	1.0	1.7	.93	.87	.74	.66	.64
5	1.7	1.6	1.1	1.2	1.3	1.0	1.3	.95	.87	.74	.75	.76
6	1.5	1.2	.96	1.3	1.2	.97	1.2	.94	.87	.76	.69	.74
7	1.3	1.2	.90	1.3	1.2	.97	1.2	.89	1.0	.74	.67	.76
8	1.3	1.2	.89	1.2	1.2	.98	1.4	.88	.95	.72	.66	.89
9	1.6	1.3	.89	1.2	1.2	.91	2.1	.88	.92	.69	.66	.79
10	1.6	1.2	10	1.3	1.2	.95	1.7	.89	.87	.69	.68	.74
11	1.6	1.1	11	1.3	1.2	.96	1.4	.95	.87	.79	.66	.76
12	1.6	1.2	6.0	1.3	1.2	.91	1.2	1.0	.85	.67	.66	1.2
13	1.2	1.1	3.4	1.4	1.2	.86	1.2	.95	.86	.60	.65	.92
14	1.1	1.1	3.4	1.8	1.2	.81	1.1	.90	.87	.60	.65	1.9
15	1.1	1.1	2.0	1.9	1.2	.86	1.1	.87	.81	.64	.64	1.3
16	1.1	1.0	1.6	1.8	1.2	.89	1.1	.89	.78	.66	.64	.97
17	1.0	.97	1.6	1.4	1.1	.89	1.1	.89	.81	.71	.68	.87
18	1.2	1.1	3.6	1.4	1.1	.79	1.1	.88	.78	.71	.67	.87
19	4.9	1.1	1.7	15	1.2	.85	1.0	.89	.74	.69	.64	.87
20	1.7	1.1	1.4	11	1.1	.89	1.0	.87	.76	1.6	9.1	.91
21	1.2	1.1	1.4	3.3	1.1	.93	1.0	.89	.80	.88	1.6	.84
22	1.2	1.0	2.6	2.3	1.1	.96	1.0	.89	.74	.80	.91	.80
23	1.1	1.0	2.7	2.0	1.2	.96	1.0	.87	.74	.75	.83	.74
24	1.1	1.0	2.0	1.7	1.1	.96	.97	.88	.74	e.73	.78	.74
25	1.3	1.0	1.7	1.7	1.0	.95	1.0	.87	.75	e.71	.74	.74
26	1.1	1.0	2.4	1.7	1.0	1.1	1.0	.93	.74	e.70	.72	.70
27	1.1	1.0	1.7	1.6	1.0	1.1	1.0	.87	.74	.76	1.3	5.7
28	1.0	1.0	1.5	1.5	.99	.98	.97	.89	.74	.69	.96	6.1
29	1.1	1.0	1.4	1.4	.97	1.2	.96	.89	.74	.69	.85	2.4
30	1.0	.99	1.4	1.5	---	1.1	.94	.85	.74	.68	.78	1.5
31	1.2	---	1.2	1.4	---	1.6	---	.93	---	.68	.74	---
TOTAL	44.6	36.16	85.84	70.8	33.96	30.24	39.34	28.08	24.57	23.14	31.97	38.21
MEAN	1.44	1.21	2.77	2.28	1.17	.98	1.31	.91	.82	.75	1.03	1.27
MAX	4.9	4.2	11	15	1.4	1.6	3.4	1.0	1.0	1.6	9.1	6.1
MIN	1.0	.97	.89	1.2	.97	.79	.94	.85	.74	.60	.64	.64
AC-FT	88	72	170	140	67	60	78	56	49	46	63	76

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2000, BY WATER YEAR (WY)

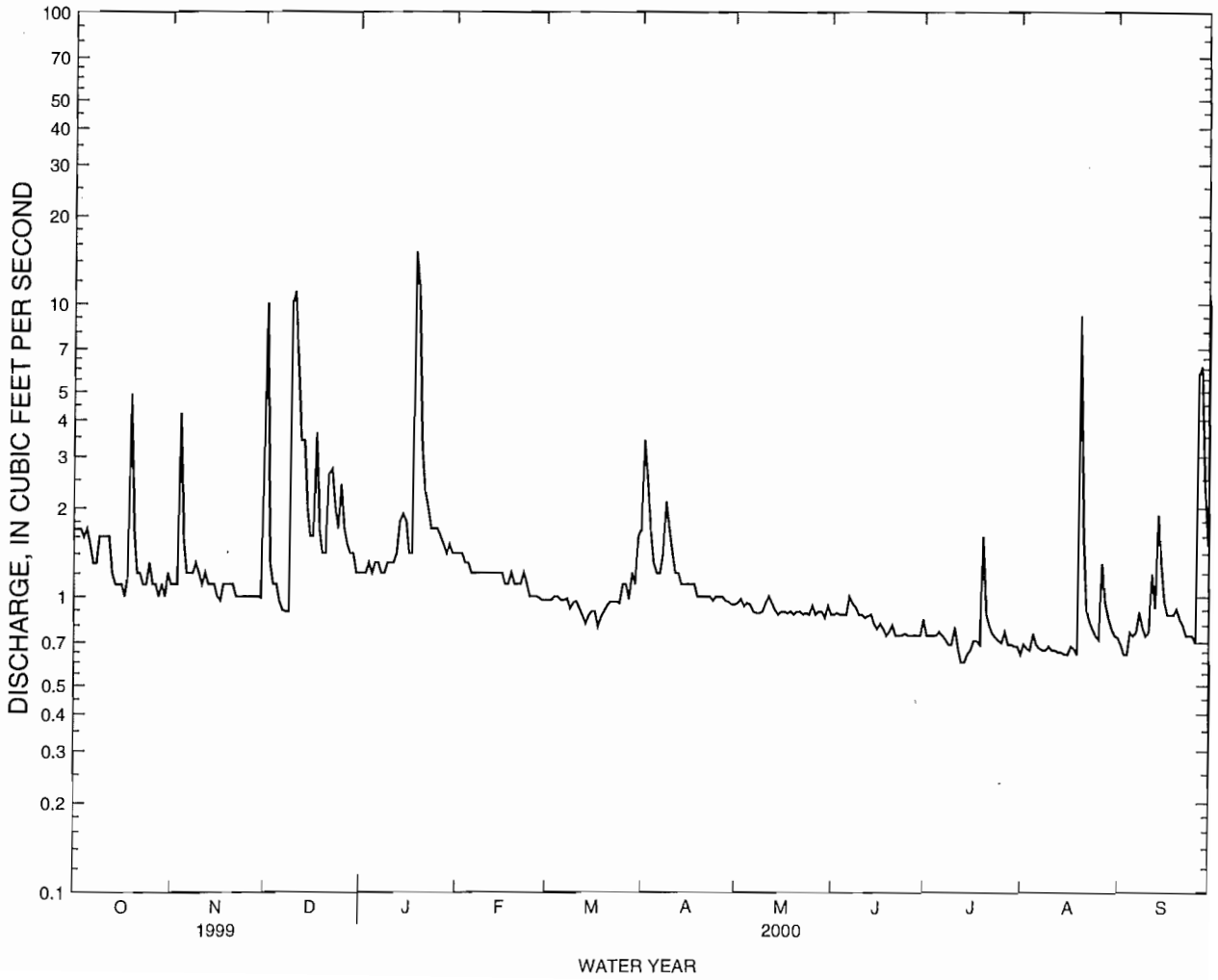
MEAN	3.01	3.71	3.62	3.65	3.52	3.97	3.43	2.98	2.60	2.85	2.59	2.85
MAX	6.69	10.6	9.56	8.65	7.55	11.8	10.6	5.52	4.78	5.89	5.78	5.81
(WY)	1992	1991	1988	1988	1989	1991	1989	1988	1991	1989	1991	1992
MIN	.66	1.21	1.09	.95	1.03	.98	.92	.85	.73	.74	.67	.67
(WY)	1985	2000	1986	1986	1986	2000	1985	1984	1984	1984	1984	1984

e Estimated

HAWAII, ISLAND OF OAHU

16283200 KAHALUU STREAM NEAR AHUIMANU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1984 - 2000	
ANNUAL TOTAL	600.70		486.91			
ANNUAL MEAN	1.65		1.33		3.23	
HIGHEST ANNUAL MEAN					5.97	1991
LOWEST ANNUAL MEAN					1.07	1984
HIGHEST DAILY MEAN	12	Jan 7	15	Jan 19	97	Mar 19 1991
LOWEST DAILY MEAN	.89	Dec 8	.60	Jul 13	.58	Sep 22 1984
ANNUAL SEVEN-DAY MINIMUM	1.0	Nov 24	.65	Aug 13	.59	Nov 5 1984
ANNUAL RUNOFF (AC-FT)	1190		966		2340	
10 PERCENT EXCEEDS	2.1		1.7		4.8	
50 PERCENT EXCEEDS	1.4		1.0		2.7	
90 PERCENT EXCEEDS	1.1		.71		.94	



HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU

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

DRAINAGE AREA.--0.97 mi^2.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--26 years (water years 1975-2000), 6.10 ft^3/s (4,420 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft^3/s, March 21, 1991, gage height, 7.93 ft, from rating curve extended above 100 ft^3/s on basis of slope area measurement at gage height 7.93 ft; minimum, 1.1 ft^3/s, April 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0215	*591	*6.03	Dec. 10	2030	310	5.12

Minimum discharge, 3.5 ft^3/s, July 30-31, August 2-8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.8	3.8	5.1	4.0	4.3	3.9	4.6	3.9	3.9	4.0	9.5	3.8
2	3.8	3.8	22	4.0	4.3	3.9	5.9	4.0	3.9	3.9	3.6	3.6
3	3.8	3.8	4.6	4.0	4.2	3.9	5.0	4.0	3.9	3.9	3.6	3.6
4	3.8	7.6	4.1	3.9	4.2	3.9	4.3	4.0	3.9	3.8	3.5	3.6
5	3.8	4.3	4.3	3.8	4.2	3.9	4.2	4.2	3.9	3.8	3.6	4.0
6	3.7	4.0	4.0	3.8	4.2	3.9	4.0	4.2	3.9	3.9	3.5	4.0
7	3.7	3.9	4.0	3.9	4.2	3.9	4.0	4.2	4.1	3.9	3.5	4.2
8	3.6	3.9	3.9	3.8	4.2	3.9	4.2	4.2	4.0	3.8	3.6	4.0
9	3.6	4.0	3.9	3.8	4.2	3.9	5.3	4.0	3.9	3.8	3.6	3.9
10	3.6	3.9	18	3.8	4.2	3.9	4.5	4.0	3.9	3.8	3.6	3.7
11	3.6	3.8	20	12	4.2	3.9	4.3	4.2	3.9	7.5	3.6	3.9
12	3.7	3.8	9.4	4.0	4.2	3.9	4.2	4.2	3.9	4.2	3.6	4.0
13	3.7	3.8	6.3	8.8	4.2	3.9	4.1	4.1	3.9	3.8	3.6	3.9
14	3.6	3.8	5.3	4.8	4.2	3.9	4.0	3.9	3.9	3.6	3.6	4.8
15	3.6	3.8	4.6	4.4	4.2	3.9	3.9	3.9	3.9	3.6	3.6	4.1
16	3.7	3.8	4.4	4.6	4.2	3.9	4.1	4.0	3.9	3.8	3.6	3.9
17	3.6	3.8	4.3	4.3	7.6	3.9	4.0	4.1	3.9	4.0	3.8	3.9
18	3.6	3.8	5.9	4.2	4.1	3.8	3.9	3.9	3.9	4.0	3.7	3.7
19	6.3	3.8	4.5	21	4.1	3.9	3.9	3.9	3.9	3.9	3.6	3.6
20	4.1	3.8	4.2	15	3.9	3.9	3.9	3.9	3.9	4.4	12	3.8
21	3.8	3.8	10	6.3	4.0	3.9	3.9	3.9	3.9	4.0	4.5	3.6
22	3.8	3.8	4.6	5.4	4.0	3.9	3.9	3.9	3.9	3.9	4.0	3.6
23	3.8	3.8	5.1	4.9	3.9	3.8	3.9	3.9	3.9	3.9	4.1	3.6
24	3.8	3.8	4.5	4.6	3.9	3.8	4.0	3.9	3.9	3.6	3.9	3.6
25	4.1	3.8	4.2	4.5	3.9	3.9	4.2	3.9	3.9	7.2	3.8	4.1
26	3.8	3.8	4.7	4.5	3.9	4.0	4.2	3.9	3.9	3.6	3.8	5.3
27	3.8	3.8	4.2	4.3	3.9	3.9	4.2	3.9	3.9	9.6	4.8	12
28	3.8	3.8	4.2	4.3	3.9	3.9	4.2	3.9	3.8	3.6	4.0	8.3
29	3.8	3.8	4.2	4.3	3.9	4.1	4.2	3.9	3.8	3.6	4.1	5.5
30	3.8	3.8	4.1	4.3	---	3.9	4.0	3.9	3.8	3.6	3.9	4.7
31	3.9	---	4.0	4.3	---	4.3	---	3.9	---	3.6	3.9	---
TOTAL	118.9	119.0	196.6	173.6	122.4	121.3	127.0	123.7	117.0	131.6	131.1	132.3
MEAN	3.84	3.97	6.34	5.60	4.22	3.91	4.23	3.99	3.90	4.25	4.23	4.41
MAX	6.3	7.6	22	21	7.6	4.3	5.9	4.2	4.1	9.6	12	12
MIN	3.6	3.8	3.9	3.8	3.9	3.8	3.9	3.9	3.8	3.6	3.5	3.6
AC-FT	236	236	390	344	243	241	252	245	232	261	260	262

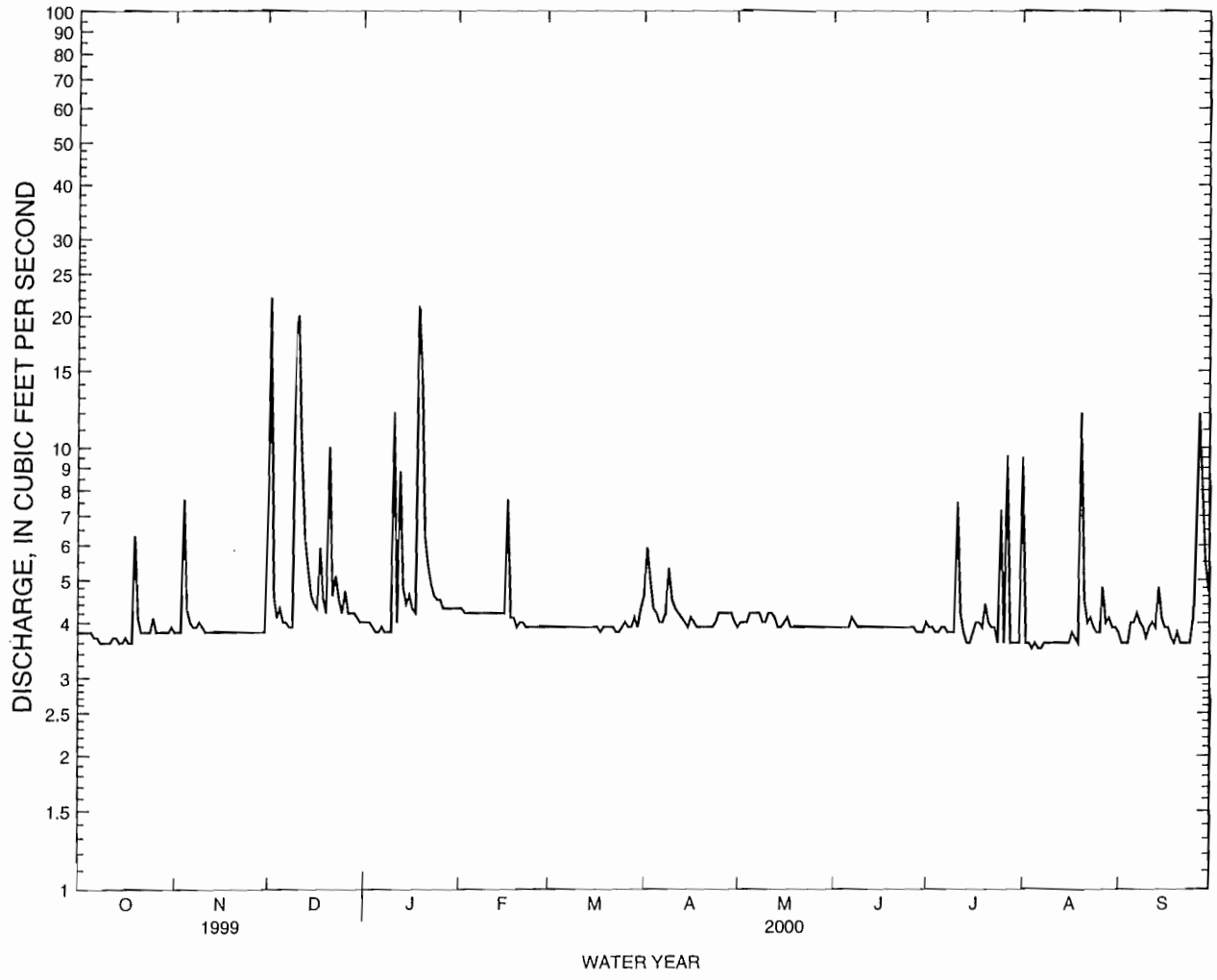
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2000, BY WATER YEAR (WY)

MEAN	5.69	6.52	6.44	6.75	6.42	7.18	6.19	5.78	5.55	5.67	5.54	5.52
MAX	9.81	14.3	15.5	12.1	13.2	17.7	15.1	8.46	8.88	9.95	10.6	9.43
(WY)	1983	1991	1988	1988	1979	1991	1989	1981	1982	1989	1982	1982
MIN	2.70	3.97	3.60	3.71	3.05	2.85	2.72	3.18	3.36	2.40	2.61	2.74
(WY)	1976	2000	1976	1977	1977	1977	1977	1977	1976	1977	1976	1976

HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1975 - 2000	
ANNUAL TOTAL	1676.2		1614.5			
ANNUAL MEAN	4.59		4.41		6.10	
HIGHEST ANNUAL MEAN					9.36	1982
LOWEST ANNUAL MEAN					3.32	1977
HIGHEST DAILY MEAN	22	Dec 2	22	Dec 2	149	Mar 19 1991
LOWEST DAILY MEAN	3.6	Oct 8	3.5	Aug 4	1.3	Apr 15 1977
ANNUAL SEVEN-DAY MINIMUM	3.6	Oct 8	3.6	Aug 2	1.4	Apr 12 1977
ANNUAL RUNOFF (AC-FT)	3320		3200		4420	
10 PERCENT EXCEEDS	4.9		4.7		7.4	
50 PERCENT EXCEEDS	4.4		3.9		5.4	
90 PERCENT EXCEEDS	3.8		3.6		3.8	



HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1975-86, March 1999 to current year.

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: June 1999 to current year.
WATER TEMPERATURE: June 1999 to current year.

INSTRUMENTATION.--Specific-conductance and temperature monitor from June 1999 to current year. Automatic water-quality (point) sampler from January 1999 to current year.

REMARKS.--Water-quality samples were collected monthly beginning in March 1999. Monthly samples were collected with a hand-held sampler using the equal-width-increment sampling method. Additional samples were collected during storm events (Dec. 10 and 21, Aug. 20, and Sept. 27) using an automatic (point) sampler located on the right bank of the stream at the gage.

Daily water temperature and specific conductance values from October 4–6 and November 22–December 3 are missing due to battery failure. Daily specific conductance values on January 25, August 2 and 5, and September 8, 12, 14–16, 20, and 21 are missing due to instrument malfunction.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 228 microsiemens per centimeter, September 21, 1999; minimum, 55 microsiemens per centimeter, December 10, 11, 1999.
WATER TEMPERATURE: Maximum, 22.5°C, September 27, 2000; minimum, 18.0°C, January 19, 20, 2000.

EXTREMES OUTSIDE PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 180 microsiemens per centimeter, April 22, 1980; minimum, 100 microsiemens per centimeter, August 9, 1977.
WATER TEMPERATURE: Maximum, 24.0°C, August 9, 1977; minimum, 19.0°C, January 24, March 6, 1980.

EXTREMES FOR THE CURRENT YEAR.--
SPECIFIC CONDUCTANCE: Maximum, 181 microsiemens, December 6, 13; minimum, 55 microsiemens, December 10, 11.
WATER TEMPERATURE: Maximum, 22.5°C, September 27; minimum, 18.0°C, January 19, 20.

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)	OXYGEN, DIS-SOLVED (MG/L) (00300)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CALCIUM DIS-SOLVED (MG/L AS CA) (00915)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG) (00925)
OCT									
14...	1035	3.6	104	9.3	7.7	147	20.5	7.5	5.5
NOV									
09...	1100	4.3	96	8.6	7.8	145	20.5	8.4	5.3
DEC									
10...	2152	91	--	--	7.9	74	20.5	3.1	2.2
15...	1140	4.6	98	8.7	7.9	144	20.5	8.3	5.9
21...	1110	23	--	--	7.4	86	20.0	4.0	3.0
JAN									
20...	1030	11	95	8.7	7.6	137	19.5	7.0	4.8
FEB									
08...	1040	4.2	95	8.6	7.7	153	20.0	8.6	5.6
MAR									
09...	1210	3.9	107	8.8	8.0	152	20.0	8.6	5.5
APR									
13...	1020	4.2	98	9.0	7.8	146	19.5	8.5	5.5
MAY									
18...	0930	3.9	99	8.9	7.9	137	20.5	8.3	5.4
JUN									
22...	1030	3.9	96	8.6	7.8	147	20.5	8.4	5.4
JUL									
19...	1120	3.9	98	8.9	7.7	144	20.0	8.5	5.5
AUG									
20...	1543	40	--	--	7.7	109	21.5	5.7	3.6
23...	1030	4.0	97	8.6	7.9	143	21.0	8.1	5.2
SEP									
11...	0940	4.5	95	8.5	8.0	140	20.5	8.3	5.1
27...	1453	38	--	--	7.6	96	22.0	4.5	2.9

HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

DATE	POTASSIUM, DISSOLVED (MG/L AS K) (00935)	SODIUM, DISSOLVED (MG/L AS NA) (00930)	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3 (39086)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3 (00453)	CHLORIDE, DISSOLVED (MG/L AS CL) (00940)	FLUORIDE, DISSOLVED (MG/L AS F) (00950)	SILICA, DISSOLVED (MG/L AS SIO2) (00955)	SULFATE DISSOLVED (MG/L AS SO4) (00945)
OCT								
14...	1	11	46	56	15	<.1	30	2.6
NOV								
09...	1.0	12	44	54	15	<.1	29	2.6
DEC								
10...	1.4	6.6	18	22	11	<.1	9.3	2.0
15...	1	12	48	58	16	<.1	30	2.5
21...	1.3	6.9	20	25	12	<.1	13	1.2
JAN								
20...	1.2	10	38	46	16	<.1	22	2.7
FEB								
08...	1.1	12	48	58	15	<.1	30	2.1
MAR								
09...	1	12	47	57	15	<.1	30	2.2
APR								
13...	.9	12	46	56	15	<.1	29	2.5
MAY								
18...	1	12	47	58	15	<.1	29	2.4
JUN								
22...	1.1	12	47	57	15	<.1	30	2.4
JUL								
19...	1	12	46	56	15	<.1	30	2.5
AUG								
20...	1.5	8.4	29	36	13	<.1	18	2.3
23...	.9	12	45	55	15	<.1	30	2.0
SEP								
11...	.8	12	44	53	14	<.1	28	2.3
27...	1.4	8.2	22	27	10	<.1	14	2.2

DATE	TIME	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N) (00623)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N) (00625)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N) (00608)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N) (00631)	NITROGEN, NITRITE DISSOLVED (MG/L AS N) (00613)	PHOSPHORUS DISSOLVED (MG/L AS P) (00666)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P) (00671)	PHOSPHORUS TOTAL (MG/L AS P) (00665)
OCT									
14...	1035	E.05	E.06	<.02	.09	<.01	.033	.02	.035
NOV									
09...	1100	<.1	E.06	<.02	.1	<.01	.037	.03	.043
DEC									
10...	2152	.1	1	<.02	<.05	<.01	.021	.02	.20
15...	1140	<.1	E.05	<.02	.10	<.01	.031	.03	.034
21...	1110	.2	1.4	<.02	<.05	<.01	.022	.01	.25
JAN									
20...	1030	<.1	<.1	<.02	.05	<.01	.021	.02	.032
FEB									
08...	1040	<.1	E.07	<.02	.14	<.01	.033	.03	.037
MAR									
09...	1210	<.1	<.1	<.02	.12	<.01	.035	.03	E.04
APR									
13...	1020	<.1	<.1	<.02	.11	<.01	.035	.03	.035
MAY									
18...	0930	<.1	E.06	<.02	.11	<.01	.036	.03	.039
JUN									
22...	1030	<.1	E.06	<.02	.10	<.01	.035	.03	.035
JUL									
19...	1120	<.1	E.05	<.02	.10	<.01	.033	.03	.035
AUG									
20...	1543	E.09	1.2	<.02	<.05	<.01	.039	.03	.30
23...	1030	E.06	<.1	<.02	.08	<.01	.032	.03	.032
SEP									
11...	0940	<.1	E.05	<.02	.07	<.01	.031	.03	.034
27...	1453	.1	.8	<.04	<.05	<.01	.036	.03	.21

E Estimated

HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

DATE	CARBON, INORG + ORGANIC PARTIC. TOTAL (MG/L AS C) (00694)	CARBON, INOR-GANIC, PARTIC. TOTAL (MG/L AS C) (00688)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C) (00681)	CARBON, ORGANIC PARTIC-ULATE TOTAL (MG/L AS C) (00689)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L) (70300)	IRON, DIS-SOLVED (UG/L AS FE) (01046)	MANGA-NESE, DIS-SOLVED (UG/L AS MN) (01056)	SEDI-MENT, SUS-PENDED (MG/L) (80154)
OCT								
14...	--	--	E.3	<.2	97	<10	<2	--
NOV								
09...	--	--	.9	.3	107	<10	<2	2
DEC								
10...	--	--	3.4	>7.1	53	46	<2	102
15...	--	--	.4	<.2	109	E5	E2	2
21...	--	--	4.9	>5.9	65	100	E1	134
JAN								
20...	--	--	1.1	.6	92	E10	<2	8
FEB								
08...	--	--	E.2	<.2	107	E6	<2	1
MAR								
09...	--	--	E.2	<.2	109	<10	<2	1
APR								
13...	--	--	E.3	<.2	110	<10	E2	1
MAY								
18...	--	--	E.3	<.2	106	<10	<2	2
JUN								
22...	--	--	.3	<.2	109	<10	E1	1
JUL								
19...	.185	<.12	.3	.185	103	<10	E2	1
AUG								
20...	--	--	2.2	13	77	15	<2	172
23...	--	--	.3	<.2	106	<10	E2	<.5
SEP								
11...	.122	<.12	.5	.122	96	<10	<2	2
27...	12.9	<.12	3.8	12.9	67	40	E1	509

E Estimated

HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	155	150	152	154	150	152	---	---	---	151	150	151
2	155	143	146	157	151	155	---	---	---	151	150	151
3	147	145	146	158	147	154	---	---	---	151	150	151
4	---	---	---	148	71	138	168	116	127	151	150	151
5	---	---	---	150	145	149	171	136	146	151	150	151
6	---	---	---	151	150	150	181	153	165	151	150	150
7	150	148	149	151	148	150	163	150	158	151	150	150
8	148	145	147	150	150	150	150	133	141	151	150	150
9	147	144	146	150	145	149	133	128	130	150	150	150
10	150	147	149	151	150	150	129	55	119	150	150	150
11	151	145	148	151	148	150	106	55	86	152	139	148
12	147	145	146	151	148	150	117	94	105	151	150	151
13	147	146	146	151	150	151	181	107	136	151	119	148
14	148	146	147	151	150	150	165	136	143	150	133	146
15	148	142	146	151	150	151	144	136	141	149	144	148
16	146	142	144	151	150	151	144	143	144	150	143	147
17	147	145	146	151	150	151	144	137	143	150	148	149
18	147	146	147	151	148	150	143	76	134	150	147	149
19	147	103	136	151	149	150	143	141	142	150	70	123
20	149	143	148	151	150	150	143	142	143	150	78	130
21	151	148	149	151	150	150	152	85	127	152	149	151
22	151	148	149	---	---	---	151	142	147	153	152	153
23	155	148	151	---	---	---	150	130	146	153	152	153
24	149	146	148	---	---	---	152	150	151	153	152	152
25	151	141	147	---	---	---	152	151	152	---	---	---
26	153	148	151	---	---	---	152	125	146	152	147	151
27	149	148	148	---	---	---	151	150	151	152	151	152
28	153	149	150	---	---	---	151	151	151	152	151	152
29	150	148	150	---	---	---	151	151	151	152	151	152
30	151	150	150	---	---	---	151	150	151	153	151	152
31	154	149	151	---	---	---	151	150	151	152	150	151
MONTH	---	---	---	---	---	---	---	---	---	---	---	---
		FEBRUARY			MARCH			APRIL			MAY	
1	152	150	151	149	148	149	147	142	145	149	146	148
2	157	149	151	149	148	149	145	132	140	149	146	148
3	156	149	150	149	148	149	149	143	146	151	147	148
4	157	149	150	149	147	149	150	146	147	152	149	150
5	157	149	150	149	148	149	150	147	148	153	148	151
6	157	149	150	149	148	149	149	147	148	152	147	151
7	156	149	150	149	148	149	150	149	149	152	147	148
8	150	144	150	149	148	149	151	148	150	151	144	148
9	151	149	150	149	148	148	151	132	143	153	148	150
10	150	149	149	149	147	148	149	146	148	152	145	148
11	150	149	150	149	147	148	149	148	149	150	145	148
12	150	149	150	149	147	148	150	148	149	151	147	150
13	151	149	150	149	147	148	151	148	149	166	145	154
14	151	149	150	149	147	148	151	147	149	166	153	161
15	151	149	150	150	148	149	149	148	149	157	146	151
16	150	149	149	149	146	148	152	148	149	155	150	152
17	151	139	146	149	146	148	149	147	148	155	144	151
18	150	149	150	149	147	148	149	147	148	152	144	147
19	150	148	150	149	146	148	149	147	149	149	145	147
20	150	149	150	150	147	148	149	147	148	149	147	148
21	150	148	149	149	147	148	149	147	148	150	146	148
22	149	148	149	148	147	148	149	147	148	159	144	147
23	149	146	149	148	147	148	149	147	148	151	145	148
24	149	146	149	148	147	148	149	147	148	151	147	149
25	149	146	149	148	147	148	151	146	148	152	148	150
26	149	147	148	148	144	147	149	145	148	153	149	150
27	149	145	148	148	146	147	149	145	147	157	148	151
28	149	147	149	151	146	148	149	145	147	152	149	151
29	149	148	149	148	144	147	149	147	148	152	149	150
30	---	---	---	148	146	147	150	146	148	153	148	150
31	---	---	---	148	140	145	---	---	---	154	149	151
MONTH	157	139	149	151	140	148	152	132	148	166	144	150

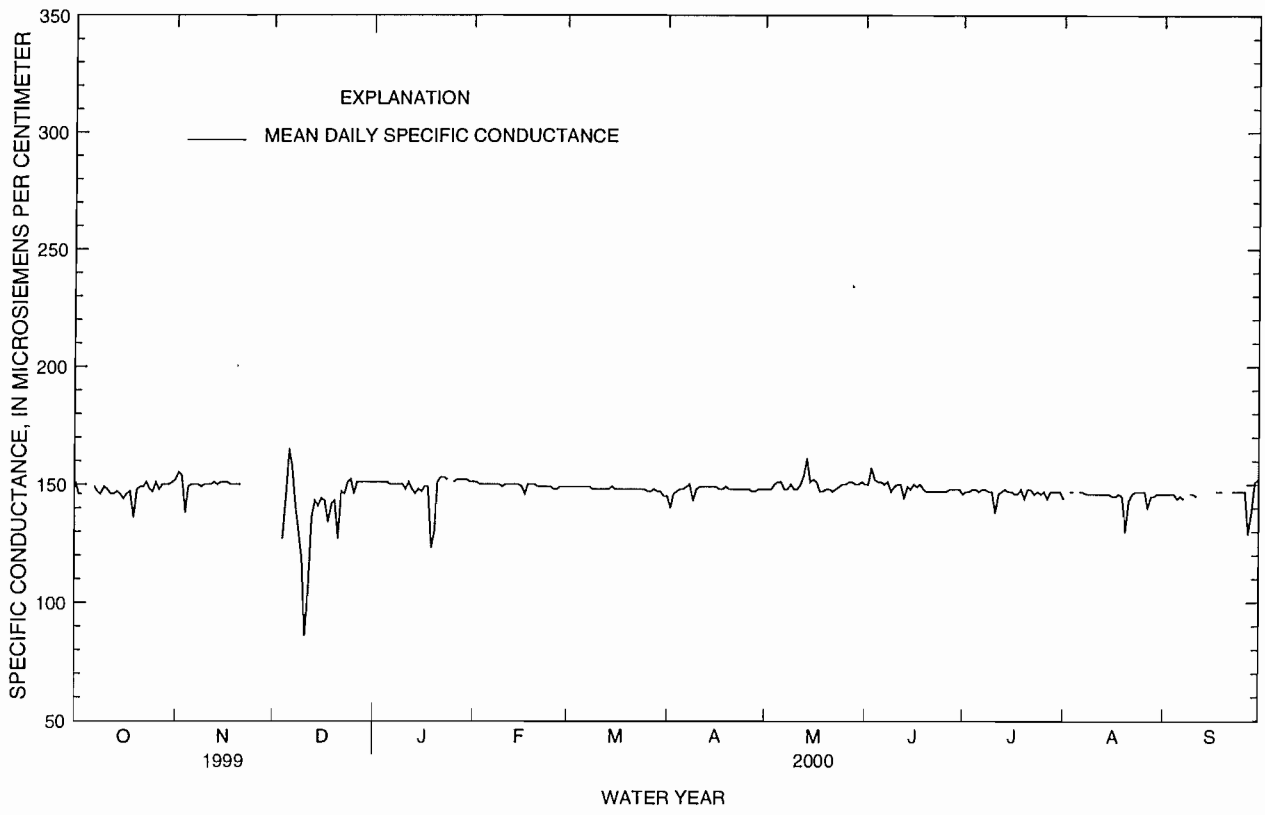
HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

SPECIFIC CONDUCTANCE (MICROSIEMENS/CM AT 25 DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	153	147	150	148	139	146	149	121	144	146	145	146
2	153	147	150	149	145	147	---	---	---	146	145	146
3	160	153	157	149	146	147	148	146	147	146	145	146
4	160	148	152	148	147	148	148	146	147	146	145	146
5	152	149	151	148	147	148	---	---	---	146	140	144
6	152	150	151	148	146	147	148	146	147	148	139	145
7	152	144	150	148	147	148	148	146	147	145	141	144
8	154	148	151	148	147	148	147	145	146	---	---	---
9	149	144	147	148	146	147	147	145	146	147	145	146
10	151	146	149	148	146	147	147	144	146	147	146	146
11	153	146	150	147	68	138	146	144	146	147	141	145
12	153	147	150	147	140	146	146	145	146	---	---	---
13	147	141	144	148	147	147	146	144	146	146	145	146
14	152	145	149	148	147	148	146	144	146	---	---	---
15	152	145	148	148	145	147	146	145	146	---	---	---
16	154	143	150	148	146	147	146	144	145	---	---	---
17	150	147	149	148	140	146	146	142	145	147	146	147
18	152	149	150	148	142	146	147	145	146	147	146	147
19	150	146	148	149	147	148	146	144	145	147	146	147
20	148	146	147	149	130	144	146	60	130	---	---	---
21	148	146	147	149	146	148	146	134	143	---	---	---
22	148	146	147	149	147	148	147	146	146	147	146	147
23	147	146	147	147	145	146	148	147	147	147	146	147
24	148	146	147	148	146	147	148	147	147	147	146	147
25	148	146	147	150	129	146	148	146	147	147	146	147
26	148	145	147	148	146	147	147	146	147	147	146	147
27	149	147	148	149	108	144	147	127	140	147	82	129
28	149	147	148	148	146	147	146	143	145	149	116	138
29	149	147	148	148	146	147	149	143	145	152	149	151
30	148	147	148	148	146	147	150	145	146	153	152	152
31	---	---	---	147	146	147	146	145	146	---	---	---
MONTH	160	141	149	150	68	147	---	---	---	---	---	---



HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		OCTOBER			NOVEMBER			DECEMBER			JANUARY	
1	20.5	20.0	20.5	20.5	20.0	20.5	---	---	---	20.0	19.5	19.5
2	20.5	20.0	20.5	20.5	20.0	20.0	---	---	---	20.0	19.5	20.0
3	21.0	20.0	20.5	20.5	20.0	20.0	---	---	---	20.0	19.5	20.0
4	---	---	---	21.0	20.0	20.5	20.5	20.0	20.0	20.5	20.0	20.0
5	---	---	---	20.5	20.5	20.5	20.5	20.0	20.0	20.0	20.0	20.0
6	---	---	---	20.5	20.0	20.5	20.0	20.0	20.0	20.5	20.0	20.0
7	20.5	20.0	20.5	20.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
8	20.5	20.0	20.5	20.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
9	20.5	20.0	20.5	20.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0
10	21.0	20.5	20.5	20.5	20.0	20.0	21.0	20.0	20.5	20.0	20.0	20.0
11	20.5	20.0	20.5	20.5	20.0	20.0	21.0	20.5	21.0	20.0	19.5	20.0
12	20.5	20.0	20.5	20.0	20.0	20.0	21.0	20.5	21.0	20.5	20.0	20.0
13	20.5	20.5	20.5	20.0	20.0	20.0	21.0	20.5	20.5	20.0	19.5	20.0
14	20.5	20.0	20.5	20.0	20.0	20.0	20.5	20.0	20.5	20.0	19.5	20.0
15	20.5	20.0	20.5	20.0	19.5	20.0	20.5	20.0	20.5	20.0	19.5	20.0
16	20.5	20.0	20.5	20.0	19.5	20.0	20.5	20.0	20.0	19.5	19.5	19.5
17	20.5	20.0	20.5	20.5	20.0	20.0	20.5	20.0	20.0	19.5	19.5	19.5
18	20.5	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.0	20.0	19.5	19.5
19	20.0	20.0	20.0	20.0	19.5	20.0	20.5	20.0	20.0	19.5	18.0	19.0
20	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	19.5	18.0	19.0
21	20.5	20.0	20.5	20.5	20.0	20.0	20.5	20.0	20.0	20.0	19.5	20.0
22	20.5	20.0	20.5	---	---	---	20.5	20.0	20.0	20.0	19.5	19.5
23	20.5	20.0	20.5	---	---	---	20.5	20.0	20.0	19.5	19.0	19.5
24	20.5	20.0	20.5	---	---	---	20.5	20.0	20.5	19.5	19.0	19.5
25	20.5	20.5	20.5	---	---	---	20.5	20.0	20.5	19.5	19.0	19.0
26	20.5	20.0	20.5	---	---	---	20.5	19.5	20.5	19.5	19.0	19.5
27	20.5	20.0	20.5	---	---	---	20.0	19.5	19.5	19.5	19.0	19.5
28	20.5	20.0	20.5	---	---	---	19.5	19.5	19.5	20.0	19.5	19.5
29	20.5	20.5	20.5	---	---	---	19.5	19.0	19.5	20.0	19.5	19.5
30	20.5	20.0	20.5	---	---	---	20.0	19.5	19.5	20.0	19.5	19.5
31	20.5	20.0	20.5	---	---	---	20.0	19.0	19.5	20.0	19.5	19.5
MONTH	---	---	---	---	---	---	---	---	---	20.5	18.0	19.5
		FEBRUARY			MARCH			APRIL			MAY	
1	20.5	20.0	20.0	20.5	20.0	20.0	20.0	19.5	19.5	21.0	20.0	20.5
2	20.0	19.5	20.0	20.5	20.0	20.0	20.0	19.5	20.0	20.5	20.0	20.5
3	20.0	19.5	19.5	20.5	20.0	20.0	20.0	20.0	20.0	21.0	20.0	20.5
4	20.5	19.5	20.0	20.5	20.0	20.0	20.0	19.5	20.0	21.0	20.0	20.5
5	20.0	19.5	19.5	21.0	20.0	20.0	20.0	19.5	20.0	20.5	20.0	20.5
6	20.0	19.5	20.0	21.0	20.0	20.0	20.0	19.5	20.0	21.0	20.0	20.5
7	20.5	19.5	20.0	20.5	20.0	20.0	20.0	19.5	20.0	21.0	20.0	20.5
8	20.0	19.5	20.0	20.5	20.0	20.0	19.5	19.5	19.5	20.5	20.0	20.5
9	20.5	20.0	20.0	20.5	19.5	20.0	19.5	19.0	19.5	20.5	20.0	20.5
10	20.0	19.5	20.0	20.5	19.5	20.0	19.5	19.5	19.5	20.5	20.0	20.5
11	20.0	19.5	20.0	20.5	19.5	20.0	20.0	19.5	19.5	20.5	20.0	20.5
12	20.5	19.5	20.0	20.5	19.5	20.0	20.5	19.5	20.0	20.5	20.0	20.5
13	20.0	19.5	20.0	21.0	20.0	20.0	20.5	19.5	20.0	20.5	20.0	20.5
14	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.5	20.0	20.5
15	20.5	20.0	20.0	21.0	20.0	20.5	20.5	20.0	20.0	21.0	20.0	20.5
16	20.0	19.5	20.0	20.5	20.0	20.0	20.0	19.5	20.0	21.0	20.0	20.5
17	20.0	20.0	20.0	20.5	20.0	20.0	20.0	19.5	20.0	21.0	20.0	20.5
18	20.5	20.0	20.0	20.0	20.0	20.0	20.0	20.0	20.0	21.0	20.0	20.5
19	20.5	19.5	20.0	20.5	20.0	20.0	21.0	19.5	20.0	21.5	20.0	20.5
20	20.0	19.5	20.0	20.5	20.0	20.0	20.0	20.0	20.0	21.5	20.0	20.5
21	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
22	20.0	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
23	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
24	20.0	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
25	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5	20.5	20.0	20.5
26	20.5	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.5	21.0	20.0	20.5
27	20.5	20.0	20.0	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
28	20.5	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.0	20.5	20.0	20.5
29	20.5	20.0	20.0	20.0	20.0	20.0	20.5	20.0	20.0	21.0	20.0	20.5
30	---	---	---	20.5	20.0	20.0	21.0	20.0	20.5	21.5	20.0	20.5
31	---	---	---	20.0	19.5	20.0	---	---	---	21.0	20.5	20.5
MONTH	20.5	19.5	20.0	21.0	19.5	20.0	21.0	19.0	20.0	21.5	20.0	20.5

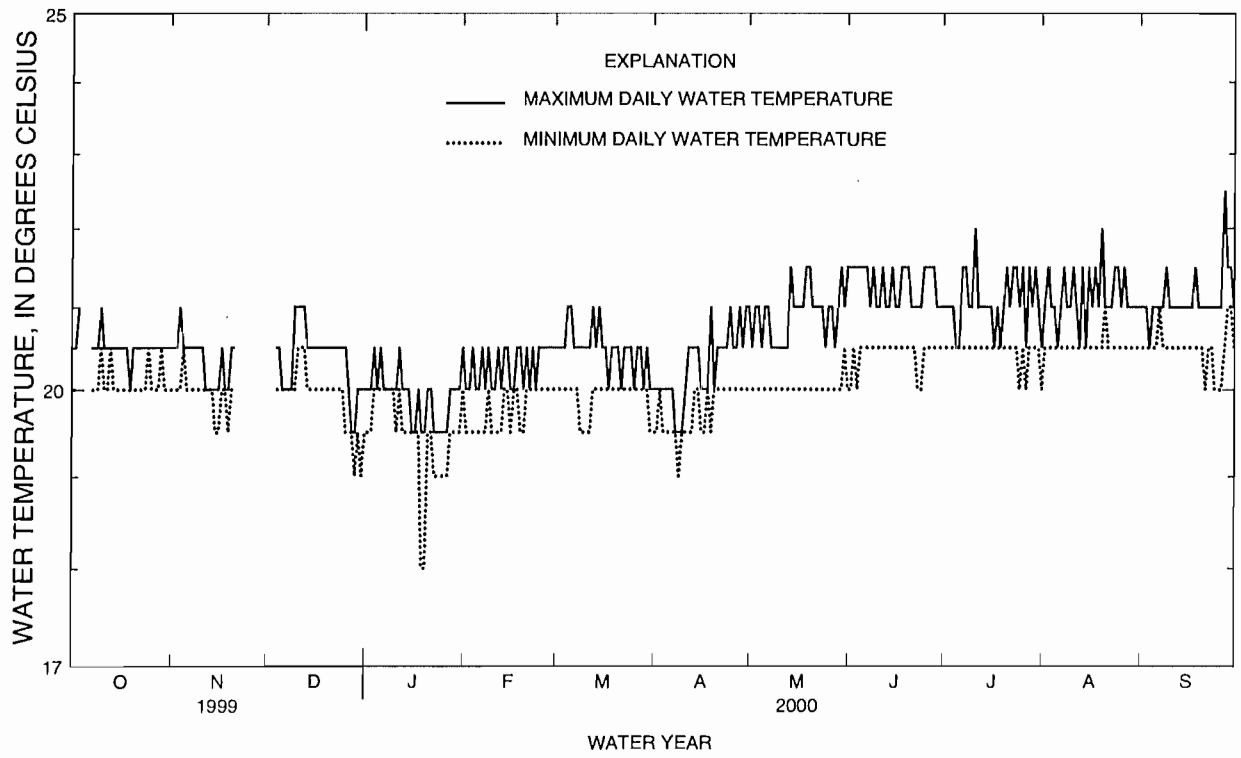
HAWAII, ISLAND OF OAHU

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

WATER-QUALITY RECORDS

TEMPERATURE, WATER (DEG. C), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAY	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN	MAX	MIN	MEAN
		JUNE			JULY			AUGUST			SEPTEMBER	
1	21.5	20.0	20.5	21.0	20.5	20.5	20.5	20.0	20.5	21.0	20.5	20.5
2	21.5	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
3	21.5	20.5	20.5	21.0	20.5	20.5	21.5	20.5	21.0	21.0	20.5	20.5
4	21.5	20.0	20.5	21.0	20.5	20.5	21.0	20.5	20.5	20.5	20.5	20.5
5	21.5	20.5	20.5	20.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
6	21.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	20.5	21.0	20.5	21.0
7	21.5	20.5	20.5	21.5	20.5	20.5	21.0	20.5	20.5	21.0	21.0	21.0
8	21.0	20.5	20.5	21.5	20.5	20.5	21.5	20.5	20.5	21.0	20.5	21.0
9	21.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.5	20.5	20.5
10	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
11	21.0	20.5	20.5	22.0	20.5	21.0	21.5	20.5	20.5	21.0	20.5	20.5
12	21.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
13	21.0	20.5	20.5	21.0	20.5	20.5	20.5	20.5	20.5	21.0	20.5	20.5
14	21.0	20.5	20.5	21.0	20.5	20.5	21.5	20.5	20.5	21.0	20.5	20.5
15	21.5	20.5	20.5	21.0	20.5	20.5	20.5	20.5	20.5	21.0	20.5	20.5
16	21.0	20.5	20.5	21.0	20.5	20.5	21.5	20.5	21.0	21.0	20.5	20.5
17	21.0	20.5	20.5	20.5	20.5	20.5	21.0	20.5	21.0	21.0	20.5	20.5
18	21.5	20.5	20.5	21.0	20.5	20.5	21.5	20.5	21.0	21.5	20.5	21.0
19	21.5	20.5	20.5	20.5	20.5	20.5	21.0	20.5	20.5	21.0	20.5	20.5
20	21.5	20.5	20.5	21.0	20.5	20.5	22.0	20.5	21.0	21.0	20.5	20.5
21	21.0	20.5	20.5	21.5	20.5	21.0	21.0	21.0	21.0	21.0	20.0	20.5
22	21.0	20.5	20.5	21.0	20.5	21.0	21.0	20.5	21.0	21.0	20.5	20.5
23	21.0	20.0	20.5	21.5	20.5	21.0	21.0	20.5	21.0	21.0	20.5	20.5
24	21.0	20.0	20.5	21.5	20.5	21.0	21.5	20.5	21.0	21.0	20.0	20.5
25	21.5	20.5	20.5	21.0	20.0	20.5	21.5	20.5	21.0	21.0	20.0	20.5
26	21.5	20.5	20.5	21.5	20.5	21.0	21.0	20.5	20.5	21.0	20.0	20.5
27	21.5	20.5	20.5	20.5	20.0	20.5	21.5	20.5	21.0	22.5	20.5	21.0
28	21.5	20.5	20.5	21.5	20.5	21.0	21.0	20.5	20.5	21.5	21.0	21.5
29	21.0	20.5	20.5	21.0	20.5	21.0	21.0	20.5	21.0	21.5	21.0	21.0
30	21.0	20.5	20.5	21.5	20.5	21.0	21.0	20.5	20.5	21.0	20.5	21.0
31	---	---	---	21.0	20.5	20.5	21.0	20.5	20.5	---	---	---
MONTH	21.5	20.0	20.5	22.0	20.0	20.5	22.0	20.0	20.5	22.5	20.0	20.5



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HAWAII, ISLAND OF OAHU

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

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

DRAINAGE AREA.--2.22 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area, WDR HI-94-1: 1993 (M).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 75 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records fair. Waiahole tunnel diverts water from tributaries and tunnels upstream of station. Elevation of the Waiahole tunnel is 800 ft (from topographic map).

AVERAGE DISCHARGE.--40 years (water years 1961-2000), 8.59 ft^3/s (6,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s, February 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s, October 27, 1975.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 10	2115	*2,050	*7.04	No other peak greater than base discharge.			

Minimum discharge, 1.5 ft^3/s, October 4 and August 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	2.0	4.8	3.2	5.9	2.2	28	2.3	1.8	2.5	2.3	2.3
2	1.7	1.9	9.7	3.1	4.3	2.2	30	2.3	1.8	2.0	2.1	2.1
3	1.6	2.3	3.1	2.8	4.0	2.1	14	2.3	1.7	1.8	1.9	2.1
4	1.5	12	2.4	2.6	3.8	2.1	7.1	2.2	1.8	1.8	1.9	2.0
5	1.5	4.5	3.5	2.6	3.8	2.1	5.2	2.2	1.7	1.7	2.2	6.2
6	1.5	2.5	2.5	2.6	3.6	2.0	4.4	2.2	1.7	1.8	2.0	4.7
7	1.9	2.8	2.4	2.5	3.6	1.9	4.4	2.1	2.6	1.7	1.8	4.6
8	1.6	2.5	2.1	2.4	3.4	2.0	5.0	2.1	2.0	1.7	1.7	6.5
9	1.5	3.4	2.1	2.4	3.4	1.9	12	2.0	1.8	1.7	1.7	4.5
10	1.5	2.5	51	2.4	3.2	1.9	7.6	2.0	1.7	1.6	1.7	3.3
11	1.5	2.1	30	2.4	3.2	1.9	5.7	2.1	1.7	2.4	1.7	2.9
12	1.5	4.3	17	2.5	3.0	1.9	4.7	2.3	1.6	2.4	1.6	3.1
13	1.6	2.3	15	7.8	3.0	1.9	4.4	2.3	1.7	1.9	1.7	5.5
14	1.5	2.1	8.4	19	2.8	2.0	4.0	2.1	1.7	1.7	1.6	6.8
15	1.5	2.0	4.7	14	2.8	2.1	3.6	2.0	1.7	2.0	1.6	4.6
16	1.6	1.9	3.6	20	2.7	2.0	3.6	2.0	1.7	2.6	1.5	3.6
17	1.6	1.8	6.2	6.8	2.6	1.9	3.6	1.8	1.8	2.3	1.7	3.5
18	1.6	2.2	31	7.4	2.6	2.0	3.3	1.8	2.0	6.1	1.7	3.1
19	7.2	2.0	14	83	2.6	2.0	3.0	1.8	1.7	2.5	1.6	2.6
20	2.7	2.0	5.8	66	2.5	1.9	3.0	1.7	1.8	2.6	53	4.7
21	1.9	2.0	4.7	15	2.4	2.0	3.0	1.7	1.9	2.4	8.2	3.1
22	1.8	1.9	6.1	11	2.5	1.9	2.9	1.8	1.9	2.8	3.3	2.7
23	1.7	1.9	6.9	9.6	2.3	2.2	2.8	1.8	2.2	2.1	2.8	2.5
24	1.8	1.8	4.8	8.4	2.3	2.0	2.6	1.8	2.1	1.9	2.4	2.3
25	5.2	1.8	4.1	7.6	2.3	2.1	2.6	1.8	1.8	1.8	2.1	2.2
26	2.2	1.8	8.3	8.9	2.4	3.3	2.6	1.8	1.8	2.0	1.9	2.2
27	2.3	1.9	4.6	5.9	2.4	2.9	2.7	1.8	1.8	2.4	5.2	15
28	1.9	1.9	3.9	5.1	2.3	2.0	2.5	1.8	1.9	2.3	6.1	23
29	1.7	2.1	3.6	4.8	2.2	2.1	2.4	1.8	1.8	2.1	5.1	11
30	1.7	2.0	3.8	4.5	---	2.1	2.3	1.8	1.8	1.9	3.1	10
31	2.7	---	3.3	4.3	---	14	---	1.9	---	2.5	2.6	---
TOTAL	63.2	78.2	273.4	340.6	87.9	76.6	183.0	61.4	55.0	69.0	129.8	152.7
MEAN	2.04	2.61	8.82	11.0	3.03	2.47	6.10	1.98	1.83	2.23	4.19	5.09
MAX	7.2	12	51	83	5.9	14	30	2.3	2.6	6.1	53	23
MIN	1.5	1.8	2.1	2.4	2.2	1.9	2.3	1.7	1.6	1.6	1.5	2.0
AC-FT	125	155	542	676	174	152	363	122	109	137	257	303

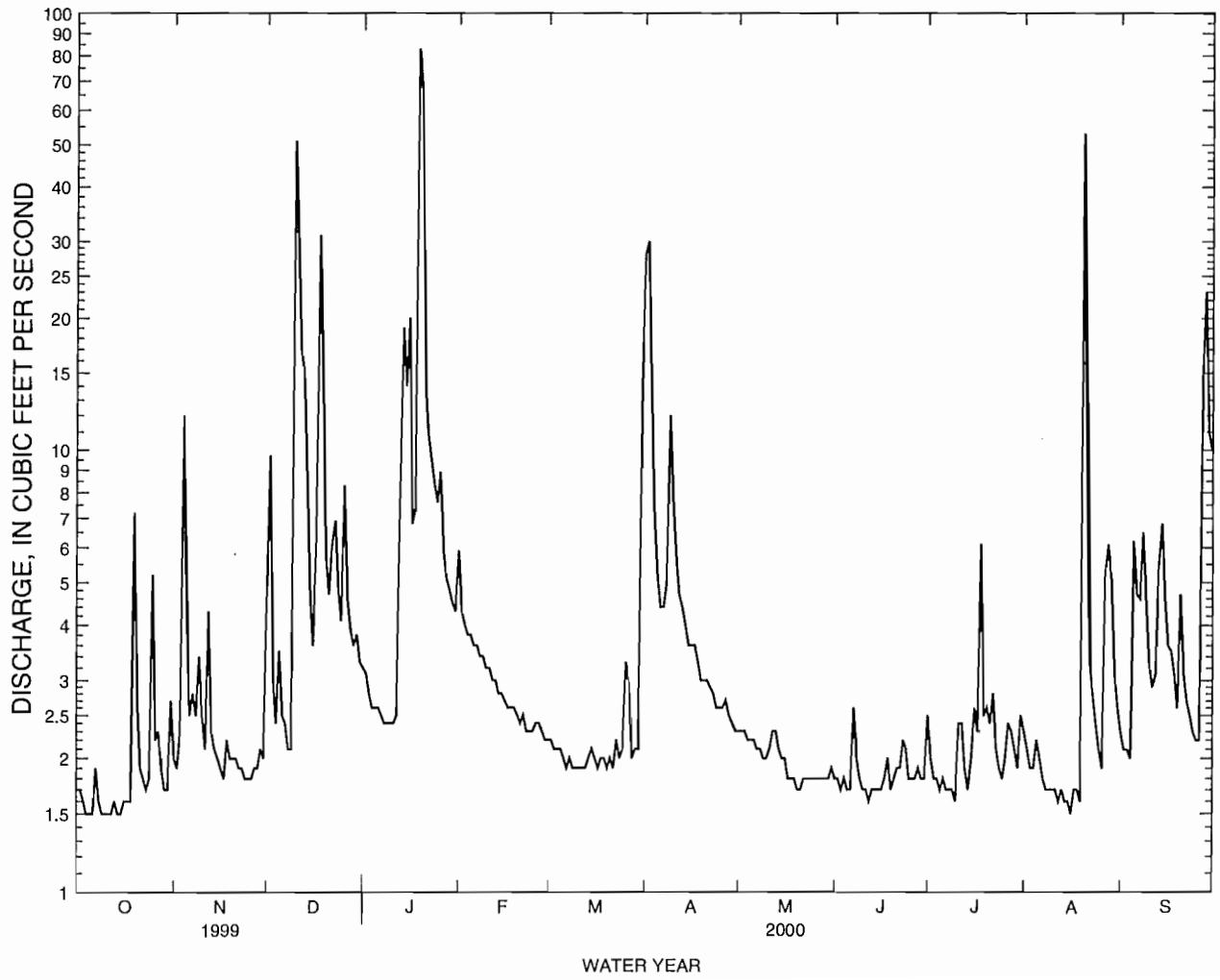
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 2000, BY WATER YEAR (WY)

MEAN	6.51	11.3	9.45	11.5	11.6	12.4	10.2	8.30	5.30	6.23	5.27	5.21
MAX	31.0	55.7	44.1	45.6	65.5	53.1	49.3	29.3	16.2	30.2	25.0	22.1
(WY)	1992	1966	1988	1988	1994	1982	1963	1965	1977	1987	1967	1986
MIN	1.55	2.13	2.23	1.67	1.77	2.03	2.65	1.98	1.83	1.76	1.57	1.38
(WY)	1985	1963	1978	1977	1978	1978	1998	2000	1984	1984	1984	1984

HAWAII, ISLAND OF OAHU

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1960 - 2000	
ANNUAL TOTAL	1681.7		1570.8			
ANNUAL MEAN	4.61		4.29		8.59	
HIGHEST ANNUAL MEAN					16.7	1982
LOWEST ANNUAL MEAN					3.33	1984
HIGHEST DAILY MEAN	63	Jan 22	83	Jan 19	868	Feb 4 1965
LOWEST DAILY MEAN	1.5	Oct 4	1.5	Oct 4	1.1	Oct 17 1975
ANNUAL SEVEN-DAY MINIMUM	1.5	Oct 9	1.5	Oct 9	1.3	Sep 19 1984
ANNUAL RUNOFF (AC-FT)	3340		3120		6220	
10 PERCENT EXCEEDS	6.9		7.1		14	
50 PERCENT EXCEEDS	3.4		2.3		4.2	
90 PERCENT EXCEEDS	1.9		1.7		2.1	



HAWAII, ISLAND OF OAHU

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

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

DRAINAGE AREA.--3.74 mi^2.

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

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

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records fair except for estimated period which is poor. Waiahole tunnel diverts water from tributaries and tunnels upstream of station. Elevation of the Waiahole tunnel is 800 ft (from topographic map). Recording rain gage located 50 ft from the streamgage at an elevation of 80 ft.

AVERAGE DISCHARGE.--41 years (water years 1960-2000), 36.3 ft^3/s (26,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,250 ft^3/s, March 20, 1991, gage height, 8.60 ft, from rating curve extended above 530 ft^3/s on basis of computation of peak flow over submerged weir; minimum, 9.9 ft^3/s, June 5, 2000.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 10	2145	1,680	4.87	Aug. 20	1830	*2,230	*5.48
Jan. 19	1545	2,080	5.32				

Minimum discharge, 9.9 ft^3/s, June 5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

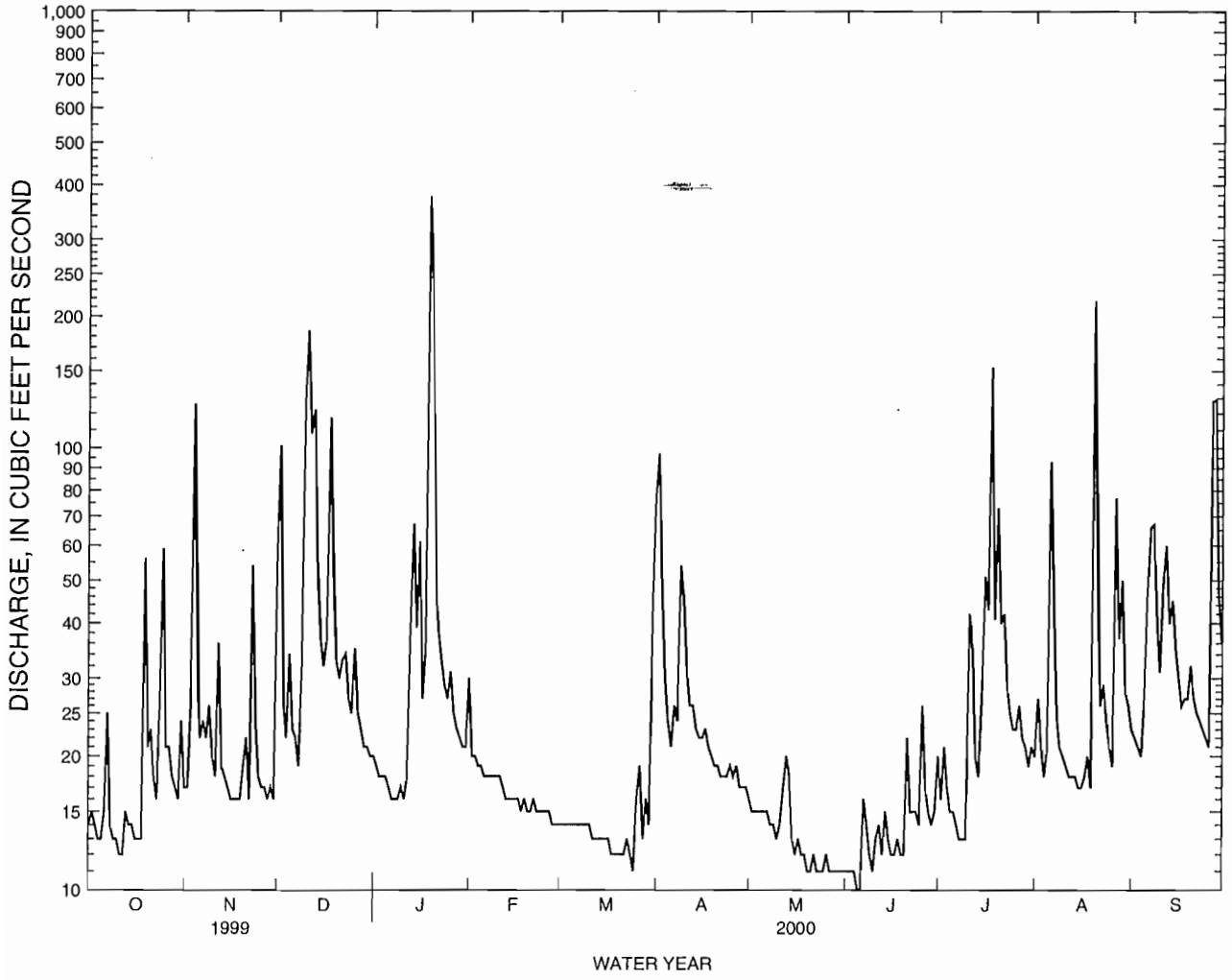
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	17	58	20	30	14	77	16	11	20	20	23
2	15	17	101	19	20	14	97	15	11	16	27	22
3	14	26	27	18	20	14	47	15	11	21	21	21
4	13	126	22	18	19	14	30	15	11	17	18	20
5	13	32	34	18	19	14	24	15	10	15	21	27
6	15	22	23	17	18	14	21	15	10	15	93	47
7	25	24	22	16	18	14	26	15	16	14	44	66
8	14	22	19	16	18	14	24	14	14	13	25	67
9	13	26	31	16	18	14	54	14	12	13	21	41
10	13	20	129	17	18	14	45	13	11	13	20	31
11	12	18	185	16	18	14	31	14	13	42	19	49
12	12	36	108	18	17	13	26	17	14	34	18	e60
13	15	19	122	38	16	13	26	20	12	20	18	e40
14	14	18	53	67	16	13	23	18	15	18	18	e45
15	14	17	37	39	16	13	22	13	13	28	17	e35
16	13	16	32	61	16	13	22	12	12	51	17	e30
17	13	16	37	27	16	13	23	13	12	43	18	e26
18	13	16	117	36	15	12	21	12	13	153	20	e27
19	56	16	51	376	16	12	20	12	12	41	17	e27
20	21	19	33	220	15	12	19	11	12	73	217	e32
21	23	22	30	52	15	12	19	11	22	40	46	e27
22	18	16	33	39	16	12	18	12	15	42	26	e25
23	16	54	34	33	15	13	18	11	15	29	29	24
24	26	24	27	29	15	12	18	11	15	25	24	23
25	59	18	25	27	15	11	19	11	14	23	21	22
26	21	17	35	31	15	16	18	12	26	23	19	21
27	21	17	25	25	15	19	19	11	17	26	77	128
28	18	16	23	23	14	13	17	11	15	22	37	129
29	17	17	21	22	14	16	17	11	14	21	50	47
30	16	16	21	21	---	14	17	11	15	19	28	36
31	24	---	20	21	---	43	---	11	---	21	26	---
TOTAL	591	740	1535	1396	493	449	858	412	413	951	1072	1218
MEAN	19.1	24.7	49.5	45.0	17.0	14.5	28.6	13.3	13.8	30.7	34.6	40.6
MAX	59	126	185	376	30	43	97	20	26	153	217	129
MIN	12	16	19	16	14	11	17	11	10	13	17	20
AC-FT	1170	1470	3040	2770	978	891	1700	817	819	1890	2130	2420
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2000, BY WATER YEAR (WY)												
MEAN	32.1	44.6	38.0	37.4	36.0	43.5	44.9	37.8	26.9	32.3	30.2	29.7
MAX	55.1	170	101	94.9	141	176	137	102	56.5	90.5	73.7	84.7
(WY)	1992	1991	1988	1988	1969	1982	1963	1965	1978	1987	1978	1994
MIN	12.6	14.5	14.5	12.9	13.2	14.5	19.3	13.3	13.8	15.0	13.6	13.3
(WY)	1985	1963	1978	1977	1978	2000	1992	2000	2000	1984	1984	1975

e Estimated

HAWAII, ISLAND OF OAHU

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1959 - 2000	
ANNUAL TOTAL	9850		10128			
ANNUAL MEAN	27.0		27.7		36.3	
HIGHEST ANNUAL MEAN					67.2	1982
LOWEST ANNUAL MEAN					20.1	1984
HIGHEST DAILY MEAN	185	Dec 11	376	Jan 19	1750	Apr 15 1963
LOWEST DAILY MEAN	11	Jun 12	10	Jun 5	10	Jun 5 2000
ANNUAL SEVEN-DAY MINIMUM	12	Jun 2	11	May 31	11	May 31 2000
ANNUAL RUNOFF (AC-FT)	19540		20090		26300	
10 PERCENT EXCEEDS	45		47		57	
50 PERCENT EXCEEDS	19		18		23	
90 PERCENT EXCEEDS	13		12		15	



HAWAII, ISLAND OF OAHU

16302000 PUNALUU DITCH NEAR PUNALUU

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

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

REVISED RECORDS.--WSP 1719: 1954-55, WDR HI-91-1: 1990 (Maximum and minimum daily discharges).

GAGE.--Water-stage recorder. Elevation of gage is 200 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Ben Shimizu. Records good. Ditch diverts water from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--47 years (water years 1954-2000), 8.21 ft^3/s (5,950 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, October 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 17 ft^3/s, December 13-14, January 22; minimum daily, 1.0 ft^3/s, December 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.0	13	13	14	13	13	9.9	6.6	11	12	10	7.7
2	7.0	13	7.3	14	15	13	8.0	6.1	10	12	7.9	9.9
3	10	13	7.9	15	14	13	5.4	5.6	11	11	5.9	15
4	12	6.8	14	14	13	12	4.8	5.2	11	11	5.8	14
5	11	10	11	14	14	12	10	5.0	11	11	6.9	13
6	10	15	8.9	13	15	13	13	4.7	11	12	7.9	9.0
7	8.7	13	7.6	13	15	12	11	4.6	9.2	12	5.4	5.4
8	7.7	12	6.9	e14	14	11	13	4.4	7.9	11	4.7	5.2
9	6.6	10	8.5	e14	15	10	10	8.0	9.5	12	10	9.9
10	5.6	8.6	12	e13	14	9.7	8.7	13	12	11	14	16
11	8.3	12	1.0	13	13	11	16	12	11	7.4	13	12
12	12	13	11	15	14	13	14	11	11	11	12	8.0
13	11	11	17	13	14	12	15	9.9	12	12	13	7.4
14	11	9.8	17	12	14	11	12	10	11	13	13	7.0
15	9.7	8.7	16	13	14	9.3	11	13	11	14	13	12
16	8.4	8.3	16	9.6	14	8.0	12	12	11	14	13	16
17	11	11	16	13	13	7.5	14	12	11	13	12	15
18	12	13	14	10	14	6.9	13	11	12	12	9.8	13
19	8.1	13	4.6	8.2	14	9.8	12	11	11	14	11	11
20	9.5	13	11	2.1	14	11	9.5	13	12	16	9.6	9.8
21	11	12	15	11	13	9.1	10	13	11	14	13	9.2
22	8.7	14	15	17	13	9.7	12	13	9.4	14	13	13
23	10	12	13	16	13	11	10	12	10	14	12	15
24	14	13	13	14	12	9.0	9.2	11	12	12	11	14
25	14	15	13	13	11	7.3	8.4	9.7	12	11	9.3	15
26	12	13	8.0	12	11	6.0	7.9	8.7	12	13	8.7	15
27	10	13	9.7	9.2	12	10	7.0	7.2	11	12	9.3	13
28	8.6	13	15	13	13	11	5.7	6.2	9.9	11	15	6.7
29	7.6	9.9	14	16	14	9.2	7.5	5.4	9.0	12	12	5.2
30	9.3	11	14	15	---	9.8	7.5	9.1	10	13	10	10
31	11	---	14	14	---	11	---	12	---	12	8.9	---
TOTAL	303.8	353.1	364.4	397.1	392	321.3	307.5	285.4	322.9	379.4	320.1	332.4
MEAN	9.80	11.8	11.8	12.8	13.5	10.4	10.2	9.21	10.8	12.2	10.3	11.1
MAX	14	15	17	17	15	13	16	13	12	16	15	16
MIN	5.6	6.8	1.0	2.1	11	6.0	4.8	4.4	7.9	7.4	4.7	5.2
AC-FT	603	700	723	788	778	637	610	566	640	753	635	659

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2000, BY WATER YEAR (WY)

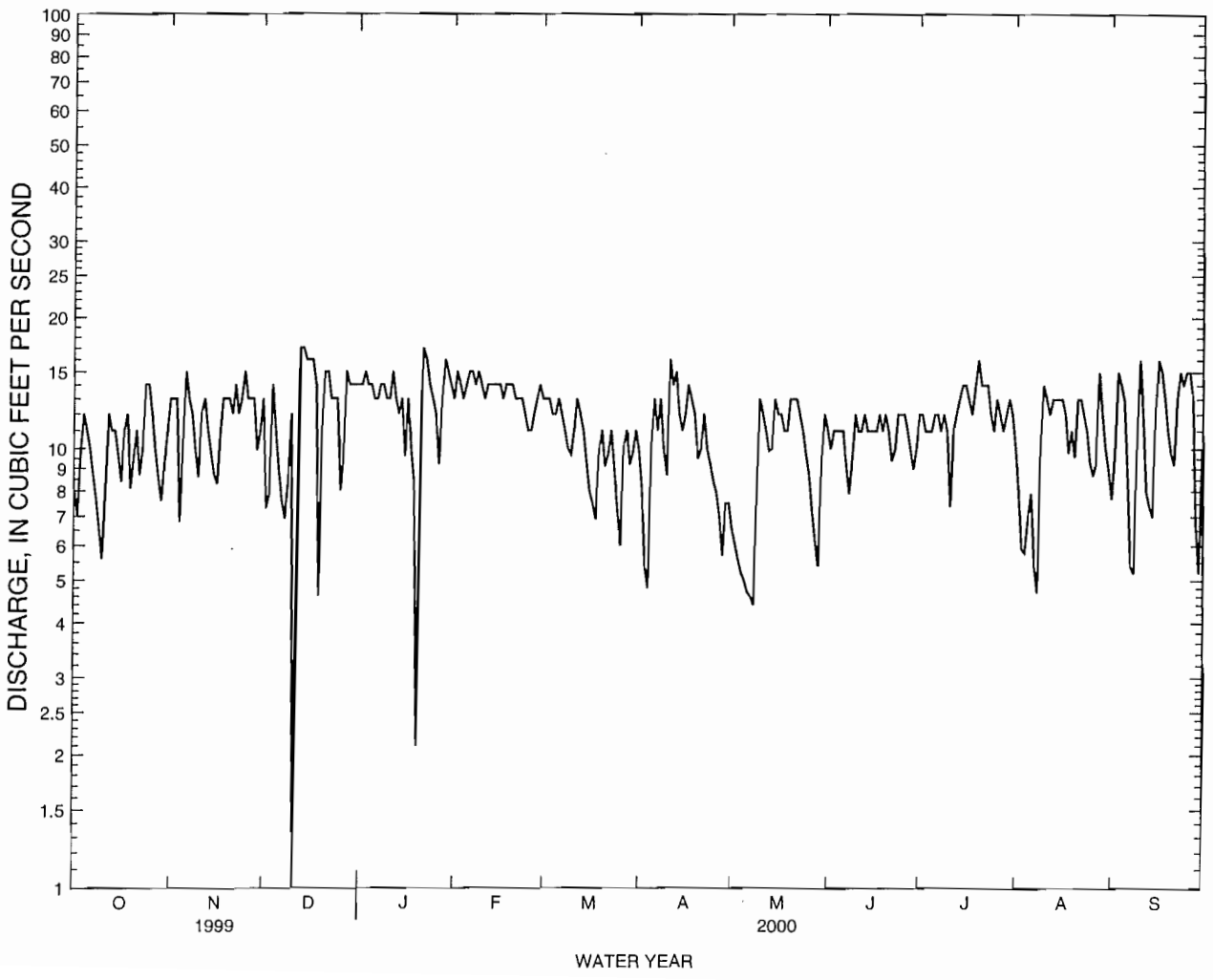
MEAN	9.11	7.57	6.15	6.07	6.11	6.90	8.39	8.71	9.56	10.0	10.2	10.0
MAX	26.4	15.3	16.0	17.6	21.7	16.1	19.0	21.2	22.6	22.0	23.9	21.3
(WY)	1965	1988	1988	1960	1964	1964	1961	1964	1963	1963	1958	1958
MIN	.002	.000	.001	.003	.011	.046	.015	.027	.020	.003	.002	.001
(WY)	1981	1981	1981	1981	1981	1979	1979	1981	1979	1980	1974	1980

e Estimated

HAWAII, ISLAND OF OAHU

16302000 PUNALUU DITCH NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1953 - 2000	
ANNUAL TOTAL	3645.2		4079.4			
ANNUAL MEAN	9.99		11.1		8.21	
HIGHEST ANNUAL MEAN					15.2	1964
LOWEST ANNUAL MEAN					.23	1981
HIGHEST DAILY MEAN	17	Dec 13	17	Dec 13	54	Oct 31 1964
LOWEST DAILY MEAN	1.0	Dec 11	1.0	Dec 11	.00	Dec 7 1963
ANNUAL SEVEN-DAY MINIMUM	5.1	Mar 14	5.1	May 2	.00	Jan 5 1969
ANNUAL RUNOFF (AC-FT)	7230		8090		5950	
10 PERCENT EXCEEDS	14		14		17	
50 PERCENT EXCEEDS	10		11		7.2	
90 PERCENT EXCEEDS	5.6		7.3		.26	



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 west of Kahana, and 1.8 mi southwest of Punaluu.

DRAINAGE AREA.--2.78 mi^2.

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

REVISED RECORDS.--WSP 1569: Drainage area. WRD Hawaii 1974: 1971-72(P), 1973(M). WDR HI-78-1: 1954(M), 1955-70(P).

GAGE.--Gage destroyed by flood of March 20-21, 1991 was restored and water-stage recorder installed on March 29, 1993. Masonry control and elevation of gage is 212 ft above mean sea level (from topographic map). Prior to March 29, 1993, datum 2.00 ft higher.

REMARKS.--Records computed by Vaughn Kunishige. Records good below 20 ft^3/s and poor above that. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--47 years (water years 1954-2000), 16.6 ft^3/s (12,030 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft^3/s, March 20, 1991, gage height, 10.02 ft, from rating curve extended above 170 ft^3/s on basis of slope-area measurements at gage heights 7.77 ft and 9.60 ft; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 10	2130	*679	*4.85	No peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	.41	23	3.2	4.7	.87	20	6.7	.88	.45	4.3	8.0
2	5.8	.27	53	2.9	1.6	.35	36	7.1	1.9	.21	12	5.7
3	2.0	1.3	12	2.0	2.2	1.3	22	7.5	.73	2.1	8.7	1.1
4	.24	76	3.6	1.9	3.1	2.3	16	7.8	1.0	1.4	8.2	1.6
5	1.2	11	7.7	2.1	2.6	1.2	7.8	8.1	1.1	1.2	7.0	4.9
6	3.4	2.0	7.7	2.8	1.1	.68	3.9	8.2	1.4	1.2	9.7	24
7	4.2	3.6	8.4	3.5	1.4	1.8	6.7	8.2	3.3	.64	15	21
8	4.8	4.2	8.6	2.5	1.8	2.9	5.3	8.5	4.0	1.1	9.9	20
9	5.9	5.9	9.6	1.8	1.2	3.1	28	4.5	2.6	.87	4.3	11
10	6.8	6.2	55	2.9	1.7	3.7	21	.19	.31	1.9	.76	3.2
11	3.7	2.4	93	2.1	2.1	2.7	6.3	1.0	1.1	18	1.2	19
12	.36	5.0	43	1.5	1.5	.55	5.0	2.1	1.2	21	2.3	18
13	1.6	3.9	29	6.2	1.0	1.7	3.6	2.8	.44	3.3	1.1	17
14	2.1	4.5	9.2	9.3	1.1	2.5	4.9	2.1	2.1	1.1	.53	20
15	2.6	5.2	7.1	10	.92	3.9	6.0	.10	.99	2.0	.68	10
16	4.4	5.6	5.1	17	1.3	5.1	4.2	.48	.96	6.4	.29	4.4
17	1.6	2.7	8.4	5.3	1.7	5.6	2.7	1.2	.83	7.7	2.0	4.6
18	.58	.61	54	19	.73	6.4	2.4	1.7	.86	25	3.7	9.8
19	30	1.3	33	92	.68	3.2	3.5	1.2	.90	5.2	2.1	11
20	6.3	5.6	15	84	.78	2.4	5.4	.11	.44	15	58	14
21	3.5	5.2	7.1	24	1.2	4.1	4.3	.04	1.3	6.9	12	9.9
22	4.7	2.1	10	8.5	1.9	3.3	2.7	.18	2.6	9.2	4.4	5.0
23	2.7	19	11	7.0	1.8	2.6	3.9	.78	2.0	4.3	5.3	2.5
24	1.2	16	6.8	6.6	2.0	4.1	5.2	1.7	.14	5.5	5.3	3.0
25	2.5	1.3	6.9	6.4	3.1	5.7	5.8	2.6	.61	4.9	6.0	2.3
26	2.2	1.9	26	8.4	2.8	7.6	6.4	3.5	5.7	3.1	6.2	1.5
27	3.4	1.7	11	9.4	2.0	3.4	7.1	4.9	2.0	3.1	19	21
28	4.5	1.7	3.8	4.8	.91	1.7	7.9	5.8	2.6	3.7	5.2	51
29	5.5	4.4	4.1	2.1	.16	6.4	5.9	6.6	3.6	2.5	12	24
30	3.7	2.6	4.5	2.0	---	3.5	5.9	2.9	1.8	1.4	7.2	14
31	2.8	---	3.4	3.3	---	20	---	.14	---	4.0	7.6	---
TOTAL	128.78	203.59	580.0	354.5	49.08	114.65	265.8	108.72	49.39	164.37	241.96	362.5
MEAN	4.15	6.79	18.7	11.4	1.69	3.70	8.86	3.51	1.65	5.30	7.81	12.1
MAX	30	76	93	92	4.7	20	36	8.5	5.7	25	58	51
MIN	.24	.27	3.4	1.5	.16	.35	2.4	.04	.14	.21	.29	1.1
AC-FT	255	404	1150	703	97	227	527	216	98	326	480	719

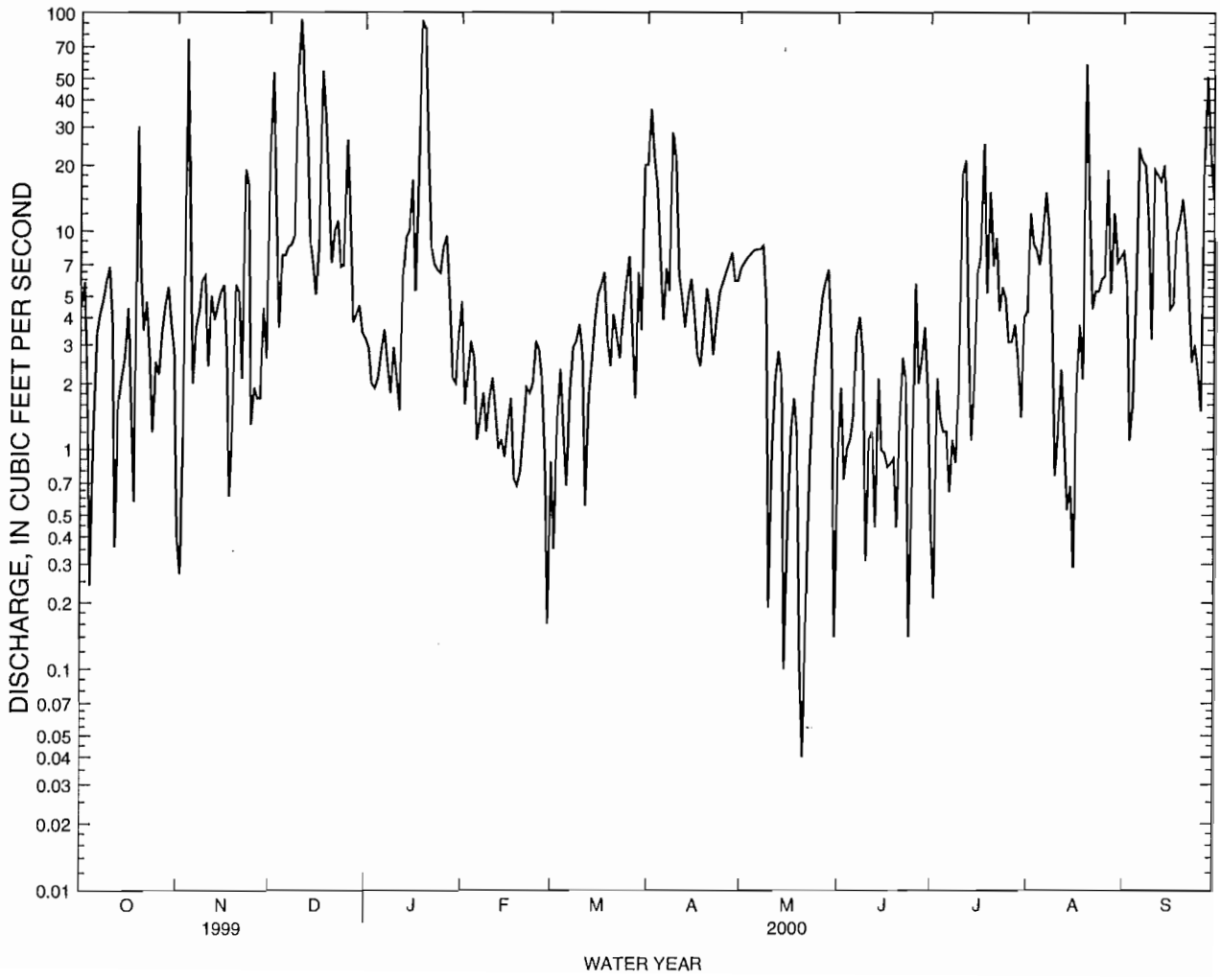
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 2000, BY WATER YEAR (WY)

MEAN	13.5	19.9	20.4	20.7	20.7	21.3	21.2	16.6	11.1	11.9	11.2	10.2
MAX	38.7	74.7	64.5	40.9	76.3	73.1	84.6	64.9	35.4	39.0	36.9	30.0
(WY)	1959	1991	1965	1988	1969	1982	1963	1965	1982	1974	1982	1994
MIN	.28	4.58	.23	3.32	.58	3.19	2.37	1.00	.000	.000	.31	.49
(WY)	1958	1960	1960	1960	1964	1993	1954	1961	1953	1953	1961	1961

HAWAII, ISLAND OF OAHU

16303000 PUNALUU STREAM NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1953 - 2000	
ANNUAL TOTAL	3138.59		2623.34			
ANNUAL MEAN	8.60		7.17		16.6	
HIGHEST ANNUAL MEAN					35.4	1982
LOWEST ANNUAL MEAN					7.17	2000
HIGHEST DAILY MEAN	93	Dec 11	93	Dec 11	1010	Apr 15 1963
LOWEST DAILY MEAN	.17	Sep 10	.04	May 21	.00	Jun 1 1953
ANNUAL SEVEN-DAY MINIMUM	1.2	Sep 5	.69	May 15	.00	Jun 1 1953
ANNUAL RUNOFF (AC-FT)	6230		5200		12030	
10 PERCENT EXCEEDS	16		17		30	
50 PERCENT EXCEEDS	5.5		3.7		11	
90 PERCENT EXCEEDS	1.6		.87		2.3	



HAWAII, ISLAND OF OAHU

16304200 KALUANUI STREAM NEAR PUNALUU

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

DRAINAGE AREA.--1.11 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 110 ft above mean sea level (from topographic map).

REMARKS.--Records computed by S.T.M. Young. Records good except for discharges greater than 50 ft^3/s which are fair and for estimated periods which are poor. No diversion upstream of station.

AVERAGE DISCHARGE.--33 years (water years 1968-2000), 4.29 ft^3/s (3,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s, January 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/s on basis of slope-area measurements at gage heights 8.85 ft and 10.0 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Aug. 20	1630	*179	*7.04				

Minimum discharge, no flow on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.22	e1.1	e13	e.70	2.1	.13	29	.68	.14	5.8	2.9	1.2
2	.58	e1.1	e55	e.64	.70	.10	37	.60	.13	1.3	1.9	1.0
3	.48	e2.2	e3.5	e.62	.47	.09	13	.55	.10	4.6	1.3	.84
4	.23	e9.6	e1.9	e.58	.39	.11	4.6	.49	.09	1.3	1.0	.72
5	.23	e1.5	e5.0	e.56	.35	.38	3.3	.44	.08	.92	1.2	16
6	1.9	e.92	e3.3	e.98	.30	.17	2.0	.54	.05	2.3	.89	7.8
7	1.2	e1.8	e2.2	e1.2	.26	.11	4.0	.52	3.1	2.1	1.0	9.5
8	.49	e1.9	e1.4	.77	.24	.11	11	.81	1.3	.90	.67	7.4
9	.41	e4.1	e9.0	1.0	.22	.08	25	.86	1.1	.97	.52	2.6
10	1.0	e1.1	e18	2.4	.20	.07	8.1	.39	.41	.78	.49	1.7
11	.44	e.82	e22	2.6	.17	.02	2.8	1.3	.21	25	.46	4.4
12	1.1	e9.0	e7.6	3.5	.16	.00	1.9	2.9	.16	5.3	.34	4.7
13	3.0	e1.1	e7.6	8.0	.15	.00	2.2	1.6	.14	1.8	.32	3.8
14	.72	e1.1	e3.1	9.1	.13	.00	1.4	.81	.49	1.3	.31	11
15	e.54	e.80	e2.2	9.2	.12	.00	1.2	.50	.51	6.1	1.7	2.6
16	e.52	e.72	e1.9	7.5	.11	.00	1.7	.35	.19	8.1	1.1	1.6
17	e.44	e.66	e2.0	1.9	.10	.00	6.3	.37	.57	5.7	4.4	2.5
18	e.38	e.88	e3.3	5.5	.09	.00	1.7	.26	3.7	12	2.3	3.0
19	e7.9	e1.6	e1.9	29	.11	.00	1.2	.24	.60	3.8	.76	1.7
20	e1.0	e1.9	e1.4	28	.18	.00	.95	.21	.30	18	34	4.3
21	e3.3	e3.3	e1.4	5.9	.11	.00	1.5	.17	.26	4.5	3.3	1.4
22	e1.2	e15	e2.0	2.9	1.9	.01	1.0	.17	.30	11	1.4	1.1
23	e.60	e11	e2.2	1.9	.40	.60	1.4	.17	2.9	3.4	3.4	.86
24	e5.2	e2.4	e1.2	1.5	.19	.39	2.6	.16	1.6	2.3	1.3	.73
25	e7.6	e1.2	e1.0	1.2	.12	.33	2.9	.14	.86	2.2	1.2	.62
26	e1.6	e1.0	e2.4	1.5	.11	7.1	2.3	.13	.83	3.6	.78	.52
27	e1.7	e1.2	e1.2	1.4	.62	3.9	1.8	.14	.61	9.7	18	21
28	e.86	e.88	e.90	.85	.47	.83	1.1	.13	.32	3.5	10	27
29	e1.1	e1.1	e.84	.74	.18	13	.94	.11	.28	2.5	13	4.2
30	e.68	e1.3	e.82	.65	---	1.4	.81	.12	.66	1.7	2.0	2.3
31	e3.5	---	e.74	.57	---	62	---	.12	---	3.8	1.5	---
TOTAL	50.12	82.28	180.00	132.86	10.65	90.93	174.70	15.98	21.99	156.27	113.44	148.09
MEAN	1.62	2.74	5.81	4.29	.37	2.93	5.82	.52	.73	5.04	3.66	4.94
MAX	7.9	15	55	29	2.1	62	37	2.9	3.7	25	34	27
MIN	.22	.66	.74	.56	.09	.00	.81	.11	.05	.78	.31	.52
AC-FT	99	163	357	264	21	180	347	32	44	310	225	294

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 2000, BY WATER YEAR (WY)

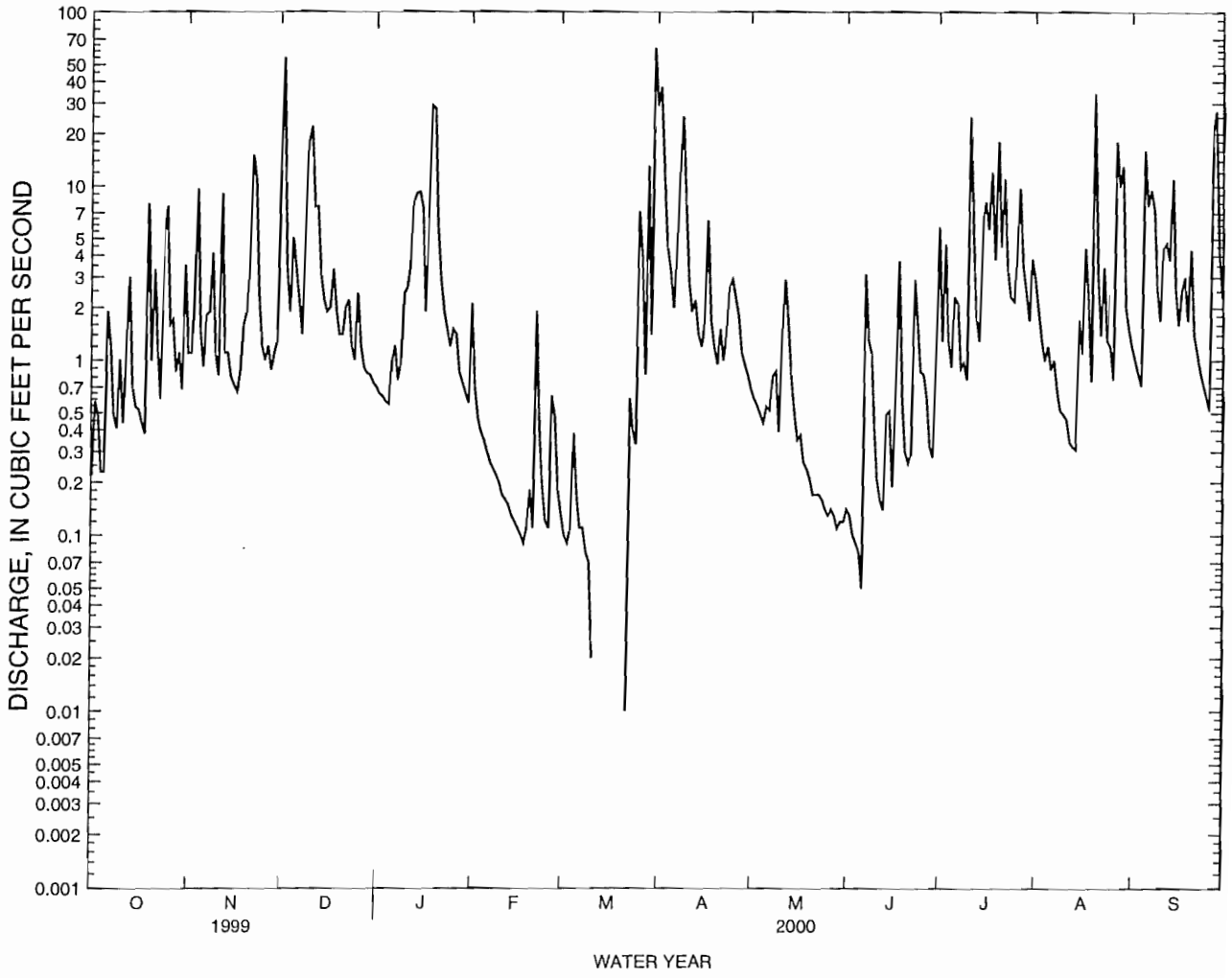
MEAN	3.28	5.88	5.01	5.27	4.39	5.42	5.74	3.63	2.76	4.06	3.21	3.04
MAX	7.68	19.0	17.7	17.9	19.7	32.2	19.3	7.93	7.72	11.7	8.37	9.34
(WY)	1992	1991	1988	1988	1979	1982	1989	1988	1987	1982	1991	1994
MIN	.27	1.66	.48	.26	.37	.14	.87	.52	.61	.21	.53	.22
(WY)	1985	1981	1977	1986	2000	1983	1979	2000	1981	1971	1984	1975

e Estimated

HAWAII, ISLAND OF OAHU

16304200 KALUANUI STREAM NEAR PUNALUU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1967 - 2000	
ANNUAL TOTAL	1107.00		1177.31			
ANNUAL MEAN	3.03		3.22		4.29	
HIGHEST ANNUAL MEAN					9.94	1982
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	55	Dec 2	62	Mar 31	230	Feb 1 1969
LOWEST DAILY MEAN	.15	Sep 15	.00	Mar 12	.00	Jul 24 1971
ANNUAL SEVEN-DAY MINIMUM	.22	Sep 11	.00	Mar 12	.00	Sep 14 1975
ANNUAL RUNOFF (AC-FT)	2200		2340		3110	
10 PERCENT EXCEEDS	7.7		8.0		9.4	
50 PERCENT EXCEEDS	1.5		1.1		1.4	
90 PERCENT EXCEEDS	.43		.13		.26	



HAWAII, ISLAND OF OAHU

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

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

DRAINAGE AREA.--3.13 mi^2.

