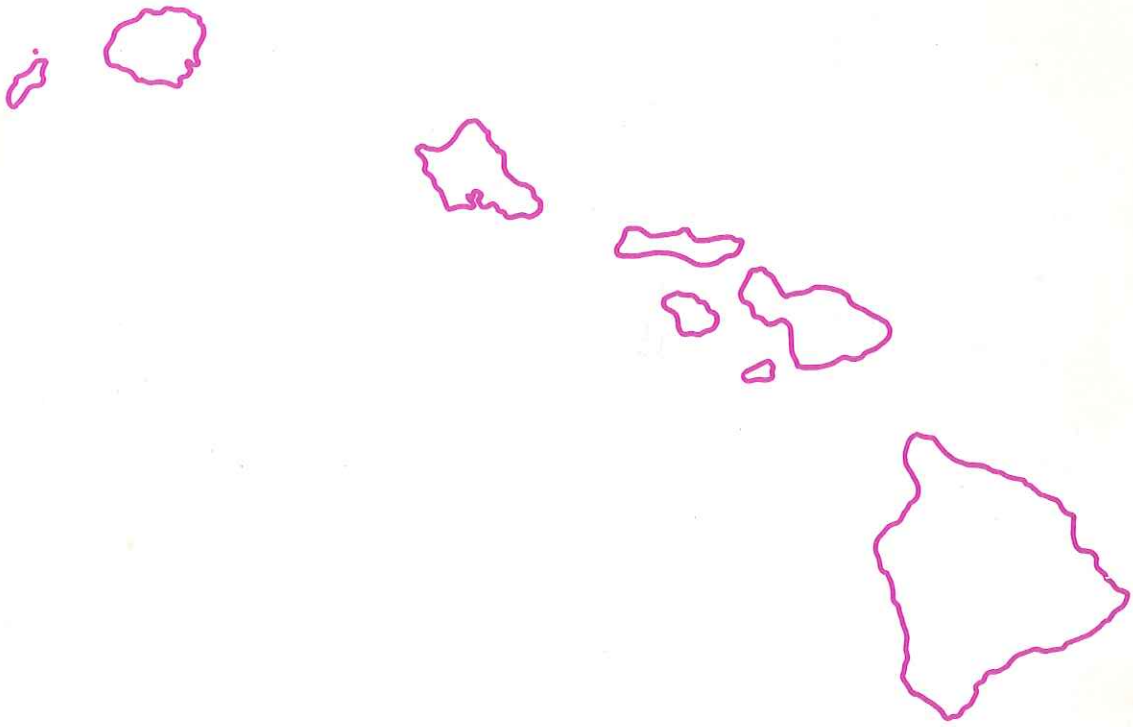
Water Resources Data Hawaii and other Pacific Areas Water Year 1994

Volume 1. Hawaii



U.S. GEOLOGICAL SURVEY WATER-DATA REPORT HI-94-1
Prepared in cooperation with the State of Hawaii
Department of Land and Natural Resources,
Division of Water Resource Management
and with other agencies

CALENDAR FOR WATER YEAR 1994

1993

OCTOBER

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

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DECEMBER

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1994

JANUARY

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FEBRUARY

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MAY

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JUNE

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JULY

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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

AUGUST

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28	29	30	31			

SEPTEMBER

S	M	T	W	T	F	S
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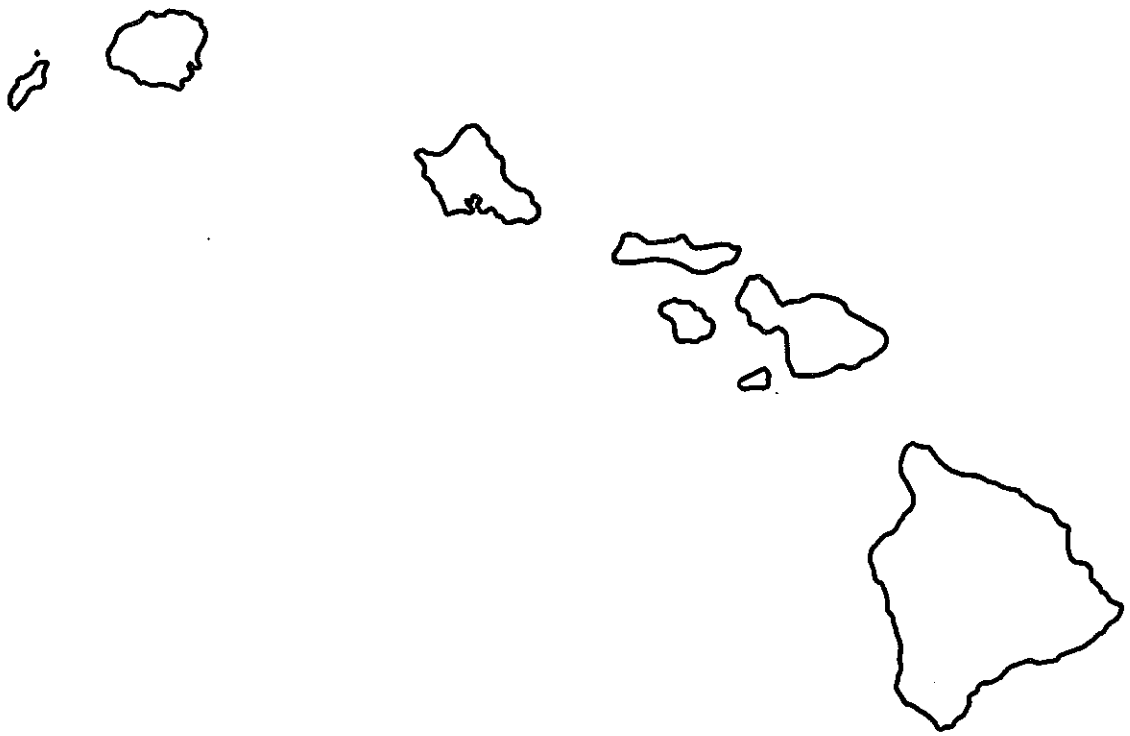
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

Water Resources Data Hawaii and other Pacific Areas Water Year 1994

Volume 1. Hawaii

by Iwao Matsuoka, Vaughn E. Kunishige, and Marty G. Lum



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Department of Land and Natural Resources,
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U.S DEPARTMENT OF THE INTERIOR

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U.S. GEOLOGICAL SURVEY

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Honolulu, Hawaii 96813

1995

PREFACE

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

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

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

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Water-resources data for the 1994 water year for Hawaii and other Pacifc Areas consist of records of stage, discharge, and water quality of streams and springs; and water levels and quality of water wells. This report volume 1 contains discharge records for 89 gaging stations; water quality at 13 gaging stations; 20 partial-record flow stations, and 167 wells; and water levels for 77 observation wells. Also included are 107 crest-stage partial record stations, 4 miscellaneous partial-record stations, 6 low-flow partial-record stations, and 46 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 agencies in Hawaii.

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

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Halaulani Stream at altitude 400 ft, near Kilauea (d)	16097500	76
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ISLAND OF OAHU		
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Letters after well number designate type of data:
(c) chemical, (t) water temperature, (w) water level

			Page
HAWAII			
ISLAND OF KAUAI			
(2-0021-01)	220057159210301	(w)	318
(2-0044-13)	220018159444702	(ctw)	319, 367
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(2-0044-15)	220016159442701	(ctw)	321, 367
(2-0120-01)	220136159205501	(ct)	367
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(2-0623-04)	220621159232101	(ctw)	324, 367
(2-0818-01)	220827159185401	(ct)	367
(2-0818-02)	220826159185401	(ct)	367
(2-0818-03)	220825159185301	(w)	324
(2-1020-03)	221038159203801	(w)	325
(2-1125-01)	221141159252501	(ct)	367
(2-1125-02)	221141159252502	(ct)	367
(2-1126-01)	221150159264501	(ctw)	325, 368
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DISCONTINUED GAGING STATIONS

The following continuous record streamflow stations in Hawaii have been discontinued or converted to partial-record stations. Daily records were collected and are stored in WATSTORE 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 R below Kekaha Ditch intk nr 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
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 Dit 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
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
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
16092000	Lower Anahola Ditch at makai weir nr Kealia	--	1909-10

DISCONTINUED GAGING STATIONS--Continued

Station Number	Station name	Drainage area (mi^2)	Period of Record
	ISLAND OF KAUAI--Continued		
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 Nanalei	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
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 Sprngs 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
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
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

DISCONTINUED GAGING STATIONS--Continued

Station Number	Station name	Drainage area (mi^2)	Period of Record
	ISLAND OF OAHU--Continued		
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	1967-71
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 canl at Kailua Rd at Kailua	--	1961-65
16264500	Kawainui Swamp canal at Wanaao Rd at Kailua	--	1961-64
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
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
16273900	Kamooalii Str at Kaneohe	4.38	1959-63, 1965-80
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
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

DISCONTINUED GAGING STATIONS--Continued

Station Number	Station name	Drainage area (mi^2)	Period of Record
	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
16404000	Pelekunu Str nr Pelekunu	2.59	1919-29, 1937-47, 1948-57, 1971-82
16405000	Lanipuni Str nr Pelekunu	1.09	1919-29, 1937-57
16406000	Waikolu Str at alt. 650 ft nr Kalaupapa	2.99	1920-23
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
16411300	Kakaako Gulch at Hwy 46 nr Mauna Loa	0.18	1964-85
16415000	EF Kawela Gulch	0.45	1946-71
16416000	Punaula Gulch nr Pukoo	0.24	1947-72
	ISLAND OF MAUI		
16501000	Palikea Str bl diversion dam nr Kipahulu	6.29	1927-29, 1931-35, 1935-38, 1939-83
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
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

DISCONTINUED GAGING STATIONS--Continued

Station Number	Station name	Drainage area (mi^2)	Period of Record
	ISLAND OF MAUI--Continued		
16553000	Waikamoi Str bl res at Kula pl intake nr Olinda	2.52	1945-49
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
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

DISCONTINUED GAGING STATIONS--Continued

Station Number	Station name	Drainage area (mi^2)	Period of Record
	ISLAND OF MAUI--Continued		
16619000	Kahakuloa Str at Kahaluloa nr Waihee	4.00	1912-13
16620000	Honokohau Str nr Honokohau	4.11	1911, 1913-20, 1922-88
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		
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
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
16718000	Upper Hamakua Ditch at Puualala nr Kukuihaele	--	1913-20
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

DISCONTINUED GAGING STATIONS--Continued

Station Number	Station name	Drainage area (mi^2)	Period of Record
	ISLAND OF HAWAII--Continued		
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
16747000	E Br Honokane nui Str at alt 1,300ft 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 770ft nr Honokane	5.41	1901
16749000	W Br Honokane nui Str at alt 1,370ft nr Honokane	1.81	1901
16749500	W Br Honokane nui Str at alt 775ft 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
16765000	Hilea Gulch tributary 2 nr Honuapo	1.86	1966-82
16767000	Ninole Gulch nr Punaluu	15.5	1966-82
16770500	Paauau Gulch at Pahala	1.74	1962-79

DISCONTINUED WATER-QUALITY STATIONS

The following continuous water-quality stations in Hawaii have been discontinued. Daily records were collected and are stored in WATSTORE 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 Wahiwa	4.29	S	1973-82
16213000	Waikele Str nr Waipahu	45.70	C,T	1973-81
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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WATER RESOURCES DATA FOR HAWAII AND OTHER PACIFIC AREAS, 1994

Volume 1--HAWAII

INTRODUCTION

The Water Resources Division of the U.S. Geological Survey, in cooperation with State, local, and other Federal agencies, obtains a large amount of data pertaining to the water resources of Hawaii and other Pacific Areas 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 and the Pacific Areas. 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 and other Pacific Areas."

This report includes records on both surface and ground water in the State. Specifically, it contains: (1) Discharge records for 89 stream-gaging stations, 4 miscellaneous streamflow stations, 107 crest-stage, partial-record streamflow stations, and 6 low-flow partial-record streamflow stations; (2) water-quality records for 13 streamflow-gaging stations, and 20 partial-record streamflow stations; (3) water-level records for 77 observation wells; (4) water-quality records for 167 observation wells; (5) accumulated rainfall records for 46 rainfall stations. Records included for stream stages and for ground-water levels in this report are only a small fraction of those obtained during the water year.

This series of annual reports for Hawaii and other Pacific Areas 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 present, in one volume, data on quantities of surface water, quality of surface and ground water, and ground-water levels.

Prior to introduction of this series (Through June 30, 1960, for Hawaii and other Pacific areas) and for several water years concurrent with it, water-resources data for Hawaii and other Pacific Areas 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 out of print, may be purchased from the U.S. Geological Survey, Earth Sciences Information Center, Open-file Reports Section, Box 25286, mail stop 517, Denver Federal Center, Denver, Colorado 80225-0046. For further ordering information, telephone (303) 236-7476.

Publications similar to this report are published annually by the 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-94-1." 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. Beginning with the 1990 water year, all water-data reports are available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the U.S. Pacific Territories, will be reproduced on a single CD-ROM disc.

Additional information, including current prices, for ordering specific reports may be obtained from the District Chief at the address given on the back of the title page or by telephone (808) 522-8290. A limited number of CD-ROM discs will be available for sale by the U.S. Geological Survey, Earth Sciences Information Center, Open-file Reports Section, Box 25286, mail stop 517, Denver Federal Center, Denver, Colorado 80225-0046.

COOPERATION

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

Hawaii Department of Land and Natural Resources, Division of Water Resource Management, Rae Loui, Deputy Director for Water Resources Management.
Hawaii Department of Transportation, Kazu Hayashida, Director.
City and County of Honolulu, Board of Water Supply, Raymond Sato, Manager and Chief Engineer.
City and County of Honolulu, Department of Public Works, Kenneth E. Sprague, Director and Chief Engineer.

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

The following organizations aided in collecting records:

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

SUMMARY OF HYDROLOGIC CONDITIONS

Surface Water

Runoff during the 1994 water year at all the index stations exceeded the normal flow (upper 25 percent of record). The monthly mean flow for all index stations was normal for the month of November, and excessive for the months of February, June, and September. The data for the index station (Waiakea Stream near Mountain View, Hawaii) on the island of Hawaii are being reviewed and was not included in the summary. The index station for Oahu was changed from Kalihi Stream near Honolulu, Oahu (16229000) to Nuuanu Stream below reservoir 2 wasteway near Honolulu starting this water year.

The annual mean discharge at East Branch of North Fork Wailua River near Lihue, Kauai was 134 percent of the 1961-90 median, 205 percent at Nuuanu Stream below reservoir 2 wasteway near Honolulu, Oahu, and 206 percent at Honopou Stream near Huelo, Maui.

Monthly and yearly mean discharges of the three index stations are compared with their medians in figure 1. Comparisons of 1994 peak discharge to peaks for period of record at the index stations are shown in Table 1.

Table 1. Comparison of peak discharge for 1994 water year with the peak discharge for the period of record at three representative stations

Station Number	Station name	Water year 1994		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	Feb. 13	12,300	Nov. 12, 1955	18,400
16232000	Nuuanu Stream below reservoir 2 wasteway near Honolulu, Oahu	Mar. 24	1,540	Jan. 16, 1921	6,990
16587000	Honopou Stream near Huelo, Maui	Mar. 24	1,260	Nov. 18, 1930	5,710

Water Quality

Dissolved-solids concentrations at the three NASQAN (National Stream Quality Accounting Network) stations showed no significant change during the 1994 water year. During 1994, the network was decreased to three stations consisting of Waimea River at Waimea, Kauai, Waikele Stream at Waipahu, Oahu, and Halawa Stream at Halawa, Molokai. Sampling frequency at the first two stations is bi-monthly while the frequency at the last station was changed to quarterly. Samples collected showed dissolved-solids concentrations ranged from 24 to 305 mg/L (milligrams per liter) during 1994. Waikele Stream at Waipahu, Oahu, had the highest concentration values and Halawa Stream at Halawa, Molokai, had the lowest concentration values.

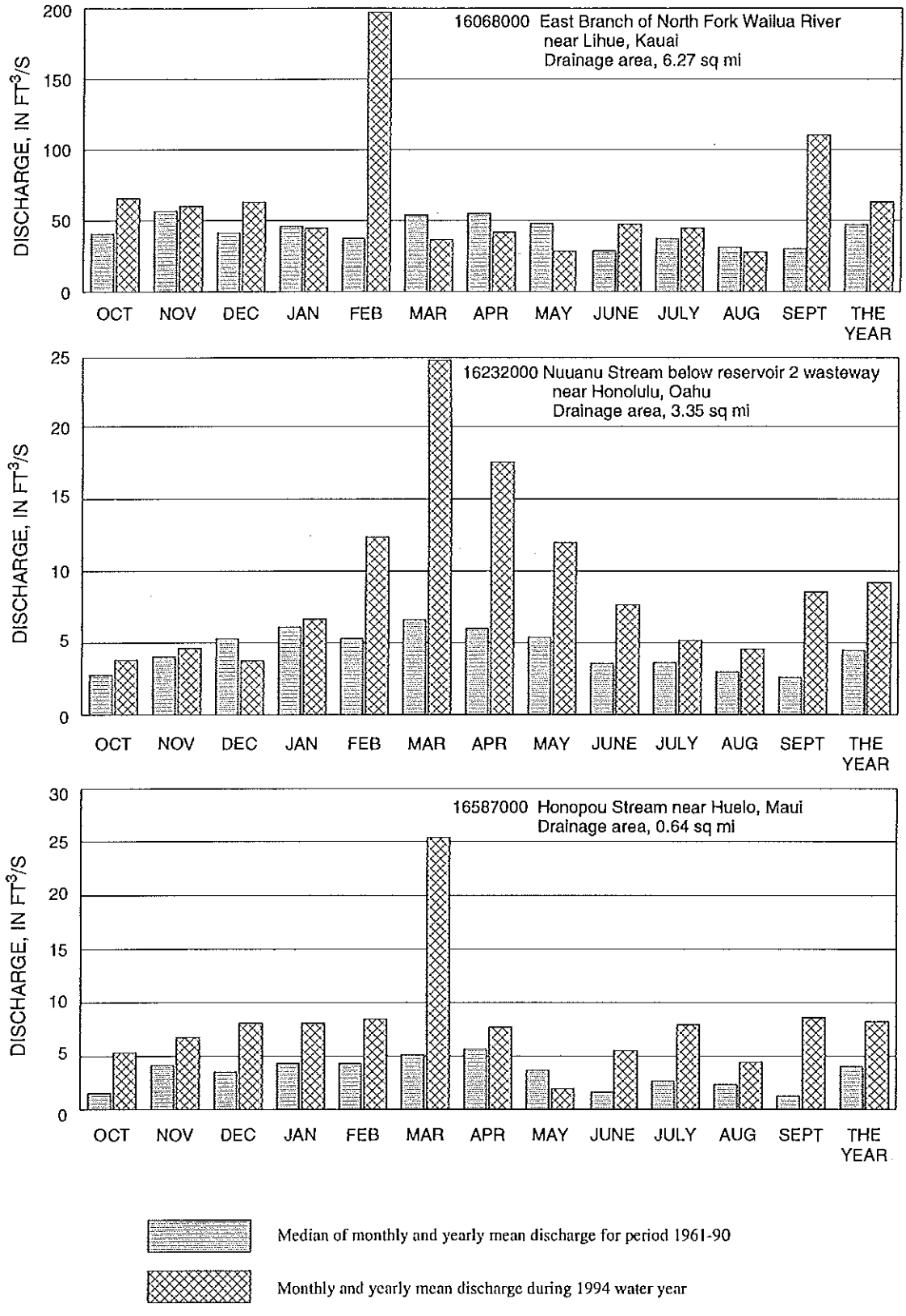

Figure 1. Discharge during 1994 water year compared with median discharge for period 1961-90 for three representative gaging stations.

Average dissolved-oxygen for all samples at each station ranged from 84 to 98 percent saturation. Waikele Stream at Waipahu, Oahu, was lowest at 84 percent, and Waimea River at Waimea, Kauai, was highest at 98 percent.

Fecal coliform densities decreased at two of the NASQAN stations in Hawaii and increased at the other. The geometric-mean values were:

NASQAN Station	Fecal Coliform (colonies per 100 milliliters) 1993	1994
Waimea River at Waimea, Kauai	210	148
Waikele Stream at Waipahu, Oahu	630	1,080
Halawa Stream at Halawa, Molokai	500	207

Analyses of water samples taken at more than 135 basal water-table wells generally did not show significant changes in chloride concentration.

SPECIAL NETWORKS AND PROGRAMS

Hydrologic Bench-Mark Network is a network of 53 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 the activities of man.

National Stream-Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN are (1) to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting, such that the data may be used for, (2) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (3) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (4) providing a nationally consistent data base useful for water-quality assessment and hydrologic research.

EXPLANATION OF THE RECORDS

The surface-water and ground-water records published in this report are for the 1994 water year that began October 1, 1993, and ended September 30, 1994. 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 2-11. 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 streamsite, well, or raingage, 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 well sites 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 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 12.)

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 13 and 14.

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

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

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

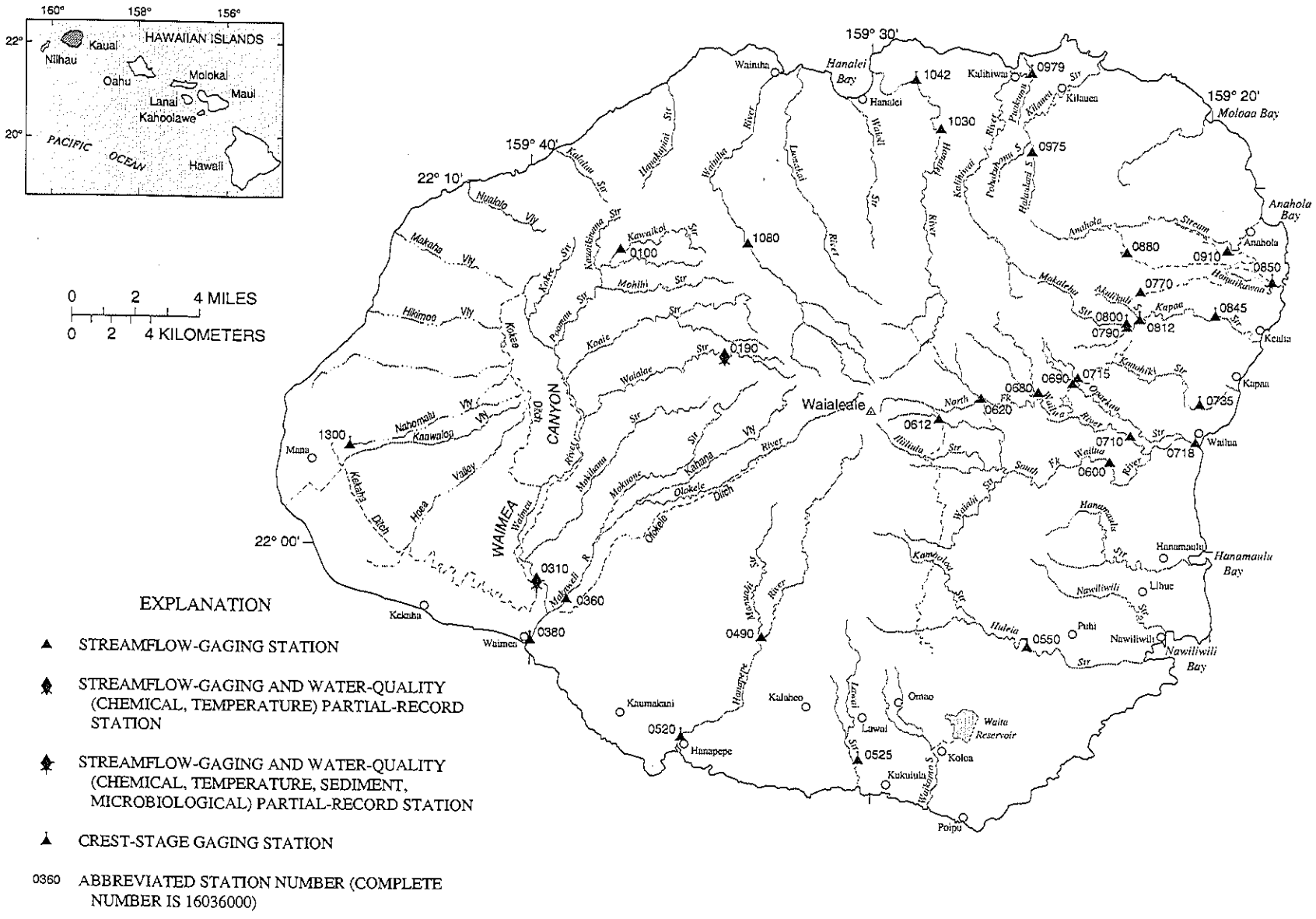

Figure 2. Locations of gaging, water-quality, and partial-record stations on Kauai.

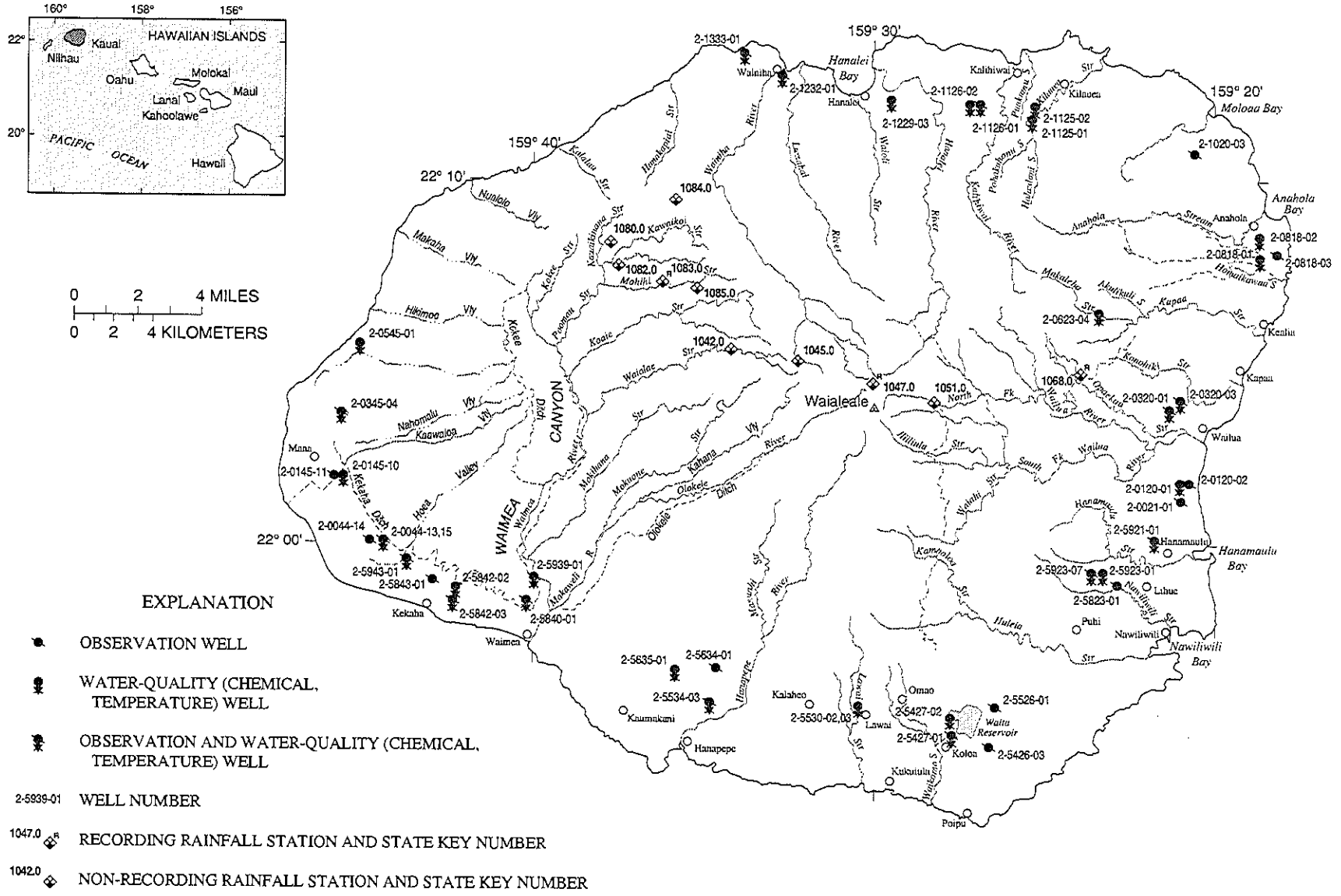

Figure 3. Locations of observation wells, ground-water quality sampling wells, and rainfall stations on Kauai.

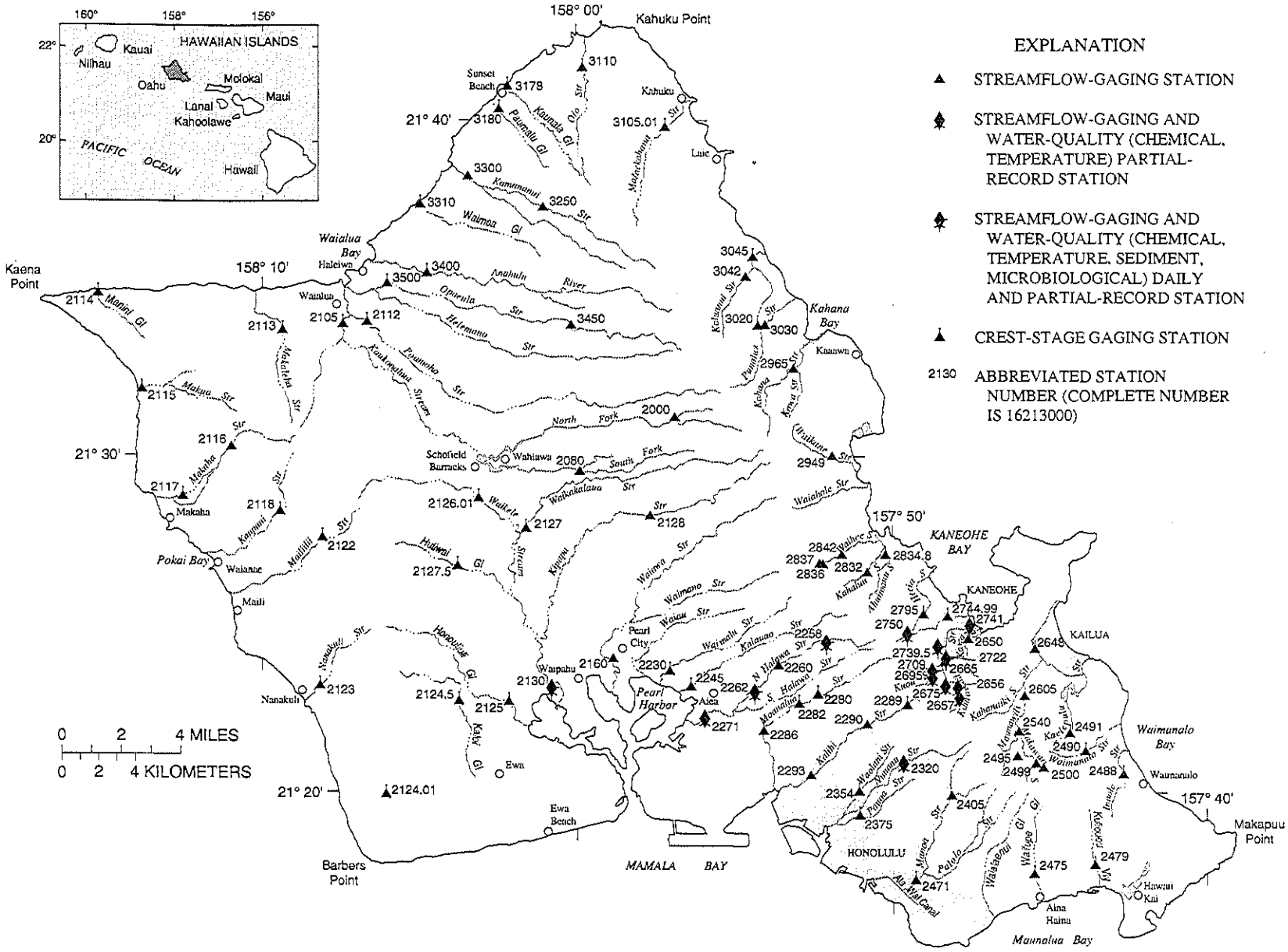

Figure 4. Locations of gaging, water-quality, and partial-record stations on Oahu.

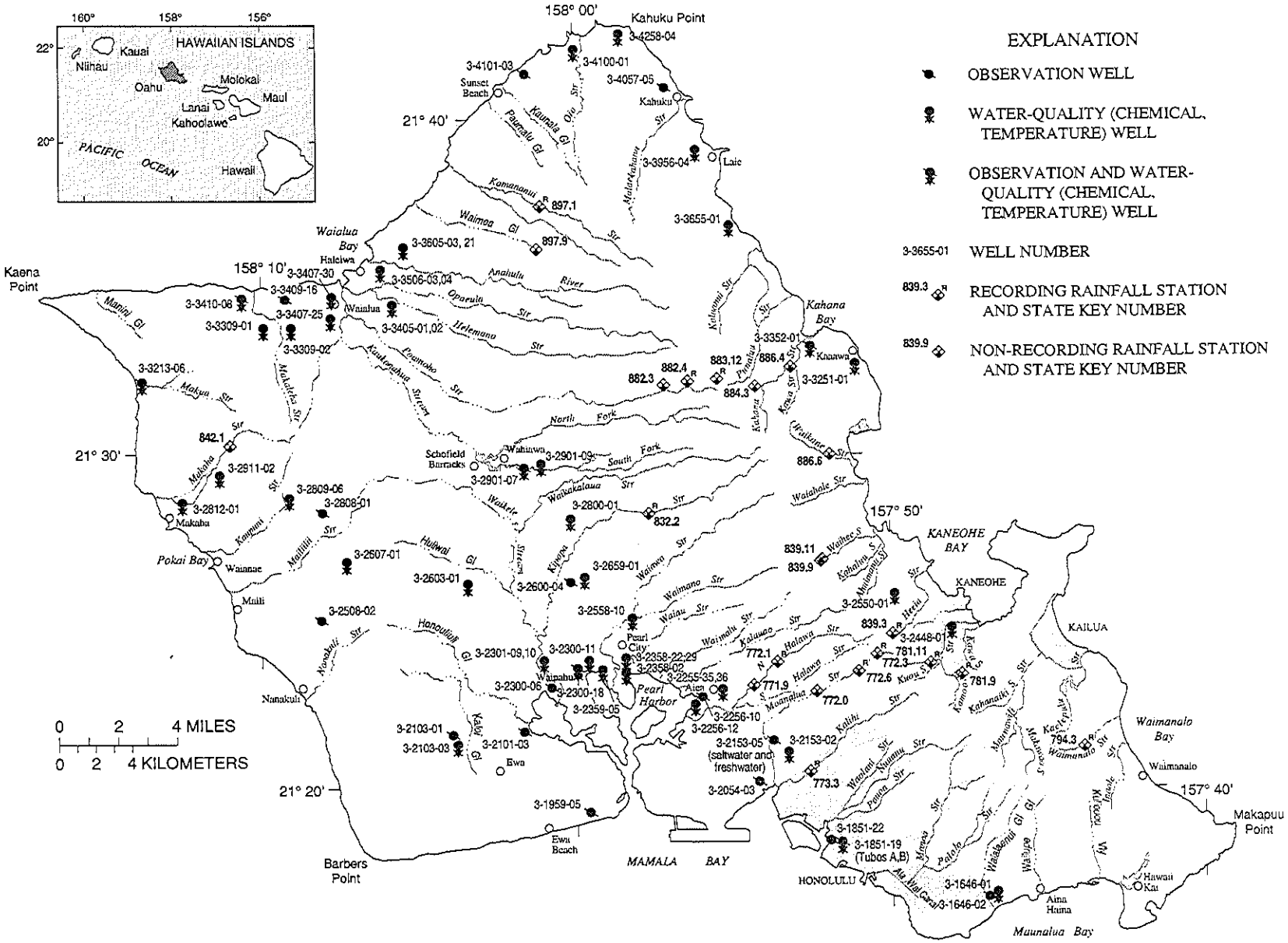

Figure 5. Locations of observation wells, ground-water quality sampling wells, and rainfall stations on Oahu.

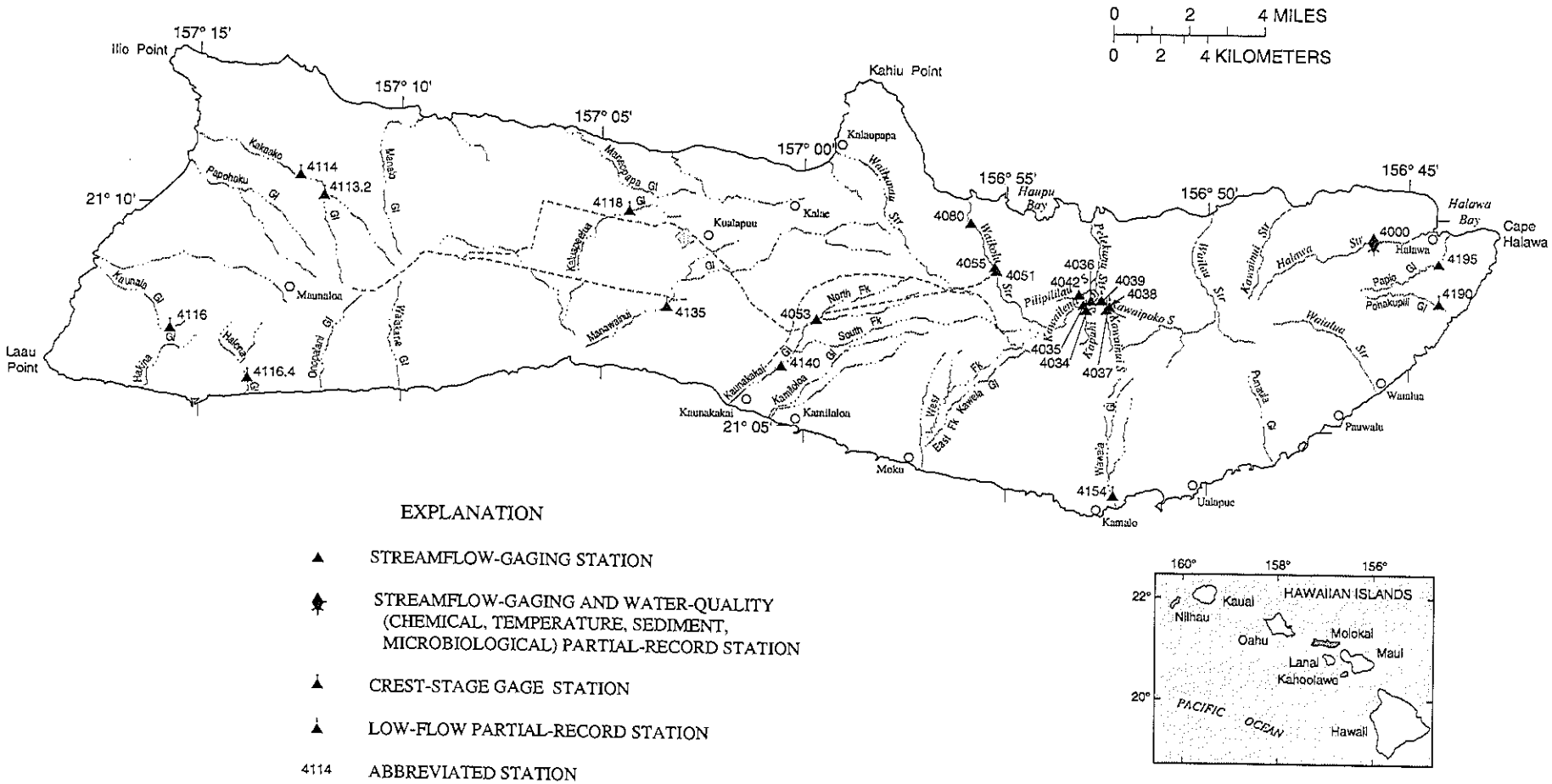

Figure 6. Locations of gaging, water-quality, and partial-record stations on Molokai.

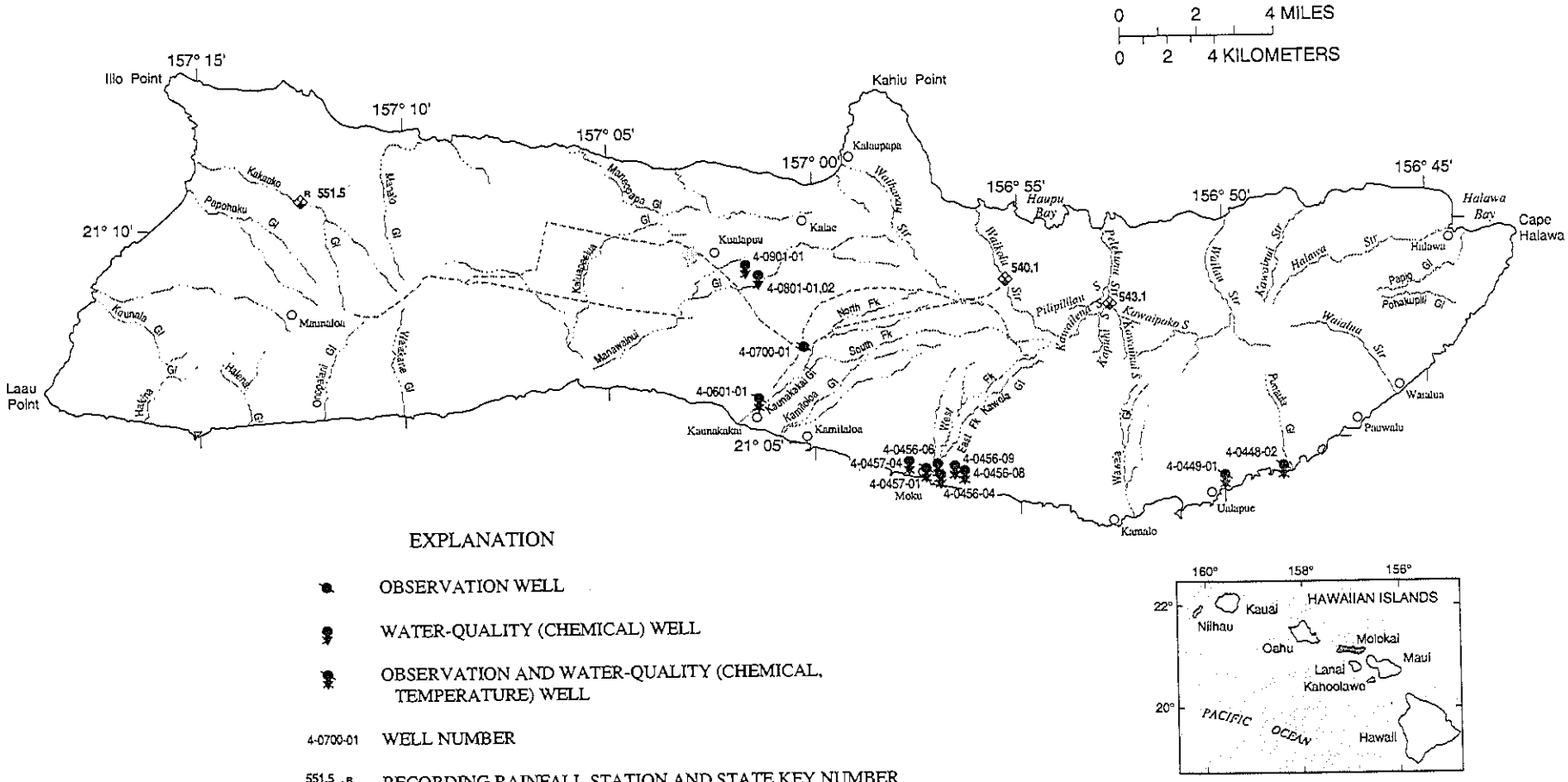

Figure 7. Locations of observation wells, ground-water quality sampling wells, and rainfall stations on Molokai.

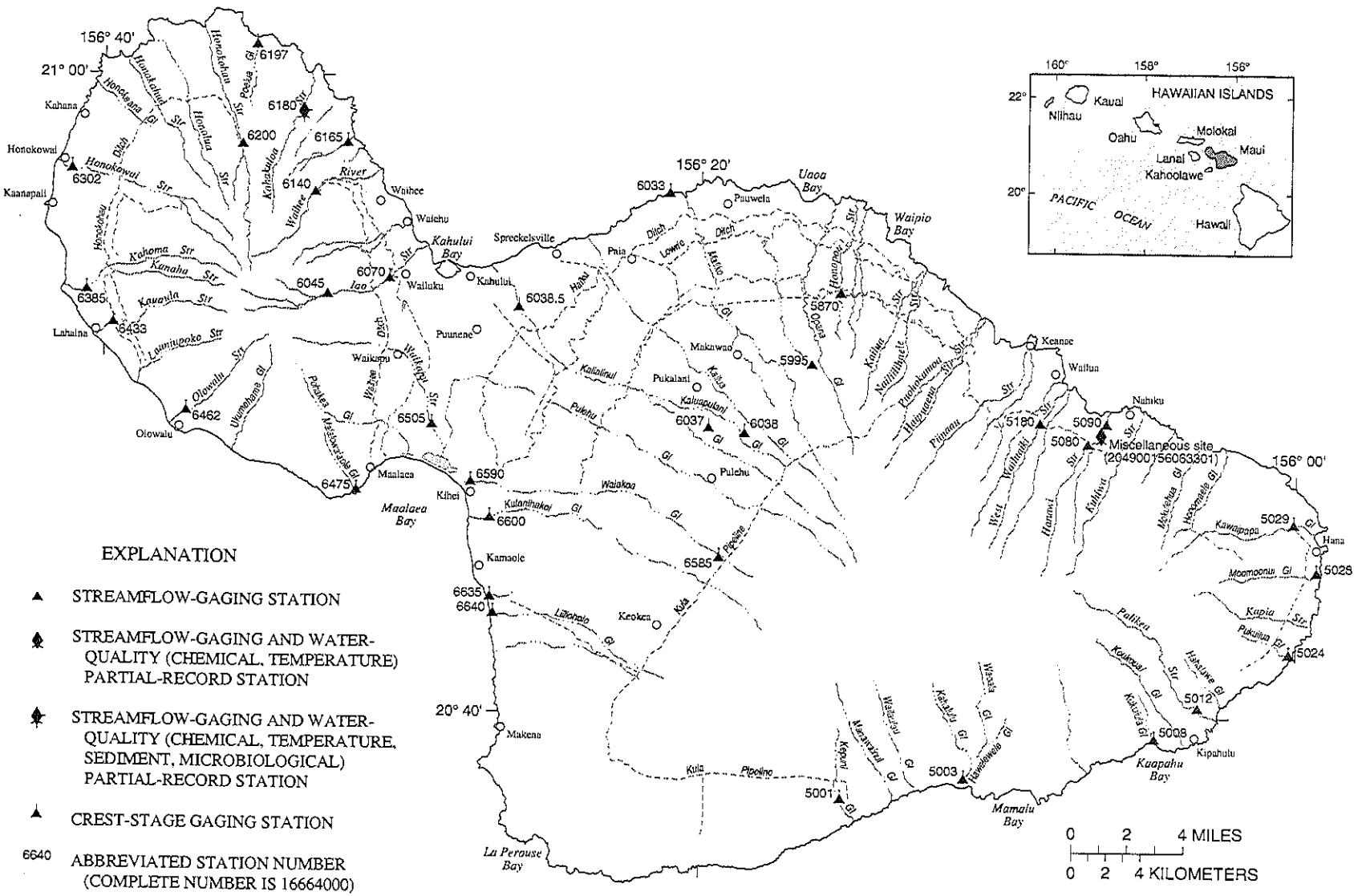

Figure 8. Locations of gaging, water-quality, and partial-record stations on Maui.

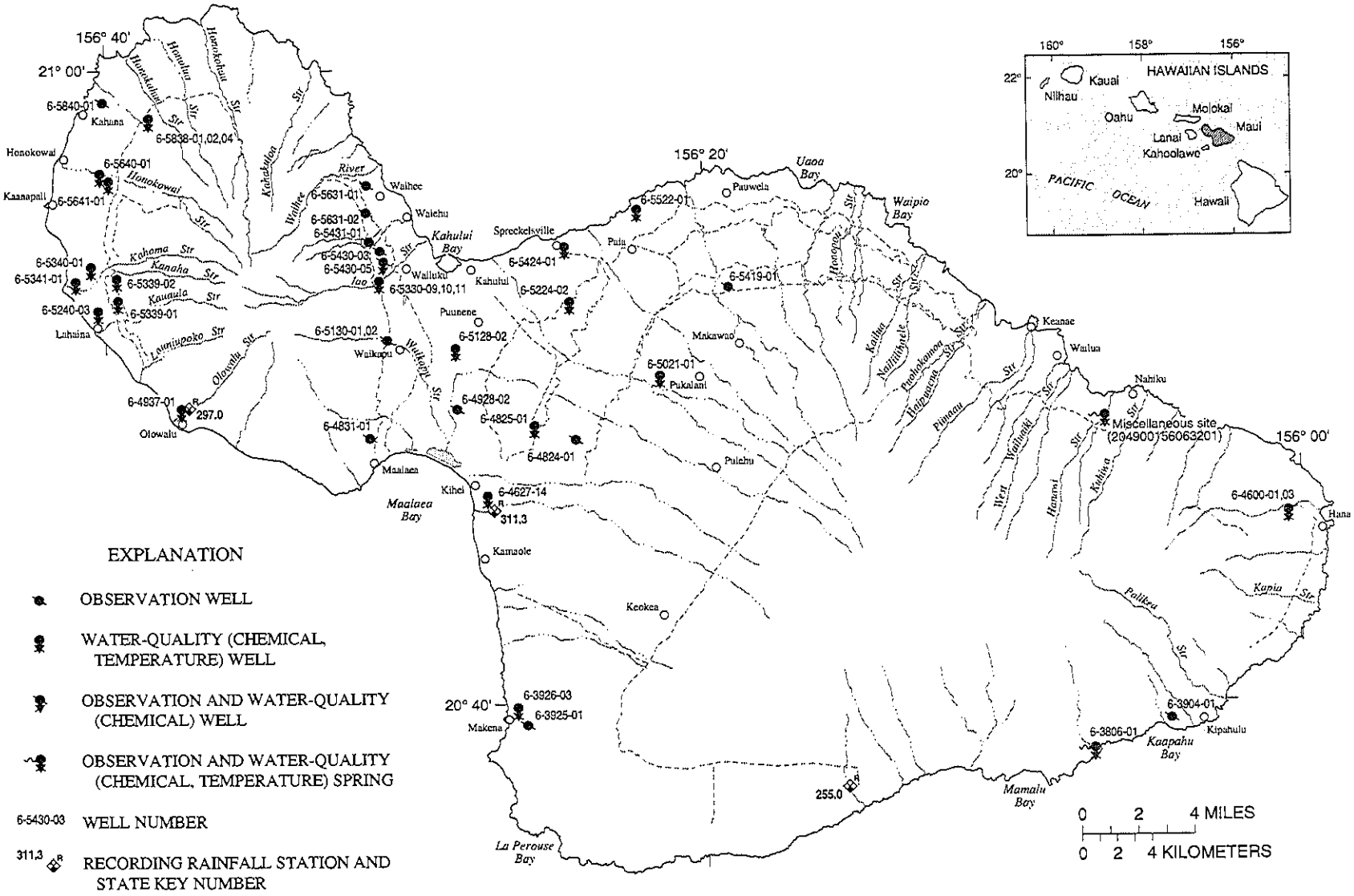

Figure 9. Locations of observation wells, ground-water quality sampling wells, and rainfall stations on Maui.

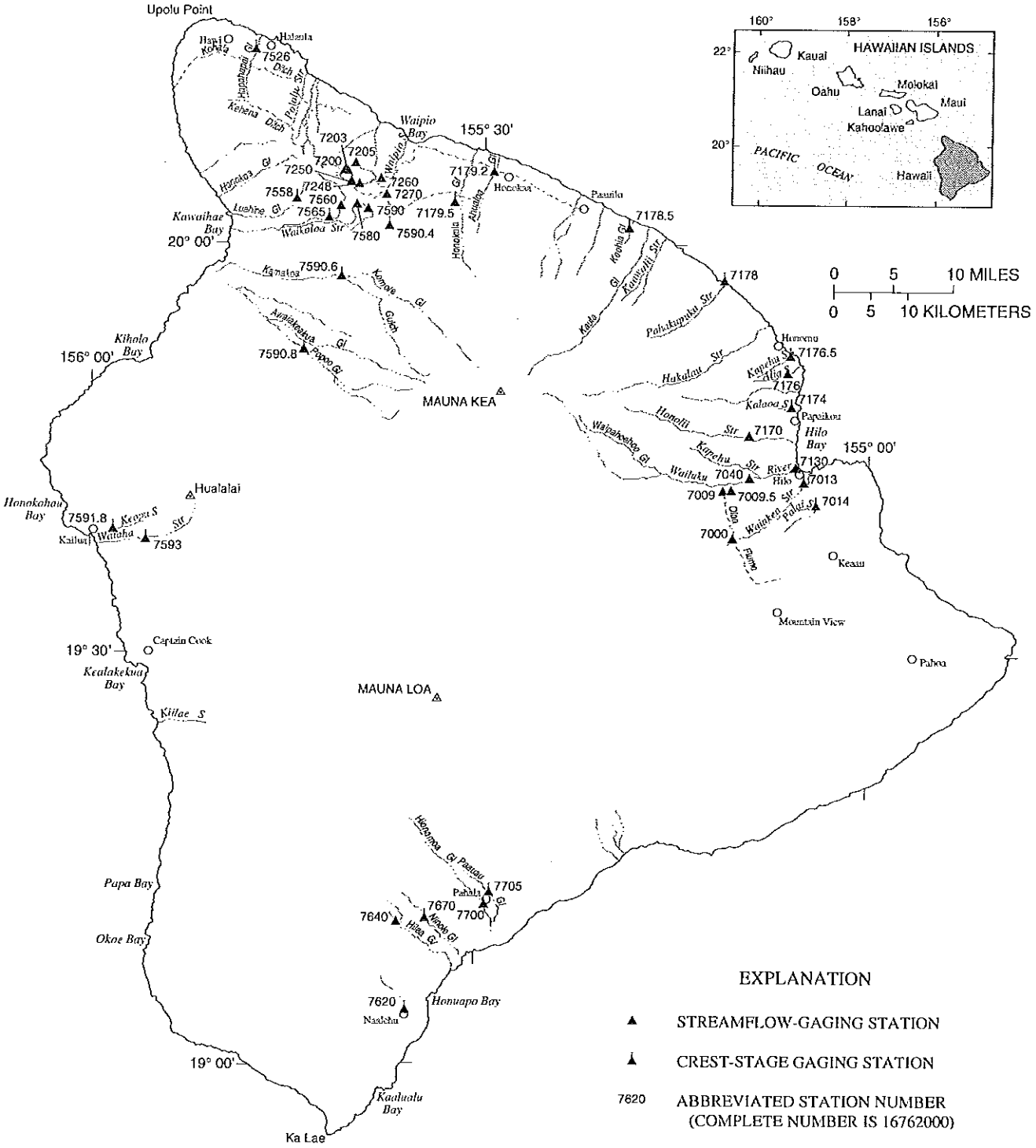

Figure 10. Locations of gaging, water-quality, and partial-record stations on Hawaii.

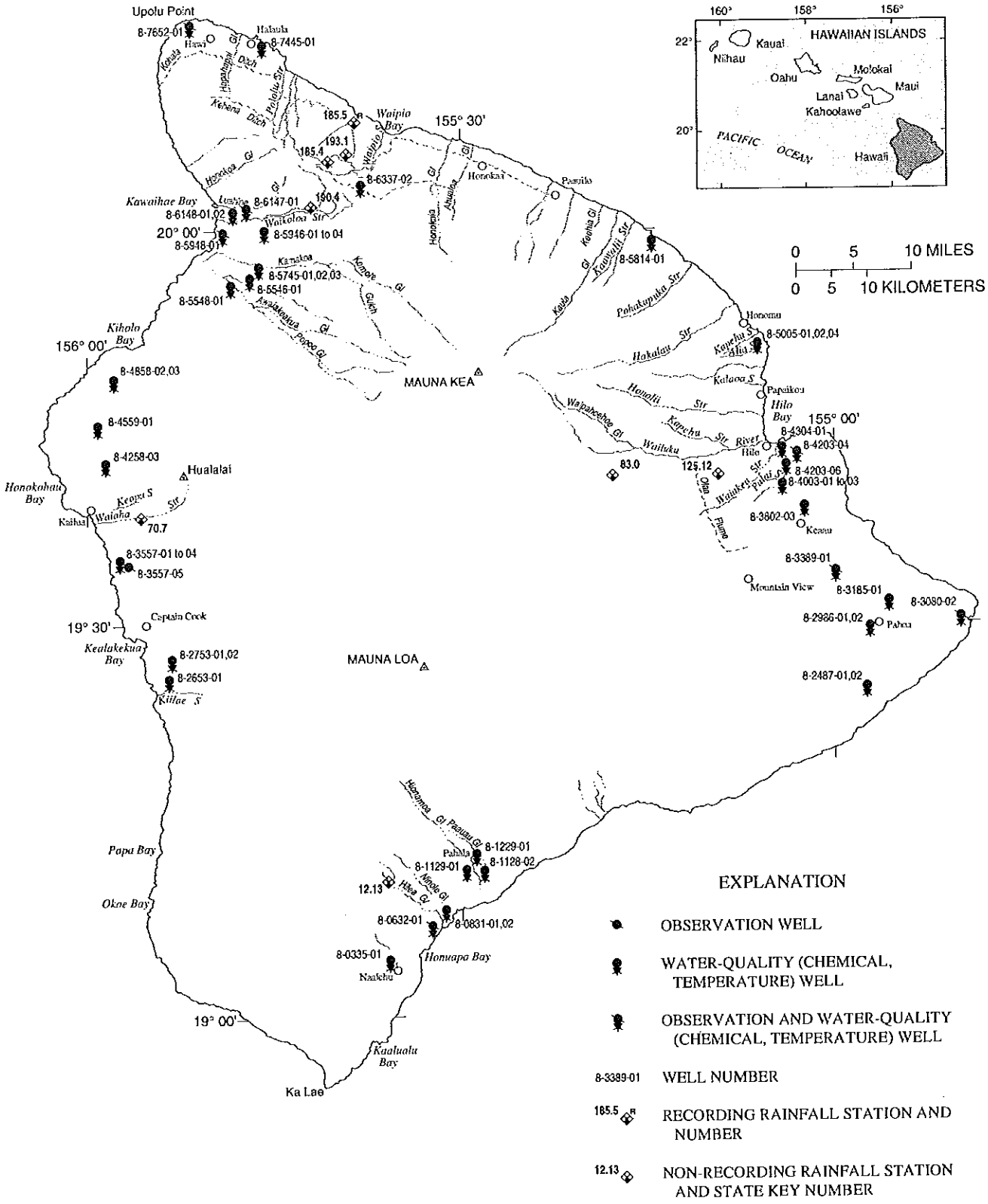

Figure 11. Locations of observation wells, ground-water quality sampling wells, and rainfall stations on Hawaii.

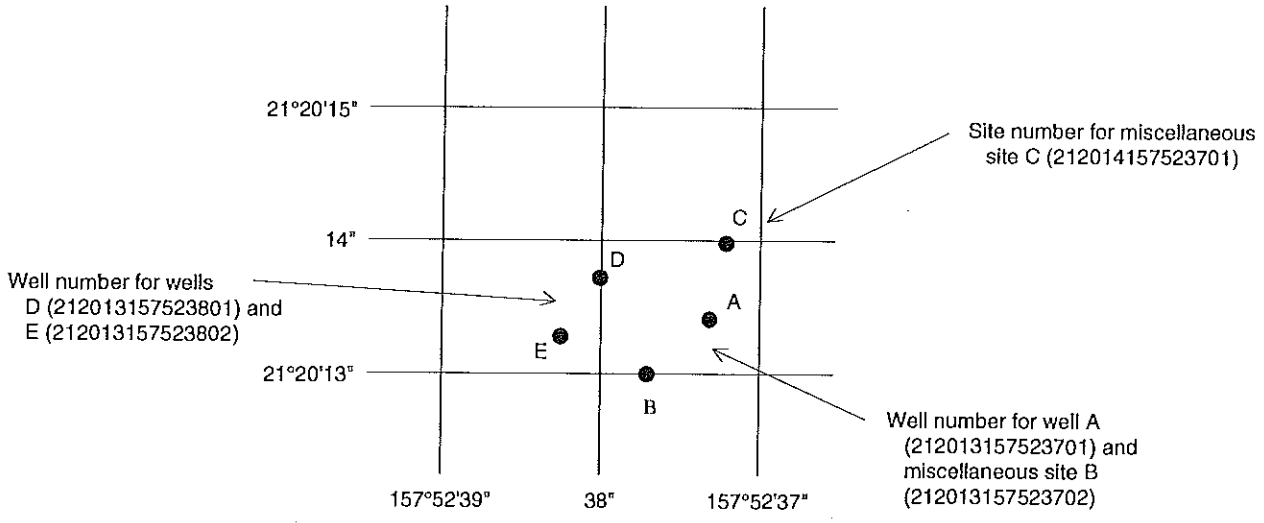

Figure 12. Sketch showing system for numbering wells and miscellaneous sites.

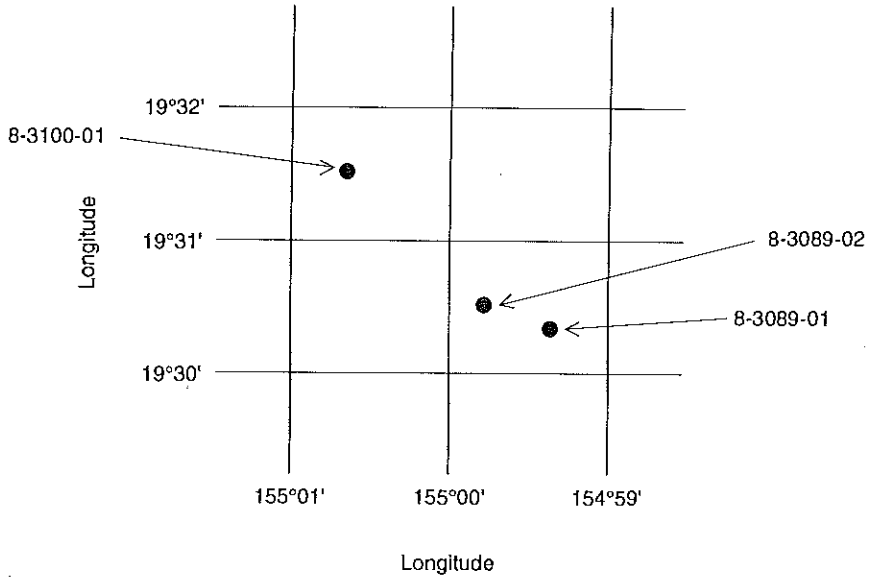

Figure 13. Sketch showing local well-numbering system.

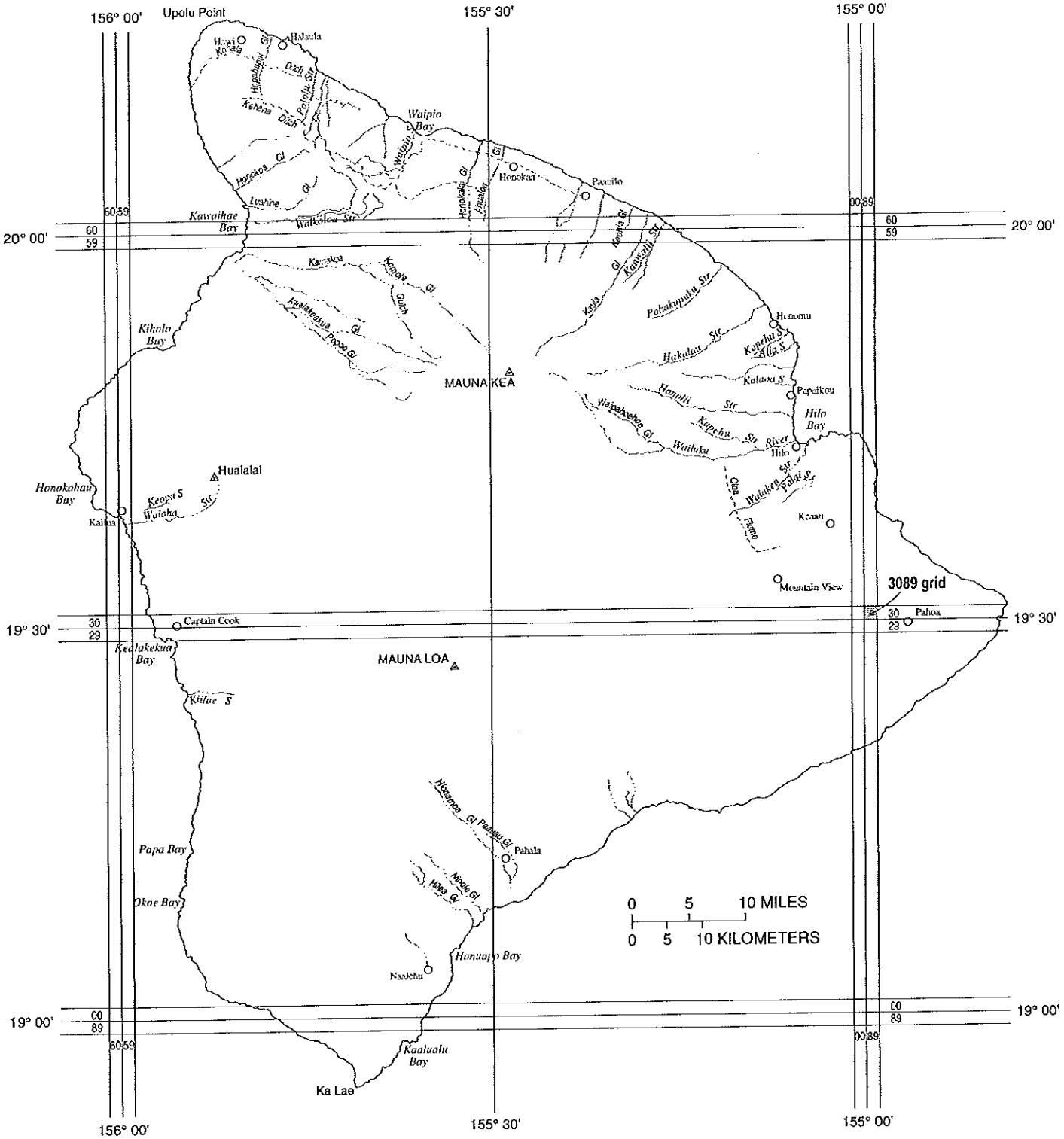

Figure 14. Map of island of Hawaii showing system for numbering local well numbers.

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 daily 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 2, 4, 6, 8, and 10.

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 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 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 daily mean 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 stations 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 manuscript or station description; 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 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. Comments to follow clarify information presented under the various headings of the station description.

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 Topographic Division of the 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 description 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 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 does 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 control by man. 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 Hawaii 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 cubic feet per second per square mile (line headed "CFSM"); or in inches (line headed "IN"), or in acre-feet (line headed "AC-FT"). Figures for cubic feet per second per square mile and runoff in inches are omitted if there is extensive regulation or diversion or if the drainage area includes large noncontributing areas.

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 description.

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 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 3 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 due to the effects of diversion, consumption, regulation by storage, increase or decrease in evaporation due to artificial causes, or to other factors. For such stations, figures of cubic feet per second per square mile and of runoff, in inches, are not published unless satisfactory adjustments can be made for diversions, for changes in contents 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 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 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 measurements 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 2, 4, 6, 8, and 10.

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 onsite 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 onsite 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 Geological Survey, Water Resources Division office in Honolulu, Hawaii.

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 taken at time of discharge measurements for water-discharge stations. For stations where water temperatures are taken manually once or twice daily, the water temperatures are taken at about the same time each day. Large streams have a small 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 Hawaii 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.

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 are analyzed locally. All other samples are analyzed in the Geological Survey laboratory in Arvada, Colorado. 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, WATSTORE, 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 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).

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 will begin using new trace-element protocols at some stations in water year 1994. Full implementation of the protocols will take place during the 1995 water year.

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 3, 5, 7, 9, and 11.

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, an alphanumeric number, derived from the township-range location of the well.

Water-level records are obtained from direct measurements with a steel or electrical tape or from the graph or punched tape 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 for every day. When complete water level data for a day is not available, the day is noted with three dashes (---). To show the intraday variation in the ground-water levels caused by local pumping and tidal fluctuations, instantaneous maximum and minimum water levels for the year are given at the bottom of each daily tables.

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-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 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). The highest and lowest water levels of the water year and their dates of occurrence are shown on a line below the abbreviated table. 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 WATSTORE DATA

The U.S. Geological Survey is the principal Federal water-data agency and, as such, collects and disseminates about 70 percent of the water data currently being used by numerous State, local, private, and other federal agencies to develop and manage our water resources. As part of the Geological Survey's program of releasing water data to the public, a large-scale computerized system has been developed for the storage and retrieval of water data collected through its activities. The National WATer Data STOrage and REtrieval System (WATSTORE) was established in 1972 to provide an effective and efficient means for the processing and maintenance of water data collected through the activities of the U.S. Geological Survey and to facilitate release of the data to the public. A variety of useful products, ranging from data tables to complex statistical analyses such as Log Pearson Type III, can be produced using WATSTORE. The system resides on the central computer facilities of the U.S. Geological Survey at its National Center in Reston, Virginia, and consists of related files and data bases.

* Station Header File - Contains descriptive information on more than 440,000 sites throughout the United States and its territories where the U.S. Geological Survey collects or has collected data.

* Daily Values File - Contains more than 220 million daily values of stream flows, stages, reservoir contents, water temperatures, specific conductances, sediment concentrations, sediment discharges, and ground-water levels.

* Peak Flow File - Contains approximately 500,000 maximum (peak) streamflow and gage-height values at surface-water sites.

* Water Quality File - Contains approximately 2 million analyses of water samples that describe the chemical, physical, biological, and radio-chemical characteristics of both surface and ground water.

* Ground-Water Site Inventory Data Base - Contains inventory data for more than 900,000 wells, springs, and other sources of ground water. The data includes site location, geohydrologic characteristics, well-construction history, and one-time field measurements such as water temperature.

In 1976, the U.S. Geological Survey opened WATSTORE to the public for direct access. The signing of a Memorandum of Agreement with the Survey is required to obtain direct access to WATSTORE. The system can be accessed either synchronously or asynchronously. The requester will be expected to pay all computer costs he/she incurs. Direct access may be obtained by contacting:

U.S. Geological Survey
National Water Data Exchange
421 USGS National Center
Reston, Virginia 22092

In addition to providing direct access to WATSTORE, data can be provided in various machine-readable formats on magnetic tape or 5-1/4 inch floppy disk and, as noted in the introduction, on CD-ROM discs. Beginning with the 1990 water year, all water-data reports will also be available on Compact Disc - Read Only Memory (CD-ROM). All data reports published for the current water year for the entire Nation, including Puerto Rico and the Trust Territories, will be reproduced on a single CD-ROM disc. 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's District offices. (See address on the back of the title page). A limited number of CD-ROM discs will be available for sale by the Books and Open-file Reports Section, U.S. Geological Survey, Federal Center, Box 25425, Denver, Colorado 80225.

DEFINITION OF TERMS

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

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

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 measure of ATP therefore provides a sensitive and rapid estimate of biomass. ATP is reported in micrograms per liter of the original water sample.

Algae are mostly aquatic single-celled, colonial, or multi-celled 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.

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

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

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

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

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

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

Benthic organisms (invertebrates) are the group of animals living in or on 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.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

1. When chemical samples are collected daily or monthly for 10 or more months during the water year.

2. When water temperature records include observations taken one or more times daily.

3. When sediment discharge records include those periods for which sediment loads are computed and are considered to be representative of the runoff for the water year.

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

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

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

Cubic foot per second-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, or 646,317 gallons or 2,447 cubic meters.

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

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

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

Annual 7-day minimum is the lowest mean discharge for 7 consecutive days for a calendar year or 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.)

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

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

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

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

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

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

Hydrologic Bench-Mark Network is a network of 53 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 the activities of man.

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

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

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

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

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 both 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.

National Stream-Quality Accounting Network (NASQAN) is a nationwide data-collection network designed by the U.S. Geological Survey to meet many of the information needs of government agencies and other groups involved in national or regional water-quality planning and management. The 284 sites in NASQAN are generally located at the downstream ends of hydrologic accounting units designated by the U.S. Geological Survey Office of Water Data Coordination in consultation with the Water Resources Council. The objective of NASQAN is to obtain information on the quality and quantity of water moving within and from the United States through a systematic and uniform process of data collection, summarization, analysis, and reporting. The design of the network is intended to provide data for (1) description of the areal variability of water quality in the Nation's rivers through analysis of data from this and other programs, (2) detection of changes or trends with time in the pattern of occurrence of water-quality characteristics, and (3) a nationally consistent data base useful for water-quality assessment and hydrologic research.

Parameter code is a 5-digit number used in the U.S. Geological Survey computerized data system, WATSTORE, to uniquely identify a specific constituent. The codes used in WATSTORE are the same as those used in the U.S. Environmental Protection Agency data system, STORET. The Environmental Protection Agency assigns and approves all requests for new codes.

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

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

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

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

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

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

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

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

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

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

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

Blue-green algae are 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 algal 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 (PCBs) 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.

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 both the United Stated and Canada, formerly called Sea Level Datum of 1929.

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

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

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

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

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

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

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

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 about 65 percent of the specific conductance (in microsiemens). This relation is not constant from stream to stream, and it may vary in the same source with changes in the composition of the water.

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

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

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

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

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

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

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

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

Kingdom	Animal
Phylum	Arthropoda
Class	Insecta
Order	Ephemeroptera
Family	Ephemeridae
Genus	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 indicates the dry mass of dissolved solids in 1 acre-foot of water. It is computed by multiplying the concentration in milligrams per liter by 0.00136.

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

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

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

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

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

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. Thus the year ending September 30, 1994, is called the "1994 water year".

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

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

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

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

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. When ordering or inquiring about prices for any of these publications, please give the title, book number, chapter number, and "U.S. Geological Survey Techniques of Water-Resources Investigations."

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

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

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

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

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

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

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.

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

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

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

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

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

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

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

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

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

3-Al0. *Discharge ratings at gaging stations,* by E. J. Kennedy: USGS--TWRI Book 3, Chapter A10. 1984. 59 pages.

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.

3-A12. *Fluorometric procedures for dye tracing,* Revised, by J. F. Wilson, Jr., E. D. Cobb, and F. A. Kilpatrick: USGS- -TWRI Book 3, Chapter A12. 1986. 34 pages.

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

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

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

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

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

3-A18. *Determination of stream reaeration coefficients by use of tracers,* by F. A. Kilpatrick, R. E. Rathbun, Nobuhiro Yotsukura, G. W. Parker, and L. L. DeLong: USGS--TWRI Book 3, Chapter A18. 1989. 52 pages.

3-A19. *Levels at streamflow gaging stations,* by E.J. Kennedy: USGS--TWRI Book 3, Chapter A19. 1990. 31 pages.

3-A20. *Simulation of soluable waste transport and buildup in surface waters using tracers,* by F. A. Kilpatrick: USGS--TWRI Book 3, Chapter A20. 1993. 38 pages.

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

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

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

3-B4. *Regression modeling of ground-water flow,* by R. L. Cooley and R. L. Naff: USGS--TWRI Book 3, Chapter B4. 1990. 232 pages.

3-B4. *Supplement 1. Regression modeling of ground-water flow - Modifications to the computer code for nonlinear regression solution of steady-state ground-water flow problems,* by R. L. Cooley: USGS--TWRI Book 3, Chapter B4. 1993. 8 pages.

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

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

3-B7. *Analytical solutions for one-, two-, and three-dimensional solute transport in ground-water systems with uniform flow,* by E. J. Wexler: USGS--TWRI Book 3, Chapter B7. 1992. 190 pages.

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

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

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

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

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

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

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

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

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

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

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

5-A3. *Methods for the determination of organic substances in water and fluvial sediments*, edited by R. L. Wershaw, M. J. Fishman, R. R. Grabbe, and L. E. Lowe: USGS--TWRI Book 5, Chapter A3. 1987. 80 pages.

5-A4. *Methods for collection and analysis of aquatic biological and microbiological samples*, by L. J. Britton and P. E. Greeson, editors: USGS--TWRI Book 5, Chapter A4. 1989. 363 pages.

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

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

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

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

6-A2. *Documentation of a computer program to simulate aquifer-system compaction using the modular finite-difference ground-water flow model*, by S. A. Leake and D. E. Prudic: USGS--TWRI Book 6, Chapter A2. 1991. 68 pages.

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

6-A4. *A modular finite-element model (MODFE) for areal and axisymmetric ground-water-flow problems, Part 2: Derivation of finite-element equations and comparisons with analytical solutions*, by R. L. Cooley: USGS--TWRI Book 6, Chapter A4. 1992. 108 pages.

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.

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

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

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

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

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

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

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HAWAII, ISLAND OF KAUAI

16010000 KAWAIKOI STREAM NEAR WAIMEA

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

DRAINAGE AREA.--3.95 mi^2.

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

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

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

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--77 years (water years 1912, 1914, 1920-94), 34.4 ft^3/s (24,920 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 11,300 ft^3/s, Jan. 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, Sept. 21, 22, 1953.

EXTREMES FOR CURRENT YEAR.--Peak discharges 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)
Feb. 12	0530	*2,530	*8.29	No other peak greater than base discharge.			

Minimum discharge, 2.9 ft^3/s, Aug. 20-22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

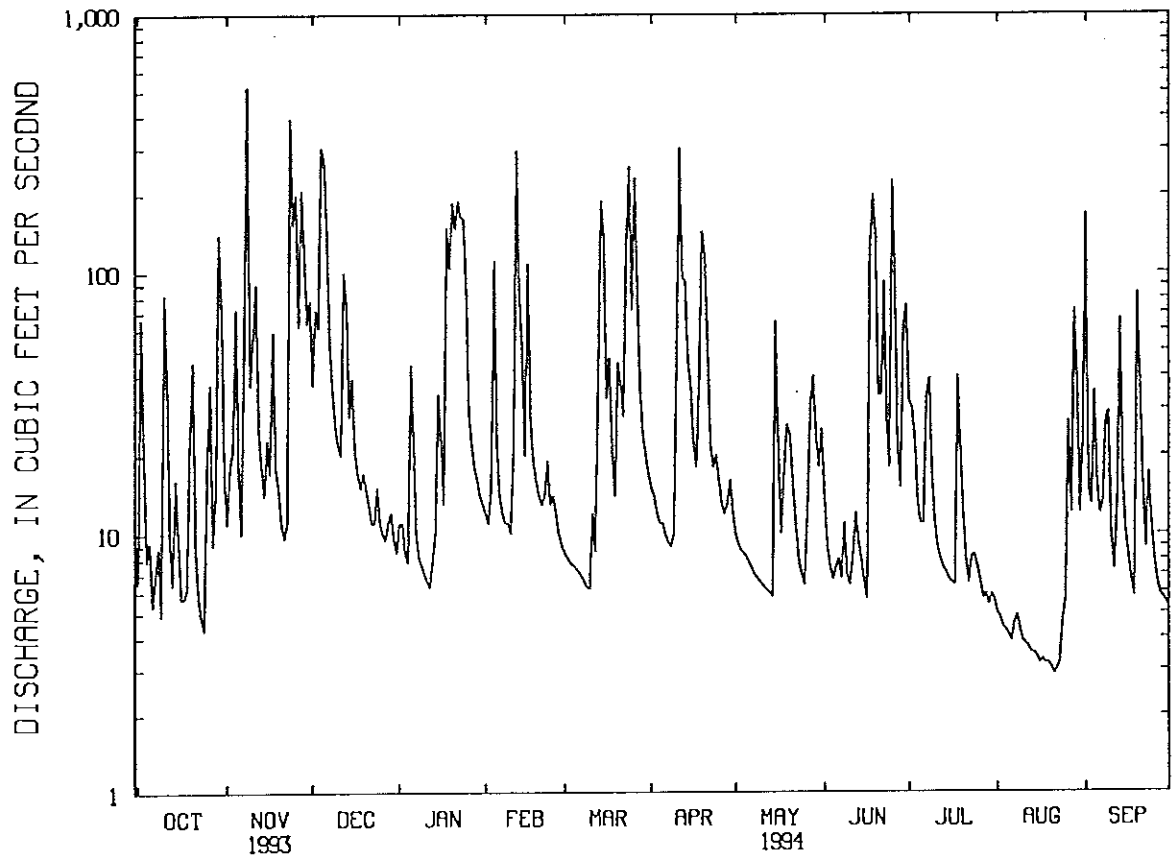
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	11	37	11	12	8.5	15	9.9	14	32	5.0	168
2	66	18	72	11	11	8.1	14	9.1	9.0	30	4.8	15
3	20	21	61	8.4	15	7.8	12	8.6	7.5	23	4.4	13
4	7.9	72	302	7.8	111	7.6	11	8.4	6.7	13	4.3	35
5	9.3	19	273	44	22	7.4	11	8.1	7.4	11	4.1	16
6	5.3	10	141	22	14	7.2	9.9	7.7	8.0	11	3.9	12
7	6.9	57	53	10	12	6.9	9.3	7.3	6.8	34	4.6	13
8	8.8	521	35	8.1	11	6.6	9.0	6.9	11	39	4.9	27
9	4.9	37	26	7.6	11	6.3	10	6.7	7.0	17	4.3	29
10	82	55	22	7.0	10	6.2	48	6.5	6.4	11	3.9	10
11	37	90	20	6.6	21	12	301	6.3	8.0	8.8	3.8	7.3
12	9.4	25	100	6.3	294	8.6	95	6.1	12	8.0	3.7	13
13	6.4	18	77	7.9	83	38	93	6.0	9.4	7.4	3.5	66
14	16	14	28	10	51	188	46	5.8	8.0	7.1	3.5	16
15	9.4	23	39	34	20	140	37	65	6.5	6.7	3.4	10
16	5.7	17	21	23	108	33	22	22	5.7	6.5	3.2	8.1
17	5.7	59	17	13	28	47	18	10	123	6.4	3.3	6.6
18	6.2	18	15	149	19	21	39	17	198	40	3.2	5.8
19	23	15	17	104	16	14	144	26	135	21	3.2	83
20	45	11	15	185	14	45	115	24	34	12	3.1	37
21	8.9	9.6	13	148	13	37	53	16	34	8.0	2.9	16
22	5.8	11	11	189	14	28	22	11	92	6.5	3.0	8.9
23	4.8	392	11	164	19	130	18	8.1	27	8.2	3.2	17
24	4.3	153	15	162	13	255	20	7.0	18	8.3	4.6	11
25	18	199	11	87	14	72	16	6.4	226	7.5	5.6	8.0
26	37	62	10	29	12	230	13	12	96	6.6	27	6.6
27	9.1	206	9.5	22	10	87	12	31	21	5.7	12	5.9
28	14	118	11	18	9.1	35	13	40	15	5.9	72	5.7
29	140	64	12	16	---	24	16	24	62	5.4	37	5.5
30	75	78	9.6	14	---	20	12	18	75	5.9	12	5.2
31	17	---	8.5	13	---	17	---	25	---	5.6	24	---
TOTAL	715.3	2403.6	1492.6	1537.7	987.1	1554.2	1254.2	465.9	1289.4	418.5	281.4	680.6
MEAN	23.1	80.1	48.1	49.6	35.3	50.1	41.8	15.0	43.0	13.5	9.08	22.7
MAX	140	521	302	189	294	255	301	65	226	40	72	168
MIN	4.3	9.6	8.5	6.3	9.1	6.2	9.0	5.8	5.7	5.4	2.9	5.2
AC-FT	1420	4770	2960	3050	1960	3080	2490	924	2560	830	558	1350

16010000 KAWAIKOI STREAM NEAR WAIMEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1994, BY WATER YEAR (WY)

MEAN	21.3	43.9	53.6	54.3	42.2	50.0	44.9	27.4	16.5	23.6	21.9	14.5
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1911 - 1994	
ANNUAL TOTAL	9184.8		13080.5			
ANNUAL MEAN	25.2		35.8		34.4	
HIGHEST ANNUAL MEAN					60.7	1982
LOWEST ANNUAL MEAN					15.3	1945
HIGHEST DAILY MEAN	521	Nov 8	521	Nov 8	2620	Jan 15 1921
LOWEST DAILY MEAN	2.2	Sep 26	2.9	Aug 21	1.1	Sep 21 1953
ANNUAL SEVEN-DAY MINIMUM	2.7	Jul 12	3.1	Aug 16	1.2	Sep 17 1953
ANNUAL RUNOFF (AC-FT)	18220		25950		24920	
10 PERCENT EXCEEDS	60		94		74	
50 PERCENT EXCEEDS	9.6		13		13	
90 PERCENT EXCEEDS	3.8		5.7		4.4	



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

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

DRAINAGE AREA.--1.79 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--53 years (water years 1921-31, 1953-94), 21.5 ft^3/s (15,590 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,300 ft3/s and maximum (*):

Date	Time	Discharge (ft3/s)	Gage height (ft)	Date	Time	Discharge (ft3/s)	Gage height (ft)
Feb. 12	unknown	1,480	4.80	Sep. 19	1830	1,740	5.18
Sep. 1	0630	*2,450	6.16				

Minimum discharge, 2.4 ft^3/s, Aug. 6, 18-20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.9	7.4	58	4.9	5.1	4.5	5.5	5.0	4.5	12	2.9	404
2	142	13	37	4.3	4.8	4.2	5.0	5.2	3.5	18	2.9	11
3	13	8.4	30	3.9	5.5	4.0	4.5	5.0	3.2	11	2.9	6.8
4	7.2	7.9	89	3.8	37	3.8	4.2	5.0	3.0	6.0	2.8	95
5	4.7	7.0	75	3.9	10	3.8	4.7	5.5	3.2	4.5	2.6	12
6	3.5	4.3	105	4.2	7.1	3.5	98	5.2	3.0	5.5	2.4	25
7	5.9	6.4	24	3.8	5.9	3.4	15	4.2	3.2	33	2.8	13
8	7.2	172	17	3.4	6.7	3.4	5.5	3.8	3.4	20	2.6	48
9	3.7	17	12	3.4	e5.0	3.2	11	3.4	3.2	8.8	2.6	39
10	33	44	9.4	3.3	e4.8	3.0	9.7	3.2	3.0	5.2	2.6	14
11	22	52	8.2	3.2	e4.7	3.2	5.8	3.0	3.2	4.5	2.6	7.2
12	5.5	11	14	3.2	e80	3.0	5.5	3.0	3.8	3.8	2.6	5.8
13	3.7	7.2	46	4.7	e38	e2.8	24	3.0	3.8	3.2	2.6	44
14	3.5	5.5	16	4.8	e30	e15	83	3.0	3.5	2.9	2.6	12
15	3.4	4.7	27	75	e20	e54	41	3.2	8.0	2.8	2.6	9.2
16	3.2	4.2	13	11	e36	e20	33	15	10	2.8	2.6	8.4
17	5.6	32	11	6.8	22	e14	8.8	5.8	69	2.9	2.6	5.2
18	3.8	11	48	37	14	9.2	3.5	5.0	46	30	2.4	4.2
19	3.2	19	35	41	e13	5.5	3.4	11	44	12	2.4	185
20	4.7	7.4	12	82	12	e10	4.1	22	15	5.2	2.4	83
21	3.6	5.4	8.4	78	9.2	e17	4.1	8.0	11	3.5	3.2	15
22	3.1	5.1	6.9	105	e20	e10	3.5	6.8	29	3.0	4.2	8.4
23	3.1	85	6.2	117	e16	e43	3.6	4.5	14	3.4	3.4	8.8
24	4.0	81	5.7	88	9.2	e84	3.6	3.5	13	4.2	12	7.6
25	18	96	5.3	45	7.6	e33	8.0	3.2	104	11	6.2	5.5
26	5.8	24	4.9	16	5.8	e73	5.5	4.1	41	4.2	64	4.8
27	3.7	42	4.8	11	5.2	e38	4.8	12	14	3.2	10	4.0
28	4.2	62	9.9	8.7	5.0	e17	8.4	42	8.8	2.8	17	4.0
29	24	55	10	7.3	---	e10	12	20	20	2.9	7.6	4.2
30	31	80	6.9	6.2	---	8.4	6.0	12	28	3.4	5.0	4.0
31	17	---	5.4	5.5	---	6.8	---	6.8	---	3.4	23	---
TOTAL	399.2	976.9	761.0	795.3	439.6	513.7	434.7	242.4	522.3	239.1	208.1	1098.1
MEAN	12.9	32.6	24.5	25.7	15.7	16.6	14.5	7.82	17.4	7.71	6.71	36.6
MAX	142	172	105	117	80	84	98	42	104	33	64	404
MIN	2.9	4.2	4.8	3.2	4.7	2.8	3.4	3.0	3.0	2.8	2.4	4.0
AC-FT	792	1940	1510	1580	872	1020	862	481	1040	474	413	2180

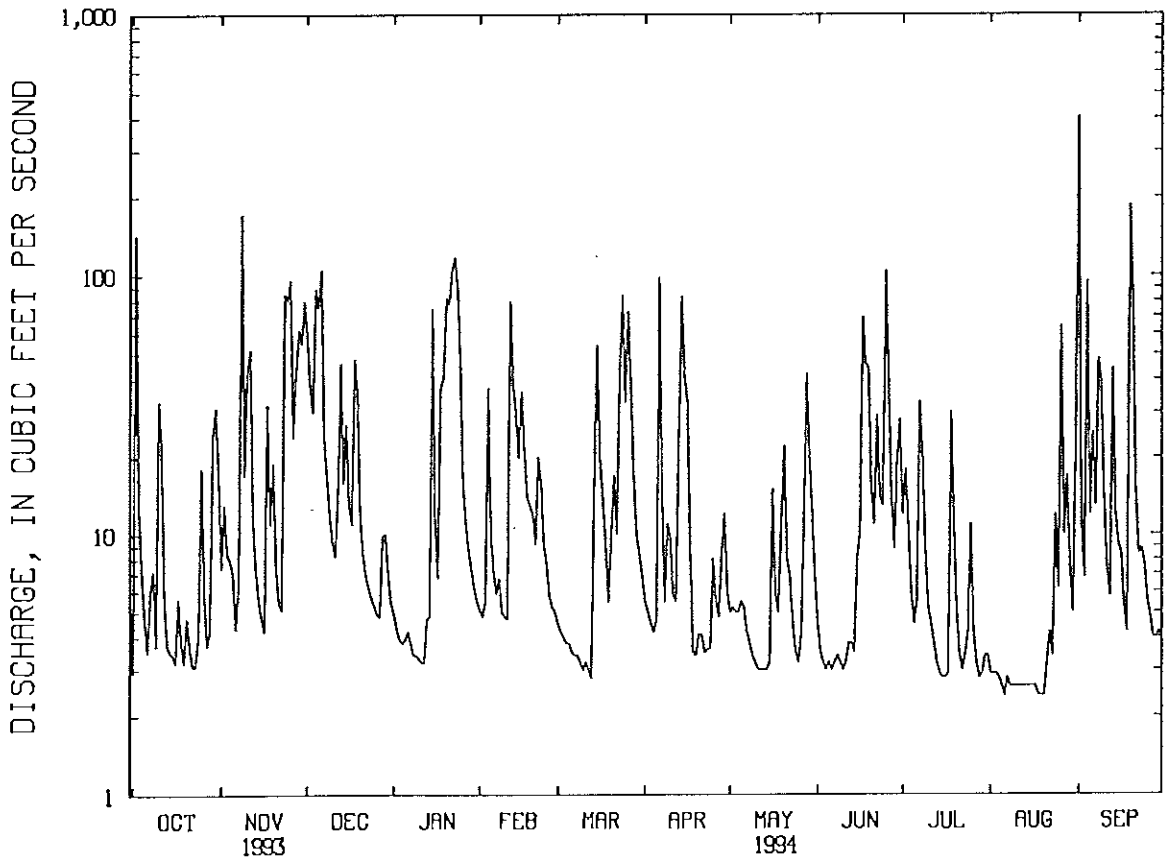
e Estimated

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1920 - 1994, BY WATER YEAR (WY)

MEAN	15.1	32.0	34.3	34.3	27.4	28.7	24.5	13.5	9.61	15.2	12.6	11.1
MAX	47.0	99.2	106	166	155	106	92.4	44.1	39.4	58.0	44.9	56.0
(WY)	1983	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1920 - 1994	
ANNUAL TOTAL	4396.3		6630.4			
ANNUAL MEAN	12.0		18.2		21.5	
HIGHEST ANNUAL MEAN					40.9	1982
LOWEST ANNUAL MEAN					8.94	1926
HIGHEST DAILY MEAN	177	Jul 24	404	Sep 1	1440	Dec 1 1957
LOWEST DAILY MEAN	1.6	Jun 4	2.4	Aug 6	.99	May 17 1966
ANNUAL SEVEN-DAY MINIMUM	1.7	May 30	2.5	Aug 14	1.1	May 26 1966
ANNUAL RUNOFF (AC-FT)	8720		13150		15590	
10 PERCENT EXCEEDS	29		45		45	
50 PERCENT EXCEEDS	4.1		6.4		6.5	
90 PERCENT EXCEEDS	2.0		3.0		2.5	



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

WATER-QUALITY RECORDS

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

REMARKS.--Quality-of-water samples obtained at the gage.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT
OCT											
05...	0930	4.8	25	6.7	22.0	17.0	6	0.97	0.96	3.9	55
JAN											
06...	1000	4.0	32	7.1	11.0	12.0	7	1.0	1.2	3.6	50
APR											
05...	0930	4.6	33	7.4	15.0	15.5	5	0.71	0.79	3.7	--
AUG											
09...	1000	2.5	32	7.1	18.0	17.5	6	0.88	0.91	3.8	57

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
OCT											
05...	0.7	0.40	6.1	0.80	5.7	<0.10	4.7	21	0.03	360	2
JAN											
06...	0.6	0.20	6.0	0.70	7.1	<0.10	6.1	24	0.03	190	1
APR											
05...	0.7	<0.10	4.1	0.60	6.7	<0.10	5.2	--	--	120	<1
AUG											
09...	0.7	0.30	5.1	0.40	6.2	<0.10	6.8	23	0.03	180	<1

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

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16031000 WAIMEA RIVER NEAR WAIMEA
(National stream-quality accounting network station)

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

DRAINAGE AREA.--57.8 mi^2.

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records good except for estimated discharges which are fair. Several upstream diversions for power and irrigation.

AVERAGE DISCHARGE.--53 years (water years 1911-17, 1945-68, 1970-72, 1976-94), 125 ft^3/s (90,870 acre-ft/yr).

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

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	0730	*5,510	*10.73				

Minimum discharge, 5.2 ft^3/s, May 9-12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	30	e19	e274	11	13	69	e12	8.8	11	65	11	1410
2	465	e24	e220	11	12	66	10	7.3	8.5	29	11	95
3	314	e27	e168	9.9	11	63	9.1	6.9	7.7	59	11	36
4	109	e55	e400	10	96	42	9.0	11	7.0	20	11	214
5	91	e39	e690	10	90	18	8.1	8.2	6.8	12	11	112
6	52	e20	e650	26	26	16	7.9	7.1	7.4	10	10	49
7	38	e27	e220	14	15	9.9	7.5	7.7	7.5	11	10	65
8	51	e460	e167	11	13	9.3	7.3	6.6	7.5	77	11	34
9	33	e270	119	11	13	8.5	8.1	6.2	8.4	48	11	197
10	24	e103	101	10	14	8.2	18	5.9	8.2	16	11	67
11	209	e126	67	9.8	45	7.6	332	6.1	7.6	11	12	34
12	53	e62	50	9.0	1340	7.9	398	6.0	7.7	10	12	17
13	28	e29	186	9.2	e352	7.9	112	6.3	9.5	9.5	12	91
14	17	e21	88	13	e551	104	121	6.3	9.5	9.2	12	88
15	19	e21	93	e121	150	259	51	48	11	9.1	12	34
16	17	e19	55	e121	705	e122	28	64	17	9.3	12	25
17	15	e76	40	e30	271	e52	16	29	95	9.3	12	18
18	18	e61	42	e125	174	e58	15	9.1	323	39	13	15
19	e16	e40	115	e245	147	e23	106	8.5	239	66	14	442
20	e30	e26	51	e300	124	e13	164	46	119	22	15	393
21	e18	e17	23	e345	109	e72	161	29	41	12	15	127
22	e16	e16	16	402	116	e30	42	10	90	10	16	52
23	e15	e154	14	281	165	e180	17	8.5	86	10	18	25
24	e14	e317	13	593	112	e509	19	7.5	34	11	18	27
25	e20	e328	12	e346	95	e393	32	6.6	135	16	35	22
26	e29	e143	12	e117	85	e484	12	6.1	604	21	122	14
27	e18	e166	11	e58	78	e193	8.9	15	64	12	84	13
28	e16	e285	13	e37	73	e92	8.4	21	26	10	57	12
29	e59	e285	19	e24	---	e45	21	109	12	9.9	65	13
30	e80	e341	17	e17	---	e28	15	37	117	9.7	30	13
31	e37	---	13	e14	---	e18	---	18	---	11	22	---
TOTAL	1951	3577	3959	3340.9	4995	3008.3	1776.3	572.7	2127.3	674.0	716	3754
MEAN	62.9	119	128	108	178	97.0	59.2	18.5	70.9	21.7	23.1	125
MAX	465	460	690	593	1340	509	398	109	604	77	122	1410
MIN	14	16	11	9.0	11	7.6	7.3	5.9	6.8	9.1	10	12
AC-FT	3870	7090	7850	6630	9910	5970	3520	1140	4220	1340	1420	7450

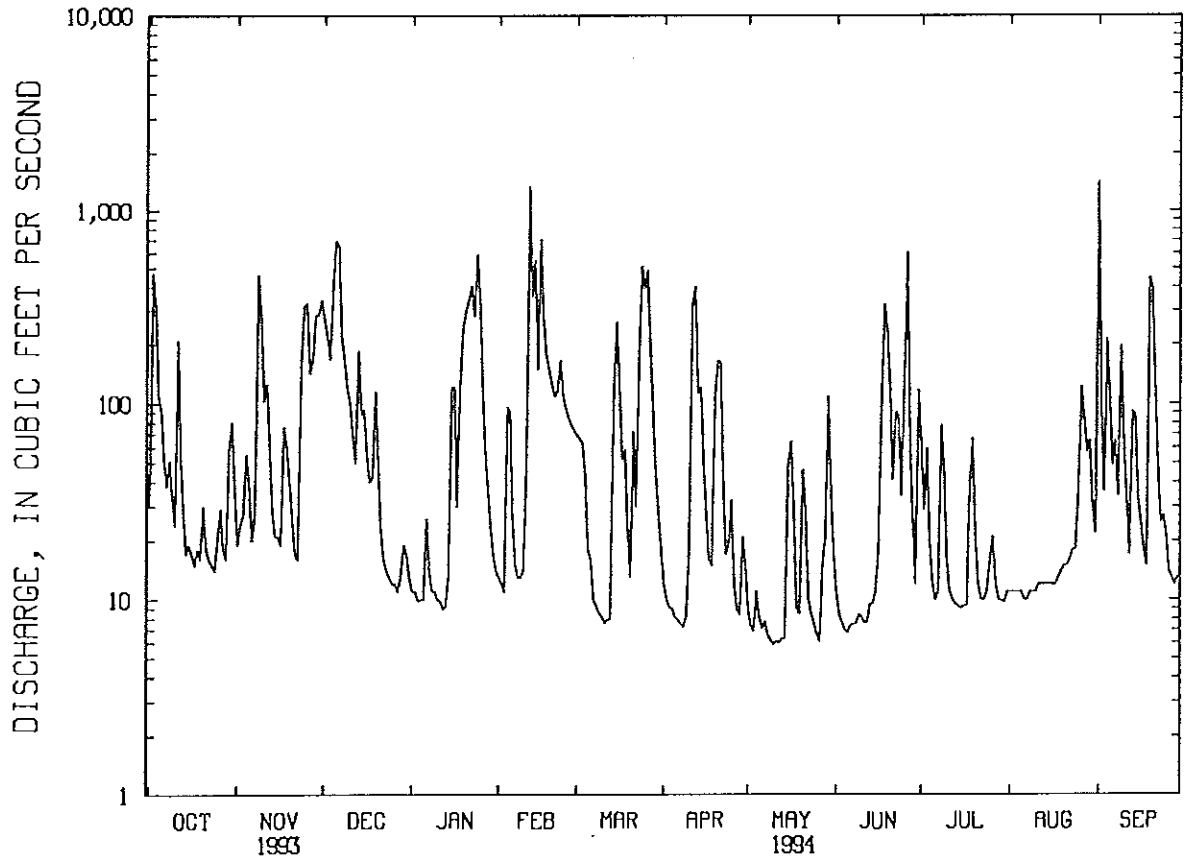
e Estimated

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1910 - 1994, BY WATER YEAR (WY)

MEAN	61.6	182	221	264	194	215	141	64.1	26.2	42.9	59.3	34.4
MAX	352	1632	1285	1639	996	1113	589	244	125	423	1453	294
(WY)	1983	1914	1968	1916	1956	1951	1918	1965	1978	1989	1950	1914
MIN	2.79	8.94	8.39	2.28	2.97	4.91	1.60	.95	1.02	2.54	.000	1.13
(WY)	1950	1945	1977	1945	1978	1959	1966	1966	1912	1953	1911	1949

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1910 - 1994	
ANNUAL TOTAL	29387.5		30451.5			
ANNUAL MEAN	80.5		83.4		125	
HIGHEST ANNUAL MEAN					297	1982
LOWEST ANNUAL MEAN					24.1	1984
HIGHEST DAILY MEAN	1670	Jan 6	1410	Sep 1	17300	Aug 16 1950
LOWEST DAILY MEAN	6.9	Apr 23	5.9	May 10	.00	Jun 12 1911
ANNUAL SEVEN-DAY MINIMUM	8.4	Apr 21	6.2	May 8	.00	Jun 16 1911
ANNUAL RUNOFF (AC-FT)	58290		60400		90870	
10 PERCENT EXCEEDS	204		241		252	
50 PERCENT EXCEEDS	20		23		15	
90 PERCENT EXCEEDS	9.6		8.5		2.2	



16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER-QUALITY RECORDS

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
OCT 19...	1000	16	147	a7.7	27.0	23.0	1.0	759	8.3	97	150
DEC 07...	1000	240	54	7.5	24.5	17.0	2.3	764	9.8	101	100
FEB 01...	1000	13	120	8.0	21.0	17.5	2.0	770	9.4	97	100
APR 12...	0930	450	41	8.2	23.0	16.5	2.9	766	9.8	100	440
JUN 07...	1000	8.4	160	8.3	30.5	24.0	0.80	766	8.4	99	170
AUG 10...	0930	12	148	8.2	28.5	24.0	0.60	763	8.1	96	92

DATE	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3
OCT 19...	82	55	--	6.8	9.2	8.3	25	0.5	0.60	--
DEC 07...	570	15	2	2.1	2.3	4.7	40	0.5	0.50	15
FEB 01...	390	43	0	5.3	7.3	6.9	25	0.5	1.1	58
APR 12...	580	10	2	1.5	1.6	3.9	44	0.5	0.30	10
JUN 07...	110	60	0	7.4	10	8.8	24	0.5	0.70	76
AUG 10...	100	56	0	7.1	9.4	8.3	24	0.5	0.60	72

DATE	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
OCT 19...	--	--	1.5	10	0.10	25	--	97	0.17
DEC 07...	0	12	1.3	7.3	<0.10	11	40	37	0.05
FEB 01...	0	47	1.5	11	<0.10	19	78	81	0.11
APR 12...	0	8	0.90	6.7	<0.10	5.1	43	26	0.06
JUN 07...	0	63	1.7	12	<0.10	24	92	102	0.13
AUG 10...	0	59	1.2	11	<0.10	24	103	97	0.14

< Actual value is known to be less than the value shown
a Laboratory value

16031000 WAIMEA RIVER NEAR WAIMEA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	BARIUM, DIS-SOLVED (UG/L AS BA)	COBALT, DIS-SOLVED (UG/L AS CO)
OCT 19...	--	<0.050	0.020	<0.20	0.020	0.020	0.030	20	3	<3
DEC 07...	0.180	0.180	0.020	<0.20	<0.010	0.040	<0.010	--	--	--
FEB 01...	--	<0.050	0.020	<0.20	0.160	0.060	0.040	80	2	<3
APR 12...	0.089	0.089	0.020	0.20	0.010	<0.010	<0.010	300	<2	<3
JUN 07...	--	<0.050	<0.010	0.20	0.020	<0.010	<0.010	--	--	--
AUG 10...	--	<0.050	0.010	0.30	<0.010	<0.010	<0.010	10	<2	<3

DATE	TIME	IRON, DIS-SOLVED (UG/L AS FE)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)
OCT 19...	1000	170	<4	13	<10	3	<1	<1.0	43	<6
FEB 01...	1000	140	<4	18	<10	3	<1	<1.0	34	<6
APR 12...	0930	270	<4	7	<10	2	<1	<1.0	13	<6
AUG 10...	0930	85	<4	13	<10	2	<1	<1.0	46	<6

CROSS SECTION ANALYSES, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	SAMPLE LOC-ATION, CROSS SECTION (FT FM R BK)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
DEC 07...*	0900	7.0	54	7.5	17.0	764	9.7	100
07...*	0902	17.0	54	7.5	17.0	764	9.8	101
07...*	0904	27.0	54	7.5	17.0	764	9.8	101
07...*	0906	37.0	54	7.5	17.0	764	9.8	101
07...*	0908	47.0	54	7.5	17.0	764	9.8	101
07...*	0910	57.0	54	7.5	17.0	764	9.8	101
07...*	0912	67.0	54	7.6	17.0	764	9.8	101
07...*	0914	54.0	54	7.6	17.0	764	9.8	101
07...*	0916	82.0	54	7.6	17.0	764	9.8	101

* Instantaneous streamflow at the time of cross-sectional measurement: Dec. 7, 240 ft^3/s.

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 19...	1000	4	0.17	100
DEC 07...	1000	8	5.2	100
FEB 01...	1000	2	0.07	100
APR 12...	0930	24	29	100
JUN 07...	1000	4	0.09	100
AUG 10...	0930	3	0.10	100

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

16036000 MAKAWELI RIVER NEAR WAIMEA

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

DRAINAGE AREA.--26.0 mi^2.

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

REVISED RECORDS.--WSP 2137: Drainage area.

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

REMARKS.--Records good, except for periods of estimated discharges which are poor. Olokele ditch diverts all low flow from the headwaters of the Olokele River 9 mi upstream for irrigation in vicinity of Makawele. A 5 ft^3/s capacity ditch diverts water from upstream of station for irrigation of taro in the vicinity of the station.

AVERAGE DISCHARGE.--51 years, 86.8 ft^3/s (62,900 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--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)
Oct. 2	unknown	6,080	9.10	Sep. 4	0600	5,380	8.65
Sep. 1	0830	6,300	9.22	Sep. 19	1830	*8,900	*10.57

Minimum discharge, 7.9 ft^3/s, Aug. 11, 12, 15-18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e25	e16	195	13	12	17	13	11	12	26	9.7	1590
2	e500	e17	114	12	12	16	12	12	11	142	10	72
3	e60	20	71	11	13	16	12	11	10	33	9.4	124
4	e100	39	163	11	89	15	12	11	9.5	16	9.2	1230
5	e50	17	202	11	26	15	12	14	9.6	13	9.1	157
6	e35	13	255	11	18	14	12	11	9.8	13	8.9	95
7	e50	13	80	10	13	13	11	10	9.9	53	11	54
8	e40	437	35	11	14	12	12	9.8	10	65	10	91
9	e25	77	27	11	15	12	31	9.8	9.2	21	9.3	214
10	e200	27	23	10	22	12	21	9.8	9.0	14	9.1	68
11	e180	54	21	9.8	146	12	155	9.8	9.4	12	8.7	23
12	e60	25	22	9.8	1330	11	104	9.7	10	12	8.4	17
13	e35	18	75	10	408	11	45	9.8	9.7	11	51	216
14	e23	16	42	15	372	27	34	9.6	9.1	9.8	10	44
15	e17	14	79	101	116	36	19	114	38	9.6	8.4	45
16	e19	13	29	41	799	22	16	87	28	10	8.2	21
17	e21	97	22	20	170	18	14	18	145	9.6	8.3	16
18	e16	27	177	30	81	18	13	12	162	232	8.3	52
19	e15	40	141	26	83	13	28	12	91	41	9.0	1140
20	e15	20	63	71	61	29	34	68	31	14	8.4	494
21	e14	17	23	96	54	33	40	17	15	10	14	150
22	e14	15	19	234	92	33	15	15	87	9.8	18	44
23	e20	62	17	176	80	125	16	12	41	18	12	33
24	e16	61	15	288	48	273	186	10	29	63	114	27
25	e17	82	14	115	38	137	18	9.9	229	42	18	22
26	e16	34	13	35	24	119	13	11	342	12	169	21
27	e15	43	13	25	22	37	11	36	80	10	34	18
28	e16	150	17	21	20	21	53	100	35	9.6	20	21
29	e16	149	23	19	---	18	26	59	50	14	14	18
30	e19	247	16	17	---	16	13	30	83	13	12	18
31	e16	---	14	15	---	14	---	16	---	9.8	151	---
TOTAL	1665	1860	2020	1485.6	4178	1165	1001	775.2	1624.2	968.2	800.4	6135
MEAN	53.7	62.0	65.2	47.9	149	37.6	33.4	25.0	54.1	31.2	25.8	204
MAX	500	437	255	288	1330	273	186	114	342	232	169	1590
MIN	14	13	13	9.8	12	11	11	9.6	9.0	9.6	8.2	16
AC-FT	3300	3690	4010	2950	8290	2310	1990	1540	3220	1920	1590	12170

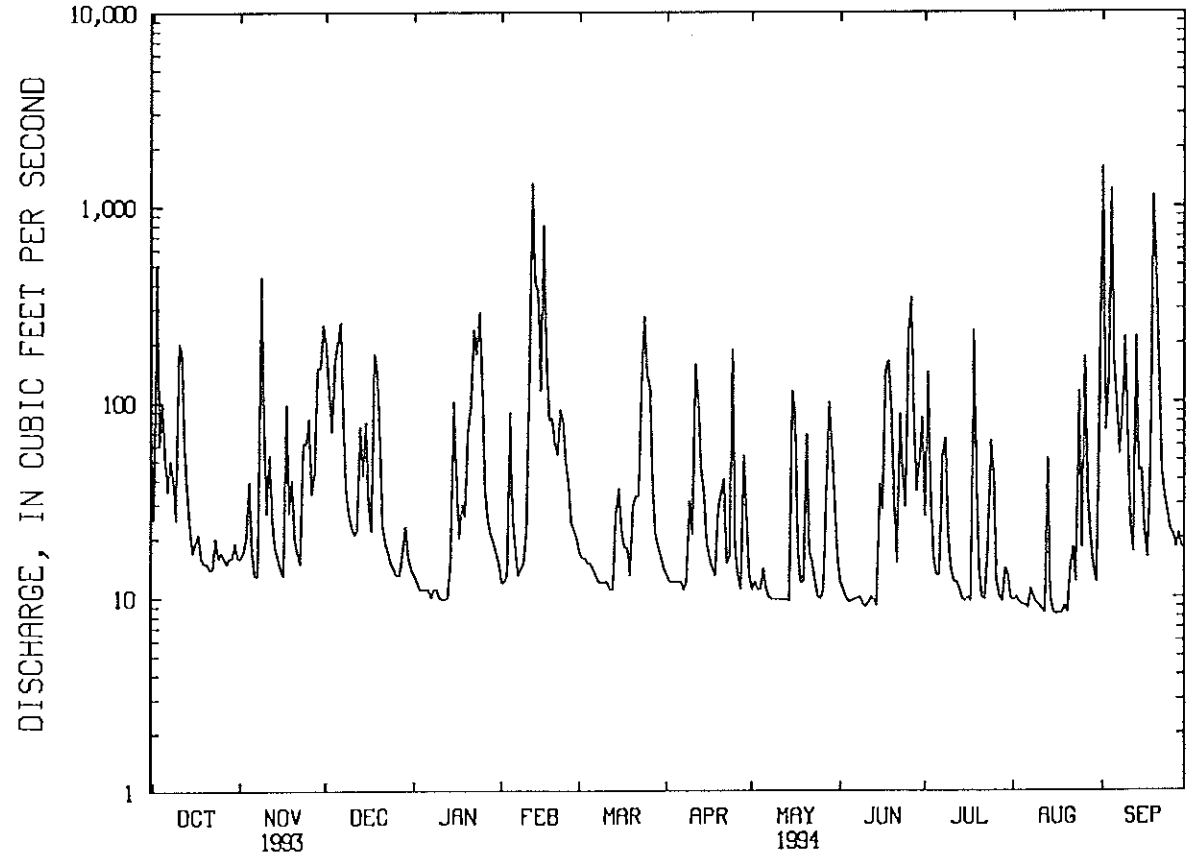
e Estimated

16036000 MAKAWELI RIVER NEAR WAIMEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1943 - 1994, BY WATER YEAR (WY)

MEAN	55.2	120	146	134	117	133	97.8	58.8	37.4	52.7	53.2	36.8
MAX	265	491	577	441	774	609	419	283	101	222	328	204
(WY)	1983	1991	1993	1989	1956	1982	1963	1965	1980	1989	1950	1994
MIN	11.7	15.2	18.0	9.49	12.0	10.6	11.6	15.5	9.56	10.0	14.2	9.54
(WY)	1960	1951	1977	1945	1978	1959	1992	1966	1951	1984	1944	1962

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1943 - 1994	
ANNUAL TOTAL	15621.9		23677.6			
ANNUAL MEAN	42.8		64.9		86.8	
HIGHEST ANNUAL MEAN					204	1982
LOWEST ANNUAL MEAN					31.1	1984
HIGHEST DAILY MEAN	574	Jan 6	1590	Sep 1	5170	Dec 1 1957
LOWEST DAILY MEAN	7.5	Jul 6	8.2	Aug 16	4.3	Jul 19 1951
ANNUAL SEVEN-DAY MINIMUM	7.9	Jul 3	8.7	Aug 14	5.7	Oct 21 1944
ANNUAL RUNOFF (AC-FT)	30990		46960		62900	
10 PERCENT EXCEEDS	96		149		172	
50 PERCENT EXCEEDS	17		19		27	
90 PERCENT EXCEEDS	9.4		9.8		12	



16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--22.4 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--77 years (water years 1913-18, 1920, 1922-24, 1926-56, 1959-94), 116 ft^3/s (84,320 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 2	1730	8,020	15.30	Sep. 2	0630	*14,900	*17.00
Feb. 16	0630	6,020	14.59	Sep. 19	1900	12,280	16.47
Jun. 25	1900	6,570	14.82	Sep. 20	1200	7,270	15.08

Minimum discharge, 5.7 ft^3/s, Nov. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

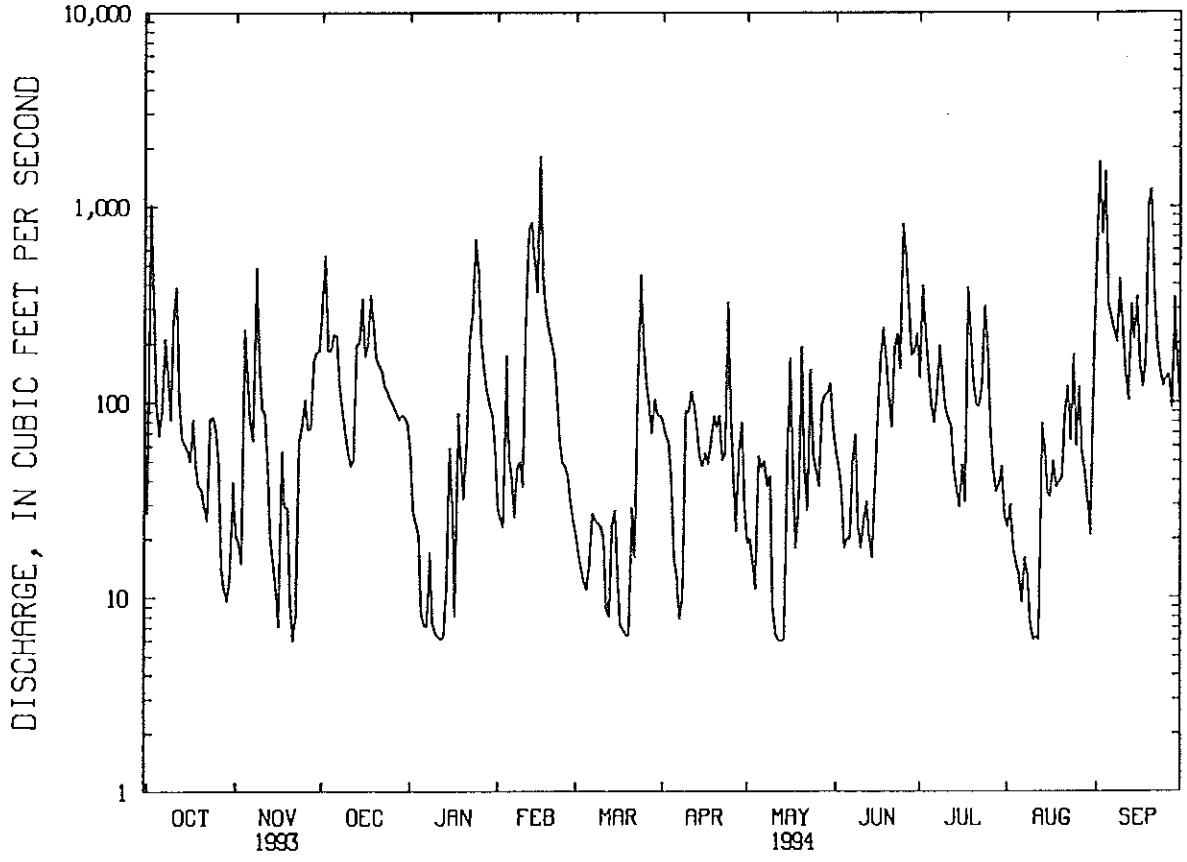
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	21	323	57	29	21	79	19	56	134	23	544
2	1020	19	559	28	25	17	68	20	47	391	30	1690
3	360	15	184	24	23	14	63	15	35	227	18	727
4	99	234	184	21	173	12	40	11	18	148	15	1510
5	68	134	220	8.3	53	11	16	53	20	96	13	316
6	92	77	217	7.2	41	15	13	46	20	79	9.5	267
7	209	64	124	7.1	26	27	7.8	50	50	112	16	230
8	142	484	91	17	46	25	9.9	37	68	194	13	203
9	82	166	71	7.4	50	24	91	42	23	133	7.3	426
10	288	94	56	6.6	37	23	89	9.1	18	93	6.1	238
11	385	86	47	6.3	294	20	114	6.5	25	82	6.3	138
12	102	47	51	6.1	774	8.7	97	6.0	31	76	6.1	103
13	66	20	196	6.3	825	8.0	74	6.0	20	45	78	317
14	61	15	201	11	522	24	53	6.1	16	36	59	210
15	57	11	335	58	365	28	47	52	37	29	34	345
16	50	7.1	172	31	1810	13	55	166	88	48	33	152
17	82	56	195	8.1	432	7.2	48	44	167	31	50	120
18	47	29	352	88	293	6.8	62	18	239	384	37	170
19	37	29	245	50	237	6.4	85	27	169	222	39	1060
20	36	9.7	167	32	202	6.4	75	191	110	126	41	1230
21	29	6.0	153	62	172	29	86	46	75	97	91	380
22	25	7.9	143	208	109	16	51	28	187	96	121	198
23	83	63	120	287	64	131	54	146	222	123	64	145
24	84	76	113	680	49	444	323	53	149	308	174	122
25	73	104	103	478	47	195	89	45	815	201	60	134
26	47	73	96	203	42	126	42	37	572	73	120	138
27	14	74	89	147	31	95	22	99	331	45	55	94
28	11	162	82	115	25	70	56	109	175	35	44	344
29	9.6	179	86	97	---	104	79	112	181	38	31	144
30	13	184	84	86	---	86	30	125	224	47	21	98
31	39	---	78	60	---	86	---	75	---	26	154	---
TOTAL	3737.6	2546.7	5137	2903.4	6796	1699.5	2018.7	1699.7	4188	3775	1469.3	11793
MEAN	121	84.9	166	93.7	243	54.8	67.3	54.8	140	122	47.4	393
MAX	1020	484	559	680	1810	444	323	191	815	391	174	1690
MIN	9.6	6.0	47	6.1	23	6.4	7.8	6.0	16	26	6.1	94
AC-FT	7410	5050	10190	5760	13480	3370	4000	3370	8310	7490	2910	23390

16060000 SOUTH FORK WAILUA RIVER NEAR LIHUE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1994, BY WATER YEAR (WY)

MEAN	88.9	169	174	178	129	151	133	101	55.2	73.2	84.6	75.1
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1912 - 1994	
ANNUAL TOTAL	19484.5		47763.9			
ANNUAL MEAN	53.4		131		116	
HIGHEST ANNUAL MEAN					284	1982
LOWEST ANNUAL MEAN					17.3	1984
HIGHEST DAILY MEAN	1020	Oct 2	1810	Feb 16	13800	Jan 16 1921
LOWEST DAILY MEAN	3.4	Apr 4	6.0	Nov 21	1.8	Sep 17 1953
ANNUAL SEVEN-DAY MINIMUM	4.0	Mar 30	8.1	Jan 7	1.8	Sep 16 1953
ANNUAL RUNOFF (AC-FT)	38650		94740		84320	
10 PERCENT EXCEEDS	156		300		266	
50 PERCENT EXCEEDS	13		68		37	
90 PERCENT EXCEEDS	4.6		11		4.7	



16061200 NORTH WAILUA DITCH BELOW WAIKOKO STREAM, NEAR LIHUE

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

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

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

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

AVERAGE DISCHARGE.--29 years, 22.0 ft^3/s (15,590 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 26 ft^3/s, Oct. 2; minimum daily, 0.79 ft^3/s, Jun. 29.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

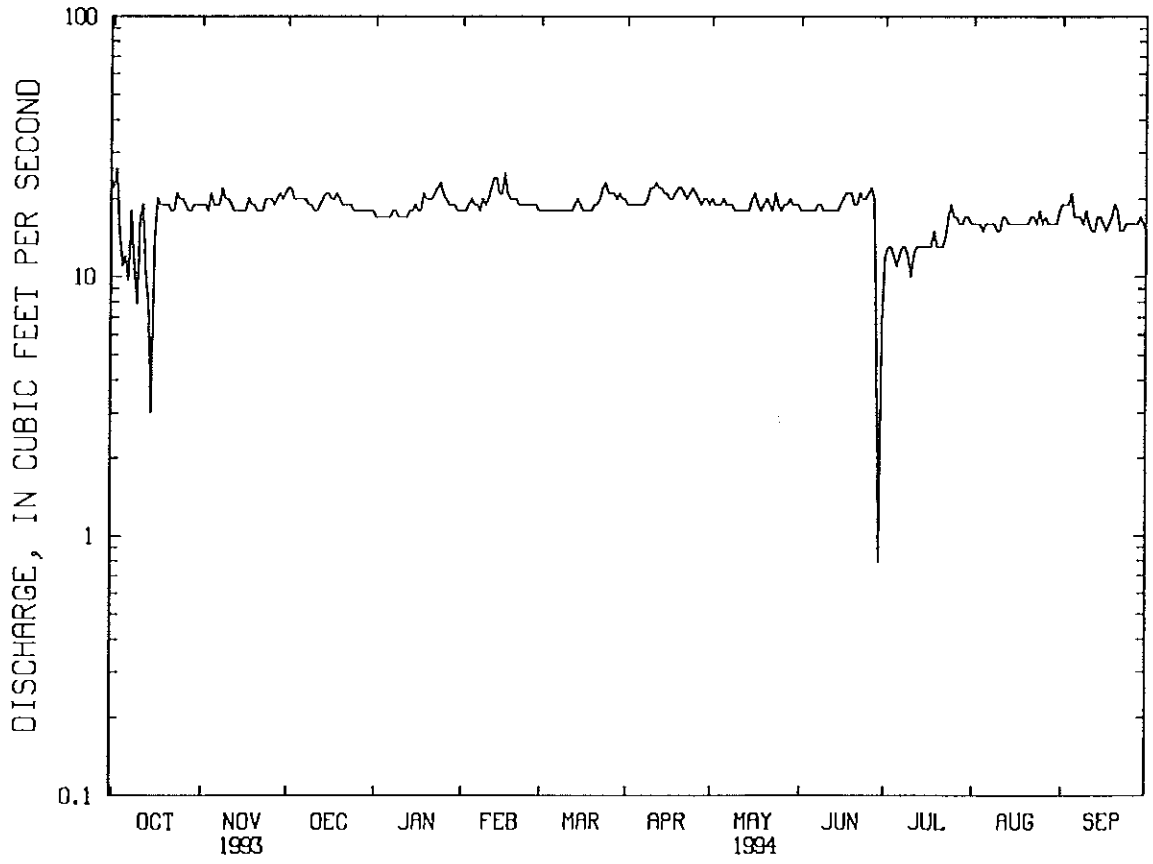
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	22	19	22	17	18	18	19	20	18	12	16	19
2	26	19	22	17	18	18	19	19	18	13	16	19
3	15	18	20	17	19	18	19	19	18	13	16	19
4	11	21	20	17	20	18	19	19	18	12	15	21
5	12	19	20	17	19	18	19	20	18	11	16	17
6	9.7	19	20	17	19	18	19	19	18	12	16	17
7	18	19	20	18	18	18	19	19	19	13	16	17
8	11	22	19	18	20	18	20	19	19	13	16	16
9	7.9	20	19	17	19	18	22	18	18	12	15	18
10	17	20	18	17	20	18	22	18	18	10	15	16
11	19	19	18	17	22	18	23	18	18	12	17	15
12	10	18	19	17	24	18	22	18	18	13	17	15
13	7.9	18	20	18	24	19	22	18	18	13	16	17
14	3.0	18	21	18	21	20	21	18	18	13	16	17
15	13	18	21	19	21	19	21	20	19	13	16	16
16	20	18	20	18	25	18	20	21	20	13	16	15
17	19	20	20	18	21	18	20	19	21	13	16	16
18	19	19	21	21	20	18	21	18	21	15	16	17
19	19	19	20	20	20	18	22	19	21	13	16	19
20	19	18	19	20	20	19	22	20	19	13	16	18
21	18	18	19	20	19	19	21	19	19	13	17	15
22	18	18	19	21	19	20	20	18	21	14	17	15
23	21	20	19	22	19	22	21	21	20	17	16	16
24	20	20	18	23	19	23	22	19	20	19	18	16
25	20	20	18	21	19	21	21	18	21	17	16	16
26	19	19	18	20	19	21	20	19	22	17	17	16
27	18	20	18	19	19	21	19	19	20	16	16	16
28	18	21	18	19	18	20	20	20	6.0	16	16	17
29	19	20	18	19	---	21	20	19	.79	17	16	16
30	19	21	18	18	---	20	19	19	6.8	17	16	15
31	19	---	18	18	---	20	---	19	---	16	18	---
TOTAL	507.5	578	600	578	559	593	614	589	531.59	431	502	502
MEAN	16.4	19.3	19.4	18.6	20.0	19.1	20.5	19.0	17.7	13.9	16.2	16.7
MAX	26	22	22	23	25	23	23	21	22	19	18	21
MIN	3.0	18	18	17	18	18	19	18	.79	10	15	15
AC-FT	1010	1150	1190	1150	1110	1180	1220	1170	1050	855	996	996

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1994, BY WATER YEAR (WY)

MEAN	22.8	23.4	21.3	20.3	20.9	21.9	22.8	22.5	22.1	22.6	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1965 - 1994	
ANNUAL TOTAL	6163.85		6585.09			
ANNUAL MEAN	16.9		18.0		22.0	
HIGHEST ANNUAL MEAN					30.3	1969
LOWEST ANNUAL MEAN					6.64	1991
HIGHEST DAILY MEAN	29	Aug 17	26	Oct 2	58	Oct 11 1966
LOWEST DAILY MEAN	.22	Jan 31	.79	Jun 29	.00	Jan 1 1965
ANNUAL SEVEN-DAY MINIMUM	.29	Jan 26	9.1	Jun 28	.00	Jan 1 1965
ANNUAL RUNOFF (AC-FT)	12230		13060		15950	
10 PERCENT EXCEEDS	24		21		30	
50 PERCENT EXCEEDS	18		18		22	
90 PERCENT EXCEEDS	.53		15		17	



16062000 STABLE STORM DITCH NEAR LIHUE

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

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

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

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

AVERAGE DISCHARGE.--57 years (water years 1938-94), 10.0 ft^3/s (7,260 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maxiumum daily discharge, 14 ft^3/s, Oct. 1, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

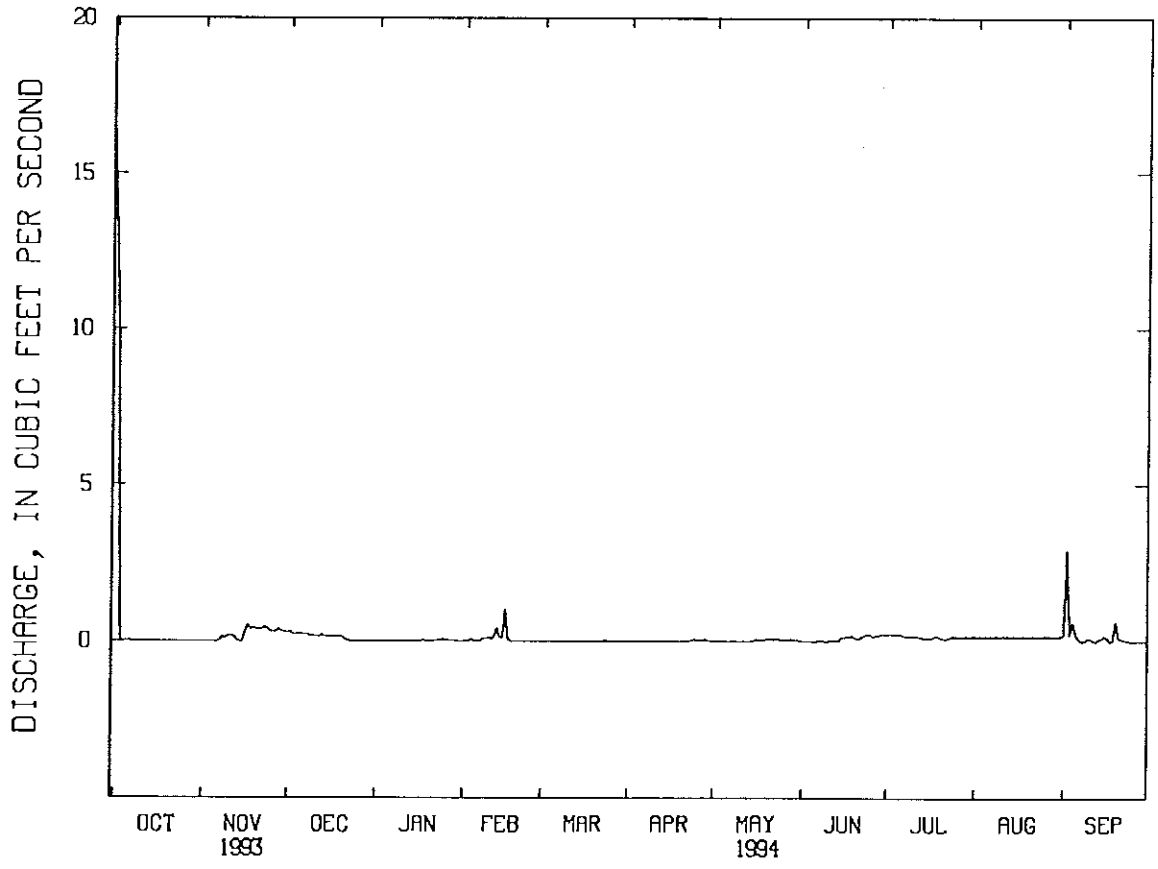
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14	.00	.28	.00	.00	.00	.00	.00	.00	.22	.15	.20
2	10	.00	.30	.00	.00	.00	.00	.01	.00	.22	.15	2.9
3	.04	.00	.22	.00	.01	.00	.00	.01	.00	.22	.15	.22
4	.00	.00	.22	.00	.05	.00	.00	.00	.00	.21	.15	.60
5	.02	.00	.25	.00	.00	.00	.00	.01	.00	.22	.15	.22
6	.01	.00	.22	.00	.01	.00	.00	.00	.00	.22	.15	.06
7	.00	.01	.22	.00	.00	.00	.00	.00	.02	.18	.15	.00
8	.00	.14	.22	.00	.08	.00	.00	.01	.02	.15	.15	.01
9	.00	.11	.17	.00	.07	.00	.00	.00	.00	.15	.15	.08
10	.00	.17	.17	.00	.10	.00	.00	.00	.00	.15	.15	.08
11	.00	.18	.16	.00	.08	.00	.00	.00	.02	.15	.15	.02
12	.00	.15	.15	.00	.12	.00	.00	.00	.02	.15	.15	.00
13	.00	.04	.19	.00	.39	.00	.00	.00	.01	.13	.15	.06
14	.00	.00	.16	.00	.13	.00	.00	.00	.01	.11	.15	.09
15	.00	.00	.15	.00	.11	.00	.00	.02	.12	.11	.15	.15
16	.00	.30	.15	.00	1.0	.00	.00	.05	.12	.11	.15	.11
17	.00	.49	.15	.00	.06	.00	.00	.03	.14	.11	.15	.00
18	.00	.39	.13	.03	.00	.00	.00	.03	.15	.15	.15	.02
19	.00	.43	.15	.00	.00	.00	.00	.05	.15	.15	.15	.63
20	.00	.39	.13	.00	.00	.00	.00	.08	.11	.11	.15	.10
21	.00	.39	.08	.00	.00	.00	.00	.08	.08	.09	.15	.07
22	.00	.39	.03	.01	.00	.00	.00	.06	.13	.08	.15	.04
23	.00	.45	.00	.02	.00	.00	.02	.08	.18	.11	.15	.02
24	.00	.39	.00	.04	.00	.01	.06	.05	.22	.15	.15	.00
25	.00	.32	.00	.05	.00	.00	.04	.04	.22	.15	.15	.00
26	.00	.30	.00	.04	.00	.00	.03	.04	.16	.15	.15	.00
27	.00	.32	.00	.02	.00	.00	.03	.04	.17	.13	.15	.00
28	.00	.38	.00	.02	.00	.00	.05	.06	.18	.14	.15	.00
29	.00	.30	.00	.01	---	.00	.02	.03	.22	.15	.15	.00
30	.00	.30	.00	.00	---	.00	.01	.03	.22	.14	.15	.00
31	.00	---	.00	.00	---	.00	---	.01	---	.15	.15	---
TOTAL	24.07	6.34	3.90	0.24	2.21	0.01	0.26	0.82	2.67	4.66	4.65	5.68
MEAN	.78	.21	.13	.008	.079	.000	.009	.026	.089	.15	.15	.19
MAX	14	.49	.30	.05	1.0	.01	.06	.08	.22	.22	.15	2.9
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.08	.15	.00
AC-FT	48	13	7.7	.5	4.4	.02	.5	1.6	5.3	9.2	9.2	11

16062000 STABLE STORM DITCH NEAR LIHUE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1938 - 1994, BY WATER YEAR (WY)

MEAN	13.1	6.28	4.62	6.44	8.90	7.85	8.94	9.80	15.7	11.8	11.9	15.0
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	.020	.000	.000	.000	.000	.000	.000	.000	.000	.014	.000	.000
(WY)	1990	1938	1991	1939	1938	1939	1939	1963	1938	1980	1964	1989

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1938 - 1994	
ANNUAL TOTAL	3497.95		55.51			
ANNUAL MEAN	9.58		.15		10.0	
HIGHEST ANNUAL MEAN					22.1	1984
LOWEST ANNUAL MEAN					.15	1994
HIGHEST DAILY MEAN	44	Apr 27	14	Oct 1	71	Apr 3 1948
LOWEST DAILY MEAN	.00	Jan 2	.00	Oct 4	.00	Oct 1 1937
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 2	.00	Oct 7	.00	Oct 1 1937
ANNUAL RUNOFF (AC-FT)	6940		110		7260	
10 PERCENT EXCEEDS	28		.22		34	
50 PERCENT EXCEEDS	1.4		.02		.32	
90 PERCENT EXCEEDS	.00		.00		.00	



16068000 EAST BRANCH OF NORTH FORK WAILUA RIVER NEAR LIHUE

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

DRAINAGE AREA.--6.27 mi^2.

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

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

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

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--79 years (water years 1913-14, 1916-17, 1920-94), 48.5 ft^3/s (35,130 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 2	1630	3,250	7.13	Sep. 2	1800	3,220	6.60
Feb. 13	0630	*12,300	*11.70				

Minimum discharge, 17 ft^3/s, Jan. 12-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

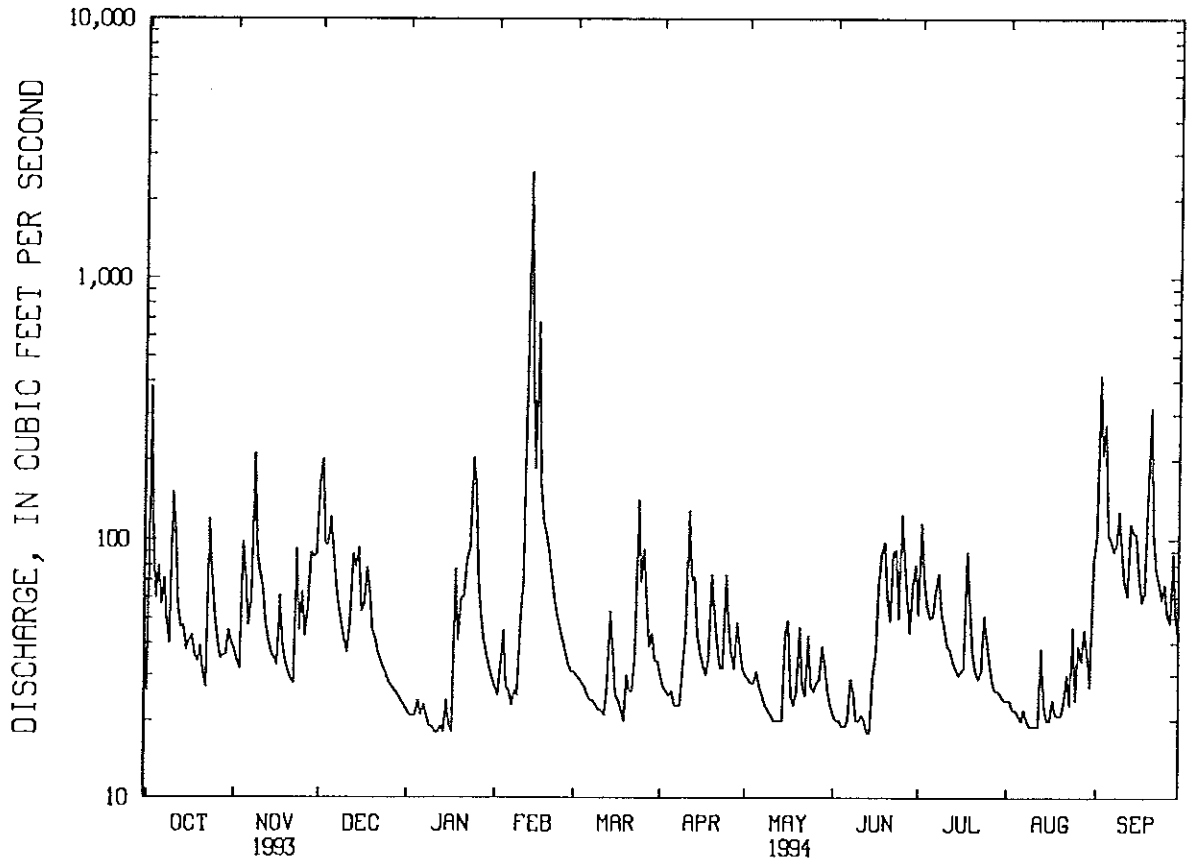
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	26	38	165	22	27	31	30	30	21	52	24	102
2	381	34	201	21	25	30	27	29	20	115	24	423
3	100	32	96	21	33	29	26	28	20	70	22	208
4	60	98	96	21	45	28	25	28	19	56	22	274
5	79	73	121	24	27	27	26	31	19	50	21	104
6	57	47	91	21	26	25	23	27	20	51	20	99
7	71	59	67	23	23	24	23	25	29	64	22	90
8	48	212	55	21	26	24	23	23	26	74	20	95
9	40	88	47	19	25	23	32	22	20	52	19	127
10	150	75	41	19	48	22	45	21	20	46	19	89
11	110	65	37	18	68	22	128	20	21	39	19	67
12	56	48	49	18	432	21	70	20	20	38	19	61
13	46	41	88	19	2570	27	72	20	18	34	38	114
14	47	37	79	18	438	53	44	20	18	32	23	106
15	38	35	93	24	186	38	37	44	30	30	20	104
16	41	33	53	19	675	25	33	49	36	31	20	72
17	43	61	57	18	160	24	30	25	68	32	24	58
18	36	40	78	77	116	22	35	23	90	90	21	62
19	34	34	63	41	105	20	73	26	97	57	21	147
20	39	31	45	59	90	30	53	46	61	37	21	316
21	30	29	42	61	73	26	40	27	49	31	24	104
22	27	28	37	84	59	26	32	25	90	29	30	76
23	119	92	34	93	51	38	32	43	91	31	23	68
24	75	45	32	204	46	140	73	27	50	51	46	59
25	53	63	30	159	41	69	47	26	124	41	24	67
26	42	43	28	70	37	92	36	28	84	33	39	51
27	35	54	27	51	33	58	32	29	60	28	34	48
28	36	89	26	41	31	39	48	39	44	26	45	88
29	36	86	25	36	---	44	39	33	67	26	36	49
30	45	88	24	32	---	34	32	26	80	25	27	42
31	40	---	23	29	---	34	---	23	---	24	82	---
TOTAL	2040	1798	1950	1383	5516	1145	1266	883	1412	1395	849	3370
MEAN	65.8	59.9	62.9	44.6	197	36.9	42.2	28.5	47.1	45.0	27.4	112
MAX	381	212	201	204	2570	140	128	49	124	115	82	423
MIN	26	28	23	18	23	20	23	20	18	24	19	42
AC-FT	4050	3570	3870	2740	10940	2270	2510	1750	2800	2770	1680	6680

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1912 - 1994, BY WATER YEAR (WY)

MEAN	41.1	59.9	60.9	59.9	49.0	57.0	57.0	47.4	33.1	38.4	40.3	36.8
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	8.87	11.0	10.6	9.81	13.0	12.3	11.5	11.8
(WY)	1954	1934	1964	1986	1986	1970	1926	1926	1969	1926	1984	1953

SUMMARY STATISTICS FOR 1993 CALENDAR YEAR			FOR 1994 WATER YEAR		WATER YEARS 1912 - 1994		
ANNUAL TOTAL	12252		23007				
ANNUAL MEAN	33.6		63.0		48.5		
HIGHEST ANNUAL MEAN					95.5		1982
LOWEST ANNUAL MEAN					21.3		1984
HIGHEST DAILY MEAN	381	Oct 2	2570	Feb 13	2570	Feb 13	1994
LOWEST DAILY MEAN	12	Apr 3	18	Jan 11	7.0	Jul 8	1926
ANNUAL SEVEN-DAY MINIMUM	13	Mar 30	19	Jan 8	8.2	Mar 5	1986
ANNUAL RUNOFF (AC-FT)	24300		45630		35130		
10 PERCENT EXCEEDS	68		98		85		
50 PERCENT EXCEEDS	22		38		31		
90 PERCENT EXCEEDS	13		21		16		



16069000 WAILUA DITCH NEAR KAPAA

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

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

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

REMARKS.--Records good except for estimated daily discharges, which are fair. 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.--57 years (water years 1938-94), 16.0 ft^3/s (11,600 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, 27 ft^3/s, Oct. 3, 4; minimum daily, 0.89 ft^3/s, Feb. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	13	13	1.4	21	8.5	23	e18	e23	23	e20	26
2	26	13	13	1.3	20	6.2	22	e18	e23	22	e20	26
3	27	13	14	1.3	20	7.3	21	e19	e23	22	e20	26
4	27	13	14	9.9	20	16	21	e19	e23	22	e20	26
5	26	13	14	20	20	18	20	e19	e23	22	e20	26
6	26	13	14	19	20	19	19	e19	e23	22	20	e25
7	25	12	14	18	19	19	19	e19	e23	22	20	e25
8	18	12	14	16	19	20	18	e19	e23	21	20	e25
9	14	12	14	10	19	20	18	e19	23	21	20	e25
10	13	12	14	4.2	19	20	18	e20	23	21	20	e25
11	13	12	14	14	9.0	20	17	e20	23	21	21	e25
12	13	12	14	15	1.2	20	17	e20	23	21	21	e25
13	12	12	14	16	1.2	19	16	e20	23	21	21	e25
14	12	12	15	17	1.2	12	16	e20	22	20	21	e25
15	11	11	15	17	1.1	7.9	16	e20	22	20	21	e25
16	11	11	15	18	1.1	8.5	16	e20	22	20	21	e25
17	12	10	7.7	18	1.2	9.0	16	e21	22	20	21	e25
18	12	10	2.4	19	.91	9.4	16	e21	22	20	21	e25
19	12	10	2.3	20	.93	9.8	16	e21	23	20	25	e25
20	13	9.9	2.1	21	.93	10	16	e21	23	e20	26	26
21	13	9.9	1.9	21	.89	18	16	e21	23	e20	26	25
22	13	9.7	1.8	21	15	23	17	e21	23	e20	26	24
23	13	9.7	1.8	22	26	23	16	e21	23	e20	26	23
24	14	9.9	1.7	23	25	23	17	e22	22	e20	26	21
25	15	12	1.6	23	23	24	18	e22	22	e20	26	20
26	14	12	1.6	23	22	24	18	e22	23	e20	26	14
27	14	12	1.6	22	20	24	18	e22	23	e20	26	8.2
28	14	12	1.5	22	17	24	e18	e22	23	e20	26	17
29	14	12	1.5	22	---	24	e18	e22	23	e20	26	18
30	14	12	1.5	21	---	24	e18	e22	23	e20	26	18
31	13	---	1.4	21	---	23	---	e23	---	e20	26	---
TOTAL	499	347.1	257.4	517.1	364.66	533.6	535	633	683	641	705	694.2
MEAN	16.1	11.6	8.30	16.7	13.0	17.2	17.8	20.4	22.8	20.7	22.7	23.1
MAX	27	13	15	23	26	24	23	23	23	23	26	26
MIN	11	9.7	1.4	1.3	.89	6.2	16	18	22	20	20	8.2
AC-FT	990	688	511	1030	723	1060	1060	1260	1350	1270	1400	1380

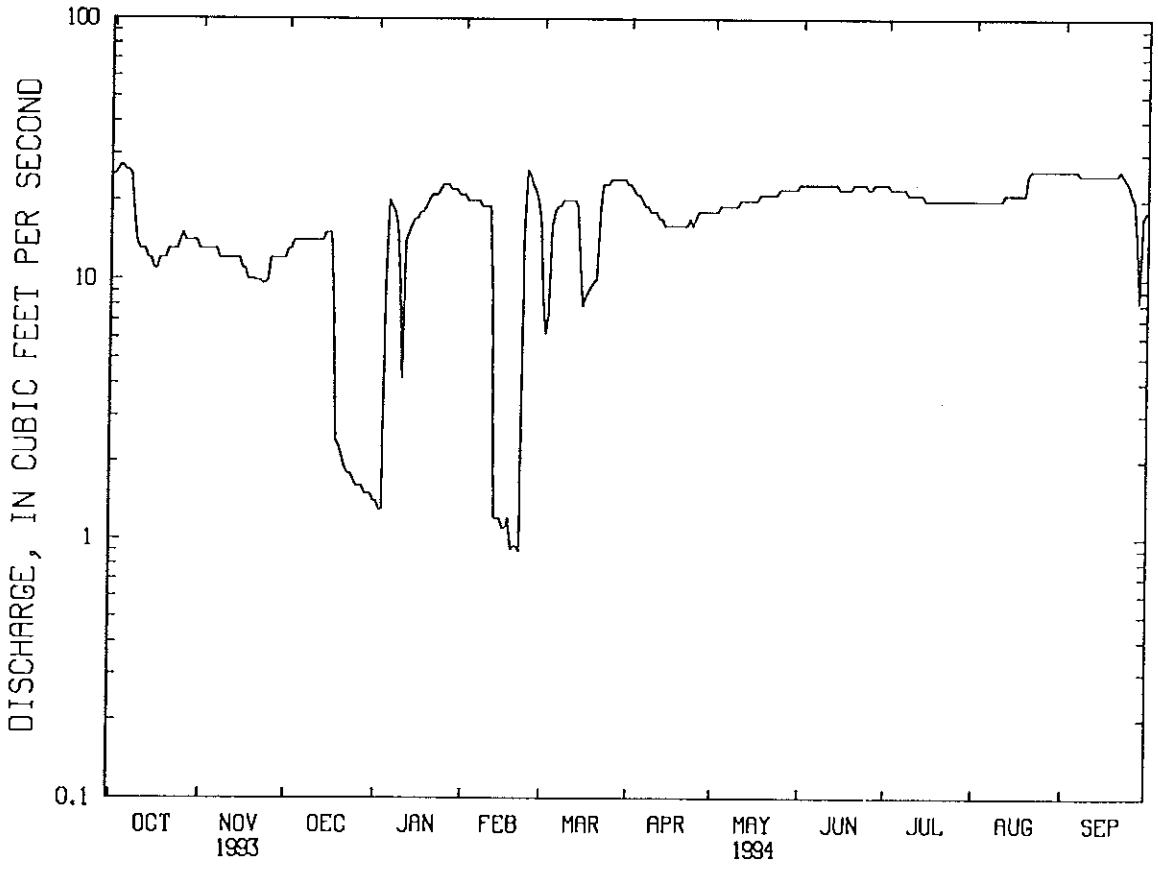
e Estimated

16069000 WAILUA DITCH NEAR KAPAA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1994, BY WATER YEAR (WY)

MEAN	18.8	12.0	8.98	10.5	11.7	12.4	13.4	16.6	21.5	22.3	22.1	22.7
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	7.87	9.72	5.72	3.89
(WY)	1969	1965	1955	1968	1969	1956	1963	1965	1962	1954	1954	1946

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1937 - 1994	
ANNUAL TOTAL	5620.8		6410.06			
ANNUAL MEAN	15.4		17.6		16.0	
HIGHEST ANNUAL MEAN					32.9	1938
LOWEST ANNUAL MEAN					6.52	1962
HIGHEST DAILY MEAN	27	Sep 23	27	Oct 3	63	Jun 4 1937
LOWEST DAILY MEAN	1.4	Dec 31	.89	Feb 21	.00	May 15 1940
ANNUAL SEVEN-DAY MINIMUM	1.5	Dec 25	1.0	Feb 15	.00	May 15 1940
ANNUAL RUNOFF (AC-FT)	11150		12710		11600	
10 PERCENT EXCEEDS	23		25		31	
50 PERCENT EXCEEDS	14		20		16	
90 PERCENT EXCEEDS	8.4		9.0		.84	



16071000 NORTH FORK WAILUA RIVER NEAR KAPAA

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

DRAINAGE AREA.--17.9 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--42 years, 122 ft^3/s (88,720 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Peak discharges 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)
Oct. 2	1700	5,180	8.09	Feb. 16	0400	4,140	7.39
Feb. 13	0730	*17,200	*12.70	Sep. 2	1800	7,680	9.34

Minimum discharge, 15 ft^3/s, Jan. 12, 13, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

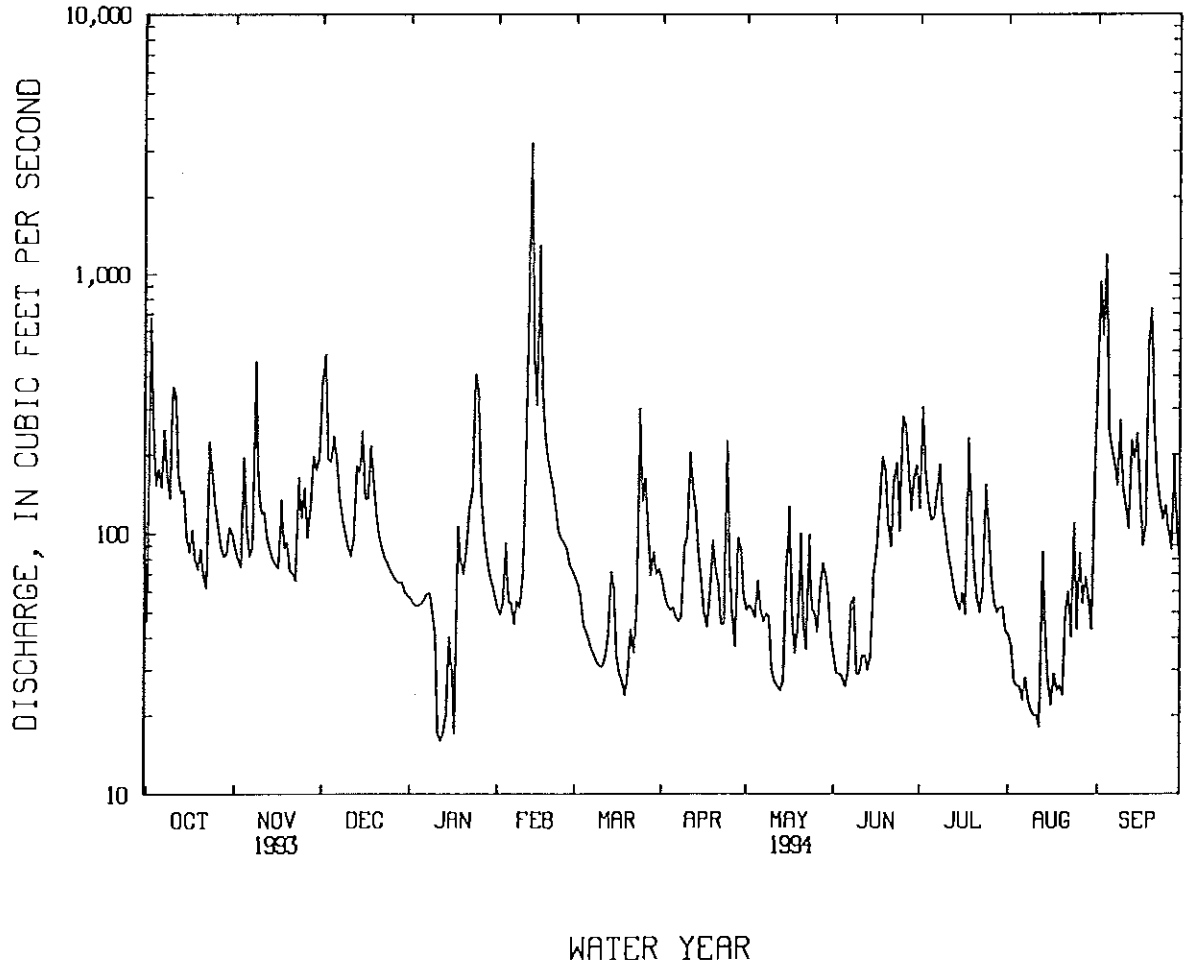
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	46	88	381	57	52	68	67	51	34	125	41	390
2	675	80	489	54	49	64	58	53	29	304	37	932
3	272	75	193	53	54	57	53	51	29	170	27	576
4	153	196	189	53	92	45	51	48	28	133	26	1190
5	177	104	235	54	55	42	52	66	26	113	26	249
6	150	82	192	56	54	39	48	51	29	115	23	210
7	248	89	138	59	45	36	46	46	54	143	28	186
8	167	456	114	59	55	34	48	49	57	184	23	153
9	137	153	100	50	52	32	89	48	29	121	21	271
10	365	119	89	41	66	31	97	30	29	102	20	151
11	343	121	82	17	166	31	203	27	34	83	20	127
12	169	96	96	16	889	34	150	26	34	72	18	104
13	143	87	181	17	3230	41	124	25	30	61	85	227
14	147	80	171	20	469	71	83	27	34	55	42	193
15	97	76	246	40	309	62	65	73	70	51	27	240
16	85	74	136	30	1300	34	49	127	86	59	22	141
17	103	135	137	17	363	29	44	49	128	49	29	90
18	79	88	216	106	236	27	59	35	196	231	25	107
19	73	93	160	78	194	24	94	44	176	128	26	548
20	87	72	120	70	168	29	72	100	110	74	24	732
21	68	70	98	88	149	43	64	44	89	56	50	260
22	62	66	88	125	123	35	45	36	164	50	60	163
23	224	165	81	145	101	49	45	99	186	61	40	134
24	172	115	77	407	95	300	226	51	102	154	110	113
25	130	149	72	352	92	132	73	50	279	109	43	128
26	108	96	69	145	87	163	48	42	259	68	84	102
27	90	124	66	102	76	104	37	60	181	54	54	87
28	82	198	65	83	72	69	96	77	122	50	68	198
29	83	175	65	71	---	85	88	70	166	52	57	99
30	105	195	60	64	---	70	58	58	182	52	43	80
31	100	---	58	58	---	73	---	40	---	42	161	---
TOTAL	4940	3717	4464	2587	8693	1953	2332	1653	2972	3121	1360	8181
MEAN	159	124	144	83.5	310	63.0	77.7	53.3	99.1	101	43.9	273
MAX	675	456	489	407	3230	300	226	127	279	304	161	1190
MIN	46	66	58	16	45	24	37	25	26	42	18	80
AC-FT	9800	7370	8850	5130	17240	3870	4630	3280	5890	6190	2700	16230

16071000 NORTH FORK WAILUA RIVER NEAR KAPAA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1994, BY WATER YEAR (WY)

MEAN	97.3	184	173	151	136	148	153	121	62.5	89.4	89.4	62.5
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	11.8	5.78	5.22	5.80	3.17
(WY)	1954	1977	1984	1986	1978	1978	1966	1992	1957	1953	1984	1953

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1952 - 1994	
ANNUAL TOTAL	26540.8		45973			
ANNUAL MEAN	72.7		126		122	
HIGHEST ANNUAL MEAN					262	1982
LOWEST ANNUAL MEAN					25.7	1984
HIGHEST DAILY MEAN	675	Oct 2	3230	Feb 13	7350	Jan 25 1956
LOWEST DAILY MEAN	6.9	Jun 24	16	Jan 12	2.2	Oct 21 1953
ANNUAL SEVEN-DAY MINIMUM	7.6	Sep 5	22	Aug 6	2.4	Oct 20 1953
ANNUAL RUNOFF (AC-FT)	52640		91190		88720	
10 PERCENT EXCEEDS	167		225		258	
50 PERCENT EXCEEDS	44		78		68	
90 PERCENT EXCEEDS	9.1		30		8.2	



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 good. Recording rain gage located at station.

AVERAGE DISCHARGE.--34 years, 2.67 ft^3/s (1,940 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,060 ft^3/s, Dec. 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, Sept. 27-30, 1968.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 2	1730	156	3.04	Feb. 16	0500	184	3.24
Feb. 13	1000	*1,020	*6.50	Sep. 20	1030	90	2.50

Minimum discharge, 0.79 ft^3/s, Oct. 1, 2

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

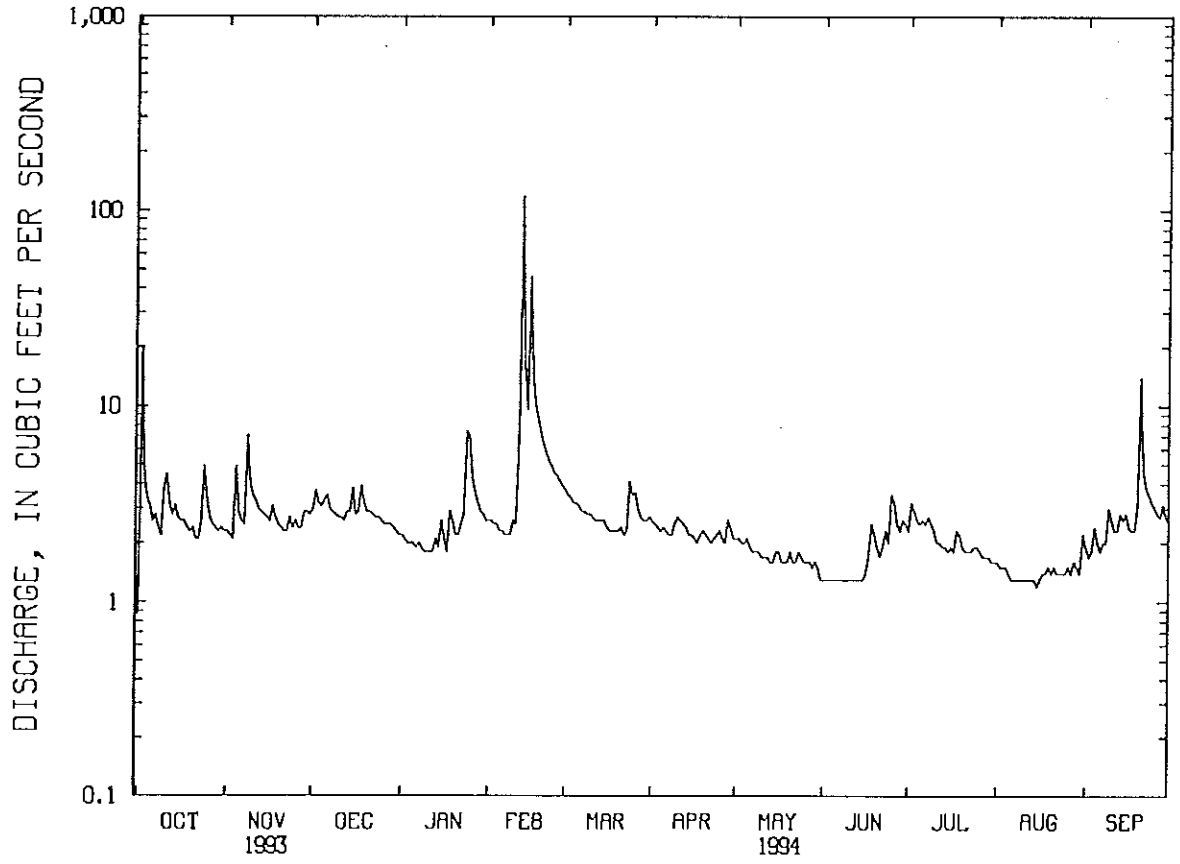
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.87	2.3	3.0	2.2	2.6	3.7	2.6	2.1	1.3	2.3	1.6	1.9
2	20	2.2	3.7	2.1	2.6	3.5	2.5	2.1	1.3	3.2	1.5	1.7
3	4.4	2.1	3.2	2.0	2.5	3.4	2.4	2.0	1.3	2.9	1.5	1.8
4	3.4	4.9	3.1	2.0	2.5	3.2	2.3	2.0	1.3	2.6	1.5	2.4
5	3.1	2.9	3.3	2.0	2.3	3.2	2.4	2.1	1.3	2.5	1.4	2.0
6	2.6	2.6	3.5	1.9	2.3	3.1	2.3	1.9	1.3	2.6	1.3	1.8
7	2.8	2.5	3.0	2.0	2.2	2.9	2.2	1.8	1.3	2.5	1.3	2.0
8	2.4	7.1	2.9	1.9	2.2	2.9	2.2	1.8	1.3	2.7	1.3	2.0
9	2.2	4.0	2.8	1.8	2.2	2.8	2.5	1.8	1.3	2.5	1.3	3.0
10	3.8	3.5	2.7	1.8	2.6	2.8	2.7	1.7	1.3	2.3	1.3	2.6
11	4.5	3.3	2.7	1.8	2.5	2.7	2.6	1.7	1.3	2.0	1.3	2.3
12	3.2	3.0	2.6	1.8	7.3	2.6	2.5	1.7	1.3	2.0	1.3	2.3
13	2.8	2.9	2.9	2.1	118	2.6	2.4	1.6	1.3	1.9	1.3	2.8
14	3.1	2.8	2.9	1.9	16	2.6	2.2	1.6	1.3	1.9	1.3	2.6
15	2.7	2.7	3.8	2.6	9.6	2.6	2.2	1.8	1.3	1.8	1.2	2.8
16	2.6	2.6	2.8	2.1	46	2.4	2.1	1.8	1.4	1.9	1.3	2.4
17	2.6	3.1	2.9	1.8	14	2.3	2.0	1.6	1.7	1.8	1.4	2.3
18	2.4	2.7	3.9	2.9	10	2.3	2.2	1.6	2.5	2.3	1.4	2.3
19	2.3	2.5	3.2	2.6	8.6	2.3	2.3	1.6	2.2	2.2	1.5	3.1
20	2.4	2.4	2.9	2.2	7.2	2.3	2.2	1.8	1.9	1.9	1.4	14
21	2.1	2.3	2.9	2.2	6.3	2.4	2.1	1.6	1.7	1.8	1.5	4.6
22	2.1	2.3	2.8	2.5	5.7	2.2	2.0	1.6	1.9	1.8	1.4	3.8
23	2.6	2.7	2.7	2.8	5.2	2.3	2.1	1.8	2.3	1.8	1.4	3.5
24	4.9	2.4	2.7	7.4	4.9	4.1	2.2	1.7	2.0	1.9	1.4	3.2
25	3.4	2.6	2.6	7.0	4.5	3.5	2.3	1.6	3.5	1.9	1.4	3.0
26	2.7	2.4	2.5	4.3	4.4	3.6	2.1	1.6	3.2	1.8	1.5	2.8
27	2.5	2.4	2.5	3.6	4.1	3.0	2.0	1.6	2.5	1.7	1.4	2.7
28	2.4	2.9	2.5	3.2	3.9	2.7	2.6	1.5	2.3	1.7	1.6	3.1
29	2.3	2.9	2.4	2.9	---	2.6	2.4	1.6	2.6	1.7	1.5	2.7
30	2.4	2.8	2.3	2.8	---	2.6	2.1	1.5	2.5	1.6	1.4	2.6
31	2.3	---	2.2	2.6	---	2.7	---	1.3	---	1.6	2.2	---
TOTAL	103.87	87.8	89.9	82.8	302.2	87.9	68.7	53.5	53.7	65.1	44.1	90.1
MEAN	3.35	2.93	2.90	2.67	10.8	2.84	2.29	1.73	1.79	2.10	1.42	3.00
MAX	20	7.1	3.9	7.4	118	4.1	2.7	2.1	3.5	3.2	2.2	14
MIN	.87	2.1	2.2	1.8	2.2	2.2	2.0	1.3	1.3	1.6	1.2	1.7
AC-FT	206	174	178	164	599	174	136	106	107	129	87	179

16071500 LEFT BRANCH OPAEKAA STREAM NEAR KAPAA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1994, BY WATER YEAR (WY)

MEAN	2.28	3.82	4.03	3.27	2.68	2.92	3.31	2.89	1.88	1.71	1.68	1.57
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	.81	.62	.29	.59	.36	.38
(WY)	1985	1964	1963	1977	1986	1978	1993	1966	1968	1968	1984	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1960 - 1994	
ANNUAL TOTAL	646.60		1129.67			
ANNUAL MEAN	1.77		3.09		2.67	
HIGHEST ANNUAL MEAN					5.72	1982
LOWEST ANNUAL MEAN					.92	1984
HIGHEST DAILY MEAN	20	Oct 2	118	Feb 13	218	Dec 14 1991
LOWEST DAILY MEAN	.52	Jul 8	.87	Oct 1	.09	Sep 28 1968
ANNUAL SEVEN-DAY MINIMUM	.55	Jul 3	1.3	Aug 9	.10	Jun 6 1968
ANNUAL RUNOFF (AC-FT)	1280		2240		1940	
10 PERCENT EXCEEDS	3.2		3.6		4.6	
50 PERCENT EXCEEDS	1.1		2.4		1.7	
90 PERCENT EXCEEDS	.65		1.4		.67	



16077000 MAKALEHA DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--57 years (water years 1938-94), 6.32 ft^3/s (4,580 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 1.8 ft^3/s, Feb. 16; minimum daily, no flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

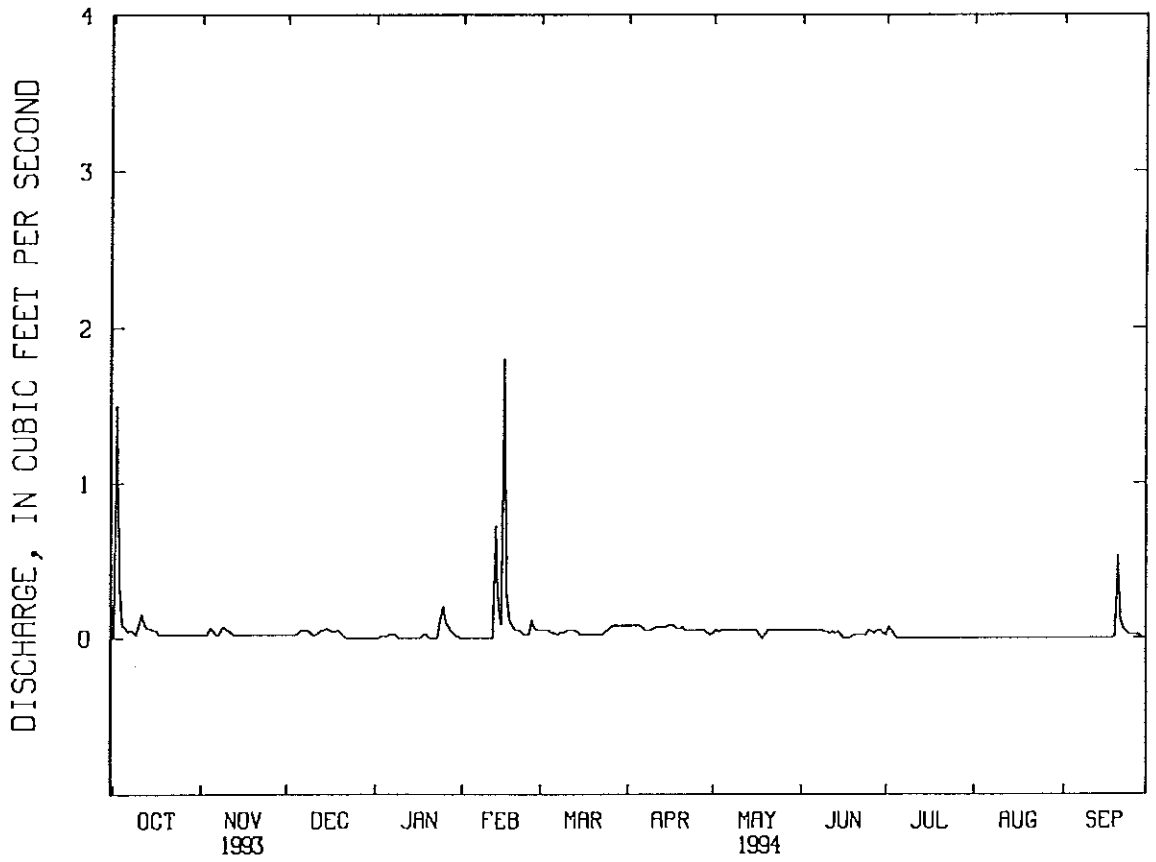
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.02	.02	.00	.00	.05	.08	.03	.05	.02	.00	.00
2	1.5	.02	.02	.00	.00	.05	.08	.05	.05	.07	.00	.00
3	.35	.02	.02	.01	.00	.05	.08	.04	.05	.05	.00	.00
4	.08	.06	.02	.01	.00	.05	.08	.05	.05	.02	.00	.00
5	.07	.05	.03	.01	.00	.03	.08	.05	.05	.00	.00	.00
6	.04	.02	.05	.02	.00	.03	.07	.05	.05	.00	.00	.00
7	.05	.02	.05	.02	.00	.02	.05	.05	.05	.00	.00	.00
8	.04	.06	.05	.02	.00	.03	.05	.05	.05	.00	.00	.00
9	.02	.07	.04	.00	.00	.03	.05	.05	.04	.00	.00	.00
10	.08	.05	.02	.00	.00	.04	.06	.05	.04	.00	.00	.00
11	.15	.04	.02	.00	.00	.05	.07	.05	.03	.00	.00	.00
12	.09	.02	.03	.00	.00	.05	.07	.05	.04	.00	.00	.00
13	.06	.02	.05	.00	.72	.05	.07	.05	.03	.00	.00	.00
14	.06	.02	.05	.00	.18	.04	.07	.05	.04	.00	.00	.00
15	.05	.02	.06	.00	.09	.02	.08	.05	.02	.00	.00	.00
16	.05	.02	.05	.00	1.8	.02	.08	.05	.00	.00	.00	.00
17	.02	.02	.04	.00	.28	.02	.08	.02	.00	.00	.00	.00
18	.02	.02	.04	.02	.11	.02	.06	.00	.00	.00	.00	.00
19	.02	.02	.05	.02	.08	.02	.06	.02	.01	.00	.00	.01
20	.02	.02	.03	.00	.05	.02	.07	.05	.02	.00	.00	.53
21	.02	.02	.01	.00	.05	.02	.05	.05	.02	.00	.00	.12
22	.02	.02	.00	.00	.04	.02	.05	.05	.02	.00	.00	.06
23	.02	.02	.00	.00	.02	.02	.05	.05	.02	.00	.00	.04
24	.02	.02	.00	.12	.02	.04	.05	.05	.02	.00	.00	.02
25	.02	.02	.00	.20	.02	.05	.05	.05	.05	.00	.00	.02
26	.02	.02	.00	.10	.11	.07	.05	.05	.04	.00	.00	.02
27	.02	.02	.00	.07	.06	.08	.05	.05	.03	.00	.00	.02
28	.02	.02	.00	.04	.05	.08	.05	.05	.05	.00	.00	.01
29	.02	.02	.00	.02	---	.08	.03	.05	.05	.00	.00	.00
30	.02	.02	.00	.01	---	.08	.02	.05	.03	.00	.00	.00
31	.02	---	.00	.00	---	.08	---	.05	---	.00	.00	---
TOTAL	2.99	0.81	0.75	0.69	3.68	1.31	1.84	1.41	1.00	0.16	0.00	0.85
MEAN	.096	.027	.024	.022	.13	.042	.061	.045	.033	.005	.000	.028
MAX	1.5	.07	.06	.20	1.8	.08	.08	.05	.05	.07	.00	.53
MIN	.00	.02	.00	.00	.00	.02	.02	.00	.00	.00	.00	.00
AC-FT	5.9	1.6	1.5	1.4	7.3	2.6	3.6	2.8	2.0	.3	.00	1.7

16077000 MAKALEHA DITCH NEAR KEALIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1994, BY WATER YEAR (WY)

MEAN	8.04	5.06	3.46	3.46	4.39	4.61	5.37	6.44	8.40	9.00	8.80	8.37
MAX	13.7	11.8	10.1	9.48	12.7	13.0	15.7	17.1	16.8	17.1	16.4	14.0
(WY)	1984	1954	1939	1983	1961	1961	1960	1956	1956	1958	1955	1969
MIN	.096	.009	.024	.022	.013	.028	.027	.030	.009	.005	.000	.007
(WY)	1994	1993	1994	1994	1993	1992	1992	1992	1993	1994	1994	1993

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1937 - 1994		
ANNUAL TOTAL	11.91		15.49				
ANNUAL MEAN	.033		.042		6.32		
HIGHEST ANNUAL MEAN					10.0		1961
LOWEST ANNUAL MEAN					.042		1994
HIGHEST DAILY MEAN	1.5	Oct 2	1.8	Feb 16	31	Aug 1	1961
LOWEST DAILY MEAN	.00	Jan 26	.00	Oct 1	.00	Jan 11	1958
ANNUAL SEVEN-DAY MINIMUM	.00	May 31	.00	Dec 22	.00	Dec 6	1959
ANNUAL RUNOFF (AC-FT)	24		31		4580		
10 PERCENT EXCEEDS	.06		.07		13		
50 PERCENT EXCEEDS	.02		.02		6.6		
90 PERCENT EXCEEDS	.00		.00		.11		



16079000 KAPAHI DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--76 years (water years 1918-20, 1922-94), 6.25 ft^3/s (4,530 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 32 ft^3/s, Nov. 4; minimum daily, 0.03 ft^3/s Feb. 27 to Mar. 2.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

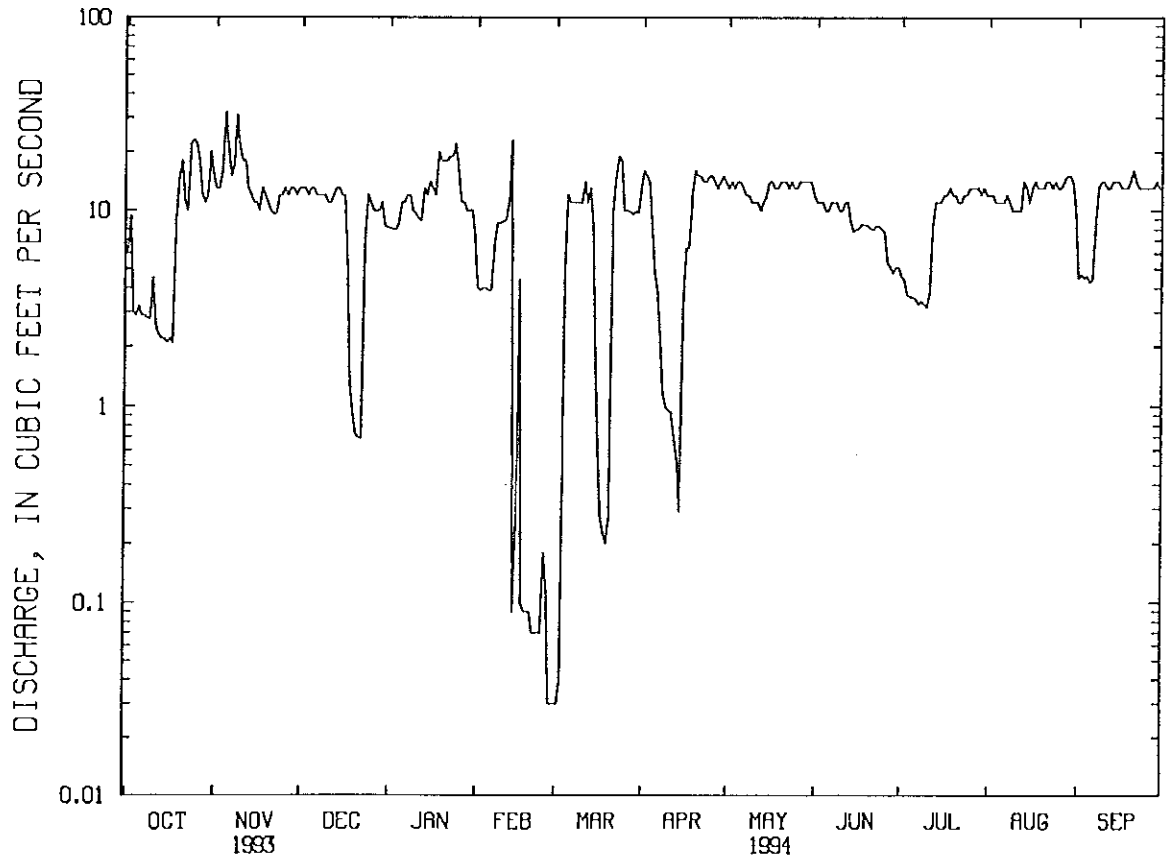
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.1	13	13	8.1	4.0	.03	16	13	11	4.6	12	4.5
2	9.4	13	13	8.0	3.9	.03	15	14	11	4.4	12	4.7
3	3.0	16	12	8.0	4.0	.04	14	13	11	3.7	11	4.5
4	2.9	32	13	8.6	4.0	4.7	8.4	14	10	3.6	11	4.6
5	3.2	21	13	11	3.9	12	4.8	14	10	3.6	11	4.3
6	2.9	15	12	11	3.9	11	3.9	13	11	3.5	11	4.4
7	2.9	17	12	12	6.6	11	2.3	12	11	3.3	12	8.4
8	2.8	31	12	12	8.6	11	1.2	12	11	3.4	11	13
9	2.8	21	12	10	8.6	11	1.0	11	10	3.3	10	14
10	4.5	18	11	9.6	8.8	11	.95	11	10	3.2	10	14
11	2.6	18	11	9.1	8.9	14	.93	11	11	3.8	10	13
12	2.3	13	12	8.9	11	11	.69	10	11	8.4	10	13
13	2.2	12	13	13	23	13	.55	11	8.8	11	14	14
14	2.2	11	13	12	.09	8.2	.29	12	7.8	11	13	14
15	2.1	11	12	14	.24	1.8	3.2	14	8.0	11	11	14
16	2.2	10	12	13	4.4	.60	6.4	14	8.1	12	13	13
17	2.1	13	5.5	12	.10	.27	6.4	13	8.5	12	14	13
18	9.2	12	1.3	20	.09	.23	12	13	8.4	13	13	13
19	15	11	.92	18	.09	.20	16	14	8.4	12	13	14
20	18	10	.72	18	.09	.27	15	14	8.1	12	13	16
21	11	9.6	.70	18	.07	10	15	14	8.0	11	14	14
22	10	9.7	.69	19	.07	15	14	13	8.3	11	14	13
23	22	12	6.7	19	.07	19	14	14	8.3	12	13	13
24	23	12	12	22	.07	18	15	13	8.0	12	14	13
25	22	13	11	16	.18	10	15	13	7.7	13	13	13
26	18	12	10	11	.12	10	14	14	5.4	13	13	13
27	12	13	10	11	.03	9.9	13	14	5.1	13	14	13
28	11	13	10	10	.03	9.6	14	14	4.8	13	15	14
29	12	12	11	10	---	9.9	15	14	5.1	12	15	13
30	20	13	8.3	10	---	9.7	14	14	5.1	13	14	13
31	15	---	8.2	7.3	---	13	---	12	---	12	10	---
TOTAL	274.4	437.3	293.03	389.6	104.94	255.47	272.01	402	259.9	277.8	384	345.4
MEAN	8.85	14.6	9.45	12.6	3.75	8.24	9.07	13.0	8.66	8.96	12.4	11.5
MAX	23	32	13	22	23	19	16	14	11	13	15	16
MIN	2.1	9.6	.69	7.3	.03	.03	.29	10	4.8	3.2	10	4.3
AC-FT	544	867	581	773	208	507	540	797	516	551	762	685

16079000 KAPAHI DITCH NEAR KEALIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1918 - 1994, BY WATER YEAR (WY)

MEAN	6.02	5.16	4.60	4.43	4.84	5.64	6.49	7.76	7.58	8.33	8.63	7.16
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	2.11	.72
(WY)	1961	1952	1949	1943	1956	1968	1945	1965	1962	1987	1987	1946

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1918 - 1994	
ANNUAL TOTAL	3237.46		3695.85			
ANNUAL MEAN	8.87		10.1		6.25	
HIGHEST ANNUAL MEAN					21.0	1918
LOWEST ANNUAL MEAN					2.23	1965
HIGHEST DAILY MEAN	32	Nov 4	32	Nov 4	94	Oct 25 1926
LOWEST DAILY MEAN	.00	Jan 3	.03	Feb 27	.00	Jun 4 1922
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 22	.07	Feb 25	.00	Nov 13 1925
ANNUAL RUNOFF (AC-FT)	6420		7330		4530	
10 PERCENT EXCEEDS	14		15		15	
50 PERCENT EXCEEDS	9.0		11		4.5	
90 PERCENT EXCEEDS	2.1		2.1		.25	



16088000 ANAHOLA DITCH ABOVE KANEHA RESERVOIR, NEAR KEALIA

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

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

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

REMARKS.--Records good. Ditch diverts water from Anahola Stream to Kaneha Reservoir, where it is stored for irrigation. Flood sometimes diverted upstream by Anahola ditch wasteway (see sta. 16087000).

AVERAGE DISCHARGE.--70 years (water years, 1923-25, 1928-94), 4.30 ft^3/s (3,110 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 0.85 ft^3/s, Apr. 19; minimum daily, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

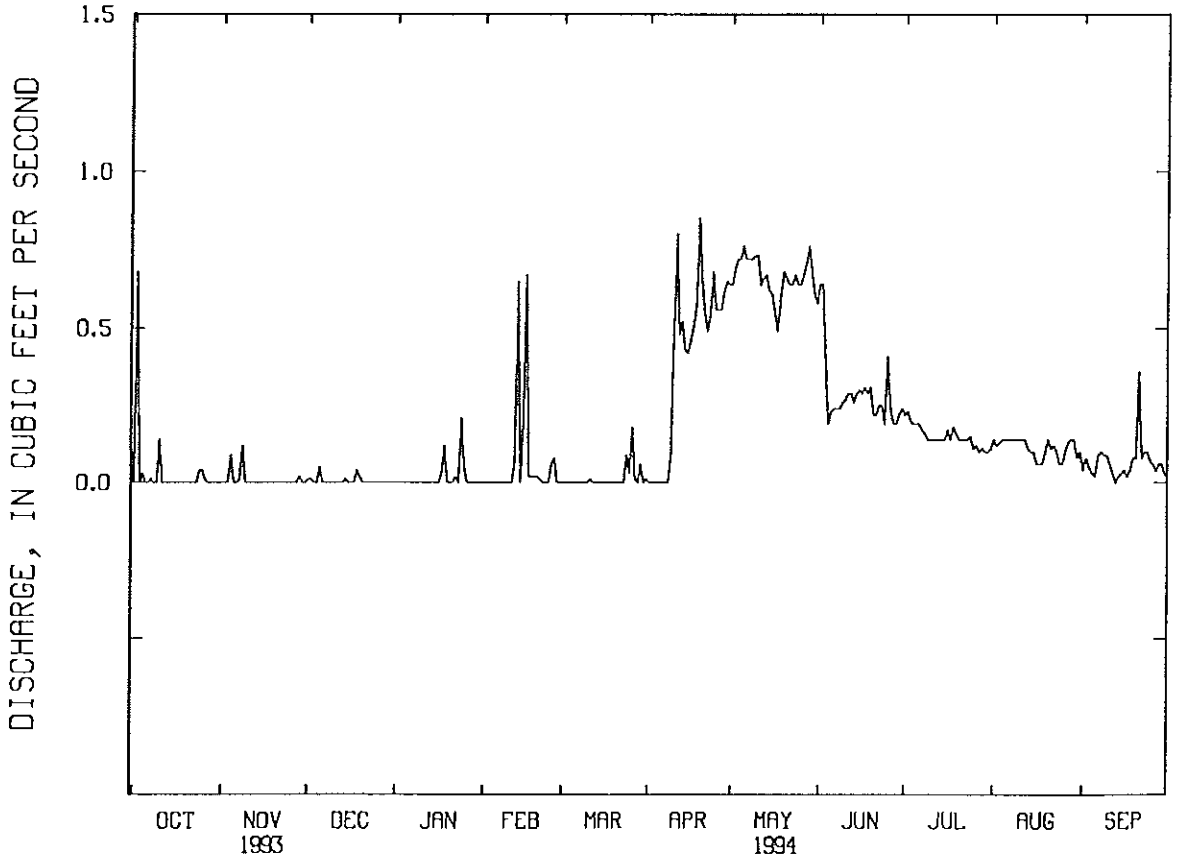
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.01	.00	.00	.00	.00	.64	.64	.22	.14	.04
2	.68	.00	.01	.00	.00	.00	.00	.69	.64	.23	.12	.08
3	.00	.00	.00	.00	.00	.00	.00	.72	.41	.20	.13	.05
4	.03	.09	.00	.00	.00	.00	.00	.72	.19	.19	.14	.03
5	.00	.00	.05	.00	.00	.00	.00	.76	.23	.19	.14	.02
6	.00	.00	.00	.00	.00	.00	.00	.72	.24	.19	.14	.09
7	.01	.01	.00	.00	.00	.00	.00	.72	.24	.17	.14	.10
8	.00	.12	.00	.00	.00	.00	.00	.72	.24	.16	.14	.09
9	.00	.00	.00	.00	.00	.00	.09	.73	.26	.14	.14	.09
10	.14	.00	.00	.00	.00	.00	.49	.73	.27	.14	.14	.06
11	.00	.00	.00	.00	.00	.01	.80	.64	.29	.14	.14	.03
12	.00	.00	.00	.00	.07	.00	.48	.66	.29	.14	.14	.00
13	.00	.00	.00	.00	.65	.00	.52	.67	.26	.14	.11	.02
14	.00	.00	.01	.00	.00	.00	.43	.62	.29	.14	.10	.03
15	.00	.00	.00	.00	.18	.00	.42	.61	.30	.14	.10	.04
16	.00	.00	.00	.00	.67	.00	.46	.55	.29	.17	.06	.02
17	.00	.00	.00	.03	.02	.00	.50	.49	.31	.14	.06	.04
18	.00	.00	.04	.12	.02	.00	.57	.59	.29	.18	.06	.08
19	.00	.00	.02	.00	.02	.00	.85	.68	.31	.16	.10	.08
20	.00	.00	.00	.00	.02	.00	.65	.66	.22	.14	.14	.36
21	.00	.00	.00	.00	.01	.00	.55	.64	.22	.14	.11	.08
22	.00	.00	.00	.02	.00	.00	.49	.64	.25	.14	.12	.10
23	.00	.00	.00	.00	.00	.00	.54	.67	.25	.14	.10	.10
24	.04	.00	.00	.21	.00	.09	.68	.64	.19	.15	.06	.07
25	.04	.00	.00	.05	.06	.03	.56	.64	.41	.11	.06	.06
26	.01	.00	.00	.00	.08	.18	.56	.67	.24	.12	.10	.04
27	.00	.00	.00	.00	.00	.01	.56	.71	.19	.10	.13	.06
28	.00	.02	.00	.00	.00	.00	.62	.76	.19	.11	.14	.06
29	.00	.00	.00	.00	---	.06	.65	.68	.22	.10	.14	.03
30	.00	.00	.00	.00	---	.00	.64	.61	.24	.10	.08	.02
31	.00	---	.00	.00	---	.01	---	.58	---	.11	.10	---
TOTAL	0.95	0.24	0.14	0.43	1.80	0.39	12.11	20.56	8.61	4.64	3.52	1.97
MEAN	.031	.008	.005	.014	.064	.013	.40	.66	.29	.15	.11	.066
MAX	.68	.12	.05	.21	.67	.18	.85	.76	.64	.23	.14	.36
MIN	.00	.00	.00	.00	.00	.00	.00	.49	.19	.10	.06	.00
AC-FT	1.9	.5	.3	.9	3.6	.8	24	41	17	9.2	7.0	3.9

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1922 - 1994, BY WATER YEAR (WY)

MEAN	4.65	3.46	2.20	2.34	3.28	3.65	4.72	4.95	4.91	6.40	5.58	4.97
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	.011	.004	.002	.003	.004	.000	.001	.009	.000	.003	.005	.002
(WY)	1992	1992	1961	1933	1969	1993	1993	1993	1993	1993	1993	1991

SUMMARY STATISTICS	FOR 1994 WATER YEAR		WATER YEARS 1922 - 1994	
ANNUAL TOTAL	55.36			
ANNUAL MEAN	.15		4.30	
HIGHEST ANNUAL MEAN			8.00	1987
LOWEST ANNUAL MEAN			.13	1992
HIGHEST DAILY MEAN	.85	Apr 19	62	Nov 12 1947
LOWEST DAILY MEAN	.00	Oct 1	.00	Dec 11 1923
ANNUAL SEVEN-DAY MINIMUM	.00	Oct 11	.00	Dec 15 1923
ANNUAL RUNOFF (AC-FT)	110		3110	
10 PERCENT EXCEEDS	.62		10	
50 PERCENT EXCEEDS	.04		3.0	
90 PERCENT EXCEEDS	.00		.03	



16091000 LOWER ANAHOLA DITCH NEAR KEALIA

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

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

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

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

AVERAGE DISCHARGE.--56 years (water years 1938-83, 1986-94), 2.39 ft^3/s (1,730 acre-ft/yr).

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

EXTREMES FOR CURRENT YEAR.--No flow for the entire year.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
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
30	.00	.00	.00	.00	---	.00	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MEAN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
MAX	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00

16091000 LOWER ANAHOLA DITCH NEAR KEALIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1937 - 1994, BY WATER YEAR (WY)

MEAN	2.78	1.82	1.22	1.31	2.01	1.72	2.17	2.70	3.21	3.34	3.23	3.33
MAX	7.48	7.72	7.46	5.39	8.12	7.38	8.51	10.9	10.0	9.58	7.55	9.16
(WY)	1955	1955	1975	1973	1975	1947	1954	1938	1937	1947	1943	1940
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1983	1952	1940	1937	1937	1937	1956	1983	1983	1983	1982	1982

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1937 - 1994		
ANNUAL MEAN					2.39		
HIGHEST ANNUAL MEAN					6.06		1947
LOWEST ANNUAL MEAN					.000		1983
HIGHEST DAILY MEAN					19	Jun 1	1938
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Jan 1	1937
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Jan 1	1937
ANNUAL RUNOFF (AC-FT)					1730		
10 PERCENT EXCEEDS	.00		.00		7.0		
50 PERCENT EXCEEDS	.00		.00		.11		
90 PERCENT EXCEEDS	.00		.00		.00		

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 confuence with Pohakuhono Stream and 2.3 mi south of Kilauea.

DRAINAGE AREA.-- 1.9 mi^2

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

REVISED RECORDSD.--WSP 2137: Drainage area.

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

REMARKS.--Records good.

AVERAGE DISCHARGE.-- 36 years (water years 1959-94), 12.1 ft^3/s (8,750 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 23	1300	656	4.63	Feb. 13	0400	*4,140	9.76
Nov. 4	0400	884	5.21	Feb. 16	0400	1,010	5.48

Minimum discharge, 5.0 ft^3/s, Aug. 11, 15, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.5	6.3	30	7.2	e6.0	6.7	7.5	6.4	e7.2	15	6.7	9.3
2	50	6.8	23	6.0	e5.8	6.5	7.0	6.6	e7.0	22	6.0	22
3	12	10	13	5.6	7.5	6.3	6.7	6.3	e6.8	16	5.8	19
4	7.2	169	13	5.6	9.3	6.2	6.5	6.2	e6.8	11	5.6	32
5	8.0	18	18	7.1	7.2	6.1	7.3	6.2	e6.8	9.8	5.6	11
6	18	10	16	6.3	7.9	5.9	6.3	5.9	e7.0	11	5.6	13
7	50	10	12	8.1	6.4	5.8	6.4	5.6	e6.6	15	5.7	11
8	13	33	9.2	6.9	6.2	5.8	6.2	5.5	e6.6	15	5.5	13
9	8.6	11	8.3	6.3	6.0	5.7	8.6	5.5	e6.2	11	5.3	26
10	44	8.8	7.7	e5.7	11	5.6	13	5.4	e6.3	9.3	5.3	14
11	22	8.3	7.2	e5.4	14	6.5	14	5.3	7.1	8.5	5.3	9.9
12	10	7.5	8.2	5.3	229	5.7	9.3	5.3	6.6	8.2	5.6	11
13	8.2	7.1	12	5.4	879	5.9	9.1	e5.5	6.3	7.7	6.5	24
14	7.3	7.0	11	5.4	35	8.6	7.8	5.4	6.5	7.4	5.5	26
15	6.8	6.6	12	5.8	22	7.0	7.1	8.4	7.1	7.9	5.2	25
16	7.1	6.8	8.5	e5.5	147	5.9	6.7	11	8.6	7.6	5.2	14
17	6.6	12	16	e5.8	21	5.8	6.4	6.8	23	7.9	5.3	10
18	6.1	7.9	24	17	14	5.6	7.5	e6.0	26	12	5.1	20
19	6.3	7.0	14	7.9	15	5.5	8.3	e7.4	22	9.9	5.5	31
20	6.0	6.4	9.4	7.2	16	7.8	11	e8.0	17	8.1	5.5	34
21	5.5	6.1	8.5	8.3	11	7.3	9.3	e6.6	13	7.1	5.6	14
22	5.3	6.0	7.8	19	9.1	8.3	7.1	e7.0	33	6.7	6.0	10
23	76	6.7	7.3	19	8.4	9.0	7.3	e10	22	6.9	5.7	9.7
24	13	5.9	7.1	54	9.0	30	10	e8.8	11	9.3	7.7	9.1
25	14	6.1	6.7	29	8.1	11	7.3	e7.4	44	8.7	6.1	8.2
26	16	5.9	6.5	13	8.0	17	6.6	e8.6	22	7.4	6.1	8.0
27	8.3	7.6	6.1	9.3	7.3	14	6.3	12	13	7.0	5.9	8.1
28	7.3	17	6.1	8.2	7.0	8.9	6.8	14	9.7	6.9	6.2	12
29	6.8	13	5.9	7.5	---	10	6.9	13	15	6.4	11	8.1
30	7.7	16	5.8	7.1	---	8.9	6.3	e9.0	23	6.2	6.6	7.4
31	7.2	---	5.8	6.6	---	8.6	---	e7.8	---	5.9	13	---
TOTAL	469.8	449.8	346.1	316.5	1533.2	257.9	236.6	232.9	403.2	298.8	191.7	469.8
MEAN	15.2	15.0	11.2	10.2	54.8	8.32	7.89	7.51	13.4	9.64	6.18	15.7
MAX	76	169	30	54	879	30	14	14	44	22	13	34
MIN	5.3	5.9	5.8	5.3	5.8	5.5	6.2	5.3	6.2	5.9	5.1	7.4
AC-FT	932	892	686	628	3040	512	469	462	800	593	380	932

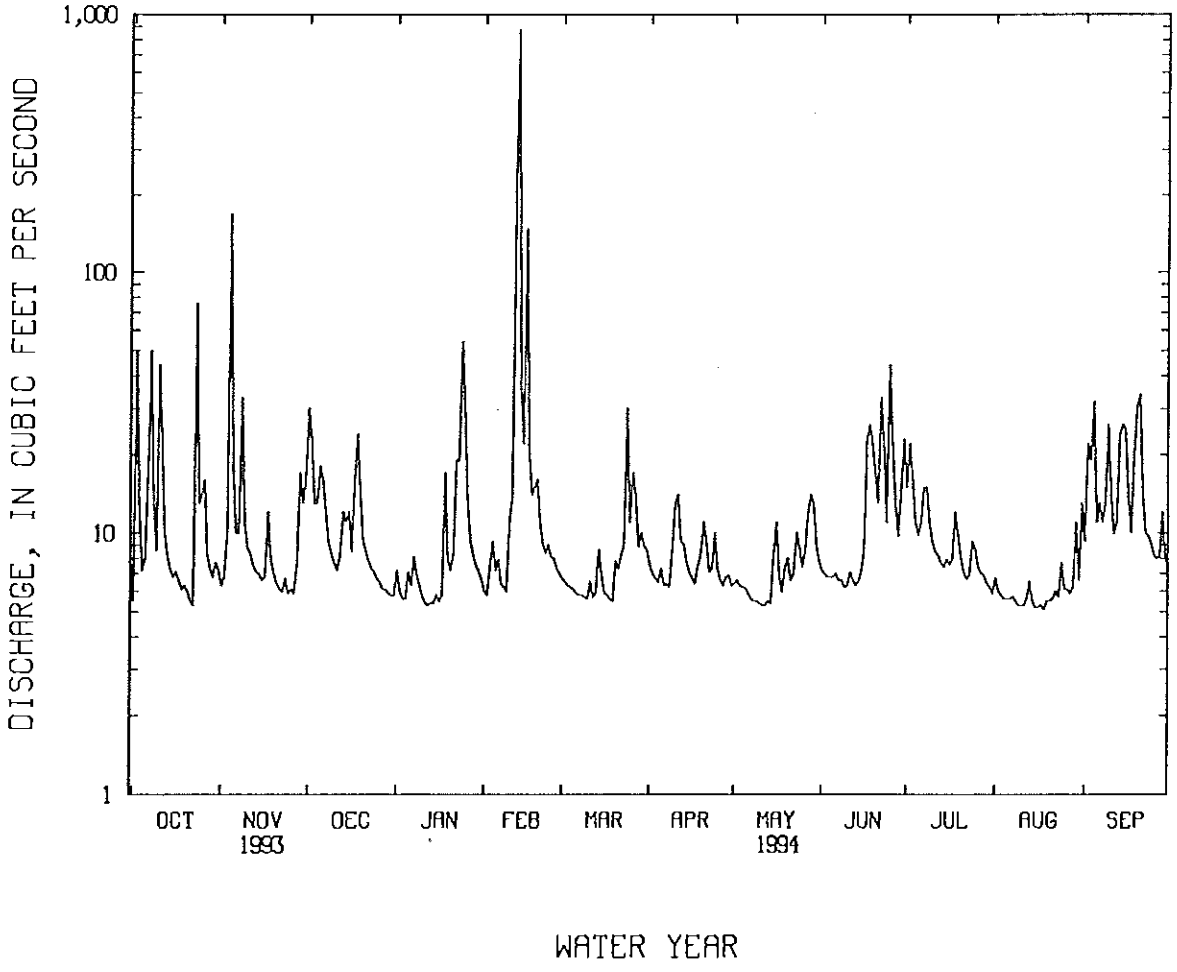
e Estimated

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1994, BY WATER YEAR (WY)

MEAN	10.5	16.3	14.4	11.6	11.9	14.1	15.2	12.2	8.61	11.5	10.5	8.28
MAX	24.6	42.4	43.1	28.4	54.8	42.7	35.1	22.5	29.1	27.1	23.7	15.7
(WY)	1983	1991	1988	1989	1994	1982	1971	1965	1978	1989	1991	1994
MIN	4.40	5.73	3.79	3.45	3.20	4.59	5.06	6.11	4.27	5.05	3.95	3.93
(WY)	1985	1977	1986	1986	1986	1970	1992	1992	1959	1975	1973	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1958 - 1994	
ANNUAL TOTAL	3225.7		5206.3			
ANNUAL MEAN	8.84		14.3		12.1	
HIGHEST ANNUAL MEAN					19.6	1982
LOWEST ANNUAL MEAN					7.01	1984
HIGHEST DAILY MEAN	169	Nov 4	879	Feb 13	879	Feb 13 1994
LOWEST DAILY MEAN	3.8	Mar 29	5.1	Aug 18	1.9	Sep 5 1968
ANNUAL SEVEN-DAY MINIMUM	3.9	Mar 29	5.3	Aug 14	2.4	Sep 2 1968
ANNUAL RUNOFF (AC-FT)	6400		10330		8750	
10 PERCENT EXCEEDS	14		20		21	
50 PERCENT EXCEEDS	6.1		7.6		7.6	
90 PERCENT EXCEEDS	4.2		5.6		4.6	



16103000 HANALEI RIVER NEAR HANALEI

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

DRAINAGE AREA.--19.1 mi^2.

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

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

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

REMARKS.--Records good except for estimated daily discharges, which are poor. Since 1925, Hanalei tunnel (sta. 16100000) has diverted from Hanalei River and its tributary Kaapoko Stream upstream to North Branch of North Fork Wailua River for irrigation. China ditch upstream diverts for irrigation of taro in vicinity of Hanalei.

AVERAGE DISCHARGE (since diversion to Hanalei tunnel).--31 years (water years 1964-94), 214 ft^3/s (155,200) acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 25,750 ft^3/s, Dec. 14, 1991, gage height, 14.45 ft, from rating curve extended above 9,600 ft^3/s; minimum, 31 ft^3/s, Sept. 30, Oct. 1, 2, 5, 12, 13, Nov. 3, 1975.

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

Date	Time	Discharge (ft3/s)	Gage height (ft)	Date	Time	Discharge (ft3/s)	Gage height (ft)
Oct. 2	unknown	11,790	11.03	Sep. 2	1730	*12,340	*11.21

Minimum discharge, 69 ft^3/s, Oct. 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e90	90	512	e107	e109	99	139	124	115	262	116	1520
2	e400	89	503	e99	e102	96	125	124	109	594	107	1600
3	e120	96	254	89	136	94	119	114	106	280	96	735
4	e90	1210	396	90	233	93	114	116	100	201	96	2520
5	e86	210	499	e200	127	91	121	128	100	170	94	428
6	e88	137	340	e124	128	89	109	109	106	170	91	370
7	e170	176	213	e124	107	89	111	100	150	294	102	277
8	e120	988	162	e109	132	88	118	98	127	268	92	342
9	e90	217	137	92	114	87	196	98	99	179	89	506
10	e600	162	120	89	187	87	274	95	99	153	89	304
11	e250	171	111	86	328	112	665	93	106	139	90	210
12	e125	124	171	86	2210	87	330	92	103	134	90	208
13	97	112	305	e105	2490	114	306	94	96	121	228	557
14	105	106	264	e102	500	268	195	95	103	115	127	360
15	82	99	285	e123	374	168	162	208	153	114	99	461
16	84	95	e195	97	1840	111	141	248	165	129	94	257
17	109	183	e195	91	336	112	129	118	385	113	104	195
18	77	114	e409	e416	226	101	165	112	488	355	97	293
19	98	124	e245	e286	187	94	316	147	522	196	96	1480
20	196	93	e156	e326	161	179	359	222	294	136	110	929
21	81	88	e150	e300	143	170	224	138	251	114	136	e315
22	72	88	e139	e406	131	197	155	118	566	108	162	e221
23	138	379	e130	e636	125	313	178	162	441	125	111	e210
24	116	154	e124	840	126	829	507	119	256	253	264	e187
25	138	221	e117	e478	120	275	192	116	704	207	126	e216
26	158	127	109	e228	112	521	149	136	533	128	241	e164
27	83	272	105	e175	104	324	132	163	328	113	162	e156
28	76	337	104	e146	101	192	209	263	203	108	219	e355
29	81	236	102	e133	---	211	161	196	314	112	295	e164
30	133	300	97	e124	---	178	131	152	410	113	155	e144
31	112	---	94	e116	---	173	---	128	---	99	478	---
TOTAL	4265	6798	6743	6423	10989	5642	6232	4226	7532	5603	4456	15684
MEAN	138	227	218	207	392	182	208	136	251	181	144	523
MAX	600	1210	512	840	2490	829	665	263	704	594	478	2520
MIN	72	88	94	86	101	87	109	92	96	99	89	144
AC-FT	8460	13480	13370	12740	21800	11190	12360	8380	14940	11110	8840	31110

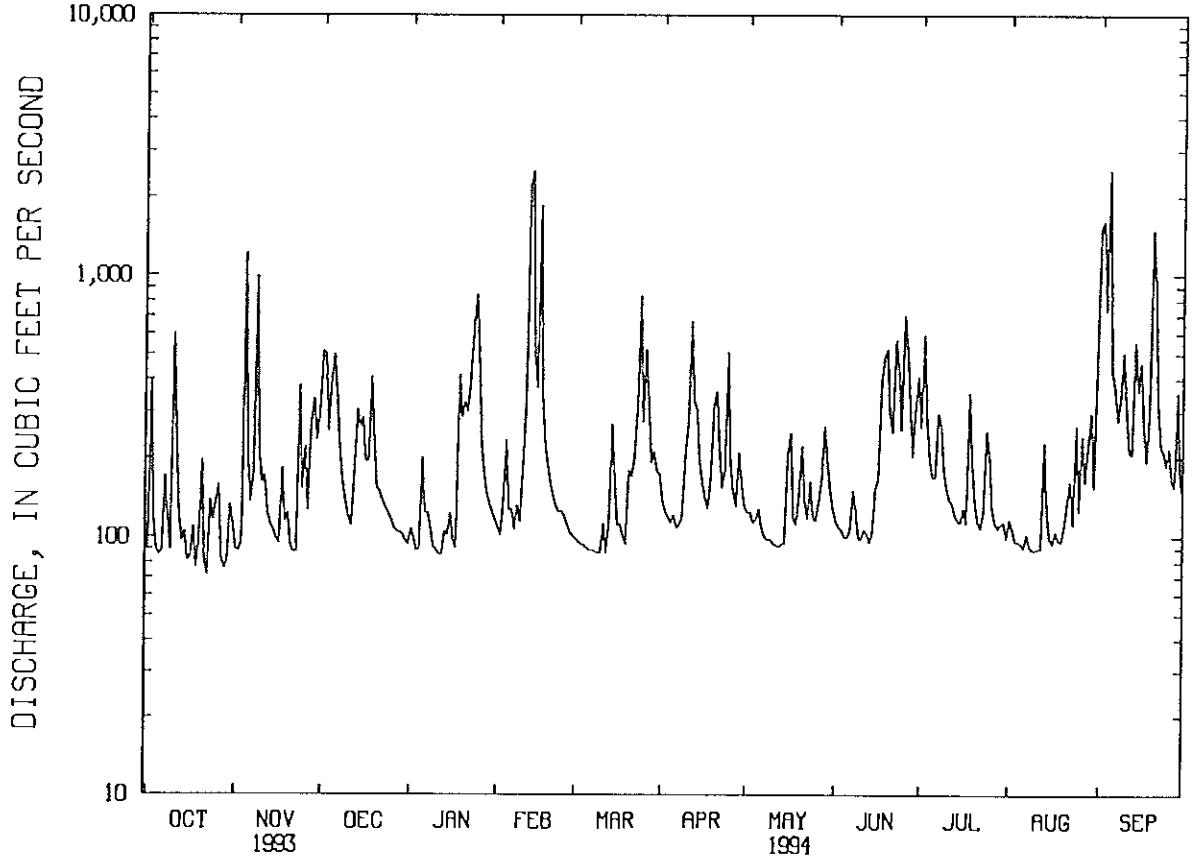
e Estimated

16103000 HANALEI RIVER NEAR HANALEI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

MEAN	174	303	248	218	229	282	294	218	143	185	158	136
MAX	466	793	596	614	616	1096	781	626	567	418	413	523
(WY)	1983	1991	1968	1989	1989	1982	1974	1967	1978	1989	1982	1994
MIN	44.0	72.8	59.6	49.5	42.8	56.4	76.3	73.5	57.5	62.6	42.1	35.7
(WY)	1985	1964	1984	1986	1978	1970	1966	1984	1975	1984	1973	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1962 - 1994	
ANNUAL TOTAL	46583		84593			
ANNUAL MEAN	128		232		214	
HIGHEST ANNUAL MEAN					408	1982
LOWEST ANNUAL MEAN					92.7	1984
HIGHEST DAILY MEAN	1210	Nov 4	2520	Sep 4	8340	May 22 1967
LOWEST DAILY MEAN	54	Jul 8	72	Oct 22	31	Nov 3 1975
ANNUAL SEVEN-DAY MINIMUM	57	Jul 3	89	Mar 4	33	Sep 19 1975
ANNUAL RUNOFF (AC-FT)	92400		167800		155200	
10 PERCENT EXCEEDS	234		412		420	
50 PERCENT EXCEEDS	89		137		117	
90 PERCENT EXCEEDS	61		92		58	



16108000 WAINIHA RIVER NEAR HANALEI

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

DRAINAGE AREA.--10.2 mi^2.

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

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

REMARKS.--Records good, except for periods above 120 cfs which are fair. No diversion upstream.

AVERAGE DISCHARGE.--39 years (water years 1953-55, 1959-94), 138 ft^3/s (100,300 acre-ft/yr).

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

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

EXTREMES FOR CURRENT YEAR.--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)
Sep. 1	0630	*12,400	7.23	Sep. 19	1730	3,620	5.23
Sep. 4	0500	3,700	5.26				

Minimum, 35 ft^3/s, Oct. 2

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

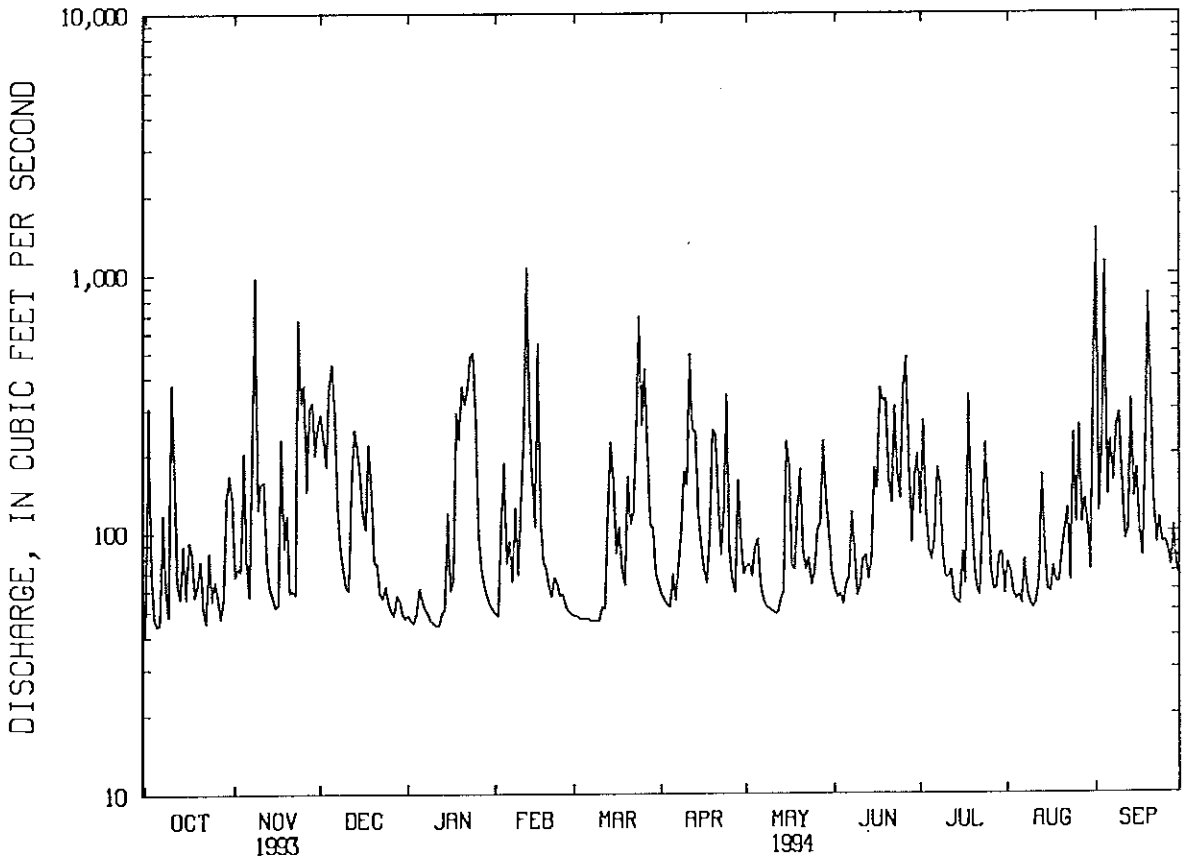
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	40	68	287	48	49	48	58	74	61	116	76	1490
2	306	73	232	46	48	48	55	75	56	270	71	119
3	74	71	180	45	106	47	53	68	58	119	59	222
4	47	204	369	49	186	47	52	87	53	85	55	1110
5	44	78	451	61	76	47	69	94	63	78	57	138
6	45	57	293	55	93	47	55	63	67	95	53	225
7	117	198	126	51	65	46	75	55	119	176	78	156
8	61	976	87	49	124	46	104	52	83	155	59	258
9	48	123	72	46	69	46	171	51	57	81	53	287
10	378	155	62	45	132	46	152	50	62	67	51	157
11	172	157	60	44	233	52	494	49	79	67	54	93
12	63	78	154	44	1070	51	251	49	81	71	66	101
13	56	62	250	49	291	118	243	55	66	56	166	325
14	89	57	213	51	161	223	119	59	77	54	87	135
15	56	52	168	118	105	160	89	224	176	53	60	174
16	92	53	117	60	543	83	71	184	146	84	59	99
17	84	229	103	65	112	104	64	74	362	63	73	80
18	57	87	218	291	77	71	97	72	321	340	64	193
19	63	116	146	228	73	63	248	120	329	138	64	839
20	78	59	77	370	62	164	241	174	158	79	85	358
21	51	60	75	314	57	107	137	85	129	61	103	131
22	45	58	58	360	67	119	82	72	308	57	123	90
23	84	671	56	484	64	246	120	79	165	108	65	112
24	55	319	62	502	57	690	345	63	135	221	240	90
25	65	375	54	278	58	260	84	69	364	130	108	92
26	57	144	50	98	53	434	65	101	481	72	259	85
27	47	305	48	73	50	211	59	108	187	60	108	73
28	56	320	57	63	49	107	158	226	91	61	133	104
29	134	199	55	57	---	103	94	136	163	82	107	72
30	166	266	49	53	---	69	69	101	200	83	71	67
31	134	---	47	51	---	63	---	70	---	58	378	---
TOTAL	2864	5670	4276	4148	4130	3966	3974	2839	4697	3240	3085	7475
MEAN	92.4	189	138	134	147	128	132	91.6	157	105	99.5	249
MAX	378	976	451	502	1070	690	494	226	481	340	378	1490
MIN	40	52	47	44	48	46	52	49	53	53	51	67
AC-FT	5680	11250	8480	8230	8190	7870	7880	5630	9320	6430	6120	14830

16108000 WAINIHA RIVER NEAR HANALEI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1994, BY WATER YEAR (WY)

MEAN	110	184	169	145	144	174	176	124	99.5	131	115	94.5
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 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1952 - 1994	
ANNUAL TOTAL	33546		50364			
ANNUAL MEAN	91.9		138		138	
HIGHEST ANNUAL MEAN					243	1982
LOWEST ANNUAL MEAN					84.7	1984
HIGHEST DAILY MEAN	976	Nov 8	1490	Sep 1	3650	Nov 21 1974
LOWEST DAILY MEAN	33	Sep 22	40	Oct 1	31	Sep 29 1965
ANNUAL SEVEN-DAY MINIMUM	36	Sep 5	46	Mar 4	33	Sep 24 1965
ANNUAL RUNOFF (AC-FT)	66540		99900		100300	
10 PERCENT EXCEEDS	187		291		265	
50 PERCENT EXCEEDS	58		81		78	
90 PERCENT EXCEEDS	40		50		48	



16200000 NORTH FORK KAUKONAHUA STREAM ABOVE RIGHT BRANCH, NEAR WAHIAWA

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

DRAINAGE AREA.--1.38 mi^2.

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

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

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

REMARKS.--Records good.

AVERAGE DISCHARGE.--71 years (water years 1914-24, 1927-52, 1961-94), 16.4 ft^3/s (11,890 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	0800	2,350	8.08	Aug. 31	1930	1,440	6.53
Feb. 15	2230	1,700	7.00	Sep. 18	2300	*2,590	*8.49

Minimum discharge, 1.2 ft^3/s, Jan. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	7.4	61	2.5	3.2	3.9	6.0	17	6.1	79	34	38
2	5.2	3.6	113	2.4	3.0	3.6	5.3	16	7.3	45	7.4	108
3	4.5	8.4	12	2.2	23	3.4	14	8.5	6.6	14	6.1	41
4	4.1	35	11	2.5	29	3.2	21	22	5.7	12	5.9	34
5	3.7	5.1	11	2.2	5.4	3.3	9.4	14	5.0	9.6	6.2	19
6	3.5	3.8	6.2	5.0	5.8	3.1	5.6	7.4	17	8.8	16	70
7	3.2	3.2	5.3	11	3.4	2.8	13	6.3	32	43	22	26
8	2.9	17	4.8	3.9	5.6	2.6	29	5.8	11	12	7.5	68
9	2.7	4.1	4.4	2.1	92	2.6	65	5.3	5.9	8.7	6.4	53
10	10	3.2	3.5	1.7	44	3.5	27	4.8	5.2	10	10	49
11	19	3.6	3.2	1.6	47	2.6	9.9	4.4	4.7	7.3	13	17
12	3.2	2.8	4.6	1.5	198	2.5	8.1	4.2	4.5	12	70	20
13	e3.0	2.7	32	8.7	59	2.2	6.4	24	7.2	7.1	25	54
14	e3.2	2.4	28	3.3	90	2.4	5.8	7.2	17	5.9	8.0	41
15	e5.0	2.2	9.6	1.7	149	2.6	5.2	29	28	63	6.6	25
16	16	7.6	41	1.6	68	2.2	4.7	16	9.9	9.8	7.8	15
17	5.8	10	88	1.4	19	1.9	7.0	12	20	56	13	12
18	3.5	4.3	23	39	12	1.8	13	5.8	20	109	14	223
19	2.9	3.7	9.6	11	9.6	1.6	4.6	72	40	14	14	41
20	2.6	2.4	7.6	43	32	19	46	22	10	10	61	23
21	2.4	2.2	6.0	21	9.6	11	7.3	9.5	7.7	8.8	12	14
22	6.8	2.0	5.0	12	7.0	24	5.8	8.3	45	8.1	20	12
23	59	7.1	4.4	24	6.3	112	54	49	8.5	27	55	12
24	9.4	3.6	4.0	42	5.9	545	30	13	17	74	31	21
25	21	4.5	3.7	77	6.3	55	12	7.2	100	18	14	24
26	7.5	2.4	3.4	12	9.9	17	7.6	21	23	9.4	29	23
27	4.1	4.5	3.2	6.8	5.3	25	7.4	12	15	9.4	11	14
28	3.7	14	3.1	5.5	4.7	24	134	18	9.6	7.3	9.2	18
29	5.5	14	4.4	4.6	---	17	12	10	12	12	8.2	8.7
30	8.2	59	2.8	3.9	---	8.4	9.0	8.3	27	6.9	10	13
31	7.2	---	2.5	3.5	---	6.7	---	7.4	---	7.6	160	---
TOTAL	245.3	245.8	521.3	360.6	953.0	915.9	585.1	467.4	527.9	724.7	713.3	1136.7
MEAN	7.91	8.19	16.8	11.6	34.0	29.5	19.5	15.1	17.6	23.4	23.0	37.9
MAX	59	59	113	77	198	545	134	72	100	109	160	223
MIN	2.4	2.0	2.5	1.4	3.0	1.6	4.6	4.2	4.5	5.9	5.9	8.7
AC-FT	487	488	1030	715	1890	1820	1160	927	1050	1440	1410	2250

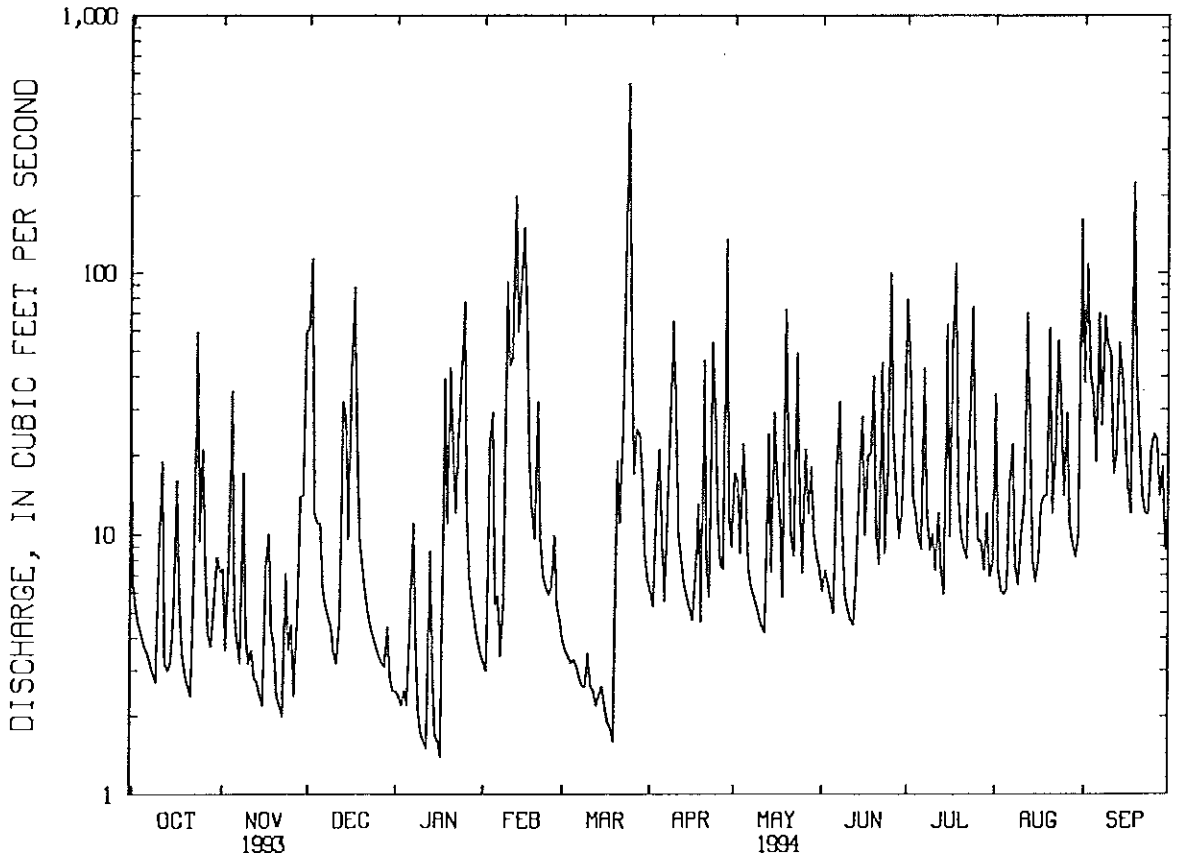
e Estimated

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1994, BY WATER YEAR (WY)

MEAN	12.5	17.0	15.0	14.9	12.8	19.8	20.1	16.4	13.4	18.3	18.4	15.7
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1913 - 1994		
ANNUAL TOTAL	3827.75		7397.0				
ANNUAL MEAN	10.5		20.3		16.4		
HIGHEST ANNUAL MEAN					29.5		1932
LOWEST ANNUAL MEAN					9.11		1984
HIGHEST DAILY MEAN	182	Jul 22	545	Mar 24	975	Feb 27	1935
LOWEST DAILY MEAN	.26	Apr 3	1.4	Jan 17	.12	Mar 13	1941
ANNUAL SEVEN-DAY MINIMUM	.30	Mar 29	2.1	Mar 13	.13	Mar 5	1986
ANNUAL RUNOFF (AC-FT)	7590		14670		11890		
10 PERCENT EXCEEDS	25		49		36		
50 PERCENT EXCEEDS	4.5		8.8		7.1		
90 PERCENT EXCEEDS	1.0		2.8		1.6		



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

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

DRAINAGE AREA.--4.04 mi^2.

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

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

REMARKS.--Records good. Prior to 1960, diversions from reservoirs upstream for use at Schofield Barracks.

AVERAGE DISCHARGE.--32 years (water years, 1961-62, 1965-94), 21.5 ft^3/s (15,600 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	1000	1,230	5.33	Mar. 24	2030	1,380	5.59
Feb. 15	2400	1,300	5.45	Sep. 18	2400	1,110	5.13
Feb. 16	0030	1,430	5.68	Sep. 19	0030	*1,540	*5.85

Minimum discharge, 1.5 ft^3/s, Jan. 17, 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.8	11	40	3.1	e4.0	5.6	13	11	8.8	38	18	52
2	4.7	5.4	151	3.0	e3.7	5.2	11	18	8.4	40	8.5	38
3	4.2	3.6	21	2.7	e28	4.9	21	16	10	15	5.0	44
4	3.8	38	20	3.5	e74	4.6	17	15	7.9	12	4.5	38
5	4.2	8.3	23	4.8	e13	5.0	18	12	7.8	10	4.2	11
6	4.3	4.3	12	5.8	e11	4.7	9.9	8.4	8.1	9.7	4.6	36
7	4.1	3.5	9.7	4.4	e6.8	4.0	12	7.1	13	34	13	45
8	3.8	30	9.1	7.0	e5.5	3.5	23	6.4	11	24	7.1	44
9	3.1	9.8	7.3	2.9	e22	3.3	35	5.9	6.8	11	4.6	36
10	3.4	4.5	6.3	2.2	e31	3.3	68	5.5	6.1	11	3.8	31
11	21	4.6	5.6	1.9	e13	3.5	17	6.4	5.5	9.9	3.6	13
12	4.4	3.5	6.9	1.8	e160	3.0	15	4.7	5.3	12	17	24
13	3.7	4.0	25	2.6	e85	2.6	9.6	5.6	6.1	8.9	26	56
14	4.0	3.2	16	9.1	e201	2.6	8.5	9.5	6.4	7.9	5.3	71
15	4.6	2.8	32	2.8	e55	5.0	7.7	29	10	14	3.8	34
16	33	10	8.5	2.1	e208	3.8	6.7	9.0	8.7	15	3.7	22
17	15	52	43	1.6	e41	3.0	6.0	10	21	47	5.5	15
18	5.5	8.3	17	34	e22	2.4	27	6.5	37	66	11	82
19	3.7	5.1	17	e16	e17	2.2	8.1	75	92	18	10	154
20	3.0	3.7	9.4	e65	e23	35	105	32	20	10	27	27
21	2.6	3.2	7.6	e80	e18	23	19	13	11	7.9	16	20
22	4.9	3.0	6.3	e17	e11	37	15	10	75	7.1	6.9	16
23	28	6.5	5.8	e25	e9.6	157	14	18	17	7.1	11	23
24	14	11	5.2	e35	e8.5	816	20	17	20	29	33	20
25	26	6.4	4.8	e110	7.7	196	9.4	8.8	136	36	10	24
26	15	4.4	4.5	e18	15	45	8.1	53	27	8.0	31	17
27	5.0	5.7	4.0	e9.7	8.9	53	14	26	16	14	9.0	11
28	3.7	26	3.8	e7.0	6.3	30	131	16	12	8.8	5.8	14
29	8.6	25	3.7	e5.5	---	34	22	14	13	6.3	5.5	9.2
30	14	28	3.8	e4.8	---	18	12	15	29	5.8	5.9	13
31	8.1	---	3.3	e4.1	---	15	---	10	---	5.1	66	---
TOTAL	270.2	334.8	532.6	492.4	1109.0	1531.2	703.0	493.8	655.9	548.5	386.3	1040.2
MEAN	8.72	11.2	17.2	15.9	39.6	49.4	23.4	15.9	21.9	17.7	12.5	34.7
MAX	33	52	151	110	208	816	131	75	136	66	66	154
MIN	2.6	2.8	3.3	1.6	3.7	2.2	6.0	4.7	5.3	5.1	3.6	9.2
AC-FT	536	664	1060	977	2200	3040	1390	979	1300	1090	766	2060

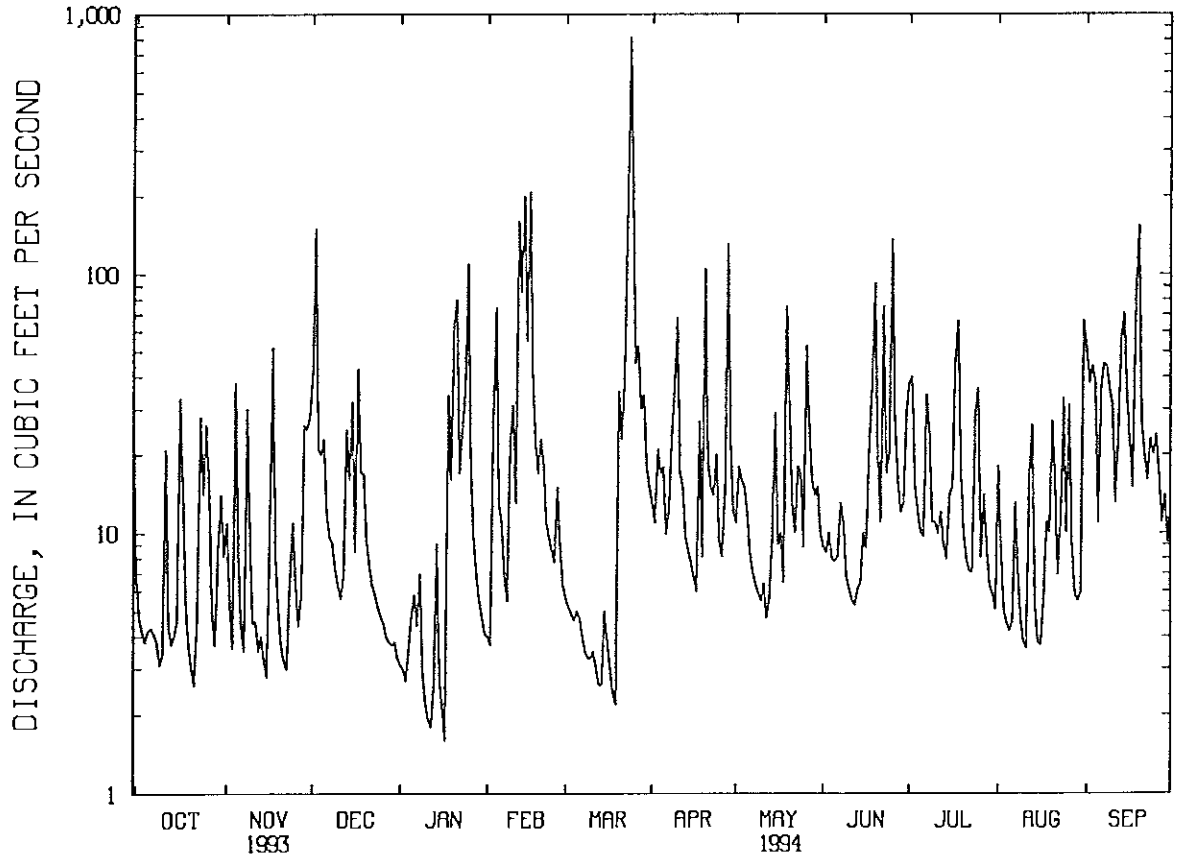
e Estimated

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1994, BY WATER YEAR (WY)

MEAN	16.9	27.7	21.8	20.1	17.3	28.5	31.4	21.2	16.7	25.0	18.4	15.1
MAX	38.0	107	61.7	55.2	99.7	104	90.1	64.9	46.1	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1961 - 1994	
ANNUAL TOTAL	5506.63		8097.9			
ANNUAL MEAN	15.1		22.2		21.5	
HIGHEST ANNUAL MEAN					37.2	1982
LOWEST ANNUAL MEAN					11.1	1984
HIGHEST DAILY MEAN	336	Jul 22	816	Mar 24	1050	Feb 1 1969
LOWEST DAILY MEAN	.23	Apr 2	1.6	Jan 17	.00	Dec 24 1960
ANNUAL SEVEN-DAY MINIMUM	.29	Mar 29	3.1	Mar 13	.00	Jan 19 1977
ANNUAL RUNOFF (AC-FT)	10920		16060		15600	
10 PERCENT EXCEEDS	33		42		50	
50 PERCENT EXCEEDS	6.0		10		8.9	
90 PERCENT EXCEEDS	.97		3.7		1.7	



16211600 MAKAHA STREAM NEAR MAKAHA

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

DRAINAGE AREA.--2.31 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records fair. Honolulu Board of Water Supply wells upstream of gage were put into production this year. Recording rain gage located at station.

AVERAGE DISCHARGE.--35 years, 1.90 ft^3/s (1,370 acre-ft/yr).

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

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1500	*440	*4.30	No other peak greater than base discharge.			

Minimum discharge, No flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	.50	.63	.17	.40	.67	e.59	.57	.24	.23	.00	.09
2	.04	.88	.53	.17	.36	.60	e.59	.54	.22	.20	.00	.17
3	.06	1.6	.51	.17	.43	.54	e.58	.52	.20	.16	.00	.33
4	.05	1.5	1.2	.21	.67	.53	e.57	.59	.18	.13	.00	.38
5	.03	.52	1.4	.22	.43	2.4	e.53	.61	.17	.12	.00	.15
6	.02	.35	.68	2.9	.36	1.1	e.56	.53	.15	.10	.00	.11
7	.03	.29	.44	.59	.32	.73	e.59	.48	.15	.10	.00	.06
8	.02	.50	.32	.41	.31	.59	e.71	.47	.11	.09	.00	.06
9	.01	.48	.27	.31	.27	.51	e.78	.45	.10	.08	.00	.06
10	.01	.49	.23	.26	.22	.47	e1.0	.41	.10	.08	.00	.08
11	.00	.44	.19	.23	.19	4.8	e1.0	.39	.10	.08	.00	.05
12	.00	.31	.24	.21	.34	1.9	e1.4	.38	.10	.05	.00	.04
13	.00	.25	.92	.21	2.7	1.2	e1.3	.33	.09	.05	.00	.72
14	.00	.20	.35	.20	24	1.1	e1.2	.29	.11	.05	.00	1.6
15	.00	.16	.38	.19	3.5	2.2	1.0	.31	.11	.05	.00	2.2
16	.00	.12	.26	.46	10	2.3	.94	.31	.13	.04	.00	1.4
17	.00	.09	.24	1.3	26	2.2	.86	.36	.12	.07	.00	.06
18	.00	.07	.21	6.1	e4.1	1.2	1.1	.35	.13	.79	.00	.04
19	.00	.05	.28	4.0	e2.7	.53	.87	1.1	.28	.30	.00	.67
20	.00	.03	.27	2.5	e2.0	.93	2.9	.93	.29	.24	.00	.47
21	.00	.03	.28	1.9	e1.7	.77	1.5	.49	.25	.20	.00	.26
22	.00	.03	.24	1.3	e1.9	.58	1.2	.38	.22	.18	.00	.19
23	.00	2.7	.24	.97	e1.6	3.6	1.0	.38	.19	.15	.00	.11
24	.00	1.7	.25	2.9	e1.4	126	.88	.32	.16	.12	.00	.06
25	1.9	1.6	.25	3.5	1.2	39	.83	.29	3.8	.09	.00	.03
26	2.9	1.2	.23	1.5	1.0	15	.79	.40	1.1	.03	.11	.00
27	.51	1.7	.21	1.1	.91	10	.62	.62	.52	.02	.00	.00
28	.30	1.3	.20	.81	.78	e5.1	1.4	.43	.34	.02	.00	.00
29	.26	.88	.20	.65	---	e3.2	1.1	.34	.28	.03	.00	.00
30	1.2	.97	.19	.54	---	e1.5	.70	.30	.25	.02	.00	.00
31	.44	---	.18	.46	---	e.90	---	.26	---	.01	.05	---
TOTAL	7.83	20.94	12.02	36.44	89.79	232.15	29.09	14.13	10.19	3.88	0.16	9.39
MEAN	.25	.70	.39	1.18	3.21	7.49	.97	.46	.34	.13	.005	.31
MAX	2.9	2.7	1.4	6.1	26	126	2.9	1.1	3.8	.79	.11	2.2
MIN	.00	.03	.18	.17	.19	.47	.53	.26	.09	.01	.00	.00
AC-FT	16	42	24	72	178	460	58	28	20	7.7	.3	19

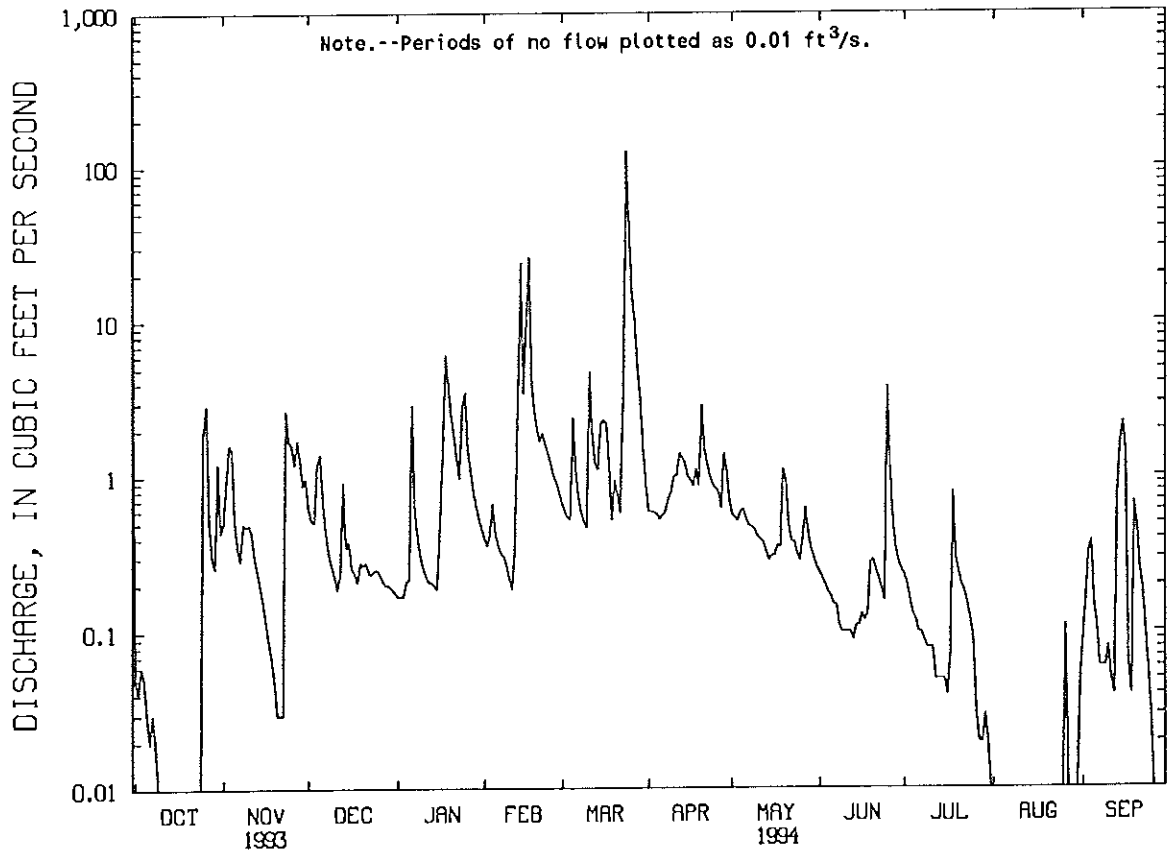
e Estimated

16211600 MAKAHA STREAM NEAR MAKAHA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY)

MEAN	.78	1.62	3.11	4.38	3.59	3.22	2.69	1.51	.65	.51	.39	.40
MAX	3.66	8.67	15.0	22.7	16.3	11.5	15.7	5.33	1.72	1.31	1.44	2.19
(WY)	1983	1966	1965	1982	1976	1962	1963	1965	1978	1986	1983	1974
MIN	.000	.074	.21	.26	.27	.33	.13	.20	.045	.059	.002	.000
(WY)	1976	1978	1960	1977	1978	1993	1993	1984	1993	1975	1975	1961

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1959 - 1994	
ANNUAL TOTAL	180.84		466.01			
ANNUAL MEAN	.50		1.28		1.90	
HIGHEST ANNUAL MEAN					3.80	1963
LOWEST ANNUAL MEAN					.77	1964
HIGHEST DAILY MEAN	7.4	Jan 1	126	Mar 24	283	Feb 7 1976
LOWEST DAILY MEAN	.00	Jun 25	.00	Oct 11	.00	Sep 25 1960
ANNUAL SEVEN-DAY MINIMUM	.00	Jun 25	.00	Oct 11	.00	Aug 28 1961
ANNUAL RUNOFF (AC-FT)	359		924		1370	
10 PERCENT EXCEEDS	1.3		1.7		3.6	
50 PERCENT EXCEEDS	.18		.30		.60	
90 PERCENT EXCEEDS	.00		.00		.08	



16212800 KIPAPA STREAM NEAR WAHIAWA

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

DRAINAGE AREA.--4.29 mi^2.

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

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

REMARKS.--Records fair. At times, a small amount of water is diverted from the gage pool for domestic use. Recording rain gage located at station.

AVERAGE DISCHARGE.--37 years, 11.1 ft^3/s (8,060 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,370 ft^3/s, Mar. 21, 1991, revised, 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)
Feb. 12	0900	1,450	8.00	Mar. 24	1900	1,000	7.06
Feb. 15	2230	1,470	8.03	Sep. 18	2300	*1,530	*8.14

Minimum discharge, 0.61 ft^3/s on Mar. 14, Aug. 11, 12.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	40	56	1.2	2.3	2.6	5.9	6.4	2.1	21	1.8	40
2	9.5	e20	e30	1.2	2.1	2.3	4.6	6.3	1.9	27	2.6	50
3	4.3	e6.5	e15	1.0	11	2.1	8.1	5.0	1.8	6.4	1.4	47
4	3.3	41	e10	.93	32	1.8	4.7	11	1.4	4.2	1.1	47
5	2.7	20	e9.0	2.2	6.9	2.2	4.3	7.6	1.2	2.6	.98	11
6	2.9	8.1	e7.0	6.8	4.1	2.0	3.5	4.4	1.1	2.2	1.3	31
7	2.7	4.8	e5.0	9.9	3.2	1.6	3.3	3.1	1.7	4.7	1.8	36
8	2.1	26	e4.0	5.6	2.8	1.4	17	2.5	3.3	4.6	1.3	14
9	1.9	15	e3.0	1.7	23	1.3	53	2.9	1.5	2.1	.89	22
10	5.6	7.6	e2.5	1.1	43	1.2	31	2.2	1.2	2.8	.76	20
11	17	4.6	2.0	.82	11	1.2	9.8	1.8	1.1	2.2	.68	7.7
12	e3.5	2.9	2.0	.74	152	1.1	9.2	1.6	.90	4.2	17	13
13	e2.5	1.9	11	6.2	73	.83	4.9	3.1	.84	2.1	16	31
14	11	1.5	14	e6.3	149	.85	4.2	3.3	.92	1.3	2.2	29
15	27	1.2	18	1.5	99	1.2	3.9	7.8	4.5	9.2	1.2	12
16	e9.0	2.4	4.0	1.1	120	1.2	3.2	4.0	4.4	9.4	.86	7.0
17	e6.2	25	33	.80	35	1.1	5.2	5.3	9.1	7.6	.75	4.8
18	e5.8	11	17	40	16	.89	25	2.1	12	28	6.2	114
19	e4.0	11	10	15	11	.74	4.6	16	27	6.6	5.8	73
20	e3.4	6.9	5.1	72	8.1	1.5	35	17	8.2	3.3	12	25
21	e3.0	4.4	3.9	26	6.6	3.0	10	4.3	2.8	2.1	4.5	17
22	e2.8	2.8	3.1	8.0	5.4	5.0	5.5	2.7	9.0	1.6	2.0	9.2
23	31	22	3.0	11	4.5	125	7.1	3.4	4.0	3.7	21	9.0
24	21	19	2.6	37	3.8	535	14	8.1	2.3	53	29	7.4
25	35	10	2.1	135	7.6	128	7.0	2.7	51	25	4.3	6.7
26	25	6.5	1.9	17	20	29	5.1	17	21	5.0	7.3	5.8
27	e10	9.3	1.6	8.3	5.0	26	3.3	21	6.5	4.0	3.5	4.3
28	e4.0	e11	1.5	5.6	3.0	16	79	7.7	3.7	3.0	1.9	7.6
29	21	e15	1.6	4.1	---	29	16	6.8	3.1	2.8	1.6	3.7
30	32	38	2.0	3.2	---	10	7.6	4.0	5.2	2.6	1.9	2.9
31	29	---	1.4	2.6	---	7.5	---	2.8	---	1.8	88	---
TOTAL	354.2	395.4	282.3	433.89	860.4	942.61	395.0	193.9	194.76	256.1	241.62	708.1
MEAN	11.4	13.2	9.11	14.0	30.7	30.4	13.2	6.25	6.49	8.26	7.79	23.6
MAX	35	41	56	135	152	535	79	21	51	53	88	114
MIN	1.9	1.2	1.4	.74	2.1	.74	3.2	1.6	.84	1.3	.68	2.9
AC-FT	703	784	560	861	1710	1870	783	385	386	508	479	1400

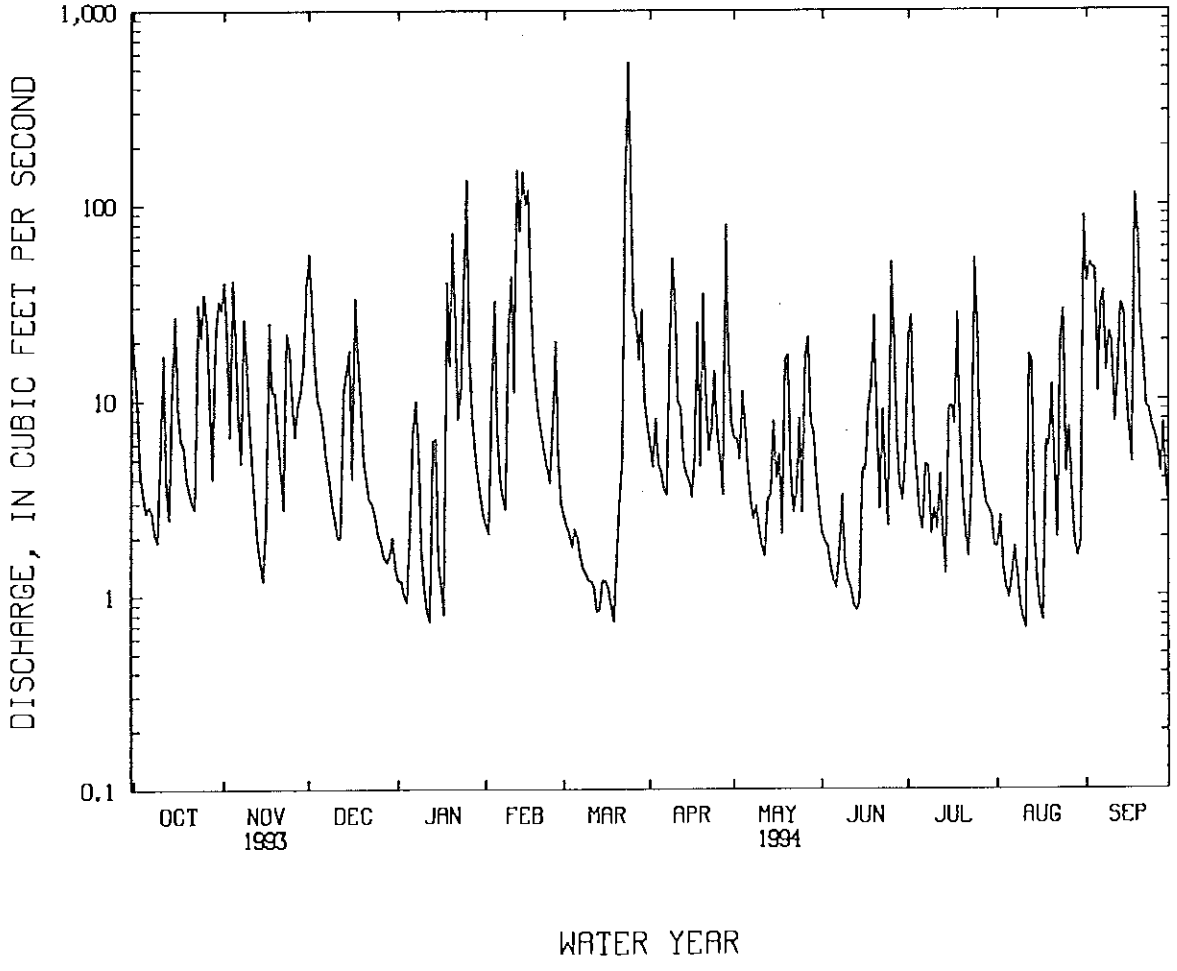
e Estimated

16212800 KIPAPA STREAM NEAR WAHIAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1957 - 1994, BY WATER YEAR (WY)

MEAN	10.3	15.0	12.9	11.2	10.6	17.1	15.6	9.70	5.42	9.89	8.49	6.37
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	.54
(WY)	1958	1963	1990	1977	1978	1983	1966	1992	1959	1968	1971	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1957 - 1994	
ANNUAL TOTAL	3194.35		5258.28			
ANNUAL MEAN	8.75		14.4		11.1	
HIGHEST ANNUAL MEAN					25.2	1982
LOWEST ANNUAL MEAN					4.50	1984
HIGHEST DAILY MEAN	203	Jul 22	535	Mar 24	852	Apr 15 1963
LOWEST DAILY MEAN	.00	Mar 28	.68	Aug 11	.00	Jun 18 1959
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 28	.97	Mar 13	.00	Jun 18 1959
ANNUAL RUNOFF (AC-FT)	6340		10430		8060	
10 PERCENT EXCEEDS	24		31		25	
50 PERCENT EXCEEDS	3.1		5.0		2.9	
90 PERCENT EXCEEDS	.27		1.3		.33	



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

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

DRAINAGE AREA.--45.7 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE.--41 years (water years 1953-59, 1961-94), 41.0 ft^3/s (29,730 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	1030	1,790	5.29	Mar. 24	2030	*2,820	*6.32
Feb. 14	0530	2,380	5.88	Sep. 19	0030	2,080	5.58
Feb. 16	0100	1,460	4.92				

Minimum discharge, 12 ft^3/s, Oct. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

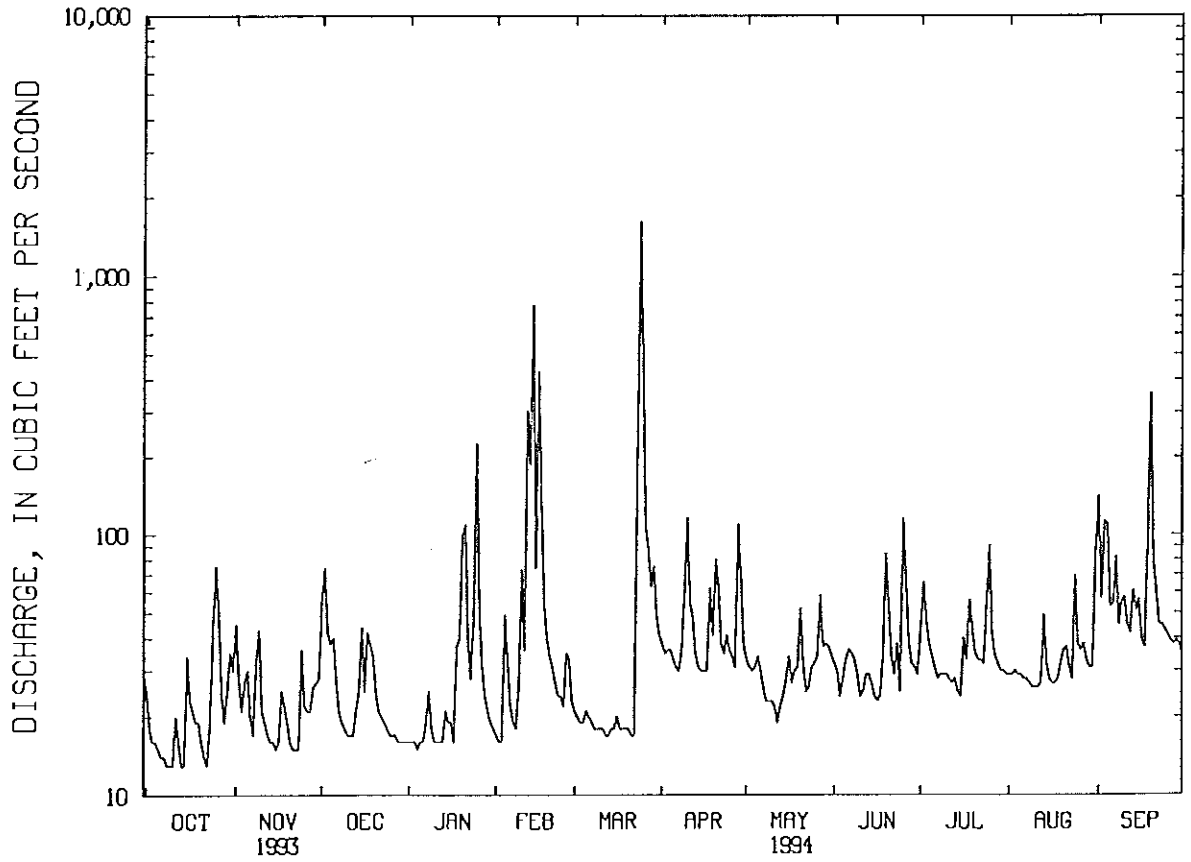
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	25	45	57	16	17	21	38	33	32	42	29	140
2	18	28	74	16	16	20	35	31	30	65	29	57
3	16	21	42	16	16	19	36	30	24	47	30	112
4	16	27	38	15	49	19	36	31	28	38	29	110
5	15	30	40	16	33	21	33	34	33	34	29	53
6	14	20	28	16	22	20	31	30	36	31	28	54
7	14	17	21	19	19	19	30	26	35	28	28	82
8	13	33	19	25	18	18	36	23	33	29	27	45
9	13	43	18	18	26	18	60	23	29	29	26	55
10	13	21	17	16	73	18	116	23	24	29	26	57
11	20	19	17	16	36	18	55	22	25	28	26	45
12	16	17	17	16	303	17	48	19	29	27	27	42
13	13	16	21	16	187	17	35	22	29	28	49	61
14	13	16	25	21	775	18	31	24	27	25	32	51
15	34	15	44	19	74	18	30	28	24	24	28	56
16	23	16	25	19	428	20	30	34	23	40	27	39
17	21	25	42	16	129	18	30	27	24	33	27	37
18	19	22	38	37	54	18	62	30	34	56	28	93
19	19	19	34	40	40	18	41	31	84	43	32	353
20	16	16	25	99	34	18	80	52	54	35	36	79
21	14	15	21	109	31	17	63	32	34	33	37	60
22	13	15	20	39	27	17	38	25	29	33	31	45
23	19	15	19	28	24	178	35	26	38	32	28	45
24	44	36	18	47	24	1620	41	31	25	54	69	43
25	75	22	17	225	22	481	36	32	115	91	38	41
26	50	21	17	54	35	107	34	34	68	41	36	39
27	25	21	17	31	33	88	31	58	39	34	38	38
28	19	26	16	24	23	63	110	37	32	32	33	39
29	25	27	16	21	---	75	69	38	31	30	31	38
30	35	28	16	19	---	49	38	37	29	30	31	35
31	30	---	16	18	---	41	---	34	---	29	85	---
TOTAL	700	692	835	1087	2568	3109	1388	957	1097	1150	1050	2044
MEAN	22.6	23.1	26.9	35.1	91.7	100	46.3	30.9	36.6	37.1	33.9	68.1
MAX	75	45	74	225	775	1620	116	58	115	91	85	353
MIN	13	15	16	15	16	17	30	19	23	24	26	35
AC-FT	1390	1370	1660	2160	5090	6170	2750	1900	2180	2280	2080	4050

16213000 WAIKELE STREAM AT WAIPAHU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1994, BY WATER YEAR (WY)

MEAN	32.5	47.7	51.2	61.8	57.3	56.1	51.0	33.7	23.5	29.2	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1953 - 1994	
ANNUAL TOTAL	9259		16677			
ANNUAL MEAN	25.4		45.7		41.0	
HIGHEST ANNUAL MEAN					77.3	1969
LOWEST ANNUAL MEAN					18.5	1954
HIGHEST DAILY MEAN	358	Jul 22	1620	Mar 24	2590	Mar 21 1991
LOWEST DAILY MEAN	11	Jun 24	13	Oct 8	.61	Feb 25 1978
ANNUAL SEVEN-DAY MINIMUM	12	Jun 20	14	Oct 4	2.5	Feb 24 1978
ANNUAL RUNOFF (AC-FT)	18370		33080		29730	
10 PERCENT EXCEEDS	42		64		65	
50 PERCENT EXCEEDS	18		30		24	
90 PERCENT EXCEEDS	12		16		12	



16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER-QUALITY RECORDS

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

PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: April 1973 to September 1981.
WATER TEMPERATURE: April 1973 to September 1981.
SUSPENDED SEDIMENT DISCHARGE: July 1972 to August 1993.

INSTRUMENTATION.--Water-quality monitor April 1973 to September 1981. Automatic pumping sediment sampler July 1972 to August 1993.