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

REVISED RECORDS.--WDR HI-94-1: 1992-93 (M).

GAGE.--Water-stage recorder and combination pipe culvert and paved road control. Elevation of gage is 590 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Stacie Young. Records fair for discharges up to 30 ft^3/s and poor for discharges greater than 30 ft^3/s and for periods of no gage height records. No diversion upstream of station. Recording rain gage located at station.

AVERAGE DISCHARGE.--37 years (water years 1964-2000), 9.99 ft^3/s (7,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,810 ft^3/s, revised, November 20, 1990, gage height, 11.34 ft, from rating curve extended above 42 ft^3/s on basis of slope-area measurements at gage heights 10.06 ft, and 11.34 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 950 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 11	0230	*1,060	*7.43	No other peak greater than base discharge.			

Minimum discharge, 0.32 ft^3/s, June 22-23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e.66	3.2	44	3.0	6.2	2.4	51	1.4	.82	5.7	2.7	e2.0
2	e.56	2.1	87	2.8	4.7	2.3	148	1.3	.59	3.5	2.1	e1.6
3	e.48	2.0	14	2.7	3.9	2.3	46	1.2	.50	3.3	1.9	e1.3
4	e.48	25	6.6	2.6	3.8	2.2	10	1.2	.48	2.2	1.5	e1.2
5	e.52	10	7.5	2.5	3.7	2.2	8.1	1.1	.45	1.4	1.5	e10
6	e.56	3.1	5.0	2.5	3.6	2.2	3.8	1.2	.40	1.2	1.4	e7.0
7	e.56	7.6	7.5	2.5	3.5	2.2	3.4	1.2	2.7	1.9	1.3	e4.0
8	e.88	5.4	4.6	2.4	3.4	2.1	8.1	1.2	2.2	1.6	1.2	e9.5
9	e.66	6.6	8.2	2.7	3.3	2.0	32	1.2	1.6	1.2	1.1	e3.0
10	e.60	4.2	68	3.4	3.2	2.0	35	1.2	1.5	.94	1.1	e2.2
11	e1.2	2.5	174	4.8	3.1	2.0	6.5	1.4	.81	16	1.0	e1.8
12	e1.1	11	33	2.7	3.1	2.0	3.6	3.8	.57	4.4	.98	e2.2
13	e4.2	3.7	20	4.7	3.0	2.0	3.1	3.2	.44	1.9	.94	2.5
14	e4.0	2.7	9.8	15	2.9	1.9	2.6	1.6	.42	1.4	.94	2.2
15	e1.5	2.5	7.2	5.7	2.9	1.9	2.3	1.1	.41	1.8	.94	2.2
16	e7.4	2.2	5.8	8.3	2.8	1.9	2.4	.93	.35	6.8	.98	1.7
17	e4.1	2.0	5.0	4.0	2.8	1.9	5.6	.85	.39	3.1	2.3	1.5
18	e1.5	2.0	5.2	12	2.8	2.0	4.0	.81	.84	14	2.9	1.6
19	e71	2.3	5.8	66	2.9	2.2	2.3	.73	2.2	3.4	1.9	1.8
20	e12	5.8	4.0	87	2.8	2.2	2.0	.70	.94	5.3	e30	1.4
21	3.1	12	3.7	17	2.6	2.3	2.0	.67	.58	5.0	e20	1.3
22	2.2	3.7	7.5	10	3.3	2.2	2.0	.68	.48	8.9	e3.0	1.3
23	1.9	2.7	7.1	7.4	3.6	2.7	1.9	.64	.42	3.1	e2.2	1.2
24	1.9	4.8	4.2	6.2	2.7	3.8	1.9	.60	1.4	2.4	e1.8	1.2
25	11	2.7	3.3	5.6	2.5	3.7	3.3	.57	1.9	2.4	e1.7	1.1
26	3.7	2.4	31	6.1	2.5	6.2	2.5	.54	1.4	2.2	e1.5	1.1
27	4.2	2.3	10	7.3	2.6	8.8	2.4	.57	.81	5.5	e30	18
28	2.7	3.2	4.2	4.9	2.6	4.6	2.4	.60	.55	3.6	e12	20
29	2.1	3.7	3.6	4.5	2.6	2.3	1.7	.64	.58	2.2	e7.5	4.0
30	1.9	2.8	3.7	4.3	---	4.3	1.5	.64	.55	1.8	e5.0	2.0
31	2.3	---	3.6	4.1	---	134	---	.61	---	1.6	e2.5	---
TOTAL	150.96	146.2	604.1	314.7	93.4	216.8	401.4	34.08	27.28	119.74	145.88	111.9
MEAN	4.87	4.87	19.5	10.2	3.22	6.99	13.4	1.10	.91	3.86	4.71	3.73
MAX	71	25	174	87	6.2	134	148	3.8	2.7	16	30	20
MIN	.48	2.0	3.3	2.4	2.5	1.9	1.5	.54	.35	.94	.94	1.1
AC-FT	299	290	1200	624	185	430	796	68	54	238	289	222

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2000, BY WATER YEAR (WY)

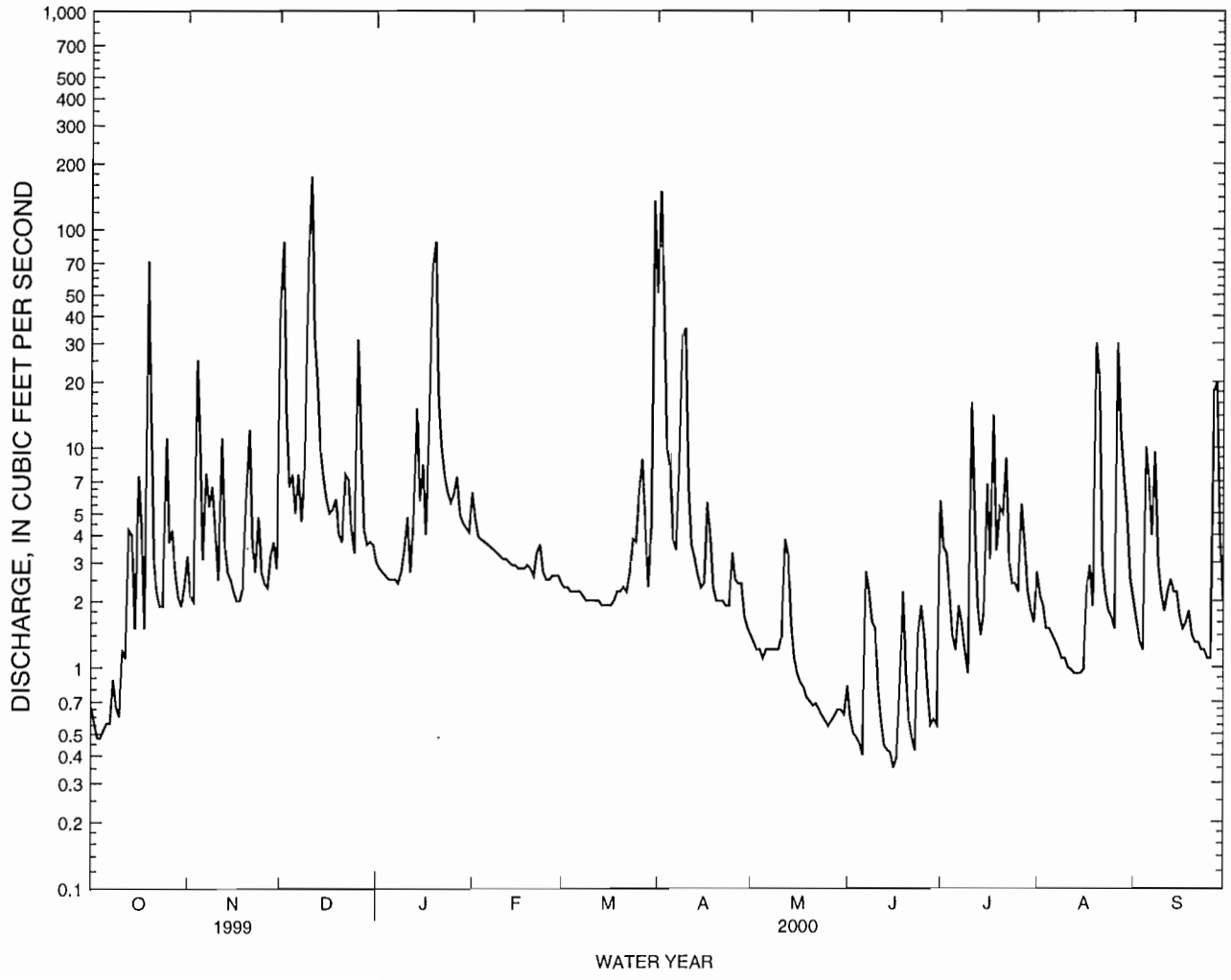
MEAN	6.49	15.4	12.7	14.6	11.8	15.0	13.9	7.93	4.99	7.87	5.31	3.96
MAX	16.3	68.6	44.8	75.8	64.2	77.3	53.6	30.5	20.1	20.2	19.7	10.8
(WY)	1966	1966	1965	1988	1969	1968	1989	1965	1978	1982	1982	1994
MIN	.000	2.27	.91	.45	.073	1.07	.79	.95	.91	.76	.57	.000
(WY)	1985	1990	1977	1986	1978	1983	1992	1966	2000	1971	1984	1984

e Estimated

HAWAII, ISLAND OF OAHU

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1963 - 2000	
ANNUAL TOTAL	2171.19		2366.44			
ANNUAL MEAN	5.95		6.47		9.99	
HIGHEST ANNUAL MEAN					22.1	1982
LOWEST ANNUAL MEAN					4.09	1984
HIGHEST DAILY MEAN	174	Dec 11	174	Dec 11	620	Nov 20 1990
LOWEST DAILY MEAN	.43	Jun 14	.35	Jun 16	.00	Aug 27 1971
ANNUAL SEVEN-DAY MINIMUM	.55	Oct 1	.48	Jun 11	.00	Oct 15 1971
ANNUAL RUNOFF (AC-FT)	4310		4690		7240	
10 PERCENT EXCEEDS	11		10		19	
50 PERCENT EXCEEDS	2.9		2.5		3.3	
90 PERCENT EXCEEDS	.77		.68		.67	



HAWAII, ISLAND OF OAHU

16330000 KAMANANUI STREAM AT MAUNAWAI

LOCATION.--Lat 21°38′20″, long 158°03′27″, Hydrologic Unit 20060000, on right bank, 0.5 mi upstream from Kamehameha Highway, 4.9 mi northeast of Waialua School, and 7.3 mi southwest of Kahuku School.

DRAINAGE AREA.--12.36 mi^2, revised, including that of Elehaha Stream which is mostly diverted into Kamananui Stream since June 14, 1975.

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

REVISED RECORDS.--WSP 1937: 1958-60. WRD Hawaii 1974: 1971(P), 1972-73(M). WDR HI-81-1: Drainage area.

GAGE.--Gage destroyed by flood of November 20, 1990 was restored and water-stage recorder installed on February 25, 1993. Control rebuilt about 75 ft downstream of gage. Elevation of gage is 20 ft above mean sea level (from topographic map). Prior to May 18, 1966, datum 2.00 ft higher.

REMARKS.--Records computed by A.H.M. Okihara. Records poor. Small diversion upstream of station.

AVERAGE DISCHARGE.--26 years (water years 1975-2000), 19.1 ft^3/s (13,800 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s, November 20, 1990, gage height, 15.84 ft, from rating curve extended above 150 ft^3/s on basis of slope-area measurements at gage heights 5.68 ft, 11.46 ft, and 15.84 ft; no flow at times.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 11	0300	*3,520	*8.22	No other peak greater than base discharge.			

Minimum daily discharge, 0.01 ft^3/s, October 8-11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.02	2.6	82	5.7	3.8	.40	120	2.5	.09	.93	4.2	1.3
2	.02	2.6	219	4.3	4.9	.35	306	2.4	.21	8.6	5.5	.67
3	.02	1.5	37	3.7	3.2	.24	118	2.2	.11	4.1	3.7	.48
4	.02	28	14	3.5	2.5	.17	26	2.1	.05	5.3	3.1	.39
5	.02	35	11	3.3	2.3	.10	17	2.0	.04	2.2	2.5	14
6	.02	6.6	9.8	3.2	2.1	.08	11	1.8	.03	1.5	2.1	8.8
7	.02	5.3	10	3.5	2.0	.06	9.0	1.7	.14	1.2	1.6	4.4
8	.01	11	8.5	3.3	1.9	.06	12	1.9	4.1	1.8	1.1	e12
9	.01	6.4	8.8	3.6	1.7	.06	34	2.3	2.6	1.1	.64	e3.0
10	.01	8.4	93	4.1	1.6	.05	47	2.5	2.3	.50	.40	e1.7
11	.01	4.1	646	7.3	1.5	.04	16	2.8	1.2	22	.39	e1.4
12	.02	11	66	4.3	1.4	.04	10	5.2	.49	10	.30	e2.2
13	1.3	9.5	34	4.3	1.2	.04	7.9	10	.15	3.2	.23	e2.6
14	3.9	4.3	17	22	1.0	.04	6.2	5.9	.07	1.7	.19	e2.2
15	1.6	3.2	13	8.2	.98	.03	5.2	3.7	.05	1.3	.18	e2.2
16	3.8	2.5	11	12	.89	.03	4.9	2.4	.04	5.9	.18	e1.6
17	4.5	1.7	8.7	8.5	.83	.03	6.9	1.8	.04	7.4	.22	e1.4
18	1.5	1.2	7.6	11	.68	.04	11	1.5	.04	15	6.7	e1.5
19	123	1.1	10	94	.62	.04	5.8	1.1	1.0	8.1	1.9	e1.8
20	44	5.0	6.6	145	.69	.03	4.6	.79	1.0	4.3	39	e1.3
21	6.8	13	5.4	35	.68	.04	4.3	.49	.34	13	30	e1.2
22	3.1	7.2	6.6	18	.56	.04	3.8	.33	.09	13	3.5	e1.2
23	2.0	3.6	13	12	1.4	.06	3.7	.25	.04	8.0	1.5	e1.1
24	.95	4.7	6.8	9.6	1.1	.09	3.4	.15	.03	5.7	1.1	e1.1
25	11	3.6	4.9	7.3	.66	2.3	5.3	.09	1.8	4.9	1.1	e1.0
26	7.5	2.4	47	6.0	.54	4.7	6.6	.07	1.9	3.6	.55	e1.0
27	4.4	2.2	29	8.6	.53	13	4.8	.06	.93	7.9	36	e27
28	4.5	2.3	11	5.7	.53	10	5.3	.05	.36	10	17	e31
29	2.5	3.7	8.2	4.6	.46	6.6	3.9	.05	.09	5.7	8.9	e4.6
30	1.4	4.5	8.2	3.7	---	9.0	2.9	.05	.04	3.7	6.9	e2.0
31	.87	---	7.2	3.1	---	210	---	.07	---	2.8	2.6	---
TOTAL	228.82	198.2	1460.3	468.4	42.25	257.76	822.5	58.25	19.37	184.43	183.28	136.14
MEAN	7.38	6.61	47.1	15.1	1.46	8.31	27.4	1.88	.65	5.95	5.91	4.54
MAX	123	35	646	145	4.9	210	306	10	4.1	22	39	31
MIN	.01	1.1	4.9	3.1	.46	.03	2.9	.05	.03	.50	.18	.39
AC-FT	454	393	2900	929	84	511	1630	116	38	366	364	270

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2000, BY WATER YEAR (WY)

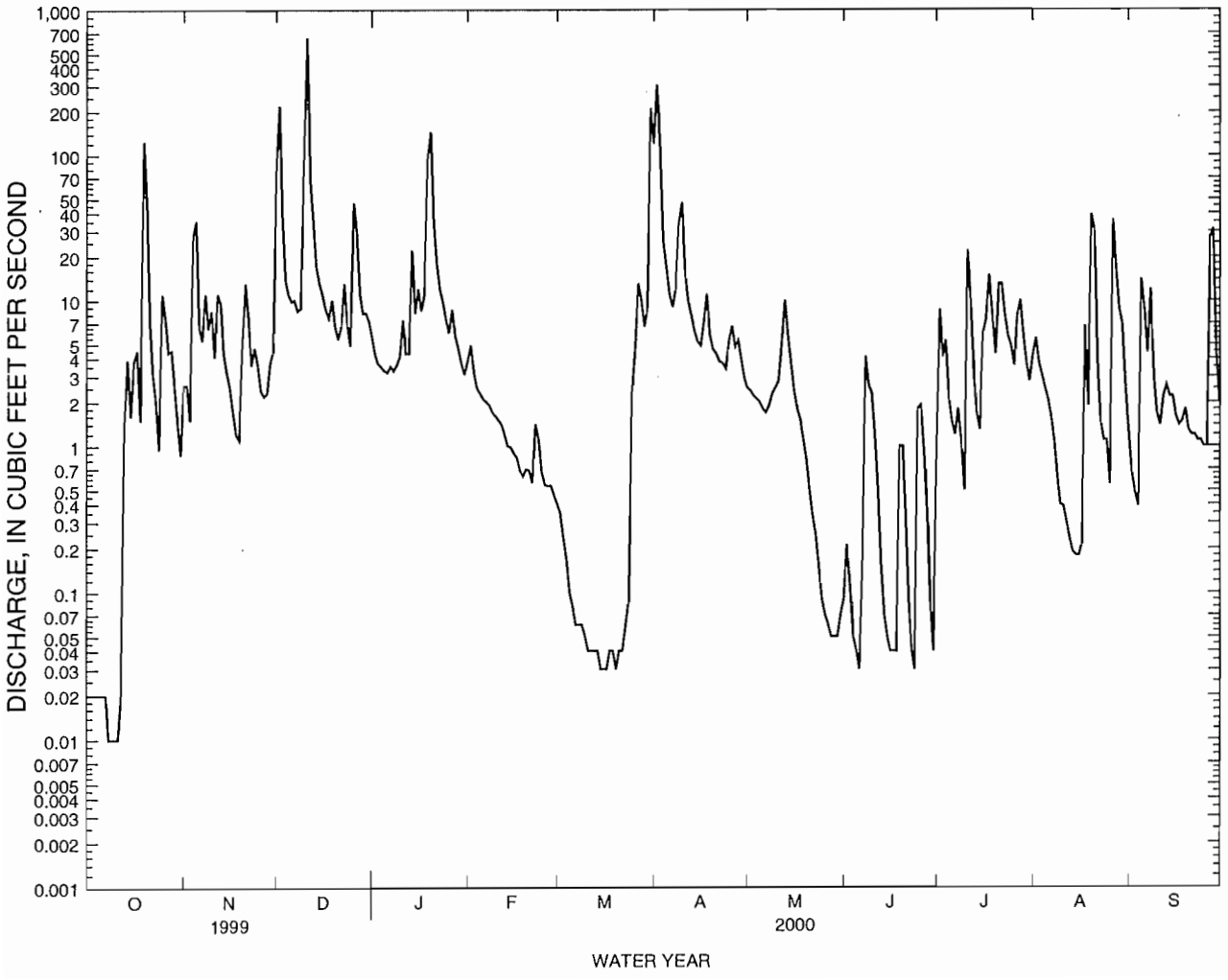
MEAN	11.5	32.0	22.0	31.3	20.5	32.5	26.1	14.3	8.99	13.2	9.59	6.67
MAX	54.1	168	107	143	96.9	155	168	58.3	52.9	52.7	46.2	19.9
(WY)	1992	1991	1988	1988	1979	1982	1989	1988	1978	1989	1995	1994
MIN	.006	2.60	.67	.094	.022	.85	.64	.95	.65	.98	.58	.006
(WY)	1985	1990	1977	1986	1978	1998	1992	1984	2000	1984	1984	1984

e Estimated

HAWAII, ISLAND OF OAHU

16330000 KAMANANUI STREAM AT MAUNAWAI--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1975 - 2000	
ANNUAL TOTAL	3937.91		4059.70			
ANNUAL MEAN	10.8		11.1		19.1	
HIGHEST ANNUAL MEAN					50.3	1982
LOWEST ANNUAL MEAN					4.81	1984
HIGHEST DAILY MEAN	646	Dec 11	646	Dec 11	1940	Jan 1 1988
LOWEST DAILY MEAN	.01	Oct 8	.01	Oct 8	.00	Sep 15 1975
ANNUAL SEVEN-DAY MINIMUM	.01	Oct 5	.01	Oct 5	.00	Sep 15 1975
ANNUAL RUNOFF (AC-FT)	7810		8050		13800	
10 PERCENT EXCEEDS	19		14		30	
50 PERCENT EXCEEDS	3.6		2.6		4.0	
90 PERCENT EXCEEDS	.29		.05		.27	



HAWAII, ISLAND OF OAHU

16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33′55″, long 158°00′10″, Hydrologic Unit 20060000, on left bank, 4.3 mi northeast of Leilehua High School in Wahiawa, and 8.1 mi east of Waialua School.

DRAINAGE AREA.--2.98 mi^2.

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

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Alex Okihara. Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--41 years (water years 1960-2000), 13.5 ft^3/s (9,820 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,540 ft^3/s, July 17, 1974, gage height, 11.94 ft from rating curve extended above 110 ft^3/s on basis of slope-area measurements at gage heights 6.74 ft and 10.12 ft; maximum gage height, 13.20 ft, November 20, 1990; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 11	0315	*913	*6.26				

Minimum discharge, 0.09 ft^3/s, March 18-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	7.5	60	3.0	4.2	.96	130	1.6	.26	5.1	7.1	4.0
2	.80	2.6	133	2.4	5.2	.66	186	1.4	.23	9.2	4.8	3.2
3	1.1	2.4	22	2.2	2.8	.55	55	1.3	.22	16	5.2	2.6
4	1.2	114	9.5	1.9	2.3	.47	17	1.3	.21	7.6	3.1	2.3
5	.93	20	18	1.8	2.1	.41	13	1.1	.21	4.4	2.6	22
6	.78	5.4	8.2	1.7	1.9	.39	7.3	1.0	.18	14	3.6	16
7	4.4	12	11	2.4	1.7	.82	5.4	.98	1.0	16	2.4	30
8	2.3	11	6.6	2.8	1.6	.54	5.9	1.1	5.3	5.1	2.4	24
9	1.5	15	6.5	3.6	1.5	.40	66	1.0	3.3	2.8	2.0	12
10	.98	7.6	92	6.0	1.4	.33	46	1.2	3.3	2.0	1.5	5.7
11	1.0	3.5	181	7.4	1.3	.28	12	1.7	1.4	38	1.4	23
12	1.6	24	55	5.1	1.3	.24	7.1	7.6	.69	30	1.2	19
13	4.7	6.4	43	9.1	1.2	.22	6.7	7.4	.45	7.6	1.1	11
14	6.1	3.4	13	31	1.1	.19	6.4	4.4	.36	4.0	1.1	19
15	2.7	3.3	9.1	29	.97	.16	4.1	2.0	.27	13	1.1	16
16	7.1	2.4	7.2	48	.88	.13	3.8	1.2	1.4	23	3.0	5.8
17	5.6	1.8	6.1	14	.81	.12	12	.86	.94	13	5.1	4.5
18	1.9	1.7	20	35	.79	.10	9.9	.69	5.2	47	7.0	7.3
19	75	3.6	19	122	.75	.10	4.8	.59	5.3	10	4.6	8.4
20	20	8.0	6.2	147	.79	.10	3.3	.51	1.7	46	93	8.4
21	4.4	17	5.1	42	.79	.11	3.0	.46	.87	19	28	6.8
22	2.3	16	9.7	23	1.3	.19	3.7	.45	.67	32	5.8	3.7
23	1.9	8.9	15	11	4.0	.44	2.8	.41	.93	8.4	8.0	2.9
24	1.5	27	10	7.8	1.6	.66	2.5	.36	4.2	6.8	6.2	2.5
25	22	6.1	4.5	6.3	.99	1.5	8.2	.33	3.5	5.8	5.2	2.3
26	6.1	4.1	24	6.4	.78	7.4	6.1	.30	1.6	7.1	3.6	2.0
27	3.7	3.7	16	10	.70	16	5.8	.26	1.1	15	37	29
28	3.4	6.9	5.1	4.9	.65	7.3	4.7	.25	1.5	10	20	63
29	2.0	8.6	3.8	3.9	1.5	19	2.6	.25	.82	6.0	35	16
30	1.4	4.8	3.7	3.4	---	12	1.9	.26	.55	4.7	9.3	5.7
31	7.9	---	5.1	3.1	---	54	---	.26	---	3.7	4.8	---
TOTAL	197.29	358.7	828.4	597.2	46.90	125.77	643.0	42.52	47.66	432.3	316.2	378.1
MEAN	6.36	12.0	26.7	19.3	1.62	4.06	21.4	1.37	1.59	13.9	10.2	12.6
MAX	75	114	181	147	5.2	54	186	7.6	5.3	47	93	63
MIN	.78	1.7	3.7	1.7	.65	.10	1.9	.25	.18	2.0	1.1	2.0
AC-FT	391	711	1640	1180	93	249	1280	84	95	857	627	750

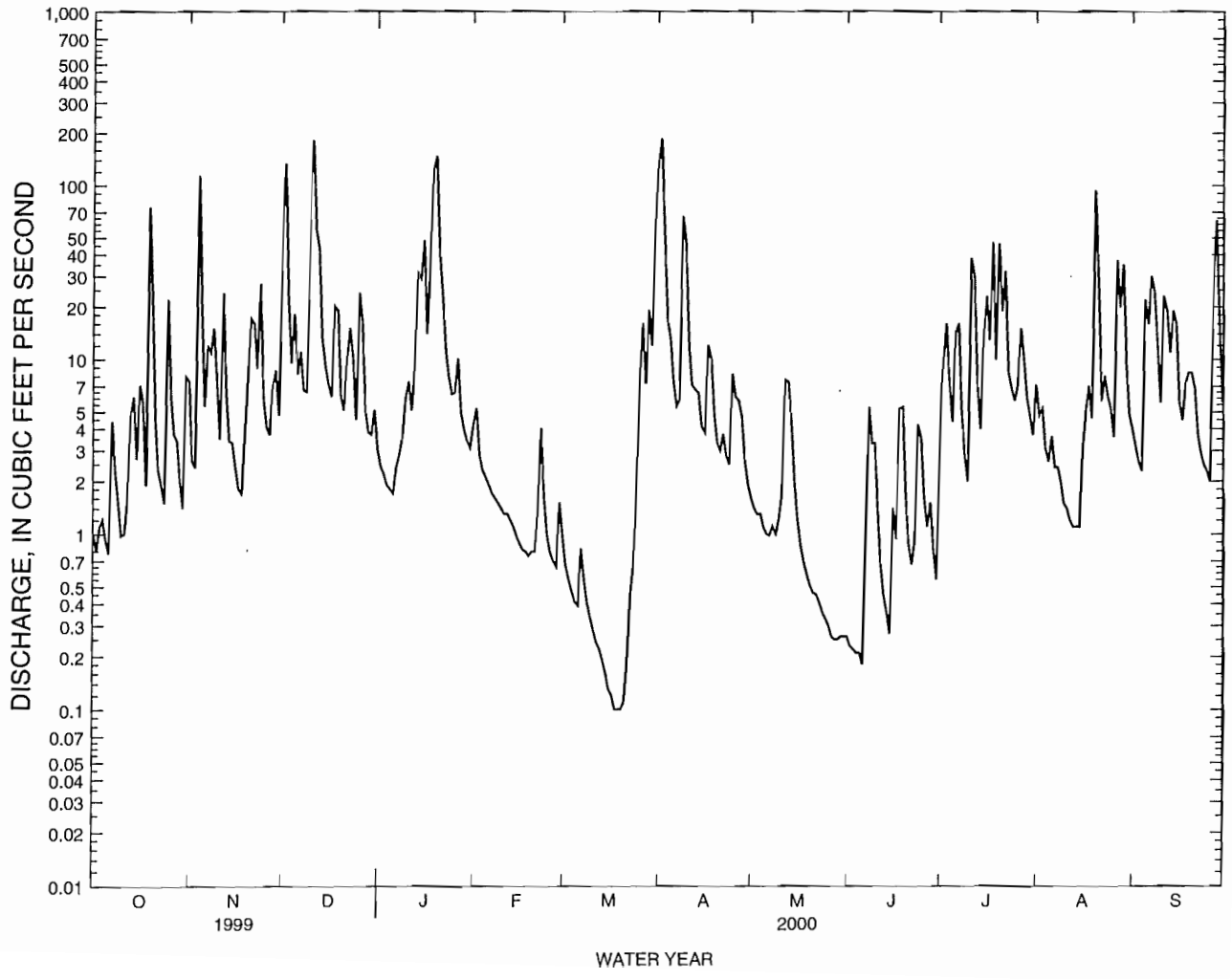
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 2000, BY WATER YEAR (WY)

MEAN	10.8	18.5	15.9	16.2	13.3	20.1	20.6	11.8	7.46	11.8	8.51	7.64
MAX	30.7	71.9	52.6	54.1	66.9	90.0	75.7	43.7	24.9	29.3	31.0	24.9
(WY)	1982	1991	1988	1988	1969	1982	1989	1965	1978	1989	1982	1994
MIN	.057	2.90	1.29	.37	.32	.35	1.57	1.37	1.59	.95	1.51	.52
(WY)	1985	1963	1977	1977	1978	1983	1966	2000	2000	1971	1984	1975

HAWAII, ISLAND OF OAHU

16345000 OPAEULA STREAM NEAR WAHIAWA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1959 - 2000	
ANNUAL TOTAL	3894.66		4014.04			
ANNUAL MEAN	10.7		11.0		13.5	
HIGHEST ANNUAL MEAN					29.7	1982
LOWEST ANNUAL MEAN					7.12	1998
HIGHEST DAILY MEAN	181	Dec 11	186	Apr 2	825	Feb 1 1969
LOWEST DAILY MEAN	.61	Sep 17	.10	Mar 18	.00	Jan 24 1977
ANNUAL SEVEN-DAY MINIMUM	.71	Sep 12	.12	Mar 15	.00	Oct 24 1984
ANNUAL RUNOFF (AC-FT)	7730		7960		9820	
10 PERCENT EXCEEDS	22		24		28	
50 PERCENT EXCEEDS	5.2		4.0		4.6	
90 PERCENT EXCEEDS	1.4		.46		.93	



Surface-Water Station Records for Molokai

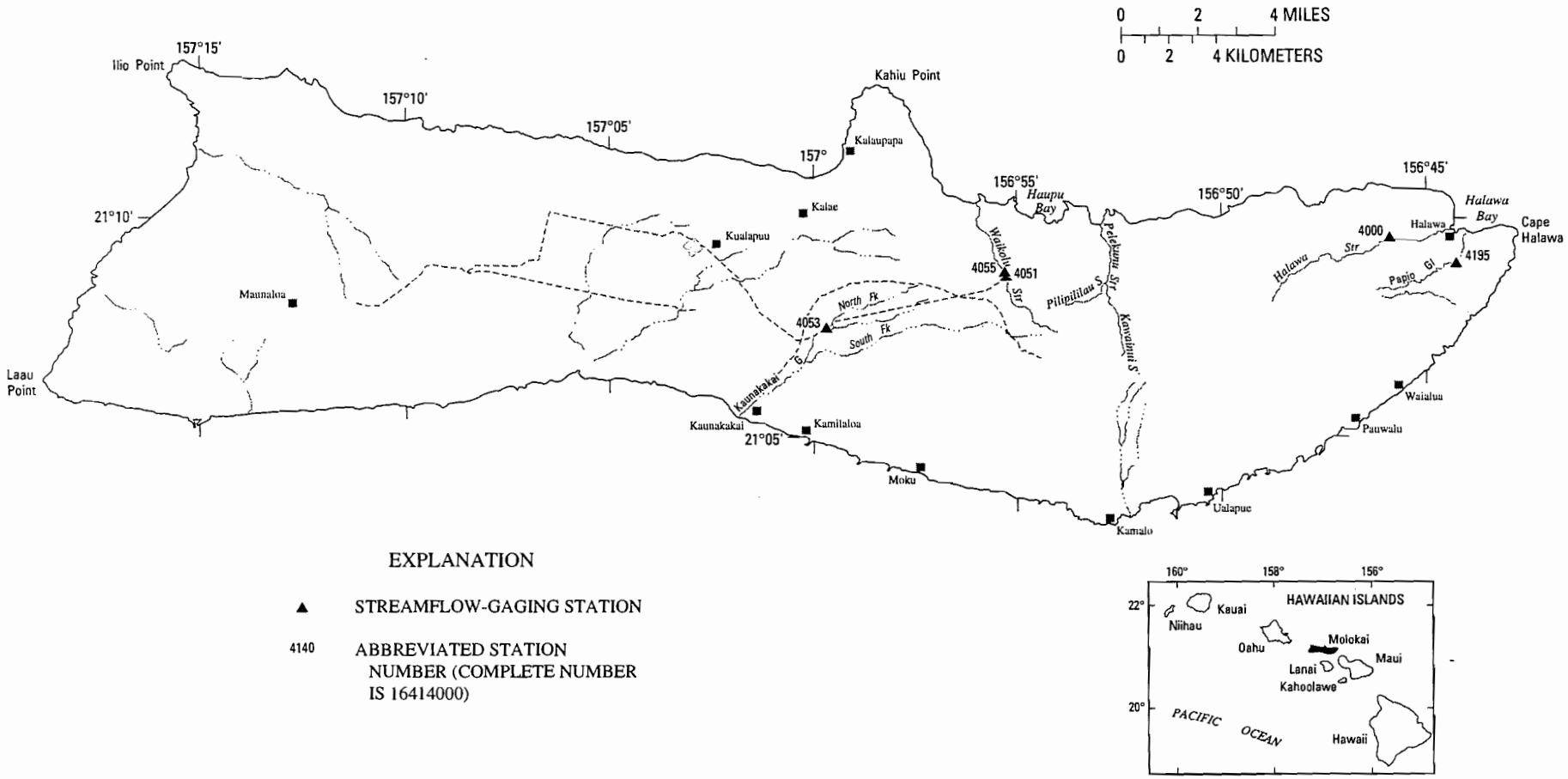


Figure 7. Locations of streamflow-gaging stations on Molokai.

HAWAII, ISLAND OF MOLOKAI

16400000 HALAWA STREAM NEAR HALAWA

LOCATION.--Lat 21°09′31″, long 156°45′53″, Hydrologic Unit 20050000, on right bank 600 ft downstream from Hipuapua Stream, and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi^2.

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS.--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft above mean sea level (from topographic map). Prior to June 25, 1923, at site 350 ft upstream of gage at different datum. June 25, 1923 to July 18, 1932, and November 17, 1937 to February 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records computed by Phil Teeters. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--76 years (water years 1918-31, 1939-2000), 29.6 ft^3/s (21,460 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s, February 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft^3/s, about November 23, 1962.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Aug. 20	0945	*3,120	*10.02	No other peak greater than base discharge.			

Minimum discharge, 3.0 ft^3/s, October 4-5.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	7.8	50	8.2	47	8.5	180	5.3	5.2	80	16	8.4
2	3.3	9.0	23	7.5	9.1	7.2	94	5.0	4.6	21	21	6.7
3	3.2	19	53	7.1	7.3	7.4	27	5.0	4.6	7.6	12	6.0
4	3.1	72	19	6.8	6.6	5.2	28	4.5	3.6	6.2	24	5.9
5	5.1	14	45	6.5	6.2	4.8	24	4.3	4.2	5.6	33	24
6	22	8.1	23	10	5.8	9.2	12	4.2	4.4	9.7	41	115
7	18	24	45	8.7	5.5	13	23	4.1	5.8	8.2	12	104
8	5.3	15	47	15	5.5	5.9	157	4.0	5.7	6.2	9.0	25
9	4.1	31	42	40	6.2	4.8	89	4.0	4.8	12	7.7	14
10	4.9	16	220	24	5.3	4.3	87	3.7	7.4	23	11	10
11	4.2	9.1	110	11	4.9	4.0	25	17	4.9	32	7.6	42
12	3.2	21	73	14	4.7	3.9	14	36	3.9	16	6.4	43
13	3.3	7.8	49	40	4.6	3.7	11	39	15	6.4	6.2	56
14	5.8	7.8	59	47	4.4	3.6	9.3	9.6	32	20	5.8	73
15	3.7	7.1	20	42	4.3	4.0	8.0	5.6	9.3	38	6.7	17
16	6.4	6.1	15	83	4.2	3.8	7.1	4.6	7.2	103	6.4	11
17	4.2	5.7	36	33	4.0	3.5	22	4.6	17	30	56	16
18	4.4	5.8	106	47	7.3	3.3	34	4.1	21	27	22	11
19	3.3	18	55	163	38	3.4	9.7	5.8	6.6	24	18	16
20	3.9	19	15	330	5.9	3.3	7.0	4.4	4.8	104	434	60
21	8.0	15	12	85	4.8	3.2	7.5	4.3	24	17	27	12
22	8.1	33	25	37	10	3.3	6.7	4.9	6.5	17	14	9.0
23	3.6	19	16	17	6.9	5.5	6.2	4.5	8.0	14	33	6.8
24	76	11	10	13	4.9	14	8.0	7.2	9.5	11	37	5.9
25	110	9.1	9.1	12	4.6	7.8	22	6.3	8.2	43	34	5.3
26	12	7.2	119	11	29	50	17	9.9	17	12	25	5.6
27	9.4	6.2	34	12	26	21	32	5.0	7.9	67	61	206
28	6.9	6.0	12	8.5	7.2	14	9.4	3.9	7.0	16	52	76
29	13	9.5	10	7.8	5.4	95	6.8	3.7	9.2	22	26	14
30	8.0	13	18	7.5	---	30	5.9	3.5	20	11	11	34
31	15	---	9.6	17	---	335	---	11	---	24	9.9	---
TOTAL	384.7	452.3	1379.7	1171.6	285.6	685.6	989.6	239.0	289.3	833.9	1085.7	1038.6
MEAN	12.4	15.1	44.5	37.8	9.85	22.1	33.0	7.71	9.64	26.9	35.0	34.6
MAX	110	72	220	330	47	335	180	39	32	104	434	206
MIN	3.1	5.7	9.1	6.5	4.0	3.2	5.9	3.5	3.6	5.6	5.8	5.3
AC-FT	763	897	2740	2320	566	1360	1960	474	574	1650	2150	2060

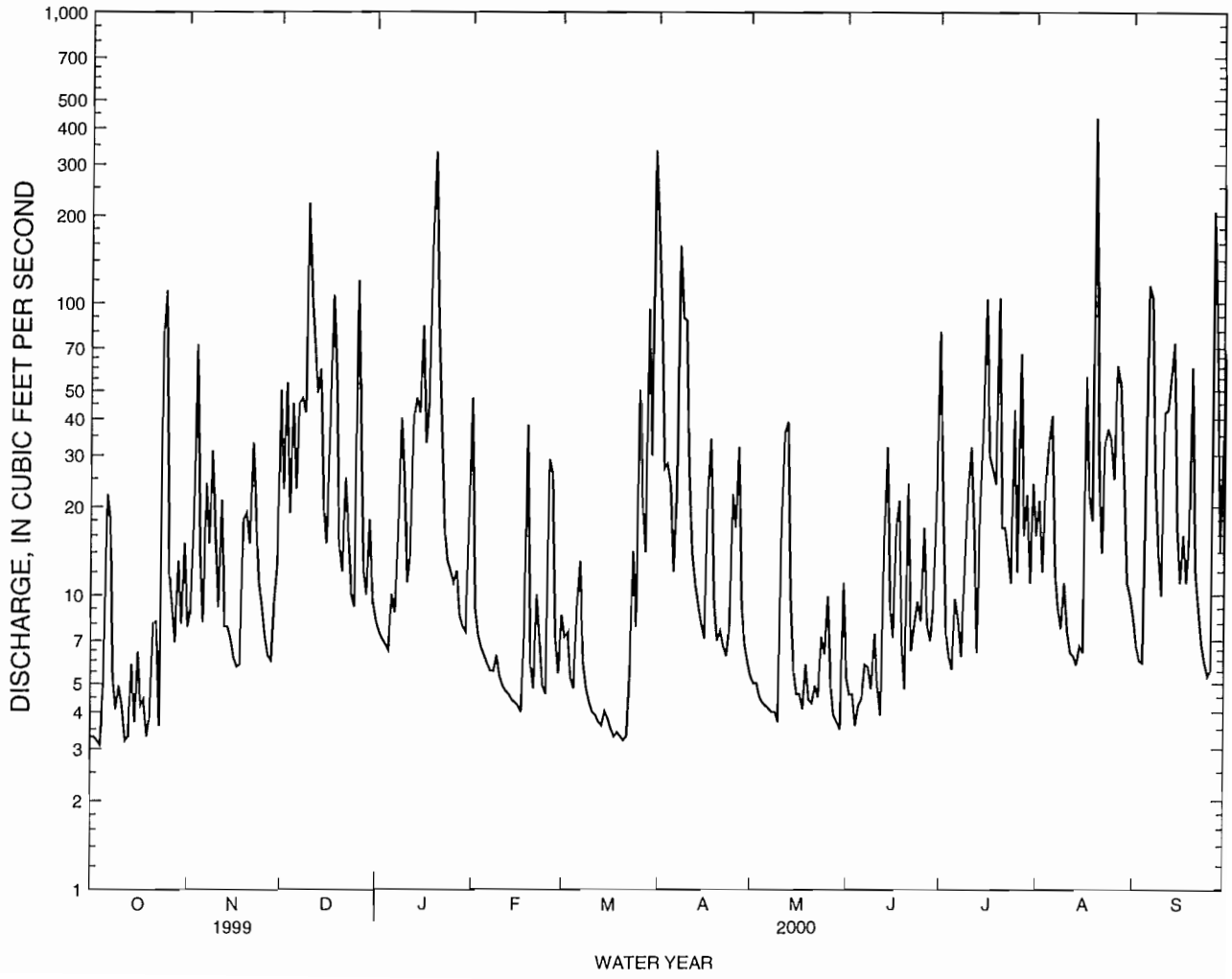
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 2000, BY WATER YEAR (WY)

MEAN	26.3	36.4	36.4	33.7	29.2	37.1	39.9	26.8	18.9	25.7	24.8	20.7
MAX	100	97.8	84.7	118	114	134	157	85.2	59.2	58.2	69.8	58.2
(WY)	1942	1951	1947	1921	1932	1942	1989	1963	1961	1954	1938	1992
MIN	2.04	5.80	8.56	5.31	2.98	5.48	11.7	4.26	4.93	6.00	1.19	2.85
(WY)	1918	1920	1977	1977	1978	1970	1990	1920	1966	1917	1971	1975

HAWAII, ISLAND OF MOLOKAI

16400000 HALAWA STREAM NEAR HALAWA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1917 - 2000	
ANNUAL TOTAL	7926.0		8835.6			
ANNUAL MEAN	21.7		24.1		29.6	
HIGHEST ANNUAL MEAN					47.4	1965
LOWEST ANNUAL MEAN					17.4	1975
HIGHEST DAILY MEAN	220	Dec 10	434	Aug 20	1240	Feb 4 1965
LOWEST DAILY MEAN	3.1	Oct 4	3.1	Oct 4	.86	Sep 1 1971
ANNUAL SEVEN-DAY MINIMUM	3.4	Sep 28	3.4	Mar 16	.90	Aug 26 1971
ANNUAL RUNOFF (AC-FT)	15720		17530		21460	
10 PERCENT EXCEEDS	53		52		65	
50 PERCENT EXCEEDS	11		9.9		13	
90 PERCENT EXCEEDS	4.7		4.2		4.8	



HAWAII, ISLAND OF MOLOKAI

16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft downstream from the east portal, 5.3 mi southeast of Kalaupapa, and 7.5 mi northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft above mean sea level, from tunnel plans.

REMARKS.--Records computed by Matt Wong. Records good except for periods of estimated discharge, which are poor. Tunnel diverts water from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--34 years (water years 1967-2000), 4.82 ft^3/s (3,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, March 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 28 ft^3/s, April 1; minimum daily, 2.2 ft^3/s, February 16, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	8.6	14	5.4	e5.1	2.5	28	5.0	4.6	4.8	7.0	4.1
2	5.8	8.3	13	5.0	e5.0	2.5	25	4.9	4.5	4.8	5.7	3.8
3	5.8	7.3	14	4.9	5.0	2.5	11	4.8	4.5	5.7	5.2	3.7
4	5.8	7.5	9.9	4.8	5.0	3.8	8.5	4.9	4.5	4.7	5.7	3.7
5	5.8	7.5	11	4.8	5.1	5.0	11	4.9	4.5	4.6	7.9	3.6
6	5.8	6.3	7.3	4.8	5.1	4.9	6.8	4.8	4.4	5.0	5.0	4.5
7	5.9	6.9	11	4.8	4.9	5.0	5.8	4.7	4.5	4.8	4.5	9.6
8	4.8	8.6	14	9.0	4.8	5.0	13	4.7	4.4	4.4	4.4	9.0
9	3.5	11	14	15	4.8	4.9	16	4.8	4.4	3.7	4.3	6.4
10	3.4	8.6	25	10	4.8	4.9	15	4.8	4.5	3.6	3.6	4.8
11	3.3	4.8	21	4.1	4.8	4.8	8.8	5.1	4.5	3.6	3.6	4.6
12	3.4	7.4	14	4.2	4.7	4.8	6.5	11	4.4	3.5	3.6	5.8
13	5.2	7.6	10	6.0	4.3	4.8	5.7	19	4.4	3.3	3.6	5.0
14	5.7	7.4	7.2	8.6	2.3	5.3	5.4	7.8	4.3	3.6	3.4	4.8
15	6.7	7.4	5.0	13	2.3	5.1	5.2	5.3	4.4	11	3.1	4.5
16	7.7	7.3	5.3	18	2.2	4.7	5.2	4.9	4.5	13	3.0	4.3
17	7.6	7.3	5.2	12	2.3	4.8	5.2	4.9	4.6	6.1	4.1	4.3
18	7.6	7.3	5.4	18	2.5	4.8	8.1	4.8	4.5	5.0	6.7	4.3
19	7.7	6.5	5.5	17	2.7	4.8	6.5	4.8	4.5	3.7	4.1	4.3
20	7.7	7.3	5.3	24	2.4	4.8	5.4	4.8	4.4	5.9	19	4.3
21	7.6	7.2	5.0	19	2.3	4.8	5.3	4.6	4.4	4.5	7.8	4.2
22	7.6	7.3	7.1	13	2.4	5.0	5.1	4.6	4.2	3.7	6.0	4.1
23	7.6	7.2	7.0	7.5	2.3	7.9	5.0	4.5	4.3	3.4	11	4.1
24	7.6	7.2	5.7	6.1	2.2	8.4	5.1	4.5	4.3	4.2	6.6	4.1
25	9.4	7.1	5.1	e5.3	2.3	6.2	5.9	4.5	4.4	8.6	5.7	3.4
26	8.1	7.1	13	e9.0	3.6	8.2	5.7	4.5	4.3	6.6	5.4	3.5
27	7.7	7.1	10	e7.9	4.0	11	19	4.5	4.2	15	4.5	5.3
28	7.6	7.1	6.2	e5.3	2.7	9.1	8.2	4.5	4.2	7.5	4.8	17
29	7.9	8.5	5.7	e5.0	2.5	12	5.5	4.5	4.4	5.3	4.3	5.6
30	7.7	9.8	9.9	e4.9	---	6.5	5.1	4.5	4.3	5.0	4.0	4.6
31	8.2	---	6.4	e5.0	---	16	---	4.5	---	6.8	4.0	---
TOTAL	202.0	226.5	298.2	281.4	104.4	184.8	272.0	170.4	132.3	175.4	171.6	155.3
MEAN	6.52	7.55	9.62	9.08	3.60	5.96	9.07	5.50	4.41	5.66	5.54	5.18
MAX	9.4	11	25	24	5.1	16	28	19	4.6	15	19	17
MIN	3.3	4.8	5.0	4.1	2.2	2.5	5.0	4.5	4.2	3.3	3.0	3.4
AC-FT	401	449	591	558	207	367	540	338	262	348	340	308

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 2000, BY WATER YEAR (WY)

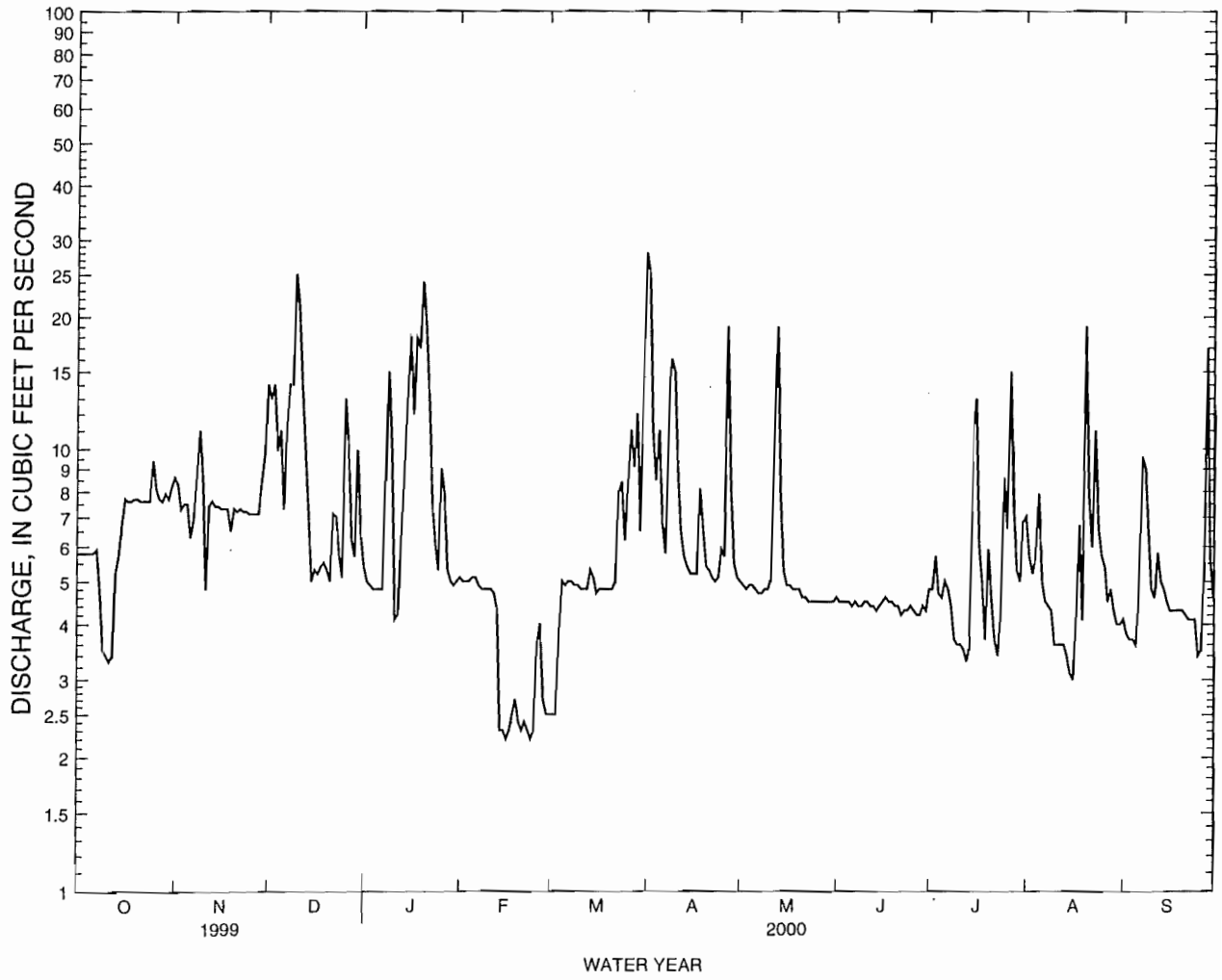
MEAN	4.06	5.78	5.70	5.21	4.91	5.68	5.71	4.57	4.24	4.55	3.86	3.40
MAX	8.05	10.2	10.8	12.5	12.5	13.8	12.8	12.3	9.49	9.89	7.22	5.81
(WY)	1996	1988	1997	1987	1990	1986	1986	1987	1998	1986	1985	1994
MIN	1.80	1.86	.41	.086	.010	.009	.001	.037	.016	.055	.004	.24
(WY)	1972	1992	1968	1968	1968	1968	1967	1967	1974	1974	1974	1974

e Estimated

HAWAII, ISLAND OF MOLOKAI

16405100 MOLOKAI TUNNEL AT EAST PORTAL--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1966 - 2000	
ANNUAL TOTAL	2608.5		2374.3			
ANNUAL MEAN	7.15		6.49		4.82	
HIGHEST ANNUAL MEAN					8.19	1987
LOWEST ANNUAL MEAN					1.31	1974
HIGHEST DAILY MEAN	25	Dec 10	28	Apr 1	41	Mar 19 1986
LOWEST DAILY MEAN	2.9	Aug 25	2.2	Feb 16	.00	Mar 30 1967
ANNUAL SEVEN-DAY MINIMUM	4.1	Aug 19	2.4	Feb 19	.00	Mar 30 1967
ANNUAL RUNOFF (AC-FT)	5170		4710		3490	
10 PERCENT EXCEEDS	12		11		9.9	
50 PERCENT EXCEEDS	6.0		5.1		3.6	
90 PERCENT EXCEEDS	4.4		3.6		1.1	



HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft upstream from the west portal, 2.5 mi northeast of Kaunakakai, and 4.7 mi south of Kalaupapa.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft above mean sea level, from tunnel plans.

REMARKS.--Records computed by Matt Wong. Records good except for estimated period which is poor. Tunnel diverts water from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal and one well in the tunnel near east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--35 years (water years 1966-2000), 7.36 ft^3/s (5,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s, April 8, 9, 1986, January 2, 26, 1988, and March 3, 1989; minimum daily, 1.8 ft^3/s, October 15, 1967, August 27, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 33 ft^3/s, April 1; minimum daily, 4.4 ft^3/s, February 16, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.9	11	17	e7.0	e6.8	4.6	33	7.2	6.6	6.7	9.3	6.1
2	7.9	11	16	e6.7	e6.8	4.6	30	7.1	6.6	6.8	7.8	5.9
3	7.9	9.3	16	e6.5	6.9	4.6	14	7.0	6.6	7.6	7.4	5.7
4	7.9	9.5	13	e6.2	6.9	5.6	9.9	7.0	6.6	6.8	7.2	5.7
5	7.9	9.7	13	e6.3	7.0	7.0	14	7.0	6.5	6.5	10	5.7
6	7.9	8.2	9.3	e6.2	6.9	6.9	9.2	6.8	6.5	7.0	7.0	6.4
7	7.9	8.5	12	e6.3	6.8	7.0	8.0	6.8	6.6	6.8	6.5	11
8	7.2	11	17	e11	6.6	7.1	14	6.8	6.5	6.5	6.4	12
9	5.5	13	17	e18	6.7	7.0	20	6.9	6.5	5.8	6.3	8.7
10	5.5	11	29	e14	6.8	6.9	18	6.9	6.5	5.7	5.7	6.8
11	5.5	7.0	25	e8.0	6.5	6.9	12	7.1	6.5	5.6	5.7	6.6
12	5.5	9.3	18	e8.5	6.6	6.9	8.8	13	6.5	5.6	5.6	7.7
13	7.0	9.8	12	e10	6.5	6.7	7.9	23	6.5	5.3	5.6	7.0
14	7.8	9.5	9.4	e13	4.5	7.4	7.5	11	6.5	5.7	5.5	6.8
15	8.4	9.4	6.9	e17	4.6	7.3	7.5	7.5	6.5	13	5.0	6.4
16	9.8	9.4	7.2	e22	4.4	6.8	7.4	7.0	6.6	16	5.0	6.2
17	9.8	9.3	7.1	e19	4.5	6.8	7.3	7.0	6.6	8.4	5.5	6.2
18	9.8	9.3	7.2	e22	4.6	6.8	10	7.0	6.6	7.0	9.1	6.2
19	9.8	8.3	7.4	e21	5.0	6.8	9.0	6.9	6.5	5.8	6.0	6.2
20	9.8	9.3	7.2	e28	4.6	6.7	7.6	6.9	6.5	7.6	22	6.2
21	9.7	9.2	6.9	e24	4.5	6.8	7.4	6.8	6.4	6.7	11	6.2
22	9.7	9.3	8.7	e17	4.6	7.0	7.3	6.8	6.3	5.7	7.9	6.1
23	9.7	9.2	9.3	e11	4.6	9.9	7.3	6.7	6.3	5.4	13	6.1
24	9.7	9.1	7.5	e8.0	4.4	10	7.2	6.6	6.4	6.0	8.8	6.1
25	11	9.1	6.9	e7.0	4.5	8.5	7.9	6.6	6.4	10	7.7	5.4
26	10	9.0	14	e11	5.4	9.8	7.6	6.6	6.3	8.9	7.7	5.5
27	9.8	9.0	14	e9.0	6.1	13	22	6.5	6.2	17	6.8	6.0
28	9.6	9.1	8.1	e8.0	5.0	12	11	6.5	6.2	10	6.5	22
29	9.9	10	7.4	e7.0	4.7	14	7.7	6.5	6.3	7.4	6.4	7.7
30	9.8	12	e12	e6.9	---	8.8	7.3	6.5	6.4	7.0	5.9	6.6
31	10	---	e8.0	e6.7	---	17	---	6.5	---	8.5	5.9	---
TOTAL	265.6	287.8	369.5	372.3	163.8	247.2	347.8	238.5	194.0	238.8	236.2	217.2
MEAN	8.57	9.59	11.9	12.0	5.65	7.97	11.6	7.69	6.47	7.70	7.62	7.24
MAX	11	13	29	28	7.0	17	33	23	6.6	17	22	22
MIN	5.5	7.0	6.9	6.2	4.4	4.6	7.2	6.5	6.2	5.3	5.0	5.4
AC-FT	527	571	733	738	325	490	690	473	385	474	469	431

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2000, BY WATER YEAR (WY)

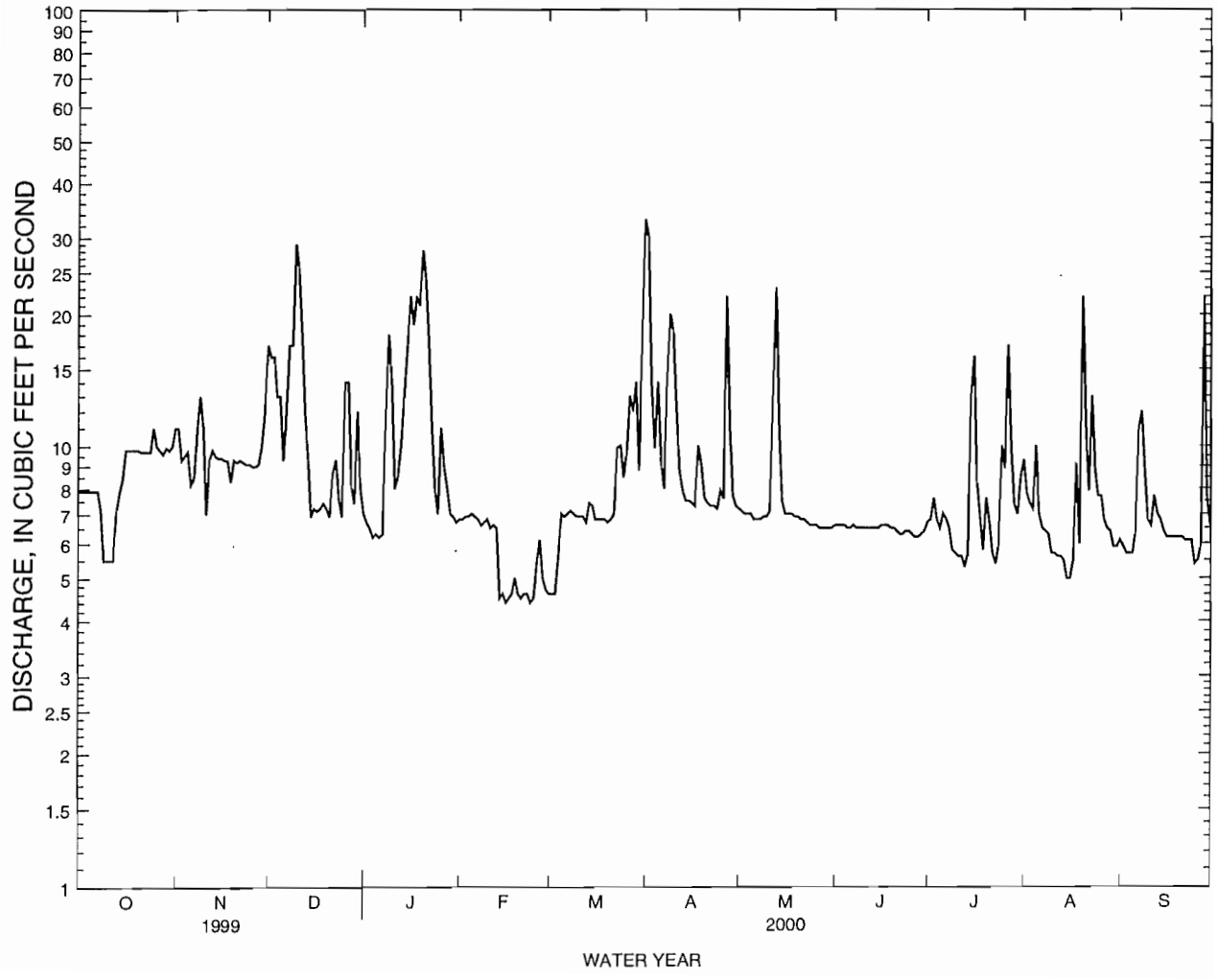
MEAN	6.51	8.25	8.06	7.54	7.40	8.24	8.33	7.21	6.90	7.22	6.41	5.98
MAX	10.6	14.0	13.8	14.4	15.9	15.5	15.6	15.8	12.8	13.2	10.2	9.21
(WY)	1996	1999	1991	1988	1990	1986	1986	1987	1998	1986	1985	1987
MIN	2.60	2.60	2.83	2.61	2.25	2.55	2.61	2.69	2.32	2.30	2.21	2.33
(WY)	1966	1966	1966	1966	1974	1967	1974	1974	1974	1974	1974	1974

e Estimated

HAWAII, ISLAND OF MOLOKAI

16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1965 - 2000	
ANNUAL TOTAL	3424.3		3178.7			
ANNUAL MEAN	9.38		8.68		7.36	
HIGHEST ANNUAL MEAN					11.4	1987
LOWEST ANNUAL MEAN					3.46	1974
HIGHEST DAILY MEAN	30	Mar 21	33	Apr 1	39	Apr 8 1986
LOWEST DAILY MEAN	4.5	Aug 25	4.4	Feb 16	1.8	Oct 15 1967
ANNUAL SEVEN-DAY MINIMUM	6.3	Oct 8	4.6	Feb 14	1.9	May 3 1976
ANNUAL RUNOFF (AC-FT)	6790		6300		5330	
10 PERCENT EXCEEDS	14		13		13	
50 PERCENT EXCEEDS	8.0		7.0		6.2	
90 PERCENT EXCEEDS	6.5		5.7		3.1	



HAWAII, ISLAND OF MOLOKAI

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08′43″, long 156°55′18″, Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft above mean sea level (from topographic map). Prior to July 1, 1962, at site 200 ft upstream of gage at datum 6.14 ft higher.

REMARKS.--Records computed by Phillip Teeters. Records poor. Since November 16, 1960, water diverted upstream at times, either into or from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--39 years (water years 1961, 1963-2000), 5.94 ft^3/s (4,300 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s, January 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/s on basis of slope-area measurement at gage height 5.25 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of October 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Aug. 20	0800	*1700	*5,20	No other peak greater than base discharge.			

Minimum discharge, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	2.2	.00	.00	.00	155	e.00	e.00	.34	.64	.25
2	.00	.00	1.8	.00	.00	.00	42	e.00	e.00	.43	.64	.25
3	.00	.00	3.9	.00	.00	.00	1.4	e.00	e.00	.64	.53	.25
4	.00	.00	.14	.00	.00	.00	.22	e.00	e.00	.76	.53	.25
5	.00	.00	.00	.00	.00	.00	1.8	e.00	e.00	.76	.76	.25
6	.00	.00	.00	.00	.00	.00	.00	e.00	e.00	.89	.76	.25
7	.00	.00	1.8	.00	.00	.00	.00	e.00	e.00	.89	.64	2.3
8	.00	.00	5.8	2.0	.00	.00	25	e.00	e.00	.89	.64	e1.8
9	.00	.00	4.4	4.7	.00	.00	9.2	e.00	e.00	.89	.53	.42
10	.00	.00	36	2.5	.00	.00	2.5	e.00	e.00	.76	.76	.25
11	.00	.00	16	.00	.00	.00	.10	e.00	e.00	.76	.76	.32
12	.00	.00	6.9	.00	.00	.00	.00	e3.0	e.00	.76	.89	.45
13	.00	.00	1.8	.00	.00	.00	.00	e10	e.00	.76	1.0	.34
14	.00	.00	.00	.00	.00	.00	.00	e5.0	e.00	.76	.53	.38
15	.00	.00	.00	7.0	.00	.00	.00	e.90	e.00	1.2	.25	.45
16	.00	.00	.00	19	.00	.00	.00	e.00	e.00	2.7	.25	.49
17	.00	.00	.00	4.5	.00	.00	.00	e.00	e.00	.34	.25	.46
18	e.00	.00	.00	18	.00	.00	.00	e.00	e.00	.34	.64	.51
19	e.00	.00	.00	13	.00	.00	.00	e.00	e.00	.43	.76	.52
20	e.00	.00	.00	46	.00	.00	e.00	e.00	e.00	.64	103	.33
21	e.00	.00	.00	19	.00	.00	e.00	e.00	e.01	.43	3.8	.14
22	e.00	.00	.00	7.4	.00	.00	e.00	e.00	.02	.17	.64	.14
23	e.00	.00	.00	.00	.00	.00	e.00	e.00	.03	.34	5.8	.13
24	e.00	.00	.00	.00	.00	.00	e.00	e.00	.10	.25	.53	.22
25	e.00	.00	.00	.00	.00	.00	e.00	e.00	.17	.34	.25	.16
26	e.00	.00	21	.00	.00	.00	e.80	e.00	.17	.25	.17	.08
27	e.00	.00	1.3	.00	.00	.00	e3.0	e.00	.25	5.4	.17	.60
28	e.00	.00	.00	.00	.00	.00	e1.0	e.00	.34	.43	.10	14
29	.00	.00	.00	.00	.00	.61	e.00	e.00	.34	.34	.04	.22
30	.00	.00	.00	.00	---	.00	e.00	e.00	.43	.34	.10	.17
31	.00	---	.00	.00	---	79	---	e.00	---	.53	.17	---
TOTAL	0.00	0.00	103.04	143.10	0.00	79.61	242.02	18.90	1.86	24.76	126.53	26.38
MEAN	.000	.000	3.32	4.62	.000	2.57	8.07	.61	.062	.80	4.08	.88
MAX	.00	.00	36	46	.00	79	155	10	.43	5.4	103	14
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.17	.04	.08
AC-FT	.00	.00	204	284	.00	158	480	37	3.7	49	251	52

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 2000, BY WATER YEAR (WY)

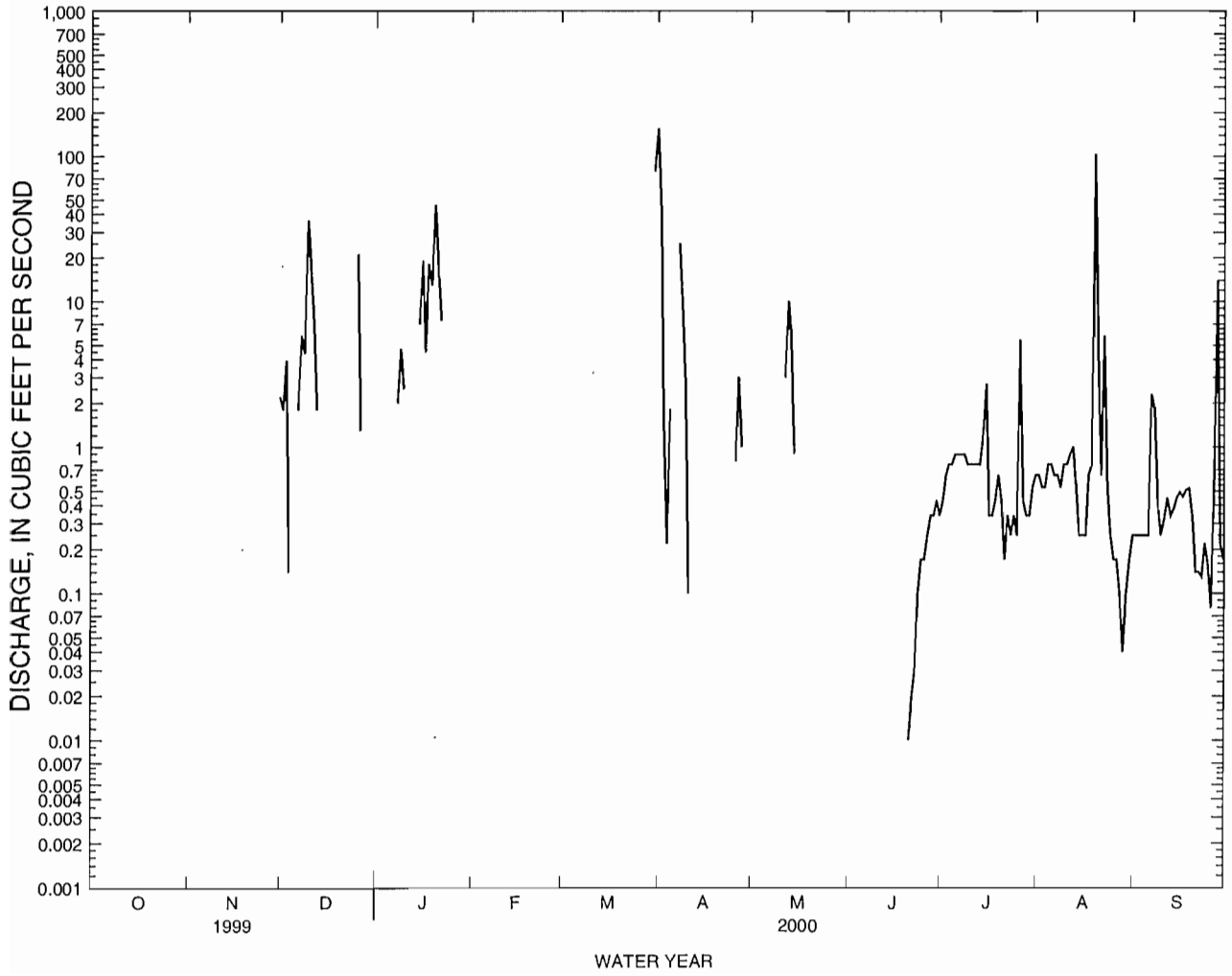
MEAN	3.09	8.51	9.14	10.8	8.58	8.75	9.49	4.54	2.37	2.79	2.05	1.41
MAX	16.7	30.5	31.0	40.5	30.6	22.6	64.8	23.6	10.5	11.0	7.52	6.81
(WY)	1966	1971	1966	1982	1979	1968	1989	1987	1961	1964	1961	1963
MIN	.000	.000	.37	.78	.000	1.31	.71	.19	.000	.23	.010	.000
(WY)	1985	2000	1976	1996	2000	1983	1996	1996	1985	1984	1996	1996

e Estimated

HAWAII, ISLAND OF MOLOKAI

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1961 - 2000	
ANNUAL TOTAL	683.74		766.20			
ANNUAL MEAN	1.87		2.09		5.94	
HIGHEST ANNUAL MEAN					11.8	1965
LOWEST ANNUAL MEAN					1.26	1985
HIGHEST DAILY MEAN	85	Mar 20	155	Apr 1	847	Apr 8 1989
LOWEST DAILY MEAN	.00	Jan 4	.00	Oct 1	.00	Sep 12 1984
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 12	.00	Oct 1	.00	Sep 12 1984
ANNUAL RUNOFF (AC-FT)	1360		1520		4300	
10 PERCENT EXCEEDS	4.1		1.9		11	
50 PERCENT EXCEEDS	.03		.00		1.3	
90 PERCENT EXCEEDS	.00		.00		.08	



HAWAII, ISLAND OF MOLOKAI

16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft downstream from wooden bridge on Highway 45, and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi^2.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Phil Teeters. Records fair. Diversion upstream of station for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--37 years (water years 1964-2000), 0.81 ft^3/s (590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, April 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 210 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Aug. 20	1015	*554	*5.64	No other peak greater than base discharge.			

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	1.5	.00	.00	.00	.00	e.00
2	.00	.00	.00	.00	.00	.00	1.2	.00	.00	.00	.00	e.00
3	.00	.00	.00	.00	.00	.00	.20	.00	.00	.00	.00	e.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00
8	.00	.00	.00	.00	.00	.00	2.8	.00	.00	.00	.00	e.00
9	.00	.00	.00	.00	.00	.00	1.9	.00	.00	.00	.00	e.00
10	.00	.00	3.6	.00	.00	.00	.33	.00	.00	.00	.00	e.00
11	.00	.00	.74	.00	.00	.00	.12	.00	.00	.00	.00	e.00
12	.00	.00	1.6	.00	.00	.00	.01	.00	.00	.00	.00	e.00
13	.00	.00	.08	.00	.00	.00	.00	.00	.00	.00	.00	e.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	1.3	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	13	.00	.00	.00	.00	.00	.00	26	.00
21	.00	.00	.00	1.5	.00	.00	.00	.00	.00	.00	e.5	.00
22	.00	.00	.00	.51	.00	.00	.00	.00	.00	.00	e.00	.00
23	.00	.00	.00	.14	.00	.00	.00	.00	.00	.00	e.00	.00
24	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	e.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00	.00
26	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00	.00
27	.00	.00	1.3	.00	.00	.00	.00	.00	.00	.00	e.00	.09
28	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	e.00	.08
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	e.00	.00
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	e.00	.00
31	.00	---	.00	.00	---	1.0	---	.00	---	.00	e.00	---
TOTAL	0.00	0.00	7.34	16.47	0.00	1.00	8.06	0.00	0.00	0.00	26.50	0.17
MEAN	.000	.000	.24	.53	.000	.032	.27	.000	.000	.000	.85	.006
MAX	.00	.00	3.6	13	.00	1.0	2.8	.00	.00	.00	26	.09
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	15	33	.00	2.0	16	.00	.00	.00	53	.3

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 2000, BY WATER YEAR (WY)

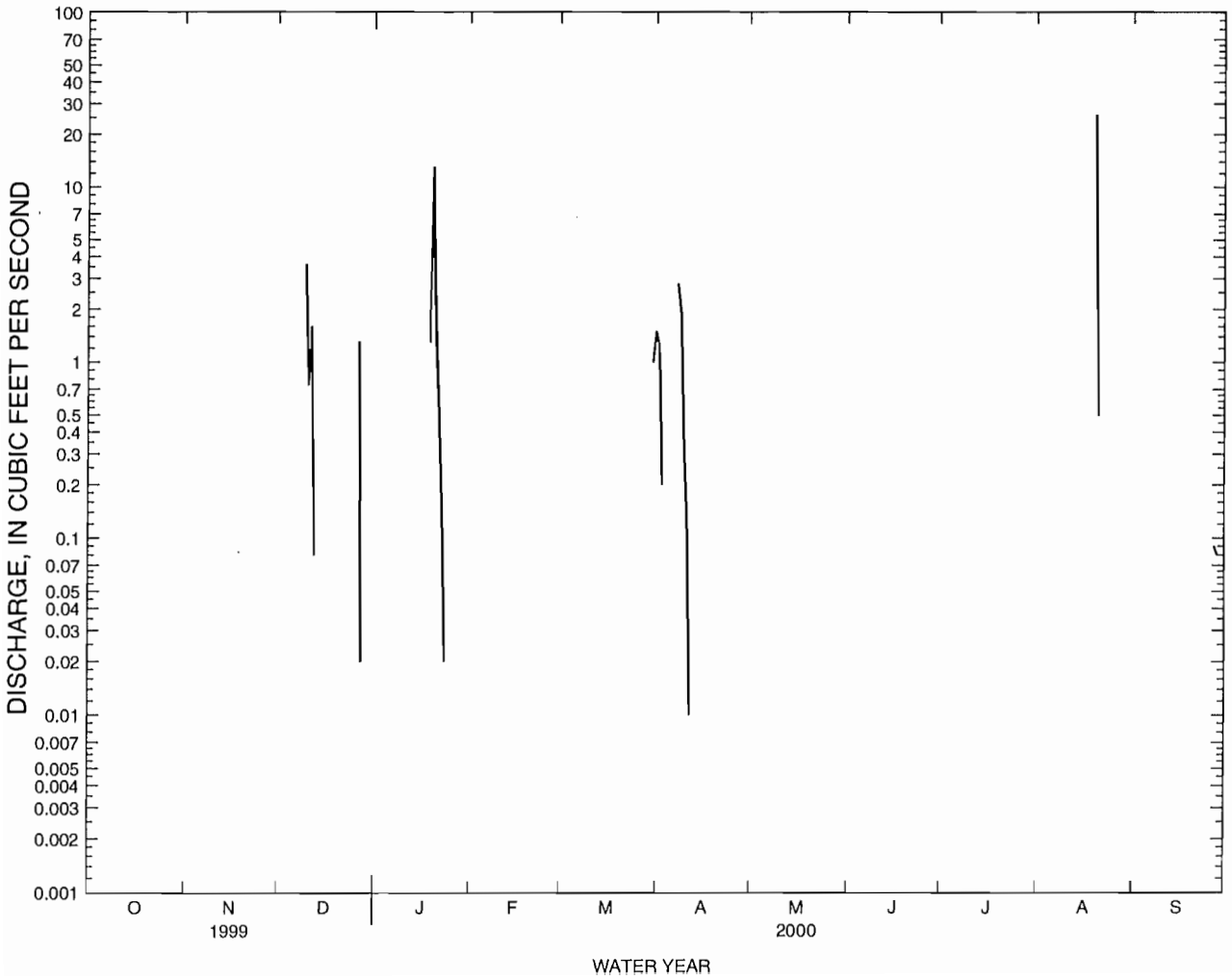
MEAN	.49	1.14	1.05	1.26	1.14	1.35	1.35	.66	.32	.43	.30	.29
MAX	2.63	7.56	6.12	4.84	5.88	6.42	10.3	3.99	1.43	1.56	1.21	2.24
(WY)	1986	1971	1965	1988	1965	1968	1989	1987	1982	1993	1980	1992
MIN	.000	.000	.000	.000	.000	.007	.003	.000	.000	.000	.000	.000
(WY)	1972	1972	1972	1977	1973	1973	1975	1975	1964	1972	1964	1964

e Estimated

HAWAII, ISLAND OF MOLOKAI

16419500 PAPIO GULCH AT HALAWA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1963 - 2000	
ANNUAL TOTAL	26.27		59.54			
ANNUAL MEAN	.072		.16		.81	
HIGHEST ANNUAL MEAN					2.32	1989
LOWEST ANNUAL MEAN					.063	1973
HIGHEST DAILY MEAN	3.8	Jan 22	26	Aug 20	164	Apr 13 1965
LOWEST DAILY MEAN	.00	Jan 18	.00	Oct 1	.00	Jul 5 1963
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 22	.00	Oct 1	.00	Aug 3 1963
ANNUAL RUNOFF (AC-FT)	52		118		590	
10 PERCENT EXCEEDS	.10		.00		1.4	
50 PERCENT EXCEEDS	.00		.00		.21	
90 PERCENT EXCEEDS	.00		.00		.00	



Surface-Water Station Records for Maui

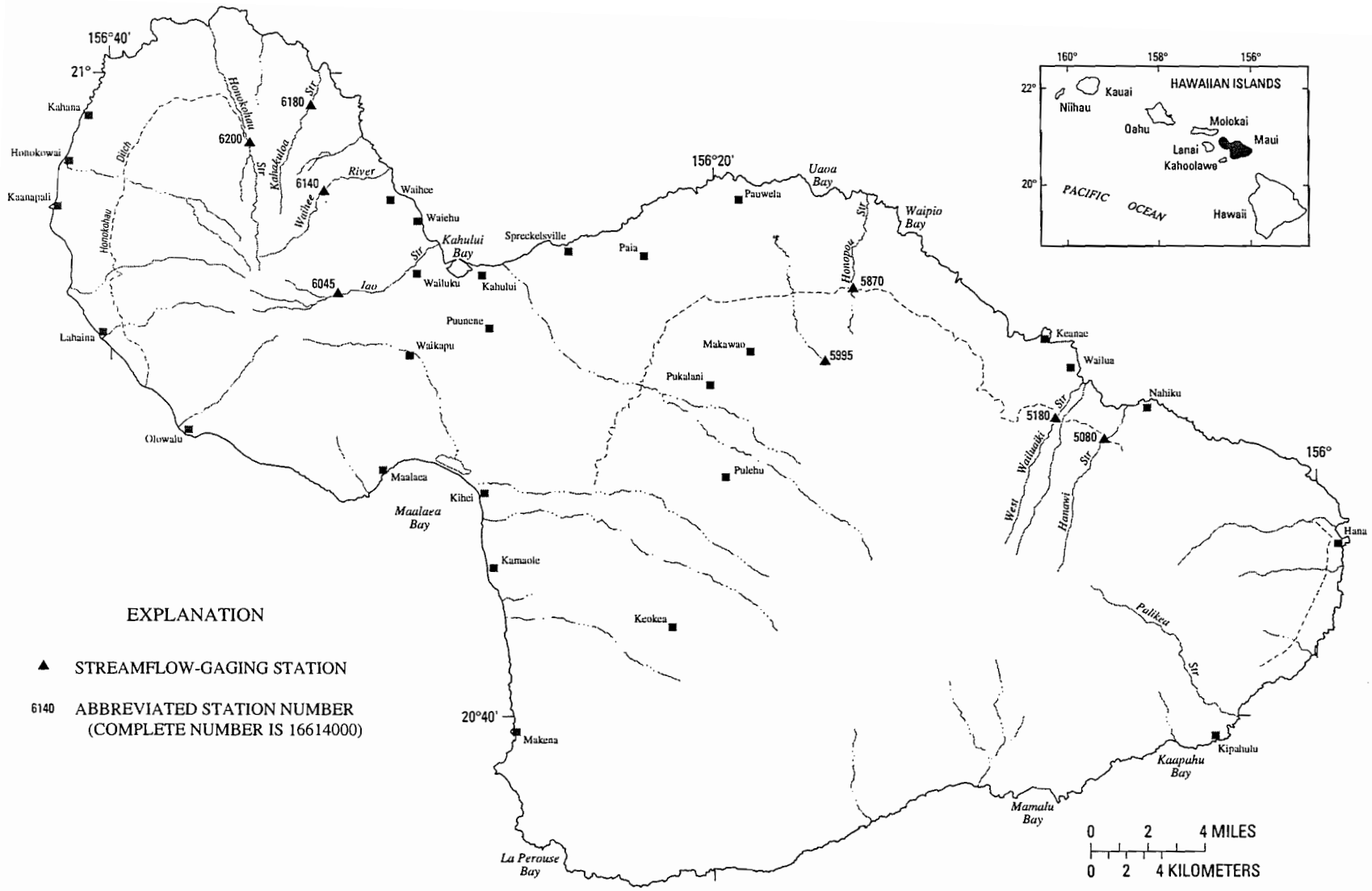


Figure 8. Locations of streamflow-gaging stations on Maui.

HAWAII, ISLAND OF MAUI

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2.

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS.--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to November 1, 1921, at site 50 ft downstream of gage at datum 0.12 ft lower.

REMARKS.--Records computed by Phil Teeters. Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--78 years (water years 1923-2000), 23.9 ft^3/s (17,350 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s, January 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s, October 28 to November 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	1315	*3,530	*9.48	No other peak greater than base discharge.			

Minimum discharge, 1.9 ft^3/s, March 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	10	154	5.3	6.5	2.7	467	4.8	2.5	9.4	4.0	9.4
2	2.7	7.3	203	5.0	6.3	2.6	79	4.5	2.4	4.0	4.6	6.9
3	2.6	3.6	164	4.7	6.2	2.5	10	4.4	2.4	4.8	3.8	5.8
4	2.6	3.6	26	4.5	6.1	2.5	19	4.1	2.3	17	4.6	5.1
5	2.7	3.3	16	4.4	5.8	2.4	51	3.9	2.4	26	5.9	4.8
6	5.2	3.0	19	4.6	5.6	2.5	16	3.8	2.3	14	3.8	13
7	8.4	5.8	9.3	9.9	5.3	2.4	6.7	3.6	2.2	6.8	3.2	33
8	3.6	6.0	43	14	5.1	2.3	52	3.5	2.2	4.2	3.0	29
9	3.0	8.5	177	14	4.9	2.3	41	3.4	2.2	3.5	5.2	15
10	2.8	5.2	301	24	4.7	2.2	51	3.4	2.2	16	26	20
11	2.6	3.5	291	22	4.5	2.2	25	4.6	2.1	8.1	7.5	22
12	2.6	25	68	13	4.3	2.2	8.8	12	2.1	4.4	4.3	22
13	2.5	7.1	18	48	4.1	2.1	6.0	33	2.3	3.5	3.5	17
14	2.4	4.4	8.7	49	3.9	2.1	5.0	9.0	3.1	5.9	3.4	11
15	2.4	3.6	6.4	240	3.7	2.1	4.6	4.9	2.2	22	3.1	8.8
16	2.5	3.1	5.5	246	3.6	2.1	3.9	4.1	2.2	21	3.3	7.4
17	2.3	2.9	5.6	54	3.5	2.0	4.7	3.7	2.3	14	33	6.6
18	2.3	2.7	6.6	95	3.5	2.1	9.2	3.5	2.2	10	23	6.3
19	2.2	3.6	7.1	191	3.3	2.0	5.3	3.4	2.1	5.8	54	5.7
20	158	11	7.2	192	3.2	2.0	4.3	3.3	2.0	7.2	50	5.4
21	7.0	5.0	7.2	143	3.2	2.0	4.7	3.2	3.0	5.1	14	5.1
22	3.8	8.5	30	67	3.3	2.1	5.0	3.1	2.8	4.1	16	4.8
23	e2.9	3.9	18	12	3.0	2.9	4.6	3.0	2.3	3.7	92	4.5
24	e2.8	3.3	9.7	8.6	2.9	6.3	7.3	2.9	2.2	4.1	63	4.3
25	e3.7	3.1	8.1	7.0	2.9	6.7	6.0	2.8	2.2	18	16	4.2
26	e2.8	3.6	7.9	6.5	2.9	38	16	2.7	9.8	13	15	4.2
27	e2.7	4.6	8.5	6.7	2.8	92	30	2.7	3.8	17	136	21
28	e2.5	8.8	6.9	6.3	2.7	15	9.8	2.6	2.6	6.7	42	14
29	2.7	37	6.4	6.3	2.7	12	6.4	2.5	2.5	5.2	13	5.6
30	2.6	126	5.9	6.4	---	4.9	5.4	3.0	3.4	4.5	23	4.8
31	5.5	---	5.6	6.5	---	121	---	2.9	---	3.8	18	---
TOTAL	255.2	327.0	1650.6	1516.7	120.5	348.2	964.7	152.3	80.3	292.8	697.2	326.7
MEAN	8.23	10.9	53.2	48.9	4.16	11.2	32.2	4.91	2.68	9.45	22.5	10.9
MAX	158	126	301	246	6.5	121	467	33	9.8	26	136	33
MIN	2.2	2.7	5.5	4.4	2.7	2.0	3.9	2.5	2.0	3.5	3.0	4.2
AC-FT	506	649	3270	3010	239	691	1910	302	159	581	1380	648

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2000, BY WATER YEAR (WY)

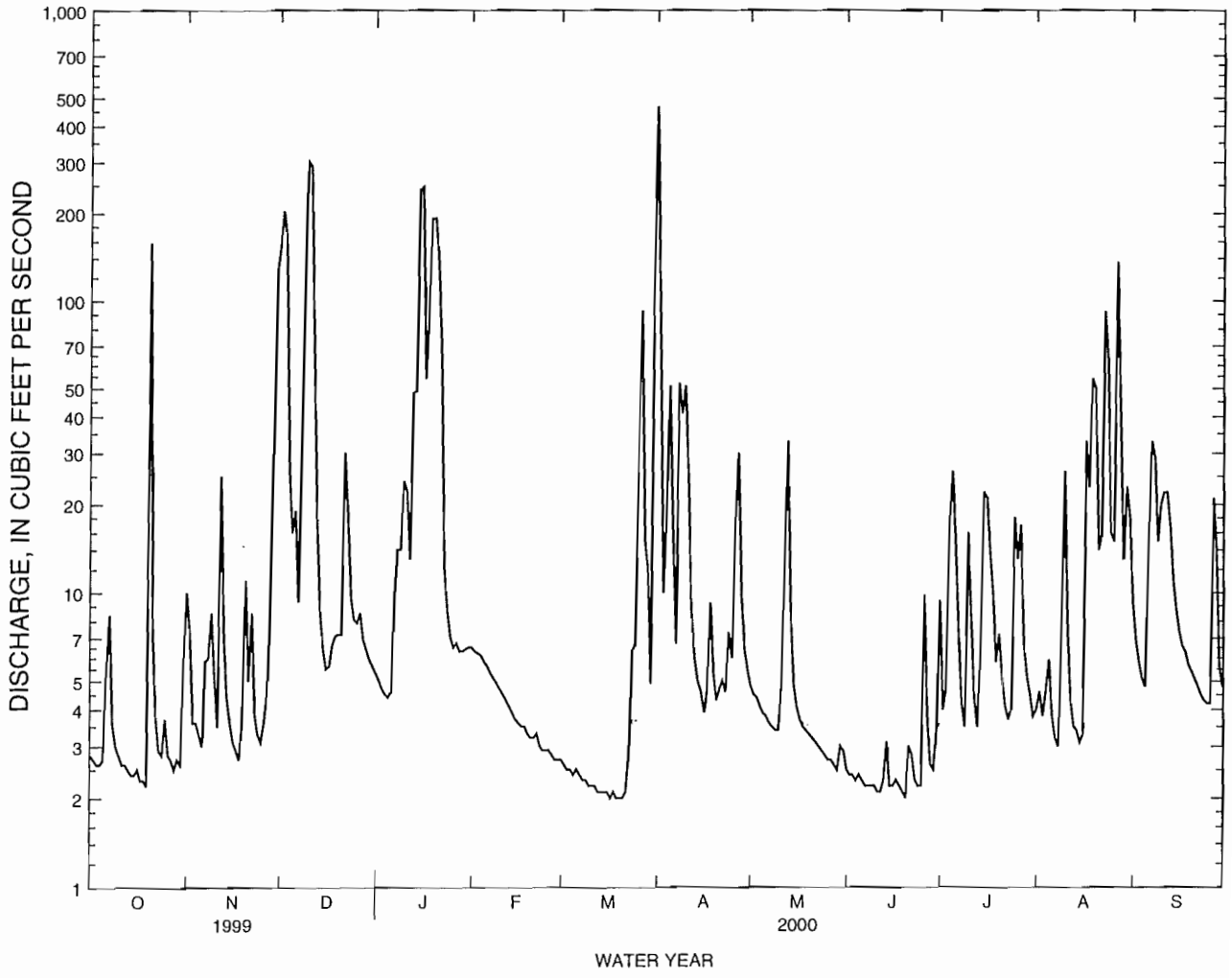
MEAN	14.8	29.7	32.5	30.5	30.6	41.0	36.4	20.1	11.3	16.1	16.9	11.7
MAX	101	110	129	123	182	235	161	68.2	61.2	62.0	66.2	52.3
(WY)	1942	1991	1947	1979	1969	1980	1989	1987	1997	1997	1957	1914
MIN	1.15	2.99	2.71	1.87	2.25	2.10	2.75	2.82	2.16	2.42	2.40	1.88
(WY)	1985	1990	1981	1977	1983	1983	1992	1945	1981	1926	1973	1974

e Estimated

HAWAII, ISLAND OF MAUI

16508000 HANAWI STREAM NEAR NAHIKU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1914 - 2000	
ANNUAL TOTAL	9115.4		6732.2			
ANNUAL MEAN	25.0		18.4		23.9	
HIGHEST ANNUAL MEAN					52.6	1969
LOWEST ANNUAL MEAN					7.59	1926
HIGHEST DAILY MEAN	480	Jan 31	467	Apr 1	1610	Jan 25 1948
LOWEST DAILY MEAN	2.2	Jun 22	2.0	Mar 17	.90	Oct 31 1984
ANNUAL SEVEN-DAY MINIMUM	2.3	Jun 17	2.0	Mar 15	.96	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	18080		13350		17350	
10 PERCENT EXCEEDS	64		34		51	
50 PERCENT EXCEEDS	5.2		4.9		7.1	
90 PERCENT EXCEEDS	2.6		2.4		2.8	



HAWAII, ISLAND OF MAUI

16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau Ditch crossing and trail bridge, and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi^2.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M), 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft above mean sea level (by vertical angles). Prior to October 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records computed by Clayton Yoshida. Records good. No diversion upstream of station. Water is diverted by Koolau Ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--80 years (water years 1915, 1917, 1923-2000), 34.9 ft^3/s (25,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, January 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s; minimum, 0.5 ft^3/s, July 26, 1922.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 20	1315	*7,490	*12.45	Apr. 01	0715	2,020	7.81
Jan. 16	0130	2,060	7.86				

Minimum discharge, 1.4 ft^3/s, March 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	12	171	5.5	8.1	2.7	736	6.6	2.7	8.5	11	15
2	4.4	10	205	5.2	7.2	2.4	106	6.0	2.5	4.1	9.7	12
3	4.0	5.5	224	4.9	6.6	2.2	26	5.8	2.3	7.7	6.9	9.9
4	3.9	5.5	45	4.6	6.2	2.2	39	5.1	2.1	33	8.1	8.9
5	4.4	4.8	25	4.7	5.8	2.0	93	4.7	2.8	26	8.7	8.1
6	8.7	4.3	25	5.4	5.4	2.4	30	4.4	2.3	14	6.1	15
7	16	6.8	21	13	5.2	2.5	17	4.1	2.0	8.2	5.9	34
8	5.4	8.0	51	12	5.1	2.2	56	3.9	2.2	5.7	5.4	31
9	4.4	9.9	177	13	5.0	2.1	63	3.7	2.0	5.0	12	21
10	4.0	7.3	165	20	4.6	2.0	66	3.8	2.0	20	34	21
11	3.6	5.4	207	19	4.5	1.9	39	6.9	1.7	9.6	10	24
12	3.5	31	61	16	4.2	1.8	19	13	1.6	6.0	7.7	25
13	3.5	12	27	61	4.0	1.8	13	35	2.4	5.0	6.7	21
14	3.2	8.6	19	56	3.9	1.8	11	10	3.3	8.4	6.4	15
15	3.1	6.9	15	375	3.7	1.8	10	6.6	2.4	23	5.4	11
16	3.5	5.9	12	422	3.6	1.8	8.6	5.5	2.2	18	6.1	9.7
17	3.1	5.2	11	58	3.5	1.5	9.4	4.8	2.5	16	54	8.6
18	2.9	4.8	11	112	3.5	1.8	14	4.5	2.2	11	33	8.3
19	2.8	7.8	9.4	242	3.3	2.2	9.0	4.3	1.9	7.9	86	7.4
20	259	20	8.2	214	2.9	1.8	7.7	4.0	1.9	8.8	64	7.0
21	16	10	7.5	141	3.1	2.1	8.2	3.8	3.9	6.4	19	6.5
22	9.2	10	30	91	4.3	5.5	7.4	3.5	3.4	5.3	19	5.9
23	6.6	5.9	22	25	3.0	15	6.8	3.3	2.4	4.8	101	5.4
24	5.4	5.0	12	17	2.7	11	9.4	3.1	2.2	6.1	81	5.1
25	7.7	5.0	8.8	14	2.7	10	7.2	2.9	2.0	33	24	4.7
26	5.1	6.2	8.9	12	2.8	54	18	2.8	8.1	19	23	4.9
27	4.5	9.6	11	20	2.6	97	32	3.1	3.3	21	243	24
28	4.1	27	7.6	12	2.5	25	12	2.9	2.3	10	61	12
29	4.5	71	6.8	10	2.4	14	8.8	3.2	2.2	8.8	22	6.7
30	4.1	176	6.3	8.9	---	8.1	7.5	5.5	4.3	7.3	31	5.8
31	6.6	---	5.9	8.1	---	227	---	4.1	---	6.6	25	---
TOTAL	422.0	507.4	1616.4	2022.3	122.4	509.6	1490.0	180.9	79.1	374.2	1036.1	393.9
MEAN	13.6	16.9	52.1	65.2	4.22	16.4	49.7	5.84	2.64	12.1	33.4	13.1
MAX	259	176	224	422	8.1	227	736	35	8.1	33	243	34
MIN	2.8	4.3	5.9	4.6	2.4	1.5	6.8	2.8	1.6	4.1	5.4	4.7
AC-FT	837	1010	3210	4010	243	1010	2960	359	157	742	2060	781

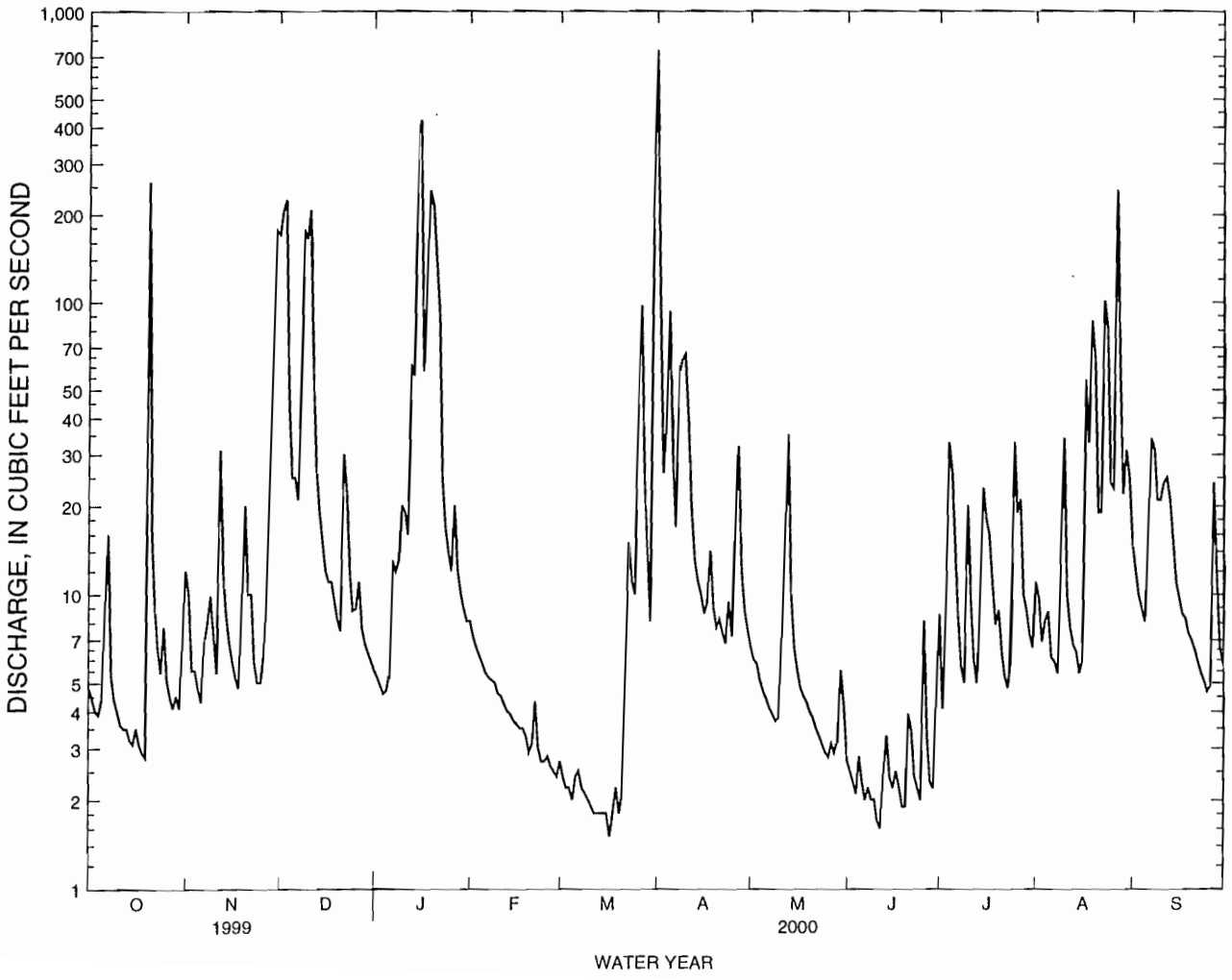
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 2000, BY WATER YEAR (WY)

MEAN	23.5	45.7	48.5	42.0	45.7	56.0	54.5	29.3	16.8	25.1	25.9	18.2
MAX	133	198	200	192	222	303	221	88.4	67.7	99.4	111	101
(WY)	1942	1922	1937	1979	1932	1942	1989	1914	1997	1914	1914	1914
MIN	.88	4.06	2.82	2.01	2.65	2.04	4.17	3.86	2.37	1.72	2.85	1.68
(WY)	1985	1992	1981	1977	1995	1926	1992	1945	1981	1922	1973	1974

HAWAII, ISLAND OF MAUI

16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1914 - 2000	
ANNUAL TOTAL	11013.2		8754.3			
ANNUAL MEAN	30.2		23.9		34.9	
HIGHEST ANNUAL MEAN					67.3	1980
LOWEST ANNUAL MEAN					14.5	1981
HIGHEST DAILY MEAN	632	Jan 31	736	Apr 1	2260	Jan 26 1948
LOWEST DAILY MEAN	1.8	Jul 4	1.5	Mar 17	.62	Jul 23 1922
ANNUAL SEVEN-DAY MINIMUM	2.2	Jun 14	1.8	Mar 12	.71	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	21840		17360		25270	
10 PERCENT EXCEEDS	69		52		77	
50 PERCENT EXCEEDS	7.6		7.2		10	
90 PERCENT EXCEEDS	3.1		2.4		3.3	



HAWAII, ISLAND OF MAUI

16587000 HONOPOU STREAM NEAR HUELO

LOCATION.--Lat 20°53'20", long 156°15'20", Hydrologic Unit 20020000, on left bank 75 ft upstream from Wailoa Ditch intake, 2.2 mi southwest of Huelo, and 2.5 mi west of Kailua.