REMARKS.--Water-quality samples are collected bimonthly.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SPECIFIC CONDUCTANCE: Maximum, 796 micromhos/cm, Dec. 1, 1980; minimum, 30 micromhos/cm, Apr. 19, 1974.
WATER TEMPERATURES: Maximum, 30.0°C, May 6, 1973; minimum, 16.0°C, Mar. 16, 1976.
SEDIMENT CONCENTRATIONS: Maximum daily mean, 3,420 mg/L, Feb. 7, 1976; minimum daily mean, 1 mg/L, Mar. 16, 20-22, 1989, July 10, 1990.
SEDIMENT DISCHARGE: Maximum daily, 32,900 tons, Apr. 19, 1974; minimum daily, less than 0.01 ton, Aug. 29, 30, 1992.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
OCT										
27...	1125	24	360	7.4	20.5	21.5	10	765	7.7	87
JAN										
05...	1020	16	460	7.2	--	21.5	1.5	765	8.9	101
FEB										
09...	1200	17	425	7.6	24.0	21.5	1.6	760	5.0	57
APR										
13...	1105	36	305	a7.3	28.0	21.5	2.7	766	8.5	96
JUN										
08...	1100	34	348	7.3	27.0	22.0	4.7	769	6.6	75
AUG										
10...	1000	27	360	7.4	28.0	22.5	5.2	761	7.5	87

DATE	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREPTOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARDNESS TOTAL (MG/L AS CACO3)	HARDNESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)
OCT										
27...	K6900	K180000	55	13	10	7.3	35	57	2	2.0
JAN										
05...	K470	460	75	19	12	11	58	62	3	2.5
FEB										
09...	67	240	67	14	11	9.6	51	61	3	2.4
APR										
13...	540	1100	57	13	10	7.7	34	56	2	2.0
JUN										
08...	35000	16000	65	13	11	9.1	38	55	2	1.8
AUG										
10...	390	430	65	13	11	9.1	40	56	2	1.8

a Laboratory value
K Results based on colony count outside acceptance range

16213000 WAIKELE STREAM AT WAIPAHU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	BICARBONATE WATER DIS IT FIELD MG/L AS HCO3	CARBONATE WATER DIS IT FIELD MG/L AS CO3	ALKALINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
OCT 27...	51	0	42	13	50	0.20	37	194	184	0.26
JAN 05...	69	0	56	17	94	0.20	65	305	301	0.41
FEB 09...	65	0	53	17	80	0.10	50	261	260	0.35
APR 13...	53	0	44	12	52	0.10	33	186	181	0.25
JUN 08...	63	0	52	12	59	0.10	45	189	211	0.26
AUG 10...	64	0	53	13	64	0.10	46	223	222	0.30

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)	ALUMINUM, DISSOLVED (UG/L AS AL)	BARIUM, DISSOLVED (UG/L AS BA)	COBALT, DISSOLVED (UG/L AS CO)
OCT 27...	0.810	0.810	0.030	0.20	0.130	0.090	0.110	80	5	<3
JAN 05...	1.60	1.60	0.050	<0.20	0.200	0.180	0.210	--	--	--
FEB 09...	1.30	1.30	0.030	<0.20	0.190	0.170	0.170	10	6	<3
APR 13...	0.770	0.770	0.030	<0.20	0.100	0.090	0.090	20	5	<3
JUN 08...	0.730	0.730	0.020	<0.20	0.130	0.090	0.090	--	--	--
AUG 10...	0.990	0.990	0.040	<0.20	0.140	0.130	0.120	50	5	<3

DATE	TIME	IRON, DISSOLVED (UG/L AS FE)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)
OCT 27...	1125	110	<4	60	<10	<1	<1	<1.0	69	19
FEB 09...	1200	41	<4	54	<10	<1	<1	<1.0	78	30
APR 13...	1105	65	<4	44	<10	1	<1	<1.0	68	16
AUG 10...	1000	46	<4	34	<10	<1	<1	<1.0	74	23

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	SEDIMENT, SUSPENDED (MG/L) (80154)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY) (80155)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM (70331)
OCT 27...	1125	26	1.7	100
FEB 09...	1200	14	0.66	100
APR 13...	1105	7	0.67	100
JUN 08...	1100	16	1.4	100
AUG 10...	1000	6	0.44	98

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

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.

REMARKS.--Records poor. Occasional small irrigation diversion and return flow upstream.

AVERAGE DISCHARGE.--42 years, 34.8 ft^3/s (25,210 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 27,900 ft^3/s, Oct. 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 and 1985.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0830	4,870	11.59	Mar. 24	1930	9,570	15.04
Feb. 12	0930	7,260	13.54	June 25	1200	3,890	10.64
Feb. 14	0630	5,950	12.54	July 24	2130	3,610	10.36
Feb. 15	2330	7,900	14.00	Sep. 18	2330	*14,270	*17.28

Minimum discharge, 1.2 ft^3/s, Oct. 14, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.9	46	64	e1.8	2.1	2.7	16	14	9.9	21	10	127
2	e6.0	12	48	e1.7	1.9	2.4	13	14	8.8	29	9.9	157
3	e3.0	6.4	18	e1.7	1.9	2.3	12	12	8.8	19	9.7	102
4	e2.5	26	11	e1.6	33	2.3	12	18	8.3	13	9.7	55
5	e2.8	10	9.4	e1.6	14	2.6	13	13	8.0	12	10	18
6	e2.3	4.2	6.2	e4.0	6.4	2.2	11	12	8.0	11	8.8	25
7	e2.0	2.7	4.0	e8.0	3.7	2.2	10	12	9.4	12	9.3	50
8	e1.9	86	3.3	e3.0	2.5	2.0	24	11	8.8	18	9.2	19
9	e1.5	22	2.9	e2.5	3.0	2.0	80	10	8.5	12	9.0	24
10	e4.0	7.3	2.8	e1.8	21	2.0	78	9.7	8.5	11	9.0	23
11	e11	4.3	2.7	e1.6	12	2.0	26	9.2	8.5	10	9.4	11
12	e4.0	3.0	2.7	e1.6	793	1.9	24	8.9	8.5	10	27	22
13	e2.5	2.5	7.4	e2.0	130	1.9	13	9.0	8.8	10	35	78
14	e1.4	2.3	6.7	e5.0	1420	1.9	11	9.0	8.8	10	16	41
15	17	2.2	57	e2.5	306	1.9	10	9.7	8.5	81	13	30
16	7.2	2.2	8.4	e1.6	793	2.0	9.9	9.8	9.1	34	11	12
17	3.0	17	66	1.5	138	2.0	9.7	9.8	10	17	8.3	7.4
18	1.8	5.8	25	125	38	2.0	27	9.7	52	109	8.1	848
19	1.5	3.1	30	34	22	2.0	11	14	109	27	8.2	637
20	1.5	2.5	11	285	17	2.0	117	32	29	17	9.7	53
21	1.4	2.3	6.7	90	12	2.0	38	15	17	13	13	35
22	1.4	2.3	4.3	19	7.8	2.0	17	11	26	12	8.3	17
23	36	2.2	3.4	18	5.4	508	13	10	20	11	20	19
24	21	5.1	e3.0	138	4.1	5150	42	10	13	385	83	11
25	39	2.8	e2.6	1310	3.3	1040	18	11	360	144	12	9.2
26	25	2.4	e2.4	55	19	142	13	45	73	24	13	8.9
27	7.5	2.4	e2.1	20	8.1	106	11	39	27	18	12	7.9
28	3.6	3.3	e2.0	11	3.7	50	274	21	18	14	8.6	12
29	15	4.9	e2.0	6.7	---	77	46	18	15	12	8.5	e12
30	38	8.1	e2.0	4.2	---	30	19	14	15	11	8.5	e6.1
31	20	---	e1.9	2.8	---	21	---	12	---	11	176	---
TOTAL	294.7	303.3	418.9	2162.2	3821.9	7170.3	1018.6	452.8	923.2	1138	603.2	2477.5
MEAN	9.51	10.1	13.5	69.7	136	231	34.0	14.6	30.8	36.7	19.5	82.6
MAX	39	86	66	1310	1420	5150	274	45	360	385	176	848
MIN	1.4	2.2	1.9	1.5	1.9	1.9	9.7	8.9	8.0	10	8.1	6.1
AC-FT	585	602	831	4290	7580	14220	2020	898	1830	2260	1200	4910

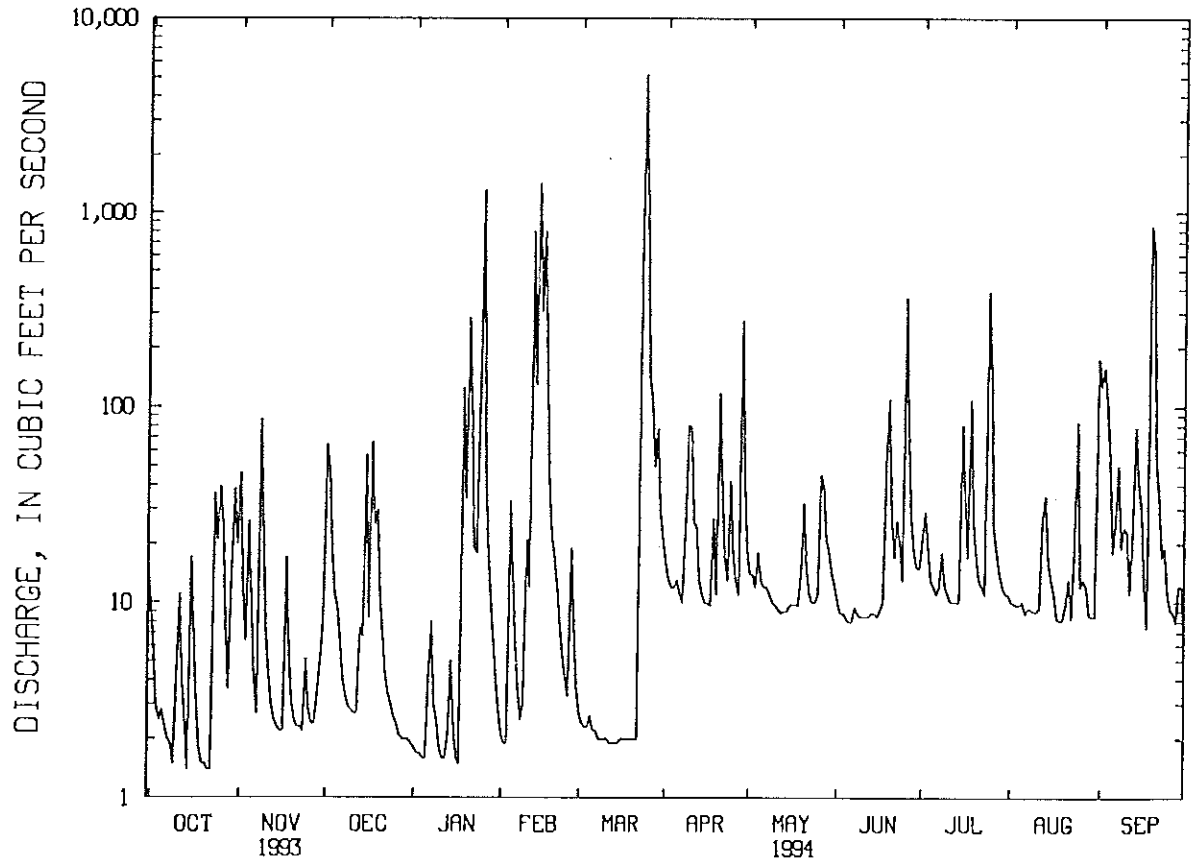
e Estimated

16216000 WAIAWA STREAM NEAR PEARL CITY--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1952 - 1994, BY WATER YEAR (WY)

MEAN	30.3	50.7	47.1	45.3	41.1	56.3	42.3	25.3	14.4	27.6	21.6	14.6
MAX	131	209	351	199	208	336	241	131	72.9	149	128	104
(WY)	1967	1991	1988	1969	1955	1980	1974	1965	1987	1970	1982	1992
MIN	1.55	2.54	1.92	1.65	1.66	1.56	1.75	1.62	1.43	1.40	1.28	1.28
(WY)	1985	1990	1984	1986	1986	1993	1992	1992	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1952 - 1994	
ANNUAL TOTAL	5804.7		20784.6			
ANNUAL MEAN	15.9		56.9		34.8	
HIGHEST ANNUAL MEAN					80.8	1982
LOWEST ANNUAL MEAN					7.56	1984
HIGHEST DAILY MEAN	1200	Jul 22	5150	Mar 24	5150	Mar 24 1994
LOWEST DAILY MEAN	1.1	May 18	1.4	Oct 14	1.1	May 18 1993
ANNUAL SEVEN-DAY MINIMUM	1.1	May 25	1.8	Dec 30	1.1	May 25 1993
ANNUAL RUNOFF (AC-FT)	11510		41230		25210	
10 PERCENT EXCEEDS	26		75		48	
50 PERCENT EXCEEDS	2.5		10		6.7	
90 PERCENT EXCEEDS	1.4		2.0		2.4	



16225800 NORTH HALAWA STREAM NEAR KANEOHE

LOCATION.--Lat 21°24'33", long 157°52'06", (Kaneohe quadrangle, 1968, 1:24,000), on right bank, 4.1 miles west of Kaneohe Post Office, and 4.4 miles east of Aiea High School.

DRAINAGE AREA.--1.64 mi^2.

PERIOD OF RECORD.--April 1991 to current year.

GAGE.--Water-stage recorder. Gage datum is 646.52 ft above mean sea level.

REMARKS.--Records fair. Suspended sediment data are collected at this site.

AVERAGE DISCHARGE- 4 years (Water Years 1991-94), 3.10 ft^3/s (2,250 acre ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 468 ft^3/s, Oct. 16, 1991, gage height, 6.92 ft; no flow at times each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 250 ft^3/s and maximum (*)

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0330	338	5.76	Mar. 24	1815	439	6.64
Feb. 9	1730	310	5.53	June 25	1000	361	5.95
Feb. 12	0800	313	5.56	July 24	2000	300	5.46
Feb. 14	0515	283	5.34	Sep. 18	2130	*460	*6.84
Feb. 15	2145	416	6.43				

Minimum discharge, No flow on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.40	2.2	5.9	.00	.56	.68	1.9	2.5	.66	.77	.44	7.0
2	.19	1.3	1.6	.00	.48	.66	1.6	2.5	.78	1.6	.43	6.7
3	.14	17	.65	.02	1.5	.57	1.5	1.8	.62	.75	.37	9.5
4	.17	10	.46	.05	4.3	.56	2.5	6.1	.51	.54	.38	6.9
5	.14	2.0	.45	.05	1.6	.74	1.8	2.3	.48	.49	.34	2.2
6	.10	.92	.29	.27	1.0	.60	1.3	1.4	.58	.54	.38	2.1
7	.07	.57	.14	2.9	.66	.53	1.2	1.1	e.52	.97	.35	2.0
8	.05	8.2	.07	.42	.68	.49	4.2	.96	e.40	.69	.31	4.1
9	.15	1.3	.04	.11	22	.49	9.2	.86	e.32	.47	.28	2.6
10	.14	.65	.02	.07	6.4	.50	9.6	.78	e.27	.57	.26	1.3
11	.13	.43	.01	.05	2.5	.47	4.0	.71	.38	.45	.28	.99
12	.07	.38	.30	.00	29	.44	2.4	.67	.36	1.2	9.4	5.6
13	.08	.26	2.5	.23	14	.37	1.8	1.1	.37	.52	1.6	4.7
14	.49	.18	4.4	.20	56	.47	1.5	.85	.52	.41	.43	3.0
15	7.4	.20	1.9	.10	27	.43	1.4	.83	.49	7.3	.27	1.7
16	.53	.57	.62	.07	22	.34	1.2	.73	.46	1.5	.25	.92
17	.45	.61	10	3.4	9.1	.33	2.1	.67	1.9	3.0	.34	.50
18	.25	.32	5.7	44	3.1	.30	6.5	.79	7.8	5.2	1.4	54
19	.15	.24	2.3	7.9	2.7	.31	2.0	3.0	17	1.4	2.0	14
20	.08	.23	.70	25	2.1	1.6	7.9	1.6	3.1	.76	6.8	6.2
21	.05	.14	.42	6.6	1.4	.80	3.9	.91	1.4	.49	1.7	3.6
22	.05	.09	.27	2.0	1.1	3.7	2.0	.71	4.6	.44	.73	2.5
23	31	.74	.20	4.5	.97	52	1.7	.73	1.3	2.1	6.3	1.8
24	3.4	.36	.15	41	.87	213	1.6	1.0	.91	39	4.2	1.2
25	16	.52	.14	98	2.8	45	1.7	.76	29	8.0	1.3	1.1
26	3.8	.25	.10	6.7	4.7	11	1.7	6.1	5.7	1.8	.95	.92
27	1.1	.25	.12	2.9	1.2	9.8	1.5	3.5	2.2	1.8	.53	.90
28	.55	.49	.13	1.6	.77	7.3	32	1.6	1.2	.77	.40	.76
29	.54	.46	.11	1.1	---	12	4.1	1.0	.94	.59	.30	.61
30	4.1	1.1	.05	.80	---	3.4	2.3	.75	.74	.45	.23	.55
31	2.7	---	.00	.62	---	2.7	---	1.1	---	.35	23	---
TOTAL	74.47	51.96	39.74	250.66	220.49	371.58	118.1	49.41	85.51	84.92	65.95	149.95
MEAN	2.40	1.73	1.28	8.09	7.87	12.0	3.94	1.59	2.85	2.74	2.13	5.00
MAX	31	17	10	98	56	213	32	6.1	29	39	23	54
MIN	.05	.09	.00	.00	.48	.30	1.2	.67	.27	.35	.23	.50
AC-FT	148	103	79	497	437	737	234	98	170	168	131	297

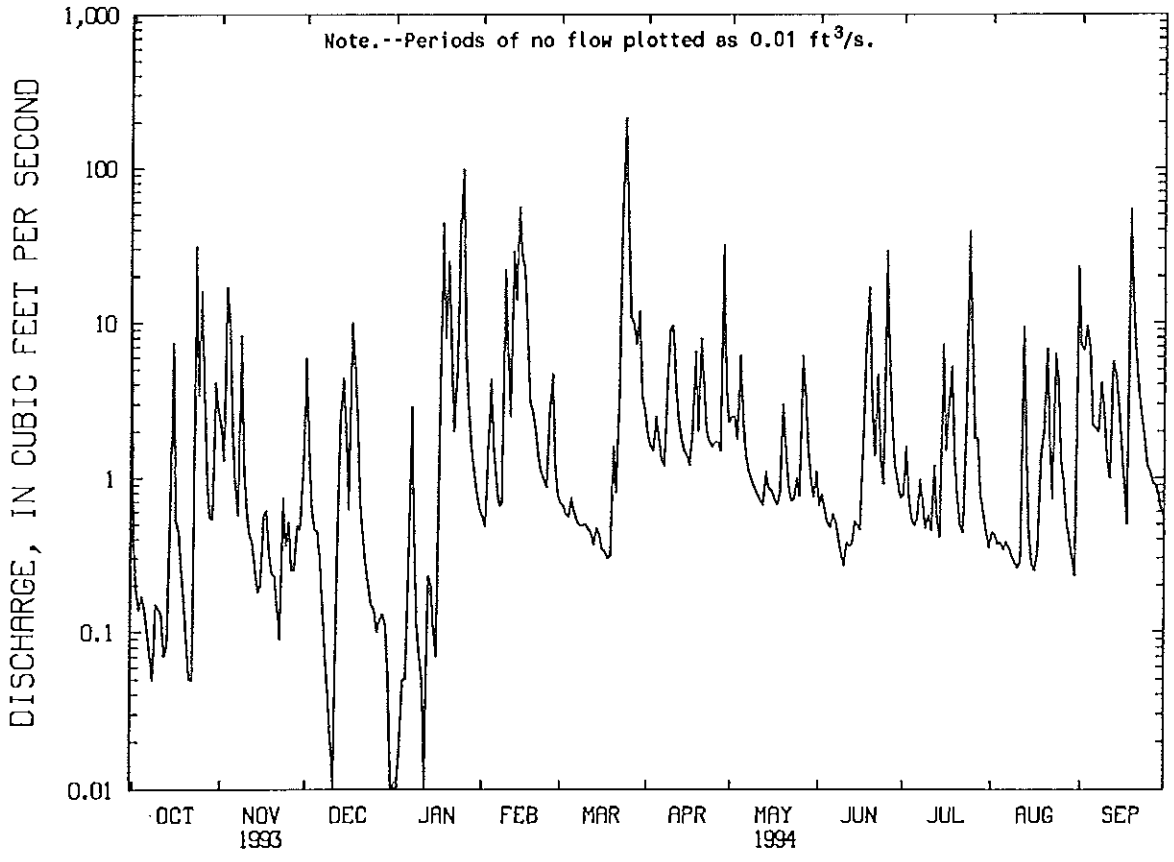
e Estimated

16225800 NORTH HALAWA STREAM NEAR KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1994, BY WATER YEAR (WY)

MEAN	3.78	3.19	3.69	3.32	2.85	4.50	1.65	.75	1.25	3.80	2.76	5.21
MAX	4.48	7.27	6.89	8.09	7.87	12.0	3.94	1.59	2.85	7.07	5.97	12.3
(WY)	1992	1993	1993	1994	1994	1994	1994	1994	1994	1993	1991	1992
MIN	2.40	.56	1.28	.81	.25	.20	.018	.033	.11	2.69	1.13	1.53
(WY)	1994	1992	1994	1992	1993	1993	1992	1992	1992	1991	1992	1991

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1991 - 1994	
ANNUAL TOTAL	615.01		1562.74			
ANNUAL MEAN	1.68		4.28		3.10	
HIGHEST ANNUAL MEAN					4.28	1994
LOWEST ANNUAL MEAN					2.23	1992
HIGHEST DAILY MEAN	96	Jul 22	213	Mar 24	213	Mar 24 1994
LOWEST DAILY MEAN	.00	May 26	.00	Dec 31	.00	Nov 28 1991
ANNUAL SEVEN-DAY MINIMUM	.00	May 26	.02	Dec 30	.00	Jan 24 1992
ANNUAL RUNOFF (AC-FT)	1220		3100		2250	
10 PERCENT EXCEEDS	3.8		7.9		6.6	
50 PERCENT EXCEEDS	.25		.90		.49	
90 PERCENT EXCEEDS	.01		.14		.00	



16225800 NORTH HALAWA STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--April 1991 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: April 1991 to current year.

INSTRUMENTATION.--Automatic pumping sediment sampler since September 1991.

REMARKS.--Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

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16226000 NORTH HALAWA STREAM NEAR AIEA

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

DRAINAGE AREA.--3.45 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--44 years (water years 1930-32, 1954-94), 5.52 ft^3/s (4,000 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1840	*1,100	*10.34	Sep. 18	1955	743	9.41

Minimum discharge, 0.01 ft^3/s on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.73	3.7	7.2	.01	.48	.63	2.8	3.1	.67	.92	.22	13
2	.31	2.1	3.7	.01	.32	.51	2.0	3.1	.49	1.7	.14	9.0
3	.09	11	1.8	.01	1.6	.42	1.6	2.3	.51	.91	.09	13
4	.04	12	.97	.01	9.9	.38	2.3	7.2	.28	.44	.07	11
5	.02	2.8	.70	.01	4.1	.60	2.1	3.2	.19	.22	.04	2.9
6	.02	1.4	.38	.01	2.3	.49	1.2	1.6	.15	.18	.06	2.6
7	.01	.73	.18	1.4	1.2	.29	1.1	1.1	.13	.84	.07	2.7
8	.02	7.6	.08	.37	.99	.17	4.3	.80	.11	.81	.06	5.4
9	.01	2.4	.04	.01	14	.09	9.6	.64	.10	.28	.05	4.4
10	.01	1.1	.02	.01	11	.10	12	.47	.08	.15	.06	2.0
11	.02	.68	.02	.01	4.1	.08	5.2	.34	.03	.10	.05	1.1
12	.01	.37	.03	.01	40	.08	3.0	.25	.03	.52	8.2	6.9
13	.01	.21	1.7	.01	23	.05	1.9	.56	.02	.19	2.2	7.4
14	.01	.10	3.1	.01	102	.06	1.3	.70	.02	.08	.21	4.4
15	7.4	.03	3.1	.01	33	.05	1.0	.59	.02	8.1	.03	3.1
16	1.1	.09	.84	.01	44	.04	.85	.30	.02	2.0	.02	1.4
17	.89	1.0	9.4	.01	28	.04	.84	.32	.50	3.2	.02	.82
18	.33	.27	5.6	39	11	.03	6.8	.25	10	7.4	.43	62
19	.12	.12	4.6	16	6.0	.02	1.8	4.0	28	1.9	1.4	31
20	.03	.03	1.6	39	4.4	1.3	14	3.3	6.6	.86	7.8	9.5
21	.01	.02	.81	21	2.5	.62	6.5	1.3	2.4	.36	2.4	6.0
22	.01	.02	.43	5.8	1.7	6.6	3.0	.72	8.1	.14	.72	3.3
23	21	.60	.22	7.7	1.3	63	1.9	.51	2.4	.83	6.2	2.4
24	4.0	.63	.09	38	1.1	310	1.9	.70	1.5	48	7.1	1.3
25	18	.58	.03	111	2.4	e110	1.6	.42	40	22	1.4	1.1
26	7.7	.37	.02	20	5.8	e30	1.6	7.6	13	4.4	1.1	.65
27	2.2	.14	.02	7.3	1.4	e16	1.4	6.1	4.3	3.0	.46	.76
28	1.1	.38	.02	3.5	.80	e12	40	2.5	2.1	1.3	.13	.64
29	1.0	.63	.02	1.9	---	19	9.7	1.4	1.3	.78	.04	.33
30	4.2	1.7	.01	1.1	---	6.4	4.0	.87	.91	.45	.02	.19
31	3.3	---	.01	.69	---	4.1	---	1.2	---	.22	25	---
TOTAL	73.70	52.80	46.74	313.91	358.39	583.15	147.29	57.44	123.96	112.28	65.79	210.29
MEAN	2.38	1.76	1.51	10.1	12.8	18.8	4.91	1.85	4.13	3.62	2.12	7.01
MAX	21	12	9.4	111	102	310	40	7.6	40	48	25	62
MIN	.01	.02	.01	.01	.32	.02	.84	.25	.02	.08	.02	.19
AC-FT	146	105	93	623	711	1160	292	114	246	223	130	417

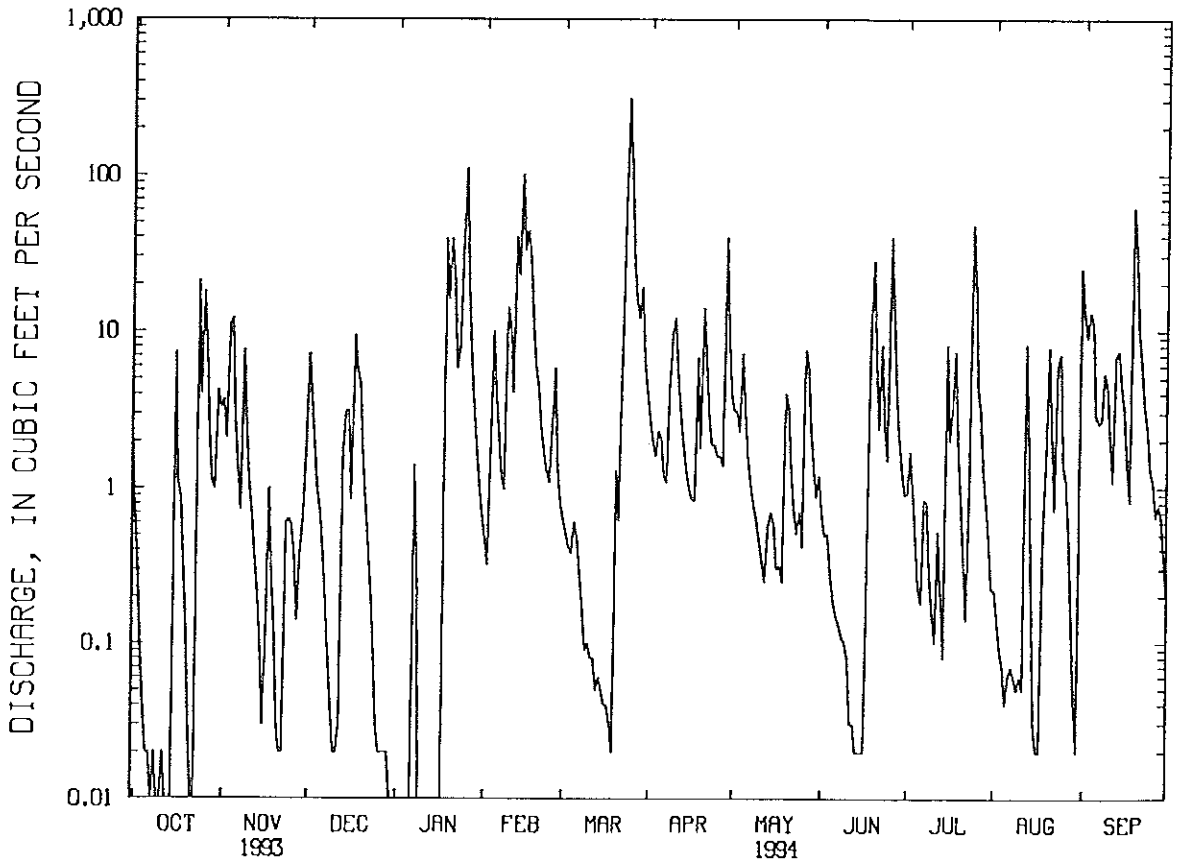
e Estimated

16226000 NORTH HALAWA STREAM NEAR AIEA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1929 - 1994, BY WATER YEAR (WY)

MEAN	3.56	7.88	8.05	6.67	8.39	8.50	7.19	5.02	1.79	3.78	3.77	2.25
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1929 - 1994		
ANNUAL TOTAL	838.24		2145.74				
ANNUAL MEAN	2.30		5.88		5.52		
HIGHEST ANNUAL MEAN					15.7		1932
LOWEST ANNUAL MEAN					1.41		1984
HIGHEST DAILY MEAN	94	Jul 22	310	Mar 24	956	Nov 18	1930
LOWEST DAILY MEAN	.00	Feb 28	.01	Oct 7	.00	Sep 14	1929
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 23	.01	Dec 30	.00	Sep 14	1929
ANNUAL RUNOFF (AC-FT)	1660		4260		4000		
10 PERCENT EXCEEDS	5.4		12		11		
50 PERCENT EXCEEDS	.11		.97		.39		
90 PERCENT EXCEEDS	.00		.02		.00		



16226200 NORTH HALAWA STREAM NEAR HONOLULU

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

DRAINAGE AREA.--4.01 mi^2.

WATER-DISCHARGE RECORDS

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

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

REMARKS.--Records fair.

AVERAGE DISCHARGE.--11 Years, 5.55 ft^3/s (4,020 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1915	*1,640	*11.85	Sep. 18	2215	985	10.86

Minimum discharge, no flow on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.1	3.9	6.6	e.01	.58	.57	3.2	3.1	e.80	.85	.16	13
2	.48	2.2	3.8	e.01	.37	.45	2.5	3.1	e.50	1.7	.12	7.0
3	.21	9.0	2.0	e.01	1.1	.36	1.9	2.6	e.52	1.1	.07	10
4	.10	14	1.2	e.01	9.1	.27	2.1	6.6	e.28	.47	.06	11
5	.05	2.9	.81	e.01	5.0	.41	2.5	3.5	e.20	.29	.05	3.0
6	.03	1.4	.59	e1.5	3.0	.44	1.3	2.2	e.16	.14	.04	2.5
7	.03	.79	.37	e.40	1.8	.22	1.1	1.4	e.13	.56	.04	2.6
8	.04	7.0	.24	e.01	1.4	.13	3.4	.96	e.12	.96	.05	4.1
9	.04	2.8	.19	e.01	18	.09	8.6	.76	e.10	.35	.04	4.1
10	.03	1.2	.16	e.01	11	.08	11	.56	e.08	.14	.04	2.0
11	.03	.80	.15	e.01	4.5	.06	5.1	.32	.05	.11	.04	1.1
12	.02	.42	.16	e.01	45	.04	3.1	.21	.08	.20	6.1	5.3
13	.01	.26	1.5	e.01	25	.04	2.1	.25	.15	.29	2.5	6.4
14	.02	.14	2.3	e.01	134	.07	1.5	.85	.05	.10	.28	3.7
15	5.3	.07	3.7	e.01	35	.07	1.1	.60	.05	6.3	.10	3.3
16	.44	.05	1.0	e.01	55	.06	.84	.27	.04	2.9	.04	1.4
17	.30	.96	9.1	e.01	35	.05	.64	.22	.04	2.5	.04	.74
18	.08	.30	5.3	e41	14	.05	5.7	.21	7.5	7.3	.04	74
19	.04	.17	5.0	e17	7.5	.03	2.2	3.0	28	2.7	.90	36
20	.01	.07	1.9	e40	5.3	.57	13	3.7	6.9	1.1	6.5	8.0
21	.00	.05	e.90	e22	2.8	.47	6.4	1.6	2.7	.48	3.1	6.1
22	.00	.11	e.48	5.8	1.8	5.1	3.2	.87	7.1	.21	.88	3.4
23	16	.33	e.25	7.2	1.1	63	2.1	.59	2.8	.36	3.7	2.8
24	2.5	1.0	e.10	36	.72	476	2.1	.56	1.7	61	7.7	1.6
25	12	.66	e.04	137	1.4	121	1.5	.52	45	28	1.7	1.2
26	9.2	.54	e.03	21	5.6	31	1.5	5.8	13	5.5	1.4	.69
27	2.4	.27	e.03	8.3	1.7	24	1.5	5.9	4.6	3.7	.61	.68
28	1.2	.39	e.03	4.0	.90	13	45	2.8	2.5	1.8	.23	.61
29	1.2	.64	e.02	2.4	---	19	10	1.7	1.6	1.1	.11	.33
30	4.1	1.4	e.01	1.5	---	6.9	4.4	1.0	.99	.65	.06	.16
31	2.9	---	e.01	.83	---	4.4	---	e1.5	---	.31	23	---
TOTAL	59.86	53.82	47.97	346.08	427.67	767.93	150.58	57.25	127.74	133.17	59.70	216.81
MEAN	1.93	1.79	1.55	11.2	15.3	24.8	5.02	1.85	4.26	4.30	1.93	7.23
MAX	16	14	9.1	137	134	476	45	6.6	45	61	23	74
MIN	.00	.05	.01	.01	.37	.03	.64	.21	.04	.10	.04	.16
AC-FT	119	107	95	686	848	1520	299	114	253	264	118	430

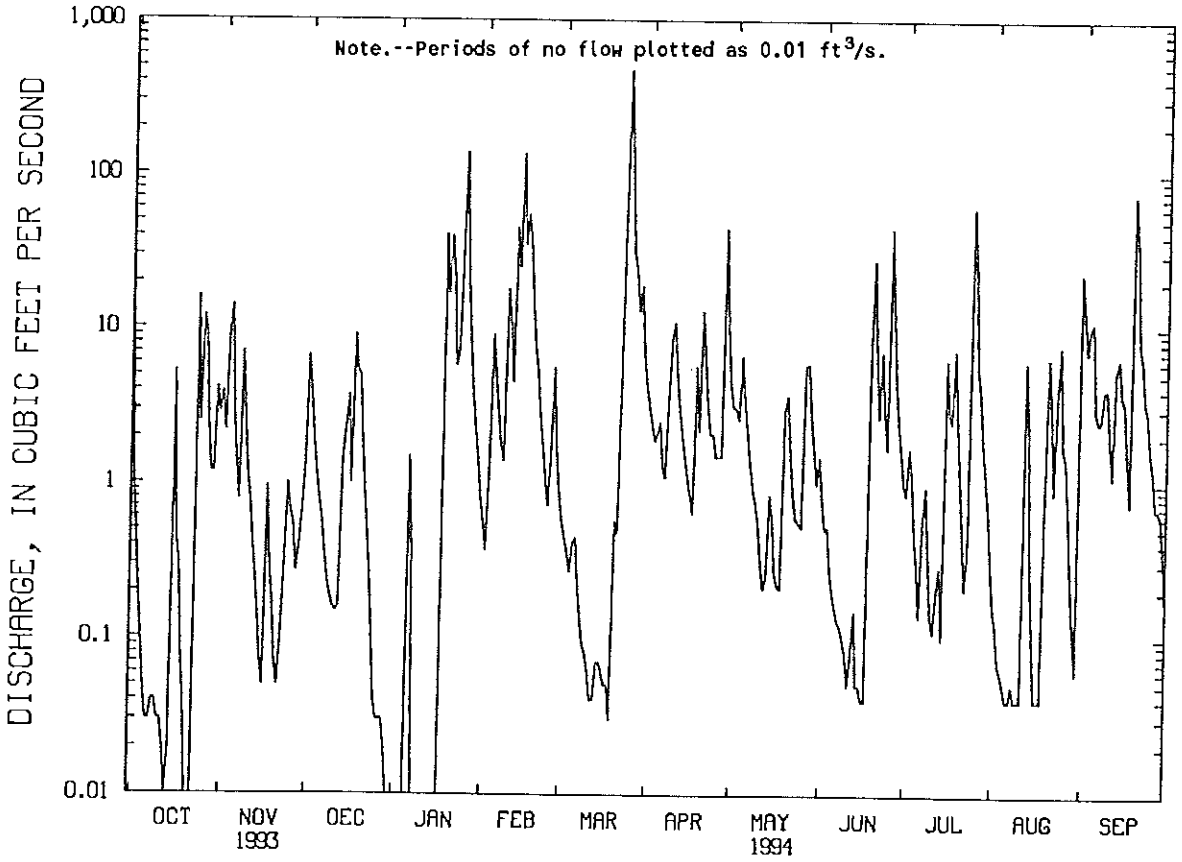
e Estimated

16226200 NORTH HALAWA STREAM NEAR HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1983 - 1994, BY WATER YEAR (WY)

MEAN	3.92	6.58	9.82	7.02	5.17	9.33	6.11	3.22	1.69	4.62	2.82	3.49
MAX	9.71	25.9	40.6	29.6	17.4	31.0	35.3	15.5	7.84	15.0	10.0	12.6
(WY)	1992	1991	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1983 - 1994	
ANNUAL TOTAL	837.54		2448.58			
ANNUAL MEAN	2.29		6.71		5.55	
HIGHEST ANNUAL MEAN					10.1	1988
LOWEST ANNUAL MEAN					1.43	1984
HIGHEST DAILY MEAN	113	Jul 22	476	Mar 24	476	Mar 24 1994
LOWEST DAILY MEAN	.00	Mar 18	.00	Oct 21	.00	Feb 1 1983
ANNUAL SEVEN-DAY MINIMUM	.00	Mar 18	.01	Dec 30	.00	Feb 1 1983
ANNUAL RUNOFF (AC-FT)	1660		4860		4020	
10 PERCENT EXCEEDS	5.2		11		11	
50 PERCENT EXCEEDS	.17		1.0		.57	
90 PERCENT EXCEEDS	.00		.04		.00	



16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER-QUALITY RECORDS

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

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

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

REMARKS.--Water-quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF DAILY RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV											
10...	1000	1.3	185	8.0	23.0	21.0	4.8	758	8.6	97	--
DEC											
06...	1500	0.53	270	7.9	25.0	22.0	6.0	732	8.4	100	300
JAN											
25...	1100	159	120	7.4	20.0	18.5	170	759	6.4	68	--
FEB											
25...	1100	1.0	240	8.1	21.0	19.5	0.70	757	8.7	95	74
MAR											
22...	0905	1.7	210	7.6	22.0	21.0	2.9	765	8.7	97	--
APR											
18...	1325	5.2	142	7.6	25.5	24.0	15	759	8.4	100	--
JUN											
07...	1320	0.14	235	7.4	27.5	25.0	48	760	7.4	90	--
JUL											
27...	1405	4.3	185	8.1	26.5	25.0	100	758	7.9	97	560
AUG											
16...	1330	0.05	262	7.4	28.5	25.0	2.1	759	6.2	75	--
30...	1330	0.04	258	7.5	29.5	25.5	2.2	760	6.6	81	860

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
25...	1100	73	14	9.1	18	35	0.9	0.90	65	7.5	29
JUL											
27...	1405	54	11	6.5	13	34	0.8	1.4	56	7.4	19

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC											
06...	1500	--	--	--	--	--	6	--	--	<0.20	<0.010
FEB											
25...	1100	<0.10	20	130	138	0.18	10	0.061	0.061	<0.20	<0.010
JUL											
27...	1405	0.10	18	117	111	0.16	132	0.089	0.089	0.40	0.120
AUG											
30...	1330	--	--	--	--	--	10	--	<0.050	<0.20	0.030

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

16226200 NORTH HALAWA STREAM NR HONOLULU--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 25...	1100	70	40	<1	<100	<2	<10	<1	<1	<1	<3
JUL 27...	1405	6000	340	<1	<100	<2	<10	<1	26	5	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 25...	<1	100	40	<1	<10	<4	30	27	<0.10	<1	<10
JUL 27...	6	8100	230	<1	<10	<4	170	7	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 25...	<1	<1	<1	<1	<1	<1.0	77	<6	<10	0.8	<1
JUL 27...	13	<1	<1	<1	<1	<1.0	54	<6	20	4.1	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 25...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 27...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 25...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 27...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 25...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 27...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

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, quarterly (discontinued).

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

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

REMARKS.--Records fair. No diversion upstream. Miscellaneous chemical analyses published for the 1969, and 1973 water years.

AVERAGE DISCHARGE.--80 years (water years 1915-94), 6.58 ft^3/s (4,760 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1730	*1,790	*9.31	No other peak greater than base discharge.			

Minimum discharge, 0.75 ft^3/s on Jan. 14, 16, 17

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	e5.3	3.3	1.2	3.2	3.6	8.7	7.7	2.8	3.7	2.9	11
2	2.5	4.2	2.9	1.1	3.0	3.4	8.0	6.8	2.8	4.8	3.3	7.5
3	2.5	12	2.0	1.1	4.3	3.2	7.7	6.2	2.8	3.2	3.2	7.2
4	2.4	11	1.9	1.1	6.4	3.0	7.4	9.2	2.7	2.8	2.4	5.9
5	2.3	5.0	1.8	1.1	4.0	3.7	7.1	5.6	2.5	2.6	2.3	4.8
6	2.2	3.8	1.6	1.3	4.2	e3.1	6.5	5.1	2.6	2.7	2.3	6.1
7	2.1	3.3	1.5	2.4	3.2	e2.8	6.5	4.6	2.8	4.4	2.7	7.3
8	1.9	5.1	1.4	1.3	3.1	e2.7	8.8	4.4	2.3	2.9	2.1	10
9	1.9	3.6	1.5	1.1	4.1	e2.6	13	4.4	2.2	2.6	2.1	6.9
10	2.2	3.3	1.4	1.1	4.3	e2.5	8.4	3.9	2.2	3.0	2.0	5.0
11	2.0	3.0	1.3	1.0	7.2	2.5	7.1	3.7	2.0	2.4	2.3	4.3
12	1.8	2.6	1.5	1.0	26	2.3	6.2	3.6	1.9	2.5	9.0	6.4
13	1.8	2.4	2.4	1.1	9.2	2.2	5.9	4.6	1.9	2.4	2.9	10
14	3.1	2.1	3.0	1.1	96	2.2	5.9	3.4	2.8	2.1	2.1	6.1
15	6.5	2.0	2.7	.97	18	2.2	5.6	3.7	2.3	19	2.0	5.1
16	2.6	2.1	1.8	.95	26	2.1	5.1	3.3	2.0	5.0	1.9	4.2
17	2.3	2.1	2.6	2.4	19	2.1	9.1	3.2	2.2	5.0	2.1	3.6
18	2.6	1.8	4.6	14	10	2.0	11	3.2	6.3	6.6	2.4	39
19	2.6	1.8	4.0	9.6	8.0	2.0	7.0	8.9	16	3.5	2.7	11
20	2.3	1.7	2.0	12	7.4	7.0	22	5.2	3.9	2.9	6.1	7.2
21	2.1	1.6	1.5	7.0	6.5	2.8	7.8	3.8	3.6	2.7	2.8	6.0
22	2.0	1.6	1.6	3.6	5.4	3.9	6.5	3.4	4.6	2.7	2.3	5.1
23	18	2.3	1.5	4.6	5.1	73	8.0	3.6	2.9	3.1	8.4	5.3
24	7.3	1.7	1.4	23	4.6	327	7.1	3.6	2.7	41	4.8	4.7
25	20	2.0	1.3	90	5.1	90	6.3	3.3	36	10	3.2	4.2
26	7.5	2.1	1.3	13	5.4	29	5.7	5.6	8.5	4.6	2.8	4.7
27	4.8	1.7	1.3	7.2	4.2	20	5.5	6.5	5.0	4.4	2.2	4.1
28	4.2	1.9	1.2	5.5	3.9	17	45	4.2	3.9	3.4	2.0	5.0
29	4.3	2.0	1.4	4.5	---	19	11	3.6	3.4	3.2	1.9	3.7
30	6.2	2.9	1.2	4.0	---	12	8.0	3.3	3.2	3.1	1.9	3.5
31	4.6	---	1.1	3.5	---	10	---	3.0	---	3.5	26	---
TOTAL	131.4	98.0	60.0	222.82	306.8	660.9	277.9	144.6	140.8	165.8	117.1	214.9
MEAN	4.24	3.27	1.94	7.19	11.0	21.3	9.26	4.66	4.69	5.35	3.78	7.16
MAX	20	12	4.6	90	96	327	45	9.2	36	41	26	39
MIN	1.8	1.6	1.1	.95	3.0	2.0	5.1	3.0	1.9	2.1	1.9	3.5
AC-FT	261	194	119	442	609	1310	551	287	279	329	232	426

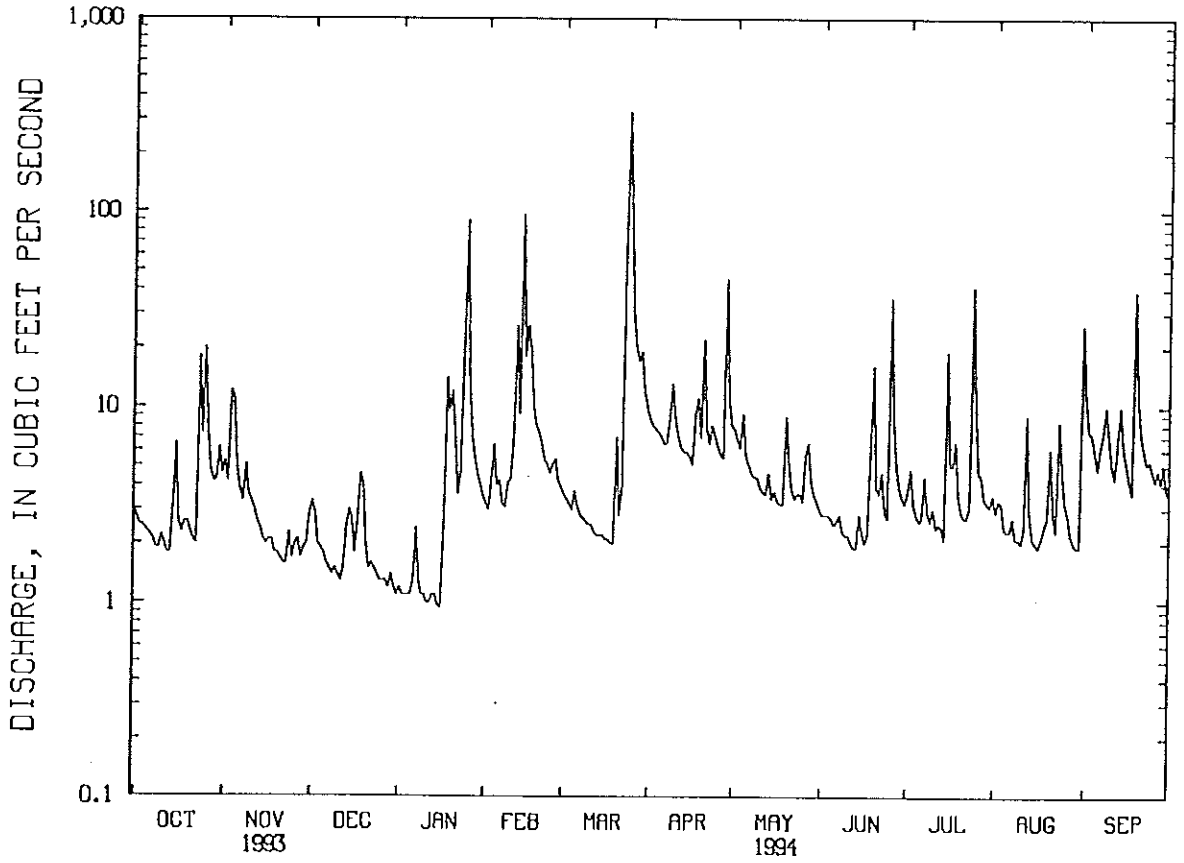
e Estimated

16229000 KALIHI STREAM NEAR HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1994, BY WATER YEAR (WY)

MEAN	4.69	7.30	8.65	9.18	7.35	8.75	8.48	6.62	3.73	4.58	5.19	4.63
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1914 - 1994		
ANNUAL TOTAL	1286.62		2541.02				
ANNUAL MEAN	3.52		6.96		6.58		
HIGHEST ANNUAL MEAN					13.5		1923
LOWEST ANNUAL MEAN					2.04		1984
HIGHEST DAILY MEAN	79	Jul 22	327	Mar 24	951	Jan 19	1923
LOWEST DAILY MEAN	.79	Apr 4	.95	Jan 16	.11	Jul 29	1966
ANNUAL SEVEN-DAY MINIMUM	.89	Apr 12	1.0	Jan 10	.15	May 15	1926
ANNUAL RUNOFF (AC-FT)	2550		5040		4760		
10 PERCENT EXCEEDS	6.6		10		12		
50 PERCENT EXCEEDS	2.0		3.4		2.9		
90 PERCENT EXCEEDS	1.1		1.7		1.0		



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 (discontinued).
SUSPENDED-SEDIMENT DISCHARGE: Water years 1969-74, 1975-93, quarterly (discontinued).

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

REMARKS.--Records fair.

AVERAGE DISCHARGE.--32 years, 10.5 ft^3/s (7,640 acre-ft/yr).

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

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

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 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)
Feb. 14	0530	1,060	4.13	Mar. 24	1830	*3,330	*6.93

Minimum discharge, 1.7 ft^3/s, Jan. 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	8.2	6.2	2.9	4.9	5.1	e11	11	4.5	5.9	4.1	16
2	3.2	5.8	5.7	2.3	4.6	4.8	e10	8.8	4.2	6.9	3.6	8.1
3	3.1	12	4.1	2.2	8.4	4.6	e9.2	7.5	4.1	4.5	4.0	7.7
4	3.0	15	4.2	2.2	15	4.6	e8.5	12	4.0	4.2	3.0	7.3
5	2.9	7.3	4.4	2.2	9.5	7.7	e8.2	8.1	3.8	3.8	2.8	6.1
6	3.0	5.5	3.3	2.8	9.0	4.6	7.5	7.2	4.0	4.6	3.5	9.4
7	2.7	4.8	3.0	3.9	5.9	4.3	7.9	6.2	4.5	9.0	3.9	11
8	2.6	10	2.8	2.6	5.8	4.2	12	6.1	3.6	4.7	2.7	15
9	2.6	5.7	2.9	2.3	7.4	4.2	14	5.4	3.6	3.8	2.6	10
10	3.5	5.2	2.6	2.2	7.6	4.0	11	5.3	3.7	4.4	2.5	6.5
11	3.9	4.6	2.4	2.2	14	4.0	9.1	5.2	3.5	3.5	2.9	4.9
12	2.8	4.0	2.9	2.2	50	3.7	8.0	5.0	3.4	3.6	9.2	8.4
13	2.2	3.7	4.7	2.1	23	3.6	7.3	6.1	3.2	3.4	3.6	17
14	3.9	3.6	4.9	2.2	251	4.6	7.0	5.0	6.0	3.2	2.6	8.9
15	8.3	3.5	5.8	2.1	33	5.5	6.6	5.9	7.9	23	2.3	7.2
16	3.7	5.5	4.0	2.1	45	4.3	5.7	4.6	7.7	7.9	2.3	5.1
17	3.2	4.6	4.2	2.1	42	4.4	7.6	4.6	8.6	7.9	3.1	4.2
18	3.2	3.8	8.7	18	17	4.3	13	5.2	17	11	2.8	40
19	3.4	3.4	8.6	16	13	4.0	8.0	15	33	5.1	3.4	16
20	3.4	3.1	4.6	25	11	15	42	8.9	8.8	4.2	7.5	7.8
21	3.5	3.0	3.6	15	9.9	7.5	12	5.7	8.8	4.0	3.5	6.5
22	3.2	3.1	3.3	8.0	8.2	9.8	9.2	5.1	11	4.1	3.0	5.4
23	16	5.9	3.1	12	7.4	140	13	5.2	6.4	3.8	8.1	6.2
24	9.8	3.7	2.7	33	6.8	777	11	5.2	5.9	49	7.0	4.8
25	32	3.5	2.7	135	7.1	194	8.7	4.5	50	16	4.6	4.2
26	11	3.2	2.6	20	7.3	43	7.4	9.2	13	6.1	4.8	4.8
27	5.9	3.9	2.5	12	5.9	27	7.1	10	7.5	6.2	3.0	3.8
28	6.0	4.0	2.5	8.6	5.4	e20	59	8.1	5.8	4.3	2.6	5.5
29	7.4	5.5	2.7	6.9	---	e23	17	6.5	5.3	3.9	2.3	3.6
30	9.3	7.4	2.3	6.0	---	e16	11	5.2	4.6	3.5	2.2	3.2
31	8.5	---	2.3	5.2	---	e12	---	4.6	---	3.7	32	---
TOTAL	180.7	162.5	120.3	361.3	635.1	1370.8	369.0	212.4	257.4	229.2	145.5	264.6
MEAN	5.83	5.42	3.88	11.7	22.7	44.2	12.3	6.85	8.58	7.39	4.69	8.82
MAX	32	15	8.7	135	251	777	59	15	50	49	32	40
MIN	2.2	3.0	2.3	2.1	4.6	3.6	5.7	4.5	3.2	3.2	2.2	3.2
AC-FT	358	322	239	717	1260	2720	732	421	511	455	289	525

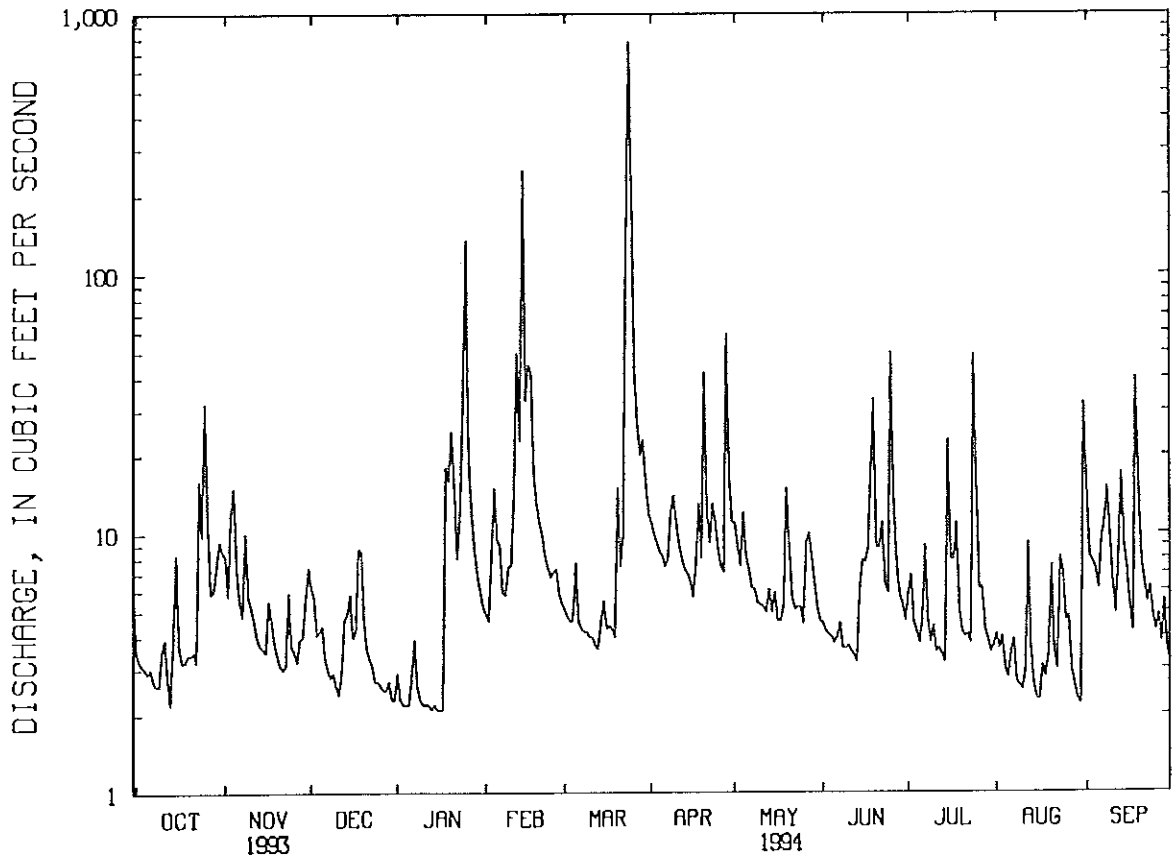
e Estimated

16229300 KALIHI STREAM AT KALIHI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

MEAN	7.03	13.8	15.7	13.8	11.4	16.7	13.9	10.1	5.29	8.10	6.21	4.75
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1962 - 1994	
ANNUAL TOTAL	1984.5		4308.8			
ANNUAL MEAN	5.44		11.8		10.5	
HIGHEST ANNUAL MEAN					21.3	1982
LOWEST ANNUAL MEAN					3.13	1984
HIGHEST DAILY MEAN	118	Jul 22	777	Mar 24	781	Feb 1 1969
LOWEST DAILY MEAN	1.0	Apr 15	2.1	Jan 13	.23	Jun 28 1966
ANNUAL SEVEN-DAY MINIMUM	1.2	Apr 12	2.1	Jan 11	.36	Oct 14 1984
ANNUAL RUNOFF (AC-FT)	3940		8550		7640	
10 PERCENT EXCEEDS	9.8		16		18	
50 PERCENT EXCEEDS	3.2		5.2		3.8	
90 PERCENT EXCEEDS	1.3		2.7		1.3	



16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

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

DRAINAGE AREA.--3.35 mi^2.

WATER-DISCHARGE RECORDS

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

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

GAGE.--Water-stage recorder and sharp-crested weirs. Datum of gage is 631.71 ft above mean sea level. Prior to Sep. 7, 1915, nonrecording gage at same site at datum 0.03 ft lower and Sep. 7, 1915, to Mar. 31, 1918, at same datum. Datum of gage lowered 1.00 ft on Feb. 4, 1992. Datum of gage is 630.71 ft above sea level.

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

AVERAGE DISCHARGE.--78 years (water years 1915-16, 1918-20, 1922-94), 7.02 ft^3/s (5,080 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1830	*1,540	*6.85	No other peak greater than base discharge.			

Minimum discharge, 2.4 ft^3/s, Oct. 21, 22, Jan. 15-17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

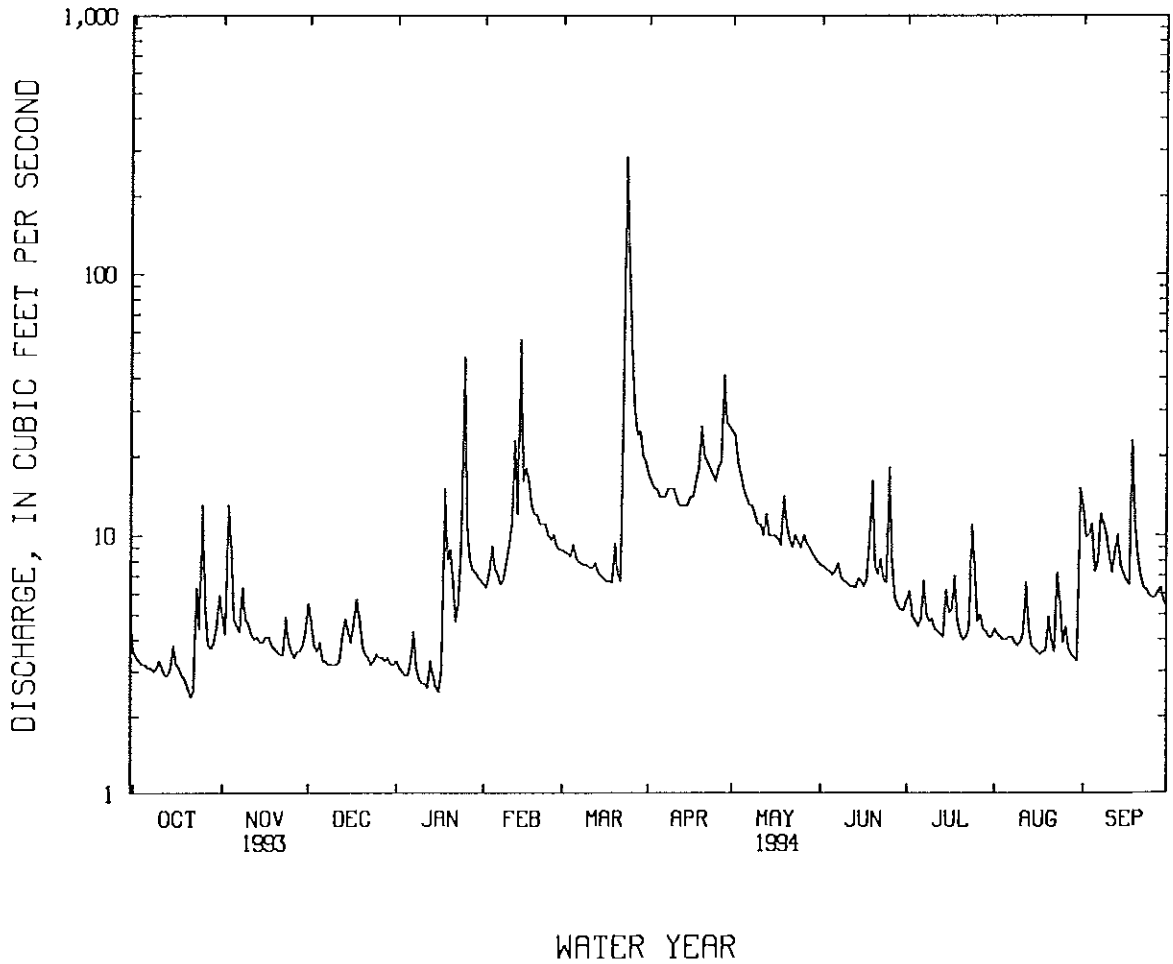
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	4.9	5.5	3.3	6.5	8.8	17	25	7.7	5.7	4.4	13
2	3.4	4.2	4.7	3.1	6.3	8.6	16	24	7.6	6.1	4.2	9.9
3	3.3	13	3.8	3.0	7.3	8.5	15	19	7.4	4.9	4.1	10
4	3.2	9.0	3.6	2.9	9.1	8.3	15	17	7.3	4.7	4.0	11
5	3.2	4.8	3.9	2.9	7.4	9.2	14	15	7.1	4.5	4.0	7.3
6	3.1	4.5	3.3	3.3	7.1	8.2	14	14	7.3	4.8	4.1	7.8
7	3.1	4.3	3.3	4.3	6.5	7.9	14	13	7.8	6.7	4.1	12
8	3.0	6.3	3.2	3.1	6.7	7.8	15	13	6.9	5.0	3.9	11
9	3.1	4.8	3.2	2.8	7.7	7.7	15	12	6.7	4.7	3.8	10
10	3.3	4.6	3.2	2.7	9.0	7.7	15	11	6.6	4.8	3.9	8.3
11	3.1	4.2	3.2	2.7	11	7.5	14	11	6.4	4.4	4.2	7.2
12	2.9	4.0	3.3	2.6	23	7.5	13	10	6.4	4.3	6.6	8.7
13	2.9	4.1	4.1	3.3	12	7.8	13	12	6.3	4.2	4.5	10
14	3.1	3.9	4.8	2.9	56	7.2	13	10	6.8	4.1	3.8	7.7
15	3.8	3.9	4.3	2.6	16	7.0	13	10	6.7	6.2	3.7	7.1
16	3.2	4.1	3.9	2.5	18	6.8	14	10	6.4	5.1	3.6	6.7
17	3.1	4.1	4.7	3.1	16	6.7	14	9.7	6.8	5.2	3.5	6.5
18	2.9	3.8	5.7	15	13	6.7	16	9.2	10	7.0	3.6	23
19	2.8	3.7	4.8	8.0	12	6.6	18	14	16	4.7	3.6	11
20	2.6	3.6	3.8	8.8	12	9.3	26	11	7.6	4.2	4.9	8.2
21	2.4	3.5	3.5	6.7	11	7.1	20	9.6	7.1	4.0	4.0	7.0
22	2.5	3.5	3.4	4.7	11	6.7	19	9.0	8.1	4.1	3.6	6.3
23	6.3	4.9	3.2	5.5	11	39	18	10	6.8	4.4	7.2	6.2
24	4.4	3.9	3.3	10	10	282	17	9.4	6.6	11	5.5	5.9
25	13	3.6	3.5	48	9.6	110	16	9.0	18	7.6	3.9	5.8
26	5.4	3.4	3.4	11	10	50	18	10	7.9	4.7	4.5	5.8
27	3.8	3.6	3.4	8.1	9.1	30	19	9.3	5.8	5.0	3.7	6.1
28	3.7	3.6	3.3	7.4	8.8	24	41	9.0	5.4	4.4	3.5	6.3
29	3.9	3.8	3.4	7.2	---	25	27	8.5	5.2	4.3	3.4	5.6
30	4.5	4.3	3.2	6.9	---	20	26	8.2	5.2	4.1	3.3	5.4
31	5.9	---	3.2	6.7	---	19	---	7.9	---	4.1	15	---
TOTAL	118.5	137.9	117.1	205.1	343.1	768.6	525	369.8	227.9	159.0	140.1	256.8
MEAN	3.82	4.60	3.78	6.62	12.3	24.8	17.5	11.9	7.60	5.13	4.52	8.56
MAX	13	13	5.7	48	56	282	41	25	18	11	15	23
MIN	2.4	3.4	3.2	2.5	6.3	6.6	13	7.9	5.2	4.0	3.3	5.4
AC-FT	235	274	232	407	681	1520	1040	733	452	315	278	509

16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1994, BY WATER YEAR (WY)

MEAN	4.30	6.87	8.90	9.52	9.12	9.69	9.45	8.09	5.01	4.30	5.03	4.51
MAX	21.5	43.7	46.8	56.0	81.3	52.5	41.7	46.2	19.0	10.7	32.4	27.7
(WY)	1931	1966	1928	1988	1932	1968	1989	1927	1938	1954	1982	1931
MIN	.23	.38	.38	.51	.39	.39	.32	.28	.35	.22	.43	.38
(WY)	1918	1946	1920	1920	1920	1926	1926	1926	1920	1922	1920	1917

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1914 - 1994		
ANNUAL TOTAL	1393.34		3368.9				
ANNUAL MEAN	3.82		9.23		7.02		
HIGHEST ANNUAL MEAN					20.0		1932
LOWEST ANNUAL MEAN					.88		1920
HIGHEST DAILY MEAN	36	Jul 22	282	Mar 24	514	May 16	1927
LOWEST DAILY MEAN	.80	Jul 10	2.4	Oct 21	.14	Jul 7	1922
ANNUAL SEVEN-DAY MINIMUM	.86	Jul 7	2.8	Jan 10	.14	Jul 18	1922
ANNUAL RUNOFF (AC-FT)	2760		6680		5080		
10 PERCENT EXCEEDS	6.6		16		14		
50 PERCENT EXCEEDS	3.5		6.5		3.6		
90 PERCENT EXCEEDS	1.1		3.2		.93		



16232000 NUUANU STREAM BELOW RESERVOIR 2 WASTEWAY, NEAR HONOLULU

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water year 1994.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT
FEB											
01...	1105	6.8	148	7.8	19.0	19.0	36	4.9	5.8	11	39
JUN											
01...	1150	5.6	135	a7.4	26.0	22.0	37	4.9	6.1	11	39
AUG											
01...	1035	4.5	130	8.2	24.0	23.0	38	5.0	6.1	11	39

DATE	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	IRON, DIS-SOLVED (UG/L AS FE)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)
FEB											
01...	0.8	0.50	38	5.6	16	<0.10	13	80	0.11	78	17
JUN											
01...	0.8	0.50	54	5.4	17	<0.10	13	90	0.12	120	18
AUG											
01...	0.8	0.50	36	5.3	15	<0.10	12	77	0.10	130	19

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a Laboratory value

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16240500 WAIAKEAKUA STREAM AT HONOLULU

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

DRAINAGE AREA.--1.06 mi^2.

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

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

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

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

AVERAGE DISCHARGE.--76 years (water years 1914-20, 1926-94), 4.94 ft^3/s (3,580 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1800	*796	*4.16	No other peak greater than base discharge.			

Minimum discharge, 2.5 ft^3/s, Oct. 21, 22, Jan. 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.4	5.0	5.9	2.8	3.7	3.6	5.4	6.1	e4.3	8.2	4.9	10
2	3.2	3.9	6.1	2.7	3.5	3.6	5.4	6.1	e4.3	8.8	3.8	14
3	3.0	23	4.1	2.6	4.5	3.4	5.2	5.3	e4.3	5.0	3.7	8.3
4	2.9	11	3.7	2.6	6.8	3.5	5.2	8.9	e4.2	4.5	3.7	5.9
5	2.9	5.0	3.7	2.6	4.7	4.3	4.8	5.5	e4.2	4.2	3.7	5.2
6	2.9	4.1	3.4	3.5	6.1	3.5	4.6	5.0	e4.5	4.6	4.0	8.6
7	2.8	3.7	3.2	7.7	3.9	3.3	4.9	4.8	e4.7	8.4	4.2	7.0
8	2.7	11	3.1	3.2	4.1	3.2	8.1	4.7	e4.6	4.8	3.8	8.7
9	2.7	4.9	3.0	2.8	5.1	3.3	8.5	4.6	e4.5	4.7	3.7	6.0
10	3.4	4.0	2.9	2.7	5.4	3.5	7.4	4.4	e4.4	4.5	3.6	4.8
11	3.1	3.7	2.9	2.7	5.9	3.4	5.4	4.3	e4.4	4.2	3.9	4.4
12	2.7	3.5	3.5	2.6	17	3.1	5.0	4.3	e4.3	4.8	7.5	7.1
13	2.7	3.4	4.7	3.1	6.9	3.1	4.7	4.6	e4.3	3.9	4.1	5.9
14	2.8	3.2	6.0	2.7	31	3.2	4.9	4.3	e4.5	3.9	3.6	4.7
15	4.0	3.2	4.5	2.7	8.1	3.1	4.6	4.6	e4.4	5.2	3.5	4.3
16	3.1	4.2	4.2	2.6	10	3.1	4.3	4.3	e4.3	4.1	3.9	4.0
17	3.4	3.8	5.4	5.4	9.3	3.0	6.4	4.2	e4.7	7.1	3.5	3.9
18	2.8	3.2	4.9	24	5.5	3.2	8.2	4.5	e5.2	7.5	4.2	24
19	3.1	3.1	4.1	10	4.9	3.0	5.7	7.0	e10	4.5	4.0	8.8
20	2.8	3.1	3.5	13	4.7	8.0	16	e5.4	e5.0	4.2	5.3	6.4
21	2.6	3.1	3.3	7.5	4.4	3.4	6.1	e4.7	e4.8	3.9	3.7	4.8
22	2.6	3.1	3.1	4.8	4.1	3.4	5.4	e4.5	e5.2	3.8	3.6	4.7
23	14	4.4	3.1	7.6	4.0	47	10	e4.9	e5.0	5.1	9.5	4.7
24	5.1	3.3	3.0	17	3.8	183	6.2	e4.6	e4.7	16	4.9	4.3
25	16	3.2	3.0	51	4.2	31	6.1	e4.5	e12	6.2	4.3	4.5
26	5.0	3.0	3.0	8.3	9.2	12	6.0	e4.8	e6.0	4.5	4.7	4.1
27	3.6	3.3	2.8	5.7	4.1	10	5.6	e4.5	e5.0	6.9	3.7	4.8
28	3.6	3.4	3.9	4.8	3.8	9.7	28	e4.4	e4.6	4.3	3.5	4.5
29	3.7	3.4	3.6	4.4	---	7.7	8.6	e4.4	4.5	4.1	3.4	4.0
30	5.1	5.5	2.9	4.0	---	6.3	6.1	e4.4	4.8	3.9	3.3	3.8
31	11	---	2.8	3.8	---	5.8	---	e4.3	---	3.8	22	---
TOTAL	132.7	145.7	117.3	220.9	188.7	390.7	212.8	152.9	151.7	169.6	149.2	196.2
MEAN	4.28	4.86	3.78	7.13	6.74	12.6	7.09	4.93	5.06	5.47	4.81	6.54
MAX	16	23	6.1	51	31	183	28	8.9	12	16	22	24
MIN	2.6	3.0	2.8	2.6	3.5	3.0	4.3	4.2	4.2	3.8	3.3	3.8
AC-FT	263	289	233	438	374	775	422	303	301	336	296	389

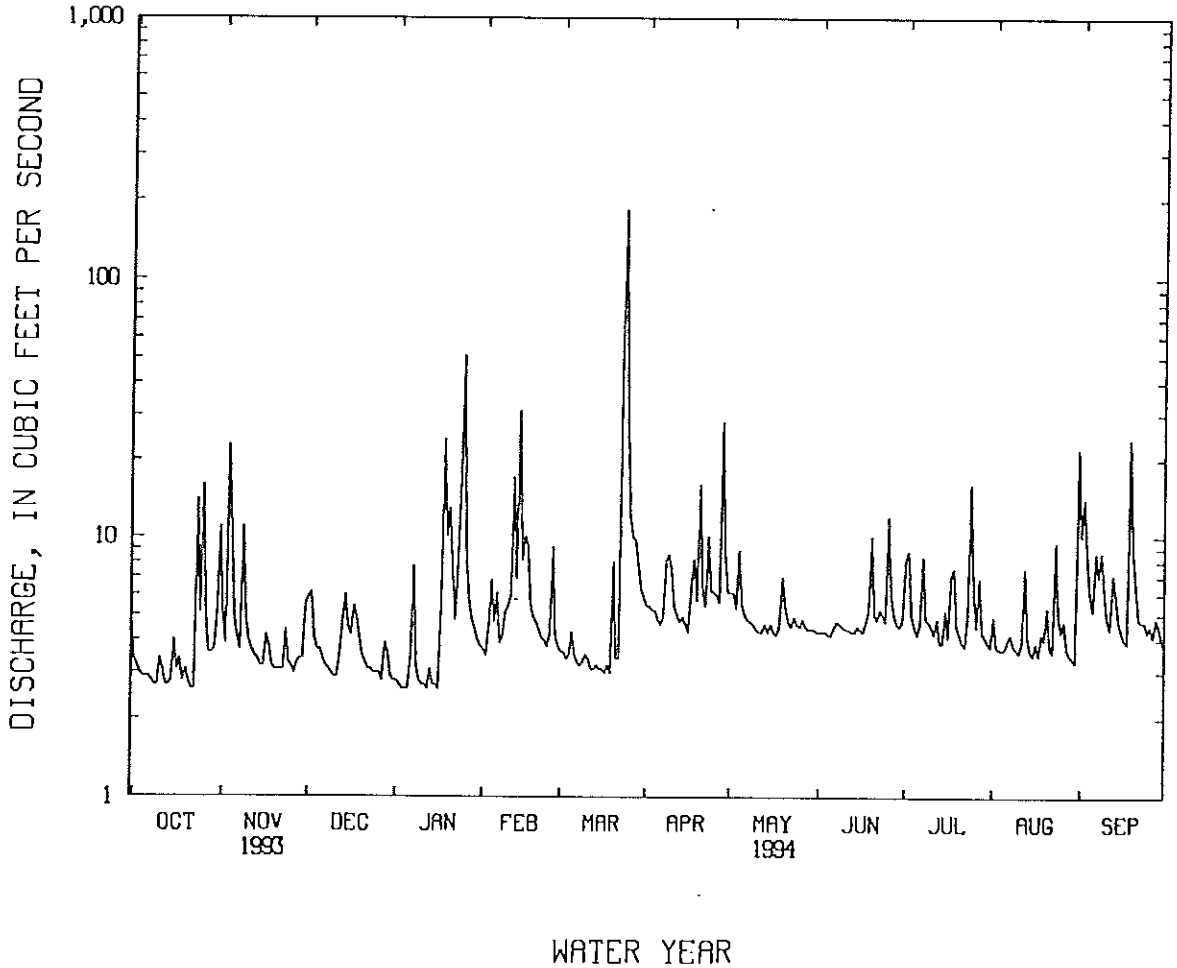
e Estimated

16240500 WAIAKEAKUA STREAM AT HONOLULU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1994, BY WATER YEAR (WY)

MEAN	4.21	5.25	5.41	4.93	4.55	5.53	5.72	5.26	4.18	4.97	4.90	4.23
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1913 - 1994	
ANNUAL TOTAL	1587.2		2228.4			
ANNUAL MEAN	4.35		6.11		4.94	
HIGHEST ANNUAL MEAN					8.23	1988
LOWEST ANNUAL MEAN					1.94	1920
HIGHEST DAILY MEAN	52	Jul 22	183	Mar 24	183	Mar 24 1994
LOWEST DAILY MEAN	2.0	Jul 16	2.6	Oct 21	.62	Feb 26 1920
ANNUAL SEVEN-DAY MINIMUM	2.2	Jul 12	2.7	Dec 30	.75	May 23 1926
ANNUAL RUNOFF (AC-FT)	3150		4420		3580	
10 PERCENT EXCEEDS	6.4		8.7		8.2	
50 PERCENT EXCEEDS	3.3		4.4		3.6	
90 PERCENT EXCEEDS	2.5		3.0		1.7	



16249500 MAUNAWILI DITCH AT AINONI SPRING

LOCATION.--Lat 21°21'08", long 157°46'03" on left bank approximately 1,000 ft below Siphon 8, 3.2 miles east of Waimanalo Elementary School, and 3.8 miles northeast of Manoa Elementary School. Altitude of gage is 440 ft. from topographic map.

PERIOD OF RECORD.--June 1991 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 440 ft. from topographic map.

REMARKS.--Records good. At times flow is diverted above gage by Waimanalo Irrigation System, State Department of Agriculture.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 2.8 ft^3/s, Jun. 25, 1994; minimum daily, no flow on Jan. 1, 2, 1993.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 2.8 ft^3/s, Jun. 25; minimum daily, 0.05 ft^3/s Mar. 27.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

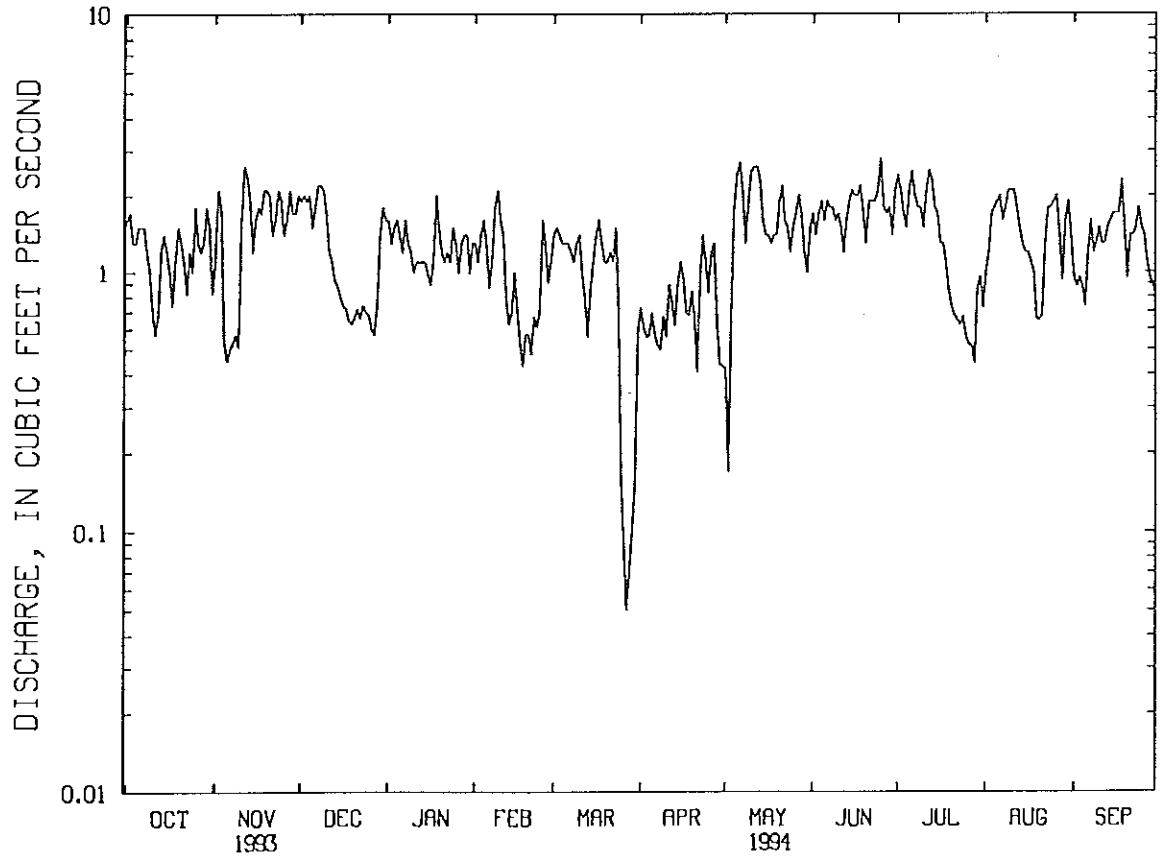
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	1.1	1.9	1.6	1.3	1.4	.73	.42	1.7	2.4	1.0	.96
2	1.7	2.1	2.0	1.3	1.1	1.5	.61	.17	1.4	2.1	1.2	.88
3	1.3	1.8	1.9	1.5	1.4	1.4	.56	.66	1.7	1.7	1.7	.95
4	1.3	.54	2.0	1.6	1.6	1.3	.57	1.8	1.9	1.5	1.8	.88
5	1.5	.45	1.5	1.4	1.3	1.3	.69	2.4	1.6	2.1	1.9	.74
6	1.5	.50	1.8	1.2	.87	1.3	.57	2.7	1.9	2.5	2.0	1.2
7	1.5	.53	2.2	1.6	1.1	1.2	.52	2.1	1.8	2.0	1.6	1.6
8	1.2	.57	2.2	1.3	1.8	1.1	.50	1.3	1.8	1.8	1.8	1.2
9	1.0	.51	2.1	1.2	2.1	1.3	.67	1.9	1.6	1.8	2.1	1.3
10	.70	1.6	1.7	1.0	1.6	1.4	.56	2.5	1.7	1.5	2.1	1.5
11	.57	2.6	1.2	1.1	1.4	.98	.89	2.6	1.5	2.1	2.1	1.3
12	.68	2.4	1.1	1.1	.79	.79	.76	2.6	1.2	2.5	1.8	1.3
13	1.2	1.9	.93	1.1	.63	.56	.62	2.3	1.6	2.3	1.5	1.5
14	1.4	1.2	.88	1.1	.69	.85	.90	1.6	1.9	1.8	1.3	1.6
15	1.2	1.6	.80	.99	1.0	1.1	1.1	1.4	2.1	1.7	1.2	1.7
16	1.0	1.8	.74	.89	.71	1.4	.94	1.4	2.0	1.3	1.2	1.7
17	.74	1.7	.72	1.1	.53	1.6	.69	1.3	2.0	1.3	1.1	1.7
18	1.1	2.1	.65	2.0	.43	1.3	.68	1.4	2.2	1.1	1.0	2.3
19	1.5	2.1	.63	1.5	.57	1.1	.84	1.4	1.7	.85	.66	1.5
20	1.3	2.0	.66	1.2	.57	1.1	.67	1.9	1.3	.74	.65	.95
21	1.1	1.4	.72	1.1	.48	1.2	.41	2.2	1.9	.68	.68	1.4
22	.82	1.6	.66	1.2	.67	1.1	.95	1.6	1.9	.65	1.3	1.4
23	1.2	2.1	.74	1.1	.61	1.5	1.4	1.5	1.9	.62	1.8	1.5
24	1.0	1.9	.70	1.5	.70	.71	1.1	1.2	2.1	.67	1.8	1.8
25	1.8	1.4	.68	1.3	1.6	.16	.83	1.5	2.8	.56	1.9	1.5
26	1.3	1.6	.60	1.0	1.3	.09	1.2	1.7	1.8	.52	2.0	1.4
27	1.2	2.1	.57	1.3	.91	.05	1.3	2.0	1.7	.52	1.4	1.1
28	1.3	1.7	.75	1.4	1.1	.07	.64	1.7	1.8	.44	.93	.96
29	1.8	1.7	1.4	1.4	---	.10	.44	1.2	1.4	.87	1.6	.89
30	1.5	2.0	1.8	.99	---	.15	.43	1.0	2.1	.96	1.9	.83
31	.82	---	1.6	1.3	---	.59	---	1.5	---	.73	1.4	---
TOTAL	37.83	46.60	37.83	39.37	28.86	29.70	22.77	50.95	54.0	42.31	46.42	39.54
MEAN	1.22	1.55	1.22	1.27	1.03	.96	.76	1.64	1.80	1.36	1.50	1.32
MAX	1.8	2.6	2.2	2.0	2.1	1.6	1.4	2.7	2.8	2.5	2.1	2.3
MIN	.57	.45	.57	.89	.43	.05	.41	.17	1.2	.44	.65	.74
AC-FT	75	92	75	78	57	59	45	101	107	84	92	78

16249500 MAUNAWILI DITCH AT AINONI SPRING--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1991 - 1994, BY WATER YEAR (WY)

MEAN	1.56	1.62	1.27	1.19	1.11	1.47	1.31	1.57	1.67	1.61	1.61	1.64
MAX	2.01	1.84	1.86	1.89	1.53	1.76	1.63	1.64	1.80	1.76	1.76	1.90
(WY)	1992	1992	1992	1992	1992	1992	1992	1994	1994	1991	1991	1992
MIN	1.22	1.47	.74	.41	.75	.96	.76	1.49	1.56	1.36	1.46	1.32
(WY)	1994	1993	1993	1993	1993	1994	1994	1993	1992	1994	1993	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1991 - 1994		
ANNUAL TOTAL	489.50		476.18				
ANNUAL MEAN	1.34		1.30		1.46		
HIGHEST ANNUAL MEAN					1.75		1992
LOWEST ANNUAL MEAN					1.30		1994
HIGHEST DAILY MEAN	2.6	Nov 11	2.8	Jun 25	2.8	Jun 25	1994
LOWEST DAILY MEAN	.00	Jan 1	.05	Mar 27	.00	Jan 1	1993
ANNUAL SEVEN-DAY MINIMUM	.07	Jan 1	.17	Mar 25	.05	Dec 31	1992
ANNUAL RUNOFF (AC-FT)	971		945		1060		
10 PERCENT EXCEEDS	2.0		2.0		2.1		
50 PERCENT EXCEEDS	1.5		1.3		1.6		
90 PERCENT EXCEEDS	.50		.60		.67		



16249900 MAUNAWILI DITCH ABOVE ANIANINUI TUNNEL NR KAILUA

LOCATION.--Lat 21°20'50", long 157°46'26" on left bank approximately 1,000 ft above Aniani Nui Tunnel, 2.5 miles east of Waimanalo Elementary School, and 3.6 miles north of Wailupe Valley Elementary School.

PERIOD OF RECORD.--December 3, 1990 to current year.

GAGE.--Water-stage recorder and 3 ft semi-circular corrugated metal pipe control with concrete on upstream end. Elevation of gage is 400 ft from topographic map.

REMARKS.--Records good, except for periods of estimated discharge which are fair.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 5.5 ft^3/s, Mar. 24, 1994; no flow on Mar. 22, 24, 1991.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 5.5 ft^3/s, Mar. 24; minimum daily, 0.61 ft^3/s, Mar. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e2.0	1.6	2.3	1.9	2.2	2.5	1.1	.88	2.8	2.7	e1.4	2.0
2	e2.0	3.0	2.4	1.7	1.9	2.5	1.1	.78	2.5	2.4	e1.6	1.8
3	e1.9	3.5	2.3	1.8	1.9	2.4	1.0	1.0	2.7	2.1	e1.8	1.7
4	e1.8	.86	2.3	1.9	2.1	2.4	.93	2.1	2.8	1.9	1.8	1.5
5	e1.9	.81	e2.3	1.8	2.1	2.7	.95	2.8	2.5	2.1	1.9	1.3
6	e2.0	.82	e2.5	1.7	1.7	2.0	.99	3.0	2.2	2.3	1.9	e1.6
7	e2.1	.73	e2.6	2.0	1.9	2.0	1.0	2.6	2.0	2.1	1.7	e1.9
8	e2.2	.72	e2.2	1.8	2.7	2.1	1.0	2.1	2.0	2.0	1.8	e1.7
9	e2.1	.79	1.8	e1.5	2.8	2.3	1.2	2.5	2.2	1.9	2.1	e1.6
10	e2.0	e2.0	2.0	e1.3	2.5	2.4	.98	3.1	2.1	1.7	2.1	e1.7
11	e1.9	e2.6	1.8	e1.1	2.4	2.0	1.2	3.1	1.9	2.0	2.1	e1.6
12	e1.9	e2.7	1.8	e1.2	2.1	1.7	1.2	3.0	2.0	2.3	1.9	e1.8
13	e2.1	e2.8	1.6	e1.3	1.9	1.4	1.1	2.6	2.3	2.0	1.6	e2.0
14	e2.1	e2.4	1.6	e1.1	2.3	1.7	1.3	2.4	2.6	1.9	1.5	2.1
15	e2.0	e2.7	1.5	e1.2	3.0	e1.7	1.4	2.1	2.8	1.8	1.5	2.2
16	e1.9	e2.8	1.5	e1.5	3.1	e1.6	1.2	2.2	2.7	1.5	1.5	2.3
17	e2.0	e2.5	1.4	1.7	2.5	e1.4	1.1	2.4	2.7	1.5	1.5	2.2
18	e2.4	e2.7	1.4	2.4	1.9	e1.2	1.2	2.4	2.7	1.4	1.3	2.7
19	e2.3	e3.0	1.3	1.8	1.8	e1.0	1.3	2.4	2.1	1.3	1.2	2.6
20	2.3	e2.8	1.3	1.5	1.6	e1.0	1.2	2.7	1.9	1.2	1.2	1.8
21	2.1	e2.4	1.3	1.9	1.4	e1.2	.95	3.1	2.5	1.1	1.3	2.1
22	1.8	e2.7	1.2	2.7	1.8	e2.2	1.2	2.6	2.5	1.1	1.8	2.2
23	2.1	e3.0	1.1	2.7	1.8	3.1	1.5	2.5	2.6	1.1	2.2	2.3
24	1.9	e2.8	1.1	3.7	1.9	e5.5	1.2	2.1	2.9	1.1	2.3	2.4
25	2.6	e2.7	1.0	4.3	2.9	e1.3	1.2	2.2	2.8	1.1	2.4	2.1
26	2.7	e2.5	1.0	2.7	2.8	.71	1.8	2.8	2.1	1.0	2.5	1.9
27	2.3	e2.7	1.1	2.4	2.0	.64	1.7	3.0	1.9	.99	2.1	1.7
28	2.2	e2.5	1.4	2.3	2.1	.61	1.6	2.7	2.1	.93	1.8	1.5
29	2.6	e2.5	1.9	2.1	---	.69	.99	2.2	2.0	1.2	2.3	1.4
30	2.3	e2.6	2.1	1.7	---	.69	.90	2.0	2.4	1.3	2.7	1.5
31	1.7	---	2.0	2.1	---	.92	---	2.4	---	1.2	2.3	---
TOTAL	65.2	68.23	53.1	60.8	61.1	55.56	35.49	73.76	71.3	50.22	57.1	57.2
MEAN	2.10	2.27	1.71	1.96	2.18	1.79	1.18	2.38	2.38	1.62	1.84	1.91
MAX	2.7	3.5	2.6	4.3	3.1	5.5	1.8	3.1	2.9	2.7	2.7	2.7
MIN	1.7	.72	1.0	1.1	1.4	.61	.90	.78	1.9	.93	1.2	1.3
AC-FT	129	135	105	121	121	110	70	146	141	100	113	113

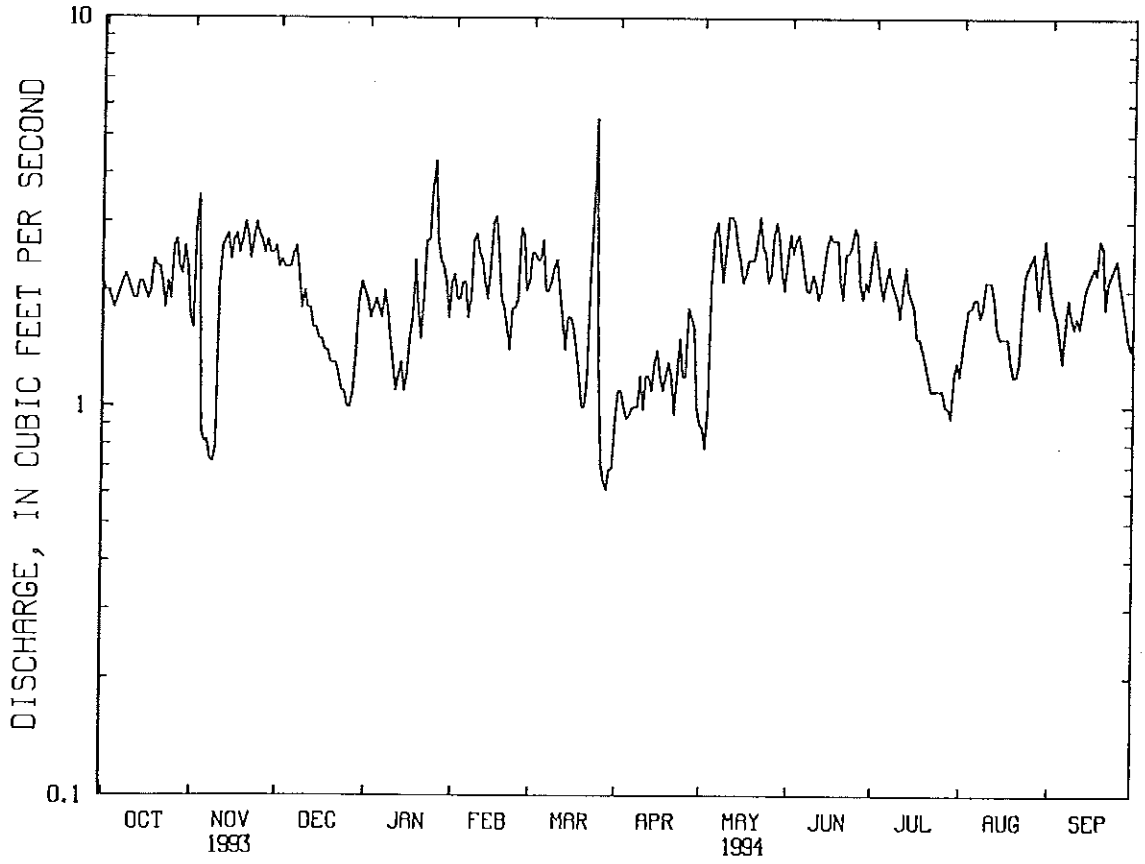
e Estimated

16249900 MAUNAWILI DITCH ABOVE ANIANINUI TUNNEL NR KAILUA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1992 - 1994, BY WATER YEAR (WY)

MEAN	2.35	2.47	1.86	1.79	1.82	2.05	1.81	2.16	2.18	2.25	2.24	2.44
MAX	2.69	2.99	2.57	2.22	2.18	2.23	2.19	2.38	2.38	2.80	2.75	3.22
(WY)	1992	1992	1992	1992	1994	1992	1993	1994	1994	1992	1992	1992
MIN	2.10	2.14	1.30	1.20	1.22	1.79	1.18	1.97	1.99	1.62	1.84	1.91
(WY)	1994	1993	1993	1993	1993	1994	1994	1993	1992	1994	1994	1994

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1992 - 1994	
ANNUAL TOTAL	719.08		709.06			
ANNUAL MEAN	1.97		1.94		2.12	
HIGHEST ANNUAL MEAN					2.48	1992
LOWEST ANNUAL MEAN					1.94	1993
HIGHEST DAILY MEAN	3.9	Jul 22	5.5	Mar 24	5.5	Mar 24 1994
LOWEST DAILY MEAN	.60	Jan 2	.61	Mar 28	.60	Jan 2 1993
ANNUAL SEVEN-DAY MINIMUM	.80	Jan 2	.77	Mar 26	.77	Mar 26 1994
ANNUAL RUNOFF (AC-FT)	1430		1410		1540	
10 PERCENT EXCEEDS	2.7		2.7		2.9	
50 PERCENT EXCEEDS	2.1		2.0		2.1	
90 PERCENT EXCEEDS	1.1		1.1		1.2	



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 miles west of Waimanalo Post Office.

PERIOD OF RECORD.--March 1954 to September 1968, October 1993 to September 1994.

GAGE.--Water-stage recorder with concrete Columbus type control. Altitude of gage is 390 ft (from topograhpic map). Prior to Jul. 12, 1993, water stage recorder at same site with different datum.

REMARKS.--Records good. Ditch diverts from headwaters of Maunawili and Makawao streams for irrigation in vicinity of Waimanalo. Station was reestablished on October 1, 1993.

AVERAGE DISCHARGE.-- 15 years (1954-1968, 1994) 2.50 ft^3/s (1,810 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 10.8 ft^3/s, Mar. 5, 1958; minimum, no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 5.5 ft^3/s, Mar. 24; minimum daily 0.49 ft^3/s Mar. 28.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

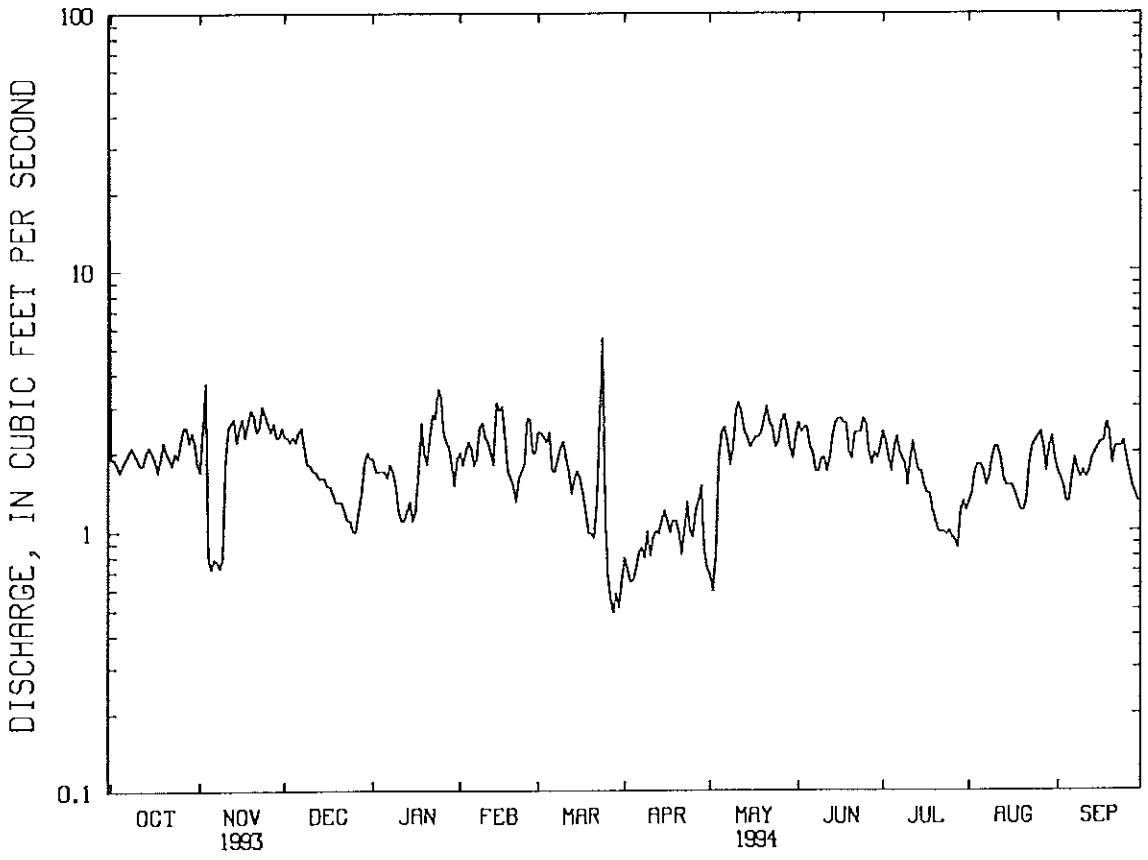
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	1.7	2.3	1.9	2.0	2.4	.79	.68	2.6	2.4	1.3	1.7
2	1.9	2.5	2.3	1.7	1.8	2.4	.71	.59	2.4	2.2	1.4	1.6
3	1.8	3.7	2.2	1.7	2.0	2.3	.64	.81	2.5	1.9	1.7	1.5
4	1.7	.79	2.3	1.7	2.2	2.2	.65	1.9	2.5	1.7	1.8	1.3
5	1.8	.72	2.2	1.7	2.1	2.4	.72	2.4	2.1	2.1	1.8	1.3
6	1.9	.78	2.4	1.6	1.8	1.7	.83	2.5	2.0	2.3	1.7	1.6
7	2.0	.77	2.5	1.8	1.9	1.7	.86	2.2	1.7	2.0	1.5	1.9
8	2.1	.73	2.1	1.7	2.5	1.9	.79	1.8	1.7	1.9	1.6	1.7
9	2.0	.78	1.8	1.5	2.6	2.1	1.0	2.1	1.9	1.8	1.9	1.6
10	1.9	1.8	1.8	1.2	2.3	2.2	.80	2.9	1.9	1.5	2.1	1.7
11	1.8	2.5	1.7	1.1	2.2	1.9	.95	3.1	1.7	1.9	2.1	1.6
12	1.8	2.6	1.7	1.1	2.0	1.7	1.0	2.8	1.9	2.2	1.9	1.7
13	2.0	2.7	1.6	1.2	1.8	1.4	.98	2.4	2.3	1.9	1.6	1.9
14	2.1	2.2	1.6	1.3	3.1	1.6	1.1	2.3	2.6	1.7	1.5	2.0
15	2.0	2.5	1.6	1.1	2.9	1.7	1.2	2.1	2.7	1.7	1.5	2.1
16	1.9	2.7	1.5	1.2	3.0	1.6	1.1	2.2	2.7	1.5	1.5	2.2
17	1.7	2.3	1.5	1.7	2.3	1.4	.99	2.3	2.6	1.4	1.4	2.2
18	1.9	2.6	1.4	2.6	1.7	1.2	1.1	2.3	2.6	1.4	1.3	2.6
19	2.2	2.9	1.3	2.0	1.6	.99	1.1	2.4	2.0	1.2	1.2	2.4
20	2.0	2.8	1.3	1.8	1.5	.98	1.0	2.7	1.9	1.1	1.2	1.8
21	1.9	2.4	1.3	2.3	1.3	.95	.81	3.0	2.4	1.0	1.3	2.1
22	1.8	2.5	1.2	2.8	1.6	1.3	1.0	2.6	2.4	.99	1.8	2.1
23	2.0	3.0	1.1	2.7	1.7	2.8	1.3	2.5	2.4	.99	2.1	2.1
24	1.9	2.8	1.1	3.5	1.8	5.5	1.0	2.1	2.7	.97	2.2	2.2
25	2.2	2.6	1.0	3.3	2.7	1.2	.95	2.2	2.6	1.0	2.3	1.9
26	2.5	2.4	1.0	2.4	2.7	.67	1.2	2.6	2.0	.95	2.4	1.7
27	2.5	2.6	1.2	2.2	2.0	.55	1.3	2.8	1.8	.92	2.1	1.5
28	2.2	2.3	1.4	2.1	2.0	.49	1.5	2.5	2.0	.86	1.7	1.4
29	2.4	2.3	1.8	1.8	---	.58	.85	2.1	1.9	1.2	2.1	1.3
30	2.2	2.5	2.0	1.5	---	.51	.72	1.9	2.1	1.3	2.3	1.3
31	1.8	---	1.9	1.9	---	.65	---	2.3	---	1.2	1.9	---
TOTAL	61.8	65.47	52.1	58.1	59.1	50.97	28.94	69.08	66.6	47.18	54.2	54.0
MEAN	1.99	2.18	1.68	1.87	2.11	1.64	.96	2.23	2.22	1.52	1.75	1.80
MAX	2.5	3.7	2.5	3.5	3.1	5.5	1.5	3.1	2.7	2.4	2.4	2.6
MIN	1.7	.72	1.0	1.1	1.3	.49	.64	.59	1.7	.86	1.2	1.3
AC-FT	123	130	103	115	117	101	57	137	132	94	108	107

16250000 MAUNAWILI DITCH NEAR WAIMANALO--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1954 - 1994, BY WATER YEAR (WY)

MEAN	3.00	2.59	1.70	1.70	1.49	1.84	2.58	3.16	3.29	3.09	5.59	5.63
MAX	4.36	3.87	3.24	3.22	2.67	3.89	4.07	4.90	4.52	4.02	46.8	47.9
(WY)	1955	1955	1961	1955	1957	1956	1966	1955	1955	1955	1993	1993
MIN	1.88	.93	.026	.000	.000	.097	.39	1.19	2.22	1.52	1.58	.61
(WY)	1968	1965	1968	1968	1968	1968	1963	1965	1994	1994	1964	1968

SUMMARY STATISTICS	FOR 1994 WATER YEAR		WATER YEARS 1954 - 1994	
ANNUAL TOTAL	667.54			
ANNUAL MEAN	1.83		2.50	
HIGHEST ANNUAL MEAN			3.43	1955
LOWEST ANNUAL MEAN			1.46	1968
HIGHEST DAILY MEAN	5.5	Mar 24	128	Jul 28 1993
LOWEST DAILY MEAN	.49	Mar 28	.00	Dec 27 1955
ANNUAL SEVEN-DAY MINIMUM	.61	Mar 26	.00	Dec 27 1955
ANNUAL RUNOFF (AC-FT)	1320		1810	
10 PERCENT EXCEEDS	2.6		4.2	
50 PERCENT EXCEEDS	1.9		2.8	
90 PERCENT EXCEEDS	.99		.57	



16254000 MAKAWAO STREAM NEAR KAILUA

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

DRAINAGE AREA.--2.04 mi^2.

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

REVISED RECORDS.--WSP 1937: Drainage area.

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

REMARKS.--Records good. Maunawili ditch diverts 1.5 mi upstream for irrigation in vicinity of Waimanalo.

AVERAGE DISCHARGE.--38 years (water years 1914-15, 1959-94), 5.16 ft^3/s (3,740 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Nov. 3	1800	900	6.50	Mar. 24	1830	*1,060	*6.90
Feb. 15	2400	398	4.95				

Minimum discharge, 1.3 ft^3/s, Oct. 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

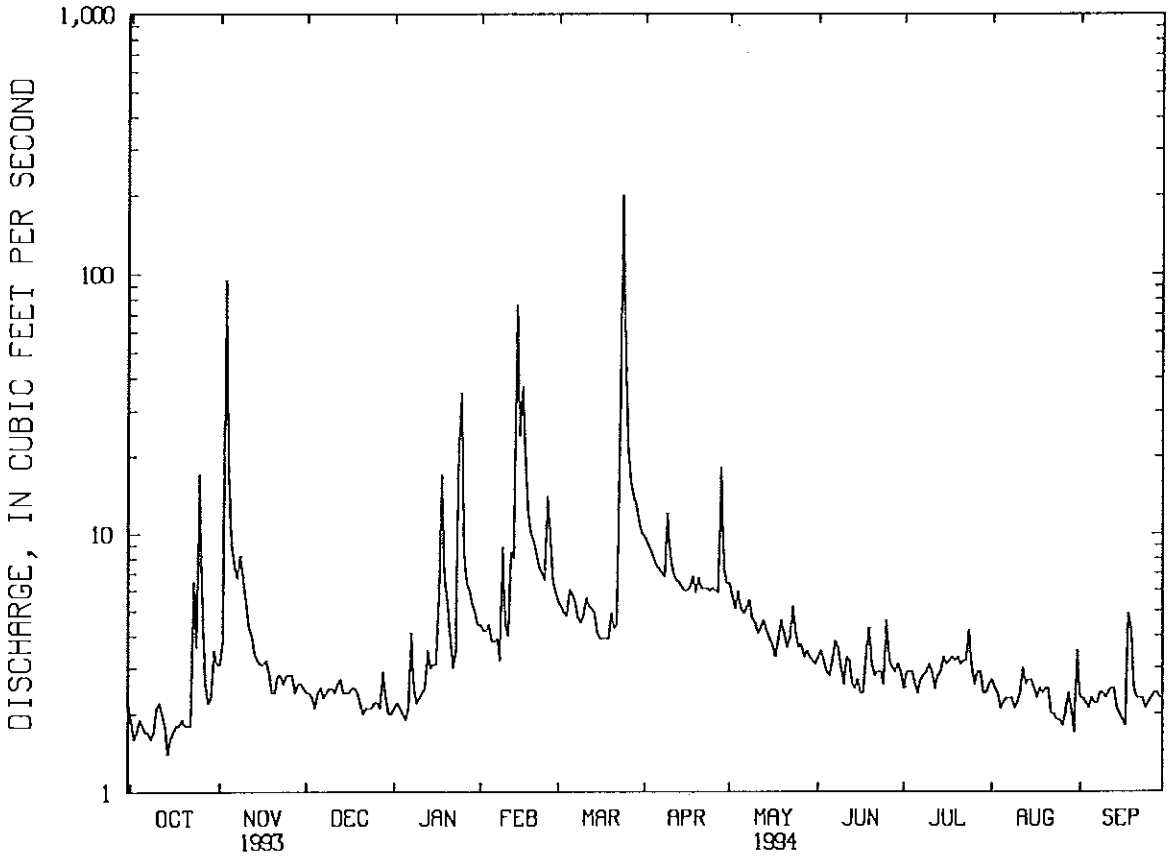
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	3.1	2.4	2.1	4.4	5.4	9.7	6.4	3.3	2.5	2.7	2.3
2	1.6	3.8	2.4	2.2	4.2	5.2	9.1	5.7	3.5	2.9	2.5	2.3
3	1.7	95	2.3	2.1	4.2	4.9	8.6	5.1	3.2	2.9	2.4	2.2
4	1.9	18	2.1	2.0	4.4	4.8	8.0	5.9	2.9	2.9	2.1	2.1
5	1.8	9.2	2.4	1.9	3.8	6.0	7.5	5.1	2.8	2.6	2.2	2.3
6	1.7	7.5	2.5	2.1	3.8	5.8	7.3	4.9	3.2	2.4	2.3	2.2
7	1.7	6.7	2.3	4.1	3.9	5.4	7.0	5.1	3.8	2.7	2.3	2.2
8	1.6	8.2	2.4	2.5	3.2	4.7	6.8	5.5	3.6	2.8	2.3	2.4
9	1.7	6.6	2.5	2.2	8.9	4.5	12	4.7	3.0	2.9	2.1	2.4
10	2.1	5.4	2.5	2.3	4.4	4.8	8.2	4.5	2.6	3.1	2.2	2.3
11	2.2	4.3	2.4	2.4	4.0	5.6	7.1	4.1	3.3	2.9	2.4	2.4
12	2.0	4.0	2.6	2.5	8.5	5.2	6.6	4.3	3.2	2.5	3.0	2.5
13	1.8	3.4	2.7	3.5	8.0	5.1	6.5	4.6	2.6	2.8	2.6	2.5
14	1.4	3.2	2.4	3.0	76	4.9	6.2	4.2	2.5	2.9	2.7	2.1
15	1.6	3.1	2.4	3.1	24	4.1	6.0	3.9	2.7	3.3	2.7	2.0
16	1.7	3.1	2.4	3.1	37	3.9	6.0	3.7	2.4	3.1	2.5	1.9
17	1.8	3.2	2.5	5.6	20	3.9	6.2	3.3	2.4	3.2	2.3	1.8
18	1.8	2.9	2.5	17	12	3.9	6.8	3.8	3.4	3.3	2.5	4.9
19	1.9	2.4	2.4	6.8	10	3.9	5.9	4.6	4.3	3.2	2.4	4.3
20	1.8	2.4	2.2	5.5	9.3	4.9	6.7	4.1	3.1	3.3	2.5	2.5
21	1.8	2.8	2.0	4.0	8.3	4.3	6.1	3.6	2.8	3.1	2.5	2.3
22	1.8	2.8	2.1	3.0	7.4	4.4	6.1	3.9	2.9	3.2	2.0	2.3
23	6.5	2.6	2.1	3.4	7.0	25	6.1	5.2	2.9	3.2	2.0	2.3
24	3.6	2.8	2.1	22	6.6	199	6.0	4.1	2.6	4.2	1.9	2.1
25	17	2.8	2.2	35	14	49	6.1	3.6	4.6	3.0	1.9	2.2
26	5.1	2.8	2.2	8.4	10	22	6.0	3.7	3.2	2.6	1.8	2.3
27	2.6	2.4	2.1	6.4	6.5	16	5.9	3.3	3.0	2.9	2.0	2.4
28	2.2	2.6	2.9	6.0	5.9	14	18	3.5	2.9	2.9	2.4	2.4
29	2.3	2.6	2.3	5.3	---	13	7.3	3.3	3.1	2.4	2.1	2.3
30	3.5	2.5	2.0	4.9	---	11	6.4	3.2	2.9	2.4	1.7	2.3
31	3.1	---	2.0	4.4	---	10	---	3.1	---	2.6	3.5	---
TOTAL	85.2	222.2	72.3	178.8	319.7	464.6	222.2	134.0	92.7	90.7	72.5	72.5
MEAN	2.75	7.41	2.33	5.77	11.4	15.0	7.41	4.32	3.09	2.93	2.34	2.42
MAX	17	95	2.9	35	76	199	18	6.4	4.6	4.2	3.5	4.9
MIN	1.4	2.4	2.0	1.9	3.2	3.9	5.9	3.1	2.4	2.4	1.7	1.8
AC-FT	169	441	143	355	634	922	441	266	184	180	144	144

16254000 MAKAWAO STREAM NEAR KAILUA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1994, BY WATER YEAR (WY)

MEAN	3.04	5.64	7.27	8.45	7.21	7.90	6.77	5.42	3.33	2.68	2.56	2.50
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1913 - 1994	
ANNUAL TOTAL	1201.9		2027.4			
ANNUAL MEAN	3.29		5.55		5.16	
HIGHEST ANNUAL MEAN					11.1	1982
LOWEST ANNUAL MEAN					1.31	1973
HIGHEST DAILY MEAN	95	Nov 3	199	Mar 24	518	Dec 31 1987
LOWEST DAILY MEAN	1.2	Jul 15	1.4	Oct 14	.50	Sep 8 1964
ANNUAL SEVEN-DAY MINIMUM	1.5	Jul 3	1.7	Oct 2	.67	Sep 8 1964
ANNUAL RUNOFF (AC-FT)	2380		4020		3740	
10 PERCENT EXCEEDS	5.3		8.1		9.0	
50 PERCENT EXCEEDS	2.4		3.1		2.8	
90 PERCENT EXCEEDS	1.7		2.1		1.4	



16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA

LOCATION.--Lat 21°22'51", long 157°45'48", Hydrologic Unit 20060000, on right bank at downstream side of bridge on Highway 61, 0.6 mile west of Maunawili School, and 1.6 miles southwest of Kailua Post Office.

DRAINAGE AREA.--5.34 mi^2.

PERIOD OF RECORD.--Water years 1922, 1956-62, 1965-67 (low-flow measurements); water years 1958-67, 1971-91 (annual maximum); daily record January 1967 to October 1971, April 1991 to current year.

GAGE.--Water-stage recorder. Datum of gage is 9.79 ft above mean sea level (levels by Sunn, Low, Tom, and Hara, Inc.), Oct. 16, 1957 to Dec. 31, 1966, crest-stage gage at site 400 ft upstream at datum 3.46 ft higher.

REMARKS.--Records good. Maunawili ditch diverts from headwaters of Maunawili and Makawao Streams for irrigation in vicinity of Waimanalo. Records of chemical analyses and suspended sediment loads were published during the water years 1969-71, and 1967-71 respectively.

AVERAGE DISCHARGE.--7 years (1967-1994), 15.9 ft^3/s (11,520 acre-ft/yr)

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,690 ft^3/s, Feb. 4, 1965, gage height, 15.62 ft (site and datum then in use), from rating curve extended above 700 ft^3/s on basis of contracted-opening measurement of peak flow; minimum, 2.1 ft^3/s, Oct. 12, 13, 1991.

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)
Nov. 3	1830	1,760	9.23	Mar. 24	1900	*2,820	*10.87
Feb. 14	0630	846	7.13				

Minimum discharge, 2.8 ft^3/s, Aug. 30.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

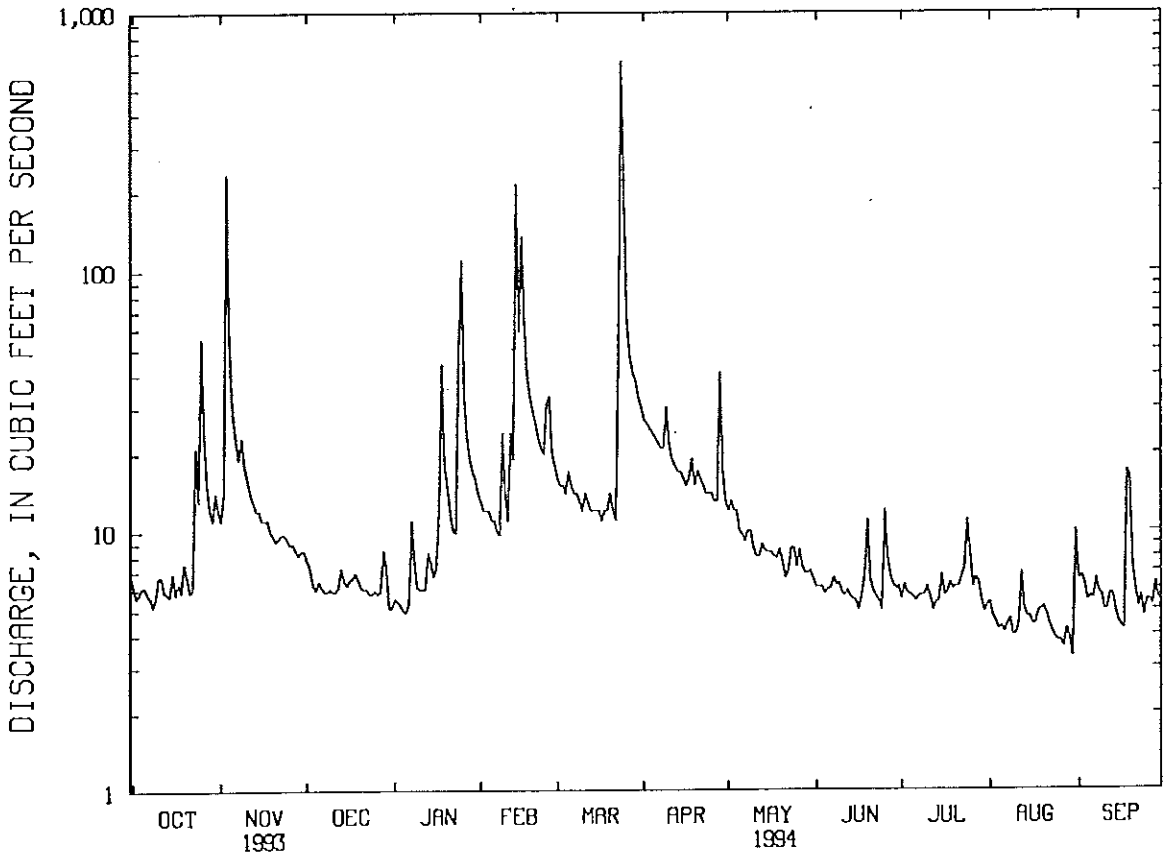
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.2	11	7.7	5.5	13	16	27	12	6.1	5.5	5.3	6.5
2	5.6	14	7.2	5.4	12	15	26	13	6.1	6.2	4.7	6.7
3	5.8	235	6.2	5.2	12	15	25	12	6.1	5.8	4.5	6.2
4	6.1	51	6.0	5.0	12	14	24	12	5.8	5.7	4.2	5.4
5	6.1	29	6.4	4.9	11	17	23	10	6.0	5.6	4.3	5.6
6	5.8	23	6.1	5.3	11	15	22	9.7	6.0	5.4	4.1	5.5
7	5.6	19	5.9	11	10	14	21	9.2	6.6	5.6	4.4	6.5
8	5.2	23	5.9	7.5	9.7	14	21	10	6.2	5.7	4.6	5.8
9	5.6	18	6.0	6.1	24	13	30	10	6.3	5.7	4.0	5.7
10	6.7	16	5.9	6.0	14	12	22	8.6	5.8	6.1	4.0	5.0
11	6.7	14	5.9	6.0	11	14	19	8.0	5.7	5.6	4.4	5.0
12	5.9	13	6.1	6.0	24	13	18	8.0	5.9	5.0	6.9	5.7
13	5.8	12	7.2	8.3	19	12	17	8.9	5.6	5.3	5.1	5.7
14	5.7	12	6.5	7.6	216	12	17	8.4	5.5	5.4	4.7	5.0
15	6.9	11	6.2	6.7	59	12	16	8.3	5.4	6.8	4.7	4.5
16	5.8	11	6.5	7.2	136	12	15	8.3	5.0	5.7	4.4	4.3
17	6.3	11	6.6	12	63	11	16	8.0	5.6	5.8	4.4	4.2
18	5.9	10	6.9	44	40	12	19	7.9	6.7	6.3	4.9	17
19	7.5	9.6	6.5	18	33	12	15	8.5	11	6.0	5.0	16
20	6.7	9.2	6.1	15	29	14	17	7.6	6.5	6.1	5.1	7.3
21	5.9	9.4	6.0	12	26	12	16	6.6	5.9	6.1	4.8	6.0
22	6.0	9.7	6.0	10	23	11	15	7.0	5.6	6.6	4.4	5.1
23	21	9.7	5.8	9.9	21	51	14	8.6	5.4	7.2	4.1	5.6
24	13	9.4	5.8	49	20	643	14	8.6	5.0	11	3.9	4.7
25	55	8.9	5.9	110	31	187	14	7.3	12	8.2	3.8	5.4
26	23	9.0	5.8	33	33	64	13	8.5	7.8	6.1	3.8	5.4
27	15	8.5	5.9	23	20	47	13	7.3	6.7	6.6	3.6	5.2
28	12	8.1	8.5	19	18	41	41	6.9	6.2	6.3	4.2	6.3
29	11	8.4	7.2	17	---	38	17	6.9	6.0	5.4	3.9	5.5
30	14	8.4	5.1	16	---	33	13	7.0	6.1	4.9	3.3	5.4
31	12	---	5.1	14	---	30	---	6.5	---	5.2	10	---
TOTAL	309.8	641.3	194.9	505.6	950.7	1426	580	269.6	190.6	188.9	143.5	188.2
MEAN	9.99	21.4	6.29	16.3	34.0	46.0	19.3	8.70	6.35	6.09	4.63	6.27
MAX	55	235	8.5	110	216	643	41	13	12	11	10	17
MIN	5.2	8.1	5.1	4.9	9.7	11	13	6.5	5.0	4.9	3.3	4.2
AC-FT	614	1270	387	1000	1890	2830	1150	535	378	375	285	373

16260500 MAUNAWILI STREAM AT HIGHWAY 61, NEAR KAILUA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1994, BY WATER YEAR (WY)

MEAN	11.5	20.6	29.2	24.4	22.9	27.7	16.9	9.37	7.49	6.85	7.33	8.17
MAX	19.8	47.6	78.2	41.1	60.6	72.9	40.3	15.1	12.5	9.90	21.0	16.9
(WY)	1993	1971	1968	1969	1969	1968	1968	1968	1971	1967	1967	1967
MIN	5.91	7.14	6.29	7.91	9.79	5.84	4.45	3.85	3.04	5.55	4.63	4.73
(WY)	1971	1970	1994	1992	1993	1993	1993	1993	1993	1970	1994	1970

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1967 - 1994		
ANNUAL TOTAL	3166.0		5589.1				
ANNUAL MEAN	8.67		15.3		15.9		
HIGHEST ANNUAL MEAN					26.0		1968
LOWEST ANNUAL MEAN					8.62		1970
HIGHEST DAILY MEAN	235	Nov 3	643	Mar 24	875	Dec 18	1967
LOWEST DAILY MEAN	2.3	Jun 24	3.3	Aug 30	2.3	Jun 24	1993
ANNUAL SEVEN-DAY MINIMUM	2.5	Jun 22	3.8	Aug 24	2.5	Jun 22	1993
ANNUAL RUNOFF (AC-FT)	6280		11090		11520		
10 PERCENT EXCEEDS	14		23		28		
50 PERCENT EXCEEDS	6.0		7.3		8.4		
90 PERCENT EXCEEDS	3.3		5.0		4.3		



16265600 RIGHT BRANCH OF KAHOOALII STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

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

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

Remarks.--Water quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV											
10...	1120	0.34	252	6.6	22.0	23.0	1.0	759	4.6	54	--
DEC											
08...	1055	0.24	230	6.2	22.5	23.0	1.1	761	4.8	56	450
JAN											
26...	1045	0.69	295	7.1	--	22.0	0.50	758	5.3	61	--
FEB											
25...	1300	E2.0	210	6.5	--	23.0	30	758	5.8	68	8600
MAR											
22...	0955	1.2	195	6.8	22.5	21.5	7.0	759	6.7	76	--
APR											
20...	1150	2.0	210	6.7	23.0	22.5	5.9	761	6.7	78	--
JUN											
06...	1020	0.82	220	6.6	25.0	24.0	1.0	765	5.7	68	--
JUL											
27...	1000	0.49	215	6.5	--	24.5	0.80	764	5.8	69	260
AUG											
15...	1425	0.54	215	6.7	27.0	24.0	0.40	758	5.4	65	--
31...	1320	0.55	210	7.4	25.0	25.0	2.0	755	8.4	102	1800

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB											
25...	1300	75	16	8.6	18	34	0.9	1.7	67	18	22
JUL											
27...	1000	59	12	7.1	17	38	1	0.90	55	14	22

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC											
08...	1055	--	--	--	--	--	4	--	--	<0.20	0.010
FEB											
25...	1300	<0.10	17	147	144	0.20	50	0.460	0.460	0.50	0.220
JUL											
27...	1000	0.10	19	129	128	0.18	4	0.490	0.490	<0.20	0.020
AUG											
31...	1320	--	--	--	--	--	8	0.360	0.360	<0.20	0.020

< Actual value is known to be less than the value shown
E Estimated

16265600 RIGHT BRANCH OF KAHOOALII STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 25...	1300	1100	<10	<1	<100	13	<10	<1	5	3	<3
JUL 27...	1000	50	<10	<1	<100	13	<10	<1	<1	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 25...	5	4600	55	3	<10	<4	320	170	0.20	<1	<10
JUL 27...	<1	470	130	<1	<10	<4	130	120	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 25...	6	<1	<1	<1	<1	<1.0	96	<6	30	5.2	<1
JUL 27...	1	<1	<1	<1	<1	<1.0	76	<6	10	0.8	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 25...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 27...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 25...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 27...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 25...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 27...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16270900 LULUKU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE

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

DRAINAGE AREA.--0.44 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

AVERAGE DISCHARGE.--14 years (water years 1968-71, 1985-94), 1.37 ft^3/s (996 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 15	2115	*380	*2.20	Mar. 24	1800	207	1.82

Minimum discharge, 0.11 ft^3/s, Dec. 22.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

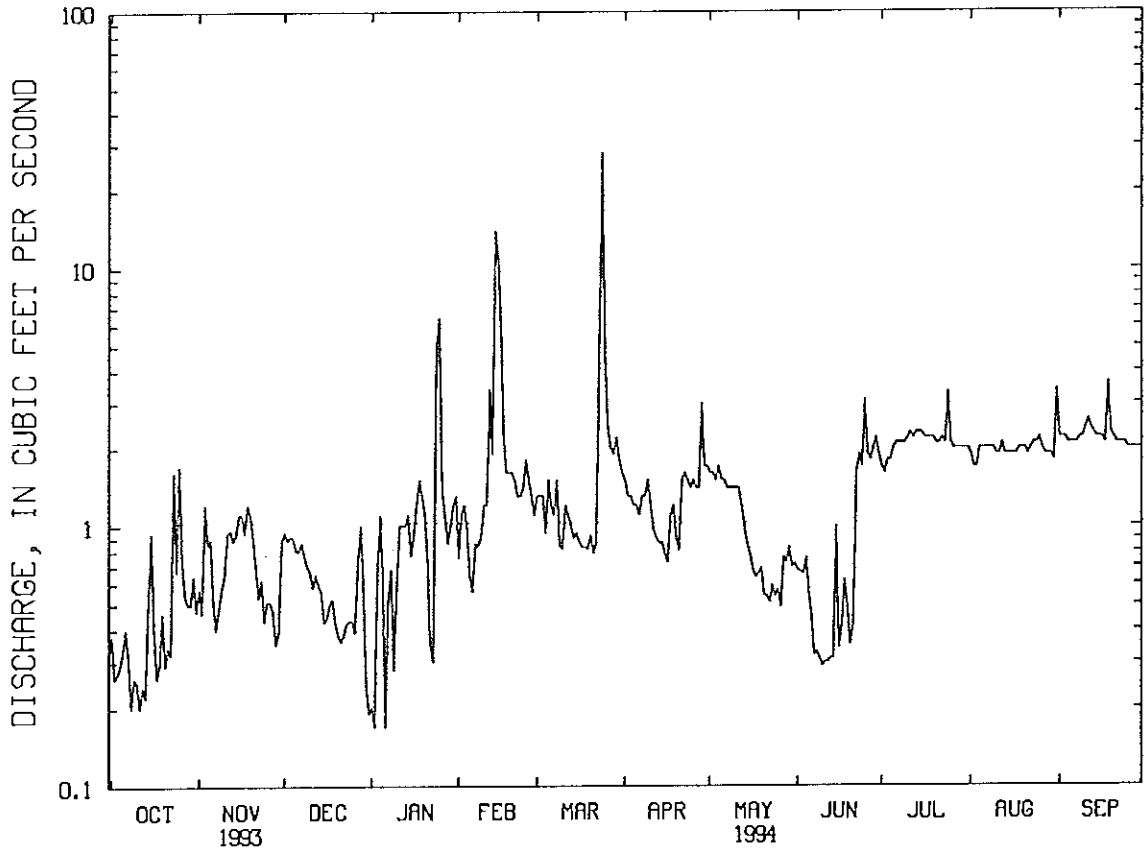
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.38	.57	.94	.20	.76	1.3	1.5	1.6	.68	1.7	1.9	2.2
2	.26	.46	.88	.17	1.1	1.3	1.3	1.6	.67	1.6	1.7	2.2
3	.27	1.2	.91	.68	1.2	1.3	1.3	1.5	.66	1.8	1.7	2.2
4	.29	.85	.90	1.1	.97	.94	1.2	1.7	.76	1.8	2.0	2.1
5	.33	.89	.81	.61	.65	1.5	1.2	1.5	.55	2.0	2.0	2.1
6	.40	.52	.80	.17	.56	1.2	1.1	1.5	.45	2.1	2.0	2.1
7	.31	.40	.86	.53	.86	1.1	1.3	1.4	.32	2.1	2.0	2.1
8	.20	.48	.77	.68	.84	1.5	1.3	1.4	.33	2.1	2.0	2.2
9	.26	.57	.70	.28	.91	.84	1.5	1.4	.31	2.1	2.0	2.2
10	.25	.65	.67	.59	1.2	.82	1.2	1.4	.29	2.2	1.9	2.4
11	.20	.94	.58	1.0	1.2	1.2	.97	1.4	.30	2.3	1.9	2.6
12	.24	.96	.65	1.0	3.4	1.1	.90	1.2	.30	2.2	2.1	2.4
13	.22	.88	.59	1.0	1.9	1.0	.86	1.0	.31	2.3	1.9	2.3
14	.49	.93	.56	1.1	14	.90	.87	.85	.31	2.3	1.9	2.2
15	.94	1.1	.43	.77	11	.94	.78	.78	1.0	2.3	1.9	2.2
16	.40	1.1	.44	.91	6.0	.87	.73	.68	.34	2.2	1.9	2.2
17	.26	.94	.50	1.2	2.3	.83	1.1	.64	.41	2.2	1.9	2.1
18	.29	1.2	.52	1.5	1.6	.83	1.2	.66	.62	2.2	2.0	3.6
19	.46	1.1	.43	1.3	1.6	.82	.90	.69	.49	2.2	2.0	2.3
20	.29	.90	.38	1.1	1.6	.92	.81	.54	.35	2.1	2.0	2.2
21	.34	.69	.36	.73	1.5	.79	1.5	.54	.42	2.1	1.9	2.1
22	.32	.53	.38	.35	1.3	.86	1.6	.51	1.6	2.2	2.0	2.1
23	1.6	.62	.42	.30	1.3	4.7	1.5	.59	1.9	2.1	2.1	2.1
24	.67	.43	.43	5.0	1.4	28	1.4	.54	1.7	3.3	2.1	2.1
25	1.7	.51	.43	6.4	1.8	4.6	1.5	.57	3.1	2.1	2.2	2.0
26	.73	.51	.39	1.4	1.5	2.4	1.4	.49	1.9	2.0	2.0	2.0
27	.54	.47	.73	1.1	1.3	2.0	1.4	.76	1.8	2.0	1.9	2.0
28	.50	.35	1.0	.86	1.1	1.9	3.0	.73	2.0	2.0	1.9	2.0
29	.50	.39	.56	1.0	---	2.2	1.7	.83	2.2	2.0	1.9	2.0
30	.64	.88	.24	1.2	---	1.8	1.7	.70	1.9	2.0	1.8	2.0
31	.47	---	.19	1.3	---	1.6	---	.72	---	2.0	3.4	---
TOTAL	14.75	22.02	18.45	35.53	64.85	72.06	38.72	30.42	27.97	65.6	61.9	66.3
MEAN	.48	.73	.60	1.15	2.32	2.32	1.29	.98	.93	2.12	2.00	2.21
MAX	1.7	1.2	1.0	6.4	14	28	3.0	1.7	3.1	3.3	3.4	3.6
MIN	.20	.35	.19	.17	.56	.79	.73	.49	.29	1.6	1.7	2.0
AC-FT	29	44	37	70	129	143	77	60	55	130	123	132

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

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1994, BY WATER YEAR (WY)

MEAN	.99	1.52	1.80	1.54	1.58	1.73	1.55	1.18	.99	1.16	1.07	1.08
MAX	2.30	3.57	4.10	3.02	4.92	3.78	3.67	2.07	1.89	2.12	2.39	2.21
(WY)	1992	1971	1988	1969	1969	1968	1989	1969	1971	1994	1991	1994
MIN	.089	.12	.26	.16	.17	.63	.39	.34	.23	.16	.14	.14
(WY)	1985	1985	1986	1986	1986	1985	1984	1984	1984	1984	1985	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1967 - 1994	
ANNUAL TOTAL	290.56		518.57			
ANNUAL MEAN	.80		1.42		1.37	
HIGHEST ANNUAL MEAN					2.13	1969
LOWEST ANNUAL MEAN					.41	1986
HIGHEST DAILY MEAN	5.1	Jul 22	28	Mar 24	67	Feb 1 1969
LOWEST DAILY MEAN	.19	Dec 31	.17	Jan 2	.03	Oct 14 1988
ANNUAL SEVEN-DAY MINIMUM	.24	Oct 7	.24	Oct 7	.07	Nov 18 1984
ANNUAL RUNOFF (AC-FT)	576		1030		996	
10 PERCENT EXCEEDS	1.2		2.2		2.1	
50 PERCENT EXCEEDS	.79		1.1		1.1	
90 PERCENT EXCEEDS	.40		.37		.30	



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

WATER-QUALITY RECORDS

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

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

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

REMARKS.--Water-quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV											
09...	1400	0.61	192	7.6	24.0	21.0	15	759	8.3	94	--
DEC											
07...	1200	0.86	218	7.7	23.0	20.5	770	762	8.7	97	4200
JAN											
25...	1425	2.4	190	6.0	--	20.5	3.5	758	8.9	99	--
FEB											
23...	1325	1.1	195	7.6	22.0	20.5	1.0	757	8.8	99	400
MAR											
22...	1230	93	185	7.4	23.0	20.0	4.6	760	8.2	90	--
APR											
19...	1330	0.82	195	7.4	23.0	21.5	1.2	760	8.6	98	--
JUN											
06...	1430	0.45	170	7.4	25.0	22.5	1.0	761	8.2	95	--
JUL											
28...	1150	1.9	165	7.9	28.0	21.5	0.80	759	8.8	100	680
AUG											
15...	1045	1.9	160	8.0	29.5	21.0	1.0	759	8.7	98	--
31...	1220	2.3	172	7.8	25.5	21.0	4.4	758	8.8	99	1900

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB											
23...	1325	60	12	7.2	14	33	0.8	1.1	61	6.8	17
JUL											
28...	1150	45	8.9	5.5	13	38	0.8	0.90	51	3.3	16

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC											
07...	1200	--	--	--	--	--	1020	--	--	0.80	1.00
FEB											
23...	1325	<0.10	25	121	121	0.16	4	0.370	0.370	<0.20	0.020
JUL											
28...	1150	0.10	29	107	108	0.15	6	0.170	0.170	<0.20	0.030
AUG											
31...	1220	--	--	--	--	--	13	0.150	0.150	<0.20	0.030

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

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 23...	1325	130	10	1	<100	<2	<10	<1	1	<1	<3
JUL 28...	1150	200	10	<1	<100	<2	<10	<1	2	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 23...	1	250	32	<1	<10	<4	40	24	0.10	<1	<10
JUL 28...	<1	380	20	<1	<10	<4	10	4	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 23...	<1	<1	<1	<1	<1	<1.0	67	<6	<10	1.5	<1
JUL 28...	<1	<1	<1	<1	<1	<1.0	52	7	<10	0.7	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 23...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 28...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 23...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 28...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 23...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 28...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE

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

DRAINAGE AREA.--3.81 mi^2.

WATER-DISCHARGE RECORDS

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

REVISED RECORDS.-- WDR HI-92-1: 1991(M).

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

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

AVERAGE DISCHARGE.--17 years, 11.3 ft^3/s (8,210 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1810	*1,070	*4.86

No other peak greater than base discharge.

Minimum discharge, 0.79 ft^3/s, Dec. 21.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

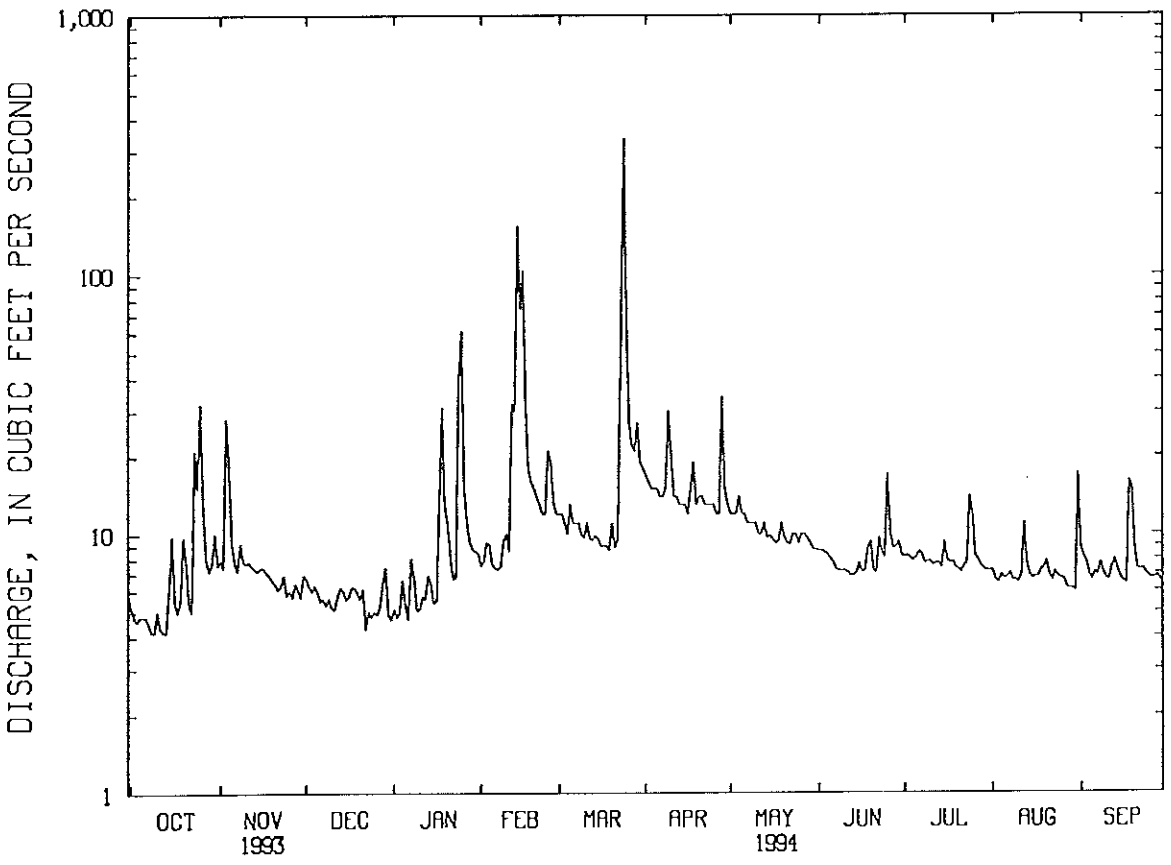
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.2	7.9	6.7	5.1	7.6	12	17	12	8.6	8.2	7.2	8.7
2	4.8	7.4	6.3	4.8	7.8	12	16	12	8.6	8.2	6.6	8.1
3	4.6	28	6.0	5.0	9.2	11	15	12	8.5	8.0	6.5	7.7
4	4.8	18	6.3	6.6	9.1	10	15	14	8.3	7.9	6.9	6.9
5	4.8	9.2	6.0	5.3	7.6	13	15	12	8.0	8.1	6.7	6.6
6	4.8	7.7	5.5	4.7	7.4	11	14	12	7.8	8.5	6.8	7.1
7	4.5	7.2	5.6	8.0	7.3	11	14	11	7.3	8.3	7.0	6.9
8	4.2	9.2	5.3	6.8	7.5	11	15	11	7.2	7.7	6.6	7.7
9	4.2	7.8	5.6	5.1	9.4	9.9	30	11	7.2	7.8	6.6	7.1
10	5.0	7.7	5.2	5.1	10	9.7	20	11	7.2	7.8	6.5	6.7
11	4.3	7.8	5.1	5.7	8.6	11	14	10	7.1	7.6	6.9	6.6
12	4.2	7.5	5.7	5.6	32	9.6	14	10	6.9	7.7	11	7.4
13	4.2	7.3	6.2	6.9	30	9.5	13	11	6.9	7.7	7.7	7.9
14	6.0	7.2	6.0	6.4	154	9.8	13	9.7	7.0	7.4	6.9	7.2
15	9.8	7.4	5.6	5.4	74	9.6	13	9.8	7.7	9.3	6.7	6.7
16	5.4	7.4	5.7	5.5	104	9.0	12	9.5	7.1	7.9	6.8	6.5
17	5.0	7.1	6.2	13	34	9.0	15	9.2	7.2	7.7	6.8	6.4
18	5.5	6.9	6.2	31	18	9.0	19	9.4	8.8	7.8	7.2	16
19	9.7	6.6	5.9	13	16	8.7	13	11	9.3	7.4	7.4	15
20	7.8	6.4	5.6	11	15	11	14	9.7	7.2	7.3	7.8	8.7
21	5.3	6.1	6.1	8.2	14	8.9	14	9.2	7.1	7.1	6.9	7.3
22	5.0	6.3	4.3	6.7	13	9.5	13	9.1	9.6	7.5	6.6	7.2
23	21	6.9	5.0	6.8	12	49	13	10	8.5	7.7	7.1	7.3
24	15	5.8	4.8	40	12	333	13	10	8.1	14	6.8	7.0
25	32	6.0	5.0	61	21	69	13	9.2	17	12	6.7	6.8
26	13	5.7	4.9	15	19	27	12	10	10	8.2	6.7	6.7
27	8.0	6.4	5.2	11	13	22	12	10	8.8	7.9	6.2	6.7
28	7.2	6.1	6.5	9.3	12	21	34	9.6	8.9	7.5	6.1	6.8
29	7.6	5.7	7.4	8.7	---	27	15	9.2	9.3	7.3	6.1	6.6
30	10	6.9	4.9	8.6	---	19	13	8.7	8.2	7.2	6.0	6.4
31	7.6	---	4.7	8.4	---	18	---	8.7	---	7.2	17	---
TOTAL	240.5	243.6	175.5	343.7	684.5	810.2	463	321.0	249.4	251.9	224.8	230.7
MEAN	7.76	8.12	5.66	11.1	24.4	26.1	15.4	10.4	8.31	8.13	7.25	7.69
MAX	32	28	7.4	61	154	333	34	14	17	14	17	16
MIN	4.2	5.7	4.3	4.7	7.3	8.7	12	8.7	6.9	7.1	6.0	6.4
AC-FT	477	483	348	682	1360	1610	918	637	495	500	446	458

16272200 KAHOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1977 - 1994, BY WATER YEAR (WY)

MEAN	8.47	11.3	13.3	15.5	13.2	14.3	13.1	11.1	9.21	8.30	7.83	7.65
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	3.90	4.56	4.05	3.83	4.03	5.32	4.53	3.59	3.19	2.91	2.94
(WY)	1985	1985	1978	1977	1978	1978	1985	1984	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1977 - 1994	
ANNUAL TOTAL	2593.8		4238.8			
ANNUAL MEAN	7.11		11.6		11.3	
HIGHEST ANNUAL MEAN					22.0	1982
LOWEST ANNUAL MEAN					4.36	1984
HIGHEST DAILY MEAN	37	Jul 22	333	Mar 24	723	Jan 1 1988
LOWEST DAILY MEAN	2.1	Aug 13	4.2	Oct 8	.29	Oct 10 1984
ANNUAL SEVEN-DAY MINIMUM	4.2	Jun 27	4.4	Oct 7	.30	Oct 10 1984
ANNUAL RUNOFF (AC-FT)	5140		8410		8210	
10 PERCENT EXCEEDS	11		15		17	
50 PERCENT EXCEEDS	6.0		7.8		7.6	
90 PERCENT EXCEEDS	4.5		5.5		4.4	



16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER-QUALITY RECORDS

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

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

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

REMARKS.--Water-quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV											
10...	1410	7.4	176	7.8	27.0	24.5	4.1	760	9.2	110	--
DEC											
08...	1245	5.1	182	7.8	26.0	23.5	5.0	762	9.2	108	<86
JAN											
26...	1315	14	175	8.0	24.5	23.0	4.5	760	9.0	105	--
FEB											
23...	1015	12	162	7.6	24.0	22.5	6.0	760	8.7	101	80
MAR											
22...	1125	11	200	7.1	24.0	21.5	0.60	762	8.9	101	--
APR											
19...	0950	13	191	7.8	25.0	23.5	3.2	763	9.0	106	--
JUN											
06...	1115	7.5	200	6.9	32.0	26.5	1.8	768	8.9	110	--
JUL											
26...	0950	8.6	175	8.1	28.0	25.5	1.3	761	8.7	106	290
AUG											
15...	1230	7.1	185	8.2	28.5	27.0	1.6	762	8.8	111	--
30...	1320	6.4	180	8.5	31.5	27.0	2.4	761	8.7	109	140

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB											
23...	1015	50	9.3	6.6	12	33	0.7	1.3	46	9.9	14
JUL											
26...	0950	51	8.0	7.6	15	38	0.9	0.90	55	5.9	19

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC											
08...	1245	--	--	--	--	--	8	--	--	<0.20	0.020
FEB											
23...	1015	<0.10	15	96	97	0.13	8	0.290	0.290	<0.20	0.030
JUL											
26...	0950	0.10	22	117	113	0.16	8	0.410	0.410	<0.20	0.020
AUG											
30...	1320	--	--	--	--	--	9	0.310	0.310	<0.20	0.010

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

16272200 KAMOOALII STREAM BELOW LULUKU STREAM NEAR KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 23...	1015	300	100	<1	<100	5	<10	<1	2	<1	<3
JUL 26...	0950	250	10	<1	<100	4	<10	<1	2	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 23...	2	560	89	<1	<10	<4	60	28	<0.10	<1	<10
JUL 26...	1	520	27	<1	<10	<4	20	2	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 23...	2	<1	<1	<1	<1	<1.0	67	<6	<10	1.9	<1
JUL 26...	1	<1	<1	<1	<1	<1.0	68	<6	<10	1.5	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 23...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 26...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 23...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 26...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 23...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 26...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE

LOCATION.--Lat 21°24'21", long 157°48'31", Hydrologic Unit 20060000, on right bank, 1.8 mi west of Castle High School, 1.2 mi northwest of Hawaiian Memorial Park Cemetary, and 2.4 mi northwest of Pali Golf Courese.

DRAINAGE AREA.--0.40 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1987 to current year.

GAGE.--Water-stage recorder.

REMARKS.--Records good except those above 21 cfs which are poor.

AVERAGE DISCHARGE.--7 years, 2.50 ft^3/s (1,810 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 207 ft^3/s, Dec. 31, 1987, gage height, 5.18 ft, from rating curve extended above 21 ft^3/s; minimum, 1.5 ft^3/s, July 18, 19, 1989.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 15	2115	*106	*3.87	No other peak greater than base discharge.			

Minimum discharge, 1.6 ft^3/s, June 13, 14.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

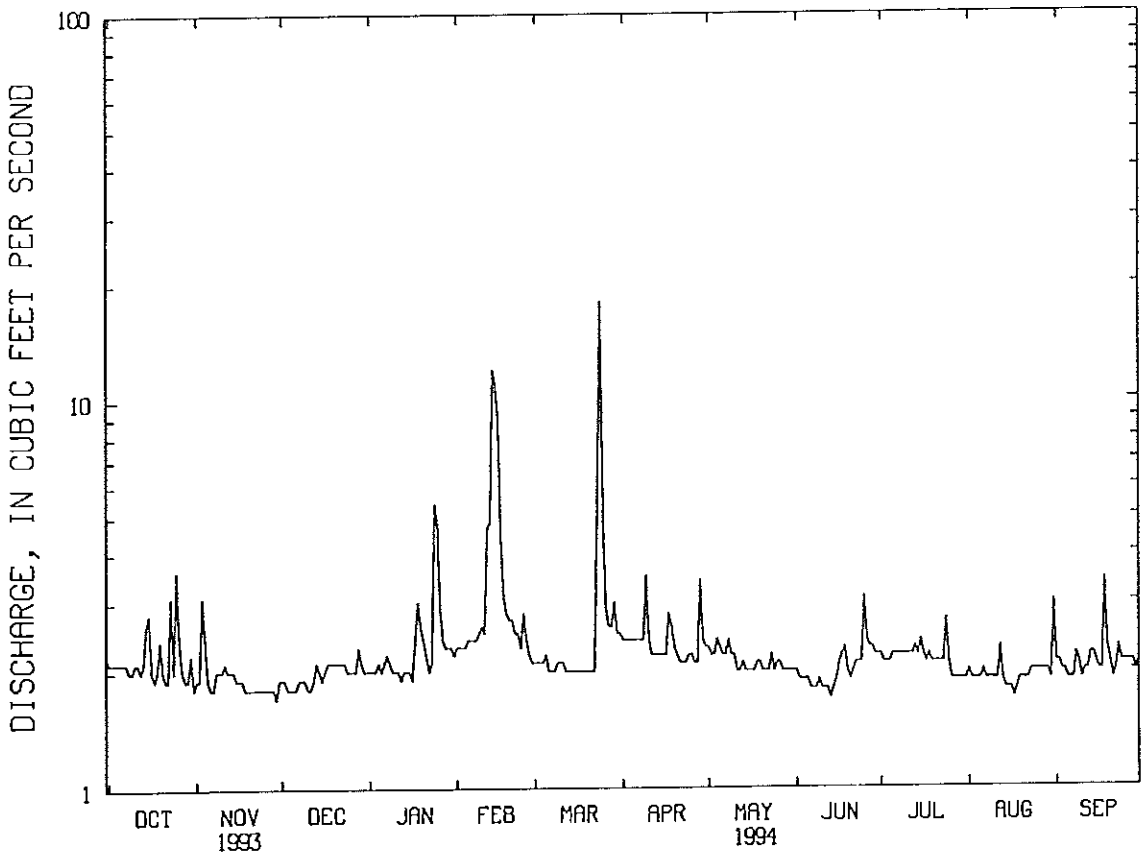
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.1	1.9	1.9	2.0	2.3	2.1	2.4	2.3	2.0	2.2	2.0	2.1
2	2.1	1.9	1.9	2.0	2.3	2.1	2.4	2.2	1.9	2.1	1.9	2.1
3	2.1	3.1	1.8	2.0	2.3	2.1	2.4	2.2	1.9	2.1	1.9	2.0
4	2.1	2.4	1.8	2.1	2.3	2.1	2.4	2.4	1.9	2.1	1.9	2.0
5	2.1	1.9	1.8	2.0	2.4	2.2	2.4	2.3	1.9	2.2	1.9	1.9
6	2.1	1.8	1.8	2.1	2.4	2.0	2.4	2.2	1.8	2.2	2.0	1.9
7	2.1	1.8	1.9	2.2	2.4	2.0	2.4	2.2	1.8	2.2	1.9	1.9
8	2.0	2.0	1.9	2.1	2.4	2.0	2.4	2.4	1.8	2.2	1.9	2.2
9	2.0	2.0	1.9	2.0	2.5	2.1	3.5	2.2	1.9	2.2	1.9	2.1
10	2.1	2.0	1.8	2.0	2.6	2.1	2.4	2.2	1.8	2.2	1.9	1.9
11	2.1	2.1	1.8	2.0	2.5	2.1	2.2	2.0	1.8	2.2	1.9	2.0
12	2.0	2.0	1.9	1.9	4.7	2.0	2.2	2.0	1.8	2.2	2.3	2.0
13	2.1	2.0	2.1	2.0	4.8	2.0	2.2	2.1	1.7	2.3	1.9	2.2
14	2.6	2.0	2.0	2.0	12	2.0	2.2	2.0	1.8	2.2	1.8	2.2
15	2.8	1.9	1.9	2.0	11	2.0	2.2	2.0	1.9	2.4	1.8	2.1
16	2.0	1.9	2.0	1.9	8.8	2.0	2.2	2.0	2.1	2.2	1.8	2.0
17	1.9	1.9	2.1	2.4	4.3	2.0	2.8	2.0	2.2	2.1	1.7	2.0
18	2.0	1.8	2.1	3.0	3.1	2.0	2.6	2.1	2.3	2.2	1.8	3.4
19	2.4	1.8	2.1	2.6	2.8	2.0	2.3	2.1	2.0	2.1	1.9	2.3
20	2.0	1.8	2.1	2.4	2.7	2.0	2.2	2.0	1.9	2.1	1.9	2.1
21	1.9	1.8	2.1	2.2	2.7	2.0	2.1	2.0	2.0	2.1	1.9	1.9
22	1.9	1.8	2.1	2.0	2.5	2.0	2.1	2.0	2.1	2.1	1.9	2.0
23	3.1	1.8	2.1	2.1	2.5	5.7	2.1	2.2	2.1	2.1	2.0	2.3
24	2.0	1.8	2.0	5.4	2.3	18	2.2	2.0	2.1	2.7	2.0	2.1
25	3.6	1.8	2.0	4.8	2.8	4.9	2.2	2.1	3.1	2.1	2.0	2.1
26	2.4	1.8	2.0	2.9	2.4	2.9	2.1	2.1	2.4	1.9	2.0	2.1
27	2.0	1.8	2.0	2.4	2.2	2.6	2.1	2.0	2.3	1.9	2.0	2.1
28	1.9	1.8	2.3	2.3	2.1	2.6	3.4	2.0	2.3	1.9	2.0	2.1
29	1.9	1.7	2.1	2.3	---	3.0	2.4	2.0	2.2	1.9	2.0	2.0
30	2.2	1.9	2.0	2.3	---	2.5	2.3	2.0	2.2	1.9	1.9	2.1
31	1.8	---	2.0	2.2	---	2.5	---	2.0	---	1.9	3.0	---
TOTAL	67.4	58.0	61.3	73.6	100.1	89.6	71.2	65.3	61.0	66.2	60.7	63.2
MEAN	2.17	1.93	1.98	2.37	3.57	2.89	2.37	2.11	2.03	2.14	1.96	2.11
MAX	3.6	3.1	2.3	5.4	12	18	3.5	2.4	3.1	2.7	3.0	3.4
MIN	1.8	1.7	1.8	1.9	2.1	2.0	2.1	2.0	1.7	1.9	1.7	1.9
AC-FT	134	115	122	146	199	178	141	130	121	131	120	125

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1988 - 1994, BY WATER YEAR (WY)

MEAN	2.42	2.56	2.93	2.72	2.84	2.77	2.75	2.20	2.11	2.25	2.19	2.25
MAX	3.07	3.45	4.99	4.31	3.57	3.78	5.44	2.46	2.31	2.64	2.50	2.85
(WY)	1992	1991	1988	1988	1994	1991	1989	1988	1988	1990	1989	1988
MIN	1.90	1.93	1.98	2.07	2.37	2.10	1.92	1.92	1.92	2.05	1.95	1.91
(WY)	1988	1990	1994	1992	1993	1993	1992	1990	1990	1992	1992	1990

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1988 - 1994	
ANNUAL TOTAL	788.4		837.6			
ANNUAL MEAN	2.16		2.29		2.50	
HIGHEST ANNUAL MEAN					2.87	1989
LOWEST ANNUAL MEAN					2.26	1992
HIGHEST DAILY MEAN	6.5	Jul 22	18	Mar 24	30	Apr 8 1989
LOWEST DAILY MEAN	1.7	Nov 29	1.7	Nov 29	1.5	Jul 18 1989
ANNUAL SEVEN-DAY MINIMUM	1.8	Nov 23	1.8	Nov 23	1.6	May 24 1990
ANNUAL RUNOFF (AC-FT)	1560		1660		1810	
10 PERCENT EXCEEDS	2.4		2.6		3.0	
50 PERCENT EXCEEDS	2.1		2.1		2.2	
90 PERCENT EXCEEDS	1.9		1.9		1.9	



16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--July 1988 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: October 1990 to current year.

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

REMARKS.--Water-quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV											
09...	1005	E2.1	221	7.9	23.0	21.0	2.9	764	8.6	96	--
DEC											
07...	1105	1.8	198	8.0	22.5	21.0	4.3	764	8.6	96	4600
JAN											
25...	0930	4.3	376	7.5	20.5	20.5	0.30	760	8.4	94	--
FEB											
24...	1050	2.2	225	7.6	--	20.5	4.1	762	8.6	96	5400
MAR											
22...	0925	2.5	198	7.8	19.0	20.5	1.0	763	8.9	99	--
APR											
20...	1410	2.2	220	8.1	22.5	22.0	4.8	762	8.5	97	--
JUN											
07...	1315	1.8	196	8.1	25.5	22.0	3.3	762	8.6	99	--
JUL											
25...	0950	2.0	192	8.0	25.0	22.0	1.5	760	8.4	96	1400
AUG											
15...	1125	1.6	200	7.9	28.0	24.0	2.5	761	8.3	99	--
30...	0945	1.8	185	8.0	26.5	22.0	2.9	761	8.2	94	500

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB											
24...	1050	69	15	7.7	18	36	0.9	1.2	67	13	20
JUL											
25...	0950	61	13	6.8	17	37	1	1.2	66	6.9	20

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC											
07...	1105	--	--	--	--	--	14	--	--	<0.20	0.060
FEB											
24...	1050	<0.10	29	147	147	0.20	20	0.510	0.510	<0.20	0.030
JUL											
25...	0950	0.10	31	136	136	0.18	11	0.110	0.110	0.20	0.040
AUG											
30...	0945	--	--	--	--	--	13	--	<0.050	<0.20	0.020

< Actual value is known to be less than the value shown
E Estimated

16273950 SOUTH FORK KAPUNAHALA STREAM AT KANEOHE--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 24...	1050	330	30	<1	<100	4	<10	<1	3	<1	<3
JUL 25...	0950	280	<10	<1	<100	3	<10	<1	3	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 24...	2	720	98	<1	<10	<4	50	27	0.20	<1	<10
JUL 25...	2	1000	100	<1	<10	<4	50	25	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 24...	<1	<1	<1	<1	<1	<1.0	79	9	<10	1.1	<1
JUL 25...	1	<1	<1	<1	<1	<1.0	69	8	10	1.4	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 24...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 25...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 24...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 25...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 24...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 25...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

16275000 HAIKU STREAM NEAR HEEIA

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

DRAINAGE AREA.--0.97 mi^2.

WATER-DISCHARGE RECORDS

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

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

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

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

AVERAGE DISCHARGE (since diversion from tunnel began).--46 years (water years 1944-77, 1983-94), 2.24 ft^3/s, (1,620 acre-ft/yr).

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

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 15	2100	*710	*3.50	Mar. 24	1815	377	3.11

Minimum discharge, 1.2 ft^3/s, Dec. 27 to Jan. 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

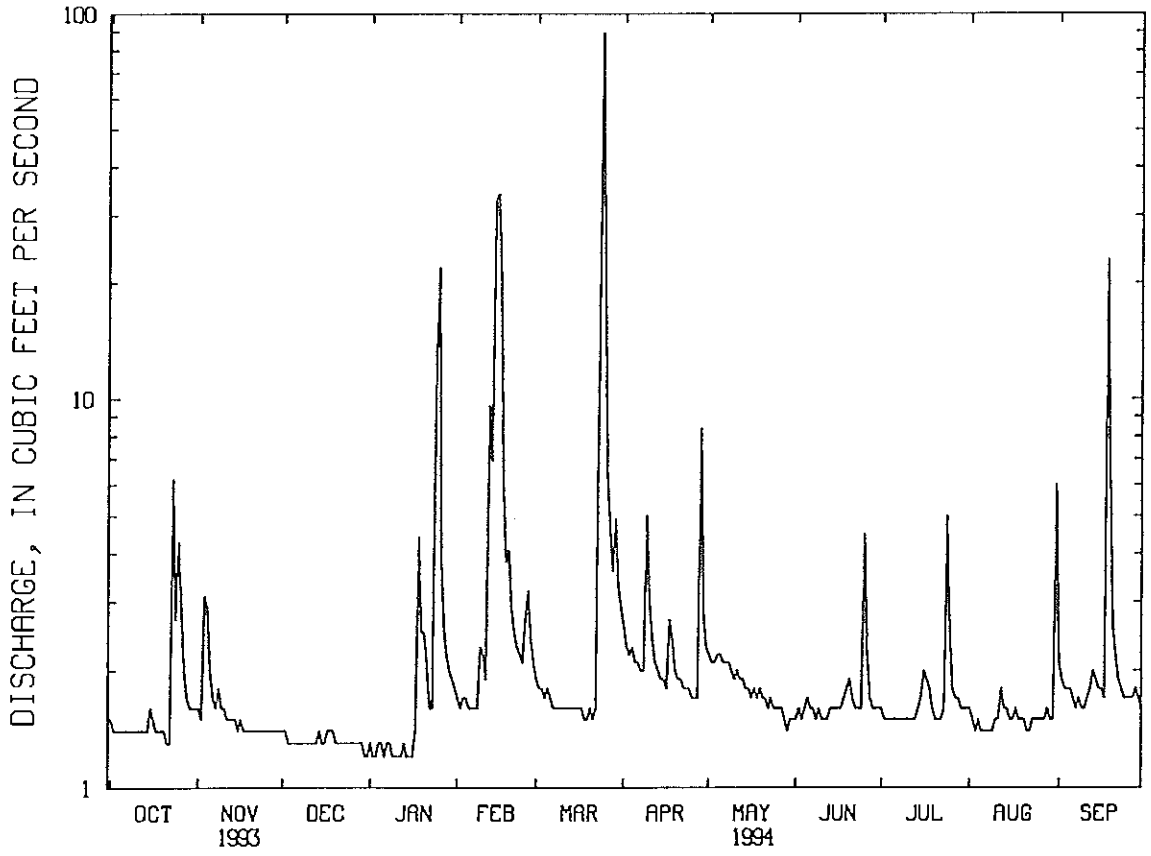
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.5	1.6	1.4	1.3	1.7	1.9	2.6	2.2	1.5	1.6	1.6	2.1
2	1.4	1.5	1.4	1.2	1.6	1.8	2.3	2.1	1.6	1.5	1.5	1.9
3	1.4	3.1	1.3	1.2	1.7	1.8	2.2	2.1	1.5	1.5	1.4	1.8
4	1.4	2.9	1.3	1.3	1.7	1.7	2.3	2.2	1.6	1.5	1.5	1.8
5	1.4	2.0	1.3	1.3	1.6	1.8	2.1	2.2	1.7	1.5	1.4	1.8
6	1.4	1.7	1.3	1.2	1.6	1.7	2.1	2.1	1.6	1.5	1.4	1.7
7	1.4	1.6	1.3	1.3	1.6	1.6	2.0	2.1	1.6	1.5	1.4	1.6
8	1.4	1.8	1.3	1.3	1.6	1.6	2.0	2.1	1.5	1.5	1.4	1.7
9	1.4	1.6	1.3	1.2	2.3	1.6	5.0	2.0	1.6	1.5	1.4	1.6
10	1.4	1.6	1.3	1.2	2.2	1.6	3.0	1.9	1.5	1.5	1.5	1.6
11	1.4	1.5	1.3	1.2	1.9	1.6	2.4	2.0	1.5	1.5	1.5	1.7
12	1.4	1.5	1.3	1.2	9.6	1.6	2.1	1.9	1.5	1.5	1.8	1.8
13	1.4	1.5	1.3	1.3	6.9	1.6	2.0	1.9	1.6	1.5	1.6	2.0
14	1.4	1.5	1.4	1.2	33	1.6	1.9	1.8	1.6	1.6	1.6	1.9
15	1.6	1.4	1.3	1.2	34	1.6	1.9	1.8	1.6	1.7	1.5	1.8
16	1.5	1.5	1.3	1.2	20	1.6	1.8	1.7	1.6	2.0	1.5	1.8
17	1.4	1.4	1.4	1.4	6.2	1.6	2.7	1.8	1.6	1.9	1.6	1.7
18	1.4	1.4	1.4	4.4	3.8	1.5	2.4	1.7	1.7	1.8	1.5	23
19	1.4	1.4	1.4	2.5	4.1	1.5	2.0	1.8	1.8	1.6	1.5	6.0
20	1.4	1.4	1.3	2.5	2.9	1.6	1.9	1.7	1.9	1.5	1.5	2.6
21	1.3	1.4	1.3	2.1	2.5	1.5	1.9	1.7	1.7	1.5	1.4	2.2
22	1.3	1.4	1.3	1.6	2.3	1.6	1.8	1.6	1.6	1.5	1.4	1.9
23	6.2	1.4	1.3	1.6	2.2	17	1.8	1.7	1.6	1.6	1.5	1.8
24	2.7	1.4	1.3	13	2.1	89	1.8	1.6	1.6	5.0	1.5	1.7
25	4.3	1.4	1.3	22	2.7	19	1.7	1.6	4.5	2.5	1.5	1.7
26	2.9	1.4	1.3	3.9	3.2	6.3	1.7	1.6	2.2	1.8	1.5	1.7
27	2.0	1.4	1.3	2.6	2.4	4.6	1.7	1.6	1.7	1.7	1.5	1.7
28	1.7	1.4	1.3	2.2	2.1	3.6	8.4	1.5	1.6	1.7	1.6	1.8
29	1.6	1.4	1.3	2.0	---	4.9	2.8	1.4	1.6	1.6	1.5	1.7
30	1.6	1.4	1.2	1.9	---	3.3	2.3	1.5	1.6	1.6	1.5	1.6
31	1.6	---	1.2	1.8	---	2.9	---	1.5	---	1.6	6.0	---
TOTAL	55.6	47.9	40.7	85.3	159.5	186.6	72.6	56.4	51.8	53.8	51.0	79.7
MEAN	1.79	1.60	1.31	2.75	5.70	6.02	2.42	1.82	1.73	1.74	1.65	2.66
MAX	6.2	3.1	1.4	22	34	89	8.4	2.2	4.5	5.0	6.0	23
MIN	1.3	1.4	1.2	1.2	1.6	1.5	1.7	1.4	1.5	1.5	1.4	1.6
AC-FT	110	95	81	169	316	370	144	112	103	107	101	158

16275000 HAIKU STREAM NEAR HEEIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1944 - 1994, BY WATER YEAR (WY)

MEAN	1.94	2.77	2.75	2.62	2.55	3.34	2.57	2.37	1.37	1.55	1.59	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1944 - 1994	
ANNUAL TOTAL	578.6		940.9			
ANNUAL MEAN	1.59		2.58		2.24	
HIGHEST ANNUAL MEAN					4.82	1965
LOWEST ANNUAL MEAN					.67	1946
HIGHEST DAILY MEAN	14	Jul 22	89	Mar 24	620	May 2 1965
LOWEST DAILY MEAN	1.2	Jun 9	1.2	Dec 30	.29	Jul 13 1945
ANNUAL SEVEN-DAY MINIMUM	1.2	Jun 13	1.2	Jan 9	.29	Oct 19 1945
ANNUAL RUNOFF (AC-FT)	1150		1870		1620	
10 PERCENT EXCEEDS	1.8		2.8		2.7	
50 PERCENT EXCEEDS	1.4		1.6		1.5	
90 PERCENT EXCEEDS	1.3		1.3		.82	



16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1982 to September 1985, October 1986 to current year.

PERIOD OF DAILY RECORD.--
SUSPENDED SEDIMENT DISCHARGE: December 1983 to September 1984, July 1987 to current year.

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

REMARKS.--Water-quality samples were also collected at this site. Table of "Sediment discharge, suspended (tons/day), Water year October 1993 to September 1994" was not completed at the time of this publication.

EXTREMES FOR PERIOD OF RECORD.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

EXTREMES FOR CURRENT YEAR.--
SEDIMENT CONCENTRATIONS: Maximum and minimum daily mean was not completed at the time of this publication.
SEDIMENT DISCHARGE: Maximum and minimum daily mean was not completed at the time of this publication.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV											
09...	0905	1.6	155	7.8	20.0	19.5	0.50	759	8.9	97	--
DEC											
08...	1025	1.3	144	7.9	23.0	19.5	0.50	756	8.6	94	110
JAN											
25...	1235	13	180	7.9	19.0	20.0	0.40	754	8.6	96	--
FEB											
24...	1315	2.0	155	7.6	21.0	20.0	0.70	756	8.7	96	400
MAR											
22...	1020	1.6	152	7.7	19.0	19.5	0.70	757	8.7	95	--
APR											
20...	1005	1.9	153	7.7	20.5	20.0	0.50	759	8.9	98	--
JUN											
07...	0955	1.5	146	7.7	--	20.5	0.80	756	8.5	95	--
JUL											
28...	1015	1.7	150	8.0	24.5	21.5	0.20	756	8.5	97	280
AUG											
17...	1040	1.5	150	7.3	24.0	21.0	0.20	757	8.6	97	--
31...	1335	2.5	152	7.8	255.5	21.5	0.40	757	8.7	99	330

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB											
24...	1315	46	9.2	5.6	12	36	0.8	0.80	48	4.6	16
JUL											
28...	1015	43	8.2	5.4	11	35	0.7	0.80	47	3.4	15

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC											
08...	1025	--	--	--	--	--	6	--	--	<0.20	0.030
FEB											
24...	1315	<0.10	24	93	102	0.13	6	0.130	0.130	<0.20	<0.010
JUL											
28...	1015	0.10	26	107	99	0.15	2	0.170	0.170	<0.20	0.020
AUG											
31...	1335	--	--	--	--	--	8	0.120	0.120	<0.20	0.010

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

16275000 HAIKU STREAM NEAR HEEIA--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB 24...	1315	80	30	<1	<100	<2	<10	<1	1	<1	<3
JUL 28...	1015	30	<10	<1	<100	<2	<10	<1	<1	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
FEB 24...	<1	130	47	<1	<10	<4	10	7	0.20	<1	<10
JUL 28...	<1	100	36	<1	<10	<4	<10	3	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
FEB 24...	<1	<1	<1	<1	<1	<1.0	53	<6	<10	0.5	<1
JUL 28...	<1	<1	<1	<1	<1	<1.0	51	<6	<10	0.4	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 24...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 28...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)	METHYL PARATHION, TOTAL (UG/L)
FEB 24...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 28...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 24...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 28...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

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.--0.99 mi^2.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 150 ft, from topographic map. Honolulu Board of Water Supply).

REMARKS.--Records 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 amount of water from the stream.

AVERAGE DISCHARGE.--11 years, 3.57 ft^3/s (2,590 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 728 ft^3/s, Sep. 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)
Feb. 15	2130	678	5.91	Sep. 18	2100	*728	*6.05

Minimum discharge, 1.4 ft^3/s, Jan. 12, 14-16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.3	3.0	2.5	2.1	2.7	3.6	4.4	3.7	2.8	e3.8	3.2	3.8
2	2.2	2.8	2.3	2.1	2.6	3.6	4.2	3.6	2.8	e3.7	3.2	3.4
3	2.1	5.0	2.2	2.0	2.7	3.6	4.2	3.6	2.8	e3.6	3.2	3.3
4	2.1	4.6	2.2	2.1	2.6	3.7	4.2	4.0	2.7	e3.5	3.2	3.2
5	2.1	3.3	2.2	2.0	2.5	3.8	4.1	3.6	2.7	e3.5	3.2	3.1
6	2.1	3.0	2.2	2.1	2.5	3.7	4.1	3.6	2.7	e3.5	3.2	3.3
7	2.0	2.7	2.2	2.3	2.5	3.7	4.2	3.6	2.7	e3.6	3.2	3.0
8	2.0	4.0	2.2	2.1	2.5	3.6	4.2	3.7	2.6	e3.5	3.2	3.0
9	2.0	3.0	2.1	2.0	5.4	3.7	6.0	3.5	2.6	e3.4	3.2	2.9
10	2.6	2.8	2.1	2.0	3.2	3.9	4.9	3.4	2.6	e3.4	3.3	2.9
11	2.1	2.7	2.1	2.0	2.8	3.8	4.4	3.4	2.8	e3.3	3.0	2.9
12	2.0	2.7	2.1	2.0	13	3.8	4.0	3.3	2.7	e3.3	8.5	3.2
13	2.0	2.6	2.2	2.1	15	3.8	3.9	4.0	2.7	e3.2	3.7	3.2
14	2.1	2.6	2.2	2.0	29	3.7	3.9	3.4	3.0	e3.2	3.3	3.6
15	3.1	2.5	2.2	1.9	e41	3.8	3.9	3.3	3.0	e4.5	3.2	3.4
16	2.2	2.5	2.1	1.9	e20	3.9	3.9	3.1	3.0	e3.5	3.1	3.0
17	2.1	2.5	2.5	3.9	e12	3.9	4.1	3.0	3.2	e3.4	3.0	2.9
18	2.1	2.4	2.7	14	e7.0	3.9	4.5	3.1	4.5	e3.6	3.0	29
19	2.1	2.4	2.4	7.0	e4.3	3.8	4.1	3.6	4.5	e3.4	3.0	11
20	2.0	2.4	2.2	4.6	e3.6	3.8	4.1	3.1	2.9	e3.4	4.3	4.6
21	2.0	2.4	2.2	3.4	e3.4	3.8	4.0	3.0	2.8	e3.3	3.3	3.8
22	2.0	2.4	2.2	2.8	e3.3	3.6	4.0	3.0	4.3	e3.3	3.0	3.6
23	12	2.4	2.1	2.9	e3.4	11	4.2	2.9	3.2	e3.3	3.3	3.4
24	4.8	2.3	2.1	20	3.4	65	4.1	2.9	3.1	e15	3.1	3.4
25	6.6	2.3	2.1	24	4.3	13	4.2	2.8	9.5	e7.0	3.0	3.3
26	5.0	2.3	2.1	5.8	4.5	5.8	4.1	3.6	4.7	e5.0	3.1	3.3
27	3.7	2.3	2.1	4.1	3.9	4.8	4.0	2.9	4.1	3.4	2.9	3.3
28	3.2	2.3	2.0	3.5	3.7	5.8	7.3	2.7	3.9	3.3	2.9	3.3
29	2.9	2.3	2.1	3.2	---	6.5	3.8	2.7	e3.7	3.2	2.9	3.3
30	3.9	2.4	2.1	2.8	---	5.2	3.7	2.7	e3.7	3.2	2.9	3.3
31	3.0	---	2.1	2.7	---	4.8	---	2.7	---	3.2	10	---
TOTAL	92.4	82.9	68.1	137.4	206.8	204.4	128.7	101.5	102.3	123.5	110.6	132.7
MEAN	2.98	2.76	2.20	4.43	7.39	6.59	4.29	3.27	3.41	3.98	3.57	4.42
MAX	12	5.0	2.7	24	41	65	7.3	4.0	9.5	15	10	29
MIN	2.0	2.3	2.0	1.9	2.5	3.6	3.7	2.7	2.6	3.2	2.9	2.9
AC-FT	183	164	135	273	410	405	255	201	203	245	219	263

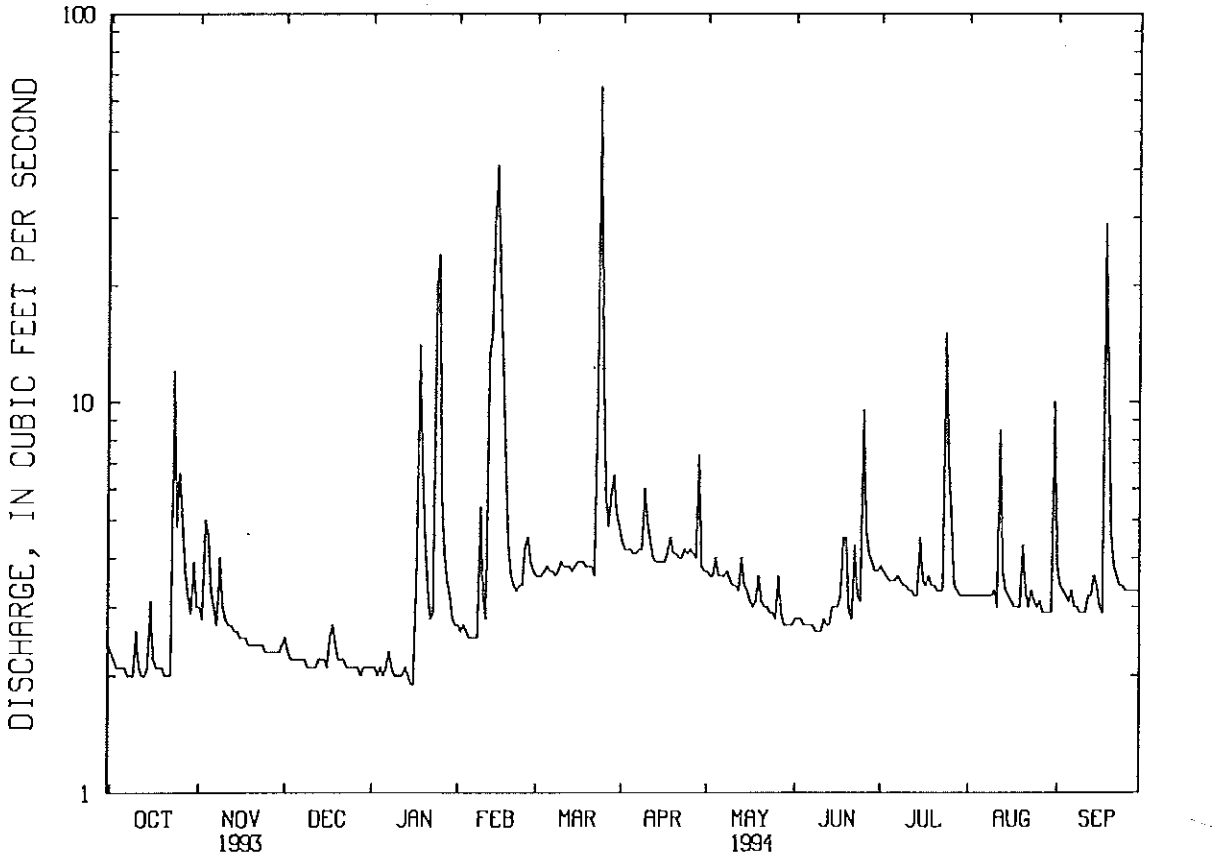
e Estimated

16283200 KAHALUU STREAM NEAR AHUIMANU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1984 - 1994, BY WATER YEAR (WY)

MEAN	3.31	3.91	4.10	3.77	4.06	4.68	3.71	3.26	2.79	3.19	2.83	3.30
MAX	6.69	10.5	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	1.24	1.09	.95	1.03	1.03	.92	.85	.73	.74	.67	.67
(WY)	1985	1986	1986	1986	1986	1984	1985	1984	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1984 - 1994		
ANNUAL TOTAL	1064.2		1491.3				
ANNUAL MEAN	2.92		4.09		3.57		
HIGHEST ANNUAL MEAN					5.97		1991
LOWEST ANNUAL MEAN					1.07		1984
HIGHEST DAILY MEAN	21	Jul 22	65	Mar 24	97	Mar 19	1991
LOWEST DAILY MEAN	2.0	Aug 7	1.9	Jan 15	.58	Sep 22	1984
ANNUAL SEVEN-DAY MINIMUM	2.0	Sep 6	2.0	Jan 10	.59	Nov 5	1984
ANNUAL RUNOFF (AC-FT)	2110		2960		2590		
10 PERCENT EXCEEDS	3.7		4.8		5.1		
50 PERCENT EXCEEDS	2.7		3.2		3.1		
90 PERCENT EXCEEDS	2.1		2.1		.91		



16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'47", long 157°52'12", Hydrologic Unit 20060000, on left bank 0.2 mi upstream from confluence with North Fork, 3.0 mi southwest of Waiahole School, and 4.0 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

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

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

REMARKS.--Records fair. Honolulu Board of Water Supply pumps water from wells in drainage area.

AVERAGE DISCHARGE.--32 years, 1.29 ft^3/s (935 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 430 ft^3/s, Oct. 28, 1981, gage height, 4.68 ft, from rating curve extended above 4.8 ft^3/s; no flow, July 7, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 47 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 15	2130	*245	*3.80	Sep. 18	2115	86	2.63

Minimum discharge, 0.19 ft^3/s on several days in Aug. and Sep.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

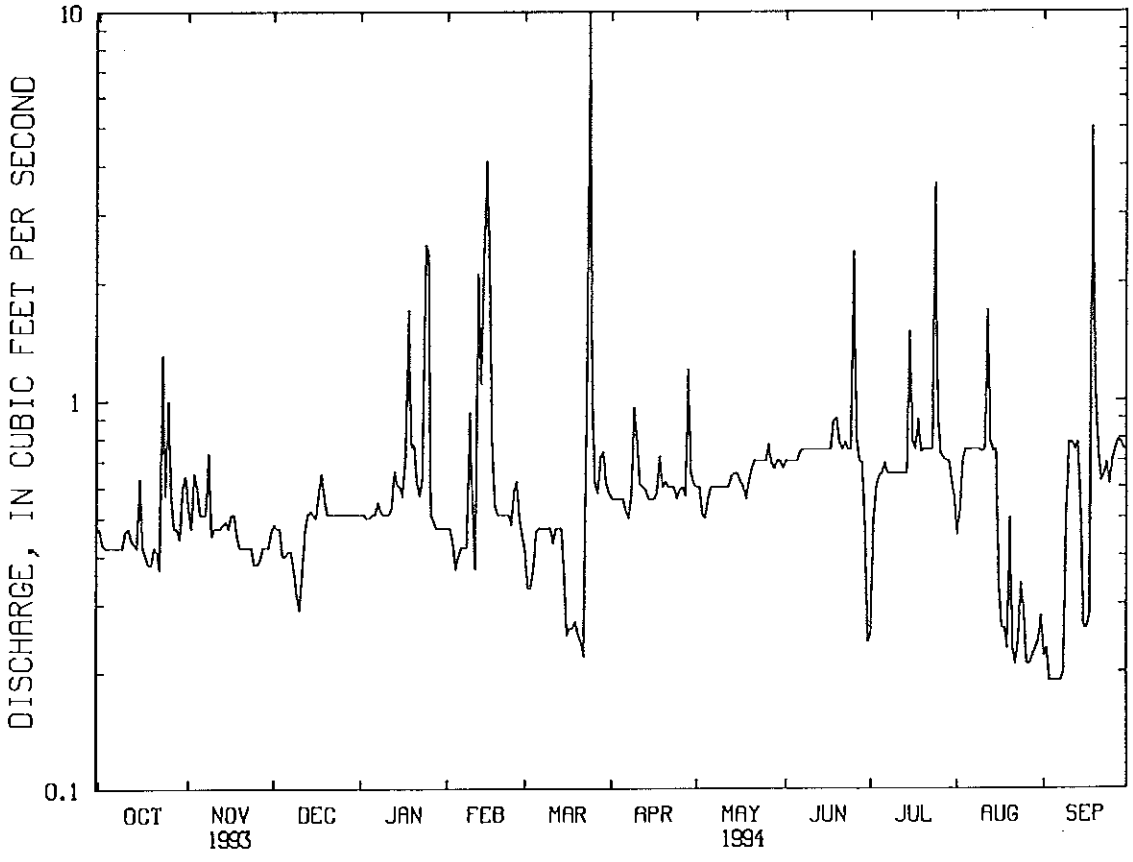
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.47	.53	.48	.51	.47	.41	.56	.60	.70	.25	.45	.22
2	.43	.47	.47	.51	.47	.33	.56	.60	.70	.49	.52	.23
3	.42	.65	.47	.50	.43	.33	.56	.51	.70	.60	.70	.19
4	.42	.60	.40	.50	.37	.37	.56	.50	.70	.64	.75	.19
5	.42	.51	.40	.51	.40	.46	.56	.56	.70	.65	.75	.19
6	.42	.51	.41	.51	.42	.47	.52	.60	.74	.69	.75	.19
7	.42	.51	.41	.55	.42	.47	.50	.60	.75	.65	.75	.19
8	.42	.73	.37	.52	.42	.47	.58	.60	.75	.65	.75	.20
9	.42	.45	.32	.51	.93	.47	.96	.60	.75	.65	.75	.52
10	.46	.47	.29	.51	.55	.47	.78	.60	.75	.65	.74	.78
11	.47	.47	.36	.51	.37	.43	.61	.60	.75	.65	.75	.78
12	.44	.47	.46	.53	2.1	.47	.60	.60	.75	.65	1.7	.75
13	.43	.48	.51	.66	1.1	.47	.59	.64	.75	.65	.78	.78
14	.42	.49	.52	.61	2.3	.47	.56	.65	.75	.65	.74	.53
15	.63	.47	.51	.60	4.1	.36	.56	.65	.75	1.5	.75	.26
16	.42	.51	.50	.57	2.2	.25	.56	.62	.75	.78	.34	.26
17	.40	.51	.58	.73	.78	.26	.58	.60	.75	.75	.26	.28
18	.38	.45	.65	1.7	.54	.26	.72	.56	.89	.89	.26	5.0
19	.38	.42	.56	.76	.51	.27	.60	.62	.90	.74	.23	1.1
20	.42	.42	.51	.77	.51	.25	.62	.67	.78	.75	.50	.77
21	.41	.42	.51	.62	.51	.24	.60	.70	.75	.75	.23	.62
22	.37	.42	.51	.57	.51	.22	.60	.70	.78	.75	.21	.64
23	1.3	.42	.51	.63	.51	1.0	.60	.70	.75	.75	.24	.69
24	.57	.38	.51	2.5	.48	10	.56	.70	.75	3.6	.34	.61
25	1.0	.38	.51	2.4	.59	1.0	.59	.70	2.4	.91	.29	.70
26	.57	.39	.51	.51	.62	.61	.60	.77	.80	.73	.21	.75
27	.47	.42	.51	.49	.50	.58	.57	.69	.70	.71	.21	.79
28	.47	.42	.51	.47	.45	.72	1.2	.67	.69	.70	.22	.78
29	.44	.42	.51	.47	---	.74	.65	.70	.47	.70	.23	.75
30	.60	.46	.51	.47	---	.61	.61	.70	.24	.62	.24	.75
31	.64	---	.51	.47	---	.58	---	.67	---	.56	.28	---
TOTAL	15.53	14.25	14.79	22.17	23.56	24.04	18.72	19.68	23.39	24.71	15.92	20.49
MEAN	.50	.47	.48	.72	.84	.78	.62	.63	.78	.80	.51	.68
MAX	1.3	.73	.65	2.5	4.1	10	1.2	.77	2.4	3.6	1.7	5.0
MIN	.37	.38	.29	.47	.37	.22	.50	.50	.24	.25	.21	.19
AC-FT	31	28	29	44	47	48	37	39	46	49	32	41

16283600 SOUTH FORK WAIHEE STREAM NEAR HEEIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

MEAN	1.30	1.34	1.29	1.28	1.28	1.33	1.29	1.30	1.21	1.29	1.30	1.28
MAX	2.47	2.85	2.49	2.39	2.97	2.96	2.79	3.57	2.60	2.62	3.17	2.47
(WY)	1969	1966	1969	1968	1969	1968	1968	1965	1968	1971	1971	1968
MIN	.36	.29	.28	.31	.28	.25	.24	.29	.27	.41	.32	.28
(WY)	1990	1990	1990	1983	1983	1983	1983	1989	1989	1981	1989	1989

SUMMARY STATISTICS FOR 1993 CALENDAR YEAR			FOR 1994 WATER YEAR		WATER YEARS 1962 - 1994		
ANNUAL TOTAL	200.81		237.25				
ANNUAL MEAN	.55		.65		1.29		
HIGHEST ANNUAL MEAN					2.52		1968
LOWEST ANNUAL MEAN					.37		1990
HIGHEST DAILY MEAN	2.0	Jul 22	10	Mar 24	33	May 2	1965
LOWEST DAILY MEAN	.29	Dec 10	.19	Sep 3	.00	Jul 8	1977
ANNUAL SEVEN-DAY MINIMUM	.37	Dec 5	.20	Sep 2	.20	Sep 2	1994
ANNUAL RUNOFF (AC-FT)	398		471		935		
10 PERCENT EXCEEDS	.60		.78		2.2		
50 PERCENT EXCEEDS	.56		.56		1.1		
90 PERCENT EXCEEDS	.42		.33		.42		



16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA

LOCATION.--Lat 21°26'46", long 157°52'18", Hydrologic Unit 20060000, on left bank 0.3 mi upstream from confluence with South Fork, 2.8 mi southwest of Waiahole School, and 4.3 mi northwest of Heeia.

DRAINAGE AREA.--0.03 mi^2.

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

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

REMARKS.--Records good except for estimated daily discharges, which are fair. Honolulu Board of Water Supply pumps water from wells in South Fork Waihee which affects the low flow at this station.

AVERAGE DISCHARGE.--32 years, 1.50 ft^3/s (1,080 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 376 ft^3/s, Feb. 4, 1965, gage height, 3.38 ft, from rating curve extended above 19 ft^3/s; no flow July 7, 8, 1977.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 45 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 15	unknown	88	2.14	Sep. 18	2115	*89	*2.15

Minimum discharge, 0.78 ft^3/s on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	.83	.82	.82	e.92	e.88	e.97	e.98	1.0	1.1	1.2	1.3
2	.82	.82	.82	.82	e.92	e.86	e.97	e.98	1.0	1.1	1.2	1.5
3	.82	.95	.82	.82	e.92	e.86	e.97	e.98	1.0	1.1	1.2	1.3
4	.82	.88	.82	.82	e.92	e.84	e.97	e.98	1.1	1.1	1.2	1.3
5	.82	.82	.82	.82	e.92	e.84	e.97	e.98	1.1	1.1	1.2	1.3
6	.82	.82	.82	.82	e.92	e.83	e.97	e.98	1.1	1.1	1.2	1.3
7	.79	.80	.82	.82	e.92	e.83	e.97	.98	1.1	1.1	1.2	1.3
8	.78	.96	.82	.82	e.92	e.82	e.99	.98	1.1	1.1	1.2	1.3
9	.78	.82	.82	.82	e1.4	e.82	e1.4	.98	1.1	1.1	1.2	1.3
10	.81	.82	.82	.82	e.96	e.82	e1.2	.98	1.1	1.1	1.2	1.3
11	.82	.82	.82	.82	e.92	e.82	e1.0	.98	1.1	1.1	1.2	1.3
12	.79	.82	.82	.82	e2.3	e.82	e1.0	.98	1.1	1.1	2.0	1.3
13	.79	.82	.82	.86	e1.5	e.82	e1.0	.98	1.1	1.1	1.3	1.5
14	.79	.82	.82	.89	e2.5	e.82	e.97	.98	1.1	1.1	1.3	1.5
15	.93	.82	.82	.82	e3.6	e.82	e.97	.98	1.1	1.9	1.2	1.4
16	.80	.82	.83	.82	e2.4	e.80	e.97	.98	1.1	1.2	1.2	1.3
17	.78	.82	.93	.86	e1.2	e.80	e.99	.98	1.1	1.2	1.2	1.3
18	.78	.82	.99	1.7	e.94	e.80	e1.1	.99	1.3	1.3	1.2	5.8
19	.78	.82	.84	.96	e.91	e.80	e1.0	1.0	1.2	1.2	1.2	1.4
20	.78	.82	.82	.99	e.91	e.80	e1.0	1.0	1.1	1.2	1.3	1.2
21	.78	.82	.82	e.88	e.91	e.80	e1.0	1.0	1.1	1.2	1.2	1.2
22	.78	.82	.82	e.82	e.91	e.80	e1.0	1.0	1.1	1.2	1.2	1.2
23	1.4	.82	.82	e.85	e.91	e1.4	e1.0	1.0	1.1	1.2	1.3	1.2
24	.83	.82	.82	e2.3	e.91	e6.5	e.97	1.0	1.1	3.4	1.2	1.2
25	1.2	.82	.82	e2.5	e1.0	e1.4	e1.0	1.0	2.4	1.4	1.2	1.2
26	.84	.82	.82	e1.0	e1.0	e1.0	e1.0	1.1	1.2	1.2	1.2	1.2
27	.82	.82	.82	e.92	e.90	e.99	e.98	1.0	1.1	1.2	1.2	1.2
28	.82	.82	.83	e.92	e.90	e1.1	e1.6	1.0	1.1	1.2	1.2	1.2
29	.80	.82	.84	.92	---	e1.2	e1.1	1.0	1.1	1.2	1.2	1.2
30	.86	.82	.82	e.92	---	e1.0	e1.0	1.0	1.1	1.2	1.2	1.2
31	.91	---	.82	e.92	---	e.99	---	1.0	---	1.2	1.9	---
TOTAL	26.16	24.92	25.76	30.69	34.34	33.68	31.03	30.75	34.4	39.0	39.1	43.2
MEAN	.84	.83	.83	.99	1.23	1.09	1.03	.99	1.15	1.26	1.26	1.44
MAX	1.4	.96	.99	2.5	3.6	6.5	1.6	1.1	2.4	3.4	2.0	5.8
MIN	.78	.80	.82	.82	.90	.80	.97	.98	1.0	1.1	1.2	1.2
AC-FT	52	49	51	61	68	67	62	61	68	77	78	86

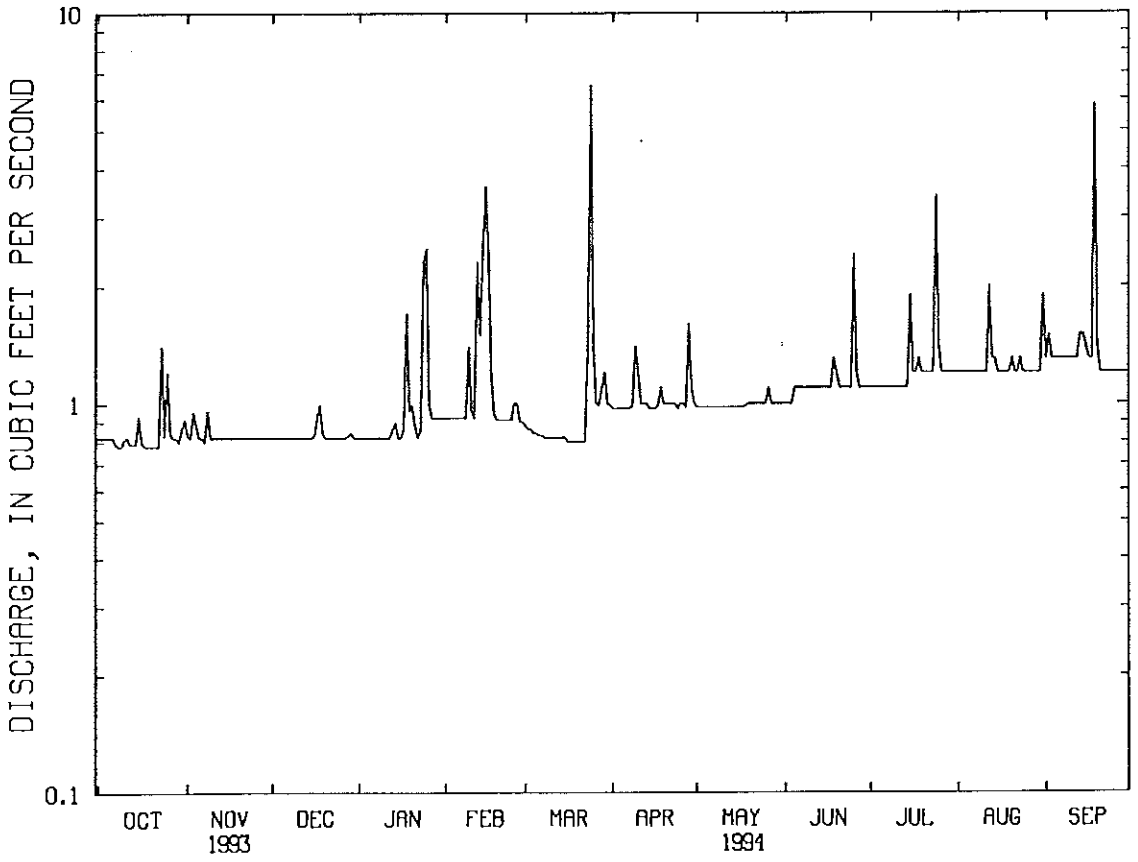
e Estimated

16283700 NORTH FORK WAIHEE STREAM NEAR HEEIA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1962 - 1994, BY WATER YEAR (WY)

MEAN	1.50	1.51	1.48	1.47	1.51	1.49	1.48	1.51	1.46	1.50	1.51	1.52
MAX	2.35	2.82	2.43	2.39	3.42	2.74	2.64	3.40	2.40	2.47	2.55	2.48
(WY)	1970	1966	1966	1970	1965	1968	1968	1965	1969	1965	1965	1969
MIN	.82	.82	.76	.72	.61	.56	.43	.58	.64	.80	.70	.78
(WY)	1990	1990	1990	1983	1983	1983	1983	1990	1990	1990	1990	1989

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1962 - 1994	
ANNUAL TOTAL	347.43		393.03			
ANNUAL MEAN	.95		1.08		1.50	
HIGHEST ANNUAL MEAN					2.42	1965
LOWEST ANNUAL MEAN					.76	1990
HIGHEST DAILY MEAN	2.7	Jul 22	6.5	Mar 24	32	May 2 1965
LOWEST DAILY MEAN	.78	Oct 8	.78	Oct 8	.00	Jul 7 1977
ANNUAL SEVEN-DAY MINIMUM	.78	Oct 16	.78	Oct 16	.35	Apr 25 1983
ANNUAL RUNOFF (AC-FT)	689		780		1080	
10 PERCENT EXCEEDS	1.1		1.3		2.2	
50 PERCENT EXCEEDS	.93		.98		1.4	
90 PERCENT EXCEEDS	.82		.82		.83	



16284200 WAIHEE STREAM NEAR KAHALUU

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

DRAINAGE AREA.--0.97 mi^2.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 170 ft, from topographic map.

REMARKS.--Records good except for estimated daily discharges, which are fair. Honolulu Board of Water Supply diverts water from tunnel and wells in drainage area.

AVERAGE DISCHARGE.--20 years, 6.33 ft^3/s (4,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,530 ft^3/s, Mar. 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, Apr. 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)
Feb. 12	0745	865	6.71	July 24	1900	368	5.32
Feb. 15	2215	*1,020	*7.01	Sep. 18	2100	870	6.72
Mar. 24	unknown	648	6.17				

Minimum discharge, 4.1 ft^3/s, Oct. 19.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.5	4.9	4.5	4.6	5.4	6.2	e6.8	e6.7	6.1	6.3	6.1	6.5
2	4.4	4.7	4.5	4.5	5.5	6.1	e6.6	e6.5	6.2	6.3	6.1	6.7
3	4.3	5.2	4.4	4.5	5.5	6.1	e6.6	e6.5	6.2	6.3	6.0	6.4
4	4.3	5.4	4.4	4.6	5.5	6.1	e6.6	e6.4	6.2	6.1	5.9	6.1
5	4.4	4.9	4.4	4.5	5.5	6.3	e6.6	e6.3	6.1	6.1	5.9	6.0
6	4.4	4.7	4.3	4.5	5.3	6.1	e6.6	e6.3	6.2	6.1	5.9	6.0
7	4.3	4.6	4.3	4.6	5.3	6.1	e6.8	6.3	6.2	6.1	5.9	6.0
8	4.3	5.4	4.4	4.6	5.3	6.1	e9.0	6.3	6.1	6.1	5.9	5.9
9	4.2	4.8	4.4	4.6	12	6.0	e10	6.3	6.1	6.1	5.9	5.7
10	4.3	4.7	4.4	4.5	6.6	6.1	e8.2	6.3	6.2	6.1	5.9	5.7
11	4.3	4.7	4.3	4.5	5.9	6.0	e7.0	6.3	6.1	6.1	6.0	5.7
12	4.2	4.6	4.4	4.5	26	6.0	e7.0	6.2	6.1	6.1	11	5.9
13	4.2	4.7	4.5	4.7	19	6.0	e7.0	6.3	6.1	6.0	6.4	6.5
14	4.3	4.6	4.5	4.7	42	6.0	e7.0	6.2	6.1	5.9	6.1	6.8
15	5.0	4.6	4.4	4.6	65	6.0	e7.0	6.3	6.2	9.1	6.0	6.1
16	4.4	4.7	4.5	4.6	45	6.0	e7.0	6.3	6.1	6.4	5.9	5.6
17	4.3	4.7	5.1	5.0	15	6.0	e7.2	6.2	6.2	6.3	5.9	5.4
18	4.3	4.6	5.3	12	9.3	6.0	e8.1	6.2	6.6	6.6	5.9	49
19	4.2	4.6	4.9	7.0	8.1	6.0	e7.6	6.3	6.6	6.3	5.9	13
20	4.2	4.6	4.6	6.3	7.4	6.1	e7.0	6.3	6.3	6.1	6.4	7.4
21	4.2	4.6	4.5	5.5	7.0	6.1	e6.8	6.2	6.2	6.1	6.0	6.4
22	4.2	4.6	4.5	5.1	6.7	6.1	e6.8	6.1	6.3	6.1	5.9	6.3
23	11	4.6	4.5	5.2	6.5	e10	e6.8	6.2	6.2	6.1	6.1	6.3
24	5.6	4.6	4.5	27	6.4	e125	e6.8	6.2	6.1	30	6.0	6.4
25	7.2	4.6	4.5	46	6.7	e10	e6.7	6.1	17	10	5.9	5.9
26	5.8	4.4	4.5	9.3	6.8	e7.6	e6.7	6.4	7.4	7.1	5.9	5.9
27	5.2	4.4	4.5	7.1	6.4	e7.2	e6.5	6.3	6.7	6.6	5.8	6.1
28	4.9	4.4	4.5	6.4	6.3	e7.8	e9.2	6.1	6.4	6.4	5.8	6.3
29	4.8	4.4	4.6	6.0	---	e8.0	e7.4	6.1	6.3	6.3	5.8	5.9
30	5.1	4.5	4.5	5.7	---	e6.9	e6.8	6.1	6.4	6.2	5.8	6.1
31	5.0	---	4.5	5.6	---	e6.9	---	6.1	---	6.1	12	---
TOTAL	149.8	140.8	140.1	232.3	357.4	322.9	216.2	194.4	199.0	223.5	196.0	234.0
MEAN	4.83	4.69	4.52	7.49	12.8	10.4	7.21	6.27	6.63	7.21	6.32	7.80
MAX	11	5.4	5.3	46	65	125	10	6.7	17	30	12	49
MIN	4.2	4.4	4.3	4.5	5.3	6.0	6.5	6.1	6.1	5.9	5.8	5.4
AC-FT	297	279	278	461	709	640	429	386	395	443	389	464

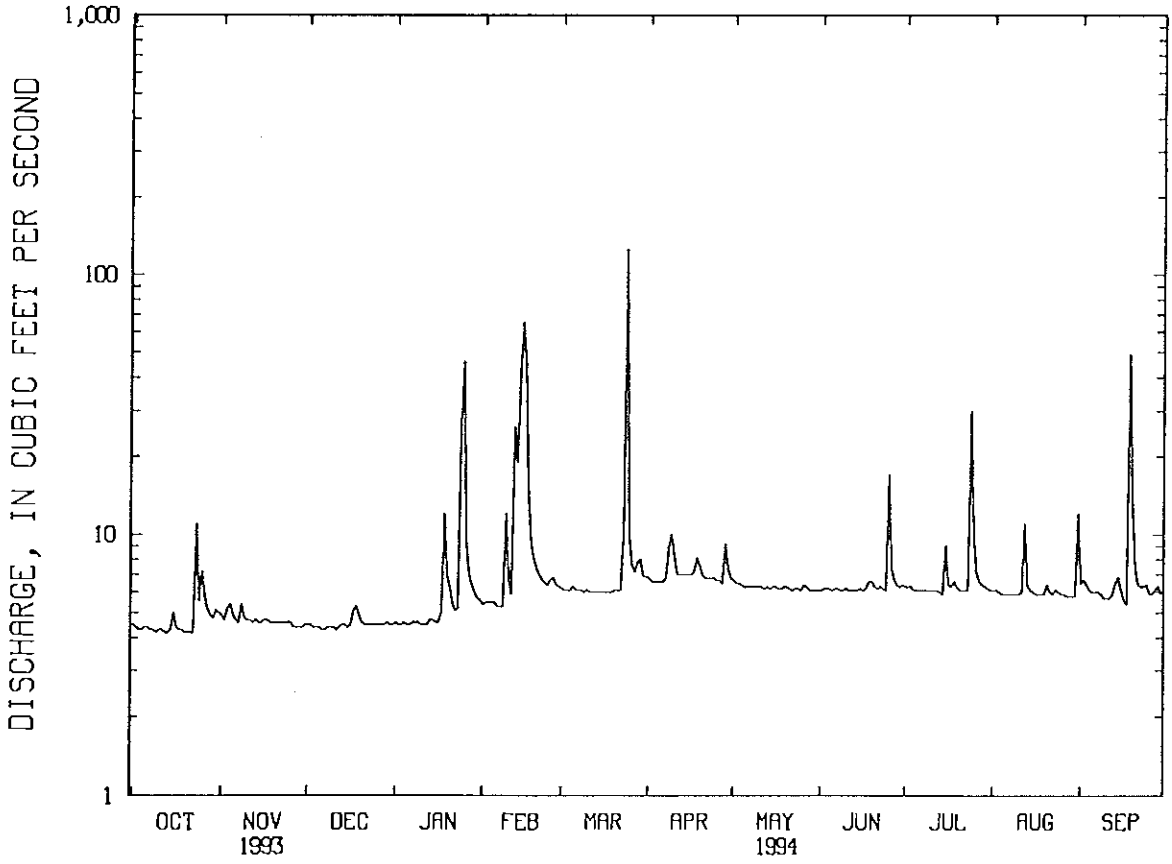
e Estimated

16284200 WAIHEE STREAM NEAR KAHALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1975 - 1994, BY WATER YEAR (WY)

MEAN	5.92	6.57	6.69	6.83	6.77	7.67	6.39	6.00	5.73	5.85	5.75	5.76
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	4.08	3.60	3.71	3.05	2.85	2.72	3.18	3.36	2.40	2.61	2.74
(WY)	1976	1978	1976	1977	1977	1977	1977	1977	1976	1977	1976	1976

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1975 - 1994		
ANNUAL TOTAL	1875.7		2606.4				
ANNUAL MEAN	5.14		7.14		6.33		
HIGHEST ANNUAL MEAN					9.36		1982
LOWEST ANNUAL MEAN					3.32		1977
HIGHEST DAILY MEAN	24	Jul 22	125	Mar 24	149	Mar 19	1991
LOWEST DAILY MEAN	4.2	Oct 9	4.2	Oct 9	1.3	Apr 15	1977
ANNUAL SEVEN-DAY MINIMUM	4.3	Oct 7	4.3	Oct 7	1.4	Apr 12	1977
ANNUAL RUNOFF (AC-FT)	3720		5170		4580		
10 PERCENT EXCEEDS	5.9		7.4		7.6		
50 PERCENT EXCEEDS	4.9		6.1		5.6		
90 PERCENT EXCEEDS	4.3		4.5		3.8		



16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE

LOCATION.--Lat 21°30'00", long 157°51'34", 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, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--34 years (water years 1961-94), 9.01 ft^3/s (6,530 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 8,800 ft^3/s, Feb. 4, 1965, gage height, 10.76 ft, from rating curve extended above 120 ft^3/s on basis of slope-area measurements at gage heights 4.88 ft, 9.46 ft, and 10.76 ft; minimum, 0.76 ft^3/s, Oct. 27, 1975.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Jan. 25	0530	770	5.00	Feb. 15	2130	4,030	9.05
Feb. 13	0300	4,370	9.32	Mar. 24	1800	1,770	6.70
Feb. 14	0515	1,580	6.43	Sep. 18	2200	*4,480	*9.41

Minimum discharge, 2.1 ft^3/s, Aug. 30.

REVISIONS.--The maximum peak discharge reported for water year 1993 has been revised as shown in the following table. This supersedes the figure published in WDR HI-93-1.

Water year	Date	Time	Discharge (ft^3/s)	Gage height (ft)
1993	Sep. 23, 1993	0430	*3,140	*10.21

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.8	4.7	4.8	2.7	8.1	9.1	16	6.3	4.1	4.5	3.2	9.2
2	5.4	4.6	6.1	2.7	7.5	8.5	24	6.4	4.2	9.5	3.0	9.2
3	5.1	12	4.1	2.4	7.9	8.1	19	5.8	3.9	5.3	2.8	7.1
4	4.9	13	3.7	2.4	7.4	7.4	13	5.8	3.9	4.4	2.8	4.6
5	4.8	7.2	3.5	2.4	6.4	7.4	12	5.7	3.6	3.9	2.7	3.5
6	7.4	5.7	3.3	2.9	6.1	6.9	11	5.2	3.6	3.6	2.6	4.2
7	4.9	5.3	3.1	4.5	5.8	6.6	11	5.1	3.7	3.4	2.8	4.9
8	4.4	10	2.9	3.1	5.5	6.4	11	5.0	3.6	3.3	2.7	3.5
9	4.2	5.7	2.9	2.4	25	6.2	37	5.0	3.5	3.2	2.7	3.6
10	5.6	5.3	2.9	2.3	10	6.2	22	4.8	3.6	3.2	2.6	5.8
11	5.1	5.1	2.9	2.3	7.0	6.3	13	4.6	3.4	3.1	2.7	3.5
12	4.3	4.8	3.1	2.3	169	5.9	11	4.5	3.4	3.6	6.0	4.1
13	4.1	4.6	3.3	7.6	215	5.5	9.7	4.5	3.4	3.1	4.7	3.8
14	4.5	4.5	4.6	5.0	216	5.5	9.3	4.4	3.4	2.8	3.0	4.9
15	4.8	4.3	4.1	3.7	546	5.2	8.7	4.6	3.5	5.5	2.8	3.7
16	4.6	4.2	3.1	3.4	330	5.1	8.2	4.5	3.6	3.8	2.6	3.3
17	4.0	e4.1	8.4	4.7	69	5.1	13	4.3	4.1	4.3	2.5	3.0
18	3.9	e4.0	5.8	34	34	5.0	16	4.2	5.0	4.6	2.6	204
19	3.8	e3.9	4.5	15	26	5.0	8.9	6.9	8.9	3.9	3.0	86
20	3.6	3.7	3.5	29	21	5.5	9.6	5.6	4.7	3.2	4.7	20
21	3.5	3.3	3.1	15	17	4.9	8.3	4.5	3.6	3.0	3.3	12
22	3.7	3.3	2.9	9.4	14	5.0	7.3	4.3	4.5	3.0	3.0	11
23	20	3.7	2.9	8.1	13	61	7.1	4.4	3.5	3.5	2.8	9.0
24	7.6	3.5	2.9	65	10	644	6.9	5.2	3.3	11	3.2	8.3
25	15	3.5	2.9	189	15	115	6.7	4.3	25	8.7	2.6	7.4
26	8.2	3.3	2.9	24	21	37	6.4	8.0	8.0	4.2	3.1	7.4
27	5.5	3.3	2.7	16	12	28	6.2	5.4	5.3	3.6	2.5	7.4
28	5.1	3.7	2.9	13	10	24	20	4.7	4.5	3.3	2.3	6.9
29	5.7	3.7	3.1	11	---	27	8.7	4.4	4.2	3.1	2.3	5.8
30	6.1	3.7	2.7	9.8	---	22	6.6	4.2	4.5	3.0	2.3	6.6
31	4.9	---	2.4	8.8	---	20	---	4.2	---	2.9	45	---
TOTAL	180.5	151.7	112.0	503.9	1834.7	1114.8	367.6	156.8	147.5	131.5	134.9	473.7
MEAN	5.82	5.06	3.61	16.3	65.5	36.0	12.3	5.06	4.92	4.24	4.35	15.8
MAX	20	13	8.4	189	546	644	37	8.0	25	11	45	204
MIN	3.5	3.3	2.4	2.3	5.5	4.9	6.2	4.2	3.3	2.8	2.3	3.0
AC-FT	358	301	222	999	3640	2210	729	311	293	261	268	940

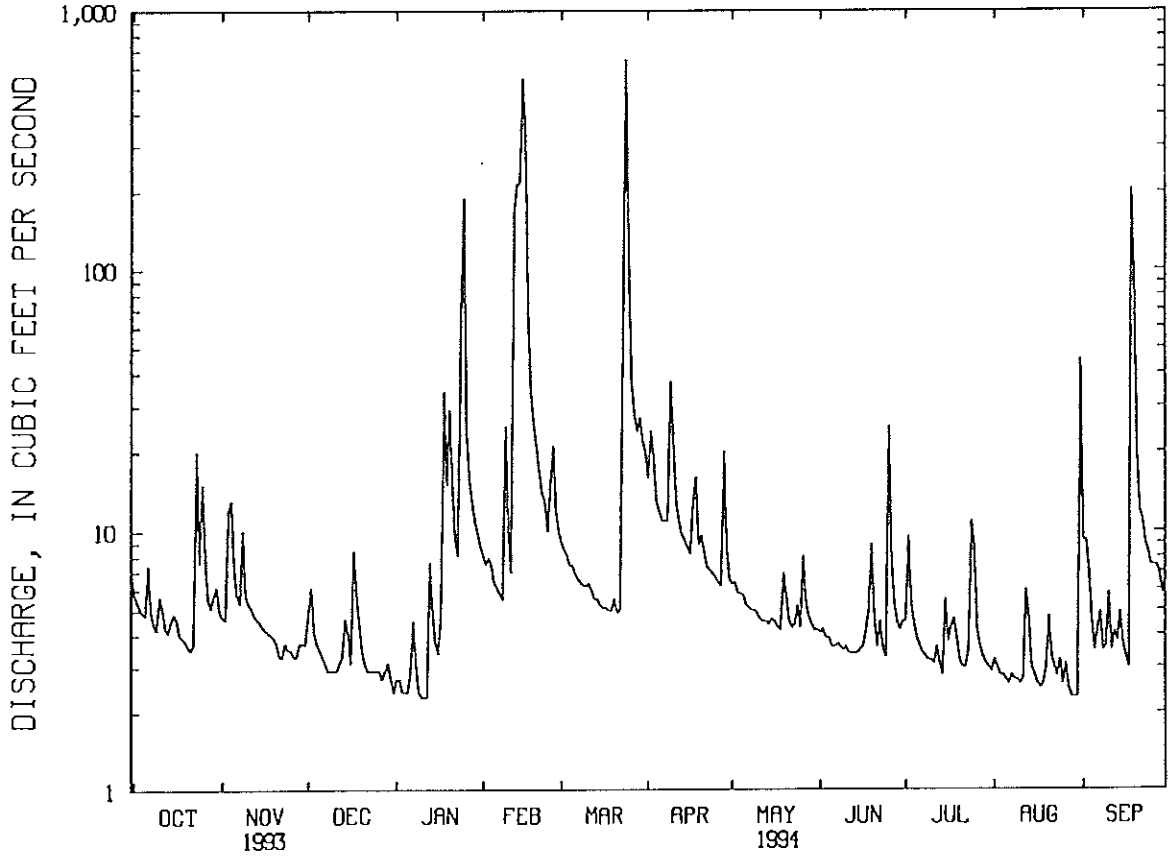
e Estimated

16294900 WAIKANE STREAM AT ALTITUDE 75 FT, AT WAIKANE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1960 - 1994, BY WATER YEAR (WY)

MEAN	6.95	11.7	10.0	11.3	12.8	13.5	10.6	8.83	5.45	6.38	5.42	5.55
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	2.88	2.19	1.83	1.76	1.57	1.38
(WY)	1985	1963	1978	1977	1978	1978	1985	1991	1984	1984	1984	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1960 - 1994		
ANNUAL TOTAL	1963.2		5309.6				
ANNUAL MEAN	5.38		14.5		9.01		
HIGHEST ANNUAL MEAN					16.7		1982
LOWEST ANNUAL MEAN					3.33		1984
HIGHEST DAILY MEAN	115	Sep 23	644	Mar 24	868	Feb 4	1965
LOWEST DAILY MEAN	1.9	Jul 10	2.3	Jan 10	1.1	Oct 17	1975
ANNUAL SEVEN-DAY MINIMUM	2.0	Jul 6	2.5	Dec 30	1.3	Sep 19	1984
ANNUAL RUNOFF (AC-FT)	3890		10530		6530		
10 PERCENT EXCEEDS	8.2		18		14		
50 PERCENT EXCEEDS	3.7		4.8		4.2		
90 PERCENT EXCEEDS	2.4		2.9		2.1		



16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA

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

DRAINAGE AREA.--3.74 mi^2.

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

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

GAGE.--Water-stage recorder and concrete-masonry control. Elevation of gage is 30 ft, from topographic map.

REMARKS.--Records fair. Waiahole tunnel diverts water from tributaries and tunnels at 800-ft elevation upstream. Recording rain gage located 50 ft from the streamgage at an elevation of 80 ft.

AVERAGE DISCHARGE.--35 years (water years 1960-94), 37.5 ft^3/s (27,190 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,250 ft^3/s, Mar. 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, 10 ft^3/s, Sept. 17, 18, 20, 1961.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	0900	*5,070	*7.84	Mar. 24	1600	1,830	5.04
Feb. 13	0200	3,690	6.83	Sep. 18	2230	4,310	7.30
Feb. 15	2330	3,760	6.89				

Minimum discharge, 16 ft^3/s, Jan. 12, 13, Aug. 8-10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

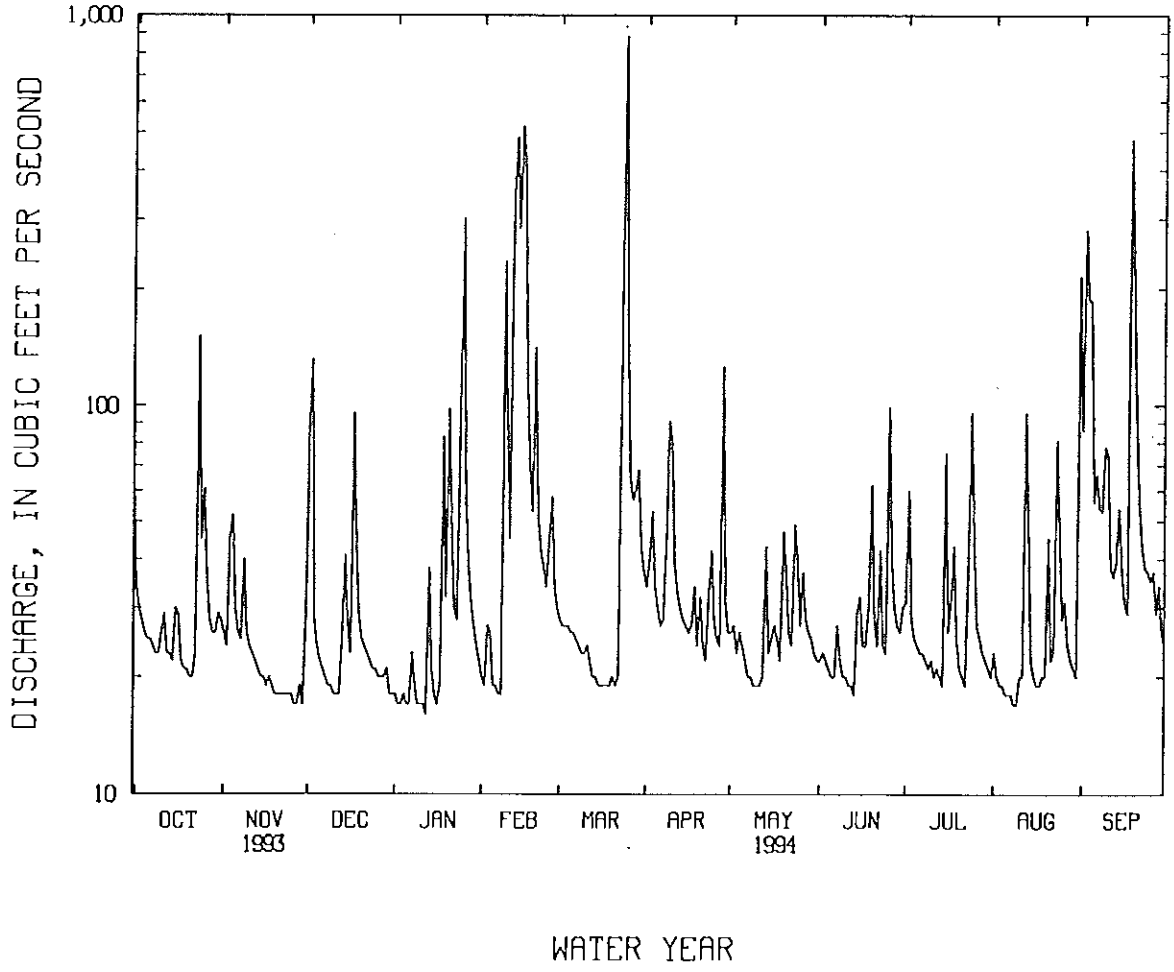
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	34	26	88	18	20	28	34	26	22	31	23	86
2	30	24	132	17	19	27	40	27	23	60	20	281
3	28	46	28	17	27	27	53	23	22	28	19	188
4	26	52	24	18	26	27	34	26	21	25	19	185
5	25	30	22	17	19	26	30	24	20	24	18	56
6	25	26	21	17	19	26	27	22	20	23	18	66
7	24	25	20	23	18	25	28	20	27	23	18	54
8	23	40	19	19	18	24	43	20	22	22	17	53
9	23	26	19	17	235	23	91	19	20	21	17	78
10	26	24	18	17	90	23	80	19	20	22	20	74
11	29	23	18	17	45	24	39	19	19	20	20	38
12	23	22	18	16	348	22	33	20	19	21	96	36
13	23	21	26	38	487	20	30	43	18	20	46	39
14	22	20	41	21	284	20	28	23	29	19	22	54
15	30	20	27	18	519	19	27	25	32	75	20	37
16	29	19	23	17	402	19	26	27	24	26	19	31
17	22	20	96	19	121	19	27	25	24	31	19	29
18	21	19	44	83	70	19	34	22	30	43	20	477
19	21	18	29	32	53	19	24	47	62	25	20	222
20	20	18	25	98	141	20	32	37	28	21	45	98
21	20	18	24	47	52	19	24	26	24	20	22	56
22	23	18	23	30	42	20	22	24	42	19	23	43
23	151	18	22	28	38	169	32	49	24	38	81	38
24	45	18	21	97	34	882	42	40	23	96	47	37
25	61	18	21	302	45	162	28	27	99	44	28	35
26	36	17	20	58	58	65	25	37	40	27	31	37
27	28	17	20	39	34	57	24	28	30	25	24	29
28	26	19	20	31	30	60	126	26	27	23	22	34
29	26	17	21	27	---	68	31	25	26	22	21	26
30	29	29	18	24	---	43	26	23	30	21	20	24
31	28	---	18	22	---	37	---	22	---	20	215	---
TOTAL	977	708	966	1244	3294	2039	1140	841	867	935	1050	2541
MEAN	31.5	23.6	31.2	40.1	118	65.8	38.0	27.1	28.9	30.2	33.9	84.7
MAX	151	52	132	302	519	882	126	49	99	96	215	477
MIN	20	17	18	16	18	19	22	19	18	19	17	24
AC-FT	1940	1400	1920	2470	6530	4040	2260	1670	1720	1850	2080	5040

16296500 KAHANA STREAM AT ALTITUDE 30 FT, NEAR KAHANA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY)

MEAN	32.5	45.2	39.0	37.1	38.2	46.5	46.8	40.5	27.3	32.9	30.9	30.5
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	15.4	19.3	18.1	14.3	15.0	13.6	13.3
(WY)	1985	1963	1978	1977	1978	1984	1992	1973	1984	1984	1984	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1959 - 1994	
ANNUAL TOTAL	11205		16602			
ANNUAL MEAN	30.7		45.5		37.5	
HIGHEST ANNUAL MEAN					67.2	1982
LOWEST ANNUAL MEAN					20.1	1984
HIGHEST DAILY MEAN	490	Sep 23	882	Mar 24	1750	Apr 15 1963
LOWEST DAILY MEAN	13	Apr 19	16	Jan 12	11	Sep 16 1961
ANNUAL SEVEN-DAY MINIMUM	14	Jun 22	17	Dec 31	11	Oct 16 1984
ANNUAL RUNOFF (AC-FT)	22230		32930		27190	
10 PERCENT EXCEEDS	46		76		59	
50 PERCENT EXCEEDS	21		26		23	
90 PERCENT EXCEEDS	15		19		15	



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, from topographic map.

REMARKS.--Records good. Ditch diverts from Punaluu Stream for irrigation in Punaluu Valley.

AVERAGE DISCHARGE.--41 years, 7.86 ft^3/s (5,690 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 54 ft^3/s, Oct. 31, 1964; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 26 ft^3/s, Feb. 18; minimum daily, 5.4 ft^3/s, Sep. 18.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

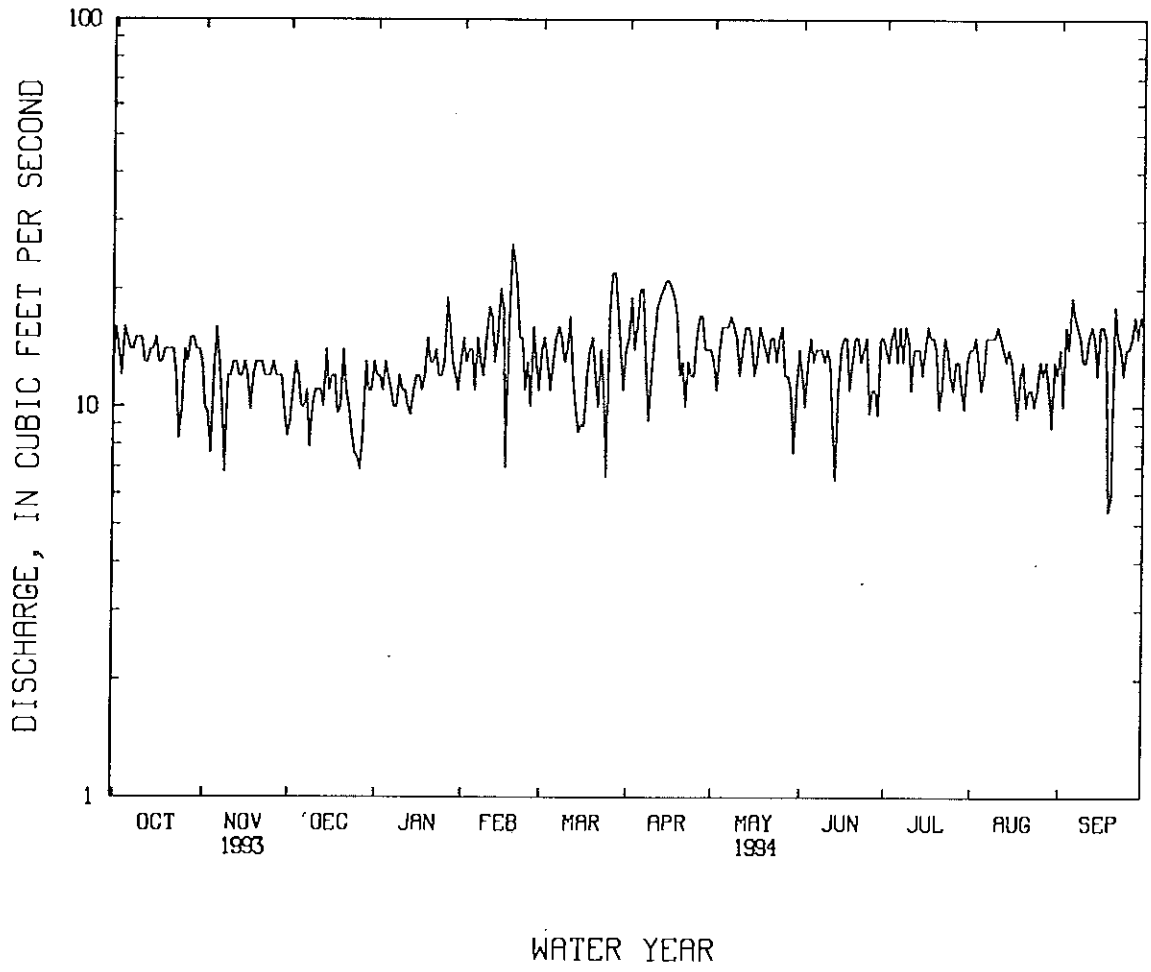
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16	10	9.1	12	15	14	15	13	12	14	14	14
2	14	9.6	11	12	13	15	19	11	10	13	15	10
3	12	7.6	13	11	14	13	14	14	13	15	13	16
4	16	12	12	13	14	11	16	16	15	16	11	14
5	15	16	10	12	11	13	20	16	13	13	12	19
6	14	13	10	11	15	15	20	16	14	16	15	17
7	14	10	11	10	13	16	13	17	14	13	15	16
8	15	6.8	7.9	10	12	15	9.2	16	14	16	15	15
9	15	12	9.9	12	15	13	12	15	13	15	15	13
10	15	12	11	11	18	14	15	12	14	11	16	13
11	13	13	11	11	17	17	18	14	13	14	15	15
12	13	13	11	10	13	12	19	16	8.9	14	14	16
13	14	12	10	9.5	15	10	20	16	6.5	14	13	15
14	14	12	14	11	20	8.6	21	15	11	12	14	12
15	15	13	11	12	18	9.0	21	12	14	14	13	16
16	13	12	12	12	7.0	8.9	20	13	15	16	11	16
17	13	9.8	12	11	15	12	19	16	15	15	9.3	15
18	14	12	9.6	12	26	14	17	15	11	15	12	5.4
19	14	13	9.9	15	24	15	12	14	13	14	13	5.8
20	14	13	14	13	20	12	13	13	15	9.8	10	18
21	14	13	11	13	15	10	10	15	15	11	11	15
22	12	12	10	14	15	14	13	15	13	15	11	14
23	8.3	12	8.6	12	11	11	12	13	14	14	10	12
24	9.8	12	7.6	12	13	6.6	12	15	15	12	11	14
25	14	13	7.4	13	10	17	15	16	9.6	11	13	14
26	13	12	6.9	19	16	22	17	12	11	13	12	15
27	15	12	8.6	16	13	22	17	12	11	13	13	17
28	15	12	13	13	11	18	14	11	9.5	11	11	15
29	14	9.8	11	12	---	14	14	7.6	15	9.8	8.8	17
30	14	8.4	11	11	---	11	14	11	15	13	13	16
31	13	---	13	13	---	14	---	14	---	14	12	---
TOTAL	425.1	348.0	327.5	378.5	419.0	417.1	471.2	431.6	382.5	416.6	391.1	430.2
MEAN	13.7	11.6	10.6	12.2	15.0	13.5	15.7	13.9	12.7	13.4	12.6	14.3
MAX	16	16	14	19	26	22	21	17	15	16	16	19
MIN	8.3	6.8	6.9	9.5	7.0	6.6	9.2	7.6	6.5	9.8	8.8	5.4
AC-FT	843	690	650	751	831	827	935	856	759	826	776	853

16302000 PUNALUU DITCH NEAR PUNALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1994, BY WATER YEAR (WY)

MEAN	8.83	7.10	5.53	5.35	5.38	6.38	8.03	8.48	9.51	9.92	10.2	9.93
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1953 - 1994	
ANNUAL TOTAL	4603.1		4838.4			
ANNUAL MEAN	12.6		13.3		7.86	
HIGHEST ANNUAL MEAN					15.2	1964
LOWEST ANNUAL MEAN					.23	1981
HIGHEST DAILY MEAN	19	Jan 11	26	Feb 18	54	Oct 31 1964
LOWEST DAILY MEAN	3.8	Jul 22	5.4	Sep 18	.00	Dec 7 1963
ANNUAL SEVEN-DAY MINIMUM	8.6	Dec 21	8.6	Dec 21	.00	Jan 5 1969
ANNUAL RUNOFF (AC-FT)	9130		9600		5690	
10 PERCENT EXCEEDS	16		16		17	
50 PERCENT EXCEEDS	13		13		5.8	
90 PERCENT EXCEEDS	9.8		10		.17	



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 Mar. 20-21, 1991 was restored and water-stage recorder installed on Mar. 29, 1993. Masonry control and elevation of gage is 212 ft from topographic map. Prior to Mar. 29, 1993, datum 2.00 ft higher.

REMARKS.--Records poor. Records do not include flow of Punaluu ditch (see station 16302000).

AVERAGE DISCHARGE.--41 years, 17.6 ft^3/s (12,720 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 6,900 ft^3/s, Mar. 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. (Datum was lowered 2.0 ft after the flood of Mar. 20, 1991).

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)
Feb. 12	0830	*4,290	*8.87	Sep. 18	2230	2,770	7.74

Minimum discharge, 1.2 ft^3/s, Jan. 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.9	15	34	2.6	5.2	11	15	12	8.7	8.0	4.8	20
2	7.0	11	16	3.1	6.4	9.2	13	14	11	12	3.8	37
3	7.3	28	5.1	3.2	6.0	11	19	9.3	7.6	6.3	5.4	74
4	3.9	21	4.8	2.2	7.8	12	13	6.7	5.5	4.7	7.8	48
5	3.8	8.7	5.9	2.5	7.7	10	9.1	6.6	7.4	5.2	6.0	14
6	4.5	8.8	5.3	3.7	3.8	7.8	7.3	6.6	6.4	3.9	2.8	15
7	4.7	10	5.0	8.7	5.5	7.1	11	4.9	6.7	5.8	3.3	13
8	2.9	20	7.2	7.2	6.8	9.0	19	5.8	5.9	3.7	2.9	12
9	3.0	8.0	5.3	2.2	100	10	38	7.4	6.9	5.7	3.1	23
10	4.6	6.7	4.4	2.8	64	9.5	32	10	6.1	9.6	2.8	23
11	5.6	6.1	4.3	3.1	16	8.0	15	7.2	6.3	5.5	3.2	11
12	4.9	4.5	4.0	3.7	200	10	11	5.3	10	3.6	15	9.6
13	4.0	5.9	5.4	6.2	e285	9.7	7.9	7.4	13	5.4	10	9.9
14	3.5	5.0	7.8	4.2	e160	12	6.6	6.4	14	5.2	4.9	16
15	3.5	3.6	7.5	2.4	e312	12	5.9	11	7.7	19	4.9	9.2
16	4.1	5.2	5.8	2.5	e243	12	5.5	12	5.4	4.8	6.6	7.4
17	4.1	6.9	18	5.5	60	8.9	7.2	7.8	6.0	5.5	8.7	7.7
18	3.0	4.2	14	38	26	7.4	7.5	6.6	11	9.3	5.6	216
19	2.9	3.7	8.1	7.9	20	6.5	5.7	15	14	6.3	4.5	117
20	2.2	3.5	3.3	30	27	9.3	7.6	11	6.2	10	10	69
21	2.9	2.7	5.3	13	22	11	7.8	7.2	5.1	8.7	7.2	27
22	3.9	3.5	6.0	5.6	13	7.8	7.7	6.7	19	3.9	7.2	21
23	58	4.0	7.2	6.4	15	50	16	17	7.1	5.9	19	18
24	14	3.4	8.3	56	11	338	19	16	5.9	21	15	15
25	17	2.6	8.7	141	18	61	17	6.5	36	14	5.6	13
26	10	3.7	9.1	21	16	23	19	12	16	8.1	7.1	14
27	4.8	3.7	6.6	13	13	21	11	11	12	7.2	4.7	7.7
28	4.5	3.6	2.9	12	14	21	40	11	12	8.5	7.1	16
29	5.0	5.3	4.9	11	---	29	14	14	6.6	9.9	8.7	6.7
30	6.4	9.7	3.9	10	---	23	11	10	5.4	6.6	4.8	8.3
31	24	---	2.1	7.0	---	18	---	6.5	---	5.6	51	---
TOTAL	235.9	228.0	236.2	437.7	1684.2	795.2	418.8	290.9	290.9	238.9	253.5	898.5
MEAN	7.61	7.60	7.62	14.1	60.1	25.7	14.0	9.38	9.70	7.71	8.18	29.9
MAX	58	28	34	141	312	338	40	17	36	21	51	216
MIN	2.2	2.6	2.1	2.2	3.8	6.5	5.5	4.9	5.1	3.6	2.8	6.7
AC-FT	468	452	469	868	3340	1580	831	577	577	474	503	1780

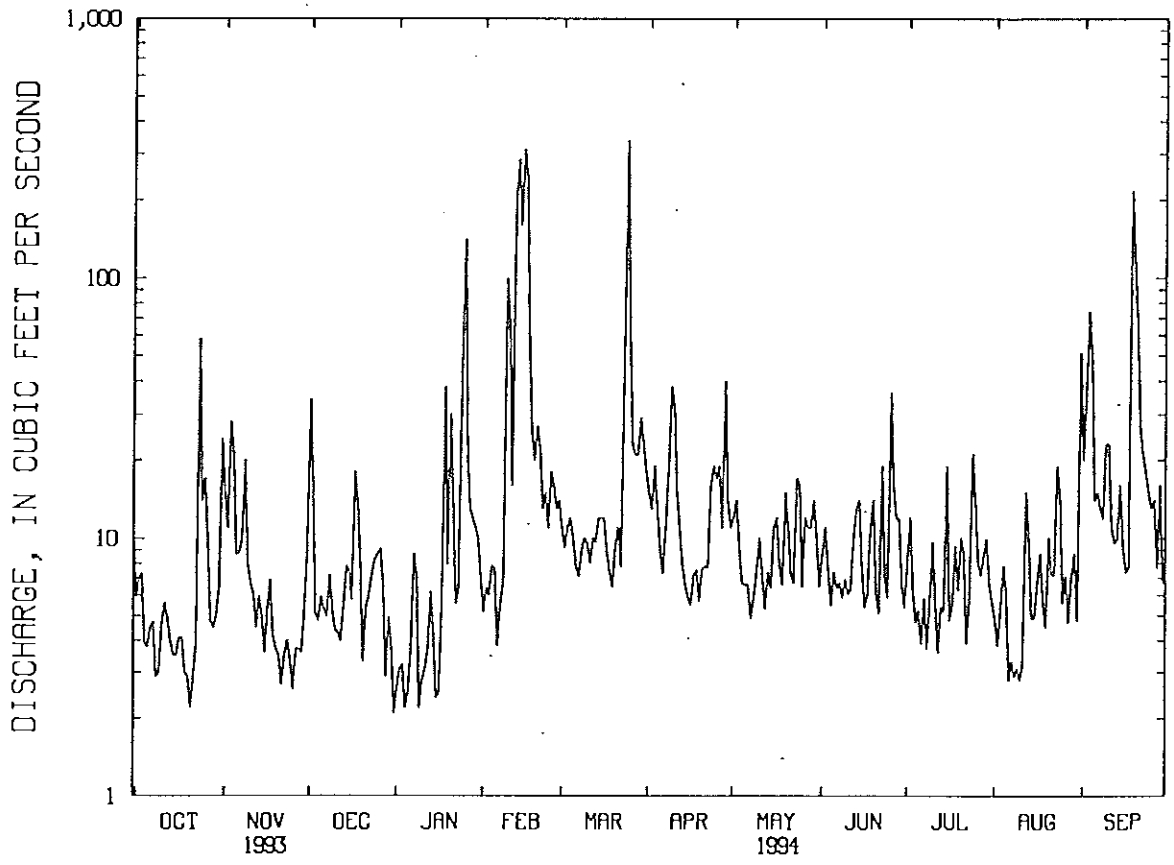
e Estimated

16303000 PUNALUU STREAM NEAR PUNALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1953 - 1994, BY WATER YEAR (WY)

MEAN	14.1	20.6	21.5	21.5	22.4	23.0	22.5	17.9	11.6	12.4	11.6	10.7
MAX	38.7	74.7	64.5	40.9	76.3	73.1	84.6	64.9	35.4	39.0	36.9	29.9
(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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1953 - 1994		
ANNUAL TOTAL	2818.4		6008.7				
ANNUAL MEAN	7.72		16.5		17.6		
HIGHEST ANNUAL MEAN					35.4		1982
LOWEST ANNUAL MEAN					7.27		1961
HIGHEST DAILY MEAN	198	Jul 22	338	Mar 24	1010	Apr 15	1963
LOWEST DAILY MEAN	1.4	Feb 16	2.1	Dec 31	.00	Jun 1	1953
ANNUAL SEVEN-DAY MINIMUM	1.9	Mar 14	2.8	Dec 31	.00	Jun 1	1953
ANNUAL RUNOFF (AC-FT)	5590		11920		12720		
10 PERCENT EXCEEDS	14		23		30		
50 PERCENT EXCEEDS	4.6		7.7		12		
90 PERCENT EXCEEDS	2.3		3.7		2.3		



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 Nauula.

DRAINAGE AREA.--1.11 mi^2.

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

GAGE.--Water-stage recorder. Elevation of gage is 110 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--27 years, 4.47 ft^3/s (3,240 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,390 ft^3/s, Jan. 6, 1982, gage height, 11.90 ft, from rating curve extended above 14 ft^3/s on basis of slope-area measurements at gage heights 8.85 ft and 10.0 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 500 ft^3/s and maximum(*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Feb. 12	0845	608	8.75	Feb. 15	2130	514	8.48
Feb. 13	0100	1,080	9.82	Sep. 18	2230	*1,410	*10.45

Minimum discharge, 0.10 ft^3/s, Jan 4.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	e1.6	4.2	17	.20	.91	.93	1.8	2.3	1.0	5.4	2.8	8.7
2	e.90	2.6	5.0	.39	.82	.81	5.7	1.9	1.3	5.7	1.5	13
3	e.72	28	1.6	.15	2.5	.69	5.1	1.6	.89	2.2	.98	21
4	e.62	12	1.4	1.5	9.1	.65	2.3	3.3	.79	1.7	.88	18
5	e.54	3.0	2.5	1.9	1.6	.63	1.7	4.2	.64	1.3	.80	2.9
6	e.47	1.7	1.2	5.3	2.6	.61	1.2	1.5	.55	1.8	.72	8.7
7	e.49	1.2	1.2	11	.91	.46	1.5	1.1	2.8	2.0	2.3	3.8
8	e.40	7.9	.80	1.1	.79	.42	11	.98	1.4	1.5	.85	3.3
9	e.38	1.4	.72	.38	31	.36	17	.85	.74	1.1	.65	13
10	e.37	1.1	.52	.23	13	.36	14	.75	.79	3.7	.60	6.0
11	e2.8	1.5	.40	.17	4.5	5.2	2.5	.64	.62	1.1	.60	2.0
12	e1.2	.84	.74	.16	75	1.8	1.9	.57	.52	3.1	15	2.2
13	e.90	.64	5.7	10	118	.51	1.4	4.5	1.7	1.8	4.7	6.6
14	e1.1	.73	9.5	1.4	43	.72	1.5	1.3	4.3	.83	1.0	6.5
15	e.63	.48	2.3	.38	59	.75	1.4	5.6	4.2	15	.81	3.3
16	e.50	2.5	1.1	.45	58	.41	.95	2.1	1.6	2.1	.70	1.9
17	e.65	3.0	9.4	15	12	.33	8.6	2.2	7.1	6.8	1.3	1.5
18	e.76	.62	5.5	43	4.8	.30	2.9	.94	4.8	13	1.7	83
19	e.56	.46	1.4	5.8	3.3	.25	.92	11	9.1	3.5	2.4	39
20	e.45	.32	.80	19	2.5	1.4	6.2	3.5	1.9	1.5	4.6	16
21	e.40	.27	.69	4.7	2.0	3.3	1.4	1.5	1.3	1.2	1.7	4.6
22	e.36	.27	.57	2.0	1.6	1.4	1.1	1.4	12	1.2	2.8	2.4
23	e11	.72	.42	3.8	1.8	37	9.2	7.7	1.5	6.8	12	2.1
24	e5.8	.63	.33	51	1.3	127	4.0	10	1.3	22	6.7	1.7
25	12	4.5	.30	55	17	19	3.0	2.3	31	4.9	1.5	2.0
26	6.2	.94	.26	6.3	8.5	8.9	2.0	7.8	6.7	1.8	3.0	2.4
27	1.5	1.1	.21	3.1	1.7	6.5	10	4.0	3.0	2.5	1.1	1.0
28	1.1	3.4	.24	2.0	1.2	8.9	e5.0	3.8	1.7	1.6	.90	1.9
29	1.6	1.1	3.4	1.6	---	11	2.8	2.1	2.5	1.7	.98	.88
30	4.5	5.4	.33	1.3	---	6.8	2.0	1.4	4.9	1.2	.79	.71
31	9.9	---	.18	1.1	---	3.5	---	1.2	---	1.2	25	---
TOTAL	70.40	92.52	75.71	249.41	478.43	250.89	130.07	94.03	112.64	121.23	101.36	280.09
MEAN	2.27	3.08	2.44	8.05	17.1	8.09	4.34	3.03	3.75	3.91	3.27	9.34
MAX	12	28	17	55	118	127	17	11	31	22	25	83
MIN	.36	.27	.18	.15	.79	.25	.92	.57	.52	.83	.60	.71
AC-FT	140	184	150	495	949	498	258	187	223	240	201	556

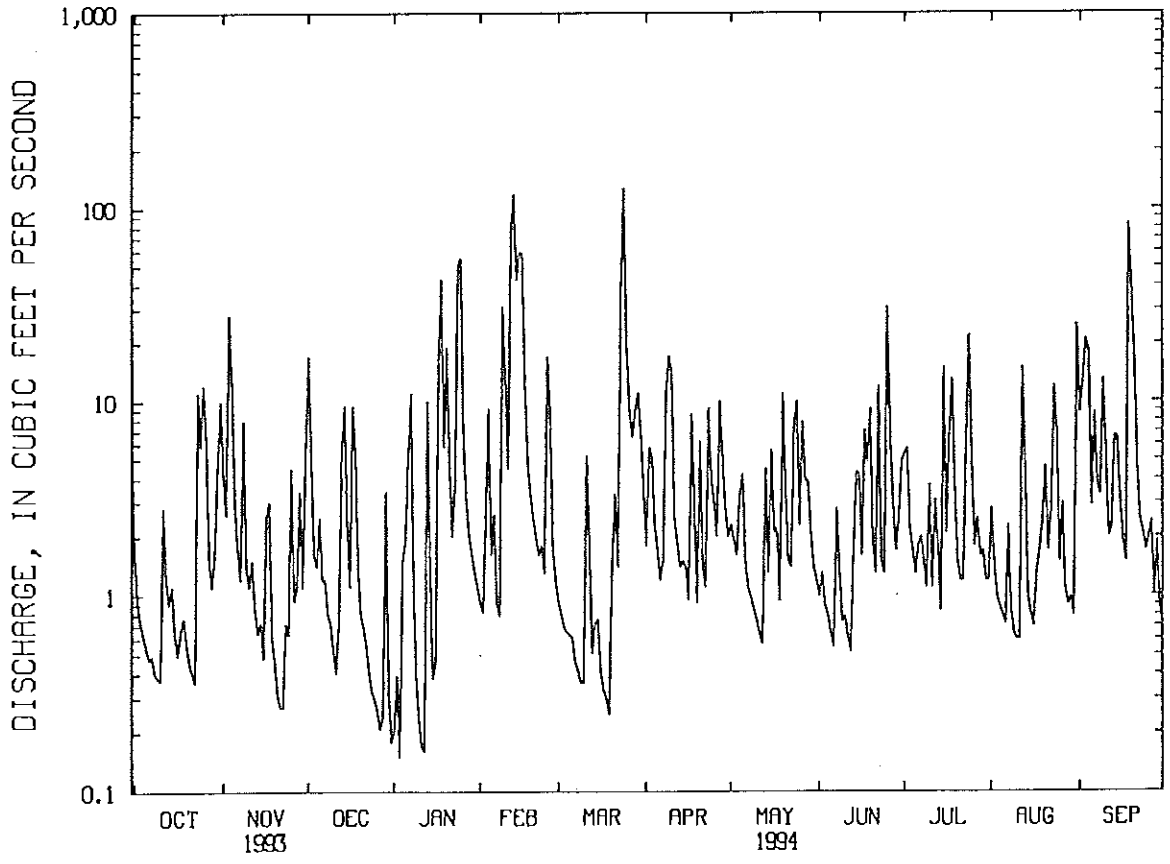
e Estimated

16304200 KALUANUI STREAM NEAR PUNALUU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1967 - 1994, BY WATER YEAR (WY)

MEAN	3.41	5.94	5.26	5.28	4.98	6.03	5.75	3.86	2.74	4.08	3.31	3.20
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	.41	.14	.87	.85	.61	.21	.53	.22
(WY)	1985	1981	1977	1986	1983	1983	1979	1991	1981	1971	1984	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1967 - 1994	
ANNUAL TOTAL	1084.31		2056.78			
ANNUAL MEAN	2.97		5.64		4.47	
HIGHEST ANNUAL MEAN					9.94	1982
LOWEST ANNUAL MEAN					2.04	1984
HIGHEST DAILY MEAN	87	Jul 22	127	Mar 24	230	Feb 1 1969
LOWEST DAILY MEAN	.00	Mar 4	.15	Jan 3	.00	Jul 24 1971
ANNUAL SEVEN-DAY MINIMUM	.03	Mar 29	.33	Dec 22	.00	Sep 14 1975
ANNUAL RUNOFF (AC-FT)	2150		4080		3240	
10 PERCENT EXCEEDS	6.8		12		9.7	
50 PERCENT EXCEEDS	.97		1.7		1.4	
90 PERCENT EXCEEDS	.13		.47		.25	



16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI

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

DRAINAGE AREA.--3.13 mi^2.

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

GAGE.--Water-stage recorder and combination pipe culvers and paved road control. Elevation of gage is 590 ft, from topographic map.

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

AVERAGE DISCHARGE.--31 years, 10.5 ft^3/s (7,580 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,810 ft^3/s, revised, Nov. 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)
Feb. 15	2400	1,080	7.54	Sep. 18	2330	1,130	7.63
Mar. 24	1400	*1,240	*7.82				

Minimum discharge, 0.67 ft^3/s, Oct. 21-23.

REVISIONS.--The maximum discharge for the period of record has been revised to 4,810 ft^3/s, Nov. 20, 1990, gage height 11.34 ft. This supersedes the figures published in the reports for water years 1992 and 1993, which were in error.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

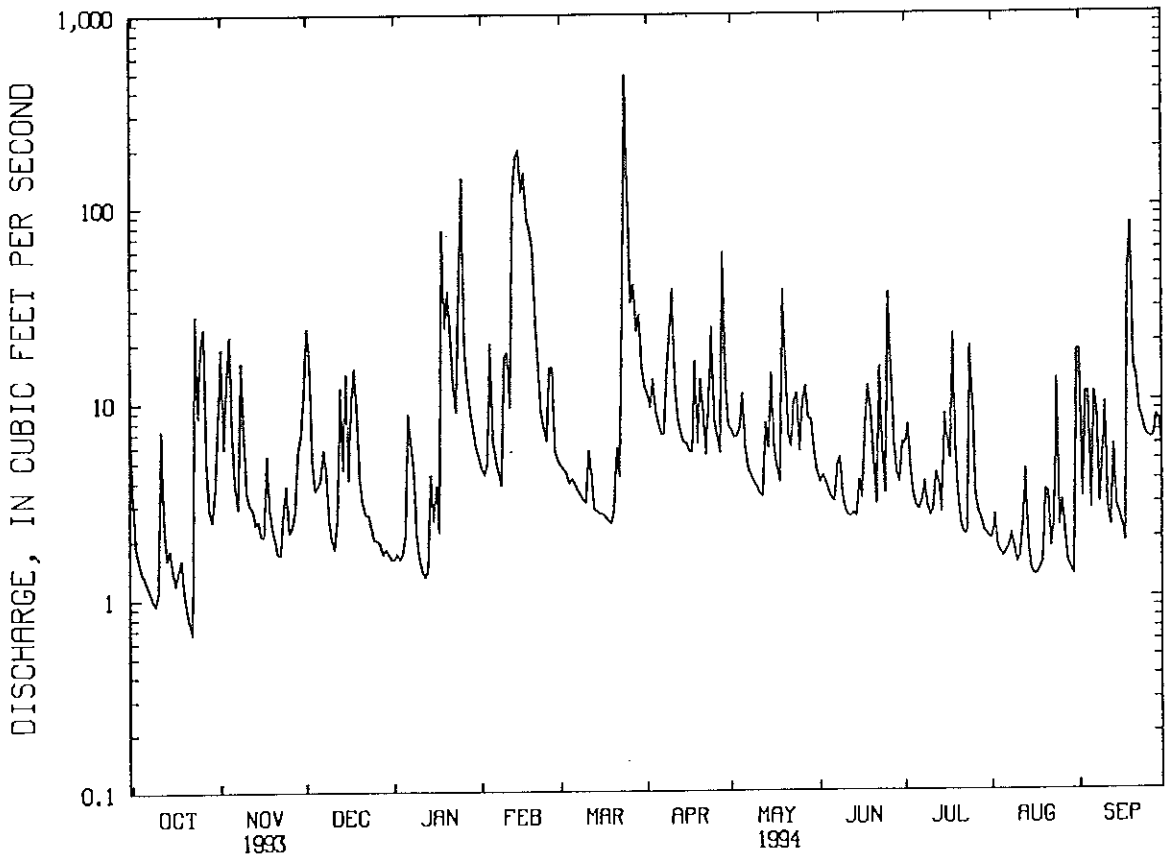
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	19	24	1.6	4.6	4.8	11	7.2	3.9	6.0	2.0	18
2	1.9	5.9	17	1.7	4.3	4.6	9.4	6.6	4.2	7.6	2.6	3.2
3	1.6	13	5.1	1.6	4.9	4.4	13	6.7	3.9	4.5	1.8	11
4	1.4	22	3.6	1.7	20	3.9	9.1	7.3	3.5	3.3	1.7	11
5	1.3	6.7	3.8	2.1	6.4	4.1	7.8	11	3.2	2.9	1.6	2.8
6	1.2	3.7	4.1	8.8	5.2	3.9	6.9	5.8	3.1	2.8	1.7	11
7	1.1	2.9	5.8	6.1	4.4	3.6	6.9	4.6	4.8	3.1	1.8	8.9
8	1.0	16	4.5	4.6	3.8	3.4	14	4.2	5.2	3.9	2.1	3.0
9	.94	6.8	2.5	2.1	17	3.2	22	3.9	3.3	2.9	1.8	5.2
10	1.1	3.5	2.0	1.6	18	3.1	38	3.7	2.8	2.6	1.5	9.7
11	7.3	3.0	1.8	1.4	9.5	5.7	12	3.4	2.6	2.8	1.6	2.7
12	2.4	2.9	2.6	1.3	116	4.3	8.1	3.3	2.6	4.3	2.3	2.3
13	1.6	2.4	12	1.4	182	2.8	6.9	7.8	2.7	3.9	4.5	5.9
14	1.8	2.5	4.6	4.3	198	2.8	6.2	5.8	2.6	2.7	1.9	2.9
15	1.4	2.1	14	2.5	120	2.7	6.2	14	4.0	8.6	1.4	2.6
16	1.2	2.1	4.1	3.8	152	2.7	5.6	5.7	3.2	6.3	1.3	2.3
17	1.4	5.4	10	2.2	88	2.6	5.6	4.6	7.2	5.1	1.3	1.9
18	1.6	2.9	15	76	77	2.5	16	3.9	12	22	1.4	47
19	1.1	2.3	9.1	24	62	2.4	6.2	37	9.1	5.5	1.5	81
20	.88	2.0	4.1	37	27	2.8	13	16	5.1	3.1	3.5	15
21	.75	1.7	3.1	22	15	5.9	8.9	6.8	3.0	2.3	3.4	13
22	.67	1.7	2.7	12	8.9	4.2	5.4	5.9	15	2.1	1.8	8.9
23	28	2.8	2.7	9.0	7.3	30	10	10	5.5	2.1	2.4	8.0
24	8.5	3.8	2.3	40	6.4	483	24	11	3.4	19	13	6.9
25	20	2.2	2.0	142	15	116	8.1	5.6	36	10	2.3	6.5
26	24	2.3	2.0	18	15	32	6.8	10	15	3.3	3.1	6.4
27	4.9	2.8	1.9	12	5.6	40	5.5	12	6.2	2.7	2.1	6.5
28	2.8	5.6	1.7	8.9	5.1	23	58	8.2	4.3	2.5	1.5	8.3
29	2.5	6.8	1.8	7.1	---	28	13	8.1	3.9	2.2	1.4	7.9
30	3.6	11	1.7	5.9	---	15	7.5	5.5	6.2	2.1	1.3	5.6
31	7.9	---	1.6	5.2	---	12	---	4.4	---	2.0	18	---
TOTAL	139.44	167.8	173.2	467.9	1198.4	859.4	371.1	250.0	187.5	154.2	89.6	325.4
MEAN	4.50	5.59	5.59	15.1	42.8	27.7	12.4	8.06	6.25	4.97	2.89	10.8
MAX	28	22	24	142	198	483	58	37	36	22	18	81
MIN	.67	1.7	1.6	1.3	3.8	2.4	5.4	3.3	2.6	2.0	1.3	1.9
AC-FT	277	333	344	928	2380	1700	736	496	372	306	178	645

16325000 KAMANANUI STREAM AT PUPUKEA MILITARY ROAD, NEAR MAUNAWAI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY)

MEAN	6.89	16.2	13.3	15.0	13.1	16.5	14.2	8.41	4.75	7.98	5.29	4.04
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	1.00	.76	.57	.000
(WY)	1985	1990	1977	1986	1978	1983	1992	1966	1992	1971	1984	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1963 - 1994		
ANNUAL TOTAL	1896.49		4383.94				
ANNUAL MEAN	5.20		12.0		10.5		
HIGHEST ANNUAL MEAN					22.1		1982
LOWEST ANNUAL MEAN					4.09		1984
HIGHEST DAILY MEAN	241	Jul 22	483	Mar 24	620	Nov 20	1990
LOWEST DAILY MEAN	.24	Apr 2	.67	Oct 22	.00	Aug 27	1971
ANNUAL SEVEN-DAY MINIMUM	.28	Mar 29	1.1	Oct 16	.00	Oct 15	1971
ANNUAL RUNOFF (AC-FT)	3760		8700		7580		
10 PERCENT EXCEEDS	11		20		20		
50 PERCENT EXCEEDS	2.4		4.5		3.3		
90 PERCENT EXCEEDS	.67		1.7		.62		



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 Nov. 20, 1990 was restored and water-stage recorder installed on Feb. 25, 1993. Control rebuilt about 75 ft downstream of gage and elevation of gage is 20 ft from topographic map. Prior to May 18, 1966, datum 2.00 ft higher.