DRAINAGE AREA.--0.64 mi^2.

PERIOD OF RECORD.--December 1910 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1219: 1914(M), 1916-50(M). WSP 1249: 1948-50(P). WSP 1569: Drainage area.

GAGE.--Water-stage recorders and concrete control. Datum of gage is 1,208 ft above mean sea level (by vertical angles). Prior to June 19, 1914, nonrecording gage at same site and datum.

REMARKS.--Records computed by Phillip Teeters. Records good. No diversion upstream of station.

AVERAGE DISCHARGE.--89 years (water years 1912-2000), 4.82 ft^3/s (3,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s, November 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of physical model of station site; minimum, 0.02 ft^3/s, several days in 1933, 1934.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 270 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0015	*312	*3.15	No other peak greater than base discharge.			

Minimum discharge, 0.17 ft^3/s, June 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.51	1.7	20	2.1	3.5	.68	29	2.0	.60	.49	1.6	7.0
2	.51	1.7	27	2.0	3.1	.56	8.1	1.9	.60	.26	1.5	6.1
3	.51	.68	25	1.9	2.9	.51	4.2	1.9	.57	.55	1.1	5.4
4	.51	.61	8.5	1.8	2.5	.52	3.6	1.7	.51	2.0	1.3	4.9
5	.60	.55	7.1	1.7	2.3	.51	3.5	1.6	.56	1.6	1.2	4.4
6	1.0	.51	5.8	1.8	2.1	.53	3.7	1.5	.48	2.3	.97	5.0
7	1.0	.64	5.2	2.1	2.0	.51	2.8	1.4	.43	.73	.90	8.0
8	.58	.62	5.5	3.1	1.8	.51	17	1.3	.44	.42	.90	5.4
9	.51	.69	14	3.1	1.7	.43	12	1.3	.43	.37	1.4	4.1
10	.52	.63	43	5.6	1.6	.43	13	1.3	.45	3.3	5.7	4.1
11	.52	.49	46	4.5	1.5	.43	7.9	1.6	.42	1.3	1.7	6.8
12	.56	3.3	19	3.9	1.4	.40	6.1	1.8	.39	.64	1.3	7.1
13	.60	1.1	12	9.1	1.3	.39	5.1	3.1	.42	.50	1.2	4.7
14	.60	.85	9.5	5.9	1.2	.37	4.4	1.7	.39	.87	1.2	4.1
15	.60	.68	7.9	25	1.1	.39	3.8	1.2	.31	4.9	1.1	3.8
16	.56	.62	6.7	45	1.1	.35	3.4	1.1	.32	3.4	1.5	3.6
17	.51	.60	5.9	11	1.0	.35	3.2	1.0	.34	2.6	5.4	3.4
18	.52	.58	6.1	19	1.1	.38	3.7	1.0	.41	1.6	3.0	3.2
19	.58	.72	5.0	22	.94	.41	2.8	.97	.29	1.2	3.9	3.0
20	1.2	.90	4.2	44	.90	.35	2.5	.90	.29	2.0	13	2.8
21	.50	2.3	3.7	25	.90	.35	2.4	.88	.32	1.3	4.3	2.6
22	.41	3.6	4.4	22	1.0	.43	2.2	.86	.28	1.1	6.1	2.4
23	.47	.91	3.7	12	.82	.51	2.1	.80	.26	.99	21	2.2
24	.91	.76	3.1	9.8	.75	.65	2.8	.79	.25	1.0	13	2.0
25	1.2	.72	2.8	8.1	.70	.63	2.2	.78	.23	1.6	7.4	1.9
26	.50	.92	6.0	7.0	.73	2.1	3.5	.71	.29	1.8	7.7	1.9
27	.43	1.3	4.3	6.0	.70	7.2	5.6	.71	.24	2.7	28	11
28	.43	.95	2.8	5.2	.65	1.9	2.8	.70	.22	1.3	14	3.6
29	.52	1.5	2.6	4.6	.61	1.9	2.3	.70	.28	1.3	8.9	2.3
30	.49	5.6	2.5	4.1	---	.94	2.1	.73	.23	1.1	10	2.2
31	1.1	---	2.3	3.7	---	10	---	.82	---	1.3	9.1	---
TOTAL	19.46	36.73	321.6	322.1	41.90	35.62	167.8	38.75	11.25	46.52	179.37	129.0
MEAN	.63	1.22	10.4	10.4	1.44	1.15	5.59	1.25	.38	1.50	5.79	4.30
MAX	1.2	5.6	46	45	3.5	10	29	3.1	.60	4.9	28	11
MIN	.41	.49	2.3	1.7	.61	.35	2.1	.70	.22	.26	.90	1.9
AC-FT	39	73	638	639	83	71	333	77	22	92	356	256

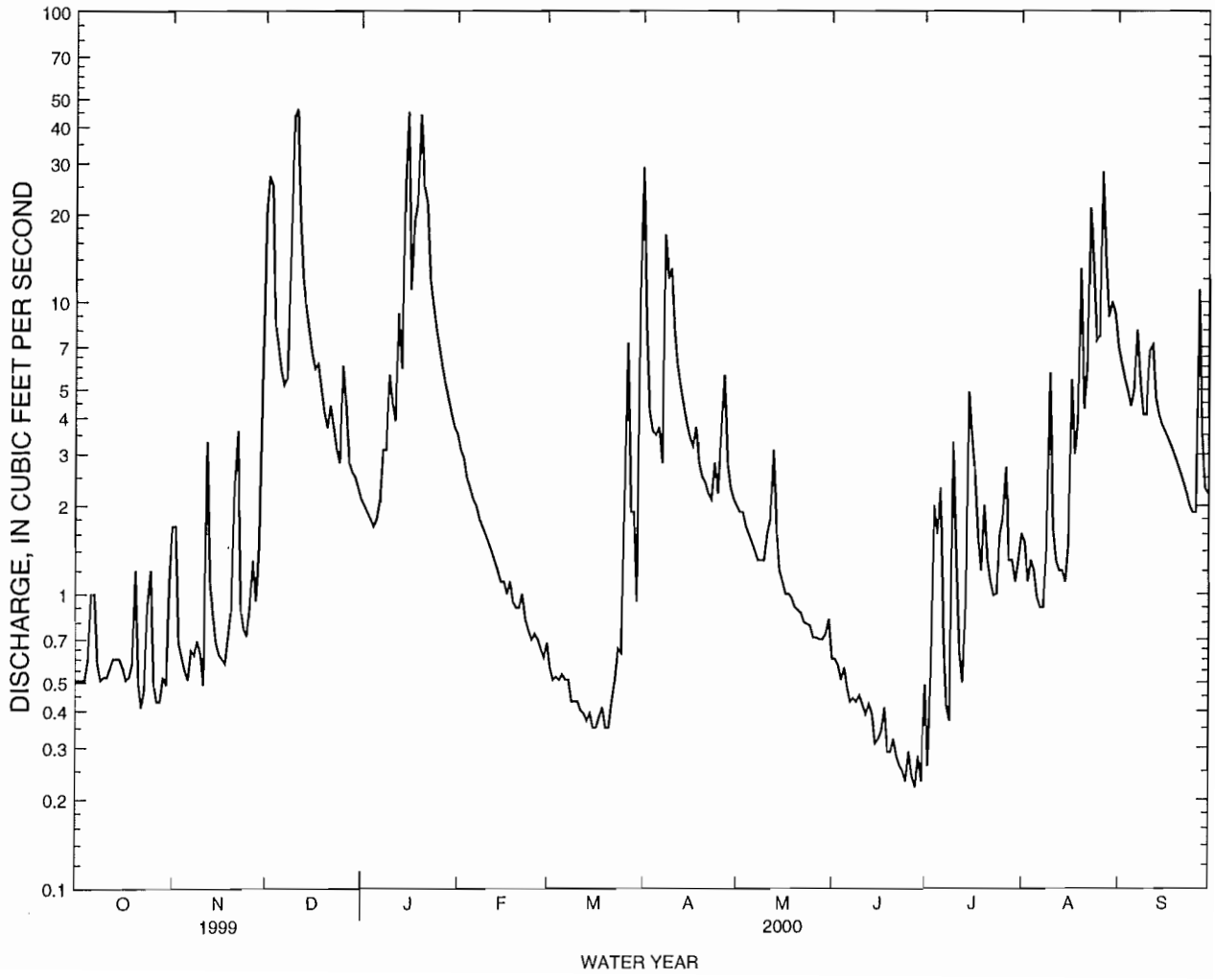
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 2000, BY WATER YEAR (WY)

MEAN	2.71	5.43	6.15	5.57	5.21	7.19	7.59	5.03	2.78	3.59	3.97	2.61
MAX	15.9	21.4	20.0	20.9	24.5	33.0	43.4	24.3	9.97	14.6	18.1	14.6
(WY)	1942	1991	1947	1921	1969	1942	1989	1916	1914	1997	1982	1992
MIN	.15	.25	1.04	.61	.62	.79	.58	.84	.38	.41	.40	.25
(WY)	1985	1963	1981	1977	1983	1992	1992	1933	2000	1981	1973	1984

HAWAII, ISLAND OF MAUI

16587000 HONOPOU STREAM NEAR HUELO--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1912 - 2000	
ANNUAL TOTAL	1636.80		1350.10			
ANNUAL MEAN	4.48		3.69		4.82	
HIGHEST ANNUAL MEAN					9.88	1914
LOWEST ANNUAL MEAN					1.73	1981
HIGHEST DAILY MEAN	94	Jan 22	46	Dec 11	305	Apr 7 1989
LOWEST DAILY MEAN	.29	Jul 3	.22	Jun 28	.11	Oct 27 1984
ANNUAL SEVEN-DAY MINIMUM	.31	Jul 2	.25	Jun 24	.11	Oct 26 1984
ANNUAL RUNOFF (AC-FT)	3250		2680		3490	
10 PERCENT EXCEEDS	10		8.1		10	
50 PERCENT EXCEEDS	1.3		1.5		2.4	
90 PERCENT EXCEEDS	.43		.43		.74	



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 north of Kailiili, and 2.7 mi east of Makawao.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,340 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Phil Teeters. Records good. Tunnel diverts water from Opana Gulch for agricultural and domestic use in the Kokomo, Makawao, and Pukalani areas.

AVERAGE DISCHARGE.--35 years (water years 1966-2000), 3.21 ft^3/s (2,330 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 18 ft^3/s, March 31, 1982, April 12, 1986, March 23, 1994; minimum daily, 0.11 ft^3/s, November 5-10, 1973, October 5, 6, 25, 26, 1974.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 13 ft^3/s, April 1; minimum daily, 0.15 ft^3/s, October 13, 14, 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.28	11	2.0	3.8	1.2	13	2.2	.99	.42	.41	2.4
2	.20	.37	8.7	1.8	3.5	1.1	9.6	2.1	.94	.36	.43	2.2
3	.18	.28	9.4	1.6	3.3	1.1	6.6	2.0	.92	.74	.40	2.0
4	.18	.22	8.4	1.5	3.2	1.1	5.3	1.9	.92	4.0	.35	1.8
5	.18	.19	5.6	1.4	3.0	1.1	9.3	1.8	.90	2.7	.41	1.7
6	.19	.17	4.3	1.4	2.8	1.0	6.8	1.8	.87	1.3	.33	1.8
7	.30	.22	3.3	1.8	2.7	1.0	4.9	1.7	.85	.70	.26	3.1
8	.29	.29	5.8	1.7	2.6	1.0	4.8	1.6	.85	.47	.24	3.2
9	.22	.29	11	1.6	2.5	.95	8.5	1.5	.80	.39	.39	2.3
10	.19	.27	10	1.6	2.4	.92	8.3	1.5	.42	.90	1.3	2.0
11	.17	.22	11	1.7	2.4	.92	7.3	1.8	.39	1.1	.75	2.1
12	.16	1.4	9.2	1.5	2.3	.92	5.7	1.9	.36	.55	.40	2.6
13	.15	1.3	7.3	3.7	2.2	.89	4.7	2.8	.37	.41	.30	2.1
14	.15	.62	5.5	5.3	2.1	.95	4.2	2.3	.38	.45	.27	1.8
15	.18	.40	4.4	7.5	1.9	.93	3.9	1.6	.45	1.3	.24	1.6
16	.18	.29	3.7	12	1.9	.85	3.5	1.4	.41	1.7	.26	1.4
17	.18	.23	3.3	8.1	1.8	.85	3.5	1.3	.40	1.0	4.7	1.3
18	.16	.19	3.8	10	1.7	.91	3.7	1.3	.35	.78	4.7	1.2
19	.15	.22	3.7	11	1.7	.93	3.2	1.3	.30	.60	3.8	1.2
20	1.1	1.1	2.9	11	1.6	.86	3.0	1.2	.42	.49	8.5	1.1
21	1.2	.61	2.6	10	1.5	.91	2.9	1.2	.69	.44	4.2	1.0
22	.43	.36	2.6	10	1.5	1.1	2.6	1.2	.47	.37	2.4	.95
23	.29	.27	3.1	8.0	1.4	1.7	2.5	1.1	.41	.30	8.6	.90
24	.29	.22	2.6	7.2	1.3	1.6	2.5	1.1	.34	.29	9.2	.85
25	.61	.19	2.3	6.6	1.3	1.3	2.4	1.1	.29	1.3	5.0	.81
26	.43	.19	3.6	5.9	1.3	5.6	2.8	1.1	.29	1.8	3.3	.81
27	.27	.25	5.3	6.6	1.2	9.2	4.8	1.0	.28	1.6	8.4	2.2
28	.21	1.1	3.0	5.4	1.2	5.6	3.0	1.0	.28	.98	6.4	2.9
29	.19	3.5	2.5	4.7	1.2	2.7	2.5	1.2	.27	.63	3.8	1.3
30	.18	11	2.3	4.3	---	2.1	2.3	1.1	.28	.47	3.1	.98
31	.19	---	2.1	4.0	---	5.7	---	1.1	---	.42	2.9	---
TOTAL	9.00	26.24	164.3	160.9	61.3	56.99	148.1	47.2	15.89	28.96	85.74	51.60
MEAN	.29	.87	5.30	5.19	2.11	1.84	4.94	1.52	.53	.93	2.77	1.72
MAX	1.2	11	11	12	3.8	9.2	13	2.8	.99	4.0	9.2	3.2
MIN	.15	.17	2.1	1.4	1.2	.85	2.3	1.0	.27	.29	.24	.81
AC-FT	18	52	326	319	122	113	294	94	32	57	170	102

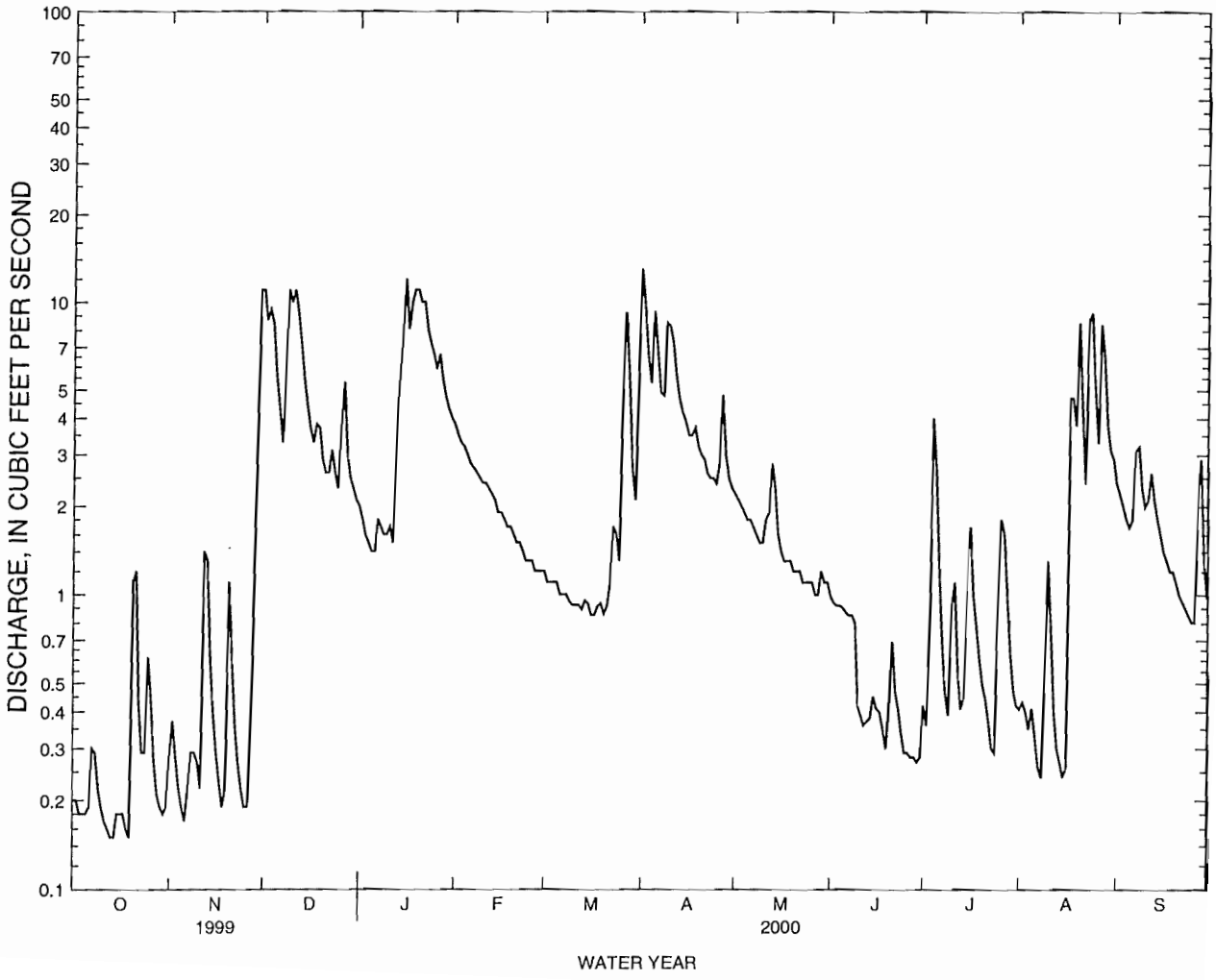
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 2000, BY WATER YEAR (WY)

MEAN	1.81	3.28	4.02	3.75	3.69	4.70	5.20	3.52	2.21	2.64	2.17	1.57
MAX	5.40	7.97	9.19	7.55	9.04	11.1	9.35	7.42	6.38	8.17	4.98	5.69
(WY)	1984	1968	1971	1989	1969	1982	1968	1987	1997	1997	1969	1992
MIN	.14	.25	.65	.22	.36	.51	.27	1.28	.50	.40	.19	.15
(WY)	1985	1992	1977	1977	1978	1983	1992	1992	1999	1981	1974	1984

HAWAII, ISLAND OF MAUI

16599500 OPANA TUNNEL AT KAILIILI--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1965 - 2000	
ANNUAL TOTAL	1117.27		856.22			
ANNUAL MEAN	3.06		2.34		3.21	
HIGHEST ANNUAL MEAN					5.34	1969
LOWEST ANNUAL MEAN					1.45	1981
HIGHEST DAILY MEAN	14	Jan 31	13	Apr 1	18	Mar 31 1982
LOWEST DAILY MEAN	.15	Oct 13	.15	Oct 13	.11	Nov 5 1973
ANNUAL SEVEN-DAY MINIMUM	.16	Oct 13	.16	Oct 13	.11	Nov 4 1973
ANNUAL RUNOFF (AC-FT)	2220		1700		2330	
10 PERCENT EXCEEDS	8.9		6.1		7.8	
50 PERCENT EXCEEDS	1.2		1.3		2.2	
90 PERCENT EXCEEDS	.22		.26		.39	



HAWAII, ISLAND OF MAUI

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU

LOCATION.--Lat 20°53'08", long 156°32'32", Hydrologic Unit 20020000, on left bank of Maniania and Waikapu Ditch intake, 0.3 mi upstream from Kepaniwai Park, 0.5 mi downstream from Iao Valley State Park, and 2.3 mi west of Wailuku Post Office.

DRAINAGE AREA.--5.98 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 780 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Clayton Yoshida. Records fair except for estimated days and discharges above 200 ft^3/s, which are poor. No appreciable diversion upstream of station.

AVERAGE DISCHARGE.--17 years (water years 1984-2000), 65.1 ft^3/s (47,160 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge 6,260 ft^3/s, January 28, 1988, gage height, 9.0 ft, from rating curve extended above 181 ft^3/s on basis of slope-area measurements at gage heights 6.48 ft and 9.0 ft; minimum, 11 ft^3/s for several days in October and November 1984, May 1996, several days in October and November 1996.

EXTREMES OUTSIDE PERIOD OF RECORD.--Maximum discharge known, 7,540 ft^3/s, December 3, 1950, from rating curve based on model study of site 2.3 mi downstream.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 21	2030	*620	*3.10				

Minimum discharge, 15 ft^3/s, October 19, September 26.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	20	24	104	20	57	31	e350	e22	21	21	29	48
2	18	28	49	19	27	25	e100	e25	20	18	28	35
3	18	22	130	18	24	22	e30	25	20	37	27	30
4	23	24	95	17	23	22	e28	22	20	21	80	28
5	39	22	82	17	22	21	e29	22	18	21	47	26
6	36	22	49	22	21	31	e27	21	17	53	30	99
7	38	44	81	21	21	27	e23	21	16	21	27	238
8	22	46	93	30	24	21	e70	20	17	19	23	133
9	21	55	113	40	22	19	e95	20	17	19	30	62
10	20	31	192	24	21	19	e110	20	49	65	33	83
11	20	24	153	33	21	19	e50	23	26	35	20	121
12	20	58	123	83	20	18	e40	30	22	22	16	100
13	37	26	85	110	20	17	e32	98	42	20	16	74
14	23	25	54	129	19	17	e32	31	37	53	17	43
15	20	28	42	e260	18	17	e27	23	23	116	30	29
16	20	26	37	e370	18	19	e24	21	62	48	43	24
17	19	23	34	e215	18	17	e36	20	53	118	127	33
18	19	23	74	e390	29	17	e38	19	53	50	46	42
19	16	80	33	e300	29	17	e30	20	27	42	95	29
20	17	79	27	e400	20	18	e26	20	39	107	105	23
21	19	42	24	e300	21	18	28	24	34	57	47	20
22	17	44	29	204	37	33	29	23	36	33	58	20
23	22	30	26	95	21	31	28	20	33	30	182	18
24	91	25	24	64	20	23	79	18	27	28	147	18
25	105	23	23	49	27	28	36	17	24	63	62	17
26	33	22	41	42	32	62	71	18	30	31	68	16
27	26	22	29	38	23	88	125	21	23	96	205	155
28	24	22	25	32	21	35	e40	21	31	34	97	74
29	26	54	23	29	20	39	e32	20	25	44	58	32
30	25	107	23	28	---	23	e28	22	31	32	93	24
31	38	---	22	27	---	e200	---	33	---	35	92	---
TOTAL	892	1101	1939	3426	696	994	1693	760	893	1389	1978	1694
MEAN	28.8	36.7	62.5	111	24.0	32.1	56.4	24.5	29.8	44.8	63.8	56.5
MAX	105	107	192	400	57	200	350	98	62	118	205	238
MIN	16	22	22	17	18	17	23	17	16	18	16	16
AC-FT	1770	2180	3850	6800	1380	1970	3360	1510	1770	2760	3920	3360

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 2000, BY WATER YEAR (WY)

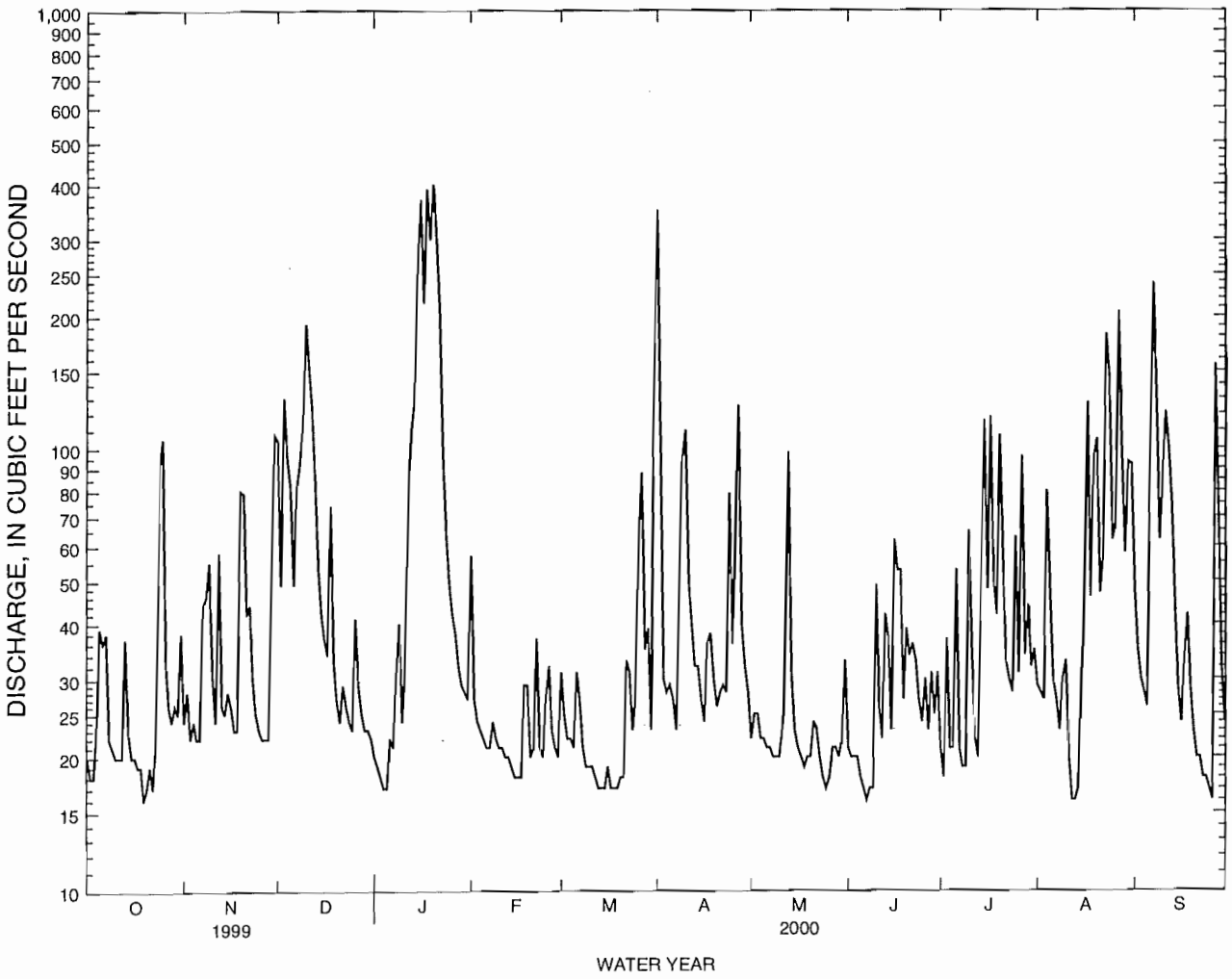
MEAN	51.1	68.7	65.3	70.3	56.6	78.7	84.7	63.1	58.5	70.3	60.3	48.9
MAX	103	132	103	149	108	176	230	136	110	137	97.0	133
(WY)	1984	1998	1997	1988	1994	1994	1989	1987	1998	1994	1993	1992
MIN	11.9	20.5	18.3	25.4	24.0	23.6	20.8	23.4	24.4	25.2	26.0	15.8
(WY)	1985	1985	1985	1985	2000	1998	1992	1999	1985	1984	1984	1984

e Estimated

HAWAII, ISLAND OF MAUI

16604500 IAO STREAM AT KEPANIWAI PARK, NEAR WAILUKU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1983 - 2000	
ANNUAL TOTAL	18353		17455			
ANNUAL MEAN	50.3		47.7		65.1	
HIGHEST ANNUAL MEAN					93.4	1994
LOWEST ANNUAL MEAN					41.4	1985
HIGHEST DAILY MEAN	317	Mar 21	400	Jan 20	913	Apr 10 1986
LOWEST DAILY MEAN	16	Oct 19	16	Oct 19	11	Oct 7 1984
ANNUAL SEVEN-DAY MINIMUM	18	Oct 16	17	Mar 13	11	Oct 16 1984
ANNUAL RUNOFF (AC-FT)	36400		34620		47160	
10 PERCENT EXCEEDS	106		99		133	
50 PERCENT EXCEEDS	29		28		41	
90 PERCENT EXCEEDS	20		19		20	



HAWAII, ISLAND OF MAUI

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE

LOCATION.--Lat 20°56′21″, long 156°32′59″, Hydrologic Unit 20020000, on right bank at dam 8 ft upstream from the abandoned Waihee canal intake, 2.6 mi southwest from Waihee Point, and 4.4 mi northwest from Wailuku Post Office.

DRAINAGE AREA.--4.20 mi^2.

PERIOD OF RECORD.--November 1910 to December 1913, November 1983 to current year. Low-flow records not equivalent prior to December 31, 1913, due to Waihee canal diverted water upstream.

GAGE.--Water-stage recorder. Elevation of gage is 605 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--16 years (water years 1985-2000), 79.0 ft^3/s (57,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,660 ft^3/s, January 28, 1988, gage height, 8.95 ft, from rating curve extended above 280 ft^3/s on basis of slope-area measurements at gage heights 6.70 ft and 8.95 ft; minimum, 14 ft^3/s, July 13, 1995.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 2,000 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Aug. 27	0630	*3,470	*5.98	No other peak greater than base discharge.			

Minimum discharge, 32 ft^3/s, on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	38	68	44	70	55	399	45	42	48	44	53
2	34	46	40	44	49	52	105	46	40	42	48	50
3	33	34	170	43	48	51	53	48	40	71	46	49
4	38	49	69	43	48	47	50	45	39	44	131	53
5	74	35	79	44	47	43	53	44	39	47	63	51
6	73	34	60	48	47	50	67	44	39	51	45	138
7	60	45	96	52	47	45	49	44	39	41	44	284
8	38	52	83	49	77	42	91	43	40	39	42	93
9	36	51	112	57	47	41	133	43	39	38	52	59
10	36	45	181	53	45	40	175	43	87	125	66	77
11	35	34	182	69	45	40	80	44	48	83	44	167
12	36	70	132	116	45	39	52	50	33	45	42	103
13	72	34	70	198	45	39	50	91	63	42	41	98
14	40	34	52	117	44	39	53	49	64	64	43	67
15	37	35	50	267	44	39	48	43	37	95	46	57
16	37	36	48	372	44	40	48	43	70	58	67	55
17	40	32	51	123	44	39	70	42	52	141	116	79
18	35	32	136	265	72	39	84	42	51	58	60	73
19	33	94	56	310	53	40	49	44	35	81	106	70
20	35	77	49	296	44	40	47	42	104	91	106	63
21	38	40	48	221	45	39	48	58	60	57	51	55
22	34	64	57	106	61	48	47	50	51	46	51	54
23	61	36	54	57	44	44	47	42	47	46	162	51
24	167	33	48	53	43	44	83	42	43	46	136	51
25	106	33	46	52	49	48	74	42	41	75	60	50
26	38	32	77	54	55	77	78	41	60	47	102	52
27	35	33	51	52	46	75	96	44	42	97	360	453
28	35	33	45	50	43	45	51	43	47	53	95	80
29	37	52	45	50	43	53	48	41	43	63	59	57
30	35	105	45	49	---	40	46	49	52	45	121	57
31	46	---	44	48	---	325	---	69	---	51	69	---
TOTAL	1488	1368	2344	3402	1434	1698	2374	1456	1487	1930	2518	2699
MEAN	48.0	45.6	75.6	110	49.4	54.8	79.1	47.0	49.6	62.3	81.2	90.0
MAX	167	105	182	372	77	325	399	91	104	141	360	453
MIN	33	32	40	43	43	39	46	41	33	38	41	49
AC-FT	2950	2710	4650	6750	2840	3370	4710	2890	2950	3830	4990	5350

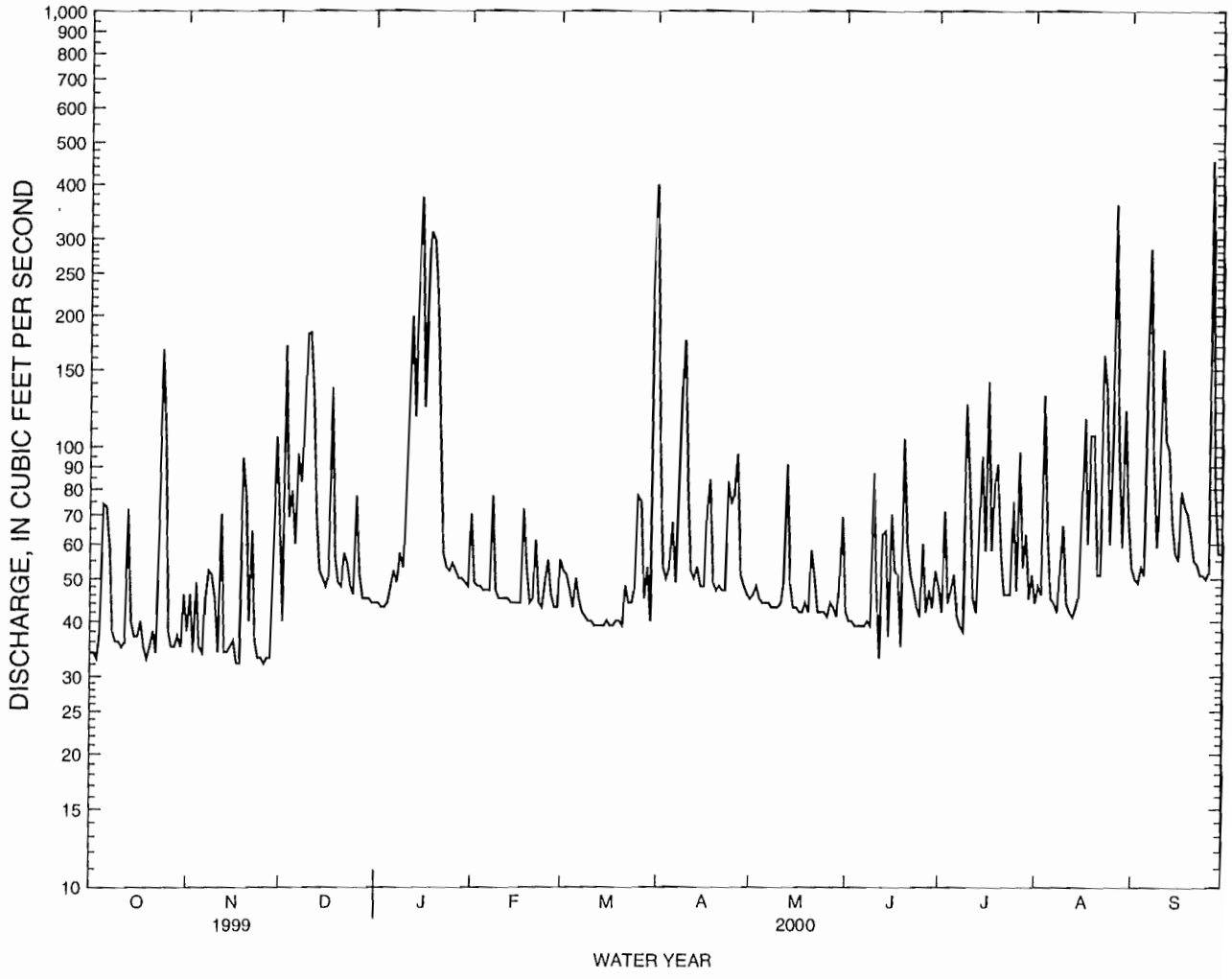
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 2000, BY WATER YEAR (WY)

MEAN	67.4	82.3	73.1	77.3	67.1	89.1	92.3	77.1	72.5	87.3	76.1	72.0
MAX	91.7	150	109	186	106	179	276	143	118	136	99.6	160
(WY)	1986	1991	1988	1988	1988	1994	1989	1987	1987	1994	1991	1992
MIN	27.4	36.8	31.3	29.4	42.2	43.7	36.6	41.5	43.4	54.8	46.1	32.9
(WY)	1985	1985	1985	1985	1993	1992	1992	1996	1984	1984	1984	1984

HAWAII, ISLAND OF MAUI

16614000 WAIHEE RIVER AT DAM NEAR WAIHEE--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1984 - 2000	
ANNUAL TOTAL	23661		24198			
ANNUAL MEAN	64.8		66.1		79.0	
HIGHEST ANNUAL MEAN					106	1994
LOWEST ANNUAL MEAN					57.5	1985
HIGHEST DAILY MEAN	467	Feb 19	453	Sep 27	1160	Jan 28 1988
LOWEST DAILY MEAN	32	Nov 17	32	Nov 17	22	Jan 18 1985
ANNUAL SEVEN-DAY MINIMUM	34	Sep 27	36	Oct 16	23	Jan 18 1985
ANNUAL RUNOFF (AC-FT)	46930		48000		57220	
10 PERCENT EXCEEDS	110		106		132	
50 PERCENT EXCEEDS	49		49		55	
90 PERCENT EXCEEDS	36		38		38	



HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU

(Hydrologic Benchmark Network Station)

LOCATION.--Lat 20°58'54", long 156°33'26", Hydrologic Unit 20020000, on right bank 0.5 mi downstream from Kapuna Stream, 1.3 mi south of Kahakuloa, 2.0 mi west of Puu Makawana, and 4.3 mi southeast of Honokohau.

DRAINAGE AREA.--3.47 mi^2.

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Matt Wong. Records fair. No diversion upstream of station.

AVERAGE DISCHARGE.--51 years (water years 1940-42, 1948-70, 1976-2000), 17.8 ft^3/s (12,860 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s, January 28, 1988, gage height, 9.93 ft from floodmarks, from rating curve extended above 510 ft^3/s, on basis of slope-area measurements at gage heights 6.70 ft, 8.48 ft, and 9.93 ft; minimum, 2.7 ft^3/s, January 22, 28, 29, February 10, 12, 13, 1985.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 31	2400	*828	*5.92	No other peak greater than base discharge.			

Minimum discharge, 3.6 ft^3/s, March 12-22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.9	7.9	19	4.6	7.6	7.4	195	5.9	5.3	9.6	6.0	6.9
2	4.5	7.7	15	4.4	5.9	6.7	42	5.8	4.6	5.2	5.2	6.0
3	4.4	5.8	50	4.3	5.5	6.4	12	6.0	4.2	14	4.6	5.5
4	7.0	15	14	4.1	5.3	7.4	7.7	5.5	4.1	5.6	36	5.3
5	9.2	8.0	13	4.1	5.2	4.9	7.7	5.4	4.1	5.3	21	9.5
6	15	5.4	8.1	4.8	5.1	4.3	7.3	5.3	4.0	10	5.9	10
7	22	7.1	13	5.2	5.0	4.5	8.7	5.1	3.9	5.6	5.0	93
8	5.9	7.6	28	4.5	17	4.2	70	5.0	4.0	4.3	4.6	24
9	5.8	11	34	5.1	7.8	3.9	107	4.9	4.0	4.0	4.7	11
10	5.2	11	42	6.4	5.1	4.0	133	4.9	4.7	43	16	23
11	4.8	6.1	49	8.9	4.9	3.8	23	4.6	6.6	20	6.4	60
12	4.6	19	24	17	4.7	3.8	9.9	6.1	6.0	8.6	4.5	30
13	5.6	6.3	11	101	4.6	3.6	7.5	17	5.9	5.1	4.2	28
14	5.8	5.5	7.1	37	4.5	3.8	6.6	8.7	9.5	12	4.2	12
15	4.9	5.9	5.8	50	4.4	4.0	5.8	5.7	8.4	17	4.3	8.6
16	6.0	5.7	5.2	142	4.3	3.6	5.4	5.0	11	13	5.0	7.8
17	4.9	5.1	5.7	33	4.4	3.6	8.1	4.7	15	34	22	8.8
18	5.2	4.6	21	142	5.5	3.6	18	4.7	18	17	12	9.9
19	4.3	17	10	127	11	3.8	6.3	4.9	6.0	6.1	11	8.5
20	4.6	18	5.2	151	4.8	3.8	5.2	4.7	42	24	33	8.8
21	5.1	8.1	4.7	82	4.4	3.7	5.1	4.6	18	7.1	8.5	6.3
22	4.3	9.3	24	35	8.5	4.9	5.0	7.6	8.3	5.5	6.2	5.9
23	7.8	6.0	19	12	5.2	4.6	4.9	4.9	5.4	4.9	45	5.4
24	64	4.9	7.7	9.5	4.5	5.0	20	4.6	5.5	4.3	41	5.1
25	42	4.7	5.5	8.3	4.2	6.4	8.6	4.5	4.6	15	11	4.9
26	7.3	4.6	42	7.8	5.5	14	10	4.5	5.4	6.5	20	5.0
27	5.6	4.7	17	7.3	5.5	18	29	4.2	5.6	12	145	173
28	5.1	4.6	6.5	6.7	4.8	6.5	8.8	4.4	4.1	5.8	23	25
29	5.0	6.2	5.6	6.4	4.4	6.6	7.0	4.3	4.3	11	11	10
30	5.1	17	5.9	6.1	---	5.9	6.4	4.3	4.2	5.7	18	8.1
31	7.1	---	5.2	6.0	---	146	---	10	---	9.2	13	---
TOTAL	293.0	249.8	523.2	1043.5	169.6	312.7	791.0	177.8	236.7	350.4	557.3	625.3
MEAN	9.45	8.33	16.9	33.7	5.85	10.1	26.4	5.74	7.89	11.3	18.0	20.8
MAX	64	19	50	151	17	146	195	17	42	43	145	173
MIN	4.3	4.6	4.7	4.1	4.2	3.6	4.9	4.2	3.9	4.0	4.2	4.9
AC-FT	581	495	1040	2070	336	620	1570	353	469	695	1110	1240

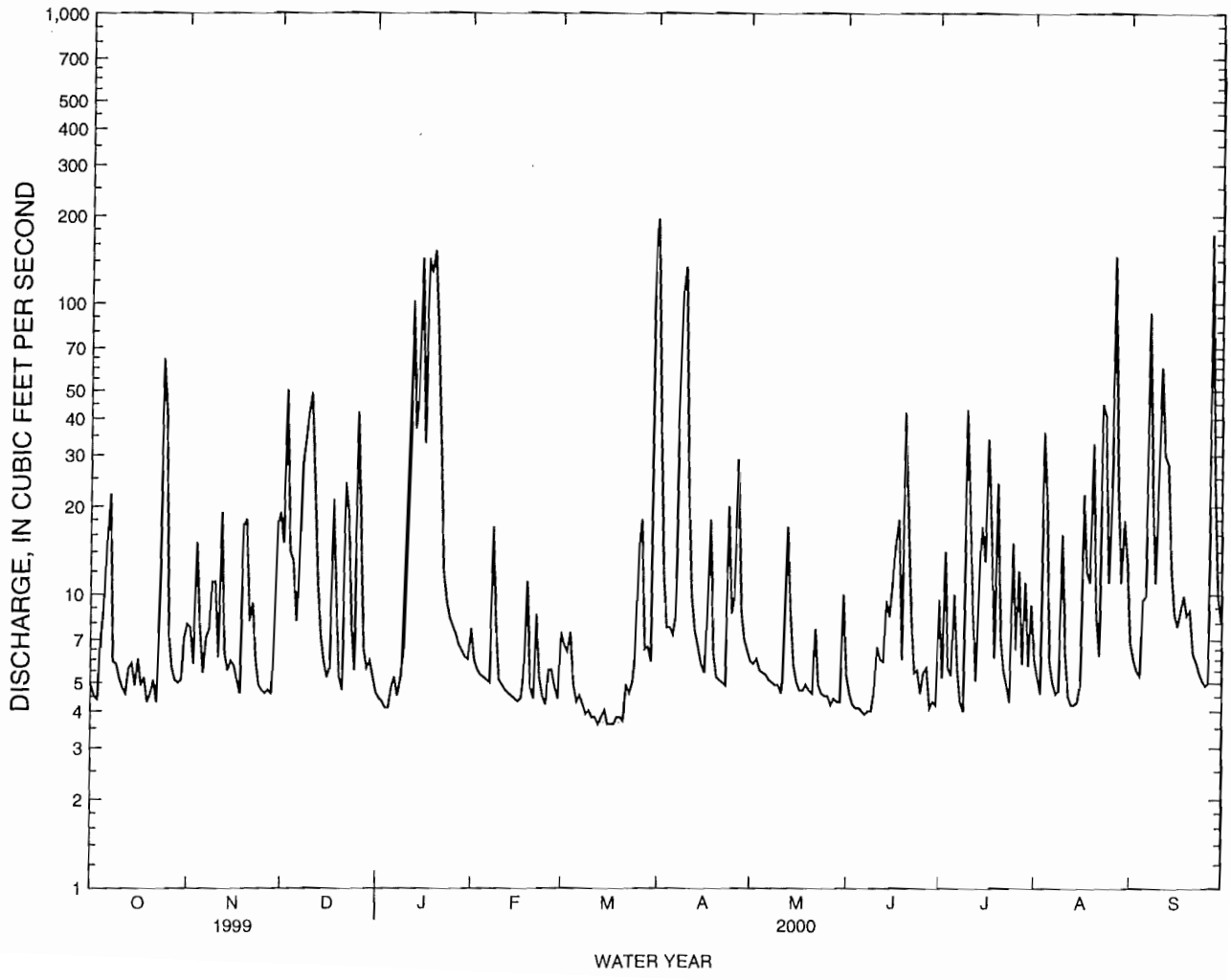
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 2000, BY WATER YEAR (WY)

MEAN	15.1	20.5	18.8	18.3	17.4	24.6	23.9	16.9	12.2	16.1	16.4	12.0
MAX	49.6	51.2	37.5	71.2	50.2	133	121	54.5	28.1	34.4	37.2	40.4
(WY)	1942	1979	1955	1988	1969	1942	1989	1987	1987	1989	1957	1992
MIN	3.20	4.41	4.88	4.82	5.09	5.78	7.02	5.21	4.99	6.32	6.09	4.18
(WY)	1985	1963	1985	1977	1978	1961	1992	1975	1962	1975	1976	1984

HAWAII, ISLAND OF MAUI

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1939 - 2000	
ANNUAL TOTAL	4978.5		5330.3			
ANNUAL MEAN	13.6		14.6		17.8	
HIGHEST ANNUAL MEAN					30.8	1942
LOWEST ANNUAL MEAN					11.0	1981
HIGHEST DAILY MEAN	182	Feb 19	195	Apr 1	696	Mar 10 1942
LOWEST DAILY MEAN	4.3	Oct 19	3.6	Mar 13	2.7	Jan 28 1985
ANNUAL SEVEN-DAY MINIMUM	4.7	Sep 27	3.7	Mar 12	2.8	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	9870		10570		12860	
10 PERCENT EXCEEDS	28		28		35	
50 PERCENT EXCEEDS	7.6		6.0		8.9	
90 PERCENT EXCEEDS	5.0		4.3		5.2	



HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU

LOCATION.--Lat 20°57'45", long 156°35'22", Hydrologic Unit 20020000, on left bank 1,250 ft upstream from intake of Honokohau Ditch, and 4.1 mi southeast of Honokohau.

DRAINAGE AREA.--4.11 mi^2.

PERIOD OF RECORD.--September, November, and December 1911 (combined flow of stream and ditch below point of diversion), March 1913 to September 1920, May 1922 to November 1988, October 1990 to current year. Record since October 1990 equivalent to earlier records.

REVISED RECORDS.--WSP 1937: Drainage area. WDR HI-79-1: 1927-48(M), 1949-78(P).

GAGE.--Water-stage recorders. Elevation of gage is 870 ft above mean sea level (from topographic map). Prior to March 7, 1913, nonrecording gage at site just below Honokohau Ditch intake at different datum. Prior to October 1, 1990, at site 250 ft downstream of gage at datum 26.67 ft lower.

REMARKS.--Records computed by Matt Wong. Records good. No diversion upstream of station. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau Ditch.

AVERAGE DISCHARGE.--82 years (water years 1914-19, 1923-88, 1991-2000), 39.1 ft^3/s (28,340 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 7,260 ft^3/s, January 28, 1988 (gage-height, 8.38 ft for datum and site then in use) from rating curve extended above 3,200 ft^3/s, on basis of slope-area measurement at gage height 8.38 ft; minimum, 8.4 ft^3/s, May 1, 1945, January 5, 1946.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 19	1415	1,060	3.90	Aug. 27	0700	*1,630	*4.22
Mar. 31	2400	1,260	4.02				

Minimum discharge, 13.0 ft^3/s, on many days.

REVISIONS.--The maximum discharges and peak discharges above base of 1,000 ft^3/s for water years 1991–99 have been revised. These figures supercede those published in Water Data Reports for 1991 to 1999.

EXTREMES FOR WATER YEARS 1991–99.--Peak discharges above base discharge of 1,000 ft^3/s and maximum(*):

MAXIMUM DISCHARGE AND GAGE HEIGHT FOR WATER YEARS 1991 THROUGH 1999

Water year	Date	Discharge (ft^3/s)	Gage height (ft)	Water year	Date	Discharge (ft^3/s)	Gage height (ft)
1991	11/19/90	3,570	4.88	1995	11/13/94	*2,180	*4.46
	01/27/91	*4,700	*5.14	1996	03/31/96	*2,600	*4.60
	03/09/91	2,630	4.61	1997	12/14/96	1,750	4.30
	03/19/91	1,770	4.31		01/20/97	*1,900	*4.36
	09/19/91	2,360	4.52	1998	11/25/97	*816	*3.71
1992	09/03/92	*1,540	*4.18	1999	02/20/99	*1,210	*3.99
1993	09/23/93	*1,520	*4.17				
1994	03/23/94	*2,660	*4.62				
	07/15/94	1,720	4.28				

HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

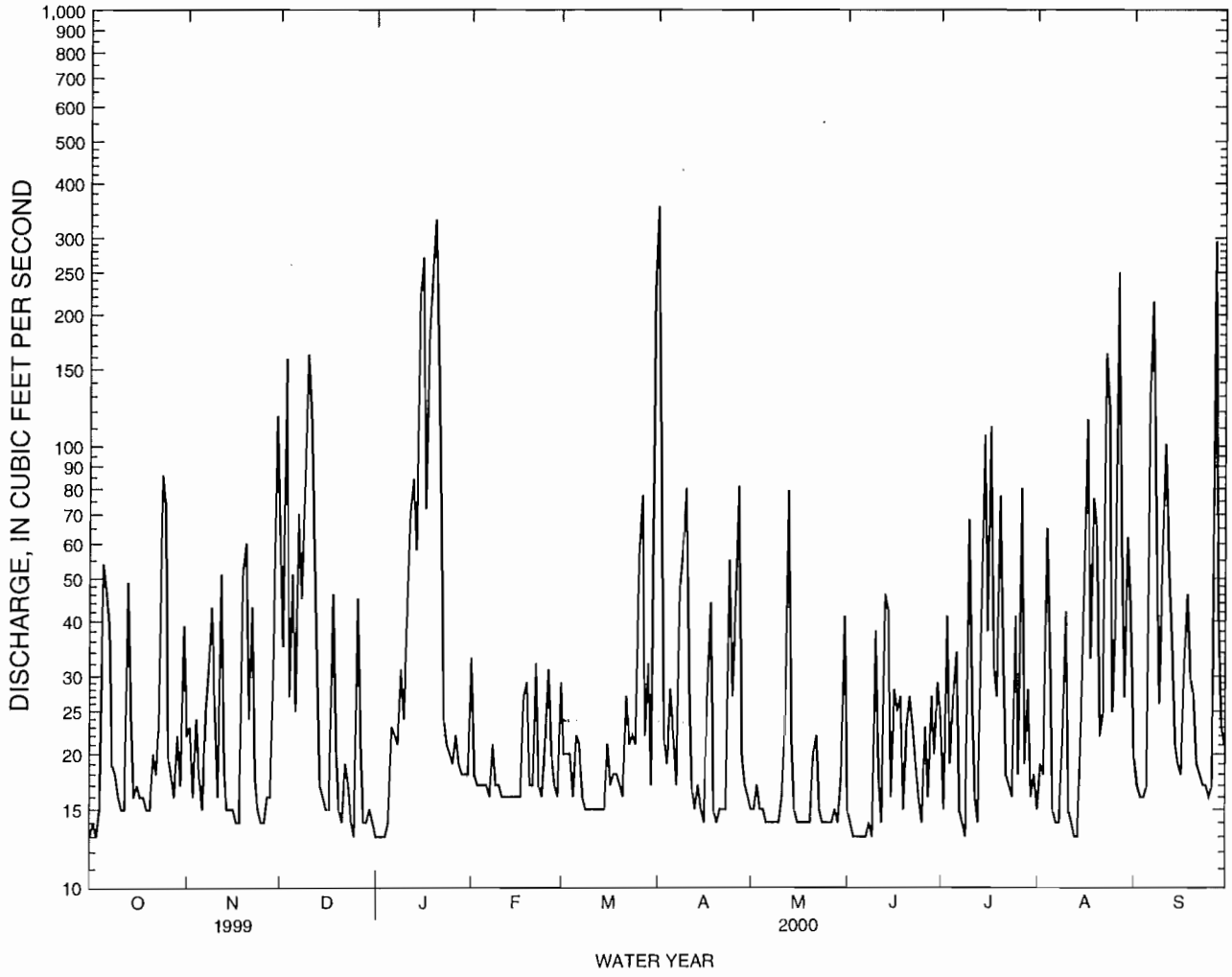
DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	13	22	63	13	33	29	354	15	15	24	15	20
2	14	23	35	13	18	20	75	15	14	15	19	17
3	13	16	158	13	17	20	22	17	13	41	18	16
4	15	24	27	13	17	20	19	15	13	19	65	16
5	54	18	51	14	17	16	28	15	13	27	34	17
6	47	15	25	23	17	22	22	14	13	34	15	128
7	39	25	70	22	16	21	17	14	13	15	14	214
8	19	32	45	21	21	16	47	14	14	14	14	72
9	18	43	80	31	17	15	58	14	13	13	21	26
10	16	24	162	24	17	15	80	14	38	68	42	54
11	15	16	117	41	16	15	29	16	18	27	15	101
12	15	51	60	70	16	15	17	23	14	16	14	53
13	49	19	31	84	16	15	15	79	46	14	13	35
14	24	15	17	58	16	15	17	22	42	41	13	21
15	16	15	16	221	16	15	15	15	16	106	23	19
16	17	15	15	270	16	21	14	14	28	38	49	18
17	16	14	15	72	16	17	28	14	25	111	115	32
18	16	14	46	173	27	18	44	14	27	32	33	46
19	15	52	21	244	29	18	15	14	15	27	76	30
20	15	60	15	330	17	17	14	14	23	77	64	27
21	20	24	14	177	17	16	15	20	27	33	22	19
22	18	43	19	71	32	27	15	22	23	18	25	18
23	24	18	17	24	17	21	15	15	19	17	163	17
24	86	15	14	21	16	22	55	14	16	16	120	17
25	73	14	13	20	21	21	27	14	14	41	25	16
26	20	14	45	19	31	56	44	14	23	18	42	17
27	18	16	21	22	20	77	81	14	16	80	250	294
28	16	16	14	19	17	22	20	15	27	19	59	41
29	22	32	14	18	16	32	17	14	20	28	27	23
30	17	117	15	18	---	17	16	18	29	16	62	21
31	39	---	14	18	---	228	---	41	---	18	40	---
TOTAL	799	822	1269	2177	562	899	1235	573	627	1063	1507	1445
MEAN	25.8	27.4	40.9	70.2	19.4	29.0	41.2	18.5	20.9	34.3	48.6	48.2
MAX	86	117	162	330	33	228	354	79	46	111	250	294
MIN	13	14	13	13	16	15	14	14	13	13	13	16
AC-FT	1580	1630	2520	4320	1110	1780	2450	1140	1240	2110	2990	2870
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 2000, BY WATER YEAR (WY)												
MEAN	31.4	41.1	41.0	36.1	36.8	44.0	48.6	40.8	34.4	40.0	41.0	30.6
MAX	94.8	110	97.5	98.6	132	144	120	130	81.1	116	103	122
(WY)	1915	1915	1955	1916	1932	1942	1980	1916	1916	1914	1914	1914
MIN	10.8	11.8	13.0	12.3	13.5	13.4	12.9	12.2	14.2	16.2	14.5	12.1
(WY)	1985	1963	1936	1944	1963	1926	1992	1945	1962	1926	1971	1984

HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1913 - 2000	
ANNUAL TOTAL	12899		12978			
ANNUAL MEAN	35.3		35.5		39.1	
HIGHEST ANNUAL MEAN					68.3	1914
LOWEST ANNUAL MEAN					24.1	1926
HIGHEST DAILY MEAN	227	Jan 31	354	Apr 1	781	Apr 7 1938
LOWEST DAILY MEAN	13	Sep 28	13	Oct 1	8.0	Aug 10 1920
ANNUAL SEVEN-DAY MINIMUM	13	Sep 27	13	Jun 3	8.5	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	25590		25740		28340	
10 PERCENT EXCEEDS	63		71		78	
50 PERCENT EXCEEDS	24		19		24	
90 PERCENT EXCEEDS	15		14		13	



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Surface-Water Station Records for Hawaii

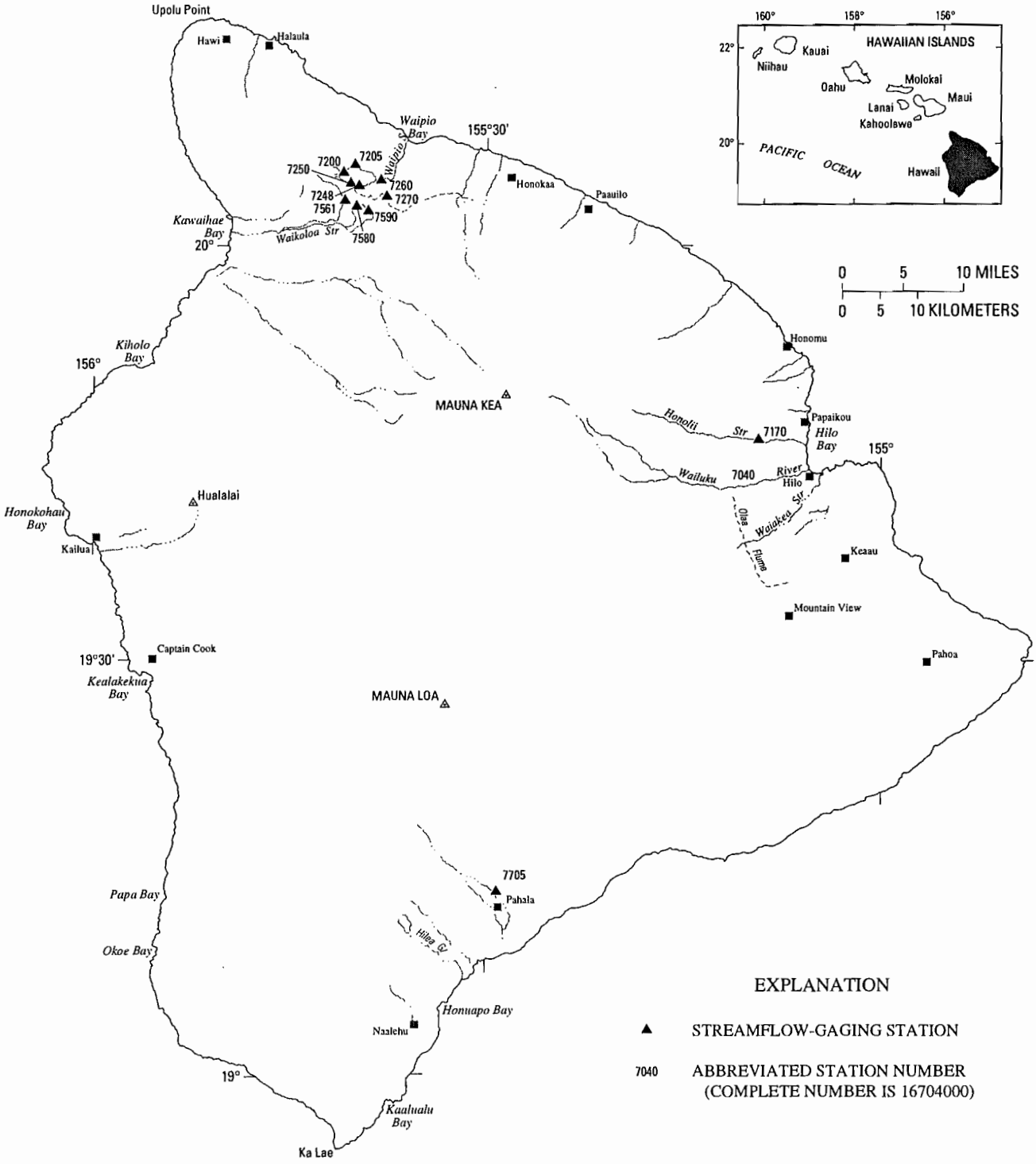

Figure 9. Locations of streamflow-gaging stations on Hawaii.

HAWAII, ISLAND OF HAWAII

16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

THE RECORDS FOR WATER YEARS 1992-95 WERE NOT COMPUTED
AT THE TIME OF PUBLICATION

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HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA

LOCATION.--Lat 19°42'56", long 155°09'12", Hydrologic Unit 20010000, on right bank 0.2 mi downstream from Hookelekele Stream, 0.9 mi west of Piihonua, and 4.1 mi west of Hilo Post Office. Prior to November 16, 1977, at site directly across river, on left bank.

DRAINAGE AREA.--230 mi^2, of which a portion probably is noncontributing.

PERIOD OF RECORD.--July 1928 to July 1940, October 1940 to December 1947, April 1948 to current year. Monthly discharge only July 1928, published in WSP 1319. Prior to July 1960, published as "above Hilo Boarding School ditch intake, near Hilo."

REVISED RECORDS.--WSP 865: 1929-36(M). WSP 965: 1941. WDR HI-80-1: 1929-79(P). WDR HI-81-1: 1940(M).

GAGE.--Water-stage recorder. Elevation of gage is 1,090 ft above mean sea level (from topographic map). Prior to November 16, 1977, at site directly across river, on left bank at same datum.

REMARKS.--Records computed by Dale Nishimoto. Records fair except for period of estimated record which is poor. Kapehu ditch diverted water from Kapehu Stream into Wailuku River upstream 1938-63. Department of Water Supply diverted about 6 ft^3/s of water upstream of gage until 1967. Hydroelectric plant diverts variable amounts of water up to 160 ft^3/s about 1 mi upstream of gage and discharges it about 500 ft below gage (from 1993).

AVERAGE DISCHARGE.--69 years (water years 1929-39, 1942-47, 1949-2000), 279 ft^3/s (202,400 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 80,200 ft^3/s, revised, August 11, 1940, gage height, 28.6 ft, from floodmarks, from rating curve extended above 13,000 ft^3/s based on slope-area measurement at gage height 26.16 ft; minimum, 0.15 ft^3/s, January 20, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge 50,000 ft^3/s on December 11 at 0700 hours, gage height 24.67 ft; minimum recorded discharge, 7.3 ft^3/s, June 9-10, but may have been less during period of no gage height record October 1 to March 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e46	e30	e800	e49	e130	e9.5	88	35	13	36	52	218
2	e46	e32	e1500	e47	e80	e9.0	73	32	12	29	67	172
3	e46	e32	e420	e45	e65	e8.5	74	31	11	28	49	142
4	e48	e330	e1070	e43	e60	e8.5	78	28	9.7	146	44	120
5	e40	e140	e180	e40	e55	e8.0	213	29	9.6	82	49	146
6	e50	e90	e115	e75	e50	e8.0	241	27	8.6	308	49	219
7	e120	e65	e105	e150	e45	e15	171	25	8.5	671	50	334
8	e60	e130	e160	e220	e42	e12	119	23	8.1	209	45	514
9	e50	e70	e2400	e390	e39	e11	89	21	7.7	138	45	538
10	e40	e100	e15000	e600	e37	e10	87	20	7.9	108	76	362
11	e30	e55	e10000	e300	e35	e9.5	123	22	11	132	72	243
12	e26	e580	e4500	e200	e33	e9.0	93	25	13	180	49	371
13	e23	e360	e850	e600	e31	e8.5	78	27	16	126	45	437
14	e23	e180	e300	e315	e29	e8.0	75	42	45	117	42	236
15	e24	e100	e170	e680	e27	e7.5	57	28	29	172	40	172
16	e23	e57	e140	e3500	e25	e7.0	52	25	21	417	37	138
17	e22	e48	e100	e600	e23	e7.0	49	25	16	1540	174	113
18	e22	e45	e200	e880	e21	e10	61	24	14	623	69	95
19	e21	e40	e350	e290	e19	e30	48	25	12	317	70	83
20	e60	e120	e150	e170	e17	e20	43	23	11	361	1760	74
21	e100	e65	e100	e320	e16	e15	40	20	22	228	502	74
22	e80	e150	e90	e780	e15	e10	41	18	15	163	210	67
23	e40	e80	e80	e180	e14	17	35	17	14	129	2620	57
24	e60	e55	e75	e145	e13	19	41	16	12	106	1990	52
25	e100	e70	e70	e130	e12	13	64	15	20	93	542	48
26	e60	e80	e65	e115	e11	22	51	15	76	101	460	44
27	e50	e85	e60	e170	e11	721	48	14	117	83	1830	146
28	e40	e130	e57	e100	e10	419	41	14	32	68	877	1300
29	e37	e160	e55	e70	e10	170	39	14	33	60	372	137
30	e35	e1750	e53	e60	---	132	38	14	25	54	296	112
31	e60	---	e51	e80	---	102	---	14	---	82	298	---
TOTAL	1482	5229	39266	11344	975	1856.0	2350	708	650.1	6907	12881	6764
MEAN	47.8	174	1267	366	33.6	59.9	78.3	22.8	21.7	223	416	225
MAX	120	1750	15000	3500	130	721	241	42	117	1540	2620	1300
MIN	21	30	51	40	10	7.0	35	14	7.7	28	37	44
AC-FT	2940	10370	77880	22500	1930	3680	4660	1400	1290	13700	25550	13420

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1928 - 2000, BY WATER YEAR (WY)

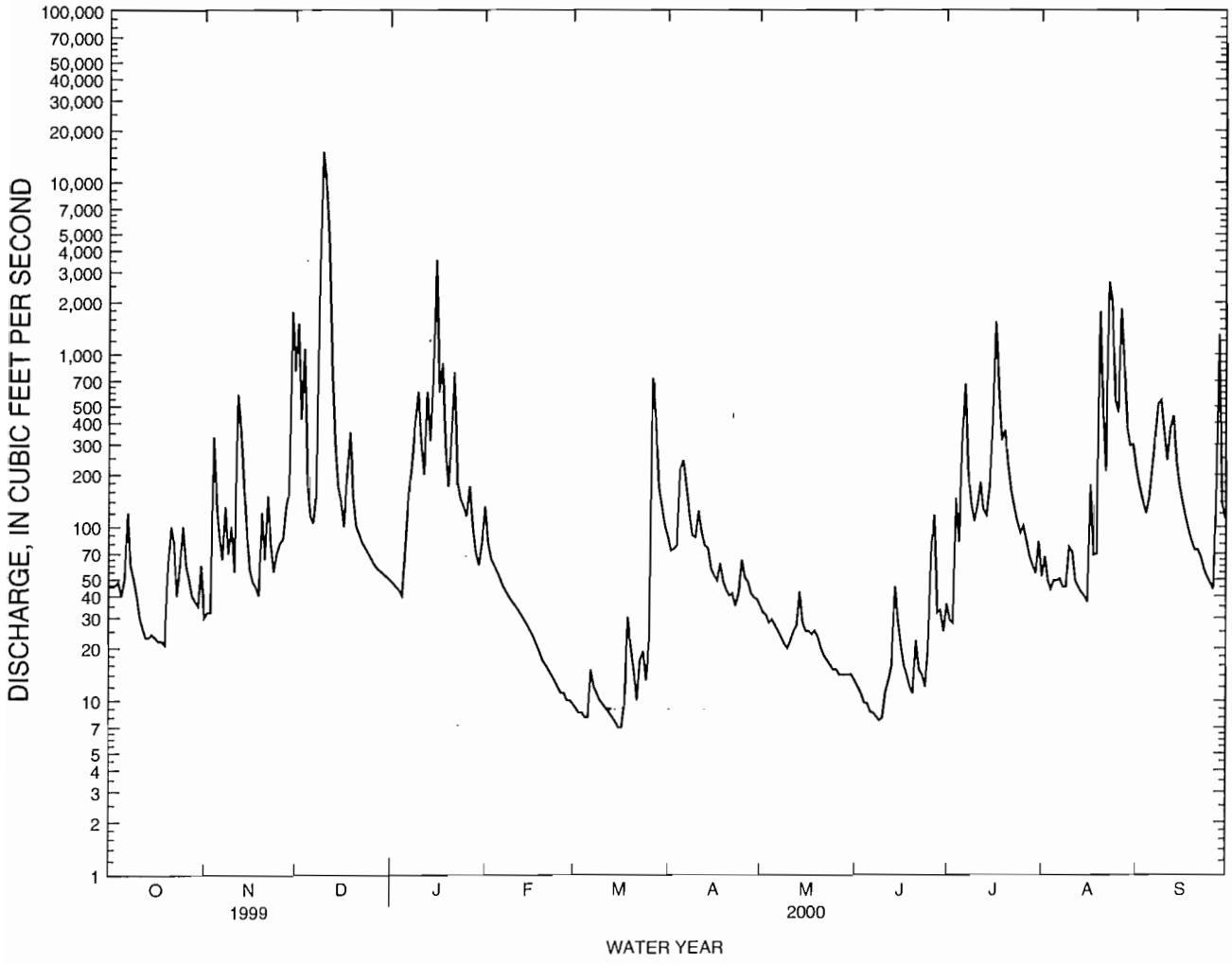
MEAN	168	379	360	290	301	409	381	222	130	217	289	168
MAX	765	2238	1368	2061	2050	2026	2262	1246	715	1140	1989	992
(WY)	1942	1991	1971	1975	1969	1991	1986	1964	1941	1989	1930	1930
MIN	2.96	19.1	7.15	1.10	.51	.26	7.83	6.23	5.48	2.79	12.8	10.2
(WY)	1985	1934	1934	1981	1983	1983	1992	1992	1981	1981	1971	1974

e Estimated

HAWAII, ISLAND OF HAWAII

16704000 WAILUKU RIVER AT PIIHONUA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1928 - 2000	
ANNUAL TOTAL	117647		90412.1			
ANNUAL MEAN	322		247		279	
HIGHEST ANNUAL MEAN					588	1991
LOWEST ANNUAL MEAN					103	1981
HIGHEST DAILY MEAN	15000	Dec 10	15000	Dec 10	22200	Jan 8 1975
LOWEST DAILY MEAN	21	Oct 19	7.0	Mar 16	.22	Mar 20 1983
ANNUAL SEVEN-DAY MINIMUM	23	Oct 13	8.1	Mar 11	.23	Mar 17 1983
ANNUAL RUNOFF (AC-FT)	233400		179300		202400	
10 PERCENT EXCEEDS	705		398		594	
50 PERCENT EXCEEDS	71		57		80	
90 PERCENT EXCEEDS	35		13		12	



HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU

LOCATION.--Lat 19°46'00", long 155°09'16", Hydrologic Unit 20010000, on left bank 0.7 mi downstream from Pohakupaa Stream, 4.1 mi west of Papaikou, and 4.8 mi northwest of Hilo Post Office.

DRAINAGE AREA.--11.6 mi^2.

PERIOD OF RECORD.--June 1911 to March 1913 (published as "at Kaiwiki, near Hilo"), February 1967 to current year.

REVISED RECORDS.--WDR HI-95-1: 1967-90 (maximum, 1988-90 (m), 1988-90).

GAGE.--Water-stage recorder. Elevation of gage is 1,540 ft above mean sea level (from topographic map). Prior to August 27, 1911, nonrecording gage and August 27, 1911 to March 24, 1913, water-stage recorder, at site 0.5 mi upstream at different datum.

REMARKS.--Record computed by Gary Sanchez. Records good. No diversion upstream. During period 1911–13, Honolii ditch diverted an average of about 3.2 ft^3/s upstream for fluming cane and domestic use.

AVERAGE DISCHARGE.--34 years (water years 1912, 1968-2000), 130 ft^3/s (94,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 22,600 ft^3/s, May 23, 1978, gage height, 20.00 ft, from floodmarks and from rating curve extended above 4,610 ft^3/s on basis of slope-area measurement at gage height 20.00 ft; minimum, 0.8 ft^3/s, January 31, 1912. Minimum discharge since February 1967 (period of no diversions), 1.0 ft^3/s, February 22–28, 1980.

EXTREMES FOR CURRENT YEAR.-- Peak discharges greater than base discharge of 4,600 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 02	0545	5,850	12.87	Dec. 11	0700	*11,500	*16.28

Minimum discharge, 3.3 ft^3/s, April 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	27	384	16	64	8.7	55	20	14	34	71	107
2	22	31	1080	15	34	8.3	58	19	12	35	81	71
3	22	31	467	15	28	8.1	97	17	10	30	38	51
4	19	151	486	14	24	8.2	148	16	9.5	255	30	42
5	16	68	87	14	22	7.6	337	14	10	127	38	97
6	20	44	56	26	20	7.7	282	13	9.4	371	49	101
7	56	32	52	86	19	11	133	12	8.9	528	62	202
8	26	64	79	103	17	10	60	12	8.6	118	39	374
9	21	34	1100	178	19	8.6	40	11	8.3	60	58	346
10	18	46	6410	378	16	7.9	56	11	9.0	74	87	199
11	16	27	5070	196	15	7.4	154	16	20	138	96	117
12	14	264	2200	164	15	7.2	79	25	21	140	44	265
13	14	165	401	540	14	7.0	53	22	18	63	34	281
14	14	88	140	143	13	6.9	43	50	44	82	31	115
15	15	57	83	312	13	6.9	36	23	30	197	27	72
16	14	38	69	1600	12	6.8	29	17	18	458	24	58
17	14	30	52	274	12	6.8	27	18	14	982	252	45
18	14	25	97	402	11	7.2	61	16	12	286	81	38
19	13	22	161	133	11	19	42	18	12	187	123	35
20	29	57	59	81	10	14	30	15	11	223	1050	36
21	65	33	44	146	10	12	25	13	19	112	282	31
22	47	73	37	356	10	10	25	12	19	66	154	39
23	25	39	33	89	9.8	30	21	12	16	47	1280	27
24	30	28	29	56	9.7	19	40	12	12	38	785	23
25	59	37	26	43	9.3	14	78	11	62	37	159	22
26	32	41	24	37	9.6	31	38	15	198	63	347	21
27	23	42	22	81	9.1	628	37	13	138	34	904	164
28	19	65	21	48	8.7	354	28	13	36	28	389	760
29	18	77	19	36	8.5	118	24	12	24	24	148	71
30	16	794	18	30	---	74	23	17	19	22	201	48
31	41	---	17	41	---	40	---	15	---	23	198	---
TOTAL	774	2530	18823	5653	473.7	1505.3	2159	510	842.7	4882	7162	3858
MEAN	25.0	84.3	607	182	16.3	48.6	72.0	16.5	28.1	157	231	129
MAX	65	794	6410	1600	64	628	337	50	198	982	1280	760
MIN	13	22	17	14	8.5	6.8	21	11	8.3	22	24	21
AC-FT	1540	5020	37340	11210	940	2990	4280	1010	1670	9680	14210	7650

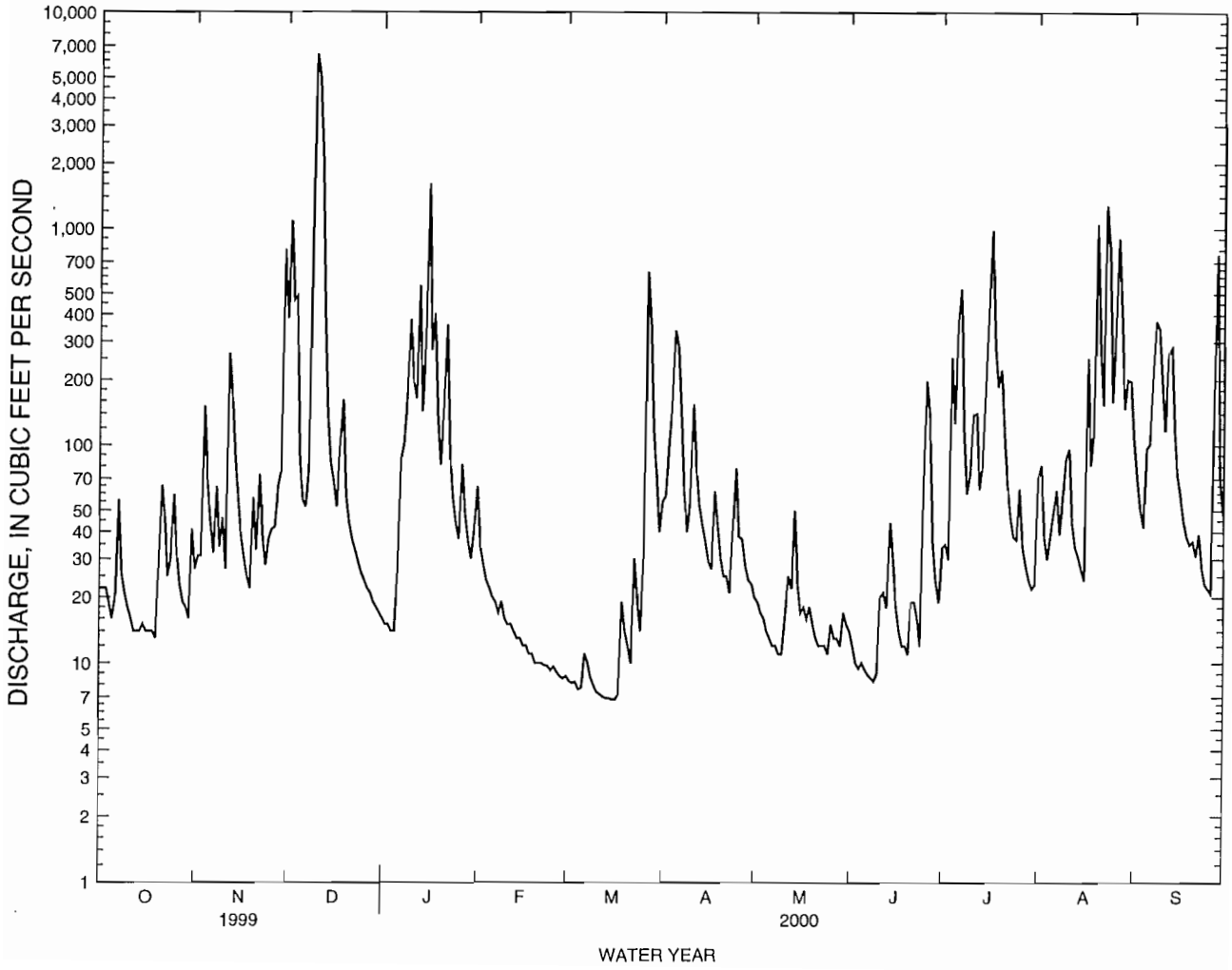
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 2000, BY WATER YEAR (WY)

MEAN	79.9	191	167	130	114	206	187	93.5	76.3	120	119	85.3
MAX	222	783	625	648	752	1349	772	319	349	384	420	276
(WY)	1991	1995	1971	1975	1969	1980	1986	1989	1997	1989	1982	1994
MIN	9.70	18.7	10.5	5.64	4.80	6.71	12.5	11.4	8.61	9.66	13.9	8.81
(WY)	1985	1986	1984	1981	1980	1983	1992	1992	1981	1981	1973	1979

HAWAII, ISLAND OF HAWAII

16717000 HONOLII STREAM NEAR PAPAIKOU--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1911 - 2000	
ANNUAL TOTAL	59032		49172.7			
ANNUAL MEAN	162		134		130	
HIGHEST ANNUAL MEAN					220	1991
LOWEST ANNUAL MEAN					53.1	1981
HIGHEST DAILY MEAN	6410	Dec 10	6410	Dec 10	6410	Dec 10 1999
LOWEST DAILY MEAN	10	Jul 19	6.8	Mar 16	.80	Jan 31 1912
ANNUAL SEVEN-DAY MINIMUM	11	Jul 4	7.0	Mar 12	1.0	Feb 22 1980
ANNUAL RUNOFF (AC-FT)	117100		97530		94070	
10 PERCENT EXCEEDS	390		276		269	
50 PERCENT EXCEEDS	38		34		42	
90 PERCENT EXCEEDS	15		11		11	



HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA

LOCATION.--Lat 20°05'18", long 155°40'58", Hydrologic Unit 20010000, on left bank 250 ft upstream from Upper Hamakua ditch intake, and 4.5 mi north of Kamuela.

DRAINAGE AREA.--1.58 mi^2.

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

REVISED RECORDS.--WDR HI-95-1: 1965-90 (m), 1970, 1971, 1979, 1984, 1990.

GAGE.--Water-stage recorder. Elevation of gage is 4,060 ft above mean sea level (from topographic map).

REMARKS.--Record computed by Dale Nishimoto. Records fair. No diversion upstream.

AVERAGE DISCHARGE.--36 years (water years 1965-2000, 15.1 ft^3/s (10,920 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,160 ft^3/s, November 18, 1979, gage height, 10.03 ft, from rating curve extended above 53 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 10.03 ft; minimum, 0.01 ft^3/s, January 23-28, February 20-21, 1977, December 16-19, February 23, 24, 1980 (revised).

EXTREMES FOR CURRENT YEAR.-- Peak discharges greater than base discharge of 440 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 03	2015	*615	*5.64	No other peak greater than base discharge.			

Minimum discharge, 0.20 ft^3/s, February 20-22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	12	25	.43	2.0	.95	e6.0	e8.0	4.6	.92	3.3	22
2	6.3	16	16	.41	1.6	1.0	e7.0	e15	2.6	.85	6.1	6.1
3	4.1	6.5	98	.40	1.2	1.1	e8.0	e25	1.7	.71	15	2.8
4	1.9	3.8	53	.40	1.0	2.2	e7.0	e6.0	1.7	29	10	1.7
5	3.0	7.8	12	.40	.83	1.4	e50	e3.0	4.9	5.8	9.7	1.3
6	21	11	5.7	2.2	.71	1.9	e30	e2.5	4.7	4.2	3.1	6.1
7	11	20	20	26	.62	10	e15	e1.3	2.1	4.8	1.9	26
8	4.2	26	38	29	.54	6.0	e7.0	e1.0	2.2	3.2	1.3	27
9	2.4	18	114	27	.48	2.5	e25	e1.5	2.2	1.9	35	16
10	1.6	29	34	28	.44	1.5	e50	e2.5	2.3	1.6	16	18
11	1.2	5.8	61	30	.39	1.1	e40	e25	6.8	2.7	4.3	20
12	1.0	71	31	19	.36	.91	e15	e15	3.6	3.9	2.2	59
13	9.3	24	9.4	45	.32	.77	e7.0	e25	3.8	2.7	1.5	26
14	7.1	27	3.8	17	.30	.63	e15	e30	6.9	16	1.1	8.3
15	2.3	22	2.3	93	.28	.53	e25	e4.0	3.3	38	1.4	3.6
16	1.8	4.8	1.7	140	.27	.73	e13	e2.0	5.3	50	5.5	2.3
17	1.9	2.8	1.4	30	.27	1.3	e20	e1.0	9.3	76	13	1.7
18	1.4	1.7	1.2	54	.25	1.1	e25	e1.0	4.0	23	19	3.7
19	1.0	2.5	1.2	40	.24	1.9	e10	e2.5	2.1	21	57	4.5
20	1.8	64	.98	36	.22	1.6	e5.5	e1.7	3.7	30	26	4.4
21	2.4	4.7	.86	62	.20	1.2	e10	e5.0	9.1	8.3	23	2.3
22	3.0	3.7	.78	94	.21	6.2	e13	e9.0	5.8	3.4	68	4.5
23	5.5	3.0	.72	8.6	.22	22	e5.5	e6.0	3.8	2.2	96	2.0
24	15	1.8	.66	4.1	.22	13	e30	2.2	2.2	2.0	30	1.3
25	35	5.6	.59	2.5	.24	12	e25	3.1	3.1	37	6.3	.99
26	9.0	31	.53	2.0	.51	20	e23	7.5	12	63	21	.84
27	7.1	14	.61	70	1.1	54	e40	2.6	10	18	36	1.9
28	3.1	63	.62	14	1.3	e45	e20	2.1	2.6	7.1	9.8	1.5
29	26	31	.56	10	.92	e20	e10	4.8	1.4	8.7	9.4	1.0
30	29	196	.51	5.1	---	e10	e3.5	20	1.0	9.8	43	1.0
31	24	---	.48	2.7	---	e5.0	---	25	---	7.9	43	---
TOTAL	245.7	729.5	536.60	893.24	17.24	247.52	560.5	260.3	128.8	483.68	617.9	277.83
MEAN	7.93	24.3	17.3	28.8	.59	7.98	18.7	8.40	4.29	15.6	19.9	9.26
MAX	35	196	114	140	2.0	54	50	30	12	76	96	59
MIN	1.0	1.7	.48	.40	.20	.53	3.5	1.0	1.0	.71	1.1	.84
AC-FT	487	1450	1060	1770	34	491	1110	516	255	959	1230	551

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2000, BY WATER YEAR (WY)

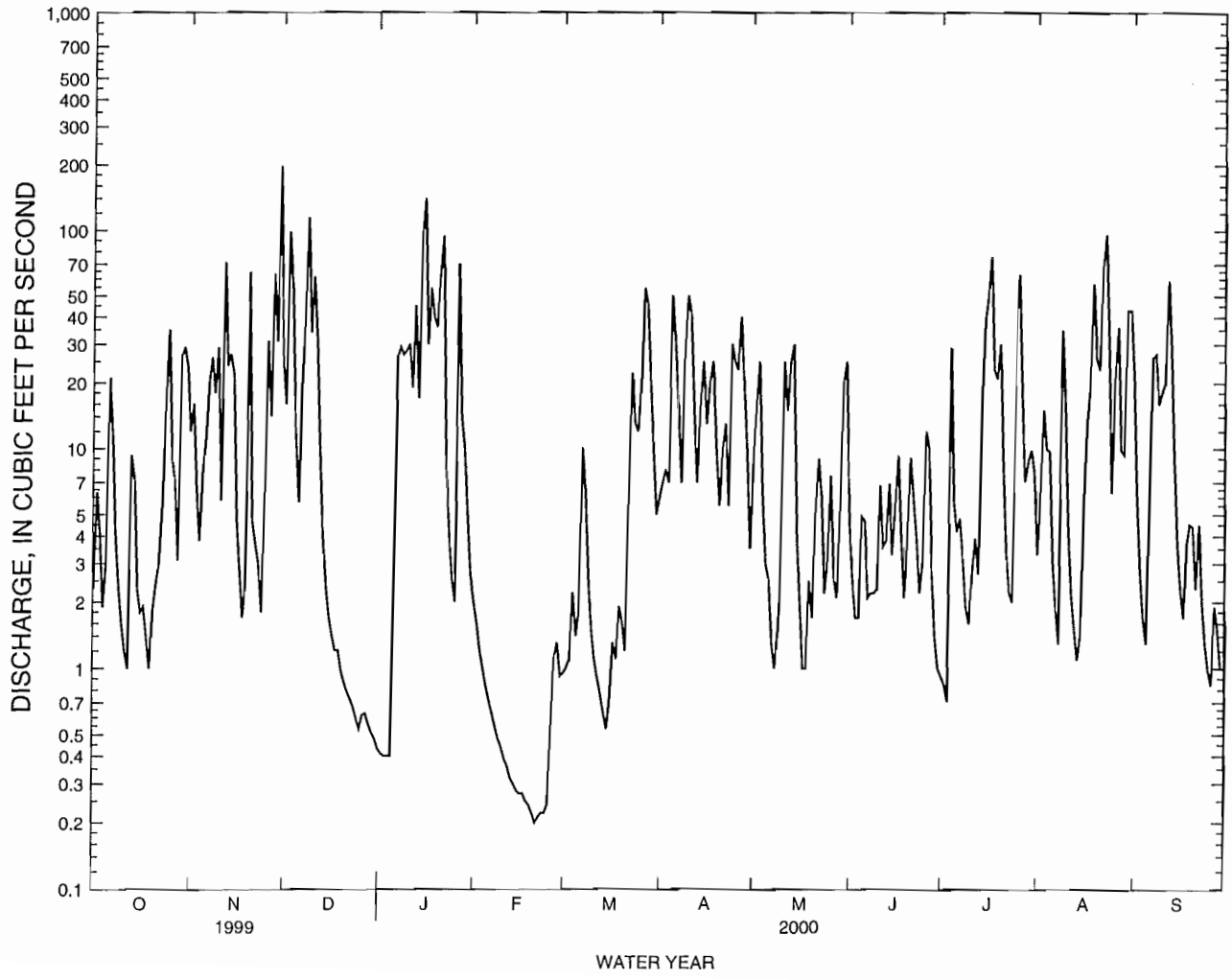
MEAN	9.17	16.9	15.4	15.3	12.1	20.9	23.0	12.5	14.0	18.7	15.0	8.51
MAX	27.3	55.8	41.4	62.5	40.6	98.0	67.5	36.0	37.7	37.0	31.8	27.5
(WY)	1984	1980	1971	1979	1969	1980	1986	1998	1998	1982	1982	1992
MIN	.17	1.77	.51	.34	.51	3.33	1.71	1.07	3.18	4.56	2.70	.27
(WY)	1985	1990	1981	1981	1995	1983	1992	1999	1985	1981	1971	1965

e Estimated

HAWAII, ISLAND OF HAWAII

16720000 KAWAINUI STREAM NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1964 - 2000	
ANNUAL TOTAL	5881.31		4998.81			
ANNUAL MEAN	16.1		13.7		15.1	
HIGHEST ANNUAL MEAN					26.3	1980
LOWEST ANNUAL MEAN					7.33	1981
HIGHEST DAILY MEAN	242	Mar 20	196	Nov 30	612	Nov 18 1979
LOWEST DAILY MEAN	.32	Jan 8	.20	Feb 21	.01	Jan 23 1977
ANNUAL SEVEN-DAY MINIMUM	.45	Jan 3	.22	Feb 19	.01	Jan 22 1977
ANNUAL RUNOFF (AC-FT)	11670		9920		10920	
10 PERCENT EXCEEDS	46		35		42	
50 PERCENT EXCEEDS	4.6		4.8		4.5	
90 PERCENT EXCEEDS	.66		.71		.51	



HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, on right bank 800 ft downstream from Kawaiki Stream intake and 4.4 mi north of Kamuela.

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

GAGE.--Water-stage recorders and concrete control. Elevation of gage is 4,020 ft (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records good except for estimated period which is fair. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela. Rain gage located at station monitoring total rainfall between service dates.

AVERAGE DISCHARGE.-- 36 years (water years 1965-2000), 7.41 ft^3/s (5,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 49 ft^3/s, November 2, 1967; no flow, July 8-9, 14-16, 1992, August 4-6, 1992.

EXTREMES FOR CURRENT YEAR.-- Maximum daily discharge, 14 ft^3/s, November 30; minimum daily, 0.28 ft^3/s, February 20-22, 24.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	10	13	.54	2.8	1.2	e5.0	e5.5	5.8	1.2	4.4	12
2	8.7	12	12	.51	2.1	1.2	e7.0	e7.5	3.4	1.1	7.7	7.2
3	6.1	8.7	11	.47	1.6	1.5	e7.0	e12	2.4	.90	11	3.4
4	2.5	6.4	13	.47	1.2	3.1	e8.5	e9.0	2.9	11	10	2.3
5	3.6	9.6	11	.51	1.0	1.8	e12	e6.0	7.6	7.5	9.3	1.6
6	8.8	12	7.3	2.9	.85	2.7	e11	e4.0	6.6	5.7	4.0	3.7
7	9.7	8.8	7.2	10	.74	10	e10	e3.0	3.0	6.7	2.6	12
8	5.5	12	12	11	.66	7.6	e7.0	e2.0	3.1	4.5	1.8	12
9	2.9	10	13	12	.60	3.3	e10	e1.2	3.0	2.8	9.4	10
10	1.9	13	12	11	.56	2.0	e13	e4.0	3.5	2.6	10	11
11	1.3	8.3	12	12	.51	1.3	e13	e8.0	9.4	4.2	5.5	11
12	1.2	11	12	11	.47	.93	e10	e11	5.5	5.9	3.0	12
13	6.8	13	9.8	12	.43	.76	e9.0	e12	5.1	3.7	2.0	12
14	8.3	13	5.0	11	.43	.61	e10	e13	8.5	9.8	1.5	8.7
15	3.0	12	3.3	13	.40	.53	e13	e7.0	4.5	12	1.8	4.4
16	2.3	7.6	2.6	13	.37	.98	e11	e4.0	6.1	12	5.8	3.0
17	2.4	4.4	2.1	12	.31	1.9	e12	e2.6	9.2	13	11	2.4
18	1.6	2.6	1.9	13	.31	1.4	e13	e1.2	5.4	11	12	4.9
19	1.1	2.8	1.7	11	.31	2.4	e10	e4.5	2.9	11	12	5.8
20	2.8	13	1.4	12	.28	1.8	e6.0	e3.0	5.4	12	12	5.8
21	3.9	7.3	1.2	13	.28	1.3	e8.0	e5.0	9.9	8.8	12	3.1
22	5.2	6.4	1.1	13	.28	4.7	e11	e9.0	8.2	4.5	12	6.5
23	7.3	5.1	1.0	9.2	.29	12	e7.0	e6.6	5.2	3.0	13	2.8
24	10	2.8	.92	4.9	.28	9.7	e11	3.0	3.0	2.8	12	1.8
25	13	6.2	.83	3.2	.31	10	e12	4.0	3.8	7.9	7.4	1.3
26	10	13	.77	2.6	.82	12	e12	8.2	8.4	13	9.4	1.1
27	9.0	12	.78	12	1.6	12	e13	3.5	9.0	12	12	2.4
28	4.8	12	.74	11	1.8	e13	e11	3.1	3.5	8.4	9.7	1.9
29	13	13	.67	10	1.1	e9.0	e7.0	4.5	2.0	8.7	9.6	1.4
30	12	14	.61	6.8	---	e6.0	e5.5	11	1.4	10	12	1.4
31	12	---	.56	3.5	---	e3.0	---	11	---	9.0	12	---
TOTAL	183.9	282.0	172.48	258.60	22.69	139.71	295.0	189.4	157.7	226.70	257.9	168.9
MEAN	5.93	9.40	5.56	8.34	.78	4.51	9.83	6.11	5.26	7.31	8.32	5.63
MAX	13	14	13	13	2.8	13	13	13	9.9	13	13	12
MIN	1.1	2.6	.56	.47	.28	.53	5.0	1.2	1.4	.90	1.5	1.1
AC-FT	365	559	342	513	45	277	585	376	313	450	512	335

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2000, BY WATER YEAR (WY)

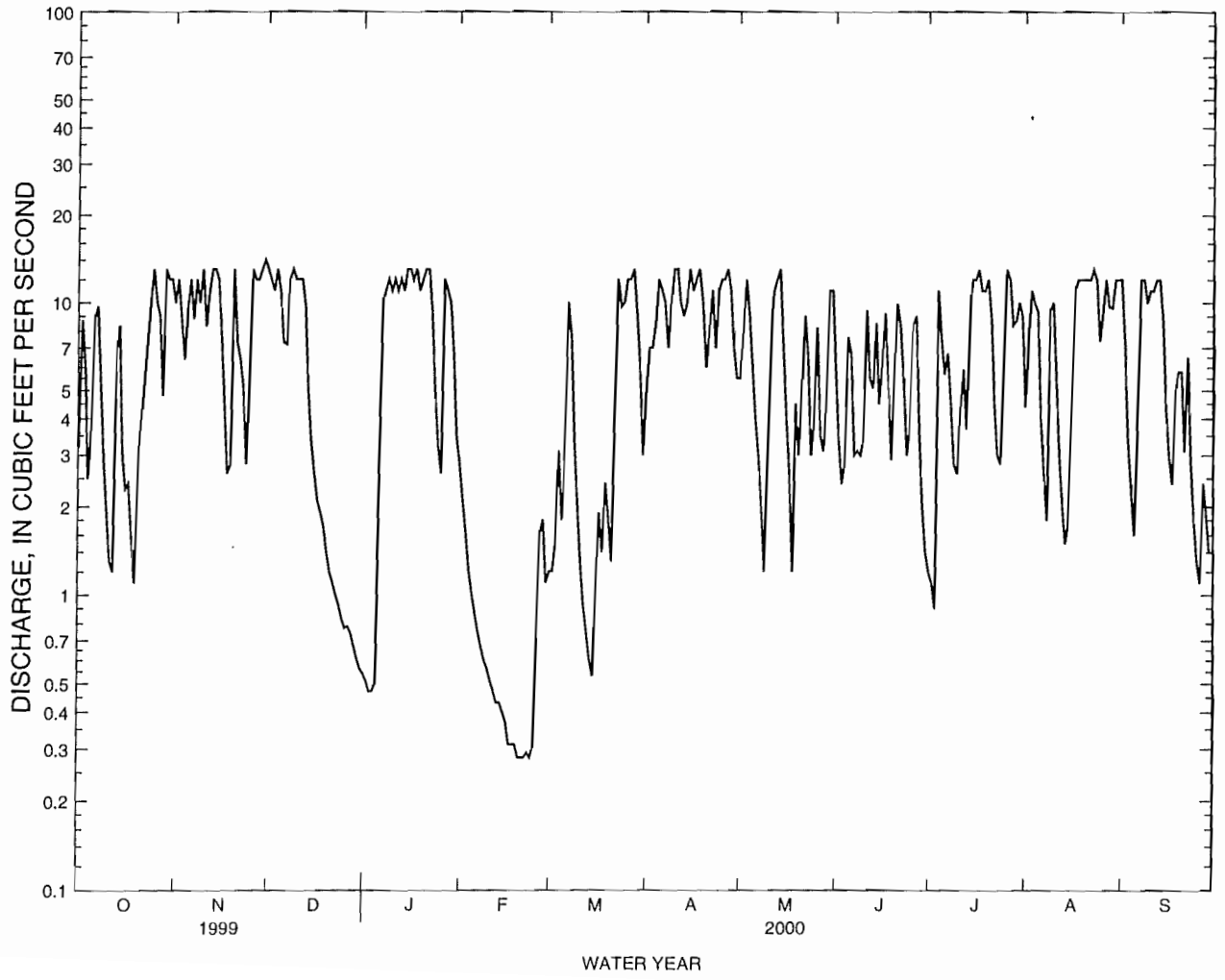
MEAN	5.69	7.77	6.78	5.83	5.35	7.92	9.25	7.25	8.52	10.3	8.40	5.75
MAX	14.0	21.0	17.5	11.9	17.1	16.0	22.1	16.2	16.5	20.5	18.7	13.4
(WY)	1965	1968	1971	1967	1969	1973	1970	1970	1966	1967	1966	1964
MIN	.14	1.85	.77	.53	.77	1.69	2.23	1.42	3.30	2.67	2.66	.19
(WY)	1985	1996	1981	1981	1995	1974	1992	1999	1984	1984	1973	1965

e Estimated

HAWAII, ISLAND OF HAWAII

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1964 - 2000	
ANNUAL TOTAL	2393.37		2354.98			
ANNUAL MEAN	6.56		6.43		7.41	
HIGHEST ANNUAL MEAN					11.3	1970
LOWEST ANNUAL MEAN					3.78	1984
HIGHEST DAILY MEAN	14	Jan 29	14	Nov 30	49	Nov 2 1967
LOWEST DAILY MEAN	.48	Mar 8	.28	Feb 20	.00	Jul 8 1992
ANNUAL SEVEN-DAY MINIMUM	.58	Mar 3	.29	Feb 18	.04	Dec 29 1980
ANNUAL RUNOFF (AC-FT)	4750		4670		5370	
10 PERCENT EXCEEDS	13		12		16	
50 PERCENT EXCEEDS	6.4		6.0		5.2	
90 PERCENT EXCEEDS	.88		.88		.70	



HAWAII, ISLAND OF HAWAII

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155°40'26", Hydrologic Unit 20010000, on right bank 0.1 mi upstream from Alakahi Stream, and 3.6 mi north of Kamuela.

PERIOD OF RECORD.--April 1968 to September 2000 (discontinued).

REVISED RECORDS.--WDR HI-94-1: 1982-90.

GAGE.--Water-stage recorder and concrete, Columbus-type control. Elevation of gage is 3,890 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records good. Ditch diverts water from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

AVERAGE DISCHARGE.--32 years (water years 1969-2000), 5.30 ft^3/s (3,840 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, August 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 20 ft^3/s, November 30; minimum daily, 0.01 ft^3/s, January 5, February 15-27, March 2, 11-21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.0	5.9	11	.02	2.1	.02	3.0	4.1	4.2	.20	3.5	10
2	4.1	7.1	9.9	.02	1.4	.01	5.2	5.6	2.1	.13	5.4	6.5
3	3.1	5.5	13	.02	.85	.02	5.2	9.5	1.1	.03	8.1	3.2
4	1.3	3.4	14	.02	.51	.04	6.4	6.9	1.4	5.4	7.6	1.8
5	1.2	5.3	9.6	.01	.32	.03	10	3.6	4.6	5.1	7.1	1.1
6	4.3	7.4	6.3	.23	.17	.13	9.6	2.0	4.3	3.5	3.2	2.4
7	5.6	5.8	6.4	4.1	.08	4.1	7.6	1.3	1.6	3.8	1.7	8.6
8	2.9	8.8	11	5.6	.05	3.8	5.0	.74	1.4	2.8	.93	8.9
9	1.7	6.7	14	6.9	.03	1.0	8.6	.92	1.3	1.3	6.8	8.1
10	.92	9.1	11	6.6	.02	.18	12	1.7	1.8	.96	7.6	8.4
11	.47	5.5	12	7.6	.02	.01	12	5.6	5.6	2.1	4.3	8.7
12	.30	10	11	7.5	.02	.01	7.3	7.6	3.5	3.0	2.0	12
13	2.7	9.4	8.5	9.8	.02	.01	6.6	8.8	2.8	2.0	1.1	10
14	4.3	9.6	4.6	7.7	.02	.01	8.2	9.8	5.5	4.8	.66	7.4
15	1.6	9.1	2.7	13	.01	.01	11	5.0	2.8	7.7	.63	4.0
16	.99	5.0	1.9	18	.01	.01	9.1	2.2	3.4	9.7	3.6	2.4
17	1.1	2.9	1.4	11	.01	.01	9.9	1.1	6.5	11	7.0	1.6
18	.61	1.6	1.1	12	.01	.01	11	.89	4.0	9.0	7.7	3.1
19	.24	1.6	.93	10	.01	.01	8.0	2.9	1.7	9.0	10	4.2
20	.57	11	.63	12	.01	.01	4.6	1.4	4.1	9.7	9.3	4.3
21	1.4	4.7	.44	13	.01	.01	5.9	3.8	6.8	7.1	8.7	2.1
22	1.7	3.7	.28	18	.01	.89	8.4	7.0	5.6	3.6	11	4.6
23	2.7	3.1	.21	9.6	.01	5.7	4.9	4.6	3.6	2.2	13	1.8
24	5.0	1.7	.13	5.5	.01	5.3	8.6	1.8	1.7	1.8	9.8	.83
25	8.2	3.0	.06	3.3	.01	5.8	9.9	2.0	1.8	6.1	6.4	.46
26	6.0	7.3	.03	2.4	.01	7.2	9.8	5.6	5.5	12	7.5	.26
27	4.8	7.4	.03	14	.01	7.9	11	2.1	6.5	9.3	10	.76
28	2.4	9.6	.03	10	.02	8.8	7.9	1.5	2.3	6.9	8.2	.67
29	7.4	9.8	.03	9.2	.02	7.5	5.7	2.3	.86	6.5	8.1	.33
30	7.6	20	.02	6.3	---	4.0	4.1	7.5	.38	7.7	11	.31
31	8.1	---	.02	3.2	---	1.5	---	8.3	---	6.8	11	---
TOTAL	94.30	201.0	152.24	226.62	5.78	64.03	236.5	128.15	98.74	161.22	202.92	128.82
MEAN	3.04	6.70	4.91	7.31	.20	2.07	7.88	4.13	3.29	5.20	6.55	4.29
MAX	8.2	20	14	18	2.1	8.8	12	9.8	6.8	12	13	12
MIN	.24	1.6	.02	.01	.01	.01	3.0	.74	.38	.03	.63	.26
AC-FT	187	399	302	450	11	127	469	254	196	320	402	256

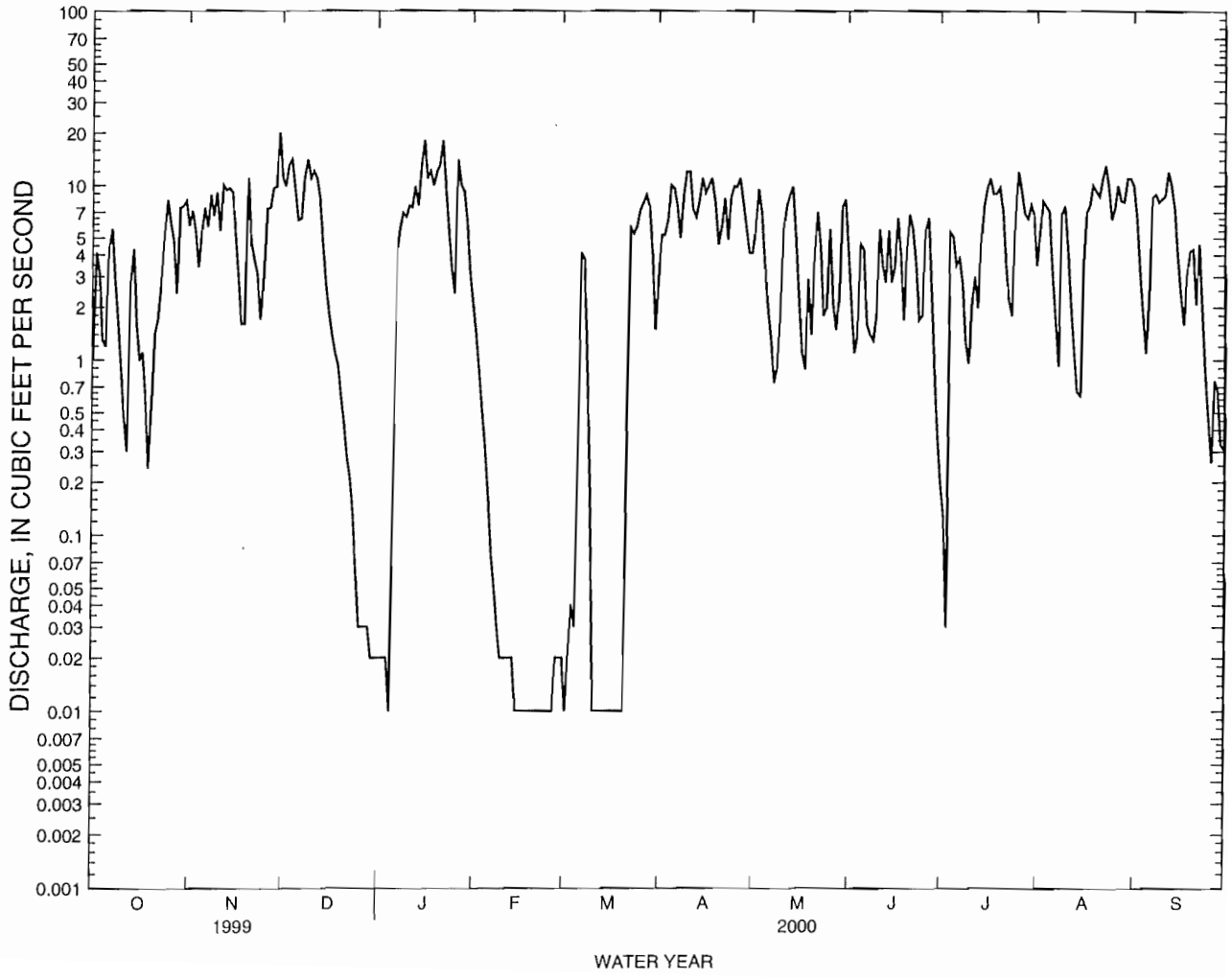
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 2000, BY WATER YEAR (WY)

MEAN	3.45	4.85	4.50	3.80	3.08	5.89	7.56	5.44	6.29	7.86	6.53	4.09
MAX	9.75	12.0	12.0	10.6	14.5	23.2	17.8	14.1	14.5	15.8	15.7	10.5
(WY)	1984	1973	1971	1979	1969	1973	1970	1998	1998	1982	1982	1992
MIN	.000	.79	.17	.088	.062	.76	.44	.44	.55	.49	.55	.33
(WY)	1985	1996	1981	1981	1980	1984	1992	1999	1980	1980	1980	1984

HAWAII, ISLAND OF HAWAII

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1968 - 2000	
ANNUAL TOTAL	1851.44		1700.32			
ANNUAL MEAN	5.07		4.65		5.30	
HIGHEST ANNUAL MEAN					9.22	1994
LOWEST ANNUAL MEAN					1.85	1980
HIGHEST DAILY MEAN	31	Mar 21	20	Nov 30	41	Aug 18 1972
LOWEST DAILY MEAN	.00	May 30	.01	Jan 5	.00	Oct 11 1968
ANNUAL SEVEN-DAY MINIMUM	.01	May 17	.01	Feb 15	.00	Oct 11 1968
ANNUAL RUNOFF (AC-FT)	3670		3370		3840	
10 PERCENT EXCEEDS	11		10		13	
50 PERCENT EXCEEDS	3.8		4.1		3.2	
90 PERCENT EXCEEDS	.05		.02		.01	



HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04′27″, long 155°40′25″, Hydrologic Unit 20010000, on right bank 25 ft upstream from Upper Hamakua ditch intake, and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi^2.

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

REVISED RECORDS.--WDR HI-94-1: 1964-90.

GAGE.--Water-stage recorders. Elevation of gage is 3,900 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Gary Sanchez. Records fair except estimated discharges which are poor. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area.

AVERAGE DISCHARGE.--36 years (water years 1965-2000), 7.87 ft^3/s (5,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,430 ft^3/s (revised), January 11, 1967, gage height 8.65 ft, from rating curve extended above 28 ft^3/s on basis of computations of peak flow over dam and slope-area measurement at gage height 8.65 ft; maximum gage height, 12.80 ft, November 18, 1979; minimum, 0.03 ft^3/s on several days in 1965.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 03	2040	*254	*5.23	No other peak greater than base discharge.			

Minimum discharge, 0.73 ft^3/s, October 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	4.4	12	1.0	2.2	1.3	2.5	3.1	2.6	1.2	e2.5	e12
2	3.0	6.6	8.5	1.0	1.9	1.3	3.4	4.8	1.8	1.1	e4.0	e3.5
3	2.4	3.7	46	1.0	1.6	1.6	6.1	18	1.4	1.0	e8.5	e2.0
4	1.4	2.2	39	1.0	1.5	2.1	5.0	4.8	1.7	6.5	e5.5	e2.0
5	1.1	4.7	7.4	1.0	1.3	1.7	37	2.7	3.9	2.8	e5.0	e2.0
6	6.3	7.0	4.4	1.2	1.2	1.6	21	1.9	3.6	2.0	e3.0	e3.0
7	4.4	11	11	7.8	1.2	4.3	6.2	1.5	1.8	2.2	e2.0	e8.0
8	1.6	19	25	9.1	1.1	4.0	3.6	1.2	1.5	2.1	e1.5	e8.0
9	1.2	12	50	12	1.1	2.3	16	1.4	1.5	1.5	e23	e6.0
10	.99	19	17	9.3	1.0	1.7	40	1.8	2.5	e1.5	e8.5	e6.0
11	.87	3.5	30	15	.96	1.5	33	15	6.6	e2.5	e3.5	e6.5
12	.84	41	18	15	.92	1.3	5.8	7.1	3.3	e3.0	e2.0	e20
13	3.7	15	7.4	34	.91	1.1	4.6	15	2.8	e2.5	e2.0	e10
14	3.6	16	3.5	11	.91	1.0	6.3	20	4.3	e12	e1.5	e5.0
15	1.4	14	2.5	47	.91	.99	18	3.1	2.2	e25	e1.5	e2.5
16	1.2	3.0	2.2	87	.88	1.1	9.0	1.7	3.2	e30	e4.0	e2.0
17	1.2	1.9	1.9	22	.87	1.3	14	1.3	6.0	e40	e8.0	e2.0
18	1.1	1.4	1.7	38	.87	1.2	18	1.3	2.8	e20	e14	e2.5
19	.91	1.8	1.6	20	.84	1.2	6.6	2.2	1.8	e18	e25	e3.0
20	1.0	37	1.5	25	.86	1.2	3.3	1.5	11	e24	e20	e3.0
21	1.6	3.1	1.4	34	.91	1.1	8.3	3.0	8.0	e8.0	e18	e2.0
22	2.0	2.1	1.4	56	.91	1.9	9.5	6.7	5.2	e3.5	e24	e2.5
23	4.3	1.8	1.4	6.5	.91	10	3.4	3.3	3.2	e3.0	e35	e2.0
24	13	1.4	1.3	3.4	.87	8.5	20	1.7	2.0	e2.5	e16	e1.5
25	25	2.2	1.2	2.5	.91	6.8	16	1.9	2.1	e25	e3.0	e1.5
26	4.7	8.0	1.1	2.2	1.1	9.9	15	4.1	7.4	e35	e5.0	e1.5
27	2.8	5.9	1.2	50	1.4	21	25	1.9	6.8	e12	e15	e1.5
28	1.7	27	1.1	8.8	1.6	20	7.1	1.5	2.2	e6.0	e7.0	e1.5
29	15	18	1.1	7.3	1.4	7.3	3.8	2.4	1.5	e6.5	e5.0	e1.0
30	16	97	1.1	4.6	---	3.3	2.8	9.0	1.3	e7.0	e15	e1.0
31	14	---	1.1	2.8	---	2.1	---	12	---	e6.0	e15	---
TOTAL	139.51	390.7	304.0	536.5	33.04	125.69	370.3	156.9	106.0	313.4	303.0	125.0
MEAN	4.50	13.0	9.81	17.3	1.14	4.05	12.3	5.06	3.53	10.1	9.77	4.17
MAX	25	97	50	87	2.2	21	40	20	11	40	35	20
MIN	.84	1.4	1.1	1.0	.84	.99	2.5	1.2	1.3	1.0	1.5	1.0
AC-FT	277	775	603	1060	66	249	734	311	210	622	601	248

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 2000, BY WATER YEAR (WY)

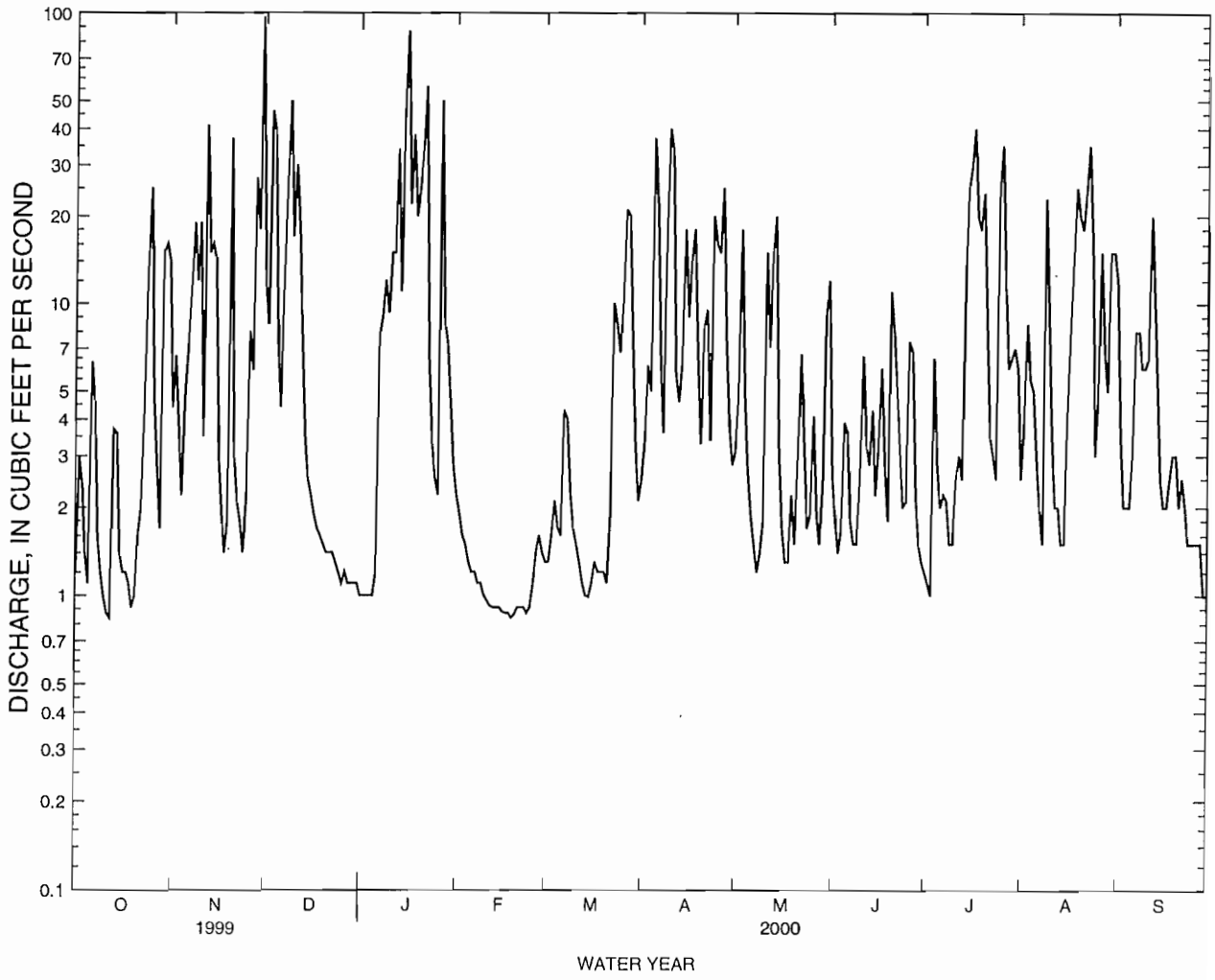
MEAN	4.94	8.31	7.38	7.76	5.82	10.2	11.7	6.96	7.92	10.3	8.32	5.01
MAX	14.7	26.5	16.7	26.4	18.6	37.9	31.6	20.5	22.6	18.7	15.9	17.8
(WY)	1999	1980	1971	1979	1969	1980	1986	1998	1998	1978	1970	1992
MIN	.31	1.07	.54	.46	.40	1.27	.82	.78	2.04	2.38	1.72	.087
(WY)	1985	1969	1981	1981	1993	1983	1992	1999	1985	1981	1971	1965

e Estimated

HAWAII, ISLAND OF HAWAII

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1964 - 2000	
ANNUAL TOTAL	3221.16		2904.04			
ANNUAL MEAN	8.83		7.93		7.87	
HIGHEST ANNUAL MEAN					13.4	1994
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	128	Mar 20	97	Nov 30	338	Nov 18 1979
LOWEST DAILY MEAN	.54	Jun 22	.84	Oct 12	.03	May 22 1965
ANNUAL SEVEN-DAY MINIMUM	.58	Jun 17	.88	Feb 14	.04	Sep 22 1965
ANNUAL RUNOFF (AC-FT)	6390		5760		5700	
10 PERCENT EXCEEDS	24		20		20	
50 PERCENT EXCEEDS	2.8		3.0		3.2	
90 PERCENT EXCEEDS	.73		1.1		.59	



HAWAII, ISLAND OF HAWAII

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 500 ft upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1974 to September 1983, September 1992 to September 1994 (discharge measurements only). October 1994 to current year.

REVISED RECORDS.--WDR HI-94-1: 1981.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records good except for estimated record which are fair. Records for 1975-1983 are poor. Records for 1984-1990, published in WDR: HI-84-1 to HI-90-1, are unreliable and should not be used. Ditch diverts from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--15 years (water years 1975-83, 1995-2000), 9.83 ft^3/s (7,120 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s, April 6, 1977; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 30 ft^3/s, November 30; minimum daily discharge, 0.38 ft^3/s, May 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.8	13	17	1.4	6.0	1.8	6.4	6.1	9.4	2.4	8.9	10
2	13	15	17	1.3	4.4	1.6	10	.38	6.0	2.1	9.7	5.7
3	9.4	13	22	1.3	3.5	2.5	10	.74	4.2	1.8	18	4.2
4	4.5	9.1	22	1.3	3.0	3.1	13	8.3	4.5	7.5	18	2.8
5	3.1	15	15	1.3	2.6	2.2	22	8.7	12	8.6	13	2.8
6	8.0	18	12	1.6	2.2	2.3	20	5.4	12	6.2	8.3	6.7
7	12	16	13	8.1	2.0	11	15	4.0	5.3	6.1	5.5	16
8	6.4	21	20	11	1.9	8.8	10	3.0	4.2	5.9	4.1	15
9	4.2	18	22	14	1.8	3.8	23	4.0	4.2	3.7	13	14
10	3.0	20	18	12	1.7	2.3	29	6.0	7.2	3.4	14	13
11	2.4	14	21	15	1.6	1.8	25	13	17	6.9	8.7	17
12	2.1	23	20	17	1.6	1.5	16	17	10	8.6	5.7	29
13	6.8	21	16	22	1.6	1.4	14	21	11	5.5	4.1	22
14	11	22	11	16	1.5	1.2	16	20	15	8.3	3.2	11
15	4.8	19	7.3	24	1.5	1.0	19	12	7.5	16	2.8	7.7
16	3.6	13	5.7	28	1.5	1.2	19	6.4	11	20	10	6.5
17	3.7	8.3	4.5	18	1.5	1.2	21	4.4	16	22	12	3.9
18	2.7	5.4	4.0	18	1.5	1.2	21	4.8	10	15	14	4.3
19	2.1	5.6	3.6	17	1.5	1.1	17	9.3	5.5	17	20	6.8
20	2.3	23	3.0	18	1.3	1.1	10	5.2	11	17	17	7.3
21	4.6	12	2.4	20	1.2	1.0	12	8.4	16	12	14	6.0
22	5.9	8.9	2.2	25	1.1	4.2	18	17	14	8.9	19	10
23	12	7.7	2.3	16	1.1	e13	11	12	9.5	5.9	22	6.0
24	18	5.2	2.1	12	1.0	e12	17	5.7	5.5	5.1	12	3.8
25	21	6.3	1.9	7.5	1.2	e13	21	4.8	11	12	5.2	2.9
26	15	13	1.7	6.4	2.0	e14	20	11	15	21	8.7	2.7
27	11	14	1.7	25	2.1	e17	21	5.8	15	15	9.4	5.2
28	6.5	18	1.6	17	2.2	18	18	4.5	6.7	12	7.2	3.6
29	21	20	1.5	17	1.9	13	14	5.4	3.9	17	6.4	2.7
30	20	30	1.5	14	---	7.9	10	15	2.8	18	11	2.5
31	19	---	1.4	7.7	---	4.2	---	16	---	13	12	---
TOTAL	263.9	447.5	294.4	413.9	58.0	169.4	498.4	265.32	282.4	323.9	336.9	251.1
MEAN	8.51	14.9	9.50	13.4	2.00	5.46	16.6	8.56	9.41	10.4	10.9	8.37
MAX	21	30	22	28	6.0	18	29	21	17	22	22	29
MIN	2.1	5.2	1.4	1.3	1.0	1.0	6.4	.38	2.8	1.8	2.8	2.5
AC-FT	523	888	584	821	115	336	989	526	560	642	668	498

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 2000, BY WATER YEAR (WY)

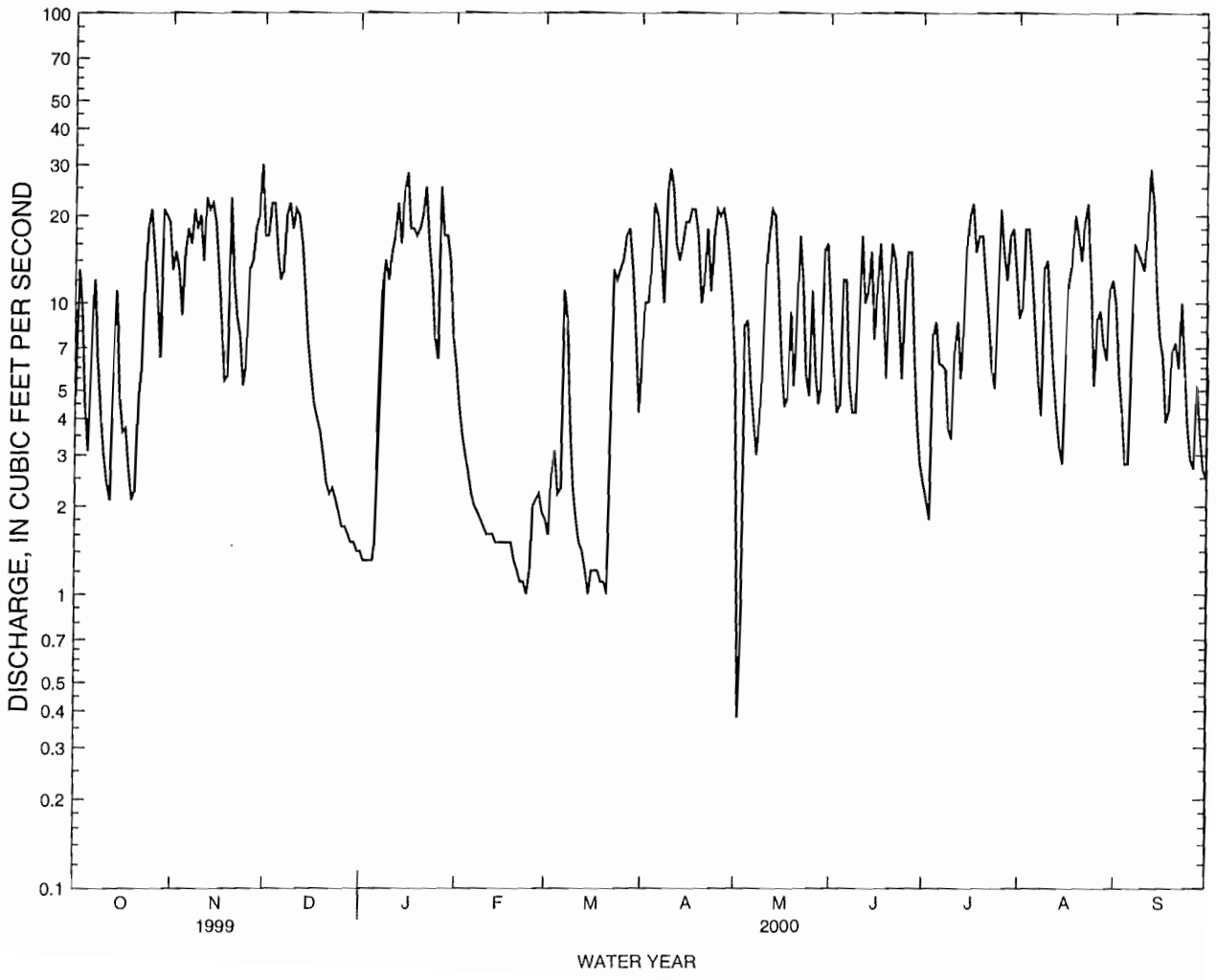
MEAN	7.69	10.7	8.18	6.04	5.81	11.5	13.6	10.5	9.98	13.7	11.6	8.54
MAX	17.3	17.4	12.6	13.4	15.1	19.7	26.0	23.9	26.3	26.0	19.6	16.9
(WY)	1999	1977	1979	2000	1999	1982	1998	1998	1998	1978	1978	1982
MIN	1.18	2.82	.79	.31	.63	3.61	2.76	2.05	3.03	2.84	2.23	2.95
(WY)	1975	1996	1981	1981	1995	1995	1981	1999	1981	1981	1979	1981

e Estimated

HAWAII, ISLAND OF HAWAII

16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1975 - 2000	
ANNUAL TOTAL	3835.27		3605.12			
ANNUAL MEAN	10.5		9.85		9.83	
HIGHEST ANNUAL MEAN					15.0	1998
LOWEST ANNUAL MEAN					3.80	1981
HIGHEST DAILY MEAN	36	Mar 21	30	Nov 30	48	Apr 6 1977
LOWEST DAILY MEAN	.97	Jun 1	.38	May 2	.00	Oct 1 1974
ANNUAL SEVEN-DAY MINIMUM	1.2	May 26	1.1	Mar 15	.00	Oct 1 1974
ANNUAL RUNOFF (AC-FT)	7610		7150		7120	
10 PERCENT EXCEEDS	21		20		24	
50 PERCENT EXCEEDS	9.4		8.7		6.7	
90 PERCENT EXCEEDS	1.7		1.6		.66	



HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft downstream from pipe railed bridge, and 4.0 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1977 to September 2000 (discontinued).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,890 ft above mean sea level (from topographic map).

REMARKS.--Records computed by Dale Nishimoto. Records fair. Ditch diverts water from Kawainui, Kawaiki, and Alakahi Streams for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--23 years (water years 1978-2000), 1.47 ft^3/s (1,060 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s, April 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum recorded daily discharge, 9.5 ft^3/s, March 26 but may have been higher during period of no gage-height record January 9-21; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00
3	.00	.00	.01	.00	.00	.00	.07	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.06	.00	.00	.00	.00	.00
7	.20	.00	.00	.00	.00	.00	.04	.00	.00	.08	.00	.00
8	.00	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00
9	.00	.00	.00	---	.00	.01	.08	.00	.00	.00	.00	.00
10	.00	.00	.00	---	.00	.00	.07	.00	.00	.00	.00	.00
11	.00	.00	.00	---	.00	.00	.06	.10	.00	.00	.00	.00
12	.00	.00	.00	---	.00	.00	.04	.00	.00	.00	.00	.65
13	.00	.00	.00	---	.00	.00	.06	.00	.00	.00	.00	.00
14	.00	.00	.00	---	.00	.00	.05	.00	.32	.13	.00	.00
15	.00	.00	.00	---	.00	.00	.06	.00	.00	.00	.00	.00
16	.00	.00	.00	---	.00	.00	.06	.04	.00	.00	.05	.00
17	.00	.00	.00	---	.00	.00	.06	.00	.00	.94	.17	.00
18	.00	.00	.00	---	.00	.00	.04	.00	.00	.00	.00	.11
19	.00	.00	.00	---	.00	.00	.03	.00	.00	.00	.00	.00
20	.00	.00	.00	---	.00	.00	.03	.00	.00	.00	.00	.00
21	.00	.00	.00	---	.00	.00	.03	.00	.00	.00	.00	.00
22	.08	.00	.00	.00	.00	.00	.04	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	2.7	.04	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.63	.07	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	9.0	.00	.00	.01	.00	.00	.00
26	.00	.00	.00	.11	.00	9.5	.00	.00	.00	.70	.00	.00
27	.00	.00	.00	.01	.00	.08	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.05	.00	.00	.00	.00	.00	.00
29	.00	.19	.00	.00	.00	.02	.00	.00	.21	.00	.00	.00
30	.00	.01	.00	.00	---	.01	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.02	---	.00	---	.00	.00	---
TOTAL	0.28	0.20	0.01	---	0.00	22.02	1.30	0.14	0.54	1.85	0.22	0.76
MEAN	.009	.007	.000	---	.000	.71	.043	.005	.018	.060	.007	.025
MAX	.20	.19	.01	---	.00	9.5	.09	.10	.32	.94	.17	.65
MIN	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.6	.4	.02	---	.00	44	2.6	.3	1.1	3.7	.4	1.5

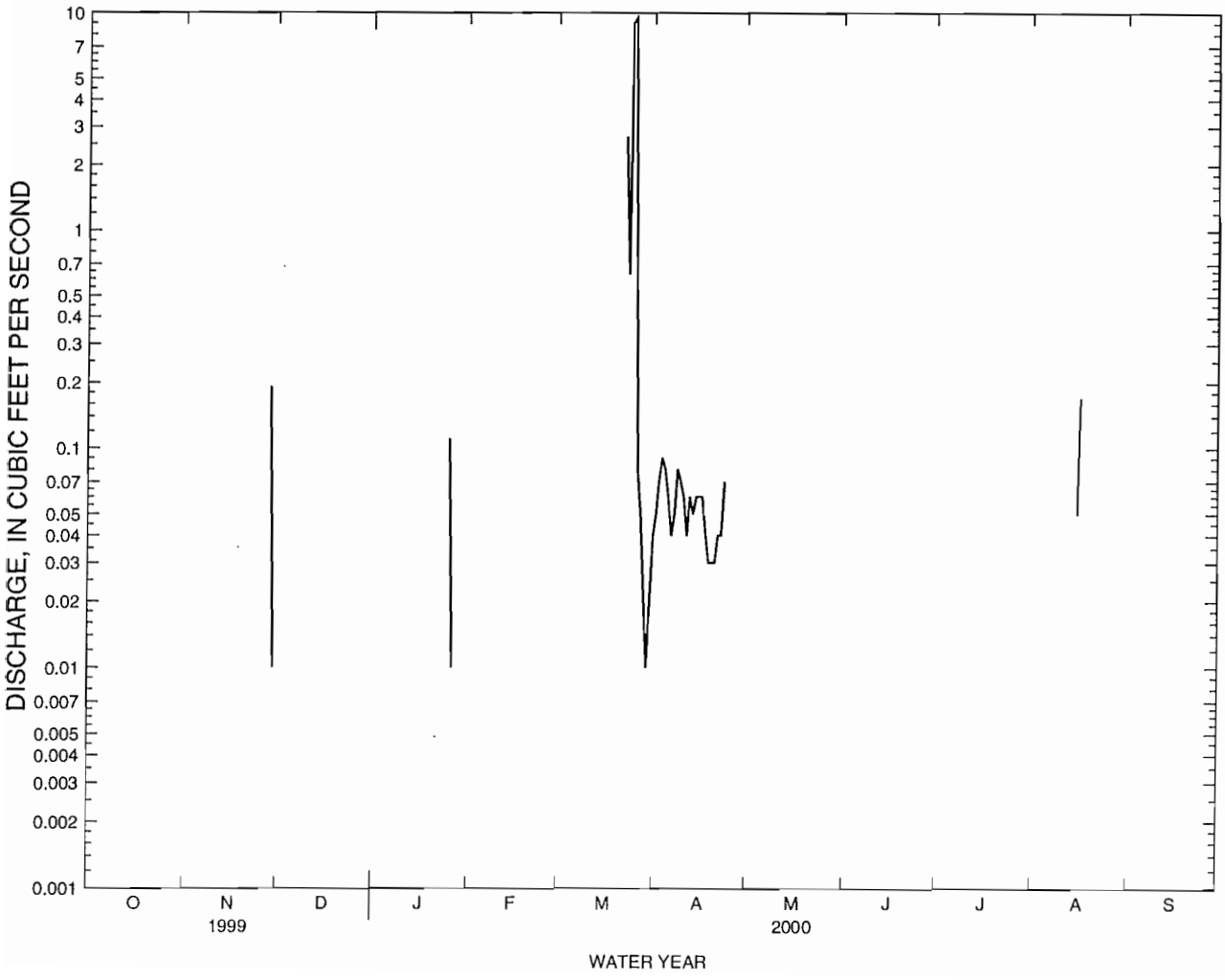
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 2000, BY WATER YEAR (WY)

MEAN	1.15	2.05	1.29	1.32	.99	2.02	2.08	1.35	1.50	1.41	1.23	.55
MAX	6.36	10.1	5.46	8.23	4.56	15.2	13.9	9.55	11.6	9.04	10.8	4.44
(WY)	1986	1988	1988	1987	1988	1985	1986	1986	1986	1978	1985	1985
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1985	1990	1989	1989	1993	1989	1993	1983	1983	1980	1984	1984

HAWAII, ISLAND OF HAWAII

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		WATER YEARS 1978 - 2000	
ANNUAL TOTAL	33.88			
ANNUAL MEAN	.093		1.47	
HIGHEST ANNUAL MEAN			6.79	1986
LOWEST ANNUAL MEAN			.007	1990
HIGHEST DAILY MEAN	13	Jun 9	42	Apr 16 1985
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1 1977
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1 1977
ANNUAL RUNOFF (AC-FT)	67		1060	
10 PERCENT EXCEEDS	.02		4.8	
50 PERCENT EXCEEDS	.00		.00	
90 PERCENT EXCEEDS	.00		.00	



HAWAII, ISLAND OF HAWAII

16756100 KOHAKOHAU STREAM ABOVE DWS INTAKE, NEAR KAMUELA

LOCATION.--Lat 20°02'58", long 155°41'05", Hydrologic Unit 20010000, on right bank 200 ft upstream of Department of Water Supply dam and intake, 0.85 mi west of Puu Ohu, and 1.85 mi northwest of junction of Highways 19 and 190.

DRAINAGE AREA.--2.40 mi^2.

PERIOD OF RECORD.--June 1998 to current year.

GAGE.--Water-stage recorder. Datum of gage is 3,470 ft above mean sea level (from topographic map).

REMARKS.--Record computed by Dale Nishimoto. Records fair. Two Parker Ranch 4-in. pipelines divert water upstream at 4,250 ft and lower. Hawaii Department of Water Supply diverts water at dam 200 ft downstream for domestic use in the Kamuela and Kawaihae areas since August 20, 1973.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 766 ft^3/s, December 3, 1999, gage height, 5.75 ft from rating curve developed using flow-over-dam computations and high water marks at gage; maximum gage height, 5.96 ft, March 21, 1999; minimum, 0.22 ft^3/s, March 15-17, 2000.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 400 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 30	1000	668	5.67	Jan. 16	0400	431	4.97
Dec. 03	2115	*766	*5.75				

Minimum discharge, 0.22 ft^3/s, March 15-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.51	5.0	26	.38	1.9	.26	1.1	2.7	2.7	.72	2.5	18
2	1.2	5.7	15	.35	1.5	.25	1.4	3.3	1.5	.62	2.4	6.3
3	1.2	3.7	121	.31	1.2	.25	2.4	16	1.0	.51	8.1	3.2
4	.72	2.2	74	.31	1.0	.26	2.2	5.8	.89	3.9	6.4	2.2
5	.54	3.7	12	.30	.87	.24	44	2.8	1.6	2.0	5.7	1.6
6	.72	6.7	5.9	.44	.77	.25	24	1.8	2.0	1.1	2.4	2.7
7	1.5	7.5	9.2	2.3	.68	.33	5.2	1.3	1.1	1.0	1.6	9.2
8	.81	27	34	9.9	.60	.57	2.5	1.0	.91	.95	1.2	14
9	.60	11	90	16	.54	.33	8.2	1.1	.89	.73	13	11
10	.47	25	31	7.8	.48	.28	46	1.1	.84	.62	11	8.8
11	.39	5.5	44	17	.42	.25	42	9.9	2.4	.97	3.0	15
12	.37	64	28	10	.35	.23	6.8	8.3	1.8	2.1	1.7	56
13	.53	23	9.1	35	.31	.23	4.3	13	1.4	1.2	1.2	19
14	.72	20	4.5	13	.31	.23	4.1	26	2.8	3.3	.99	6.4
15	.50	18	3.0	71	.30	.23	11	4.7	1.5	17	.84	3.2
16	.40	5.1	2.1	185	.29	.22	9.1	2.3	2.5	39	1.5	2.3
17	.35	2.7	1.7	30	.28	.23	12	1.5	4.7	72	3.3	1.8
18	.32	1.8	1.4	53	.27	.23	19	1.3	2.2	20	6.7	1.6
19	.31	1.6	1.2	19	.27	.23	7.7	1.7	1.3	8.4	43	1.5
20	.45	56	1.1	25	.27	.23	3.0	1.3	6.9	11	20	1.5
21	.71	5.5	1.0	43	.26	.24	3.8	1.4	6.7	5.9	9.2	1.3
22	.64	2.8	.91	111	.28	.25	8.3	3.7	4.5	2.8	58	2.6
23	2.3	1.9	.87	9.3	.28	.71	2.8	2.4	3.2	1.8	82	1.4
24	6.4	1.5	.82	4.1	.27	3.2	9.5	1.3	1.9	1.5	17	1.0
25	25	1.4	.75	2.6	.28	3.2	17	1.0	1.6	12	5.7	.86
26	6.0	2.6	.69	1.9	.31	5.9	13	1.4	2.4	59	9.3	.75
27	2.8	5.2	.69	92	.30	21	29	1.1	3.9	12	24	.98
28	1.6	40	.61	11	.29	25	10	.91	1.5	6.4	7.9	.74
29	13	26	.55	7.9	.27	7.6	4.3	.99	.99	6.5	6.9	.59
30	12	263	.49	4.7	---	2.7	2.7	3.3	.83	7.5	28	.56
31	20	---	.43	2.6	---	1.3	---	9.1	---	4.5	34	---
TOTAL	103.06	645.1	522.01	786.19	15.15	76.43	356.4	133.50	68.45	307.02	418.53	196.08
MEAN	3.32	21.5	16.8	25.4	.52	2.47	11.9	4.31	2.28	9.90	13.5	6.54
MAX	25	263	121	185	1.9	25	46	26	6.9	72	82	56
MIN	.31	1.4	.43	.30	.26	.22	1.1	.91	.83	.51	.84	.56
AC-FT	204	1280	1040	1560	30	152	707	265	136	609	830	389

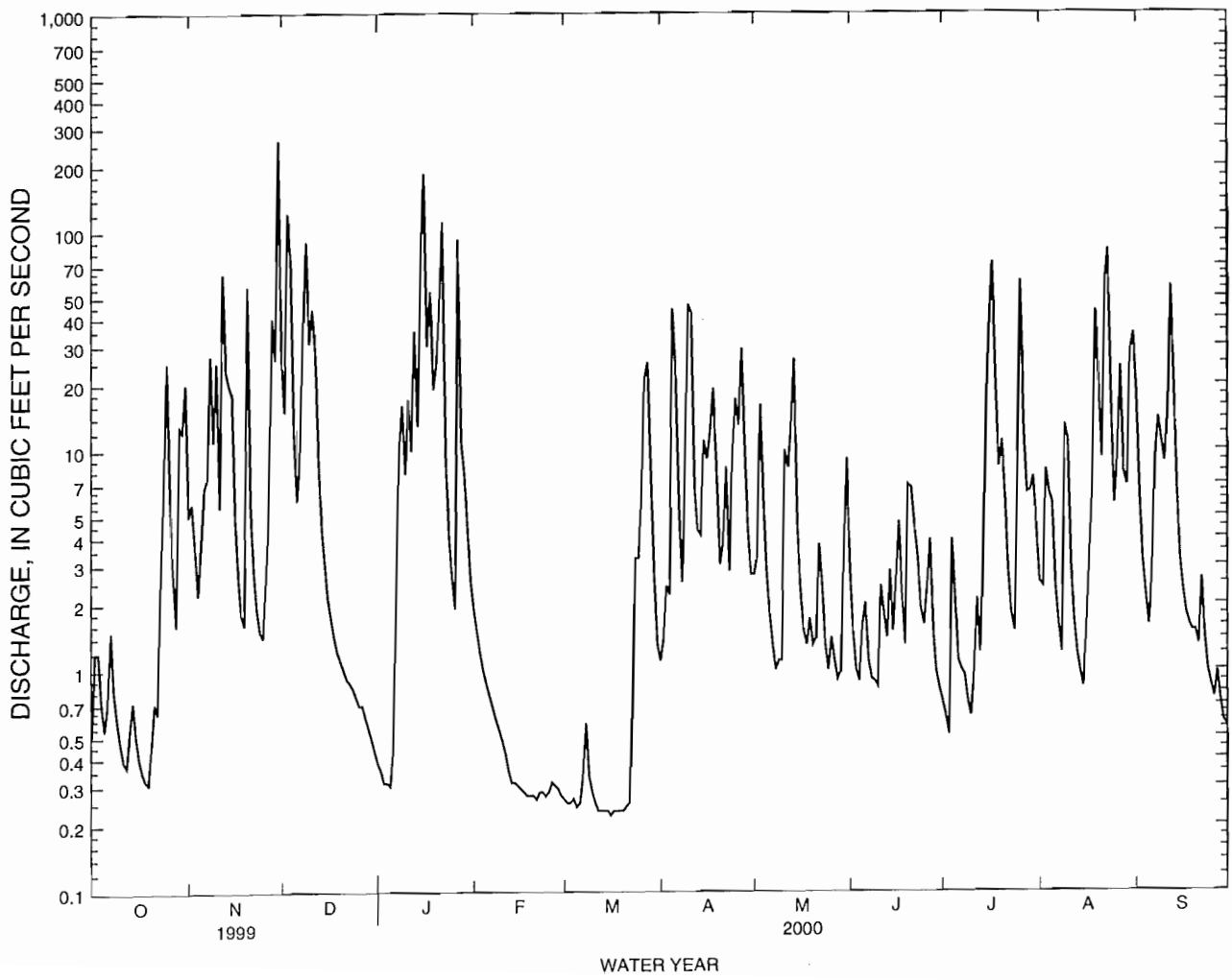
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1998 - 2000, BY WATER YEAR (WY)

MEAN	13.9	20.0	14.0	18.5	12.3	28.6	8.89	2.40	2.15	12.6	16.4	11.5
MAX	24.6	21.5	16.8	25.4	24.5	54.8	11.9	4.31	2.28	21.1	20.8	21.7
(WY)	1999	2000	2000	2000	1999	1999	2000	2000	2000	1998	1998	1998
MIN	3.32	18.6	11.1	11.6	.52	2.47	5.90	.50	2.01	6.85	13.5	6.23
(WY)	2000	1999	1999	1999	2000	2000	1999	1999	1999	1999	2000	1999

HAWAII, ISLAND OF HAWAII

16756100 KOHAKOHAU STREAM BELOW DWS INTAKE, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1998 - 2000	
ANNUAL TOTAL	5126.42		3627.92			
ANNUAL MEAN	14.0		9.91		12.5	
HIGHEST ANNUAL MEAN					15.1	1999
LOWEST ANNUAL MEAN					9.91	2000
HIGHEST DAILY MEAN	356	Mar 21	263	Nov 30	356	Mar 21 1999
LOWEST DAILY MEAN	.27	Jun 22	.22	Mar 16	.22	Mar 16 2000
ANNUAL SEVEN-DAY MINIMUM	.29	May 26	.23	Mar 12	.23	Mar 12 2000
ANNUAL RUNOFF (AC-FT)	10170		7200		9070	
10 PERCENT EXCEEDS	32		25		34	
50 PERCENT EXCEEDS	2.2		2.3		3.2	
90 PERCENT EXCEEDS	.43		.31		.44	



HAWAII, ISLAND OF HAWAII

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

LOCATION.--Lat 20°02′48″, long 155°39′58″, Hydrologic Unit 20010000, on right bank 160 ft upstream from Marine Dam, 0.4 mi east of Puu Ohu, and 1.6 mi north of Kamuela.

DRAINAGE AREA.--1.18 mi^2.

PERIOD OF RECORD.--May 1947 to current year.

REVISED RECORDS.--WSP 1569: Drainage area. WSP 1937: 1948(M), 1949-51(P), 1952(M), 1954(M), 1955, 1956-57(P), 1958-60.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,460 ft above mean sea level (from topographic map).

REMARKS.--Record computed by Dale Nishimoto. Records good. Parker Ranch diverts less than 1 ft^3/s through a 6-in. pipe upstream of gage.

AVERAGE DISCHARGE.--53 years (water years 1948-2000), 9.34 ft^3/s (6,770 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,410 ft^3/s, November 18, 1979, gage height, 6.84 ft, from rating curve extended above 120 ft^3/s on the basis of computations of flow over dam at gage heights 5.46 ft and 5.96 ft; minimum, 0.34 ft^3/s, June 5-6, 1992.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 30	1000	217	3.41	Dec. 03	2100	*228	*3.45

Minimum recorded discharge, 1.2 ft^3/s, March 19-22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.2	5.3	13	2.3	3.7	2.0	2.9	5.2	3.6	2.4	4.3	21
2	5.6	6.0	11	2.2	3.3	1.9	3.0	6.2	3.0	2.3	4.2	7.6
3	4.1	4.5	46	2.2	3.0	1.9	3.4	21	2.6	2.2	12	4.7
4	2.7	4.0	38	2.2	2.9	2.1	3.5	7.3	2.7	2.9	12	3.8
5	2.3	6.6	9.5	2.2	2.8	2.0	24	4.2	4.4	2.8	7.7	3.3
6	3.3	9.1	6.0	2.5	2.7	1.9	15	3.3	4.4	2.5	4.0	5.1
7	3.7	9.2	9.8	4.6	2.5	2.9	5.3	2.8	2.9	2.4	3.2	12
8	2.6	24	23	7.9	2.4	3.4	3.5	2.6	2.6	2.3	2.8	12
9	2.3	15	39	9.1	2.4	2.4	20	3.1	2.5	2.2	13	11
10	2.1	19	19	5.5	2.4	2.0	52	3.3	4.0	2.2	9.4	9.6
11	2.0	6.2	33	11	2.4	1.9	43	16	5.6	3.7	3.9	15
12	2.0	40	21	11	2.3	1.8	8.1	8.6	3.8	4.8	3.0	42
13	2.4	18	10	29	2.3	1.7	6.2	17	5.4	2.8	2.6	22
14	2.9	22	6.1	11	2.2	1.7	6.4	24	6.8	4.1	2.3	8.0
15	2.2	17	4.8	41	2.0	1.6	15	5.2	3.5	13	2.3	4.9
16	2.2	5.9	4.2	89	2.0	1.7	11	3.5	7.6	27	4.4	4.0
17	2.1	4.2	3.8	25	2.1	1.6	17	2.9	10	41	6.8	3.5
18	2.0	3.3	3.5	34	2.1	1.6	20	3.1	4.9	13	7.4	3.4
19	1.8	3.4	3.3	18	2.1	1.6	8.4	3.9	3.2	9.9	28	3.5
20	2.2	32	3.1	21	2.1	1.5	4.3	3.0	19	12	18	3.8
21	2.4	5.9	2.9	29	2.1	1.5	7.2	3.6	10	5.3	8.1	3.3
22	2.9	4.2	2.8	69	2.1	1.6	9.4	6.4	5.9	3.6	34	5.6
23	6.8	3.5	2.8	11	2.0	2.8	4.3	4.4	4.5	3.0	44	3.4
24	11	3.0	2.7	6.4	1.9	5.7	14	3.0	3.4	2.8	13	2.8
25	21	3.0	2.6	4.8	1.9	6.1	16	2.8	4.4	9.4	6.0	2.6
26	6.2	3.7	2.5	4.0	2.1	7.9	14	3.4	7.0	35	13	2.5
27	3.8	4.8	2.4	43	2.1	11	24	2.7	6.9	10	20	3.4
28	2.9	16	2.4	9.7	2.1	15	9.3	2.5	3.4	6.6	9.2	2.8
29	17	16	2.4	8.8	2.0	6.1	5.5	2.9	2.8	9.5	8.0	2.5
30	15	88	2.4	6.7	---	3.4	4.2	6.3	2.5	13	26	2.4
31	16	---	2.3	4.5	---	2.6	---	9.4	---	6.9	31	---
TOTAL	158.7	402.8	335.3	527.6	68.0	102.9	379.9	193.6	153.3	260.6	363.6	231.5
MEAN	5.12	13.4	10.8	17.0	2.34	3.32	12.7	6.25	5.11	8.41	11.7	7.72
MAX	21	88	46	89	3.7	15	52	24	19	41	44	42
MIN	1.8	3.0	2.3	2.2	1.9	1.5	2.9	2.5	2.5	2.2	2.3	2.4
AC-FT	315	799	665	1050	135	204	754	384	304	517	721	459

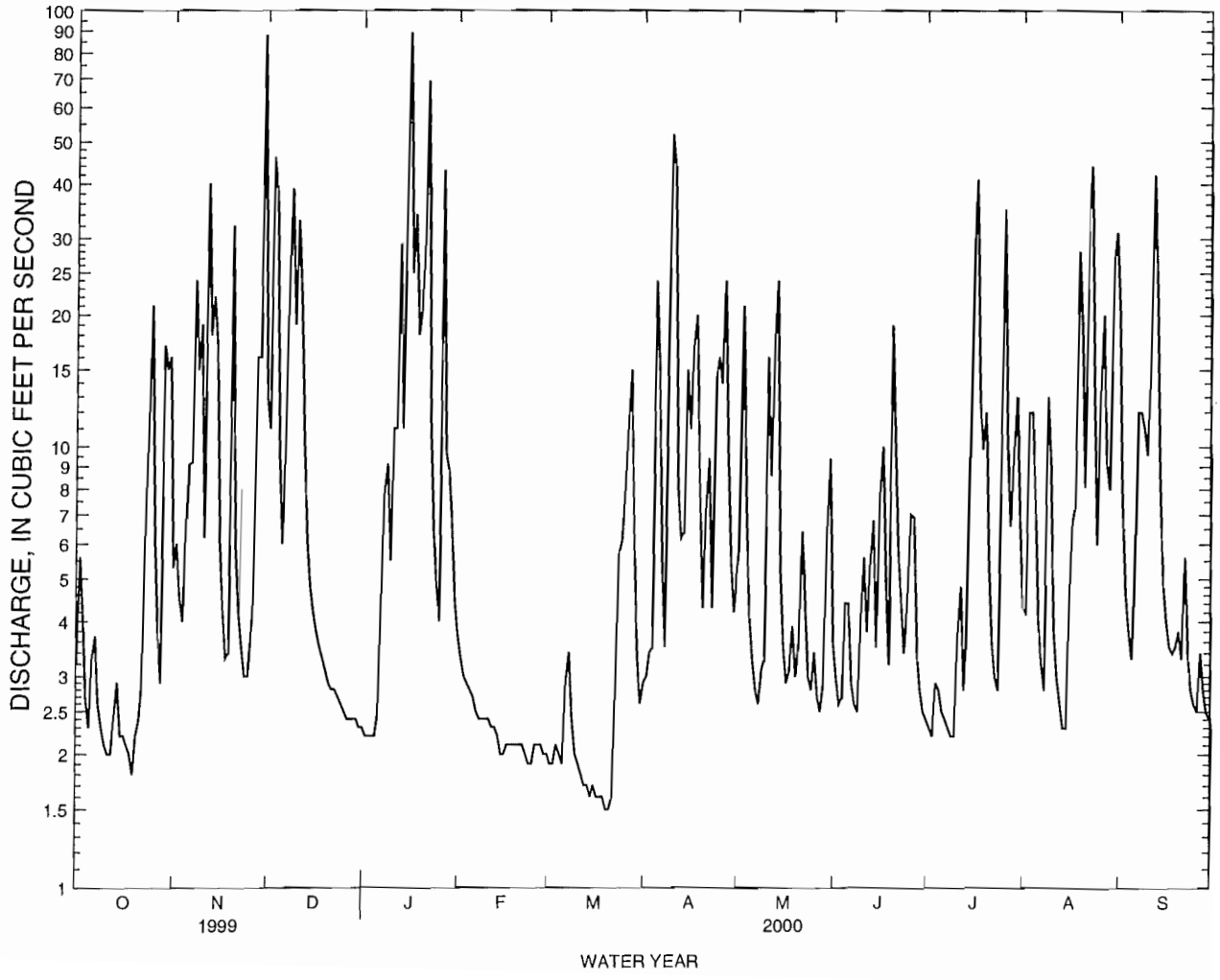
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1947 - 2000, BY WATER YEAR (WY)

MEAN	5.96	8.88	9.72	8.66	7.55	10.7	13.0	9.16	8.97	11.9	11.2	5.99
MAX	18.2	43.7	31.4	38.7	23.0	52.1	43.4	22.1	28.4	21.3	33.6	24.9
(WY)	1984	1980	1958	1979	1960	1980	1986	1998	1998	1950	1958	1992
MIN	.98	1.42	1.47	1.46	1.31	2.11	1.53	1.95	2.68	3.08	2.27	.91
(WY)	1997	1963	1996	1953	1954	1983	1992	1999	1962	1961	1973	1965

HAWAII, ISLAND OF HAWAII

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1947 - 2000	
ANNUAL TOTAL	3323.8		3177.8			
ANNUAL MEAN	9.11		8.68		9.34	
HIGHEST ANNUAL MEAN					17.8	1980
LOWEST ANNUAL MEAN					4.49	1981
HIGHEST DAILY MEAN	125	Mar 21	89	Jan 16	641	Nov 18 1979
LOWEST DAILY MEAN	1.5	May 25	1.5	Mar 20	.37	Jun 3 1992
ANNUAL SEVEN-DAY MINIMUM	1.5	Jun 17	1.6	Mar 15	.42	May 21 1992
ANNUAL RUNOFF (AC-FT)	6590		6300		6770	
10 PERCENT EXCEEDS	21		21		21	
50 PERCENT EXCEEDS	4.1		4.1		4.3	
90 PERCENT EXCEEDS	2.0		2.1		1.8	



HAWAII, ISLAND OF HAWAII

16759000 HAUANI GULCH NEAR KAMUELA

LOCATION.--Lat 20°02′28″, long 155°39′05″, Hydrologic Unit 20010000, on left bank 800 ft downstream from small tributary and 1.8 mi northeast of Kamuela.

DRAINAGE AREA.--0.47 mi^2.

PERIOD OF RECORD.--March 1956 to current year. Prior to July 1960, published as Hauani Stream near Kamuela.

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. Concrete control since February 27, 1963. Elevation of gage is 3,117.42 ft above mean sea level (Hawaii County Department of Water Supply benchmark).

REMARKS.--Records computed by Gary Sanchez. Records good except for discharges less than 2 ft^3/s which are poor. Diversion upstream for livestock and domestic use.

AVERAGE DISCHARGE.--44 years (water years 1957-2000), 1.74 ft^3/s (1,260 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 822 ft^3/s, November 18, 1979, gage height, 4.56 ft, from rating curve extended above 11 ft^3/s on the basis of slope-conveyance study; maximum gage height, 4.65 ft, October 23, 1957; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 78 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 30	0925	*93	*2.69	No other peak greater than base discharge.			

Minimum discharge, 0.15 ft^3/s, March 21, 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.32	.82	2.2	.36	.62	.28	.44	.86	.46	.35	.74	3.0
2	.28	.75	1.4	.36	.56	.27	.39	1.0	.40	.31	.65	1.1
3	.27	.60	14	.36	.54	.29	.56	3.5	.34	.30	1.9	.70
4	.25	.55	7.9	.36	.54	.30	.47	1.1	.34	.37	1.6	.58
5	.31	.89	1.6	.36	.48	.28	4.3	.69	.71	.34	.97	.51
6	.43	1.3	.93	.41	.44	.27	2.1	.57	.63	.30	.61	.78
7	.34	2.3	2.0	.63	.42	.39	.73	.49	.37	.28	.49	1.3
8	.28	5.0	3.8	.78	.41	.43	.49	.44	.33	.27	.41	1.7
9	.26	3.8	6.0	.84	.39	.33	3.8	.55	.30	.26	1.7	1.5
10	.24	3.3	2.5	.66	.39	.29	11	.57	1.8	.28	1.0	1.0
11	.23	.98	5.2	1.4	.39	.27	8.7	3.5	1.1	.31	.51	2.5
12	.26	12	3.2	1.5	.37	.25	1.5	1.3	.54	.29	.41	6.4
13	.35	3.8	1.5	4.3	.36	.25	.99	4.1	1.5	.28	.37	3.3
14	.35	3.6	.91	1.5	.36	.25	.91	4.2	1.0	.34	.34	1.1
15	.26	2.5	.75	8.4	.36	.23	1.7	.91	.50	1.6	.33	.73
16	.25	.99	.67	23	.36	.23	1.6	.65	.85	3.5	.72	.61
17	.24	.73	.60	5.2	.36	.22	3.0	.54	1.2	7.1	.68	.55
18	.22	.59	.57	5.9	.34	.20	3.6	.60	.67	1.7	.67	.50
19	.22	.75	.53	2.8	.33	.18	1.4	.72	.48	1.3	6.2	.49
20	.30	6.9	.49	2.5	.33	.17	.78	.47	3.4	1.7	3.1	.49
21	.30	.93	.46	4.9	.32	.16	1.6	.63	1.3	.76	.97	.46
22	.31	.68	.46	18	.30	.20	1.4	.90	.71	.55	4.9	.50
23	1.2	.58	.46	2.0	.30	.43	.75	.60	.58	.45	7.1	.41
24	2.1	.51	.42	1.1	.28	.89	2.2	.43	.46	.40	1.8	.37
25	3.1	.50	.42	.81	.31	.64	2.6	.39	1.1	1.5	.83	.36
26	.84	.50	.39	.70	.37	.79	2.3	.39	1.4	6.1	2.0	.37
27	.50	.55	.39	13	.32	1.7	5.1	.33	1.0	1.3	2.4	.61
28	.39	2.6	.39	1.4	.30	2.2	1.6	.33	.50	.78	1.0	.39
29	2.7	3.5	.39	1.2	.29	.75	.97	.47	.41	1.4	.85	.34
30	3.7	24	.39	.94	---	.44	.75	.94	.37	1.7	3.3	.33
31	2.8	---	.39	.74	---	.33	---	1.1	---	1.1	4.5	---
TOTAL	23.60	86.50	61.31	106.41	11.14	13.91	67.73	33.27	24.75	37.22	53.05	32.98
MEAN	.76	2.88	1.98	3.43	.38	.45	2.26	1.07	.82	1.20	1.71	1.10
MAX	3.7	24	14	23	.62	2.2	11	4.2	3.4	7.1	7.1	6.4
MIN	.22	.50	.39	.36	.28	.16	.39	.33	.30	.26	.33	.33
AC-FT	47	172	122	211	22	28	134	66	49	74	105	65

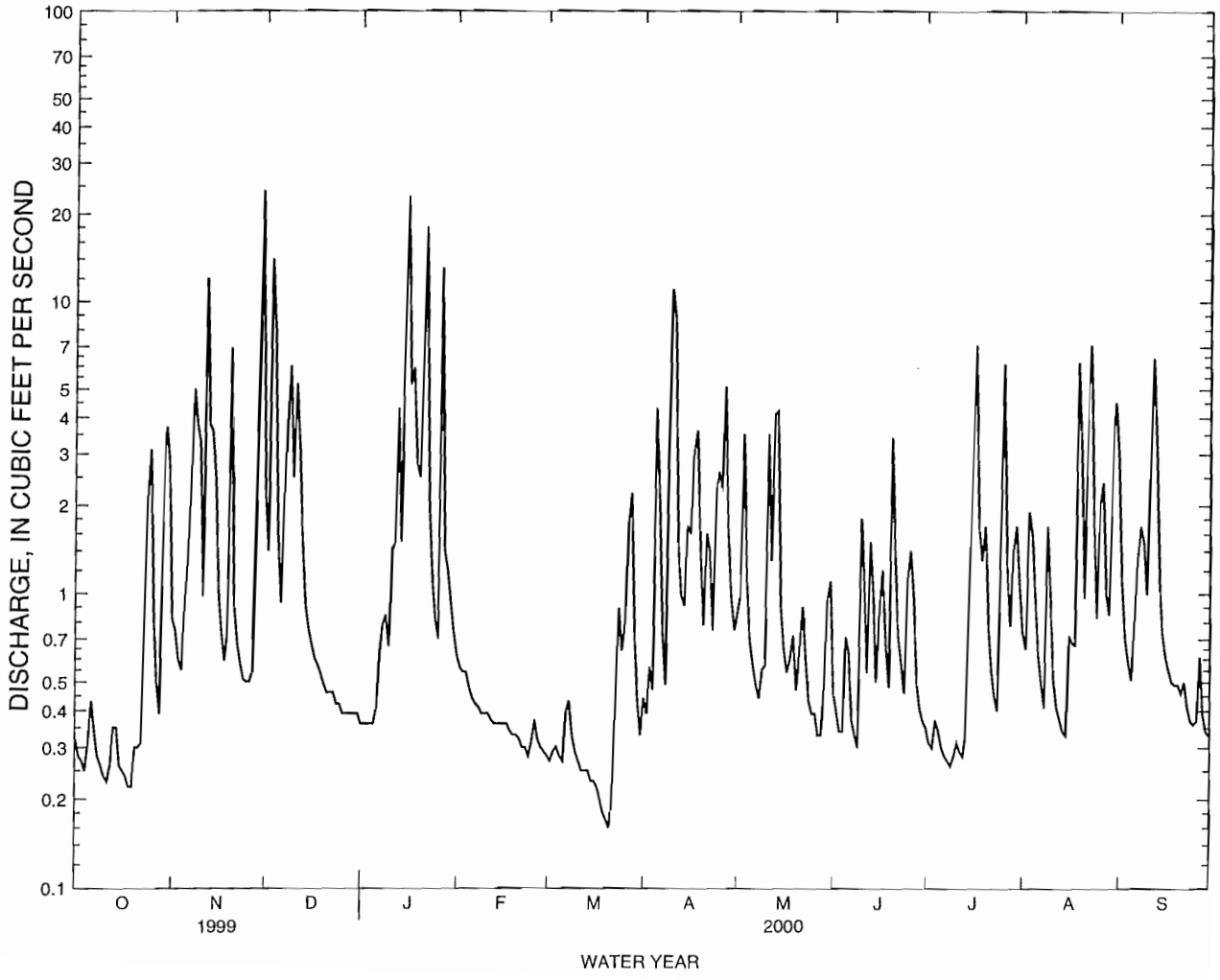
STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1956 - 2000, BY WATER YEAR (WY)

MEAN	.97	1.61	1.83	1.78	1.38	2.21	2.74	1.48	1.52	2.23	2.11	.95
MAX	3.86	8.31	7.01	11.9	6.69	15.7	10.5	4.89	7.07	6.69	8.13	5.93
(WY)	1984	1980	1960	1979	1960	1980	1986	1998	1998	1958	1958	1992
MIN	.008	.000	.071	.046	.089	.10	.20	.20	.16	.15	.12	.000
(WY)	1985	1963	1996	1962	1983	1983	1981	1966	1981	1961	1965	1965

HAWAII, ISLAND OF HAWAII

16759000 HAUANI GULCH NEAR KAMUELA--Continued

SUMMARY STATISTICS	FOR 1999 CALENDAR YEAR		FOR 2000 WATER YEAR		WATER YEARS 1956 - 2000	
ANNUAL TOTAL	653.13		551.87			
ANNUAL MEAN	1.79		1.51		1.74	
HIGHEST ANNUAL MEAN					3.66	1998
LOWEST ANNUAL MEAN					.48	1981
HIGHEST DAILY MEAN	40	Mar 21	24	Nov 30	108	Mar 24 1980
LOWEST DAILY MEAN	.15	Jun 23	.16	Mar 21	.00	Jul 29 1961
ANNUAL SEVEN-DAY MINIMUM	.17	Jun 17	.19	Mar 16	.00	Sep 8 1961
ANNUAL RUNOFF (AC-FT)	1300		1090		1260	
10 PERCENT EXCEEDS	3.9		3.5		3.9	
50 PERCENT EXCEEDS	.58		.62		.53	
90 PERCENT EXCEEDS	.25		.29		.09	



HAWAII, ISLAND OF HAWAII

16770500 PAAUAU GULCH AT PAHALA

LOCATION.--Lat 19°12′39″, long 155°28′48″, Hydrologic Unit 20010000, on right bank 50 ft downstream from Wood Valley Road bridge over Paauau Stream and 0.7 mi north of Pahala.

DRAINAGE AREA.--1.74 mi^2.

PERIOD OF RECORD.--October 1999 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 972 ft above mean sea level (from stadia survey).

COOPERATION.--State of Hawaii, Commission on Water Resources Management.

REMARKS.--Records computed by Dale Nishimoto. Records poor. No diversion upstream. Gage height of zero flow is 0.20 ft. Gage is operated as a streamflow gage, but the stage-discharge rating was not adequately defined for the year.

EXTREMES FOR CURRENT YEAR.--Maximum gage height, 4.44 ft, September 28; minimum gage height, 0.20 ft, on several days.

GAGE HEIGHT, FEET, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.20	.20	.20	.20	.20	.20	.19	.20	.20	---	---	---
2	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
3	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
4	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
5	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
6	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
7	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
8	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
9	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
10	.20	.20	1.21	.20	.20	.20	.20	.20	.20	---	---	---
11	.20	.20	2.02	.20	.20	.20	.20	.20	.20	---	---	---
12	.20	.20	1.87	.20	.20	.20	.20	.20	.20	---	---	---
13	.20	.20	.97	.24	.20	.20	.20	.20	.20	---	---	---
14	.20	.20	.60	.19	.20	.20	.20	.20	.20	---	---	---
15	.20	.20	.24	.20	.20	.20	.20	.20	.20	---	---	---
16	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
17	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
18	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
19	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
20	1.00	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
21	.79	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
22	.33	.20	.22	.20	.20	.20	.20	.20	.20	---	---	---
23	.20	.20	.22	.20	.20	.20	.20	.20	.20	---	---	---
24	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
25	.20	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---
26	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---	---
27	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---	---
28	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---	---
29	.20	.20	.20	.20	.20	.20	.20	.20	---	---	---	---
30	.20	.20	.20	.20	---	.36	.20	.20	---	---	---	---
31	.20	---	.20	.20	---	.86	---	.20	---	---	---	---
MEAN	.25	.20	.39	.20	.20	.23	.20	.20	---	---	---	---
MAX	1.00	.20	2.02	.24	.20	.86	.20	.20	---	---	---	---
MIN	.20	.20	.20	.19	.20	.20	.19	.20	---	---	---	---

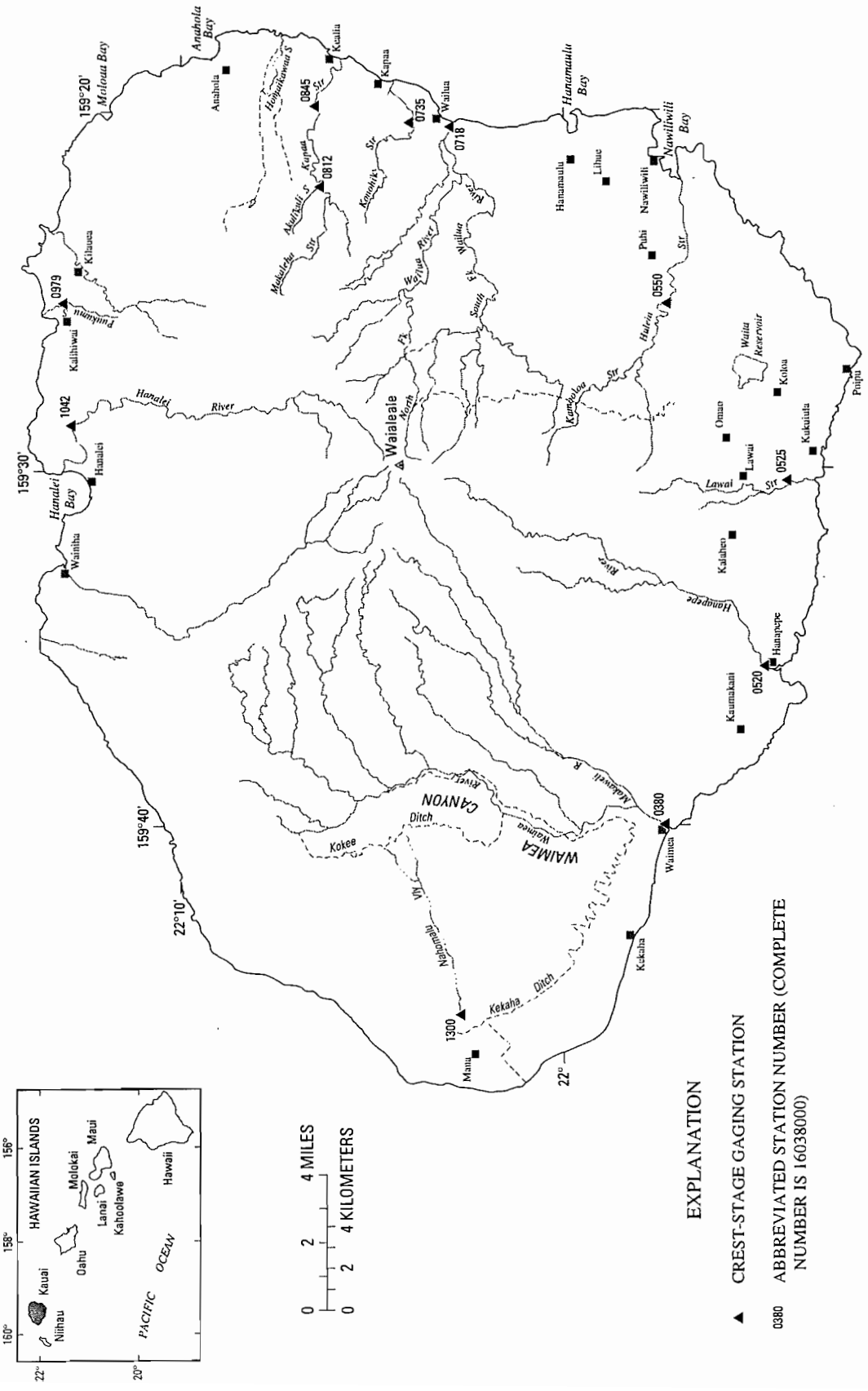
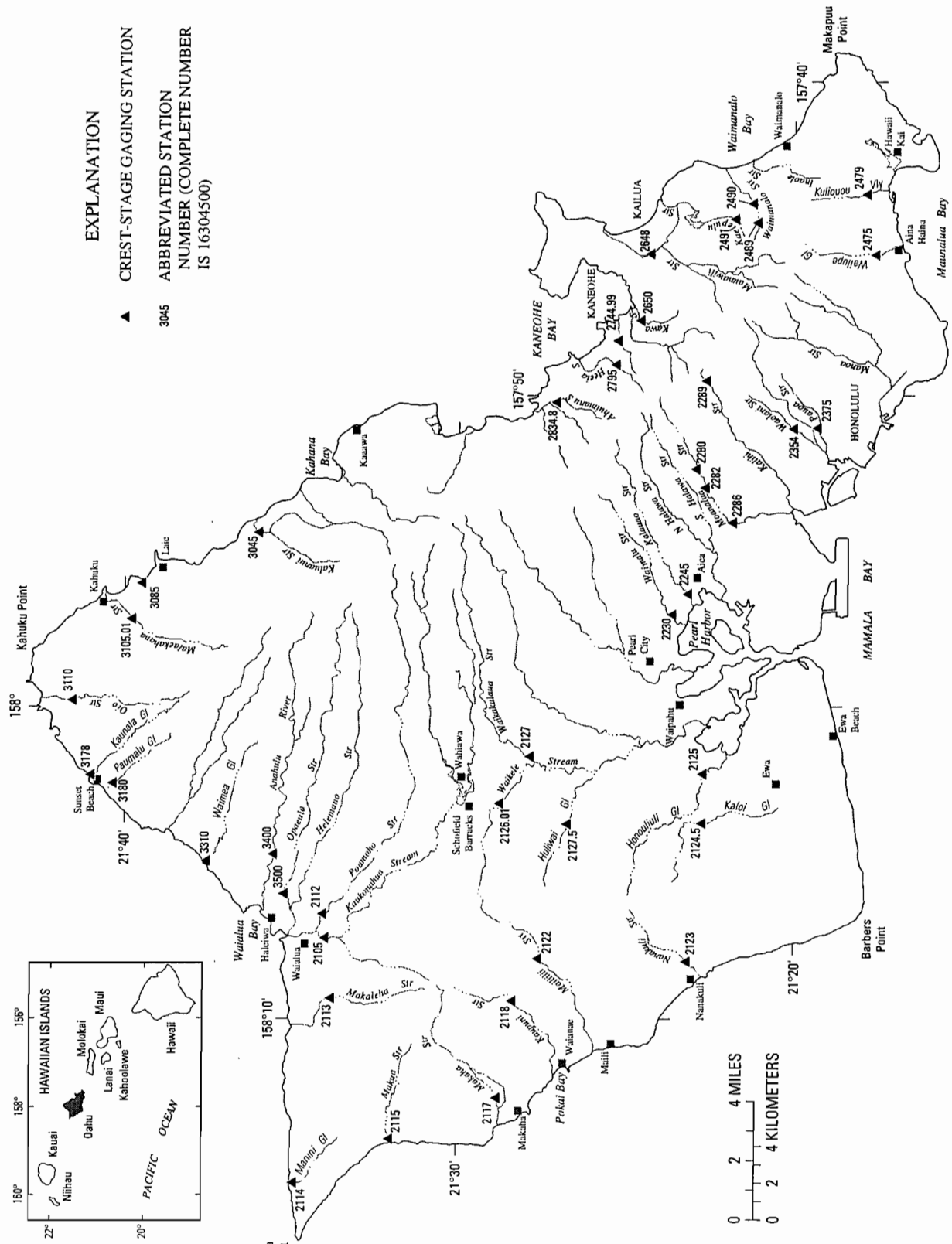


Figure 10. Locations of crest-stage gaging stations on Kauai.


EXPLANATION
CREST-STAGE GAGING STATION
3045 ABBREVIATED STATION NUMBER (COMPLETE NUMBER IS 16304500)
HAWAIIAN ISLANDS
Kauai
Niihau
Oahu
Molokai
Maui
Lanai
Kahoolawe
Hawaii
PACIFIC OCEAN
4 MILES
4 KILOMETERS
Kahuku Point
Kaena Point
Barbers Point
Makapuu Point
Waialua Bay
Kahana Bay
KANEOHE BAY
MAMALA BAY
Waimanalo Bay
Maunalua Bay
Pearl Harbor
Pokai Bay
Sunset Beach
Schofield Barracks
Pearl City
Ewa Beach
Waipahu
Ewa
Waialua
Haleiwa
Laie
Kahuku
Kaluanui
Waimea
Anahulu
Opaeula
Helemano
Poamoho
Kaukonahua
Waiahole
Waikakalaua
Waikele
Stream
Halawa
Waiawa
Kalauao
Waimalu
Aiea
Kalihi
Nuuanu
Manoa
Palolo
Waialae
Kuliouou
Waiahole
Waiahee
Waiaholo
Kaneohe
Kahaluu
Waikane
Waiahole
Waiawa
Waimano
Waiau
Honouliuli
Kaloi
Nanakuli
Maili
Waianae
Makaha
Makaha
Makaha
Mokuleia
Kaiaka
Kawaihapai
Manini
Kaiwi
Waialae
Kuliouou
Hawaii Kai
Aina Haina
Maunalua Bay
Waimanalo
Kaneohe
Kailua
Honolulu
Ahuimanu
Kahaluu
Waiahole
Waikane
Waiawa
Waimano
Waiau
Halawa
Aiea
Waimalu
Kalauao
Waiawa
Waikakalaua
Waikele
Stream
Honouliuli
Kaloi
Nanakuli
Maili
Waianae
Pokai Bay
Makaha
Makaha
Makaha
Mokuleia
Kaiaka
Kawaihapai
Manini
Kaena Point
Waialua Bay
Haleiwa
Waialua
Kahuku
Laie
Kahuku Point
Sunset Beach
Schofield Barracks
Pearl City
Ewa Beach
Waipahu
Ewa
Barbers Point
Makapuu Point
Waimanalo
Kaneohe
Kailua
Honolulu
Waialae
Kuliouou
Hawaii Kai
Aina Haina
Maunalua Bay

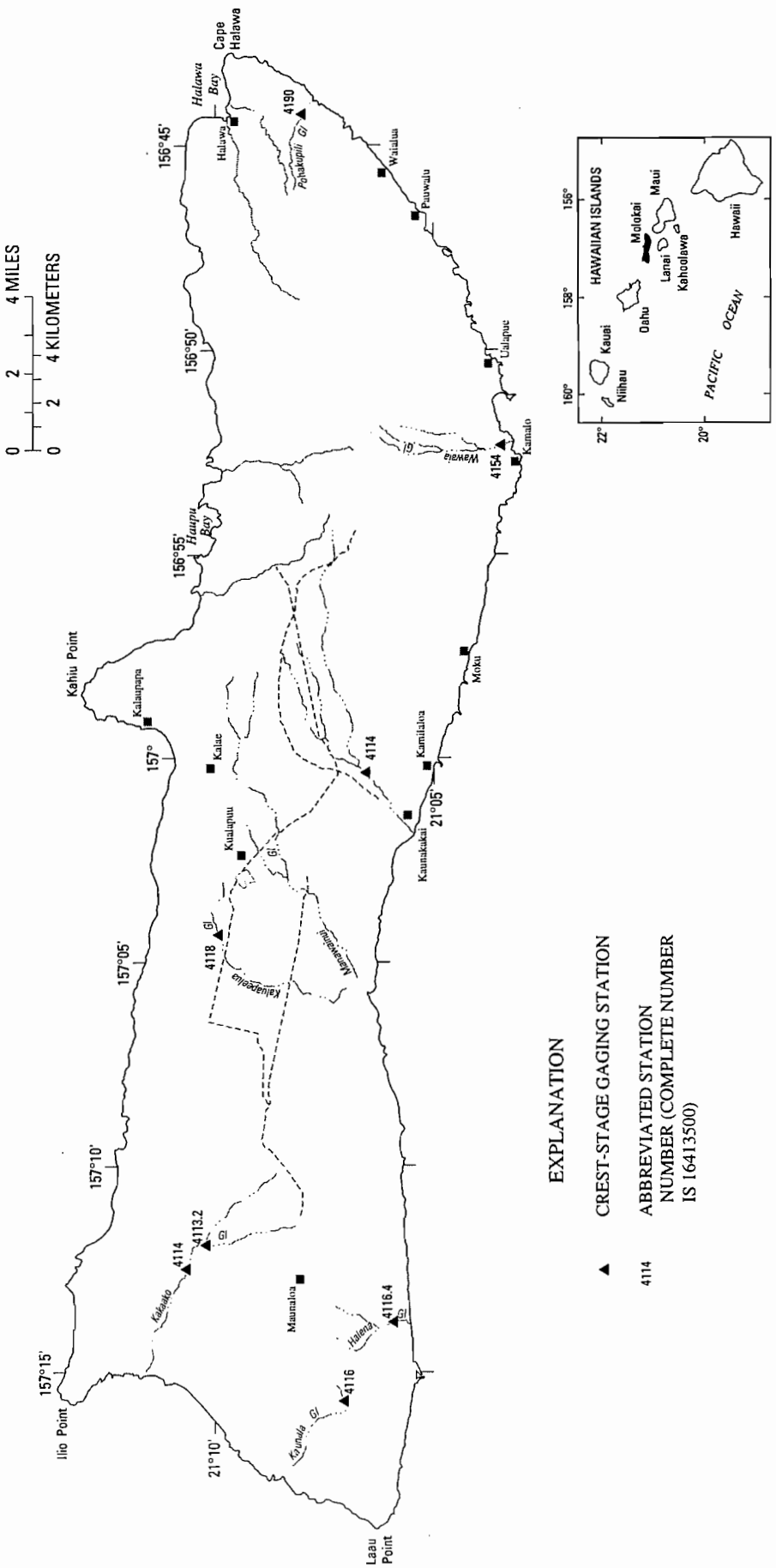


Figure 12. Locations of crest-stage gaging stations on Molokai.