REMARKS.--Records fair. Small diversion upstream.

AVERAGE DISCHARGE.--36 years, 18.7 ft^3/s (13,540 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 16,800 ft^3/s, Nov. 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)
Feb. 12	1015	2,660	7.12	Mar. 24	1600	*3,490	*7.95
Feb. 13	0415	1,590	5.99	Sep. 19	0015	2,500	6.96
Feb. 16	0030	2,460	6.92				

Minimum discharge, 0.18 ft^3/s, Oct. 22, 23.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

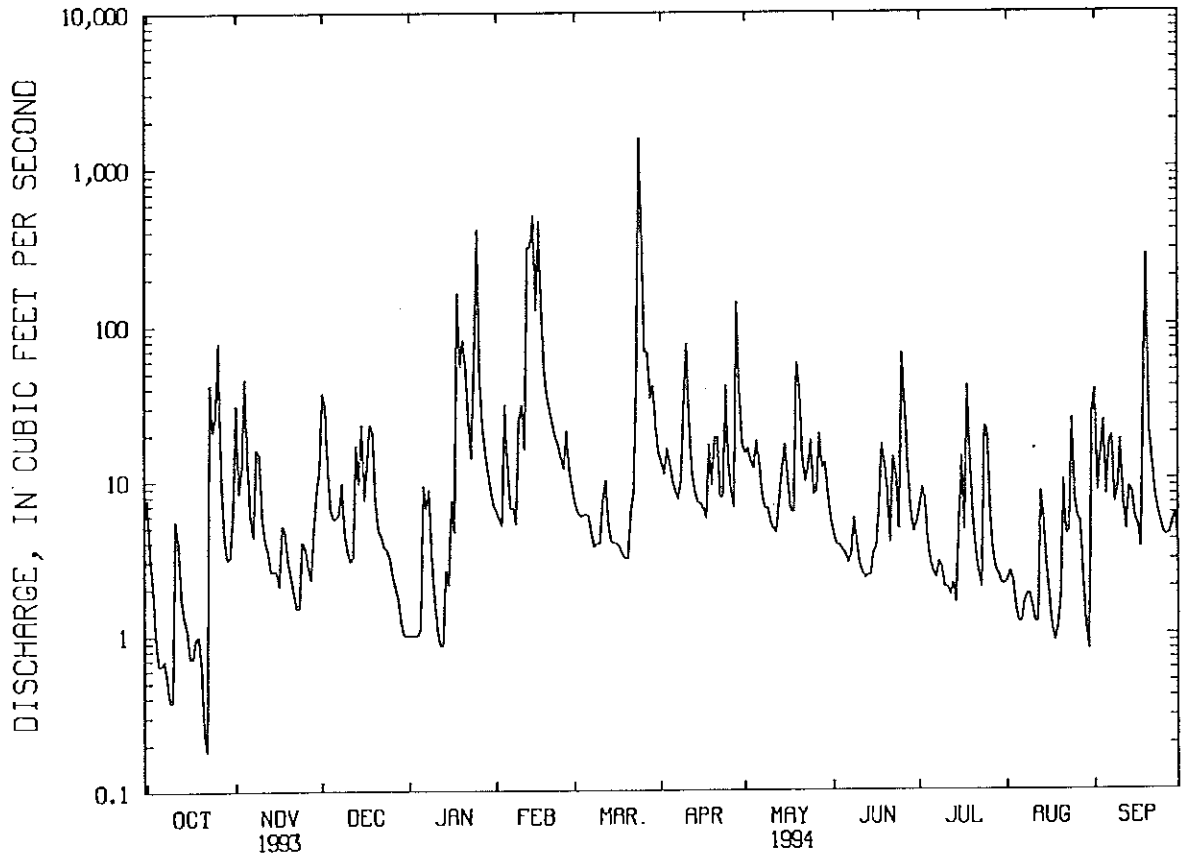
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.7	31	37	1.0	6.3	7.3	13	15	4.5	6.5	2.2	38
2	3.3	8.4	31	1.0	5.6	6.3	11	16	3.8	8.8	2.5	8.4
3	2.1	12	12	1.0	5.1	5.9	16	13	3.8	7.5	2.2	15
4	1.0	46	6.5	1.0	31	5.9	13	12	3.5	4.0	1.5	24
5	.65	13	5.7	1.1	13	6.0	10	18	3.3	2.9	1.2	7.9
6	.65	5.8	5.8	9.2	6.6	5.9	8.5	13	2.9	2.5	1.2	17
7	.69	4.4	6.1	6.6	6.6	4.6	7.6	8.1	3.3	2.3	1.6	19
8	.53	16	9.7	8.7	5.2	3.7	10	6.5	5.6	2.9	1.8	7.1
9	.38	15	4.5	3.1	25	3.9	32	6.6	3.9	2.7	1.8	8.5
10	.38	5.9	3.5	1.7	31	3.9	76	5.3	2.8	2.0	1.5	18
11	5.5	4.1	3.0	1.1	16	7.5	23	4.8	2.5	2.0	1.2	7.1
12	4.1	3.5	3.2	.86	312	10	11	4.6	2.3	1.8	1.2	4.7
13	1.8	2.6	17	.86	321	5.2	8.4	7.5	2.4	2.1	8.3	8.8
14	1.3	2.6	9.6	2.6	503	4.0	7.2	12	2.4	1.6	5.7	8.3
15	1.1	2.6	23	2.1	126	3.9	7.1	17	3.4	5.0	2.8	5.6
16	.72	2.1	7.6	7.4	460	3.9	6.5	10	3.6	14	1.8	5.0
17	.72	5.1	13	4.6	131	3.7	5.7	6.3	6.5	4.7	1.1	3.6
18	.96	4.7	23	162	51	3.3	17	6.2	17	41	.91	36
19	.99	3.0	21	55	35	3.1	9.2	57	13	13	1.1	274
20	.64	2.4	7.2	81	28	3.1	19	41	8.7	5.8	1.7	21
21	.23	1.9	4.8	54	23	6.2	19	14	3.9	3.4	10	13
22	.18	1.5	4.4	25	19	8.4	7.8	9.8	14	2.5	4.4	8.1
23	42	1.5	3.7	14	17	43	7.9	12	11	2.0	4.6	6.2
24	21	4.0	3.6	60	14	1540	41	18	4.8	22	25	5.2
25	26	3.7	3.1	410	12	332	13	8.1	66	21	7.6	4.4
26	78	2.8	2.4	45	21	68	8.4	8.4	31	6.0	5.6	4.3
27	11	2.3	2.0	22	12	67	6.7	20	12	3.4	5.3	4.4
28	4.4	4.8	1.7	15	9.3	34	140	12	6.2	2.6	2.2	5.2
29	3.1	8.5	1.2	11	---	41	37	13	4.6	2.4	1.1	6.0
30	3.2	12	1.0	8.5	---	22	17	8.1	5.2	2.1	.80	3.9
31	6.1	---	1.0	6.9	---	15	---	5.6	---	2.1	27	---
TOTAL	230.42	233.2	278.3	1023.32	2245.7	2277.7	609.0	408.9	257.9	202.6	136.91	597.7
MEAN	7.43	7.77	8.98	33.0	80.2	73.5	20.3	13.2	8.60	6.54	4.42	19.9
MAX	78	46	37	410	503	1540	140	57	66	41	27	274
MIN	.18	1.5	1.0	.86	5.1	3.1	5.7	4.6	2.3	1.6	.80	3.6
AC-FT	457	463	552	2030	4450	4520	1210	811	512	402	272	1190

16330000 KAMANANUI STREAM AT MAUNAWAI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1958 - 1994, BY WATER YEAR (WY)

MEAN	12.5	28.5	22.4	26.8	23.7	33.6	28.6	15.5	6.91	12.8	9.16	5.80
MAX	56.7	168	107	143	106	155	168	62.8	52.9	52.7	68.0	19.9
(WY)	1959	1991	1988	1988	1969	1982	1989	1965	1978	1989	1958	1994
MIN	.006	.51	.67	.094	.022	1.23	.64	.95	.33	.52	.20	.006
(WY)	1985	1963	1977	1986	1978	1983	1992	1984	1959	1971	1971	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1958 - 1994	
ANNUAL TOTAL	3020.35		8501.65			
ANNUAL MEAN	8.27		23.3		18.7	
HIGHEST ANNUAL MEAN					50.3	1982
LOWEST ANNUAL MEAN					4.81	1984
HIGHEST DAILY MEAN	572	Jul 22	1540	Mar 24	1940	Jan 1 1988
LOWEST DAILY MEAN	.01	Apr 2	.18	Oct 22	.00	Jun 21 1959
ANNUAL SEVEN-DAY MINIMUM	.02	Apr 14	.61	Oct 4	.00	Jul 23 1959
ANNUAL RUNOFF (AC-FT)	5990		16860		13540	
10 PERCENT EXCEEDS	17		34		31	
50 PERCENT EXCEEDS	2.8		6.2		3.9	
90 PERCENT EXCEEDS	.12		1.4		.30	



16345000 OPAEULA STREAM NEAR WAHIAWA

LOCATION.--Lat 21°33'55", long 158°00'10", Hydrologic Unit 200600000, on left bank, 4.3 mi northeast of Leilehua High School in Wahiawa, and 8.1 mi east of Waialua School.

DRAINAGE AREA.--2.98 mi^2.

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

REVISED RECORDS.--WSP 1937: 1960.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 1,120 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--35 years, 14.0 ft^3/s (10,160 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, Nov. 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)
Feb. 12	1000	1,460	7.52	Mar. 24	1930	1,425	7.45
Feb. 15	2330	*2,070	*8.74	Sep. 18	2330	2,060	8.71

Minimum discharge, 1.10 ft^3/s, Jan. 12, 13.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

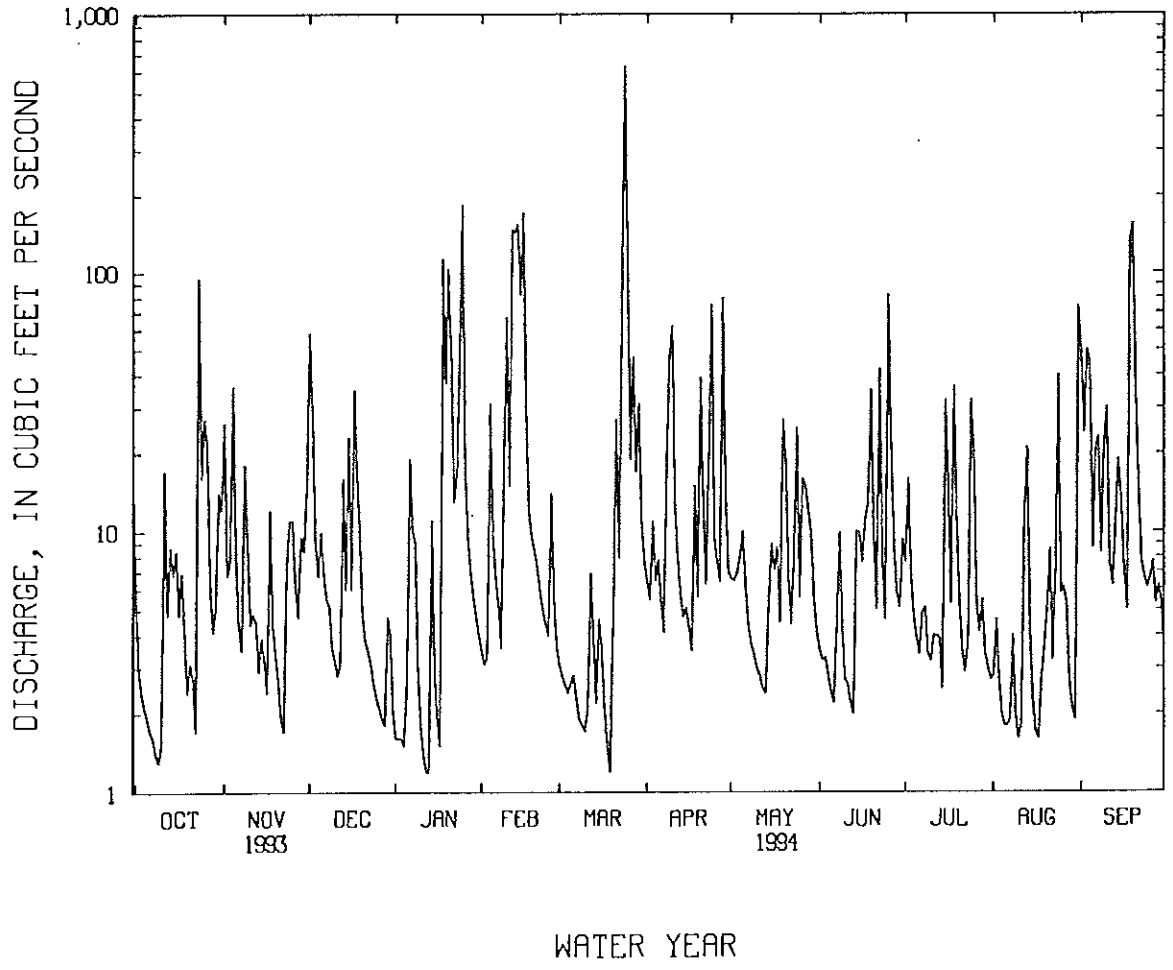
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.6	26	58	1.6	3.5	3.1	6.4	6.6	3.5	7.6	2.8	51
2	3.0	6.8	28	1.6	3.1	2.8	5.5	6.5	3.2	16	4.6	24
3	2.4	7.5	9.2	1.6	3.3	2.6	11	6.9	3.3	6.8	2.7	50
4	2.1	36	6.7	1.5	31	2.4	6.5	8.0	2.8	4.7	2.0	45
5	1.9	8.1	9.9	2.6	9.6	2.6	7.8	10	2.4	3.9	1.8	8.7
6	1.7	4.4	6.9	19	6.7	2.8	5.4	6.2	2.2	3.4	1.8	21
7	1.6	3.5	5.5	10	5.3	2.3	4.1	4.4	4.7	4.9	1.9	23
8	1.4	18	5.2	9.0	3.6	1.9	19	3.7	9.9	5.1	4.0	8.3
9	1.3	9.1	3.6	3.0	19	1.8	48	3.4	4.2	3.4	2.0	22
10	1.5	4.4	3.2	1.8	67	1.7	62	3.0	2.7	3.2	1.6	30
11	17	4.8	2.8	1.4	15	2.1	13	2.8	2.6	4.0	1.8	7.5
12	4.8	4.5	3.1	1.2	147	6.9	8.0	2.5	2.2	4.0	12	6.2
13	8.7	2.9	16	1.2	143	4.0	5.8	2.4	2.0	3.9	21	11
14	6.8	3.9	6.0	11	154	2.2	4.7	5.3	10	2.5	4.3	19
15	8.4	3.2	23	3.0	82	4.6	5.1	9.0	9.9	32	2.3	13
16	4.8	2.4	6.0	1.9	172	3.6	4.3	7.1	7.6	15	1.7	6.9
17	6.9	12	35	1.5	28	2.1	3.5	8.7	11	5.3	1.6	5.0
18	4.1	4.4	17	113	12	1.5	15	4.5	13	36	2.7	136
19	2.4	3.4	10	37	9.5	1.2	5.6	27	35	11	3.6	155
20	3.1	2.7	4.9	103	8.4	4.6	39	19	9.8	5.4	5.2	35
21	2.7	1.9	3.8	45	7.2	27	13	6.8	5.0	3.5	8.6	15
22	1.7	1.7	3.5	13	5.9	7.9	6.3	4.4	42	2.9	3.2	7.7
23	95	7.4	3.1	17	5.0	70	20	8.4	7.5	3.7	7.2	6.7
24	16	11	2.6	48	4.4	630	75	25	4.6	32	40	6.1
25	27	11	2.3	184	4.0	125	9.4	5.6	82	20	5.8	6.6
26	21	6.3	2.1	17	14	19	7.7	16	21	5.3	6.1	7.7
27	6.3	4.7	1.9	9.3	5.7	47	6.4	15	8.8	4.1	5.3	5.3
28	4.1	9.5	1.8	6.9	3.7	17	80	12	5.8	5.5	2.7	6.2
29	5.1	8.4	4.7	5.6	---	31	14	9.8	5.1	3.4	2.1	5.4
30	14	15	4.0	4.7	---	11	7.0	5.5	9.3	3.0	1.9	3.5
31	12	---	2.0	4.0	---	7.7	---	4.1	---	2.7	74	---
TOTAL	294.4	244.9	291.8	680.4	972.9	1049.4	518.5	259.6	333.1	264.2	238.3	747.8
MEAN	9.50	8.16	9.41	21.9	34.7	33.9	17.3	8.37	11.1	8.52	7.69	24.9
MAX	95	36	58	184	172	630	80	27	82	36	74	155
MIN	1.3	1.7	1.8	1.2	3.1	1.2	3.5	2.4	2.0	2.5	1.6	3.5
AC-FT	584	486	579	1350	1930	2080	1030	515	661	524	473	1480

16345000 OPAEULA STREAM NEAR WAHIAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1959 - 1994, BY WATER YEAR (WY)

MEAN	11.1	18.7	16.4	15.9	14.5	21.9	21.4	12.9	7.32	12.0	8.51	7.81
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	1.75	2.02	.95	1.51	.52
(WY)	1985	1963	1977	1977	1978	1983	1966	1966	1975	1971	1984	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1959 - 1994	
ANNUAL TOTAL	3217.65		5895.3			
ANNUAL MEAN	8.82		16.2		14.0	
HIGHEST ANNUAL MEAN					29.7	1982
LOWEST ANNUAL MEAN					7.24	1984
HIGHEST DAILY MEAN	290	Jul 22	630	Mar 24	825	Feb 1 1969
LOWEST DAILY MEAN	.06	Apr 4	1.2	Jan 12	.00	Jan 24 1977
ANNUAL SEVEN-DAY MINIMUM	.17	Mar 30	1.6	Oct 4	.00	Oct 24 1984
ANNUAL RUNOFF (AC-FT)	6380		11690		10160	
10 PERCENT EXCEEDS	21		35		29	
50 PERCENT EXCEEDS	3.8		5.8		4.6	
90 PERCENT EXCEEDS	.94		2.0		.90	



16400000 HALAWA STREAM NEAR HALAWA
(National stream-quality accounting network station)

LOCATION.--Lat 21°09'31", long 156°45'53", Hydrologic Unit 20050000, on right bank 600 ft downstream from Hipuapua Stream and 1.5 mi west of Halawa.

DRAINAGE AREA.--4.62 mi^2.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1917 to July 1932, November 1937 to current year.

REVISED RECORDS.--WSP 1319: 1928, 1929(M), 1930-31, 1938-50(M), drainage area. WSP 1719: 1954.

GAGE.--Water-stage recorder. Elevation of gage is 210 ft, from topographic map. Prior to June 25, 1923, at site 350 ft upstream at different datum. June 25, 1923 to July 18, 1932, and Nov. 17, 1937 to Feb. 3, 1965, at present site at datum 2.00 ft higher.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--70 years (water years 1918-31, 1939-94), 30.0 ft^3/s (21,740 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 26,900 ft^3/s, Feb. 4, 1965, gage height, 19.91 ft, from floodmarks, from rating curve extended above 163 ft^3/s on basis of slope-area measurement of peak flow; minimum, 0.76 ft^3/s, about Nov. 23, 1962.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1130	*1,950	*8.36	No other peak greater than base discharge.			

Minimum discharge, 3.5 ft^3/s, Jan. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

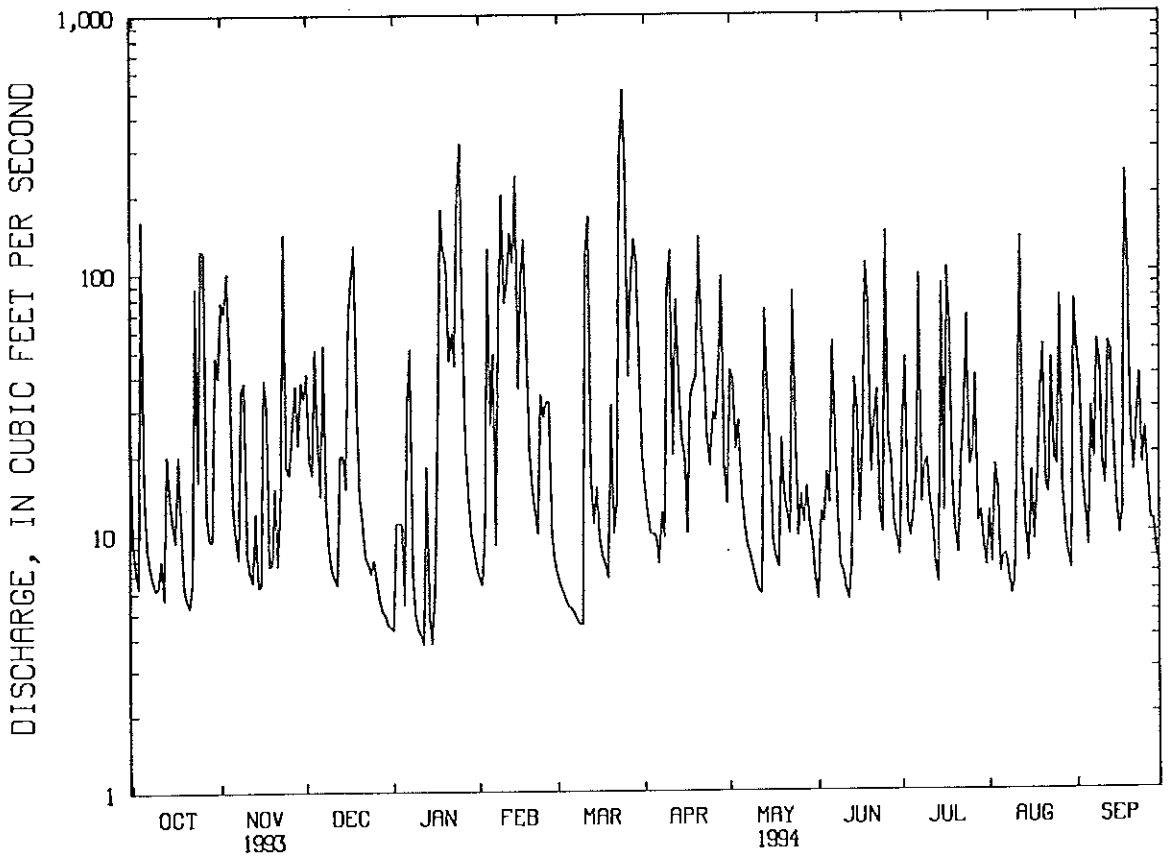
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	78	41	4.3	6.8	7.0	15	42	5.6	27	12	49
2	7.3	71	19	11	6.4	6.4	12	39	12	47	7.6	39
3	6.3	101	17	11	10	6.0	10	21	11	11	18	16
4	160	46	51	11	125	5.6	10	27	17	9.6	15	12
5	15	13	23	5.4	26	5.3	9.7	15	13	12	7.0	8.8
6	8.9	9.6	14	33	49	5.2	7.7	11	54	17	8.1	30
7	7.5	8.1	53	51	9.1	5.0	12	9.1	25	98	8.2	19
8	6.7	36	13	7.0	68	4.7	9.7	8.3	12	13	6.8	54
9	6.2	38	8.8	4.9	202	4.5	88	7.3	7.5	18	5.8	45
10	6.3	8.4	7.3	4.3	77	4.5	122	6.6	7.1	19	6.5	18
11	8.0	7.1	6.8	4.1	91	120	20	6.0	6.1	13	25	15
12	5.7	6.6	6.4	3.8	143	165	79	5.9	5.6	11	136	53
13	20	12	20	18	110	16	39	72	7.5	7.3	17	49
14	14	6.3	20	4.9	237	11	23	34	39	6.4	10	22
15	11	6.4	15	3.8	36	15	20	19	30	90	7.7	13
16	9.4	39	69	6.3	98	9.6	10	9.2	11	12	17	9.7
17	20	31	97	23	135	8.2	33	8.0	23	104	9.3	12
18	11	7.6	128	177	53	7.6	37	7.4	109	63	16	241
19	6.2	7.7	31	123	21	6.8	40	23	75	15	35	106
20	5.6	15	14	108	15	31	138	14	17	9.9	52	25
21	5.3	7.6	11	46	12	10	60	12	27	8.3	15	17
22	6.6	14	8.2	59	10	13	43	9.9	35	19	14	27
23	88	142	7.7	44	34	276	23	85	12	28	46	40
24	16	18	7.1	210	28	507	18	26	10	68	19	18
25	123	17	7.9	317	32	257	29	9.8	144	18	18	25
26	121	25	6.6	63	32	40	27	14	23	20	81	16
27	12	37	5.6	21	10	91	44	11	19	40	15	11
28	9.5	22	5.1	14	7.9	134	97	15	11	11	9.9	11
29	9.5	38	4.9	10	---	110	18	11	9.5	12	8.1	8.3
30	48	33	4.5	8.7	---	45	13	9.2	8.2	8.8	7.2	7.3
31	40	---	4.4	7.5	---	20	---	6.6	---	7.4	78	---
TOTAL	823.4	901.4	727.3	1415.0	1684.2	1947.4	1107.1	594.3	786.1	843.7	731.2	1017.1
MEAN	26.6	30.0	23.5	45.6	60.1	62.8	36.9	19.2	26.2	27.2	23.6	33.9
MAX	160	142	128	317	237	507	138	85	144	104	136	241
MIN	5.3	6.3	4.4	3.8	6.4	4.5	7.7	5.9	5.6	6.4	5.8	7.3
AC-FT	1630	1790	1440	2810	3340	3860	2200	1180	1560	1670	1450	2020

16400000 HALAWA STREAM NEAR HALAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1917 - 1994, BY WATER YEAR (WY)

MEAN	26.9	36.3	36.7	34.0	30.1	37.9	40.8	27.3	18.6	25.7	25.2	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1917 - 1994		
ANNUAL TOTAL	9794.9		12578.2				
ANNUAL MEAN	26.8		34.5		30.0		
HIGHEST ANNUAL MEAN					47.4		1965
LOWEST ANNUAL MEAN					17.4		1975
HIGHEST DAILY MEAN	338	Jul 22	507	Mar 24	1240	Feb 4	1965
LOWEST DAILY MEAN	2.0	Mar 3	3.8	Jan 12	.86	Sep 1	1971
ANNUAL SEVEN-DAY MINIMUM	2.2	Feb 28	5.0	Mar 4	.90	Aug 26	1971
ANNUAL RUNOFF (AC-FT)	19430		24950		21740		
10 PERCENT EXCEEDS	73		93		65		
50 PERCENT EXCEEDS	11		15		14		
90 PERCENT EXCEEDS	4.2		6.4		4.8		



16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--Water years 1969-74, 1975 to current year.

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT												
05...	1230	14	39	7.0	26.5	24.0	4.5	755	8.0	96	1600	4800
JAN												
04...	1230	25	60	7.2	21.5	18.5	2.5	754	9.2	99	580	2200
APR												
05...	1155	9.9	59	7.1	25.0	20.5	0.50	757	8.6	96	64	460
JUL												
19...	1245	15	42	7.1	25.0	21.5	3.0	756	8.5	97	31	380

DATE	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT												
05...	5	2	0.81	0.79	5.3	66	1	0.50	4	0	5	2.3
JAN												
04...	8	2	1.2	1.2	7.5	65	1	0.70	7	0	6	2.2
APR												
05...	8	2	1.1	1.2	7.2	65	1	0.50	7	0	6	2.1
JUL												
19...	6	2	0.89	0.83	5.2	65	1	0.40	4	0	3	1.6

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)	PHOS-PHORUS DIS-SOLVED (MG/L AS P)	PHOS-PHORUS ORTHO, DIS-SOLVED (MG/L AS P)
OCT												
05...	7.3	0.10	4.6	35	24	0.05	<0.050	0.040	0.20	0.030	<0.010	<0.010
JAN												
04...	12	<0.10	7.1	38	36	0.05	<0.050	0.040	<0.20	0.040	0.020	0.010
APR												
05...	12	<0.10	8.9	40	37	0.05	<0.050	0.030	<0.20	0.010	<0.010	<0.010
JUL												
19...	8.0	<0.10	4.3	30	24	0.04	<0.050	0.030	0.20	0.020	0.010	<0.010

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

16400000 HALAWA STREAM NEAR HALAWA--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	ALUMINUM, DISSOLVED (UG/L AS AL)	BARIUM, DISSOLVED (UG/L AS BA)	COBALT, DISSOLVED (UG/L AS CO)	IRON, DISSOLVED (UG/L AS FE)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)
OCT 05...	200	2	<3	220	<4	3	<10	<1	<1	<1.0	12	<6
JAN 04...	50	11	<3	72	<4	2	<10	<1	<1	<1.0	19	<6
APR 05...	40	11	<3	25	<4	1	<10	<1	<1	<1.0	16	<6
JUL 19...	180	<2	<3	170	<4	2	<10	<1	<1	<1.0	13	<6

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 05...	1230	5	0.19	100
JAN 04...	1230	7	0.47	100
APR 05...	1155	2	0.05	100
JUL 19...	1245	3	0.12	100

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

16404200 PILIPILILAU STREAM NEAR PELEKUNU

LOCATION.--Lat 21°08'08", long 156°53'09", Hydrologic Unit 20050000, on right bank 500 ft downstream from left-bank tributary, 1.9 mi south of former village of Pelekunu, and 5.8 mi north of Kamalo.

DRAINAGE AREA.--0.49 mi^2.

PERIOD OF RECORD.--August 1968 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 1,000 ft, from topographic map.

REMARKS.--Records fair.

AVERAGE DISCHARGE.--26 years, 1.62 ft^3/s (1,170 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 835 ft^3/s, Jan. 25, 1982, gage height, 4.25 ft, from rating curve extended above 6.2 ft^3/s on basis of slope-area measurement at gage height, 4.25 ft; minimum, 0.50 ft^3/s, Sept. 2-8, 21-29, 1975, Nov. 26 to Dec. 3, 1977.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1200	*100	*2.94

No other peak greater than base discharge.

Minimum discharge, 0.64 ft^3/s, Sep. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.72	.99	1.7	1.0	1.2	e1.3	2.3	1.8	1.1	.99	.89	.76
2	.72	.99	1.5	1.2	1.2	1.2	2.2	2.0	1.1	.99	.84	.84
3	.72	.99	1.6	.99	1.5	1.2	2.1	1.8	.99	.94	.84	.84
4	.76	.89	2.8	.94	2.6	1.2	2.0	1.8	.94	.89	.84	.76
5	.76	.84	1.7	.99	2.2	1.2	2.0	1.6	.89	.89	.84	.72
6	.76	.80	1.4	2.4	1.7	1.2	2.0	1.6	1.2	.99	.84	.72
7	.72	.76	1.7	1.2	1.6	1.1	2.0	1.6	1.2	2.2	.84	.72
8	.72	1.0	1.4	.99	1.6	1.1	2.0	1.6	1.0	.94	.84	.80
9	.72	2.7	1.2	.94	2.0	1.0	1.9	1.6	.99	.94	.84	.84
10	.72	1.0	1.2	.94	2.3	1.0	2.0	1.5	.99	.89	.84	.76
11	.76	.94	1.2	.94	3.2	3.1	3.0	1.4	.99	.89	.84	.80
12	.72	.89	1.2	.99	3.1	3.0	4.9	1.4	.99	.89	.94	1.0
13	.76	.84	1.2	.99	3.0	1.6	3.0	1.6	.99	.89	.84	.89
14	.80	.86	1.2	.94	8.3	1.6	2.3	1.6	1.0	.84	.84	.80
15	.76	.80	1.2	.99	2.6	1.4	2.0	1.6	.99	1.0	.80	.72
16	.76	1.0	1.4	1.0	2.8	1.5	2.0	1.5	.94	.89	.80	.68
17	.96	.94	1.4	1.0	3.1	1.3	2.0	1.3	.99	1.2	.80	.68
18	.76	.84	2.1	3.2	2.1	1.3	2.0	1.3	1.6	1.6	.80	.84
19	.80	.80	2.0	5.8	2.0	1.3	4.1	1.3	1.2	.99	.80	2.7
20	.72	.84	1.3	3.9	1.9	1.6	5.8	1.3	.99	.94	.84	.80
21	.72	.80	1.2	2.3	1.8	2.0	3.0	1.3	1.0	.89	.80	.76
22	.72	1.2	1.2	2.1	1.7	2.0	2.6	1.3	.99	.89	.80	.76
23	.76	14	1.1	2.0	2.0	11	2.3	1.3	.94	.89	.94	.76
24	.72	3.1	1.0	2.4	1.6	27	2.2	1.3	.94	.99	.84	.72
25	24	2.3	.99	2.9	e1.6	13	2.2	1.2	3.0	.89	.84	.76
26	3.8	2.8	.99	1.8	e1.7	5.4	2.0	1.3	1.3	.94	1.0	.72
27	1.3	2.7	.94	1.6	e1.4	5.0	2.0	1.3	1.3	.99	.80	.72
28	1.1	2.0	.94	1.5	e1.4	4.0	2.0	1.2	1.0	.84	.76	.72
29	1.2	2.0	.94	1.4	---	3.1	1.9	1.2	.99	.89	.76	.68
30	1.3	2.2	.94	1.3	---	2.8	1.8	1.2	.99	.84	.76	.68
31	1.2	---	.94	1.3	---	2.5	---	1.1	---	.89	.84	---
TOTAL	51.94	52.81	41.58	51.94	63.2	107.0	73.6	44.9	33.53	30.73	25.89	24.95
MEAN	1.68	1.76	1.34	1.68	2.26	3.45	2.45	1.45	1.12	.99	.84	.83
MAX	24	14	2.8	5.8	8.3	27	5.8	2.0	3.0	2.2	1.0	2.7
MIN	.72	.76	.94	.94	1.2	1.0	1.8	1.1	.89	.84	.76	.68
AC-FT	103	105	82	103	125	212	146	89	67	61	51	49

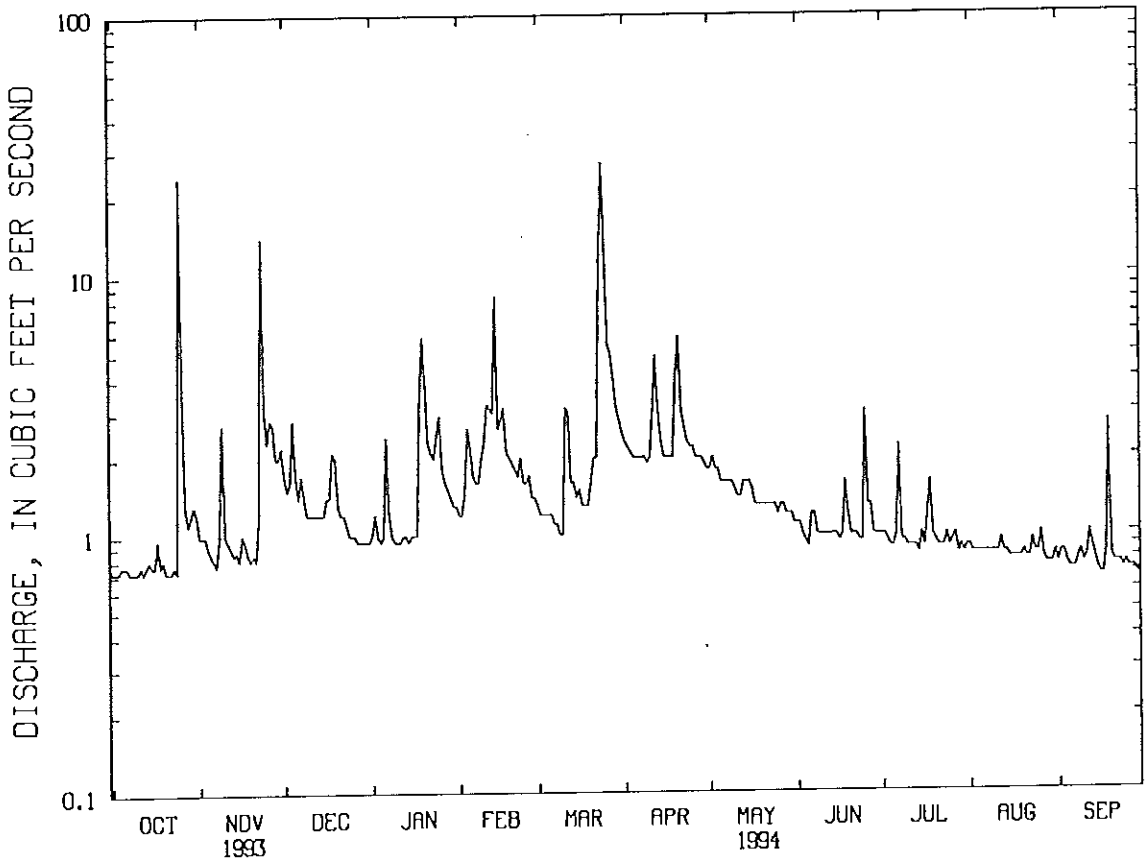
e Estimated

16404200 PILIPILILAU STREAM NEAR PELEKUNU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, BY WATER YEAR (WY)

MEAN	.91	1.60	1.82	2.63	2.11	2.31	2.43	1.72	1.14	1.04	.91	.82
MAX	1.68	4.85	3.92	6.55	5.56	4.41	12.1	5.92	2.22	1.90	1.56	1.38
(WY)	1994	1979	1969	1982	1979	1980	1989	1987	1987	1980	1980	1992
MIN	.58	.60	.58	.64	.58	1.02	.75	.77	.69	.60	.58	.53
(WY)	1978	1978	1976	1977	1978	1975	1978	1975	1975	1975	1975	1975

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1968 - 1994	
ANNUAL TOTAL	509.41		602.07			
ANNUAL MEAN	1.40		1.65		1.62	
HIGHEST ANNUAL MEAN					2.69	1982
LOWEST ANNUAL MEAN					.77	1978
HIGHEST DAILY MEAN	24	Oct 25	27	Mar 24	152	Apr 8 1989
LOWEST DAILY MEAN	.72	Jun 28	.68	Sep 16	.50	Sep 3 1975
ANNUAL SEVEN-DAY MINIMUM	.72	Jul 9	.71	Sep 24	.50	Sep 21 1975
ANNUAL RUNOFF (AC-FT)	1010		1190		1170	
10 PERCENT EXCEEDS	2.2		2.6		2.8	
50 PERCENT EXCEEDS	1.0		1.1		1.0	
90 PERCENT EXCEEDS	.76		.76		.65	



16405100 MOLOKAI TUNNEL AT EAST PORTAL

LOCATION.--Lat 21°08'38", long 156°55'16", Hydrologic Unit 20050000, on left bank 100 ft downstream from the east portal, 5.3 mi southeast of Kalaupapa, and 7.5 mi northeast of Kaunakakai.

PERIOD OF RECORD.--July 1966 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 989 ft, from tunnel plans.

REMARKS.--Records good except for period of estimated discharge, which are fair. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft in Waikolu Valley near the east portal. Water is used for irrigation in west-central Molokai.

AVERAGE DISCHARGE.--28 years, 4.52 ft^3/s (3,270 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, Mar. 19, 1986; no flow at times.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 30 ft^3/s, Nov. 23; minimum daily, 1.9 ft^3/s, Oct. 6, 9, 10, Nov. 19, 20.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.6	6.4	7.8	3.9	3.9	3.7	5.6	e6.5	e5.4	5.2	4.8	6.8
2	3.3	4.8	4.9	4.8	3.6	3.7	5.3	e8.2	4.6	6.4	5.2	7.3
3	3.7	7.1	6.6	5.2	5.8	3.9	5.2	e8.5	4.4	5.7	4.9	9.3
4	2.5	7.0	20	4.6	21	3.7	5.6	e8.5	4.5	5.3	4.7	6.1
5	2.0	4.6	9.4	4.0	14	3.6	5.0	e9.0	6.8	5.1	4.6	4.5
6	1.9	3.9	5.1	15	14	3.6	4.9	e7.4	7.3	5.8	4.6	5.7
7	2.8	3.6	10	9.5	6.0	3.6	6.0	e6.0	11	17	4.6	4.8
8	3.0	5.4	6.6	5.3	9.8	3.7	6.9	e6.0	8.1	7.1	4.5	7.4
9	1.9	18	4.1	4.2	9.9	3.5	6.7	e6.5	5.0	5.5	4.5	8.6
10	1.9	7.2	3.5	3.9	7.6	3.3	9.8	e6.0	4.6	5.5	4.0	5.6
11	2.3	5.1	3.0	3.7	12	18	14	e6.0	4.4	4.9	3.8	4.6
12	2.8	4.1	3.6	3.7	20	19	24	e6.0	4.3	5.1	5.4	12
13	2.7	3.3	8.4	4.1	6.6	8.0	16	e6.2	4.4	4.9	5.2	10
14	4.1	6.5	5.3	3.8	21	14	9.9	e6.0	5.0	4.8	4.0	5.2
15	3.7	4.8	6.4	3.7	8.3	9.5	8.8	e8.5	5.9	7.5	3.9	4.1
16	3.5	2.6	7.1	3.9	9.9	9.2	6.2	e9.6	5.7	6.2	3.8	4.1
17	9.6	6.3	12	4.7	16	8.0	7.0	e8.9	7.0	10	3.6	3.8
18	6.6	2.4	12	15	7.2	5.8	8.3	e6.8	17	16	3.8	6.4
19	4.4	1.9	14	28	5.2	4.5	17	e7.9	10	6.9	7.5	10
20	4.1	1.9	5.4	22	4.5	9.2	23	e8.2	7.2	6.0	7.4	5.3
21	3.4	2.0	4.9	18	4.1	11	13	e6.0	7.3	5.2	4.5	4.4
22	3.0	6.3	3.4	8.2	3.9	13	13	e5.7	8.5	5.0	5.3	4.2
23	3.3	30	2.9	12	4.4	28	8.9	e6.5	5.4	5.1	8.8	4.9
24	4.0	17	2.7	11	5.2	26	e9.0	e6.5	4.8	9.9	9.0	4.4
25	23	13	2.6	18	4.2	26	e8.6	e6.5	17	6.9	5.5	4.2
26	20	17	2.6	8.0	4.0	14	e8.0	e6.2	11	6.8	13	4.6
27	6.0	17	3.4	6.1	3.9	17	e7.6	e7.4	13	10	6.8	4.4
28	6.2	9.1	3.9	4.8	3.8	15	e9.0	e6.5	7.2	3.0	5.0	3.9
29	9.3	12	3.9	4.5	---	8.6	e8.0	e7.1	6.1	4.0	4.1	3.9
30	13	13	3.7	4.3	---	7.6	e7.0	e6.8	5.7	4.7	4.4	3.8
31	9.4	---	3.7	4.1	---	6.8	---	e6.2	---	4.3	5.4	---
TOTAL	171.0	243.3	192.9	252.0	239.8	314.5	287.3	218.1	218.6	205.8	166.6	174.3
MEAN	5.52	8.11	6.22	8.13	8.56	10.1	9.58	7.04	7.29	6.64	5.37	5.81
MAX	23	30	20	28	21	28	24	9.6	17	17	13	12
MIN	1.9	1.9	2.6	3.7	3.6	3.3	4.9	5.7	4.3	3.0	3.6	3.8
AC-FT	339	483	383	500	476	624	570	433	434	408	330	346

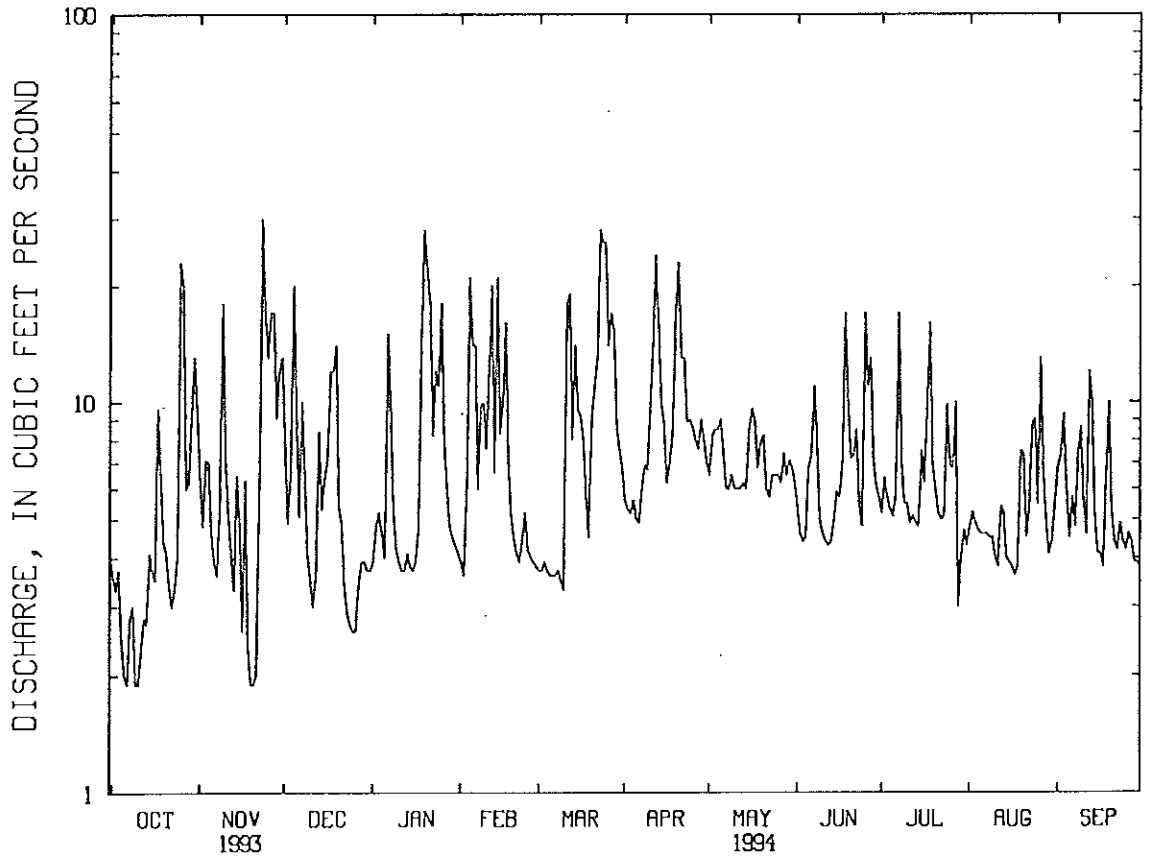
e Estimated

16405100 MOLOKAI TUNNEL AT EAST PORTAL--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1966 - 1994, BY WATER YEAR (WY)

MEAN	3.81	5.26	5.09	4.94	4.73	5.41	5.40	4.44	3.86	4.28	3.68	3.18
MAX	7.34	10.2	10.6	12.5	12.5	13.8	12.8	12.3	8.37	9.89	7.22	5.81
(WY)	1986	1988	1991	1987	1990	1986	1986	1987	1986	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1966 - 1994	
ANNUAL TOTAL	2377.3		2684.2			
ANNUAL MEAN	6.51		7.35		4.52	
HIGHEST ANNUAL MEAN					8.19	1987
LOWEST ANNUAL MEAN					1.31	1974
HIGHEST DAILY MEAN	33	Jul 24	30	Nov 23	41	Mar 19 1986
LOWEST DAILY MEAN	1.3	Aug 29	1.9	Oct 6	.00	Mar 30 1967
ANNUAL SEVEN-DAY MINIMUM	2.0	Jan 21	2.3	Oct 5	.00	Mar 30 1967
ANNUAL RUNOFF (AC-FT)	4720		5320		3270	
10 PERCENT EXCEEDS	13		14		9.5	
50 PERCENT EXCEEDS	5.0		5.8		3.2	
90 PERCENT EXCEEDS	2.5		3.6		.90	



16405300 MOLOKAI TUNNEL AT WEST PORTAL

LOCATION.--Lat 21°07'27", long 156°59'50", Hydrologic Unit 20050000, on left bank 50 ft upstream from the west portal, 2.5 mi northeast of Kaunakakai, and 4.7 mi south of Kalaupapa.

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

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 970 ft, from tunnel plans.

REMARKS.--Records excellent, except those for estimated discharge which are fair. Tunnel diverts from Waikolu Stream and two tributaries; diversion is augmented by water pumped from two wells and from the stream at elevation 728 ft 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.--29 years, 7.06 ft^3/s (5,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 39 ft^3/s, Apr. 8, 9, 1986, Jan. 2, 26, 1988, and Mar. 3, 1989; minimum daily, 1.8 ft^3/s, Oct. 15, 1967, Aug. 27, 1992.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 34 ft^3/s, Nov. 23, Mar. 23; minimum daily, 3.9 ft^3/s, Nov. 16.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.9	9.1	11	6.3	6.8	6.3	8.5	8.5	7.9	9.0	e5.8	e9.3
2	6.8	7.4	7.3	7.1	6.3	5.7	8.3	9.5	8.0	9.8	e6.4	e9.6
3	7.1	9.5	8.8	7.5	7.8	6.2	8.0	10	7.7	9.3	e5.8	e13
4	5.9	9.8	23	7.1	25	5.9	8.7	10	7.8	8.8	e5.6	e8.9
5	5.3	7.6	12	6.5	16	5.9	8.0	11	10	8.5	e5.6	e7.2
6	5.2	6.5	7.7	18	18	5.9	8.0	9.5	10	8.6	e5.6	e8.3
7	4.8	6.4	12	13	9.2	6.0	8.9	8.8	15	21	e5.6	e7.7
8	6.3	6.5	9.7	8.5	13	6.2	9.8	8.3	12	11	e5.6	e10
9	5.1	23	6.7	7.1	13	6.2	9.5	9.0	8.5	8.9	e5.4	e12
10	5.0	10	6.1	6.5	9.8	5.7	12	8.8	7.8	8.5	e4.9	e8.6
11	5.4	7.7	5.3	6.5	15	20	15	8.8	7.6	8.1	e4.9	e7.2
12	5.6	6.8	5.8	6.5	23	24	29	8.6	7.4	8.4	e6.4	e15
13	5.5	5.8	11	6.7	9.0	11	19	8.7	7.8	8.2	e6.4	e13
14	6.0	8.7	7.6	6.6	24	17	12	8.8	8.0	8.2	e4.9	e8.0
15	5.8	7.9	8.7	6.5	11	13	13	11	8.9	11	e4.9	e6.6
16	5.3	3.9	9.6	6.5	12	12	9.3	11	9.0	9.8	e4.7	e6.6
17	11	9.2	15	6.5	19	12	9.6	11	9.5	13	e4.7	e6.4
18	9.2	4.7	15	17	10	9.2	12	9.0	21	20	e4.9	e8.0
19	6.4	4.3	17	33	8.1	7.1	20	9.5	14	11	e8.9	e13
20	6.5	4.3	7.8	26	7.1	12	29	10	10	9.3	e8.6	e9.3
21	4.9	4.3	7.4	22	6.6	14	16	8.0	10	8.7	e6.0	e6.9
22	5.0	6.3	5.9	10	6.3	15	17	7.9	12	8.1	e7.0	e6.9
23	5.2	34	5.3	17	6.7	34	12	8.7	8.8	8.3	e9.3	e7.2
24	6.1	22	5.1	14	8.3	31	12	8.8	8.0	13	e10	e6.9
25	25	14	5.1	21	6.8	33	10	8.9	20	10	e8.3	e6.6
26	24	20	4.6	11	6.6	18	9.5	8.8	14	8.7	e16	e7.2
27	8.5	21	5.5	9.2	6.5	21	9.3	9.8	16	e13	e10	e6.9
28	8.5	12	6.5	7.4	6.5	20	11	9.3	11	e4.5	e8.3	e6.4
29	11	15	6.4	7.3	---	12	10	9.4	9.6	e5.4	e6.6	e6.4
30	17	15	6.4	7.0	---	11	8.8	9.7	9.4	e5.0	e7.2	e6.4
31	12	---	6.3	7.1	---	9.8	---	8.8	---	e5.4	e7.7	---
TOTAL	252.3	322.7	271.6	342.4	317.4	416.1	373.2	287.9	316.7	300.5	212.0	255.5
MEAN	8.14	10.8	8.76	11.0	11.3	13.4	12.4	9.29	10.6	9.69	6.84	8.52
MAX	25	34	23	33	25	34	29	11	21	21	16	15
MIN	4.8	3.9	4.6	6.3	6.3	5.7	8.0	7.9	7.4	4.5	4.7	6.4
AC-FT	500	640	539	679	630	825	740	571	628	596	421	507

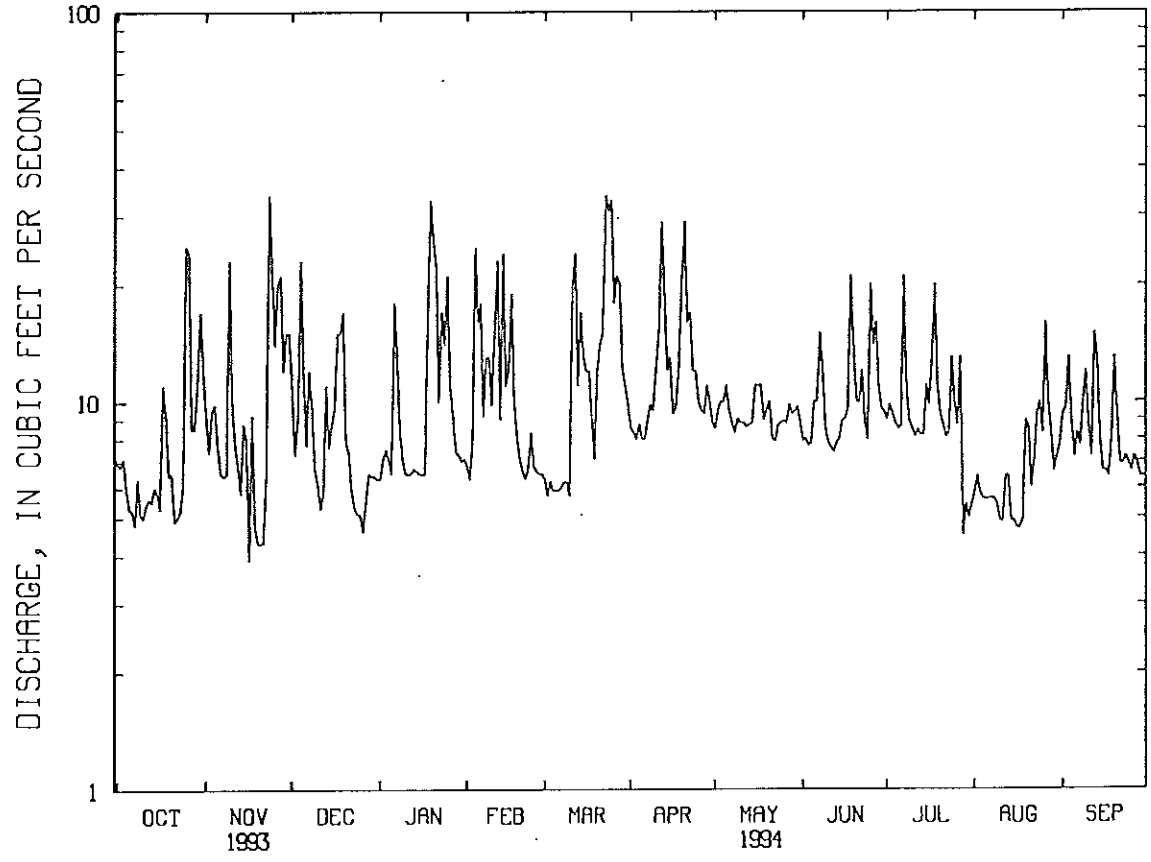
e Estimated

16405300 MOLOKAI TUNNEL AT WEST PORTAL--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1965 - 1994, BY WATER YEAR (WY)

MEAN	6.19	7.55	7.36	7.20	7.23	8.01	8.05	7.14	6.58	6.99	6.29	5.74
MAX	9.10	13.3	13.8	14.4	15.9	15.5	15.6	15.8	11.7	13.2	10.2	9.21
(WY)	1986	1988	1991	1988	1990	1986	1986	1987	1986	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1965 - 1994	
ANNUAL TOTAL	3373.4		3668.3			
ANNUAL MEAN	9.24		10.1		7.06	
HIGHEST ANNUAL MEAN					11.4	1987
LOWEST ANNUAL MEAN					3.46	1974
HIGHEST DAILY MEAN	37	Jul 24	34	Nov 23	39	Apr 8 1986
LOWEST DAILY MEAN	3.2	Aug 27	3.9	Nov 16	1.8	Oct 15 1967
ANNUAL SEVEN-DAY MINIMUM	3.6	Jan 21	5.3	Aug 11	1.9	May 3 1976
ANNUAL RUNOFF (AC-FT)	6690		7280		5110	
10 PERCENT EXCEEDS	16		17		12	
50 PERCENT EXCEEDS	7.8		8.7		5.7	
90 PERCENT EXCEEDS	4.9		5.6		3.0	



16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on right bank 1.8 mi southwest of Haupu Bay, 2.3 mi upstream from mouth, and 5.2 mi southeast of Kalaupapa.

DRAINAGE AREA.--1.99 mi^2.

PERIOD OF RECORD.--May 1956 to October 1961, July 1962 to current year.

REVISED RECORDS.--WSP 1719: 1959. WSP 2137: 1965(P).

GAGE.--Water-stage recorder. Elevation of gage is 900 ft, from topographic map. Prior to July 1, 1962, at site 200 ft upstream at datum 6.14 ft higher.

REMARKS.--Records good. Since Nov. 16, 1960, water diverted upstream at times, either into or from Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--33 years (water years 1961, 1963-94), 6.49 ft^3/s (4,700 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,570 ft^3/s, Jan. 25, 1982, gage height, 6.64 ft, from rating curve extended above 43 ft^3/s on basis of slope-area measurement at gage height 5.25 ft; no flow at times since 1984.

EXTREMES OUTSIDE PERIOD OF RECORD.--Flood of Oct. 31, 1961, reached a stage of 13.62 ft, from floodmarks, former site and datum, discharge, 6,220 ft^3/s, by slope-area measurement.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 590 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 25	1000	898	4.24	Mar. 24	1200	*968	*4.34
Nov. 23	1600	786	4.06				

Minimum discharge, No flow on many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

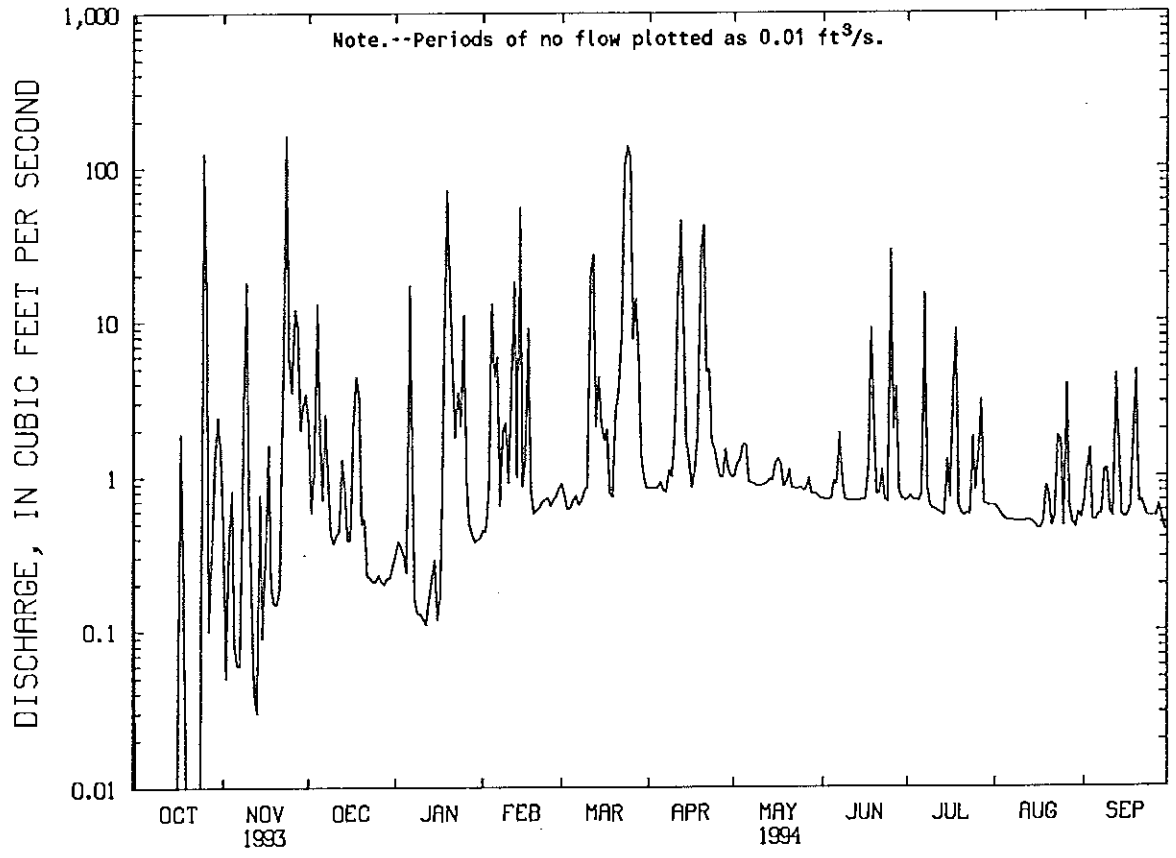
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.43	2.1	.31	.45	.90	.84	1.0	.72	.71	.65	.67
2	.00	.05	.59	.38	.44	.76	.84	1.2	.71	.75	.61	1.1
3	.00	.41	1.1	.35	.77	.62	.84	1.3	.71	.71	.57	1.5
4	.00	.81	13	.31	13	.62	.85	1.6	.72	.71	.54	.52
5	.00	.08	1.9	.24	4.4	.70	.92	1.6	.94	.70	.52	.52
6	.00	.06	.71	17	5.9	.75	.82	.92	.89	.78	.52	.57
7	.00	.06	2.5	1.1	.65	.66	.80	.91	1.9	15	.52	.57
8	.00	2.1	.95	.16	2.0	.70	1.1	.89	.99	.85	.51	1.1
9	.00	18	.42	.13	2.2	.81	1.0	.87	.71	.65	.51	1.1
10	.00	.67	.37	.13	.91	.86	1.9	.87	.70	.62	.51	.59
11	.00	.19	.42	.12	3.9	20	15	.89	.70	.61	.51	.55
12	.00	.04	.44	.11	18	27	45	.90	.70	.59	.52	4.5
13	.00	.03	1.3	.16	.99	2.1	9.3	.96	.70	.58	.52	1.6
14	.00	.77	.83	.22	55	4.4	1.7	.95	.70	.56	.51	.57
15	.00	.09	.39	.29	.87	2.2	1.3	1.2	.71	1.3	.49	.54
16	.00	.29	.39	.12	1.3	1.7	.85	1.3	.71	.73	.46	.56
17	1.9	1.6	2.2	.17	9.1	2.0	1.1	1.2	1.1	3.7	.46	.63
18	.26	.20	4.4	5.2	.82	.78	1.9	.87	9.1	8.9	.51	1.8
19	.01	.15	3.4	71	.58	.74	29	.92	2.4	.65	.87	4.8
20	.00	.15	.49	18	.61	2.6	42	1.1	.78	.58	.77	.68
21	.00	.19	.54	5.3	.63	3.5	4.7	.84	.78	.56	.48	.70
22	.00	4.2	.23	1.8	.69	7.7	4.9	.84	1.1	.58	.55	.61
23	.00	161	.22	3.5	.71	104	1.7	.83	.71	.57	1.8	.55
24	.00	5.7	.21	2.1	.73	138	1.5	.85	.69	1.8	1.7	.55
25	124	3.5	.21	11	.65	115	1.2	.82	29	.82	.48	.55
26	15	12	.23	1.0	.71	7.7	1.0	.83	2.0	1.4	3.9	.55
27	.10	9.3	.21	.50	.75	14	1.0	.97	3.8	3.1	.64	.65
28	.32	2.0	.20	.43	.84	6.0	1.5	.77	.82	.67	.50	.55
29	1.3	2.9	.22	.38	---	1.4	1.1	.78	.72	.66	.47	.45
30	2.4	3.4	.22	.39	---	1.0	1.0	.76	.71	.65	.58	.45
31	1.4	---	.26	.40	---	.84	---	.72	---	.65	.54	---
TOTAL	146.69	230.37	40.65	142.30	127.60	470.04	176.66	30.46	66.92	51.14	22.72	30.08
MEAN	4.73	7.68	1.31	4.59	4.56	15.2	5.89	.98	2.23	1.65	.73	1.00
MAX	124	161	13	71	55	138	45	1.6	29	15	3.9	4.8
MIN	.00	.03	.20	.11	.44	.62	.80	.72	.69	.56	.46	.45
AC-FT	291	457	81	282	253	932	350	60	133	101	45	60

16405500 WAIKOLU STREAM AT ALTITUDE 900 FT, NEAR KALAUPAPA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1961 - 1994, BY WATER YEAR (WY)

MEAN	3.52	9.18	9.73	12.0	9.56	9.42	10.2	5.12	2.59	3.09	2.22	1.57
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	.77	.37	.96	.81	1.31	.98	.68	.000	.23	.050	.059
(WY)	1985	1985	1976	1986	1978	1983	1992	1984	1985	1984	1985	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1961 - 1994	
ANNUAL TOTAL	1025.47		1535.63			
ANNUAL MEAN	2.81		4.21		6.49	
HIGHEST ANNUAL MEAN					11.8	1965
LOWEST ANNUAL MEAN					1.26	1985
HIGHEST DAILY MEAN	161	Nov 23	161	Nov 23	847	Apr 8 1989
LOWEST DAILY MEAN	.00	Jul 7	.00	Oct 1	.00	Sep 12 1984
ANNUAL SEVEN-DAY MINIMUM	.00	Jul 7	.00	Oct 1	.00	Sep 12 1984
ANNUAL RUNOFF (AC-FT)	2030		3050		4700	
10 PERCENT EXCEEDS	3.5		5.2		12	
50 PERCENT EXCEEDS	.26		.74		1.5	
90 PERCENT EXCEEDS	.00		.15		.43	



16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA

LOCATION.--Lat 21°09'45", long 156°55'54", Hydrologic Unit 20050000, on left bank 0.7 mi upstream from mouth and 4.4 mi southeast of Molokai Lighthouse near Kalaupapa.

DRAINAGE AREA.--3.68 mi^2.

PERIOD OF RECORD.--July 1919 to November 1930, August 1931 to July 1932, September 1937 to January 1948, July 1948 to current year. Prior to August 1931, published as "at pipeline crossing, near Kalaupapa."

REVISED RECORDS.--WSP 1155: 1932(M), 1938-44(M), 1946-48(M). WSP 1319: 1923(M), 1930(M), 1932, 1938-40, 1945(M), 1974-81(M), drainage area.

GAGE.--Water-stage recorder. Datum of gage is 252 ft above mean sea level (hand levels by Bureau of Reclamation). Prior to Nov. 19, 1930, at site 500 ft upstream at different datums. Aug. 14, 1931, to July 20, 1932, and Sept. 20, 1937, to Jan. 26, 1948, at present site at datum 1.49 ft higher, and July 30, 1948, to June 30, 1962, at present site at datum 1.00 ft higher.

REMARKS.--Records fair. Diversion upstream for domestic use in Kalaupapa, and since Nov. 16, 1960, water has been diverted upstream to Molokai tunnel.

AVERAGE DISCHARGE (since Molokai tunnel diversion began).--34 years (water years 1961-94), 18.0 ft^3/s (13,070 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 13,210 ft^3/s, Apr. 8, 1989, gage height, 8.50 ft, from rating curve extended above 26 ft^3/s on basis of slope-area measurement at gage height 6.68 ft; minimum, 2.0 ft^3/s, Nov. 1, 2, 1926, June 5, 1926.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,200 ft^3/s (revised) and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 25	1000	1,600	4.92	Mar. 23	1030	1,300	4.66
Nov. 23	1630	1,440	4.78	Mar. 24	1200	*2,220	*5.36

Minimum discharge, 5.9 ft^3/s, Oct. 24, 25.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

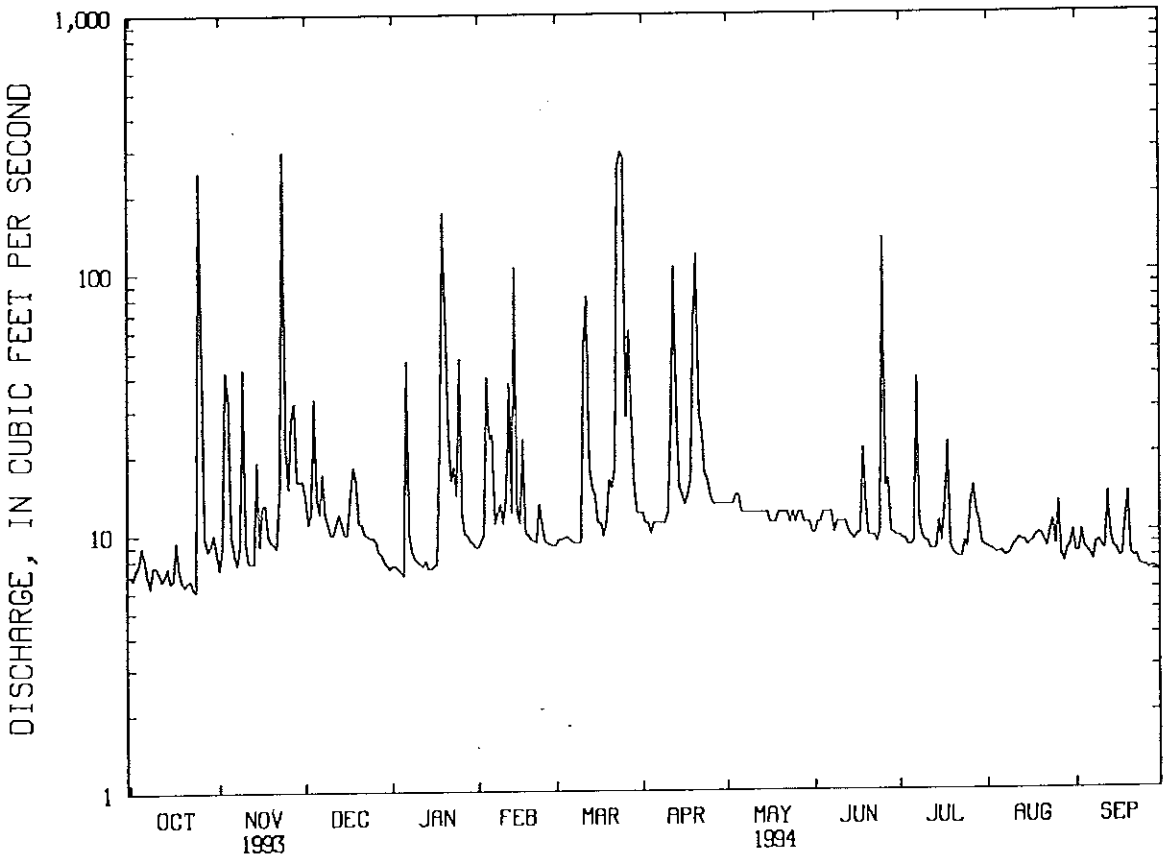
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.0	7.4	14	7.6	8.9	9.0	12	13	10	9.7	8.7	8.3
2	6.8	9.0	11	7.6	9.4	9.5	11	13	11	9.4	8.6	8.3
3	7.4	42	12	7.4	9.9	9.5	11	13	11	9.4	8.5	10
4	7.7	33	33	7.2	40	9.6	10	14	12	8.9	8.3	8.6
5	9.0	9.9	14	7.0	23	9.7	11	14	12	8.9	8.3	8.4
6	8.1	8.5	12	46	24	9.5	11	12	12	9.2	8.4	8.1
7	7.0	7.7	17	10	11	9.3	11	12	12	39	8.1	7.7
8	6.3	9.1	12	8.6	12	9.2	11	12	10	11	8.1	9.0
9	7.6	43	11	8.1	13	9.2	11	12	11	9.7	8.3	9.1
10	7.6	9.4	10	7.9	11	9.3	12	12	11	9.2	8.8	8.7
11	7.2	7.8	10	7.7	14	53	26	12	11	9.2	9.0	8.5
12	6.7	7.8	11	7.6	38	81	105	12	11	8.6	9.4	14
13	7.0	7.8	12	7.9	12	18	31	12	10	8.6	9.2	9.6
14	7.5	19	11	7.4	105	15	15	12	9.7	8.6	9.2	8.6
15	6.6	9.1	10	7.4	12	14	14	12	9.4	11	8.8	8.5
16	6.7	13	10	7.6	11	11	13	11	9.9	9.2	9.0	7.9
17	9.4	13	14	7.7	23	11	14	11	9.9	13	9.2	8.0
18	7.4	9.9	18	24	10	9.8	16	11	21	22	9.6	11
19	6.6	9.4	16	171	9.9	11	65	12	13	8.9	9.8	14
20	6.4	9.2	11	70	9.5	16	118	12	9.7	8.3	9.7	8.1
21	6.6	8.9	11	26	9.4	15	29	12	9.7	8.1	9.2	7.9
22	6.7	15	10	16	9.3	18	25	12	9,7	8.0	8.7	8.0
23	6.2	296	9.9	18	13	255	17	11	9.2	8.0	9.9	7.4
24	6.1	22	9.7	14	11	292	16	12	10	9.2	11	7.3
25	247	15	9.7	47	9.4	281	14	11	134	8.7	8.9	7.3
26	45	28	9.4	12	9.2	28	13	12	15	13	13	7.1
27	9.7	32	8.5	10	9.1	60	13	12	16	15	8.1	7.2
28	8.7	16	8.4	9.9	9.0	28	13	11	10	12	7.6	7.2
29	9.1	16	7.9	9.4	---	15	13	11	9.9	11	8.5	7.1
30	10	16	7.6	9.2	---	12	13	11	9.7	9.0	8.8	7.0
31	8.6	---	7.4	8.9	---	12	---	10	---	8.8	10	---
TOTAL	509.7	749.9	368.5	616.1	486.0	1349.6	694	369	459.8	342.6	280.7	257.9
MEAN	16.4	25.0	11.9	19.9	17.4	43.5	23.1	11.9	15.3	11.1	9.05	8.60
MAX	247	296	33	171	105	292	118	14	134	39	13	14
MIN	6.1	7.4	7.4	7.0	8.9	9.0	10	10	9.2	8.0	7.6	7.0
AC-FT	1010	1490	731	1220	964	2680	1380	732	912	680	557	512

16408000 WAIKOLU STREAM BELOW PIPELINE CROSSING, NEAR KALAUPAPA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1919 - 1994, BY WATER YEAR (WY)

MEAN	12.7	20.4	23.7	23.9	21.4	24.9	26.3	17.7	12.5	12.4	12.1	9.80
MAX	35.9	58.5	65.2	92.4	72.8	116	235	105	26.9	34.9	40.4	28.8
(WY)	1962	1962	1955	1988	1955	1942	1989	1987	1938	1958	1958	1931
MIN	3.20	5.07	2.93	5.91	5.59	7.69	7.13	4.77	3.15	3.43	2.91	3.60
(WY)	1985	1976	1976	1977	1985	1983	1978	1984	1985	1984	1985	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1919 - 1994	
ANNUAL TOTAL	5266.6		6483.8			
ANNUAL MEAN	14.4		17.8		18.0	
HIGHEST ANNUAL MEAN					37.9	1989
LOWEST ANNUAL MEAN					6.12	1985
HIGHEST DAILY MEAN	296	Nov 23	296	Nov 23	3810	Apr 8 1989
LOWEST DAILY MEAN	6.1	Oct 24	6.1	Oct 24	2.0	Oct 6 1985
ANNUAL SEVEN-DAY MINIMUM	6.6	Oct 18	6.6	Oct 18	2.2	Dec 27 1984
ANNUAL RUNOFF (AC-FT)	10450		12860		13070	
10 PERCENT EXCEEDS	17		23		28	
50 PERCENT EXCEEDS	9.4		10		11	
90 PERCENT EXCEEDS	6.9		7.6		6.1	



16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI

LOCATION.--Lat 21°06'21", long 157°00'34", Hydrologic Unit 20050000, on left bank 0.6 mi upstream from Molokai Ranch pipeline crossing, 1.3 mi northeast of Kaunakakai Post Office, and 1.7 mi upstream from mouth.

DRAINAGE AREA.--6.57 mi^2.

PERIOD OF RECORD.--December 1949 to current year. Prior to July 1958, published as Kaunakakai Stream at Kaunakakai.

REVISED RECORDS.--WSP 1289: 1950-51. WSP 1569: Drainage area.

GAGE.--Water-stage recorder. Elevation of gage is 240 ft, from topographic map.

REMARKS.--Records good. Flow has been augmented by occasional spillage from Molokai tunnel since May 1965.

AVERAGE DISCHARGE.--44 years (water years 1951-94), 1.88 ft^3/s (1,370 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 3,060 ft^3/s, Oct. 31, 1961, gage height, 9.30 ft, from rating curve extended above 620 ft^3/s on basis of slope-area measurements at gage heights 7.22 ft and 9.30 ft; no flow most of the time each year.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 280 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 25	1200	480	5.20	Mar. 24	1530	468	5.17
Nov. 23	1800	*576	*5.44	Mar. 25	0130	326	4.77
Mar. 23	1330	326	4.77				

Minimum discharge, no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

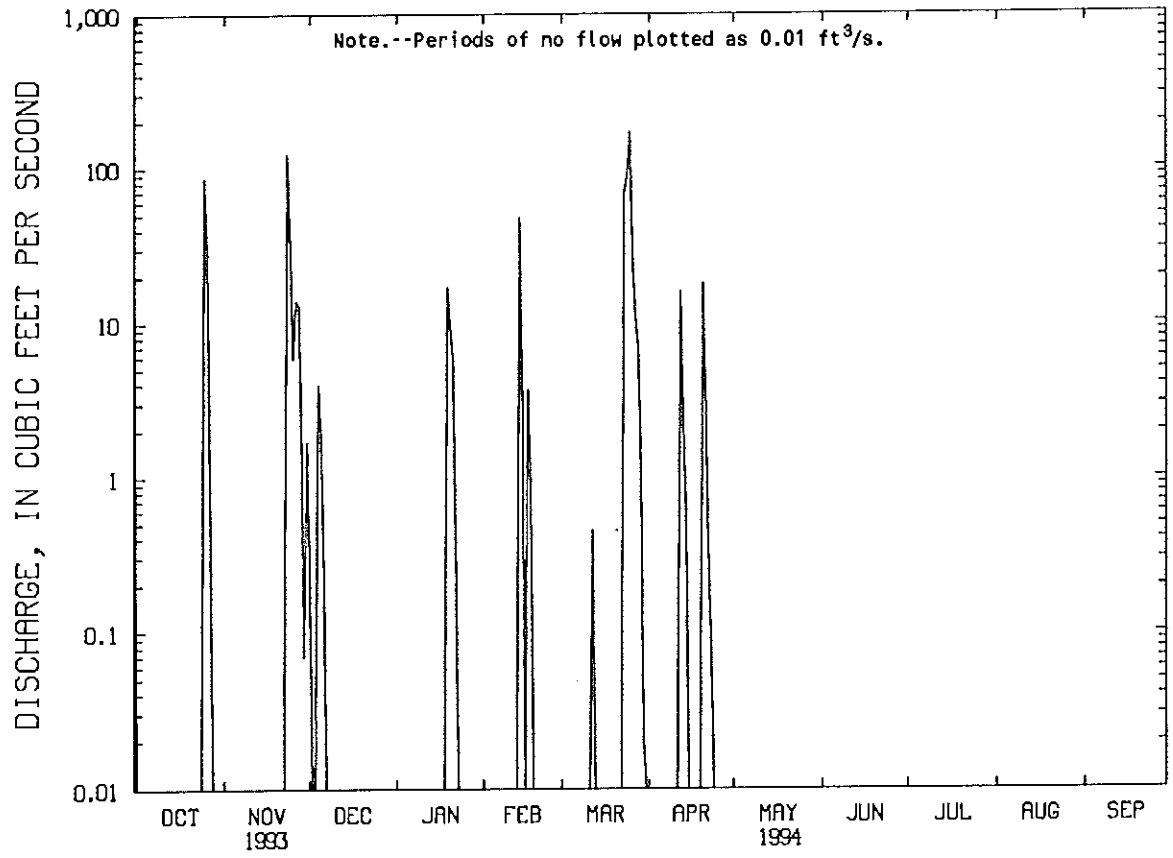
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.25	.00	.00	.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	4.0	.00	.00	.00	.00	.00	.00	.00	.00	.00
5	.00	.00	1.8	.00	.00	.00	.00	.00	.00	.00	.00	.00
6	.00	.00	.26	.00	.00	.00	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.45	16	.00	.00	.00	.00	.00
13	.00	.00	.00	.00	.00	.01	2.1	.00	.00	.00	.00	.00
14	.00	.00	.00	.00	48	.00	.58	.00	.00	.00	.00	.00
15	.00	.00	.00	.00	3.4	.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	3.7	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.84	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	17	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	9.6	.00	.00	18	.00	.00	.00	.00	.00
21	.00	.00	.00	5.5	.00	.00	2.8	.00	.00	.00	.00	.00
22	.00	.00	.00	.37	.00	.00	.33	.00	.00	.00	.00	.00
23	.00	124	.00	.00	.00	70	.08	.00	.00	.00	.00	.00
24	.00	37	.00	.00	.00	88	.00	.00	.00	.00	.00	.00
25	87	5.9	.00	.00	.00	171	.00	.00	.00	.00	.00	.00
26	30	14	.00	.00	.00	26	.00	.00	.00	.00	.00	.00
27	.74	13	.00	.00	.00	11	.00	.00	.00	.00	.00	.00
28	.00	2.0	.00	.00	.00	6.9	.00	.00	.00	.00	.00	.00
29	.00	.07	.00	.00	---	1.2	.00	.00	.00	.00	.00	.00
30	.00	1.7	.00	.00	---	.02	.00	.00	.00	.00	.00	.00
31	.00	---	.00	.00	---	.00	---	.00	---	.00	.00	---
TOTAL	117.74	197.67	6.31	32.47	55.94	374.58	39.89	0.00	0.00	0.00	0.00	0.00
MEAN	3.80	6.59	.20	1.05	2.00	12.1	1.33	.000	.000	.000	.000	.000
MAX	87	124	4.0	17	48	171	18	.00	.00	.00	.00	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	234	392	13	64	111	743	79	.00	.00	.00	.00	.00

16414000 KAUNAKAKAI GULCH AT KAUNAKAKAI--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1950 - 1994, BY WATER YEAR (WY)

MEAN	.60	3.41	3.95	5.31	2.62	3.15	2.50	.68	.032	.073	.31	.059
MAX	7.09	25.4	16.5	29.7	15.5	26.8	46.2	17.5	.74	1.39	6.56	1.02
(WY)	1962	1951	1956	1982	1979	1951	1989	1987	1966	1966	1950	1966
MIN	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000
(WY)	1951	1952	1953	1953	1953	1952	1952	1950	1950	1950	1951	1950

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1950 - 1994	
ANNUAL TOTAL	478.48		824.60			
ANNUAL MEAN	1.31		2.26		1.88	
HIGHEST ANNUAL MEAN					6.01	1989
LOWEST ANNUAL MEAN					.002	1953
HIGHEST DAILY MEAN	124	Nov 23	171	Mar 25	643	Apr 8 1989
LOWEST DAILY MEAN	.00	Jan 4	.00	Oct 1	.00	Jan 1 1950
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 10	.00	Oct 1	.00	Jan 1 1950
ANNUAL RUNOFF (AC-FT)	949		1640		1370	
10 PERCENT EXCEEDS	.00		.15		.37	
50 PERCENT EXCEEDS	.00		.00		.00	
90 PERCENT EXCEEDS	.00		.00		.00	



16419500 PAPIO GULCH AT HALAWA

LOCATION.--Lat 21°08'55", long 156°44'16", Hydrologic Unit 20050000, on left bank 200 ft downstream from wooden bridge on Highway 45 and 0.8 mi south of Halawa.

DRAINAGE AREA.--0.94 mi^2.

PERIOD OF RECORD.--July 1963 to current year.

GAGE.--Water-stage recorder. Elevation of gage is 640 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges which are poor. Diversion upstream for domestic use at Puu O Hoku Ranch.

AVERAGE DISCHARGE.--31 years, 0.89 ft^3/s (648 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,720 ft^3/s, Apr. 13, 1965, gage height, 11.25 ft, from rating curve extended above 37 ft^3/s on basis of slope-area measurements at gage heights 4.60 ft, 7.15 ft, and 11.25 ft; no flow at times.

EXTREMES FOR CURRENT YEAR.--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)
Mar. 24	1200	*299	*4.54	No other peak greater than base discharge.			

Minimum discharge, 0.14 ft^3/s, Sep. 16, 17.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.35	.35	.35	.20	.32	.50	e.95	.60	.35	.38	.23	.44
2	.32	.90	.26	.23	.32	.46	e.85	.60	.38	.46	.23	.34
3	.32	3.1	.20	.22	.32	.46	e.80	.60	.38	.42	.20	.29
4	1.3	.65	.50	.18	1.5	.42	e.80	.60	.42	.35	.20	.26
5	.55	.42	.32	.16	.50	.38	.75	.60	.42	.38	.20	.20
6	.32	.32	.26	.20	.73	.38	.70	.55	.50	.35	.20	.23
7	.29	.29	.79	.29	.37	.38	.70	.55	.46	1.5	.20	.29
8	.26	.29	.42	.23	.44	.38	.65	.55	.42	.60	.20	.26
9	.26	.68	.23	.18	3.2	.35	1.2	.55	.38	.38	.20	.38
10	.26	.29	.20	.18	.90	.35	2.9	.50	.38	.38	.18	.32
11	.26	.26	.20	.16	1.0	1.1	1.1	.50	.38	.35	.36	.20
12	.23	.23	.18	.16	2.0	4.0	1.3	.50	.38	.35	1.3	.34
13	.23	.23	.20	.86	1.2	.60	.95	.80	.38	.32	.46	.35
14	.23	.23	.20	.29	1.6	.42	.85	1.2	.46	.32	.29	.29
15	.23	.22	.20	.18	2.0	.38	.85	.60	.54	.66	.23	.20
16	.23	.20	.27	.16	2.7	.35	.70	.55	.46	.38	.26	.16
17	.26	.83	1.9	.19	8.0	.35	.84	.50	.38	.55	.20	.16
18	.29	.32	5.0	3.3	4.8	.35	.85	.46	1.0	.90	.20	1.3
19	.23	.20	1.4	1.6	1.6	.38	.65	.46	.92	.38	.29	1.2
20	.23	.20	.60	1.1	1.2	.42	2.3	.46	.60	.29	1.1	.32
21	.20	.23	.38	.61	1.0	.38	1.1	.46	.50	.26	.38	.20
22	.23	.23	.38	.40	.85	.35	1.2	.46	.55	.26	.26	.23
23	.36	1.1	.32	.93	.80	6.8	.80	.50	.42	.35	.23	.81
24	.35	.52	.32	7.2	1.3	33	.70	.65	.38	.56	.23	.32
25	1.9	.26	.32	12	.70	9.1	.75	.46	1.8	.46	.20	.23
26	1.7	.26	.38	1.5	.60	2.2	.65	.42	.68	.32	.90	.23
27	.42	.23	.29	.80	.55	1.9	.60	.42	.42	.38	.38	.20
28	.32	.20	.26	.50	.55	3.3	1.6	.42	.38	.32	.23	.18
29	.29	.20	.23	.38	---	2.0	.80	.42	.35	.32	.20	.16
30	.88	.32	.23	.38	---	e1.3	.60	.42	.35	.29	.18	.18
31	.46	---	.23	.35	---	e1.0	---	.38	---	.26	.48	---
TOTAL	13.76	13.76	17.02	35.12	41.05	73.74	29.49	16.74	15.42	13.48	10.40	10.27
MEAN	.44	.46	.55	1.13	1.47	2.38	.98	.54	.51	.43	.34	.34
MAX	1.9	3.1	5.0	12	8.0	33	2.9	1.2	1.8	1.5	1.3	1.3
MIN	.20	.20	.18	.16	.32	.35	.60	.38	.35	.26	.18	.16
AC-FT	27	27	34	70	81	146	58	33	31	27	21	20

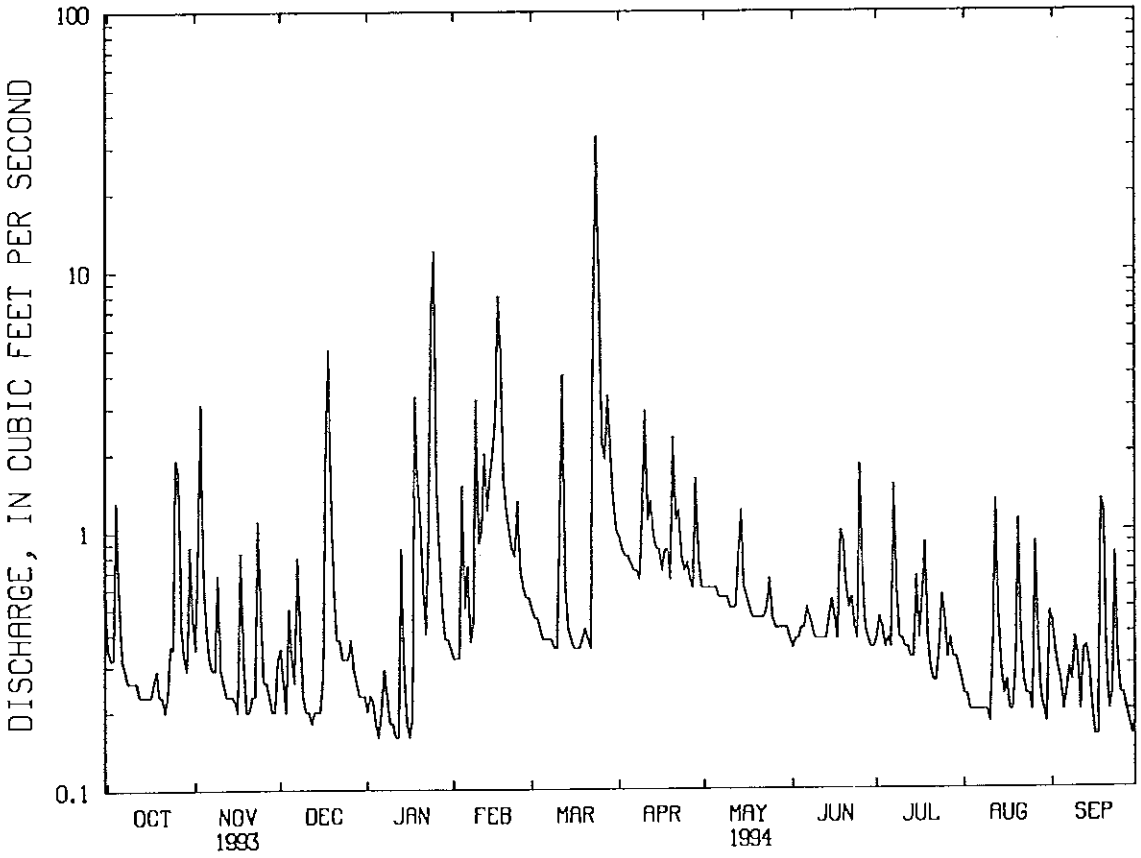
e Estimated

16419500 PAPIO GULCH AT HALAWA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1963 - 1994, BY WATER YEAR (WY)

MEAN	.54	1.20	1.17	1.34	1.30	1.51	1.55	.73	.33	.46	.31	.31
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1963 - 1994	
ANNUAL TOTAL	257.15		290.25			
ANNUAL MEAN	.70		.80		.89	
HIGHEST ANNUAL MEAN					2.32	1989
LOWEST ANNUAL MEAN					.063	1973
HIGHEST DAILY MEAN	13	Mar 8	33	Mar 24	164	Apr 13 1965
LOWEST DAILY MEAN	.18	Jul 9	.16	Jan 5	.00	Jul 5 1963
ANNUAL SEVEN-DAY MINIMUM	.20	Dec 9	.20	Aug 4	.00	Aug 3 1963
ANNUAL RUNOFF (AC-FT)	510		576		648	
10 PERCENT EXCEEDS	1.2		1.3		1.6	
50 PERCENT EXCEEDS	.38		.38		.24	
90 PERCENT EXCEEOS	.23		.20		.00	



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16501200 OHEO GULCH AT DAM NEAR KIPAHULU

LOCATION.--Lat 20°40'17", long 156°03'17", Hydrologic Unit 20020000, on right bank 31 ft upstream from dam, 1,000 ft downstream from the confluence of Palikea and Pipiwai Streams, 0.8 mi upstream from mouth, and 1.0 mi north from Kipahulu Church.

DRAINAGE AREA.--8.06 mi^2.

PERIOD OF RECORD.--July 1, 1988 to current year. Forty-eight years of records are available for the right branch drainage, 1.3 mi upstream (Palikea Stream, 16501000) for periods prior to Sep. 30, 1983.

REVISED RECORDS.--WDR HI-94-1: 1989-93 (P).

GAGE.--Water-stage recorder. Datum of gage is 420 ft above mean sea level (from topographic map).

AVERAGE DISCHARGE.--6 years (water years 1989-94), 65.4 ft^3/s (47,390 acre-ft/yr).

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

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 14,700 ft^3/s, Sep. 18, 1994 from rating curve extended on the basis of flow over dam computation; minimum, no flow, Feb. 24-29, Mar. 1-12, 29, 30, Apr. 14-17, 26-28, May 11-13, 1992.

EXTREMES FOR CURRENT PERIOD.--Peak discharges greater than base discharge of 2,680 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Dec. 17	0100	11,200	11.16	Aug. 31	unknown	9,770	10.60
Feb. 9	0900	6,270	8.89	Sep. 18	1900	*14,700	*12.40
Mar. 24	1630	5,960	8.72				

Minimum discharge, 0.32 ft^3/s, Jan. 15.

REVISIONS.--The peak discharges greater than base discharge of 2,680 ft^3/s and annual maximum (*) reported for water years 1989 to 1993 have been revised as shown in the following table. They supersede figures published in WDR HI-90-1, HI-91-1, HI-92-1, and HI-93-1.

Water year	Date	Time	Discharge (ft^3/s)	Gage height (ft)
1989	Dec. 6, 1988	1400	*5,100	*8.20
	Jan. 11, 1989	2230	2,820	6.52
	Apr. 2, 1989	0400	2,910	6.60
	Apr. 7, 1989	1730	2,730	6.44
1990	Oct. 1, 1989	1900	3,380	6.99
	Oct. 24, 1989	0030	*3,860	*7.35
	Jan. 19, 1990	0530	3,350	6.96
1991	Oct. 19, 1990	0630	3,200	6.84
	Nov. 19, 1990	0530	4,040	7.48
	Nov. 23, 1990	1400	2,730	6.44
	Jan. 27, 1991	1430	*4,060	*7.50
	Mar. 12, 1991	1830	2,790	6.49
	Mar. 20, 1991	0230	3,400	7.00
1992	Dec. 2, 1991	0500	*3,980	*7.44
1993	Dec. 31, 1992	0500	*4,220	*7.61

16508000 HANAWI STREAM NEAR NAHIKU

LOCATION.--Lat 20°48'37", long 156°07'00", Hydrologic Unit 20020000, on left bank 200 ft upstream from Koolau ditch intake and trail, 1.9 mi southwest of Nahiku, and 4.5 mi southeast of Keanae.

DRAINAGE AREA.--3.49 mi^2.

PERIOD OF RECORD.--January 1914 to January 1916, November 1921 to current year. Monthly discharge only April to June 1915, published in WSP 1319.

REVISED RECORDS.--WSP 1045: 1922-43(M). WSP 1569: Drainage area. WSP 1719: 1915(M), 1922, 1924-25, 1927, 1930-35, 1937, 1939-40, 1942-43.

GAGE.--Water-stage recorder. Datum of gage is 1,318 ft above mean sea level (by vertical angles). Prior to Nov. 1, 1921, at site 50 ft downstream at datum 0.12 ft lower.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--72 years (water years 1923-94), 24.1 ft^3/s (17,490 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, about 5,570 ft^3/s, Jan. 18, 1916, gage height, 11.6 ft, present site and datum, from rating curve extended above 814 ft^3/s by physical model of station site; minimum, 0.90 ft^3/s, Oct. 28 to Nov. 1, 1984.

EXTREMES FOR CURRENT YEAR.--Peak discharges greater than base discharge of 1,700 ft^3/s and maximum (*):

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 23	1700	1,980	6.97	Mar. 24	1600	3,800	9.86
Dec. 17	0130	1,980	6.95	Aug. 31	0930	1,910	6.82
Feb. 9	0830	2,240	7.46	Sep. 19	0530	*3,830	*9.90

Minimum discharge, 2.5 ft^3/s, Oct. 9, 10.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

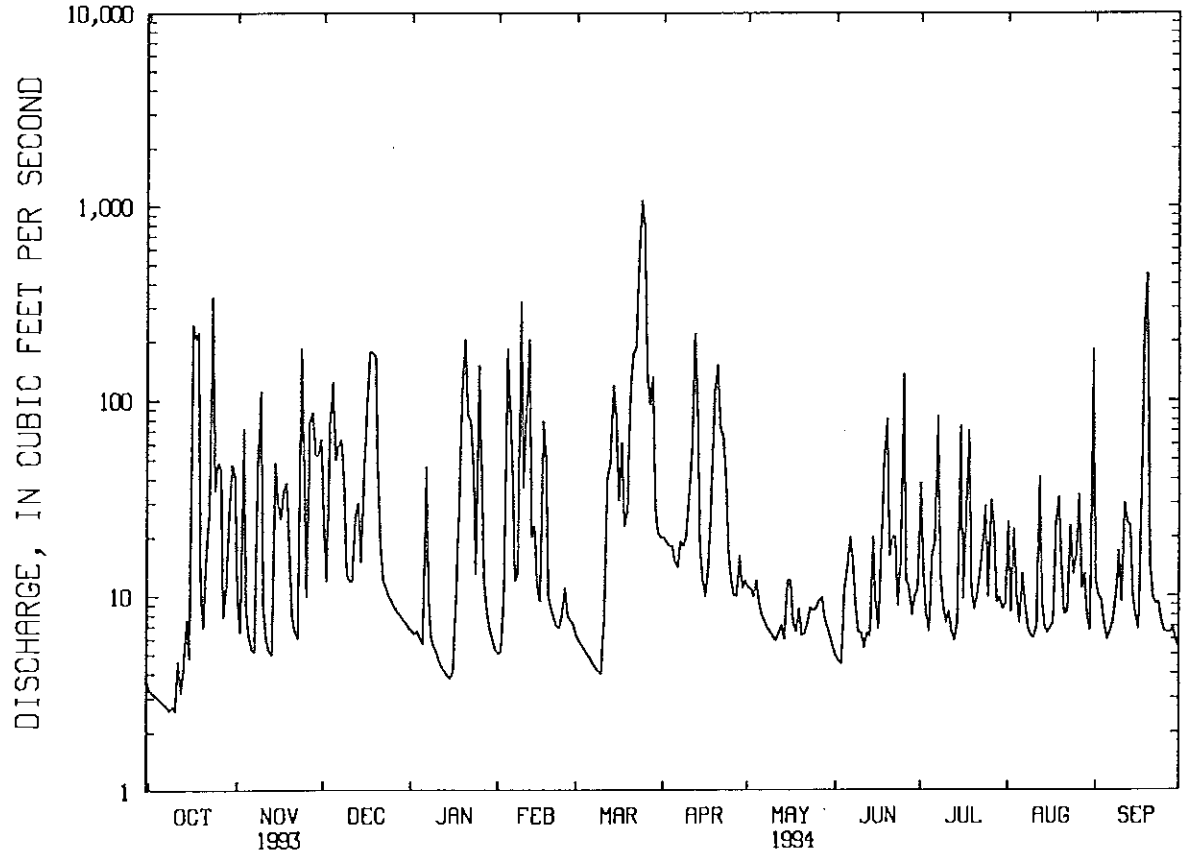
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	9.2	23	6.7	5.1	6.3	20	11	4.9	38	24	12
2	3.2	6.5	12	6.4	5.2	5.9	19	11	4.6	13	8.3	10
3	3.1	72	78	6.6	9.9	5.6	18	9.9	4.5	7.9	22	9.5
4	3.0	8.5	124	6.1	183	5.3	18	12	11	6.6	9.9	7.3
5	2.9	6.2	50	5.7	94	5.0	15	9.3	14	16	7.3	6.0
6	2.8	5.3	59	46	42	4.8	14	8.0	20	19	13	6.5
7	2.7	5.2	63	10	12	4.5	19	7.4	15	83	9.1	7.4
8	2.6	49	37	6.1	13	4.3	18	6.9	8.8	13	6.9	10
9	2.7	111	13	5.5	320	4.1	20	6.6	6.5	8.9	6.3	17
10	2.6	8.9	12	5.1	36	4.0	32	6.2	6.5	7.3	6.1	9.3
11	4.6	6.1	12	4.6	83	7.7	54	5.9	5.4	8.3	7.0	30
12	3.2	5.2	26	4.3	203	40	219	6.4	6.5	6.6	41	24
13	4.2	5.0	30	4.1	20	48	91	7.1	6.2	5.9	9.3	23
14	7.6	48	15	3.9	23	118	18	6.0	20	7.3	6.9	10
15	4.8	30	42	3.8	11	84	12	12	9.0	74	6.5	7.8
16	244	25	94	4.1	9.4	31	10	12	6.8	9.7	6.9	6.8
17	205	35	177	10	78	61	14	7.3	18	26	7.3	31
18	222	38	175	31	51	23	35	6.6	53	70	24	243
19	11	17	167	122	10	27	108	8.6	80	11	32	445
20	6.9	7.8	39	204	8.6	114	151	6.3	16	8.5	14	15
21	16	6.5	18	84	7.7	172	72	6.4	20	10	8.1	9.9
22	27	6.1	12	79	7.0	185	66	7.3	20	13	8.3	9.1
23	339	184	11	48	6.9	557	41	8.7	8.9	18	23	9.3
24	35	50	10	13	8.1	1060	17	8.4	15	29	13	7.4
25	48	10	9.4	150	11	780	12	8.7	136	9.9	16	6.6
26	45	79	8.8	42	7.9	136	10	9.5	12	31	33	6.5
27	7.8	86	8.3	12	7.5	95	10	9.8	11	23	11	6.5
28	11	53	8.0	8.5	7.2	131	16	7.6	8.0	9.3	13	6.9
29	27	53	7.6	6.8	---	29	11	6.9	10	9.8	7.6	5.8
30	47	63	7.3	6.0	---	21	12	6.1	11	8.6	6.7	5.4
31	41	---	6.9	5.3	---	20	---	5.4	---	9.1	181	---
TOTAL	1386.0	1089.5	1355.3	950.6	1280.5	3789.5	1172	251.3	568.6	610.7	588.5	1004.0
MEAN	44.7	36.3	43.7	30.7	45.7	122	39.1	8.11	19.0	19.7	19.0	33.5
MAX	339	184	177	204	320	1060	219	12	136	83	181	445
MIN	2.6	5.0	6.9	3.8	5.1	4.0	10	5.4	4.5	5.9	6.1	5.4
AC-FT	2750	2160	2690	1890	2540	7520	2320	498	1130	1210	1170	1990

16508000 HANAWI STREAM NEAR NAHIKU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1994, BY WATER YEAR (WY)

MEAN	14.9	29.4	32.6	31.0	31.2	42.0	37.0	20.6	10.8	15.8	17.2	11.9
MAX	101	110	129	123	182	235	161	68.2	33.5	53.1	66.2	52.3
(WY)	1942	1991	1947	1979	1969	1980	1989	1987	1987	1914	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1914 - 1994		
ANNUAL TOTAL	9113.5		14046.5				
ANNUAL MEAN	25.0		38.5		24.1		
HIGHEST ANNUAL MEAN					52.6		1969
LOWEST ANNUAL MEAN					7.59		1926
HIGHEST DAILY MEAN	379	Jul 24	1060	Mar 24	1610	Jan 25	1948
LOWEST DAILY MEAN	2.2	Feb 28	2.6	Oct 8	.90	Oct 31	1984
ANNUAL SEVEN-DAY MINIMUM	2.4	Mar 23	2.8	Oct 4	.96	Oct 25	1984
ANNUAL RUNOFF (AC-FT)	18080		27860		17490		
10 PERCENT EXCEEDS	57		88		52		
50 PERCENT EXCEEDS	7.1		11		7.3		
90 PERCENT EXCEEDS	2.7		5.3		2.8		



16509000 HANAWI STREAM BELOW GOVERNMENT ROAD, NEAR NAHIKU

LOCATION.--Lat 20°49'15", long 156°06'25", Hydrologic Unit 20020000, on right bank about 0.8 mi downstream from Hanawi stream highway bridge, 0.7 mi southwest of Nahiku and 6.4 mi southeast of Keanae school.

DRAINAGE AREA.--1.6 mi^2.

PERIOD OF RECORD.--July 1932 to July 1947, Mar. 1992 to current year. Records at same site collected by East Maui Irrigation Co. Jan. 1927 to June 1932.

GAGE.--Water-stage recorder and concrete control. Datum of gage is 500 ft above mean sea level (by barometer).

REMARKS.--Records fair. Entire flow of stream above station up to 39 ft^3/s is diverted by East Maui Irrigation Co. ditch at altitude 1,300 ft for irrigation in central Maui. Maui Land and Pineapple Co. pumps from the stream at the highway bridge.

AVERAGE DISCHARGE.--17 years (1932-47, 1994), 40.8 ft^3/s (29,550 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--1932-47: Maximum discharge 11,100 ft^3/s, Mar. 21, 1937, gage height 9.54 ft, from rating curve extended above 43 ft^3/s; minimum, 12.7 ft^3/s, Feb. 25, 26, 1936. Flood that destroyed shelter Apr. 6 or 7, 1938, probably reached a higher stage than 9.54 ft, the maximum given.

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)
Oct. 23	1800	1,840	7.46	Mar. 24	1230	*4,730	*10.21
Feb. 9	0730	2,080	7.86	Sep. 19	0500	4,230	9.80

Minimum discharge, 15 ft^3/s, Mar. 4-11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17	22	26	17	17	16	e19	e18	17	29	23	21
2	17	20	21	16	17	16	e19	e18	17	21	20	21
3	17	63	49	16	17	16	e18	e18	17	20	24	21
4	17	20	87	17	135	15	e18	e18	17	20	20	21
5	17	19	35	16	66	15	e18	18	18	21	19	20
6	17	18	36	37	32	15	e18	18	19	21	20	20
7	17	18	41	18	19	15	e19	18	20	73	19	19
8	16	47	25	17	20	15	e18	18	19	25	19	19
9	16	77	19	17	235	15	e19	17	19	23	19	23
10	16	19	19	17	33	15	e35	17	18	22	18	21
11	17	18	18	17	63	16	e70	17	18	21	18	23
12	16	18	19	17	145	27	149	17	18	19	33	22
13	17	18	21	16	22	28	63	18	18	19	21	23
14	18	42	19	16	22	69	e21	17	20	19	20	21
15	17	26	25	16	18	51	e20	17	19	58	19	21
16	177	29	79	17	17	21	e19	18	19	20	19	20
17	174	24	116	18	77	34	e20	18	19	23	19	34
18	172	24	128	22	32	18	e35	18	31	63	22	179
19	23	20	136	88	18	21	69	18	49	27	25	e350
20	20	18	26	185	17	77	106	18	21	20	21	e40
21	29	18	19	62	16	118	e70	18	21	20	20	e20
22	37	18	18	64	16	132	e60	18	22	20	19	e19
23	264	136	18	41	16	377	e40	18	19	22	24	e19
24	41	39	18	22	17	937	e23	18	23	31	21	e19
25	40	20	18	156	17	550	e20	18	109	23	21	e19
26	36	61	18	41	16	144	e19	18	22	30	24	e18
27	20	42	17	22	16	118	e18	18	21	24	21	e18
28	20	31	17	20	16	138	e20	18	20	21	20	e17
29	23	34	17	18	---	55	e19	18	19	21	19	e17
30	32	41	17	18	---	e25	e18	18	19	20	20	e16
31	34	---	17	18	---	e20	---	18	---	20	107	---
TOTAL	1394	1000	1139	1082	1152	3129	1080	552	708	816	734	1121
MEAN	45.0	33.3	36.7	34.9	41.1	101	36.0	17.8	23.6	26.3	23.7	37.4
MAX	264	136	136	185	235	937	149	18	109	73	107	350
MIN	16	18	17	16	16	15	18	17	17	19	18	16
AC-FT	2760	1980	2260	2150	2280	6210	2140	1090	1400	1620	1460	2220

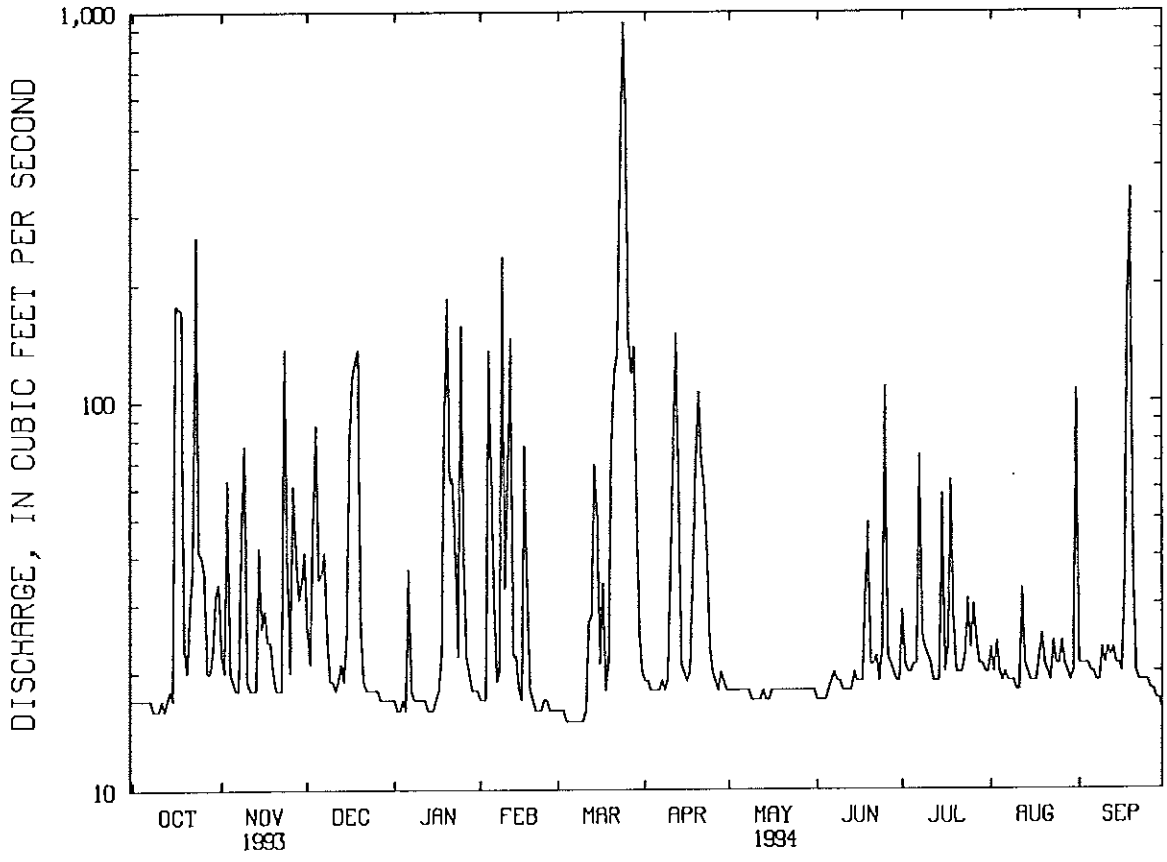
e Estimated

16509000 HANAWI STREAM BELOW GOVERNMENT ROAD, NEAR NAHIKU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1932 - 1994, BY WATER YEAR (WY)

MEAN	29.3	32.9	57.8	47.6	44.2	66.7	50.8	39.5	24.8	29.2	33.5	27.6
MAX	115	52.8	241	132	138	244	255	150	65.7	56.7	113	48.5
(WY)	1942	1940	1937	1937	1937	1942	1938	1938	1941	1937	1940	1940
MIN	17.9	18.0	15.7	17.1	13.8	17.3	17.6	16.5	16.4	16.5	18.6	17.4
(WY)	1936	1944	1936	1945	1936	1934	1992	1945	1940	1945	1944	1945

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1932 - 1994	
ANNUAL TOTAL	10535		13907			
ANNUAL MEAN	28.9		38.1		40.8	
HIGHEST ANNUAL MEAN					85.0	1937
LOWEST ANNUAL MEAN					21.3	1944
HIGHEST DAILY MEAN	264	Oct 23	937	Mar 24	2320	Apr 7 1938
LOWEST DAILY MEAN	16	Mar 23	15	Mar 4	13	Feb 22 1936
ANNUAL SEVEN-DAY MINIMUM	16	Mar 23	15	Mar 4	13	Feb 22 1936
ANNUAL RUNOFF (AC-FT)	20900		27580		29550	
10 PERCENT EXCEEDS	42		69		50	
50 PERCENT EXCEEDS	19		20		20	
90 PERCENT EXCEEDS	17		17		17	



16518000 WEST WAILUAIKI STREAM NEAR KEANAE

LOCATION.--Lat 20°49'16", long 156°08'37", Hydrologic Unit 20020000, on left bank 500 ft upstream from Koolau ditch crossing and trail bridge and 2.8 mi south of Keanae Post Office.

DRAINAGE AREA.--3.66 mi^2.

PERIOD OF RECORD.--January 1914 to December 1915, May 1916 to October 1917, November 1921 to current year. Monthly discharge only for some periods, published in WSP 1319.

REVISED RECORDS.--WSP 1569. Drainage area. WSP 2137: 1915-16(M), 1923-25(M), 1929-31(M), 1934-35(M), 1937-39(M), 1941-43(M), 1946-47(M), 1948(P), 1949(M), 1952-53(M), 1955-56(M), 1959-60(M), 1960(P), 1961(M), 1963(M).

GAGE.--Water-stage recorder. Datum of gage is 1,343.1 ft above mean sea level (by vertical angles). Prior to Oct. 3, 1974, at present site at datum 0.50 ft higher.

REMARKS.--Records good. No diversion upstream. Water is diverted by Koolau ditch, 500 ft downstream, for domestic supply and irrigation of sugarcane in central Maui.

AVERAGE DISCHARGE.--74 years (water years 1915, 1917, 1923-94), 35.6 ft^3/s (25,780 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 9,900 ft^3/s, Jan. 14, 1923, gage height, 13.5 ft, from floodmarks, from rating curve extended above 660 ft^3/s by logarithmic plotting; minimum, 0.5 ft^3/s, July 26, 1922.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)	Date	Time	Discharge (ft^3/s)	Gage height (ft)
Oct. 16	1530	2,330	8.25	Mar. 24	1500	*6,100	*11.68
Oct. 23	1800	3,070	9.11	Sep. 19	0530	5,530	11.27
Mar. 23	1100	2,110	7.98				

Minimum discharge, 2.5 ft^3/s, Oct. 8.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

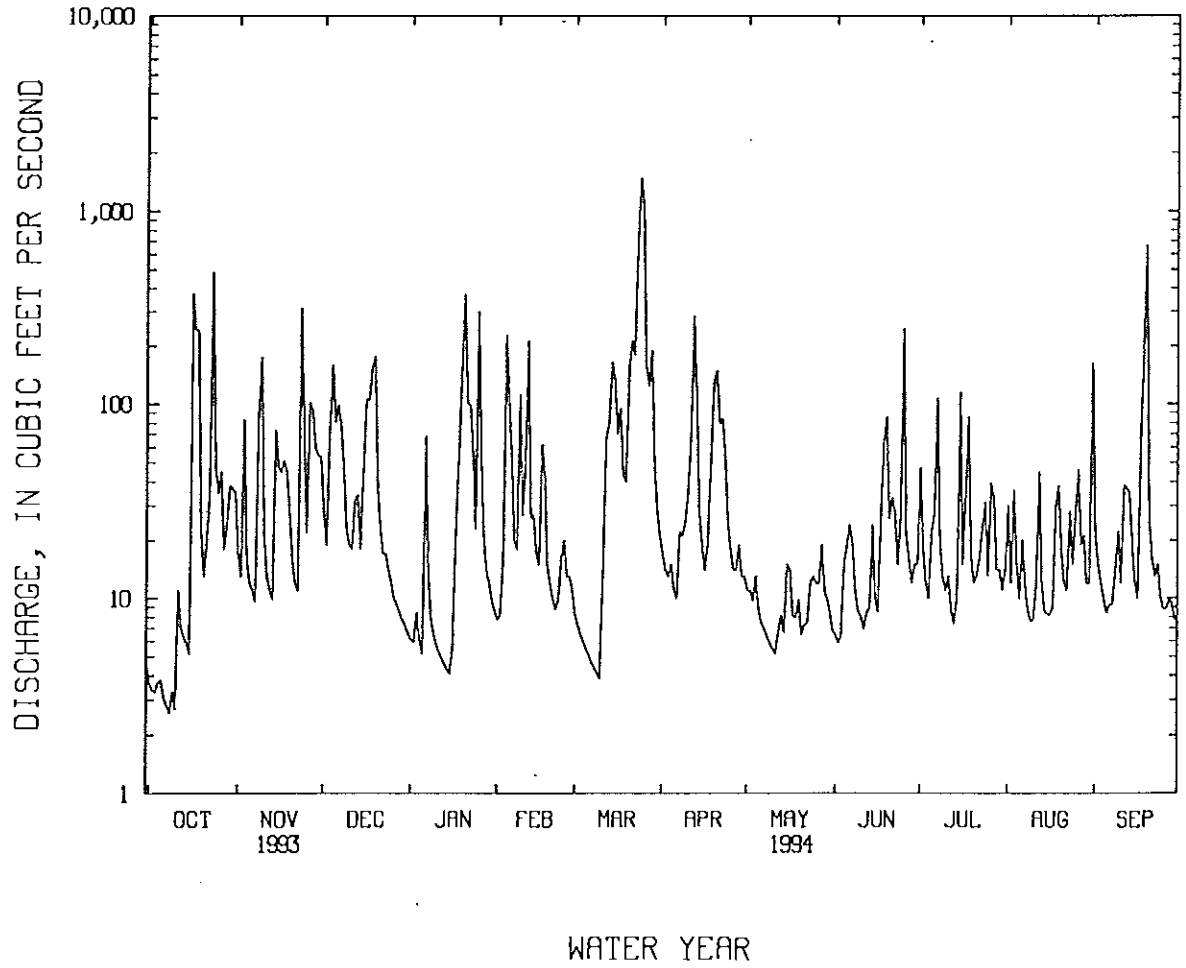
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.7	17	28	6.1	7.8	8.3	17	11	6.5	47	30	22
2	3.4	13	19	6.0	8.1	7.3	14	11	5.9	18	12	15
3	3.3	83	74	8.4	16	6.5	13	9.7	6.4	12	36	12
4	3.7	16	159	6.1	226	6.0	15	13	15	10	15	9.9
5	3.8	12	81	5.2	104	5.5	11	8.7	19	22	10	8.4
6	3.1	11	98	68	51	5.1	10	7.5	24	27	20	9.2
7	2.8	9.6	77	14	20	4.7	22	7.0	19	107	12	9.3
8	2.6	90	46	8.0	18	4.4	21	6.4	11	20	8.7	14
9	3.3	175	23	6.6	111	4.1	25	5.9	8.6	13	7.6	22
10	2.7	21	19	5.8	27	3.9	35	5.5	8.0	11	7.7	12
11	11	13	18	5.3	47	15	69	5.2	7.0	13	12	38
12	7.0	11	32	4.9	212	67	283	6.6	8.4	8.7	45	37
13	6.3	9.9	34	4.6	26	80	105	8.1	9.0	7.4	12	35
14	5.9	73	18	4.3	27	165	28	6.7	24	10	8.5	19
15	5.2	47	46	4.1	17	135	19	15	10	115	8.3	12
16	373	45	106	5.7	15	70	14	14	8.5	15	8.2	10
17	241	51	105	25	62	95	19	8.1	26	34	8.9	68
18	242	45	154	59	43	43	50	8.0	64	85	30	183
19	23	28	176	161	15	40	131	9.8	85	17	38	660
20	13	16	38	372	12	150	148	6.5	26	12	18	26
21	20	12	23	101	10	214	79	7.3	33	13	12	16
22	34	11	17	98	8.8	180	84	7.4	28	16	11	13
23	486	313	17	57	9.8	699	54	12	15	23	28	15
24	48	76	14	23	16	1470	25	13	26	31	15	10
25	35	22	12	299	20	1050	18	12	246	13	27	8.8
26	45	101	10	54	13	154	14	12	21	39	46	8.8
27	18	92	9.3	21	13	124	14	19	16	33	19	9.8
28	24	59	8.4	14	11	190	19	11	12	14	21	9.4
29	38	55	7.7	12	---	48	13	9.9	15	14	12	7.8
30	37	53	7.2	9.8	---	29	13	8.4	15	11	12	7.7
31	35	---	6.6	8.6	---	21	---	6.8	---	14	163	---
TOTAL	1779.8	1580.5	1483.2	1477.5	1166.5	5094.8	1382	292.5	818.3	825.1	713.9	1328.1
MEAN	57.4	52.7	47.8	47.7	41.7	164	46.1	9.44	27.3	26.6	23.0	44.3
MAX	486	313	176	372	226	1470	283	19	246	115	163	660
MIN	2.6	9.6	6.6	4.1	7.8	3.9	10	5.2	5.9	7.4	7.6	7.7
AC-FT	3530	3130	2940	2930	2310	10110	2740	580	1620	1640	1420	2630

16518000 WEST WAILUAIKI STREAM NEAR KEANAE--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1914 - 1994, BY WATER YEAR (WY)

MEAN	23.9	46.4	49.7	42.9	47.1	57.6	55.8	30.3	16.5	25.3	26.5	18.7
MAX	133	198	200	192	222	303	221	88.4	58.1	99.4	111	101
(WY)	1942	1922	1937	1979	1932	1942	1989	1914	1941	1914	1914	1914
MIN	.88	4.06	2.82	2.01	2.80	2.04	4.17	3.86	2.37	1.72	2.85	1.68
(WY)	1985	1992	1981	1977	1983	1926	1992	1945	1981	1922	1973	1974

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1914 - 1994	
ANNUAL TOTAL	12557.8		17942.2			
ANNUAL MEAN	34.4		49.2		35.6	
HIGHEST ANNUAL MEAN					67.3	1980
LOWEST ANNUAL MEAN					14.5	1981
HIGHEST DAILY MEAN	576	Mar 8	1470	Mar 24	2260	Jan 26 1948
LOWEST DAILY MEAN	2.3	Feb 28	2.6	Oct 8	.62	Jul 23 1922
ANNUAL SEVEN-DAY MINIMUM	2.6	Feb 1	3.1	Oct 4	.71	Oct 25 1984
ANNUAL RUNOFF (AC-FT)	24910		35590		25780	
10 PERCENT EXCEEDS	82		105		79	
50 PERCENT EXCEEDS	11		15		10	
90 PERCENT EXCEEDS	3.4		6.4		3.3	



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 good. No diversion upstream.

AVERAGE DISCHARGE.--83 years (water years 1912-94), 4.85 ft^3/s (3,510 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 5,710 ft^3/s, Nov. 18, 1930, gage height, 7.28 ft from rating curve extended above 110 ft^3/s by test of 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)
Oct. 23	1630	455	3.38	June 25	0100	470	3.40
Dec. 17	0100	616	3.57	July 15	0400	301	3.13
Feb. 12	0930	1,030	4.04	Aug. 31	1030	271	3.07
Mar. 24	1200	*1,260	*4.29	Sep. 19	0230	686	3.66

Minimum discharge, 0.60 ft^3/s, Oct. 6-8, 10, 15.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

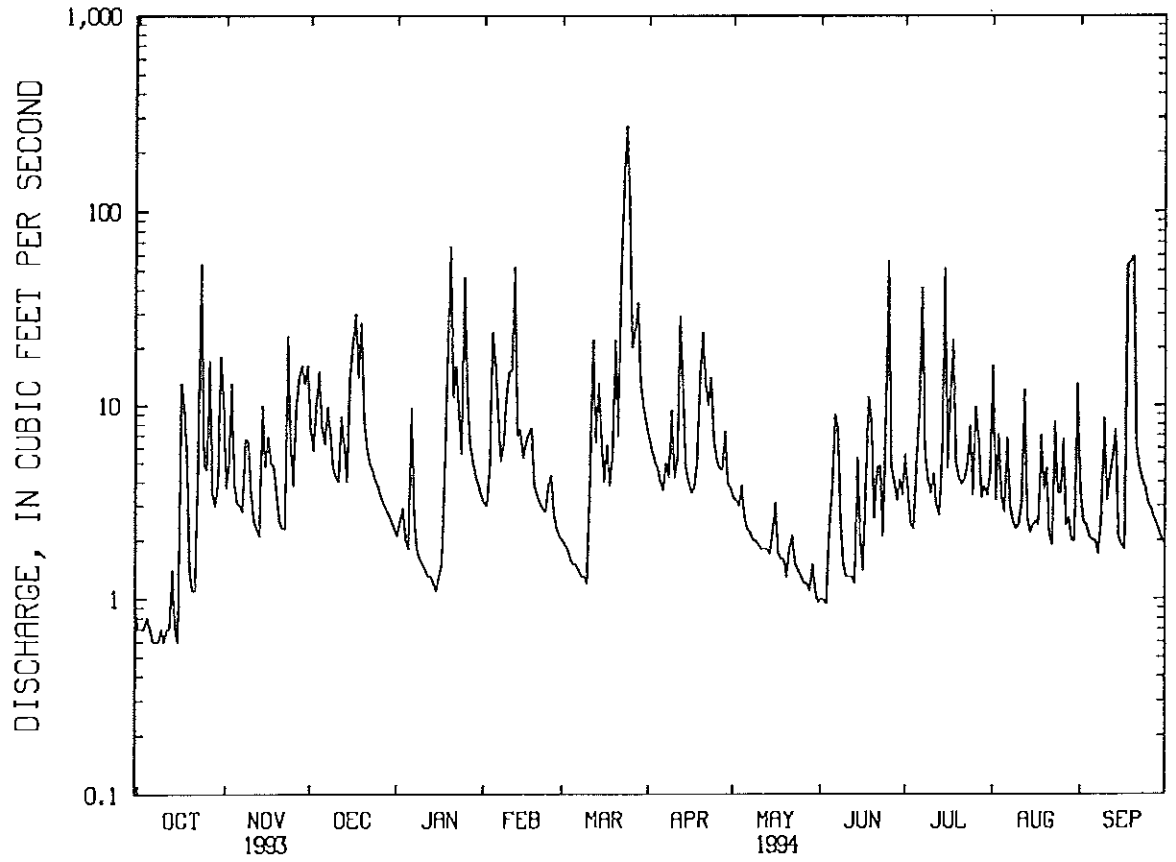
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	3.7	7.5	2.1	3.1	2.0	6.8	3.3	1.0	5.5	16	3.7
2	.70	4.9	5.8	2.5	3.0	1.9	5.8	3.2	.99	3.5	3.2	2.5
3	.70	13	10	2.9	4.6	1.8	5.1	3.0	.95	2.4	7.1	2.4
4	.80	3.9	15	2.0	24	1.6	4.7	3.8	2.3	2.3	3.3	2.1
5	.70	3.1	7.7	1.8	17	1.5	4.0	2.6	3.7	5.0	2.8	2.0
6	.60	3.0	6.3	9.7	9.4	1.5	3.6	2.3	8.9	9.1	6.7	2.0
7	.60	2.8	9.8	2.7	5.1	1.4	5.0	2.2	7.6	41	3.0	1.7
8	.60	6.6	7.2	1.8	6.2	1.3	4.2	2.0	2.5	5.6	2.5	2.7
9	.70	6.5	4.7	1.6	11	1.3	9.4	2.0	1.5	4.1	2.3	8.6
10	.60	3.6	4.2	1.5	15	1.2	4.2	1.9	1.3	3.5	2.4	3.2
11	.70	2.5	4.0	1.4	15	4.5	5.1	1.8	1.3	4.4	3.1	4.3
12	.70	2.3	8.7	1.3	52	22	29	1.8	1.3	3.0	12	5.4
13	1.4	2.1	6.2	1.3	6.9	6.4	12	1.8	1.2	2.7	2.6	7.5
14	.70	10	4.0	1.2	7.5	13	4.7	1.7	5.3	5.4	2.2	2.1
15	.60	4.8	14	1.1	5.3	6.7	4.0	2.2	2.0	51	2.4	1.9
16	13	6.9	21	1.3	6.3	4.0	3.5	3.1	1.4	4.7	2.5	1.8
17	10	5.0	30	1.5	7.1	6.2	3.7	1.7	3.9	11	2.4	53
18	5.5	4.8	14	4.7	7.6	3.8	5.0	1.6	11	22	7.0	56
19	1.4	3.4	27	19	3.8	5.5	14	1.6	8.4	5.0	3.6	59
20	1.1	2.5	8.4	66	3.4	22	24	1.3	2.6	4.2	4.7	6.1
21	1.1	2.3	6.0	11	3.1	6.9	13	1.8	4.7	3.9	2.1	4.7
22	5.6	2.3	5.0	16	2.9	47	10	2.1	4.8	4.1	1.9	4.1
23	54	23	4.6	9.3	2.8	142	14	1.5	2.1	4.8	8.2	3.7
24	4.9	6.2	4.1	5.6	3.8	269	6.5	1.4	8.7	7.8	3.5	3.1
25	4.6	3.8	3.8	46	4.3	104	5.2	1.3	56	3.4	3.5	2.9
26	17	9.7	3.4	12	2.7	20	4.7	1.2	4.7	9.8	6.6	2.6
27	3.5	14	3.1	6.3	2.3	24	4.6	1.2	4.0	6.8	2.4	2.4
28	3.0	16	2.9	5.1	2.1	34	7.3	1.1	3.2	3.3	2.6	2.2
29	3.9	13	2.7	4.3	---	13	3.9	1.5	4.1	3.8	2.0	2.0
30	18	16	2.5	3.8	---	9.8	3.7	1.1	3.4	3.4	2.0	1.9
31	11	---	2.3	3.4	---	8.1	---	.96	---	4.4	13	---
TOTAL	168.40	201.7	255.9	250.2	237.3	787.4	230.7	60.06	164.84	250.9	139.6	257.6
MEAN	5.43	6.72	8.25	8.07	8.47	25.4	7.69	1.94	5.49	8.09	4.50	8.59
MAX	54	23	30	66	52	269	29	3.8	56	51	16	59
MIN	.60	2.1	2.3	1.1	2.1	1.2	3.5	.96	.95	2.3	1.9	1.7
AC-FT	334	400	508	496	471	1560	458	119	327	498	277	511

16587000 HONOPOU STREAM NEAR HUELO--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1911 - 1994, BY WATER YEAR (WY)

MEAN	2.74	5.48	6.14	5.54	5.42	7.19	7.68	5.18	2.81	3.54	4.03	2.75
MAX	15.9	21.4	20.0	20.9	24.5	33.0	43.4	24.3	9.97	12.6	18.1	14.6
(WY)	1942	1991	1947	1921	1969	1942	1989	1916	1914	1914	1982	1992
MIN	.15	.25	1.04	.61	.62	.79	.58	.84	.52	.41	.40	.25
(WY)	1985	1963	1981	1977	1983	1992	1992	1933	1962	1981	1973	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1911 - 1994	
ANNUAL TOTAL	1822.19		3004.60			
ANNUAL MEAN	4.99		8.23		4.85	
HIGHEST ANNUAL MEAN					9.88	1914
LOWEST ANNUAL MEAN					1.73	1981
HIGHEST DAILY MEAN	81	Mar 8	269	Mar 24	305	Apr 7 1989
LOWEST DAILY MEAN	.60	Feb 28	.60	Oct 6	.11	Oct 27 1984
ANNUAL SEVEN-DAY MINIMUM	.64	Oct 5	.64	Oct 5	.11	Oct 26 1984
ANNUAL RUNOFF (AC-FT)	3610		5960		3510	
10 PERCENT EXCEEDS	11		15		10	
50 PERCENT EXCEEDS	2.5		3.8		2.5	
90 PERCENT EXCEEDS	.88		1.3		.74	



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.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--July 1939 to August 1943, September 1947 to November 1970, December 1974 to current year. Records for January 1913 to December 1914 (fragmentary) at site 1.0 mi upstream not equivalent owing to difference in drainage areas.