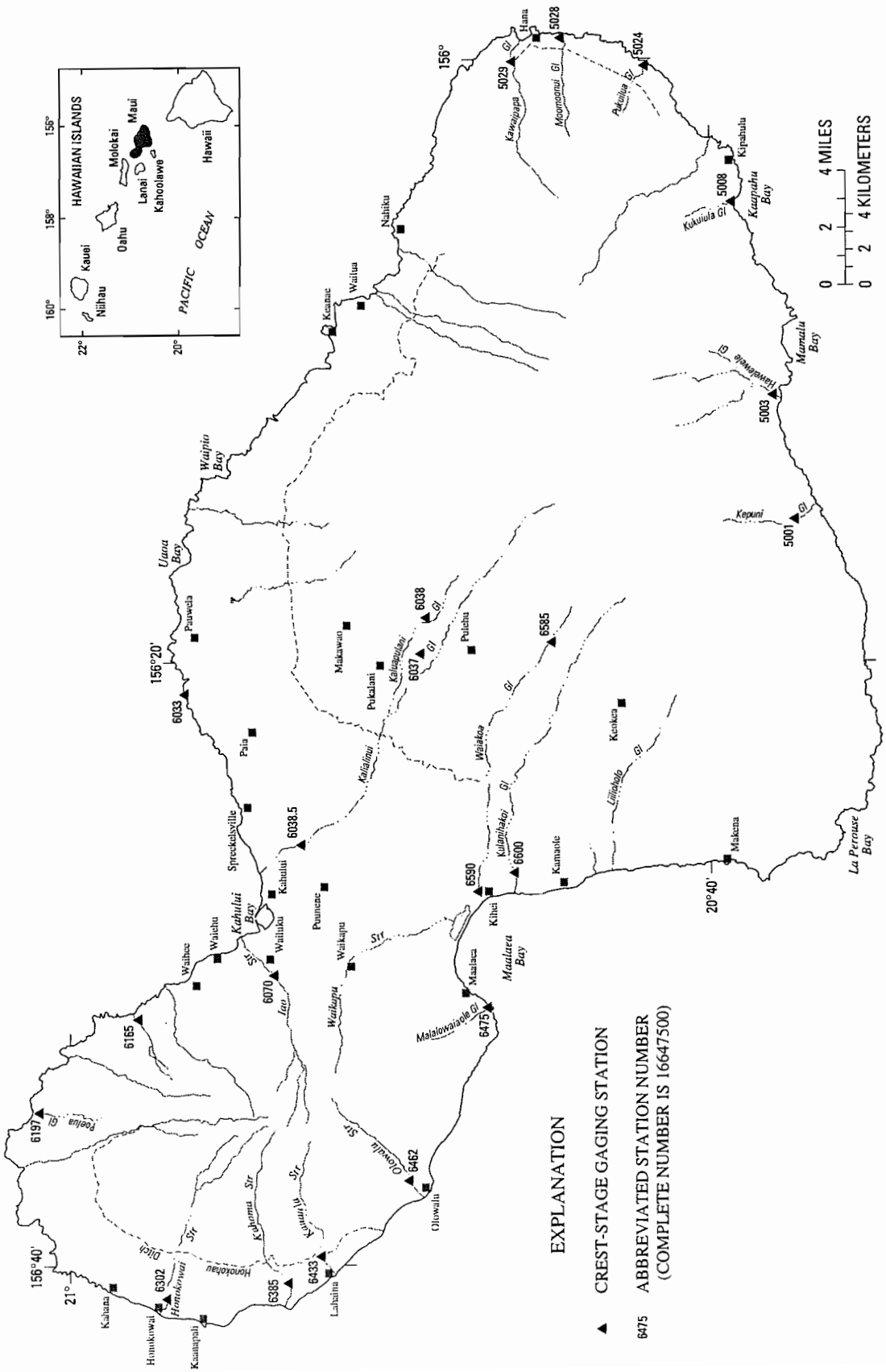


Figure 13. Locations of crest-stage gaging stations on Maui.

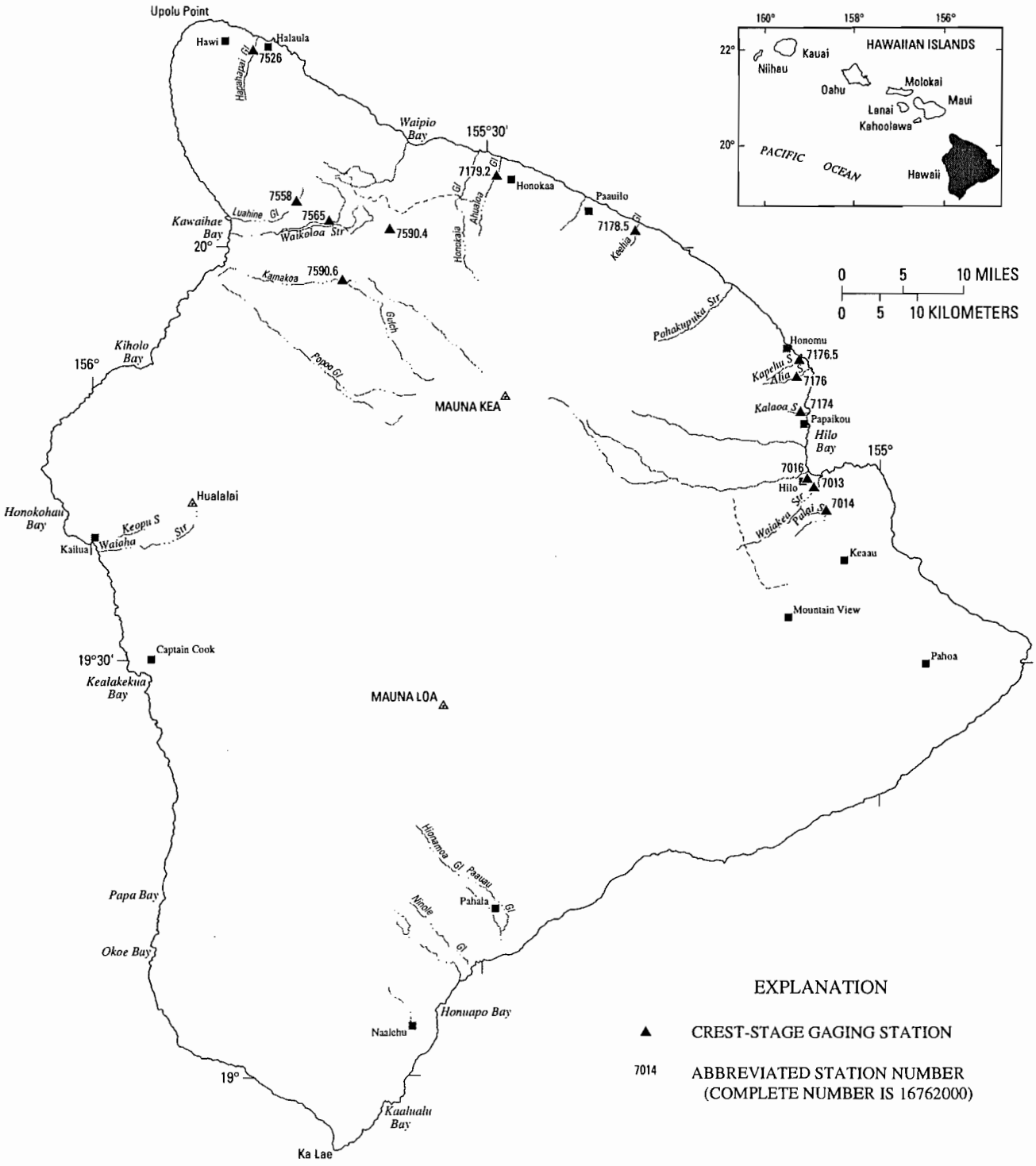


Figure 14. Locations of crest-stage gaging stations on Hawaii.

As the number of streams on which streamflow information is likely to be desired far exceeds the number of continuous-record stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than continuous-record stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to these 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 three tables. The first is a table of annual maximum stage and discharge at crest-stage stations, the second is a table of discharge measurements at low-flow partial-record stations, and the third is a table of 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 of peak flow or by current meter. The date of the maximum discharge is not always certain, but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been obtained 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.

Revised annual maximum discharge at crest-stage partial-record stations during water years 1998-99

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Maui									
16619700 Poelua Gulch nr Kahakuloa	Lat 21°00′58″, long 156°34′58″, at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse and 2.2 mi northwest of Kahakuloa.	1.18	1965-1999	02-20-99	6.33	126	03-16-68	15.22	1,760
16630200 Honokowai Str at Honokowai	Lat 20°56′58″, long 156°41′07″, 0.5 mi southeast of Honokowai and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-1998	11-25-97	3.27	154	08-01-82	11.0	4,520

e Estimated
< Actual value is known to be less than the value shown

Annual maximum discharge at crest-stage partial-record stations during water year 2000

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Kauai									
16038000 Waimea River at Waimea	Lat 21°57′23″, long 159°39′59″, 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-2000b	10-06-99	5.92	-	02-07-49	11.40	-
16052000 Hanapepe River at Hanapepe	Lat 21°54′47″, long 159°35′33″, 400 ft upstream from bridge on Highway 50 and 0.5 mi upstream from mouth.	26.6	1950-2000b	12-20-99	4.14	-	04-15-63	11.30	-
16052500 Lawai Str nr Koloa	Lat 21°54′11″, long 159°30′21″, on right bank at private road bridge, 0.9 mi upstream from mouth, and 2.4 mi southwest of Koloa.	6.62	1962-63, 1964-72≠ 1973-2000	12-20-99	3.75	875	01-31-75	11.37	5,810
16055000 Huleia Str nr Lihue	Lat 21°57′20″, long 159°25′23″, at highway bridge, 3.7 mi southwest of Lihue, and 4.5 mi upstream from mouth.	17.6	1912-15≠, 1962-67, 1968-70≠, 1971-2000	12-20-99	8.57	1,840	11-28-70	22.40	26,800
16071800 Wailua Riv nr Kapaa	Lat 22°03′00″, long 159°20′26″, at State park 600 ft upstream from highway bridge, 850 ft upstream from mouth, and 2.5 mi southwest of Kapaa.	52.6	1962-2000b	09-28-00	5.13	-	11-26-70	8.57	-
16073500 Konohiki Str nr Kapaa	Lat 22°04′01″, long 159°20′21″, at culvert on private road, 1.8 mi upstream from mouth, and 2.4 mi southwest of Kapaa High School.	3.38	1964-67, 1970-2000	11-04-99	8.00	217	12-14-91	16.92	2,530
16081200 Akulikuli Str nr Kapaa	Lat 22°06′25″, long 159°22′07″, at Kahuna Road crossing, 800 ft upstream from mouth, and 3.5 mi northwest of Kapaa armory.	0.40	1964-2000	03-27-00	<3.99	<200	12-14-91	11.40	1,550
16084500 Kapaa Str at old highway crossing nr Kealia	Lat 22°06′28″, long 159°19′52″, at abutment of old highway bridge, 100 ft upstream from road crossing, 1.4 mi northwest of Kealia, and 2.1 mi upstream from mouth.	14.0	1962-2000	10-20-99	8.96	2,200	12-14-91	23.11	30,330
16097900 Puukumu Str nr Kilauea	Lat 22°13′02″, long 159°25′18″, at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	0.91	1964-68, 1971-2000	10-20-99	<2.90	<40	04-07-71	17.27	1,430
16104200 Hanalei Riv at Highway 56 bridge nr Hanalei	Lat 22°12′50″, long 159°28′43″, at highway bridge, 1.6 mi northeast of Hanalei, and 2.4 mi upstream from mouth.	21.0	1963-2000b	11-04-99	11.17	-	11-03-95	13.82	-
16130000 Nahomalu Valley nr Mana	Lat 22°02′41″, long 159°45′17″, on left bank 1.1 mi northeast of Mana, and 5.3 mi northwest of Kekaha School.	3.81	1962-63, 1964-71≠, 1972-2000	11-04-99	3.99	153	04-15-72	7.15	2,120

≠ Operated as a continuous-record gaging station
b Gage height only
< Actual value is known to be less than the value shown
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Oahu									
16210500 Kaukonahua Str at Waialua	Lat 21°33′56″, long 158°07′26″, 0.2 mi upstream from Highway 99, 0.4 mi southeast of Waialua High School, and 1.3 mi southwest of Weed Circle.	38.7	1963, 1968-2000	12-02-99	24.66	6,110	04-15-63	26.4	15,600
16211200 Poamoho Str at Waialua	Lat 21°34′00″, long 158°06′40″, at culvert crossing of Kaheaka Road, 0.2 mi upstream from Highway 83, and 1.1 mi east of Waialua High School.	12.7	1967-2000	12-02-99	20.18	unknown	04-19-74	24.0	7,340
16211300 Makaleha Str nr Waialua	Lat 21°33′49″, long 158°09′21″, 1.0 mi southwest of Dillingham Ranch and 1.9 mi southwest of former sugar mill at Waialua.	4.15	1958-63, 1964-65≠, 1966-2000	10-19-99	7.66	unknown	11-13-65 11-14-96	7.41 9.41	3,640 -
16211400 Manini Gulch at Kaena	Lat 21°34′50″, long 158°15′12″, 180 ft upstream from Highway 99, 1.7 mi west of Camp Erdman, and 2.0 mi east of Kaena Point.	1.08	1974-2000	10-19-99	12.15	unknown	01-01-88	19.61	1,000
16211500 Makua Str at Makua	Lat 21°31′59″, long 158°13′49″, on bridge at Farrington Highway crossing, 0.1 mi north of Makua cemetery and 4.5 mi southeast of Kaena Point lighthouse.	4.28	1958-2000	2000	<6.16	unknown	02-07-76 11-14-96	a8.00 11.74	3,220 -
16211700 Makaha Str at Makaha	Lat 21°28′47″, long 158°12′31″, 0.9 mi upstream from Farrington Highway and 1.1 mi north of junction of Farrington Highway and Makaha Valley Road.	5.25	1966-2000	10-19-99	7.91	unknown	11-14-96	17.60	e5,000
16211800 Kaupuni Str at altitude 372 ft, nr Waianae	Lat 21°28′20″, long 158°09′26″, at abandoned diversion dam, 2.6 mi northeast of Waianae cemetery, and 2.8 mi northeast of junction of Waianae Valley Road and Farrington Highway.	3.58	1961-72≠, 1973-2000	10-19-99	3.94	unknown	01-06-82	7.82	3,640
16212200 Mailiilii Str nr Waianae	Lat 21°27′34″, long 158°08′05″, at bridge at Lualualei Naval Reservation and 3.4 mi east of cemetery nr Waianae.	1.51	1958-2000	2000	<0.98	unknown	01-06-82	7.20	2,460
16212300 Nanakuli Str at Nanakuli	Lat 21°23′08″, long 158°08′11″, on left bank 0.7 mi southwest of Nanaikapono Elementary School, 1.8 mi north of Kahe Point Electric Plant, and 0.6 mi upstream of Farrington Highway.	3.98	1968-2000	10-19-99	19.07	e21	a2-7-76 10-20-85	26.20 26.28	3,320 -
16212450 Kaloi Gulch tributary nr Honouliuli	Lat 21°22′41″, long 158°03′45″, at culvert on private road, 1.8 mi west of Honouliuli, and 2.8 mi northwest of Ewa Post Office.	1.70	1968-2000	8-20-00	2.10	29	11-25-75	7.89	-

< Actual value is known to be less than the value shown
≠ Operated as a continuous-record gaging station
a At old gage datum
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Oahu--Continued									
16212500 Honouliuli Str nr Waipahu	Lat 21°22′40″, long 158°02′10″, at bridge on Farrington Highway and 1.8 mi west of Waipahu Post Office.	11.0	1956-2000	8-20-00	0.51	unknown	01-06-82	10.28	3,500
16212601 Waikele Str at Wheeler Field	Lat 21°28′44″, long 158°03′07″, at culvert 0.3 mi west of east-west runway at Wheeler Field and 1.9 mi southwest of Wahiawa Post Office.	6.35	1958, 1960-2000	12-02-99	4.30	137	01-06-82	22.50	1,850
16212700 Waikakalaua Str nr Wahiawa	Lat 21°27′50″, long 158°01′38″, 0.2 mi downstream from Kamehameha Highway and 2.4 mi south of Wahiawa Post Office.	6.93	1958-2000	12-02-99	11.55	unknown	04-15-63	16.50	4,830
16212750 Huliwai Gulch nr Kunia Camp	Lat 21°26′43″, long 158°03′47″, 200 ft upstream from Highway 75 and 1.2 mi south of Kunia Camp.	4.29	1974-2000	12-02-99	11.79	63	02-10-79 10-16-91	8.36 13.49	600 -
16223000 Waimalu Str nr Aiea	Lat 21°23′48″, long 157°56′56″, 1,300 ft upstream from bridge on Moanalua Road and 1.2 mi northwest of Aiea High School.	5.97	1952-70≠, 1973-2000	12-02-99	3.22	1,440	01-05-68 05-14-60	6.82 9.49	8,020 -
16228000 Moanalua Str nr Honolulu	Lat 21°22′53″, long 157°52′22″, on left bank 1.8 mi northeast of Tripler Hospital and 5.0 mi north of Honolulu Post Office.	2.73	1927-78≠, 1979-2000	08-20-00	7.85	unknown	11-18-30 05-14-63	11.58 11.82	4,580 -
16228200 Moanalua Str nr Aiea	Lat 21°22′37″, long 157°53′03″, on right bank 1.1 mi northeast of Tripler Hospital and 2.9 mi east of Aiea sugar refinery.	3.34	1969-2000	08-20-00	5.38	unknown	03-18-80	9.97	4,860
16228600 Moanalua Str at Tripler Hospital	Lat 21°21′52″, long 157°54′05″, on right bank 0.5 mi west of Tripler Hospital and 1.6 mi northeast of Aliamanu School.	4.44	1971-2000	08-20-00	14.36	1,230	03-18-80	21.0	6,200
16228900 Kalihi Str nr Kaneohe	Lat 21°22′35″, long 157°49′32″, on right bank 800 ft downstream from Likelike Highway and 2.8 mi southwest of Castle High School in Kaneohe.	0.60	1967-71≠, 1972-2000	08-20-00	3.88	630	01-08-80	5.60	1,700
16235400 Waolani Str at Honolulu	Lat 21°20′00″, long 157°51′04″, at Wyllie Street bridge and 1.8 mi northeast of Honolulu Post Office.	1.29	1958-2000	12-02-99	4.50	1,500	05-14-63	6.14	2,500
16237500 Pauoa Str at Honolulu	Lat 21°19′18″, long 157°51′03″, at Lusitana Street bridge and 1.1 mi northeast of Honolulu Post Office.	1.43	1958-2000	12-02-99	0.93	500	05-14-63	4.65	2,200
16247500 Wailupe Gulch at Aina Haina	Lat 21°17′46″, long 157°45′29″, at Ani Street bridge and 1.0 mi upstream from Kalanianaole Highway in Aina Haina.	2.35	1958-2000	2000	<0.46	unknown	12-18-67 03-05-58	5.72 7.20	3,600 -
16247900 Kuliouou Valley at Kuliouou	Lat 21°17′50″, long 157°43′35″, at Kuliouou, 300 ft downstream from single-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-2000	2000	<27.44	unknown	12-31-87	36.55	4,700

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

≠ Operated as a continuous-record gaging station

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Oahu--Continued									
16248950 Kahawai Str at Waimanalo	Lat 21°21′04″, long 157°43′33″, on left bank 30 ft downstream from Kalanianaole Highway bridge, 1.9 mi northwest of Waimanalo Post Office, and 0.75 mi southwest of Bellows Air Force Station radio towers.	1.18	1998-2000	01-19-00	<7.38	unknown	01-22-99	7.70	unknown
16249000 Waimanalo Str at Waimanalo	Lat 21°21′14″, long 157°43′50″, on right bank 260 ft downstream from Highway 72 and 2.3 mi northeast of Waimanalo Post Office.	2.16	1967-70≠, 1971-2000	01-19-00	2.86	unknown	02-14-85 03-06-63 11-26-70	10.82 - 10.00	- a4,560 a4,560
16249100 Kaelepulu Str tributary at Kailua	Lat 21°21′44″, long 157°44′22″, 30 ft upstream from Kalanianaole Highway, 1.6 mi northwest of Waimanalo School, and 2.4 mi south of Kailua Post Office.	0.16	1963-2000	10-19-99	1.91	41	12-31-87	7.53	467
16264800 Kawainui Canal of Kailua	Lat 21°24′36″, long 157°45′31″, datum of gage is at mean sea level.	11.0	1957-60, 1963-64, 1967-97 2000	01-20-00	2.41	-	01-12-75	5.82	-
16265000 Kawa Str at Kaneohe	Lat 21°24′32″, long 157°47′36″, 50 ft upstream from bridge on Kaneohe Bay Drive at Kaneohe, 0.2 mi northeast of Castle High School, and 0.6 mi upstream from mouth.	1.19	1965, 1968-74, 1977-2000	01-07-00	5.63	430	02-01-69	17.90	5,290
16274499 Keaahala Str at Kamehameha Highway, at Kaneohe	Lat 21°25′12″, long 157°48′15″, 35 ft upstream from bridge on Kamehameha Highway at Kaneohe.	0.62	1959-2000	08-20-00	2.52	234	05-02-65	11.50	2,750
16283480 Ahuimanu Str nr Kahaluu	Lat 21°27′04″, long 157°50′13″, at bridge on Ahuimanu Road and 0.8 mi south of Kahaluu.	2.31	1963-2000	12-02-99	4.83	296	02-01-69 11-25-70	11.80 14.30	7,300 7,300
16304500 Kaluanui Stream at Hauula	Lat 21°35′57″, long 157°54′24″, Kaluanui on left downstream wingwall of stream at concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls. Datum lowered 18.47 ft.	2.12	1958-2000	12-10-99	20.55	unknown	01-06-82	25.42(r)	4,920
16308500 Kahawainui Stream at Laie	Lat 21°39′25″, long 157°55′57″, 800 ft northeast of Zion Cemetery on upstream side of bridge at Kamehameha Highway.	4.79	1997-2000	12-10-99	5.01	-	12-10-99	5.01	-
16310501 Malaekahana Str at altitude 30 ft, nr Kahuku	Lat 21°39′47″, long 157°57′11″, at abandoned plantation railroad bridge, 1.1 mi southwest of junction of plantation road and Highway 83, and 1.2 mi south of Kahuku Hospital.	4.05	1958-2000	12-02-99	12.63	unknown	04-15-63 12-02-99	12.10 12.63	4,640 -

< Actual value is known to be less than the value shown
(r) Revised
≠ Operated as a continuous-record gaging station
b Gage height only

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Oahu--Continued									
16311000 Oio Stream nr Kahuku	Lat 21°41′32″, long 157°59′48″, on left bank of stream 0.5 mi southwest of junction of Plantation Road and Highway 83 at Kuilima bridge and 2.7 mi west of Kahuku Hospital.	2.13	1958-2000	12-02-99	2.70	unknown	05-02-65 11-14-96	8.13 8.63	1,390 -
16317800 Kaunala Gulch nr Sunset Beach	Lat 21°40′59″, long 158°02′12″, on downstream left bank wingwall of road bridge on Highway 83 near Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-2000	10-19-99	6.99	unknown	11-20-90 10-19-99	6.01 6.99	450 -
16318000 Paumalu Gulch at Sunset Beach	Lat 21°40′19″, long 158°02′28″ 0.4 mi upstream from Highway 83 at Sunset Beach and 2.2 mi northeast of Waimea.	2.59	1968-2000	12-11-99	3.27	212	04-19-74 04-04-89	4.97 6.44	982 -
16331000 Waimea Gulch nr Kawailoa Camp	Lat 21°37′29″, long 158°04′58″, at culvert on Ashley Road, 0.1 mi upstream from Highway 83, and 1.1 mi north of Kawailoa Camp.	2.23	1968-2000	12-11-99	1.89	43.4	03-18-80	11.2	2,030
16340000 Anahulu River nr Haleiwa	Lat 21°35′28″, long 158°04′45″, 1.7 mi southeast of junction of Emerson Road and Kamehameha Highway and 2.5 mi east of Waialua School at Haleiwa.	13.5	1958-2000	12-11-99	6.58	2,250	04-19-74	15.80	15,900
16350000 Opaeula Str nr Haleiwa	Lat 21°35′09″, long 158°06′01″, 0.6 mi upstream from Kamehameha Highway and 2.1 mi northeast of Waialua.	5.96	1956-2000	12-11-99	11.34	702	04-19-74	20.7	7,600
Island of Molokai									
16411320 Kakaako Gulch abv Kamakahi Gulch, nr Mauna Loa	Lat 21°10′11″, long 157°11′56″, 0.1 mi upstream from Kamakahi Gulch, 1.7 mi downstream from Highway 46, and 2.5 mi northeast of Mauna Loa.	1.40	1964-2000	09-27-00	1.07	unknown	11-12-65	4.80	670
16411400 Kakaako Gulch nr Mauna Loa	Lat 21°10′39″, long 157°12′31″, on left bank 1.0 mi downstream from Kamakahi Gulch, and 3.0 mi north of Mauna Loa School.	5.34	1963-72≠, 1973-2000	03-31-00	-	unknown	02-11-89	8.47	2,860
16411600 Kaunala Gulch nr Mauna Loa	Lat 21°07′01″, long 157°15′43″, at Sand Haul Road, 3.2 mi east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	0.28	1964-2000	05-16-00	<0.60	unknown	12-25-84	3.87	151
16411640 Halena Gulch nr Mauna Loa	Lat 21°05′53″, long 157°13′47″, 2.7 mi southwest of Mauna Loa and 5.5 mi east of Laau Point.	2.07	1965-2000	05-16-00	<0.98	<135	01-11-74	8.20	2,920
16411800 Kaluapeelua Gulch at Hoolehua	Lat 21°09′55″, long 157°04′22″, 0.4 mi south of Hoolehua and 2.1 mi west of Kualapuu.	1.46	1964-2000	No flow.			12-08-73	3.30	86
16413500 Manawainui Gulch nr Kualapuu	Lat 21°07′42″, long 157°03′25″, at bridge on Highway 46, 0.5 mi south of Holomua School, and 2.3 mi southwest of Kualapuu.	10.4	1965-97, 2000	08-20-00	unknown	1,080	04-04-89	-	3,620

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

≠ Operated as a continuous-record gaging station

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
Island of Molokai--Continued									
16414000 Kaunakakai Gulch at Kaunakakai	Lat 21°06′21″, long 157°00′34″, on left bank 0.6 mi upstream from Molokai Ranch pipeline crossing 1.3 mi northeast of Kaunakakai Post Office and 1.7 mi upstream from mouth.	6.57	1949-98≠, 1999-2000	03-31-00	unknown	unknown	10-31-61	9.30	3,060
16415400 Wawaia Gulch at Kamalo	Lat 21°03′25″, long 156°52′20″, at Highway 45, 0.3 mi upstream from mouth, and 0.5 mi northeast of Kamalo.	2.12	1964-2000	08-20-00	1.65	600	04-13-65	2.61	1,250
16419000 Pohakupili Gulch nr Halawa	Lat 21°07′59″, long 156°44′15″, at Highway 45, 0.5 mi upstream from mouth, and 1.9 mi south of Halawa.	0.48	1964-2000	08-20-00	unknown	477	11-04-66	8.93	989
Island of Maui									
16500100 Kepuni Gulch nr Kahikinui House	Lat 20°37′21″, long 156°15′16″, on right bank 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui House, and 8.5 mi west of Kaupo.	1.91	1963-72≠, 1973-2000	No flow.			09-18-94	13.68	2,320
16500300 Hawelewele Gulch nr Kaupo	Lat 20°38′01″, long 156°11′08″, 700 ft upstream from Piilani Highway 31 and 3.9 mi west of Kaupo.	11.3	1967-2000	10-20-99	7.36	1,620	01-08-80	15.10	13,600
16500800 Kukuiula Gulch nr Kipahulu	Lat 20°39′18″, long 156°04′44″, at Highway 31, 1.3 mi west of Kipahulu, and 3.2 mi east of Kaupo.	0.76	1963-68≠, 1969-2000	08-27-00	5.46	399	03-31-82	13.76	5,950
16502400 Pukuilua Gulch nr Hana	Lat 20°42′00″, long 156°00′14″, at Highway 31, 0.4 mi southwest of Puuiki and 4.0 mi south of Hana.	0.48	1963-2000	08-27-00	2.77	107	01-23-65	9.30	788
16502800 Moomoonui Gulch at Hana	Lat 20°44′37″, long 155°59′18″, at Highway 31 just downstream from Moomooiki Gulch and 1.0 mi south of Hana.	0.90	1963-2000	08-27-00	10.41	587	11-26-92	14.71	2,480
16502900 Kawaipapa Gulch at Hana	Lat 20°46′08″, long 156°00′04″, 1,000 ft upstream from Highway 36 and 0.3 mi northwest of Hana Hospital.	5.83	1965-2000	08-27-00	>6.27	>2,280	08-01-82	11.03	16,880
16603300 Unnamed gulch at Maliko Bay	Lat 20°56′26″, long 156°21′04″, at Hana Highway, 0.5 mi west of Maliko Bay and 1.3 mi north of Hamakuapoko.	0.43	1963-2000	08-20-00	1.62	934	03-27-79	17.28	171
16603700 Kalialinui Gulch tributary nr Pukalani	Lat 20°49′02″, long 156°19′44″, at Lower Kula Road and 1.4 mi south of Pukalani.	1.17	1967-2000	01-20-00	<2.12	<30	01-09-80	7.35	414
16603800 Kaluapulani Gulch tributary nr Pukalani	Lat 20°48′52″, long 156°18′32″, at Haleakala Highway, 1.5 mi west of Olinda Prison Camp and 2.3 mi southeast of Pukalani.	0.45	1963-2000	08-27-00	<1.65	<31	07-23-64	9.90	306

≠ Operated as a continuous-record gaging station
< Actual value is known to be less than the value shown
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
			Island of Maui--Continued						
16603850 Kalialinui Gulch nr Kahului	Lat 20°52′47″, long 156°26′06″, 600 ft upstream from Hansen Road, 0.5 mi northeast of Puunene Hospital and 2.5 mi southeast of Kahului Post Office.	17.9	1967-2000	No flow.			01-28-71	8.33	1,330
16607000 Iao Str at Wailuku	Lat 20°53′38″, long 156°30′27″, 560 ft upstream from Market Street bridge at Wailuku and 1.9 mi upstream from mouth.	8.24	1951≠, 1952-2000	04-01-00	3.86	1,690	12-03-50	6.21	7,540
16616500 Unnamed gulch at Maluhia Camp	Lat 20°57′26″, long 156°31′41″, at Kahekili Highway, 0.6 mi east of Maluhia Camp and 1.8 mi northwest of Waihee.	0.12	1964-2000	No flow.			01-12-75	7.29	e97
16619700 Poelua Gulch nr Kahakuloa	Lat 21°00′58″, long 156°34′58″, at Highway 30 (bypass), 1.3 mi southeast of Nakalele Point lighthouse and 2.2 mi northwest of Kahakuloa.	1.18	1965-2000	01-19-00	5.31	78	03-16-68	15.22	1,760
16630200 Honokowai Str at Honokowai	Lat 20°56′58″, long 156°41′07″, 0.5 mi southeast of Honokowai and 1.1 mi northwest of Puukolii.	5.59	1962-63, 1965-2000	12-03-99	3.80	216	08-01-82	11.0	4,520
16638500 Kahoma Str at Lahaina	Lat 20°53′12″, long 156°40′36″, 0.2 mi west of Kelawea, 0.6 mi northeast of Lahaina, 0.6 mi downstream from Kanaha Str and 0.9 mi upstream from mouth.	5.22	1963-89≠ 1990-2000	08-20-00	-	unknown	07-11-65	11.03	2,490
16643300 Kauaula Str nr mouth, nr Lahaina	Lat 20°52′09″, long 156°39′43″, 0.7 mi upstream from Honoapiilani Highway (bypass) and 1.3 mi southeast of Lahaina Lighthouse.	4.12	1960,1962, 1964-2000	08-27-00	<2.88	<137	05-13-60	7.9	2,660
16646200 Olowalu Str at Olowalu	Lat 20°49′23″, long 156°37′15″, on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.	4.08	1962-72≠, 1973-2000	12-03-99	3.29	252	03-24-67	5.40	1,300
16647500 Malalowaiaole Gulch nr Maalaea	Lat 20°46′56″, long 156°31′32″, at Honoapiilani Highway, 200 ft upstream from mouth, 0.2 mi north of McGregor Point, and 1.2 mi southwest of Maalaea.	0.64	1964-2000	12-26-99	<3.14	<3	01-10-80	12.95	350
16658500 Waiakoa Gulch tributary nr Waiakoa	Lat 20°44′56″, long 156°19′22″, at Upper Kula Road, 1.0 mi southeast of Waiakoa, and 1.0 mi northeast of junction of Lower and Upper Kula Roads.	0.98	1964-2000	No flow.			01-28-71	8.23	409
16659000 Waiakoa Gulch at Kihei	Lat 20°47′14″, long 156°27′41″, 0.3 mi northeast of Kihei and 0.4 mi upstream from mouth.	10.1	1963-2000	No flow.		<34	01-28-71	9.66	1,560
16660000 Kulanihakoi Gulch nr Kihei	Lat 20°46′06″, long 156°27′03″, on right bank 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.	14.4	1963-70≠, 1971-2000	No flow.			01-28-71	9.40	4,460

≠ Operated as a continuous-record gaging station
< Actual value is known to be less than the value shown

Annual maximum discharge at crest-stage partial-record stations during water year 2000--Continued

Station name and number	Location	Drainage area (mi^2)	Period of record	Water year 2000 maximum			Period of record max		
				Date	Gage height (ft)	Dis-charge (ft^3/s)	Date	Gage height (ft)	Dis-charge (ft^3/s)
			Island of Hawaii						
16701300 Waiakea Str at Hilo	Lat 19°42′38″, long 155°05′02″, 0.3 mi upstream from Kinoole Street bridge and 1.3 mi southeast of Hilo Post Office.	35.8	1968-91, 1993-2000	12-11-99	6.60	1,140	08-12-94	10.90	3,670
16701400 Palai Str at Hilo	Lat 19°40′56″, long 155°04′04″, at Highway 11, 300 ft south of Palai Street intersection, and 3.5 mi southeast of Hilo Post Office.	5.08	1965-90, 1994-2000	Records being reviewed.					
16701600 Alenaio Str at Hilo	Lat 19°43′10″, long 155°05′27″, 0.65 mi south of Hilo Post Office, 0.65 mi west of Kapiolani School, and 0.1 mi upstream from Kapiolani Street bridge.	8.62	1997-2000	12-11-99	6.03	e710	07-30-97	6.36	1,010
16717600 Alia Str nr Hilo	Lat 19°50′38″, long 155°06′21″, on upstream right bank wingwall of culvert on Highway 19 at Pepeekeo 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	0.58	1962-72≠, 1979, 1986, 1994-2000	12-10-99	8.20	242	02-20-79	17.1	2,850
16717650 Kapehu Str nr Pepeekeo	Lat 19°51′52″, long 155°06′11″, at culvert on Highway 19, 1.0 mi southeast of Honomu, 2.2 mi north of Pepeekeo, and 9.4 mi north of Hilo.	1.09	1963-90, 1994-2000	Records being reviewed.					
16717850 Keehia Gulch nr Ookala	Lat 20°01′08″, long 155°18′45″, at culvert on Highway 19, 1.7 mi west of Ookala, and 4.1 mi southeast of Paauilo.	0.62	1963-91, 1993-2000	Records being reviewed.					
16717920 Ahualoa Gulch at Honokaa	Lat 20°05′12″, long 155°29′17″, at Highway 24, 1.1 mi northwest of Honokaa Hospital, and 1.5 mi upstream from mouth.	2.27	1963-90, 1995-2000	Records being reviewed.					
16752600 Hapahapai Gulch at Kapaau	Lat 20°14′00″, long 155°48′00″, at Highway 27, 300 ft east of Kapaau Post Office.	1.52	1963-90, 1995-2000	unknown	<4.63	<41	01-09-80	11.42	426
16755800 Luahine Gulch nr Waimea	Lat 20°03′11″, long 155°44′35″, on culvert 5.1 mi northwest of Waimea and 5.7 mi east of Kawaihae.	0.32	1963-90, 1994-2000	Records being reviewed.					
16756500 Keanuiomano Str nr Kamuela	Lat 20°01′48″, long 155°42′05″, on left bank 150 ft upstream from Highway 25 at Waiaka and 2.0 mi west of Kamuela.	4.3	1964-72≠, 1973-90, 1995-2000	12-03-99	4.89	446	04-20-68	10.02	3,540
16759040 Paiakuli Reservoir tributary nr Waimea	Lat 20°02′16″, long 155°38′08″, at Highway 19, 2.1 mi west of Puukapu Reservoir, and 2.6 mi northeast of Waimea.	0.27	1963-70, 1994-2000	11-30-99	2.41	74	01-11-67	5.63	340
16759060 Kamakoa Gulch nr Waimea	Lat 19°57′32″, long 155°41′02″, at bridge, 1.4 mi north of Saddle Road Junction, and 4.5 mi south of Waimea.	50.6	1963-91, 1994-2000	Records being reviewed.					

≠ Operated as a continuous-record gaging station

e Estimated stage as 0.3 ft above top of 9.01 ft pipe plus base cap elevation of 4.63 ft (gage datum). Caused by debris pile at entrance of culvert.

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 potential of the stream. The column headed "Period of record" shows the water years in which measurements were made at the same, or nearly the same, site.

Discharge measurements made at low-flow partial-record stations during water year 2000

Station name and number	Location	Period of record	Date	Measurement	
				Gage height (ft)	Discharge (ft^3/s)
Island of Maui					
16588000 Wailoa ditch at Honopou, near Huelo	Lat 20°53′20″, long 156°15′19″, on right bank 100 ft downstream from intake at Honopou Stream, 0.5 mi west of Lupi, and 2.2 mi southwest of Huelo.	1924-87≠, 1988-2000	10-06-99	--	123
			02-04-00	--	111
			04-13-00	--	242
			08-02-00	--	176
16589000 New Hamakua ditch at Honopou, near Huelo	Lat 20°53′28″, long 156°15′22″, on right bank 15 ft upstream from tunnel portal, 600 ft downstream from Honopou Stream crossing and 2.1 mi southwest of Huelo.	1919-85≠, 1986-2000	10-06-99	--	0.21
			02-04-00	--	1.98
			04-13-00	--	4.93
			08-02-00	--	1.21
16592000 Lowrie ditch at Honopou Gulch, near Huelo	Lat 20°54′57″, long 156°15′08″, on left bank 0.2 mi downstream from siphon across Honopou Stream, 1.6 mi west of Huelo, and 2.7 mi northwest of Kailua.	1911-26≠, 1931-85≠, 1986-2000	10-14-99	--	3.77
			02-07-00	--	17.1
			04-26-00	--	14.1
			08-22-00	--	23.4
16594000 Haiku ditch at Honopou Gulch, near Kailua	Lat 20°55′07″, long 156°14′58″, on right bank on west side of Honopou Gulch, 160 ft below Hana Highway, 2.5 mi northwest of Kailua, and 5.0 mi east of Haiku.	1911≠, 1914≠, 1916-28≠, 1931-85≠, 1986-2000	10-14-99	--	0.63
			02-07-00	--	3.61
			04-26-00	--	1.33
			08-22-00	--	1.51
205915156360001 Honokohau Stream 4.0	Lat 20°59′15″, long 156°36′00″, Honokohau Stream, upstream from Taro Gate release, at altitude 410 ft.	1995, 1997-2000	10-27-99	--	2.92
			03-17-00	--	1.22
			05-24-00	--	1.55
			07-11-00	--	2.16
			08-25-00	--	2.29
205928156360601 Honokohau Stream 5.9	Lat 20°59′28″, long 156°36′06″, Honokohau Stream, 350 ft upstream from dam, at altitude 350 ft.	1997-2000	10-27-99	--	4.52
			03-17-00	--	3.01
			05-24-00	--	2.92
			07-11-00	--	3.15
			08-25-00	--	3.01
210128156364201 Honokohau Stream 9.1	Lat 21°01′28″, long 156°36′42″, Honokohau Stream, 100 ft downstream from Highway 340 bridge, at altitude 5 ft.	1997-2000	10-27-99	--	3.49
			02-09-00	--	1.73
			03-17-00	--	1.98
			05-24-00	--	1.59
			07-11-00	--	2.98
			08-25-00	--	3.92
Island of Hawaii					
194202155111501 Olaa Spring near Kaumana	Lat 19°42′02″, long 155°11′15″, at Olaa Spring near Kaumana	1999-2000	10-13-99	1.50	5.07
			11-08-99	2.00	10.1
			01-05-00	1.98	10.8
			02-10-00	1.92	9.82
			03-06-00	1.54	2.61
			05-16-00	1.70	7.06
			06-01-00	1.62	2.93
			09-26-00	2.00	11.8

≠ Operated as a continuous-record gaging station

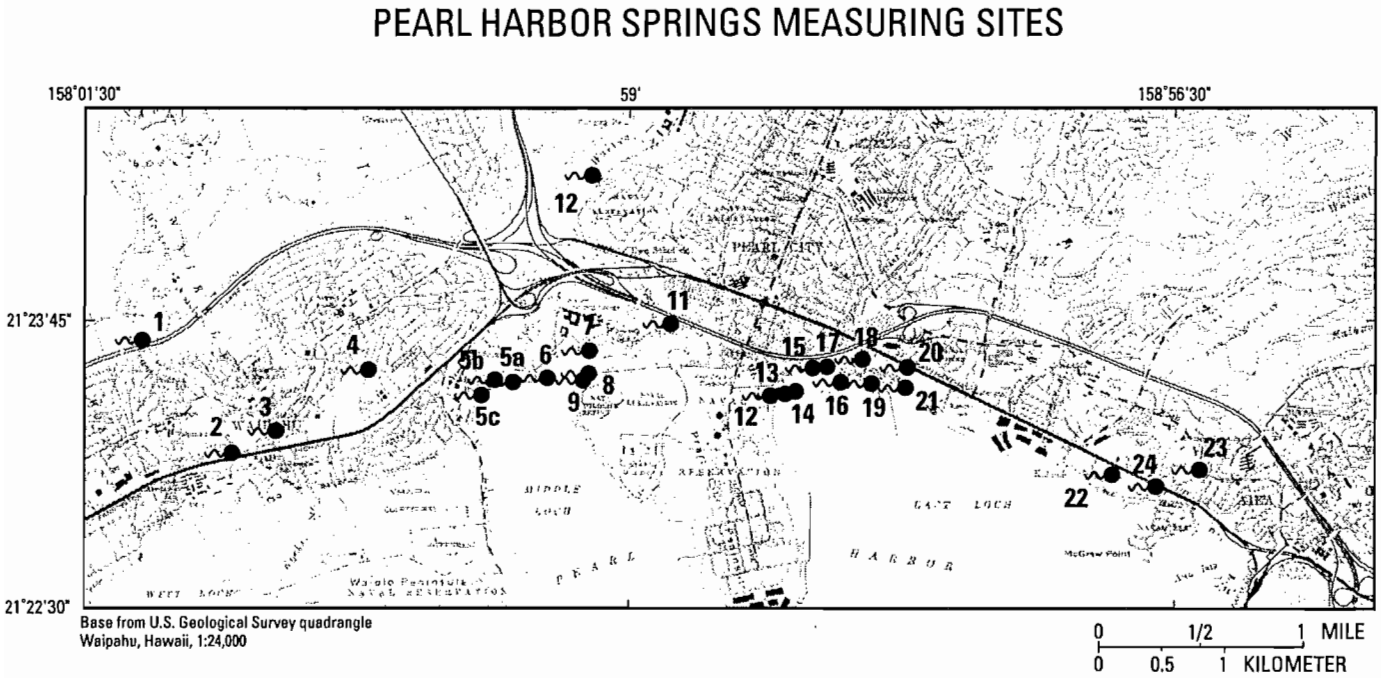


Figure 15. Map showing locations of Pearl Harbor Springs measuring sites, Oahu.

Discharge, specific-conductance, and water-temperature measurements at low-flow stations, Pearl Harbor Springs, Oahu

Map number (see figure 15)	Station number	Station name	Location	Time	Measurement		Specific conductance (µS/cm)	Water temperature (°C)
					Date	Discharge (ft^3/s)		
1	16212950	Waikele Stream below H-1 Freeway at Waipahu	Lat 21°23'39", long 158°01'14", below H-1 Freeway, 100 ft upstream from cane haul road, 0.7 mi northwest of Waipahu Sugar Mill, and 0.7 mi upstream from gaging station 16213000.	0945 1215	04/06/00 06/30/00	13.1 1.06	92 118	20.0 27.5
2	16213000	Waikele Stream at Waipahu	Lat 21°23'11", long 158°00'49", on left bank 300 ft upstream from bridge on Highway 90, and 0.3 mi southwest of former sugar refinery at Waipahu.	1100 0850	04/06/00 06/30/00	28.7 15.6	347 536	21.5 22.0
3	212317158003701	Kapakahi Stream above Farrington Highway	Lat 21°23'17", long 158°00'37", upstream from two 4-ft concrete pipe culverts in parking lot of shopping center at Hanawai Circle at Waipahu, 500 ft upstream from Farrington Highway.	1150 1255	04/06/00 06/29/00	1.50 1.43	563 550	23.0 24.0
4	212332158001201	Waipahu Drainage Canal above Paiwa Street	Lat 21°23'32", long 158°00'12", 1,500 ft upstream from Farrington Highway and 0.5 mi east of Waipahu Sugar Mill, upstream from Paiwa Street bridge.	1430 1000	04/06/00 06/30/00	2.23 2.07	605 598	29.0 23.0
5	212328157593601	Spring Outlet 2 West of Waiawa Spring	Lat 21°23'28", long 157°59'36", a 5×8 ft concrete box culvert 0.4 mi west of Waiawa Spring outlet and 1,200 ft east of Waipahu High School. Drains from former watercress fields (now covered) to Pearl Harbor.	1037 0835	04/06/00 06/29/00	0.52 0.49	3,610 4,220	22.0 24.5
6	212330157592201	Spring Outlet 1 West of Waiawa Spring	Lat 21°23'30", long 157°59'22", a 12-in. concrete pipe culvert 1,000 ft west of Waiawa Spring outlet and 2,500 ft east of Waipahu High School. Drains from former watercress fields (now covered) to Pearl Harbor.	1138 0950	04/06/00 06/29/00	0.67 0.62	4,960 4,660	27.0 25.0
7	16214000	Pearl Harbor Springs at Waiawa near Pearl City	Lat 21°23'36", long 157°59'11", near Leeward Community College, 0.7 mi west of Pearl City, and 9.8 mi northwest of Honolulu, about 350 ft upstream from the mouth.	1114 0815	04/06/00 06/29/00	16.1 14.3	3,860 3,650	24.0 22.0
10	16215800	Waiawa Stream above Kamehameha Highway near Pearl City	Lat 21°24'23", long 157°59'10", 50 ft downstream from old cane haul road in Pearl City Industrial Park, 2,000 ft upstream from Kamehameha Highway, and 0.6 mi upstream from gaging station 16216000.	1325 1100	04/06/00 06/27/00	5.59 no flow	156 --	21.5 --
11	16216100	Waiawa Stream below H-1 near Pearl City	Lat 21°23'44", long 157°58'48", below H-1 Freeway, 1,200 ft downstream from gaging station 16216000, and 2,000 ft east of Leeward Community College.	1410 1005	04/06/00 06/27/00	11.4 3.53	380 --	23.0 --
12	212325157581801	Puukapu Site 3	Lat 21°23'25", long 157°58'18", at a 3-ft concrete pipe 1,000 ft west of Waimano flood channel at mouth. Drains from watercress fields to Pearl Harbor.	1127 0925	04/07/00 06/29/00	1.33 1.08	1,270 1,220	21.0 22.0

Discharge, specific-conductance, and water-temperature measurements at low-flow stations, Pearl Harbor Springs, Oahu--Continued

Map number (see figure 15)	Station number	Station name	Location	Time	Measurement		Specific conductance (µS/cm)	Water temperature (°C)
					Date	Discharge (ft^3/s)		
13	212325157581301	Puukapu Site 2	Lat 21°23′25″, long 157°58′13″, at two 4-ft concrete culverts on concrete roadway 100 ft north of old concrete gage house and 300 ft west of Waimano flood channel at mouth.	0955	04/07/00	2.14	1,520	22.5
				0815	06/29/00	1.65	1,460	21.0
14	212326157580901	Puukapu Site 1	Lat 21°23′26″, long 157°58′09″, at two 3-ft concrete pipe culverts on right bank of Waimano flood channel at mouth. Drains from watercress fields to mouth of channel.	0943	04/07/00	0.60	2,890	19.5
				0806	06/29/00	0.55	2,790	20.0
15	16216550	Waimano Flood Channel below H-1 at Pearl City	Lat 21°23′32″, long 157°58′08″, 100 ft below Pearl Harbor bikeway, 600 ft from mouth, and 1,600 ft west of Hawaiian Electric Co. power plant at Waiau.	1009	04/06/00	0.74	696	21.0
				0915	06/29/00	0.59	390	22.5
17	212333157580101	Kaluaoopu Spring	Lat 21°23′33″, long 157°58′01″, at concrete bridge on bikeway, 700 ft west of No. 1 generator in the Hawaiian Electric Co. power plant. Measures the combined flow from the watercress fields and freeway storm drain.	1120	04/07/00	7.25	811	22.0
				0835	06/30/00	6.98	945	21.5
18	16219000	Hawaiian Electric Co. Tunnel at Waiau near Pearl City	Lat 21°23′33″, long 157°57′55″, concrete ditch at Hawaiian Electric Co. Waiau power plant, 20 ft downstream from tunnel portal, and 0.6 mi east of Pearl City.	0915	04/07/00	2.43	966	20.0
				1025	06/29/00	2.13	930	20.0
19	212329157575001	Makai Spring at Hawaiian Electric Co. Power Plant	Lat 21°23′29″, long 157°57′50″, south of power plant at outlet of a 30-in. concrete pipe draining overflow from power plant and seepage from Old Rice Mill Spring into Pearl Harbor.	1042	04/07/00	0.50	1,790	20.5
				0825	06/30/00	0.46	1,620	20.5
20	212331157574101	Waiau Spring below Kamehameha Highway	Lat 21°23′31″, long 157°57′41″, below Kamehameha Highway and 500 ft from outlet to Pearl Harbor. Drains from Waiau Springs.	1050	04/07/00	1.88	342	21.0
				1000	06/29/00	1.37	338	21.5
22	16224000	Pearl Harbor Spring at Kalauao near Aiea	Lat 21°23′06″, long 157°56′46″, at Kamehameha Highway bridge, drains from Sumida watercress farm, 1.1 mi west of Aiea, and 7.6 mi northwest of Honolulu.	1140	04/07/00	11.1	1,630	24.5
				0918	06/30/00	12.3	1,620	22.0
23	16224500	Kalauao Stream at Moanalua Road at Aiea	Lat 21°23′07″, long 157°56′22″, at Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	0915	04/07/00	0.61	552	21.5
				1015	06/30/00	0.27	837	23.0
24	16224550	Kalauao Stream above Kamehameha Highway at Aiea	Lat 21°23′02″, long 157°56′35″, above Kamehameha Highway and 1,300 ft from mouth, 1,000 ft downstream from gaging station 16224500, and 0.8 mi northwest of Aloha Stadium.	1012	04/07/00	0.92	680	23.5
				0802	06/30/00	0.56	848	23.5

Ground-Water Station Records

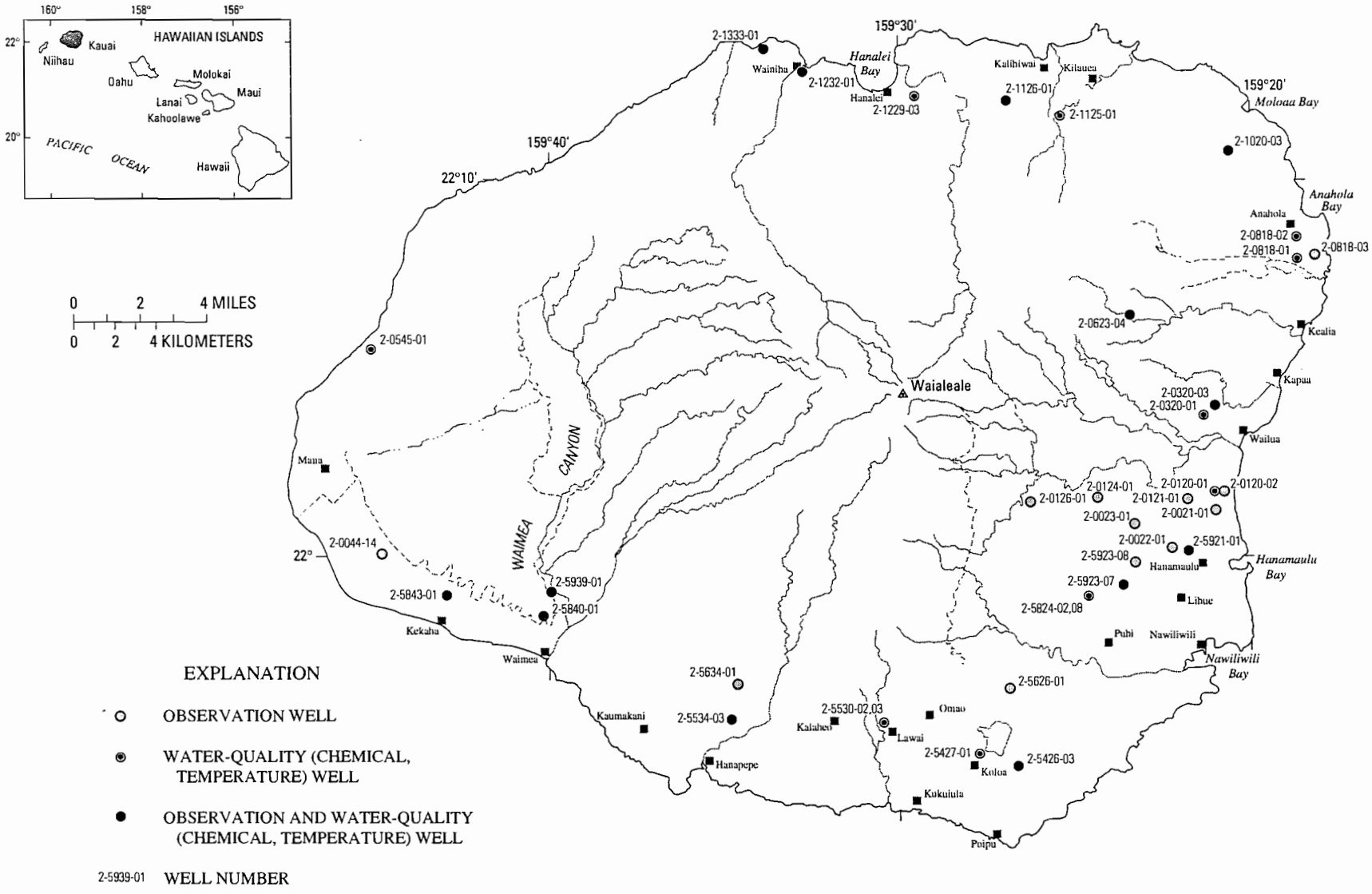


Figure 16. Locations of observation wells and ground-water quality sampling sites on Kauai.

220057159210301. Local number 2-0021-01.

LOCATION.--Lat 22°00'57", long 159°21'03", Hydrologic Unit 20070000, 1.0 mi southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 277 ft, casing diameter 8-in., cased to 196 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point is the top of 4-in. galvanized coupling, 166.70 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1980 to June 1993. Water-level recorder, June 1993 to November 1999. Occasional measurements, November 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.86 ft above mean sea level, March 3, 1995; lowest water level measured, 11.84 ft above mean sea level, February 7, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	12.77	FEB 07	11.84	JUN 13	12.68
NOV 23	12.56	APR 13	12.19	AUG 04	13.14

220013159224001. Local number 2-0022-01.

LOCATION.--Lat 22°00'13", long 159°22'40", Hydrologic Unit 20070000, 3.2 mi north of Lihue, and 1.4 mi west of the nearest shoreline. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 700 ft; 20-in. solid casing: 0–58 ft; grouted: 0–58 ft; open hole: 58 ft to bottom.

DATUM.--Elevation of land-surface datum is 273 ft. Measuring point is the top of 4-in. stem welded to 20-in. casing, 277.67 ft above mean sea level.

PERIOD OF RECORD.--Water-level: occasional measurements, February 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 251.64 ft above mean sea level, August 2, 1999; lowest water level measured, 240.20 ft above mean sea level, September 5, 2000.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai, Department of Water.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	245.43	JAN 04	242.97	APR 13	244.33	AUG 04	240.71
NOV 22	244.66	FEB 07	245.21	MAY 15	243.40	SEP 05	240.20
DEC 08	243.88	MAR 14	244.76	JUN 13	242.42		

220051159231801. Local number 2-0023-01.

LOCATION.--Lat 22°00′51″, long 159°23′18″, Hydrologic Unit 20070000, 2.5 mi northwest of Lihue, and 2.8 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,147 ft; 10-in. solid steel outer casing: 0–156 ft, 4-in. solid pvc casing: 0–20 ft, annular space grouted: 0–156 ft, open hole: 156 ft to bottom.

DATUM.--Elevation of land-surface datum is 319 ft. Measuring point is the top of 4-in. well casing, 319.88 ft above mean sea level.

PERIOD OF RECORD.--Water-level: occasional measurements, November 1996 to December 8, 1999. Continuous water-level recorder, December 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 176.77 ft above mean sea level, August 2, 1999; lowest water level measured, 163.85 ft above mean sea level, November 14, 1996.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai, Department of Water.

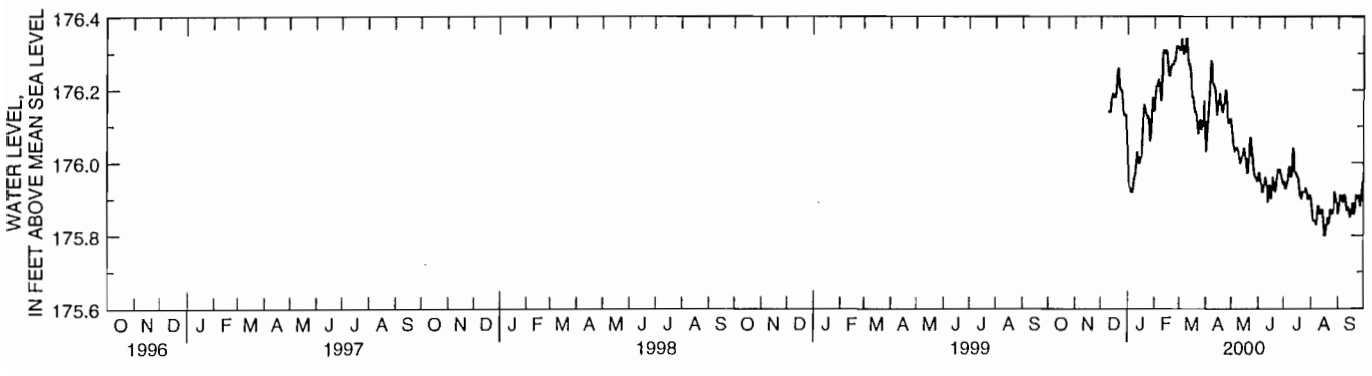
WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	176.22	NOV 22	176.07

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	176.04	176.14	176.31	176.03	176.10	175.97	175.95	175.90	175.86
2	---	---	---	175.98	176.18	176.31	176.06	176.08	175.97	175.93	175.88	175.87
3	---	---	---	175.94	176.21	176.31	176.10	176.05	175.95	175.93	175.85	175.89
4	---	---	---	175.93	176.21	176.34	176.14	176.04	175.94	175.94	175.84	175.91
5	---	---	---	175.92	176.22	176.32	176.18	176.03	175.92	175.95	175.84	175.91
6	---	---	---	175.92	176.23	176.30	176.22	176.04	175.92	175.98	175.84	175.90
7	---	---	---	175.92	176.21	176.30	176.28	176.04	175.93	175.99	175.83	175.89
8	---	---	---	175.95	176.19	176.31	176.27	176.04	175.95	175.98	175.85	175.91
9	---	---	176.14	175.96	176.17	176.34	176.23	176.03	175.96	175.96	175.88	175.91
10	---	---	176.14	175.97	176.24	176.34	176.21	176.02	175.95	175.97	175.88	175.90
11	---	---	176.14	176.00	176.30	176.29	176.21	176.00	175.93	176.04	175.86	175.87
12	---	---	176.14	176.03	176.31	176.27	176.20	176.00	175.89	176.03	175.86	175.87
13	---	---	176.17	176.02	176.30	176.27	176.16	176.01	175.91	175.98	175.87	175.88
14	---	---	176.18	176.00	176.30	176.25	176.13	176.02	175.94	175.97	175.87	175.86
15	---	---	176.19	176.00	176.31	176.22	176.15	176.03	175.91	175.97	175.85	175.85
16	---	---	176.18	176.01	176.30	176.18	176.17	176.04	175.90	175.96	175.80	175.86
17	---	---	176.18	176.02	176.26	176.18	176.19	176.02	175.93	175.96	175.80	175.88
18	---	---	176.18	176.06	176.24	176.16	176.18	176.01	175.96	175.94	175.82	175.89
19	---	---	176.20	176.12	176.24	176.14	176.15	175.98	175.95	175.91	175.83	175.86
20	---	---	176.25	176.16	176.26	176.14	176.14	175.97	175.93	175.91	175.85	175.86
21	---	---	176.26	176.15	176.27	176.13	176.14	176.00	175.92	175.90	175.83	175.88
22	---	---	176.23	176.14	176.27	176.10	176.16	176.05	175.94	175.92	175.84	175.91
23	---	---	176.20	176.13	176.27	176.08	176.18	176.07	175.96	175.92	175.87	175.91
24	---	---	176.20	176.12	176.28	176.10	176.20	176.04	175.98	175.92	175.87	175.91
25	---	---	176.20	176.13	176.28	176.12	176.19	176.02	175.98	175.92	175.86	175.91
26	---	---	176.18	176.10	176.30	176.11	176.14	175.99	175.98	175.93	175.86	175.89
27	---	---	176.14	176.06	176.32	176.09	176.11	175.97	175.97	175.92	175.88	175.88
28	---	---	176.13	176.08	176.32	176.10	176.11	175.96	175.96	175.90	175.92	175.91
29	---	---	176.13	176.13	176.32	176.13	176.12	175.96	175.95	175.90	175.91	175.93
30	---	---	176.13	176.18	---	176.17	176.12	175.95	175.94	175.91	175.90	175.95
31	---	---	176.10	176.16	---	176.10	---	175.95	---	175.91	175.89	---
MEAN	---	---	---	176.04	176.26	176.21	176.16	176.02	175.94	175.95	175.86	175.89
MAX	---	---	---	176.18	176.32	176.34	176.28	176.10	175.98	176.04	175.92	175.95
MIN	---	---	---	175.92	176.14	176.08	176.03	175.95	175.89	175.90	175.80	175.85



220019159444801. Local number 2-0044-14.

LOCATION.--Lat 22°00'19", long 159°44'48", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 13-in., cased to 164 ft.

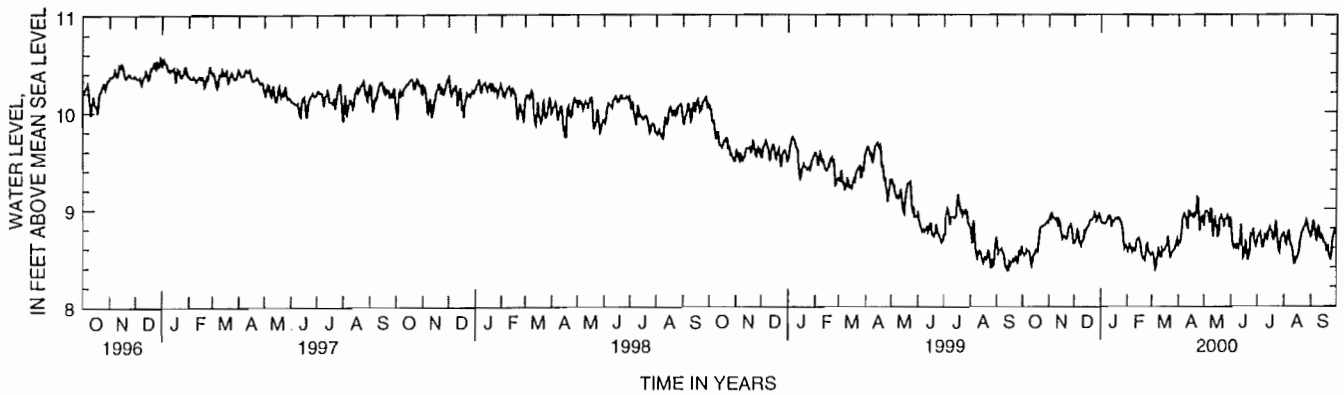
DATUM.--Elevation of land-surface datum is 8 ft. Measuring point is the top of standpipe, 11.49 ft until February 9, 1997; changed measuring point to top of recorder shelf on February 10, 1997, 11.57 ft above mean sea level. Prior to June 1979, nonrecording gage at datum 0.25 ft lower.

PERIOD OF RECORD.--Occasional measurements 1937 to 1962 (measured by Kekaha Sugar Company). Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.07 ft above mean sea level, December 20, 1937; lowest water level measured, 7.52 ft above mean sea level, August 15, 1947.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.57	8.88	8.65	8.89	8.59	8.54	8.62	8.83	8.88	8.66	8.76	8.72
2	8.55	8.91	8.66	8.86	8.57	8.55	8.68	8.94	8.74	8.72	8.72	8.73
3	8.53	8.94	8.68	8.86	8.59	8.54	8.65	8.98	8.64	8.73	8.65	8.83
4	8.54	8.91	8.75	8.86	8.65	8.44	8.71	8.98	8.61	8.75	8.64	8.88
5	8.54	8.94	8.78	8.85	8.61	8.39	8.79	8.98	8.63	8.76	8.72	8.85
6	8.58	8.91	8.76	8.85	8.59	8.41	8.90	8.96	8.61	8.69	8.75	8.76
7	8.57	8.91	8.66	8.86	8.57	8.49	8.93	8.91	8.60	8.61	8.78	8.69
8	8.57	8.90	8.65	8.87	8.61	8.55	8.95	8.86	8.65	8.61	8.68	8.67
9	8.56	8.89	8.63	8.89	8.57	8.61	8.94	9.00	8.62	8.65	8.64	8.80
10	8.53	8.90	8.67	8.92	8.57	8.52	8.90	9.00	8.60	8.73	8.62	8.83
11	8.44	8.87	8.67	8.91	8.58	8.51	8.84	8.78	8.64	8.72	8.60	8.77
12	8.42	8.82	8.69	8.94	8.67	8.51	8.80	8.72	8.71	8.74	8.50	8.69
13	8.45	8.89	8.77	8.90	8.69	8.59	8.99	8.88	8.84	8.68	8.44	8.75
14	8.53	8.87	8.76	8.82	8.69	8.57	8.94	8.90	8.64	8.75	8.44	8.72
15	8.53	8.79	8.79	8.88	8.70	8.58	8.96	8.84	8.50	8.79	8.51	8.70
16	8.54	8.75	8.81	8.87	8.68	8.58	8.93	8.80	8.51	8.81	8.48	8.65
17	8.58	8.70	8.82	8.88	8.64	8.61	8.93	8.73	8.56	8.78	8.52	8.65
18	8.58	8.72	8.83	8.89	8.56	8.62	8.96	8.74	8.68	8.78	8.54	8.65
19	8.57	8.71	8.87	8.91	8.52	8.65	8.91	8.90	8.66	8.71	8.59	8.57
20	8.66	8.72	8.89	8.91	8.49	8.72	8.97	8.91	8.51	8.69	8.67	8.57
21	8.73	8.71	8.89	8.90	8.49	8.65	8.93	8.93	8.48	8.69	8.71	8.63
22	8.81	8.70	8.89	8.91	8.48	8.55	9.01	8.90	8.53	8.79	8.76	8.53
23	8.81	8.71	8.91	8.90	8.55	8.50	9.12	8.89	8.57	8.88	8.78	8.50
24	8.82	8.79	8.93	8.88	8.63	8.55	9.11	8.82	8.74	8.79	8.80	8.49
25	8.83	8.82	8.96	8.87	8.64	8.56	8.92	8.89	8.73	8.66	8.82	8.53
26	8.83	8.82	8.94	8.83	8.57	8.57	8.78	8.90	8.73	8.58	8.84	8.67
27	8.84	8.84	8.88	8.77	8.56	8.58	8.84	8.91	8.80	8.56	8.88	8.72
28	8.84	8.81	8.89	8.65	8.54	8.59	8.92	8.93	8.67	8.65	8.86	8.76
29	8.86	8.74	8.92	8.60	8.53	8.62	8.93	8.89	8.65	8.71	8.80	8.79
30	8.87	8.65	8.96	8.62	---	8.67	8.91	8.81	8.63	8.73	8.77	8.81
31	8.86	---	8.93	8.63	---	8.69	---	8.92	---	8.73	8.75	---
MEAN	8.64	8.82	8.80	8.84	8.59	8.56	8.89	8.88	8.65	8.71	8.68	8.70
MAX	8.87	8.94	8.96	8.94	8.70	8.72	9.12	9.00	8.88	8.88	8.88	8.88
MIN	8.42	8.65	8.63	8.60	8.48	8.39	8.62	8.72	8.48	8.56	8.44	8.49



220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, 0.3 mi southwest of Wailua County Golf Course, and 1.6 mi south southwest of Wailua River Mouth. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 312 ft, casing diameter 6-in., cased to 60 ft.

DATUM.--Elevation of land-surface datum is 11 ft. Measuring point is the top of 10-in. plastic pipe, 11.36 ft above mean sea level. Prior to June 24, 1980 measuring point was the top of 6-in. steel casing, 11.93 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, 1973 to 1980, 1987 to current year.
Water quality: occasional measurements, 1982 to 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.79 ft above mean sea level, February 21, 1974; lowest water level measured, 7.78 ft above mean sea level, February 7, 2000.

REMARKS.--Water level affected by pumping of nearby well. Well destroyed. No water-level measurements from February 7, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	10.27	OCT 29	8.14	NOV 22	7.99	DEC 08	9.62	FEB 7	7.78

220133159242001. Local number, 2-0124-01.

LOCATION.--Lat 22°01'33", long 159°24'20", Hydrologic unit 20070000, 3.7 mi northwest of Lihue, and 3.8 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,033 ft, 10-in. solid steel outer casing: 0–161 ft; 4-in. solid steel casing: 0–80 ft; 4-in. alternating perforated/solid steel casing: 80–1,032 ft; annular space grouted: 0–160 ft; annular space open: 160–726 ft.

DATUM.--Elevation of land-surface datum is 466 ft. Measuring point is the top of 4-in. well casing, 467.12 ft above mean sea level.

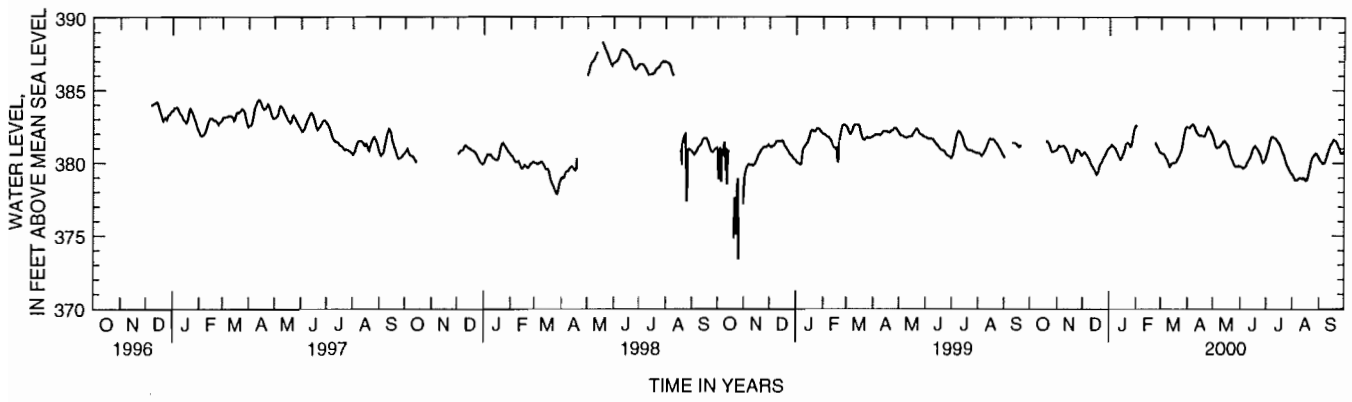
PERIOD OF RECORD.--Water level: occasional measurements, started in November 1996. Continuous water level recorder, December 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 388.31 ft above mean sea level, May 19, 1998; lowest water level measured, 368.10 ft above mean sea level, October 27, 1998.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai Department of Water.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	380.94	380.59	381.05	382.56	380.71	382.46	381.78	379.79	380.54	379.16	380.32
2	---	381.05	380.70	381.09	382.61	380.68	382.46	381.57	379.77	380.73	379.06	380.22
3	---	381.17	380.73	381.17	---	380.67	382.44	381.32	379.71	380.97	378.93	380.14
4	---	381.13	380.67	381.24	---	380.64	382.50	381.13	379.67	381.20	378.83	380.08
5	---	381.15	380.59	381.20	---	380.56	382.61	381.08	379.68	381.55	378.82	379.99
6	---	381.15	380.51	381.11	---	380.44	382.64	381.10	379.72	381.71	378.84	379.97
7	---	381.16	380.40	381.06	---	380.35	382.67	381.11	379.76	381.81	378.91	380.00
8	---	381.17	380.28	380.98	---	380.26	382.58	381.14	379.89	381.83	378.96	380.10
9	---	381.14	380.13	380.86	---	380.09	382.44	381.24	380.05	381.79	378.98	380.29
10	---	381.08	380.00	380.72	---	379.88	382.28	381.32	380.16	381.74	378.97	380.49
11	---	381.00	379.88	380.57	---	379.77	382.15	381.38	380.27	381.71	378.95	380.68
12	---	380.91	379.76	380.41	---	379.82	382.05	381.50	380.33	381.68	378.94	380.89
13	---	380.78	379.68	380.31	---	379.97	381.97	381.54	380.53	381.60	378.95	381.07
14	---	380.63	379.59	380.25	---	380.01	381.92	381.48	380.71	381.51	378.97	381.22
15	---	380.46	379.48	380.32	---	380.02	381.91	381.40	380.94	381.41	378.90	381.32
16	---	380.26	379.33	380.50	---	380.02	381.92	381.31	381.06	381.31	378.81	381.38
17	---	380.12	379.22	380.65	---	380.04	381.91	381.16	381.14	381.22	378.83	381.49
18	---	380.04	379.27	380.81	---	380.06	381.90	380.97	381.19	381.05	378.99	381.58
19	381.51	380.06	379.44	381.05	---	380.13	381.88	380.69	381.10	380.91	379.21	381.56
20	381.46	380.14	379.69	381.29	---	380.29	381.86	380.51	381.01	380.74	379.45	381.53
21	381.45	380.36	379.89	381.36	---	380.39	381.93	380.35	380.94	380.61	379.74	381.49
22	381.37	380.62	379.97	381.39	---	380.50	382.08	380.24	380.84	380.45	380.04	381.37
23	381.25	380.83	380.06	381.36	381.42	380.64	382.24	380.08	380.70	380.27	380.26	381.24
24	381.07	380.91	380.18	381.30	381.32	380.79	382.41	379.92	380.57	380.06	380.39	381.08
25	380.90	380.89	380.33	381.15	381.21	381.05	382.49	379.84	380.37	379.90	380.48	380.97
26	380.78	380.85	380.44	381.16	381.09	381.33	382.43	379.78	380.15	379.78	380.55	380.78
27	380.78	380.80	380.52	381.30	381.00	381.71	382.32	379.77	380.06	379.65	380.62	380.67
28	380.80	380.69	380.65	381.72	380.83	382.01	382.20	379.78	380.11	379.52	380.67	380.65
29	380.83	380.56	380.78	382.07	380.75	382.28	382.06	379.82	380.19	379.41	380.64	380.70
30	380.86	380.53	380.93	382.34	---	382.49	381.94	379.83	380.33	379.32	380.56	380.80
31	380.89	---	381.01	382.50	---	382.50	---	379.79	---	379.26	380.45	---
MEAN	---	380.75	380.15	381.11	---	380.65	382.22	380.77	380.36	380.81	379.48	380.80
MAX	---	381.17	381.01	382.50	---	382.50	382.67	381.78	381.19	381.83	380.67	381.58
MIN	---	380.04	379.22	380.25	---	379.77	381.86	379.77	379.67	379.26	378.81	379.97



220126159261501. Local number, 2-0126-01.

LOCATION.--Lat 22°01'26", long 159°26'15", Hydrologic unit 20070000, 5.3 northwest of Lihue, and 6.2 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics and Waimea Canyon Basalt, Miocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled well, depth 1,004 ft, 10-in. solid steel outer casing: 0-198 ft; 4-in. solid pvc casing: 0-126 ft; 4.5-in. perforated pvc casing: 126 ft to bottom; annular space grouted: 0-198 ft; annular space open: 198 ft to bottom.

DATUM.--Elevation of land-surface datum is 678 ft. Measuring point is the top of 4-in. well casing, 679.06 ft above mean sea level.

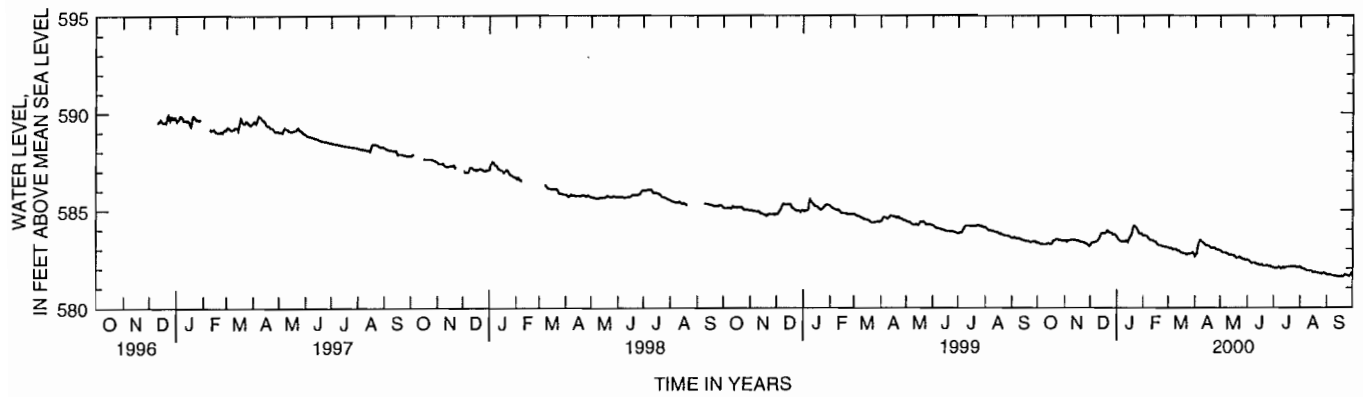
PERIOD OF RECORD.--
Water level: occasional measurements started in November 1996.
Continuous water-level recorder, December 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 589.96 ft above mean sea level, December 23, 1996; lowest water level measured, 581.56 ft above mean sea level, September 11, 12, 15, 16, 19, 20, 2000.

REMARKS.--Well part of network of observation wells in cooperation with the County of Kauai Department of Water.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	583.35	583.41	583.19	583.61	583.68	583.07	582.63	582.92	582.44	582.06	582.09	581.69
2	583.32	583.42	583.28	583.53	583.70	583.05	582.66	582.89	582.43	582.03	582.05	581.68
3	583.28	583.44	583.33	583.48	583.70	583.04	582.75	582.85	582.38	582.02	582.02	581.69
4	583.27	583.39	583.32	583.45	583.68	583.06	583.00	582.82	582.34	582.01	582.00	581.70
5	583.26	583.44	583.34	583.42	583.65	583.03	583.23	582.81	582.31	582.01	581.99	581.68
6	583.26	583.44	583.36	583.39	583.62	582.98	583.34	582.82	582.28	582.05	581.97	581.64
7	583.25	583.44	583.38	583.38	583.55	582.98	583.43	582.80	582.29	582.07	581.93	581.62
8	583.25	583.46	583.38	583.38	583.48	583.00	583.44	582.80	582.30	582.06	581.90	581.62
9	583.25	583.49	583.40	583.39	583.46	583.00	583.38	582.78	582.30	582.03	581.89	581.63
10	583.25	583.49	583.46	583.40	583.45	582.99	583.34	582.75	582.28	582.00	581.89	581.61
11	583.25	583.49	583.54	583.41	583.45	582.94	583.32	582.72	582.26	582.02	581.87	581.59
12	583.26	583.47	583.60	583.43	583.43	582.91	583.29	582.71	582.23	582.07	581.87	581.59
13	583.29	583.46	583.72	583.40	583.41	582.93	583.23	582.70	582.23	582.04	581.87	581.61
14	583.29	583.46	583.79	583.37	583.38	582.90	583.18	582.69	582.23	582.03	581.88	581.59
15	583.27	583.46	583.82	583.47	583.37	582.86	583.17	582.68	582.19	582.05	581.86	581.58
16	583.26	583.44	583.82	583.61	583.33	582.82	583.18	582.67	582.17	582.06	581.80	581.59
17	583.26	583.43	583.82	583.65	583.26	582.80	583.17	582.65	582.19	582.08	581.79	581.59
18	583.32	583.42	583.81	583.71	583.21	582.79	583.14	582.62	582.21	582.09	581.81	581.60
19	583.42	583.39	583.82	583.89	583.19	582.77	583.09	582.56	582.18	582.07	581.81	581.58
20	583.41	583.35	583.89	584.13	583.19	582.78	583.06	582.54	582.14	582.07	581.81	581.58
21	583.47	583.35	583.94	584.18	583.19	582.76	583.05	582.55	582.13	582.08	581.78	581.63
22	583.49	583.36	583.90	584.17	583.16	582.72	583.06	582.58	582.13	582.11	581.77	581.67
23	583.51	583.36	583.85	584.12	583.14	582.71	583.05	582.59	582.14	582.11	581.77	581.67
24	583.50	583.33	583.83	584.06	583.13	582.75	583.06	582.54	582.15	582.10	581.75	581.66
25	583.48	583.30	583.84	584.00	583.12	582.77	583.03	582.52	582.14	582.09	581.73	581.64
26	583.45	583.28	583.82	583.91	583.12	582.76	582.98	582.49	582.11	582.09	581.72	581.61
27	583.46	583.27	583.75	583.81	583.11	582.76	582.95	582.47	582.13	582.09	581.75	581.59
28	583.45	583.24	583.74	583.78	583.09	582.77	582.95	582.46	582.10	582.07	581.77	581.62
29	583.44	583.18	583.73	583.78	583.09	582.80	582.96	582.45	582.08	582.08	581.77	581.73
30	583.44	583.15	583.74	583.79	---	582.82	582.95	582.44	582.06	582.09	581.75	581.79
31	583.42	---	583.70	583.73	---	582.72	---	582.44	---	582.09	581.73	---
MEAN	583.35	583.39	583.64	583.67	583.36	582.87	583.10	582.66	582.22	582.06	581.85	581.64
MAX	583.51	583.49	583.94	584.18	583.70	583.07	583.44	582.92	582.44	582.11	582.09	581.79
MIN	583.25	583.15	583.19	583.37	583.09	582.71	582.63	582.44	582.06	582.00	581.72	581.58



220354159205602. Local number, 2-0320-03.

LOCATION.--Lat 22°03′54″, long 159°20′56″, Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 302 ft; 14-in. casing diameter, cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point is the top of 1-in. hole on pump base on southeast side after removing elbow and nipple, 156.94 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, August 1976 to current year.
Water quality: occasional measurements, 1972, 1976 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.91 ft above mean sea level, November 19, 1982; lowest water level measured, 3.80 ft below mean sea level, August 9, 2000.

REMARKS.--Water is used for public supply. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	-0.29	FEB 15	1.19	JUN 15	-3.38
DEC 09	-0.12	APR 19	0.62	AUG 09	-3.80

220825159185301. Local number 2-0818-03.

LOCATION.--Lat 22°08′25″, long 159°18′50″, Hydrologic Unit 20070000, 1.3 mi southwest of Kahala Point, and 0.2 mi south of Anahola School. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 466 ft, 12-in. casing diameter, cased to 290 ft.

DATUM.--Elevation of land-surface datum is 267 ft. Measuring point is the top of west side of 4 1/2-in. pipe at 268.99 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, October 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.64 ft above mean sea level, October 8, 1997; lowest water level measured, 7.34 ft above mean sea level, April 8, 1998, lowest water level measured with nearby pump on, 6.79 ft above mean sea level, February 15, 2000.

REMARKS.--Water for future public supply. Water level affected by pumping of nearby wells.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	11.08	FEB 15	6.79	JUN 15	10.29
DEC 09	11.15	APR 19	10.72	AUG 09	10.57

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10′38″, long 159°20′38″, Hydrologic Unit 20070000, 2.6 mi south of Kulikoa Point, and 2.6 mi northwest of Kuaehu Point. Owner: Amfac Properties Development Corp.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 700 ft.

DATUM.--Elevation of land-surface datum is 358 ft. Measuring point is the top of temporary metal girder over well opening, elevation 358.52 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1972 to 1991, 1997.

REVISED RECORDS.--WRD HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 144.56 ft above mean sea level, March 30, 1990; lowest water level measured, 66.17 ft above mean sea level, November 6, 1973, lowest water level measured with pump on, 42.69 ft above mean sea level, October 4, 1973.

REMARKS.--Pump is in the process of being replaced. Well unused at this time.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	99.33	FEB 11	97.37	JUN 16	89.59
DEC 20	100.44	APR 13	93.70	AUG 09	89.00

221150159264501. Local number, 2-1126-01.

LOCATION.--Lat 22°11′50″, long 159°26′45″, Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal, and 4.0 mi east southeast of Puupoa Point. Owner: Princeville Hanalei.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 763 ft; 14-in. casing diameter, cased to 435 ft.

DATUM.--Elevation of land-surface datum is 349 ft. Measuring point is the top of 3/4-in. pipe, in 1-in. hole on southside of pump base, after removing airline connection, 349.88 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1977 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 43.36 ft above mean sea level, June 3, 1974; lowest water level measured, 4.12 ft below mean sea level, November 17, 1992, lowest water level measured with pump on, 10.30 ft below mean sea level, June 2, 1983.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	7.56	FEB 11	8.78	JUN 20	4.92
DEC 10	8.56	APR 13	6.93	AUG 03	5.03

221247159324801. Local number, 2-1232-01.

LOCATION.--Lat 22°12′47″, long 159°32′48″, Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point, and 1.5 mi southeast of Haena Point. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 188 ft, 6-in. casing diameter, cased to 140 ft.

DATUM.--Elevation of land-surface datum is 67 ft. Measuring point was the top of 1-in. pipe 0.06 ft above flange, 66.56 ft above mean sea level. New measuring point is the top of 1-in. pipe 0.16 ft above flange, 66.68 ft above mean sea level from levels of June 16, 1999.

PERIOD OF RECORD.--
Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1975 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.48 ft above mean sea level, June 3, 1974; lowest water level measured, 4.69 ft above mean sea level, August 6, 1993, lowest water level measured with pump on, 10.04 ft below mean sea level, June 9, 1975.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20*	-8.62	FEB 15	9.65	JUN 15	7.44
DEC 09	7.52	APR 19	8.25	AUG 09	7.12

* Pump on for measurement.

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13′18″, long 159°33′59″, Hydrologic Unit 20070000, 0.6 mi south southwest of Haena Point, and 1.2 mi east southeast of Kailiu Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 159 ft; 8-in. casing diameter, cased to 104 ft.

DATUM.--Elevation of land-surface datum is 82 ft. Measuring point is the top of airline hole after removing plug, elevation 82.05 ft above mean sea level from levels of December 12, 1995.

PERIOD OF RECORD.--
Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WRD HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.35 ft above mean sea level, December 8, 1989; lowest water level measured, 4.86 ft below mean sea level; June 15, 2000.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	0.17	FEB 15	-2.50	JUN 15	-4.86
DEC 09	-0.41	APR 19	-3.73	AUG 09	-4.11

215434159263301. Local number, 2-5426-03.

LOCATION.--Lat 21°54′34″, long 159°26′33″, Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill, and 2.6 mi north of Makahuena Point. Owner: Grove Farm Co. Inc.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 318 ft, 12-in. casing diameter, cased to 176 ft.

DATUM.--Elevation of land-surface datum is 222 ft. Measuring point is the top of 1-in. hole on southwest side of flange, 222.30 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1997.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 34.83 ft above mean sea level, January 10, 1974; lowest water level measured, 15.48 ft above mean sea level, June 16, 1982, lowest water level measured with pump on, 5.05 ft above mean sea level, March 10, 1975.

REMARKS.--Water used for irrigation. Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	25.59	FEB 10	25.49	JUN 09	25.37
DEC 08	25.70	APR 11	25.24	AUG 07	24.80

215454159274201. Local number, 2-5427-01.

LOCATION.--Lat 21°54′54″, long 159°27′42″, Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir, and 2.7 mi northeast of Kaulala Point. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 455 ft; 12-in. casing diameter, cased to 263 ft.

DATUM.--Elevation of land-surface datum is 247 ft. Measuring point is the bottom edge of the east side opening on pump base 246.77 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-94 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 40.04 ft above mean sea level, July 15, 1974; lowest water level measured, 27.97 ft above mean sea level, October 6, 1988, lowest water level measured with pump on, 22.77 ft above mean sea level, March 3, 1983.

REMARKS.--Water used for public supply. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	34.39	FEB 16	34.30	JUN 14	34.02
DEC 08	34.42	APR 12	33.92	AUG 08	34.00

215522159342601. Local number, 2-5534-03.

LOCATION.--Lat 21°55′22″, long 159°34′26″, Hydrologic Unit 20070000, 1.9 mi north from Weli Point, and 2.9 mi northeast from Puolo Point. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 109 ft; 9-in. casing diameter.

DATUM.--Elevation of land-surface datum is 79 ft. Measuring point is the top of 3/4-in. galvanized pipe on northwest side of pump base 78.78 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.91 ft above mean sea level, February 1, 1990; lowest water level measured, 12.62 ft above mean sea level, May 20, 1986, lowest water level measured with pump on, 9.19 ft above mean sea level, October 13, 1978.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	16.31	FEB 16	17.31	JUN 14	16.85
DEC 08	17.35	APR 12	18.20	AUG 08	15.90

215509159340401. Local number, 2-5534-06.

LOCATION.--Lat 21°55′09″, long 159°34′04″, Hydrologic Unit 20070000, 1.6 mi north of Weli Point and 2.4 mi northeast of Puolo Point. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 740 ft; no final casing.

DATUM.--Elevation of land surface is 385.48 ft. Measuring point is top of standpipe, 386.61 ft above mean sea level.

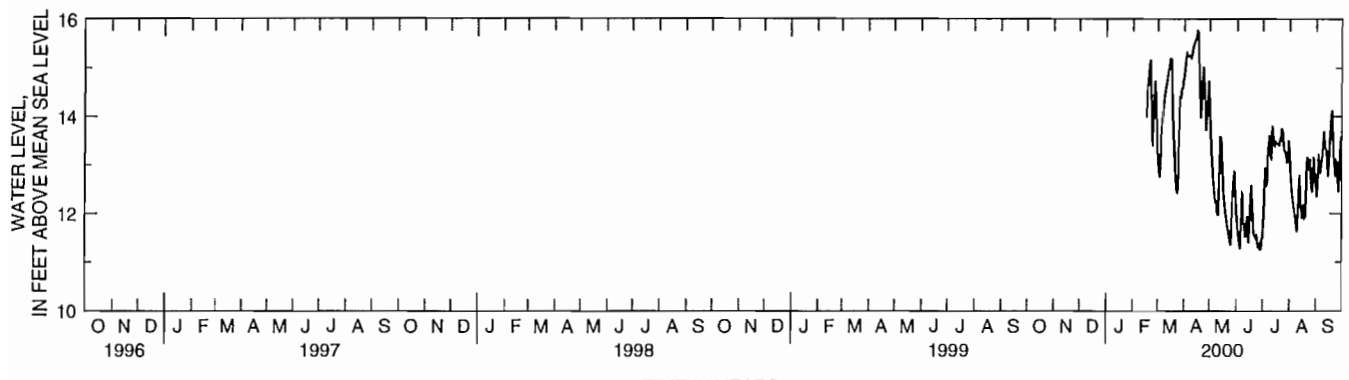
PERIOD OF RECORD.--Water-level recorder January 11, 2000 to present.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.62 ft above mean sea level, January 19, 2000; lowest water level measured, 11.02 ft above mean sea level, June 29, 2000.

REMARKS.--Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	13.20	14.84	14.25	11.85	11.52	13.24	12.53
2	---	---	---	---	---	12.94	15.01	13.58	11.68	11.95	12.85	12.35
3	---	---	---	---	---	12.75	15.22	13.27	11.52	12.61	12.62	12.72
4	---	---	---	---	---	13.03	15.29	12.98	11.38	12.95	12.42	13.22
5	---	---	---	---	---	13.63	15.24	12.76	11.27	12.55	12.27	12.94
6	---	---	---	---	---	13.85	15.24	12.56	11.76	12.67	12.14	12.83
7	---	---	---	---	---	14.06	15.25	12.37	12.42	13.34	12.02	13.02
8	---	---	---	---	---	14.25	15.24	12.24	12.40	13.47	11.91	13.11
9	---	---	---	---	---	14.42	15.22	12.25	11.85	13.61	11.77	13.36
10	---	---	---	---	---	14.55	15.30	12.02	11.67	13.26	11.63	13.69
11	---	---	---	---	---	14.64	15.42	11.96	11.51	13.10	11.89	13.41
12	---	---	---	---	---	14.76	15.49	12.59	11.71	13.81	12.55	13.35
13	---	---	---	---	---	14.89	15.54	13.59	11.95	13.65	12.79	13.29
14	---	---	---	---	---	14.99	15.59	13.52	11.56	13.41	12.48	12.96
15	---	---	---	---	---	15.12	15.65	13.11	11.39	13.40	12.05	12.77
16	---	---	---	---	---	15.20	15.75	12.59	11.80	13.50	11.90	13.26
17	---	---	---	---	13.99	15.08	15.73	12.37	12.35	13.45	12.06	13.61
18	---	---	---	---	14.55	14.09	15.28	12.18	12.58	13.43	12.20	13.97
19	---	---	---	---	14.79	13.71	14.45	12.02	12.23	13.43	11.92	14.12
20	---	---	---	---	14.98	13.33	13.97	11.88	11.75	13.42	11.94	13.68
21	---	---	---	---	15.16	12.97	14.19	11.75	11.59	13.52	13.05	13.22
22	---	---	---	---	14.61	12.68	14.75	11.64	11.53	13.51	13.16	12.96
23	---	---	---	---	13.78	12.49	15.02	11.53	11.50	13.75	13.05	12.76
24	---	---	---	---	13.40	12.42	14.85	11.42	11.53	13.69	12.88	13.09
25	---	---	---	---	14.06	12.86	14.30	11.35	11.40	13.43	13.13	13.05
26	---	---	---	---	14.53	13.67	13.85	11.88	11.28	13.30	12.61	12.62
27	---	---	---	---	14.73	14.42	13.72	12.43	11.40	13.27	12.49	12.45
28	---	---	---	---	14.26	14.37	14.11	12.68	11.26	13.19	12.44	13.09
29	---	---	---	---	13.55	14.56	14.54	12.87	11.26	13.04	13.16	13.39
30	---	---	---	---	---	14.58	14.73	12.52	11.46	13.20	13.08	13.58
31	---	---	---	---	---	14.73	---	12.03	---	13.50	12.75	---
MEAN	---	---	---	---	---	13.94	14.96	12.46	11.69	13.22	12.47	13.15
MAX	---	---	---	---	---	15.20	15.75	14.25	12.58	13.81	13.24	14.12
MIN	---	---	---	---	---	12.42	13.72	11.35	11.26	11.52	11.63	12.35



215630159265101. Local number, 2-5626-01.

LOCATION.--Lat 21°56′30″, long 159°26′51″, Hydrologic Unit 20070000, 5.7 mi south of Lihue, and 3.8 mi northwest of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 802 ft; 12.25-in. solid steel outer casing: 0–156 ft; 4-in. solid pvc casing: 0–20 ft; annular space grouted: 0–256 ft; open hole: 256 ft to bottom.

DATUM.--Elevation of land-surface is 485 ft. Measuring point is the top of 4-in. well casing, 485.40 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 180.15 ft above mean sea level, December 14, 1998; lowest water level measured, 173.49 ft above mean sea level, November 8, 1996.

REMARKS.--Well part of a network of observation wells in cooperation with the County of Kauai Department of Water.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	179.92	JAN 05	179.69	APR 13	179.54	JUL 25	179.43
NOV 22	179.88	FEB 07	179.77	MAY 15	179.53	SEP 05	179.46
DEC 08	179.86	MAR 14	179.67	JUN 13	179.53		

215607159344301. Local number 2-5634-01.

LOCATION.--Lat 21°56′07″, long 159°34′43″, Hydrologic Unit 20070000, 2.7 mi north of Weli Point, and 3.3 mi northeast of Puolo Point. Owner: State of Hawaii.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 508 ft, 8-in. casing diameter, cased to 507 ft.

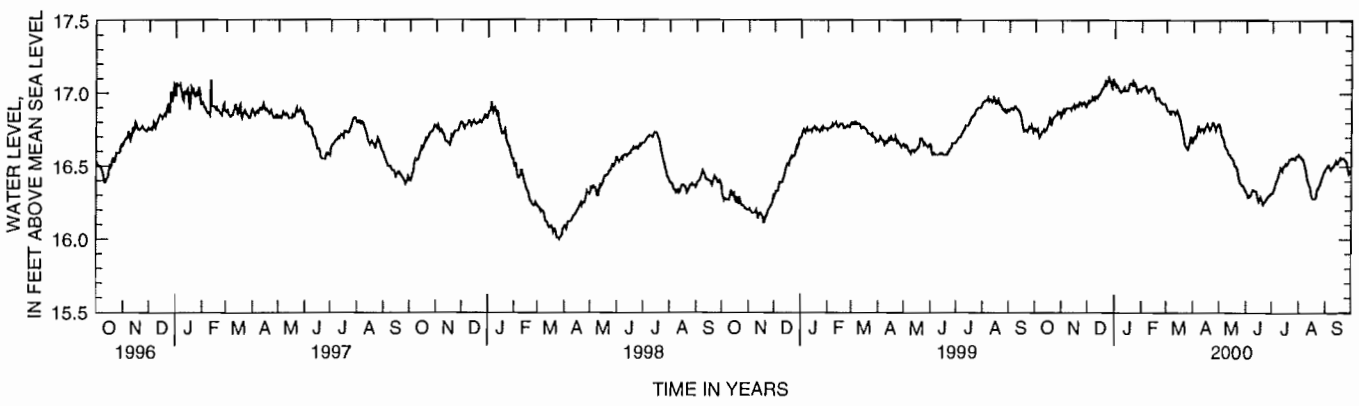
DATUM.--Elevation of land-surface datum is 439 ft. Measuring point is the top of recorder shelf 440.68 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.83 ft above mean sea level, January 15, 16, 1992; lowest water level measured, 15.87 ft above mean sea level, November 1, 1989.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.76	16.85	16.94	17.07	17.03	16.90	16.68	16.79	16.33	16.32	16.58	16.48
2	16.74	16.88	16.95	17.05	17.04	16.88	16.70	16.77	16.31	16.32	16.57	16.49
3	16.74	16.89	16.94	17.06	17.04	16.88	16.71	16.74	16.29	16.34	16.57	16.50
4	16.75	16.86	16.95	17.05	17.04	16.88	16.70	16.71	16.30	16.36	16.56	16.51
5	16.72	16.89	16.95	17.04	17.05	16.86	16.72	16.70	16.29	16.38	16.55	16.51
6	16.70	16.89	16.97	17.02	17.05	16.86	16.76	16.69	16.30	16.40	16.55	16.49
7	16.71	16.90	16.96	17.02	17.03	16.88	16.78	16.67	16.31	16.41	16.53	16.48
8	16.72	16.90	16.97	17.01	17.02	16.88	16.75	16.64	16.33	16.43	16.50	16.49
9	16.74	16.90	16.96	17.02	17.01	16.88	16.74	16.63	16.34	16.45	16.48	16.50
10	16.74	16.90	16.98	17.02	17.02	16.87	16.75	16.62	16.34	16.47	16.44	16.50
11	16.75	16.90	16.98	17.03	17.03	16.86	16.76	16.61	16.33	16.49	16.41	16.51
12	16.74	16.89	16.97	17.04	17.04	16.87	16.76	16.59	16.33	16.48	16.39	16.53
13	16.75	16.90	16.99	17.02	17.04	16.88	16.74	16.58	16.33	16.47	16.37	16.54
14	16.75	16.91	16.99	17.02	17.04	16.86	16.75	16.58	16.30	16.50	16.36	16.52
15	16.77	16.92	17.00	17.02	17.03	16.85	16.77	16.56	16.27	16.50	16.32	16.52
16	16.78	16.90	17.01	17.02	17.00	16.83	16.78	16.56	16.26	16.51	16.29	16.54
17	16.80	16.91	17.03	17.04	16.97	16.81	16.79	16.55	16.28	16.52	16.28	16.55
18	16.84	16.92	17.03	17.06	16.96	16.78	16.78	16.54	16.29	16.51	16.28	16.56
19	16.82	16.91	17.05	17.07	16.97	16.75	16.76	16.51	16.28	16.52	16.28	16.55
20	16.78	16.91	17.06	17.07	16.97	16.73	16.75	16.50	16.25	16.53	16.28	16.56
21	16.81	16.94	17.08	17.06	16.97	16.69	16.76	16.50	16.24	16.55	16.29	16.56
22	16.83	16.94	17.06	17.08	16.95	16.65	16.78	16.48	16.25	16.55	16.33	16.56
23	16.84	16.93	17.07	17.06	16.94	16.64	16.80	16.44	16.26	16.55	16.35	16.55
24	16.84	16.92	17.09	17.07	16.94	16.63	16.80	16.41	16.27	16.56	16.35	16.54
25	16.85	16.93	17.11	17.06	16.93	16.62	16.79	16.39	16.28	16.56	16.37	16.54
26	16.85	16.94	17.10	17.02	16.93	16.62	16.77	16.38	16.29	16.55	16.38	16.51
27	16.87	16.94	17.07	17.01	16.93	16.64	16.75	16.37	16.30	16.55	16.41	16.47
28	16.86	16.92	17.05	17.03	16.93	16.67	16.77	16.37	16.30	16.55	16.42	16.45
29	16.87	16.91	17.04	17.03	16.92	16.70	16.78	16.36	16.31	16.57	16.44	16.46
30	16.87	16.92	17.10	17.03	---	16.70	16.79	16.35	16.31	16.57	16.46	16.48
31	16.84	---	17.08	17.02	---	16.66	---	16.33	---	16.57	16.47	---
MEAN	16.79	16.91	17.02	17.04	16.99	16.78	16.76	16.55	16.30	16.49	16.41	16.52
MAX	16.87	16.94	17.11	17.08	17.05	16.90	16.80	16.79	16.34	16.57	16.58	16.56
MIN	16.70	16.85	16.94	17.01	16.92	16.62	16.68	16.33	16.24	16.32	16.28	16.45



215856159243201. Local number, 2-5824-02.

LOCATION.--Lat 21°58′56″, long 159°24′16″, Hydrologic Unit 20070000, 2.0 mi nwest of Lihue, and 3.5 mi northwest of the nearest shoreline. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 250 ft, 12-in. solid casing: 0–60 ft; 12-in. perforated casing; 60–185 ft; 8-in. open hole: 185–200 ft; 6-in. open hole; 200–250 ft.

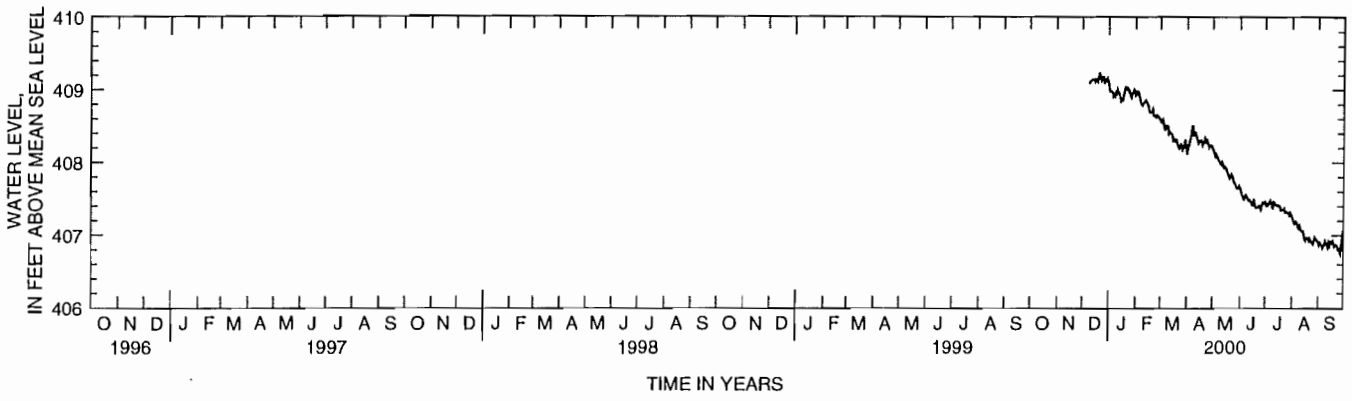
DATUM.--Elevation of land surface is 482 ft. Measuring point is top of the 12-in. well casing, 483.68 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, December 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 409.27 ft above mean sea level, December 20, 21, 1999; lowest water level measured, 406.71 ft above mean sea level, September 27, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	409.06	408.91	408.60	408.12	408.19	407.66	407.46	407.26	406.91
2	---	---	---	408.98	408.98	408.56	408.22	408.18	407.62	407.42	407.23	406.87
3	---	---	---	408.98	408.97	408.57	408.24	408.13	407.57	407.41	407.19	406.90
4	---	---	---	408.98	408.97	408.59	408.29	408.09	407.55	407.44	407.16	406.88
5	---	---	---	408.98	408.92	408.52	408.34	408.12	407.51	407.43	407.17	406.87
6	---	---	---	408.92	408.89	408.46	408.39	408.10	407.50	407.46	407.19	406.83
7	---	---	---	408.94	408.82	408.46	408.50	408.06	407.53	407.48	407.16	406.85
8	---	---	---	408.92	408.80	408.51	408.50	408.04	407.56	407.45	407.11	406.87
9	---	---	409.09	408.97	408.79	408.51	408.37	408.02	407.55	407.39	407.10	406.92
10	---	---	409.12	408.95	408.82	408.50	408.40	407.99	407.51	407.38	407.13	406.90
11	---	---	409.12	409.00	408.83	408.40	408.41	407.97	407.50	407.46	407.08	406.87
12	---	---	409.14	408.96	408.85	408.42	408.36	408.00	407.48	407.45	407.07	406.84
13	---	---	409.14	408.96	408.86	408.41	408.32	407.95	407.49	407.42	407.06	406.90
14	---	---	409.15	408.91	408.84	408.40	408.27	407.93	407.48	407.42	407.06	406.86
15	---	---	409.15	408.85	408.80	408.38	408.28	407.94	407.45	407.41	407.01	406.92
16	---	---	409.12	408.87	408.78	408.30	408.30	407.92	407.41	407.42	406.94	406.92
17	---	---	409.15	408.86	408.70	408.30	408.31	407.88	407.46	407.41	406.93	406.90
18	---	---	409.14	408.93	408.69	408.32	408.31	407.86	407.50	407.40	406.96	406.92
19	---	---	409.12	408.97	408.69	408.30	408.25	407.81	407.43	407.35	406.97	406.88
20	---	---	409.19	409.04	408.70	408.31	408.28	407.79	407.39	407.35	406.96	406.85
21	---	---	409.24	409.04	408.73	408.26	408.28	407.81	407.38	407.35	406.93	406.87
22	---	---	409.19	409.01	408.65	408.22	408.33	407.84	407.39	407.36	406.96	406.87
23	---	---	409.13	409.02	408.65	408.20	408.30	407.82	407.40	407.37	406.94	406.86
24	---	---	409.15	408.98	408.64	408.23	408.33	407.76	407.41	407.32	406.91	406.81
25	---	---	409.18	408.99	408.63	408.27	408.26	407.73	407.38	407.33	406.91	406.82
26	---	---	409.18	408.92	408.65	408.21	408.25	407.71	407.36	407.32	406.89	406.78
27	---	---	409.09	408.90	408.64	408.18	408.21	407.69	407.41	407.31	406.93	406.75
28	---	---	409.13	408.94	408.63	408.20	408.23	407.66	407.45	407.31	406.97	406.85
29	---	---	409.14	408.98	408.60	408.25	408.24	407.65	407.44	407.28	406.95	406.97
30	---	---	409.16	409.00	---	408.32	408.23	407.65	407.45	407.31	406.94	407.07
31	---	---	409.12	408.97	---	408.23	---	407.68	---	407.29	406.92	---
MEAN	---	---	---	408.96	408.77	408.37	408.30	407.90	407.47	407.39	407.03	406.88
MAX	---	---	---	409.06	408.98	408.60	408.50	408.19	407.66	407.48	407.26	407.07
MIN	---	---	---	408.85	408.60	408.18	408.12	407.65	407.36	407.28	406.89	406.75



215803159401201. Local number, 2-5840-01.

LOCATION.--Lat 21°58′03″, long 159°40′12″, Hydrologic Unit 20070000, 0.7 mi north of Waimea Recreational Pier State Park, and 2.4 mi east northeast of Oomano Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 190 ft, 8-in. casing diameter, cased to 167 ft.

DATUM.--Elevation of land-surface datum is 168 ft. Measuring point is the top of 1-in. hole on pump base, 168.08 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, 1973 to current year.
Water quality: occasional measurements, 1973 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 13.10 ft above mean sea level, January 26, 1989; lowest water level measured, 6.58 ft above mean sea level, July 19, 1990, lowest water level measured with pump on, 4.76 ft above mean sea level, December 8, 1980.

REMARKS.--Water used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	8.71	FEB 16	8.61	JUN 14	7.94
DEC 08	8.60	APR 12	7.95	AUG 08	8.42

215857159430101. Local number, 2-5843-01.

LOCATION.--Lat 21°58′57″, long 159°43′01″, Hydrologic Unit 20070000, 2.7 mi east northeast from Kokole Point, and 1.4 mi north northwest of Oomano Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 55 ft, 15-ft casing diameter, cased to 10 ft.

DATUM.--Elevation of land surface is 57 ft. Measuring point was the top of 1/4-in. steel plate 57.80 ft above mean sea level. Measuring point changed April 12, 2000, to top of 1-in. pipe, 57.92 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, 1972, 1985 to current year.
Water quality: occasional measurements, 1972, 1997 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 9.52 ft above mean sea level, February 5, 1990; lowest water level measured, 7.82 ft above mean sea level, April 25, 1988.

REMARKS.--Well used for public supply. Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	8.58	FEB 16	8.50	JUN 14	7.91
DEC 08	8.69	APR 12	8.22	AUG 08	7.97

215958159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59′58″, long 159°21′43″, Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park, and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 540 ft, 14-in. casing diameter, cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point is the top of 1-in. pipe, northeast side of flange after removing the plug, elevation 302.66 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to July 1992. Occasional measurements, October 1992 to current year.
Water quality: occasional measurements, 1997 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.69 ft above mean sea level, November 26, 1985; lowest water level measured, 9.41 ft above mean sea level, June 5, 1997.

REMARKS.--Water level affected by pumping.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	12.27	FEB 15	11.44	JUN 15	11.75
DEC 09	12.00	APR 19	11.52	AUG 09	12.08

215901159235201. Local number 2-5923-07.

LOCATION.--Lat 21°59′01″, long 159°23′52″, Hydrologic Unit 20070000, 4.2 mi northwest of Ninini Point and 3.4 mi west from Lihue Airport terminal. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 200 ft, 12-in. casing diameter, cased to 200 ft.

DATUM.--Elevation of land-surface datum is 364 ft. Measuring point is the top of 1-in. pump base opening, after removing copper fittings, 365.48 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, 1985 to current year.
Water quality: occasional measurements, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 226.86 ft above mean sea level, December 8, 1989; lowest water level measured, 211.27 ft above mean sea level, August 18, 1999.

REMARKS.--Water used for public supply. Water level affected by pumping and by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	211.82	FEB 15	215.52	JUN 15	211.68
DEC 09	213.89	APR 19	214.84	AUG 09	214.64

215950159231601. Local number 2-5923-08.

LOCATION.--Lat 21°59'50", long 159°23'16", Hydrologic Unit 20070000, 1.5 mi northwest of Lihue, and 2.8 mi west of the nearest shoreline. Owner: U.S. Geological Survey.

AQUIFER.--Koloa Volcanics, Pliocene to Pleistocene age.

WELL CHARACTERISTICS.---Drilled well, depth 1,002 ft, 12.75-in. solid steel outer casing: 0-124 ft; 4-in. solid pvc casing: 0-87 ft; 4-in. perforated pvc casing: 87 ft to bottom; annular space grouted: 0-124 ft; annular space gravel packed: 124 ft to bottom.

DATUM.--Elevation of land-surface datum is 272 ft. Measuring point is the top of 4-in. well casing, 273.49 ft above mean sea level.

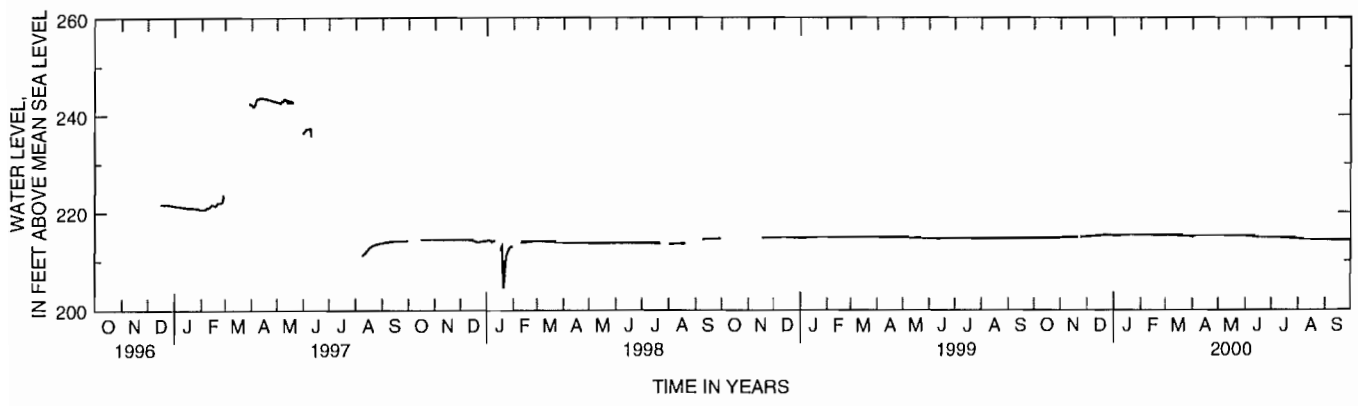
PERIOD OF RECORD.--Water-level recorder, February 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 244.14 ft above mean sea level, April 10, 1997; lowest water level measured, 204.37 ft above mean sea level, January 20, 21, 1998.

REMARKS.--Well part of network of observation wells in cooperation with the County of Kauai Department of Water.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	214.69	214.80	215.02	215.23	215.37	215.34	215.01	215.34	215.14	214.85	214.57	214.32
2	214.67	214.82	215.05	215.20	215.40	215.33	215.05	215.32	215.13	214.84	214.54	214.31
3	214.65	214.84	215.05	215.19	215.40	215.33	215.10	215.31	215.11	214.82	214.52	214.32
4	214.64	214.80	215.04	215.18	215.40	215.35	215.14	215.30	215.10	214.82	214.50	214.32
5	214.64	214.86	215.06	215.16	215.39	215.33	215.19	215.30	215.07	214.82	214.46	214.32
6	214.62	214.86	215.10	215.15	215.39	215.31	215.27	215.30	215.03	214.84	214.45	214.31
7	214.62	214.87	215.11	215.17	215.36	215.32	215.33	215.28	215.02	214.84	214.43	214.30
8	214.63	214.89	215.11	215.20	215.33	215.33	215.33	215.26	215.03	214.83	214.42	214.30
9	214.64	214.90	215.11	215.24	215.33	215.34	215.30	215.22	215.03	214.82	214.42	214.32
10	214.63	214.89	215.13	215.27	215.34	215.33	215.29	215.20	215.01	214.81	214.41	214.31
11	214.64	214.88	215.14	215.31	215.35	215.29	215.31	215.18	215.00	214.81	214.40	214.27
12	214.65	214.87	215.15	215.33	215.35	215.27	215.31	215.17	214.94	214.81	214.41	214.28
13	214.67	214.87	215.19	215.32	215.35	215.27	215.27	215.17	214.93	214.76	214.41	214.29
14	214.65	214.88	215.19	215.30	215.34	215.22	215.24	215.18	214.93	214.74	214.41	214.24
15	214.63	214.89	215.21	215.30	215.35	215.18	215.26	215.18	214.90	214.73	214.41	214.24
16	214.62	214.89	215.21	215.32	215.33	215.16	215.30	215.20	214.88	214.72	214.38	214.24
17	214.63	214.90	215.22	215.33	215.29	215.15	215.32	215.20	214.90	214.72	214.37	214.24
18	214.68	214.92	215.22	215.36	215.26	215.15	215.33	215.18	214.92	214.71	214.37	214.24
19	214.75	214.91	215.25	215.43	215.26	215.13	215.32	215.16	214.91	214.69	214.37	214.25
20	214.72	214.89	215.31	215.47	215.28	215.14	215.32	215.16	214.89	214.66	214.38	214.24
21	214.73	214.93	215.35	215.44	215.30	215.12	215.34	215.20	214.87	214.66	214.36	214.25
22	214.73	---	215.32	215.44	215.28	215.10	215.36	215.25	214.89	214.66	214.36	214.27
23	214.74	---	215.31	215.43	215.29	215.10	215.37	215.25	214.91	214.66	214.37	214.28
24	214.74	214.98	215.32	215.41	215.29	215.11	215.37	215.22	214.93	214.64	214.36	214.28
25	214.74	214.98	215.34	215.39	215.30	215.12	215.37	215.18	214.92	214.63	214.36	214.26
26	214.74	214.99	215.33	215.36	215.32	215.10	215.35	215.18	214.90	214.63	214.35	214.25
27	214.77	215.01	215.27	215.33	215.33	215.08	215.33	215.17	214.89	214.61	214.36	214.23
28	214.77	215.00	215.27	215.34	215.33	215.10	215.34	215.17	214.88	214.60	214.38	214.26
29	214.78	214.99	215.29	215.37	215.34	215.11	215.35	215.17	214.87	214.61	214.37	214.32
30	214.79	214.99	215.32	215.39	---	215.13	215.35	215.16	214.85	214.61	214.36	214.35
31	214.78	---	215.28	215.37	---	215.06	---	215.15	---	214.59	214.34	---
MEAN	214.69	---	215.20	215.31	215.33	215.21	215.28	215.22	214.96	214.73	214.41	214.28
MAX	214.79	---	215.35	215.47	215.40	215.35	215.37	215.34	215.14	214.85	214.57	214.35
MIN	214.62	---	215.02	215.15	215.26	215.06	215.01	215.15	214.85	214.59	214.34	214.23



215906159395601. Local number, 2-5939-01.

LOCATION.--Lat 21°59'06", long 159°39'56", Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea Recreational Pier State Park, and 3.2 mi northeast from Oomano Point. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Basalt, Miocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 43 ft, 6.5-ft diameter, uncased.

DATUM.--Elevation of land surface is 42 ft. Measuring point is the top west side of concrete base 41.61 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, 1972 to current year.
Water quality: occasional measurements, 1972 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.43 ft above mean sea level, January 14, 1988; lowest water level measured, 8.71 ft above mean sea level, March 9, 1981, lowest water level measured with pump on, 5.86 ft above mean sea level, May 7, 1975.

REMARKS.--Water is presently unused.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	9.40	FEB 10	9.20	JUN 14	9.01
DEC 08	10.11	APR 10	9.48	AUG 07	9.03

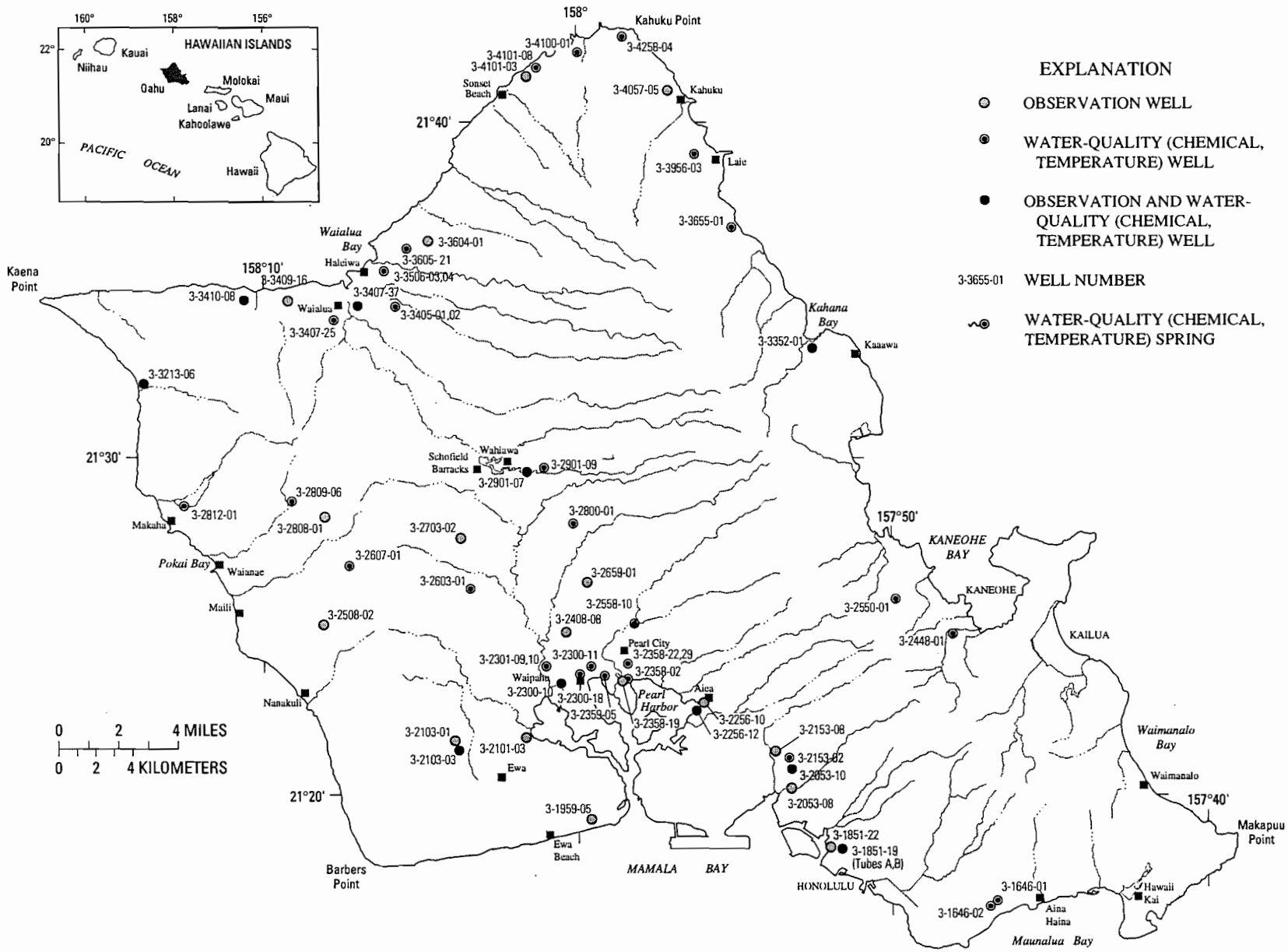


Figure 17. Locations of observation wells and ground-water quality sampling sites on Oahu.

211646157465202. Local number, 3-1646-02.

LOCATION.--Lat 21°16′46″, long 157°46′52″, Hydrologic Unit 20060000, at Waialae Golf Course. Owner: Bishop Estate.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 131 ft, 4-in. casing diameter, cased to 100 ft.

DATUM.--Elevation of land-surface datum is 16 ft. Measuring point is top of metal cover, 16.37 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--Occasional measurements, September 1972 to current year (discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.63 ft above mean sea level, January 27, 1983; lowest measured, 7.00 ft above mean sea level, June 10, 1986, July 23, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	7.68	JAN 21	7.61	APR 12	7.35	MAY 23	7.33	JUL 28	7.38	SEP 20	7.34

211832157515501. Local number, 3-1851-19 Tube A.

LOCATION.--Lat 21°18′32″, long 157°51′55″, Hydrologic Unit 20060000, corner of Richards and Halekauwila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, 1/2-in. galvanized pipe at 1,043 ft depth. Tube A is the pipe closer to Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point is chiseled square inside of wooden cover of well, elevation 5.80 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office. Water level affected by high salinity of water (see water-quality section).

PERIOD OF RECORD.--
Water level: occasional measurements, April 1969, March 1973 to current year.
Water quality: occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.16 ft above mean sea level, August 13, 1974; lowest measured, 5.53 ft above mean sea level, September 25, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	(a)	JAN 21	5.84	APR 04	(a)	MAY 23	(a)	JUL 21	(a)	SEP 28	(a)

a No flow, unable to read water level

211832157515502. Local number, 3-1851-19 Tube B.

LOCATION.--Lat 21°18′32″, long 157°51′55″, Hydrologic Unit 20060000, corner of Richards and Halekauwila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, 1/2-in. galvanized pipe at 988 ft depth. Tube B is the pipe furthest from Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point is chiseled square inside of wooden cover of well, elevation 5.80 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office. Water level affected by high salinity of water (see water-quality section).

PERIOD OF RECORD.--

Water level: occasional measurements, April 1969, March 1973 to current year.
Water quality: occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.16 ft above mean sea level, February 3, 1983; lowest measured, 11.83 ft above mean sea level, September 28, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	13.31	JAN 21	14.32	APR 04	13.62	MAY 23	12.76	SEP 28	11.83

211828157515801. Local number, 3-1851-22.

LOCATION.--Lat 21°18′28″, long 157°51′58″, Hydrologic Unit 20060000, northeast corner of the mini-park at the intersection of Richards Street and Ala Moana Boulevard. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, 3-in. PVC pipe casing, depth 1,142 ft, bottom 60 ft slotted.

DATUM.--Elevation of land-surface datum is 7 ft. Measuring point is northeast corner of manhole cover, 7.30 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: water-level recorder, June 1983 to November 1986, occasional measurements, December 1982 to current year.
Water quality: occasional measurements, 1982, 1987, 1998.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.74 ft above mean sea level, April 12, 1991; lowest measured, 14.74 ft, above mean sea level, September 27, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	15.81	JAN 21	16.83	APR 04	16.51	MAY 23	15.73	JUL 21	15.09	SEP 27	14.74

211907157594701. Local number, 3-1959-05.

LOCATION.--Lat 21°19′06″, long 157°59′46″, Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: National Oceanic and Atmospheric Administration (NOAA).

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land-surface datum is 5 ft. Measuring point is top of 5-in. PVC casing, 6.40 ft above mean sea level.

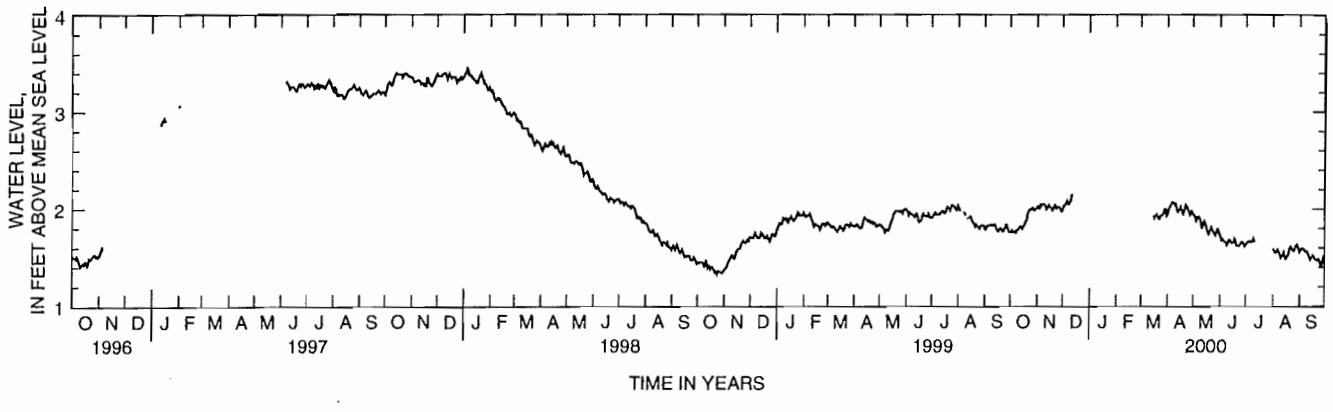
REMARKS.--Geophysical log and water-quality records are available in files of USGS Hawaii district office.

PERIOD OF RECORD.--
Water level: water-level recorder, December 1966 to January 1967, September 1968 to current year.
Water quality: occasional measurements, August 1965, November 1966, and December 1968.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.38 ft above mean sea level, January 17, 1969; lowest measured, 2.81 ft below mean sea level, August 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.76	2.01	1.99	---	---	---	1.94	1.95	1.73	1.63	---	1.56
2	1.76	2.03	2.03	---	---	---	1.98	1.94	1.71	1.64	1.59	1.57
3	1.78	2.03	2.03	---	---	---	2.01	1.93	1.68	1.66	1.57	1.58
4	1.77	2.00	2.05	---	---	---	2.02	1.91	1.69	1.66	1.55	1.59
5	1.76	2.04	2.06	---	---	---	2.04	1.88	1.68	1.67	1.55	1.59
6	1.76	2.03	2.08	---	---	---	2.06	1.90	1.67	1.67	1.56	1.58
7	1.77	2.05	2.05	---	---	---	2.07	1.92	1.66	1.66	1.58	1.58
8	1.76	2.05	2.05	---	---	---	2.07	1.92	1.66	1.66	1.57	1.56
9	1.78	2.05	2.07	---	---	---	2.06	1.90	1.63	1.67	1.55	1.56
10	1.79	2.04	2.08	---	---	---	2.04	1.87	1.64	1.69	1.52	1.56
11	1.80	2.03	2.13	---	---	---	2.05	1.80	1.67	1.66	1.50	1.54
12	1.81	2.00	2.15	---	---	---	2.01	1.82	1.68	---	1.51	1.53
13	1.82	2.01	---	---	---	---	1.97	1.85	1.68	---	1.53	1.50
14	1.81	2.03	---	---	---	---	1.97	1.87	1.66	---	1.55	1.48
15	1.80	2.04	---	---	---	---	1.99	1.85	1.65	---	1.51	1.49
16	1.82	2.02	---	---	---	1.93	2.01	1.82	1.65	---	1.49	1.51
17	1.83	2.02	---	---	---	1.91	2.02	1.78	1.66	---	1.49	1.52
18	1.85	2.01	---	---	---	1.93	1.99	1.75	1.69	---	1.51	1.51
19	1.87	1.99	---	---	---	1.93	1.96	1.74	1.68	---	1.53	1.49
20	1.89	2.00	---	---	---	1.94	1.95	1.76	1.63	---	1.55	1.48
21	1.95	2.02	---	---	---	1.92	1.98	1.79	1.62	---	1.60	1.48
22	1.97	2.04	2.25	---	---	1.90	2.02	1.81	1.62	---	1.61	1.48
23	1.99	2.03	---	---	---	1.90	2.04	1.79	1.62	---	1.60	1.47
24	1.99	2.01	2.30	---	---	1.93	2.03	1.77	1.63	---	1.58	1.48
25	2.00	2.02	---	---	---	1.93	2.00	1.75	1.64	---	1.57	1.46
26	2.00	2.02	---	---	---	1.94	1.99	1.74	1.66	---	1.57	1.42
27	2.01	2.02	---	---	---	1.94	1.97	1.73	1.66	---	1.60	1.42
28	2.00	2.01	---	---	---	1.98	1.94	1.76	1.65	---	1.62	1.45
29	1.99	1.99	---	---	---	2.00	1.95	1.79	1.64	---	1.63	1.50
30	2.00	1.98	---	---	---	2.00	1.97	1.79	1.62	---	1.62	1.52
31	2.00	---	---	---	---	1.93	---	1.76	---	---	1.59	---
MEAN	1.87	2.02	---	---	---	---	2.00	1.83	1.66	---	---	1.52
MAX	2.01	2.05	---	---	---	---	2.07	1.95	1.73	---	---	1.59
MIN	1.76	1.98	---	---	---	---	1.94	1.73	1.62	---	---	1.42



212038158061501. Local number, 3-2006-12.

LOCATION.--Lat 21°20′38″, long 158°06′15″, Hydrologic Unit 20060000, 1.1 mi southwest of Makakilo Elementary School, 0.4 mi east of Honokai Hale, and 2.1 mi southeast of the Kahe Point Power Plant. Owner: Honolulu Board of Water Supply.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, 6-in. casing, cased to 108 ft.

DATUM.--Elevation of land-surface datum is 138 ft. Measuring point is top of casing, 139.13 ft above mean sea level.

REMARKS.--Prior to October 1995, unpublished records are available in files of the USGS Hawaii District office.

PERIOD OF RECORD.--Water level: occasional measurements, March 1990 to July 31, 2000 (water-level measurements discontinued).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.71 ft above mean sea level, February 18, 1992; lowest measured, 13.57 ft above mean sea level, May 20, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	14.02	JAN 14	13.86	MAR 23	13.70	MAY 31	13.77	JUL 31	13.72

212046157531401. Local number, 3-2053-10, Fort Shafter Well.

LOCATION.--Lat 21°20′46″, long 157°53′14″, Hydrologic Unit 20060000, in Fort Shafter, about 1,000 ft east of Buckner Gate, and 100 ft north of Fort Shafter Elementary School. Owner: U.S. Army.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 279 ft, 12-in. casing diameter, cased to 169 ft.

DATUM.--Elevation of land-surface datum is 20 ft. Measuring point is a chiseled "1 1" on top of 8-inch casing (flange removed), at south end of pump house (Bldg. 509), 24.90 ft above mean sea level.

REMARKS.--Prior to January 2000, unpublished records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Occasional water quality measurements, December 1915 to November 1972.
Occasional water level measurements, December 1915 to September 1931, January 2000 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.82 ft above mean sea level, April 1917; lowest measured, 17.79 ft above mean sea level, September 20, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 31	19.03	SEP 20	17.79

212154158015201. Local number, 3-2101-03.

LOCATION.--Lat 21°21′54″, long 158°01′52″, Hydrologic Unit 20060000, 0.4 mi southeast of Honouliuli, and 0.5 mi north of Ewa Hospital. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 355 ft, 6-in. PVC casing, cased to 165 ft. Well casing was modified in January 1958 and May 1982.

DATUM.--Elevation of land-surface datum is 15.38 ft. Measuring point is top of horizontal flange below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, and 1978-81 are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--Water level: occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft above mean sea level, April 1918; lowest observed, less than 11.32 ft above mean sea level (below petcock then in use), September 2, and October 19, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 12	17.53	JAN 14	17.85	MAR 15	17.46	MAY 30	17.36	AUG 01	17.04	SEP 01	16.80

212132158035701. Local number, 3-2103-01.

LOCATION.--Lat 21°21′32″, long 158°03′57″, Hydrologic Unit 20060000, 1 mi east of Makakilo, and 2 mi north of Barbers Point Naval Air Station. Owner: U.S. Navy.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 206 ft, 6-in. casing diameter, cased to 17 ft.

DATUM.--Elevation of land-surface datum is 210 ft. Measuring point is top of 6-in. pipe, elevation 211.70 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii district office.

PERIOD OF RECORD.--
Water level: water-level recorder, September 1966 to December 1971. Occasional measurements, August 1942 to December 1942, January 1953 to September 1967, September 1972 to current year.
Water quality: occasional measurements, 1942, 1953-68.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.81 ft above mean sea level, February 20, 1957; lowest measured, 14.25 ft above mean sea level, July 5, 1978, September 20, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	14.64	JAN 14	14.62	MAR 23	14.47	MAY 31	14.40	AUG 01	14.41	SEP 14	14.54

212133158035501. Local number, 3-2103-03.

LOCATION.--Lat 21°21′33″, long 158°03′55″, Hydrologic Unit 20060000, 1 mi east of Makakilo, and 2 mi north of Barbers Point Naval Air Station. Owner: U.S. Navy.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Vertical dug shaft (6×12 ft), depth 163 ft, with three (6×15 ft) horizontal development tunnels (tunnel 1 is 200 ft long, tunnel 2 is 25 ft long, and tunnel 3 is 25 ft long) at an elevation of 5 ft above mean sea level.

DATUM.--Elevation of land-surface datum is 160 ft. Measuring point is top of concrete ledge under manhole, elevation 155.50 ft above mean sea level.

REMARKS.--Prior to October 1997, unpublished water-level records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, March 1952 to February 1953, March 1973 to current year.
Water quality: occasional measurements, May 1952 to June 1962, August 1966 to August 1968, March 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.50 ft above mean sea level, December 8, 1982 and January 28, 1983; lowest measured, 14.25 ft above mean sea level, July 5 and September 20, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	14.64	JAN 14	14.63	MAR 23	14.46	MAY 31	14.39	AUG 01	14.39	SEP 27	14.55

212106157533701. Local number, 3-2153-02.

LOCATION.--Lat 21°21′06″, long 157°53′37″, Hydrologic Unit 20060000, in Pineapple Place near Moanalua School. Owner: Damon Estate.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 289 ft, 10-in. casing, cased to 79 ft.

DATUM.--Elevation of land-surface datum is 20 ft. Measuring point is top of 3/4-in. pipe on casing about 15 ft streamward from small pump house and elevation is 20.78 ft above mean sea level.

REMARKS.--Prior to March 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, April 1910 to March 1974, December 1977 to March 1993, and June 1999 to current year.
Water quality: occasional measurements, April 1910 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 31.88 ft above mean sea level, April 1917; lowest measured, 16.39 ft above mean sea level, September 19, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 08	18.42	JAN 06	18.70	MAR 23	17.98	APR 04	18.50	JUL 21	17.77	SEP 20	17.65

212117157534601. Local number, 3-2153-08.

LOCATION.--Lat 21°21′17″, long 157°53′46″, Hydrologic Unit 20060000, 1,300 ft northwest of junction of H-1 freeway and Puuloa Road, and 0.5 mi south of Tripler Army Hospital. Owner: U.S. Army.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 306 ft, 16-in. casing diameter, cased to 57 ft.

DATUM.--Elevation of land-surface datum is 28 ft. Measuring point is top of 3/4-in. copper overflow pipe at base of pump, 33.16 ft above mean sea level.

REMARKS.--Prior to May 1998, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--Occasional measurements, April 1945 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.79 ft above mean sea level, April 21, 1969; lowest measured, 17.44 ft above mean sea level, October 1, 1998.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 04	17.83	DEC 01	18.06	FEB 01	18.58	APR 11	18.36	JUN 01	17.67	AUG 02	17.59
NOV 01	18.15	JAN 03	18.44	MAR 01	18.22	MAY 03	18.13	JUL 03	17.58	SEP 01	17.58

212238157561101. Local number, 3-2256-10.

LOCATION.--Lat 21°22′38″, long 157°56′11″, Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 173 ft, 12-in. casing diameter, cased to 143 ft.

DATUM.--Elevation of land-surface datum is 10 ft. Measuring point is top of 10-in. stilling pipe for water-level recorder, 26.15 ft above mean sea level.

REMARKS.--Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of USGS Hawaii district office.

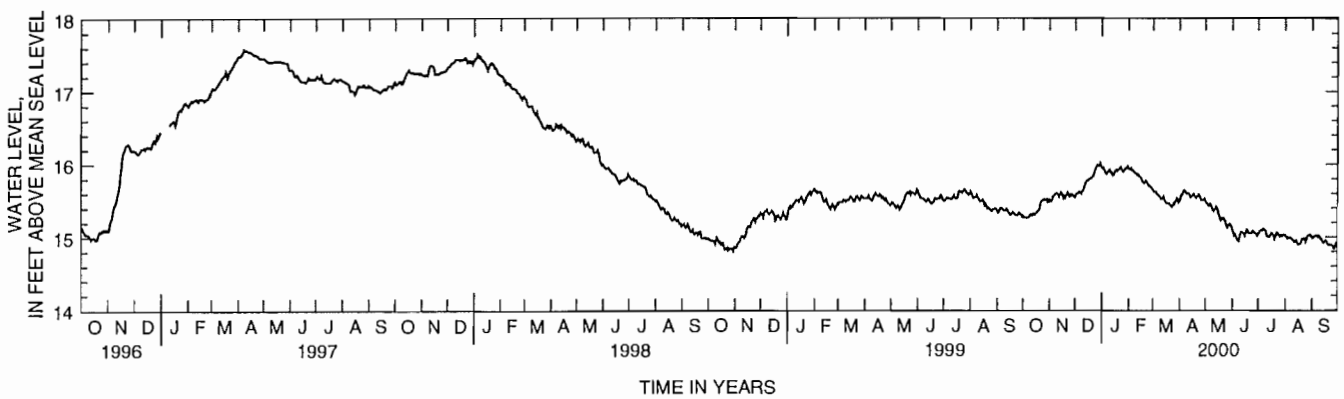
PERIOD OF RECORD.--Water level: occasional measurements, January 1928 to February 1931, September 1934 to August 1966. Water-level recorder, September 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft above mean sea level, January 16, 1928; lowest measured, 12.97 ft above mean sea level, October 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	15.29	15.51	15.55	15.95	15.94	15.64	15.49	15.50	15.10	15.04	15.03	15.00
2	15.27	15.49	15.59	15.94	15.94	15.62	15.54	15.47	15.07	15.06	15.01	14.99
3	15.27	15.49	15.60	15.95	15.93	15.62	15.58	15.46	15.02	15.08	15.00	15.00
4	15.27	15.51	15.60	15.92	15.94	15.62	15.58	15.45	15.04	15.09	14.98	15.01
5	15.26	15.56	15.61	15.89	15.92	15.59	15.61	15.43	15.02	15.10	14.98	15.01
6	15.27	15.56	15.62	15.87	15.92	15.58	15.64	15.43	14.99	15.09	14.99	15.02
7	15.27	15.58	15.61	15.87	15.90	15.57	15.64	15.45	14.96	15.11	14.99	15.02
8	15.28	15.60	15.60	15.90	15.88	15.56	15.61	15.44	14.96	15.10	14.98	15.00
9	15.30	15.60	15.63	15.91	15.88	15.55	15.60	15.41	14.95	15.10	14.97	15.01
10	15.31	15.60	15.64	15.92	15.87	15.52	15.60	15.37	15.01	15.08	14.96	15.00
11	15.30	15.58	15.67	15.89	15.85	15.52	15.60	15.36	15.05	15.02	14.94	14.97
12	15.30	15.56	15.71	15.89	15.86	15.53	15.59	15.37	15.07	15.01	14.93	14.97
13	15.32	15.58	15.74	15.86	15.84	15.55	15.55	15.39	15.07	15.00	14.94	14.94
14	15.31	15.61	15.76	15.85	15.83	15.51	15.55	15.41	15.06	15.00	14.95	14.92
15	15.31	15.60	15.78	15.86	15.82	15.49	15.56	15.39	15.04	15.02	14.92	14.92
16	15.33	15.58	15.78	15.90	15.80	15.47	15.58	15.34	15.02	15.05	14.90	14.94
17	15.34	15.54	15.79	15.91	15.77	15.46	15.59	15.30	15.06	15.05	14.90	14.95
18	15.35	15.56	15.80	15.92	15.75	15.46	15.57	15.26	15.10	15.03	14.91	14.94
19	15.36	15.54	15.81	15.91	15.74	15.46	15.55	15.23	15.10	15.01	14.91	14.90
20	15.38	15.57	15.81	15.92	15.75	15.46	15.54	15.24	15.07	14.98	14.93	14.90
21	15.45	15.59	15.83	15.93	15.77	15.44	15.55	15.26	15.05	15.01	14.97	14.89
22	15.48	15.61	15.84	15.95	15.76	15.43	15.57	15.26	15.05	15.05	14.97	14.89
23	15.50	15.60	15.88	15.96	15.74	15.42	15.58	15.23	15.05	15.06	14.98	14.89
24	15.50	15.56	15.92	15.93	15.72	15.44	15.57	15.21	15.07	15.05	14.98	14.89
25	15.51	15.56	15.95	15.91	15.70	15.46	15.53	15.15	15.08	15.02	14.94	14.88
26	15.52	15.58	15.97	15.90	15.70	15.45	15.51	15.13	15.06	15.01	14.97	14.85
27	15.51	15.57	15.99	15.92	15.69	15.48	15.51	15.14	15.06	15.02	15.01	14.84
28	15.51	15.58	15.98	15.94	15.68	15.50	15.51	15.17	15.05	15.01	15.02	14.87
29	15.52	15.57	15.98	15.94	15.66	15.53	15.51	15.18	15.04	15.01	15.02	14.91
30	15.48	15.55	16.01	15.96	---	15.52	15.52	15.17	15.02	15.03	15.03	14.93
31	15.48	---	15.98	15.97	---	15.48	---	15.14	---	15.03	15.02	---
MEAN	15.37	15.57	15.78	15.91	15.81	15.51	15.56	15.31	15.04	15.04	14.97	14.94
MAX	15.52	15.61	16.01	15.97	15.94	15.64	15.64	15.50	15.10	15.11	15.03	15.02
MIN	15.26	15.49	15.55	15.85	15.66	15.42	15.49	15.13	14.95	14.98	14.90	14.84

WTR YR 2000 MAX 16.04, DECEMBER 30; MIN 14.81, SEPTEMBER 26-27



212238157561102. Local number, 3-2256-12.

LOCATION.--Lat 21°22′38″, long 157°56′11″, Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 182 ft, 12-in. casing diameter, cased to 139 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point is corner of concrete base next to faucet, 13.18 ft above mean sea level.

REMARKS.--Prior to October 1996, unpublished water-level records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--
Water level: occasional measurements, January 1928 to December 1931, 1934, 1946-47, 1966, November 1973 to current year.
Water quality: occasional measurements, January 1928 to November 1929, 1930-31, 1934, 1947, December 1966, September 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.07 ft above mean sea level, January 16, 1928; lowest measured, 13.15 ft above mean sea level, September 18, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 08	15.43	JAN 06	15.83	APR 04	15.58	MAY 23	15.18	JUL 21	14.94	SEP 20	14.87

212340158001901. Local number, 3-2300-18.

LOCATION.--Lat 21°23′40″, long 158°00′19″, Hydrologic Unit 20060000, 700 ft south of August Ahrens School, and 1,400 ft northeast of L'Orange Park, Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,090 ft, 12-in. casing diameter, cased to 38 ft. Well was deepened May 1980 and modified February 1984. Prior to May 1980, well depth 205 ft.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point is top of casing, 27.73 ft above mean sea level.

PERIOD OF RECORD.--
Water level: water-level recorder, August 1970 to July 1983, March 1984 to November 1987.
Occasional measurements, October 1987 to current year (discontinued).
Water quality: occasional measurements, 1930, 1942-45, 1947-49, 1951-54, 1968, 1983, 1985-86, 1991, 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.40 ft above mean sea level, January 4, 1983; lowest measured, 14.01 ft above mean sea level, September 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 08	17.65	JAN 06	17.89	APR 11	17.56	JUL 03	17.18

212318157583401. Local number, 3-2358-19.

LOCATION.--Lat 21°23′18″, long 157°58′34″, Hydrologic Unit 20060000, 0.3 mi southwest of Lehua Elementary School, and 0.7 mi south of Pearl City Elementary School. Owner: U.S. Navy.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 172 ft, 17-in. casing diameter, cased to 112 ft.

DATUM.--Elevation of land-surface datum is 13.30 ft. Measuring point is 1-in. square chiseled on concrete base wall, northeast corner, elevation is 13.30 ft above mean sea level.

REMARKS.--Prior to October 1995, unpublished records are available in files of USGS Hawaii District office.

PERIOD OF RECORD.--
Water level: occasional measurements, September 1972, November 1973 to December 1988, and March 3, 1993 to current year.
Water quality: occasional measurements, 1944, 1946, 1954, 1956-58, 1972-80.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.68 ft above mean sea level, December 7, 1982; lowest measured, 12.30 ft above mean sea level, September 18, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	14.71	DEC 29	14.99	APR 04	14.62	MAY 23	14.42	JUL 21	14.14	SEP 15	13.97

212614157594301. Local number, 3-2659-01.

LOCATION.--Lat 21°26′14″, long 157°59′43″, Hydrologic Unit 20060000, 2.3 mi southeast of Kipapa School and 0.5 mi southwest of entrance to Mililani Memorial Park Cemetery. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,790 ft, 9-in. casing, cased to 424 ft.

DATUM.--Elevation of land-surface datum is 412 ft. Measuring point is top of casing, elevation is 412.98 ft above mean sea level.

REMARKS.--Prior to October 1995, unpublished records in files of the USGS Hawaii district office.

PERIOD OF RECORD.--Water level: occasional measurements, October 1986 to April 1987, March 1990 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 23.74 ft above mean sea level, March 5, 1990; lowest measured, 17.23 ft above mean sea level, October 3, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	19.58	JAN 20	19.78	MAR 11	19.48	MAY 10	19.33	AUG 03	18.94

212813158080201. Local number, 3-2808-01.

LOCATION.--Lat 21°28′13″, long 158°08′04″, Hydrologic Unit 20060000, inside Lualualei Naval Ammunition Depot, 1,000 ft west from the intersection of Kolekole Road and Radford Street, at Building 492, and 3.3 mi north from the entrance of the depot. Owner: U.S. Navy.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Depth 535 ft, cased to 179 ft, 12-in.-diameter steel casing to 179 ft, then 3-in. to 535 ft.

DATUM.--Elevation of land-surface datum is 435 ft. Measuring point is on pump 2 ft above base. Remove 1/2-in. nipple, elevation 437.45 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, June 1956 to December 1957, June 1973 to December 1984, August 1988 to current year.
Water quality: occasional measurements, October 1956 to December 1957, February 1972 to August 1988.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 441.81 ft above mean sea level, February 28, 1983; lowest measured, 420.78 ft above mean sea level, October 24, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 10	428.91	JAN 14	429.83	MAR 23	428.72	MAY 31	428.67	AUG 01	427.71

212927158014801. Local number, 3-2901-07.

LOCATION.--Lat 21°29′27″, long 158°01′48″, Hydrologic Unit 20060000, across the main gate of Wheeler Air Force Base, and 1,200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 ft x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point is top of pump chamber floor at recorder, 287.00 ft above mean sea level.

REMARKS.--maximum daily water levels are published due to the fluctuations in the water level caused by pumping.

PERIOD OF RECORD.--
Water level: water-level recorder, November 1938 to current year.
Water quality: occasional measurements, 1966-72, 1975 to current year.

REVISED RECORDS.--WDR HI-99-1: Elevation of land-surface datum and measuring point. WDR HI-99-1: (m) based on non-pumping values.

EXTREMES FOR PERIOD OF RECORD (Non-pumping values).--Highest water level measured, 284.40 ft above mean sea level, May 12, 1969; lowest measured, 270.82 ft above mean sea level, May 1, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	273.26	273.90	274.07	273.59	274.35	274.32	273.53	274.25	274.25	273.83	274.20	274.10
2	273.26	273.40	273.99	273.57	274.26	274.20	273.59	273.39	273.36	273.81	273.89	273.78
3	273.22	273.44	273.90	274.21	274.13	274.21	274.21	273.59	273.51	274.10	273.87	273.65
4	274.10	273.39	273.91	274.15	274.29	274.21	274.10	273.59	273.29	273.26	273.99	273.83
5	274.10	273.40	273.91	274.17	274.28	274.21	274.10	273.59	273.80	273.26	274.01	273.81
6	273.59	273.40	273.96	274.13	274.31	274.19	274.15	273.59	273.84	273.48	274.02	273.77
7	273.24	273.40	273.97	274.15	274.26	273.50	274.20	273.59	273.80	273.46	274.02	273.83
8	273.22	273.89	273.99	274.19	274.25	274.19	274.19	273.96	274.02	273.97	273.81	273.84
9	273.21	273.91	274.04	274.21	274.34	273.50	274.14	274.07	273.89	273.26	274.01	273.68
10	273.21	273.93	274.04	274.21	274.28	273.54	274.14	274.13	274.01	273.91	273.16	273.80
11	273.26	273.91	274.04	274.21	274.31	273.63	274.11	274.07	273.89	274.01	273.30	273.62
12	273.29	273.90	274.04	274.23	274.31	273.50	274.10	274.11	273.77	273.45	273.29	273.21
13	273.29	273.91	274.04	274.20	274.29	274.05	274.07	274.15	274.07	273.29	273.86	273.89
14	273.96	273.93	274.11	274.15	273.74	273.99	274.07	274.15	274.05	273.29	273.89	273.96
15	273.90	273.93	274.04	274.19	273.77	273.40	274.15	273.97	273.26	274.01	273.11	273.99
16	273.95	273.96	274.13	274.21	273.77	274.04	274.13	273.45	273.27	274.04	273.06	273.68
17	273.96	273.95	274.07	274.23	273.72	274.07	274.10	273.44	273.32	273.83	273.09	273.69
18	273.99	274.13	274.10	273.69	273.69	274.10	273.60	273.44	273.53	273.80	273.09	273.68
19	274.08	273.78	274.08	273.74	273.70	274.11	273.59	273.39	273.16	273.97	273.11	273.65
20	273.95	273.90	274.10	273.74	273.72	274.05	273.57	274.02	273.44	273.97	274.04	273.65
21	273.96	273.95	274.08	273.70	274.25	273.87	273.59	273.50	273.29	274.02	273.26	273.68
22	273.96	273.96	274.10	273.70	274.08	274.07	274.15	274.05	273.14	274.07	273.27	273.70
23	274.01	273.96	274.14	273.70	274.20	274.04	273.59	274.02	273.35	274.02	273.30	273.15
24	273.96	273.95	274.07	274.25	274.21	274.07	274.14	273.93	273.39	273.95	273.29	273.15
25	273.86	273.96	274.13	274.25	274.21	274.10	274.14	273.89	273.33	273.29	273.24	273.27
26	273.91	273.97	274.20	274.23	274.19	274.07	274.10	273.87	273.48	273.77	273.12	273.26
27	273.77	273.97	274.13	274.17	274.23	274.04	274.11	274.08	273.65	273.48	273.29	273.24
28	273.74	273.96	273.63	274.23	274.04	273.56	274.15	273.93	273.27	273.48	273.74	273.29
29	273.95	273.89	273.63	274.31	274.21	273.62	274.17	274.01	273.65	273.50	273.81	273.97
30	274.13	273.86	273.69	274.28	---	273.60	274.19	273.39	273.75	273.51	273.80	273.38
31	273.89	---	273.66	274.25	---	273.50	---	273.36	---	273.89	273.77	---
MEAN	273.72	273.83	274.00	274.07	274.12	273.92	274.01	273.81	273.59	273.71	273.57	273.64
MAX	274.13	274.13	274.20	274.31	274.35	274.32	274.21	274.25	274.25	274.10	274.20	274.10
MIN	273.21	273.39	273.63	273.57	273.69	273.40	273.53	273.36	273.14	273.26	273.06	273.15

NON-PUMPING VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 05	274.10	DEC 01	274.07	FEB 01	274.35	MAY 01	274.25	AUG 01	274.20
OCT 30	274.13	DEC 23	274.14	MAR 01	274.32	JUN 01	274.25	SEP 01	274.10
NOV 01	274.13	JAN 03	274.21	APR 03	274.21	JUL 03	274.10		

Note: Non-pumping water levels are measured after all pumps in the pump chamber are turned off for 2 hours

213224158135901. Local number, 3-3213-06.

LOCATION.--Lat 21°32′24″, long 158°13′59″, Hydrologic Unit 20060000, along Farrington Highway, 1.2 mi north of Makua Cave, and 1 mi southeast of Yokohama Bay. Owner: U.S. Air Force.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled well, depth 50 ft, cased to 21 ft with 6-in. black steel pipe.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point is top of 6-in. casing, elevation is 26.47 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, October 1972 to current year.
Water quality: occasional measurements, 1965, 1967, February 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.92 ft above mean sea level, January 2, 1975; lowest measured, 6.49 ft above mean sea level, July 15, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 12	6.88	JAN 13	6.77	MAR 16	6.71	MAY 19	6.60	JUL 31	6.52	SEP 14	6.55

213327157524401. Local number, 3-3352-01.

LOCATION.--Lat 21°33′27″, long 157°52′43″, Hydrologic Unit 20060000, at mouth of Kahana Valley, and 700 ft southwest of Kamehameha Highway, Kahana. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 441 ft, 10-in. casing diameter, cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point is top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, April 1935 to 1990, 1992 to current year.
Water quality: occasional measurements, 1935 to 1991, 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, March 29, 1966; lowest measured, 11.83 ft above mean sea level, July 28 and September 14, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	12.03	JAN 14	12.21	MAR 08	12.30	MAY 18	11.91	JUL 28	11.83	SEP 14	11.83

213438158091101. Local number, 3-3409-16.

LOCATION.--Lat 21°34′36″, long 158°09′12″, Hydrologic Unit 20060000, 1.6 mi west of Waialua High School, 2.6 mi east of Mokuleia Beach Park along Farrington Highway. Owner: J. Mendonca.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 518 ft, cased to 440 ft, diameter 10-in. to 396 ft, 8-in. to 440 ft.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point is chiseled 1-1/2-in. square on concrete, 3.7 ft in front of door of well shelter, elevation is 8.48 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, December 1924 to current year.
Water quality: occasional measurements, 1924-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, January 16, 1969; lowest measured, 16.75 ft above mean sea level, August 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	17.76	JAN 20	17.56	APR 12	17.17	JUN 14	17.25	JUL 26	17.05	SEP 21	17.20

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34′46″, long 158°10′49″, Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Company, Inc.

AQUIFER.--Waianae Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 447 ft, 1-in. casing diameter, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point is top of recorder shelf over 12-in. stilling well, 20.53 ft above mean sea level. On June 14, 2000, measuring point was changed to top of 1 1/2 inch drain pipe at bottom of 12-inch stilling well, 14.50 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: water-level recorder, January 1963 to February 1972. Occasional measurements, January 1929 to December 1962, March 1972 to current year.
Water quality: occasional measurements, 1929 to 1985, 1989 to 1991, 1994 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.98 ft above mean sea level, January 5, 1969; lowest measured, 16.08 ft above mean sea level, August 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 15	18.17	JAN 04	17.91	APR 12	17.65	JUN 14	17.59	JUL 26	17.51	SEP 20	17.52

214053157570401. Local number, 3-4057-05.

LOCATION.--Lat 21°40′53″, long 157°57′04″, Hydrologic Unit 20060000, 0.4 mi northeast of Kahuku Hospital, and 500 ft north of Kahuku High School.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled flowing artesian well, depth 397 ft, 12-in. metal casing, cased to 172 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point is top of 10-in. standpipe, elevation is 16.01 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the USGS Hawaii District office.

PERIOD OF RECORD.--

Water level: water-level recorder, August 1958 to December 1990. Occasional measurements, March 1911 to May 1918, March 1921, January 1926 to August 1958, December 1990 to current year.
Water quality: occasional measurements, 1908, 1911-16, 1924-78.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.12 ft above mean sea level, January 1916; lowest measured, 8.00 ft above mean sea level, October 5, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	12.23	JAN 14	12.16	MAR 13	11.32	MAY 23	11.60	JUL 28	11.81	SEP 18	11.89

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41′25″, long 158°01′34″, Hydrologic Unit 20060000, 1,500 ft northeast of University of Hawaii agriculture experiment station in Waialee, and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Koolau Basalt, Pleistocene to Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, 8-in. casing diameter, cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point is top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of USGS Hawaii district office.

PERIOD OF RECORD.--Occasional measurements, February 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft above mean sea level, November 14, 1932; lowest measured, 10.97 ft above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 03	12.99	JAN 14	12.81	MAR 13	12.53	MAY 23	12.42	JUL 28	12.39	SEP 18	12.56

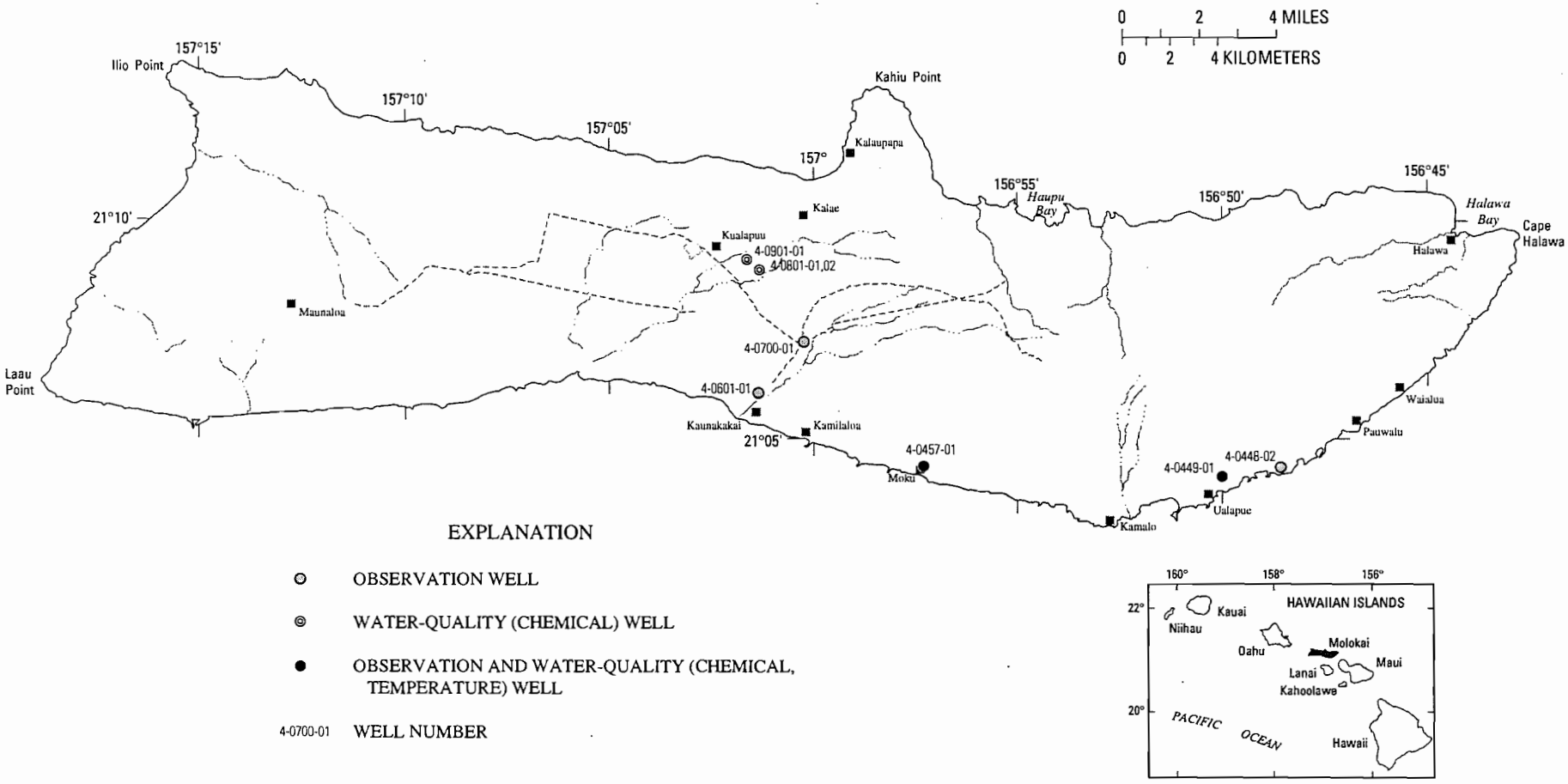


Figure 18. Locations of observation wells and ground-water quality sampling sites on Molokai.

210425156483001. Local number, 4-0448-02.

LOCATION.--Lat 21°04′25″, long 156°48′30″, Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 6 ft, depth 21 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point is top of 2 in. x 2 in. steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

PERIOD OF RECORD.--

Water level: water-level recorder, August 1970 to January 1973. Occasional measurements, February 1973 to current year.
Water quality: occasional measurements, 1970-73, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, November 26, 1970; lowest measured, 3.67 ft above mean sea level, February 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	4.25	NOV 30	4.20	FEB 1	4.23	APR 18	3.99	JUN 21	3.85	AUG 8	3.82
						APR 18	4.03				

210402156495801. Local number, 4-0449-01.

LOCATION.--Lat 21°04′02″, long 156°49′58″, Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point is top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply; water level affected by pumping.

PERIOD OF RECORD.--

Water level: occasional measurements, 1938-39, 1941-63, November 1972 to current year.
Water quality: occasional measurements, 1948, 1952-56, 1970-91, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, January 19, 1950; lowest measured, 2.09 ft above mean sea level, September 16, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	a	OCT 13	3.42	NOV 30	3.06	FEB 1	3.20	APR 19	3.04	JUN 21	2.96	AUG 8	2.70

a cannot access well, lock changed

210419156570501. Local number, 4-0457-01.

LOCATION.--Lat 21°04'19", long 156°57'05", Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 ft x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 229 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point is top of steel plate, 37.36 ft, above mean sea level.

REMARKS.--Water from this well is used for public supply. Water level measured after pump has been turned off for 30 minutes.

PERIOD OF RECORD.--
Water level: occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year.
Water quality: occasional measurements, 1948, 1954-56, 1960, 1962, 1971, 1973-91, 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.78 ft above mean sea level, February 5, 1991; lowest measured, 1.47 ft above mean sea level, June 24, 1955.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	a	NOV 30	a	FEB 1	a	APR 18	a	JUN 21	a	AUG 8	a

210605157012001. Local number, 4-0601-01.

LOCATION.--Lat 21°06'01", long 157°01'11", Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony. Owner: Molokai Ranch.

AQUIFER.--East Molokai Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, 12-in. casing diameter, cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point is top of 15-in. surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, May 1954 to current year.
Water quality: occasional measurements, 1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, January 20, 1969; lowest measured, 1.60 ft above mean sea level, December 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 12	2.80	NOV 30	2.76	FEB 1	2.47	APR 18	2.42	JUN 21	2.47	AUG 8	2.47

a unable to measure, obstruction at measuring point

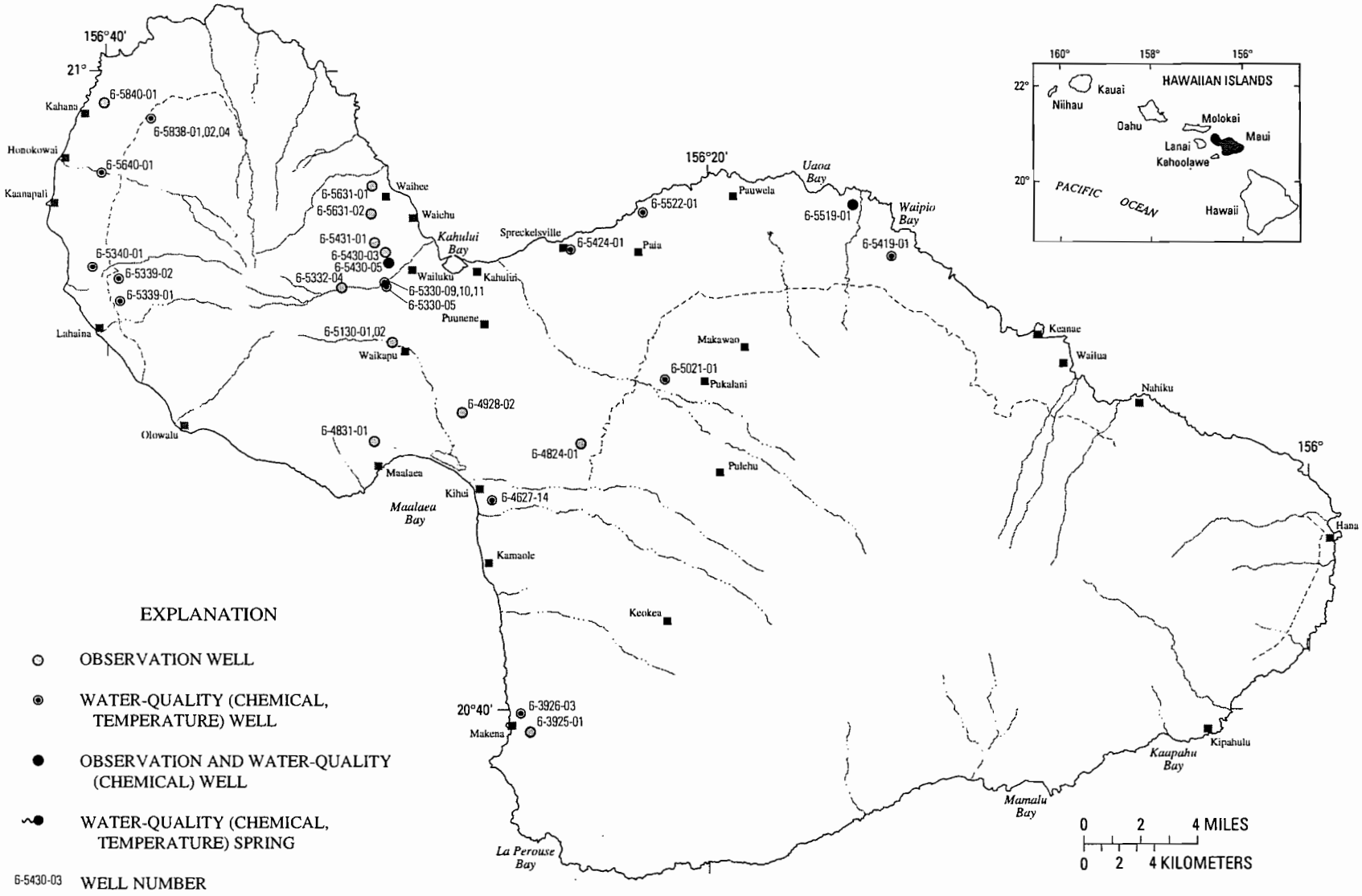


Figure 19. Locations of observation wells and ground-water quality sampling sites on Maui.

GROUND-WATER LEVELS

HAWAII, ISLAND OF MAUI

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39′12″, long 156°25′59″, Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena Roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, 8-in. casing diameter, cased to 343 ft, perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 351 ft. Measuring point is top of 2-in. pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, August 24, 1964; lowest measured, 0.45 ft below mean sea level, April 10, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	-0.09	FEB 10	-0.23	APR 10	-0.45	AUG 3	-0.36

204827156242201. Local number, 6-4824-01.

LOCATION.--Lat 20°48′27″, long 156°24′22″, Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa Gulch, and 4 mi east of Kihei. Owner: State of Hawaii.

AQUIFER.--Kula Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 646 ft, 12-in. casing diameter, cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point is top of 3-in. pipe attached to the steel casing cover, 594.74 ft above mean sea level.

REMARKS.--Water-quality records for 1971, 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1971, May 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.20 ft above mean sea level, January 17, 1974; lowest measured, 3.58 ft above mean sea level, June 14, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	3.99	NOV 23	4.00	JAN 31	3.96	APR 26	3.92	JUN 14	3.58	AUG 22	3.74

204818156310301. Local number, 6-4831-01.

LOCATION.--Lat 20°48′18″, long 156°31′03″, Hydrologic Unit 20020000, on sugar plantation road 0.7 mi north of Maalaea, and 0.9 mi southwest of intersection of Honoapiilani Highway and Kihei Road. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, 8-in. casing diameter, cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point is top of 8-in. casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974. Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, November 30, 1983; lowest measured, 4.66 ft above mean sea level, June 12, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 8	5.01	DEC 2	4.97	FEB 11	4.78	APR 10	4.68	JUN 12	4.66	AUG 4	4.67

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°49′09″, long 156°28′14″, Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Basalt, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 ft x 9 ft vertical shaft, depth 52 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point is top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.09 ft above mean sea level, January 12, 1980; lowest measured, 3.05 ft above mean sea level, March 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	3.46	DEC 2	3.53	FEB 11	3.40	APR 10	3.26	JUN 12	3.14	AUG 4	3.15

205140156304501. Local number, 6-5130-01.

LOCATION.--Lat 20°51′40″, long 156°30′45″, Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well, depth 757 ft, 8-in. casing diameter, cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point is top of 6-in. pipe coupling, 551.33 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.90 ft above mean sea level, October 13, 1982; lowest measured, 11.21 ft above mean sea level, April 4, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	12.27	JAN 4	12.08	APR 4	11.21	JUL 6	11.56
NOV 22	12.05	FEB 24	11.97	MAY 16	11.55	AUG 24	11.31

205154156303801. Local number, 6-5130-02.

LOCATION.--Lat 20°51′54″, long 156°30′38″, Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,020 ft, 20-in. casing diameter, cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point is top of casing, 519.33 ft above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, July 15, 1987; lowest measured, 11.30 ft above mean sea level, August 24, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	12.48	JAN 4	12.66	APR 4	11.73	JUL 6	11.41
NOV 22	12.53	FEB 24	12.19	MAY 16	11.58	AUG 24	11.30

205305156304401. Local number, 6-5330-05.

LOCATION.--Lat 20°53′05″, long 156°30′44″, Hydrologic Unit 20020000, 1,500 ft southwest of Wailuku Elementary School, 1,500 ft southeast of Maui DWS water tank near intersection of Wailuku Heights Road and Iao Valley Road.

AQUIFER.--Wailuku Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Three drilled wells in vault, at bottom of excavated inclined shaft. Vault floor about 32 ft above mean sea level, well nearest inclined shaft is measured. Depth 310 ft below vault floor, casing length unknown.

DATUM.--Elevation of land-surface datum is 401.51 ft. Datum of vault floor is 32.14 ft. Measuring point is the edge of steel plate, inside access hole cut through pump base casing, at cement floor level, 32.17 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, February 1996 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 16.33 ft above mean sea level, April 22, 1997; lowest measured, 8.51 ft above mean sea level, August 24, 2000.

REMARKS.--Water level affected by pumping of adjacent well in shaft, and by other nearby wells.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	14.25	DEC 10	15.17	JAN 20	11.97	APR 4	9.89	JUL 6	8.90
DEC 3	15.04	JAN 5	12.85	FEB 24	10.90	MAY 23	9.45	AUG 24	8.51

205329156305502. Local number, 6-5330-09.

LOCATION.--Lat 20°53′29″, long 156°30′55″, Hydrologic Unit 20020000, 05 mi northwest of Wailuku and 0.6 mi west on Mokuhau Road from Market Street. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well. Depth 600 ft, 18-in. casing diameter, length of casing 411 ft.

DATUM.--Elevation of land-surface datum is 354 ft. Measuring point is top of 1 1/2-in. plug, 353.79 ft above mean sea level.

PERIOD OF RECORD.--Chloride samples collected since 1972. Pump removed sometime in 1998 (Sept., Oct., Nov.). Water-level measurements began December 1, 1998.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.04 ft above mean sea level, March 5, 1999; lowest measured, 3.88 ft above mean sea level, August 24, 1999.

REMARKS.--Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	3.97	JAN 4	7.89	FEB 16	9.31	MAY 16	5.82	AUG 24	6.42
NOV 22	4.74	JAN 4	7.90	APR 4	8.61	JUL 6	6.59		

205312156321402. Local number, 6-5332-04.

LOCATION.--Lat 20°53′12″, long 156°32′14″, Hydrologic Unit 20020000, 1.9 mi southwest of Puuohala Village, 1.9 mi west of Wailuku Elementary School, and 10 ft from well 6-5332-04. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 254 ft.

DATUM.--Elevation of land-surface datum is 713 ft. Measuring point is top of 2-in. PVC pipe.

PERIOD OF RECORD.--Occasional measurements, October 1991 to current year. Prior to October 1995, unpublished records are in the files of the U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 39.41 ft below land-surface datum, July 1, 1996; lowest measured, 83.20 ft below land-surface datum, July 6, 2000.

REMARKS.--Water level affected by pumping of nearby well.

WATER LEVEL, IN FEET BELOW LAND-SURFACE DATUM, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	81.26	JAN 4	82.50	APR 4	82.12	MAY 16	69.95	MAY 16	82.16	AUG 24	81.30
NOV 19	82.40	FEB 24	82.69	MAY 16	70.95	MAY 16	81.97	JUL 6	83.20		

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54′19″, long 156°30′44″, Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 580 ft, 1.5-in. PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point is top of 1-in. galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984. Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, December 31, 1982; lowest measured, 9.08 ft above mean sea level, October 1, 1999.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	9.08	JAN 4	10.84	APR 4	11.12	JUL 6	10.15
NOV 19	9.52	FEB 16	11.71	MAY 16	11.03	AUG 24	9.98

205405156305401. Local number, 6-5430-05.

LOCATION.--Lat 20°54′59″, long 156°30′54″, Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,400 ft, 10-in. casing diameter, cased to 400 ft.

DATUM.--Elevation of land-surface datum is 380 ft. Measuring point is top of 10-in. casing, 380.84 ft above mean sea level.

PERIOD OF RECORD.--

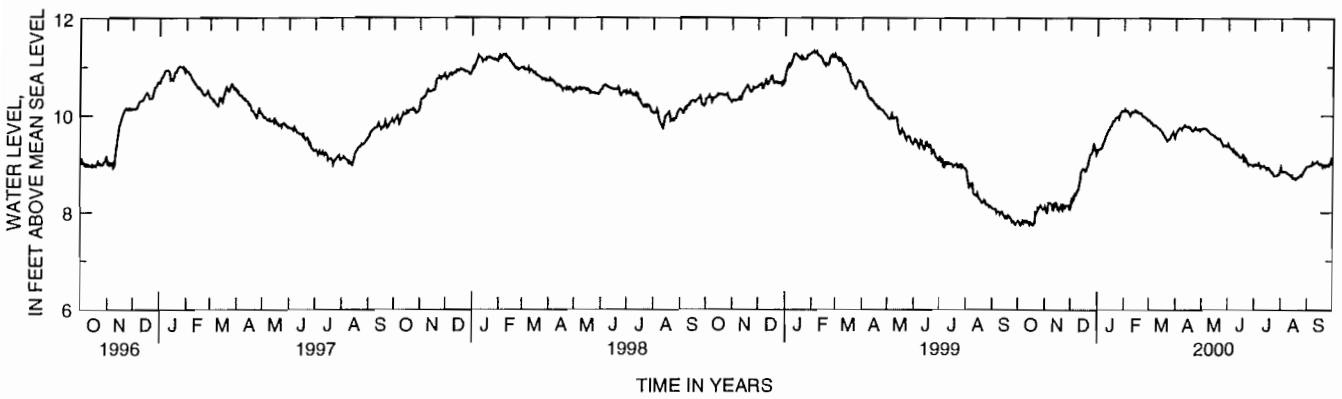
Water level: occasional measurements, August 1983 to May 1986. Water-level recorder, June 1986 to current year.
Water quality: 1982, 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft above mean sea level, December 14, 1989; lowest measured, 7.66 ft above mean sea level, October 18, 1999.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.83	8.12	8.11	9.24	10.10	9.91	9.63	9.73	9.42	8.98	8.93	8.95
2	7.82	8.05	8.25	9.30	10.13	9.89	9.67	9.74	9.37	9.00	8.86	8.95
3	7.76	8.00	8.22	9.30	10.09	9.85	e9.69	9.73	9.34	8.99	8.84	8.97
4	e7.74	8.00	8.31	9.31	10.09	9.86	9.72	9.74	9.33	8.98	8.85	8.97
5	7.79	8.19	8.28	9.31	10.10	9.82	9.74	9.73	9.32	e9.00	8.85	8.97
6	7.82	8.19	8.41	e9.34	10.07	9.80	9.75	9.73	9.28	9.02	8.84	8.98
7	7.78	8.20	8.34	9.40	10.05	9.81	9.74	9.70	9.30	8.98	8.84	9.03
8	7.83	8.19	8.41	9.43	10.01	9.81	9.72	9.70	9.25	8.94	8.83	9.00
9	7.83	8.16	e8.46	9.48	10.04	9.80	9.75	9.67	9.26	8.97	8.81	9.02
10	7.81	8.09	8.46	9.54	10.08	9.78	9.78	9.66	9.21	8.96	8.80	9.02
11	7.83	8.15	8.57	9.57	10.07	9.76	9.81	9.63	9.23	8.96	8.79	9.03
12	7.82	8.08	8.67	9.63	10.08	9.74	9.81	9.62	9.20	8.97	8.76	9.04
13	7.78	8.12	8.82	9.67	10.08	9.74	9.78	9.62	9.19	8.94	8.75	9.05
14	7.75	8.20	8.86	9.69	10.11	9.71	9.78	9.61	9.15	8.94	8.77	9.02
15	7.80	8.20	8.89	9.72	10.10	9.70	9.77	9.60	9.14	8.90	8.71	9.00
16	7.79	8.08	8.90	9.77	10.07	9.67	9.78	9.58	9.14	8.92	8.72	9.01
17	7.75	8.10	8.89	9.78	10.08	9.64	9.77	9.56	9.17	8.93	8.71	9.01
18	7.74	8.05	8.85	9.82	10.06	9.61	9.75	9.56	9.21	8.90	8.69	8.98
19	7.75	8.10	8.86	9.88	10.06	9.57	9.72	9.54	9.06	8.89	8.71	8.95
20	7.81	8.14	8.92	9.89	10.06	9.56	9.70	9.52	9.06	8.85	8.71	8.99
21	8.00	8.08	8.96	9.89	10.03	9.51	9.69	9.53	9.12	8.82	8.73	8.99
22	7.98	8.02	9.05	9.94	10.00	9.49	9.71	9.53	9.08	8.83	8.74	8.95
23	8.01	8.15	9.15	9.96	9.99	9.51	9.73	9.50	9.03	8.79	e8.76	8.97
24	8.10	8.13	9.19	9.97	9.99	9.51	9.75	9.47	8.99	8.76	8.78	8.97
25	8.08	8.10	9.21	9.98	9.97	9.54	9.72	9.43	9.01	8.76	8.76	8.99
26	8.10	8.14	9.22	9.94	9.96	9.56	9.71	9.38	9.00	8.76	8.79	8.97
27	8.14	8.14	9.32	10.00	9.95	9.61	e9.72	9.38	9.00	8.76	8.83	8.99
28	8.11	8.13	9.42	10.06	9.92	9.63	9.73	9.39	8.99	8.79	8.86	9.06
29	8.08	8.14	9.36	10.08	9.90	9.66	9.70	9.39	8.99	8.78	8.89	9.12
30	8.06	8.05	9.27	10.10	---	9.60	9.72	9.37	8.97	8.80	8.91	9.11
31	8.08	---	9.20	10.09	---	9.56	---	9.38	---	8.87	8.95	---
MEAN	7.89	8.12	8.80	9.71	10.04	9.68	9.73	9.57	9.16	8.89	8.80	9.00
MAX	8.14	8.20	9.42	10.10	10.13	9.91	9.81	9.74	9.42	9.02	8.95	9.12
MIN	7.74	8.00	8.11	9.24	9.90	9.49	9.63	9.37	8.97	8.76	8.69	8.95

e Estimated



205437156310501. Local number, 6-5431-01.

LOCATION.--Lat 20°54′37″, long 156°31′05″, Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 555 ft, 1.5-in. PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

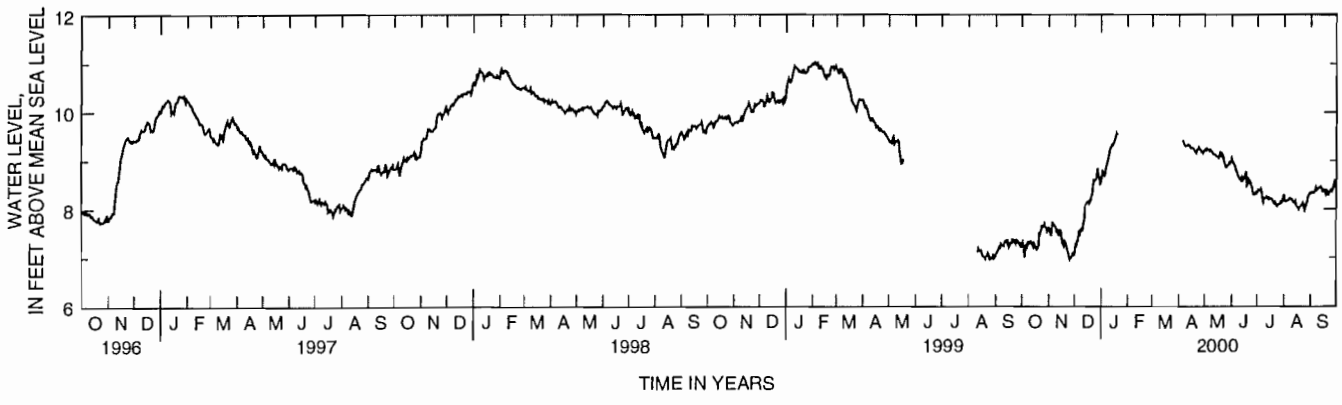
DATUM.--Elevation of land-surface datum is 493 ft. Measuring point is top of 1.5-in. PVC casing, 492.51 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, January 2, 1983; lowest measured, 6.86 ft above mean sea level, November 26, 1999.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.25	7.63	7.11	8.59	---	---	---	9.20	9.04	8.35	8.30	8.34
2	7.30	7.54	7.29	8.71	---	---	---	9.23	8.99	8.39	8.17	8.33
3	7.22	7.47	7.21	8.78	---	---	---	9.21	8.94	8.38	8.16	8.35
4	7.01	7.47	7.35	8.75	---	---	---	9.24	8.92	8.38	8.17	8.35
5	7.15	7.73	7.35	8.67	---	---	9.38	9.22	8.88	8.41	8.18	8.34
6	7.28	7.68	7.56	8.76	---	---	9.39	9.22	8.79	8.36	8.18	8.37
7	7.23	7.68	7.44	8.86	---	---	9.36	9.20	8.79	8.19	8.21	8.44
8	7.32	7.65	7.58	8.93	---	---	9.31	9.22	8.71	8.15	8.22	8.39
9	7.33	7.60	7.59	9.00	---	---	9.30	9.19	8.68	8.23	8.20	8.42
10	7.29	7.51	7.54	9.10	---	---	9.31	9.18	8.63	8.22	8.20	8.42
11	7.33	7.59	7.70	9.19	---	---	9.32	9.14	8.64	8.24	8.17	8.44
12	7.31	7.47	7.79	9.27	---	---	9.33	9.13	8.60	8.25	8.14	8.45
13	7.26	7.46	8.04	9.27	---	---	9.31	9.12	8.65	8.22	8.13	8.46
14	7.22	7.57	8.09	9.33	---	---	9.29	9.11	8.56	8.23	8.16	8.41
15	7.29	7.52	8.13	9.32	---	---	9.25	9.08	8.62	8.20	8.07	8.37
16	7.26	7.31	8.15	9.37	---	---	9.26	9.08	8.66	8.22	8.05	8.40
17	7.20	7.27	8.16	9.42	---	---	9.25	9.06	8.72	8.22	8.03	8.39
18	7.17	7.23	8.12	9.48	---	---	9.24	9.10	8.77	8.19	8.00	8.35
19	7.19	7.34	8.16	9.56	---	---	9.20	9.18	8.48	8.18	8.04	8.31
20	7.24	7.32	8.23	9.53	---	---	9.18	9.10	8.50	8.13	8.04	8.38
21	7.53	7.25	8.29	---	---	---	9.16	9.13	8.61	8.11	8.07	8.36
22	7.49	7.15	8.45	---	---	---	9.22	9.07	8.58	8.14	8.08	8.28
23	7.55	7.12	8.59	---	---	---	9.24	8.98	8.53	8.07	8.12	8.36
24	7.65	7.03	8.57	---	---	---	9.27	8.91	8.48	8.06	8.05	8.37
25	7.63	6.97	8.60	---	---	---	9.23	8.87	8.43	8.09	7.99	8.40
26	7.64	7.01	8.60	---	---	---	9.22	8.87	8.31	8.09	8.04	8.37
27	7.69	7.00	8.74	---	---	---	9.18	8.90	8.30	8.11	8.13	8.41
28	7.63	7.05	8.84	---	---	---	9.19	8.92	8.30	8.15	8.15	8.51
29	7.60	7.11	8.72	---	---	---	9.16	8.96	8.34	8.13	8.26	8.60
30	7.54	7.03	8.60	---	---	---	9.19	8.94	8.32	8.15	8.28	8.60
31	7.58	---	8.50	---	---	---	---	8.97	---	8.23	8.33	---
MEAN	7.37	7.36	8.04	---	---	---	---	9.09	8.63	8.21	8.14	8.40
MAX	7.69	7.73	8.84	---	---	---	---	9.24	9.04	8.41	8.33	8.60
MIN	7.01	6.97	7.11	---	---	---	---	8.87	8.30	8.06	7.99	8.28



205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56′17″, long 156°31′11″, Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-in. PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point is top of 1.5-in. PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, December 6, 1982; lowest measured, 11.10 ft above mean sea level, August 24, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	11.17	JAN 4	11.48	APR 4	11.52	JUL 6	11.31
NOV 19	11.15	FEB 16	11.91	MAY 16	11.51	AUG 24	11.10

205651156313201. Local number, 6-5631-02.

LOCATION.--Lat 20°56′51″, long 156°31′32″, Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Basalt, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, 16-in. casing diameter, cased to 290 ft, perforated from 290 to 310 ft.