REVISED RECORDS.--WSP 1319: 1948, 1949(M). WSP 1569: Drainage area.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 330 ft, from topographic map.

REMARKS.--Records good. No diversion upstream.

AVERAGE DISCHARGE.--45 years (1940-42, 1948-70, 1976-94), 18.1 ft^3/s (13,110 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 4,220 ft^3/s, Jan. 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, Jan. 22, 28, 29, Feb. 10, 12, 13, 1985.

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

Date	Time	Discharge (ft^3/s)	Gage height (ft)
Mar. 24	1430	*1,546	*7.08

No other peak greater than base discharge.

Minimum discharge, 5.0 ft^3/s, Oct. 10, 11.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

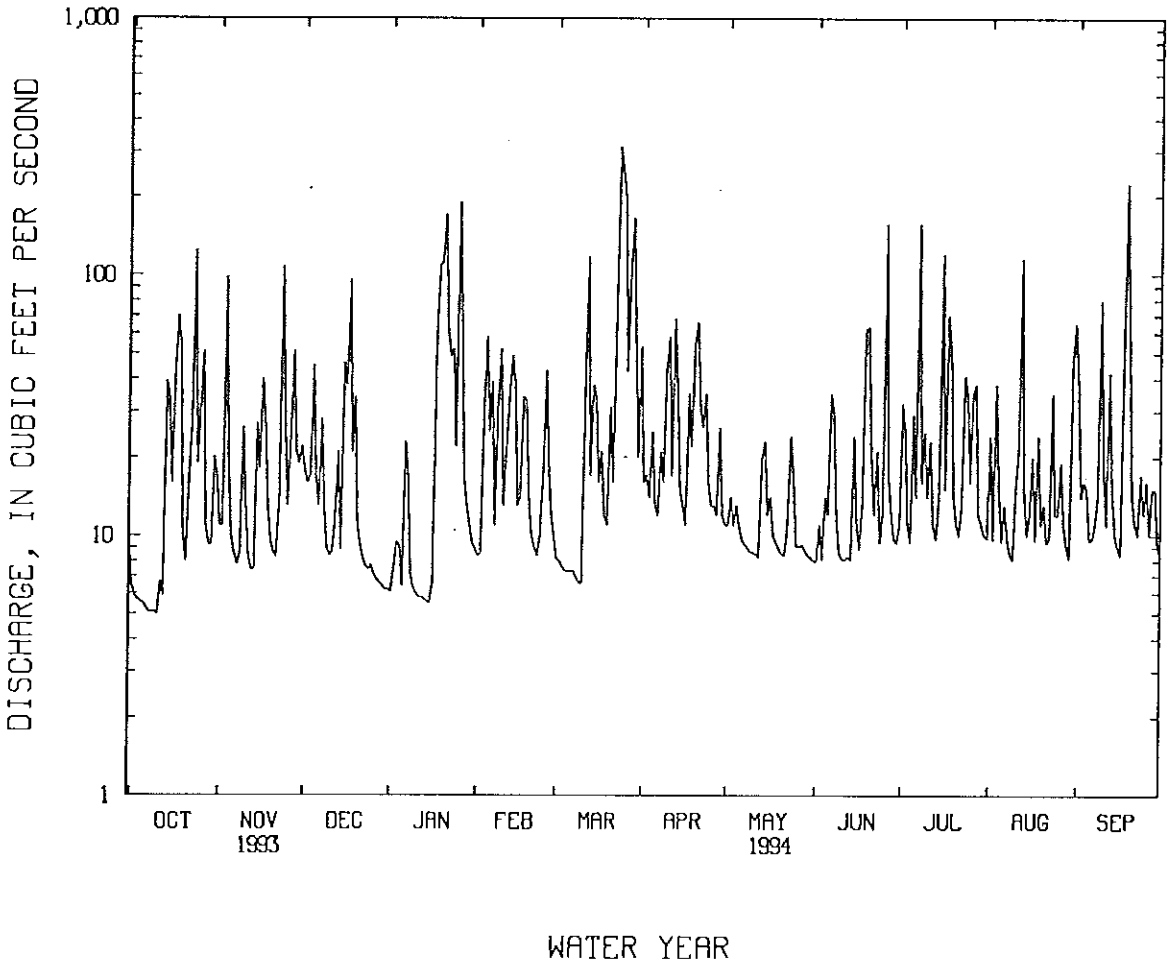
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.5	11	18	6.1	8.4	8.1	16	11	8.0	32	24	39
2	5.9	11	16	7.5	8.5	8.0	17	14	11	25	9.7	14
3	5.7	98	17	9.4	31	7.6	14	11	8.1	11	38	16
4	5.6	19	45	9.2	58	7.3	25	13	14	9.4	15	15
5	5.5	10	17	6.4	25	7.3	13	11	12	29	9.5	9.6
6	5.3	8.6	13	23	39	7.3	12	9.7	35	14	13	9.7
7	5.1	7.8	28	17	11	7.3	21	9.3	29	156	9.8	11
8	5.1	8.5	13	7.2	32	6.9	16	9.0	12	16	8.5	14
9	5.1	26	8.9	6.3	52	6.6	44	8.7	8.6	25	8.1	80
10	5.0	13	8.4	6.0	13	6.6	58	8.6	8.1	14	15	18
11	6.7	8.3	8.7	5.8	21	44	17	8.5	8.1	23	22	11
12	5.9	7.4	12	5.8	35	117	68	8.3	8.3	11	115	42
13	39	7.5	21	5.7	49	17	35	20	8.1	9.7	15	15
14	34	27	8.9	5.6	38	38	15	23	24	14	10	10
15	16	18	46	5.5	13	34	13	12	11	120	12	9.0
16	42	40	38	6.6	14	16	11	14	8.9	15	20	8.4
17	70	27	96	58	34	21	35	10	13	70	9.6	46
18	54	13	21	109	33	12	22	9.4	62	51	24	223
19	10	9.5	34	112	14	11	55	8.9	63	14	11	56
20	8.0	8.6	11	171	10	31	66	8.5	21	11	13	14
21	16	8.3	9.3	62	9.0	16	31	8.4	12	10	9.4	11
22	27	14	8.2	49	8.4	70	26	11	21	13	9.7	10
23	124	108	7.6	52	10	314	35	24	9.4	41	35	17
24	19	28	7.4	22	17	252	16	16	12	35	12	12
25	31	13	7.7	189	43	197	13	9.1	156	16	12	16
26	51	23	7.1	63	19	43	13	9.1	17	35	19	10
27	11	51	6.8	17	12	107	12	9.2	12	38	11	15
28	9.3	21	6.6	13	9.8	165	26	8.7	9.7	12	9.0	15
29	9.3	19	6.4	11	---	52	12	8.4	9.4	11	8.2	9.1
30	20	22	6.2	9.4	---	20	11	8.2	11	10	47	8.3
31	17	---	6.2	8.9	---	53	---	8.0	---	9.8	65	---
TOTAL	675.0	686.5	560.4	1079.4	667.1	1703.0	768	348.0	642.7	900.9	639.5	784.1
MEAN	21.8	22.9	18.1	34.8	23.8	54.9	25.6	11.2	21.4	29.1	20.6	26.1
MAX	124	108	96	189	58	314	68	24	156	156	115	223
MIN	5.0	7.4	6.2	5.5	8.4	6.6	11	8.0	8.0	9.4	8.1	8.3
AC-FT	1340	1360	1110	2140	1320	3380	1520	690	1270	1790	1270	1560

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1939 - 1994, BY WATER YEAR (WY)

MEAN	15.5	20.7	19.0	18.0	17.8	25.7	24.4	17.6	12.2	16.4	16.8	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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1939 - 1994	
ANNUAL TOTAL	6887.0		9454.6			
ANNUAL MEAN	18.9		25.9		18.1	
HIGHEST ANNUAL MEAN					30.8	1942
LOWEST ANNUAL MEAN					11.0	1981
HIGHEST DAILY MEAN	246	Mar 8	314	Mar 23	696	Mar 10 1942
LOWEST DAILY MEAN	5.0	Oct 10	5.0	Oct 10	2.7	Jan 28 1985
ANNUAL SEVEN-DAY MINIMUM	5.2	Oct 4	5.2	Oct 4	2.8	Feb 6 1985
ANNUAL RUNOFF (AC-FT)	13660		18750		13110	
10 PERCENT EXCEEDS	38		53		36	
50 PERCENT EXCEEDS	10		13		9.1	
90 PERCENT EXCEEDS	6.8		7.4		5.3	



16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY RECORDS

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

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
OCT										
12...	1230	5.9	80	7.9	25.0	21.5	0.60	752	8.1	93
DEC										
06...	1135	9.6	73	7.9	22.0	19.0	0.30	753	8.4	92
MAR										
08...	1210	6.9	87	8.0	24.0	20.0	0.30	757	8.7	96
APR										
19...	1235	52	43	7.3	21.0	17.5	0.80	757	9.2	97
JUN										
07...	1135	56	52	7.5	25.0	20.0	1.0	753	8.5	95
AUG										
16...	1155	19	56	7.4	25.0	21.5	0.60	754	8.4	96

DATE	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS TOTAL (MG/L AS CACO3)	HARD-NESS NONCARB DISSOLV FLD. AS CACO3 (MG/L)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)
OCT										
12...	K11	780	20	0	3.8	2.6	7.1	42	0.7	0.90
DEC										
06...	K14	630	16	1	3.0	2.1	7.2	48	0.8	0.80
MAR										
08...	K5	350	21	0	4.1	2.7	8.5	45	0.8	0.80
APR										
19...	220	K34	8	1	1.5	1.1	4.9	54	0.7	0.50
JUN										
07...	190	1300	10	2	1.8	1.3	5.0	51	0.7	0.60
AUG										
16...	93	450	12	2	2.2	1.5	5.3	49	0.7	0.30

DATE	BICAR-BONATE WATER DIS IT FIELD MG/L AS HCO3	CAR-BONATE WATER DIS IT FIELD MG/L AS CO3	ALKA-LINITY WAT DIS TOT IT FIELD MG/L AS CACO3	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)
OCT										
12...	29	0	24	1.9	9.2	0.10	20	59	60	0.08
DEC										
06...	19	0	16	1.8	9.1	0.10	15	53	49	0.07
MAR										
08...	30	0	25	1.8	9.4	<0.10	20	60	63	0.08
APR										
19...	9	0	7	1.6	7.2	<0.10	6.7	30	28	0.04
JUN										
07...	10	0	8	1.6	9.1	<0.10	8.6	30	33	0.04
AUG										
16...	12	0	10	1.4	7.9	<0.10	11	45	36	0.06

< 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)

16618000 KAHAKULOA STREAM NEAR HONOKOHAU--Continued

WATER-QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)	PHOSPHORUS DISSOLVED (MG/L AS P)	PHOSPHORUS ORTHO, DISSOLVED (MG/L AS P)	ALUMINUM, DISSOLVED (UG/L AS AL)	BARIUM, DISSOLVED (UG/L AS BA)	COBALT, DISSOLVED (UG/L AS CO)
OCT 12...	0.092	0.092	<0.010	<0.20	0.030	0.030	0.020	30	<2	<3
DEC 06...	0.110	0.110	0.020	<0.20	<0.010	<0.010	0.010	--	--	--
MAR 08...	0.150	0.150	0.040	<0.20	0.040	0.030	0.020	30	10	<3
APR 19...	--	<0.050	0.010	<0.20	<0.010	<0.010	<0.010	<10	11	<3
JUN 07...	0.060	0.060	0.010	<0.20	0.020	0.020	<0.010	--	--	--
AUG 16...	0.060	0.060	0.020	<0.20	0.020	0.020	0.010	50	<2	<3

DATE	TIME	IRON, DISSOLVED (UG/L AS FE)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)
OCT 12...	1230	15	<4	<1	<10	<1	<1	<1.0	26	<6
MAR 08...	1210	7	<4	<1	<10	<1	<1	<1.0	28	8
APR 19...	1235	63	<4	<1	<10	<1	<1	<1.0	12	<6
AUG 16...	1155	49	<4	<1	<10	<1	<1	<1.0	15	<6

DATE	TIME	RADIUM 226, DISSOLVED, RADON METHOD (PCI/L)	RA-226 2 SIGMA WATER, DISS, (PCI/L)	URANIUM NATURAL DISSOLVED (UG/L AS U)	URANIUM NATURAL 2 SIGMA WATER, DISS, (UG/L)
DEC 06...	1135	<0.02	0.010	0.01	<1.0
JUN 07...	1135	<0.02	0.010	0.03	<1.0

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	TIME	SEDIMENT, SUSPENDED (MG/L)	SEDIMENT, DISCHARGE, SUSPENDED (T/DAY)	SED. SUSP. SIEVE DIAM. % FINER THAN .062 MM
OCT 12...	1230	<1	--	100
DEC 06...	1135	2	0.05	100
MAR 08...	1210	2	0.04	100
APR 19...	1235	3	0.42	100
JUN 07...	1135	5	0.76	100
AUG 16...	1155	3	0.15	100

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

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. Previous to Oct. 1990 at site 250 ft downstream.

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, Oct. 1990 to current year. Record since Oct. 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, from topographic map. Prior to Mar. 7, 1913, nonrecording gage at site just below Honokohau ditch intake at different datum. Oct. 1, 1990 at site 250 ft downstream at datum 26.67 ft lower.

REMARKS.--Records fair. No diversion upstream. All medium and low flow, together with the inflow from two development tunnels downstream of station, is diverted into Honokohau ditch.

AVERAGE DISCHARGE.--76 years (water years 1914-19, 1923-88, 1991-94), 39.6 ft^3/s (28,680 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Prior to Oct. 1990. Maximum discharge, 7,260 ft^3/s revised, Jan. 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, Jan. 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)
Mar. 23	1200	*1,530	*4.62	Jul. 15	1400	1,110	4.28

Minimum discharge, 18 ft^3/s on several days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	24	e22	e36	20	21	23	30	46	27	72	68	64
2	22	e18	e32	19	21	22	30	46	27	48	24	31
3	20	98	46	23	55	22	29	31	24	30	40	29
4	20	e31	80	e21	128	22	40	46	42	28	34	25
5	19	e19	39	e19	71	22	31	31	41	75	36	24
6	19	e18	e35	e46	76	22	29	30	87	65	70	35
7	18	e18	e62	e35	32	22	54	29	73	238	30	25
8	18	32	e29	e19	59	21	45	28	32	39	24	49
9	18	e71	e20	e19	40	21	63	28	25	40	22	105
10	18	e27	e24	e19	59	22	70	27	25	29	38	38
11	e21	e20	e25	19	122	36	41	27	23	38	37	30
12	e18	e19	33	19	113	92	151	27	26	26	158	69
13	e46	e19	58	19	27	49	94	34	23	24	30	36
14	e31	e26	e32	19	60	104	34	42	54	25	25	28
15	e25	e28	76	19	26	60	34	41	51	309	32	24
16	e116	e74	110	19	24	42	29	52	26	30	39	21
17	92	42	108	27	34	58	76	29	72	127	28	91
18	71	e29	e31	78	42	30	64	34	131	163	44	292
19	e22	e19	110	152	36	59	107	43	104	29	34	72
20	e19	e19	e26	241	27	119	141	28	40	27	31	26
21	e19	18	e23	80	24	80	63	27	45	24	25	27
22	e28	27	e20	93	23	180	72	34	52	38	27	27
23	175	158	e19	85	23	502	98	40	25	69	155	30
24	e29	e41	e19	32	23	351	51	32	41	123	33	25
25	e63	e21	e19	97	31	256	36	27	257	45	32	28
26	e51	e50	e19	47	29	65	36	28	53	87	46	24
27	e21	88	e19	27	25	118	36	29	37	80	25	27
28	e19	e56	e19	24	23	126	59	26	26	27	22	27
29	e24	46	e20	23	---	53	30	31	25	30	21	22
30	e37	128	20	22	---	33	29	26	37	27	47	21
31	42	---	20	22	---	36	---	24	---	27	75	---
TOTAL	1165	1282	1229	1404	1274	2668	1702	1023	1551	2039	1352	1372
MEAN	37.6	42.7	39.6	45.3	45.5	86.1	56.7	33.0	51.7	65.8	43.6	45.7
MAX	175	158	110	241	128	502	151	52	257	309	158	292
MIN	18	18	19	19	21	21	29	24	23	24	21	21
AC-FT	2310	2540	2440	2780	2530	5290	3380	2030	3080	4040	2680	2720

e Estimated

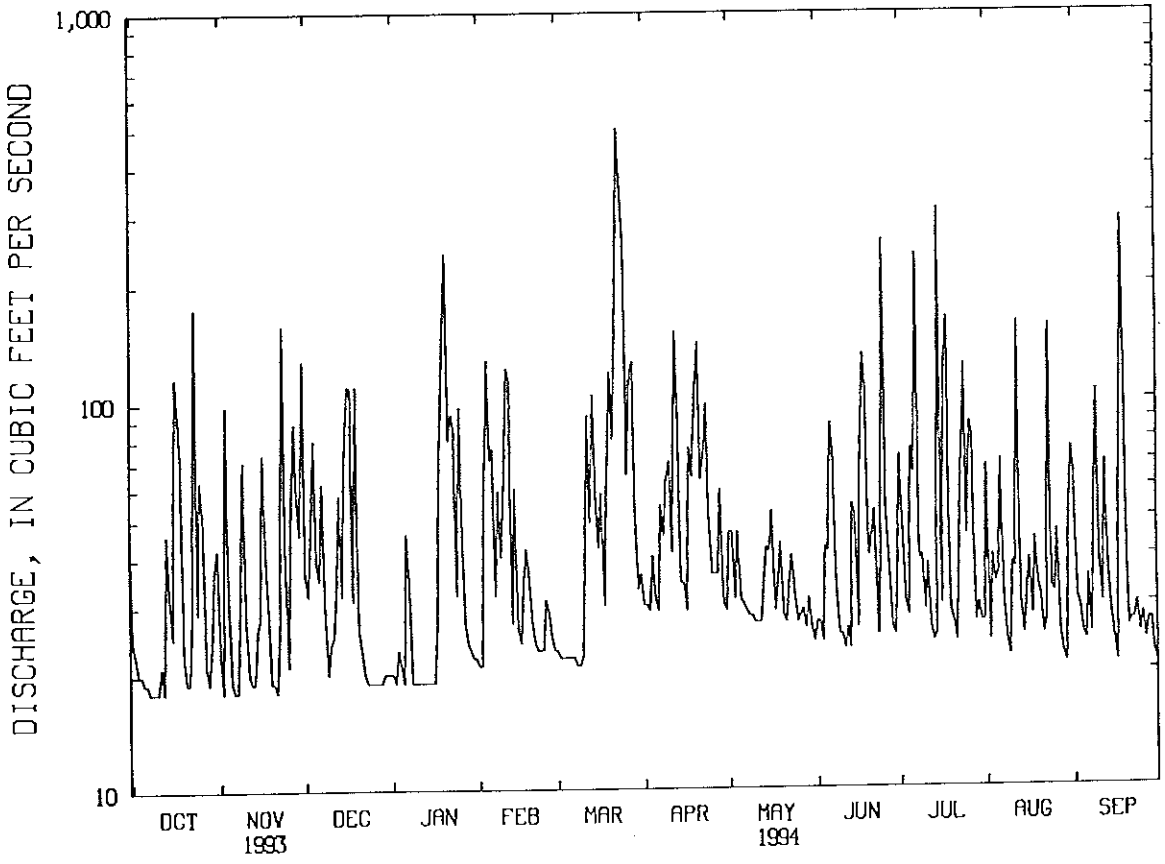
HAWAII, ISLAND OF MAUI

16620000 HONOKOHAU STREAM NEAR HONOKOHAU--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1913 - 1994, BY WATER YEAR (WY)

MEAN	31.7	41.3	41.4	35.9	37.4	44.6	49.5	42.0	34.6	40.4	41.6	30.7
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

SUMMARY STATISTICS FOR 1993 CALENDAR YEAR			FOR 1994 WATER YEAR		WATER YEARS 1913 - 1994	
ANNUAL TOTAL	13047		18061		39.6	
ANNUAL MEAN	35.7		49.5		68.3	1914
HIGHEST ANNUAL MEAN					24.1	1926
LOWEST ANNUAL MEAN					781	Apr 7 1938
HIGHEST DAILY MEAN	264	Jul 22	502	Mar 23	8.0	Aug 10 1920
LOWEST DAILY MEAN	13	Apr 18	18	Oct 7	8.5	Feb 6 1985
ANNUAL SEVEN-DAY MINIMUM	15	Jul 9	19	Oct 4	28680	
ANNUAL RUNOFF (AC-FT)	25880		35820		79	
10 PERCENT EXCEEDS	71		98		24	
50 PERCENT EXCEEDS	24		31		13	
90 PERCENT EXCEEDS	16		20			



16700000 WAIAKEA STREAM NEAR MOUNTAIN VIEW

RECORDS BEING REVIEWED

16700900 OLAA FLUME SPRING NEAR KAUMANA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16700950 LYMAN SPRINGS NO. 2 NEAR PIIHONUA

RECORDS BEING REVIEWED

16704000 WAILUKU RIVER AT PIIHONUA

RECORDS BEING REVIEWED

HAWAII, ISLAND OF HAWAII

16713000 WAILUKU RIVER AT HILO

RECORDS BEING REVIEWED

16717000 HONOLII STREAM NEAR PAPAIKOU

RECORDS BEING REVIEWED

16720000 KAWAINUI STREAM NEAR KAHUELA

RECORDS BEING REVIEWED

16720300 KAWAIKI STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

16720500 UPPER HAMAKUA DITCH BELOW KAWAIKI STREAM, NEAR KAMUELA

RECORDS BEING REVIEWED

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA

LOCATION.--Lat 20°04'31", long 155° 40'26", Hydrologic Unit 20010000, on right bank 0.1 mi upstream from Alakahi Stream and 3.6 mi north of Kamuela.

PERIOD OF RECORD.--April 1968 to current year.

GAGE.--Stevens digital water-stage recorder and concrete, Columbus-type control. Elevation of gage is 3,890 ft, from topographic map.

REMARKS.--Records good except for periods of estimated records which are poor. Ditch diverts from Kawainui and Kawaiki Streams for irrigation in vicinity of Kamuela.

AVERAGE DISCHARGE.--Water year 1991: 23 years, 5.06 ft^3/s (3,670 acre-ft/yr).

Water year 1992: 24 years, 4.99 ft^3/s (3,620 acre-ft/yr).

Water year 1993: 25 years, 5.10 ft^3/s (3,690 acre-ft/yr).

Water year 1994: 26 years, 5.25 ft^3/s (3,810 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 41 ft^3/s, Aug. 18, 1972; no flow at times.

EXTREMES FOR CURRENT YEAR.--Water year 1991: Maximum daily discharge, 34 ft^3/s, Mar. 14; no flow on several days.

Water year 1992: Maximum daily discharge, 35 ft^3/s, Sep. 5; no flow on many days.

Water year 1993: Maximum daily discharge, 32 ft^3/s, Apr. 21; minimum daily discharge, 0.03 ft^3/s, Oct. 21, 22, Feb. 19, 20.

Water year 1994: Maximum daily discharge, 40 ft^3/s, Mar. 25; minimum daily discharge, 0.02 ft^3/s, Oct. 6-9.

REVISIONS.--The maximum daily discharges for water years 1982-90 have been revised. Daily discharges, in cubic feet per second, for Jan. 6, 1973 to Feb. 28, 1973, Dec. 5, 1976 to Jan. 2, 1977, Dec. 12, 1977 to Feb. 16, 1978, and water years 1981-90, have also been revised. These figures supersede those published in annual reports for water years 1973, 1977, 1978, and 1981-90.

Water year 1982: Maximum daily discharge, 30 ft^3/s Jan. 26, 1982.

Water year 1983: Maximum daily discharge, 27 ft^3/s Dec. 19, 1982.

Water year 1984: Maximum daily discharge, 20 ft^3/s Oct. 16, 1983.

Water year 1985: Maximum daily discharge, 17 ft^3/s Mar. 6, 1985.

Water year 1986: Maximum daily discharge, 36 ft^3/s Apr. 10, 1986.

Water year 1987: Maximum daily discharge, 24 ft^3/s Jan. 11, 1987.

Water year 1988: Maximum daily discharge, 20 ft^3/s Nov. 21, 1987.

Water year 1989: Maximum daily discharge, 23 ft^3/s Apr. 28, 1989.

Water year 1990: Maximum daily discharge, 16 ft^3/s Mar. 8, 1990.

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, JANUARY 6, 1973 TO FEBRUARY 28, 1973
DAILY MEAN VALUES

Jan.	6	.84	Jan.	20	19	Feb.	3	e2.5	Feb.	16	2.5
	7	3.7		21	6.0		4	e1.5		17	1.1
	8	4.8		22	1.7		5	e.90		18	.96
	9	1.4		23	1.0		6	e.70		19	.60
	10	.71		24	8.2		7	e2.0		20	3.8
	11	.49		25	7.1		8	e3.0		21	33
	12	.30		26	13		9	e25		22	8.0
	13	.20		27	26		10	e9.0		23	6.9
	14	.30		28	34		11	e2.5		24	14
	15	.20		29	29		12	e1.2		25	24
	16	.10		30	e22		13	e5.0		26	29
	17	4.4		31	e24		14	e3.4		27	15
	18	3.6	Feb.	1	e15		15	2.2		28	4.6
	19	1.5		2	e6.0						

DISCHARGE, CUBIC FEET PER SECOND, DECEMBER 5, 1976 TO JANUARY 2, 1977
DAILY MEAN VALUES

Dec.	5	.06		13	4.9		20	.26		27	6.1
	6	.00		14	1.3		21	.08		28	2.2
	7	2.6		15	.45		22	.00		29	.90
	8	6.6		16	8.9		23	.00		30	.45
	9	5.7		17	5.7		24	.00		31	.14
	10	6.1		18	2.0		25	4.6	Jan.	1	.02
	11	5.7		19	.60		26	2.3		2	.01
	12	3.2									

DISCHARGE, CUBIC FEET PER SECOND, DECEMBER 12, 1977 TO FEBRUARY 16, 1978
DAILY MEAN VALUES

Dec.	12	e.00		29	e.00		15	e.00	Feb.	1	e.00
	13	e.00		30	e.00		16	e.00		2	e.00
	14	e.35		31	e.00		17	e.00		3	e.00
	15	e.80	Jan.	1	e4.5		18	e.00		4	e.00
	16	e1.5		2	e3.4		19	e.00		5	e.00
	17	e3.0		3	e3.2		20	e6.0		6	e.00
	18	e5.0		4	e3.2		21	e9.0		7	e.00
	19	e4.0		5	e2.5		22	e4.0		8	e.15
	20	e3.0		6	e1.7		23	e2.0		9	e3.0
	21	e2.8		7	e1.3		24	e8.0		10	e1.0
	22	e2.5		8	e1.0		25	e7.2		11	e.80
	23	e2.3		9	e.25		26	e8.8		12	e.20
	24	e.08		10	e.05		27	e6.0		13	e.00
	25	e.01		11	e.01		28	e6.0		14	e.00
	26	e.00		12	e.00		29	e2.0		15	e.01
	27	e.00		13	e.00		30	e.90		16	e.02
	28	e.00		14	e.00		31	e.07			

e Estimated

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAHUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.28	4.4	.45	.00	.00	6.8	1.1	19	2.2	.05	.58	1.3
2	.60	2.2	.33	.00	.00	6.9	.56	12	3.5	.00	.78	2.0
3	1.9	1.2	.26	.00	.00	6.7	4.4	4.1	2.2	.00	4.9	8.9
4	4.1	.82	.19	.00	.00	5.8	9.7	1.6	1.0	.00	12	5.1
5	.88	.60	.16	.00	.00	3.2	4.8	.78	2.2	.00	9.2	7.9
6	.41	.49	.12	.00	.00	2.3	2.2	.49	11	.00	2.7	3.0
7	.20	.41	.08	.00	.00	2.7	1.9	.30	5.5	.00	1.4	1.3
8	.21	3.6	.05	.00	2.8	2.3	1.5	.20	13	.00	8.7	.60
9	.88	7.9	.02	.00	6.0	5.0	.78	.11	8.1	.00	13	.26
10	.34	5.8	.01	.00	1.9	3.0	.49	.05	3.5	.00	13	.12
11	.20	10	.01	.00	.51	1.4	.33	.02	2.8	.00	13	.03
12	.24	7.8	.00	.00	.20	.78	.18	.01	3.2	.00	13	.00
13	.10	4.4	.00	.00	.05	.45	.05	.00	2.1	.00	6.6	.00
14	.60	2.1	.00	.00	.00	.26	.02	.00	4.2	.87	2.6	.00
15	.33	1.1	.08	.00	.00	.13	.00	.00	5.7	.77	1.5	.00
16	.22	1.2	.53	.00	.00	.05	.00	.00	3.2	3.0	.91	.00
17	.60	7.1	.86	1.9	.00	.26	.00	.00	1.6	1.5	.65	.00
18	.52	9.2	.35	.59	.00	1.1	.00	.00	5.9	.85	7.1	.00
19	.33	7.9	.16	.03	.00	1.2	.12	.00	2.6	1.7	10	.01
20	.26	5.2	1.0	.16	.00	.78	1.4	2.1	1.4	6.3	10	7.4
21	.20	2.5	.43	.06	2.9	.37	2.7	4.4	1.4	13	3.7	1.6
22	.22	1.5	.21	.00	.00	.18	1.2	1.4	.71	7.3	2.6	.45
23	.52	2.8	.08	.00	4.1	.07	1.0	.64	.31	11	9.7	.76
24	.18	4.7	.02	.00	7.0	.02	10	.33	.15	8.2	3.6	2.2
25	.07	2.4	.00	.00	7.0	.02	12	.17	.03	8.7	1.5	.95
26	.04	2.4	.00	.00	7.3	.05	4.2	.06	.00	2.6	.84	5.5
27	.02	3.2	.00	.00	7.9	2.0	1.6	.01	.00	1.6	.71	13
28	.44	1.4	.00	.00	8.9	10	.84	.00	.00	1.5	.65	11
29	6.6	.82	.00	.00	---	4.8	.41	.55	.00	.94	.93	4.3
30	5.8	.58	.00	.00	---	2.0	2.8	.66	.01	.88	.85	1.5
31	12	---	.00	.00	---	2.6	---	3.6	---	.87	1.2	---
TOTAL	39.29	105.72	5.40	2.74	56.56	73.22	66.28	52.58	87.51	71.63	157.90	79.18
MEAN	1.27	3.52	.17	.088	2.02	2.36	2.21	1.70	2.92	2.31	5.09	2.64
MAX	12	10	1.0	1.9	8.9	10	12	19	13	13	13	13
MIN	.02	.41	.00	.00	.00	.02	.00	.00	.00	.00	.58	.00
AC-FT	78	210	11	5.4	112	145	131	104	174	142	313	157

CAL YR 1980 TOTAL 595.24 MEAN 1.63 MAX 30 MIN .00 AC-FT 1180
WTR YR 1981 TOTAL 798.01 MEAN 2.19 MAX 19 MIN .00 AC-FT 1580

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.8	.81	7.7	.20	4.5	5.1	5.1	17	3.6	16	21	17
2	9.9	1.8	7.8	.09	2.8	9.4	2.5	16	2.1	28	17	16
3	6.7	3.6	7.9	1.1	2.1	6.1	2.5	9.0	1.4	22	18	6.6
4	3.6	4.2	7.6	1.7	1.5	11	8.3	5.3	1.0	23	20	6.0
5	3.2	1.1	6.9	.75	3.6	8.1	6.9	5.5	.71	23	14	4.0
6	1.2	.39	6.7	.28	10	3.3	3.0	3.3	.48	21	8.0	3.6
7	.87	10	9.8	.13	10	8.2	2.1	2.1	.32	15	14	8.3
8	.45	12	12	2.0	6.9	10	1.6	5.8	.25	18	11	17
9	.26	9.8	7.9	6.2	8.8	11	3.2	13	.69	20	15	13
10	.15	5.8	7.1	1.4	13	12	5.3	14	2.7	24	24	20
11	.05	9.0	5.7	.80	23	12	2.5	16	2.1	18	21	7.7
12	.00	12	3.5	1.1	11	12	1.7	14	1.0	18	26	4.5
13	.00	11	4.5	.65	2.7	21	6.6	11	7.0	18	21	6.3
14	.10	5.0	5.5	.35	1.5	11	9.7	14	3.7	26	11	13
15	2.8	1.8	3.6	.18	1.2	11	4.2	8.6	3.0	26	5.7	20
16	.71	1.0	2.1	.08	1.1	5.9	12	5.1	5.1	22	4.7	18
17	.18	.58	1.4	.01	1.0	4.5	13	2.8	3.8	21	4.3	8.8
18	.03	.38	.95	.01	.82	9.6	12	6.2	4.3	24	13	8.5
19	.01	.32	.66	.10	.63	4.6	7.7	14	1.6	21	9.3	10
20	.00	.23	.48	.01	.47	2.6	9.2	10	1.1	9.4	6.0	4.5
21	.00	.16	.34	3.5	.33	1.5	9.3	13	.76	22	6.6	2.8
22	.05	2.6	.25	11	.23	6.7	11	13	.57	16	16	2.1
23	.03	8.6	.18	9.1	.15	16	9.1	7.6	.44	7.4	21	14
24	.00	24	.11	5.3	.10	14	9.9	4.1	.28	4.1	21	7.7
25	8.8	8.5	1.7	15	.25	12	13	6.0	.24	3.2	15	13
26	6.4	6.8	5.5	30	.05	10	15	12	9.6	2.2	22	12
27	2.5	6.4	2.5	28	.02	6.5	14	5.5	21	1.5	21	5.9
28	5.0	8.7	1.5	18	.37	3.5	18	8.9	21	1.1	22	6.5
29	9.0	6.0	.92	13	---	2.2	22	6.8	18	1.8	20	13
30	3.3	4.3	.56	14	---	3.2	21	9.3	18	2.8	20	6.9
31	1.4	---	.36	9.3	---	10	---	8.4	---	14	18	---
TOTAL	69.49	166.87	123.71	173.34	108.12	264.0	261.4	287.3	135.84	489.5	486.6	296.7
MEAN	2.24	5.56	3.99	5.59	3.86	8.52	8.71	9.27	4.53	15.8	15.7	9.89
MAX	9.9	24	12	30	23	21	22	17	21	28	26	20
MIN	.00	.16	.11	.01	.02	1.5	1.6	2.1	.24	1.1	4.3	2.1
AC-FT	138	331	245	344	214	524	518	570	269	971	965	589

CAL YR 1981 TOTAL 1007.67 MEAN 2.76 MAX 24 MIN .00 AC-FT 2000
WTR YR 1982 TOTAL 2862.87 MEAN 7.84 MAX 30 MIN .00 AC-FT 5680

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.7	.14	2.3	.44	4.5	.00	12	21	16	12	12	3.0
2	9.5	.04	1.2	.37	.97	.00	12	18	9.5	10	8.9	3.2
3	5.1	.01	.66	.24	.29	.00	6.0	17	15	11	6.3	9.1
4	2.3	.01	.36	.22	.05	.00	1.6	20	9.9	14	13	3.6
5	1.6	.01	.21	.24	.01	.00	.70	16	9.0	12	12	3.3
6	1.8	.05	.08	.40	.01	.00	.30	15	13	15	9.5	7.7
7	3.8	.01	9.2	.66	.01	.00	.11	21	11	15	9.6	13
8	12	.00	4.3	.64	.01	.00	10	16	13	14	5.7	12
9	16	.00	2.3	.37	.00	.00	5.8	8.4	9.8	13	3.0	11
10	14	.00	1.1	.22	.00	.00	1.6	6.1	13	12	2.0	11
11	18	.70	1.7	.13	.00	.00	1.2	12	9.3	12	6.2	10
12	21	4.9	5.9	.04	.00	.00	7.4	12	6.9	11	12	9.1
13	13	17	2.0	.01	.00	.00	5.0	16	4.3	13	11	12
14	7.5	22	4.3	.07	.00	.00	7.9	16	11	14	6.0	7.3
15	3.1	16	3.8	2.5	.00	.00	15	13	4.9	14	3.0	4.3
16	1.7	15	15	.79	.00	.00	8.2	11	5.0	13	2.8	6.6
17	3.2	8.2	9.0	.29	.12	.00	14	14	12	13	3.6	10
18	6.7	3.0	20	.12	2.7	1.7	10	9.0	7.8	12	7.6	16
19	2.2	1.4	27	.02	.32	10	13	4.1	12	9.2	3.2	12
20	1.2	3.5	8.8	.00	.00	2.8	14	2.5	7.0	4.7	1.8	9.1
21	1.4	15	11	.01	.00	.64	12	2.0	6.4	6.0	6.9	8.8
22	8.8	6.4	6.6	.01	.00	.00	14	7.2	11	6.7	3.2	4.5
23	2.6	2.1	7.1	.01	.00	3.0	14	7.1	12	8.3	3.3	3.1
24	1.3	13	9.0	.01	.00	7.0	13	6.0	8.0	12	10	1.8
25	.83	7.9	3.0	.01	.00	10	12	12	6.6	13	10	6.5
26	.55	4.1	15	.01	.00	4.9	9.7	8.9	6.1	13	10	8.5
27	.66	2.2	6.0	.01	.00	7.7	12	9.5	8.0	13	9.3	12
28	2.1	6.9	2.5	.01	.00	4.1	16	4.6	3.2	12	13	11
29	1.0	15	1.1	.01	---	4.1	17	3.3	14	8.8	10	15
30	.54	6.4	.63	.02	---	1.3	21	2.5	10	6.8	7.5	12
31	.29	---	.42	.02	---	1.0	---	9.4	---	12	5.1	---
TOTAL	168.47	170.97	181.56	7.90	8.99	58.24	286.51	340.6	284.7	355.5	227.5	256.5
MEAN	5.43	5.70	5.86	.25	.32	1.88	9.55	11.0	9.49	11.5	7.34	8.55
MAX	21	22	27	2.5	4.5	10	21	21	16	15	13	16
MIN	.29	.00	.08	.00	.00	.00	.11	2.0	3.2	4.7	1.8	1.8
AC-FT	334	339	360	16	18	116	568	676	565	705	451	509

CAL YR 1982 TOTAL 3023.80 MEAN 8.28 MAX 30 MIN .00 AC-FT 6000
WTR YR 1983 TOTAL 2347.44 MEAN 6.43 MAX 27 MIN .00 AC-FT 4660

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	6.9	.22	.08	3.0	.08	2.0	2.0	.71	1.8	1.3	5.3
2	9.1	9.8	.11	.00	2.7	.63	1.4	2.1	.36	1.8	.90	2.8
3	4.9	9.6	.03	.00	3.6	1.5	1.3	2.3	.22	1.4	.46	.91
4	3.8	7.1	.00	.00	2.6	2.0	2.8	2.2	.15	1.2	1.3	.40
5	4.0	10	.00	2.3	1.6	1.5	1.7	1.6	.55	1.7	9.4	.21
6	5.9	6.9	.00	3.0	.74	.69	4.1	.99	1.1	1.4	8.4	.10
7	11	4.0	.00	2.3	.41	.26	3.8	.61	.94	1.1	3.3	.02
8	15	2.6	.01	2.1	4.2	.06	3.2	.36	1.3	1.5	1.1	.00
9	10	2.0	.01	.94	3.1	.00	2.3	.25	1.7	1.4	.48	.00
10	12	1.4	.00	.34	2.6	.00	3.2	.28	1.8	1.2	4.5	.20
11	9.6	1.0	.67	.09	1.2	.00	2.8	.75	1.7	.62	5.8	.10
12	6.6	8.7	.07	.16	.57	.00	2.3	1.1	2.1	.64	6.5	.00
13	4.9	10	.00	2.1	.53	.00	2.3	.44	2.3	1.6	6.8	.00
14	5.9	6.6	.00	1.7	2.5	.00	7.6	.23	1.7	1.2	2.8	.00
15	11	5.5	.06	1.6	3.2	.01	3.8	.34	1.6	.81	2.6	.00
16	20	2.7	2.0	1.3	2.5	.56	4.3	.89	1.8	.54	5.9	.00
17	12	1.8	.66	.52	2.0	.42	6.5	2.1	1.8	.34	1.8	.00
18	6.9	1.1	.11	.17	1.7	.02	5.3	2.7	1.5	.16	.71	.00
19	12	.70	.00	.01	2.8	.00	3.5	2.0	1.4	.05	.36	.00
20	8.6	.45	.00	.00	3.8	.00	3.0	2.3	1.3	.19	.19	.00
21	7.1	.26	.00	.00	2.5	.00	2.8	2.2	1.4	.13	.14	.00
22	6.2	.16	.00	.00	1.8	.02	2.8	2.0	1.5	.00	2.1	.00
23	6.6	.99	.00	.00	1.8	.73	3.5	2.1	1.6	.00	6.9	.00
24	15	2.1	.00	.00	1.8	.48	2.7	2.5	1.8	.00	4.1	.00
25	12	3.1	.33	.00	1.7	.87	2.3	2.1	1.6	.00	1.8	.00
26	13	5.3	14	.66	1.7	1.2	1.5	2.1	1.4	.00	5.0	.00
27	18	1.7	5.0	.41	1.1	1.6	1.0	1.6	1.6	.21	8.7	.00
28	12	.86	3.8	.96	.54	2.5	.97	1.1	1.5	1.5	4.7	.00
29	11	.47	1.6	7.3	.24	3.6	2.3	1.8	1.3	1.3	1.7	.00
30	9.1	.38	.70	5.3	---	2.6	2.2	1.8	1.0	.67	.76	.00
31	7.9	---	.27	5.3	---	2.3	---	1.4	---	2.2	2.1	---
TOTAL	302.1	114.17	29.65	38.64	58.53	23.63	89.27	46.24	40.73	26.66	102.60	10.04
MEAN	9.75	3.81	.96	1.25	2.02	.76	2.98	1.49	1.36	.86	3.31	.33
MAX	20	10	14	7.3	4.2	3.6	7.6	2.7	2.3	2.2	9.4	5.3
MIN	3.8	.16	.00	.00	.24	.00	.97	.23	.15	.00	.14	.00
AC-FT	599	226	59	77	116	47	177	92	81	53	204	20

CAL YR 1983 TOTAL 2272.36 MEAN 6.23 MAX 21 MIN .00 AC-FT 4510
WTR YR 1984 TOTAL 882.26 MEAN 2.41 MAX 20 MIN .00 AC-FT 1750

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	5.3	.02	.18	6.7	7.3	6.0	6.1	6.7	7.8	6.0
2	.00	.00	1.5	.00	.00	6.2	13	11	3.1	7.4	8.5	4.2
3	.00	.00	.40	.00	.00	4.2	7.2	7.6	3.0	7.1	8.7	9.2
4	.00	.01	.71	1.1	.00	6.1	3.1	3.3	1.4	9.6	9.3	5.3
5	.00	.01	.71	5.8	.00	7.1	1.7	4.6	1.7	9.0	8.9	2.2
6	.00	.00	.14	2.3	.00	17	1.5	3.0	4.3	4.6	9.4	2.7
7	.00	.00	3.5	.69	.00	14	.87	5.3	1.4	6.7	12	1.7
8	.00	.01	5.5	.19	.00	14	1.4	12	.64	4.9	14	1.6
9	.00	.72	11	.01	.00	9.2	6.7	9.0	3.1	1.4	12	.67
10	.00	2.1	7.1	.00	.00	11	6.0	9.6	2.3	.76	8.8	.28
11	.00	4.2	3.8	.00	.00	12	3.7	11	1.1	.46	4.1	.15
12	.00	6.0	1.4	.00	.00	9.7	1.5	10	.60	.19	8.4	.02
13	.00	5.0	.62	.00	.00	11	.83	10	.85	.04	9.8	.00
14	.00	1.4	.27	1.1	.00	13	3.5	6.1	.61	.00	10	.00
15	.00	.72	.12	5.5	.00	10	2.8	4.3	.23	.93	10	.00
16	.00	1.7	.00	2.1	.00	9.8	11	2.0	.05	7.4	9.5	.00
17	.00	1.8	.00	.53	.00	9.3	9.5	1.1	.00	7.3	12	1.3
18	.00	2.5	.00	.10	.00	8.8	9.4	.62	.00	9.5	4.7	6.3
19	.00	10	2.5	.00	.00	9.3	8.0	.30	.00	6.4	2.1	10
20	.00	7.9	5.8	.00	.00	7.9	7.5	.18	.43	2.2	1.1	8.5
21	.00	6.6	3.2	.00	.00	11	5.8	.11	5.5	4.0	.91	7.5
22	.00	3.5	.96	.00	.58	12	3.5	.08	1.1	7.7	4.6	6.6
23	.00	5.7	.27	.00	1.7	9.7	6.8	5.4	.27	6.4	4.3	3.7
24	.00	4.0	.03	.00	1.3	6.2	7.6	8.2	.03	9.2	1.5	2.8
25	.00	1.2	4.0	.00	4.5	3.3	3.1	7.5	.01	9.5	.76	1.0
26	.00	.39	8.5	.00	6.6	2.2	1.4	5.0	.01	7.7	3.1	.63
27	.00	.19	7.1	.00	6.1	1.3	1.5	9.3	.91	7.9	9.1	1.2
28	.00	.08	3.7	.00	6.6	.97	5.4	9.9	.70	8.2	8.7	4.9
29	.00	.00	1.4	.00	---	3.2	6.1	9.5	.26	8.3	11	7.3
30	.00	1.6	.60	2.1	---	5.4	2.1	7.6	5.9	9.9	8.7	7.7
31	.00	---	.22	2.0	---	3.3	---	8.4	---	9.1	8.0	---
TOTAL	0.00	67.33	80.35	23.54	27.56	254.87	149.80	187.99	45.60	180.48	231.77	103.45
MEAN	.000	2.24	2.59	.76	.98	8.22	4.99	6.06	1.52	5.82	7.48	3.45
MAX	.00	10	11	5.8	6.6	17	13	12	6.1	9.9	14	10
MIN	.00	.00	.00	.00	.00	.97	.83	.08	.00	.00	.76	.00
AC-FT	.00	134	159	47	55	506	297	373	90	358	460	205

CAL YR 1984 TOTAL 584.02 MEAN 1.60 MAX 11 MIN .00 AC-FT 1160
WTR YR 1985 TOTAL 1352.74 MEAN 3.71 MAX 17 MIN .00 AC-FT 2680

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10	3.5	21	13	.00	.00	15	12	8.5	6.4	4.7	2.7
2	5.1	1.4	12	13	.00	.00	13	9.1	4.9	5.9	7.4	1.5
3	1.6	.85	9.8	12	.00	.00	15	14	9.8	11	9.1	.79
4	.73	1.0	7.7	5.3	.00	.00	17	13	12	13	10	3.0
5	.32	.52	3.3	2.1	.00	.00	18	10	12	11	8.6	1.0
6	2.5	.27	1.6	1.1	.03	.00	18	11	7.3	8.6	7.6	.36
7	2.0	.15	.92	11	.00	.00	20	13	10	13	7.9	.16
8	7.0	.08	.52	14	.00	.00	32	6.5	9.5	13	11	.05
9	7.7	.07	.29	16	.00	.01	32	3.5	8.6	13	10	3.2
10	5.9	.07	.16	11	.00	.01	36	2.7	12	13	6.8	6.8
11	8.9	.07	.11	4.5	.00	.00	34	7.0	8.5	8.4	2.5	2.0
12	7.5	.07	.05	2.2	5.0	.00	22	10	4.0	6.9	3.8	.83
13	4.5	.07	.01	1.3	6.1	.01	16	5.1	7.5	10	6.6	1.1
14	1.7	.07	.04	.75	1.0	1.3	12	2.5	13	4.9	12	1.2
15	1.3	.69	.00	.46	2.0	4.5	9.8	1.5	11	5.4	12	.33
16	.61	10	2.2	.27	13	.82	4.2	2.7	13	10	11	.13
17	1.0	3.0	.73	.14	4.5	.21	2.7	11	7.0	7.4	5.9	.03
18	5.9	.98	.17	.06	1.2	.00	2.2	9.1	12	3.7	2.8	.00
19	4.7	11	.04	.02	.43	.89	2.5	5.8	21	6.9	1.4	.00
20	3.1	5.0	.00	.00	.09	10	2.2	10	14	4.9	.79	.00
21	2.7	1.7	.00	.53	.00	20	4.3	4.6	13	1.8	.41	.00
22	1.6	3.1	.00	3.7	.00	21	7.1	2.6	8.9	5.5	1.8	.00
23	2.3	3.7	.00	1.0	.00	21	6.3	2.2	8.1	5.7	9.8	.00
24	7.0	1.4	.00	.33	.00	9.3	5.3	1.3	13	2.1	10	.00
25	3.2	1.6	.00	.20	.00	4.1	3.8	.82	16	.96	4.7	.00
26	7.5	10	.00	.04	.00	2.5	3.5	.70	14	.75	1.7	.00
27	8.5	6.5	1.1	.00	.00	7.8	6.6	3.2	13	2.2	3.3	.00
28	9.1	3.3	7.5	.00	.00	9.9	10	6.4	10	6.2	6.3	.00
29	5.4	2.5	11	.00	---	15	7.3	9.3	9.1	1.7	5.7	.00
30	5.8	1.7	7.4	.00	---	16	12	18	8.2	.88	7.4	.00
31	3.1	---	4.9	.00	---	15	---	13	---	.52	6.8	---
TOTAL	138.26	74.36	92.54	114.00	33.35	159.35	389.8	221.62	318.9	204.71	199.80	25.18
MEAN	4.46	2.48	2.99	3.68	1.19	5.14	13.0	7.15	10.6	6.60	6.45	.84
MAX	10	11	21	16	13	21	36	18	21	13	12	6.8
MIN	.32	.07	.00	.00	.00	.00	2.2	.70	4.0	.52	.41	.00
AC-FT	274	147	184	226	66	316	773	440	633	406	396	50

CAL YR 1985 TOTAL 1510.22 MEAN 4.14 MAX 21 MIN .00 AC-FT 3000
WTR YR 1986 TOTAL 1971.87 MEAN 5.40 MAX 36 MIN .00 AC-FT 3910

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAHUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	7.1	11	3.2	2.0	.01	20	9.1	6.4	10	8.2	.00
2	.00	6.2	16	7.3	1.2	.30	12	12	2.2	9.7	5.9	.00
3	.00	1.8	17	7.7	.80	4.0	9.8	9.9	1.1	11	2.3	.00
4	.57	.59	12	2.8	.54	.84	6.4	11	.63	11	1.3	.00
5	3.3	.17	7.3	4.0	.45	.23	2.7	12	2.0	12	.76	.00
6	8.3	.02	14	1.5	.29	.02	6.4	9.5	6.1	9.8	.38	.00
7	10	.09	8.4	.70	.17	.01	4.7	15	5.7	7.3	.32	.00
8	5.4	.01	4.2	.45	.08	3.6	1.6	11	4.5	7.2	1.5	.00
9	1.5	3.0	6.2	.16	.03	2.2	1.0	6.3	6.3	11	.90	.00
10	.47	3.6	6.3	14	.02	.42	1.1	3.6	7.9	9.3	2.0	.00
11	.10	5.4	11	24	.01	.04	1.0	2.3	11	8.0	5.4	.27
12	.00	9.1	9.6	23	.01	.00	1.3	1.6	8.8	8.3	7.5	1.4
13	.01	7.2	5.9	13	.01	.00	2.8	1.1	8.7	10	3.6	5.0
14	4.6	8.3	5.5	14	.11	.00	6.6	.83	6.6	16	1.1	2.2
15	4.6	8.2	4.6	13	.54	.40	9.3	.86	11	11	.48	.38
16	3.6	6.6	2.2	13	.50	4.0	9.5	.48	12	7.7	.49	.02
17	5.5	7.8	6.7	6.9	11	2.8	8.1	.25	9.4	5.5	.29	.00
18	1.3	3.6	5.4	13	10	2.7	8.6	.12	6.0	6.2	.27	.84
19	.64	6.9	2.5	14	8.7	6.6	8.0	.07	7.1	7.2	.05	3.6
20	5.1	9.6	1.2	7.3	8.1	6.4	8.8	.03	9.9	13	.19	1.7
21	5.8	7.7	8.4	4.6	3.5	6.6	5.7	.02	10	10	3.0	.28
22	1.6	7.8	6.3	10	1.3	5.4	13	.00	9.4	7.7	2.5	.00
23	.43	4.0	6.9	7.1	.64	6.6	5.9	.13	9.1	3.8	.53	.04
24	.08	5.9	4.3	4.3	.26	4.0	2.6	12	4.3	2.3	.11	.17
25	1.3	3.3	5.4	13	2.2	2.7	1.4	7.5	2.7	1.5	.07	.00
26	11	4.7	2.6	13	1.3	1.4	3.1	8.9	8.6	1.1	1.3	.00
27	7.9	8.1	1.2	6.9	.35	2.2	10	7.9	9.8	1.7	.41	.00
28	7.8	8.0	.70	3.5	.05	3.7	10	5.3	6.5	6.4	.07	.00
29	3.0	10	.40	7.7	---	1.8	6.7	8.2	9.9	4.5	.00	.00
30	.90	12	.28	4.1	---	4.0	3.0	7.7	10	6.6	.00	.00
31	.34	---	2.2	2.2	---	3.2	---	9.6	---	6.0	.00	---
TOTAL	95.14	166.78	195.68	259.41	54.16	76.17	191.1	174.29	213.63	242.8	50.92	15.90
MEAN	3.07	5.56	6.31	8.37	1.93	2.46	6.37	5.62	7.12	7.83	1.64	.53
MAX	11	12	17	24	11	6.6	20	15	12	16	8.2	5.0
MIN	.00	.01	.28	.16	.01	.00	1.0	.00	.63	1.1	.00	.00
AC-FT	189	331	388	515	107	151	379	346	424	482	101	32

CAL YR 1986 TOTAL 2124.31 MEAN 5.82 MAX 36 MIN .00 AC-FT 4210
WTR YR 1987 TOTAL 1735.98 MEAN 4.76 MAX 24 MIN .00 AC-FT 3440

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAHUELA--Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	4.3	2.7	1.1	2.5	.30	.86	6.5	8.9	4.6	6.4	1.6	.01
2	4.0	4.3	2.0	10	.13	.33	6.0	8.7	6.3	4.9	2.8	.11
3	2.0	1.6	2.6	7.9	.03	.31	7.6	6.6	5.8	4.2	3.3	.08
4	.35	.45	.98	7.1	.00	.80	7.4	3.5	9.1	3.2	6.6	.02
5	.00	.22	.98	4.9	.00	.83	7.9	6.7	8.1	7.4	8.6	3.0
6	.03	1.6	9.0	5.1	.00	2.5	9.8	5.3	5.5	6.8	12	6.1
7	.06	2.3	8.4	4.0	.04	.98	6.9	4.2	5.7	7.9	9.2	3.7
8	.16	1.5	6.4	1.5	1.6	1.7	3.3	8.2	5.1	9.3	8.0	1.7
9	.01	.40	1.8	8.2	2.7	2.1	3.2	4.5	3.7	9.7	5.3	.77
10	.00	2.1	1.5	7.3	.93	.54	9.2	2.5	2.1	6.0	2.5	1.5
11	.00	5.3	1.2	6.9	5.1	.12	8.8	2.3	1.7	8.4	1.7	5.5
12	.00	3.5	3.0	5.8	3.8	.01	4.6	7.3	2.3	11	3.6	3.8
13	.00	1.5	11	3.2	4.5	.01	2.3	8.7	3.8	8.2	6.1	1.5
14	.00	1.8	6.5	1.4	1.8	1.2	1.6	5.0	2.1	9.2	4.1	.76
15	.00	4.0	3.1	.83	.65	8.4	1.0	6.6	1.3	7.9	2.0	.35
16	.00	4.1	1.6	5.3	2.3	4.2	.70	3.7	3.5	5.9	2.0	.20
17	.00	2.0	1.0	5.9	1.3	1.4	1.2	5.1	6.6	5.8	6.5	.09
18	.00	5.7	1.1	2.3	.46	.55	3.0	2.0	5.3	9.1	3.0	.19
19	.10	5.3	1.0	1.3	.20	.33	2.7	1.2	3.1	7.9	1.3	.14
20	1.2	7.1	1.4	.68	.04	.33	1.2	1.1	8.3	7.3	1.2	.06
21	1.1	20	.72	.33	.00	.08	6.4	6.4	7.5	8.7	.93	1.8
22	2.3	12	.36	.16	.13	.21	8.6	7.9	7.5	5.9	1.8	2.0
23	3.6	8.1	.19	1.6	4.1	.51	3.6	8.5	5.9	2.7	1.1	2.7
24	3.0	5.7	.08	2.1	2.0	.88	2.1	5.5	6.6	1.7	.47	2.7
25	3.3	3.2	.22	2.8	3.8	.19	6.6	2.3	6.1	1.4	.23	2.5
26	3.5	4.3	3.1	5.8	9.4	.03	8.8	1.3	4.0	.95	.11	3.0
27	2.6	2.8	2.7	8.1	6.0	.01	9.4	1.1	7.6	.82	.23	4.6
28	3.0	3.6	.78	6.5	4.5	.01	12	5.8	5.3	6.3	.35	2.7
29	3.3	2.3	.26	4.0	2.2	.03	12	7.2	3.8	7.6	.25	2.1
30	3.3	1.7	.09	1.5	---	.11	9.1	4.5	4.5	7.8	.14	.81
31	3.3	---	.01	.64	---	6.7	---	2.7	---	3.7	.06	---
TOTAL	44.51	121.17	74.17	125.64	58.01	36.26	173.50	155.3	152.8	194.07	97.07	54.49
MEAN	1.44	4.04	2.39	4.05	2.00	1.17	5.78	5.01	5.09	6.26	3.13	1.82
MAX	4.3	20	11	10	9.4	8.4	12	8.9	9.1	11	12	6.1
MIN	.00	.22	.01	.16	.00	.01	.70	1.1	1.3	.82	.06	.01
AC-FT	88	240	147	249	115	72	344	308	303	385	193	108

CAL YR 1987 TOTAL 1518.23 MEAN 4.16 MAX 24 MIN .00 AC-FT 3010
WTR YR 1988 TOTAL 1286.99 MEAN 3.52 MAX 20 MIN .00 AC-FT 2550

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.29	.76	3.1	4.7	.01	.36	6.2	11	10	4.6	6.9	6.6
2	.11	.91	1.3	2.3	.00	.19	6.6	6.4	8.3	3.8	12	9.4
3	.02	.55	.71	5.8	8.5	.08	5.4	4.0	6.3	4.0	8.1	7.2
4	.00	.50	.38	5.3	6.3	3.5	1.7	4.0	5.4	10	9.2	7.7
5	.54	3.8	.23	5.1	5.8	6.1	8.1	3.3	12	11	8.0	6.1
6	2.7	1.2	.13	2.6	1.8	7.0	8.1	2.3	15	13	9.9	5.3
7	.87	.34	.46	3.3	1.5	8.9	14	1.7	13	8.1	6.5	6.8
8	.34	5.1	.19	6.0	1.2	7.2	8.4	7.7	10	7.5	4.1	5.3
9	.16	4.2	.04	6.8	.57	4.1	3.3	9.4	8.3	6.5	3.7	6.1
10	.03	5.0	.22	7.7	5.7	3.8	1.8	8.9	6.1	10	2.8	8.8
11	.02	6.6	5.7	6.4	7.9	2.1	1.4	7.9	5.1	12	2.2	8.7
12	1.0	5.4	4.3	2.7	7.3	1.4	1.2	7.8	12	12	2.5	5.8
13	.88	5.8	1.4	3.6	3.6	.73	.78	13	8.3	18	2.5	2.8
14	.41	6.2	.69	9.7	1.5	.37	13	11	12	17	6.0	2.6
15	.14	5.1	.29	9.2	.90	2.2	6.8	9.4	14	14	6.0	2.2
16	.02	3.7	.76	7.5	.48	5.4	5.3	10	12	11	6.5	1.4
17	.00	2.0	4.7	6.4	.32	1.6	3.8	9.7	12	9.6	4.6	3.7
18	.00	1.4	1.5	6.4	.30	.68	3.5	9.3	10	9.7	3.2	3.0
19	.00	3.2	.49	6.1	.32	.30	3.3	8.0	6.3	20	5.9	4.9
20	.00	2.1	.30	6.1	.41	.19	3.3	12	7.2	14	18	2.8
21	.00	6.8	.20	3.5	.21	.11	4.6	9.6	7.7	10	11	1.7
22	.00	8.5	.29	5.8	.49	.03	6.0	9.7	5.5	15	9.5	1.2
23	.00	8.0	.12	2.3	1.5	.09	5.1	12	4.2	11	7.6	.87
24	.00	7.6	2.3	1.1	8.2	.02	4.9	9.6	2.7	9.0	6.4	.63
25	.00	5.8	6.3	.63	7.7	.64	4.1	14	2.1	12	3.7	1.4
26	.00	3.0	6.8	.39	4.3	.29	3.7	12	1.8	12	3.5	3.5
27	.00	5.9	3.2	.32	1.4	.18	3.6	9.3	1.3	10	2.8	7.6
28	1.8	4.1	2.7	.20	.67	.70	23	9.1	1.0	9.5	1.4	4.7
29	2.3	3.8	4.7	.12	---	4.0	20	11	8.3	13	.79	5.5
30	1.3	6.6	5.3	.09	---	5.0	17	13	8.1	13	.96	2.0
31	.72	---	6.0	.04	---	6.6	---	13	---	9.5	.93	---
TOTAL	13.65	123.96	64.80	128.19	78.88	73.86	197.98	279.1	236.0	339.8	177.18	136.30
MEAN	.44	4.13	2.09	4.14	2.82	2.38	6.60	9.00	7.87	11.0	5.72	4.54
MAX	2.7	8.5	6.8	9.7	8.5	8.9	23	14	15	20	18	9.4
MIN	.00	.34	.04	.04	.00	.02	.78	1.7	1.0	3.8	.79	.63
AC-FT	27	246	129	254	156	147	393	554	468	674	351	270

CAL YR 1988 TOTAL 1249.55 MEAN 3.41 MAX 12 MIN .00 AC-FT 2480
WTR YR 1989 TOTAL 1849.70 MEAN 5.07 MAX 23 MIN .00 AC-FT 3670

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.95	.28	.00	.24	8.1	14	7.6	.07	8.7	11	8.5	1.8
2	.68	.18	.00	1.5	7.7	13	5.9	.18	8.9	13	8.4	.77
3	.91	.09	.00	4.3	8.1	13	9.0	1.7	7.1	11	8.8	4.5
4	.71	.03	.00	6.0	7.5	13	7.8	6.5	7.4	8.5	8.0	10
5	3.5	.03	.00	5.5	7.3	12	7.4	7.6	5.7	5.7	5.8	10
6	7.5	.05	.00	2.7	7.9	12	5.0	8.1	7.4	4.6	5.3	8.2
7	3.0	.07	.00	1.4	9.5	13	2.1	9.0	6.9	4.5	9.1	4.0
8	1.4	.07	.00	.32	6.3	16	1.1	10	9.1	5.8	8.3	2.2
9	3.0	.17	2.5	8.2	3.3	12	.63	7.6	8.0	5.0	5.1	6.8
10	3.6	.07	5.7	6.6	e2.1	8.2	.37	7.6	5.0	4.2	3.1	10
11	1.2	.00	1.6	6.7	e1.5	8.9	.22	6.9	3.8	4.2	3.0	6.9
12	.63	.00	.47	8.3	e1.0	10	.09	3.0	3.2	9.2	3.6	9.0
13	.34	.00	.60	5.1	e.80	8.9	.02	1.4	5.1	6.8	8.9	8.0
14	.20	.00	1.2	1.8	e.60	4.9	.00	1.1	4.7	3.3	5.7	8.1
15	.14	.00	.37	1.6	e.50	6.4	.02	3.1	6.1	1.8	8.9	8.5
16	.09	.01	.10	3.0	e.30	9.8	.16	2.1	9.3	2.7	10	11
17	.03	4.6	.01	6.0	e.20	6.7	.24	1.3	9.7	7.1	8.8	13
18	.03	4.3	.00	11	e.15	4.9	.46	2.6	9.4	9.0	4.6	10
19	.85	1.6	.00	7.1	e.10	4.2	5.3	6.8	8.4	9.0	3.6	10
20	6.2	3.1	.00	8.1	e.10	2.8	7.9	10	8.8	8.7	7.2	6.9
21	6.6	3.8	.00	5.9	e.05	2.0	7.1	13	9.4	7.4	4.0	5.9
22	3.3	2.0	.00	2.5	e.03	1.5	9.8	9.0	10	5.5	2.5	5.7
23	7.5	1.8	.00	3.8	e.01	1.0	7.4	7.1	10	6.6	8.8	4.0
24	6.6	4.1	.00	2.0	3.8	.46	6.1	9.4	12	7.9	10	7.4
25	7.6	1.3	.00	.96	7.5	.27	3.5	10	12	9.5	10	3.3
26	7.0	.50	.00	.55	9.1	.16	2.5	9.7	10	8.6	10	2.8
27	3.8	.23	.00	.40	7.1	.08	.66	11	12	8.8	12	5.5
28	2.3	.11	.00	5.3	8.1	.06	.33	11	10	9.2	9.3	7.4
29	1.2	.02	.04	5.7	---	6.6	.17	9.3	13	9.8	5.7	11
30	.69	.00	2.3	8.3	---	6.8	.06	11	10	9.2	3.3	9.1
31	.42	---	1.2	9.3	---	8.2	---	8.8	---	8.8	3.1	---
TOTAL	81.97	28.51	16.09	140.17	108.74	220.83	98.93	205.95	251.1	226.4	213.4	211.77
MEAN	2.64	.95	.52	4.52	3.88	7.12	3.30	6.64	8.37	7.30	6.88	7.06
MAX	7.6	4.6	5.7	11	9.5	16	9.8	13	13	13	12	13
MIN	.03	.00	.00	.24	.01	.06	.00	.07	3.2	1.8	2.5	.77
AC-FT	163	57	32	278	216	438	196	409	498	449	423	420

CAL YR 1989 TOTAL 1773.86 MEAN 4.86 MAX 23 MIN .00 AC-FT 3520
WTR YR 1990 TOTAL 1803.86 MEAN 4.94 MAX 16 MIN .00 AC-FT 3580

e Estimated

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	7.3	3.3	2.1	.89	.49	.00	13	10	7.8	6.6	2.2	3.0
2	5.0	2.0	1.6	.55	.35	.00	9.3	5.9	7.9	4.0	1.7	2.3
3	9.2	1.3	.60	.40	.26	.00	12	3.7	7.7	1.7	1.8	4.6
4	8.7	.94	.34	.30	.14	.00	10	5.1	4.9	1.5	2.0	11
5	8.3	.70	.70	.23	.04	.29	17	10	4.1	1.1	1.3	7.2
6	5.8	.63	6.8	.87	.00	4.0	15	7.0	5.1	.75	3.2	3.8
7	4.3	.44	3.5	6.2	.00	7.5	12	8.8	11	.73	18	4.9
8	4.2	.29	13	4.7	.00	9.7	12	9.8	8.3	.59	5.5	8.9
9	3.7	.21	32	2.0	.00	11	7.3	6.4	6.8	.33	4.1	7.7
10	2.6	.15	16	4.5	.00	8.8	4.9	3.5	4.5	6.0	4.1	11
11	11	.10	9.5	6.7	.00	12	3.0	4.0	3.2	12	3.1	11
12	9.4	.06	10	3.2	.00	16	3.0	4.1	4.2	6.8	3.8	9.9
13	9.0	.06	11	2.1	1.3	27	7.5	3.7	6.0	7.1	2.0	9.6
14	10	12	12	1.5	8.9	34	5.3	14	7.9	9.2	1.4	4.5
15	13	12	7.7	1.1	6.8	31	6.1	13	9.5	10	.98	5.3
16	13	8.3	4.7	1.8	3.7	26	5.3	8.0	6.2	10	.79	7.5
17	11	4.5	4.3	3.7	1.3	30	4.6	9.9	4.7	6.7	.94	6.9
18	13	15	7.5	1.7	.59	18	4.6	7.9	7.4	7.6	1.0	4.0
19	9.8	12	10	.71	.72	14	5.5	7.0	5.8	9.2	.83	3.5
20	4.9	8.9	10	.61	4.5	10	4.1	4.6	3.1	8.1	.79	3.2
21	2.7	7.6	8.5	.49	6.6	8.1	3.2	4.3	2.7	4.5	.55	2.0
22	2.0	4.1	8.9	.41	5.4	5.1	3.6	3.5	2.2	5.5	.42	1.4
23	4.6	8.7	6.9	5.1	2.0	3.5	3.1	2.5	1.7	3.3	.42	1.0
24	9.1	12	11	2.8	.85	2.2	10	2.2	1.4	7.0	.50	.75
25	9.6	6.4	9.6	1.6	1.6	1.6	11	2.0	7.0	4.1	.50	.51
26	7.3	3.8	4.3	.67	.70	1.3	9.5	5.3	10	1.2	2.0	.31
27	5.8	3.7	3.0	9.2	.25	6.2	9.7	10	8.1	.34	9.5	.22
28	2.6	3.6	2.2	15	.04	9.5	12	12	9.4	.25	13	.19
29	5.0	3.0	1.5	3.0	---	9.2	12	13	8.4	2.8	8.6	.23
30	11	2.3	1.2	1.3	---	9.9	13	11	7.7	4.9	4.0	.08
31	6.4	---	1.1	.75	---	10	---	9.5	---	1.4	3.6	---
TOTAL	229.3	138.08	221.54	84.08	46.53	325.89	248.6	221.7	184.7	145.29	102.62	136.49
MEAN	7.40	4.60	7.15	2.71	1.66	10.5	8.29	7.15	6.16	4.69	3.31	4.55
MAX	13	15	32	15	8.9	34	17	14	11	12	18	11
MIN	2.0	.06	.34	.23	.00	.00	3.0	2.0	1.4	.25	.42	.08
AC-FT	455	274	439	167	92	646	493	440	366	288	204	271

CAL YR 1990 TOTAL 2266.21 MEAN 6.21 MAX 32 MIN .00 AC-FT 4500
WTR YR 1991 TOTAL 2084.82 MEAN 5.71 MAX 34 MIN .00 AC-FT 4140

16724800 UPPER HAHAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.04	.01	.00	10	3.3	.01	.20	.00	.00	4.4	3.1	3.5
2	.02	.00	.00	11	.71	.00	2.0	.00	.00	3.3	5.5	22
3	.00	.00	.25	7.7	6.1	.00	5.1	.00	.00	3.2	2.2	17
4	.00	.00	5.4	3.2	9.2	.00	2.2	.01	.00	10	1.2	16
5	.00	.04	2.2	1.5	11	.00	.50	7.6	.00	9.1	1.3	35
6	.00	.00	6.0	.73	11	.00	.04	11	.00	5.0	1.5	22
7	1.3	.01	4.2	.38	9.2	.00	.00	7.8	.00	.46	7.5	6.8
8	2.9	.21	1.2	.18	4.3	.00	.00	3.2	.46	.01	4.1	4.1
9	.67	1.1	.37	.04	1.7	.00	.00	1.2	6.6	.21	2.6	3.9
10	.17	.10	.03	.00	.67	.00	.01	.14	7.5	.93	2.1	2.1
11	.01	.00	.00	.00	.47	.00	1.0	.00	6.0	1.1	11	2.1
12	.00	.00	.00	.00	1.6	.00	1.7	.00	3.3	1.3	5.0	2.1
13	.00	.00	.00	.00	4.4	.00	.32	.00	3.6	1.1	2.8	6.2
14	.00	.00	.00	.00	1.5	.00	.00	.00	1.4	.17	1.8	32
15	1.8	.00	.00	9.4	2.2	.00	.00	.00	3.9	.10	6.4	8.6
16	.82	.00	.00	4.6	.73	.13	.00	.00	3.3	1.6	16	6.9
17	.10	.00	.06	1.5	.14	.10	.00	.00	1.6	7.6	7.8	8.7
18	.00	.00	.00	.53	.01	.62	.00	.00	.81	7.3	2.6	8.2
19	.00	4.8	.14	6.5	.00	5.6	.00	.00	1.9	5.1	3.4	6.4
20	.00	3.8	1.6	4.5	.00	8.2	.00	.00	3.8	16	10	4.2
21	.00	1.2	3.2	1.4	.00	4.5	.00	.00	1.2	12	19	3.1
22	.02	5.0	.99	.44	.00	1.5	.00	.00	.65	12	7.3	2.1
23	.00	7.8	7.6	.10	.00	.55	.00	.00	4.8	9.6	15	8.7
24	.00	3.9	3.6	.01	.00	.60	.00	.00	6.5	2.2	16	6.4
25	.01	4.1	4.5	.00	.00	8.8	.00	.00	9.1	18	11	16
26	.00	1.5	17	.00	.00	7.5	.00	.00	11	29	15	28
27	.00	.45	9.5	.00	.00	3.1	.00	.00	11	32	6.2	17
28	.00	.08	9.4	.00	.00	1.1	.00	.00	10	13	9.7	7.1
29	.00	.00	10	.00	.01	1.7	.01	.00	5.3	4.7	18	4.6
30	.00	.00	7.1	.47	---	3.7	.01	.00	2.9	4.7	7.2	3.9
31	.01	---	11	8.0	---	.82	---	.00	---	4.4	4.4	---
TOTAL	7.87	34.10	105.34	72.18	68.24	48.53	13.09	30.95	106.62	219.58	226.7	314.7
MEAN	.25	1.14	3.40	2.33	2.35	1.57	.44	1.00	3.55	7.08	7.31	10.5
MAX	2.9	7.8	17	11	11	8.8	5.1	11	11	32	19	35
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	1.2	2.1
AC-FT	16	68	209	143	135	96	26	61	211	436	450	624

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1992, BY WATER YEAR (WY)

MEAN	3.38	4.26	3.86	3.76	2.95	5.62	7.24	5.30	5.52	7.54	6.34	3.95
MAX	9.75	12.0	12.0	10.6	14.5	23.2	17.7	14.0	10.7	15.8	15.7	10.5
(WY)	1984	1973	1971	1979	1969	1973	1970	1970	1970	1982	1982	1992
MIN	.000	.95	.17	.088	.062	.76	.44	1.00	.55	.49	.55	.33
(WY)	1985	1990	1981	1981	1980	1984	1992	1992	1980	1980	1980	1984

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1968 - 1992	
ANNUAL TOTAL	1643.21		1247.90			
ANNUAL MEAN	4.50		3.41		4.99	
HIGHEST ANNUAL MEAN					9.03	1973
LOWEST ANNUAL MEAN					1.85	1980
HIGHEST DAILY MEAN	34	Mar 14	35	Sep 5	41	Aug 18 1972
LOWEST DAILY MEAN	.00	Feb 6	.00	Oct 3	.00	Oct 11 1968
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 6	.00	Nov 11	.00	Oct 11 1968
ANNUAL RUNOFF (AC-FT)	3260		2480		3620	
10 PERCENT EXCEEDS	10		10		13	
50 PERCENT EXCEEDS	3.2		.77		2.8	
90 PERCENT EXCEEDS	.00		.00		.00	

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.3	1.3	5.6	14	1.2	.35	1.8	20	19	8.5	6.4	2.5
2	2.6	.87	10	7.7	.62	18	1.4	17	19	17	12	1.3
3	1.9	2.0	7.1	3.3	.35	20	5.7	22	9.5	14	18	.81
4	1.4	1.3	5.5	7.2	.21	13	4.2	13	12	21	8.1	.57
5	1.2	1.2	15	24	.11	11	9.4	19	19	7.3	5.7	.40
6	.94	5.1	10	26	.11	22	9.6	12	16	4.3	6.5	.30
7	.75	4.8	9.4	17	.10	18	24	12	13	5.2	9.2	.21
8	.75	2.5	6.9	9.0	.08	12	15	21	18	3.0	13	.14
9	.58	9.8	26	5.0	.08	15	7.7	20	16	2.7	15	.72
10	.44	9.9	23	3.0	.07	18	12	24	18	2.1	21	.67
11	.33	3.7	16	2.1	.11	16	4.9	12	18	1.7	22	2.6
12	.80	2.4	12	1.7	.11	5.8	4.8	7.6	17	1.3	17	6.0
13	.58	11	5.4	1.2	.05	3.9	4.2	6.7	10	1.2	23	5.4
14	.30	18	3.5	1.3	.05	3.6	3.6	3.5	5.5	.95	25	1.6
15	.17	23	2.3	5.2	.04	14	7.7	3.9	3.4	4.8	18	.74
16	.13	8.5	5.3	12	.04	5.3	4.9	4.9	8.4	6.1	26	.41
17	.11	4.5	3.2	11	.04	9.5	4.5	5.3	11	11	10	.33
18	.10	2.9	2.7	4.3	.04	5.6	3.9	4.8	19	13	5.4	1.1
19	.07	1.6	1.6	4.1	.03	2.5	4.2	8.7	17	21	10	1.7
20	.06	1.1	.68	4.6	.03	6.8	30	6.4	9.8	18	11	5.8
21	.03	.76	1.5	3.4	.88	7.5	32	4.9	5.4	28	5.3	2.9
22	.03	1.3	12	2.2	1.9	3.4	30	3.1	8.6	26	7.2	.93
23	.35	12	8.3	1.4	1.4	12	16	1.4	8.7	27	14	2.0
24	1.3	8.9	3.8	.99	2.5	6.1	12	3.7	5.4	27	15	7.8
25	1.1	5.3	2.7	.70	5.5	2.4	11	6.1	17	23	12	2.2
26	10	11	1.9	.50	4.9	1.3	10	3.6	21	18	5.7	1.1
27	11	4.4	1.6	.33	1.9	4.6	5.9	6.7	21	32	4.7	.56
28	11	3.6	1.3	.19	.88	7.4	5.4	8.9	20	19	4.8	.31
29	7.3	6.2	1.3	3.7	---	2.8	4.8	4.3	17	16	2.4	.22
30	3.4	9.7	1.1	7.7	---	9.1	16	1.9	12	21	1.6	3.8
31	2.6	---	.75	2.6	---	4.4	---	2.0	---	11	1.2	---
TOTAL	64.62	178.63	207.43	187.41	23.33	281.35	306.6	290.4	414.7	412.15	356.2	55.12
MEAN	2.08	5.95	6.69	6.05	.83	9.08	10.2	9.37	13.8	13.3	11.5	1.84
MAX	11	23	26	26	5.5	22	32	24	21	32	26	7.8
MIN	.03	.76	.68	.19	.03	.35	1.4	1.4	3.4	.95	1.2	.14
AC-FT	128	354	411	372	46	558	608	576	823	817	707	109

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1993, BY WATER YEAR (WY)

MEAN	3.33	4.33	3.97	3.85	2.87	5.76	7.36	5.46	5.84	7.77	6.54	3.87
MAX	9.75	12.0	12.0	10.6	14.5	23.2	17.7	14.0	13.8	15.8	15.7	10.5
(WY)	1984	1973	1971	1979	1969	1973	1970	1970	1993	1982	1982	1992
MIN	.000	.95	.17	.088	.062	.76	.44	1.00	.55	.49	.55	.33
(WY)	1985	1990	1981	1981	1980	1984	1992	1992	1980	1980	1980	1984

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1968 - 1993	
ANNUAL TOTAL	1551.27		2777.94			
ANNUAL MEAN	4.24		7.61		5.10	
HIGHEST ANNUAL MEAN					9.03	1973
LOWEST ANNUAL MEAN					1.85	1980
HIGHEST DAILY MEAN	35	Sep 5	32	Apr 21	41	Aug 18 1972
LOWEST DAILY MEAN	.00	Jan 10	.03	Oct 21	.00	Oct 11 1968
ANNUAL SEVEN-DAY MINIMUM	.00	Feb 19	.04	Feb 14	.00	Oct 11 1968
ANNUAL RUNOFF (AC-FT)	3080		5510		3690	
10 PERCENT EXCEEDS	11		19		13	
50 PERCENT EXCEEDS	1.7		5.2		2.9	
90 PERCENT EXCEEDS	.00		.35		.00	

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	5.4	9.2	.46	.72	.84	2.4	15	4.1	17	e7.0	15
2	.55	2.2	6.5	.37	.57	.48	2.0	19	9.9	13	e8.0	15
3	.29	1.2	13	2.2	2.9	.28	6.5	10	17	17	e8.5	12
4	.14	.71	14	2.6	11	.15	15	12	18	15	e7.8	14
5	.06	1.9	21	1.5	19	.07	11	13	11	16	7.3	13
6	.02	9.1	23	6.1	16	.05	12	8.5	6.3	14	9.9	11
7	.02	9.6	14	7.7	12	.04	15	4.7	6.2	9.0	8.8	11
8	.02	7.7	16	2.5	7.6	.04	13	3.3	7.3	6.2	7.0	5.4
9	.02	16	11	1.5	5.8	.04	9.6	2.1	3.7	7.6	6.3	8.3
10	.03	6.1	12	1.0	9.7	.04	6.4	1.4	3.2	8.0	5.7	15
11	.88	2.7	12	.68	14	.95	14	.99	3.6	5.3	13	15
12	5.8	1.5	21	.45	9.7	23	31	.81	10	10	19	21
13	8.6	4.6	17	.31	3.3	26	19	5.9	10	16	13	14
14	4.0	7.5	10	.22	7.4	28	10	5.6	8.6	11	7.2	8.7
15	1.5	8.9	15	.13	5.0	28	9.5	11	14	19	7.6	8.4
16	1.2	4.6	15	.12	5.4	21	6.0	8.8	23	16	11	6.3
17	6.6	13	12	1.4	2.5	21	4.7	8.5	23	14	7.3	17
18	5.2	15	8.8	4.3	4.1	20	14	7.4	12	13	15	15
19	2.0	11	20	10	1.7	23	23	9.0	13	22	13	9.0
20	.73	4.9	15	19	1.0	25	28	8.6	12	18	9.7	5.2
21	.82	5.1	7.6	22	.62	26	32	4.7	12	18	6.1	3.1
22	4.2	6.2	4.1	17	.39	20	21	4.9	14	14	10	2.7
23	7.2	12	5.5	10	.26	25	19	8.3	17	16	19	4.9
24	4.8	15	6.3	13	.19	26	16	7.0	14	18	15	3.0
25	2.4	7.4	5.3	13	2.6	40	13	6.4	18	10	7.2	1.8
26	15	12	2.9	11	7.1	26	21	6.3	16	7.4	5.7	1.3
27	5.1	16	2.0	4.4	1.8	14	14	5.5	21	9.5	12	.94
28	3.7	13	1.6	2.8	1.0	11	13	9.6	24	5.7	5.7	.75
29	6.2	11	1.2	2.0	---	12	7.0	8.8	15	4.7	2.7	.49
30	9.1	13	.89	1.3	---	5.8	9.2	4.4	14	e4.3	1.9	.33
31	9.5	---	.66	.94	---	3.6	---	4.4	---	e5.5	7.8	---
TOTAL	107.08	244.31	323.55	159.98	153.35	427.38	417.3	225.90	380.9	380.2	285.2	258.61
MEAN	3.45	8.14	10.4	5.16	5.48	13.8	13.9	7.29	12.7	12.3	9.20	8.62
MAX	15	16	23	22	19	40	32	19	24	22	19	21
MIN	.02	.71	.66	.12	.19	.04	2.0	.81	3.2	4.3	1.9	.33
AC-FT	212	485	642	317	304	848	828	448	756	754	566	513

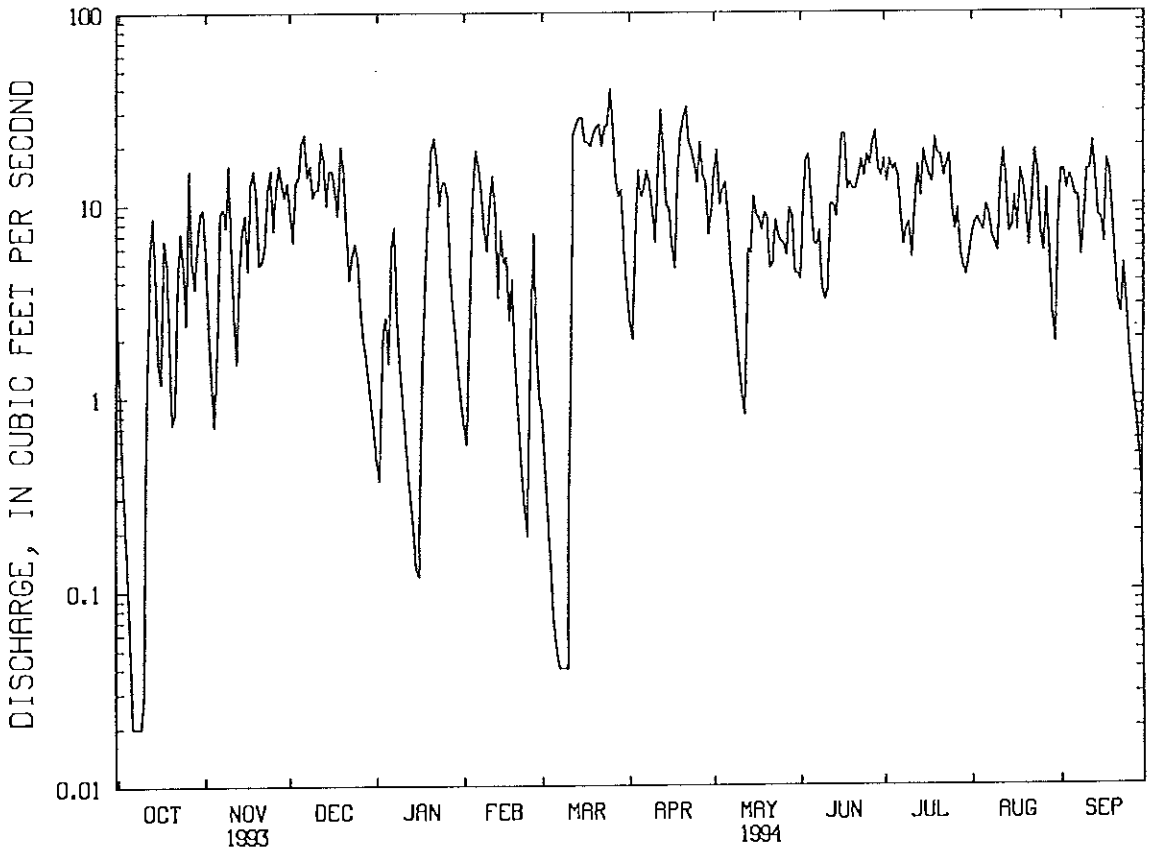
e Estimated

16724800 UPPER HAMAKUA DITCH ABOVE ALAKAHI STREAM, NEAR KAMUELA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1968 - 1994, BY WATER YEAR (WY)

MEAN	3.34	4.48	4.22	3.90	2.97	6.06	7.60	5.52	6.09	7.93	6.64	4.05
MAX	9.75	12.0	12.0	10.6	14.5	23.2	17.7	14.0	13.8	15.8	15.7	10.5
(WY)	1984	1973	1971	1979	1969	1973	1970	1970	1993	1982	1982	1992
MIN	.000	.95	.17	.088	.062	.76	.44	1.00	.55	.49	.55	.33
(WY)	1985	1990	1981	1981	1980	1984	1992	1992	1980	1980	1980	1984

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1968 - 1994	
ANNUAL TOTAL	3002.20		3363.76			
ANNUAL MEAN	8.23		9.22		5.25	
HIGHEST ANNUAL MEAN					9.22	1994
LOWEST ANNUAL MEAN					1.85	1980
HIGHEST DAILY MEAN	32	Apr 21	40	Mar 25	41	Aug 18 1972
LOWEST DAILY MEAN	.02	Oct 6	.02	Oct 6	.00	Oct 11 1968
ANNUAL SEVEN-DAY MINIMUM	.04	Feb 14	.04	Oct 4	.00	Oct 11 1968
ANNUAL RUNOFF (AC-FT)	5950		6670		3810	
10 PERCENT EXCEEDS	19		19		13	
50 PERCENT EXCEEDS	5.8		8.3		3.1	
90 PERCENT EXCEEDS	.41		.73		.01	



16725000 ALAKAHI STREAM NEAR KAMUELA

LOCATION.--Lat 20°04'27", long 155° 40'25", Hydrologic Unit 20010000, on right bank 25 ft upstream from upper Hamakua ditch intake and 3.5 mi north of Kamuela.

DRAINAGE AREA.--0.87 mi^2.

PERIOD OF RECORD.--January 1964 to current year.

GAGE.--Stevens digital and graphic water-stage recorders. Elevation of gage is 3,900 ft, from topographic map.

REMARKS.--For water year 1991, records poor except for estimated daily discharges which are very poor. For water years 1992-94, records fair except for estimated daily discharges which are poor. Parker Ranch pipeline diverts from tributary 0.4 mi upstream for ranch use in Kamuela area.

AVERAGE DISCHARGE.--Water year 1991: 27 years, 7.54 ft^3/s (5,460 acre-ft/yr).

Water year 1992: 28 years, 7.50 ft^3/s (5,430 acre-ft/yr).

Water year 1993: 29 years, 7.53 ft^3/s (5,460 acre-ft/yr).

Water year 1994: 30 years, 7.73 ft^3/s (5,600 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,330 ft^3/s, Nov. 18, 1979, gage height, 12.80 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 12.80 ft; minimum, 0.03 ft^3/s on several days in 1965.

EXTREMES FOR CURRENT YEAR.--Water year 1991. 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. 9	0100	230	5.03	Mar. 12	unknown	288	5.50
Jan. 27	2330	*637	*7.82	Aug. 7	--	unknown	unknown

Minimum discharge, 0.43 ft^3/s, Feb. 13.

Water year 1992. 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)
Sep. 14	0615	*500	*6.98	No other peak greater than base discharge.			

Minimum discharge, 0.18 ft^3/s, Mar. 13, June 3-5.

Water year 1993. 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)
Jan. 6	2130	*292	*5.53	No other peak greater than base discharge.			

Minimum discharge, 0.14 ft^3/s, Feb. 17-19.

Water year 1994. 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)
Oct. 26	0320	212	4.88	Mar. 25	0900	*279	*5.43
Feb. 10	1700	198	4.76				

Minimum discharge, 0.43 ft^3/s, Oct. 8-10.

REVISIONS.--The peak discharges above base of 180 ft^3/s and annual maximum (*) for water years 1964-90 have been revised. Daily discharges, in cubic feet per second, for water years 1964-90, have also been revised. These figures supersede those published in annual reports for water years 1964-90.

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

EXTREMES FOR WATER YEARS 1964-90.--Peak discharges above base of 180 ft^3/s and maximum (*):

Water year	Date	Time	Discharge (ft^3/s)	Gage height (ft)
1964	Feb. 24, 1964	0015	*198	*4.46
1965	July 11, 1965	1600	*254	*4.80
1966	July 24, 1966	1615	189	4.40
	Aug. 24, 1966	1700	*588	*6.28
1967	Dec. 19, 1966	0030	198	4.46
	Dec. 27, 1966	1100	412	5.58
	Jan. 11, 1967	1900	*1,430	*8.65
1968	Feb. 17, 1968	1600	291	5.00
	Apr. 6, 1968	1430	224	4.62
	Apr. 10, 1968	1915	464	5.80
	Apr. 18, 1968	1900	249	4.77
	Apr. 20, 1968	2330	*846	*7.13
1969	Mar. 17, 1969	2330	*265	*4.86
1970	Dec. 5, 1969	0145	*303	*5.06
	Jan. 6, 1970	1345	198	4.46
	Apr. 23, 1970	1100	260	4.83
	July 10, 1970	0030	200	4.47
	Aug. 26, 1970	0145	240	4.72
1971	Nov. 5, 1970	1445	*556	*6.16
	Dec. 5, 1970	0945	246	4.75
	Dec. 19, 1970	2230	193	4.43
	Dec. 27, 1970	2200	222	4.61
	Apr. 18, 1971	2015	207	4.52
1972	Apr. 10, 1972	0900	206	4.51
	Aug. 31, 1972	1530	*366	*5.37
1973	Feb. 21, 1973	0500	*120	*3.89
1974	Nov. 12, 1973	0900	210	4.54
	Jan. 7, 1974	1430	210	4.54
	Mar. 19, 1974	1500	*424	*5.63
	Apr. 16, 1974	0315	193	4.43
1975	Oct. 20, 1974	1545	*613	*6.37
1976	Apr. 3, 1976	1230	*122	*3.91
1977	Apr. 20, 1977	1815	*162	*4.22
1978	June 23, 1978	1800	*141	*4.06
1979	Jan. 14, 1979	2230	217	4.58
	Jan. 23, 1979	1130	*349	*5.29
1980	Nov. 18, 1979	0330	*1,330	*12.80
	Jan. 9, 1980	1330	828	10.92
	Mar. 14, 1980	0830	192	5.43
	Mar. 17, 1980	0630	663	9.73
	Mar. 24, 1980	0130	747	10.35
	Apr. 2, 1980	0430	376	7.35
1981	Oct. 31, 1980	0115	*233	*5.90
1982	Nov. 24, 1981	0830	226	5.82
	Jan. 9, 1982	0130	*754	*10.40
	Jan. 27, 1982	0030	405	7.62
	Feb. 11, 1982	2030	501	8.45
1983	Dec. 18, 1982	1830	*414	*7.70
	May 31, 1983	1500	270	6.31
1984	Oct. 16, 1983	0930	188	5.38
	Oct. 24, 1983	1800	213	5.68
	Oct. 27, 1983	0130	227	5.84
	Dec. 26, 1983	0900	*391	*7.49
	Jan. 29, 1984	1930	182	5.31
1985	Mar. 6, 1985	1700	*296	*6.57
1986	Feb. 16, 1986	0300	198	5.50
	Mar. 20, 1986	2330	412	6.40
	Mar. 23, 1986	1700	427	6.50
	Apr. 5, 1986	1800	212	4.88
	Apr. 8, 1986	1230	432	6.53
	Apr. 10, 1986	1130	*448	*6.64
	May. 6, 1986	1600	288	5.50
1987	Dec. 6, 1986	0730	184	4.63
	Jan. 12, 1987	0730	199	4.77
	Jan. 18, 1987	2300	*350	*5.96
	Apr. 1, 1987	0230	226	5.00
	Apr. 22, 1987	0230	331	5.82
1988	Nov. 21, 1987	0130	*608	*7.65
1989	Feb. 3, 1989	0800	548	7.28
	Apr. 7, 1989	2000	*1,100	*10.28
	Apr. 28, 1989	1830	522	7.12
	Aug. 20, 1989	0430	203	4.80
1990	Sep. 17, 1990	0330	*197	*4.75

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1963 TO SEPTEMBER 1964
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	.46	.68	6.2	2.7	17	.93	14	4.6	3.1
2	---	---	---	3.1	.53	17	1.7	11	.84	11	52	4.6
3	---	---	---	3.9	.48	9.3	1.3	5.4	.68	3.9	12	2.3
4	---	---	---	.93	.53	7.0	1.1	7.7	.63	4.6	4.6	3.9
5	---	---	---	.62	.48	3.9	1.2	29	1.6	15	3.1	6.2
6	---	---	---	1.9	.56	2.3	1.5	7.7	1.6	4.6	2.3	4.6
7	---	---	---	2.3	1.3	9.3	2.5	9.9	1.1	3.1	1.9	12
8	---	---	---	1.4	7.7	15	3.4	3.5	3.4	1.6	7.7	10
9	---	---	---	.56	22	3.9	12	2.7	2.4	1.2	23	11
10	---	---	---	.45	22	2.9	15	13	1.7	.93	6.2	4.6
11	---	---	---	.45	14	5.4	12	9.0	1.3	1.6	9.3	6.2
12	---	---	---	.59	5.7	7.7	22	10	.84	3.9	15	4.2
13	---	---	---	.56	29	3.1	3.9	42	.56	4.6	7.4	9.3
14	---	---	---	.39	72	2.2	2.3	7.5	19	23	3.3	7.0
15	---	---	---	.39	39	2.6	1.4	3.2	11	36	2.3	3.1
16	---	---	---	22	7.2	6.5	.93	1.8	7.0	2.3	9.3	23
17	---	---	---	16	2.4	2.7	5.4	1.2	4.6	1.7	5.4	48
18	---	---	---	12	1.6	1.6	2.5	1.1	3.1	7.0	6.2	19
19	---	---	---	3.0	2.4	1.3	3.9	15	1.4	23	3.1	3.9
20	---	---	---	2.3	12	1.9	4.6	77	9.3	20	1.9	3.1
21	---	---	---	1.6	9.7	2.3	3.4	10	29	32	1.6	4.6
22	---	---	---	1.2	30	1.3	9.3	5.5	9.3	6.2	1.2	3.1
23	---	---	---	.68	32	2.3	11	54	17	32	1.1	1.6
24	---	---	---	.84	22	14	20	54	3.1	7.7	.93	1.1
25	---	---	---	5.8	9.9	6.3	48	57	4.6	3.9	.77	.93
26	---	---	---	6.9	2.6	3.0	25	39	6.2	1.9	.77	.77
27	---	---	---	34	23	2.2	3.1	8.4	3.1	1.6	.62	19
28	---	---	---	3.5	4.6	20	15	2.6	6.2	5.4	2.3	22
29	---	---	---	1.7	2.3	10	11	1.9	22	12	1.2	23
30	---	---	---	1.1	---	25	2.6	1.4	9.3	48	7.7	2.3
31	---	---	---	.99	---	5.7	---	1.1	---	7.0	29	---
TOTAL	---	---	---	131.61	377.66	203.9	249.73	509.6	182.78	340.73	227.79	267.50
MEAN	---	---	---	4.25	13.0	6.58	8.32	16.4	6.09	11.0	7.35	8.92
MAX	---	---	---	34	72	25	48	77	29	48	52	48
MIN	---	---	---	.39	.48	1.3	.93	1.1	.56	.93	.62	.77
AC-FT	---	---	---	261	749	404	495	1010	363	676	452	531

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1964 TO SEPTEMBER 1965
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	7.6	.43	.19	2.3	1.2	.43	.36	12	.84	.39	.20
2	3.9	9.9	.50	.12	1.3	15	.39	12	23	.59	.31	.19
3	6.2	12	.97	.12	2.3	51	.34	7.4	6.9	.39	.28	.17
4	4.6	5.1	1.1	.11	1.2	21	3.7	6.5	3.0	.25	.25	.15
5	29	18	.71	.11	.80	4.1	24	4.3	11	.23	.20	.17
6	8.5	33	.50	.09	.59	3.4	46	6.2	22	.20	.19	.15
7	12	21	.43	.08	.43	2.7	14	7.4	11	.28	.19	.12
8	4.6	36	.43	.08	.28	2.9	21	4.6	7.7	.68	13	.11
9	2.3	9.0	2.1	.06	.23	2.0	16	8.2	2.4	1.9	19	.11
10	2.8	25	3.2	.14	.19	1.3	3.9	3.2	1.3	8.0	7.7	.09
11	2.2	32	11	.43	.15	.93	2.1	1.0	9.9	36	1.7	.11
12	.93	18	42	.19	.15	3.3	1.3	.45	9.9	8.0	8.8	.12
13	.77	3.7	3.3	.12	.12	1.6	.80	.31	3.2	1.7	9.8	.09
14	.62	2.2	2.0	.11	.11	.93	.65	.20	1.9	1.5	1.3	.11
15	4.6	1.6	1.3	.09	.43	3.6	.46	.17	.84	7.9	4.2	.09
16	11	1.2	1.0	.08	2.7	3.6	.39	.12	.84	7.0	2.9	.06
17	3.9	1.0	9.2	.06	9.9	1.4	.39	.11	.88	25	.93	.06
18	1.6	.97	1.8	.05	3.8	.76	.34	.06	.56	14	.48	.06
19	15	2.5	5.7	.05	15	.59	.34	.05	2.0	3.6	.39	.05
20	19	2.0	3.3	.05	20	.43	.34	.05	14	17	.31	.05
21	48	1.5	1.2	.05	11	.39	.34	.05	5.5	22	.25	.05
22	15	1.0	.71	25	7.3	6.9	.34	.03	2.0	8.7	.23	.03
23	29	.93	.46	40	2.9	8.6	.19	.03	1.2	2.5	.23	.03
24	9.7	.80	.39	7.6	2.0	8.8	.15	.03	.74	2.9	.23	.05
25	17	.65	.23	2.3	7.3	19	.14	.12	.45	1.3	.42	.05
26	23	.54	.19	2.5	2.6	2.8	.14	.79	.31	.84	.50	.03
27	13	.50	.19	1.8	5.1	1.3	.12	1.9	.28	.53	.31	.03
28	2.7	.46	.15	.97	2.1	.80	.12	.84	3.3	.84	.25	.03
29	1.7	.39	.15	3.7	---	.71	.12	5.7	2.2	.79	.23	.03
30	1.3	.43	.14	3.2	---	.76	.11	3.8	.88	.48	.25	.03
31	3.4	---	.19	12	---	.54	---	.88	---	.42	.20	---
TOTAL	298.52	248.97	94.97	101.45	102.28	172.34	138.64	76.85	161.18	176.36	75.42	2.62
MEAN	9.63	8.30	3.06	3.27	3.65	5.56	4.62	2.48	5.37	5.69	2.43	.087
MAX	48	36	42	40	20	51	46	12	23	36	19	.20
MIN	.62	.39	.14	.05	.11	.39	.11	.03	.28	.20	.19	.03
AC-FT	592	494	188	201	203	342	275	152	320	350	150	5.2

CAL YR 1964 TOTAL 3133.76 MEAN 8.56 MAX 77 MIN .14 AC-FT 6220
WTR YR 1965 TOTAL 1649.60 MEAN 4.52 MAX 51 MIN .03 AC-FT 3270

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1965 TO SEPTEMBER 1966
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.05	12	5.7	12	1.4	.93	.31	.36	17	14	2.2	1.5
2	.05	3.1	45	25	.99	.84	.31	12	6.0	15	1.7	1.2
3	.05	6.3	14	17	.74	1.3	.31	9.9	8.8	19	5.6	1.1
4	.03	4.5	12	9.1	.59	1.5	.39	2.5	5.4	25	19	2.8
5	.03	2.6	9.6	4.6	.56	.93	2.0	.99	2.5	13	5.3	4.6
6	.03	1.3	52	8.0	.53	.93	15	.48	1.0	12	17	8.2
7	13	.74	59	13	2.3	.63	10	.74	.59	20	17	2.3
8	15	.93	19	2.8	7.7	.56	9.6	3.1	.48	3.4	19	1.5
9	9.4	9.0	9.0	1.7	9.1	.48	3.9	8.8	3.1	6.8	3.9	13
10	4.0	3.9	7.4	2.9	2.3	.42	1.9	2.5	3.7	8.0	14	17
11	1.9	2.0	17	1.9	1.6	1.1	1.0	1.1	2.5	4.9	14	9.1
12	1.7	1.3	5.7	1.3	3.1	1.5	.59	.93	1.3	1.9	6.2	15
13	.79	1.4	3.1	1.0	1.4	1.3	.48	.68	4.3	1.7	20	4.2
14	.59	6.8	2.2	.88	1.9	9.8	.53	.68	36	3.2	11	40
15	.48	48	3.6	1.0	23	40	9.9	.53	6.2	3.9	7.7	15
16	1.4	23	9.0	1.3	36	8.0	4.5	1.1	2.2	9.1	33	6.8
17	2.3	6.7	17	2.9	36	2.5	7.9	1.4	1.9	32	37	4.2
18	1.7	5.6	12	4.5	25	12	2.0	.53	1.1	20	6.2	13
19	1.0	14	11	2.9	7.9	29	.79	.28	1.7	6.8	6.0	33
20	.59	36	22	1.9	2.9	14	.45	.23	7.9	3.4	15	4.9
21	.48	15	37	2.5	4.0	6.0	.36	.25	33	12	4.9	2.5
22	.39	22	5.6	15	3.3	2.6	.25	.23	19	4.8	3.9	1.5
23	.48	11	2.8	e5.0	2.0	1.6	.20	.20	9.0	2.8	1.9	1.2
24	.45	4.0	1.9	e2.0	1.6	1.1	.20	.19	19	23	96	1.1
25	.36	2.8	2.3	33	1.9	.80	.20	.17	12	5.6	25	.91
26	.28	12	2.8	11	3.6	.63	6.7	.19	49	4.3	11	.74
27	.19	25	1.7	2.8	3.1	.59	7.0	.45	25	9.9	19	.65
28	.19	22	2.0	33	1.4	.48	3.3	.39	13	2.8	10	.82
29	.15	4.5	9.0	32	---	.42	1.4	.48	19	1.5	12	.91
30	.11	2.8	12	5.0	---	.39	.56	.48	37	1.9	6.5	.65
31	17	---	7.7	2.3	---	.39	---	11	---	4.9	4.5	---
TOTAL	74.17	310.27	420.1	259.28	185.91	142.72	92.03	62.86	348.67	296.6	455.5	209.38
MEAN	2.39	10.3	13.6	8.36	6.64	4.60	3.07	2.03	11.6	9.57	14.7	6.98
MAX	17	48	59	33	36	40	15	12	49	32	96	40
MIN	.03	.74	1.7	.88	.53	.39	.20	.17	.48	1.5	1.7	.65
AC-FT	147	615	833	514	369	283	183	125	692	588	903	415

CAL YR 1965 TOTAL 1811.68 MEAN 4.96 MAX 59 MIN .03 AC-FT 3590
WTR YR 1966 TOTAL 2857.49 MEAN 7.83 MAX 96 MIN .03 AC-FT 5670

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1966 TO SEPTEMBER 1967
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.53	1.7	.60	16	.46	13	26	9.8	1.4	1.5	2.1	.85
2	.46	1.0	.50	11	.42	17	33	3.8	.90	.85	4.7	.70
3	.39	.75	.46	25	.42	4.0	16	1.7	.65	.60	21	.65
4	.36	.70	.36	72	.39	3.6	4.4	1.2	.56	2.2	6.7	.65
5	.36	2.9	.32	30	.36	7.6	14	1.0	.50	8.2	3.4	2.0
6	20	2.9	.32	11	.36	3.1	16	.95	.42	6.8	4.6	1.7
7	11	2.0	.39	6.5	.32	2.0	8.6	1.3	.53	37	19	3.4
8	3.1	1.0	.60	8.9	.32	1.3	6.6	.90	.50	20	24	3.2
9	1.7	2.9	4.1	20	7.1	1.2	3.8	.70	.46	4.6	4.2	11
10	2.2	2.1	25	7.7	3.1	3.3	13	.65	.42	4.7	2.7	9.4
11	1.7	2.5	15	167	2.1	14	9.6	1.5	.42	7.7	2.0	4.9
12	1.2	2.6	11	16	5.9	5.9	2.7	4.9	.39	16	2.3	3.4
13	.90	1.2	6.6	e5.7	5.6	2.4	1.9	6.1	.36	6.2	10	2.0
14	1.1	.85	15	e3.8	2.4	1.5	1.4	3.3	.32	12	6.4	3.0
15	6.8	.95	4.8	e2.6	1.6	1.1	1.2	2.4	.39	40	6.4	1.2
16	8.4	2.4	3.6	e3.5	1.4	.90	1.0	2.0	.50	49	8.7	.90
17	17	1.3	3.2	9.8	1.2	1.7	20	1.2	.65	21	4.8	.75
18	9.6	.80	17	9.8	.90	5.6	2.8	.85	2.6	9.8	15	2.0
19	40	.90	68	7.9	.80	8.2	1.7	.60	1.0	4.3	3.8	1.2
20	11	.85	57	4.6	2.5	5.8	1.1	.53	.95	4.1	2.3	.85
21	2.7	.60	42	3.2	4.2	12	.90	.42	3.3	8.2	1.9	.80
22	1.8	.56	6.6	2.4	2.1	11	.75	.39	1.4	19	1.4	.75
23	1.2	.50	3.5	1.7	5.2	4.0	.75	.50	.75	11	1.2	.70
24	1.0	14	2.4	1.3	4.3	2.2	.85	.46	1.4	4.1	1.0	.60
25	17	6.8	1.8	1.1	2.0	2.0	.75	.42	1.4	7.3	1.2	.53
26	10	6.1	9.1	.95	1.1	21	.70	29	14	17	4.9	.56
27	4.7	11	37	.80	8.4	40	1.4	15	8.4	33	4.2	.65
28	2.0	2.3	8.4	.65	54	14	2.6	9.2	23	7.2	2.0	.70
29	1.3	1.2	4.6	.60	---	4.2	7.9	3.6	7.1	19	1.2	.56
30	.90	.90	e2.3	.56	---	17	5.2	2.4	3.4	10	.95	.65
31	1.1	---	e2.1	.50	---	32	---	2.4	---	3.4	1.0	---
TOTAL	181.50	76.26	353.65	452.56	118.95	262.60	206.60	109.17	78.07	395.75	175.05	60.25
MEAN	5.85	2.54	11.4	14.6	4.25	8.47	6.89	3.52	2.60	12.8	5.65	2.01
MAX	40	14	68	167	54	40	33	29	23	49	24	11
MIN	.36	.50	.32	.50	.32	.90	.70	.39	.32	.60	.95	.53
AC-FT	360	151	701	898	236	521	410	217	155	785	347	120

CAL YR 1966 TOTAL 2664.36 MEAN 7.30 MAX 96 MIN .17 AC-FT 5280
WTR YR 1967 TOTAL 2470.41 MEAN 6.77 MAX 167 MIN .32 AC-FT 4900

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1967 TO SEPTEMBER 1968
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.0	16	9.9	.42	.75	.56	6.8	8.9	1.1	1.6	1.8	6.2
2	1.0	126	33	2.5	.53	.53	15	9.4	1.0	1.2	2.6	2.6
3	.70	90	13	2.2	1.2	39	52	18	.90	.95	5.2	2.5
4	.60	20	25	16	1.6	46	13	4.8	3.7	.75	5.2	1.2
5	.50	15	16	5.4	.95	8.2	4.7	5.2	4.8	.60	8.0	.80
6	.50	18	26	3.3	.53	3.0	19	3.5	3.1	.56	3.0	.80
7	.42	25	20	2.0	.46	1.6	19	2.4	1.9	.53	4.6	.70
8	.39	4.0	3.3	1.4	.42	1.2	9.6	2.0	1.7	.53	2.5	.65
9	.25	6.0	7.6	1.1	.35	.95	8.4	1.7	4.0	.53	2.0	.50
10	.23	23	20	.85	.31	.75	84	1.6	8.0	.53	15	.39
11	.23	23	3.6	.65	.29	.65	37	1.4	3.8	.53	15	.58
12	.28	8.6	4.3	.53	.25	.56	7.9	1.4	2.1	.50	15	1.2
13	.53	3.8	9.6	.46	.31	.70	3.3	4.0	1.6	4.4	6.3	.57
14	.53	2.5	18	.42	.39	1.2	2.5	6.1	7.7	22	23	.53
15	.46	1.9	3.2	.39	.36	56	12	3.4	2.6	16	3.5	9.1
16	.39	1.4	2.0	.39	3.8	18	6.6	4.1	2.5	3.3	2.2	5.4
17	.28	1.2	1.5	18	64	6.3	4.4	2.3	8.4	7.7	1.7	1.7
18	.28	.95	1.2	4.4	22	2.7	23	2.9	6.4	8.0	1.8	.85
19	.32	.85	1.0	17	3.6	30	8.9	62	15	6.1	1.0	.65
20	.28	2.8	.95	3.0	2.0	32	65	45	4.4	4.6	.75	2.6
21	.28	3.4	.95	1.8	10	8.8	e9.2	5.2	2.4	4.4	.67	3.1
22	6.5	17	.95	1.2	5.4	5.9	e3.2	2.9	7.0	5.6	.71	1.2
23	3.8	4.1	.75	.90	2.2	23	3.1	2.2	6.6	5.4	2.3	1.0
24	1.7	2.4	.65	.70	1.3	40	9.2	1.7	9.2	4.8	1.0	5.8
25	1.2	1.7	.65	.95	.90	8.2	10	1.7	5.6	3.2	.88	7.1
26	.90	13	.70	15	1.7	6.4	7.1	1.7	8.0	1.8	1.0	8.4
27	.95	7.3	.56	6.8	1.0	3.6	7.0	2.0	6.5	1.4	.85	3.2
28	.65	3.2	.53	8.9	1.0	2.2	37	2.0	7.7	3.6	.70	4.7
29	.75	7.2	.53	4.0	.80	19	24	1.5	3.5	5.4	1.9	11
30	.60	2.4	.50	1.9	---	59	13	1.5	2.2	4.3	2.4	4.8
31	49	---	.46	1.2	---	33	---	1.4	---	2.6	8.1	---
TOTAL	77.50	451.70	226.38	123.76	128.40	459.00	524.9	213.9	143.40	123.41	140.66	89.82
MEAN	2.50	15.1	7.30	3.99	4.43	14.8	17.5	6.90	4.78	3.98	4.54	2.99
MAX	49	126	33	18	64	59	84	62	15	22	23	11
MIN	.23	.85	.46	.39	.25	.53	2.5	1.4	.90	.50	.67	.39
AC-FT	154	896	449	245	255	910	1040	424	284	245	279	178

CAL YR 1967 TOTAL 2614.58 MEAN 7.16 MAX 167 MIN .23 AC-FT 5190
WTR YR 1968 TOTAL 2702.83 MEAN 7.38 MAX 126 MIN .23 AC-FT 5360

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1968 TO SEPTEMBER 1969
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	.22	1.6	.46	6.9	52	e68	8.4	.70	10	8.8	23
2	1.4	.22	2.7	.39	15	13	e30	7.2	1.3	11	3.0	19
3	1.4	.14	5.4	5.5	75	10	e15	12	9.8	3.4	8.5	11
4	.90	.13	18	15	18	14	e24	12	9.8	2.6	2.9	18
5	.70	.12	12	9.8	6.0	20	e11	3.6	2.5	1.4	5.8	5.5
6	.65	.11	12	19	2.6	34	e23	2.1	1.2	18	20	3.3
7	.70	.12	5.7	7.9	1.4	9.3	e20	1.5	.90	17	13	2.3
8	.50	.09	2.1	4.0	1.0	8.2	e30	1.4	.70	18	3.0	2.1
9	.43	.11	1.3	14	.75	19	e15	1.2	.55	10	1.8	1.9
10	.39	.12	.90	10	.65	7.3	e9.8	1.1	.55	9.7	10	1.7
11	.36	.09	.65	2.8	.60	5.5	e56	1.0	17	6.0	7.8	1.5
12	.39	.09	.80	1.5	.50	3.0	e82	1.0	13	5.8	14	1.3
13	.36	.09	80	1.1	.46	1.8	e34	.90	4.5	2.5	48	1.2
14	.32	.09	37	1.8	30	1.4	e33	.90	1.7	21	48	2.3
15	.32	.09	5.1	1.4	59	1.3	e19	1.2	1.1	5.0	56	1.9
16	.29	.11	17	1.1	51	12	e40	2.4	.85	2.4	15	1.4
17	.29	.12	10	.85	16	33	e33	1.8	.60	6.0	29	1.2
18	.29	.10	8.4	.70	23	24	e20	1.4	.55	10	19	4.7
19	.36	.29	3.1	.60	22	11	e23	1.2	.60	23	7.7	9.2
20	3.2	.60	1.7	.60	20	8.4	e32	1.0	.55	34	7.8	3.7
21	2.4	.60	2.3	7.3	18	6.3	e19	.90	.55	5.0	3.1	11
22	2.2	.32	1.5	2.4	17	7.5	e37	.90	4.2	7.0	2.8	9.0
23	1.3	.55	1.4	1.3	19	6.2	e13	5.7	1.6	14	6.0	6.6
24	.75	.43	1.0	1.0	13	9.4	e6.6	7.7	.90	16	15	3.2
25	.43	1.9	2.3	.75	21	36	e4.3	5.7	.80	9.2	8.4	3.6
26	.39	2.4	3.5	.65	39	e6.6	3.4	23	.95	3.0	7.5	15
27	.39	.95	1.5	.60	13	e6.2	9.8	10	1.1	1.9	4.2	9.6
28	.29	3.3	1.0	.60	32	e5.8	19	2.6	1.4	1.4	6.1	13
29	.29	15	1.3	13	---	e5.5	21	1.5	8.4	11	7.6	11
30	.29	3.6	.95	15	---	e8.9	10	1.0	10	7.0	15	5.5
31	.25	---	.65	12	---	e19	---	.75	---	20	9.0	---
TOTAL	23.83	32.10	242.85	153.10	521.86	405.6	760.9	123.05	98.35	312.3	413.8	203.7
MEAN	.77	1.07	7.83	4.94	18.6	13.1	25.4	3.97	3.28	10.1	13.3	6.79
MAX	3.2	15	80	19	75	52	82	23	17	34	56	23
MIN	.25	.09	.65	.39	.46	1.3	3.4	.75	.55	1.4	1.8	1.2
AC-FT	47	64	482	304	1040	805	1510	244	195	619	821	404

CAL YR 1968 TOTAL 2246.03 MEAN 6.14 MAX 84 MIN .09 AC-FT 4450
WTR YR 1969 TOTAL 3291.44 MEAN 9.02 MAX 82 MIN .09 AC-FT 6530

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1969 TO SEPTEMBER 1970
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11	.33	3.9	2.1	.90	10	32	23	2.6	42	2.1	4.6
2	2.6	.27	1.4	.98	.46	12	15	4.8	5.3	25	2.6	5.2
3	1.5	.31	.78	1.8	.36	4.7	23	3.0	4.0	24	3.1	3.8
4	1.2	.29	3.4	22	.29	2.7	11	2.4	3.7	32	6.2	14
5	.95	.27	30	2.9	.22	1.3	5.4	1.9	2.2	18	30	7.8
6	.75	19	2.2	29	.15	1.3	13	1.8	1.6	36	14	13
7	.80	11	1.4	5.9	.18	14	13	14	3.0	16	12	8.4
8	.85	3.3	1.7	2.0	.26	5.0	4.6	39	5.6	13	10	4.5
9	1.3	1.4	1.7	1.6	.26	2.0	12	25	3.3	22	4.4	3.2
10	.65	.78	14	1.0	2.9	1.4	16	39	2.8	40	2.8	2.6
11	.39	.48	7.5	.68	2.2	.85	15	13	2.9	4.6	2.5	2.2
12	.36	.38	1.7	11	.90	1.8	10	12	6.2	9.3	9.2	1.9
13	.39	.34	16	2.1	.46	8.2	15	4.0	10	3.9	5.7	1.7
14	.46	.29	33	17	.40	12	8.2	3.0	10	2.9	4.8	1.6
15	.43	.24	12	7.2	5.0	8.3	19	15	11	3.5	8.0	1.6
16	.39	.22	3.1	2.1	2.6	4.3	14	9.2	5.1	16	5.3	1.6
17	.39	.24	1.6	3.1	1.0	2.0	14	12	29	14	17	6.5
18	.39	.23	.91	1.3	.60	7.6	4.3	22	24	14	21	13
19	.39	.22	.73	.81	.46	10	17	9.8	12	6.3	30	7.3
20	.50	.22	.90	.50	.36	10	4.3	12	3.4	3.7	11	4.0
21	1.3	.22	.65	.37	.32	4.0	3.0	4.8	3.3	2.7	4.8	3.3
22	2.1	.24	.47	.55	.36	13	20	3.4	7.5	2.9	16	25
23	1.1	.23	.41	12	1.5	30	114	2.4	6.2	13	15	7.0
24	11	.21	.38	4.2	1.9	15	20	1.7	5.2	8.9	14	4.0
25	4.7	.22	.36	1.4	2.8	3.6	5.5	1.4	14	4.0	60	2.6
26	1.5	.78	.34	1.0	2.4	2.3	23	22	4.1	5.0	80	2.0
27	.85	1.8	.34	1.5	2.9	4.2	16	29	2.7	8.2	25	1.8
28	.70	.64	1.5	1.6	1.4	6.0	4.5	25	21	5.3	34	1.6
29	1.0	19	3.3	1.2	---	2.4	22	5.8	11	3.0	20	1.4
30	.65	6.8	4.8	3.0	---	2.8	49	4.8	4.3	2.2	15	1.3
31	.46	---	2.0	2.3	---	15	---	5.0	---	1.9	7.7	---
TOTAL	51.05	69.95	152.47	144.19	33.54	217.75	542.8	371.2	227.0	403.3	493.2	158.5
MEAN	1.65	2.33	4.92	4.65	1.20	7.02	18.1	12.0	7.57	13.0	15.9	5.28
MAX	11	19	33	29	5.0	30	114	39	29	42	80	25
MIN	.36	.21	.34	.37	.15	.85	3.0	1.4	1.6	1.9	2.1	1.3
AC-FT	101	139	302	286	67	432	1080	736	450	800	978	314

CAL YR 1969 TOTAL 3266.13 MEAN 8.95 MAX 82 MIN .21 AC-FT 6480
WTR YR 1970 TOTAL 2864.95 MEAN 7.85 MAX 114 MIN .15 AC-FT 5680

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1970 TO SEPTEMBER 1971
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	25	14	3.0	1.6	.85	12	3.0	3.0	.74	3.0	1.4
2	1.3	9.6	14	3.0	1.4	.80	3.1	2.0	12	.60	2.6	2.0
3	1.2	3.7	11	2.5	1.2	.75	2.6	2.5	9.0	.59	2.9	7.7
4	1.6	12	5.7	2.0	1.1	.70	3.3	2.5	2.5	.55	2.3	3.7
5	11	46	54	12	.98	5.4	12	7.5	6.6	.46	1.5	1.4
6	6.7	9.2	43	16	.90	3.0	2.8	10	5.3	1.2	1.1	1.0
7	5.6	7.1	18	8.0	.90	4.1	2.1	10	7.5	1.2	.84	.85
8	3.3	6.0	5.4	3.5	.86	8.9	1.5	3.5	2.7	17	.75	1.5
9	3.3	13	3.3	12	.85	4.6	6.3	2.0	2.2	9.2	.67	3.3
10	2.1	36	2.6	5.0	.85	2.3	3.7	1.5	21	7.8	.56	1.8
11	1.9	11	2.0	3.5	.79	1.5	12	1.0	6.4	11	.52	1.1
12	1.5	7.6	2.0	3.0	.77	12	20	.90	2.4	17	.51	.95
13	1.4	8.1	2.0	2.5	.79	8.2	9.6	.90	1.4	60	6.9	.85
14	1.3	17	1.5	2.0	.83	4.1	4.9	.80	1.2	21	3.9	.95
15	1.4	e7.9	1.3	1.5	.92	4.8	12	.80	1.0	7.3	1.9	.90
16	1.7	e3.7	1.1	1.2	1.3	2.8	24	1.0	.75	5.7	8.2	.70
17	1.3	2.6	14	1.2	1.0	1.9	11	1.5	.68	4.8	4.0	.55
18	1.2	1.9	11	1.1	.90	1.3	21	1.0	.94	4.3	1.9	.55
19	1.2	1.5	21	16	.83	.90	24	1.5	2.7	1.7	1.2	.60
20	11	2.9	22	6.9	.84	.70	11	1.5	1.4	3.8	.87	.65
21	9.5	17	6.9	3.3	2.9	.65	6.7	2.5	.96	1.8	.71	1.2
22	17	4.0	6.7	2.4	2.6	.65	6.1	1.5	.74	1.5	.60	1.9
23	16	2.6	7.3	1.7	4.5	.50	4.9	2.0	.65	1.3	.50	.91
24	17	4.5	7.8	1.4	3.5	.60	3.8	15	.65	3.4	.46	.83
25	4.7	6.9	67	1.2	4.6	6.8	3.5	10	1.4	11	.55	.89
26	4.9	2.7	59	1.1	2.2	78	2.6	4.0	2.9	2.9	.50	1.0
27	4.3	1.8	42	1.0	1.4	34	2.2	2.0	2.9	1.5	.46	1.0
28	3.0	1.4	30	32	1.1	13	3.6	5.5	2.9	1.5	.43	2.4
29	2.2	2.4	19	9.9	---	5.6	4.0	5.5	1.6	3.2	.65	2.2
30	2.2	3.2	18	3.3	---	8.6	3.0	12	1.0	36	1.2	1.6
31	4.9	---	5.0	2.2	---	4.9	---	6.5	---	10	1.0	---
TOTAL	147.0	278.3	517.6	165.4	42.41	222.90	239.3	121.90	106.37	250.04	53.18	46.38
MEAN	4.74	9.28	16.7	5.34	1.51	7.19	7.98	3.93	3.55	8.07	1.72	1.55
MAX	17	46	67	32	4.6	78	24	15	21	60	8.2	7.7
MIN	1.2	1.4	1.1	1.0	.77	.50	1.5	.80	.65	.46	.43	.55
AC-FT	292	552	1030	328	84	442	475	242	211	496	105	92

CAL YR 1970 TOTAL 3534.38 MEAN 9.68 MAX 114 MIN .15 AC-FT 7010
WTR YR 1971 TOTAL 2190.78 MEAN 6.00 MAX 78 MIN .43 AC-FT 4350