DATUM.--Elevation of land-surface datum is 281 ft. Measuring point is top of 16-in. casing, 285.23 ft above mean sea level (revised November 1997).

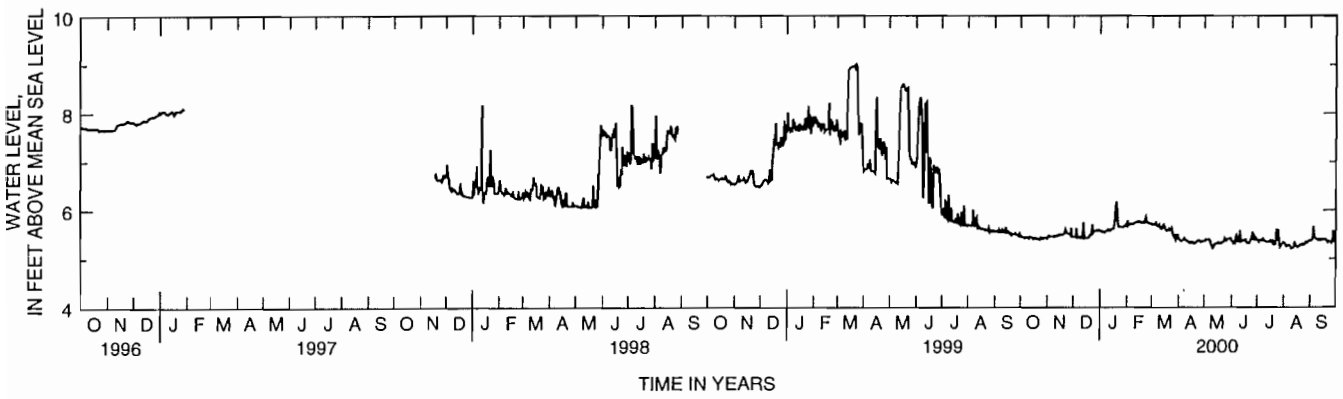
PERIOD OF RECORD.--Water-level recorder, April 1988 to January 29, 1997. Recorder removed due to installation of pump in the well. Water-level recorder reinstalled November 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.05 ft above mean sea level, October 22, November 2, 10, 11, 1989; lowest water level measured, 7.59 ft above mean sea level, November 8, 9, 1996. Lowest water level measured after pumping resumed, 5.00 ft above mean sea level, August 1, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.46	5.42	5.45	5.57	5.68	5.70	5.40	5.36	5.36	5.38	5.33	5.38
2	5.47	5.45	5.45	5.57	5.78	5.71	5.39	5.36	5.36	5.37	5.32	5.37
3	5.44	5.47	5.44	5.56	5.69	5.71	5.38	5.39	5.32	5.35	5.28	5.38
4	5.44	5.45	5.44	5.55	5.71	5.71	5.36	5.39	5.35	5.38	5.26	5.40
5	5.44	5.46	5.62	5.56	5.70	5.70	5.37	5.38	5.33	5.38	5.25	5.66
6	5.42	5.46	5.43	5.54	5.72	5.75	5.38	5.38	5.47	5.37	5.27	5.43
7	5.43	5.46	5.44	5.54	5.72	5.68	5.39	5.39	5.49	5.38	5.27	5.42
8	5.43	5.46	5.43	5.56	5.71	5.67	5.41	5.37	5.35	5.40	5.27	5.41
9	5.44	5.45	5.45	5.58	5.72	5.66	5.39	5.29	5.35	5.38	5.25	5.40
10	5.43	5.47	5.43	5.57	5.73	5.69	5.37	5.25	5.35	5.36	5.21	5.39
11	5.42	5.47	5.46	5.60	5.74	5.63	5.36	5.22	5.57	5.36	5.22	5.38
12	5.45	5.46	5.42	5.59	5.75	5.62	5.35	5.23	5.35	5.34	5.22	5.39
13	5.44	5.48	5.74	5.58	5.76	5.61	5.34	5.29	5.36	e5.34	5.23	5.40
14	5.44	5.49	5.42	5.60	5.75	5.68	5.32	5.30	5.36	5.34	5.35	5.38
15	5.43	5.48	5.43	5.61	5.77	5.69	5.33	5.31	5.37	5.34	5.28	5.39
16	5.41	5.50	5.42	5.61	5.75	5.66	5.33	5.31	5.38	5.36	5.25	5.40
17	5.43	5.49	5.42	5.63	5.76	5.59	5.34	5.33	5.37	5.37	5.24	5.40
18	5.43	5.49	5.43	5.75	5.74	5.59	5.33	5.31	5.38	5.35	5.25	5.40
19	5.41	5.50	5.44	6.07	5.74	5.57	5.31	5.31	5.33	5.32	5.25	5.40
20	5.41	5.50	5.47	6.17	5.75	5.59	5.32	5.33	5.32	5.36	5.27	5.39
21	5.40	5.53	5.50	5.89	5.74	5.61	5.33	5.32	5.33	5.29	5.29	5.36
22	5.40	5.60	5.50	5.67	e5.80	5.58	5.34	5.34	5.32	5.29	5.29	5.34
23	5.41	5.56	5.70	5.66	5.85	5.59	5.36	5.35	5.36	5.31	5.28	5.36
24	5.40	5.52	5.54	5.66	5.75	5.62	5.37	5.41	5.39	5.59	5.31	5.36
25	5.43	5.52	5.57	5.65	5.74	5.52	5.37	5.39	5.45	5.59	5.29	5.35
26	5.42	5.52	5.57	5.65	5.74	5.47	5.36	5.37	5.54	5.58	5.30	5.33
27	5.41	5.50	5.57	5.65	5.72	5.44	5.34	5.40	5.37	5.30	5.34	5.35
28	5.43	5.48	5.59	5.65	5.72	5.47	5.34	5.40	5.44	5.24	5.33	5.57
29	5.43	5.63	5.57	5.67	5.71	5.39	5.35	5.40	5.40	5.27	5.34	5.35
30	5.43	5.45	5.59	5.67	---	5.45	5.36	5.41	5.42	5.29	5.36	5.35
31	5.43	---	5.59	5.70	---	5.50	---	5.41	---	5.32	5.37	---
MEAN	5.43	5.49	5.50	5.66	5.74	5.61	5.36	5.35	5.38	5.36	5.28	5.40
MAX	5.47	5.63	5.74	6.17	5.85	5.75	5.41	5.41	5.57	5.59	5.37	5.66
MIN	5.40	5.42	5.42	5.54	5.68	5.39	5.31	5.22	5.32	5.24	5.21	5.33

e Estimated



205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58′56″, long 156°40′01″, Hydrologic Unit 20020000, on pineapple plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanics, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, 8-in. casing diameter, cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft, but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point is top of 9-in. casing, 257.45 ft above mean sea level. Levels of August 11, 1993.

REMARKS.--Water-quality records for 1964 and 1980 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water-level recorder, August 1975 to June 25, 1993. Occasional measurements, July 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, September 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	3.16	FEB 3	2.73	JUN 8	2.71
DEC 17	2.93	APR 14	2.68	JUL 31	2.62

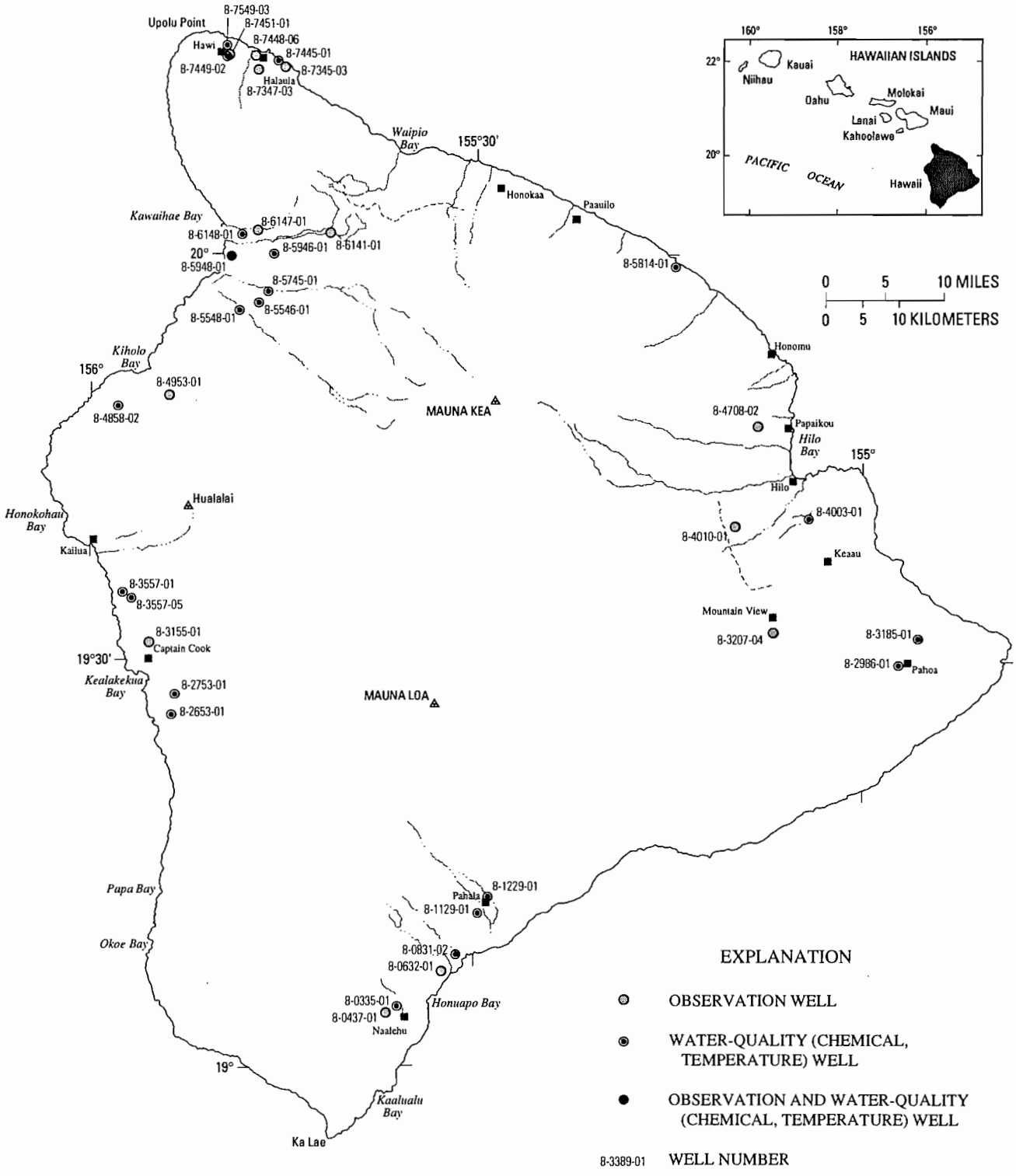


Figure 20. Locations of observation wells and ground-water quality sampling sites on Hawaii.

190423155371501. Local number, 8-0437-01.

LOCATION.--Lat 19°04′23″, long 155°37′15″, Hydrologic Unit 20010000, 2,500 ft northwest of Waiohinu. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 972 ft, 4-in. casing diameter, cased to 240 ft, screened from 240 to 972 ft.

DATUM.--Elevation of land-surface datum is 1,299 ft. Measuring point is top of 4-in. casing, 1,299.83 ft above mean sea level.

PERIOD OF RECORD.--

Water level: occasional measurements, September 1995, September 1997 to current year.
Water quality: October 1994.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1,014.57 ft above mean sea level, September 23, 1997; lowest measured, 1,012.17 ft above mean sea level, October 25, 1999.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	1012.17	APR 13	1012.90	JUL 21	1012.23
JAN 27	1013.34	JUN 05	1012.52		

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06′02″, long 155°32′59″, Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 140 ft, 14-in. casing diameter, cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point is 0.38 ft above 1-in. hole in pump base, 103.64 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of the Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, April 1972 to current year.
Water quality: occasional measurements, 1994-97.

REVISED RECORDS.--WDR HI-91-1: 1984-90 (The units of the minimum water level for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.39 ft above mean sea level, October 19, 1978; lowest measured, 0.15 ft above mean sea level, May 26, 1998.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	.94	APR 13	.70	JUL 21	1.05
JAN 27	.81	JUN 05	.57		

193117155550801. Local number, 8-3155-01.

LOCATION.--Lat 19°31′17″, long 155°55′08″, Hydrologic Unit 20010000, 0.3 mi east of Kealakekua Post Office and 0.6 mi north of Konawaena High School. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,510 ft, 4-in. casing diameter, cased to 1,500 ft perforated from 1,250 to 1,500 ft.

DATUM.--Elevation of land-surface datum is 1,745 ft. Measuring point is top of aluminum cap on 4-in. casing, 1,745.70 ft above mean sea level.

REMARKS.--Water level may be affected by pumping well 50 ft away.

PERIOD OF RECORD.--Water level: occasional measurements, April 1992 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 469.06 ft above mean sea level, December 18, 1997; lowest measured, 463.89 ft above mean sea level, July 20, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	467.25	APR 12	465.15	JUL 20	463.89
FEB 01	(a)	JUN 06	464.46		

193251155072101. Local number, 8-3207-04.

LOCATION.--Lat 19°32′51″, long 155°07′21″, Hydrologic Unit 20010000, 1.4 mi southwest of Mountain View. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,143 ft, 4-in. casing and 8-in. casing diameter, from 0 to 75 ft, cased to 660 ft slotted from 660 to 1,120 ft, solid from 1,120 to 1,143 ft. Hole caved from 1,143 to 1,155 ft; hole grouted to 95 ft.

DATUM.--Elevation of land-surface datum is 1,687 ft. Measuring point is top of casing, 1,687.84 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, March 1995, December 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1,013.58 ft above mean sea level, May 19, 1999; lowest measured, 982.87 ft above mean sea level, May 26, 1998.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	992.55	APR 06	996.25	JUL 21	986.90
JAN 27	990.14	JUN 09	990.06		

(a) Well casing covering observation well.

194035155102201. Local number, 8-4010-01.

LOCATION.--Lat 19°40′35″, long 155°10′22″, Hydrologic Unit 20010000, 2 mi west of Kaumana at western end of Kaumana Estates subdivision. Owner: U.S. Geological Survey.

AQUIFER.--Kau Basalt, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,375 ft, 4-in. casing diameter, cased to 732 ft, screened from 732 to 1,375 ft.

DATUM.--Elevation of land-surface datum is 1,796 ft. Measuring point is top of 4-in. casing, 1,796.29 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, February 1995, January 1998 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 982.10 ft above mean sea level, November 8, 1999; lowest measured, 962.17 ft above mean sea level, January 21, 1999.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 13	980.81	DEC 07	980.59	FEB 10	979.67	APR 20	979.37	JUN 01	978.97	SEP 26	973.43
NOV 08	982.10	JAN 05	980.22	MAR 06	979.49	MAY 16	979.17	JUL 24	977.31		

194731155080401. Local number, 8-4708-02.

LOCATION.--Lat 19°47′31″, long 155°08′04″, Hydrologic Unit 20010000, 3.0 mi up Kaie'ie Road near DWS water tank and 2.6 mi west-northwest of Papaikou Post Office. Owner: U.S. Geological Survey.

AQUIFER.--Hamakua Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,030 ft, 4-in. casing diameter, cased to 790 ft, perforated section 790 to 1,030 ft.

DATUM.--Elevation of land-surface datum is 1,140 ft. Measuring point is top of 4-in. casing, 1,135.08 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, June 1998 to current year.
Water quality: aquifer test, November 1997, in files of Hawaii District office.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 145.37 ft above mean sea level, January 24, 2000; lowest measured, 145.03 ft above mean sea level, April 11, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	(a)	JAN 24	145.37	JUN 01	145.11
NOV 02	145.19	APR 11	145.03	JUL 19	145.10

(a) Equipment problem. No measurement taken.

194945155534401. Local number, 8-4953-01.

LOCATION.--Lat 19°49′45″, long 155°53′44″, Hydrologic Unit 20010000, 2.7 mi inland from Kiholo Bay. Owner: State of Hawaii.

AQUIFER.--Hualalai Volcanics, Holocene and Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 971 ft, 12-in. casing diameter, cased to 926 ft, screened from 926 to 966 ft.

DATUM.--Elevation of land-surface datum is 931.65 ft. Measuring point is top of 7 1/4 in. (O.D.) casing, 932.48 ft above mean sea level.

REMARKS.--State exploratory well drilling program.

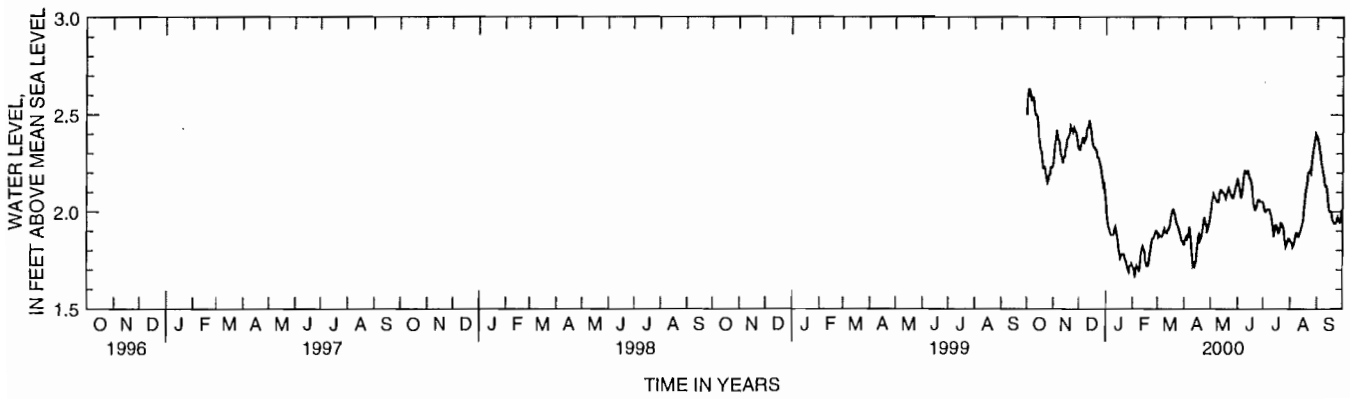
PERIOD OF RECORD.--

Water level: occasional measurements, June 1972 to September 1999; continuous water-level measurements September 30, 1999 to current year.
Water quality: 1972.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.85 ft above mean sea level, June 6, 1972 (data from Hawaii State Department of Land and Natural Resources, Circular C63, 1973); lowest measured, 1.58 ft above mean sea level, January 27, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.50	2.25	2.32	2.05	1.72	1.89	1.83	1.98	2.17	2.04	1.85	2.39
2	2.60	2.29	2.32	1.98	1.71	1.87	1.86	2.01	2.15	2.01	1.84	2.37
3	2.63	2.35	2.34	1.95	1.69	1.88	1.87	2.05	2.12	2.00	1.84	2.35
4	2.63	2.37	2.36	1.92	1.66	1.87	1.85	2.07	2.09	2.00	1.82	2.32
5	2.61	2.42	2.38	1.91	1.71	1.87	1.87	2.09	2.07	2.01	1.83	2.29
6	2.57	2.39	2.38	1.89	1.72	1.87	1.89	2.08	2.09	2.01	1.85	2.25
7	2.59	2.37	2.36	1.88	1.71	1.88	1.92	2.07	2.13	2.01	1.88	2.23
8	2.59	2.36	2.37	1.88	1.70	1.90	1.88	2.06	2.17	2.01	1.89	2.20
9	2.57	2.32	2.38	1.88	1.69	1.91	1.82	2.05	2.21	1.99	1.89	2.18
10	2.52	2.29	2.43	1.88	1.73	1.89	1.77	2.05	2.21	1.98	1.87	2.14
11	2.50	2.28	2.43	1.91	1.78	1.89	1.72	2.05	2.20	1.95	1.87	2.13
12	2.50	2.25	2.45	1.92	1.81	1.89	1.73	2.09	2.21	1.91	1.89	2.13
13	2.49	2.28	2.47	1.90	1.82	1.91	1.72	2.11	2.21	1.87	1.90	2.10
14	2.45	2.28	2.44	1.88	1.81	1.91	1.74	2.11	2.19	1.89	1.92	2.04
15	2.40	2.32	2.41	1.85	1.80	1.92	1.78	2.10	2.17	1.93	1.93	2.01
16	2.35	2.33	2.37	1.81	1.75	1.95	1.83	2.10	2.17	1.93	1.96	2.00
17	2.32	2.37	2.34	1.78	1.73	1.98	1.87	2.09	2.15	1.92	2.01	2.00
18	2.31	2.38	2.33	1.76	1.72	2.00	1.88	2.08	2.12	1.89	2.06	2.00
19	2.27	2.39	2.33	1.77	1.72	2.01	1.85	2.07	2.08	1.89	2.10	1.96
20	2.22	2.40	2.32	1.78	1.73	2.01	1.86	2.09	2.03	1.90	2.12	1.95
21	2.23	2.44	2.32	1.78	1.78	1.98	1.88	2.11	2.01	1.94	2.15	1.94
22	2.23	2.43	2.28	1.78	1.80	1.96	1.91	2.12	2.01	1.94	2.20	1.94
23	2.20	2.42	2.28	1.76	1.84	1.94	1.95	2.11	2.02	1.93	2.20	1.94
24	2.17	2.41	2.27	1.75	1.86	1.93	1.97	2.09	2.05	1.92	2.21	1.96
25	2.15	2.43	2.25	1.74	1.86	1.92	1.95	2.08	2.06	1.89	2.20	1.97
26	2.16	2.42	2.23	1.71	1.87	1.90	1.93	2.07	2.06	1.85	2.24	1.95
27	2.19	2.41	2.20	1.70	1.88	1.89	1.89	2.07	2.05	1.82	2.29	1.95
28	2.19	2.40	2.17	1.69	1.90	1.87	1.91	2.09	2.05	1.83	2.32	1.94
29	2.23	2.36	2.13	1.72	1.90	1.85	1.93	2.11	2.05	1.84	2.35	2.00
30	2.23	2.33	2.14	1.72	---	1.85	1.95	2.13	2.05	1.86	2.38	2.01
31	2.23	---	2.10	1.73	---	1.83	---	2.15	---	1.86	2.40	---
MEAN	2.38	2.36	2.32	1.83	1.77	1.91	1.86	2.08	2.11	1.93	2.04	2.09
MAX	2.63	2.44	2.47	2.05	1.90	2.01	1.97	2.15	2.21	2.04	2.40	2.39
MIN	2.15	2.25	2.10	1.69	1.66	1.83	1.72	1.98	2.01	1.82	1.82	1.94



195947155485801. Local number, 8-5948-01.

LOCATION.--Lat 19°59′47″, long 155°48′58″, Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 268 ft, 10-in. casing diameter, cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point is hole in pump base, 246.62 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation, water level affected by pumping.

PERIOD OF RECORD.--
Water level: occasional measurements, April 1970, March 1973 to current year.
Water quality: occasional measurements, 1970, 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1976-80 (water-level data), 1976-90 (extremes for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.83 ft above mean sea level, August 29, 1994; lowest measured, 1.38 ft above mean sea level, September 28, 1979.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	3.19	APR 11	2.75	JUL 20	3.01
FEB 01	2.87	JUN 07	3.15		

200143155414201. Local number, 8-6141-01.

LOCATION.--Lat 20°01′43″, long 155°41′42″, Hydrologic Unit 20010000, 2.6 mi west of Kamuela Post Office. Owner: U.S. Geological Survey.

AQUIFER.--Hawi Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,507 ft, 4-in. diameter steel casing, cased to 1,260 ft, 4-inch slotted casing from 1,260 to 1,507 ft.

DATUM.--Elevation of land-surface datum is 2,506.38 ft. Measuring point is paint mark at top of 4-inch casing at 2,507.00 ft above mean sea level.

REMARKS.--Drilling completed August 6, 1999.

PERIOD OF RECORD.--Water level: September 1999 to present.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 1,245.37 ft, November 2, 1999; lowest measured, 1,244.84 ft, July 19, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 28	(a)	JAN 31	1,244.97	JUN 08	1,244.87
NOV 02	1,245.37	APR 11	1,244.90	JUL 19	1,244.84

(a) Equipment problem. No measurement taken.

200132155471101. Local number, 8-6147-01.

LOCATION.--Lat 20°01′32″, long 155°47′11″, Hydrologic Unit 20010000, on Highway 26, 3.1 mi east of Kawaihae, and 2.8 mi northeast of Hapuna Beach Park. Owner: State of Hawaii.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 1,008 ft, 8-in. casing diameter, cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft, but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point is top of pipe coupling on casing cover 983.08 ft (revised, November 18, 1986) above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of Hawaii District office.

PERIOD OF RECORD.--

Water level: occasional measurements, June to July 1963, June 1973 to current year.
Water quality: occasional measurements, 1994-97.

REVISED RECORDS.--WRD HI-91-1: 1975-90 (Station ID number).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.23 ft above mean sea level, May 1, 1987; lowest measured, 4.66 ft above mean sea level, May 3, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	5.31	APR 11	5.02	JUL 20	5.01
FEB 01	5.07	JUN 07	5.21		

201307155452001. Local number, 8-7345-03.

LOCATION.--Lat 20°13′07″, long 155°45′20″, Hydrologic Unit 20010000, 8.5 mi east of Hawi. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 495 ft, 8-in. casing diameter, cased to 440 ft, open hole 440 to 495 ft.

DATUM.--Elevation of land-surface datum is 396 ft. Measuring point is top of casing, 395.75 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, April 1990 to September 1995, December 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.75 ft above mean sea level, April 25, 1990; lowest measured, 8.82 ft above mean sea level, July 1, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	(a)	APR 11	(a)	JUL 20	(a)
JAN 31	(a)	JUN 07	(a)		

201347155470501. Local number, 8-7347-03.

LOCATION.--Lat 20°13′43″, long 155°46′54″, Hydrologic Unit 20010000, near intersection of Highway 270 and Kauhola Point Lighthouse Road and 40 ft north of Kohala Sugar Company Halaula well. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 405 ft, 8-in. casing diameter, cased to 80 ft, open hole 80 to 405 ft.

DATUM.--Elevation of land-surface datum is 340.5 ft. Measuring point is top of casing, 340.99 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, July 1989, July 1990 to December 1990, September 1999 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 14.03 ft above mean sea level, September 10, 1990; lowest measured, 8.32 ft above mean sea level, July 19, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	8.86	APR 11	8.46	JUL 19	8.32
JAN 31	8.84	JUN 08	8.56		

(a) Portable pump installed in well. No measurement possible.

201406155454401. Local number, 8-7445-01.

LOCATION.--Lat 20°14′06″, long 155°45′44″, Hydrologic Unit 20010000, 7.5 mi east of Hawi. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Basalt, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 460 ft, open hole.

DATUM.--Elevation of land-surface datum is 108.50 ft. Measuring point is top of casing, 0.11 ft above bolt head. Measuring point elevation is 108.76 ft.

PERIOD OF RECORD.--
Water level: April 1989, April, July, August 1990, 1991, July 1992, May 1993, June 1994, 1995, 1999 to present.
Water quality: April 1989, 1990, June 1994, 1995.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.55 ft above mean sea level, January 27, 1995; lowest measured, 6.78 ft above mean sea level, July 1, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	7.33	APR 11	6.89	JUL 19	6.79
JAN 31	7.18	JUN 08	6.85	SEP 28	6.81

201429155480201. Local number, 8-7448-06.

LOCATION.--Lat 20°14′29″, long 155°48′02″, Hydrologic Unit 20010000, 3.4 mi east of Hawi. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 440 ft, 8-in. casing diameter, cased to 123 ft, open hole 123 to 440 ft.

DATUM.--Elevation of land-surface datum is 411 ft. Measuring point is top of casing, 411.62 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, May 1990 to January 1991, October 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.53 ft above mean sea level, May 25, 1999; lowest measured, 6.85 ft above mean sea level, March 23, 1998.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	7.52	APR 11	7.11	JUL 19	7.19
JAN 31	7.90	JUN 08	7.18		

201440155510601. Local number, 8-7451-01.

LOCATION.--Lat 20°14′45″, long 155°51′06″, Hydrologic Unit 20010000, 3.1 mi south of Upolu Point. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 632 ft, 8-in. casing diameter, cased to 100 ft, open hole 100 to 632 ft.

DATUM.--Elevation of land-surface datum is 567 ft. Measuring point is top of casing, 566.65 ft above mean sea level.

PERIOD OF RECORD.--Water level: occasional measurements, May 1990 to September 1995, October 1997 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.60 ft above mean sea level, September 25, 1995; lowest measured, 3.63 ft above mean sea level, May 28, 1998.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	4.07	APR 11	3.67	JUL 19	3.74
JAN 31	3.81	JUN 07	3.95		

201517155493701. Local number, 8-7549-03.

LOCATION.--Lat 20°15′13″, long 155°49′27″, Hydrologic Unit 20010000, 1.15 mi north-northeast of intersection of Highways 250 and 270 in Hawi and 0.9 mi southeast of Alanahihi Point. Owner: U.S. Geological Survey.

AQUIFER.--Pololu Volcanics, Pleistocene age.

WELL CHARACTERISTICS.--Drilled water-table well, depth 440 ft, 10-in. casing diameter, cased to 130 ft, open hole 130 to 440 ft.

DATUM.--Elevation of land-surface datum is 299.5 ft. Measuring point is top of casing, 300.14 ft above mean sea level.

PERIOD OF RECORD.--
Water level: occasional measurements, May 1990 to September 1995, September 1999 to current year.
Water quality: occasional measurements, March 1990.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.91 ft above mean sea level, December 10, 1991; lowest measured, 1.94 ft above mean sea level, April 11, 2000.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 27	2.50	APR 11	1.94	JUL 19	2.00
JAN 31	1.98	JUN 08	2.37	SEP 28	2.33

220136159205501 - 2-0120-01 Kalepa Ridge W-7

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
29...	0705	718	25.0	141
NOV				
22...	0855	750	25.0	137
FEB 2000				
07...	0750	750	24.5	138
APR				
12...	0840	807	25.0	140
JUN				
13...	0745	--	25.5	142
AUG				
04...	1210	832	25.5	147

220354159205601 - 2-0320-01 Nonou W-A [a]

DATE	TIME
OCT 1999	
20...	1000
DEC	
09...	0950
FEB 2000	
15...	1000
APR	
19...	0900
JUN	
15...	0920
AUG	
09...	0855

220354159205602 - 2-0320-03 Nonou W-B

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
20...	0950	800	383	23.5	46
DEC					
09...	1000	800	353	24.0	44
FEB 2000					
15...	1000	--	366	24.0	45
APR					
19...	0930	--	256	24.0	45
JUN					
15...	1430	--	--	24.0	46
AUG					
09...	0920	--	399	24.0	46

220530159450401 - 2-0545-01 Kaulaula

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	1235	741	24.5	134
DEC				
17...	1105	590	23.0	135
FEB 2000				
10...	1200	620	24.0	137
APR				
10...	1210	661	23.5	135
JUN				
09...	1245	--	25.0	139
AUG				
07...	1245	733	25.0	134

220827159185401 - 2-0818-01 Anahola A

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
20...	1055	206	24.0	21
DEC				
09...	b1040	--	--	--
FEB 2000				
15...	1355	204	24.0	21
APR				
19...	b1015	--	--	--
JUN				
15...	1035	--	24.0	22
AUG				
09...	b1010	--	--	--

220826159185401 - 2-0818-02 Anahola B

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
20...	b1100	--	--	--	--
DEC					
09...	1045	--	204	24.0	20
FEB 2000					
15...	b1350	--	--	--	--
APR					
19...	1025	--	277	23.5	23
JUN					
15...	b1030	--	--	--	--
AUG					
09...	1010	190	283	24.0	23

See footnotes at end of table

221038159203801 - 2-1020-03 Moloaa [a]

DATE	TIME
OCT 1999	
28...	1440
DEC	
20...	1530
FEB 2000	
11...	1250
APR	
13...	0920
JUN	
16...	1205
AUG	
09...	1330

221141159252501 - 2-1125-01 Kilauea W-1

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
28...	1155	650	158	24.0	17
DEC					
09...	1345	650	130	24.0	17
FEB 2000					
15...	1050	--	138	24.0	16
APR					
19...	1050	--	174	23.0	20
JUN					
15...	1330	--	--	27.5	15
AUG					
09...	1300	--	184	23.5	18

221150159264501 - 2-1126-01 Princeville W-1

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
28...	0845	161	22.5	17
DEC				
10...	0830	140	22.5	17
FEB 2000				
11...	0720	147	22.0	18
APR				
13...	0755	167	22.0	17
JUN				
20...	0830	--	22.5	18
AUG				
03...	0825	142	22.5	18

221201159293401 - 2-1229-03 Maka Ridge

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
20...	1325	--	280	23.5	49
DEC					
09...	1320	170	233	23.5	49
FEB 2000					
15...	1300	--	248	23.5	52
APR					
19...	1215	--	285	23.5	54
JUN					
15...	1300	--	--	23.5	58
AUG					
09...	1245	--	342	23.5	60

221247159324801 - 2-1232-01 Wainiha

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
20...	1255	--	118	23.5	21
DEC					
09...	1155	--	121	23.0	20
FEB 2000					
15...	1240	25.0	103	23.0	23
APR					
19...	1315	--	103	23.0	23
JUN					
15...	1210	--	--	24.0	22
AUG					
09...	1215	--	123	23.0	22

221318159335901 - 2-1333-01 Haena

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
20...	1215	194	22.0	21
DEC				
09...	1230	179	21.5	22
FEB 2000				
15...	1210	185	22.0	21
APR				
19...	1245	192	22.0	24
MAY				
15...	1150	--	22.0	23
AUG				
09...	1150	216	22.0	24

215434159263301 - 2-5426-03 Koloa [a]

DATE	TIME
OCT 1999	
18...	1035

See footnotes at end of table

215454159274201 - 2-5427-01 Koloa W-A

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
DEC 1999				
08...	1320	200	23.0	26
JUN 2000				
14...	b0800	--	--	--
AUG				
08...	b0840	--	--	--

215455159274201 - 2-5427-02 Koloa W-B

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
19...	0800	224	22.5	26
FEB 2000				
16...	0810	232	22.5	26
APR				
12...	0820	217	22.5	26
JUN				
14...	0810	--	23.0	27
AUG				
08...	0845	248	23.0	26

215522159342601 - 2-5534-03 Hanapepe Town

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
19...	1040	393	24.0	38
DEC				
08...	1040	376	24.0	33
FEB 2000				
16...	1050	426	24.0	35
APR				
12...	1050	383	24.0	31
JUN				
14...	1110	--	24.0	33
AUG				
08...	1110	408	24.0	33

215535159302601 - 2-5530-03 Lawai, Kauai

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	1415	238	23.0	28
DEC				
08...	1345	228	24.0	27
FEB 2000				
16...	1330	242	23.5	27
APR				
12...	1115	230	23.0	29
JUN				
14...	1220	--	32.0	26
AUG				
07...	1450	242	23.5	29

215803159401201 - 2-5840-01 Waimea

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
19...	0910	533	24.0	100
DEC				
08...	1025	530	24.0	96
FEB 2000				
16...	1000	542	24.0	89
APR				
12...	1010	608	25.0	132
JUN				
14...	1000	--	24.0	143
AUG				
08...	1030	760	24.5	159

215857159430101 - 2-5843-01 Kekaha Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
19...	0950	515	24.0	79
DEC				
08...	0945	545	24.0	84
FEB 2000				
16...	0920	536	24.5	71
APR				
12...	0920	620	24.0	86
JUN				
14...	0930	--	24.5	98
AUG				
08...	0955	650	24.5	101

See footnotes at end of table

215958159214301 - 2-5921-01 Kalepa Ridge W-10

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
20...	0840	462	25.5	58
DEC				
09...	0850	450	25.0	58
FEB 2000				
15...	0850	459	25.5	58
APR				
19...	0835	462	25.0	55
JUN				
15...	0900	--	25.5	58
AUG				
09...	0835	499	25.5	58

215906159395601 - 2-5939-01 Waimea Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	1340	325	24.0	45
DEC				
08...	1100	321	24.0	43
FEB 2000				
10...	1250	278	24.5	30
APR				
10...	1300	315	24.0	40
JUN				
14...	1030	--	24.0	34
AUG				
07...	1400	376	24.5	50

215901159235201 - 2-5923-07 Kilohana W-I

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
20...	0730	--	181	23.5	20
DEC					
09...	0815	430	186	23.0	20
FEB 2000					
15...	0815	430	185	23.0	20
APR					
19...	0810	--	193	23.0	22
JUN					
15...	0830	--	--	23.5	21
AUG					
09...	0810	--	196	23.0	21

211646157465201 - 3-1646-01 Waialae Golf Course 1-B

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	b1430	--	--	--
JAN 2000				
21...	b1330	--	--	--
APR				
12...	1347	843	22.0	193
MAY				
23...	1340	930	22.0	220
JUL				
28...	b1328	--	--	--
SEP				
20...	b1525	--	--	--

212106157533701 - 3-2153-02 Moanalua

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999					
08...	1010	70	500	21.5	103
JAN 2000					
06...	1222	70	501	22.0	100
APR					
04...	1348	60	497	22.0	104
MAY					
23...	1205	60	493	22.0	104
JUL					
21...	1421	60	497	22.0	104
SEP					
20...	1440	60	500	22.0	105

211832157515501 - 3-1851-19 Halekauwila Street, Pipe A

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	b1521	--	--	--
JAN 2000				
21...	1416	34600	23.5	13000
APR				
04...	b1524	--	--	--
MAY				
13...	b1500	--	--	--
JUL				
21...	b1500	--	--	--
SEP				
28-28	b1025	--	--	--

212133158035501 - 3-2103-03 Barbers Point Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
10...	0925	1060	23.5	231
JAN 2000				
14...	0913	1070	23.0	218
MAR				
23...	0927	1060	23.0	218
MAY				
31...	0925	1060	23.5	220
AUG				
01...	0852	1060	23.5	220
SEP				
27...	0945	1060	23.5	219

211832157515502 - 3-1851-19 Halekauwila Street, Pipe B

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	1458	18900	24.5	6810
JAN 2000				
21...	1412	19000	24.0	6630
APR				
04...	1524	19200	24.0	6720
MAY				
23...	1456	19300	24.5	6810
JUL				
21...	1458	19500	24.5	7070
SEP				
28-28	1025	19800	24.0	7210

212238157561102 - 3-2256-12 Aiea US Navy (187-C)

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
08...	1053	834	23.5	216
JAN 2000				
06...	1133	882	23.0	223
APR				
04...	1310	832	23.5	213
MAY				
23...	1130	869	23.5	220
JUL				
21...	1345	880	23.0	223
SEP				
20...	1400	832	24.0	213

See footnotes at end of table

212343158001001 - 3-2300-11 Waipahu Street

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
08...	0924	577	22.0	122
JAN 2000				
06...	0952	579	22.0	121
APR				
11...	0905	565	22.0	119
JUN				
30...	1021	565	21.5	120
SEP				
15...	0853	549	22.0	117
SEP				
28-28	0952	547	22.0	116

212358158010901 - 3-2301-09,10 Waikele Gulch-composite

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
08...	0900	631	22.0	127
JAN 2000				
06...	0927	586	22.0	113
APR				
11...	0940	620	22.0	127
JUN				
30...	1100	715	22.0	156
SEP				
15...	0906	707	22.0	155

212332157582201 - 3-2358-02 Pearl City, US Navy

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	1331	1370	21.0	384
DEC				
29...	1418	1400	21.5	382
APR 2000				
04...	1150	1130	22.0	299
MAY				
23...	1041	1380	22.0	377
JUN				
29...	0930	1390	21.0	377
SEP				
15...	1001	1400	22.0	382

212336157591801 - 3-2359-05 Waiawa Road

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
22...	1505	2770	22.0	811
DEC				
29...	1337	2870	22.0	826
APR 2000				
04...	1052	2810	22.0	817
MAY				
23...	0940	2730	22.0	801
JUL				
21...	1139	2680	22.0	799
SEP				
20...	1257	2640	22.0	756

212342157584301 - 3-2358-22 Taba Farm, Waiawa (204-4)

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
22...	1527	1470	20.5	402
DEC				
29...	1348	1550	20.5	416
APR 2000				
04...	1113	1510	20.5	403
MAY				
23...	1000	1480	21.0	397
JUL				
21...	1126	1460	20.5	388
SEP				
20...	1315	1440	20.5	388

212343157584701 - 3-2358-29 Taba Farm, Waiawa (204-9)

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
22...	1514	3200	20.5	937
DEC				
29...	1352	3480	20.5	1020
APR 2000				
04...	1106	3570	20.5	1050
MAY				
23...	1015	3360	20.5	1000
JUL				
21...	1118	3120	20.5	922
SEP				
20...	1307	2970	20.5	875

See footnotes at end of table

212422157485601 - 3-2448-01 Hawaii State Hospital

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	0840	202	20.5	20
JAN 2000				
11...	0945	205	20.5	20
MAR				
28...	0825	202	20.5	19
MAY				
23...	0830	203	20.5	19
JUL				
28...	0815	202	20.5	20
SEP				
18...	0820	201	20.5	20

212617158033801 - 3-2603-01 Waikele, Oahu, HI

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999					
12...	0835	--	337	22.5	46
JAN 2000					
21...	0923	--	335	22.0	46
MAR					
28...	1200	300	333	22.1	47
JUN					
12...	0824	--	336	22.5	45
JUL					
31...	0905	--	333	22.5	46
SEP					
14...	0915	--	333	22.5	46

212506157582301 - 3-2558-10 Waiawa Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	1255	245	22.0	42
JAN 2000				
06...	1012	247	22.0	42
APR				
04...	1031	246	24.0	40
MAY				
23...	0918	242	23.0	40
SEP				
15...	0930	241	23.0	41
SEP				
28-28	0935	242	23.5	41

212656158071801 - 3-2607-01 Lualualei, Iwo Jima Road

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
10...	1100	436	25.0	66
JAN 2000				
14...	1035	425	25.0	62
MAR				
23...	b1040	--	--	--
MAY				
31...	1023	433	25.0	63
AUG				
01...	b0943	--	--	--
SEP				
27...	b1000	--	--	--

212556157500301 - 3-2550-01 Heeia

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999					
03...	0904	--	139	23.0	19
JAN 2000					
11...	1150	15.0	136	23.0	19
MAR					
08...	1450	--	136	23.5	19
MAY					
23...	1400	--	136	23.5	20
JUL					
28...	1410	--	138	23.5	19
SEP					
18...	1130	--	137	23.5	19

212803158000701 - 3-2800-01 Mililani

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
23...	1351	155	22.0	19
JAN 2000				
04...	1414	159	22.0	20
MAR				
11...	1459	152	22.0	18
MAY				
09...	1612	153	22.0	19
JUL				
26...	1432	153	22.0	19

See footnotes at end of table

212828158092001 - 3-2809-06 Waianae Tunnel

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
22...	1334	425	22.5	36
JAN 2000				
13...	1436	430	22.5	36
MAR				
16...	1330	415	22.5	34
MAY				
19...	1431	415	22.5	34
JUL				
31...	0955	421	22.5	35
SEP				
14...	1130	425	22.5	36

212859158124301 - 3-2812-01 Makaha Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
12...	1030	777	25.5	159
DEC				
22...	1440	778	25.0	156
JAN 2000				
13...	1225	650	24.5	120
MAR				
16...	1215	510	25.0	86
MAY				
19...	1410	418	26.0	57
JUL				
31...	1238	760	26.0	150

212927158014801 - 3-2901-07 Schofield Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
MAR 2000				
29...	0850	170	21.5	20
JUN				
14...	1435	169	21.5	19
SEP				
06...	0805	168	21.0	19
20...	1242	167	21.0	19

212945158014301 - 3-2901-09 Wahiawa Walker Avenue

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
15...	b1430	--	--	--
16...	b1440	--	--	--
23...	b0840	--	--	--
JAN 2000				
04...	b1400	--	--	--
MAR				
11...	1415	200	22.0	22
MAY				
09...	1557	199	22.0	22
JUL				
26...	0844	199	22.0	22

213224158135901 - 3-3213-06 Makua US Air Force

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
12...	1100	865	23.5	204
JAN 2000				
13...	1250	877	23.5	193
MAR				
16...	1255	863	23.5	190
MAY				
19...	1340	858	24.0	191
JUL				
31...	1301	855	23.5	191
SEP				
14...	1050	851	23.5	191

213327157524401 - 3-3352-01 Kahana Valley

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	0925	259	22.5	35
JAN 2000				
14...	1350	256	22.5	35
MAR				
08...	1210	257	22.5	35
MAY				
18...	1330	257	23.0	36
JUL				
28...	1340	260	23.0	36
SEP				
14...	1445	259	23.0	37

See footnotes at end of table

213411158074501 - 3-3407-25 Waialua High School

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
23...	0900	1510	23.0	380
JAN 2000				
20...	1415	1500	22.5	369
APR				
11...	0907	1560	23.0	387
JUN				
20...	0922	1580	23.5	390
AUG				
03...	0857	1570	22.0	391
SEP				
20...	0845	1610	23.5	410

213427158055501 - 3-3405-02 Waialua Pump 2

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
23...	1310	352	22.5	46
JAN 2000				
21...	0906	350	22.0	46
MAR				
28...	1423	347	22.0	47

213429158055501 - 3-3405-01 Waialua Pump 1

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
MAY 2000				
09...	1530	343	22.5	47
AUG				
02...	1446	343	22.5	46

213446158104901 - 3-3410-08 Kawaihapai, Mokuleia

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
15...	1340	696	22.0	145
JAN 2000				
04...	1316	714	22.0	140
APR				
12...	1111	694	22.0	141
JUN				
14...	1150	698	22.0	141
JUL				
26...	1115	692	22.0	143
SEP				
20...	1207	671	22.5	140

213512158061601 - 3-3506-03 TO 04 Composite--Haleiwa Batt

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
23...	0955	416	22.0	69
JAN 2000				
20...	1130	418	22.0	67
APR				
11...	1022	415	23.0	67
JUN				
14...	0955	419	24.5	68
AUG				
02...	1319	418	22.5	70

213656157550401 - 3-3655-01 Hauula

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	1530	231	21.0	32
JAN 2000				
14...	1325	243	22.0	36
MAR				
13...	1407	229	21.0	32
MAY				
23...	1250	228	21.0	31
JUL				
28...	1310	226	21.0	31
SEP				
18...	1045	226	21.0	30

214157158000101 - 3-4100-01 Turtle Bay Golf Course

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999					
03...	1135	--	--	--	--
JAN 2000					
14...	1100	--	293	20.5	51
MAR					
13...	1045	--	309	20.5	53
MAY					
23...	1030	--	314	21.0	53
JUL					
28...	1020	--	306	20.5	52
SEP					
18...	0935	600	305	20.5	52

See footnotes at end of table

2141311158011601 - 3-4101-08 Waialee II

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	1425	223	20.5	35
JAN 2000				
14...	1150	221	20.5	34
MAR				
13...	1137	221	20.5	34
MAY				
23...	1140	--	--	--
JUL				
28...	1115	--	--	--
SEP				
18...	1000	--	--	--

214233157583501 - 3-4258-04 Kahuku Air Field

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
03...	1120	1680	23.5	467
JAN 2000				
14...	1020	1680	22.5	462
MAR				
13...	0945	1680	23.5	465
MAY				
23...	0945	1690	23.5	461
JUL				
28...	0950	1690	24.0	470
SEP				
14...	1345	1690	24.0	473

See footnotes at end of table

210425156483001 - 4-0448-02 Mapulehu Shaft 2

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
12...	1330	334	25.0	20
NOV				
30...	1130	332	24.5	21
FEB 2000				
01...	1230	343	24.5	21
APR				
18...	1150	329	24.0	20
JUN				
21...	1115	321	25.0	20
AUG				
08...	1205	286	26.0	21

210402156495801 - 4-0449-01 Ualapue Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
13...	0900	344	21.0	66
NOV				
30...	1210	329	21.0	63
FEB 2000				
01...	1300	324	20.5	60
APR				
18...	1225	324	20.5	62
JUN				
21...	1345	324	21.0	61
AUG				
08...	1230	296	22.5	62

210419156570501 - 4-0457-01 Kawela Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
12...	1410	419	24.0	92
NOV				
30...	1250	407	23.5	91
FEB 2000				
01...	1435	408	23.5	90
APR				
18...	1340	436	23.5	97
JUN				
21...	1045	490	23.5	114
AUG				
08...	1010	448	23.5	116

210605157012001 - 4-0601-01 Kaunakakai

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
12...	1025	332	24.5	29
NOV				
30...	1350	330	24.5	30
FEB 2000				
01...	1020	302	24.0	29
APR				
18...	1430	275	24.5	25
JUN				
21...	1010	292	24.5	26
AUG				
08...	1430	275	25.0	29

See footnotes at end of table

210856157011201 - 4-0801-01 DHHL 1

DATE	TIME	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999		
28...	0830	139
NOV		
15...	0755	106
DEC		
14...	0800	147
JAN 2000		
11...	0840	87
MAR		
01...	1135	83
APR		
07...	0830	135
JUL		
06...	0930	55
SEP		
15...	0715	152

210857156010701 - 4-0801-02 DHHL 2

DATE	TIME	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999		
28...	0812	76
NOV		
15...	0740	62
DEC		
14...	0745	79
JAN 2000		
12...	0800	63
MAR		
02...	0825	62
APR		
07...	0820	73
JUL		
06...	0945	90
SEP		
15...	0700	76

210903157013001 - 4-0901-01 Kukui, Inc.

DATE	TIME	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999		
27...	0930	52
NOV		
01...	0930	53
DEC		
06...	0930	49
JAN 2000		
03...	0930	46
FEB		
01...	0930	43
MAR		
01...	0930	48
APR		
06...	0930	48
MAY		
01...	0935	46
JUN		
01...	0930	47
JUL		
03...	0937	46

203947156261201 - 6-3926-03 Wailea

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
19...	0945	3840	19.0	1130
FEB 2000				
11...	1055	2340	19.0	611
APR				
10...	1215	2640	19.0	706
AUG				
11...	0930	2700	19.0	818

204635156270101 - 6-4627-14 Waiakea Homesteads

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
19...	0845	1350	23.5	202
FEB 2000				
11...	1205	1340	23.5	205
APR				
10...	1330	1320	23.5	197
AUG				
04...	1015	1300	23.5	196

205014156212701 - 6-5021-01 Pukalani

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
NOV 1999				
23...	1040	2060	21.5	563
JAN 2000				
31...	0945	2060	21.0	565
APR				
26...	1345	2070	21.5	564
AUG				
14...	0530	--	--	562

205329156305501 - 6-5330-10 Mokuhau Pump 1

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
05...	1055	676	22.0	146
NOV				
23...	0900	716	22.0	156
JAN 2000				
04...	b1055	--	--	--
FEB				
24...	1105	687	22.0	146
APR				
04...	1140	722	22.0	156
MAY				
16...	1005	719	22.0	158
AUG				
24...	b1130	--	--	--

205330156305401 - 6-5330-11 Mokuhau Pump 3

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
05...	1100	603	22.5	119
NOV				
23...	0905	619	22.5	126
JAN 2000				
04...	1055	670	22.5	141
FEB				
24...	1100	480	22.5	85
APR				
04...	b1145	--	--	--
MAY				
16...	1010	472	22.5	83
AUG				
24...	1140	694	22.5	148

205322156394501 - 6-5339-01 Waipuka 1

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	0910	610	21.5	110
JAN 2000				
03...	1030	569	22.0	88
FEB				
03...	b1345	--	--	--
APR				
14...	b1010	--	--	--
JUN				
08...	b1215	--	--	--
JUL				
31...	1135	521	21.0	87

205320156394501 - 6-5339-02 Waipuka 2

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	b0920	--	--	--
JAN 2000				
03...	b1040	--	--	--
FEB				
03...	b1345	--	--	--
APR				
14...	1015	514	30.0	86
JUN				
08...	1220	512	21.0	87
JUL				
31...	1130	554	21.0	98

See footnotes at end of table

205343156401101 - 6-5340-01 Kahoma Shaft [a]

DATE	TIME
OCT 1999	
18...	0925
JAN 2000	
03...	1055
FEB	
03...	1230
APR	
14...	1100
JUN	
07...	1200
JUL	
31...	1110

205412156193801 - 6-5419-01 Haiku

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
07...	0945	496	20.0	104
NOV				
22...	1010	489	20.5	103
JAN 2000				
31...	0920	488	20.0	102
APR				
26...	1200	518	20.0	110
JUN				
14...	1055	525	20.0	111
AUG				
22...	b1145	--	--	--

205416156244301 - 6-5424-01 Specklesville Shaft [a]

DATE	TIME
OCT 1999	
07...	0850
NOV	
23...	0925
JAN 2000	
31...	0840
APR	
26...	1320
JUN	
14...	1130
AUG	
22...	1330

205405156305401 - 6-5430-05 Waiehu Deep Monitor Well

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)	SAMPLE DEPTH DISTANCE BELOW MSL FEET (78890)
OCT 1999					
04...	0855	215	22.5	15	200
04...	0910	208	22.5	13	400
04...	0930	564	22.0	136	600
04...	0950	3030	22.0	899	650
04...	1015	5330	22.0	1650	675
04...	1040	20500	22.0	7390	700
04...	1105	38800	22.5	14700	725
04...	1130	44900	22.5	16800	750
04...	1155	48200	22.5	18000	800
04...	1225	50000	23.0	18800	1000
JAN 2000					
06...	1005	220	22.5	17	200
06...	1020	426	21.5	95	400
06...	1040	509	22.0	120	600
06...	1100	2740	21.5	809	650
06...	1125	5920	22.0	1860	675
06...	1150	22400	22.0	8290	700
06...	1215	39700	22.0	15200	725
06...	1240	45300	22.0	17000	750
06...	1305	48400	22.0	18000	800
06...	1335	50100	22.0	18800	1000
APR					
03...	1050	211	23.0	13	200
03...	1105	387	22.5	84	400
03...	1125	523	22.0	125	600
03...	1150	2640	22.0	778	650
03...	1215	6120	22.5	1920	675
03...	1235	24400	22.0	8960	700
03...	1300	40400	22.0	15300	725
03...	1325	45400	22.0	17100	750
03...	1353	48100	22.0	17900	800
03...	1420	50100	22.0	18700	1000
JUL					
05...	0950	218	23.0	14	200
05...	1005	209	22.0	13	400
05...	1020	513	22.0	121	600
05...	1045	2830	22.0	828	650
05...	1110	6410	22.0	2010	675
05...	1135	24600	22.0	9010	700
05...	1200	40100	22.0	15100	725
05...	1225	45800	22.0	16900	750
05...	1250	48200	22.5	17800	800
05...	1320	50000	22.5	18600	1000

See footnotes at end of table

205511156222101 - 6-5522-01 Kuau Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
07...	0905	1320	21.5	304
NOV				
23...	0940	1380	21.5	318
JAN 2000				
31...	b0855	--	--	--
APR				
26...	1310	1110	22.0	233
JUN				
14...	1115	1330	22.0	298
AUG				
22...	b1325	--	--	--

205651156401001 - 6-5640-01 Honokowai Shaft [a]

DATE	TIME
OCT 1999	
18...	0950
JAN 2000	
03...	1110
FEB	
03...	1315
APR	
14...	1120
JUN	
08...	1140
JUL	
31...	1055

205837156384601 - 6-5838-01 Napili A [a]

DATE	TIME
OCT 1999	
18...	1115
DEC	
17...	1020
FEB 2000	
03...	1120
APR	
14...	1325
JUN	
08...	1045
JUL	
31...	0950

205838156383101 - 6-5838-02 Napili B

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	1125	359	20.0	76
DEC				
17...	1030	358	20.0	75
FEB 2000				
03...	1125	365	20.0	78
APR				
14...	1405	370	20.0	79
JUN				
08...	1030	366	20.0	77
JUL				
31...	0940	313	20.0	65

205848156383601 - 6-5838-04 Napili C

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
18...	b1155	--	--	--
DEC				
17...	b1040	--	--	--
FEB 2000				
03...	b1140	--	--	--
APR				
11...	b1335	--	--	--
JUN				
08...	b1020	--	--	--
JUL				
31...	0930	501	20.0	114

See footnotes at end of table

190347155354301 - 8-0335-01 Naalehu

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
25...	1230	--	164	21.5	14
JAN 2000					
27...	1440	--	93	22.0	10
APR					
13...	0955	440	170	19.5	16
JUN					
05...	1350	430	170	20.0	18
JUL					
21...	0920	--	93	26.5	11

190832155310801 - 8-0831-01 NINOLE TH1

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
APR 2000				
13...	1045	825	18.5	211
JUN				
05...	1255	818	18.5	214

190832155310901 - 8-0831-02 Ninole

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
25...	1100	790	21.0	200
JAN 2000				
27...	1300	830	18.0	214
APR				
13...	b1045	--	--	--
JUN				
05...	b1250	--	--	--
JUL				
21...	1015	770	18.5	193

191114155294801 - 8-1129-01 Pahala W-2, HI

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
25...	b1047	--	--	--
JAN 2000				
27...	1230	97	22.0	5
APR				
13...	1110	90	18.5	4
JUN				
05...	1230	89	24.0	6
JUL				
21...	1040	92	19.0	6

191219155291601 - 8-1229-01 Pahala

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
25...	b1030	--	--	--	--
JAN 2000					
27...	b1215	--	--	--	--
APR					
13...	1140	390	90	18.0	5
JUN					
05...	1150	390	90	18.0	5
JUL					
21...	b1100	--	--	--	--

192646155532001 - 8-2653-01 Keei W-C

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
25...	b1420	--	--	--	--
FEB 2000					
01...	0845	450	238	20.0	41
APR					
12...	b0930	--	--	--	--
JUN					
06...	1345	475	228	20.0	39
JUL					
20...	b1750	--	--	--	--

192738155534201 - 8-2753-01 Keei W-A [a]

DATE	TIME
OCT 1999	
25...	1430
FEB 2000	
01...	0910
APR	
12...	0915
JUN	
06...	1325
JUL	
20...	1740

192731155534101 - 8-2753-02 Keei W-B

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
25...	1440	375	1160	19.5	304

See footnotes at end of table

192924154564701 - 8-2986-01 Pahoa, W-2A

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
29...	1130	132	26.0	8
JAN 2000				
28...	1115	135	22.0	8
APR				
06...	1105	128	23.0	6
JUN				
09...	1345	128	28.0	8
JUL				
18...	1315	134	26.0	10

193113154555801 - 8-3185-01 Hawaiian Shores

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
29...	1115	--	130	21.5	16
JAN 2000					
28...	1340	497	125	22.0	16
APR					
06...	1145	--	124	21.0	16
JUN					
09...	1415	--	124	22.0	17
JUL					
18...	1350	--	130	21.5	17

193510155570801 - 8-3557-01 Kahaluu A

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
26...	0800	800	603	20.0	140
FEB 2000					
01...	0945	800	562	20.0	133
APR					
12...	0840	790	509	20.0	117
JUN					
06...	0650	800	508	20.0	119
JUL					
20...	1615	780	510	20.5	115

193502155572301 - 8-3557-05 Kahaluu Shaft

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
26...	0740	1260	20.0	320
FEB 2000				
01...	1010	1250	20.0	340
APR				
12...	0810	1120	20.0	299
JUN				
06...	0630	936	20.0	252
JUL				
20...	1600	1070	20.5	279

194037155035301 - 8-4003-01 Panaewa, HI

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
29...	1210	81	21.0	5
JAN 2000				
28...	1030	80	21.0	6
APR				
06...	1220	82	21.0	7
JUN				
09...	1305	79	23.0	7
JUL				
18...	1420	81	20.5	7

194818155582301 - 8-4858-02 Kona Village

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
26...	b0935	--	--	--
FEB 2000				
01...	1135	2440	21.0	583
APR				
12...	1120	2460	21.0	569
JUN				
06...	1453	2430	21.0	589
JUL				
20...	1410	2540	21.0	588

195546155462001 - 8-5546-01 Waikoloa

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
26...	1310	1000	632	28.0	109
FEB 2000					
03...	1220	1000	638	28.5	115
APR					
12...	1300	1000	635	28.5	119
JUN					
07...	0835	1000	642	28.5	121
JUL					
20...	1115	1000	678	28.5	124

195546155480301 - 8-5548-01 Parker W-1 [a]

DATE	TIME
OCT 1999	
26...	1215
FEB 2000	
03...	1200
APR	
12...	1245
JUN	
07...	0800
JUL	
20...	1050

See footnotes at end of table

195724155455301 - 8-5745-01 Parker W-5

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
26...	1430	800	286	26.5	29
FEB 2000					
03...	1250	780	282	26.5	28
APR					
12...	b1325	--	--	--	--
JUN					
07...	0900	800	278	26.0	28
JUL					
20...	1200	780	268	26.5	28

195857155142301 - 8-5814-01 Laupahoehoe

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
28...	1350	125	386	20.0	81
JAN 2000					
31...	0720	--	322	19.0	58
APR					
11...	0920	125	370	19.5	81
JUN					
08...	b1540	--	--	--	--
JUL					
19...	b1015	--	--	--	--

195929155462501 - 8-5946-01 Lalamilo

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
26...	b1430	--	--	--	--
FEB 2000					
01...	1235	630	479	26.0	86
APR					
12...	b1430	--	--	--	--
JUN					
07...	b1435	--	--	--	--
JUL					
20...	b0950	--	--	--	--

195912155464201 - 8-5946-02 LALAMILO B

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
26...	1430	830	330	26.0	42
JUL 2000					
20...	1005	850	328	26.5	41

195939155464201 - 8-5946-03 LALAMILO C

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
APR 2000					
12...	1440	875	389	26.0	62
JUN					
07...	1447	875	459	25.5	85

195947155485801 - 8-5948-01 Hapuna Beach Park

DATE	TIME	FLOW RATE (G/M) (00059)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
26...	1500	310	1850	26.0	492
FEB 2000					
01...	1505	280	1870	25.0	512
APR					
11...	1635	260	1810	25.5	490
JUN					
07...	1330	225	1800	26.5	513
JUL					
20...	0900	260	1895	26.0	508

200122155480901 - 8-6148-01 Kawaihae W-1

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	TEMPER-ATURE WATER (DEG C) (00010)	CHLOR-IDE WATER UNFLTRD (MG/L) (99220)
OCT 1999				
26...	b1545	--	--	--
FEB 2000				
01...	b1540	--	--	--
APR				
11...	b1610	--	--	--
JUN				
07...	b1212	--	--	--
JUL				
20...	0830	423	28.5	81

200121155480801 - 8-6148-02 Kawaihae W-4 [a]

DATE	TIME
APR 2000	
11...	1610
JUN	
07...	1213
JUL	
20...	0840

See footnotes at end of table

201308155451901 - 8-7345-03 Makapala [a]

DATE	TIME
OCT 1999	
27...	1015
JAN 2000	
31...	1145
APR	
11...	1415
JUN	
08...	1010
JUL	
19...	1550

201428155494201 - 8-7449-02 Hawi H

DATE	TIME	FLOW RATE (G/M) (00059)	SPECIFIC CONDUCTANCE (US/CM) (00095)	TEMPERATURE WATER (DEG C) (00010)	CHLORIDE WATER UNFLTRD (MG/L) (99220)
OCT 1999					
27...	b1300	--	--	--	--
JAN 2000					
31...	1445	600	197	22.0	25
APR					
11...	1230	540	192	22.0	26
JUN					
08...	0915	--	175	24.0	25
JUL					
19...	1420	--	190	28.0	28

> Actual value is known to be greater than the value shown
< Actual value is known to be less than the value shown
a Unable to sample, pump off, locked, or inoperable
b Sampling alternated with a nearby well
c Sampled by Kawela Plantation Homeowners Association
d Laboratory specific conductance
f Sampled by Hawaii Department of Hawaiian Home Lands
g Sampled by Kukui, Inc.

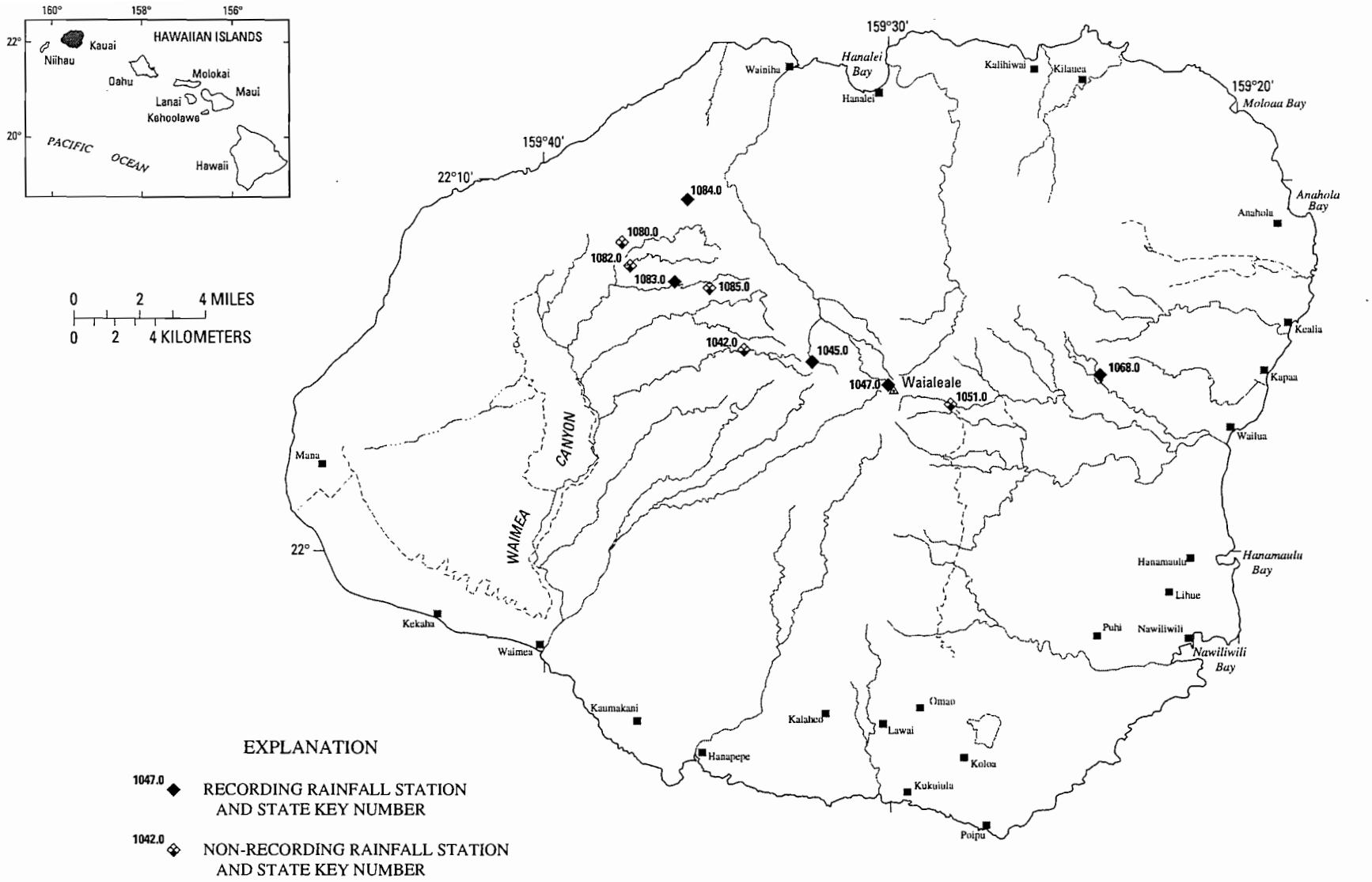


Figure 21. Locations of rainfall stations on Kauai.

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI

220523159341201. State Key Number 1042.0 Waialae rain gage near Waimea, Kauai.

LOCATION.--Lat 22°05′23″, long 159°34′12″, Hydrologic Unit 20070000, on ridge 6.4 mi southeast of Kokee Lodge, and 11.0 mi northeast of Waimea.

PERIOD OF RECORD.--1911 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio rain-gage catchment. Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 26	5.6 estimated (a)
Oct. 26 to Dec. 31	25.4 estimated (b)
Jan. 01 to Feb. 04	9.4 estimated (b)
Feb. 04 to May 02	17.2
May 02 to Jul. 18	12.4
Jul. 18 to Sep. 30	12.6 estimated (c)

CAL YR 1999 Total 88.9
WTR YR 2000 Total 82.6

(a) Estimated values based on accumulation rain can reading of 14.4 inches from Aug. 03 to Oct. 26
(b) Estimated values based on accumulation rain can reading of 34.8 inches from Oct. 26 to Feb. 04
(c) Estimated values based on accumulation rain can reading of 14.0 inches from Jul. 18 to Oct. 11

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220504159321401. State Key Number 1045.0 Waialeale Trail rain gage near Lihue, Kauai.

LOCATION.--Lat 22°05'04", long 159°32'14", Hydrologic Unit 20070000, 14.0 mi west of Kapaa Beach Park and 8.4 mi south of Hanalei Bay.

PERIOD OF RECORD.--1962 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,560 ft (from topographic map).

REMARKS.--Records good, except for estimated period which is poor. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.14	.21	2.55	.00	.01	---	---	---	.00	.26	.02	.00
2	.02	.03	3.42	.01	.00	---	---	a--	.00	.68	.01	.00
3	.17	.00	.99	.00	---	---	---	.01	.02	1.61	.00	.07
4	.13	4.42	.11	.00	---	---	---	.00	.48	.14	.01	.01
5	.42	.06	.27	.12	---	---	---	.00	.20	.26	.01	.65
6	.76	.02	.87	.61	---	---	---	.03	.07	3.56	.42	.60
7	.32	.95	.20	.85	---	---	---	.06	1.16	1.26	.04	.32
8	.34	.40	.14	.53	---	---	---	.49	.43	.15	.04	.19
9	.24	.31	1.80	.47	---	---	---	.06	.18	.05	.07	.01
10	.20	.01	4.70	.72	---	---	---	.14	.00	.03	.06	.14
11	.08	.06	.79	.25	---	---	---	.50	.04	1.64	.10	.54
12	.48	.87	1.12	.36	---	---	---	.80	.58	.63	.03	.09
13	.32	.02	.41	.27	---	---	---	.00	.49	.01	.13	.01
14	.30	.10	.27	1.07	---	---	---	.00	.01	.48	.04	.03
15	.07	.00	.00	2.07	---	---	---	.00	.01	.93	.03	.10
16	.04	.00	.01	.36	---	---	---	.00	.18	.89	.33	.00
17	.00	.05	.00	.24	---	---	---	.00	.44	.20	1.35	.06
18	.70	.00	.09	1.37	---	---	---	.00	.11	.20	.20	.08
19	.71	.35	.10	1.82	---	---	---	.00	.05	.02	.08	.01
20	1.54	.24	2.49	1.44	---	---	---	.00	.00	.30	1.44	.11
21	2.33	.66	1.22	1.42	---	---	---	.00	.28	.22	.38	.00
22	.00	.20	.05	.00	---	---	---	.01	.27	.24	.37	.00
23	.00	.02	1.04	.01	---	---	---	.00	.49	.11	.44	.00
24	.03	.03	.26	.00	---	---	---	.00	.32	.27	.09	.07
25	.03	.34	.76	.09	---	---	---	.04	.41	.53	.15	.00
26	.05	.34	1.62	.89	---	---	---	.01	.10	.43	.04	.00
27	.21	1.02	.01	.00	---	---	---	.00	.21	.48	.34	.81
28	.02	1.12	.07	.00	---	---	---	.02	.06	.31	1.00	1.82
29	.07	.59	.11	.00	---	---	---	.00	.41	.03	1.65	.27
30	.28	.57	.36	.00	---	---	---	.00	.26	.00	.03	.05
31	.30	---	.04	.00	---	---	---	.03	---	.05	.03	---
TOTAL	10.30	12.99	25.87	14.97	---	---	---	---	7.26	15.97	8.93	6.04

CAL YR 1999 Total 157.04
WTR YR 2000 Total 128.50

(a) Estimated total rainfall is 23.97 inches from Feb. 03 to May 02 based on nearby Waialeale rain gage

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220427159300201. State Key Number 1047.0 Mount Waialeale rain gage near Lihue, Kauai.

LOCATION.--Lat 22°04′27″, long 159°30′02″, Hydrologic Unit 20070000, 3/4 mi north of Kawaikini summit (5,240 ft).

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 5,150 ft (from topographic map).

REMARKS.--Records good. Recorded rainfall read in hundredths of an inch. Accumulated rainfall read in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.46	.46	2.85	.00	.80	.69	3.09	.01	.02	1.32	.05	.04
2	.17	.17	5.73	.00	.00	.21	6.33	.08	.00	1.25	.49	.14
3	1.14	.18	1.34	.00	.00	.05	3.58	.49	.07	2.39	.13	.52
4	.42	7.71	.95	.03	.00	.20	3.64	.03	1.84	.19	.20	.15
5	1.06	1.41	1.19	1.11	.00	.00	1.22	.13	.40	.45	.06	2.14
6	2.50	.08	1.26	1.14	.00	.08	1.83	.31	.20	3.45	.25	4.17
7	1.45	3.19	.62	1.31	.00	.19	.57	.46	2.11	1.15	.44	2.40
8	.87	2.29	.39	2.11	.00	.02	.20	1.63	.79	.60	.15	2.32
9	.39	1.53	2.68	1.41	.00	.00	2.21	.31	.37	.43	.36	.31
10	.50	.03	7.45	2.09	.01	.00	.92	.57	.14	.32	.59	1.03
11	.33	.17	1.62	2.11	.00	.03	.24	.82	.65	5.66	.63	3.22
12	1.20	2.32	2.88	4.41	.00	.01	.54	1.47	1.00	11.02	.17	2.59
13	1.29	.36	3.07	.60	.01	.00	.12	.07	1.19	.41	.64	.82
14	.66	.25	.50	2.55	.20	.01	.25	.00	.43	1.56	.19	.52
15	.04	.01	.03	3.92	.01	.12	.08	.00	.13	3.60	.28	.46
16	.36	.03	.00	.75	.00	.05	1.08	.00	.46	4.53	1.03	.21
17	.01	.13	.04	.95	.00	.41	1.56	.00	.95	1.14	2.18	.56
18	.80	.01	.75	2.33	.00	1.72	.50	.02	.68	3.21	.57	1.59
19	1.72	2.15	.18	6.75	.19	.14	.10	.03	.14	.94	.67	.14
20	4.79	1.33	4.22	2.50	.00	.40	.14	.01	.32	3.45	5.21	.26
21	5.15	1.97	1.58	3.24	.09	.66	.60	.10	.90	1.19	1.56	.01
22	.00	2.14	.05	.03	.64	.20	.37	.11	.94	1.04	1.11	.00
23	.05	.71	1.28	.14	.46	1.02	.76	.01	1.29	.77	1.07	.00
24	.73	.96	.35	.00	.07	.98	1.67	.11	.68	.68	1.31	.00
25	.39	.72	.88	.17	.47	1.91	.52	.34	1.38	1.00	.96	.11
26	.49	.67	1.76	1.52	1.73	2.14	1.09	.02	.80	1.73	.26	.00
27	.82	1.19	.01	.05	.50	2.28	1.25	.13	1.26	1.24	1.59	2.20
28	.28	2.07	.04	.04	.05	.77	.02	.27	.41	1.06	3.15	6.29
29	.19	1.06	.08	.02	.38	2.63	.02	.16	1.49	.37	3.33	.97
30	.93	.73	.12	.00	---	.44	.05	.10	1.63	.01	.72	.38
31	1.93	---	.00	.00	---	.12	---	.25	---	.18	1.12	---
TOTAL	31.12	36.03	43.90	41.28	5.61	17.48	34.55	8.04	22.67	56.34	30.47	33.55

CAL YR 1999 Total 374.55
WTR YR 2000 Total 361.04

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220356159281401. State Key Number 1051.0 North Wailua ditch rain gage near Lihue, Kauai.

LOCATION.--Lat 22°03'56", long 159°28'14", Hydrologic Unit 20070000, 4.0 mi west of Wailua Reservoir and 2.0 mi east southeast of Waialeale rain gage.

PERIOD OF RECORD.--1928 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service non-recording rain gage. Elevation of gage is 1,110 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest hundredths of an inch. Can readings are made by East Kauai Water Company.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall	Period	Rainfall
Oct. 01 to Oct. 04	1.17 estimated (a)	Apr. 10 to Apr. 17	0.68
Oct. 04 to Oct. 11	2.55	Apr. 17 to Apr. 24	1.40
Oct. 11 to Oct. 18	2.68	Apr. 24 to May 01	1.02
Oct. 18 to Oct. 25	6.80	May 01 to May 08	0.55
Oct. 25 to Nov. 01	1.45	May 08 to May 15	1.90
Nov 01 to Nov. 08	4.55	May 15 to May 22	0.05
Nov. 08 to Nov. 15	1.52	May 22 to May 29	0.13
Nov. 15 to Nov. 22	2.67	May 29 to Jun. 05	0.93
Nov. 22 to Nov. 29	3.10	Jun. 05 to Jun. 12	2.70
Nov. 29 to Dec. 06	6.00	Jun. 12 to Jun. 19	1.95
Dec. 06 to Dec. 31	12.75 estimated (b)	Jun. 19 to Jun. 26	2.17
Jan. 01 to Jan. 04	0.00 estimated (b)	Jun. 26 to Jul. 03	6.26
Jan. 04 to Jan. 10	3.60	Jul. 03 to Jul. 10	3.02
Jan. 10 to Jan. 17	8.64	Jul. 10 to Jul. 17	9.24
Jan. 17 to Jan. 24	6.68	Jul. 17 to Jul. 24	5.93
Jan. 24 to Jan. 31	0.82	Jul. 24 to Jul. 31	2.30
Jan. 31 to Feb. 07	0.33	Jul. 31 to Aug. 07	0.42
Feb. 07 to Feb. 14	0.22	Aug. 07 to Aug. 14	0.86
Feb. 14 to Feb. 21	0.35	Aug. 14 to Aug. 21	2.64
Feb. 21 to Feb. 28	1.54	Aug. 21 to Aug. 28	2.64
Feb. 28 to Mar. 06	0.50	Aug. 28 to Sep. 05	2.73
Mar. 06 to Mar. 13	0.04	Sep. 05 to Sep. 11	3.86
Mar. 13 to Mar. 20	0.78	Sep. 11 to Sep. 18	3.31
Mar. 20 to Mar. 27	2.55	Sep. 18 to Sep. 25	0.81
Mar. 27 to Apr. 03	3.80	Sep. 25 to Sep. 30	6.01 estimated (c)
Apr. 03 to Apr. 10	7.35		

CAL YR 1999 Total 147.74
WTR YR 2000 Total 145.95

(a) Estimated value based on accumulation rain can reading of 1.46 inches from Sep. 27 to Oct. 04
(b) Estimated value based on nearby Waialeale rain gage (State Key Number 1047.0)
(c) Estimated value based on accumulation rain can reading of 6.68 inches from Sep. 25 to Oct. 02

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220443159235601. State Key Number 1068.0 Left Branch Opaekea rain gage near Kapaa, Kauai.

LOCATION.--Lat 22°04'43", long 159°23'56", Hydrologic Unit 20070000, in USGS stream-gaging station 16071500 on left bank, 5.0 mi west of Kapaa Beach Park and 0.7 mi northeast of Wailua Reservoir.

PERIOD OF RECORD.--1960 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 470 ft (from topographic map).

REMARKS.--Records good. Recorded rainfall read in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.13	.07	.57	.01	.05	.18	.42	.00	.00	.22	.07	.00
2	.08	.03	1.03	.00	.00	.00	.79	.00	.00	.22	.00	.03
3	.26	.00	.16	.00	.00	.01	1.57	.02	.00	.33	.03	.17
4	.02	1.70	.30	.02	.00	.00	.95	.00	.41	.05	.00	.02
5	.15	.23	.29	.17	.00	.00	.14	.01	.06	.00	.05	.44
6	.24	.04	.36	.08	.00	.00	.33	.04	.03	.62	.00	.43
7	.50	.42	.06	.30	.02	.04	.43	.00	.33	.10	.05	.25
8	.04	.33	.04	.30	.00	.00	.14	.22	.14	.01	.01	.15
9	.10	.29	.67	.06	.06	.00	.44	.01	.13	.01	.02	.08
10	.09	.00	.71	.24	.00	.00	.07	.07	.05	.09	.01	.05
11	.05	.12	.15	.16	.00	.00	.06	.03	.33	.60	.00	.13
12	.30	.12	1.68	.62	.00	.00	.08	.21	.09	.85	.00	.52
13	.24	.00	1.12	.11	.00	.00	.00	.00	.11	.01	.06	.04
14	.11	.01	.43	.27	.02	.00	.02	.00	.00	.18	.02	.44
15	.02	.00	.14	1.14	.00	.00	.00	.00	.01	.62	.05	.34
16	.18	.00	.00	.05	.00	.00	.21	.00	.18	.56	.16	.05
17	.07	.07	.00	.15	.00	.05	.13	.00	.27	.08	.35	.19
18	1.20	.00	.05	.48	.00	.22	.12	.00	.09	.15	.05	.07
19	.74	.63	.02	2.00	.17	.01	.00	.00	.00	.06	.04	.04
20	1.73	.03	.92	.44	.00	.01	.01	.00	.11	.42	.46	1.27
21	.34	.67	.11	.32	.01	.34	.13	.01	.25	.16	.00	.02
22	.00	.20	.01	.00	.17	.05	.01	.00	.21	.43	.07	.00
23	.00	.00	.29	.00	.02	.09	.07	.00	.31	.16	.03	.00
24	.33	.02	.11	.00	.00	.20	.16	.05	.09	.18	.14	.01
25	.08	.06	.18	.00	.06	.18	.09	.01	.27	.40	.19	.07
26	.15	.05	.38	.75	.45	.38	.09	.00	1.18	.32	.00	.00
27	.09	.61	.00	.00	.28	.09	.13	.00	.03	.31	.64	.44
28	.04	.39	.01	.00	.00	.11	.00	.04	.16	.16	.35	1.52
29	.00	.09	.01	.00	.01	.11	.00	.00	.70	.12	.11	.34
30	.23	.11	.06	.00	---	.57	.00	.01	.40	.01	.01	.50
31	.10	---	.18	.01	---	.01	---	.08	---	.08	.08	---
TOTAL	7.61	6.29	10.04	7.68	1.32	2.65	6.59	0.81	5.94	7.51	3.05	7.61

CAL YR 1999 TOTAL 79.13
WTR YR 2000 TOTAL 67.10

220817159374401. State Key Number 1080.0 Paukahana rain gage near Waimea, Kauai.

LOCATION.--Lat 22°08′17″, long 159°37′44″, Hydrologic Unit 20070000, 2.0 mi east of Kokee lodge and 7.0 mi south southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage. Elevation of gage is 3,700 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 15	1.3 estimated (a)
Oct. 15 to Dec. 07	6.3
Dec. 07 to Dec. 31	12.0 estimated (b)
Jan. 01 to Feb. 07	5.4 estimated (b)
Feb. 07 to Apr. 18	14.8
Apr. 18 to Jun. 08	2.0
Jun. 08 to Aug. 03	4.3
Aug. 03 to Sep. 30	3.2 estimated (c)

CAL YR 1999 TOTAL 49.1
WTR YR 2000 TOTAL 49.3

220739159373001. State Key Number 1082.0 Waiakoali rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07′39″, long 159°37′30″, Hydrologic Unit 20070000, 2.4 mi east southeast of Kokee Lodge and 7.4 mi south southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio rain-gage catchment. Elevation of gage is 3,420 ft (from topographic map).

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 15	1.2 estimated (c)
Oct. 15 to Dec. 07	7.8
Dec. 07 to Dec. 31	12.1 estimated (d)
Jan. 01 to Feb. 07	5.5 estimated (d)
Feb. 07 to Apr. 18	13.6
Apr. 18 to Jun. 08	1.0
Jun. 08 to Aug. 03	4.0
Aug. 03 to Sep. 30	2.2 estimated (f)

CAL YR 1999 TOTAL 50.5
WTR YR 2000 TOTAL 47.4

(a) Estimated values based on accumulation rain can reading of 6.4 inches from Aug. 06 to Oct. 15
(b) Estimated values based on accumulation rain can reading of 17.4 inches from Dec. 07 to Feb. 07
(b) Estimated values based on accumulation rain can reading of 4.2 inches from Aug. 03 to Oct. 06
(c) Estimated values based on accumulation rain can reading of 5.8 inches from Aug. 06 to Oct. 15
(d) Estimated values based on accumulation rain can reading of 17.6 inches from Dec. 07 to Feb. 07
(f) Estimated values based on accumulation rain can reading of 2.8 inches from Aug. 03 to Oct. 06

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220713159361201. State Key Number 1083.0 Mohihi crossing rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07'13", long 159°36'12", Hydrologic Unit 20070000, 3.8 mi east of Kokee Lodge and 7.5 mi south of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 3,420 ft (from topographic map).

REMARKS.--Records fair. Accumulated rainfall recorded in tenths of an inch and recording rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.06	---	---	.00	.00	.00	.50	.00	.00	.03	.01	.00
2	.02	---	---	.00	.00	.00	3.04	.00	.00	.19	.00	.00
3	.10	---	---	.00	.00	.00	4.70	.00	.00	.53	.00	.02
4	.15	---	---	.00	.00	.00	2.43	.00	.20	.01	.00	.00
5	.08	---	---	.00	.00	.00	.10	.00	.05	.09	.00	.27
6	.16	---	---	.04	.00	.00	.10	.00	.10	.86	.30	.10
7	.05	---	a--	.09	.00	.00	.05	.01	.88	.06	.01	.05
8	.04	---	.05	.16	.00	.00	.41	.01	.04	.01	.01	.02
9	.16	---	.42	.10	.02	.00	.40	.01	.01	.01	.01	.00
10	.16	---	3.02	.20	.00	.00	.16	.00	.00	.00	.00	.00
11	.03	---	.18	.01	.00	.00	.00	.11	.00	.22	.01	.04
12	.22	---	.45	.14	.00	.00	.01	.39	.00	.55	.00	.02
13	.05	---	.84	.20	.00	.00	.02	.00	.01	.01	.05	.00
14	.26	---	.24	.54	.20	.00	.00	.00	.01	.06	.01	.00
15	.00	---	.00	.88	.02	.00	.00	.00	.00	.10	.01	.00
16	.03	---	.00	.10	.07	.00	.34	.00	.16	.06	.04	.00
17	.02	---	.00	.11	.00	.08	.13	.00	.40	.00	.25	.00
18	.32	---	.02	.63	.00	.32	.03	.00	.25	.00	.06	.00
19	.87	---	.05	.73	.00	.01	.00	.00	.02	.00	.03	.00
20	.48	---	2.00	.61	.00	.03	.00	.00	.00	.01	.28	.00
21	.17	---	1.07	.48	.00	.09	.02	.00	.01	.01	.05	.00
22	.18	---	.02	.00	.00	.24	.00	.00	.15	.08	.01	.00
23	.07	---	.99	---	.01	.19	.11	.00	.18	.01	.05	.00
24	.04	---	.57	---	.00	.06	.10	.00	.17	.10	.01	.00
25	.02	---	.53	b--	.00	.13	.04	.00	.03	.47	.06	.00
26	---	---	1.41	.51	.01	.60	.08	.00	.03	.11	.00	.00
27	---	---	.00	.00	.01	.34	.15	.00	.00	.13	.02	.16
28	---	---	.08	.00	.00	.09	.00	.00	.00	.03	.13	.39
29	---	---	.06	.00	.00	.19	.00	.01	.09	.01	.06	.30
30	---	---	.44	.00	---	.61	.00	.00	.05	.00	.00	.26
31	---	---	.00	.00	---	.27	---	.00	---	.05	.00	---
TOTAL	---	---	---	---	0.34	3.25	12.92	0.54	2.84	3.80	1.47	1.63

CAL YR 1999 Total 63.87
WTR YR 2000 Total 56.55

(a) Catchment plugged. Used adjacent accumulation can reading of 7.96 inches from Oct. 26 to Dec. 07
(b) Estimated total rainfall for Jan. 23 to 25 is 0.09 inches based on nearby Kilohana rain gage (State Key Number 1084.0)

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220927159355001. State Key Number 1084.0 Kilohana rain gage near Hanalei, Kauai.

LOCATION.--Lat 22°09′27″, long 159°35′50″, Hydrologic Unit 20070000, 4.1 mi east southeast of Kalalau Beach and 4.9 mi south southwest of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Electronic data logger with a tipping bucket catchment (0.01 in. per tip). Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records good. Recording rainfall in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.21	2.04	.00	.00	.01	2.53	.00	.01	.04	.01	.00
2	.02	.02	.21	.00	.00	.00	8.76	.00	.00	.18	.00	.00
3	.41	.00	.30	.00	.00	.00	9.30	.06	.07	.74	.00	.03
4	.25	.87	.17	.00	.00	.00	6.61	.00	1.89	.03	.04	.05
5	.11	.15	.24	.05	.00	.00	.57	.00	.18	.22	.01	.40
6	.09	.06	.53	.13	.00	.00	.38	.00	.80	1.23	.55	.20
7	.42	.95	.20	.21	.00	.02	.08	.01	2.43	.27	.01	.10
8	.14	.61	.07	.32	.00	.00	1.63	.01	.06	.01	.00	.13
9	.27	.30	1.00	.19	.01	.00	2.01	.01	.01	.05	.00	.00
10	.41	.01	2.69	.53	.01	.00	.25	.03	.00	.03	.03	.01
11	.11	.08	.26	.05	.00	.00	.02	.26	.00	.44	.05	.09
12	.41	.76	.83	.30	.00	.00	.08	.87	.00	.27	.00	.15
13	.03	.07	.40	.87	.00	.00	.07	.02	.02	.01	.11	.03
14	.02	.06	.24	2.36	.41	.01	.01	.00	.00	.21	.04	.03
15	.00	.00	.02	4.05	.01	.00	.01	.00	.00	.25	.01	.01
16	.18	.00	.01	.51	.18	.00	1.13	.00	.34	.13	.07	.00
17	.28	.54	.00	.12	.01	.22	.78	.00	.77	.00	.72	.11
18	1.66	.00	.02	1.47	.00	.76	.13	.00	.59	.10	.10	.01
19	.76	.32	.01	4.93	.12	.03	.00	.00	.05	.00	.11	.00
20	.33	.12	.56	3.01	.00	.06	.03	.00	.07	.02	1.40	.00
21	.74	.06	.52	2.23	.02	.43	.12	.00	.10	.02	.09	.00
22	.01	.04	.05	.04	.18	.21	.02	.00	.66	.28	.05	.00
23	.00	.00	.30	.03	.04	.53	.17	.00	.69	.03	.04	.00
24	.04	.00	.17	.00	.00	.17	.29	.00	.40	.89	.05	.00
25	.05	.13	.19	.14	.02	.33	.21	.00	.11	.59	.17	.00
26	.05	.27	1.40	1.03	.04	1.97	.30	.01	.08	.62	.00	.00
27	.16	2.73	.01	.00	.01	.79	.70	.04	.00	.76	.09	.40
28	.00	1.34	.24	.00	.00	.15	.00	.01	.12	.09	1.59	.43
29	.03	.99	.17	.00	.02	.12	.01	.02	.30	.02	.50	.21
30	.15	.60	.93	.00	---	1.19	.01	.01	.07	.00	.00	.58
31	.22	---	.01	.00	---	1.46	---	.02	---	.23	.02	---
TOTAL	7.45	11.29	13.79	22.57	1.08	8.46	36.21	1.38	9.82	7.76	5.86	2.97

CAL YR 1999 Total 107.97
WTR YR 2000 Total 128.64

RAINFALL RECORDS

HAWAII, ISLAND OF KAUAI--Continued

220703159351201. State Key Number I085.0 Mohihi-Koaie divide rain gage near Waimea, Kauai.

LOCATION.--Lat 22°07′03″, long 159°35′12″, Hydrologic Unit 20070000, 5.0 mi east of Kokee Lodge and 7.5 mi south of Kailiu Point.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records are in files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Standard 8-in. National Weather Service accumulation rain gage. Elevation of gage is 4,000 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 14	2.1 estimated (a)
Oct. 14 to Dec. 31	18.3 estimated (b)
Jan. 01 to Feb. 04	6.1 estimated (b)
Feb. 04 to May 02	19.0
May 02 to Jul. 31	10.0
Jul. 31 to Sep. 30	3.2 estimated (c)

CAL YR 1999 TOTAL 69.7
WTR YR 2000 TOTAL 58.7

(a) Estimated values based on accumulation rain can reading of 10.2 inches from Aug. 03 to Oct. 14
(b) Estimated values based on accumulation rain can reading of 24.4 inches from Oct. 14 to Feb. 04
(c) Estimated values based on accumulation rain can reading of 3.6 inches from Jul. 31 to Oct. 11

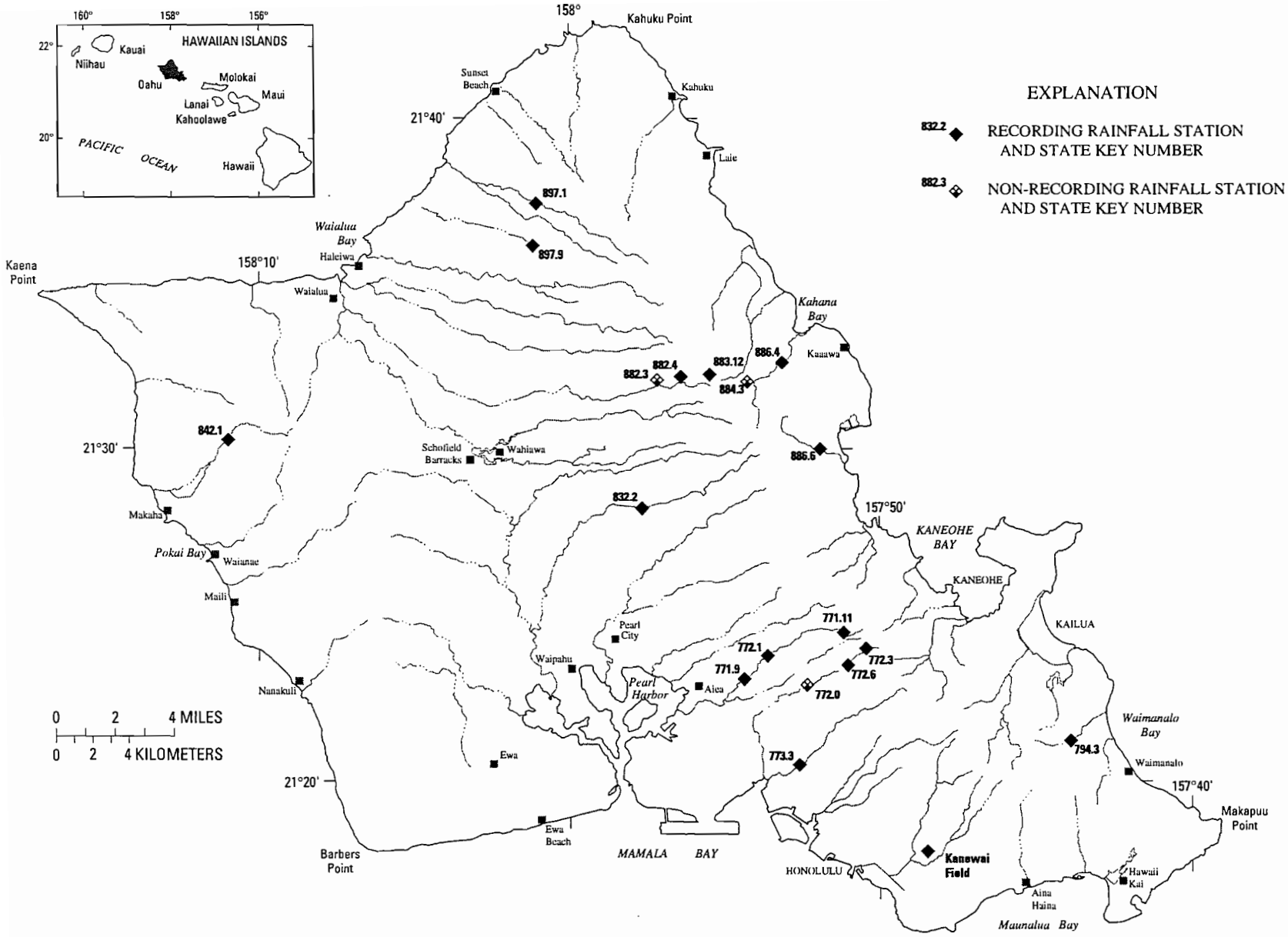


Figure 22. Locations of rainfall stations on Oahu.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU

212428157511201. State Key Number 771.11 North Halawa Valley rain gage at tunnel portal near Kaneohe, Oahu.

LOCATION.--Lat 21°24′28″, long 157°51′12″, Hydrologic Unit 20060000, on roof of Halawa portal control center, 3.2 mi west of Kaneohe Post Office and 2.4 mi southwest of Ahuimanu School.