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1971 TO SEPTEMBER 1972
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.6	.57	11	1.2	.85	.51	1.1	4.0	.48	6.2	1.2	16
2	2.4	2.3	7.5	.80	.47	.37	4.4	2.9	.43	8.9	1.0	7.2
3	1.4	5.3	3.6	.60	.36	.34	6.2	2.3	.33	7.1	1.1	7.6
4	1.1	1.7	2.4	5.3	.32	15	3.9	1.6	.28	4.4	1.4	20
5	1.1	.93	1.3	1.6	13	39	12	8.1	.26	5.0	2.7	e6.3
6	17	.70	.85	1.2	3.1	4.7	4.9	3.6	.25	7.1	5.0	e2.4
7	13	.73	.65	2.1	2.0	2.3	3.3	2.1	.25	23	2.1	e1.7
8	2.7	9.2	.49	6.9	1.9	1.3	37	2.9	.28	13	1.4	1.4
9	1.5	21	15	3.6	6.4	.90	57	2.4	1.5	4.4	1.0	1.2
10	1.9	3.4	11	1.4	15	.66	90	1.5	3.1	2.5	.75	2.0
11	1.9	10	22	.90	3.7	.57	12	1.2	1.4	1.7	.70	3.3
12	1.3	13	4.4	.55	1.8	.43	8.9	.92	.77	3.0	2.8	1.6
13	3.6	5.4	2.3	.46	1.6	.39	4.2	.77	.54	4.2	12	1.1
14	1.4	6.8	17	.75	2.1	.42	2.7	.90	1.6	20	32	.90
15	.92	3.1	23	1.4	1.5	.39	1.9	1.3	1.3	3.0	9.6	.80
16	.72	1.9	4.2	1.2	.90	.41	1.4	.85	.84	2.5	2.8	.70
17	.65	5.4	2.1	.60	.59	.43	1.2	.58	2.0	2.1	19	.65
18	.60	24	1.2	.46	11	.43	1.1	.48	7.2	3.1	94	.65
19	1.3	23	9.1	.46	13	.43	3.9	.46	5.4	1.8	32	.60
20	2.8	4.9	19	.70	3.7	.48	12	1.2	2.1	1.4	18	.55
21	4.9	2.5	8.4	1.1	2.3	1.0	5.7	3.2	.94	2.1	8.2	1.2
22	7.9	1.6	4.2	4.6	1.1	.88	6.6	2.2	.57	1.3	3.3	1.5
23	2.3	6.1	2.0	1.4	.79	.55	16	5.4	.49	1.2	2.2	1.0
24	1.1	7.8	1.2	11	.67	.46	6.1	5.1	.39	1.4	1.6	.85
25	2.1	11	.90	11	15	.46	7.4	3.7	.35	5.2	1.3	.75
26	3.5	7.6	.85	2.7	4.2	.43	13	3.6	4.3	45	1.2	.65
27	3.5	2.5	3.6	2.5	1.7	.38	9.6	1.5	20	30	1.3	1.9
28	1.5	1.4	5.7	5.0	.96	.40	3.4	.84	21	14	1.1	4.3
29	.97	2.8	3.5	2.3	.64	22	14	.58	3.7	7.9	1.2	12
30	.74	5.4	10	1.8	---	6.5	7.8	.79	3.8	3.0	1.3	6.3
31	.68	---	2.4	.95	---	2.2	---	.67	---	1.8	15	---
TOTAL	89.08	192.03	200.84	76.53	110.65	104.72	358.7	67.64	85.85	237.3	278.25	107.10
MEAN	2.87	6.40	6.48	2.47	3.82	3.38	12.0	2.18	2.86	7.65	8.98	3.57
MAX	17	24	23	11	15	39	90	8.1	21	45	94	20
MIN	.60	.57	.49	.46	.32	.34	1.1	.46	.25	1.2	.70	.55
AC-FT	177	381	398	152	219	208	711	134	170	471	552	212

CAL YR 1971 TOTAL 1729.83 MEAN 4.74 MAX 78 MIN .43 AC-FT 3430
WTR YR 1972 TOTAL 1908.69 MEAN 5.21 MAX 94 MIN .25 AC-FT 3790

e Estimated

16725000 ALAKAHI STREAM NEAR KAHUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1972 TO SEPTEMBER 1973
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.4	2.7	1.0	3.9	9.8	14	7.5	8.7	5.7	9.3	1.4	1.1
2	2.7	15	.95	2.5	4.0	11	4.8	4.1	7.9	8.6	1.2	1.0
3	14	33	3.3	5.8	2.9	7.1	3.0	10	6.2	9.8	1.2	1.0
4	6.5	21	2.2	2.8	2.1	20	2.5	9.5	4.8	18	1.2	1.0
5	3.0	36	1.7	1.6	1.5	5.0	2.4	4.9	9.3	20	1.1	1.0
6	4.5	16	1.4	1.2	1.3	34	2.1	3.3	4.4	6.9	1.2	3.2
7	2.8	39	1.2	1.9	1.4	57	1.6	5.5	3.6	12	2.4	6.6
8	1.8	18	1.2	2.9	2.1	6.7	4.0	5.3	7.1	23	1.9	2.6
9	1.4	4.9	12	1.4	45	6.0	9.5	5.6	2.8	33	1.5	1.4
10	1.3	7.9	3.2	1.1	9.6	7.4	39	4.6	2.4	9.4	1.2	1.1
11	1.0	33	1.8	.80	3.2	9.7	14	4.5	2.3	9.2	1.5	.95
12	.85	6.7	1.4	.70	2.2	4.3	16	5.2	3.7	6.9	2.8	.90
13	.80	3.4	1.1	.65	2.4	2.7	15	3.7	6.2	4.4	2.1	1.7
14	.70	6.5	.99	.70	2.8	12	5.8	2.9	4.2	8.2	2.7	3.4
15	.65	13	14	.65	1.7	32	16	2.6	5.7	15	1.5	1.7
16	.70	48	3.4	.70	2.0	17	9.4	2.0	21	4.5	1.3	1.4
17	.70	19	1.8	3.6	1.3	46	6.3	14	15	3.6	1.4	2.8
18	.60	16	1.3	2.9	1.1	13	4.9	23	4.0	2.6	1.2	1.4
19	.60	6.7	7.7	1.5	.91	37	2.5	29	2.8	1.8	3.0	1.0
20	.60	3.3	3.9	12	5.4	18	1.9	5.0	2.1	1.5	4.1	1.2
21	.80	2.5	1.9	3.3	42	18	2.3	3.8	1.7	2.0	2.4	1.3
22	5.0	2.4	2.2	1.5	4.3	6.1	3.2	3.9	3.0	5.7	3.4	2.5
23	5.1	2.7	14	1.2	3.2	13	7.2	5.8	2.6	4.6	1.7	15
24	4.9	2.9	4.3	3.9	5.6	54	9.5	7.8	2.5	2.6	1.2	12
25	2.5	1.9	2.4	4.8	19	8.8	4.0	3.4	1.6	2.4	2.2	9.0
26	7.4	1.6	10	6.2	21	3.6	4.8	2.2	1.3	2.8	1.7	4.6
27	9.3	1.5	8.1	54	7.8	12	15	1.7	1.2	1.8	2.2	4.8
28	2.7	1.4	2.8	43	3.4	6.2	4.3	2.3	1.0	6.0	1.8	2.8
29	1.4	1.2	1.7	24	---	16	6.4	4.1	1.0	4.5	1.4	19
30	2.7	1.1	1.4	13	---	29	7.3	5.8	1.0	2.2	1.4	6.1
31	3.5	---	1.1	18	---	23	---	13	---	1.5	1.2	---
TOTAL	99.90	368.3	115.44	222.20	209.01	549.6	232.2	207.2	138.1	243.8	56.5	113.55
MEAN	3.22	12.3	3.72	7.17	7.46	17.7	7.74	6.68	4.60	7.86	1.82	3.78
MAX	14	48	14	54	45	57	39	29	21	33	4.1	19
MIN	.60	1.1	.95	.65	.91	2.7	1.6	1.7	1.0	1.5	1.1	.90
AC-FT	198	731	229	441	415	1090	461	411	274	484	112	225

CAL YR 1972 TOTAL 2010.38 MEAN 5.49 MAX 94 MIN .25 AC-FT 3990
WTR YR 1973 TOTAL 2555.80 MEAN 7.00 MAX 57 MIN .60 AC-FT 5070

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1973 TO SEPTEMBER 1974
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	5.1	1.5	3.2	1.6	3.4	.95	.84	2.3	1.2	2.6	14	5.5
2	3.1	1.3	5.1	1.4	2.2	.91	.78	2.9	1.1	2.7	7.5	4.2
3	1.9	1.1	3.6	1.5	1.7	.92	.74	2.0	1.1	1.8	9.2	6.5
4	1.3	1.1	5.9	4.1	1.4	.90	1.0	1.6	1.2	2.9	7.4	3.1
5	1.1	1.0	4.0	4.8	1.3	.90	.91	1.4	1.2	8.1	9.0	2.2
6	1.1	.95	5.2	3.1	1.2	5.9	.88	1.3	1.2	8.5	6.3	1.7
7	1.0	.96	4.0	48	1.1	4.8	3.0	1.4	2.2	8.0	5.5	1.6
8	1.0	.95	6.7	25	1.1	5.5	7.5	2.1	5.9	8.4	5.0	1.5
9	1.0	.91	14	14	2.3	7.3	3.4	6.0	5.1	6.5	5.2	1.5
10	1.0	.90	6.6	5.2	1.9	2.7	2.6	23	8.6	3.7	11	1.5
11	4.6	1.6	3.3	3.4	12	1.6	3.9	4.9	12	3.6	32	1.4
12	4.0	56	2.8	2.5	6.8	1.2	17	3.5	5.3	2.3	25	1.4
13	4.7	39	2.4	1.9	10	2.1	6.6	3.7	3.3	1.7	12	1.4
14	10	5.0	1.8	1.6	6.7	2.4	6.7	4.8	6.5	1.4	7.4	1.3
15	8.6	4.1	1.5	1.4	3.4	2.2	19	2.8	8.4	1.3	5.8	1.3
16	6.4	2.8	1.4	1.2	2.3	2.3	77	4.3	4.5	1.4	6.0	1.3
17	3.9	2.2	1.2	1.1	1.7	1.5	18	12	2.9	2.7	7.8	1.3
18	18	1.8	1.2	1.2	1.4	1.8	24	11	2.1	2.7	7.6	1.3
19	14	1.5	1.2	1.1	1.2	30	12	21	1.9	3.4	12	1.2
20	12	3.5	1.2	1.1	1.2	e6.0	23	17	2.2	3.3	12	1.2
21	6.4	4.6	1.1	1.1	1.1	e3.2	36	11	3.0	1.3	7.7	1.2
22	3.8	5.9	1.0	1.1	1.1	2.0	13	6.3	2.2	1.2	13	1.2
23	4.1	14	1.0	1.1	1.1	1.4	6.8	3.7	5.7	1.2	e8.4	1.2
24	3.1	23	1.0	14	1.1	1.2	4.1	2.5	6.9	4.7	e4.2	1.2
25	2.5	9.7	1.0	5.4	1.1	1.1	2.9	2.1	4.3	11	e3.1	1.2
26	2.8	8.0	1.0	14	1.0	2.2	2.2	1.7	2.6	11	e2.5	1.1
27	2.7	13	1.0	5.8	1.0	1.6	1.9	1.4	1.8	20	e2.3	1.1
28	2.6	12	3.6	3.0	.95	1.2	2.9	1.3	1.6	6.5	e2.2	1.1
29	11	6.8	4.5	12	---	1.0	2.2	1.2	1.4	5.2	e1.8	1.2
30	4.4	4.4	4.4	14	---	.93	1.9	1.2	1.3	5.5	14	1.3
31	2.2	---	2.6	6.0	---	.89	---	1.1	---	8.2	14	---
TOTAL	149.4	229.57	98.5	202.7	72.75	98.60	302.75	162.5	108.7	152.8	280.9	54.2
MEAN	4.82	7.65	3.18	6.54	2.60	3.18	10.1	5.24	3.62	4.93	9.06	1.81
MAX	18	56	14	48	12	30	77	23	12	20	32	6.5
MIN	1.0	.90	1.0	1.1	.95	.89	.74	1.1	1.1	1.2	1.8	1.1
AC-FT	296	455	195	402	144	196	601	322	216	303	557	108

CAL YR 1973 TOTAL 2449.63 MEAN 6.71 MAX 57 MIN .65 AC-FT 4860
WTR YR 1974 TOTAL 1913.37 MEAN 5.24 MAX 77 MIN .74 AC-FT 3800

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1974 TO SEPTEMBER 1975
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.3	5.6	.73	1.7	2.5	43	1.6	4.2	1.0	13	25	5.0
2	1.2	2.9	.57	1.2	2.0	4.9	1.3	6.6	.97	6.3	11	3.7
3	1.1	1.8	.46	.92	1.4	6.0	1.2	5.3	.94	9.4	4.2	3.3
4	1.0	1.5	.42	6.7	.98	6.6	2.0	3.2	2.3	10	3.5	3.0
5	.95	1.3	.39	12	1.2	20	7.1	8.0	6.7	5.6	8.7	2.4
6	.94	2.0	.36	13	2.8	9.8	9.5	6.6	8.5	3.5	4.5	2.0
7	.95	2.0	.73	32	1.6	6.6	8.1	12	5.8	2.7	3.4	2.2
8	.95	1.6	1.3	33	.99	7.5	5.2	11	3.1	4.4	2.4	3.0
9	.90	1.1	3.3	4.8	.71	5.0	2.8	11	2.5	4.4	5.9	2.6
10	.92	.90	2.0	3.2	1.4	13	1.8	4.0	2.6	2.7	15	3.0
11	1.1	21	1.5	2.1	15	11	1.4	2.7	2.9	6.2	17	2.2
12	1.6	20	1.1	8.0	8.1	29	1.1	2.0	9.4	16	5.6	1.7
13	1.3	4.8	1.3	4.3	4.1	16	.98	1.8	6.4	23	8.2	1.6
14	1.2	5.7	1.4	3.0	3.3	21	.90	1.5	4.7	30	8.7	1.4
15	1.1	4.2	1.0	2.0	2.3	13	2.2	1.3	5.0	8.9	14	1.4
16	1.0	2.4	11	1.4	6.9	12	3.6	2.2	4.8	7.3	12	4.7
17	.96	2.0	3.4	1.2	16	7.4	2.6	1.8	3.4	10	11	13
18	.95	1.6	1.7	.90	20	13	8.4	5.5	2.5	17	13	3.6
19	1.3	3.8	.97	.70	6.4	16	9.2	7.1	1.9	5.2	18	2.3
20	33	5.4	7.6	.65	3.5	5.2	23	9.8	1.5	3.4	9.6	1.8
21	9.9	12	20	.60	2.4	3.7	37	6.5	1.2	2.6	10	1.6
22	5.9	5.1	34	.65	1.6	4.0	11	3.5	1.1	2.1	4.5	1.4
23	3.0	2.5	10	.65	6.0	4.6	15	2.1	1.1	3.1	6.2	1.3
24	1.8	1.5	6.3	.86	4.1	2.7	19	1.5	1.1	2.3	3.8	1.3
25	1.7	1.1	3.7	36	2.2	2.0	7.4	1.5	6.1	2.0	3.3	1.2
26	4.5	.79	16	7.6	8.8	1.6	4.8	2.7	3.8	1.7	2.6	1.2
27	42	.63	11	3.2	33	1.3	5.4	2.2	2.2	1.7	2.2	1.3
28	10	.61	4.6	1.9	51	1.2	7.7	1.6	1.5	1.7	2.3	1.4
29	5.5	.71	2.9	1.2	---	2.7	7.5	1.3	1.3	1.5	10	1.3
30	9.9	.95	1.9	1.1	---	3.2	9.1	1.2	1.4	2.6	19	1.2
31	5.7	---	1.4	3.3	---	3.0	---	1.1	---	13	16	---
TOTAL	153.62	117.49	153.03	189.83	210.28	296.0	217.88	132.8	97.71	223.3	280.6	77.1
MEAN	4.96	3.92	4.94	6.12	7.51	9.55	7.26	4.28	3.26	7.20	9.05	2.57
MAX	42	21	34	36	51	43	37	12	9.4	30	25	13
MIN	.90	.61	.36	.60	.71	1.2	.90	1.1	.94	1.5	2.2	1.2
AC-FT	305	233	304	377	417	587	432	263	194	443	557	153

CAL YR 1974 TOTAL 1860.04 MEAN 5.10 MAX 77 MIN .36 AC-FT 3690
WTR YR 1975 TOTAL 2149.64 MEAN 5.89 MAX 51 MIN .36 AC-FT 4260

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1975 TO SEPTEMBER 1976
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.2	2.0	7.1	1.1	1.2	1.8	20	15	2.5	7.3	2.5	3.4
2	16	1.7	4.3	1.1	1.2	17	11	5.8	2.0	6.2	2.3	16
3	18	1.5	2.8	1.2	1.2	16	23	4.0	1.8	13	2.1	8.4
4	9.1	1.4	5.3	1.3	1.2	9.8	40	3.8	1.7	9.8	2.0	4.8
5	7.4	1.3	8.9	1.6	1.1	11	10	5.5	1.5	8.3	4.2	3.5
6	8.3	1.2	4.4	3.0	15	17	7.4	8.2	1.5	11	16	2.7
7	10	1.1	4.9	2.5	12	13	4.9	5.3	1.6	62	7.5	2.3
8	6.2	1.1	2.8	33	4.4	12	5.7	4.6	3.0	48	5.8	1.3
9	8.4	14	2.1	13	3.2	10	34	3.8	2.6	18	3.7	2.3
10	3.9	5.5	2.1	6.7	2.6	7.9	21	4.1	2.0	7.6	2.8	3.9
11	2.8	11	1.6	4.0	2.0	16	7.8	8.6	1.7	4.5	7.5	5.0
12	2.2	11	1.4	4.2	1.7	7.4	6.8	9.6	1.6	6.2	12	2.4
13	1.8	3.6	1.3	17	1.5	3.9	4.8	18	3.4	5.4	12	1.1
14	1.6	2.4	1.2	15	15	2.8	4.1	11	7.5	5.4	8.9	.80
15	9.8	2.3	1.2	6.5	8.3	2.2	3.4	5.2	8.5	14	5.4	.67
16	21	18	1.1	54	3.7	6.5	3.4	3.9	13	5.9	5.8	.79
17	15	9.4	5.0	15	4.3	29	3.1	5.5	15	4.4	3.9	.49
18	17	3.6	3.2	5.1	4.2	8.1	3.0	3.4	22	3.5	2.9	.45
19	9.8	8.9	2.0	3.6	3.2	4.1	5.2	2.9	16	3.0	25	.43
20	4.0	23	1.5	2.7	2.7	7.6	6.2	4.6	21	19	20	.42
21	3.3	5.6	1.3	2.2	6.2	8.5	6.1	8.5	14	30	5.8	.43
22	2.2	3.7	1.3	1.9	20	5.8	25	5.6	9.6	12	4.2	.38
23	1.7	2.7	1.2	1.7	21	7.6	32	4.1	8.2	32	3.2	.39
24	1.5	5.1	1.2	1.5	11	11	9.7	3.1	5.8	18	2.6	.47
25	2.0	4.6	1.2	1.4	7.3	8.5	6.4	2.5	5.4	10	2.3	.46
26	6.8	2.6	1.2	1.3	5.0	5.6	4.1	2.3	9.0	5.7	2.1	10
27	8.9	1.9	1.1	1.2	3.6	10	3.2	2.1	9.2	5.2	2.1	4.8
28	8.9	2.0	1.1	1.2	2.5	16	2.6	1.9	6.0	4.0	18	3.1
29	6.6	2.9	1.2	1.2	2.0	8.1	5.6	2.9	6.2	3.2	7.6	12
30	3.5	5.0	1.2	1.1	---	14	11	6.9	16	2.7	4.9	3.1
31	2.5	---	1.1	1.2	---	17	---	4.1	---	2.4	4.4	---
TOTAL	221.4	160.1	77.3	207.5	168.3	315.2	330.5	176.8	219.3	387.7	209.5	96.28
MEAN	7.14	5.34	2.49	6.69	5.80	10.2	11.0	5.70	7.31	12.5	6.76	3.21
MAX	21	23	8.9	54	21	29	40	18	22	62	25	16
MIN	1.2	1.1	1.1	1.1	1.1	1.8	2.6	1.9	1.5	2.4	2.0	.38
AC-FT	439	318	153	412	334	625	656	351	435	769	416	191

CAL YR 1975 TOTAL 2184.30 MEAN 5.98 MAX 51 MIN .60 AC-FT 4330
WTR YR 1976 TOTAL 2569.88 MEAN 7.02 MAX 62 MIN .38 AC-FT 5100

16725000 ALAKAHI STREAM NEAR KAHUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1976 TO SEPTEMBER 1977
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.99	2.2	.64	.52	.75	5.0	1.5	4.1	3.8	1.3	14	4.7
2	.65	1.0	.52	.44	.46	4.6	1.0	2.9	5.3	1.5	6.5	2.9
3	.57	16	.44	.39	6.5	9.7	5.0	2.4	5.5	4.3	15	4.0
4	.44	6.0	.39	.36	3.0	18	10	2.3	4.8	13	4.4	4.6
5	.38	5.0	.60	.35	1.4	20	34	2.0	2.9	10	13	3.5
6	.36	14	.69	.30	1.6	21	42	2.9	3.0	14	48	2.3
7	3.6	16	13	.28	2.0	33	42	5.6	2.7	19	19	3.5
8	3.5	25	12	.27	2.2	7.2	25	4.4	1.7	37	4.7	2.6
9	20	19	6.3	.28	1.0	3.5	20	2.8	1.2	12	2.7	2.0
10	8.0	46	10	.27	.60	2.4	20	1.9	.96	20	2.3	2.0
11	15	7.3	6.2	.29	.80	1.8	15	1.3	.85	11	6.9	2.3
12	5.0	3.9	3.7	.28	.32	1.4	10	1.1	.98	23	20	1.8
13	2.3	2.5	6.2	.29	.26	2.6	5.7	.91	1.4	21	3.7	1.6
14	1.1	2.0	2.5	.29	.26	3.8	5.0	.80	4.8	11	2.7	1.7
15	1.9	1.5	1.4	.25	.26	4.9	3.6	.69	3.0	5.8	2.1	1.4
16	3.3	24	42	.27	.26	2.2	4.5	.70	2.0	10	1.7	2.0
17	1.5	34	6.4	.22	.26	1.7	3.0	.93	1.5	34	1.4	9.6
18	.85	8.2	3.4	.26	.22	14	2.2	.80	1.3	14	1.3	4.6
19	1.0	5.3	2.0	.26	.18	5.0	1.8	.64	3.8	11	1.3	2.3
20	9.0	12	1.3	.26	.18	30	25	.57	12	4.1	4.4	1.6
21	6.0	7.5	.98	.26	.18	22	12	.51	24	5.9	13	1.2
22	7.5	3.5	.79	.26	.22	37	6.1	2.7	7.7	4.5	15	1.1
23	2.7	2.9	.65	.26	.18	33	3.3	1.7	9.5	2.7	12	1.4
24	1.2	2.0	.52	.26	.26	18	2.2	1.7	4.6	2.0	4.9	2.9
25	1.4	3.4	5.0	.26	1.9	3.8	5.8	9.8	3.2	1.9	5.2	1.6
26	8.0	3.3	2.7	.26	8.9	3.5	4.7	6.6	2.1	2.1	2.8	1.1
27	15	1.7	11	.26	21	2.0	4.1	6.6	1.4	11	2.3	.97
28	10	1.2	3.0	.26	5.0	2.5	5.7	14	1.3	13	17	.86
29	6.5	.91	1.5	9.5	---	8.0	25	6.3	1.3	3.9	9.0	.74
30	3.4	.75	.94	4.0	---	3.0	17	12	1.3	5.0	19	.68
31	4.9	---	.67	1.5	---	4.0	---	7.0	---	5.5	18	---
TOTAL	146.04	278.06	147.43	23.21	60.15	328.6	362.2	108.65	119.89	334.5	293.3	73.55
MEAN	4.71	9.27	4.76	.75	2.15	10.6	12.1	3.50	4.00	10.8	9.46	2.45
MAX	20	46	42	9.5	21	37	42	14	24	37	48	9.6
MIN	.36	.75	.39	.22	.18	1.4	1.0	.51	.85	1.3	1.3	.68
AC-FT	290	552	292	46	119	652	718	216	238	663	582	146

CAL YR 1976 TOTAL 2682.61 MEAN 7.33 MAX 62 MIN .36 AC-FT 5320
WTR YR 1977 TOTAL 2275.58 MEAN 6.23 MAX 48 MIN .18 AC-FT 4510

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1977 TO SEPTEMBER 1978
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.55	7.4	1.0	51	1.7	15	4.8	4.5	1.9	8.1	15	e18
2	.57	16	1.0	29	1.5	18	4.6	5.5	3.7	15	10	e16
3	.55	17	1.0	8.0	1.3	3.9	5.2	3.2	2.3	11	5.0	e8.8
4	.58	8.9	1.2	5.8	1.3	2.5	4.6	2.2	1.8	32	12	e5.2
5	.56	4.3	1.1	3.9	1.2	1.6	6.0	1.7	1.5	43	15	e17
6	.62	3.0	1.0	3.1	1.1	1.2	7.7	1.3	1.4	15	20	e8.7
7	1.8	2.5	1.0	2.5	1.1	18	11	1.1	1.6	14	18	e4.9
8	2.8	3.2	1.0	2.0	1.3	16	4.2	1.3	2.3	15	15	e5.0
9	1.8	4.7	1.0	1.6	2.9	5.1	2.7	3.5	1.9	23	10	e5.2
10	1.3	3.0	1.1	1.4	1.8	3.1	2.0	3.2	1.6	40	8.0	e16
11	1.1	2.7	1.0	1.3	1.4	2.1	1.5	10	1.9	25	13	e5.9
12	6.2	3.8	1.0	1.2	1.3	6.8	1.2	8.7	11	19	9.0	e4.3
13	4.5	3.5	.98	1.2	1.2	4.3	1.2	6.8	9.3	22	10	e4.5
14	2.5	7.3	1.4	1.1	1.1	2.5	2.4	17	6.8	9.7	10	e6.0
15	1.9	9.4	2.0	1.1	1.1	2.3	1.8	17	5.9	5.2	7.0	e4.2
16	18	5.0	5.7	1.0	1.1	40	3.4	11	12	4.3	20	e3.6
17	20	3.3	21	1.1	1.0	10	2.1	5.1	8.1	4.1	25	e8.2
18	4.7	2.4	49	1.0	1.0	20	1.4	3.5	10	20	8.0	e5.4
19	3.2	1.8	34	1.1	1.0	23	1.2	2.6	32	40	4.5	e6.6
20	3.5	1.6	9.0	12	1.0	19	1.0	2.0	9.6	42	5.0	e7.2
21	6.5	1.4	6.1	16	1.0	7.2	1.0	13	6.9	33	17	e4.5
22	21	1.4	5.4	5.0	1.0	7.7	.97	6.9	11	11	15	e6.0
23	9.9	1.3	3.8	3.2	6.4	3.7	.96	3.8	56	8.9	15	e5.5
24	7.6	1.2	2.9	15	3.2	2.7	1.3	2.7	13	5.6	12	e3.9
25	10	1.2	2.2	6.3	1.7	2.2	2.9	2.7	7.1	8.6	e16	e3.6
26	4.2	1.1	1.9	20	1.2	2.9	8.3	5.2	10	18	17	e3.3
27	11	1.0	1.6	7.0	1.1	3.2	5.5	3.3	23	20	13	e3.0
28	16	1.0	1.4	6.0	1.0	8.0	19	2.6	22	18	e5.7	e2.7
29	15	1.0	1.3	3.9	---	3.4	10	2.0	13	20	e6.4	e2.6
30	9.6	1.0	1.2	2.8	---	2.6	8.3	1.8	13	18	16	2.5
31	5.6	---	1.2	2.1	---	3.4	---	1.6	---	10	e5.2	---
TOTAL	193.13	122.4	164.48	217.7	43.0	261.4	128.23	156.8	301.6	578.5	377.8	198.3
MEAN	6.23	4.08	5.31	7.02	1.54	8.43	4.27	5.06	10.1	18.7	12.2	6.61
MAX	21	17	49	51	6.4	40	19	17	56	43	25	18
MIN	.55	1.0	.98	1.0	1.0	1.2	.96	1.1	1.4	4.1	4.5	2.5
AC-FT	383	243	326	432	85	518	254	311	598	1150	749	393

CAL YR 1977 TOTAL 2184.06 MEAN 5.98 MAX 49 MIN .18 AC-FT 4330
WTR YR 1978 TOTAL 2743.34 MEAN 7.52 MAX 56 MIN .55 AC-FT 5440

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.4	1.5	3.0	3.5	12	6.5	e.80	8.7	2.4	4.9	6.3	2.4
2	2.5	1.0	2.5	2.5	6.0	4.0	2.5	4.8	2.1	3.8	6.2	7.9
3	e3.7	2.0	2.0	2.5	3.8	3.0	6.0	14	2.1	12	29	6.5
4	e3.2	1.5	1.5	2.0	3.1	2.5	9.2	7.6	2.2	13	16	5.1
5	e22	1.0	15	2.0	10	2.5	5.0	3.8	2.1	12	24	3.6
6	e6.0	10	65	2.0	6.0	e2.5	8.2	2.6	1.9	20	5.8	2.9
7	e4.1	5.0	8.0	1.5	4.0	e2.0	7.2	2.5	1.8	62	4.4	2.9
8	e17	3.0	6.0	1.5	3.0	e5.0	3.9	2.7	1.8	30	3.5	13
9	e13	2.5	15	1.5	5.0	e65	2.9	2.1	1.8	9.8	3.0	7.6
10	e7.6	1.5	6.0	1.5	25	e18	2.2	2.3	3.5	5.4	2.7	4.3
11	e4.6	3.5	6.0	1.4	25	e5.0	1.9	2.6	24	4.6	2.5	3.3
12	e5.6	18	9.0	7.4	12	e2.5	1.6	2.3	39	4.0	2.3	2.8
13	3.8	20	20	70	20	e6.0	1.5	4.2	12	3.5	2.4	2.4
14	3.3	15	25	99	20	e7.0	1.4	10	5.1	14	9.7	2.2
15	2.9	20	10	94	18	e10	1.9	19	4.3	15	46	2.0
16	3.5	20	5.0	97	15	e12	1.8	11	5.0	7.6	24	1.9
17	2.8	15	5.0	72	16	e6.0	1.5	7.3	6.0	8.1	7.6	2.5
18	2.5	10	10	33	8.0	e2.5	1.9	3.8	16	4.7	5.1	5.5
19	2.4	5.0	15	9.0	6.0	e3.5	2.3	3.5	40	4.9	4.3	3.3
20	3.3	12	15	7.2	e5.0	e10	2.3	2.8	16	4.2	3.7	2.5
21	4.5	20	5.0	37	3.5	e4.5	2.2	2.4	11	5.7	3.3	2.1
22	3.3	5.5	2.5	22	3.0	e3.0	2.5	4.8	21	32	3.1	1.8
23	12	3.5	3.0	121	12	e2.0	8.7	4.8	43	16	2.8	1.8
24	8.1	3.0	2.0	70	e25	1.5	3.8	3.5	14	7.5	2.8	1.9
25	8.2	4.0	1.5	18	e49	1.5	4.7	3.0	34	19	2.8	4.8
26	12	10	2.5	10	12	1.5	4.6	5.4	45	8.6	2.8	3.4
27	6.0	12	3.0	5.8	20	1.0	2.7	3.8	25	12	2.6	11
28	4.2	8.0	2.5	6.2	12	e.95	2.1	2.8	23	23	2.4	8.2
29	3.0	8.0	2.0	7.0	---	e.90	1.9	2.4	17	8.6	2.8	4.9
30	2.5	4.0	2.0	7.1	---	e.85	3.2	2.4	7.3	5.1	3.0	3.7
31	2.0	---	4.0	4.1	---	e.83	---	2.8	---	4.6	2.6	---
TOTAL	182.0	245.5	274.0	818.7	359.4	194.03	102.40	155.7	429.4	385.6	239.5	128.2
MEAN	5.87	8.18	8.84	26.4	12.8	6.26	3.41	5.02	14.3	12.4	7.73	4.27
MAX	22	20	65	121	49	65	9.2	19	45	62	46	13
MIN	2.0	1.0	1.5	1.4	3.0	.83	.80	2.1	1.8	3.5	2.3	1.8
AC-FT	361	487	543	1620	713	385	203	309	852	765	475	254

CAL YR 1978 TOTAL 2964.83 MEAN 8.12 MAX 65 MIN .96 AC-FT 5880
WTR YR 1979 TOTAL 3514.43 MEAN 9.63 MAX 121 MIN .80 AC-FT 6970

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	3.5	1.6	1.5	2.6	e.62	29	34	15	.50	1.3	23	11
2	2.9	1.0	18	1.5	e.60	5.3	90	10	.45	1.5	6.8	3.5
3	2.8	.80	16	1.1	e.80	5.1	37	6.0	1.5	2.4	6.4	2.8
4	2.5	.65	10	.95	e.60	10	19	38	12	3.3	13	3.6
5	2.8	.55	5.6	.75	e.58	46	6.0	10	6.0	1.9	6.3	12
6	2.4	.55	5.0	.50	e.56	58	6.1	8.0	6.5	14	4.6	3.5
7	2.1	.46	4.5	.40	e.54	23	3.7	5.0	2.5	9.4	4.3	2.8
8	1.8	.75	4.0	.26	e.53	30	2.0	5.0	1.0	2.5	6.8	2.2
9	2.8	2.1	3.5	289	e.52	59	1.3	6.0	5.0	2.6	2.6	1.9
10	2.1	1.1	3.0	76	e1.5	20	.82	4.0	7.0	4.2	1.8	2.8
11	1.0	.75	3.5	120	e3.0	6.3	9.7	5.0	38	13	1.4	6.0
12	.65	.55	2.2	e6.0	e2.0	5.0	77	10	20	5.9	1.2	3.1
13	.55	3.3	1.5	e1.5	e6.0	30	48	10	25	6.3	1.2	25
14	.43	49	1.0	e1.1	e17	67	25	3.0	8.0	4.9	1.0	12
15	.75	65	.75	e1.1	14	15	20	3.5	6.0	4.9	.95	16
16	.95	106	.50	e1.0	16	11	4.1	5.0	6.0	3.3	2.7	4.5
17	11	138	.32	e.90	e4.5	81	.49	4.5	5.5	2.6	2.8	3.3
18	5.2	338	.22	e1.0	e2.5	4.0	1.2	2.0	6.5	2.3	3.0	2.8
19	3.5	12	.18	e1.0	e1.7	12	1.1	10	5.0	2.9	4.3	2.4
20	2.8	9.2	.22	e.90	e1.2	20	.67	12	3.9	2.0	24	5.0
21	2.8	18	.40	e.80	e1.1	7.3	13	6.0	2.6	6.8	8.4	42
22	1.8	6.9	.29	e1.4	e.90	87	40	4.0	3.0	7.9	2.9	9.1
23	1.6	5.5	16	e2.0	e.85	139	19	1.5	5.0	5.3	2.4	3.1
24	2.1	5.2	6.2	e1.5	e.80	236	11	1.0	2.6	6.8	2.2	2.4
25	1.2	5.0	17	e1.1	e.75	58	15	.90	5.7	11	2.1	1.8
26	1.2	4.9	12	e.95	e.70	45	20	2.0	8.3	16	1.4	1.5
27	3.0	4.8	13	e.85	e3.0	11	15	1.0	3.9	19	1.2	1.4
28	2.1	4.8	4.5	e.75	15	9.2	12	.75	2.2	7.1	13	2.4
29	2.8	4.6	18	e.68	16	30	10	.50	1.9	4.2	7.8	2.6
30	2.5	3.5	5.4	e.63	---	6.1	20	.30	1.5	7.9	41	2.1
31	2.2	---	2.3	e.63	---	8.1	---	.60	---	3.9	22	---
TOTAL	75.83	794.56	176.58	518.85	113.85	1173.4	562.18	190.55	203.05	187.1	222.55	194.6
MEAN	2.45	26.5	5.70	16.7	3.93	37.9	18.7	6.15	6.77	6.04	7.18	6.49
MAX	11	338	18	289	17	236	90	38	38	19	41	42
MIN	.43	.46	.18	.26	.52	4.0	.49	.30	.45	1.3	.95	1.4
AC-FT	150	1580	350	1030	226	2330	1120	378	403	371	441	386

CAL YR 1979 TOTAL 3859.90 MEAN 10.6 MAX 338 MIN .18 AC-FT 7660
WTR YR 1980 TOTAL 4413.10 MEAN 12.1 MAX 338 MIN .18 AC-FT 8750

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	2.2	5.2	.77	.39	.25	8.8	.95	58	2.6	.14	.13	.70
2	2.2	e3.2	.70	.39	.25	11	.69	10	2.5	.12	.12	.77
3	1.6	e2.0	.64	.39	.27	11	2.8	4.2	2.2	.12	4.0	3.7
4	1.4	1.1	.62	.39	.25	7.1	5.9	2.2	1.3	.11	13	2.0
5	1.2	.92	.59	.39	.30	3.2	3.6	1.4	1.5	.11	4.2	2.7
6	1.2	.82	.57	.35	.32	2.7	2.1	1.0	9.6	.11	2.3	1.9
7	1.3	.71	.55	.29	.27	3.7	1.6	.83	4.0	.10	1.1	.88
8	41	1.0	.54	.29	9.4	4.0	1.4	.64	20	.10	6.2	.49
9	10	12	.50	.27	5.9	8.2	1.1	.41	e4.4	.10	16	.21
10	7.6	3.6	.50	.25	2.4	4.0	.84	.36	2.4	.08	16	.14
11	16	34	.46	.25	1.3	2.5	.63	.36	1.4	.07	8.9	.14
12	58	12	.46	.25	.87	1.7	.56	.33	1.7	.07	12	.13
13	14	2.6	.46	.25	.66	1.3	.53	.29	1.1	.16	3.1	.13
14	5.5	1.7	.46	.25	.39	1.0	.50	.29	2.0	.13	2.0	.12
15	3.5	1.2	.47	.23	.36	.76	.51	.29	2.5	.13	1.2	.12
16	3.2	1.1	.69	.22	.35	.55	.48	.29	2.0	1.5	.83	.12
17	12	8.0	.82	2.1	.33	.69	.45	.33	1.2	.83	.60	.12
18	6.7	17	.63	1.6	.33	1.3	.43	.44	2.8	.30	2.8	.20
19	4.9	8.8	.53	.73	.30	1.7	.58	.61	1.7	.99	10	.41
20	3.0	3.5	.77	.84	.29	1.2	1.1	4.1	.92	4.3	6.2	3.6
21	2.8	1.8	.67	.81	9.8	.91	2.1	4.2	.65	40	2.3	1.4
22	3.2	1.4	.56	.63	19	.62	1.5	1.7	.39	3.4	1.9	.56
23	7.3	1.5	.47	.39	3.6	.52	1.7	1.0	.20	6.4	4.9	.78
24	3.0	1.9	.43	.36	16	.56	8.4	.76	.13	5.8	2.1	2.0
25	2.0	1.3	.43	.35	14	.58	10	.54	.13	4.0	1.1	.94
26	1.6	1.5	.43	.33	12	.74	4.1	.51	.12	2.0	.70	2.6
27	1.4	2.2	.43	.32	23	2.2	2.4	.48	.11	1.0	.57	25
28	4.3	1.3	.43	.29	33	6.7	1.4	.49	.13	.66	.46	7.8
29	21	.99	.41	.27	---	3.4	1.0	1.5	.12	.42	.49	2.7
30	15	.85	.39	.25	---	1.6	13	1.6	.14	.28	.50	1.6
31	52	---	.39	.24	---	1.3	---	3.8	---	.17	.52	---
TOTAL	310.1	135.19	16.77	14.36	155.19	95.53	72.35	102.95	69.94	73.70	126.22	63.96
MEAN	10.0	4.51	.54	.46	5.54	3.08	2.41	3.32	2.33	2.38	4.07	2.13
MAX	58	34	.82	2.1	33	11	13	58	20	40	16	25
MIN	1.2	.71	.39	.22	.25	.52	.43	.29	.11	.07	.12	.12
AC-FT	615	268	33	28	308	189	144	204	139	146	250	127

CAL YR 1980 TOTAL 3828.19 MEAN 10.5 MAX 289 MIN .26 AC-FT 7590
WTR YR 1981 TOTAL 1236.26 MEAN 3.39 MAX 58 MIN .07 AC-FT 2450

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1981 TO SEPTEMBER 1982
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.9	19	21	.64	3.0	6.4	3.0	21	2.8	16	33	10
2	13	8.4	19	.53	2.0	9.2	2.1	14	2.1	65	9.4	11
3	3.5	8.7	20	.56	1.6	5.5	2.0	4.5	1.6	20	11	8.3
4	2.5	26	15	1.3	1.4	10	6.3	3.1	1.4	34	13	4.9
5	2.4	7.2	10	.89	3.7	4.4	4.7	3.5	1.2	30	7.4	3.1
6	1.3	3.3	9.6	.61	9.2	2.5	2.7	2.6	1.1	16	4.5	3.0
7	.95	22	33	.48	9.6	5.4	1.9	2.1	1.0	7.3	6.7	6.3
8	.65	23	42	.38	6.0	11	1.7	3.7	.91	10	5.3	14
9	.47	8.2	15	65	11	12	2.2	17	.94	16	16	7.4
10	.31	3.7	8.7	e4.0	22	19	3.1	29	1.6	52	44	24
11	.24	6.5	4.6	e2.0	160	12	2.1	38	1.3	9.3	22	6.0
12	.22	18	2.7	1.5	38	22	1.7	9.8	1.0	12	50	3.9
13	.21	14	2.9	1.0	10	84	5.0	15	3.2	12	19	4.0
14	.22	3.0	4.2	.80	5.0	9.4	8.7	11	2.7	45	7.4	9.0
15	1.6	2.0	2.8	.60	3.5	11	3.4	4.8	2.8	42	5.6	20
16	.86	1.4	1.9	.50	2.5	3.2	24	3.2	4.0	16	3.6	16
17	.47	.90	1.4	.40	1.5	3.0	14	2.5	3.2	14	2.8	7.5
18	.23	.75	1.1	.36	1.1	9.0	8.8	11	3.6	30	13	7.4
19	.18	.65	.95	.50	.92	2.9	6.3	18	2.1	17	5.7	8.1
20	.18	.46	.81	.43	.82	2.0	6.8	6.1	1.5	4.6	4.1	5.6
21	.17	.43	.69	12	.72	1.6	6.3	11	1.1	25	4.0	4.8
22	.29	4.3	.59	11	.64	19	13	8.2	.95	7.5	19	3.2
23	.21	6.2	.53	6.9	.56	61	5.2	4.0	.86	3.6	28	14
24	.21	121	.44	3.5	.54	37	15	2.8	.66	2.9	22	7.0
25	9.6	19	5.6	48	.51	22	20	8.0	.70	2.8	9.0	11
26	3.9	8.4	12	136	.49	8.4	29	9.2	15	2.4	24	7.8
27	2.0	8.7	2.7	142	.44	3.5	33	3.8	37	2.1	22	6.0
28	13	26	1.8	55	.84	2.5	53	5.9	33	1.8	23	6.1
29	5.9	7.2	1.3	7.9	---	2.0	71	4.3	16	2.2	12	9.3
30	2.5	3.3	1.0	19	---	2.1	52	9.3	15	2.4	10	6.8
31	1.6	---	.82	6.0	---	7.4	---	5.3	---	38	24	---
TOTAL	70.77	381.69	244.13	529.78	297.58	410.4	408.0	291.7	160.32	558.9	480.5	255.5
MEAN	2.28	12.7	7.88	17.1	10.6	13.2	13.6	9.41	5.34	18.0	15.5	8.52
MAX	13	121	42	142	160	84	71	38	37	65	50	24
MIN	.17	.43	.44	.36	.44	1.6	1.7	2.1	.66	1.8	2.8	3.0
AC-FT	140	757	484	1050	590	814	809	579	318	1110	953	507

CAL YR 1981 TOTAL 1470.79 MEAN 4.03 MAX 121 MIN .07 AC-FT 2920
WTR YR 1982 TOTAL 4089.27 MEAN 11.2 MAX 160 MIN .17 AC-FT 8110

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1982 TO SEPTEMBER 1983
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	6.4	1.3	2.9	2.1	1.9	.15	8.2	52	17	11	11	3.0
2	7.8	1.2	2.2	1.9	1.2	.15	5.4	26	6.7	11	7.1	3.4
3	5.6	1.2	1.8	1.7	.85	.14	3.0	21	18	8.1	5.8	8.7
4	4.6	1.1	1.5	1.6	.65	.13	1.5	41	5.2	24	17	3.6
5	2.4	1.0	1.4	1.5	.50	.14	.75	8.2	8.1	10	11	5.4
6	2.2	1.1	1.3	1.5	.46	.13	.46	9.1	10	33	6.7	7.5
7	4.0	1.1	7.3	1.5	.40	.13	.28	49	6.0	26	6.8	22
8	7.6	.99	3.9	1.4	.40	.13	5.3	13	9.3	21	4.4	15
9	17	.91	2.8	1.3	.40	.13	3.0	4.2	4.7	12	2.8	10
10	11	.92	2.2	1.2	.40	.11	1.4	3.5	8.1	8.8	2.3	9.1
11	13	1.4	2.2	1.2	.32	.09	.86	6.6	4.3	8.0	5.0	8.4
12	23	2.6	4.4	1.1	.32	.09	3.5	6.1	3.2	7.1	16	7.6
13	19	20	2.8	1.0	.32	.09	3.3	17	3.3	19	10	15
14	7.8	45	2.8	1.0	.32	.09	13	15	6.0	24	5.8	5.9
15	5.7	9.9	2.8	2.5	.29	.09	29	5.7	2.9	15	3.1	3.6
16	4.7	6.7	20	1.7	.29	.09	4.7	6.2	6.3	14	2.6	5.3
17	2.7	5.1	5.8	1.2	1.8	.11	19	6.7	7.5	9.7	2.4	21
18	5.4	3.3	86	1.0	3.1	2.6	5.7	4.2	5.2	9.1	5.1	30
19	5.1	2.5	77	.90	1.4	6.5	8.8	2.8	10	6.6	3.8	10
20	2.8	2.2	15	.80	.75	2.2	13	2.3	3.7	3.8	2.4	6.8
21	2.8	16	15	.70	.46	.85	7.4	2.2	5.6	4.5	4.9	6.1
22	8.0	5.0	8.7	.60	.36	.37	15	4.8	11	4.8	3.9	3.6
23	4.6	3.0	11	.60	.26	1.3	10	4.4	7.9	7.3	2.7	2.9
24	2.3	10	15	.55	.26	2.8	6.3	3.6	4.3	15	11	2.1
25	1.9	4.5	5.0	.55	.22	5.9	4.8	6.6	3.7	19	7.7	11
26	1.7	3.5	26	.50	.22	2.8	4.3	4.6	5.0	14	7.3	7.2
27	1.9	2.7	8.9	.50	.15	3.7	8.2	5.2	5.1	18	7.5	14
28	2.7	3.2	5.1	.46	.15	2.9	19	2.9	9.4	11	23	9.6
29	1.8	16	3.3	.46	---	2.9	25	2.5	21	6.2	9.9	46
30	1.6	4.3	2.6	.46	---	1.8	46	2.1	15	5.2	5.6	13
31	1.4	---	2.2	.50	---	.89	---	40	---	10	4.1	---
TOTAL	188.5	177.72	348.9	33.98	18.15	39.50	276.15	378.5	233.5	396.2	218.7	316.8
MEAN	6.08	5.92	11.3	1.10	.65	1.27	9.20	12.2	7.78	12.8	7.05	10.6
MAX	23	45	86	2.5	3.1	6.5	46	52	21	33	23	46
MIN	1.4	.91	1.3	.46	.15	.09	.28	2.1	2.9	3.8	2.3	2.1
AC-FT	374	353	692	67	36	78	548	751	463	786	434	628

CAL YR 1982 TOTAL 4107.80 MEAN 11.3 MAX 160 MIN .36 AC-FT 8150
WTR YR 1983 TOTAL 2626.60 MEAN 7.20 MAX 86 MIN .09 AC-FT 5210

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1983 TO SEPTEMBER 1984
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	9.8	3.8	1.1	1.2	3.7	1.2	3.4	2.6	2.0	7.8	1.8	4.0
2	6.7	14	1.0	.99	4.7	7.8	2.6	3.0	1.6	6.8	1.3	2.9
3	3.7	6.1	.97	.89	10	6.7	2.1	4.3	1.4	2.4	.92	1.5
4	3.2	5.2	.89	.82	4.0	8.0	14	3.8	1.0	2.2	1.7	1.0
5	3.0	15	.82	17	2.5	2.9	3.4	2.7	.89	7.1	26	.79
6	4.4	4.0	.81	11	1.9	2.0	26	2.1	1.2	2.8	6.9	.67
7	23	2.8	.81	3.9	1.6	1.5	21	1.7	1.0	1.9	2.9	.58
8	37	2.5	1.1	3.8	19	1.2	16	1.5	3.0	3.3	1.7	.51
9	8.9	2.2	1.4	2.3	5.5	1.0	5.6	1.4	5.6	3.9	1.1	.54
10	17	1.8	1.2	1.6	3.4	.93	19	1.4	7.3	2.4	3.3	.67
11	7.0	1.8	2.4	1.2	2.3	.82	11	2.2	4.4	1.3	3.3	.65
12	5.5	14	1.5	1.2	1.7	.78	4.4	2.9	8.3	1.3	11	.49
13	4.0	17	1.1	8.7	1.6	.81	4.9	1.9	14	8.0	5.2	.43
14	5.2	4.4	1.1	3.8	4.2	.94	49	1.5	4.3	2.5	2.5	.42
15	13	4.0	1.4	4.9	15	.94	16	1.5	3.2	1.4	2.2	.43
16	65	2.8	2.6	2.8	8.2	1.6	19	1.9	6.3	.97	4.3	.39
17	11	2.4	2.0	1.8	4.1	1.5	49	12	6.2	.80	2.3	.35
18	5.7	1.8	1.3	1.3	2.8	1.1	24	13	2.7	.67	1.3	.35
19	9.1	1.6	1.0	1.0	12	.94	10	4.4	2.0	.59	.92	.35
20	6.7	1.4	.87	.90	28	.82	5.1	9.6	1.4	.64	.73	.35
21	5.9	1.4	.76	.82	9.5	.76	5.4	6.2	1.4	.58	.68	.34
22	5.4	1.3	.72	.74	3.9	.88	4.6	3.9	2.7	.51	2.5	.33
23	6.1	1.7	.67	.70	4.5	2.8	9.6	6.3	4.8	.45	7.1	.34
24	38	2.2	.65	.67	4.8	1.8	5.1	10	7.8	.53	2.9	.38
25	12	3.8	.71	.65	3.2	1.9	3.2	4.8	4.2	.52	2.1	.36
26	18	4.6	123	.90	3.3	4.6	2.5	5.2	2.4	.43	5.2	.35
27	58	2.3	9.8	.80	2.3	8.0	2.1	3.1	5.3	2.4	16	.35
28	8.9	1.7	3.7	2.4	1.8	18	1.9	2.5	3.3	6.4	3.6	.35
29	8.6	1.4	2.5	53	1.4	29	5.5	4.8	1.9	2.3	2.2	.35
30	e6.0	1.3	2.0	19	---	9.5	3.8	4.2	1.6	1.3	1.3	.35
31	e4.1	---	1.5	21	---	8.1	---	2.7	---	2.0	2.2	---
TOTAL	419.9	130.3	171.38	171.78	170.9	128.82	349.2	129.1	113.19	76.19	127.15	20.87
MEAN	13.5	4.34	5.53	5.54	5.89	4.16	11.6	4.16	3.77	2.46	4.10	.70
MAX	65	17	123	53	28	29	49	13	14	8.0	26	4.0
MIN	3.0	1.3	.65	.65	1.4	.76	1.9	1.4	.89	.43	.68	.33
AC-FT	833	258	340	341	339	256	693	256	225	151	252	41

CAL YR 1983 TOTAL 2633.06 MEAN 7.21 MAX 123 MIN .09 AC-FT 5220
WTR YR 1984 TOTAL 2008.78 MEAN 5.49 MAX 123 MIN .33 AC-FT 3980

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1984 TO SEPTEMBER 1985
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.35	.23	6.7	.70	1.4	13	8.6	6.5	3.3	7.0	8.0	3.6
2	.36	.22	2.7	.54	.72	5.9	34	25	2.6	7.0	7.9	3.9
3	.40	.55	1.5	.44	.55	3.4	4.4	5.5	2.6	7.2	8.8	9.2
4	.36	.98	1.6	3.7	.35	5.3	2.8	3.0	1.9	21	7.6	3.7
5	.35	1.1	1.8	11	.27	19	2.3	3.5	2.0	15	6.4	2.6
6	.36	.55	1.1	2.8	.25	120	2.0	3.2	3.6	3.9	13	2.8
7	.35	.33	7.8	1.7	.25	73	1.6	4.1	2.1	4.9	36	2.5
8	.35	1.0	7.7	.98	.25	65	2.0	28	1.4	4.3	38	2.4
9	.35	5.6	70	.66	.24	13	4.8	8.6	3.0	2.5	15	1.7
10	.35	4.4	8.1	.50	.22	27	4.9	9.2	2.6	1.9	6.0	1.3
11	.35	14	3.1	.35	.22	30	3.8	14	1.8	1.5	3.2	1.1
12	.37	8.9	2.2	.27	.22	11	2.5	11	1.3	1.1	7.8	.93
13	.36	5.7	1.4	.24	.22	20	1.9	8.9	1.6	.88	9.3	.83
14	.34	2.9	.94	8.7	.22	40	3.5	3.7	1.4	.78	15	.76
15	.31	2.1	.72	8.7	.23	12	3.4	2.8	.94	2.6	8.8	.76
16	.31	2.1	.57	2.9	.23	8.5	26	1.9	.76	9.3	9.4	.74
17	.28	2.0	.52	1.7	.25	7.0	11	1.4	.65	8.8	20	4.1
18	.28	5.1	.41	.97	.22	6.7	8.2	1.0	.57	21	3.3	7.8
19	.28	59	1.3	.66	.22	7.6	4.8	.82	.54	4.4	2.5	40
20	.29	14	4.0	.51	.22	7.3	4.0	.73	1.4	2.7	2.0	10
21	.28	5.1	2.3	.33	.23	16	3.6	.66	7.2	4.9	1.8	5.7
22	.28	2.9	1.3	.29	4.5	20	2.9	.64	2.4	8.3	2.4	4.3
23	.26	3.4	.77	.40	4.4	8.0	4.6	12	1.3	7.0	3.2	3.1
24	.25	2.6	.60	.29	4.4	3.5	5.2	9.8	.85	15	2.1	2.5
25	.25	1.8	16	.24	13	2.7	2.8	5.3	.81	15	1.6	2.0
26	.25	1.1	25	.22	26	2.2	2.1	3.5	.84	5.1	3.6	1.6
27	.25	.92	8.2	.22	8.3	1.9	1.8	12	1.7	6.2	16	2.5
28	.24	.75	3.3	.21	15	1.6	3.5	13	1.7	5.9	9.5	5.8
29	.22	.60	2.2	.19	---	2.1	4.2	8.2	1.4	7.8	22	9.9
30	.22	3.7	1.4	2.8	---	3.0	2.5	4.6	7.0	15	8.8	10
31	.22	---	.96	2.8	---	2.4	---	4.2	---	9.6	6.8	---
TOTAL	9.47	153.63	186.19	56.01	82.58	558.1	169.7	216.75	61.26	227.56	305.8	148.12
MEAN	.31	5.12	6.01	1.81	2.95	18.0	5.66	6.99	2.04	7.34	9.86	4.94
MAX	.40	59	70	11	26	120	34	28	7.2	21	38	40
MIN	.22	.22	.41	.19	.22	1.6	1.6	.64	.54	.78	1.6	.74
AC-FT	19	305	369	111	164	1110	337	430	122	451	607	294

CAL YR 1984 TOTAL 1636.49 MEAN 4.47 MAX 70 MIN .22 AC-FT 3250
WTR YR 1985 TOTAL 2175.17 MEAN 5.96 MAX 120 MIN .19 AC-FT 4310

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1985 TO SEPTEMBER 1986
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	27	3.9	74	38	.40	.30	17	18	4.4	3.2	3.4	3.0
2	4.1	2.7	14	30	.37	.29	8.3	7.3	2.8	3.3	8.3	2.4
3	2.6	2.2	6.2	20	.34	.27	18	11	13	15	9.6	1.9
4	2.1	1.8	4.1	3.4	.31	.25	36	7.1	11	14	9.0	3.0
5	1.6	1.5	2.4	2.4	.34	.24	34	4.4	12	7.0	6.8	2.2
6	3.2	1.2	1.8	1.7	.53	.24	34	39	3.6	4.4	5.2	1.6
7	2.8	1.2	1.4	30	.40	.23	39	7.1	8.5	17	6.5	1.3
8	9.6	1.0	1.1	38	.31	.22	180	2.9	5.9	16	11	1.2
9	10	.90	.95	46	.30	.60	116	2.1	15	15	8.1	12
10	4.0	.90	.75	9.2	.28	1.1	220	1.8	8.9	11	4.4	5.1
11	13	.80	.65	3.2	.27	.54	82	3.2	5.3	3.7	2.6	2.4
12	6.2	.70	.60	2.4	21	.49	20	3.7	2.5	3.8	2.8	1.8
13	3.8	.65	.60	1.9	5.0	1.1	15	2.4	11	5.2	5.1	2.6
14	2.7	.60	.60	1.6	2.3	2.8	11	1.8	15	2.7	16	3.1
15	2.5	2.4	.46	1.2	17	3.7	10	1.5	16	2.9	11	1.9
16	1.9	20	3.2	1.0	42	1.7	3.5	2.9	14	8.1	8.5	1.4
17	1.8	2.8	1.6	.88	3.2	1.0	2.4	9.5	3.2	4.7	3.9	1.1
18	7.5	1.9	1.0	.73	2.0	1.1	2.1	5.6	9.7	2.9	2.7	.98
19	4.5	26	.70	.67	1.4	2.6	2.6	4.1	75	4.8	2.1	.91
20	2.9	3.3	.60	.61	.99	61	2.8	6.3	10	3.8	1.6	.87
21	2.9	2.1	.50	1.2	.75	113	4.6	2.5	7.0	2.4	1.4	.83
22	2.5	2.5	.46	2.7	.62	91	7.3	2.0	4.1	3.3	2.2	.80
23	2.6	3.0	.40	1.6	.55	101	6.6	1.9	3.7	2.6	14	.77
24	7.3	2.0	.36	.96	.53	12	5.5	1.5	9.6	2.0	14	.75
25	3.7	2.6	.36	1.1	.46	4.4	4.8	1.3	36	1.8	3.6	.76
26	6.7	11	.70	.83	.42	2.2	4.3	1.1	13	1.5	2.4	.76
27	11	3.9	2.8	.66	.35	8.3	8.9	2.1	10	2.2	4.4	.72
28	15	2.4	8.1	.58	.33	7.2	20	3.2	5.4	5.1	4.4	.71
29	3.9	1.8	26	.53	---	36	13	8.4	6.3	2.5	4.6	.71
30	4.4	1.5	5.2	.48	---	41	20	61	4.1	1.9	8.5	.69
31	3.4	---	3.8	.40	---	23	---	11	---	1.5	5.5	---
TOTAL	177.2	109.25	165.39	243.93	102.75	518.87	948.7	237.7	346.0	175.3	193.6	58.26
MEAN	5.72	3.64	5.34	7.87	3.67	16.7	31.6	7.67	11.5	5.65	6.25	1.94
MAX	27	26	74	46	42	113	220	61	75	17	16	12
MIN	1.6	.60	.36	.40	.27	.22	2.1	1.1	2.5	1.5	1.4	.69
AC-FT	351	217	328	484	204	1030	1880	471	686	348	384	116

CAL YR 1985 TOTAL 2277.72 MEAN 6.24 MAX 120 MIN .19 AC-FT 4520
WTR YR 1986 TOTAL 3276.95 MEAN 8.98 MAX 220 MIN .22 AC-FT 6500

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1986 TO SEPTEMBER 1987
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.70	9.2	21	3.4	2.3	1.4	112	23	5.4	18	15	.99
2	.80	5.8	68	24	1.9	4.7	31	37	3.3	11	4.3	.97
3	.76	2.7	70	8.6	1.7	8.3	14	12	2.7	22	2.8	.93
4	2.0	2.0	16	3.2	1.5	2.9	4.9	21	2.3	20	2.2	.94
5	3.6	1.5	4.2	3.4	1.5	2.2	3.3	14	3.7	29	1.8	.93
6	17	1.2	47	2.6	1.4	1.7	4.0	6.3	8.4	7.8	1.6	.93
7	29	1.3	4.7	2.2	1.3	1.5	3.9	62	6.8	4.4	1.6	.93
8	4.1	1.1	2.9	1.8	1.2	5.3	2.8	10	6.8	6.5	2.6	.89
9	2.5	3.4	4.2	1.5	1.2	3.9	2.4	4.3	6.5	19	2.2	1.6
10	1.8	4.9	4.1	73	1.1	2.4	2.4	3.4	12	8.3	6.0	1.4
11	1.4	11	16	109	1.0	1.8	2.3	3.2	36	7.8	7.1	1.8
12	1.1	29	8.3	97	.99	1.5	2.7	2.8	12	7.4	16	3.0
13	1.1	8.2	3.9	8.7	1.0	1.3	4.0	2.4	12	18	3.8	11
14	6.2	12	3.9	18	1.3	1.2	8.7	2.2	3.9	71	2.6	3.3
15	4.0	11	3.7	9.7	1.5	1.6	34	2.1	29	11	1.9	2.3
16	5.7	6.1	2.7	13	1.5	7.5	20	2.0	41	4.8	1.8	1.6
17	5.3	8.4	3.6	4.0	41	5.3	9.8	1.8	8.7	4.1	1.7	1.4
18	2.5	3.2	3.3	59	24	6.5	10	1.7	4.0	4.6	1.5	6.5
19	1.9	17	2.7	23	9.6	11	12	1.6	4.3	5.8	1.4	6.3
20	13	18	2.3	3.9	8.6	6.9	13	1.5	24	37	1.5	3.6
21	5.8	4.9	14	2.9	3.4	5.9	6.3	1.4	16	11	3.3	2.5
22	2.7	6.6	4.8	8.4	2.6	5.0	61	1.4	12	5.0	3.3	1.7
23	1.9	3.2	6.3	4.0	2.1	6.6	4.3	1.7	11	3.0	2.1	1.3
24	1.4	3.7	3.6	3.0	1.8	4.3	3.1	55	3.2	2.5	1.5	1.7
25	5.5	2.9	3.7	24	3.7	3.4	2.6	9.6	2.6	2.1	1.4	1.3
26	47	2.7	2.9	20	3.0	2.9	3.0	21	13	1.9	2.5	1.2
27	7.5	10	2.2	4.1	2.1	2.5	23	9.9	21	2.6	2.0	1.0
28	11	9.4	1.9	2.9	1.7	2.7	17	7.4	5.0	5.8	1.5	.99
29	3.1	20	1.7	5.6	---	2.6	5.1	11	18	3.5	1.3	.96
30	2.3	37	1.6	3.5	---	4.0	3.3	8.8	22	4.7	1.2	.97
31	1.7	---	2.6	2.5	---	7.1	---	18	---	4.2	1.1	---
TOTAL	194.36	257.4	337.8	549.9	125.99	125.9	425.9	359.5	356.6	363.8	100.6	64.93
MEAN	6.27	8.58	10.9	17.7	4.50	4.06	14.2	11.6	11.9	11.7	3.25	2.16
MAX	47	37	70	109	41	11	112	62	41	71	16	11
MIN	.70	1.1	1.6	1.5	.99	1.2	2.3	1.4	2.3	1.9	1.1	.89
AC-FT	386	511	670	1090	250	250	845	713	707	722	200	129

CAL YR 1986 TOTAL 3614.67 MEAN 9.90 MAX 220 MIN .22 AC-FT 7170
WTR YR 1987 TOTAL 3262.68 MEAN 8.94 MAX 112 MIN .70 AC-FT 6470

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

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

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	31	10	3.2	15	1.8	2.4	8.4	8.6	3.9	6.3	2.0	.77
2	13	17	5.5	64	1.5	1.9	9.7	8.2	5.8	4.0	2.8	.84
3	3.9	3.6	6.3	23	1.4	1.8	13	5.0	5.6	3.5	3.1	.83
4	2.7	2.7	3.5	14	1.3	1.7	13	2.8	21	3.1	8.2	.76
5	2.0	2.4	3.4	5.1	1.2	1.8	14	7.8	12	7.9	16	21
6	3.7	4.0	62	5.2	1.2	3.2	34	4.0	3.6	8.8	58	6.5
7	4.5	5.9	39	4.2	1.4	2.3	7.5	3.7	4.5	11	15	3.2
8	2.6	3.9	18	2.6	3.3	3.4	3.5	7.8	3.2	23	6.9	2.3
9	2.2	2.7	3.9	39	4.2	3.4	5.0	3.3	2.3	20	3.6	1.6
10	1.6	16	3.4	15	2.6	2.0	29	2.4	1.9	4.0	2.4	6.9
11	1.3	24	2.6	12	11	1.6	20	2.2	1.7	9.8	2.0	7.0
12	1.1	5.5	9.1	7.2	5.1	1.4	4.1	11	2.0	31	4.8	3.5
13	1.0	3.6	64	5.7	6.3	1.2	2.8	11	3.1	5.9	6.2	2.2
14	.99	9.9	6.8	4.4	3.2	6.4	2.3	3.6	2.2	12	2.9	1.6
15	.98	6.7	3.0	2.1	2.3	50	2.0	5.0	1.8	6.1	2.1	1.4
16	.90	5.6	2.4	18	3.2	6.0	1.7	3.0	7.1	3.8	2.1	1.2
17	.87	3.9	2.0	10	2.6	2.8	2.0	4.0	9.8	4.8	8.7	1.0
18	1.0	20	2.0	4.0	1.9	2.1	2.9	2.4	4.9	14	2.7	1.0
19	4.7	13	1.9	2.5	1.8	2.0	2.5	1.8	3.0	6.7	1.8	1.0
20	8.0	71	2.0	2.0	1.6	1.9	2.0	1.9	20	5.1	1.5	.95
21	5.8	141	1.8	1.8	1.4	1.6	11	6.3	7.6	8.9	1.4	2.3
22	16	58	1.7	1.5	1.6	1.6	14	12	8.8	4.1	1.8	2.2
23	24	18	1.5	2.6	9.1	1.6	3.3	14	7.2	2.6	1.5	2.8
24	9.5	8.8	1.3	3.2	4.5	1.6	2.5	3.9	13	2.2	1.3	2.5
25	15	5.3	1.6	4.7	18	1.4	4.0	2.4	9.6	2.2	1.0	3.9
26	12	8.0	5.1	20	50	1.2	17	1.9	6.1	1.7	.91	4.9
27	4.8	5.1	3.7	34	11	1.2	15	1.8	16	1.6	.94	4.9
28	6.8	7.5	2.1	12	4.9	1.1	32	14	7.1	11	1.2	3.4
29	9.0	5.3	1.7	5.5	3.2	1.7	39	7.3	6.7	9.7	1.1	2.4
30	6.8	3.8	1.5	2.7	---	2.5	9.4	3.0	6.2	12	.93	2.0
31	8.1	---	1.3	2.0	---	15	---	2.7	---	2.9	.84	---
TOTAL	205.84	492.2	267.3	345.0	162.6	129.8	326.6	168.8	207.7	249.7	165.72	96.85
MEAN	6.64	16.4	8.62	11.1	5.61	4.19	10.9	5.45	6.92	8.05	5.35	3.23
MAX	31	141	64	64	50	50	39	14	21	31	58	21
MIN	.87	2.4	1.3	1.5	1.2	1.1	1.7	1.8	1.7	1.6	.84	.76
AC-FT	408	976	530	684	323	257	648	335	412	495	329	192

CAL YR 1987 TOTAL 3438.46 MEAN 9.42 MAX 141 MIN .87 AC-FT 6820
WTR YR 1988 TOTAL 2818.11 MEAN 7.70 MAX 141 MIN .76 AC-FT 5590

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1988 TO SEPTEMBER 1989
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.4	1.9	2.8	3.0	.95	1.4	7.4	8.1	11	2.5	5.4	8.6
2	1.2	1.9	2.1	2.4	.90	1.2	9.3	4.6	7.1	2.0	6.2	7.6
3	1.0	1.8	1.7	7.6	67	1.1	6.0	4.0	4.3	2.4	5.6	3.7
4	1.0	2.2	1.4	4.4	29	19	2.6	5.2	4.5	8.6	4.5	3.6
5	3.5	6.0	1.2	5.8	11	8.5	29	5.1	37	9.8	7.6	2.9
6	3.8	2.3	1.2	2.9	6.0	20	14	4.7	58	19	4.4	5.6
7	2.1	1.6	1.2	2.6	3.5	10	216	4.4	16	4.7	3.2	5.2
8	1.4	15	1.2	16	2.1	7.0	70	12	8.9	3.6	2.4	3.3
9	1.2	4.0	1.0	6.0	1.6	5.0	12	15	5.4	3.4	2.1	3.7
10	.96	14	1.0	17	15	3.2	5.8	11	3.6	7.9	1.8	6.7
11	.97	16	12	4.5	20	2.6	2.6	7.8	3.2	14	1.6	7.1
12	2.0	4.6	5.3	2.7	12	2.1	2.0	7.3	34	15	2.4	4.0
13	2.4	7.2	2.6	5.0	3.2	1.8	1.7	45	7.9	71	2.3	2.4
14	1.7	8.2	1.9	50	2.4	1.5	103	19	23	53	5.6	2.3
15	1.3	4.3	1.5	34	2.1	5.7	22	11	42	11	7.2	2.2
16	1.1	3.0	2.1	7.1	1.6	7.3	9.4	16	17	5.0	5.2	1.9
17	.95	2.2	6.9	4.3	1.4	2.6	5.7	12	20	4.1	3.5	2.5
18	.87	2.5	2.4	3.9	1.4	1.9	6.5	9.8	13	12	2.6	2.7
19	.80	3.6	1.6	9.3	1.5	1.5	6.5	12	3.6	67	6.1	4.0
20	.76	2.6	1.4	4.6	1.6	1.3	7.3	31	11	6.9	80	2.5
21	.72	18	1.2	3.5	1.4	1.2	13	11	5.7	6.2	10	2.1
22	.71	32	1.2	4.5	1.4	1.0	23	10	2.9	20	7.6	1.9
23	.71	15	1.0	2.6	2.4	1.1	18	22	2.3	4.6	4.8	1.7
24	.73	7.6	2.6	2.0	36	1.0	5.3	12	2.0	5.4	4.2	1.5
25	.71	3.5	19	1.6	15	1.2	3.8	53	1.8	10	2.5	1.5
26	.68	2.5	19	1.4	3.5	1.2	4.9	18	1.7	6.3	2.1	2.0
27	.86	4.4	3.4	1.4	2.4	1.0	3.8	8.1	1.6	3.5	1.8	5.1
28	5.1	3.2	2.9	1.2	1.7	1.3	169	10	1.4	17	1.5	3.9
29	4.4	3.6	4.0	1.1	---	3.6	117	19	11	22	1.4	4.7
30	3.0	8.1	5.3	1.1	---	4.8	37	31	5.9	7.6	1.4	2.4
31	2.2	---	4.3	1.0	---	13	---	24	---	4.3	1.3	---
TOTAL	50.23	202.8	116.4	214.5	248.05	135.1	933.6	463.1	366.8	429.8	198.3	109.3
MEAN	1.62	6.76	3.75	6.92	8.86	4.36	31.1	14.9	12.2	13.9	6.40	3.64
MAX	5.1	32	19	50	67	20	216	53	58	71	80	8.6
MIN	.68	1.6	1.0	1.0	.90	1.0	1.7	4.0	1.4	2.0	1.3	1.5
AC-FT	100	402	231	425	492	268	1850	919	728	853	393	217

CAL YR 1988 TOTAL 2222.20 MEAN 6.07 MAX 64 MIN .68 AC-FT 4410
WTR YR 1989 TOTAL 3467.98 MEAN 9.50 MAX 216 MIN .68 AC-FT 6880

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1989 TO SEPTEMBER 1990
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.5	1.0	2.1	14	61	7.3	1.5	22	18	7.1	2.5
2	1.5	1.4	1.0	2.8	10	44	5.7	1.7	24	45	6.9	2.3
3	1.6	1.2	1.0	5.7	15	50	20	9.9	19	16	8.0	12
4	6.1	1.1	1.0	8.1	7.8	41	7.8	9.4	17	5.3	7.7	16
5	14	1.2	.90	5.7	8.9	32	6.5	20	13	4.0	4.4	20
6	9.7	1.2	.85	2.9	14	31	4.7	20	14	3.2	4.3	8.8
7	3.4	1.2	.90	2.1	29	41	2.9	29	19	2.8	19	4.0
8	2.4	1.2	.83	1.6	6.6	56	2.4	36	41	4.7	7.3	3.3
9	4.6	1.2	13	41	4.7	9.0	2.1	6.1	22	4.7	4.0	6.4
10	4.3	1.2	6.9	11	2.8	6.1	1.8	9.7	13	3.8	3.2	20
11	1.8	1.1	3.3	12	2.1	9.6	1.6	6.1	13	6.6	2.7	5.0
12	1.4	1.0	2.0	32	1.8	13	1.8	3.2	12	24	3.5	9.2
13	1.2	1.0	1.6	5.4	1.6	8.5	1.4	2.5	9.0	5.5	11	6.6
14	1.1	.95	1.5	2.8	1.4	5.5	1.4	2.7	4.8	3.4	4.5	7.6
15	1.0	.90	1.4	2.8	1.4	7.6	1.9	3.3	5.0	2.8	11	8.2
16	1.0	.95	1.2	4.0	1.2	12	2.4	2.5	32	3.5	15	20
17	.92	4.9	1.0	17	1.2	4.3	2.4	2.4	21	9.2	9.2	37
18	.92	5.0	.95	53	1.2	3.1	2.8	4.1	14	24	3.9	14
19	3.1	2.8	.90	9.2	1.2	2.6	15	14	7.0	16	4.0	14
20	10	4.4	.75	17	1.7	2.2	20	55	22	13	6.6	5.4
21	9.5	4.6	.75	6.2	2.1	2.1	15	56	11	6.1	4.0	5.0
22	5.0	2.8	.70	3.5	1.2	1.8	34	11	17	4.3	3.4	4.9
23	13	2.5	.65	4.7	1.0	1.6	5.8	5.7	17	4.9	12	4.0
24	9.9	4.5	.65	2.9	12	1.5	4.2	18	41	14	18	8.0
25	10	2.5	.60	2.3	17	1.4	2.8	25	24	31	14	3.8
26	8.5	1.7	.55	1.8	32	1.4	2.4	14	11	12	16	3.1
27	4.6	1.4	.50	1.6	6.8	1.2	2.1	39	24	15	17	5.2
28	3.4	1.3	.50	4.7	17	1.5	1.7	19	14	19	7.5	19
29	2.6	1.2	.70	5.6	---	11	1.4	8.3	41	22	4.2	24
30	2.1	1.0	3.5	14	---	7.2	1.4	67	12	11	3.3	13
31	1.7	---	2.8	39	---	14	---	19	---	9.9	2.8	---
TOTAL	142.04	58.90	53.88	324.5	216.7	484.2	182.7	521.1	555.8	364.7	245.5	312.3
MEAN	4.58	1.96	1.74	10.5	7.74	15.6	6.09	16.8	18.5	11.8	7.92	10.4
MAX	14	5.0	13	53	32	61	34	67	41	45	19	37
MIN	.92	.90	.50	1.6	1.0	1.2	1.4	1.5	4.8	2.8	2.7	2.3
AC-FT	282	117	107	644	430	960	362	1030	1100	723	487	619

CAL YR 1989 TOTAL 3353.37 MEAN 9.19 MAX 216 MIN .50 AC-FT 6650
WTR YR 1990 TOTAL 3462.32 MEAN 9.49 MAX 67 MIN .50 AC-FT 6870

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.2	e4.4	2.5	2.2	e1.5	1.5	e25	e15	5.8	6.6	e3.5	2.6
2	6.0	e3.7	2.4	2.1	1.4	1.2	e15	e7.5	7.3	5.4	e3.0	2.3
3	16	e3.4	2.2	1.9	1.2	.95	e20	e5.0	6.5	3.6	e2.5	7.0
4	15	e3.2	2.2	1.8	1.1	.90	e16	e6.0	3.8	2.8	e3.0	16
5	12	e2.9	2.7	1.8	1.0	.80	e30	e12	3.4	2.4	e2.0	6.4
6	5.1	e2.5	8.5	2.7	.90	.90	e28	e7.0	4.1	2.1	e3.5	3.5
7	3.6	e2.3	4.7	6.2	.80	3.3	e25	e10	36	2.2	e40	4.1
8	3.1	e2.0	56	6.1	.70	7.9	e25	e12	7.1	1.9	e6.5	10
9	2.7	e2.0	176	4.9	.65	22	e8.0	e7.5	5.2	1.9	e6.0	5.9
10	2.5	1.9	20	10	.65	10	e6.0	e4.5	3.6	16	e6.0	18
11	47	1.8	7.5	6.2	.60	37	e4.5	e5.0	3.3	31	e5.0	13
12	9.7	1.8	7.6	4.1	.60	116	e4.0	e5.0	4.5	5.2	e5.5	9.1
13	9.0	1.8	12	3.1	2.9	108	e8.0	e4.5	5.9	12	e9.0	11
14	16	56	16	e2.6	12	129	e6.0	e20	10	9.6	4.8	4.0
15	34	36	5.0	e2.6	3.8	99	e7.0	e18	15	16	3.3	3.7
16	29	12	3.7	e4.2	2.6	65	e6.0	e9.0	4.9	11	2.9	5.0
17	14	6.0	3.2	e5.8	2.1	77	e5.0	e12	5.2	4.5	4.6	5.7
18	20	70	13	e3.7	1.4	10	e5.0	e9.0	5.9	12	6.7	3.8
19	9.6	34	9.8	e3.0	1.4	11	e5.5	e7.0	3.3	12	5.0	3.0
20	4.3	11	17	e2.6	3.7	5.8	e4.5	e5.5	2.6	6.8	5.3	2.8
21	3.5	8.3	6.0	2.4	5.6	4.5	e4.0	e4.5	2.1	e5.0	3.7	2.3
22	4.3	5.9	8.1	2.4	4.0	2.6	e4.0	e4.0	1.9	e6.0	2.9	2.1
23	11	36	13	6.7	3.5	2.3	e3.5	e3.5	1.9	e5.0	2.5	2.1
24	11	21	20	e4.5	3.0	2.0	e12	e3.0	2.2	e8.0	2.3	2.0
25	10	5.0	9.4	e3.0	2.6	1.7	e15	e3.0	17	e5.5	2.3	1.9
26	7.9	e3.9	3.9	2.5	2.2	1.5	e12	e6.0	34	e2.5	2.3	1.8
27	6.8	e3.4	3.2	162	1.7	e5.5	e13	e12	8.4	e2.0	25	1.7
28	5.7	e3.0	2.9	89	1.8	e15	e18	e15	15	e2.0	21	1.7
29	9.8	e2.8	2.8	e4.3	---	e14	e18	e20	9.1	e3.5	8.0	1.8
30	23	e2.6	2.5	e3.0	---	e16	e20	e15	7.7	e6.0	3.7	1.7
31	6.8	---	2.4	e2.9	---	e17	---	8.9	---	e2.5	3.0	---
TOTAL	366.6	350.6	446.2	360.3	65.40	789.35	373.0	276.4	242.7	213.0	204.8	156.0
MEAN	11.8	11.7	14.4	11.6	2.34	25.5	12.4	8.92	8.09	6.87	6.61	5.20
MAX	47	70	176	162	12	129	30	20	36	31	40	18
MIN	2.5	1.8	2.2	1.8	.60	.80	3.5	3.0	1.9	1.9	2.0	1.7
AC-FT	727	695	885	715	130	1570	740	548	481	422	406	309

CAL YR 1990 TOTAL 4370.9 MEAN 12.0 MAX 176 MIN 1.0 AC-FT 8670
WTR YR 1991 TOTAL 3844.35 MEAN 10.5 MAX 176 MIN .60 AC-FT 7630

e Estimated

16725000 ALAKAHI STREAM NEAR KAHUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.37	.69	.25	17	2.6	1.8	.80	.68	.19	5.3	3.1	3.6
2	.32	.44	.23	22	1.2	.86	2.6	.44	.18	4.2	6.0	45
3	.32	.61	.40	5.7	8.8	.55	3.7	.33	.18	3.1	3.3	29
4	.29	.76	5.5	1.8	24	.46	1.8	.34	.19	25	5.3	22
5	.29	1.4	1.4	1.2	36	.40	1.0	23	.20	16	4.1	72
6	.28	.95	3.8	.86	37	.31	.68	44	.33	6.8	5.1	31
7	2.5	1.0	2.5	.69	13	.26	.52	10	.93	3.1	15	6.0
8	2.9	.82	1.1	.55	2.6	.24	.42	2.4	3.8	1.8	4.7	3.0
9	1.1	1.2	.69	.48	1.4	.19	.32	1.5	22	6.0	2.6	2.9
10	.62	.74	.51	.42	.95	.17	.37	.95	15	8.2	2.1	1.9
11	.49	.53	.37	.36	.79	.17	2.3	.68	5.9	3.3	17	1.5
12	.37	.42	.29	.32	1.0	.17	2.7	.54	3.0	3.8	5.0	1.2
13	.30	.34	.28	.29	2.9	.15	1.4	.44	2.9	4.8	3.4	12
14	.28	.30	.27	.27	1.3	.18	.73	.37	2.0	4.8	2.2	101
15	2.8	.27	.28	30	1.1	.41	.51	.32	5.0	4.5	13	8.2
16	1.8	.27	.28	2.7	.81	.93	.38	.29	3.9	22	29	7.3
17	.85	.24	.70	1.3	.56	.99	.30	.27	2.2	28	8.8	9.1
18	.58	.23	.61	.81	.44	2.0	.26	.23	1.6	9.5	2.9	9.1
19	.48	4.3	.47	7.6	.38	6.3	.25	.19	2.6	8.2	4.2	7.6
20	.39	2.1	.81	2.8	.33	18	.25	.18	3.4	44	14	5.3
21	.38	.98	2.3	1.3	.28	3.1	.24	.18	1.8	18	37	2.5
22	1.1	11	1.2	.79	.27	1.6	.23	.17	2.0	20	8.1	1.3
23	.78	10	21	.58	.25	1.1	.21	.16	6.2	16	21	13
24	.58	1.9	2.7	.47	.23	1.1	.17	.16	15	3.0	19	6.5
25	.73	1.7	20	.39	.21	21	.16	.19	27	38	17	31
26	.71	1.1	80	.36	.20	13	.16	.18	39	77	16	66
27	.54	.73	11	.34	.18	2.2	.16	.17	30	73	6.6	26
28	.45	.51	8.5	.31	.18	1.3	.38	.23	27	12	11	4.8
29	.36	.37	13	.28	.61	1.6	.71	.25	4.0	3.6	27	2.1
30	.30	.28	4.9	.55	---	2.7	.97	.23	2.4	3.9	7.7	1.8
31	.40	---	28	21	---	1.2	---	.21	---	4.3	4.4	---
TOTAL	23.66	46.18	213.34	123.52	139.57	84.44	24.68	89.28	229.90	481.2	325.6	533.7
MEAN	.76	1.54	6.88	3.98	4.81	2.72	.82	2.88	7.66	15.5	10.5	17.8
MAX	2.9	11	80	30	37	21	3.7	44	39	77	37	101
MIN	.28	.23	.23	.27	.18	.15	.16	.16	.18	1.8	2.1	1.2
AC-FT	47	92	423	245	277	167	49	177	456	954	646	1060

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1992, BY WATER YEAR (WY)

MEAN	4.98	7.70	6.89	7.76	5.66	9.91	11.3	6.88	6.89	9.61	7.75	4.85
MAX	13.5	26.5	16.7	26.4	18.6	37.9	31.6	16.8	18.5	18.7	15.9	17.8
(WY)	1984	1980	1971	1979	1969	1980	1986	1990	1990	1978	1970	1992
MIN	.31	1.07	.54	.46	.65	1.27	.82	2.03	2.04	2.38	1.72	.087
(WY)	1985	1969	1981	1981	1983	1983	1992	1966	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1964 - 1992	
ANNUAL TOTAL	2964.13		2315.07			
ANNUAL MEAN	8.12		6.33		7.50	
HIGHEST ANNUAL MEAN					12.1	1980
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	162	Jan 27	101	Sep 14	338	Nov 18 1979
LOWEST DAILY MEAN	.23	Nov 18	.15	Mar 13	.03	May 22 1965
ANNUAL SEVEN-DAY MINIMUM	.30	Nov 12	.17	May 21	.04	Sep 22 1965
ANNUAL RUNOFF (AC-FT)	5880		4590		5430	
10 PERCENT EXCEEDS	16		21		18	
50 PERCENT EXCEEDS	3.5		1.2		3.2	
90 PERCENT EXCEEDS	.49		.23		.57	

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.7	1.1	3.4	37	.61	.32	1.2	28	33	6.0	3.9	1.6
2	1.4	.88	7.9	6.2	.40	44	1.1	22	26	19	11	1.2
3	1.2	1.1	3.9	2.4	.32	33	3.6	30	5.2	9.9	28	1.0
4	1.1	.96	3.3	25	.26	9.9	3.4	7.1	16	31	5.1	.90
5	.96	1.2	21	69	.24	5.5	6.4	25	21	3.4	5.3	.84
6	.87	3.3	5.3	69	.24	35	16	6.1	15	2.0	5.7	.80
7	.80	2.6	3.5	24	.22	20	49	13	8.9	2.1	7.7	.75
8	.89	1.5	2.3	5.3	.20	6.4	12	27	31	1.4	15	.71
9	.76	18	68	1.3	.20	13	4.8	21	12	1.4	20	1.2
10	.68	7.2	52	.91	.18	16	8.1	35	15	1.3	36	1.2
11	.64	1.9	15	.78	.30	15	1.9	6.2	17	1.1	37	2.2
12	.69	1.4	7.6	.61	.31	2.3	1.5	4.1	12	1.0	12	6.2
13	.69	7.3	3.0	.54	.25	1.5	1.7	3.1	4.8	.90	40	4.7
14	.58	34	2.0	.50	.22	2.9	1.2	1.5	2.0	.81	43	1.6
15	.54	53	1.6	5.1	.18	16	4.2	1.5	1.4	2.5	17	1.1
16	.50	4.4	2.7	15	.17	2.2	2.0	1.5	6.0	3.2	48	.91
17	.50	2.1	1.9	14	.15	6.0	1.3	1.7	12	7.3	6.0	.87
18	.52	1.5	1.4	1.7	.15	2.4	.95	2.4	28	11	3.5	1.7
19	.48	e1.3	1.2	1.5	.16	1.2	1.9	5.3	11	39	8.8	2.3
20	.46	e1.0	1.2	1.5	.23	3.4	73	3.6	4.5	18	8.2	6.2
21	.43	.83	1.7	1.0	.30	3.9	72	1.6	2.3	60	3.7	2.7
22	.41	1.0	18	.82	.59	1.5	59	1.3	4.4	43	5.6	1.4
23	.51	8.5	4.8	.61	.54	11	9.2	1.1	4.1	33	15	6.1
24	.85	4.3	2.7	.47	.67	2.9	7.7	2.9	2.7	50	18	5.2
25	.74	2.6	1.8	.40	1.6	1.3	6.2	4.1	28	30	7.6	1.6
26	7.4	8.8	1.4	.32	1.4	.92	5.9	2.0	26	13	3.2	1.1
27	5.9	2.3	1.3	.29	.77	3.9	2.8	4.5	28	65	2.5	.88
28	7.5	1.6	1.2	.26	.44	4.1	2.7	5.9	20	13	3.3	.74
29	3.1	7.8	1.1	2.1	---	1.2	2.6	2.5	13	12	1.6	.69
30	1.8	7.7	1.0	2.6	---	7.1	31	1.4	8.4	27	1.3	2.9
31	1.3	---	1.0	.96	---	2.0	---	2.2	---	6.4	1.1	---
TOTAL	45.90	191.17	244.2	291.17	11.30	275.84	394.35	274.6	418.7	514.71	424.1	61.29
MEAN	1.48	6.37	7.88	9.39	.40	8.90	13.1	8.86	14.0	16.6	13.7	2.04
MAX	7.5	53	68	69	1.6	44	73	35	33	65	48	6.2
MIN	.41	.83	1.0	.26	.15	.32	.95	1.1	1.4	.81	1.1	.69
AC-FT	91	379	484	578	22	547	782	545	830	1020	841	122

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1993, BY WATER YEAR (WY)

MEAN	4.86	7.66	6.93	7.81	5.49	9.88	11.4	6.94	7.12	9.84	7.95	4.75
MAX	13.5	26.5	16.7	26.4	18.6	37.9	31.6	16.8	18.5	18.7	15.9	17.8
(WY)	1984	1980	1971	1979	1969	1980	1986	1990	1990	1978	1970	1992
MIN	.31	1.07	.54	.46	.40	1.27	.82	2.03	2.04	2.38	1.72	.087
(WY)	1985	1969	1981	1981	1993	1983	1992	1966	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1964 - 1993	
ANNUAL TOTAL	2513.16		3147.33			
ANNUAL MEAN	6.87		8.62		7.53	
HIGHEST ANNUAL MEAN					12.1	1980
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	101	Sep 14	73	Apr 20	338	Nov 18 1979
LOWEST DAILY MEAN	.15	Mar 13	.15	Feb 17	.03	May 22 1965
ANNUAL SEVEN-DAY MINIMUM	.17	May 21	.18	Feb 14	.04	Sep 22 1965
ANNUAL RUNOFF (AC-FT)	4980		6240		5460	
10 PERCENT EXCEEDS	21		28		18	
50 PERCENT EXCEEDS	1.8		2.6		3.2	
90 PERCENT EXCEEDS	.24		.53		.57	

e Estimated

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

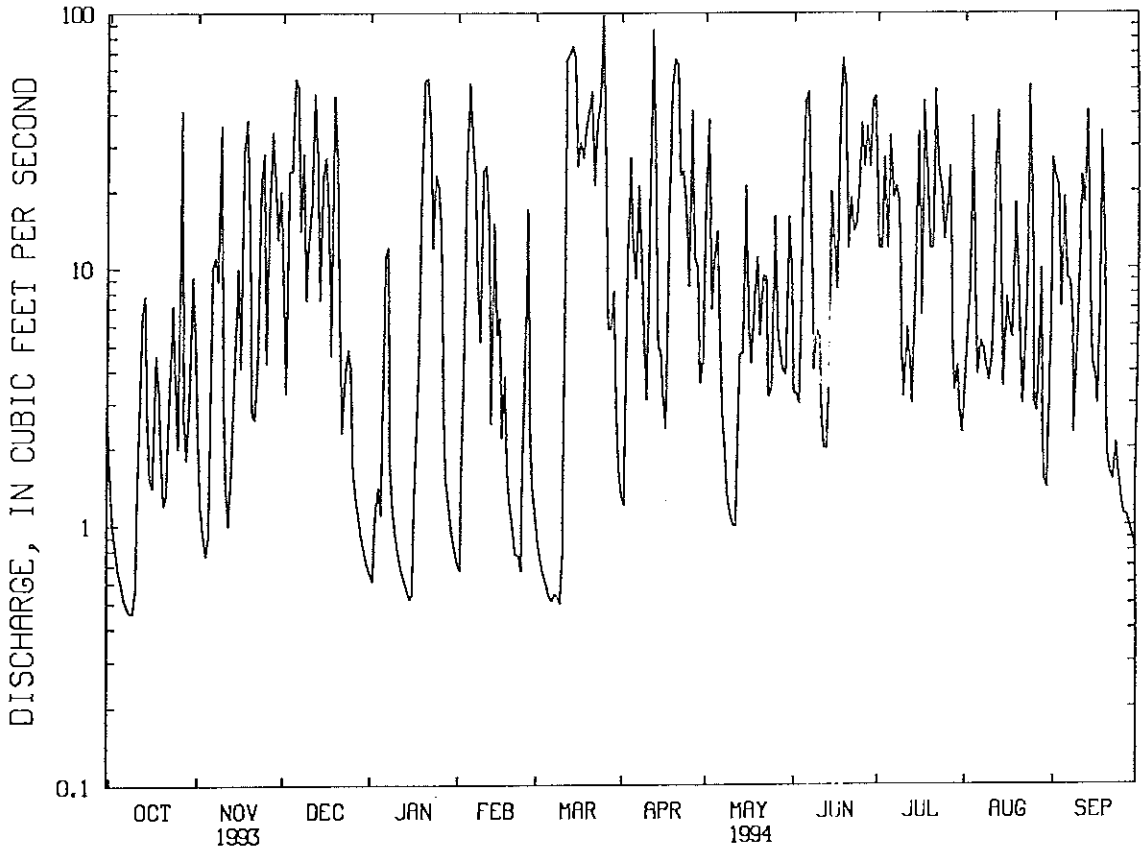
DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	1.6	2.3	8.2	.65	.71	1.1	1.3	20	3.3	12	4.8	23
2	1.0	1.2	3.3	.61	.67	.84	1.2	38	3.3	12	8.2	21
3	.82	.92	24	1.1	4.1	.72	11	6.9	3.0	27	39	7.1
4	.67	.77	24	1.4	26	.64	27	11	20	12	7.5	19
5	.60	.91	55	1.1	53	.59	12	14	45	33	3.9	9.2
6	.52	10	51	11	32	.53	9.1	5.4	49	19	5.2	8.9
7	.48	11	14	12	23	.51	21	2.8	14	21	4.9	6.6
8	.46	8.9	28	1.8	8.4	.54	11	2.0	4.0	18	4.2	2.3
9	.46	36	7.5	1.2	5.2	.53	5.1	1.3	5.8	5.1	3.7	8.2
10	.56	3.3	13	.93	24	.50	3.1	1.1	5.4	3.2	4.6	23
11	2.0	1.4	18	.78	25	.79	18	1.0	2.7	5.9	25	18
12	6.6	1.0	48	.68	15	66	86	1.0	2.0	4.5	41	41
13	7.8	1.8	28	.62	2.5	69	26	4.6	2.0	3.0	9.0	8.0
14	2.6	4.6	7.5	.57	15	74	5.0	4.7	20	14	3.5	4.4
15	1.5	9.9	23	.52	5.5	67	4.7	21	13	34	7.7	3.9
16	1.4	4.1	27	.54	6.4	25	3.1	6.3	8.1	6.6	6.0	3.0
17	4.6	29	16	1.5	2.2	31	2.4	4.3	32	45	5.4	34
18	3.5	38	4.6	4.2	3.8	27	17	7.3	67	23	18	14
19	1.9	15	47	21	1.7	35	52	11	55	12	9.2	3.3
20	1.2	2.7	27	54	1.2	41	66	5.5	12	12	5.0	1.9
21	1.3	2.6	6.0	55	.99	49	63	9.3	19	50	3.0	1.6
22	3.5	4.6	2.3	37	.77	21	23	9.2	14	24	6.7	1.5
23	7.1	22	3.8	12	.77	37	24	3.2	15	21	52	2.1
24	3.6	28	4.8	23	.67	44	17	3.4	21	13	15	1.6
25	2.0	4.3	4.1	21	3.5	98	8.5	16	37	17	3.0	1.3
26	41	17	1.7	14	17	29	41	5.9	25	25	2.8	1.1
27	2.6	34	1.3	2.9	2.5	5.8	11	4.7	36	5.5	9.9	1.1
28	1.8	22	1.1	1.5	1.4	5.8	10	4.0	25	3.4	2.7	1.0
29	3.2	13	.91	1.2	---	8.1	3.6	3.9	45	4.2	1.5	.91
30	9.2	20	.80	.94	---	2.9	4.3	16	47	2.8	1.4	.78
31	5.3	---	.71	.81	---	1.7	---	10	---	2.3	27	---
TOTAL	120.87	350.30	501.62	285.55	282.98	744.59	587.4	254.8	650.6	490.5	340.8	272.79
MEAN	3.90	11.7	16.2	9.21	10.1	24.0	19.6	8.22	21.7	15.8	11.0	9.09
MAX	41	38	55	55	53	98	86	38	67	50	52	41
MIN	.46	.77	.71	.52	.67	.50	1.2	1.0	2.0	2.3	1.4	.78
AC-FT	240	695	995	566	561	1480	1170	505	1290	973	676	541

16725000 ALAKAHI STREAM NEAR KAMUELA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1964 - 1994, BY WATER YEAR (WY)

MEAN	4.83	7.79	7.24	7.86	5.64	10.3	11.6	6.98	7.59	10.0	8.04	4.89
MAX	13.5	26.5	16.7	26.4	18.6	37.9	31.6	16.8	21.7	18.7	15.9	17.8
(WY)	1984	1980	1971	1979	1969	1980	1986	1990	1994	1978	1970	1992
MIN	.31	1.07	.54	.46	.40	1.27	.82	2.03	2.04	2.38	1.72	.087
(WY)	1985	1969	1981	1981	1993	1983	1992	1966	1985	1981	1971	1965

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1964 - 1994	
ANNUAL TOTAL	3638.85		4882.80			
ANNUAL MEAN	9.97		13.4		7.73	
HIGHEST ANNUAL MEAN					13.4	1994
LOWEST ANNUAL MEAN					3.39	1981
HIGHEST DAILY MEAN	73	Apr 20	98	Mar 25	338	Nov 18 1979
LOWEST DAILY MEAN	.15	Feb 17	.46	Oct 8	.03	May 22 1965
ANNUAL SEVEN-DAY MINIMUM	.18	Feb 14	.54	Oct 4	.04	Sep 22 1965
ANNUAL RUNOFF (AC-FT)	7220		9690		5600	
10 PERCENT EXCEEDS	29		37		19	
50 PERCENT EXCEEDS	3.6		5.9		3.2	
90 PERCENT EXCEEDS	.60		.88		.59	



16726000 UPPER HAMAKUA DITCH ABOVE WAIMEA RESERVOIR DIVERSION, NEAR KAMUELA

LOCATION.--Lat 20°03'31", long 155° 37'40", Hydrologic Unit 20010000, on left bank 120 ft upstream from diversion intake leading to Waimea Reservoir and 3.7 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1974 to September 1983 (revised), September 1992 to current year (discharge measurements only).

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 3,020 ft, from topographic map.

REMARKS.--Records for 1975-1983 poor (revised). 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. The ditch was under repair since June 19, 1991 to the end of the year, so no flow passed the gage.

AVERAGE DISCHARGE.--9 years (water years 1975-83), 9.96 ft^3/s (7,220 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 48 ft^3/s, Apr. 6, 1977; no flow at times.

EXTREMES FOR CURRENT YEAR.--Not known.

REVISIONS.-- Revised daily discharges, in cubic feet per second, for Jan. 28, 1981 to Mar. 10, 1981, are given below. These figures supersede those published in the annual report for 1981.

DISCHARGE, CUBIC FEET PER SECOND, JANUARY 28, 1981 TO MARCH 10, 1981
DAILY MEAN VALUES

Jan.	28	.00	Feb.	8	14	Feb.	19	.00	Mar.	2	10
	29	.00		9	4.7		20	.00		3	9.1
	30	.00		10	1.8		21	2.2		4	8.1
	31	.00		11	.84		22	13		5	5.7
Feb.	1	.00		12	.56		23	5.7		6	5.2
	2	.00		13	.32		24	15		7	8.0
	3	.00		14	.17		25	13		8	6.7
	4	.00		15	.10		26	13		9	14
	5	.00		16	.10		27	22		10	3.5
	6	.00		17	.01		28	23			
	7	.00		18	.00	Mar.	1	11			

MONTH		TOTAL	MEAN	MAXIMUM	MINIMUM	AC-FT
January	1981	9.47	0.31	5.9	.00	19
February	1981	129.50	4.62	23	.00	257
March	1981	122.96	3.97	14	.53	244
Wtr Yr	1981	1,388.07	3.80	36	.00	2,750

INSTANTANEOUS DISCHARGE MEASUREMENTS, IN CUBIC FEET PER SECOND
WATER YEARS 1992 TO 1994

DATE	DISCHARGE (ft^3/s)	DATE	DISCHARGE (ft^3/s)	DATE	DISCHARGE (ft^3/s)
09-24-92	10.7	11-04-93	2.53	04-14-94	11.5
12-01-92	2.04	11-04-93	2.43	04-14-94	11.2
03-03-93	27.2	11-05-93	2.09	05-18-94	7.62
03-03-93	27.3	12-16-93	19.6	05-18-94	7.46
04-23-93	8.27	12-16-93	19.2	06-23-94	6.74
04-23-93	8.58	02-25-94	13.8	08-05-94	2.57
06-23-93	9.34	02-25-94	14.1	08-05-94	2.60

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA

LOCATION.--Lat 20°02'53", long 155°37'17", Hydrologic Unit 20010000, on right bank 25 ft downstream from pipe railed bridge, and 4.0 mi northeast of Kamuela Post Office.

PERIOD OF RECORD.--October 1977 to current year.

GAGE.--Water-stage recorder and concrete control. Elevation of gage is 2,890 ft, from topographic map.

REMARKS.--Records fair except for estimated daily discharges, which are poor. Ditch diverts above into Waimea Reservoir for use in vicinity of Kamuela.

AVERAGE DISCHARGE.--
Water year 1991. 14 years, 2.16 ft^3/s (1,560 acre-ft/yr).

Water year 1992. 15 years, 2.05 ft^3/s (1,480 acre-ft/yr).

Water year 1993. 16 years, 1.93 ft^3/s (1,390 acre-ft/yr).

Water year 1994. 17 years, 1.82 ft^3/s (1,320 acre-ft/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 42 ft^3/s, Apr. 16, 1985; no flow at times.

EXTREMES FOR CURRENT YEAR.--
Water year 1991. Maximum daily discharge, 3.70 ft^3/s, Feb. 14; no flow for many days.

Water year 1992. Maximum daily discharge, 18 ft^3/s, June 24; no flow for many days.

Water year 1993. Maximum daily discharge, 8.1 ft^3/s, Mar. 4; no flow for many days.

Water year 1994. Maximum daily discharge, 10 ft^3/s, Apr. 4; no flow for many days.

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1990 TO SEPTEMBER 1991
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
2	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01	.00
4	.00	.00	.00	.00	.00	.00	.00	.01	.00	.00	.02	.00
5	.00	.00	.00	.00	.00	.00	.21	.01	.00	.00	.01	.00
6	.00	.00	.00	e.05	.00	.00	.00	.00	.00	.00	.01	.00
7	.00	.00	.00	e.02	.00	.00	.00	.00	.00	.00	1.2	.00
8	.00	.00	.20	e.01	.00	.03	.00	.00	.00	.00	.02	.00
9	.00	.00	.65	.00	.00	.00	.00	.00	.00	.00	.00	.00
10	.00	.00	.03	.10	.00	.00	.00	.00	.00	.00	.00	.00
11	.04	.00	.00	e.05	.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	.00	.00	.41	.00	.00	.00	.00	.04	.00
13	.00	.00	.00	.00	2.6	.45	.00	.00	.00	.00	.01	.00
14	.01	.00	.00	.00	3.7	.55	.00	.02	.00	.00	.00	.00
15	.18	.00	.00	.00	.00	.10	.00	.04	.05	.00	.00	.00
16	.03	.00	.00	e.05	.00	.12	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.00	.30	.00	.00	.00	.00	.00	.00
18	.00	.28	.11	.00	.00	.00	.00	.02	.00	.00	.00	.00
19	.00	.01	.02	.00	.00	.00	.00	.00	.00	.00	.00	.00
20	.00	.05	.00	.00	.00	.03	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.01
23	.00	.06	.06	e.05	.00	.00	.00	.00	.00	.00	.00	.00
24	.00	.02	.13	.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	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	e.10	.00	.00	.00	.01	.00	.00	.04	.00
28	.00	.00	.00	e1.0	.00	.00	.00	.00	.00	.00	.01	.00
29	.00	.00	.00	e.05	---	.00	.00	.02	.00	.16	.00	.00
30	.01	.00	.00	.00	---	.00	.02	.00	.00	.08	.00	.00
31	.00	---	.00	.00	---	.01	---	.00	---	.00	.00	---
TOTAL	0.27	0.42	1.20	1.48	6.30	2.00	0.23	0.13	0.05	0.24	1.38	0.01
MEAN	.009	.014	.039	.048	.22	.065	.008	.004	.002	.008	.045	.000
MAX	.18	.28	.65	1.0	3.7	.55	.21	.04	.05	.16	1.2	.01
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.5	.8	2.4	2.9	12	4.0	.5	.3	.1	.5	2.7	.02

CAL YR 1990 TOTAL 4.26 MEAN .012 MAX .65 MIN .00 AC-FT 8.4
WTR YR 1991 TOTAL 13.71 MEAN .038 MAX 3.7 MIN .00 AC-FT 27

e Estimated

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAHUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1991 TO SEPTEMBER 1992
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.72	.27	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	.68	.00	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	6.9	.00	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	7.9	.00	.00	.01	.00	.00	.00	.00
5	.00	.00	.00	.00	7.8	.00	.00	15	.00	.00	.00	.00
6	.00	.00	.00	.00	7.8	.00	.00	15	.00	.00	.00	.00
7	.00	.00	.00	.00	6.2	.00	.00	14	.00	.00	.00	.00
8	.00	.00	.00	.00	2.7	.00	.00	5.0	.00	.00	.00	.00
9	.00	.00	.00	.00	.20	.00	.00	1.8	2.3	.00	.00	.00
10	.00	.00	.00	.00	.02	.00	.00	.18	11	.00	.00	.00
11	.00	.00	.00	.00	.01	.00	.14	.01	8.8	.00	.00	.00
12	.00	.00	.00	.00	.00	.00	.00	.00	2.3	.00	.00	.00
13	.00	.00	.00	.00	.04	.00	.00	.00	3.4	.00	.00	.00
14	.00	.00	.00	.00	.00	.00	.00	.00	.55	.00	.00	.04
15	.00	.00	.00	.40	.44	.00	.00	.00	.25	.00	.00	.00
16	.00	.00	.00	.00	.53	.00	.00	.00	.00	.00	.00	.00
17	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	.00	.00	.01	.00	.00	.00	.00	.00	.00
20	.00	.00	.00	.00	.00	3.5	.00	.00	.08	.00	.00	.00
21	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
22	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
23	.00	.00	.00	.00	.00	.00	.00	.00	6.7	.00	.00	.00
24	.00	.00	.00	.00	.00	.00	.00	.00	18	.00	.00	.00
25	.00	.00	.01	.00	.00	4.0	.00	.00	9.2	.00	.00	.01
26	.00	.00	.03	.00	.00	8.6	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	.00	.00	.67	.00	.00	.00	.00	.00	.00
28	.00	.00	.00	.00	.00	.72	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	.00	.24	.00	.00	.00	.00	.00	.00
30	.00	.00	.00	.00	---	2.6	.00	.00	.00	.00	.00	.00
31	.00	---	.00	4.1	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.04	4.50	41.95	20.61	0.14	51.00	62.58	0.00	0.00	0.05
MEAN	.000	.000	.001	.15	1.45	.66	.005	1.65	2.09	.000	.000	.002
MAX	.00	.00	.03	4.1	7.9	8.6	.14	15	18	.00	.00	.04
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.08	8.9	83	41	.3	101	124	.00	.00	.1

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1992, BY WATER YEAR (WY)

MEAN	1.70	2.84	1.95	1.87	1.18	2.88	3.02	2.07	2.23	2.15	1.88	.76
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	.001	.000	.004	.000	.000	.000	.000	.000
(WY)	1985	1990	1989	1989	1990	1989	1990	1983	1983	1980	1984	1984

SUMMARY STATISTICS	FOR 1991 CALENDAR YEAR		FOR 1992 WATER YEAR		WATER YEARS 1978 - 1992	
ANNUAL TOTAL	11.86		180.87			
ANNUAL MEAN	.032		.49		2.05	
HIGHEST ANNUAL MEAN					6.79	1986
LOWEST ANNUAL MEAN					.007	1990
HIGHEST DAILY MEAN	3.7	Feb 14	18	Jun 24	42	Apr 16 1985
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Oct 1 1977
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 30	.00	Oct 1	.00	Oct 1 1977
ANNUAL RUNOFF (AC-FT)	24		359		1480	
10 PERCENT EXCEEDS	.01		.19		7.3	
50 PERCENT EXCEEDS	.00		.00		.00	
90 PERCENT EXCEEDS	.00		.00		.00	

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00
2	.00	.00	.00	.00	e.00	e4.0	.00	.00	.00	.00	.00	.00
3	.00	.00	.00	.00	e.00	e3.5	.00	.00	.00	.00	.00	.00
4	.00	.00	.00	.00	e.00	8.1	.00	.00	.00	.00	.00	.00
5	.00	.00	.00	.09	e.00	2.6	.00	.00	.00	.00	.00	.00
6	.00	.00	.00	.21	e.00	.01	.00	.00	.00	.00	.00	.00
7	.00	.00	.00	.10	e.00	.00	.00	.00	.00	.00	.00	.00
8	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
9	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.01	.00
10	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.02	.00
11	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00	.00	.00
12	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
13	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
14	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.06	.00
15	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.01	.00
16	.00	.00	.00	e.01	e.00	.00	.00	.00	.00	.00	.33	.00
17	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
18	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
19	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.01	.00	.00
20	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
21	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.01	.00	.00
22	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.04	.00	.00
23	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.02	.00	.00
24	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.07	.00	.00
25	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
26	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
27	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.04	.00	.00
28	.00	.00	.00	e.00	e.00	.00	.00	.00	.00	.00	.00	.00
29	.00	.00	.00	e.00	---	.00	.00	.00	.00	.02	.00	.00
30	.00	.00	.00	e.00	---	.00	.00	.00	.00	.04	.00	.00
31	.00	---	.00	e.00	---	.00	---	.00	---	.00	.00	---
TOTAL	0.00	0.00	0.00	0.41	0.00	18.21	0.00	0.00	0.00	0.25	0.43	0.00
MEAN	.000	.000	.000	.013	.000	.59	.000	.000	.000	.008	.014	.000
MAX	.00	.00	.00	.21	.00	8.1	.00	.00	.00	.07	.33	.00
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.00	.00	.00	.8	.00	36	.00	.00	.00	.5	.9	.00

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1993, BY WATER YEAR (WY)

MEAN	1.59	2.67	1.83	1.76	1.10	2.74	2.83	1.94	2.09	2.01	1.76	.71
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

SUMMARY STATISTICS	FOR 1992 CALENDAR YEAR		FOR 1993 WATER YEAR		WATER YEARS 1978 - 1993	
ANNUAL TOTAL	180.83		19.30			
ANNUAL MEAN	.49		.053		1.92	
HIGHEST ANNUAL MEAN					6.79	1986
LOWEST ANNUAL MEAN					.007	1990
HIGHEST DAILY MEAN	18	Jun 24	8.1	Mar 4	42	Apr 16 1985
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Oct 1 1977
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 1	.00	Oct 1	.00	Oct 1 1977
ANNUAL RUNOFF (AC-FT)	359		38		1390	
10 PERCENT EXCEEDS	.19		.00		6.8	
50 PERCENT EXCEEDS	.00		.00		.00	
90 PERCENT EXCEEDS	.00		.00		.00	

e Estimated

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA--Continued

DISCHARGE, CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.00	.00	.00	.00	.00	1.7	e.00	.00	.00	e.00	.01
2	.00	.00	.00	.00	.00	.00	2.8	e.25	.00	.06	e.00	.01
3	.00	.00	.00	.00	.00	.00	5.0	e.00	.00	.02	e.01	.00
4	.00	.00	.00	.00	.00	.00	9.7	e.00	.00	.00	e.00	.01
5	.00	.00	.04	.00	.00	.00	10	e.00	.03	.00	e.00	.00
6	.00	.19	.05	.00	.00	.00	3.7	e.00	.00	.01	e.00	.00
7	.00	1.3	.00	.00	.00	.00	.00	e.00	.00	.03	e.00	.00
8	.00	.33	.00	.00	.00	.00	5.9	e.00	.00	.03	e.00	.00
9	.00	8.5	.00	.00	.00	.00	8.4	e.00	.00	.00	e.00	.00
10	.00	.04	.00	.00	.00	.00	3.8	e.00	.00	.00	.00	.00
11	.00	.00	.00	.00	.01	.00	2.1	e.00	.00	.00	.01	.01
12	.00	.00	.04	.00	.00	.09	1.0	e.00	.00	.00	.02	.03
13	.00	.04	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00
14	.00	.48	.00	.00	.00	.66	e.00	e.00	.00	.02	.00	.00
15	.00	1.2	.00	.00	.00	4.1	e.00	e.00	.00	.01	.00	.00
16	.00	.08	.00	.00	.00	2.4	e.00	e.00	.00	.00	.00	.00
17	.00	1.3	.00	.00	.00	.00	e.00	.00	.00	.01	.00	.01
18	.00	.00	.00	.00	.00	.00	e.5	.00	.05	.00	.00	.00
19	.00	.00	.00	.00	.00	.00	e1.2	.00	.01	.00	.00	.02
20	.00	.00	.00	.00	.00	.00	e1.7	.00	.00	.00	.00	.00
21	.00	.00	.00	.02	.00	.00	e1.5	.00	.00	.11	.00	.00
22	.00	.00	.00	.00	.00	.00	e.5	.00	.00	.10	.00	.00
23	.00	.09	.00	.00	.00	.01	e.00	.00	.00	.06	.01	.00
24	.00	.06	.00	.01	.00	.01	e.00	.00	.09	.01	.00	.00
25	.00	.00	.00	.06	.00	1.4	e.00	.00	.05	.01	.00	.00
26	.06	.02	.00	.01	.00	.02	e.3	.00	.00	.00	.00	.00
27	.00	.06	.00	.00	.00	.00	e.00	.00	.02	.00	.00	.00
28	.00	.00	.00	.00	.00	.00	e.00	.00	.00	.00	.00	.00
29	.00	.00	.00	.00	---	.00	e.00	.00	.05	.00	.00	.00
30	.00	.00	.00	.00	---	.00	e.00	.00	.15	e.00	.00	.00
31	.00	---	.00	.00	---	1.1	---	.00	---	e.00	.00	---
TOTAL	0.06	13.69	0.13	0.10	0.01	9.79	59.80	0.25	0.45	0.48	0.05	0.10
MEAN	.002	.46	.004	.003	.000	.32	1.99	.008	.015	.015	.002	.003
MAX	.06	8.5	.05	.06	.01	4.1	10	.25	.15	.11	.02	.03
MIN	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00	.00
AC-FT	.1	27	.3	.2	.02	19	119	.5	.9	1.0	.1	.2

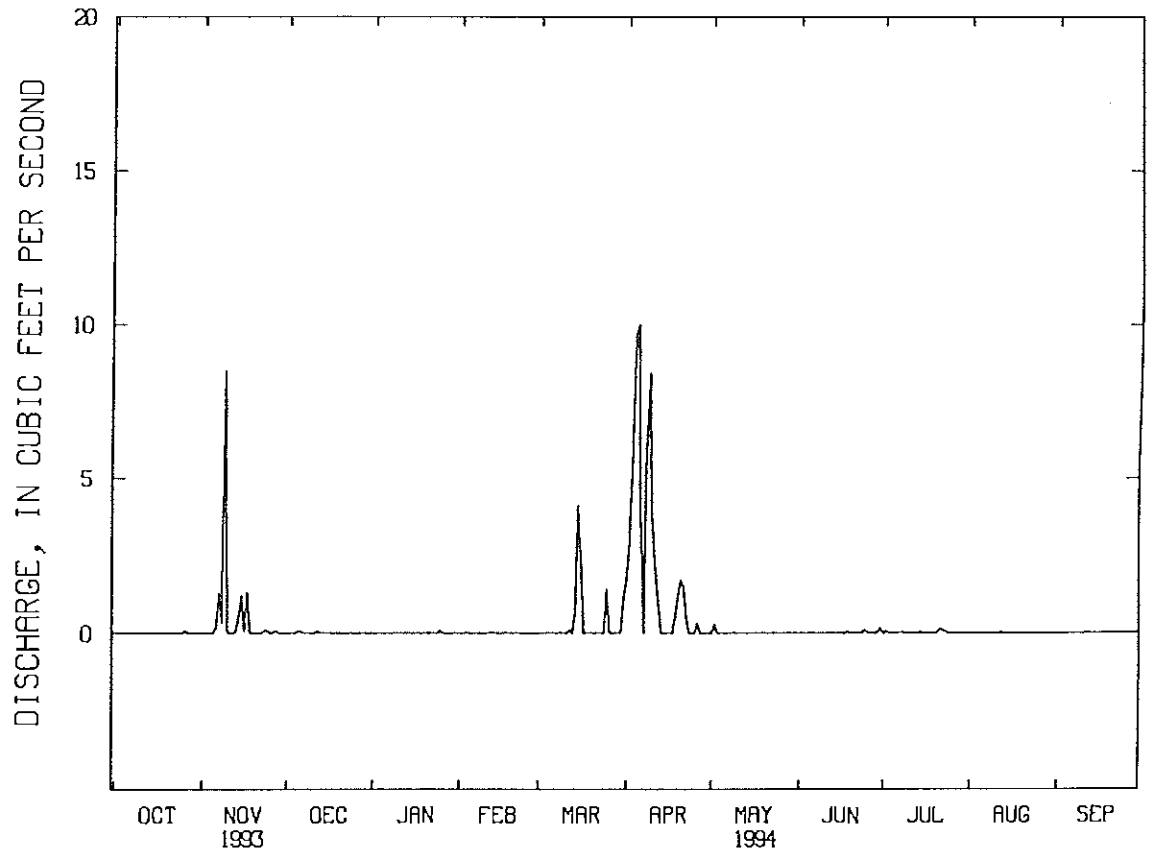
e Estimated

16727000 UPPER HAMAKUA DITCH ABOVE PUUKAPU RESERVOIR, NEAR KAMUELA--Continued

STATISTICS OF MONTHLY MEAN DATA FOR WATER YEARS 1978 - 1994, BY WATER YEAR (WY)

MEAN	1.50	2.54	1.72	1.65	1.04	2.59	2.78	1.83	1.97	1.90	1.66	.67
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

SUMMARY STATISTICS	FOR 1993 CALENDAR YEAR		FOR 1994 WATER YEAR		WATER YEARS 1978 - 1994	
ANNUAL TOTAL	33.18		84.91			
ANNUAL MEAN	.091		.23		1.82	
HIGHEST ANNUAL MEAN					6.79	1986
LOWEST ANNUAL MEAN					.007	1990
HIGHEST DAILY MEAN	8.5	Nov 9	10	Apr 5	42	Apr 16 1985
LOWEST DAILY MEAN	.00	Jan 1	.00	Oct 1	.00	Oct 1 1977
ANNUAL SEVEN-DAY MINIMUM	.00	Jan 8	.00	Oct 1	.00	Oct 1 1977
ANNUAL RUNOFF (AC-FT)	66		168		1320	
10 PERCENT EXCEEDS	.01		.08		6.4	
50 PERCENT EXCEEDS	.00		.00		.00	
90 PERCENT EXCEEDS	.00		.00		.00	



16756000 KOHAKOHAU STREAM NEAR KAMUELA

RECORDS BEING REVIEWED

16758000 WAIKOLOA STREAM AT MARINE DAM, NEAR KAMUELA

RECORDS BEING REVIEWED

16759000 HAUANI GULCH NEAR KAMUELA

RECORDS BEING REVIEWED

16764000 HILEA GULCH TRIBUTARY NEAR HONUAPO

RECORDS BEING REVIEWED

As the number of streams on which streamflow information is likely to be desired far exceeds the number of stream-gaging stations feasible to operate at one time, the Geological Survey collects limited streamflow data at sites other than stream-gaging stations. When limited streamflow data are collected on a systematic basis over a period of years for use in hydrologic analyses, the site at which the data are collected is called a partial-record station. Data collected at these partial-record stations are usable in low-flow or flood-flow analyses, depending on the type of data collected. In addition, discharge measurements are made at other sites not included in the partial-record program. These measurements are generally made in times of drought or flood to give better areal coverage to 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 discharge measurements at low-flow partial-record stations, the second is a table of annual maximum stage and discharge at crest-stage stations, and the third is a table of discharge measurements at miscellaneous sites.

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 practically the same, site.

Discharge measurements made at low-flow partial-record stations during water year 1994

Station No.	Station name	Location	Drainage area mi^2	Period of record	Measurements	
					Date	Discharge (ft^3/s)
		Hawaii, Island of Molokai				
16403400	Kapuhi Stream at altitude 1,000 ft, near Pelekunu	Lat 21°07'50", long 156°53'02", 500 ft upstream from Kawailena Stream, 2.2 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.51	1968-94	10-29-93 03-01-94 06-09-94	2.05 1.34 1.01
16403500	Kawailena Stream near Pelekunu	Lat 20°07'52", long 156°53'05", 800 ft upstream from mouth, 2.2 mi south of former village of Pelekunu, and 5.5 mi north of Kamalo.	0.65	1968-94	10-29-93 03-01-94 06-09-94	2.27 2.12 1.52
16403600	Kapuhi Stream near Pelekunu	Lat 21°07'57", long 156°52'56", on left bank 400 ft downstream from Kawailena Stream, 2.1 mi south of former village of Pelekunu, and 5.6 mi north of Kamalo.	1.20	1968-70≠, 1974-94	10-29-93 03-01-94 06-09-94	5.07 4.03 3.03
16403700	Kawainui Stream at altitude 1,000 ft, near Pelekunu	Lat 20°07'46", long 156°52'31", 400 ft upstream from Kawaipoko Stream, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.79	1968-94	10-29-93 03-01-94 06-09-94	5.79 2.22 4.22
16403800	Kawaipoko Stream near Pelekunu	Lat 21°07'48", long 156°52'30", 300 ft upstream from mouth, 2.4 mi south of former village of Pelekunu, and 5.4 mi north of Kamalo.	0.26	1968-94	10-29-93 03-01-94 06-09-94	1.31 0.51 1.17
16403900	Kawainui Stream near Pelekunu	Lat 21°07'59", long 156°52'38", on right bank 900 ft upstream from confluence with Kapuhi Stream, 2.1 mi south of former village of Pelekunu, and 5.7 mi north of Kamalo.	1.17	1968-79≠, 1980-94	10-29-93 03-01-94 06-09-94	8.15 3.42 4.46

≠ Operated as a continuous-record gaging station

Crest-stage partial-record stations

Prior to 1973, crest-stage partial-record station records for the State of Hawaii were published in an annual progress report entitled "An Investigation of Floods in Hawaii." The following table contains annual maximum discharge for crest-stage stations. A crest-stage gage is a device which will register the peak stage occurring between inspections of the gage. A stage-discharge relation for each gage is developed from discharge measurements made by indirect measurements or peak flow or by current meter. The date of the maximum discharge is not always certain but is usually determined by comparison with nearby continuous-record stations, weather records, or local inquiry. Only the maximum discharge for each water year is given. Information on some lower floods may have been made for purposes of establishing the stage-discharge relation, but these are not published herein. The years given in the period of record represent water years for which the annual maximum has been determined.