PERIOD OF RECORD.--Continuous-record station, July 15, 1998 to current year.

GAGE.--Standard 8-in. National Weather Service collector attached to a 7 5/16-in. rain can with float-type recorder system. Elevation of the gage is 1,100 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	2.10	.10	.40	.20	1.70	.00	.00	.50	.20	.10
2	.10	.20	1.70	.10	.00	.00	2.30	.10	.00	.60	.20	.10
3	.00	.40	.00	.10	.00	.00	.60	.10	.00	.60	.00	.10
4	.30	1.20	.20	.00	.00	.10	.50	.00	.00	.20	.10	.30
5	.40	.00	.70	.00	.00	.00	.00	.00	.20	.10	.50	1.40
6	.20	.00	.20	.50	.00	.10	.10	.30	.30	.30	.10	.60
7	.30	.50	.20	.10	.00	.00	.00	.20	1.20	.00	.10	1.10
8	.20	.30	.30	.10	.20	.10	.60	.00	.30	.00	.00	.30
9	.20	.70	.80	.50	.00	.00	.90	.00	.00	.10	.10	.10
10	.00	.20	4.40	.30	.00	.00	.50	.20	.20	.80	.20	.10
11	.30	.30	1.10	.30	.00	.00	.00	.50	.00	3.00	.00	.80
12	.40	.60	1.70	.30	.00	.00	.10	.60	.00	.10	.10	.30
13	.40	.00	.70	.70	.00	.00	.10	.40	.20	.00	.10	.30
14	.50	.30	1.30	---	.00	.00	.00	.00	.20	.60	.00	.60
15	.20	.00	.10	---	.00	.00	.00	.00	.00	1.00	.10	.00
16	.20	.10	.00	---	.00	.00	.50	.00	.30	1.30	.30	.20
17	.10	.10	.40	---	.10	.00	.30	.10	.40	.20	1.80	.70
18	.00	.50	.40	---	.10	.20	.10	.00	.00	.60	.50	.20
19	2.20	.40	.00	---	.30	.00	.00	.20	.00	.10	.30	.20
20	.10	.50	.10	---	.00	.00	.20	.00	.40	1.70	7.30	.00
21	.10	.10	.00	a--	.40	.10	.30	.10	.70	.40	.00	.00
22	.10	.20	.50	.00	.00	.10	.00	.20	.10	.00	.10	.00
23	.10	.10	.60	.00	.00	.60	.20	.00	.30	.10	.30	.00
24	2.20	.00	.00	.00	.00	.10	.20	.10	.00	.10	.10	.00
25	.60	.10	.00	.00	.10	.70	.10	.00	.30	.40	.00	.00
26	.00	.00	.40	1.20	.20	1.00	.50	.10	.10	.40	.30	.00
27	.30	.20	.10	.00	.20	1.70	.60	.00	.00	.80	1.20	3.20
28	.10	.20	.00	.00	.10	.10	.00	.00	.00	.00	1.30	.60
29	.00	.00	.10	.00	.00	1.60	.00	.00	.10	.10	.50	.30
30	.20	.20	.20	.00	---	.00	.00	.20	.80	.00	.00	.00
31	.80	---	.00	.20	---	3.30	---	.40	---	.30	.20	---
TOTAL	10.60	7.40	18.30	---	2.10	10.00	10.40	3.80	6.10	14.40	16.00	11.60

WTR YR 2000 TOTAL 128.7

a Cumulative rainfall total January 14 (0015) to January 21 (2400) is 13.5 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212304157542201. State Key Number 771.9 North Halawa rain gage near Honolulu, Oahu.

LOCATION.--Lat 21°23'04", long 157°54'22", (Waipahu quadrangle, 1983, 1:24000) Hydrologic Unit 20060000, in USGS stream-gaging station 16226200, on right bank, 0.6 mi north of Oahu Prison, 1.0 mi south of Keaiwa Heiau, and 1.7 mi east of Aiea High School.

PERIOD OF RECORD.--Continuous-record station, May 1, 1983 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage receiver and 7 5/16-in. rain can with float-type system attached to an electronic data logger. Elevation of gage is 160 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall read in 0.1-inch increments, at intervals of 15 minutes.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	1.1	.0	.2	.0	.7	.0	.0	.1	.0	.0
2	.0	.0	2.8	.0	.0	.0	1.3	.0	.0	.3	.0	.0
3	.0	.1	.2	.0	.0	.0	.3	.0	.0	.2	.0	.0
4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0
5	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.1
6	.1	.0	.0	.0	.0	.0	.0	.0	.0	.5	.0	.0
7	.0	.1	.1	.0	.0	.0	.0	.0	.1	.0	.0	.0
8	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	.0	.2	.5	.2	.0	.0	.0	.0	.1	.0	.0	.0
10	.0	.0	3.7	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.2	.0	.0	.0	.0	.2	.0	.2	.0	.0
12	.2	.2	.4	.0	.0	.0	.0	.2	.0	.0	.0	.0
13	.0	.0	.0	.0	.0	.0	.0	.2	.0	.0	.0	.0
14	.2	.1	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0
15	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0	.0	.0
16	.0	.0	.0	.1	.0	.0	.0	.0	.2	.0	.0	.0
17	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.2	.0
18	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0
19	1.8	.0	.0	1.3	.0	.0	.0	.0	.0	.0	.0	.0
20	.0	.0	.0	1.4	.0	.0	.0	.0	.0	.5	1.3	.0
21	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.9	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	.0	.0	.6	.0	.0	.3	.0	.0	.1	.0	.0	.0
24	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	.1	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0
26	.1	.0	.3	.5	.0	.3	.2	.0	.0	.0	.0	.0
27	.0	.1	.0	.0	.0	.7	.3	.0	.0	.5	.0	.1
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
29	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
30	.0	.0	.0	.0	---	.0	.0	.0	.0	.0	.0	.0
31	.0	---	.0	.0	---	.0	---	.0	---	.0	.0	---
TOTAL	2.6	1.7	10.6	4.5	0.2	1.4	2.8	0.6	0.6	2.4	1.6	0.2

CAL YR 1998 TOTAL 23.4
WTR YR 1999 TOTAL 31.8

a Cumulative reading November 6 (1700) to November 13 (0930) is 0.1.
b Cumulative reading November 13 (1000) to November 18 (1200) is 3.0.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212253157522201. State Key Number 772.0 Moanalua rain gage near Honolulu, Oahu.

LOCATION.--Lat 21°22′53″, long 157°52′22″, Hydrologic Unit 20060000, 1.8 mi northeast of Tripler Hospital, and 5.0 mi north of Honolulu Post Office.

PERIOD OF RECORD.--Accumulated-rainfall station, June 1926 (revised) to December 8, 1964. Continuous-record station, December 8, 1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector attached to a 7 5/16-in. rain can with float-type recorder system. An electronic data logger was installed on February 6, 1997 replacing the digital recorder. Housed with recording crest-gage. Elevation of the gage is 340 ft above mean sea level (from topographic map).

REMARKS.--Records good except for the estimated days January 22-24, which are poor. Rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.1	1.9	.0	.2	.0	1.2	.0	.0	.6	.0	.0
2	.1	.1	6.2	.0	.0	.0	2.5	.0	.0	.6	.0	.0
3	.0	.1	.2	.0	.0	.0	.6	.0	.0	.8	.0	.0
4	.0	.1	.0	.0	.0	.0	.3	.0	.0	.3	.1	.0
5	.4	.0	.4	.0	.0	.0	.0	.0	.1	.2	.3	.4
6	.3	.1	.1	.1	.0	.0	.0	.0	.0	1.0	.0	.3
7	.1	.2	.1	.0	.0	.1	.0	.0	.4	.1	.0	.3
8	.1	.1	.3	.5	.0	.0	.0	.0	.4	.0	.0	.3
9	.0	.4	.5	.5	.0	.0	.2	.1	.0	.1	.0	.1
10	.1	.0	4.2	.2	.0	.0	.4	.0	.1	.2	.4	.0
11	.0	.1	.5	.2	.0	.0	.0	.8	.0	.6	.0	.4
12	.5	.7	.9	.1	.0	.0	.0	.3	.0	.7	.0	.0
13	.1	.0	.1	.2	.0	.0	.0	.4	.1	.0	.0	.1
14	.0	.2	.0	.2	.0	.0	.0	.0	1.2	.4	.0	.1
15	.0	.0	.0	1.6	.0	.0	.0	.0	.0	.5	.0	.0
16	.0	.0	.0	.2	.0	.0	.3	.0	.1	.7	.1	.0
17	.0	.0	.0	.0	.0	.0	.3	.0	.1	.1	1.2	.1
18	.0	.2	.0	.5	.0	.1	.0	.0	.1	.2	.2	.3
19	2.0	.2	.0	2.9	.2	.0	.0	.0	.0	.0	.2	.2
20	.0	.2	.1	2.9	.0	.0	.1	.0	.1	1.1	2.7	.0
21	.0	.0	.0	.4	.1	.0	.2	.1	.1	.1	.0	.0
22	.0	1.3	.4	e.5	.0	.0	.0	.1	.2	.0	.0	.0
23	.2	.0	.6	e.0	.0	.6	.1	.0	.0	.3	.1	.0
24	.7	.0	.0	e.0	.0	.0	.0	.0	.1	.1	.1	.0
25	.3	.1	.0	.0	.0	.3	.2	.1	.0	.1	.0	.0
26	.1	.0	.6	1.0	.1	1.2	.1	.0	.0	.2	.0	.0
27	.1	.2	.0	.0	.0	.9	.6	.0	.0	.7	.6	1.2
28	.1	.1	.0	.0	.0	.2	.0	.0	.2	.1	.6	.1
29	.0	.1	.0	.0	.0	.6	.0	.0	.1	.0	.3	.0
30	.0	.3	.0	.0	---	.0	.0	.0	.1	.0	.0	.0
31	.3	---	.0	.0	---	.4	---	.1	---	.0	.0	---
TOTAL	5.5	4.9	17.1	12.0	0.6	4.4	7.1	2.0	3.5	9.8	6.9	3.9

e Estimated

CAL YR 1999 TOTAL 84.2
WTR YR 2000 TOTAL 77.7

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212346157533701. State Key Number 772.1 North Halawa rain gage near Aiea, Oahu.

LOCATION.--Lat 21°23′46 ″(revised), long 157°53′37 ″, Hydrologic Unit 20060000, 2.7 mi above confluence with South Halawa Stream, 2.7 mi northeast of Aiea Post Office, and 6.5 mi northwest of Honolulu.

PERIOD OF RECORD.--Continuous-record station, August 6, 1929 to June 30, 1933, June 3, 1953 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--A 12-in. collector and 10-in. storage tank with float-type recorder system. Elevation of gage is 320 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in 0.083-inch increments.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.08	1.25	.00	.08	.00	1.17	.00	.00	.17	.00	.00
2	.00	.00	3.42	.00	.00	.00	1.42	.00	.00	.33	.00	.00
3	.00	.08	.17	.00	.00	.00	.33	.08	.00	.33	.00	.00
4	.08	.08	.00	.00	.00	.00	.17	.00	.00	.08	.17	.00
5	.17	.00	.08	.00	.00	.08	.00	.00	.00	.00	.08	.25
6	.17	.00	.08	.08	.00	.00	.00	.00	.08	.50	.00	.08
7	.00	.17	.00	.00	.00	.00	.00	.00	.25	.00	.00	.25
8	.00	.17	.17	.08	.00	.00	.00	.00	.33	.00	.00	.00
9	.00	.25	.58	.33	.00	.00	.00	.00	.08	.00	.00	.00
10	.00	.00	2.92	.08	.00	.00	.08	.00	.00	.00	.08	.00
11	.00	.00	.08	.08	.00	.00	.00	.33	.00	.42	.00	.00
12	.25	.42	.42	.00	.00	.00	.00	.25	.00	.00	.00	.08
13	.08	.00	.00	.00	.00	.00	.00	.17	.00	.00	.00	.00
14	.08	.08	.00	.17	.00	.00	.00	.00	.33	.17	.00	.00
15	.00	.00	.00	1.00	.00	.00	.00	.00	.00	.17	.00	.00
16	.00	.00	.00	.33	.00	.00	.08	.00	.25	.25	.00	.00
17	.00	.00	.00	.08	.00	.00	.25	.00	.08	.00	.83	.00
18	.00	.00	.00	.42	.00	.00	.00	.00	.00	.00	.00	.00
19	1.50	.08	.00	2.08	.08	.00	.00	.00	.00	.00	.00	.17
20	.00	.08	.00	1.92	.00	.00	.00	.00	.17	.75	2.08	.00
21	.00	.08	.00	.25	.00	.00	.08	.00	.08	.08	.00	.00
22	.00	.58	.33	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.58	.00	.00	.33	.00	.00	.08	.08	.00	.00
24	.42	.00	.00	.00	.00	.08	.00	.00	.00	.00	.00	.00
25	.17	.00	.00	.00	.08	.17	.08	.00	.00	.00	.00	.00
26	.08	.00	.33	.58	.00	.50	.17	.00	.00	.00	.00	.00
27	.00	.17	.00	.00	.08	.75	.42	.00	.00	.58	.17	.58
28	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00	.25	.00
29	.00	.00	.00	.00	.00	.25	.00	.00	.00	.00	.17	.00
30	.00	.08	.00	.00	---	.00	.00	.00	.08	.00	.00	.00
31	.00	---	.00	.00	---	.25	---	.00	---	.00	.00	---
TOTAL	3.00	2.40	10.41	7.48	0.32	2.49	4.25	0.83	1.81	3.91	3.83	1.41

CAL YR 1999 TOTAL 38.16
WTR YR 2000 TOTAL 42.14

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212359157502601. State Key Number 772.3 Moanalua rain gage no. 1 at altitude 1,000 ft near Honolulu, Oahu.

LOCATION.--Lat 21°23'59", long 157°50'26", (Kaneohe quadrangle, 1959, 1:24000) Hydrologic Unit 20060000, 2.7 mi southwest of Kaneohe Post Office, and 4.2 mi northeast of Tripler Hospital.

PERIOD OF RECORD.--Continuous-record station, June 25, 1968 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in. rain can with recorder. An electronic data logger was installed on February 5, 1997 replacing the digital recorder. Elevation of gage is 1,000 ft above mean sea level (from topographic map).

REMARKS.--Records poor except for period of daily record, August 25 to September 30, which is good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	---	---	.0
2	---	---	---	---	---	---	---	---	---	---	---	.1
3	---	---	---	---	---	---	---	---	---	---	---	.0
4	---	---	---	---	---	---	---	---	---	---	---	.2
5	---	---	---	---	---	---	---	---	---	---	---	1.7
6	---	---	---	---	---	---	---	---	---	---	---	.8
7	---	---	---	---	---	---	---	---	---	---	---	.8
8	---	---	---	---	---	---	---	---	---	---	---	.4
9	---	---	---	---	---	---	---	---	---	---	---	.0
10	---	---	---	---	---	---	---	---	---	---	---	.0
11	---	---	---	---	---	---	---	---	---	---	---	.8
12	---	---	---	---	---	---	---	---	---	---	---	.5
13	---	---	---	---	---	---	---	---	---	---	---	.2
14	---	---	---	---	---	---	---	---	---	---	---	.8
15	---	---	---	---	---	---	---	---	---	---	---	.0
16	---	---	---	---	---	---	---	---	---	---	---	.0
17	---	---	---	---	---	---	---	---	---	---	---	.6
18	---	---	---	---	---	---	---	---	---	---	---	.2
19	---	---	---	---	---	---	---	---	---	---	---	.3
20	---	---	---	---	---	---	---	---	---	---	---	.2
21	---	---	---	---	---	---	---	---	---	---	---	.0
22	---	---	---	---	---	---	---	---	---	---	---	.0
23	---	---	---	---	---	---	---	---	---	---	---	.0
24	---	---	---	---	---	---	---	---	---	---	---	.0
25	---	---	---	---	---	---	---	---	---	---	a.0	.0
26	---	---	---	---	---	---	---	---	---	---	.2	.0
27	---	---	---	---	---	---	---	---	---	---	1.3	3.7
28	---	---	---	---	---	---	---	---	---	---	1.2	.7
29	---	---	---	---	---	---	---	---	---	---	.5	.2
30	---	---	---	---	---	---	---	---	---	---	.0	.0
31	---	---	---	---	---	---	---	---	---	---	.2	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	12.2

a Partial day total; 1030-2400 hours. No record Oct 1 to Aug 25 (1015 hrs) due to leaking storage can.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212329157510501. State Key Number 772.6 Moanalua rain gage near Kaneohe, Oahu.

LOCATION.--Lat 21°23'29", long 157°51'05", (Kaneohe quadrangle, 1959, 1:24000) Hydrologic Unit 20060000, in USGS stream-gaging station 16227500, on left bank 3.3 mi northeast of Tripler Hospital, and 3.6 mi southwest of Kaneohe Post Office.

PERIOD OF RECORD.--Continuous-record station, August 29, 1968 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector attached to 7 5/16-in. rain can with a digital recorder. An electronic data logger was installed on February 5, 1997 replacing the digital recorder. Elevation of gage is 660 ft above mean sea level (from topographic map).

REMARKS.--Records good except for periods of no daily record, which are fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.1	2.3	.0	.3	.0	1.8	.0	.0	1.0	.3	.0
2	.1	.3	3.9	.0	.0	.0	3.1	.0	.0	.7	---	.0
3	.0	.4	.0	.0	.0	.1	.8	.2	.0	.9	---	.1
4	.0	.4	.2	.0	.0	.0	.6	.0	.0	.2	---	.1
5	.3	.0	.7	.0	.0	.0	.0	.0	.3	.3	---	1.5
6	.3	.1	.2	.3	.0	.0	.0	.1	.0	.8	---	.7
7	.3	.3	.2	.1	.0	.0	.0	.0	.8	.0	---	.7
8	.1	.1	.3	.3	.0	.0	.2	.0	.4	.0	---	.5
9	.0	.8	.6	.7	.0	.0	.7	.0	.0	.1	---	.0
10	.1	.0	5.2	.2	.0	.0	.6	.1	.1	.5	---	.1
11	.1	.2	.9	.4	.0	.0	.0	.3	.0	2.3	---	1.1
12	.6	.6	2.0	.2	.0	.0	.0	.4	.0	.3	---	.3
13	.3	.0	.6	.4	.0	.0	.0	.5	.2	.0	---	.4
14	.0	.3	.8	.0	.0	.0	.0	.0	.6	.5	---	.3
15	.0	.0	.0	.6	.0	.0	.0	.0	.0	.9	---	.2
16	.1	.0	.0	.0	.0	.0	.5	.0	.4	1.1	---	.0
17	.0	.0	.2	.0	.0	.0	.4	.0	.3	.5	---	.5
18	.0	.5	.1	.3	.1	.0	.0	.0	.1	.8	---	.4
19	2.2	.3	.0	---	.3	.0	.0	.1	.0	.0	---	.4
20	.0	.6	.1	---	.0	.0	.2	.0	.1	2.2	---	.1
21	.1	.0	.0	---	.3	.1	.2	.0	.5	.2	---	.0
22	.0	.7	.5	---	.0	.1	.1	.2	.1	.0	---	.0
23	.3	.0	.6	---	.1	.5	.0	.0	.2	.4	---	.0
24	1.4	.0	.0	---	.0	.1	.2	.0	.0	.1	---	.0
25	.6	.1	.0	a--	.0	.6	.2	.1	.3	.3	b--	.1
26	.0	.0	.6	1.1	.1	1.5	.2	.1	.0	.2	.0	.0
27	.1	.2	.0	.0	.1	1.3	.6	.0	.1	1.1	1.2	3.4
28	.1	.3	.0	.0	.0	.1	.0	.0	.2	.1	1.2	.3
29	.0	.0	.0	.0	.0	1.4	.0	.0	.1	.0	.6	.0
30	.0	.3	.1	.0	---	.0	.0	.0	.2	.0	.0	.0
31	.6	---	.0	.1	---	1.6	---	.6	---	.1	.2	---
TOTAL	7.7	6.6	20.1	10.7	1.3	7.4	10.4	2.7	5.0	15.6	16.9	11.2

CAL YR 1999 TOTAL 101.2
WTR YR 2000 TOTAL 115.6

a Estimated total rainfall from January 19 to 25 is 6.0 inches.
b Estimated total rainfall from August 2 to August 25 is 13.4 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212029157523601. State Key Number 773.3 Kalihi rain gage at Kalihi, Oahu.

LOCATION.--Lat 21°20'29", long 157°52'36", Hydrologic Unit 20060000, in USGS stream-gaging station 16229300 on left bank, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu Post Office.

PERIOD OF RECORD.--Continuous-record station, July 1962 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage with tipping-bucket attachment. An electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 70 ft above mean sea level (from topographic map).

REMARKS.--Records good until October 25, then poor for the rest of the year. Rainfall recorded in tenths of an inch until October 25, then hundredths of an inch from October 25 –September 30..

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	---	---	.00	.05	.00	.21	.00	.00	.00	.01	.00
2	.00	---	---	.00	.00	.00	.73	.00	.00	.00	.00	.00
3	.00	---	---	.00	.00	.00	.08	.00	.00	.00	.00	.00
4	.00	---	---	.00	.00	.00	.01	.00	.00	.00	.01	.00
5	.00	---	---	.00	.00	.03	.00	.00	.00	.00	.00	.00
6	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.10	---	---	.00	.00	.00	.00	.00	.00	.01	.00	.00
9	.00	---	---	.00	.00	.00	.00	.00	.00	.01	.00	.00
10	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.10	---	---	.01	.00	.00	.00	.00	.00	.03	.00	.00
13	.00	---	---	.02	.00	.00	.00	.00	.00	.00	.00	.00
14	.10	---	---	.02	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	---	---	.15	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	---	---	.08	.00	.00	.00	.00	.00	.00	.00	.00
18	.10	---	---	.03	.00	.02	.00	.00	.00	.00	.00	.00
19	1.40	---	---	.73	.05	.00	.00	.00	.00	.00	.00	.00
20	.10	---	b.00	.52	.00	.00	.00	.00	.00	.02	.00	.00
21	.00	---	.00	.10	.00	.05	.00	.00	.00	.00	.00	.00
22	.10	---	.20	.01	.01	.05	.00	.00	.00	.00	.04	.00
23	.00	---	.35	.00	.00	.11	.00	.00	.00	.00	.00	.00
24	.00	---	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
25	a.10	---	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
26	---	---	.35	.47	.00	.16	.00	.00	.00	.02	.00	.00
27	---	---	.00	.00	.01	.10	.00	.00	.00	.04	.00	.00
28	---	---	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	---	---	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00
30	---	---	.00	.00	---	.06	.00	.00	.00	.00	.00	.00
31	---	---	.00	.00	---	.02	---	.00	---	.00	.00	---
TOTAL	---	---	---	2.16	0.12	0.64	1.03	0.00	0.00	0.13	0.06	0.00

a Partial day from (0015) to (1445). No record Oct 25 (1500) to Dec 20 (0945).
b Partial day total 1000 hrs to 2400 hrs.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

211747157485601. Manoa rain gage at Kanewai Field at Honolulu, Oahu (State Key Number not yet assigned).

LOCATION.--Lat 21°17′47″, long 157°48′56 ″, Hydrologic Unit 20060000, in USGS stream-gaging station 16242500 on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream of confluence with Palolo Stream.

PERIOD OF RECORD.--Continuous-record station, May 14, 1999 to current year.

GAGE.--Standard 8-in. National Weather Service collector and 8-in. rain can with tipping-bucket attachment. An electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 22 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1998 TO SEPTEMBER 1999
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.00	.01	.07	.00
2	---	---	---	---	---	---	---	---	.03	.00	.00	.00
3	---	---	---	---	---	---	---	---	.02	.00	.00	.23
4	---	---	---	---	---	---	---	---	.00	.02	.08	.04
5	---	---	---	---	---	---	---	---	.02	.01	.02	.00
6	---	---	---	---	---	---	---	---	.01	.03	.00	.00
7	---	---	---	---	---	---	---	---	.01	.05	.04	.00
8	---	---	---	---	---	---	---	---	.01	.03	.00	.08
9	---	---	---	---	---	---	---	---	.00	.02	.03	.02
10	---	---	---	---	---	---	---	---	.00	.00	.02	.00
11	---	---	---	---	---	---	---	---	.00	.03	.02	.00
12	---	---	---	---	---	---	---	---	.00	.07	.02	.06
13	---	---	---	---	---	---	---	---	.00	.17	.03	.00
14	---	---	---	---	---	---	---	.00	.00	.04	.01	.00
15	---	---	---	---	---	---	---	.00	.05	.03	.04	.00
16	---	---	---	---	---	---	---	1.46	.01	.05	.04	.04
17	---	---	---	---	---	---	---	.24	.00	.30	.00	.07
18	---	---	---	---	---	---	---	.00	.00	.01	.00	.04
19	---	---	---	---	---	---	---	.00	.02	.08	.00	.02
20	---	---	---	---	---	---	---	.00	.00	.04	.00	.03
21	---	---	---	---	---	---	---	.00	.01	.06	.00	.07
22	---	---	---	---	---	---	---	.00	.00	.35	.00	.00
23	---	---	---	---	---	---	---	.00	.15	.05	.00	.00
24	---	---	---	---	---	---	---	.00	.07	.01	.01	.00
25	---	---	---	---	---	---	---	.13	.00	.00	.00	.02
26	---	---	---	---	---	---	---	.01	.00	.00	.09	.00
27	---	---	---	---	---	---	---	.00	.04	.02	.11	.00
28	---	---	---	---	---	---	---	.00	.00	.24	.01	.00
29	---	---	---	---	---	---	---	.00	.00	.00	.06	.00
30	---	---	---	---	---	---	---	.00	.01	.00	.08	.00
31	---	---	---	---	---	---	---	.00	---	.00	.01	---
TOTAL	---	---	---	---	---	---	---	---	0.46	1.72	0.79	0.72

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

211747157485601. Manoa rain gage at Kanewai Field at Honolulu, Oahu (State Key Number not yet assigned).

LOCATION.--Lat 21°17′47″, long 157°48′56″, Hydrologic Unit 20060000, in USGS stream-gaging station 16242500 on left bank, 0.5 mi northeast of Kaimuki High School, 0.4 mi northwest of St. Louis High School, and 0.3 mi upstream of confluence with Palolo Stream.

PERIOD OF RECORD.--Continuous-record station, May 14, 1999 to current year.

GAGE.--Standard 8-in. National Weather Service collector and 8-in. rain can with tipping-bucket attachment. An electronic data logger records rainfall at 15-minute intervals. Elevation of gage is 22 ft above mean sea level (from topographic map).

REMARKS.--Records good except for December 12-20 and April 3-11 which are fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.03	1.06	.00	.07	.00	.57	.00	.00	.06	.01	.00
2	.02	.00	.03	.00	.00	.00	1.74	.02	.00	.02	.00	.00
3	.00	.08	.00	.00	.00	.00	.15	.01	.00	.15	.00	.00
4	.00	.01	.01	.00	.00	.00	.18	.00	.00	.02	.00	.02
5	.06	.00	.12	.00	.00	.00	.00	.00	.02	.01	.00	.13
6	.01	.00	.00	.09	.00	.00	.01	.00	.03	.09	.04	.03
7	.02	.15	.06	.00	.00	.01	.00	.00	.05	.04	.00	.09
8	.05	.05	.06	.09	.00	.00	.05	.00	.10	.04	.00	.07
9	.00	.04	.04	.03	.00	.00	.04	.00	.00	.00	.00	.00
10	.02	.00	1.75	.01	.00	.00	.00	.00	.00	.05	.11	.00
11	.01	.03	.14	.00	.00	.00	.00	.13	.00	.00	.00	.00
12	.03	.09	.22	.03	.00	.00	.01	.07	.00	.01	.00	.00
13	.00	.03	.18	.07	.00	.01	.01	.11	.15	.00	.04	.01
14	.06	.06	.04	.03	.00	.00	.00	.00	.01	.04	.00	.01
15	.00	.00	.00	.40	.00	.00	.00	.00	.00	.05	.00	.00
16	.03	.00	.00	.06	.00	.00	.04	.00	.15	.06	.00	.00
17	.00	.00	.00	.11	.00	.00	.07	.00	.05	.00	.16	.00
18	.00	.02	.00	.17	.00	.00	.05	.00	.00	.01	.01	.00
19	1.20	.02	.00	.92	.12	.00	.00	.00	.00	.00	.03	.02
20	.06	.03	.05	.47	.00	.00	.01	.00	.00	.06	.17	.18
21	.01	.01	.05	.34	.07	.01	.03	.00	.10	.00	.00	.00
22	.00	.00	.43	.00	.01	.12	.00	.00	.06	.00	.00	.00
23	.00	.00	.32	.00	.00	.19	.00	.00	.03	.00	.00	.00
24	.04	.00	.00	.00	.00	.00	.00	.00	.02	.02	.00	.00
25	.03	.00	.00	.00	.00	.11	.04	.00	.00	.11	.00	.00
26	.04	.02	.30	.65	.00	.08	.06	.00	.00	.00	.00	.00
27	.00	.07	.00	.00	.04	.06	.10	.03	.00	.06	.06	.34
28	.00	.15	.00	.00	.01	.02	.00	.05	.00	.00	.60	.02
29	.00	.02	.00	.00	.00	.00	.00	.01	.00	.00	.01	.03
30	.00	.05	.01	.00	---	.00	.00	.00	.03	.00	.00	.00
31	.02	---	.00	.00	---	.05	---	.00	---	.19	.00	---
TOTAL	1.71	0.96	4.87	3.47	0.32	0.66	3.16	0.43	0.80	1.09	1.24	0.95

WTR YR 2000 TOTAL 19.66

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212114157435001. State Key Number 794.3 Waimanalo rain gage at Waimanalo, Oahu.

LOCATION.--Lat 21°21'14", long 157°43'50", Hydrologic Unit 20060000, in USGS stream-gaging station 16249000, 260 ft downstream from Kalanianaole Highway, and 2.3 mi northwest of Waimanalo Post Office.

PERIOD OF RECORD.--Continuous-record station, January 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain gage collector and 7 5/16-in. diameter rain can, 4 ft tall, with a float system attached to a data logger. Elevation of gage is 20 ft above mean sea level (from topographic map).

REMARKS.--Records are good. Rainfall recorded in 0.10-inch increments.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.40	.00	.30	.00	.20	.00	.00	.00	.10	.00
2	.00	.10	.00	.00	.00	.00	1.70	.00	.00	.00	.00	.00
3	.00	.10	.00	.00	.00	.00	.20	.00	.00	.10	.00	.00
4	.00	.10	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00
5	.20	.00	.30	.00	.00	.00	.00	.00	.00	.00	.00	.50
6	.00	.00	.00	.10	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.10	.00	.00	.00	.00	.40	.00	.10	.00	.00	.00
8	.00	.00	.10	.00	.00	.00	.30	.00	.00	.00	.00	.00
9	.00	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	1.60	.00	.00	.00	.10	.00	.00	.00	.00	.00
11	.00	.00	.20	.00	.00	.00	.00	.00	.00	.10	.00	.00
12	.00	.00	.50	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.10	.10	.00	.00	.00	.10	.10	.00	.00	.00
14	.00	.00	1.00	.40	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.60	.10	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.10	.00	.00	.20	.40	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.10	.00	.00	.00
18	.00	.00	.20	.10	.00	.00	.00	.00	.00	.00	.00	.00
19	.80	.10	.10	2.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.30	.50	.00	.00	.10	.00	.00	.00	1.20	1.00
21	.00	.00	.10	.10	.00	.00	.00	.00	.00	.00	.00	.00
22	.10	.00	1.10	.10	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	1.50	.00	.00	.10	.00	.00	.00	.00	.00	.00
24	.20	.00	.00	.00	.00	.00	.10	.00	.00	.00	.00	.00
25	.00	.00	.10	.00	.00	.10	.00	.00	.00	.10	.00	.00
26	.00	.00	1.40	.20	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.10	.10	.70
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.70	.60
29	.00	.10	.10	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.40	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.10	---	.00	.00	---	3.30	---	.00	---	.10	.00	---
TOTAL	1.40	0.70	10.10	3.80	0.30	3.50	3.30	0.50	0.30	0.60	2.10	2.80

WTR YR 2000 TOTAL 29.40

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

212813157574001. State Key Number 832.2 Kipapa rain gage near Wahiawa, Oahu.

LOCATION.--Lat 21°28′13″, long 157°57′40″, Hydrologic Unit 20060000, on left bank of stream 1,700 ft below Forest Reserve Boundary, 4.9 mi southeast of Wahiawa Post Office, and 6.3 mi northeast of Waipahu. The rain gage is housed in the same shelter with USGS stream-gaging station 16212800.

PERIOD OF RECORD.--Continuous-record station, January 2, 1957 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in. storage can with a float-type recorder system. Elevation of gage is 690 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for estimated period which is poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.2	1.1	.0	.3	.2	.8	.0	.1	.4	.0	.1
2	.1	.2	6.5	.0	.0	.0	1.5	.0	.0	.7	.1	.0
3	.0	.3	.6	.0	.0	.0	.5	.0	.0	.5	.0	.0
4	.0	.5	.0	.0	.0	.0	.2	.0	.0	.2	.0	.0
5	.3	.0	.5	.0	.0	.0	.0	.0	.1	.3	.2	.2
6	.2	.0	.3	.3	.0	.0	.0	.1	.1	.9	.0	.1
7	.2	.1	.2	.0	.0	.0	.0	.1	.6	.2	.0	.0
8	.1	.2	.1	.4	.0	.0	.0	.1	.5	.0	.0	a--
9	.1	.4	.7	.5	.0	.0	.0	.0	.1	.1	.0	---
10	.0	.0	3.7	.1	.0	.0	.2	.1	.0	.0	.3	---
11	.0	.1	.3	.0	.0	.0	.0	.7	.0	.4	.0	---
12	.5	.7	1.0	.2	.0	.0	.0	.8	.0	.0	.0	---
13	.2	.1	.0	.1	.0	.1	.2	.4	.0	.0	.0	---
14	.0	.2	.0	.2	.0	.0	.0	.0	.1	.4	.0	---
15	.0	.0	.0	.8	.0	.1	.0	.0	.0	.1	.1	---
16	.0	.0	.0	.4	.0	.0	.2	.0	.2	.3	.0	---
17	.0	.0	.0	.3	.0	.0	.3	.0	.0	.0	.7	---
18	.0	.3	.0	.2	.0	.3	.1	.1	.1	.2	.0	---
19	2.9	.1	.0	2.2	.1	.0	.0	.0	.0	.1	.1	---
20	.0	.0	.1	1.3	.0	.0	.0	.0	.0	.5	1.8	---
21	.1	.2	.3	.7	.0	.2	.1	.1	.1	.1	.0	---
22	.0	.4	.6	.0	.0	.1	.0	.0	.3	.0	.2	---
23	.0	.1	.4	.0	.1	1.1	.0	.0	.1	.2	.2	---
24	.2	.0	.0	.0	.0	.3	.1	.0	.1	.1	.0	---
25	.3	.0	.0	.0	.2	.2	.2	.0	.1	.0	.0	---
26	.2	.1	.6	1.2	.2	1.5	.3	.0	.0	.3	.0	---
27	.1	.4	.0	.0	.2	.6	.8	.0	.0	1.1	.0	---
28	.1	.3	.0	.0	.0	.1	.0	.0	.0	.1	.3	---
29	.1	.1	.0	.0	.0	.2	.0	.0	.2	.0	.2	---
30	.0	.1	.0	.0	---	.0	.0	.0	.1	.0	.0	---
31	.1	---	.0	.0	---	.1	---	.0	---	.0	.0	b--
TOTAL	5.8	5.1	17.0	8.9	1.1	5.1	5.5	2.5	2.9	7.2	4.2	1.51

CAL YR 1999 TOTAL 80.6
WTR YR 2000 TOTAL 66.8

a Partial day total 0001 hrs to 0930 hrs is 0.0 inches.
b Estimated cumulative rainfall from September 8-30 is 1.1 inches.

213016158105901. State Key Number 842.1 Makaha rain gage near Makaha, Oahu.

LOCATION.--Lat 21°30'16", long 158°10'59", Hydrologic Unit 20060000, in USGS stream-gaging station 16211600, on right bank, 1.5 mi northeast of Kaneaki Heiau, and 3.4 mi northeast of Makaha.

PERIOD OF RECORD.--Continuous-record station, July 1959 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in., 4-ft tall rain can with a float-type system attached to an electronic data logger. Readings are taken at 15-minute intervals. Elevation of gage is 957 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in tenths of an inch. Logger stopped recording February 13-17. The last reading on February 13 was the same as the reading on February 17, so assume no rain for this period. These days were flagged as "estimated."

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.2	.0	.2	.0	.9	.0	.0	.1	.0	.0
2	.0	.0	.0	.0	.0	.0	.9	.0	.0	.0	.0	.0
3	.0	.1	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0
4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.8
7	.0	.0	.1	.0	.0	.0	.0	.1	.0	.0	.0	.1
8	.0	.0	.0	.0	.0	.0	.7	.0	.0	.0	.0	.0
9	.0	.0	.0	.1	.0	.0	.2	.0	.0	.0	.0	.0
10	.0	.0	2.0	.0	.0	.0	.1	.0	.1	.0	.0	.0
11	.0	.0	.2	.0	.0	.0	.0	.1	.2	.0	.0	.0
12	.2	.2	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	.0	.1	.0	.1	e.0	.0	.1	.1	.0	.0	.0	.0
14	.5	.0	.0	.0	e.0	.0	.0	.0	.0	.0	.0	.0
15	.0	.0	.0	.1	e.0	.0	.0	.0	.0	.0	.1	.0
16	.0	.0	.0	.0	e.0	.0	.1	.0	.0	.0	.0	.0
17	.0	.0	.0	.0	e.0	.0	.0	.0	.0	.0	.0	.0
18	.3	.2	.0	.1	.0	.2	.0	.0	.1	.0	.0	.0
19	5.1	.0	.0	1.1	.0	.0	.0	.1	.0	.0	.0	.0
20	.0	.0	.2	.2	.0	.0	.0	.0	.0	.1	.0	.1
21	.1	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.1	1.3	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	.0	.0	.9	.0	.0	.1	.0	.0	.1	.0	.0	.0
24	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
25	.0	.0	.3	.0	.0	.0	.0	.0	.3	.0	.0	.0
26	.0	.0	1.0	.6	.0	.0	.0	.1	.2	.0	.0	.0
27	.0	.0	.0	.1	.1	.0	.1	.0	.0	.0	.0	.0
28	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0	.1	.1
29	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
30	.0	.0	.8	.0	---	.0	.0	.0	.0	.0	.0	.1
31	.0	---	.0	.0	---	1.9	---	.1	---	.2	.0	---
TOTAL	6.2	0.8	7.6	2.4	0.3	2.2	3.3	0.6	1.0	0.4	0.2	1.4

e Estimated

CAL YR 1999 TOTAL 30.5
WTR YR 2000 TOTAL 26.4

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213205157571001. State Key Number 882.3 Poamoho rain gage no. 3 near Wahiawa, Oahu.

LOCATION.--Lat 21°32′05″, long 157°57′10″, Hydrologic Unit 20060000, on right side of Poamoho Trail, and 0.2 mi northeast from trail marker.

PERIOD OF RECORD.--Accumulated-rainfall station, July 12, 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--A 3-in. diameter, 5-ft tall aluminum non-recording gage. Elevation of gage is 1,800 ft above mean sea level (from topographic map).

REMARKS.--Record good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Nov. 17 to Jan. 13	33.2
Jan. 13 to Mar. 02	15.7
Mar. 02 to May 10	17.2
May 10 to Aug. 01	24.7
Aug. 01 to Oct. 06	21.8

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213211157562400. State Key Number 882.4 Poamoho rain gage no. 2 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'11", long 157°56'24", Hydrologic Unit 20060000, on Poamoho trail 1.0 mi west of junction with Koolau Summit Trail, and 5.3 mi northeast of Leilehua High School in Wahiawa.

PERIOD OF RECORD.--Continuous-record station, June 8, 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector on a 10-in. storage can with a float-type system attached to an electronic data logger. Elevation of gage is 1,960 ft above mean sea level (from topographic map).

REMARKS.--Record good for periods when logger was operational and poor when it malfunctioned. Rainfall recorded in 0.188-inch increments.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.19	2.25	.00	.38	.00	3.56	.00	.00	---	a--	---
2	.19	.19	5.25	.00	.00	.00	2.25	.00	.00	---	---	---
3	.00	.56	.37	.00	.00	.00	.56	.00	.00	---	---	---
4	.00	3.00	.00	.00	.00	.00	.38	.00	.19	---	---	---
5	1.31	.19	.56	.00	.00	.00	.19	.00	.00	---	---	---
6	.75	.00	.38	.38	.00	.00	.00	.38	.19	---	---	---
7	.19	.56	.19	.19	.00	.00	.00	.00	1.12	---	---	---
8	.19	.56	.00	.38	.00	.00	.19	.38	.19	---	---	---
9	.19	.38	1.50	.75	.00	.00	1.12	.19	.38	---	---	---
10	.00	.19	5.44	.38	.00	.00	1.12	.00	.19	---	---	---
11	.00	.19	4.31	.19	.00	.00	.00	.56	---	---	---	---
12	.56	.75	2.44	.37	.00	.00	.00	.94	---	---	---	---
13	.75	.00	.38	.38	.00	.19	.56	.38	---	---	---	---
14	.19	.19	.00	.75	.00	.00	.00	.00	---	---	---	---
15	.00	.19	.00	1.31	.00	.19	.00	.00	---	---	---	---
16	.19	.00	.00	1.50	.00	.00	.56	.00	---	---	---	---
17	.00	.00	.38	.56	.00	.00	.56	.00	---	---	---	---
18	.00	.00	.75	1.69	.00	.19	.00	.00	---	---	---	---
19	2.81	.38	.19	5.06	.00	.00	.00	.00	---	---	---	---
20	.00	1.12	.19	2.62	.00	.00	.19	.00	---	---	---	---
21	.56	.19	.00	.94	.19	.19	.19	.19	---	---	---	---
22	.00	3.94	.56	.00	.19	.00	.19	.38	---	---	---	---
23	.19	1.69	.38	.00	.00	.56	.00	.00	---	---	---	---
24	.94	.75	.00	.00	.00	.19	.56	.00	---	---	---	---
25	.56	.19	.19	.00	.00	.19	.19	.00	---	---	---	---
26	.19	.19	.94	.94	.19	1.31	.38	.19	---	---	---	---
27	.19	.19	.00	.00	.37	.75	.56	.00	---	---	---	---
28	.19	.38	.00	.00	.00	.19	.00	.19	---	---	---	---
29	.00	.19	.00	.00	.00	1.69	.00	.19	---	---	---	---
30	.00	.56	.19	.00	---	.00	.00	.00	---	---	---	---
31	.75	---	.00	.00	---	.94	---	.19	---	---	---	b--
TOTAL	11.08	16.91	26.84	18.39	1.32	6.58	13.31	4.16	---	---	---	---

CAL YR 1999 TOTAL 161.18
WTR YR 2000 TOTAL 166.69

a No daily record June 11 (1000 hrs) to August 1 (1115 hrs), logger malfunctioned. Accumulated total for this period is 31.08 inches.

b No daily record August 1 (1130 hrs) to October 6 (1015 hrs). Accumulated total for this period is 35.14 inches. Estimated cummulative total for August 1 (1130 hrs) to September 30 (2400 hrs) is 34.76 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213215157552800. State Key Number 883.12 Poamoho rain gage no. 1 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'15", long 157°55'28", Hydrologic Unit 20060000, at junction of Poamoho and Koolau summit trails, and 6.2 mi northeast of Leilehua High School in Wahiawa.

PERIOD OF RECORD.--Continuous-record station, June 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector on a 10-in. storage can with a float-type system attached to an electronic data logger. Elevation is 2,480 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in 0.188-inch increments.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.19	.38	1.69	.00	.19	.00	2.06	.00	.19	.75	.19	.00
2	.38	.00	2.44	.00	.00	.00	1.31	.00	.00	.38	.94	.00
3	.00	.75	.19	.00	.00	.00	.00	.19	.00	.56	.19	.00
4	.19	3.75	.00	.00	.00	.00	.19	.00	.19	.19	.00	.75
5	.56	.00	.38	.00	.00	.00	.00	.00	.00	.56	.38	.56
6	.56	.19	.38	.00	.00	.00	.75	.19	.00	1.12	.75	2.81
7	.19	.56	.00	.19	.00	.00	.00	.00	.94	.00	1.13	1.50
8	.19	.38	.00	.19	.00	.00	.19	.19	.56	.00	.00	.75
9	.00	.38	1.12	.19	.00	.00	1.88	.19	.00	.56	.19	.19
10	.19	.19	4.12	.38	.00	.00	.94	.00	.56	.56	.00	.00
11	.00	.19	4.12	.38	.00	.00	.19	.38	.38	3.56	.00	3.75
12	.38	.56	2.25	.38	.00	.00	.00	.19	.00	2.06	.00	.56
13	.56	.00	.56	.19	.00	.00	.00	.38	.19	.00	.19	.38
14	.38	.19	.00	.56	.00	.00	.00	.00	.94	.56	.00	1.12
15	.00	.00	.00	1.12	.00	.00	.00	.00	.19	.75	.56	.00
16	.19	.00	.00	1.31	.00	.00	.38	.00	.19	1.31	.00	.19
17	.00	.00	.94	.19	.00	.00	.38	.19	.19	1.69	.75	.00
18	.00	.19	1.50	1.31	.00	.00	.00	.00	.56	1.50	.19	1.12
19	2.81	.19	.00	4.12	.00	.19	.19	.19	.00	.75	.19	1.31
20	.00	1.31	.38	1.88	.00	.00	.00	.00	.38	3.38	3.94	.56
21	.38	.38	.19	.38	.00	.00	.19	.00	.00	.56	.00	.00
22	.00	1.69	.75	.00	.19	.00	.00	.38	.38	.19	.19	.00
23	.19	2.06	.38	.00	.00	.75	.19	.00	.19	.19	.94	.00
24	.94	1.31	.00	.19	.00	.00	.56	.00	.00	.38	.19	.00
25	.56	.00	.00	.00	.00	.00	.19	.00	.56	.00	.00	.00
26	.19	.19	1.12	.56	.56	.94	.38	.19	1.12	.38	.00	.00
27	.00	.00	.00	.00	.00	.56	.56	.00	.00	.38	1.88	3.56
28	.19	.38	.00	.00	.00	.00	.00	.00	.00	.00	1.31	1.87
29	.00	.00	.19	.00	.00	1.88	.00	.19	.94	.00	.38	.00
30	.19	.56	.38	.00	---	.19	.00	.00	.00	.19	.00	.00
31	.56	---	.00	.37	---	1.69	---	.19	---	.38	.00	---
TOTAL	9.97	15.78	23.08	13.89	0.94	6.20	10.53	3.04	8.65	22.89	14.48	20.98

CAL YR 1999 TOTAL 138.49
WTR YR 2000 TOTAL 150.43

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213221157541501. State Key Number 884.3 Punaluu rain gage near Punaluu, Oahu.

LOCATION.--Lat 21°32′21″, long 157°54′15″, Hydrologic Unit 20060000, 4.9 mi south of Hauula School, and 1.5 mi south of USGS stream-gaging station on Punaluu Ditch 16302000.

PERIOD OF RECORD.--Accumulated-rainfall station, July 14, 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector with standard 8-in. diameter, 24-in. tall can, and an auxiliary 3-in. diameter, 5-ft tall measuring can. Elevation of gage is 750 ft above mean sea level (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 22	a4.1 (estimated)
Oct. 22 to Jan. 10	35.8
Jan. 10 to Mar. 09	10.9
Mar. 09 to May 16	17.4
May 16 to Jul. 13	9.4
Jul. 13 to Sep. 30	b25.2 (estimated)

WTR YR 2000 TOTAL 102.8

a Estimate based on cumulative total for September 9 to October 22 of 8.4 inches.

b Estimate based on cumulative total for July 13 to October 2 of 26.3 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213237157530701. State Key Number 886.4 Kahana rain gage at altitude 95 ft near Kahana, Oahu.

LOCATION.--Lat 21°32'37", long 157°53'07", Hydrologic Unit 20060000, on right bank, 600 ft upstream from Kawa Stream, about 40 ft bankward from USGS stream-gaging station 16296500, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaaawa.

PERIOD OF RECORD.--Accumulated-rainfall station, December 23, 1958 to May 11, 1961, February 19, 1990 to June 17, 1994. Continuous-record station, May 11, 1961 to February 19, 1990, June 17, 1994 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--An electronic data logger with a float system using an 8-in. receiver and 7 5/16-in. diameter rain can, 4-ft tall. Readings are taken at 15-minute intervals. Elevation of gage is 95 ft above mean sea level (from topographic map).

REMARKS.--Records good, except for days of no daily rainfall and estimated period which are poor.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.00	1.90	.00	.30	.00	.80	.00	.10	.40	e.10	---
2	.10	.00	.60	.00	.00	.00	1.00	.00	.00	.00	e.20	---
3	.00	.60	.00	.00	.00	.00	.40	.00	.00	.30	e.00	---
4	.10	1.30	.00	.00	.00	.10	.30	.00	.10	.10	e.00	---
5	.20	.10	.60	.00	.00	.00	.00	.00	.00	.00	e.10	---
6	.00	.00	.10	.10	.00	.00	.00	.00	.00	e.10	e.00	---
7	.10	.30	.10	.10	.00	.00	.60	.00	.80	e.00	e.10	---
8	.10	.20	.00	.10	.00	.00	.40	.10	.10	e.00	e.00	---
9	.00	.20	.30	.00	.00	.00	1.00	.00	.20	e.00	e.00	---
10	.00	.10	2.60	.20	.00	.00	.50	.00	.00	e.30	e.00	---
11	.00	.20	1.50	.10	.00	.00	.10	.20	.20	e.40	e.00	---
12	.20	.40	.90	.30	.00	.00	.10	.20	.10	e.00	e.00	---
13	.40	.00	.20	1.10	.00	.00	.20	.10	.10	e.00	e.00	---
14	.00	.00	.00	.40	.00	.00	.00	.00	.20	e.10	e.00	---
15	.00	.00	.00	.60	.00	.00	.00	.00	.00	e.30	e.00	---
16	.40	.00	.00	.40	.00	.00	.10	.10	.00	e.10	e.00	---
17	.00	.00	.70	.10	.00	.00	.30	.10	.10	e.50	e.10	---
18	.00	.00	.70	.40	.00	.20	.00	.00	.20	e.10	e.10	---
19	1.80	.10	.00	3.10	.10	.00	.00	.00	.00	e.00	e.00	---
20	.00	.70	.00	.90	.00	.00	.00	.00	.20	e.20	e3.40	---
21	.00	.00	.00	.20	.10	.00	.00	.00	.10	e.20	e.00	---
22	.00	.00	.50	.00	.10	.00	.10	.00	.30	e.10	---	---
23	.00	.50	.20	.00	.00	.20	.10	.00	.10	e.00	---	---
24	.30	.00	.00	.00	.00	.00	.20	.00	.10	e.10	---	---
25	.30	.00	.00	.00	.00	.10	.10	.00	.10	e.00	---	---
26	.10	.00	.90	.20	.10	.50	.10	.10	.90	e.20	---	---
27	.00	.00	.00	.00	.00	.30	.10	.00	.00	e.00	---	---
28	.00	.20	.00	.00	.10	.00	.00	.00	.00	e.10	---	---
29	.00	.10	.00	.00	.00	.30	.00	.00	.00	e.00	---	---
30	.10	.10	.10	.00	---	.00	.00	.00	.10	e.00	---	---
31	.50	---	.00	.10	---	3.00	---	.00	---	e.30	a--	b--
TOTAL	4.80	5.10	11.90	8.40	0.80	4.70	6.50	0.90	4.10	3.90	6.20	9.80

e Estimated

CAL YR 1999 TOTAL 76.10
WTR YR 2000 TOTAL 67.10

a Estimated cumulative total for August 22 to August 31 is 2.10 inches.

b Estimated cumulative total for September 1 to September 30 is 9.80 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213000157515401. State Key Number 886.6 Waikane rain gage at altitude 75 ft at Waikane, Oahu.

LOCATION.--Lat 21°30'00", long 157°51'54", Hydrologic Unit 20060000, in USGS stream-gaging station 16294900, 0.3 mi downstream from Waikeekee Stream, 0.7 mi west of Waikane, and 1.2 mi northwest of Waiahole School.

PERIOD OF RECORD.--Continuous-record station, February 18, 1960 to October 2, 1985, May 17, 1994 to current year. Accumulated-rainfall station, October 2, 1985 to May 17, 1994. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 7 5/16-in., 4-ft tall rain can with a float-type system attached to an electronic data logger. Readings are taken at 15-minute intervals. Elevation of gage is 75 ft above mean sea level (from topographic map).

REMARKS.--Records good except to days with no daily rainfall recorded which are fair. Daily record read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.1	.0	.4	.0	---	.0	.6	.0	.0	.2	.1	.0
2	.0	.0	.4	.0	---	.0	.4	.0	.0	.0	.1	.0
3	.0	.5	.0	.0	---	.0	.1	.0	.0	.1	.0	.0
4	.0	.8	.0	.0	---	.0	.0	.0	.0	.0	.0	.0
5	.0	.0	.1	.0	---	.0	.0	.0	.0	.1	.2	.5
6	.0	.0	.0	.0	---	.0	.0	.0	.0	.1	.0	.1
7	.2	.1	.1	.0	---	.0	.0	.0	.7	.0	.0	.1
8	.0	.0	.0	.0	---	.0	.6	.0	.1	.1	.0	.4
9	.0	.1	.0	.0	---	.0	.3	.0	.0	.0	.0	.0
10	.1	.0	2.8	.0	a--	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.5	.0	---	.0	.0	.0	.0	.5	.0	.0
12	.0	.2	.4	.0	---	.0	.0	.1	.0	.0	.0	.0
13	.0	.0	.0	1.4	---	.1	.1	.1	.0	.0	.0	.1
14	.0	.1	.0	.4	---	.0	.0	.0	.1	.0	.0	.5
15	.3	.0	.1	.5	---	.0	.0	.0	.0	.2	.0	.0
16	.1	.0	.0	.1	b--	.0	.0	.2	.1	.1	.0	.0
17	.2	.0	.1	.0	.0	.0	.1	.0	.0	.2	.2	.0
18	.0	.3	.2	.3	.0	.0	.0	.0	.2	.2	.1	.0
19	1.4	.1	.0	2.1	.1	.0	.0	.0	.1	.0	.0	.1
20	.1	.1	.1	.4	.0	.0	.0	.0	.1	.0	1.8	.6
21	.0	.1	.0	---	.0	.0	.0	.0	.1	.1	.0	.0
22	.0	.0	.4	---	.0	.0	.0	.0	.2	.1	.0	.0
23	.1	.0	.4	---	.0	.2	.0	.1	.1	.0	.0	.0
24	.1	.0	.0	---	.0	.1	.0	.0	.0	.1	.0	.0
25	.2	.0	.0	---	.0	.3	.0	.0	.0	.0	.0	.0
26	.0	.0	.9	---	.0	.4	.0	.0	.2	.1	.1	.0
27	.0	.1	.0	---	.0	.1	.1	.0	.0	.0	.3	1.7
28	.1	.0	.0	---	.0	.0	.0	.0	.2	.0	.2	1.1
29	.0	.1	.0	---	.0	.1	.0	.0	.0	.0	.3	.0
30	.0	.0	.3	---	---	.0	.0	.0	.1	.0	.0	.2
31	.4	---	.0	---	---	1.8	---	.0	---	.2	.0	---
TOTAL	3.4	2.6	7.2	---	---	3.1	2.3	0.5	2.3	2.4	3.4	5.4

CAL YR 1999 TOTAL 37.3
WTR YR 2000 TOTAL 38.2

a No daily record 01/21/2000 (1300 hrs) to 02/10/2000 (0915 hrs), logger malfunctioned. Accumulated total for this period is 0.3 inches.

b No daily record 02/10/2000 (0930 hrs) to 02/16/2000 (0930 hrs), logger malfunctioned. Accumulated total for this period is 0.0 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213725158010401. State Key Number 897.1 Kamananui rain gage at Pupukea Military Road near Maunawai, Oahu.

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on left bank, at USGS stream-gaging station 16325000, 75.0 ft upstream from Pupukea Military Road, and 3.5 mi southeast of Maunawai.

PERIOD OF RECORD.--Continuous-record station, July 1, 1963 to current year. Prior to October 1992, unpublished records are in the files of the Geological Survey.

GAGE.--Standard 8-in. National Weather Service collector and 8-in. rain can attached to a tipping-bucket counter. An electronic data logger was installed on March 26, 1996 to record rainfall at 15-minute intervals. Elevation of gage is 590 ft above mean sea level (from topographic map).

REMARKS.--Records good except for the periods: October 20 to January 12 which is poor; June 20 to August 24 which is fair; and August 24 to September 12 which is poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	---	---	---	.27	.00	1.26	.00	.00	.40	.00	.00
2	.00	---	---	---	.00	.00	2.52	.00	.00	.00	.00	.00
3	.00	---	---	---	.00	.00	.54	.00	.00	.08	.24	.40
4	.10	---	---	---	.00	.00	.18	.00	.09	.16	.00	.08
5	.00	---	---	---	.00	.00	.00	.00	.00	.08	.00	.08
6	.10	---	---	---	.00	.00	.09	.00	.27	.00	.00	.08
7	.00	---	---	---	.00	.18	.00	.00	.54	.00	.00	.00
8	.00	---	---	---	.00	.00	.09	.18	.45	.00	.00	.00
9	.10	---	---	---	.00	.00	.36	.00	.09	.32	.00	.08
10	.20	---	---	---	.00	.00	.54	.18	.00	.08	.00	.16
11	.00	---	---	a--	.00	.00	.00	.45	.00	.00	.00	e.08
12	.40	---	---	.09	.00	.00	.00	.63	.00	.00	.08	e.00
13	.30	---	---	.27	.00	.00	.00	.09	.00	.24	.16	.00
14	.20	---	---	.09	.00	.00	.00	.00	.00	.32	.00	.00
15	.20	---	---	.27	.00	.00	.00	.00	.00	.00	.32	.00
16	.10	---	---	.09	.00	.00	.18	.00	.18	.16	.16	.00
17	.00	---	---	.00	.00	.00	.54	.00	.09	.00	.00	.00
18	.00	---	---	.45	.00	.18	.09	.00	.18	.08	.56	.00
19	4.40	---	---	1.08	.00	.00	.00	.00	.00	.08	.16	.00
20	---	---	---	.81	.00	.09	.00	.00	.00	.32	.00	.00
21	---	---	---	.27	.09	.09	.09	.00	.00	.24	.08	.00
22	---	---	---	.00	.00	.00	.00	.00	.00	.08	.00	.00
23	---	---	---	.00	.00	.27	.00	.00	.00	.16	.00	.00
24	---	---	---	.00	.00	.18	.09	.00	.16	.16	.00	.00
25	---	---	---	.00	.00	.27	.27	.00	.00	.24	.48	.00
26	---	---	---	.45	.09	.81	.00	.00	.00	.16	.56	.00
27	---	---	---	.00	.09	.09	.36	.00	.00	.00	.08	1.00
28	---	---	---	.00	.00	.09	.00	.00	.40	.00	.08	.20
29	---	---	---	.00	.00	.09	.00	.00	.08	.08	.00	.00
30	---	---	---	.00	---	.00	.00	.00	.24	.16	.00	.00
31	---	---	---	.18	---	1.98	---	.09	---	.00	.00	---
TOTAL	---	---	---	---	0.54	4.32	7.20	1.62	2.77	3.60	2.96	2.16

e Estimated

CAL YR 1999 TOTAL 51.3
WTR YR 2000 TOTAL 54.1

a Total accumulated rainfall October 20 to January 11 is 18.8 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF OAHU--Continued

213608158011101. State Key Number 897.9 Pupukea Road rain gage at altitude 1,160 ft near Haleiwa, Oahu (formerly published as Pupukea Road rain gage at altitude 1,600 ft near Haleiwa, Oahu).

LOCATION.--Lat 21°36'08", long 158°01'11", Hydrologic Unit 20060000, 4.3 mi southeast of Maunawai, 5.5 mi east of Haleiwa Beach Park, and 400 ft left of the road on the ridge.

PERIOD OF RECORD.--Continuous-record station, November 1, 1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service rain collector attached to 8-in. storage can with a recording float-type system. On January 23, an electronic data logger was installed to replace the recorder. Elevation of gage is 1,160 ft above mean sea level (from topographic map).

REMARKS.--Records good. Rainfall recorded in 0.12-inch increments.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	1.56	.00	.24	.00	1.92	.00	.12	.36	.12	.00
2	.12	.00	2.52	.00	.00	.00	2.40	.00	.00	.60	.00	.00
3	.00	.48	.48	.00	.00	.00	.48	.00	.00	.36	.00	.00
4	.12	.60	.00	.00	.00	.00	.48	.00	.00	.12	.12	.12
5	.12	.00	.24	.00	.00	.00	.00	.00	.00	.36	.12	.48
6	.12	.00	.36	.00	.00	.00	.12	.00	.48	.48	.00	.00
7	.00	.60	.24	.12	.00	.12	.00	.00	.48	.00	.00	.24
8	.00	.36	.12	.36	.00	.00	.24	.24	.48	.24	.00	.00
9	.12	.12	.72	.24	.00	.00	.24	.00	.00	.00	.00	.00
10	.36	.00	2.40	.12	.00	.00	.48	.12	.00	.12	.00	.00
11	.00	.24	2.88	.12	.00	.00	.00	.60	.00	.36	.00	.48
12	.48	.72	.60	.12	.00	.00	.00	.60	.00	.00	.00	.00
13	.12	.12	.00	.12	.00	.00	.12	.24	.12	.00	.00	.00
14	.12	.12	.00	.12	.00	.00	.00	.00	.24	.36	.00	.00
15	.12	.00	.00	.36	.00	.00	.00	.00	.00	.12	.24	.00
16	.48	.00	.00	.24	.00	.00	.24	.00	.12	.12	.12	.00
17	.00	.00	.00	.12	.00	.00	.48	.00	.12	.00	.24	.00
18	.00	.24	.00	.48	.00	.24	.12	.00	.12	.24	.12	.00
19	3.48	.12	.00	1.68	.24	.00	.00	.00	.00	.12	.00	.00
20	.00	.24	.12	1.80	.00	.00	.00	.00	.00	.12	.72	.00
21	.00	.12	.00	.60	.00	.24	.12	.00	.00	.24	.00	.00
22	.00	.12	.84	.00	.00	.00	.12	.00	.12	.00	.24	.00
23	.00	.00	.12	.00	.00	.60	.00	.00	.12	.12	.24	.00
24	.12	.00	.00	.00	.00	.24	.12	.00	.12	.12	.00	.00
25	.24	.12	.00	.00	.12	---	.24	.00	.00	.12	.00	.00
26	.24	.00	1.80	.48	.00	a--	.24	.00	.00	.12	.00	.00
27	.00	.48	.00	.12	.24	.24	.36	.00	.00	.72	.36	.60
28	.12	.72	.00	.00	.00	.12	.00	.12	.00	.12	.36	.12
29	.00	.12	.00	.00	.00	.48	.00	.12	.12	.00	.12	.00
30	.00	.36	.24	.00	---	.00	.00	.00	.24	.00	.00	.00
31	.12	---	.00	.00	---	1.68	---	.00	---	.24	.00	---
TOTAL	6.60	6.00	15.24	7.20	0.84	5.04	8.52	2.04	3.00	5.88	3.12	2.04

WTR YR 2000 TOTAL 65.5

a Estimated cumulative total for March 25 (0001) to March 26 (2400) is 1.08 inches.

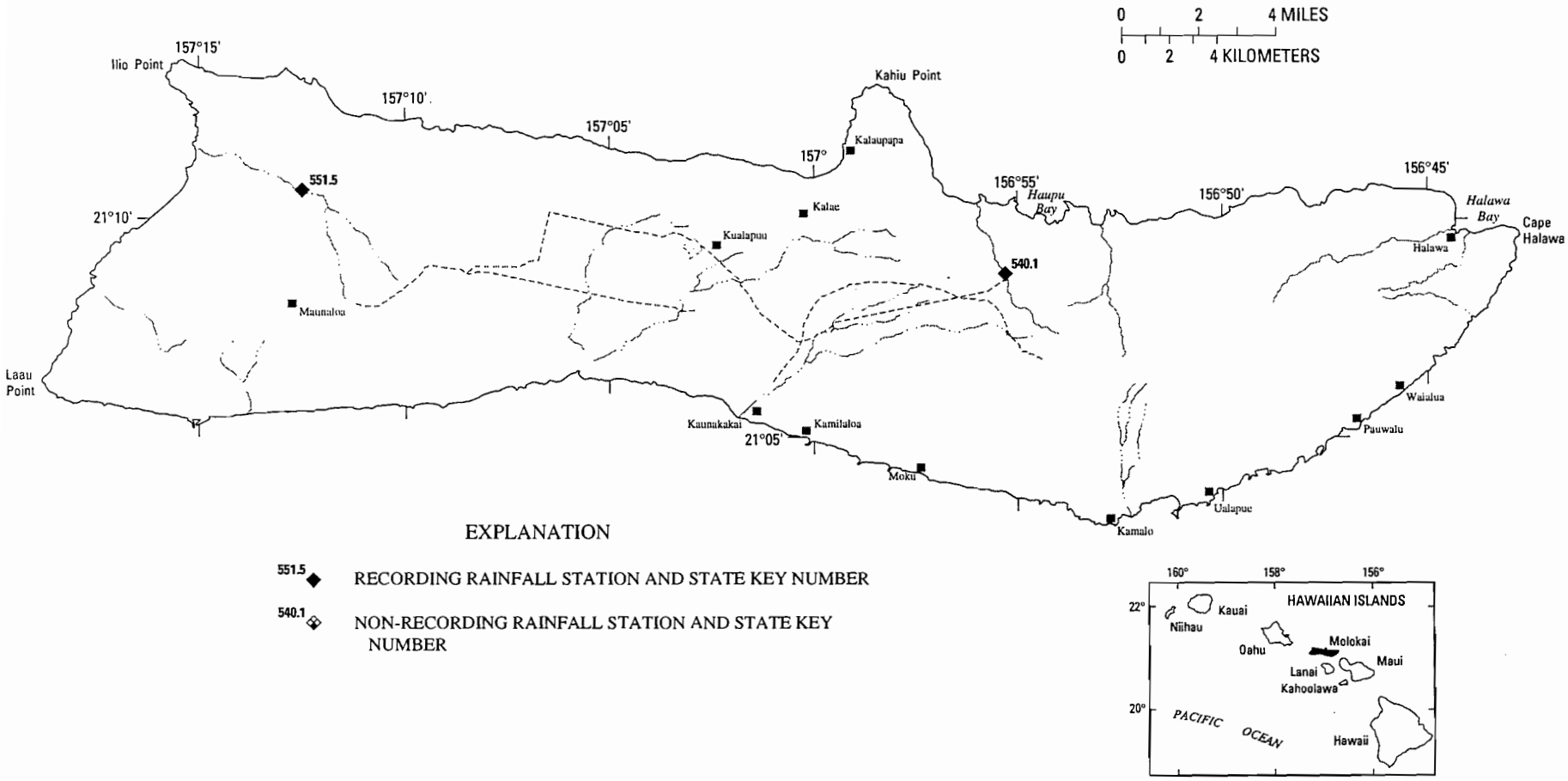


Figure 23. Locations of rainfall stations on Molokai.

RAINFALL RECORDS

HAWAII, ISLAND OF MOLOKAI

210843156551801. State Key Number 540.1 Waikolu rain gage at altitude 900 ft, near Kalaupapa, Molokai.

LOCATION.--Lat 21°08′43″, long 156°55′18″, Hydrologic Unit 20050000, on left bank near USGS stream-gaging station 16405500, 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

PERIOD OF RECORD.--1957 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment and National Weather Service accumulation can as a backup. Elevation of gage is 900 ft (from topographic map).

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	---	---	---	---	---	---	---	---	---	---	---
2	.00	---	---	---	---	---	---	---	---	---	---	---
3	.01	---	---	---	---	---	---	---	---	---	---	---
4	.00	---	---	---	---	---	---	---	---	---	---	---
5	.17	---	---	---	---	---	---	---	---	---	---	---
6	.07	---	---	---	---	---	---	---	---	---	---	---
7	.03	---	---	---	---	---	---	---	---	---	---	---
8	.03	---	---	---	---	---	---	---	---	---	---	d--
9	.01	---	---	---	---	---	---	---	---	---	---	.00
10	.12	---	---	---	---	---	---	---	---	---	---	.00
11	.01	---	---	---	---	---	---	---	---	---	---	.11
12	.46	---	---	---	---	---	---	---	---	---	---	.01
13	.00	---	---	---	---	---	---	---	---	---	---	.06
14	.00	---	---	---	---	---	---	---	---	---	---	.00
15	.00	---	---	---	---	---	---	---	---	---	---	.00
16	.00	---	---	---	---	---	---	---	---	---	---	.00
17	.03	---	---	---	---	---	---	---	---	---	---	.00
18	---	---	---	---	---	---	---	---	---	---	---	.02
19	---	---	---	---	---	---	---	---	---	---	---	.01
20	---	---	---	---	---	---	---	---	---	---	---	.01
21	---	---	---	---	---	---	---	---	c--	---	---	.02
22	---	---	---	---	---	---	---	---	---	---	---	.00
23	---	---	---	---	---	---	---	---	---	---	---	.00
24	---	---	---	---	---	---	---	---	---	---	---	.00
25	---	---	---	b--	---	---	---	---	---	---	---	.00
26	---	---	---	---	---	---	---	---	---	---	---	.07
27	---	---	---	---	---	---	---	---	---	---	---	1.26
28	---	---	---	---	---	---	---	---	---	---	---	.35
29	a--	---	---	---	---	---	---	---	---	---	---	.00
30	---	---	---	---	---	---	---	---	---	---	---	.11
31	---	---	---	---	---	---	---	---	---	---	---	---
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

a Total accumulated rainfall for August 9, 1999 (0940) to October 29 (0915) is 6.00 inches.

b Total accumulated rainfall for October 29 (0915) to January 25 (0910) is 24.00 inches.

c Total accumulated rainfall for January 25 (0910) to June 21 (1245) is 23.6 inches.

d Total accumulated rainfall for June 21 (1245) to September 8 (1035) is 16.4 inches.

RAINFALL RECORDS

HAWAII, ISLAND OF MOLOKAI--Continued

211039157123101. State Key Number 551.5 Kakaako rain gage near Mauna Loa, Molokai.

LOCATION.--Lat 21°10'39", long 157°12'31", Hydrologic Unit 20050000, in the USGS stream-gaging station 16411400 on left bank, 1.0 mi downstream of Kamakahi Gulch, and 3.0 mi north of Mauna Loa school.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment and an 8-in. National Weather Service rain gage used as a backup accumulation can. Elevation of gage is 380 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.00	.00	.02	.34	.00	.01	.03	.01	.00
2	.00	.00	.00	.00	.00	.00	.39	.00	.02	.00	.00	.00
3	.00	.02	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.05	.00	.00	.00	.12	.00	.00	.00	.01	.06
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.42
6	.00	.00	.01	.03	.00	.00	.00	.00	.03	.06	.02	.00
7	.00	.04	.06	.00	.00	.00	.00	.00	.09	.00	.00	.04
8	.00	.00	.06	.00	.00	.00	.27	.00	.00	.00	.00	.00
9	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.46	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.15	.00	.00	.00	.00	.01	.00	.01	.00	.00
12	.00	.00	.06	.00	.00	.00	.00	.05	.00	.00	.00	.00
13	.00	.00	.02	.00	.00	.00	.01	.06	.00	.00	.00	.00
14	.06	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
15	.01	.00	.00	.05	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.14	.03	.00	.00	.00
17	.00	.00	.00	.05	.00	.00	.02	.00	.07	.00	.00	.00
18	.00	.01	.00	.00	.12	.00	.07	.00	.00	.00	.00	.00
19	.06	.00	.00	.30	.02	.00	.00	.00	.00	.00	.05	.00
20	.14	.00	.02	.47	.00	.00	.00	.00	1.04	.00	.75	.00
21	.00	.00	.01	.07	.00	.00	.00	.00	.01	.00	.00	.00
22	.00	.00	.58	.00	.00	.08	.00	.00	.03	.00	.00	.00
23	.00	.00	.04	.00	.00	.02	.00	.00	.00	.00	.00	.00
24	.00	.00	.06	.00	.00	.00	.03	.00	.00	.01	.00	.00
25	.00	.00	.05	.01	.00	.01	.00	.00	.04	.19	.00	.00
26	.00	.00	.99	.11	.00	.01	.02	.00	.00	.01	.00	.02
27	.00	.01	.00	.00	.00	.00	.05	.00	.00	.05	.00	.86
28	.00	.08	.00	.00	.00	.00	.00	.00	.00	.02	.09	.76
29	.00	.01	.00	.00	.00	.12	.00	.00	.00	.00	.00	.00
30	.00	.01	.02	.00	---	.26	.00	.00	.00	.00	.00	.00
31	.05	---	.00	.02	---	1.69	---	.00	---	.17	.00	---
TOTAL	0.32	0.18	2.78	1.12	0.14	2.21	1.32	0.26	1.37	0.55	0.93	2.16

CAL YR 1999 TOTAL 11.42
WTR YR 2000 TOTAL 13.34

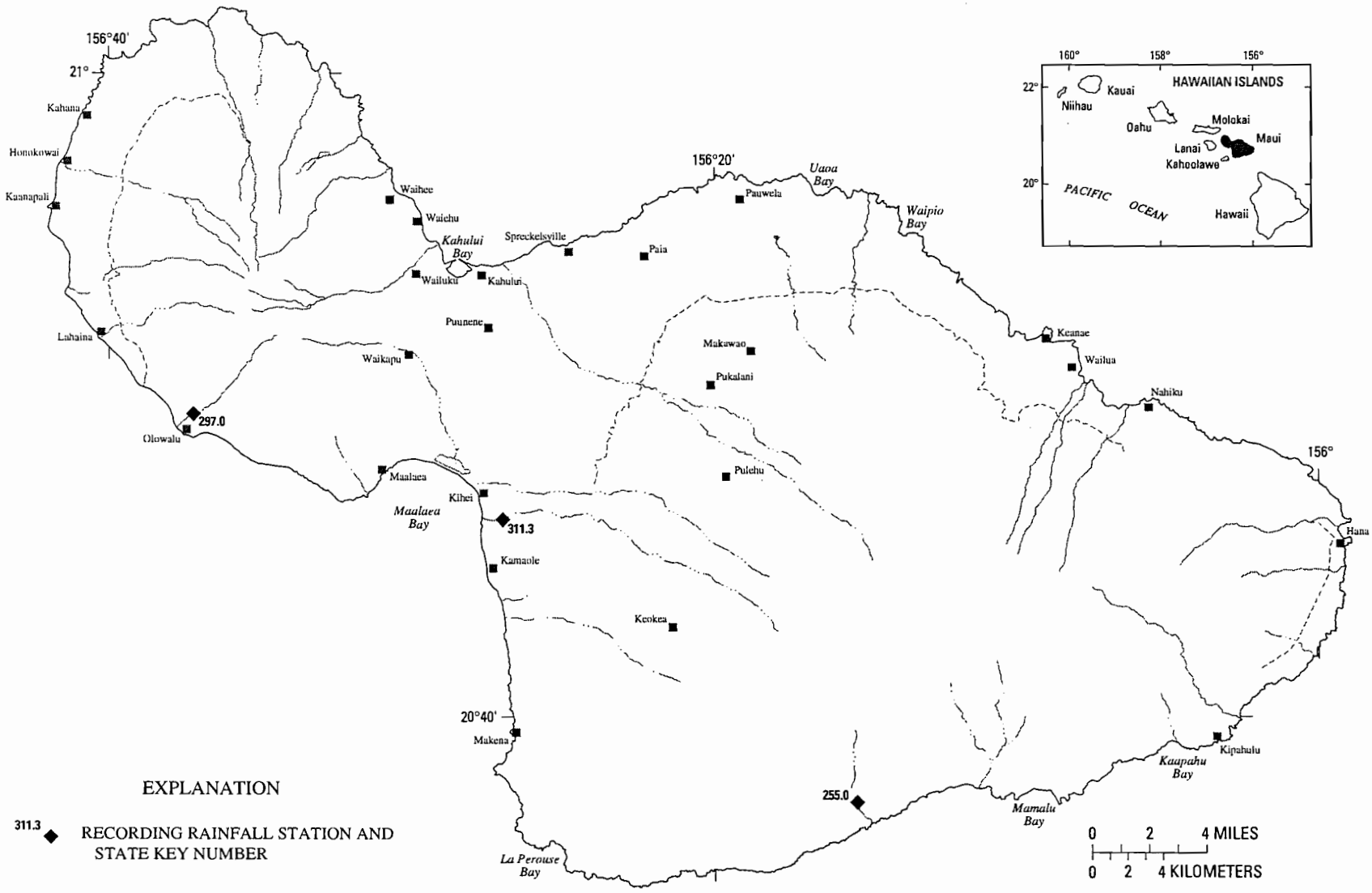


Figure 24. Locations of rainfall stations on Maui.

RAINFALL RECORDS

HAWAII, ISLAND OF MAUI

203721156151601. State Key Number 255.0 Kepuni Gulch rain gage near Kaupo, Maui.

LOCATION.--Lat 20°37'21", long 156°15'16", Hydrologic Unit 20020000, next to the discontinued USGS stream-gaging station 16500100 on right bank, 120 ft upstream from bridge on Highway 31, 400 ft upstream from Kamole Gulch, 1.1 mi east of Kahikinui house, and 8.5 mi west of Kaupo.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment. The National Weather Service rain gage was converted to a backup accumulation can. Elevation of gage is 740 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.01	.29	.00	.00	.00	.17	.00	.00	.06	.37	.00
2	.00	.00	.88	.00	.00	.00	.00	.00	.00	.00	.17	.00
3	.00	.05	.09	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.17	.00	.00	.00	.00	.00	.12
6	.28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	1.89
7	.00	.00	.00	.00	.00	.00	.36	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	1.79	.00	.00	.00	.00	.00	.07	.43	.00	.00
11	.00	.00	2.48	.00	.00	.00	.00	.00	.00	.13	.00	.00
12	.00	.00	.19	.00	.06	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.16	.06	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.13	.00	.00	.00	.00	.00	.00	.00	.00	.01
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.21	.18	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.03	.05	.00
18	.00	.00	1.84	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.23	.00	.00	.00	.00	.03	.00	.00	.00	.00
20	2.77	.00	.00	.00	.00	.00	.00	.00	.00	.00	.25	.01
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.31	2.63	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.02	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.07	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.42	.00	.00	.00
26	.00	.00	.93	.00	.00	.00	.00	.00	.00	.00	.03	.00
27	.00	.00	.34	.00	.00	.20	.00	.00	.00	.00	.03	.97
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.22	.06
29	.00	.00	.00	.00	.00	.21	.00	.00	.05	.00	.00	.00
30	.00	.00	.00	.00	---	.42	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.15	---	.00	---	.00	.00	---
TOTAL	3.05	0.37	11.98	0.06	0.06	1.15	0.53	0.03	0.54	0.93	1.39	3.06

CAL YR 1999 TOTAL 19.65
WTR YR 2000 TOTAL 23.15

RAINFALL RECORDS

HAWAII, ISLAND OF MAUI--Continued

204923156371501. State Key Number 297.0 Olowalu rain gage at Olowalu, Maui.

LOCATION.--Lat 20°49'23", long 156°37'15", Hydrologic Unit 20020000, in USGS stream-gaging station 16646200 on downstream side of center pier of plantation road bridge, 0.6 mi northeast of Olowalu, and 5.5 mi southeast of Lahaina.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Sutron 8400 data logger with a Rain-O-Matic tipping basket attachment until July 28, then changed to a Campbell Scientific tipping bucket attachment. A Standard 8-in. National Weather Service accumulation can also was installed as a backup. Elevation of gage is 130 ft (from topographic map).

REMARKS.--Records fair. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	---	---	.00	.00	.04	.00	.00	.00	.00	.00
3	.00	.00	---	---	.00	.00	.05	.00	.00	.01	.00	.00
4	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
5	.02	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
10	.01	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	---	---	.00	.00	.00	.00	.00	.01	.00	.00
15	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
20	.41	.00	---	---	.00	.00	.00	.00	.16	.00	.00	.00
21	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	---	---	.00	.08	.00	.00	.00	.00	.00	.00
23	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	---	---	.00	.00	.01	.00	.00	.00	.00	.00
27	.00	.00	---	---	.00	.00	.01	.00	.00	.00	.03	.58
28	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	---	---	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	---	---	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	---	---	---	.00	---	.00	---	.00	.00	---
TOTAL	0.44	0.00	---	---	---	0.08	0.11	0.00	0.16	0.02	0.03	0.58

e Estimated

RAINFALL RECORDS

HAWAII, ISLAND OF MAUI--Continued

204606156270301. State Key Number 311.3 Kulanihakoi rain gage near Kihei, Maui.

LOCATION.--Lat 20°46'06", long 156°27'03", Hydrologic Unit 20020000, in USGS stream-gaging station 16660000 on right bank, 0.5 mi northeast of Lihue Cemetery, 0.8 mi upstream from mouth, and 1.3 mi southeast of Kihei.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey and at the National Weather Service.

GAGE.--Data logger with a .01-in. tipping bucket attachment. The National Weather Service rain gage was converted to a backup accumulation can. Elevation of gage is 35 ft (from topographic map).

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.09	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.07	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.08	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.08	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.14	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.03	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
16	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
18	.13	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.02	.00	.00	.00	.00	.00	.00	.00	.00
20	.39	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00
21	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.16	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
25	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.68	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00	.00	.02
28	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
30	.00	.00	.01	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.08	---	.00	---	.13	.00	---
TOTAL	0.52	0.01	1.19	0.03	0.00	0.08	0.17	0.00	0.00	0.14	0.00	0.02

CAL YR 1999 TOTAL 3.72
WTR YR 2000 TOTAL 2.16

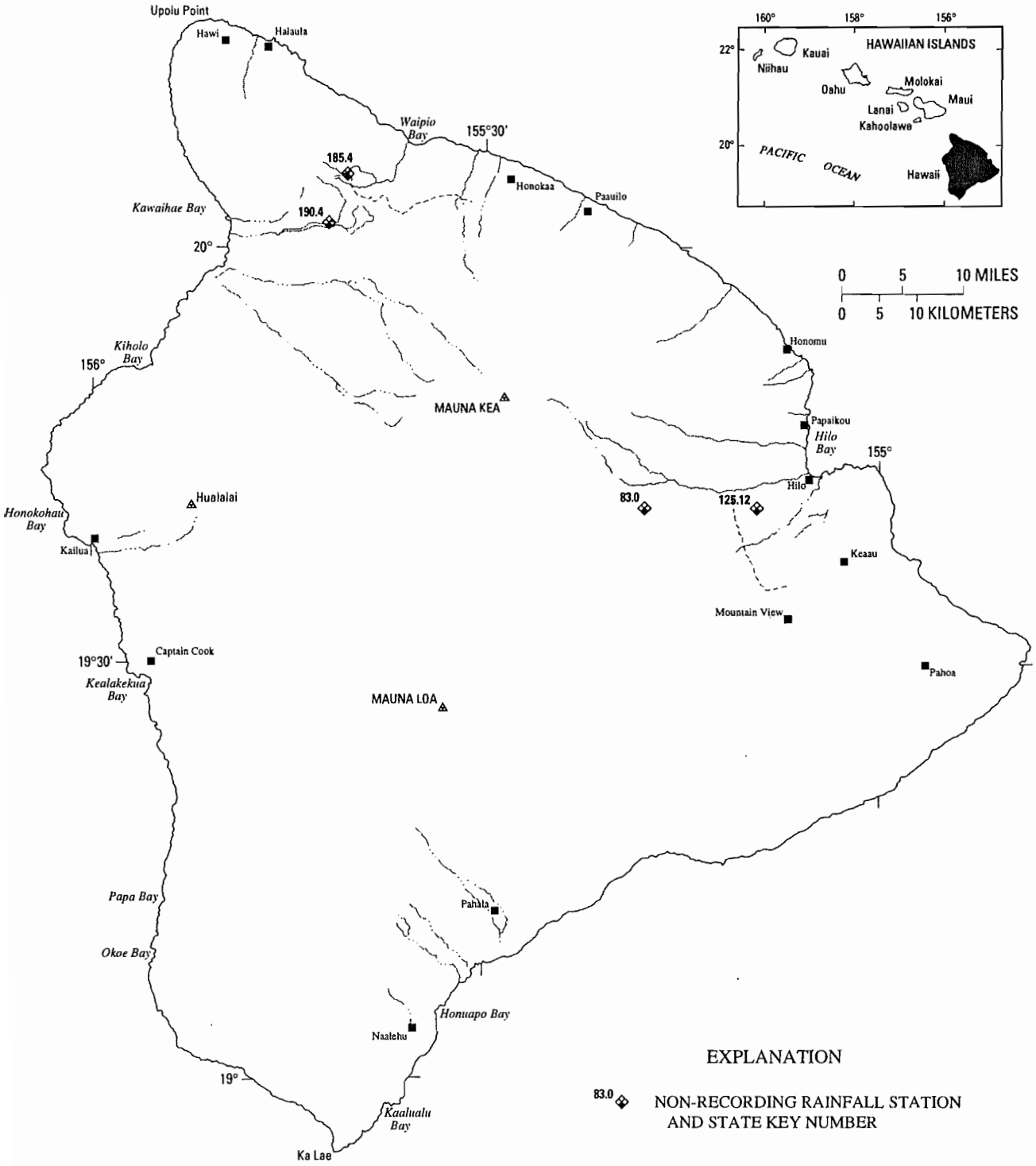


Figure 25. Locations of rainfall stations on Hawaii.

RAINFALL RECORDS

HAWAII, ISLAND OF HAWAII

194117155174801. State Key Number 83.0 Quarry at Saddle Road rain gage, Hawaii.

LOCATION.--Lat 19°41'17", long 155°17'48", Hydrologic Unit 20010000, 200 ft north of 16 mi marker on Saddle Road west of Hilo, at old quarry site.

PERIOD OF RECORD.--1967 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service nonrecording rain gage. Elevation of gage is 4,140 ft (from topographic map).

REMARKS.--Records poor. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Jul. 14 to Nov. 02	>0.4 a
Nov. 02 to Nov. 08	0.1
Nov. 08 to Jan. 26	18.9
Jan. 26 to Apr. 20	15.0
Apr. 20 to Jul. 24	18.6
Jul. 24 to Aug. 31	19.3
Aug. 31 to Oct. 03	9.4

200515155404201. State Key Number 185.4 Upper Hamakua Ditch rain gage below Kawaiki Stream near Kamuela, Hawaii.

LOCATION.--Lat 20°05'15", long 155°40'42", Hydrologic Unit 20010000, 15 ft from USGS stream-gaging station 16720500 on right bank, and 800 ft downstream of Kawaiki Stream.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service nonrecording rain gage. Elevation of gage is 4,020 ft (from topographic map).

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 21	3.0 estimate b
Oct. 21 to Jan. 19	44.3
Jan. 19 to Mar. 16	14.3
Mar. 16 to Mar. 21	0.9
Mar. 21 to Mar. 28	5.3
Mar. 28 to May 23	31.6
May 23 to Jul. 11	14.3
Jul. 11 to Sep. 14	>44.5
Sep. 14 to Sep. 30	1.6 estimate c

> Actual value is known to be greater than value shown.
a Accumulated rainfall reduced by leak through hole in collector. Actual value is known to be greater than value shown.
b Estimated value based on accumulated reading of 21.5 inches from Jul. 27 to Oct. 21, 1999
c Estimated value based on accumulated reading of 23.2 inches from Sep. 14 to Oct. 31, 2000

RAINFALL RECORDS

HAWAII, ISLAND OF HAWAII--Continued

200148155420501. State Key Number 190.4 Keanuiomano rain gage near Kamuela, Hawaii.

LOCATION.--Lat 20°01′48″, long 155°42′05″, Hydrologic Unit 20010000, in USGS stream-gaging station 16756500 on left bank, 150 ft upstream from junction of State Highways 19 and 250, and 2.0 mi west of junction of State Highways 19 and 190.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records are in the files of the U.S. Geological Survey.

GAGE.--Standard 8-in. National Weather Service nonrecording rain gage housed in recording crest-stage gage 16756500. Elevation of gage is 2,410 ft (from topographic map).

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1999 TO SEPTEMBER 2000
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 28	0.4 estimate a
Oct. 28 to Jan. 20	8.9
Jan. 20 to Mar. 30	2.2
Mar. 30 to May 25	1.8
May 25 to Jul. 14	1.4
Jul. 14 to Sep. 30	0.8 estimate b

CAL YR 1999 TOTAL 19.0
WTR YR 2000 TOTAL 15.5

a Estimated value based on accumulated reading of 0.5 inches from Sep. 1 to Oct. 28, 2000
b Estimated value based on accumulated reading of 1.6 inches from Jul. 14 to Oct. 31, 2000

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CONVERSION FACTORS AND VERTICAL DATUM

Multiply	By	To obtain
	Length	
inch (in.)	2.54×10^{1}	millimeter
	2.54×10^{-2}	meter
foot (ft)	3.048×10^{-1}	meter
mile (mi)	1.609×10^{0}	kilometer
	Area	
acre	4.047×10^{3}	square meter
	4.047×10^{-1}	square hectometer
	4.047×10^{-3}	square kilometer
square mile (mi^2)	2.590×10^{0}	square kilometer
	Volume	
gallon (gal)	3.785×10^{0}	liter
	3.785×10^{0}	cubic decimeter
	3.785×10^{-3}	cubic meter
million gallons (Mgal)	3.785×10^{3}	cubic meter
	3.785×10^{-3}	cubic hectometer
cubic foot (ft^3)	2.832×10^{1}	cubic decimeter
	2.832×10^{-2}	cubic meter
cubic-foot-per-second day [(ft^3/s) d]	2.447×10^{3}	cubic meter
	2.447×10^{-3}	cubic hectometer
acre-foot (acre-ft)	1.233×10^{3}	cubic meter
	1.233×10^{-3}	cubic hectometer
	1.233×10^{-6}	cubic kilometer
	Flow	
cubic foot per second (ft^3/s)	2.832×10^{1}	liter per second
	2.832×10^{1}	cubic decimeter per second
	2.832×10^{-2}	cubic meter per second
gallon per minute (gal/min)	6.309×10^{-2}	liter per second
	6.309×10^{-2}	cubic decimeter per second
	6.309×10^{-5}	cubic meter per second
million gallons per day (Mgal/d)	4.381×10^{1}	cubic decimeter per second
	4.381×10^{-2}	cubic meter per second
	Mass	
ton (short)	9.072×10^{-1}	megagram or metric ton

Sea level: In this report "sea level" refers to the National Geodetic Vertical Datum of 1929 (NGVD of 1929)—a geodetic datum derived from a general adjustment for the first-order level nets of both the United States and Canada, formerly called Sea Level Datum of 1929.

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