Annual maximum discharge at crest-stage partial-record stations during water year 1991

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1991 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, 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	11-20-90	5.23	640	02-20-79	9.07	2,590
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	11-20-90	6.69	296	03-18-80	9.10	500
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	1963-91	01-27-91	4.78	237	04-07-89	5.33	277
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 norhteast of Waimea.	0.27	1963-91	01-28-91	4.93	231	12-26-83	3.70	400
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	No flow			04-20-68	6.71	1,210

Annual maximum discharge at crest-stage partial-record stations during water year 1992

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1992 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Hawaii						
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	1963-92	09-14-92	2.65	79	04-07-89	5.33	277

Annual maximum discharge at crest-stage partial-record stations during water year 1993

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1993 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, 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	07-24-93	3.98	306	02-20-79	9.07	2,590
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	11-29-92	5.35	203	03-18-80	9.10	500
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	1963-93	01-06-93	3.36	132	04-07-89	5.33	277

Annual maximum discharge at crest-stage partial-record stations during water year 1993

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1993 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Oahu						
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	1956-93	12-26-92	a11.37	711	04-19-74	20.7	7,600

Annual maximum discharge at crest-stage partial-record stations during water year 1994

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Kauai						
16038000 Waimea River at Waimea	Lat 21°57'23", long 159°39'59", 150 ft upstream from highway bridge at Waimea and 0.2 mi upstream from mouth.	86.5	1944-94b	10-02-93	5.61	-	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	1950-94b	10-02-93	4.56	-	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≠ 1973-94	02-16-94	3.56	780	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≠, 1971-94	02-16-94	9.56	2,700	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	1962-94b	10-02-93	6.79	-	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, 1970-94	02-16-94	7.52	130	12-14-91	16.92	2,530
16080000 Kapaa Str at Kapahi ditch intake nr Kapaa	Lat 22°06'15", long 159°22'29", on right bank at Kapahi ditch intake, 3.8 mi northwest of Kapaa, and 4.3 mi northwest of Wailua.	3.86	1936-85≠, 1986-94	02-13-94	5.14	7,580	12-14-91	5.66	9,660
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	1964-94	10-02-93	5.28	385	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	1962-94	02-13-94	16.25	14,000	12-14-91	23.11	30,330
16085000 Homaikawaa Str nr Kealia	Lat 22°07'23", long 159°18'12", at culvert on Highway 56, 1.6 mi southeast of Anahola School, and 1.6 mi north of Kealia.	0.85	1964-94	Destroyed by flood of 12-14-91.			12-14-91	-	e3,800

≠ Operated as a continuous-record gaging station
a Revised
b Gage height only
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1994

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Kauai--Continued						
16097900 Puukumu Str nr Kilauea	Lat 22°13'01", long 159°25'18", at culvert on Highway 56, 0.8 mi northwest of Kilauea School, and 0.9 mi upstream from mouth.	0.91	1964-68, 1971-94	02-13-94	9.54	120	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	1963-94b	10-02-93	9.77	-	12-14-91	13.31	-
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≠, 1972-94	10-02-93	4.35	220	04-15-72	7.15	2,120

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, 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, 1968-94	03-24-94	21.95	e2,000	04-05-63	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	1967-94	02-15-94	15.82	e1,800	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 sugar mill at Waialua.	4.15	1958-63, 1964-65≠ 1966-94	02-15-94	4.36	e350	11-13-65	7.41	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	1974-94	02-15-94	13.41	415	01-01-88	19.61	1,000
16211500 Makua Str at Makua	Lat 21°31'59", long 158°13'49", on left bank 20 ft upstream from old concrete highway ford, 140 ft downstream from Farrington Highway box culvert, 0.1 mi north of Makua cemetery, and 4.5 mi southeast of Kaena Point lighthouse.	4.24	1958-94	03-24-94	8.29	e700	02-07-76	8.00	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 Makhaha Valley Road.	5.25	1966-94	03-24-94	10.11	824	02-07-76	16.40	4,310
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≠, 1973-94	03-24-94	5.34	e300	01-06-82	7.82	3,640
16212200 Mailiili 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	1958-94	02-15-94	1.59	e150	01-06-82	7.20	2,460

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Oahu--Continued						
16212300 Nanakuli Str at Nanakuli	Lat 21°23'08", long 158°08'11", 0.7 mi upstream from Highway 90 and 0.6 mi northeast of Nanakuli Post Office.	3.98	1968-94	02-15-94	23.18	e300	02-07-76	26.20	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	1968-94	02-15-94	3.12	109	01-08-80	7.45	724
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	1956-94	02-15-94	1.78	177	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, 1960-94	09-18-94	5.13	212	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.	7.49	1958-94	09-18-94	8.99	1,370	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.	0.84	1974-94	09-18-94	9.95	e75	02-10-79	8.36	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≠, 1973-94	03-24-94	3.46	1,990	01-05-68	6.82	8,020
16224500 Kalauao Str at Moanalua Road, at Aiea	Lat 21°23'07", long 157°56'22", on left bank at downstream side of Moanalua Road bridge, 0.4 mi northwest of Aiea Post Office, and 2.3 mi southeast of Pearl City Post Office.	2.59	1957-82≠, 1984-94	03-24-94	-	e1,800	05-14-63	6.63	2,580
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 norht of Honolulu Post Office.	2.73	1927-78≠, 1979-94	03-24-94	8.05	1,380	11-18-30	11.58	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	1969-94	03-24-94	5.36	1,620	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	1971-94	03-24-94	-	e1,800	03-08-80	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≠, 1972-94	03-24-94	4.06	720	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.	1.28	1958-94	03-24-94	4.46	1,480	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	1958-94	03-24-94	1.20	670	05-14-63	4.65	2,200

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
	Hawaii, Island of Oahu--Continued								
16247100 Manoa-Palolo Drainage Canal at Moiliili	Lat 21°17'24", long 157°49'17", on left bank at Kaimuki High School, 0.3 mi downstream from confluence of Manoa and Palolo Streams, and 0.6 mi upstream from point of discharge into Ala Wai Canal.	10.6	1968-94	03-24-94	89.55	5,570	12-18-67	12.6	10,100
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	1958-94	03-24-94	3.35	1,120	12-18-67	5.72	3,600
16247900 Kuliouou Valley at Kuliouou	Lat 21°17'50", long 157°43'35", at Kuliouou, 300 ft downstream of single-lane wooden bridge, and 0.6 mi upstream from Highway 72.	1.18	1958-59, 1970-94	03-24-94	28.62	630	12-31-87	36.55	4,700
16248800 Inoaole Str at Waimanalo	Lat 21°29'31", long 157°42'40", 30 ft upstream from culvert on Hihimanu Street and 0.8 mi northwest of Waimanalo Post Office.	1.21	1958-94	11-03-93	5.75	e300	05-07-81	7.55	1,600
16249000 Waimanalo Str at Waimanalo	Lat 21°21'12", long 157°43'52", on right bank 40 ft upstream from Highway 72 and 2.3 mi northeast of Waimanalo Post Office.	2.16	1967-70≠, 1971-94	11-03-93	3.50	e1,800	03-06-63	10.0	4,560
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	1963-94	11-03-93	2.99	102	12-31-87	7.53	476
16264800 Kawainui Canal at Kailua	Lat 21°24'15", long 157°45'28", at head of canal and 1.2 mi northwest of Kailua Post Office.	11.0	1957-60, 1963-64, 1967-94b	10-25-93	2.56	-	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, 1977-94	02-15-94	6.44	602	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 in Kaneohe.	0.62	1959-94	02-15-94	-	e300	05-02-65	11.50	2,750
16279500 Heeia Str at Kaneohe	Lat 21°25'17", long 157°49'01", 60 ft downstream from culvert on Kahekili Highway, 0.7 mi west of Kaneohe Post Office, and 0.8 mi southwest of Heeia.	1.80	1965-66, 1968-94	02-15-94	-	e1,400	05-02-65	9.50	5,600
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	1963-94	02-15-94	7.60	e2,000	02-01-69	11.8	7,300
16304500 Kaluanui Str at Hauula	Lat 21°35'57", long 157°54'24", on left downstream wingwall of concrete bridge, 1.2 mi southeast of cemetery in Hauula, and 1.4 mi northeast of Sacred Falls.	2.12	1958-94	02-13-94	6.18	e2,000	01-06-82	6.95	4,920

≠ Operated as a continuous-record gaging station
b Gage height only
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Oahu--Continued						
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	1958-94	02-13-94	4.68	e300	04-15-63	12.10	4,640
16311000 Oio Str nr Kahuku	Lat 21°41'32", long 157°59'48", 0.6 mi southwest of junction of plantation road and Highway 83 and 2.7 mi west of Kahuku Hospital.	2.13	1958-94	02-13-94	4.00	e100	05-02-65	8.13	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 nr Sunset Beach and 2.9 mi northeast of Waimea.	1.98	1973-94	02-12-94	5.39	e50	11-20-90	6.01	450
16318000 Paumalu Gulch at Sunset	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	1968-94	03-24-94	4.08	e150	04-19-74	4.97	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	1968-94	02-12-94 03-24-94	2.14 2.14	e10 e10	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	1958-94	03-24-94	7.54	2,880	04-19-74	15.8	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	1956-94	09-18-94	13.76	1,860	04-19-74	20.7	7,600
			Hawaii, 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	1964-94	02-14-94	-	e5	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≠, 1973-94	02-14-94	-	e35	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 east of Laau Point lighthouse, and 3.3 mi southwest of Mauna Loa.	0.28	1964-94	02-14-94	1.47	25	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	1965-94	02-14-94	3.80	710	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	1964-94	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 misouthwest of Kualapuu.	10.4	1965-94	03-24-94	-	e200	04-04-89	-	3,620

≠ Operated as a continuous-record gaging station
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
	Hawaii, Island of Molokai--Continued								
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	1964-94	03-24-94	1.49	519	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	1964-94	03-24-94	7.20	320	11-04-66	8.93	989

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
	Hawaii, 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≠, 1973-94	09-18-94	13.68	2,320	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	1967-94	09-18-94	10.28	4,380	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≠, 1969-94	09-18-94	9.44	1,640	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	1963-94	09-18-94	6.87	489	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	1963-94	03-24-94	14.54	2,200	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	1965-94	03-24-94	10.55	12,060	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	1963-94	03-24-94	1.77	12	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	1967-94	06-25-94	2.91	59	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	1963-94	06-25-94	1.45	24	07-23-64	9.90	306
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	1967-94	03-24-94	4.74	143	01-28-71	8.33	1,330

≠ Operated as a continuous-record gaging station

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Maui--Continued						
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≠, 1952-94	03-24-94	5.22	3,680	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 norhtwest of Waihee.	0.12	1964-94	03-24-94	-	e80	01-12-75	7.29	e97
16619700 Poelua Gulch nr Kaha-kuloa	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	1965-94	03-24-94	11.53	464	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, 1965-94	07-15-94	5.11	718	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≠ 1990-94a	03-25-94	-	e650	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 Lanhaina Lighthouse.	4.12	1960, 1962, 1964-94	03-23-94	4.32	487	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≠, 1973-94	03-25-94	4.20	600	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	1964-94	12-19-93	-	e<1	01-10-80	12.95	350
16650500 Waikapu Str nr Kihei	Lat 20°49'02", long 156°29'00", at railroad bridge beside Lower Maalaea Road, 2.5 mi northeast of Maalaea, and 2.5 mi northwest of Kihei.	6.97	1963-94	03-10-94	-	e255	11-04-88	8.69	1,170
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	1964-94	10-25-93	2.18	46	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	1963-94	No flow.			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≠, 1971-94	No flow.			01-28-71	9.40	4,460
16663500 Kamaole Gulch at Kamaole	Lat 20°43'36", long 156°27'02", at Kihei Road, 350 ft upstream from mouth, and 0.2 mi south of Kamaole.	4.28	1972-94	No flow.			03-17-82	9.01	291

≠ Operated as a continuous-record gaging station
< Actual value is known to be less than the value shown
a At a different datum
e Estimated

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
	Hawaii, Island of Maui--Continued								
16664000 Liilioholo Gulch at Kamaole	Lat 20°43'04", long 156°26'55", on upstream side of Kihei Road, 300 ft upstream from mouth, and 0.8 mi south of Kamaole.	4.12	1972-94	No flow.			02-11-82	13.73	526

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum Date	Gage height (ft)	Discharge (ft^3/s)	Period of record max Date	Gage height (ft)	Discharge (ft^3/s)
	Hawaii, 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, 1993-94	08-12-94	10.90	3,670	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	08-12-94	5.92	575	02-20-79	8.10	1,260
16717400 Kalaoa Mauka Str nr Hilo	Lat 19°48'07", long 155°06'03", at culvert on Highway 19, 1.0 mi north of Papaikou, and 5.1 mi north of Hilo Post Office.	0.24	1963-94	Records being reviewed.					
16717600 Alia Str nr Hilo	Lat 19°50'38", long 155°06'21", on left bank 10 ft downstream from culvert on Highway 19 at Pepeekeo 2.0 mi south of Honomu, and 8.0 mi north of Hilo.	0.58	1962-72≠, 1973-90, 1994	08-12-94	10.54	387	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	12-19-93	9.31	963	02-20-79	29.93	3,320
16717800 Pohakupuka Str nr Papaaloa	Lat 19°57'20", long 155°11'20", right bank 200 ft downstream from Highway 19, 2.8 mi northwest of Honohina, and 3.0 mi southwestof Papaaloa.	2.76	1963-80≠, 1983-94	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, 1993-94	08-12-94	5.62	221	03-18-80	9.10	500
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	1963-94	Records being reviewed.					
16717950 Honokaia Gulch tributary nr Honokaa	Lat 20°02'58", long 155°32'19", at culvert 4.8 mi southwest of Honokaa Hospital, and 5.5 mi southeast of Kukuihaele.	2.42	1963-94	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	1963-94	Records being reviewed.					
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	1963-94	03-25-94	2.44	63	04-07-89	5.33	277

≠ Operated as a continuous-record gaging station

Annual maximum discharge at crest-stage partial-record stations during water year 1994--Continued

Station name and number	Location	Drainage area mi^2	Period of record	Water year 1994 maximum			Period of record max		
				Date	Gage height (ft)	Discharge (ft^3/s)	Date	Gage height (ft)	Discharge (ft^3/s)
			Hawaii, Island of Hawaii--Continued						
16756500 Keanuiomano Str nr Kamuela	Lat 201'48", 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≠, 1973-94			Records being reviewed.			
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 norhteast of Waimea.	0.27	1963-91, 1994	03-25-94	3.40	149	12-26-83	3.70	400
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	10-26-93	4.04	183	04-20-68	6.71	1,210
16759080 Popoo Gulch nr Waikii	Lat 19°52'11", long 155°43'51", at bridge on Highway 19, 2.0 mi north of Keamuku, and 5.2 mi west of Waikii.	33.1	1963-94			Records being reviewed.			
16759180 Keopu Str nr Kailua	Lat 19°38'54", long 155°58'15", at county road bridge, 1.9 mi east of Kailua, and 2.3 mi northwest of Holualoa Post Office.	2.61	1962, 1965-94			Records being reviewed.			
16759300 Waiaha Str at Luawai, nr Holualoa	Lat 19°38'12", long 155°55'45", on right bank at Luawai, 1.8 mi northeast of Holualoa School and 4.2 mi southeast of Honokohau School.	8.74	1961-71≠, 1972-94			Records being reviewed.			
16762000 Alapai Gulch at Naalehu	Lat 19°04'00", long 155°35'19", at debris catchment outlet of Naalehu Watershed Protection Project and 0.2 mi upstream from Highway 11 at Naalehu.	2.87	1963-94			Records being reviewed.			
16767000 Ninole Gulch nr Punaluu	Lat 19°10'44", long 155°33'46", on right bank 300 ft downstream from forest-reserve boundary, 4.6 mi northwest of Punaluu, and 6.0 mi north of Honuapo.	15.5	1966-82≠, 1983-94			Records being reviewed.			
16770000 Hionamoa Gulch at Pahala	Lat 19°11'45", long 155°29'11", at bridge, 0.6 mi southwest of Pahala and 4.1 mi north of Punaluu.	9.41	1963-90, 1994	09-19-94	-	1,340	02-20-79	-	10,400
16770500 Paauau Gulch at Pahala	Lat 19°12'39", long 155°28'48", on right bank 100 ft downstream from bridge on Wood Valley Road and 0.7 mi north of Pahala.	1.74	1962-79≠, 1980-94			Records being reviewed.			

≠ Operated as a continuous-record gaging station

Discharge measurements made at miscellaneous sites during water year 1994

Station No.	Station name	Location	Measured previously (water years)	Measurements Date	Measurements Discharge (ft^3/s)
		Hawaii, 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≠, 1988-93	10-19-93 03-29-94 07-07-94 09-06-94	264 150 298 166
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≠, 1986-93	10-18-93 03-29-94 07-01-94 09-06-94	149 72.5 139 2.58
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≠, 1986-93	10-19-93 04-22-94 07-01-94 09-06-94	39.4 48.3 95.3 27.6
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≠, 1986-93	10-18-93 10-18-93 04-22-94 07-07-94 09-06-94	117 115 0.61 77.1 2.83

≠ Operated as a continuous-record gaging station

Water-quality partial-record stations are particular sites where chemical-quality, and/or sediment data are collected systematically over a period of years for use in hydrologic analyses. A schematic diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu is shown in figure 15 and the data are listed in downstream order.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU

16227100 - HALAWA STREAM BELOW H1 (LAT 21°22'17" LONG 157°55'57")

DATE	TIME	DISCHARGE, INST. CUBIC FEET PER SECOND	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE AIR (DEG C)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./100 ML)
NOV											
10...	1300	1.6	325	9.4	25.0	30.0	2.7	762	10.9	144	--
DEC											
06...	1105	0.78	540	9.2	25.5	24.0	2.0	734	10.2	126	1000
JAN											
25...	1400	121	110	7.4	19.0	19.5	77	761	6.0	65	--
FEB											
24...	1055	2.5	468	9.4	24.5	26.0	0.60	762	13.7	169	--
MAR											
22...	0840	E3.0	570	8.3	--	21.0	0.70	765	9.0	101	--
APR											
18...	1115	12	350	8.3	24.5	27.5	22	766	9.7	122	--
JUN											
07...	1035	0.96	790	8.6	27.5	30.0	1.0	766	10.5	139	--
JUL											
27...	0940	3.7	330	9.2	29.5	30.0	2.0	763	11.3	150	1300
AUG											
16...	1025	0.52	870	8.6	28.0	29.0	2.0	764	10.0	130	--
30...	1015	0.34	941	8.6	27.5	29.0	1.7	765	11.1	144	710

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
FEB											
24...	1055	130	25	17	43	41	2	1.7	89	21	71
JUL											
27...	0940	90	18	11	27	39	1	1.7	--	13	46

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC										
06...	1105	--	--	--	--	--	6	--	0.20	0.020
FEB										
24...	1055	<0.10	19	256	251	0.35	10	<0.050	<0.20	<0.010
JUL										
27...	0940	0.10	20	190	--	--	6	<0.050	<0.20	0.020
AUG										
30...	1015	--	--	--	--	--	13	<0.050	<0.20	0.020

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
FEB											
24...	1055	40	<10	<1	<100	5	<10	<1	<1	<1	<3
JUL											
27...	0940	220	30	<1	<100	3	<10	<1	1	<1	<3

< Actual value is known to be less than the value shown
E Estimated

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16227100 - HALAWA STREAM BELOW H1--Continued

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
FEB 24...	2	90	12	<1	<10	<4	20	6	<0.10	<1	<10
JUL 27...	2	270	11	<1	<10	<4	10	4	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
FEB 24...	<1	<1	<1	<1	<1	<1.0	190	<6	<10	2.7	<1
JUL 27...	1	<1	<1	<1	<1	<1.0	120	<6	<10	2.4	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 24...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 27...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	0.01	<0.010	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 24...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 27...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 24...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 27...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

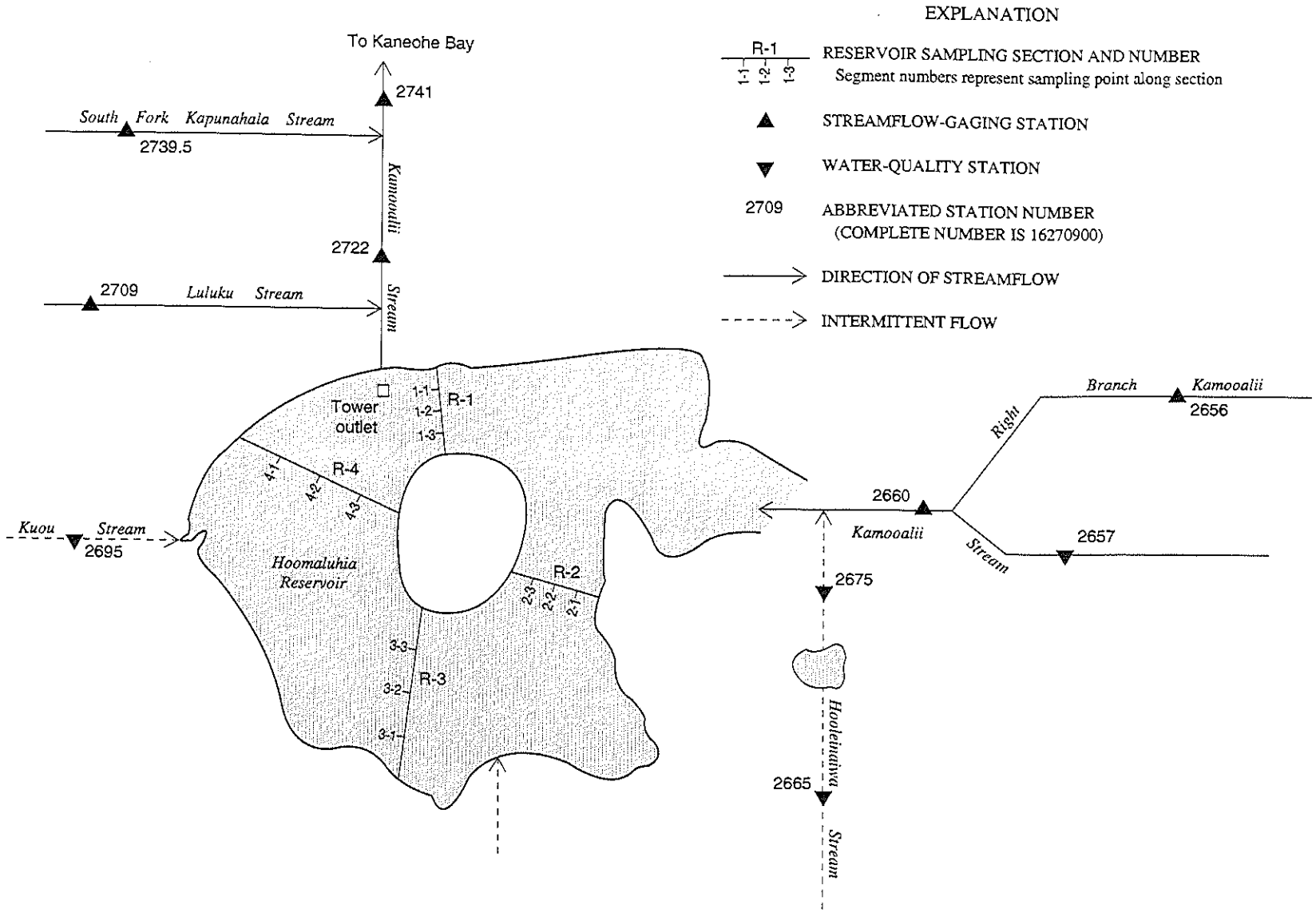


Figure 15. Diagram showing water-quality stations in Kamooalii Stream basin, Kaneohe, Oahu.

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16265700 - KAMOOALII STREAM AT ALTITUDE 200 FT, NEAR KANEOHE (LAT 21°23'12" LONG 157°47'56")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND (00061)	SPE-CIFIC CON-DUCT-ANCE (US/CM) (00095)	PH WATER WHOLE FIELD (STAND-ARD UNITS) (00400)	TEMPER-ATURE AIR (DEG C) (00020)	TEMPER-ATURE WATER (DEG C) (00010)	TUR-BID-ITY (NTU) (00076)	BARO-METRIC PRES-SURE (MM OF HG) (00025)	OXYGEN, DIS-SOLVED (MG/L) (00300)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION) (00301)
NOV 09...	1300	0.69	23	7.1	21.5	21.5	0.80	760	7.6	86
DEC 07...	1350	0.43	224	6.7	22.5	21.5	0.50	760	6.3	72
JAN 25...	1140	3.1	225	6.8	--	21.0	1.7	759	8.3	94
FEB 25...	1030	2.5	205	6.8	--	21.0	1.0	760	8.2	92
MAR 22...	1430	1.7	214	6.7	22.0	21.0	0.50	758	7.6	86
APR 19...	1310	2.8	225	6.9	26.0	21.5	1.2	761	8.5	97
JUN 06...	1315	1.5	220	6.7	25.0	22.5	0.90	765	7.7	89
JUL 29...	0840	0.78	220	7.1	25.0	22.5	0.30	760	7.1	82
AUG 15...	1325	0.64	220	6.9	26.5	23.5	0.30	759	6.9	82
31...	1045	0.95	200	7.4	25.5	22.5	1.3	757	8.6	100

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 07...	1350	170	2	--	--	<0.20	0.020
FEB 25...	1030	150	8	0.290	0.290	<0.20	0.040
JUL 29...	0840	220	5	0.570	0.570	<0.20	0.020
AUG 31...	1045	2500	7	0.490	0.490	<0.20	0.060

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16266500 - HOOLEINAIWA STREAM AT ALTITUDE 22D FT, NEAR KANEOHE (LAT 21°23'06" LONG 157°48'16")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
NOV										
12...	1015	0.27	164	6.6	22.0	22.0	0.60	758	6.9	79
DEC										
07...	1100	0.13	170	6.8	23.0	21.0	0.30	730	6.7	79
JAN										
26...	1030	0.78	180	6.7	20.0	21.5	0.30	756	7.3	83
FEB										
25...	1320	1.9	140	6.8	--	21.5	36	757	7.8	89
MAR										
22...	1200	0.38	168	6.6	20.0	21.5	0.20	759	7.2	82
APR										
19...	1055	0.50	180	6.8	23.0	22.0	0.30	762	8.1	93
JUN										
06...	1305	0.16	170	6.7	25.5	23.0	0.50	762	6.7	78
JUL										
28...	1405	0.11	162	7.3	27.0	24.0	0.40	758	6.8	81
AUG										
16...	1410	0.05	160	6.9	26.5	23.5	0.30	757	6.4	76
30...	0905	0.03	170	6.8	25.5	22.5	0.60	758	6.4	74

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC								
07...	1100	K24	2	--	--	<0.20	--	<0.010
FEB								
25...	1320	K17000	86	0.130	0.130	0.50	0.63	0.120
JUL								
28...	1405	85	5	0.080	0.080	<0.20	--	0.020
AUG								
30...	0905	140	7	--	<0.050	<0.20	--	<0.010

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16267500 - HOOLEINAIWA STREAM ABOVE CONFLUENCE WITH KAMOOALII STR, NR KANEOHE (LAT 21°23'18" LONG 157° 48'18")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
NOV										
12...	0912	0.73	194	6.4	21.5	23.0	2.9	760	7.0	82
DEC										
07...	0945	0.45	200	7.2	23.0	20.5	6.7	731	7.3	84
JAN										
26...	0940	1.7	174	7.0	21.0	20.5	2.0	757	7.5	84
FEB										
25...	1230	1.3	185	7.4	21.5	21.5	3.1	759	7.8	89
MAR										
22...	1120	0.81	186	7.0	21.0	21.0	1.4	761	7.7	87
APR										
19...	0920	1.2	190	7.3	25.5	22.0	3.1	763	8.0	91
JUN										
06...	1040	0.65	190	7.0	26.5	24.5	3.8	763	6.8	82
JUL										
28...	1400	0.58	185	7.5	28.5	26.5	2.2	758	7.2	90
AUG										
16...	1140	0.45	190	7.3	29.0	26.5	1.5	759	6.4	80
30...	1125	0.34	200	7.3	26.0	25.5	2.4	759	6.5	80

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC							
07...	0945	450	6	--	--	<0.20	0.020
FEB							
25...	1230	K5500	16	0.084	0.084	<0.20	0.020
JUL							
28...	1400	220	9	--	<0.050	<0.20	0.020
AUG							
30...	1125	87	8	--	<0.050	<0.20	<0.010

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16269500 - KUOU STREAM AT ALTITUDE 220 FT, NEAR KANEOHE (LAT 21°23'30" LONG 157°48'44")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
NOV										
10...	1310	E0.03	400	6.6	25.5	22.0	0.90	758	7.3	84
DEC										
07...	1200	E0.03	370	7.2	25.5	21.0	0.30	730	6.8	80
JAN										
27...	1225	0.05	335	7.0	23.5	20.5	0.40	754	5.2	58
FEB										
25...	1140	0.21	301	6.8	--	21.0	10	760	8.1	91
MAR										
22...	1345	0.08	354	6.8	21.5	21.0	0.40	758	7.8	89
APR										
20...	1420	0.19	310	7.0	24.0	21.5	0.90	761	8.0	91
JUN										
07...	1040	E0.02	340	6.6	25.5	22.5	0.60	761	7.7	89
JUL										
25...	1400	0.03	320	7.4	27.5	24.5	1.9	757	7.4	89
AUG										
15...	1500	E0.01	300	7.2	29.0	24.0	0.60	759	7.0	84
31...	1000	0.02	252	7.3	25.5	23.5	3.7	757	7.8	93

DATE	TIME	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC							
07...	1200	K440	6	--	--	<0.20	0.020
FEB							
25...	1140	9600	46	0.220	0.220	0.30	0.090
JUL							
25...	1400	2000	9	0.270	0.270	<0.20	0.020
AUG							
31...	1000	3600	9	0.260	0.260	<0.20	0.030

< Actual value is known to be less than the value shown
E Estimated
K Result based on colony count outside acceptance range (non ideal colony count)

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STREAM BELOW KAM HWY (LAT 21°24'54" LONG 157°48'03")

DATE	TIME	DIS-CHARGE, INST. CUBIC FEET PER SECOND	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE FIELD (STAND-ARD UNITS)	TEMPER-ATURE AIR (DEG C)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
NOV 10...	1015	13	206	8.7	25.0	25.0	5.7	764	9.2	111	--
DEC 08...	1125	9.7	210	8.7	25.5	23.0	4.5	730	9.8	120	1100
JAN 27...	1015	17	220	7.9	24.0	21.5	4.5	761	5.9	67	--
FEB 25...	1000	17	200	7.6	23.0	22.5	2.6	764	9.6	110	1200
MAR 22...	1310	14	218	8.6	23.0	22.5	1.1	766	9.1	105	--
APR 18...	1350	22	210	8.1	25.0	29.0	1.6	767	8.9	115	--
JUN 07...	0910	12	223	8.4	26.0	24.0	3.0	767	9.7	115	--
JUL 29...	1045	11	198	8.9	27.5	28.0	2.1	760	9.2	118	2600
AUG 15...	1515	10	192	9.0	28.0	30.0	3.0	764	8.0	106	--
31...	1045	25	201	8.3	28.5	26.0	9.3	765	8.4	103	6100

DATE	TIME	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
FEB 25...	1000	63	13	7.3	14	32	0.8	1.1	60	11	18
JUL 29...	1045	54	10	7.1	15	37	0.9	0.90	58	6.6	20

DATE	TIME	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUS-PENDED (MG/L)	NITRO-GEN, NO2+NO3 TOTAL (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	PHOS-PHORUS TOTAL (MG/L AS P)
DEC 08...	1125	--	--	--	--	--	18	--	--	<0.20	0.030
FEB 25...	1000	<0.10	18	117	120	0.16	14	0.350	0.350	<0.20	0.030
JUL 29...	1045	0.10	23	116	119	0.16	17	0.200	0.200	0.30	0.040
AUG 31...	1045	--	--	--	--	--	29	0.350	0.350	0.30	0.050

DATE	TIME	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)	COBALT, DIS-SOLVED (UG/L AS CO)
FEB 25...	1000	270	70	<1	<100	5	<10	<1	2	<1	<3
JUL 29...	1045	480	10	<1	<100	3	<10	<1	3	<1	<3

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

16274100 - KANEOHE STREAM BELOW KAM HWY--Continued

DATE	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)
FEB 25...	2	580	140	<1	<10	<4	40	18	0.20	<1	<10
JUL 29...	3	1100	53	1	<10	<4	60	4	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
FEB 25...	1	<1	<1	<1	<1	<1.0	83	<6	<10	1.8	<1
JUL 29...	1	<1	<1	<1	<1	<1.0	70	<6	<10	2.4	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLOR-DANE, TOTAL (UG/L)	CHLOR-PYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DI-AZINON, TOTAL (UG/L)	DI-ELDRIN TOTAL (UG/L)	DI-SYSTON TOTAL (UG/L)	2, 4-DP TOTAL (UG/L)
FEB 25...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	0.040	<0.01	<0.01
JUL 29...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	0.030	<0.01	<0.01

DATE	2,4-D, TOTAL (UG/L)	ENDO-SULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DY-FONATE) WATER WHOLE TOT.REC (UG/L)	HEPTA-CHLOR, TOTAL (UG/L)	HEPTA-CHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALA-THION, TOTAL (UG/L)	METH-OXY-CHLOR, TOTAL (UG/L)	METHYL PARA-THION, TOTAL (UG/L)
FEB 25...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.01
JUL 29...	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	0.010	<0.010	<0.01	<0.01	<0.01

DATE	MIREX, TOTAL (UG/L)	NAPH-THA-LENES, POLY-CHLOR. TOTAL (UG/L)	PARA-THION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PER-THANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOX-APHENE, TOTAL (UG/L)	TOTAL TRI-THION (UG/L)	2,4,5-T TOTAL (UG/L)
FEB 25...	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01	<0.01
JUL 29...	<0.01	<0.10	<0.01	0.2	<0.1	<0.01	<0.01	<1	<0.01	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157482601 HOOMALUHIA RES SEC 1-1 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	0955	1.00	186	7.7	21.5	762	7.7	87
09...	0957	3.00	188	7.7	21.5	762	7.7	87
09...	0959	5.00	188	7.7	21.5	762	7.7	87
09...	1001	7.00	188	7.7	21.5	762	7.6	86
09...	1003	8.00	188	7.7	21.5	762	7.6	86
MAR								
23...	0931	1.00	192	7.5	21.0	759	7.8	88
23...	0932	3.00	194	7.6	21.0	759	7.8	88
23...	0933	5.00	194	7.6	21.0	759	7.7	87
23...	0934	7.00	194	7.6	21.0	759	7.8	87
23...	0935	8.00	194	7.6	21.0	759	7.8	88
JUN								
08...	1024	1.00	200	7.5	25.5	761	6.7	82
08...	1025	3.00	202	7.5	25.5	761	6.7	82
08...	1026	5.00	200	7.5	25.0	761	6.5	79
08...	1028	7.00	200	7.5	25.0	761	6.1	75
08...	1029	8.00	202	7.5	25.0	761	5.7	69
JUL								
27...	1048	1.00	188	7.5	26.5	758	6.6	82
27...	1049	3.00	190	7.6	26.0	758	6.8	84
27...	1050	5.00	188	7.6	26.0	758	6.5	80
27...	1051	7.00	188	7.5	25.5	758	5.7	70
27...	1052	8.00	188	7.5	25.5	758	4.9	59

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157482602 HOOMALUHIA RES SEC 1-2 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1007	1.00	186	7.8	21.5	762	7.8	88
09...	1009	3.00	188	7.8	21.5	762	7.7	88
09...	1010	5.00	188	7.8	21.5	762	7.7	88
09...	1011	7.00	188	7.8	21.5	762	7.6	87
09...	1012	9.00	188	7.7	21.5	762	7.5	85
MAR								
23...	0924	1.00	194	7.4	21.0	759	7.8	88
23...	0926	3.00	194	7.4	21.0	759	7.8	88
23...	0927	5.00	194	7.4	21.0	759	7.8	88
23...	0928	7.00	194	7.4	21.0	759	7.8	87
23...	0929	9.00	194	7.4	21.0	759	7.7	87
JUN								
08...	1016	1.00	200	7.4	25.5	761	6.6	82
08...	1017	3.00	202	7.4	25.5	761	6.7	82
08...	1019	5.00	200	7.4	25.0	761	6.6	81
08...	1020	7.00	200	7.4	25.0	761	5.9	72
08...	1021	9.00	204	7.4	25.0	761	5.1	61
JUL								
27...	1030	1.00	188	7.3	26.0	758	6.7	83
27...	1035	3.00	190	7.5	26.0	758	6.7	83
27...	1037	5.00	190	7.5	26.0	758	6.3	78
27...	1038	7.00	192	7.5	25.5	758	5.8	71
27...	1039	9.00	188	7.4	25.0	758	5.4	65

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE (LAT 21°23'35" LONG 157°48'26")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)
DEC										
09...	1018	1.00	188	7.8	21.5	1.5	762	7.8	89	--
09...	1019	3.00	188	7.8	21.5	--	762	7.8	89	--
09...	1020	5.00	188	7.8	21.5	--	762	7.8	89	--
09...	1021	7.00	188	7.8	21.5	2.0	762	7.8	88	--
09...	1023	9.00	188	7.8	21.5	--	762	7.6	86	--
09...	1024	11.0	188	7.7	21.5	2.5	762	7.4	84	--
MAR										
23...	0915	1.00	192	6.9	21.0	1.0	759	7.9	89	K22
23...	0917	3.00	192	7.0	21.0	--	759	7.8	88	--
23...	0918	5.00	194	7.0	21.0	--	759	7.8	87	--
23...	0919	7.00	194	7.1	21.0	1.0	759	7.8	88	K14
23...	0921	9.00	194	7.1	21.0	--	759	7.8	88	--
23...	0922	11.0	194	7.2	21.0	1.0	759	7.8	88	27
23...	0925	a--	194	7.1	21.0	1.5	759	7.8	88	--
JUN										
08...	1000	1.00	200	7.2	25.5	1.5	761	6.7	82	--
08...	1002	3.00	202	7.2	25.5	--	761	6.7	81	--
08...	1005	5.00	200	7.2	25.0	--	761	6.6	80	--
08...	1007	7.00	200	7.2	25.0	1.3	761	6.4	78	--
08...	1008	9.00	202	7.2	24.5	--	761	5.9	71	--
08...	1010	11.0	204	7.1	24.0	2.5	761	5.5	66	--
JUL										
27...	0930	1.00	190	7.2	26.0	0.80	758	6.8	84	K13
27...	0932	3.00	190	7.2	26.0	--	758	6.8	84	--
27...	0934	5.00	190	7.2	26.0	--	758	6.4	79	--
27...	0936	7.00	194	7.2	25.5	1.1	758	5.9	73	K43
27...	0938	9.00	190	7.2	25.0	--	758	4.8	59	--
27...	0940	11.0	196	7.2	24.5	1.1	758	5.2	63	>120
27...	1000	a--	194	7.2	25.5	1.4	758	5.9	73	--

DATE	TIME	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)
MAR											
23...	0925	57	8.8	8.5	15	36	0.9	1.2	56	8.6	19
JUL											
27...	1000	53	7.6	8.2	15	38	0.9	0.90	55	6.4	20

DATE	TIME	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC											
09...	1018	--	--	--	--	--	4	--	--	--	--
09...	1021	--	--	--	--	--	4	--	--	--	--
09...	1024	--	--	--	--	--	4	--	--	--	--
MAR											
23...	0915	--	--	--	--	--	2	0.380	0.380	<0.20	<0.010
23...	0919	--	--	--	--	--	4	0.390	0.390	<0.20	<0.010
23...	0922	--	--	--	--	--	3	0.390	0.390	<0.20	0.010
23...	0925	<0.10	18	112	115	0.15	3	0.400	0.400	<0.20	0.010
JUL											
27...	0930	--	--	--	--	--	2	0.490	0.490	<0.20	0.010
27...	0936	--	--	--	--	--	4	0.540	0.540	0.30	0.020
27...	0940	--	--	--	--	--	5	0.550	0.550	0.30	0.030
27...	1000	0.10	19	113	110	0.15	--	--	--	--	--

> Actual value is known to be greater than the value shown
< Actual value is known to be less than the value shown
a Composite sample.
K Results based on colony count outside the acceptance range (non-ideal colony count)

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157482603 - HOOMALUHIA RES SEC 1-3 NR KANEOHE--Continued

DATE	TIME	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
MAR 23...	0925	120	10	<1	<100	6	<10	<1	<1	<1	<3
JUL 27...	1000	120	<10	<1	<100	7	<10	<1	<1	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)	MOLYBDENUM, DISSOLVED (UG/L AS MO)
MAR 23...	<1	320	19	<1	<10	<4	50	17	<0.10	<1	<10
JUL 27...	1	310	21	<1	<10	<4	30	4	<0.10	<1	<10

DATE	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)	CARBON, ORGANIC TOTAL (MG/L AS C)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
MAR 23...	1	<1	<1	<1	<1	<1.0	80	<6	10	1.8	1
JUL 27...	<1	<1	<1	<1	<1	<1.0	75	<6	<10	2.0	<1

DATE	ALDRIN, TOTAL (UG/L)	CHLORDANE, TOTAL (UG/L)	CHLORPYRIFOS TOTAL RECOVER (UG/L)	DDD, TOTAL (UG/L)	DDE, TOTAL (UG/L)	DDT, TOTAL (UG/L)	DEF TOTAL (UG/L)	DIAZINON, TOTAL (UG/L)	DIELDRIN TOTAL (UG/L)	DISYSTON TOTAL (UG/L)	2,4-D, TOTAL (UG/L)
MAR 23...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01
JUL 27...	<0.010	<0.1	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01	<0.010	<0.01	<0.01

DATE	2, 4-DP TOTAL (UG/L)	2,4,5-T TOTAL (UG/L)	ENDOSULFAN, TOTAL (UG/L)	ENDRIN WATER UNFLTRD REC (UG/L)	ETHION, TOTAL (UG/L)	FONOFOS (DYFONATE) WATER WHOLE TOT.REC (UG/L)	HEPTACHLOR, TOTAL (UG/L)	HEPTACHLOR EPOXIDE TOTAL (UG/L)	LINDANE TOTAL (UG/L)	MALATHION, TOTAL (UG/L)	METHOXYCHLOR, TOTAL (UG/L)
MAR 23...	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	0.07	<0.01
JUL 27...	<0.01	<0.01	<0.010	<0.010	<0.01	<0.01	<0.010	<0.010	<0.010	<0.01	<0.01

DATE	METHYL PARATHION, TOTAL (UG/L)	MIREX, TOTAL (UG/L)	NAPHTHALENES, POLYCHLOR. TOTAL (UG/L)	PARATHION, TOTAL (UG/L)	PCB, TOTAL (UG/L)	PERTHANE TOTAL (UG/L)	PHORATE TOTAL (UG/L)	SILVEX, TOTAL (UG/L)	TOXAPHENE, TOTAL (UG/L)	TOTAL TRITHION (UG/L)
MAR 23...	<0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01
JUL 27...	0.01	<0.01	<0.10	<0.01	<0.1	<0.1	<0.01	<0.01	<1	<0.01

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212331157482501 HOOMALUHIA RES SEC 2-1 NR KANEOHE, OAHU, HI (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1049	1.00	188	7.8	21.5	762	7.7	88
09...	1051	3.00	188	7.7	21.5	762	7.6	87
09...	1053	5.00	188	7.7	21.5	762	7.7	87
09...	1054	7.00	188	7.7	21.5	762	7.6	86
09...	1055	8.00	188	7.7	21.5	762	7.7	87
MAR								
23...	1120	1.00	196	7.7	21.0	759	7.5	84
23...	1121	3.00	194	7.7	21.0	759	7.5	84
23...	1122	5.00	194	7.7	21.0	759	7.4	84
23...	1123	7.00	194	7.7	21.0	759	7.4	84
23...	1124	8.00	194	7.7	21.0	759	7.4	84
JUN								
08...	1058	1.00	198	7.6	25.5	761	6.9	85
08...	1059	3.00	200	7.6	25.5	761	6.9	85
08...	1100	5.00	200	7.6	25.5	761	6.9	85
08...	1101	7.00	200	7.6	25.5	761	6.5	80
08...	1103	8.00	200	7.6	25.0	761	6.4	78
JUL								
27...	1329	1.00	190	7.5	27.0	758	7.3	92
27...	1330	3.00	190	7.5	27.0	758	7.3	92
27...	1331	5.00	190	7.6	26.5	758	7.3	90
27...	1332	7.00	190	7.6	26.0	758	7.4	91
27...	1333	8.00	190	7.6	26.0	758	6.3	77

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212331157482502 - HOOMALUHIA RES SEC 2-2 NR KANEOHE (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1040	1.00	188	7.8	21.5	762	7.7	87
09...	1042	3.00	188	7.8	21.5	762	7.7	88
09...	1043	5.00	188	7.8	21.5	762	7.8	88
09...	1044	7.00	188	7.8	21.5	762	7.8	88
09...	1045	9.00	188	7.8	21.5	762	7.7	88
09...	1047	11.0	188	7.8	21.5	762	7.7	87
MAR								
23...	1113	1.00	194	7.8	21.0	759	7.6	85
23...	1114	3.00	192	7.7	21.0	759	7.6	86
23...	1115	5.00	192	7.7	21.0	759	7.6	86
23...	1116	7.00	192	7.7	21.0	759	7.6	85
23...	1117	9.00	192	7.7	21.0	759	7.7	86
23...	1118	11.0	190	7.7	21.0	759	7.6	85
JUN								
08...	1048	1.00	198	7.6	25.5	761	6.9	85
08...	1049	3.00	200	7.6	25.5	761	6.9	84
08...	1050	5.00	200	7.6	25.5	761	6.9	84
08...	1051	7.00	200	7.6	25.5	761	6.8	83
08...	1053	9.00	204	7.6	24.5	761	5.5	66
08...	1054	11.0	204	7.5	24.0	761	4.7	56
JUL								
27...	1322	1.00	190	7.5	27.0	758	7.3	91
27...	1323	3.00	188	7.5	26.5	758	7.3	92
27...	1324	5.00	190	7.5	26.5	758	7.4	93
27...	1325	7.00	190	7.5	26.0	758	6.8	84
27...	1326	9.00	196	7.5	25.0	758	5.6	68
27...	1327	11.0	196	7.4	24.5	758	4.4	53

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212331157482503 HOOMALUHIA RES SEC 2-3 NR KANEOHE, OAHU, HI (LAT 21°23'31" LONG 157°48'25")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1032	1.00	188	7.8	21.5	762	7.7	88
09...	1034	3.00	188	7.8	21.5	762	7.7	87
09...	1035	5.00	188	7.8	21.5	762	7.8	88
09...	1036	7.00	188	7.8	21.5	762	7.7	88
09...	1038	9.00	188	7.8	21.5	762	7.7	87
MAR								
23...	1108	1.00	192	7.8	21.0	759	7.9	88
23...	1109	3.00	192	7.8	21.0	759	7.8	87
23...	1110	5.00	192	7.8	21.0	759	7.8	88
23...	1111	7.00	192	7.8	21.0	759	7.8	87
23...	1112	9.00	192	7.8	21.0	759	7.8	87
JUN								
08...	1039	1.00	200	7.6	25.5	761	6.8	84
08...	1040	3.00	198	7.6	25.5	761	6.8	83
08...	1041	5.00	198	7.6	25.5	761	6.8	84
08...	1042	7.00	200	7.6	25.5	761	6.9	84
08...	1044	9.00	204	7.5	24.0	761	5.1	62
JUL								
27...	1314	1.00	190	7.4	27.0	758	7.2	91
27...	1316	3.00	188	7.4	27.0	758	7.3	91
27...	1317	5.00	190	7.4	26.5	758	7.3	92
27...	1318	7.00	190	7.4	26.0	758	7.0	87
27...	1319	9.00	194	7.4	25.0	758	4.8	58

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212329157483101 HOOMALUHIA RES SEC 3-1 NR KANEOHE, OAHU, HI (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1128	1.00	186	7.8	21.5	762	8.0	91
09...	1129	3.00	188	7.8	21.5	762	8.0	91
09...	1130	5.00	188	7.8	21.5	762	8.0	91
09...	1131	7.00	188	7.8	21.5	762	7.9	90
09...	1132	8.00	188	7.8	21.5	762	7.8	89
MAR								
23...	1044	1.00	190	7.8	21.0	759	7.7	87
23...	1045	3.00	192	7.8	21.0	759	7.7	87
23...	1046	5.00	192	7.8	21.0	759	7.7	87
23...	1047	7.00	190	7.8	21.0	759	7.7	86
23...	1048	8.00	190	7.8	21.0	759	7.7	86
JUN								
08...	1150	1.00	200	7.7	26.5	761	7.0	87
08...	1152	3.00	200	7.7	26.0	761	7.0	87
08...	1153	5.00	200	7.7	26.0	761	7.0	86
08...	1154	7.00	200	7.7	26.0	761	6.9	85
08...	1155	8.00	200	7.7	26.0	761	6.9	85
JUL								
27...	1353	1.00	190	7.6	27.0	758	7.1	90
27...	1354	3.00	190	7.6	27.0	758	7.1	89
27...	1355	5.00	190	7.6	27.0	758	7.1	89
27...	1356	7.00	188	7.7	27.0	758	6.8	86
27...	1357	8.00	188	7.6	26.0	758	6.5	80

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212329157483102 - HOOMALUHIA RES SEC 3-2 NR KAHEOHE (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC									
09...	1113	1.00	186	7.8	21.5	1.2	762	7.9	90
09...	1115	3.00	188	7.8	21.5	--	762	8.0	90
09...	1116	5.00	188	7.8	21.5	1.4	762	7.9	90
09...	1117	7.00	188	7.8	21.5	--	762	7.9	89
09...	1118	9.00	186	7.8	21.5	--	762	7.8	89
09...	1120	10.0	188	7.8	21.5	3.7	762	7.8	88
MAR									
23...	1050	1.00	192	7.8	21.0	1.1	759	7.7	87
23...	1051	3.00	192	7.8	21.0	--	759	7.7	86
23...	1052	5.00	194	7.8	21.0	2.1	759	7.7	87
23...	1053	7.00	192	7.8	21.0	--	759	7.6	86
23...	1054	9.00	190	7.7	21.0	--	759	7.6	86
23...	1055	10.0	190	7.7	21.0	1.1	759	7.5	84
JUN									
08...	1159	1.00	200	7.7	26.5	1.3	761	7.0	87
08...	1200	3.00	198	7.7	26.0	--	761	7.0	87
08...	1201	5.00	200	7.8	26.0	1.3	761	7.0	86
08...	1203	7.00	198	7.8	26.0	--	761	7.0	86
08...	1204	9.00	200	7.7	25.5	--	761	6.8	84
08...	1205	10.0	200	7.7	25.5	1.8	761	6.7	82
JUL									
27...	1345	1.00	190	7.6	27.0	2.1	758	7.3	92
27...	1346	3.00	190	7.7	27.0	--	758	7.0	88
27...	1347	5.00	190	7.7	27.0	0.70	758	7.3	92
27...	1348	7.00	190	7.7	26.5	--	758	6.8	84
27...	1350	9.00	188	7.7	26.0	--	758	5.2	64
27...	1351	10.0	190	7.6	25.0	0.90	758	3.3	40

DATE	TIME	COLIFORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	RESIDUE TOTAL AT 105 DEG. C, SUSPENDED (MG/L)	NITROGEN, NO2+NO3 TOTAL (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	PHOSPHORUS TOTAL (MG/L AS P)
DEC							
09...	1113	--	4	--	--	--	--
09...	1116	--	4	--	--	--	--
09...	1120	--	12	--	--	--	--
MAR							
23...	1050	64	4	0.370	0.370	<0.20	<0.010
23...	1052	67	5	0.390	0.390	<0.20	<0.010
23...	1055	57	3	0.400	0.400	<0.20	<0.010
JUL							
27...	1345	K5	7	0.510	0.510	0.20	0.020
27...	1347	K7	5	0.480	0.480	<0.20	0.010
27...	1351	<4	4	0.470	0.470	<0.20	0.010

< 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)

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212329157483103 HOOMALUHIA RES SEC 3-3 NR KANEOHE, OAHU, HI (LAT 21°23'29" LONG 157°48'31")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1102	1.00	188	7.8	21.5	762	8.0	90
09...	1103	3.00	188	7.8	21.5	762	7.9	90
09...	1105	5.00	188	7.8	21.5	762	7.8	89
09...	1106	7.00	188	7.8	21.5	762	7.8	88
09...	1107	9.00	188	7.7	21.5	762	7.6	87
09...	1109	11.0	188	7.7	21.5	762	7.6	86
MAR								
23...	1058	1.00	192	7.7	21.0	759	7.8	88
23...	1059	3.00	192	7.7	21.0	759	7.7	87
23...	1100	5.00	194	7.7	21.0	759	7.7	86
23...	1101	7.00	194	7.7	21.0	759	7.7	87
23...	1102	9.00	194	7.7	21.0	759	7.7	86
23...	1104	11.0	194	7.7	21.0	759	7.6	86
JUN								
08...	1208	1.00	200	7.8	26.5	761	7.1	88
08...	1210	3.00	200	7.7	26.0	761	7.1	87
08...	1211	5.00	200	7.8	26.0	761	7.1	87
08...	1212	7.00	200	7.8	25.5	761	7.0	86
08...	1213	9.00	198	7.8	25.5	761	7.0	86
08...	1214	11.0	204	7.6	24.5	761	3.8	46
JUL								
27...	1337	1.00	190	7.7	27.0	758	7.2	92
27...	1338	3.00	190	7.7	27.0	758	7.3	91
27...	1339	5.00	188	7.7	26.5	758	7.2	91
27...	1340	7.00	190	7.7	26.5	758	6.9	86
27...	1342	9.00	192	7.6	25.0	758	4.1	51
27...	1343	11.0	188	7.6	25.0	758	3.8	46

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157483001 HOOMALUHIA RES SEC 4-1 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1155	1.00	186	7.8	21.5	762	7.9	89
09...	1156	3.00	188	7.8	21.5	762	7.9	89
09...	1157	5.00	188	7.8	21.5	762	7.8	88
09...	1158	7.00	188	7.8	21.5	762	7.8	88
09...	1159	8.00	188	7.8	21.5	762	7.7	87
MAR								
23...	0950	1.00	192	7.7	21.0	759	7.8	88
23...	0951	3.00	192	7.7	21.0	759	7.8	88
23...	0953	5.00	194	7.7	21.0	759	7.8	88
23...	0955	7.00	194	7.7	21.0	759	7.8	87
23...	0956	8.00	194	7.7	21.0	759	7.8	87
JUN								
08...	1134	1.00	200	7.7	26.0	761	6.9	86
08...	1135	3.00	200	7.7	26.0	761	7.0	86
08...	1137	5.00	200	7.7	25.5	761	6.8	83
08...	1138	7.00	200	7.7	25.5	761	6.6	81
08...	1139	8.00	202	7.6	24.0	761	5.8	69
JUL								
27...	1133	1.00	190	7.5	26.5	758	6.8	85
27...	1134	3.00	190	7.5	26.5	758	6.8	85
27...	1135	5.00	190	7.5	26.5	758	6.8	85
27...	1136	7.00	188	7.5	26.0	758	4.9	60
27...	1137	8.00	190	7.5	25.5	758	4.4	54

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157483002 - HOOMALUHIA RES SEC 4-2 NR KANEOHE (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1148	1.00	186	7.8	21.5	762	7.9	90
09...	1149	3.00	188	7.8	21.5	762	7.8	89
09...	1150	5.00	188	7.8	21.5	762	7.6	86
09...	1151	7.00	186	7.7	21.5	762	7.7	87
09...	1152	9.00	188	7.7	21.5	762	7.5	85
MAR								
23...	1000	1.00	192	7.7	21.0	759	7.8	88
23...	1001	3.00	192	7.7	21.0	759	7.7	87
23...	1003	5.00	194	7.7	21.0	759	7.8	87
23...	1005	7.00	194	7.7	21.0	759	7.7	87
23...	1006	9.00	192	7.7	21.0	759	7.7	87
JUN								
08...	1125	1.00	200	7.6	26.0	761	6.9	85
08...	1127	3.00	200	7.6	26.0	761	6.9	85
08...	1128	5.00	200	7.6	25.5	761	6.9	84
08...	1129	7.00	200	7.6	25.5	761	6.8	83
08...	1131	9.00	202	7.6	24.0	761	6.0	71
JUL								
27...	1126	1.00	190	7.4	26.5	758	6.9	86
27...	1127	3.00	190	7.4	26.5	758	6.9	85
27...	1128	5.00	190	7.4	26.0	758	6.9	86
27...	1129	7.00	190	7.4	26.0	758	6.0	74
27...	1130	9.00	190	7.4	25.0	758	4.1	51

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212335157483003 HOOMALUHIA RES SEC 4-3 NR KANEOHE, OAHU, HI (LAT 21°23'35" LONG 157°48'30")

DATE	TIME	SAMPLING DEPTH (FEET)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE FIELD (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	BAROMETRIC PRESSURE (MM OF HG)	OXYGEN, DISSOLVED (MG/L)	OXYGEN, DISSOLVED (PERCENT SATURATION)
DEC								
09...	1139	1.00	186	7.8	21.5	762	7.9	90
09...	1141	3.00	188	7.8	21.5	762	7.9	90
09...	1142	5.00	188	7.8	21.5	762	7.8	89
09...	1143	7.00	188	7.8	21.5	762	7.8	88
09...	1144	9.00	188	7.8	21.5	762	7.8	88
09...	1145	11.0	188	7.8	21.5	762	7.7	87
MAR								
23...	1007	1.00	192	7.7	21.0	759	7.8	87
23...	1008	3.00	194	7.7	21.0	759	7.8	87
23...	1009	5.00	194	7.7	21.0	759	7.8	87
23...	1010	7.00	194	7.7	21.0	759	7.8	87
23...	1011	9.00	194	7.7	21.0	759	7.8	87
23...	1012	11.0	194	7.7	21.0	759	7.8	87
JUN								
08...	1114	1.00	200	7.8	26.0	761	6.9	85
08...	1116	3.00	200	7.7	25.5	761	6.9	85
08...	1117	5.00	202	7.7	25.5	761	6.8	84
08...	1118	7.00	202	7.7	25.5	761	6.8	83
08...	1120	9.00	204	7.6	25.0	761	5.0	60
08...	1122	11.0	204	7.5	24.5	761	4.6	55
JUL								
27...	1117	1.00	190	7.1	26.5	758	6.8	85
27...	1119	3.00	188	7.1	26.0	758	6.9	86
27...	1120	5.00	190	7.2	26.0	758	6.9	85
27...	1121	7.00	190	7.2	26.0	758	6.8	85
27...	1123	9.00	188	7.3	25.0	758	4.5	55
27...	1124	11.0	190	7.2	25.0	758	4.3	52

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

212336157482601 - HOOMALUHIA RESERVOIR AT OUTLET, NEAR KANEOHE (LAT 21°23'36" LONG 157°48'26")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	BARO-METRIC PRES-SURE (MM OF HG)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)
JUN						
08...	1400	200	26.0	762	7.6	94
08...	1500	202	26.0	762	7.9	98
08...	1600	200	26.0	762	7.5	93
08...	1700	198	26.0	762	7.8	96
08...	1800	198	26.0	762	7.8	96
08...	1900	198	26.5	762	7.8	97
08...	2000	200	26.5	762	7.8	97
08...	2100	200	26.0	762	7.6	94
08...	2200	200	26.0	762	7.6	94
08...	2300	198	26.0	762	7.5	93
08...	2400	198	26.0	762	7.4	91
09...	0100	198	26.0	762	7.3	90
09...	0200	200	26.0	762	7.4	91
09...	0300	200	26.0	762	7.4	91
09...	0400	200	26.0	762	7.1	87
09...	0500	198	26.0	762	7.2	89
09...	0600	198	26.0	762	7.2	89
09...	0700	198	26.0	762	7.0	86
09...	0800	198	25.5	762	7.0	86
09...	0900	198	26.0	762	7.0	86
09...	1000	200	26.0	762	7.3	90
09...	1100	200	26.0	762	7.5	92
09...	1200	198	26.0	762	7.5	93
09...	1300	200	26.0	762	7.6	94
09...	1400	200	26.0	762	7.7	95

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF MAUI

204900156063301 HANAWI STREAM WATERFALL AT BIG SPRINGS NEAR NAHIKU (LAT 20°49'00" LONG 156°06'33")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	TRITIUM TOTAL (PCI/L)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L)
FEB 24...	1030	44	19.0	7.2	0.8
JUN 14...	1635	45	19.0	11	2.0

HAWAII, ISLAND OF KAUAI

220057159210301. Local number 2-0021-01.

LOCATION.--Lat 22°00'57", long 159°21'04", Hydrologic Unit 20070000, 1.0 mi south southwest of Wailua County Golf Course, and 1.3 mi north of Hanamaulu Park. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table; depth 276 ft, casing diameter 8 in., cased to 196 ft.

DATUM.--Elevation of land surface datum is 166 ft. Measuring point: Top of 4-in. galvanized coupling, 166.70 ft. above mean sea level.

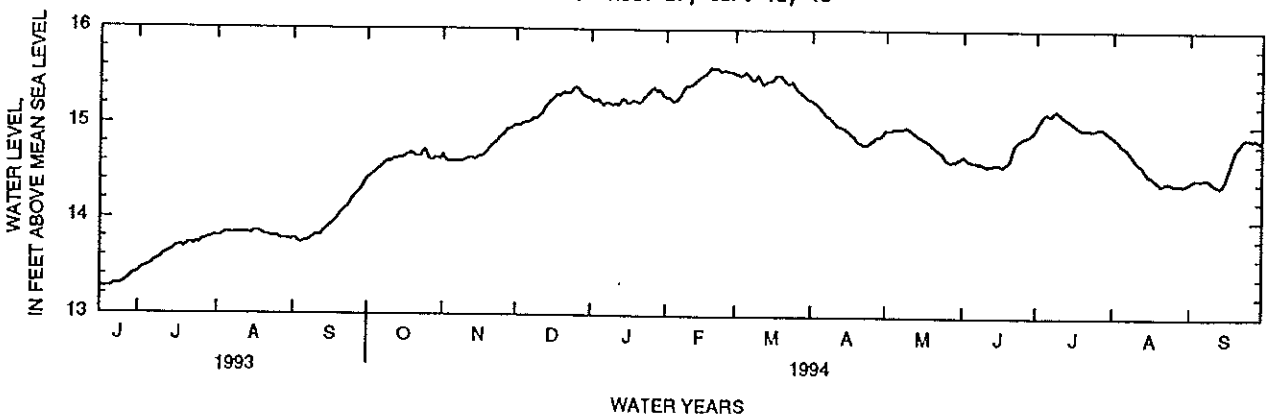
PERIOD OF RECORD.--Occasional measurements June 1980 to June 1993. Water-level recorder, June 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.71 ft above mean sea level, Nov. 19, 1982; lowest measured, 12.65 ft above mean sea level, Oct. 28, 1991.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.42	14.67	14.99	15.27	15.29	15.54	15.26	14.95	14.68	14.99	14.89	14.42
2	14.44	14.63	14.99	15.25	15.29	15.53	15.24	14.95	14.66	15.04	14.87	14.44
3	14.46	14.61	14.99	15.26	15.27	15.52	15.22	14.95	14.64	15.08	14.85	14.45
4	14.48	14.61	15.01	15.26	15.25	15.53	15.19	14.96	14.63	15.12	14.81	14.45
5	14.51	14.61	15.02	15.23	15.26	15.55	15.16	14.96	14.62	15.13	14.79	14.45
6	14.53	14.61	15.02	15.21	15.28	15.53	15.13	14.97	14.62	15.12	14.78	14.45
7	14.55	14.61	15.03	15.23	15.32	15.50	15.10	14.96	14.61	15.12	14.75	14.46
8	14.58	14.61	15.06	15.23	15.37	15.47	15.09	14.97	14.61	15.15	14.71	14.46
9	14.60	14.61	15.06	15.22	15.41	15.48	15.06	14.98	14.60	15.16	14.68	14.44
10	14.61	14.62	15.07	15.21	15.41	15.52	15.03	14.97	14.59	15.14	14.64	14.42
11	14.61	14.63	15.10	15.22	15.42	15.48	15.00	14.95	14.58	15.12	14.61	14.40
12	14.63	14.64	15.12	15.21	15.43	15.43	14.99	14.93	14.59	15.09	14.60	14.39
13	14.63	14.64	15.17	15.23	15.46	15.44	14.98	14.91	14.59	15.08	14.57	14.38
14	14.64	14.63	15.21	15.27	15.48	15.46	14.97	14.89	14.60	15.06	14.53	14.40
15	14.64	14.64	15.24	15.26	15.50	15.46	14.95	14.88	14.60	15.04	14.49	14.44
16	14.65	14.66	15.26	15.23	15.52	15.47	14.93	14.86	14.59	15.02	14.49	14.52
17	14.67	14.66	15.29	15.23	15.53	15.51	14.90	14.85	14.58	15.00	14.46	14.59
18	14.68	14.68	15.31	15.25	15.56	15.52	14.89	14.83	14.60	14.98	14.44	14.67
19	14.69	14.70	15.30	15.25	15.60	15.52	14.84	14.81	14.61	14.97	14.42	14.75
20	14.68	14.74	15.32	15.24	15.59	15.49	14.83	14.78	14.64	14.97	14.40	14.79
21	14.66	14.77	15.34	15.24	15.59	15.46	14.81	14.76	14.73	14.97	14.40	14.82
22	14.66	14.79	15.33	15.25	15.59	15.44	14.80	14.74	14.80	14.97	14.42	14.86
23	14.66	14.81	15.33	15.29	15.56	15.44	14.80	14.72	14.83	14.96	14.42	14.88
24	14.71	14.84	15.34	15.32	15.57	15.45	14.81	14.69	14.85	14.96	14.41	14.88
25	14.72	14.87	15.38	15.34	15.57	15.41	14.84	14.65	14.87	14.97	14.40	14.88
26	14.65	14.89	15.39	15.37	15.56	15.37	14.85	14.63	14.88	14.98	14.40	14.87
27	14.62	14.92	15.37	15.39	15.56	15.35	14.88	14.62	14.89	14.98	14.40	14.88
28	14.62	14.95	15.33	15.36	15.55	15.33	14.88	14.63	14.90	14.97	14.40	14.87
29	14.64	14.95	15.31	15.37	---	15.31	14.89	14.63	14.92	14.95	14.39	14.85
30	14.64	14.97	15.29	15.34	---	15.28	14.92	14.65	14.94	14.93	14.40	14.88
31	14.63	---	15.29	15.31	---	15.27	---	14.66	---	14.91	14.41	---
MEAN	14.61	14.72	15.20	15.27	15.46	15.45	14.97	14.83	14.69	15.03	14.56	14.61
MAX	14.72	14.97	15.39	15.39	15.60	15.55	15.26	14.98	14.94	15.16	14.89	14.88
MIN	14.42	14.61	14.99	15.21	15.25	15.27	14.80	14.62	14.58	14.91	14.39	14.38

WTR YR 1994 MAX 15.62 FEB. 20-22 MIN 14.35 AUG. 29, SEP. 12, 13



HAWAII, ISLAND OF KAUAI--Continued

220018159444702. Local number 2-0044-13

LOCATION.--Lat 22°00'18", long 159°44'47", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 206 ft; casing diameter 12 in, cased to 165 ft.

DATUM.--Elevation of land surface datum is 8 ft. Measuring point: Top of standpipe 10.61 ft above mean sea level. From July 27, 1977 to Sept.10, 1981, before standpipe was extended, measuring point elevation at top of standpipe was at 9.11 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements July 1977 to current year.
WATER QUALITY: Occasional measurements October 1981 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 10.23 ft above mean sea level, Oct. 13, 1992 and Feb. 16, 1993; lowest measured, 8.33 ft above mean sea level, Mar. 29, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	10.09	DEC 6	9.91	JAN 31	9.96	APR 11	9.93	JUN 6	9.76	AUG 8	9.54

HAWAII, ISLAND OF KAUAI--Continued

220019159444801. Local number 2-0044-14.

LOCATION.--Lat 22°00'19", long 159°44'48", Hydrologic Unit 20070000, 1.8 mi northeast of Kokole Point, and 2.8 mi northwest of Kekaha School. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 245 ft, casing diameter 12 in., cased to 164 ft.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point: Top of standpipe, 11.49 ft above mean sea level. Prior to June 1979 nonrecording gage at datum 0.25 ft lower.

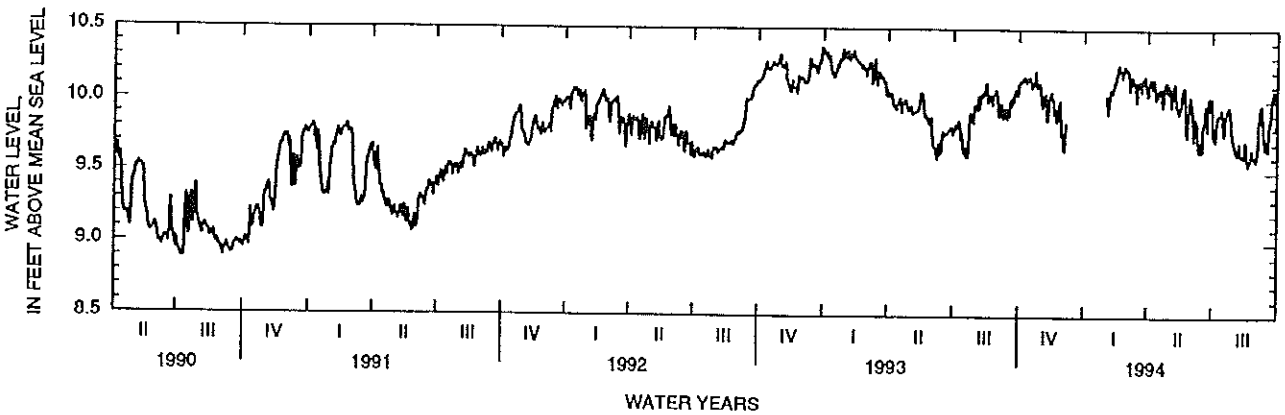
PERIOD OF RECORD.--Occasional measurements, 1937 to 1962 (measured by Kekaha Sugar Co.). Water-level recorder, June 1979 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.07 ft above mean sea level, Dec. 20, 1937; lowest measured, 7.52 ft above mean sea level, Aug. 15, 1947.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	10.12	10.09	9.77	---	10.04	10.21	10.04	10.11	10.01	9.85	9.69	9.62
2	10.12	10.00	9.76	---	10.01	10.21	10.05	10.08	9.98	9.77	9.67	9.66
3	10.13	9.98	9.68	---	9.97	10.22	10.13	10.01	9.94	9.75	9.65	9.72
4	10.14	9.96	9.66	---	9.92	10.22	10.15	9.97	9.78	9.74	9.64	9.86
5	10.14	10.03	9.71	---	10.00	10.19	10.15	10.01	9.73	9.73	9.63	9.91
6	10.15	10.02	9.84	---	10.02	10.10	10.15	10.09	9.80	9.76	9.63	9.96
7	10.14	10.04	9.85	---	10.05	10.08	10.11	10.10	9.89	9.85	9.67	9.97
8	10.16	10.05	---	---	10.08	10.15	10.09	10.12	9.84	9.90	9.71	9.90
9	10.16	9.98	---	---	10.08	10.17	10.15	10.12	9.85	9.88	9.63	9.87
10	10.16	9.87	---	---	10.06	10.17	10.15	10.06	9.84	9.90	9.62	9.77
11	10.15	9.90	---	---	10.09	10.12	10.10	9.97	9.69	9.91	9.62	9.73
12	10.13	9.92	---	---	10.10	10.12	10.02	9.96	9.66	9.91	9.63	9.71
13	10.15	10.02	---	---	10.13	10.14	10.03	9.96	9.65	9.91	9.63	9.67
14	10.15	10.04	---	---	10.14	10.13	10.06	9.93	9.69	9.94	9.61	9.71
15	10.16	10.05	---	---	10.15	10.07	10.03	9.92	9.72	9.91	9.64	9.73
16	10.15	10.06	---	---	10.18	10.00	10.07	9.95	9.65	9.81	9.72	9.66
17	10.16	10.02	---	---	10.19	10.05	10.08	9.97	9.66	9.77	9.68	9.69
18	10.13	10.02	---	---	10.23	10.13	10.09	9.95	9.81	9.79	9.61	9.82
19	10.12	9.98	---	---	10.25	10.14	10.09	10.04	9.85	9.86	9.59	9.85
20	10.10	9.91	---	---	10.24	10.14	10.06	10.07	9.85	9.90	9.56	9.88
21	10.11	9.93	---	---	10.22	10.14	9.98	10.09	9.93	9.92	9.58	9.96
22	10.12	9.95	---	---	10.21	10.11	9.97	10.10	9.97	9.94	9.59	10.00
23	10.12	9.88	---	---	10.20	10.07	10.02	10.09	9.88	9.94	9.59	10.03
24	10.16	9.86	---	---	10.17	10.12	10.09	10.01	9.80	9.96	9.62	10.06
25	10.20	9.88	---	---	10.20	10.15	10.11	9.83	9.92	9.95	9.66	10.07
26	10.11	9.94	---	---	10.22	10.16	10.13	9.76	10.01	9.93	9.63	10.06
27	10.10	9.98	---	---	10.24	10.16	10.13	9.77	10.02	9.83	9.62	10.07
28	10.10	10.00	---	---	10.24	10.17	10.10	9.84	9.99	9.79	9.61	10.00
29	10.12	9.92	---	---	---	10.13	10.06	9.91	9.97	9.75	9.60	9.81
30	10.11	9.77	---	---	---	10.08	10.09	10.00	10.02	9.73	9.59	9.80
31	10.12	---	---	---	---	10.11	---	10.03	---	9.71	9.59	---
MEAN	10.14	9.97	---	---	10.13	10.13	10.08	9.99	9.85	9.85	9.63	9.85
MAX	10.20	10.09	---	---	10.25	10.22	10.15	10.12	10.02	9.96	9.72	10.07
MIN	10.10	9.77	---	---	9.92	10.00	9.97	9.76	9.65	9.71	9.56	9.62

WTR YR 1994 MAX 10.40 FEB. 22 MIN 9.41 AUG. 20



HAWAII, ISLAND OF KAUAI--Continued

220016159442701. Local number, 2-0044-15.

LOCATION.--Lat 22°00'16", long 159°44'27", Hydrologic Unit 20070000, 2.5 mi Northwest from Kekaha School and, 1.8 mi Northeast of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 63.1 ft, 12 ft concrete casing, cased to 63.1 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point is the south top of concrete ring at 57.84 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements 1973 to current year.
WATER QUALITY: Occasional measurements 1973 to current year.

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, 11.73 ft above mean sea level, Jan. 24, 1978; lowest measured, 4.89 ft above mean sea level, Jun. 6, 1988.

REMARKS.--Water used for irrigation of sugar cane.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 4.89 ft above mean sea level, Jun. 6, 1988. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	9.37	DEC 6	9.41	JAN 31	9.80	APR 11	9.80	JUN 6	8.45	AUG 8	8.43

220134159205401. Local number 2-0120-02.

LOCATION.--Lat 22°01'34", long 159°20'54", Hydrologic unit 20070000, .3 mi southwest of Wailua County Golf Course and 1.6 mi south southwest of Wailua River Mouth. Owner: State of Hawaii, DOWALD.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 312 ft, casing diameter 6 in., cased to 60 ft.

DATUM.--Elevation of land-surface datum is 11 ft. Measuring point 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, Feb. 21, 1974; lowest measured, 8.08 ft above mean sea level, Oct. 12, 1978.

REMARKS.--Well affected by pumping of nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	10.07	DEC 20	11.00	FEB 9	10.95	APR 18	10.78	JUN 13	9.78	AUG 15	9.59

HAWAII, ISLAND OF KAUAI--Continued

220148159453502. Local number, 2-0145-11.

LOCATION.--Lat 22°01'48", long 159°43'35", Hydrologic Unit 20070000, 1.0 mi Southeast from Hana Camp and 3.3 mi north of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 31.5 ft, probably obstructed; casing diameter 12 in, cased depth unknown.

DATUM.--Elevation of land-surface datum is 29 ft. Measuring point is the top of steel pipe 29.23 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.30 ft above mean sea level, Oct. 13, 1992; lowest water level measured, 14.48 ft above mean sea level, Dec. 6, 1993.

REMARKS.--Water level affected by pumping of nearby wells.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	15.86	DEC 6	14.48	JAN 31	21.53	APR 11	22.74	JUN 6	21.83	AUG 8	21.74

220354159205601. Local number, 2-0320-01

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 240 ft, casing diameter 8 in., cased to 193 ft.

DATUM.--Elevation of land-surface datum is 155 ft. Measuring point: Top edge of steel pump-base at breather hole, 155.98 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Ocasional measurements, February 1960, June 1973 to current year.
WATER QUALITY: 1960, 1966, 1972-80, 1985-89, 1991, 1993.

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, 20.04 ft above mean sea level, Feb. 17, 1960; lowest measured, 0.88 ft above mean sea level, Aug. 14, 1992.

REMARKS.--Water used for public supply. Water level affected by pumping of nearby well.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 0.88 ft above mean sea level, Aug. 14, 1992. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	3.15	DEC 10	4.09	FEB 8	3.43	APR 8	4.69	JUN 8	2.74	AUG 5	3.47

HAWAII, ISLAND OF KAUAI--Continued

220354159205602. Local number, 2-0320-03.

LOCATION.--Lat 22°03'54", long 159°20'56", Hydrologic Unit 20070000, 0.6 mi east of Sleeping Giant Mountain, and 1.3 mi northwest of Wailua River bridge. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 302 ft; casing diameter 14 in, cased to 168 ft.

DATUM.--Elevation of land-surface datum is 156 ft. Measuring point is the top edge of steel pump base at breather hole, 156.94 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements, Aug. 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, Nov. 19, 1982; lowest water level measured, 1.36 ft above mean sea level, Aug. 14, 1992.

REMARKS.--Water is used for public supply. Water level affected by pumping of nearby well.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 1.36 ft above mean sea level, Aug. 14, 1992. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	3.30	DEC 10	4.49	FEB 8	3.70	APR 8	4.52	JUN 8	3.04	AUG 5	3.76

220341159453901. Local number, 2-0345-04.

LOCATION.--Lat 22°03'41", long 159°43'39", Hydrologic Unit 20070000, 1.7 mi north northeast from Mana Camp and 1.7 mi east southeast from Nohili Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 66 ft, concrete casing, diameter 12 ft, cased to 66 ft.

DATUM.--Elevation of land-surface datum 57 ft. Measuring point is the top of concrete ring (south side) at 60.80 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, 6.90 ft above mean sea level, Jan. 31, 1974; lowest measured, 2.25 ft above mean sea level, Oct. 24, 1984.

REMARKS.--Water is used for irrigation of sugar cane.

REVISONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 2.25 ft above mean sea level, Oct. 24, 1984. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	4.32	DEC 6	3.45	JAN 31	4.82	APR 11	4.77	JUN 6	3.52	AUG 8	2.42

HAWAII, ISLAND OF KAUAI--Continued

220621159232101. Local number 2-0623-04.

LOCATION.--Lat 22°06'11", long 159°23'21", Hydrologic Unit 20070000, 1.3 mi northeast of Kapahi Reservoir, and at the end of Kahuna Road. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled perch water table; depth 1,023 ft, casing diameter 12 in., cased to 168 ft above mean sea level.

DATUM.--Elevation of land surface datum is 518 ft. Measuring point: Top of 3/4" pipe on concrete pump base, 516.35 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements Apr. 1993 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 470.60 ft above mean sea level, Apr. 8, 1994; lowest measured, 415.87 ft above mean sea level, Apr. 23, 1993.

REMARKS.--Water used for public supply.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	433.51	DEC 10	452.79	FEB 8	467.00	APR 8	470.60	JUN 8	464.37	AUG 5	461.98

220825159185301. Local number 2-0818-03.

LOCATION.--Lat 22°08'25", long 159°18'53", Hydrologic Unit 20070000, 1.3 mi southwest of Kahala Point and 0.2 mi south of Anahola School. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table; depth 466 ft, casing diameter 12 in., cased to 290 ft above mean sea level.

DATUM.--Elevation of land surface datum is 267 ft. Measuring point: Top of west side of 4 1/2-in. pipe at 268.99 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements Oct. 1991 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.03 ft above mean sea level, Feb. 14, 1992; lowest measured, 10.91 ft above mean sea level, Jun. 8, 1994.

REMARKS.--Water for future public supply. Water level affected by nearby wells.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	11.35	DEC 10	11.19	FEB 8	10.98	APR 8	11.08	JUN 8	10.91	AUG 4	11.07

HAWAII, ISLAND OF KAUAI--Continued

221038159203801. Local number, 2-1020-03.

LOCATION.--Lat 22°10'38", long 159°20'38", Hydrologic Unit 20070000, 2.6 mi south of Kulikoa Point and 2.6 mi northwest of Kuaehu Point. Owner: Amfac Properties Development Corp.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well; depth 700 ft.

DATUM.--Elevation of land-surface datum 358 ft. Measuring point 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.

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, Mar. 30, 1990; lowest measured, 66.17 ft above mean sea level, Nov. 6, 1973.

REMARKS.--Pump is in process of being replaced. Well unused at this time.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 66.17 ft above mean sea level, Nov. 6, 1973. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	111.52	DEC 15	111.68	FEB 9	111.36	APR 15	110.11	JUN 15	107.28	AUG 12	104.41

221150159264501. Local number, 2-1126-01.

LOCATION.--Lat 22°11'50", long 159°26'45", Hydrologic Unit 20070000, 1.2 mi south of Princeville Airport terminal and 4.0 mi east southeast of Puupoa Point. Owner: Princeville Hanalei.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 763 ft; casing diameter 14 in, cased to 435 ft.

DATUM.--Elevation of land-surface datum 348 ft. Measuring point is the top of 3/4-in pipe, in 1-in hole on south side of pump base, after removing airline connection, 349.64 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, Nov. 17,1992.

REMARKS.--Water used for public supply and irrigation of golf course. Water level affected by nearby well.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 4.12 ft below mean sea level, Nov. 17, 1992. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	5.49	DEC 15	6.91	FEB 2	7.07	APR 15	8.12	JUN 15	7.88	AUG 12	7.06

HAWAII, ISLAND OF KAUAI--Continued

221247159324801. Local number, 2-1232-01.

LOCATION.--Lat 22°12'47", long 159°32'48", Hydrologic Unit 20070000, 0.9 mi southwest of Kolokoko Point and 1.5 mi southeast of Haena Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water table well; depth 188 ft; casing diameter 6 in, cased to 140 ft.

DATUM.--Elevation of land-surface datum is 65 ft. Measuring point is the top of 1 in. pipe .06 ft above flange, 66.56 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1975 to current year.

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 measured, 4.69 ft above mean sea level, Aug. 6, 1993.

REMARKS.--Water used for public supply.

REVISIONS.--The minimum water level for the period of record reported for water year 1993 has been revised to 4.69 ft above mean sea level, Aug. 6, 1993. The value previously reported was taken while the water level in the well was not fully recovered.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	6.26	DEC 10	6.46	FEB 8	7.16	APR 8	6.92	JUN 8	6.29	AUG 5	5.54

221318159335901. Local number, 2-1333-01.

LOCATION.--Lat 22°13'18", long 159°33'59", Hydrologic Unit 20070000, .6 mi south southwest of Haena Point and 1.2 mi east southeast of Kailiu Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 159 ft; casing diameter 8 in, cased to 104 ft.

DATUM.--Elevation of land-surface datum 83 ft. Measuring point is the top of unthreaded hole after removing 1 in pipe, 0.22 ft above hole on pump base, 82.45 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972 to current year.
Water quality: Occasional measurements 1972 to current year.

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, Dec. 8, 1989; lowest water level measured, 1.45 ft above mean sea level, Aug. 26, 1986.

REMARKS.--Water used for public supply.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 1.45 ft above mean sea level, Aug. 26, 1986. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	8.48	DEC 10	8.16	FEB 2	8.39	APR 8	8.68	JUN 8	a---	AUG 5	8.34

a Unable to measure water level. County replacing pump.

HAWAII, ISLAND OF KAUAI--Continued

215434159263301. Local number, 2-5426-03.

LOCATION.--Lat 21°54'34", long 159°26'33", Hydrologic Unit 20070000, 0.6 mi northeast of Koloa Mill and 2.6 mi north of Makahuena Point. Owner: Grove Farm Co. Inc.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 318 ft; casing diameter 12 in, cased to 176 ft.

DATUM.--Elevation of land-surface datum is 221 ft. Measuring point is the top of 1 in hole on southwest side of flange, 222.30 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements of water level 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, 34.83 ft above mean sea level, Jan. 10, 1974; lowest water level measured, 15.48 ft above mean sea level, Jun. 16, 1982.

REMARKS.--Water used for irrigation and washing of sugar cane at mill.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 15.48 ft above mean sea level, Jun. 16, 1982.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	24.77	DEC 20	24.40	FEB 7	25.75	APR 18	26.22	JUN 20	24.47	AUG 15	24.17

215454159274201. Local number, 2-5427-01.

LOCATION.--Lat 22°54'54", long 159°27'42", Hydrologic Unit 20070000, 0.1 mi west of the southwest corner of Waita Reservoir and 2.7 mi northeast of Kaulala Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 456 ft; casing diameter 12 in, cased to 263 ft.

DATUM.--Elevation of land surface datum is 245 ft. Measuring point is the top of 1/2 in. pipe 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, Oct. 6, 1988.

REMARKS.--Water used for public supply. Water level affected by nearby well.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 27.97 ft above mean sea level, Oct. 6, 1988. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	34.37	DEC 9	34.58	FEB 7	34.61	JUN 9	34.61	AUG 4	34.42

HAWAII, ISLAND OF KAUAI--Continued

215536159263501. Local number, 2-5526-01.

LOCATION.--Lat 21°55'36", long 159°26'35", Hydrologic Unit 20070000, 3.7 mi north of Makahuena Point and 2.5 mi southeast of Knudsen Gap. Owner: McBryde Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 1010 ft; casing diameter 20 in, cased to 400 ft.

DATUM.--Elevation of land-surface is 355 ft. Measuring point is the top of 1 in. hole on top of pipe flange, southeast side of pump, 355.28 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1977 to current year.
Water quality: Occasional measurements 1977 to current year.

REVISED RECORDS.--WDR HI-94-1: 1988-93 (Tho minimum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 108.83 ft above mean sea level, Jun. 4, 1992; lowest measured, 25.28 ft above mean sea level, Apr. 5, 1984.

REMARKS.--Water used for sugar cane irrigation.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 25.28 above mean sea level, Apr. 5, 1984. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	99.02	DEC 9	76.47	FEB 7	81.72	APR 7	81.78	JUN 9	81.99	AUG 4	83.08

215522159342601. Local number, 2-5534-03.

LOCATION.--Lat 21°55'22", long 159°34'26", Hydrologic Unit 20070000, 1.9 mi north from Weli Point and 2.9 mi northeast from Puolo Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 108 ft; casing diameter 9 in, cased to 108 ft.

DATUM.--Elevation of land surface datum 78 ft. Measuring point 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, Feb. 1, 1990; lowest water level measured, 12.62 ft above mean sea level, May 20, 1986.

REMARKS.--Water used for public supply.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 12.62 ft above mean sea level, May 20, 1986. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	15.54	DEC 9	15.72	FEB 7	16.34	APR 7	15.52	JUN 9	16.16	AUG 8	14.98

HAWAII, ISLAND OF KAUAI--Continued

215607159344301. Local number 2-5634-01.

LOCATION.--Lat 21°56'07", long 159°34'43", Hydrologic Unit 20070000, 2.7 mi north of Weli Point and 3.3 mi northeast of Puolo Point. Owner: State of Hawaii.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 508 ft, casing diameter 8 in., cased to 507 ft.

DATUM.--Elevation of land-surface datum is 439 ft. Measuring point: Top of casing 440.62 ft above mean sea level.

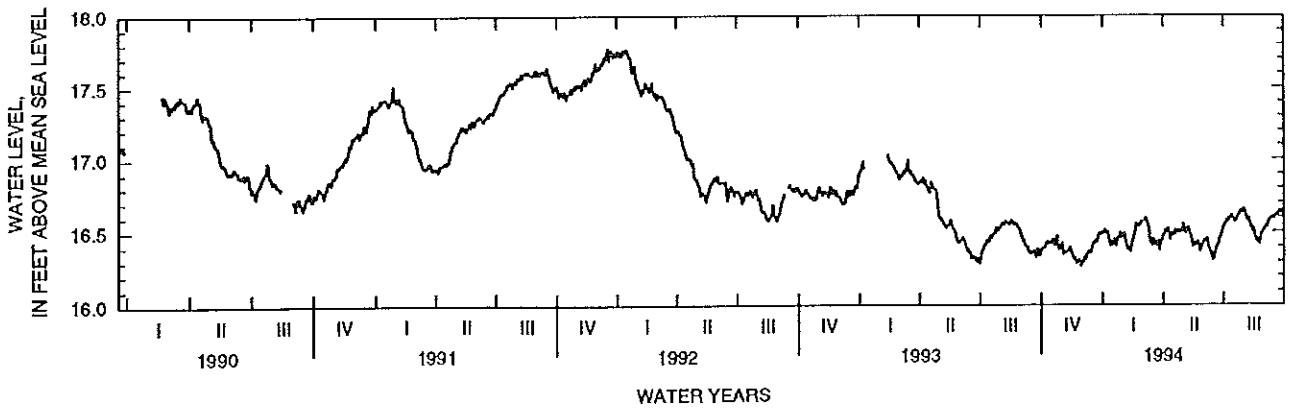
PERIOD OF RECORD.--Water level recorder, February 1986 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.83 ft above mean sea level, Jan. 15, 16 1992; lowest measured, 15.87 ft above mean sea level, Nov. 1, 1989.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	16.38	16.42	16.29	16.49	16.47	16.57	16.48	16.54	16.44	16.53	16.65	16.52
2	16.38	16.39	16.29	16.49	16.49	16.57	16.48	16.51	16.44	16.54	16.64	16.52
3	16.38	16.35	16.30	16.50	16.45	16.57	16.49	16.50	16.43	16.55	16.62	16.54
4	16.39	16.37	16.32	16.51	16.43	16.57	16.51	16.49	16.44	16.55	16.59	16.53
5	16.39	16.37	16.33	16.49	16.41	16.59	16.50	16.51	16.45	16.56	16.58	16.53
6	16.40	16.36	16.31	16.49	16.40	16.58	16.50	16.51	16.45	16.58	16.57	16.56
7	16.40	16.36	16.32	16.50	16.38	16.57	16.51	16.53	16.44	16.57	16.58	16.57
8	16.42	16.36	16.35	16.50	16.38	16.56	16.52	16.53	16.40	16.59	16.59	16.58
9	16.43	16.36	16.35	16.47	16.39	16.54	16.50	16.51	16.39	16.58	16.57	16.58
10	16.43	16.37	16.36	16.45	16.37	16.53	16.47	16.50	16.38	16.58	16.55	16.59
11	16.42	16.38	16.37	16.43	16.38	16.48	16.45	16.48	16.36	16.59	16.53	16.59
12	16.43	16.38	16.36	16.41	16.39	16.43	16.47	16.47	16.36	16.60	16.54	16.59
13	16.43	16.39	16.36	16.41	16.42	16.44	16.47	16.44	16.34	16.61	16.51	16.59
14	16.43	16.38	16.36	16.43	16.44	16.42	16.49	16.42	16.33	16.60	16.50	16.60
15	16.42	16.36	16.38	16.43	16.45	16.42	16.48	16.40	16.31	16.59	16.51	16.59
16	16.43	16.35	16.39	16.41	16.47	16.41	16.48	16.41	16.31	16.58	16.52	16.60
17	16.44	16.33	16.42	16.43	16.48	16.45	16.48	16.42	16.32	16.57	16.48	16.60
18	16.45	16.32	16.42	16.45	16.52	16.43	16.51	16.41	16.35	16.57	16.46	16.61
19	16.45	16.31	16.42	16.43	16.55	16.43	16.49	16.42	16.37	16.57	16.45	16.62
20	16.42	16.32	16.43	16.41	16.55	16.43	16.50	16.41	16.38	16.58	16.43	16.61
21	16.41	16.32	16.44	16.41	16.54	16.41	16.50	16.42	16.40	16.59	16.43	16.61
22	16.42	16.29	16.43	16.44	16.54	16.41	16.50	16.43	16.41	16.60	16.45	16.63
23	16.43	16.29	16.43	16.46	16.54	16.43	16.51	16.43	16.41	16.61	16.43	16.64
24	16.46	16.30	16.45	16.46	16.54	16.44	16.50	16.42	16.43	16.62	16.42	16.63
25	16.47	16.30	16.47	16.46	16.55	16.40	16.50	16.39	16.46	16.63	16.44	16.64
26	16.40	16.30	16.49	16.49	16.56	16.38	16.50	16.37	16.46	16.64	16.46	16.63
27	16.38	16.31	16.48	16.49	16.57	16.40	16.51	16.38	16.47	16.63	16.49	16.64
28	16.39	16.30	16.48	16.46	16.57	16.43	16.50	16.39	16.48	16.64	16.49	16.63
29	16.40	16.27	16.49	16.48	---	16.44	16.52	16.40	16.50	16.63	16.50	16.61
30	16.40	16.29	16.49	16.47	---	16.44	16.55	16.41	16.52	16.65	16.50	16.63
31	16.40	---	16.50	16.48	---	16.46	---	16.43	---	16.65	16.52	---
MEAN	16.42	16.34	16.40	16.46	16.47	16.47	16.50	16.45	16.41	16.59	16.52	16.59
MAX	16.47	16.42	16.50	16.51	16.57	16.59	16.55	16.54	16.52	16.65	16.65	16.64
MIN	16.38	16.27	16.29	16.41	16.37	16.38	16.45	16.37	16.31	16.53	16.42	16.52

WTR YR 1994 MAX 16.68 AUG. 1, SEP. 25 MIN 16.23 NOV. 23, 29, 30



HAWAII, ISLAND OF KAUAI--Continued

215845159232101. Local number, 2-5823-01.

LOCATION.--Lat 21°58'45", long 159°23'21", Hydrologic Unit 20070000, 3.5 mi northwest of Ninini Point, and 2.4 mi west from Lihue Airport terminal. Owner: Kauai County, Department of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled perch water-table well; depth 36 ft; casing diameter 6 ft, cased to 36 ft. Lateral tunnels connected to well extends 450 ft upstream and 502 ft downstream of well.

DATUM.--Elevation of land surface is 214.5 ft. Measuring point is the top of eight inch plastic pipe, 216.65 ft above mean sea level.

PERIOD OF RECORD.--Water level recorder, July 14, 1992 to current year.

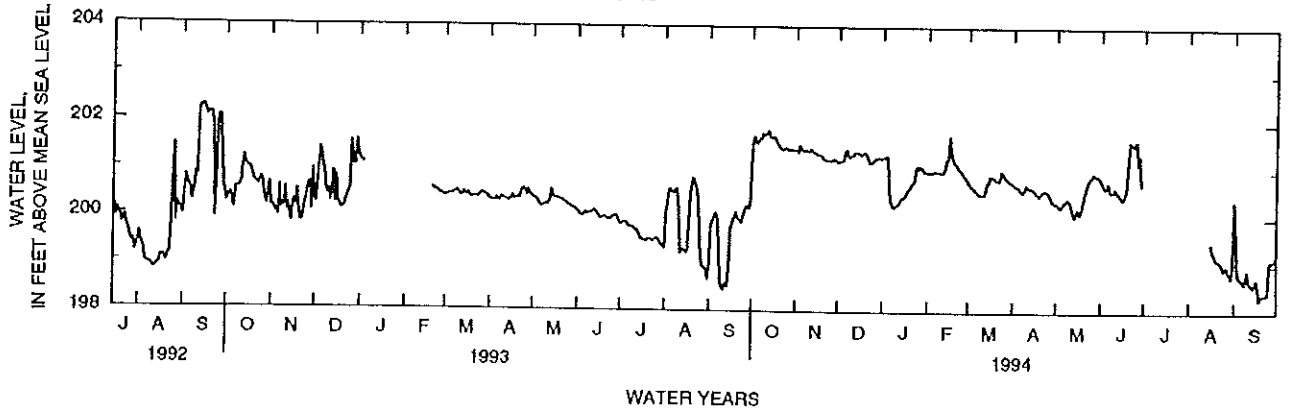
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 202.32 ft above mean sea level, Dec. 4, 1992; lowest measured, 198.29 ft above mean sea level, Sep. 18, 1994.

REMARKS.--Water used for public supply; well pumping frequently.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	201.17	201.43	201.19	201.27	200.98	200.76	200.74	200.33	200.82	---	---	200.37
2	201.60	201.42	201.20	201.29	200.98	200.72	200.71	200.31	200.74	---	---	199.83
3	201.69	201.39	201.20	201.30	200.97	200.69	200.69	200.26	200.68	---	---	198.92
4	201.60	201.51	201.20	201.31	200.98	200.66	200.68	200.25	200.65	---	---	198.77
5	201.57	201.46	201.24	201.01	200.98	200.63	200.65	200.28	200.67	---	---	198.73
6	201.61	201.42	201.40	200.38	201.00	200.59	200.61	200.33	200.75	---	---	198.73
7	201.67	201.41	201.42	200.32	200.99	200.57	200.58	200.37	200.60	---	---	198.66
8	201.67	201.43	201.31	200.25	200.99	200.53	200.56	200.37	200.57	---	---	198.64
9	201.76	201.41	201.29	200.24	200.98	200.51	200.65	200.41	200.59	---	---	198.78
10	201.74	201.41	201.31	200.26	200.97	200.52	200.70	200.38	200.59	---	---	198.89
11	201.76	201.40	201.33	200.28	200.97	200.50	200.67	200.32	200.64	---	---	198.66
12	201.77	201.44	201.35	200.30	200.99	200.52	200.65	200.20	200.56	---	---	198.63
13	201.81	201.40	201.39	200.36	201.07	200.60	200.65	200.06	200.55	---	---	198.60
14	201.70	201.38	201.39	200.42	201.24	200.77	200.64	200.06	200.50	---	---	198.57
15	201.69	201.37	201.38	200.43	201.26	200.74	200.62	200.17	200.46	---	---	198.63
16	201.70	201.35	201.36	200.46	201.72	200.89	200.58	200.20	200.43	---	199.48	198.70
17	201.69	201.33	201.35	200.49	201.42	200.88	200.54	200.10	200.45	---	199.33	198.56
18	201.63	201.33	201.35	200.57	201.27	200.88	200.51	200.13	200.54	---	199.26	198.29
19	201.55	201.32	201.38	200.61	201.19	200.85	200.49	200.26	200.68	---	199.19	198.35
20	201.51	201.28	201.38	200.66	201.15	200.82	200.52	200.42	201.22	---	199.14	198.38
21	201.48	201.25	201.33	200.71	201.12	200.81	200.57	200.55	201.64	---	199.12	198.38
22	201.45	201.23	201.24	200.75	201.07	200.81	200.58	200.65	201.59	---	199.11	198.39
23	201.44	201.22	201.18	200.80	201.04	200.84	200.60	200.76	201.60	---	199.06	198.40
24	201.45	201.21	201.17	201.07	201.00	200.98	200.59	200.84	201.55	---	198.99	198.42
25	201.46	201.21	201.20	201.09	200.95	200.95	200.56	200.87	201.63	---	198.92	199.05
26	201.45	201.21	201.24	201.04	200.90	200.89	200.53	200.90	201.64	---	198.98	199.10
27	201.43	201.22	201.27	201.09	200.87	200.85	200.47	200.95	201.16	---	198.99	199.10
28	201.43	201.24	201.27	201.08	200.82	200.82	200.37	200.93	201.34	---	198.87	199.12
29	201.44	201.23	201.27	201.01	---	200.80	200.36	200.91	200.73	---	198.84	199.14
30	201.43	201.20	201.28	200.99	---	200.77	200.33	200.91	200.73	---	198.76	199.23
31	201.42	---	201.27	200.99	---	200.76	---	200.87	---	---	198.98	---
MEAN	201.57	201.34	201.29	200.74	201.07	200.74	200.58	200.46	200.88	---	---	198.80
MAX	201.81	201.51	201.42	201.31	201.72	200.98	200.74	200.95	201.64	---	---	200.37
MIN	201.17	201.20	201.17	200.24	200.82	200.50	200.33	200.06	200.43	---	---	198.29

WTR YR 1994 MAX 201.92 OCT. 2 MIN 198.13 SEP. 18



HAWAII, ISLAND OF KAUAI--Continued

215803159401201. Local number, 2-5840-01.

LOCATION.--Lat 21°58'03", long 159°40'12", Hydrologic Unit 20070000, 0.7 mi north of Waimea Recreational Pier State Park, and 2.4 mi east northeast of Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal-table well; depth 190 ft; casing diameter 8 in, cased to 167 ft.

DATUM.--Elevation of land surface is 167 ft. Measuring point 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 1972-89, 94.

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, Jan. 26, 1989; lowest measured, 6.58 ft above mean sea level, Jul. 19 1990.

REMARKS.--Water used for public supply.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 6.58 ft above mean sea level, Jul. 19, 1990. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	8.73	DEC 9	8.81	FEB 7	8.84	APR 7	8.80	JUN 9	8.68	AUG 4	8.80

215843159422901. Local number, 2-5842-03.

LOCATION.--Lat 21°58'43", long 159°42'28", Hydrologic Unit 20070000, 1.0 mi north of Oomano Point and 3.5 mi east of Kokole Point. Owner: Kekaha Sugar Co.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 27 ft; diameter 15 ft; uncased.

DATUM.--Elevation of land surface is 46 ft. Measuring point is the top of H-Beam on east side of pump base, 22.96 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Recording station 1973-79. Occasional measurements 1979 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, 9.45 ft above mean sea level, Jan. 16, 1974; lowest measured, 4.94 ft above mean sea level, Jan. 23, 1981.

REMARKS.--Water used for irrigation and for cleaning sugar cane at mill. Pump is run almost continuous when mill is in operation.

REVISIONS.--The minimum water level for the period reported for water years 1988 to 1993 has been revised to 4.94 ft above mean sea level, Jan. 23, 1981. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	a---	DEC 6	5.75	JAN 31	a---	APR 11	a---	JUN 6	a---	AUG 8	a---

a No measurement made, well pumping. Chloride sample taken.

HAWAII, ISLAND OF KAUAI--Continued

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, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well; depth 53 ft, casing diameter 15 ft, cased to 10 ft.

DATUM.--Elevation of land surface is 57 ft. Measuring point is the top west side of concrete shaft 57.70 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1972, 1985 to current year.
Water quality: One measurement in 1972.

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, Feb. 5, 1990; lowest measured, 7.82 ft above mean sea level, Apr. 25, 1988.

REMARKS.--Well used for public supply.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 7.82 ft above mean sea level, Apr. 25, 1988. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 14	8.80	DEC 6	8.96	FEB 7	8.94	APR 7	8.84	JUN 9	8.53	AUG 4	8.42

215958159214301. Local number 2-5921-01.

LOCATION.--Lat 21°59'58", long 159°21'43", Hydrologic Unit 20070000, 1.0 mi west of Hanamaulu Beach Park and 3.3 mi south southwest of Lydgate State Park. Owner: Kauai County, Department of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 540 ft, casing diameter 14 in., cased to 315 ft.

DATUM.--Elevation of land-surface datum is 302 ft. Measuring point: Top of I-beam, elevation 302.68 ft, above mean sea level.

PERIOD OF RECORD.--Occasional measurements, July 1980 to September 1985. Water-level recorder, October 1985 to July 1992. Occasional measurements from Oct. 1992 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, Nov. 26, 1985; lowest measured, 13.58 ft above mean sea level, Jun. 6, 1992.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 13.58 ft above mean sea level, Jul. 6, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	16.95	DEC 20	17.13	FEB 8	16.70	APR 18	16.24	JUN 13	15.71	AUG 15	15.25

HAWAII, ISLAND OF KAUAI--Continued

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, Dept. of Water.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled perch water-table well; depth 200 ft, casing diameter 12 in, cased to 200 ft.

DATUM.--Elevation of land surface is 364 ft. Measuring point is the top of pump base opening, after removing copper fittings, 365.48 ft above mean sea level.

PERIOD OF RECORD.--
Water level: Occasional measurements 1985 to current year.
Water quality: Occasional measurements 1985 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 226.86 ft above mean sea level, Dec. 8, 1989; lowest water level measured, 213.17 ft above mean sea level, Jun. 7, 1991.

REMARKS.--Water used for public supply. Water level affected by nearby well.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	215.74	DEC 10	215.45	FEB 8	219.05	APR 8	215.57	JUN 8	213.38	AUG 5	216.86

215906159395601. Local number, 2-5939-01.

LOCATION.--Lat 21°59'06", long 159°39'56", Hydrologic Unit 20070000, 2.3 mi north northeast of Waimea Recreational Pier State Park, and 3.2 mi northeast from Oomano Point. Owner: Kauai County, Dept. of Water.

AQUIFER.--Waimea Canyon Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well; depth 40 ft, 6.5 ft diameter, uncased.

DATUM.--Elevation of land surface is 42 ft. Measuring point 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, Jan. 14, 1988; lowest water level measured, 8.71 ft above mean sea level, Mar 9, 1981.

REMARKS.--Water is used for public supply.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 8.71 ft above mean sea level, Mar. 9, 1981. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	9.53	DEC 9	9.40	FEB 7	9.96	APR 7	9.48	JUN 9	9.24	AUG 8	9.00

HAWAII, ISLAND OF KAUAI--Continued

215937159434201. Local number, 2-5943-01.

LOCATION.--Lat 21°59'37", long 159°43'42", Hydrologic Unit 20070000, 2.2 mi northeast of Kokole Point and 2.4 mi northwest of Oomano Point. Owner: Kekaha Sugar Co.

AQUIFER.--Koloa Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well. Well is a 45 degree inclined Maui type shaft from 59 ft to 16 ft elevation and a vertical sump 10 ft in diameter and 15 ft deep with a lateral tunnel extending into the hillside at the bottom of the shaft.

DATUM.--Elevation of land surface is 60 ft. Measuring point is the top of I-beam supporting pump platform, 13.61 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, 10.62 ft above mean sea level, Oct. 16, 1989; lowest water level measured, 8.15 ft above mean sea level, Jul. 22, 1981.

REMARKS.--Water used for irrigation of sugar cane.

REVISIONS.--The minimum water level for the period of record reported for water years 1988 to 1993 has been revised to 8.15 ft above mean sea level, Jul. 22, 1981. The value previously reported was taken while well was being pumped.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 18	8.90	DEC 6	8.21	JAN 31	9.43	APR 11	8.96	JUN 6	9.10	AUG 8	8.51

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.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Depth 131 ft, casing diameter 4-in, cased to 100 ft.

DATUM.--Elevation of land-surface datum is 18 ft. Measuring point is top of casing, 13.84 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--Occasional measurements, September 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 8.63 ft above mean sea level, Jan. 27, 1983; lowest, 7.00 ft above mean sea level, June 10, 1986, July 23, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	7.89	DEC 15	7.77	MAR 1	7.71	MAY 24	7.71	SEP 19	7.98

211832157515501. Local number, 3-1851-19 Tube A.

LOCATION.--Lat 21°18'32", long 157°51'55", Hydrologic Unit 20060000, corner of Richards and Halekawila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, 1/2-inch galvanized pipe at 1,043 feet depth. Tube A is the pipe closer to Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: 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 U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1969, March 1973 to current year.
WATER QUALITY: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 20.16 ft above mean sea level, Aug. 13, 1974; lowest, 5.53 ft above mean sea level, Sep. 25, 1990.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 15	5.95	MAR 1	6.27	MAY 24	6.90	SEP 20	5.91

HAWAII, ISLAND OF OAHU--Continued

211832157515501. Local number, 3-1851-19 Tube B.

LOCATION.--Lat 21°18'32", long 157°51'55", Hydrologic Unit 20060000, corner of Richards and Halekawila Streets, adjacent to Ala Moana Boulevard. Owner: Hawaiian Electric Company.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, 1/2-inch galvanized pipe at 988 feet depth. Tube B is the pipe furthest from Richards Street.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: 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 U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1969, March 1973 to current year.
WATER QUALITY: 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 26.16 ft above mean sea level, Feb. 3, 1983; lowest, 13.54 ft above mean sea level, Oct. 20, 1993.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	13.54	DEC 15	14.30	MAR 1	14.37	MAY 24	16.15	SEP 20	17.70

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.--Basalt of Koolau Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled artesian well, 3-in PVC pipe, depth 1,142 ft, bottom 60 ft slotted.

DATUM.--Elevation of land-surface datum is 7 ft. Measuring point: Edge of manhole cover, 7.30 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Water level recorder, June 1983 to Nov. 1986
Occasional measurements, Dec. 1982 to current year.
WATER QUALITY: 1982, 1987.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.74 ft above mean sea level, Apr. 12,1991; lowest, 15.97 ft, above mean sea level, Sep. 11-13, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	17.60	DEC 15	18.65	MAR 1	17.79	MAY 24	20.00	SEP 23	21.95

HAWAII, ISLAND OF OAHU--Continued

211907157594701. Local number, 3-1959-05.

LOCATION.--Lat 21°19'06", long 157°59'46", Hydrologic Unit 20060000, 600 ft northwest of Ewa Beach Park, and 1.2 mi southeast of Campbell High School. Owner: Hawaii Institute of Geophysics.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,110 ft, 5-in. PVC casing, bottom 12 ft perforated.

DATUM.--Elevation of land surface datum is 6 ft. Measuring point: Top of 5-in. PVC casing, 6.40 ft above mean sea level.

REMARKS.--Geophysical log and water-quality records are available in files of district office.

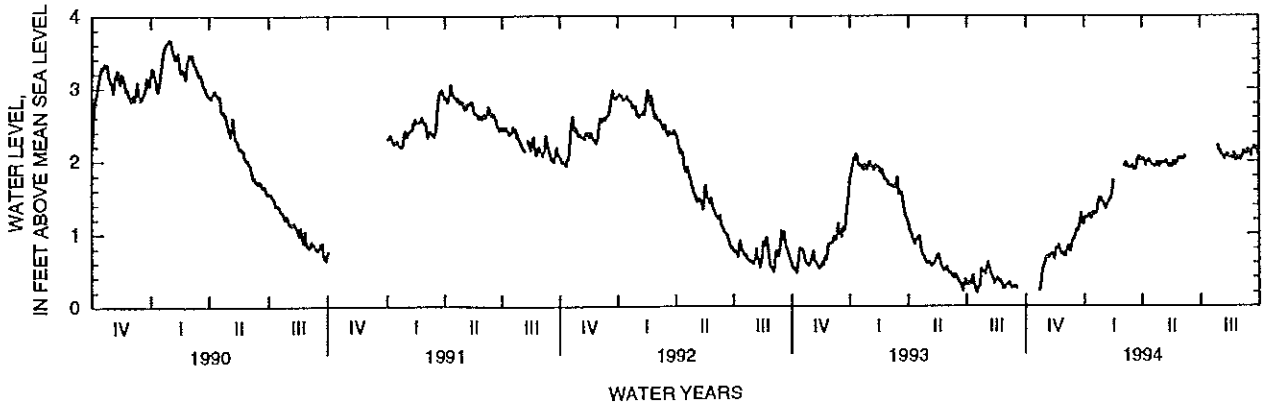
PERIOD OF RECORD.--Water-level recorder, December 1966 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 5.38 ft above mean sea level, Jan. 17, 1969; lowest, 2.81 ft below mean sea level, Aug. 25, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.65	.70	1.20	1.40	---	2.02	1.99	2.05	---	2.11	2.02
2	---	.68	.70	1.23	1.37	---	2.02	1.99	2.04	---	2.10	2.05
3	---	.69	.75	1.24	1.36	---	2.04	1.98	2.04	---	2.10	2.05
4	---	.69	.79	1.24	1.37	1.92	2.02	1.97	2.03	---	2.09	2.08
5	---	.68	.82	1.22	1.40	1.96	2.00	1.97	2.05	---	2.07	2.11
6	---	.70	.84	1.24	1.43	1.98	1.98	1.97	2.07	---	2.05	2.14
7	---	.69	.80	1.25	1.44	1.98	1.95	1.97	2.06	---	2.04	2.13
8	---	.70	.79	1.27	1.46	1.96	1.97	2.01	2.05	---	2.05	2.12
9	---	.72	.77	1.27	1.49	1.93	2.00	2.01	---	---	2.08	2.11
10	---	.73	.77	1.23	1.48	1.93	2.01	2.00	---	---	2.10	2.10
11	---	.73	.85	1.22	1.49	1.91	2.01	1.97	---	---	2.09	2.12
12	---	.71	.90	1.22	1.53	1.92	2.02	1.94	---	---	2.07	2.16
13	---	.71	.93	1.26	1.59	1.92	2.01	1.93	---	---	2.10	2.16
14	---	.68	.93	1.31	1.67	1.91	1.98	1.92	---	---	2.08	2.15
15	---	.66	.94	1.31	1.74	1.92	1.98	1.95	---	---	2.05	2.14
16	---	.74	.95	1.28	---	1.93	1.96	1.96	---	---	2.05	2.11
17	---	.81	.99	1.28	---	1.94	1.95	1.96	---	---	2.06	2.08
18	---	.81	1.03	1.28	---	1.91	1.96	1.93	---	---	2.06	2.08
19	---	.81	1.06	1.29	---	1.89	1.95	1.93	---	---	2.04	2.15
20	---	.82	1.07	1.31	---	1.90	1.94	1.99	---	---	2.04	2.17
21	---	.84	1.04	1.36	---	1.89	1.94	2.01	---	---	2.07	2.17
22	.22	.82	1.06	1.42	---	1.89	1.93	1.96	---	---	2.11	2.20
23	.23	.77	1.09	1.48	---	1.92	1.95	1.95	---	---	2.09	2.20
24	.28	.75	1.16	1.50	---	2.01	1.98	1.99	---	---	2.03	2.19
25	.38	.72	1.23	1.50	---	2.03	1.99	1.98	---	---	2.01	2.18
26	.44	.72	1.28	1.50	---	2.03	1.99	1.99	---	---	2.02	2.15
27	.51	.73	1.27	1.50	---	2.06	1.96	2.02	---	2.20	2.03	2.14
28	.55	.75	1.20	1.45	---	2.07	1.93	2.05	---	2.21	2.06	2.13
29	.56	.74	1.17	1.45	---	2.03	1.94	2.04	---	2.17	2.07	2.10
30	.58	.71	1.14	1.44	---	2.01	1.96	2.04	---	2.14	2.05	2.12
31	.61	---	1.16	1.42	---	2.01	---	2.03	---	2.15	2.04	---
MEAN	---	.73	.97	1.33	---	---	1.98	1.98	---	---	2.06	2.13
MAX	---	.84	1.28	1.50	---	---	2.04	2.05	---	---	2.11	2.20
MIN	---	.65	.70	1.20	---	---	1.93	1.92	---	---	2.01	2.02

WTR YEAR 1994 MAX 2.33 JULY 26 MIN 0.15 OCT 23



HAWAII, ISLAND OF OAHU--Continued

212012157541301. Local number, 3-2054-03.

LOCATION.--Lat 21°20'12", long 157°54'13", Hydrologic Unit 20060000, 600 ft north of Keehi Lagoon Beach Park, and 1.3 miles east of the main terminal of Honolulu International Airport.

AQUIFER.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Artesian well, 6-in. PVC casing inside a 12-in steel casing, and grouted. A 12-in standpipe, 10 ft tall, is attached at the top of the well. Well is 668 ft deep and is cased to 602 ft.

DATUM.--Elevation of land-surface datum is 11 ft. Measuring point: Top of 12-in standpipe, elevation, 21.40 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1969, January 1974 to current year.
WATER QUALITY: 1965, 1969, 1972, 1973.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 22.07 ft above mean sea level, Feb. 3, 1983; lowest, 16.74 ft above mean sea level, Sep. 20, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 19	18.21	DEC 15	18.73	MAR 1	18.92	MAY 23	19.54	SEP 19	19.89

212154158015201. Local number, 3-2101-03.

LOCATION.--Lat 21°21'54", long 158°01'52", Hydrologic Unit 20060000, 0.4 mi southeast of Honouliuli, and 0.5 mi north of Ewa Hospital. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 355 ft, 6-in. PVC casing, cased to 165 ft. Well was modified in January 1958 and May 1982.

DATUM.--Elevation of land-surface datum is 15 ft. Measuring point: Top of horizontal flange below petcock, 13.31 ft above mean sea level.

REMARKS.--Water-quality records for 1910-16, 1920-21, 1923-75, 1978-81, are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1910 to June 1921, September 1923 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 29.16 ft above mean sea level, April 1918; lowest observed, less than 11.2 ft, above mean sea level (below petcock then in use), Sept. 2, and Oct. 19, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	14.52	MAR 2	14.49	MAY 20	17.71	JUL 11	15.32	SEP 19	17.89

HAWAII, ISLAND OF OAHU--Continued

212132158035701. Local number, 3-2103-01.

LOCATION.--Lat 21°21'32", long 158°03'57", Hydrologic Unit 20060000, 1 mile east of Makakilo and 2 miles north of Barbers Point Naval Air Station. owner: U.S. Navy.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Depth 206 ft, casing diameter 6-in, cased to 17 ft.

DATUM.--Elevation of land-surface datum is 210 ft. Measuring point: Top of 6-in pipe. Elevation : 211.70 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Water level recorder, Sep. 1966 to Dec. 1971.
Occasional measurements, August 1942 to December 1942, January 1953 to September 1967, September 1972 to current year.
WATER QUALITY: 1942, 1953-68.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.81 ft above mean sea level, Feb. 20, 1957; lowest, 14.25 ft above mean sea level, July 5, 1978, Sep. 20, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	14.91	MAR 16	14.90	MAY 23	14.92	SEP 23	14.86

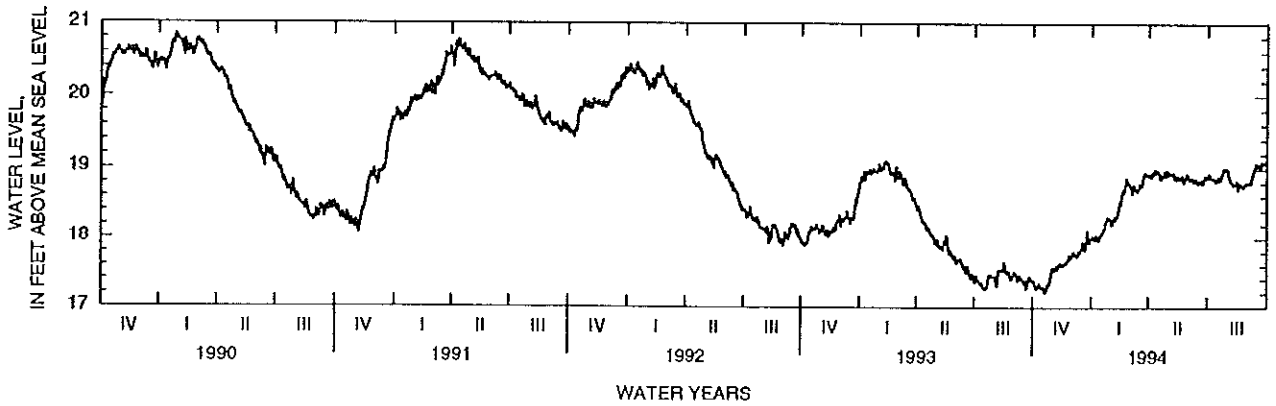
HAWAII, ISLAND OF OAHU--Continued

212123157535501. Local number, 3-2153-05 Fresh Water Well.
LOCATION.--Lat 21°21'23", long 157°53'55", Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.
AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.
WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 6-in. PVC casing, cased to 24 ft, perforated from 24 to 1,246 ft. Well was modified and deepened August 1980. The well is a combination of a 3-in PVC (salt water) and a 6-in PVC (fresh water), encased in a 12-in steel casing.
DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 3-in. PVC casing, 37.90 ft, revised, above mean sea level.
REMARKS.--Geophysical logs are available in files of district office.
PERIOD OF RECORD.--Water-level recorder, March 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.53 ft above mean sea level, Jan. 9, 1983; lowest 16.56 ft above mean sea level, July 24, 1987.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	17.39	17.58	17.74	18.00	18.24	18.80	18.91	18.96	18.90	18.87	18.98	18.80
2	17.37	17.55	17.75	18.03	18.21	18.79	18.90	18.93	18.88	18.88	18.91	18.81
3	17.38	17.53	17.76	18.04	18.21	18.76	18.91	18.92	18.86	18.91	18.90	18.82
4	17.34	17.54	17.79	18.02	18.24	18.74	18.93	18.93	18.85	18.93	18.86	18.82
5	17.31	17.55	17.81	18.01	18.29	18.76	18.91	18.94	18.87	18.88	18.83	18.82
6	17.29	17.57	17.77	17.98	18.31	18.74	18.89	18.92	18.86	18.88	18.83	18.80
7	17.27	17.60	17.76	18.00	18.32	18.66	18.90	18.92	18.87	18.88	18.81	18.87
8	17.28	17.58	17.78	18.02	18.28	18.73	18.94	18.92	18.87	18.87	18.81	18.91
9	17.28	17.55	17.77	18.05	18.31	18.77	18.96	18.93	18.84	18.87	18.78	18.93
10	17.29	17.60	17.75	18.03	18.30	18.77	18.93	18.94	18.82	18.87	18.79	18.97
11	17.34	17.63	17.76	17.98	18.33	18.72	18.94	18.87	18.82	18.87	18.78	19.01
12	17.31	17.61	17.79	17.98	18.36	18.71	18.99	18.87	18.84	18.85	18.78	19.02
13	17.29	17.64	17.83	17.98	18.40	18.71	18.94	18.86	18.86	18.84	18.80	19.05
14	17.30	17.64	17.79	18.02	18.45	18.69	18.97	18.86	18.85	18.83	18.82	19.07
15	17.27	17.64	17.82	18.06	18.53	18.69	18.98	18.87	18.83	18.83	18.83	19.06
16	17.27	17.60	17.83	18.05	18.49	18.70	18.96	18.90	18.82	18.85	18.81	19.04
17	17.29	17.61	17.86	18.08	18.53	18.74	18.94	18.90	18.80	18.88	18.71	19.04
18	17.29	17.63	17.86	18.09	18.63	18.75	18.95	18.88	18.80	18.88	18.77	19.06
19	17.25	17.62	17.95	18.09	18.63	18.79	18.87	18.86	18.83	18.89	18.77	19.04
20	17.22	17.63	17.89	18.13	18.69	18.75	18.88	18.87	18.84	18.85	18.77	19.06
21	17.23	17.65	17.87	18.13	18.69	18.78	18.87	18.86	18.85	18.85	18.79	19.03
22	17.23	17.64	17.84	18.15	18.67	18.76	18.88	18.88	18.83	18.90	18.78	19.09
23	17.26	17.64	17.86	18.21	18.71	18.79	18.90	18.91	18.80	18.93	18.77	19.10
24	17.32	17.65	17.90	18.27	18.77	18.87	18.93	18.88	18.80	18.94	18.74	19.08
25	17.33	17.69	18.02	18.26	18.82	18.91	18.93	18.82	18.82	18.97	18.74	19.09
26	17.33	17.71	18.11	18.29	18.86	18.89	18.97	18.82	18.86	19.01	18.77	19.07
27	17.33	17.69	18.03	18.31	18.81	18.94	18.96	18.83	18.87	19.00	18.78	19.09
28	17.39	17.76	17.98	18.28	18.82	18.93	18.89	18.85	18.90	18.98	18.80	19.10
29	17.44	17.71	17.94	18.29	---	18.94	18.91	18.90	18.88	19.00	18.80	19.07
30	17.49	17.72	17.95	18.30	---	18.91	18.98	18.90	18.88	19.01	18.79	19.08
31	17.55	---	17.99	18.30	---	18.92	---	18.93	---	18.99	18.79	---
MEAN	17.32	17.63	17.86	18.11	18.50	18.79	18.93	18.89	18.85	18.90	18.80	18.99
MAX	17.55	17.76	18.11	18.31	18.86	18.94	18.99	18.96	18.90	19.01	18.98	19.10
MIN	17.22	17.53	17.74	17.98	18.21	18.66	18.87	18.82	18.80	18.83	18.71	18.80

WTR YEAR 1994 MAX 19.12 SEP 23 MIN 17.10 OCT 20



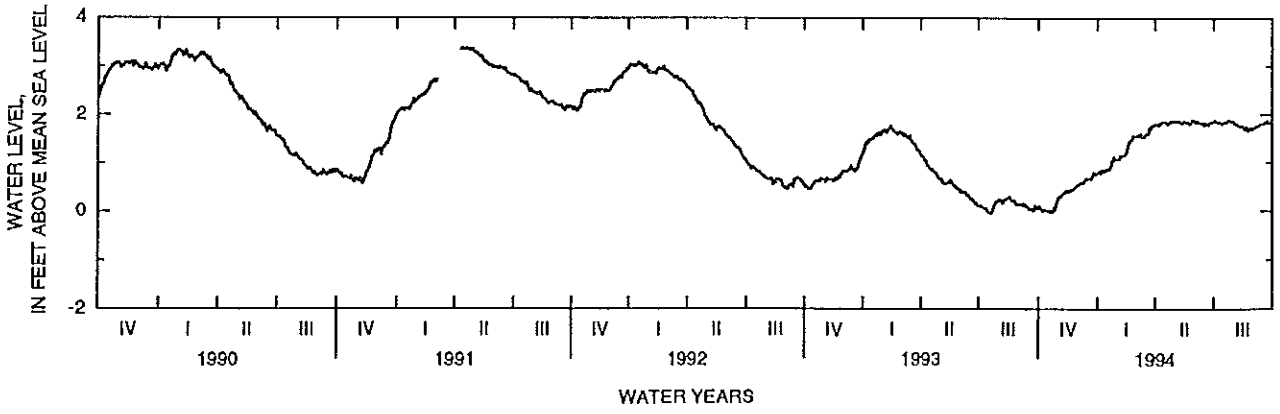
HAWAII, ISLAND OF OAHU--Continued

212123157535503. Local number, 3-2153-05 Salt Water well.
LOCATION.--Lat 21°21'23", long 157°53'55", Hydrologic Unit 20060000, 0.4 mi northwest of Moanalua Elementary School, and 0.5 mi southwest of Tripler Hospital, in Moanalua. Owner: Honolulu Board of Water Supply.
AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.
WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,246 ft, 3-in. PVC casing, cased to 46 ft,where it becomes 3/4-in PVC pipe; two 5/8-in holes at elevation 1,190 ft. Well was modified and deepened August 1980, and used to monitor water level (salt). The well is a combination of a 3-in PVC (salt water) and a 6-in PVC (fresh water), encased in a 12-in steel casing.
DATUM.--Elevation of land-surface datum is 35 ft. Measuring point: Top of 6-in PVC casing, 37.90 ft above mean sea level.
REMARKS.--Geophysical logs are available in files of district office. Prior to October 1993, unpublished records in files of the U.S. Geological Survey.
PERIOD OF RECORD.--Water-level recorder, March 1981 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.45 ft above mean sea level, Jan. 9, 1983; lowest, 1.45 ft below mean sea level, Oct. 24, 1981.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.10	.29	.54	.79	1.08	1.56	1.79	1.88	1.87	1.84	1.86	1.72
2	.08	.30	.54	.81	1.08	1.56	1.80	1.88	1.86	1.86	1.84	1.73
3	.10	.27	.54	.82	1.08	1.56	1.80	1.86	1.85	1.87	1.83	1.73
4	.07	.30	.56	.82	1.08	1.55	1.79	1.87	1.83	1.87	1.81	1.73
5	.04	.32	.58	.79	1.11	1.58	1.78	1.88	1.85	1.85	1.80	1.73
6	.03	.33	.58	.79	1.15	1.57	1.78	1.87	1.86	1.85	1.79	1.75
7	.00	.35	.58	.82	1.15	1.56	1.79	1.86	1.86	1.84	1.79	1.76
8	.02	.36	.60	.84	1.15	1.55	1.82	1.87	1.85	1.85	1.79	1.76
9	.03	.36	.59	.85	1.16	1.57	1.83	1.87	1.83	1.85	1.78	1.77
10	.04	.39	.58	.85	1.15	1.59	1.82	1.86	1.83	1.84	1.77	1.76
11	.03	.39	.60	.83	1.16	1.55	1.81	1.84	1.83	1.85	1.75	1.78
12	.02	.39	.62	.82	1.17	1.54	1.83	1.83	1.84	1.82	1.76	1.80
13	.02	.42	.65	.82	1.17	1.55	1.84	1.83	1.84	1.83	1.76	1.80
14	.01	.42	.65	.86	1.20	1.55	1.85	1.83	1.82	1.82	1.77	1.82
15	.00	.41	.68	.86	1.22	1.54	1.85	1.85	1.81	1.81	1.76	1.81
16	-.01	.40	.68	.85	1.28	1.56	1.85	1.86	1.80	1.82	1.76	1.80
17	.01	.41	.66	.86	1.30	1.58	1.85	1.86	1.78	1.84	1.73	1.80
18	.01	.41	.66	.87	1.38	1.59	1.84	1.85	1.80	1.85	1.71	1.82
19	.00	.41	.66	.87	1.42	1.60	1.81	1.84	1.82	1.84	1.70	1.83
20	-.02	.44	.66	.87	1.45	1.60	1.81	1.83	1.82	1.83	1.69	1.83
21	-.02	.45	.67	.89	1.45	1.60	1.81	1.84	1.80	1.83	1.73	1.82
22	-.01	.44	.66	.92	1.46	1.60	1.81	1.84	1.80	1.85	1.74	1.86
23	-.02	.44	.67	1.00	1.48	1.67	1.84	1.85	1.79	1.87	1.70	1.86
24	.03	.46	.70	1.03	1.50	1.73	1.86	1.83	1.79	1.87	1.67	1.83
25	.08	.48	.74	1.05	1.53	1.70	1.85	1.81	1.82	1.88	1.67	1.83
26	.03	.48	.80	1.07	1.55	1.71	1.86	1.81	1.84	1.88	1.68	1.83
27	.05	.49	.80	1.11	1.56	1.76	1.87	1.83	1.84	1.88	1.71	1.84
28	.12	.51	.76	1.06	1.56	1.77	1.86	1.85	1.85	1.86	1.73	1.84
29	.17	.52	.76	1.08	---	1.77	1.85	1.88	1.85	1.85	1.71	1.83
30	.20	.53	.76	1.08	---	1.77	1.87	1.89	1.84	1.86	1.69	1.84
31	.24	---	.78	1.08	---	1.79	---	1.89	---	1.86	1.70	---
MEAN	.05	.41	.66	.91	1.29	1.62	1.83	1.85	1.83	1.85	1.75	1.80
MAX	.24	.53	.80	1.11	1.56	1.79	1.87	1.89	1.87	1.88	1.86	1.86
MIN	-.02	.27	.54	.79	1.08	1.54	1.78	1.81	1.78	1.81	1.67	1.72

WTR YR 1994 MAX 1.90 MAY 5, 8 29 MIN -0.03 OCT 15, 16



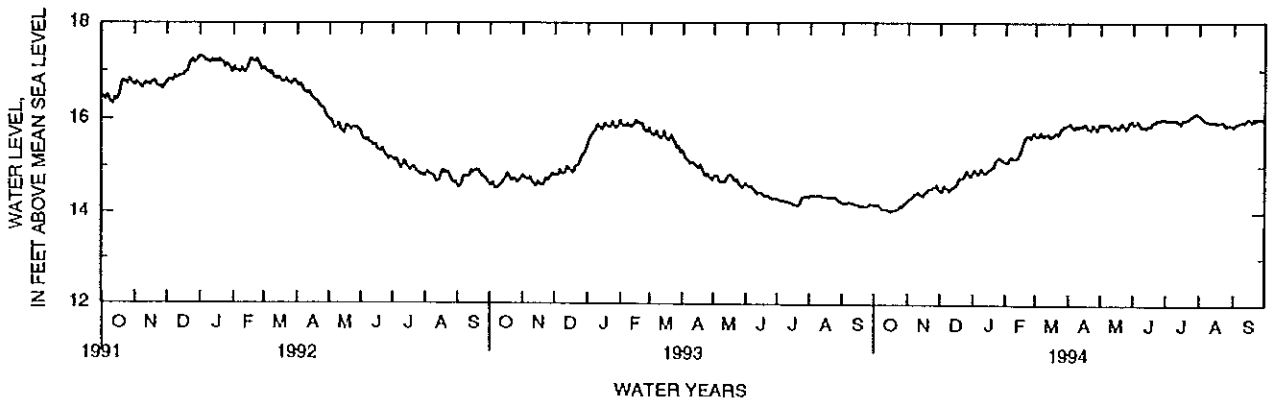
HAWAII, ISLAND OF OAHU--Continued

212238157561101. Local number, 3-2256-10.
LOCATION.--Lat 21°22'38", long 157°56'11", Hydrologic Unit 20060000, 0.4 mi southwest of Aiea School, and 0.5 mi east of McGrew Point. Owner: U.S. Navy.
AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.
WELL CHARACTERISTICS.--Drilled artesian well, depth 173 ft, casing diameter 12 in., cased to 143 ft.
DATUM.--Elevation of land-surface datum is 10 ft. Measuring point: Top of 10-inch stilling pipe for water-level recorder, 26.15 ft above mean sea level.
REMARKS.--Water-quality records for 1923, 1928-30, 1934-68, 1972, 1974-75 are available in files of district office.
PERIOD OF RECORD.-- Occasional measurements, January 1928 to February 1931, September 1934 to August 1966. Water-level recorder, September 1966 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 25.90 ft above mean sea level, Jan. 16, 1928; lowest, 12.97 ft above mean sea level, Oct. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	14.17	14.26	14.49	14.88	15.11	15.66	15.88	15.89	15.91	15.97	16.07	15.84
2	14.17	14.28	14.47	14.91	15.09	15.65	15.88	15.86	15.88	15.98	16.05	15.86
3	14.17	14.29	14.46	14.92	15.10	15.64	15.89	15.86	15.90	15.98	16.03	15.88
4	14.17	14.31	14.55	14.88	15.15	15.64	15.85	15.90	15.91	15.98	16.00	15.89
5	14.15	14.32	14.58	14.85	15.18	15.68	15.84	15.87	15.93	15.96	15.98	15.90
6	14.13	14.34	14.55	14.84	15.20	15.71	15.82	15.88	15.91	15.96	15.96	15.91
7	14.11	14.38	14.53	14.86	15.19	15.68	15.81	15.88	15.88	15.97	15.96	15.92
8	14.09	14.41	14.53	14.91	15.18	15.65	15.86	15.89	15.85	15.98	15.95	15.92
9	14.07	14.40	14.51	14.94	15.17	15.64	15.85	15.88	15.83	15.97	15.94	15.92
10	14.07	14.41	14.48	14.91	15.17	15.67	15.82	15.85	15.84	15.98	15.94	15.93
11	14.07	14.43	14.51	14.88	15.18	15.67	15.85	15.81	15.84	15.97	15.93	15.93
12	14.07	14.40	14.53	14.86	15.20	15.67	15.85	15.79	15.83	15.94	15.93	15.94
13	14.06	14.40	14.55	14.86	15.23	15.68	15.85	15.83	15.82	15.94	15.94	15.96
14	14.05	14.38	14.57	14.90	15.27	15.65	15.84	15.84	15.84	15.94	15.94	15.98
15	14.04	14.37	14.58	14.90	15.33	15.63	15.88	15.86	15.85	15.90	15.94	15.99
16	14.04	14.40	14.59	14.93	15.40	15.64	15.88	15.85	15.84	15.95	15.92	15.98
17	14.05	14.43	14.63	14.94	15.47	15.67	15.88	15.82	15.84	15.97	15.91	15.96
18	14.05	14.45	14.69	14.95	15.55	15.66	15.84	15.80	15.88	15.97	15.92	15.94
19	14.05	14.45	14.73	14.97	15.60	15.68	15.81	15.80	15.92	15.98	15.92	15.95
20	14.06	14.50	14.76	14.99	15.62	15.71	15.80	15.87	15.93	15.98	15.92	15.95
21	14.07	14.52	14.75	15.01	15.63	15.70	15.79	15.90	15.92	15.99	15.92	15.95
22	14.07	14.52	14.75	15.09	15.66	15.68	15.78	15.89	15.93	16.00	15.93	15.97
23	14.08	14.52	14.77	15.15	15.63	15.69	15.83	15.86	15.98	16.02	15.92	15.98
24	14.11	14.53	14.81	15.15	15.62	15.75	15.87	15.83	15.97	16.04	15.88	15.99
25	14.15	14.56	14.85	15.17	15.62	15.80	15.84	15.81	15.96	16.05	15.86	15.99
26	14.12	14.56	14.90	15.19	15.67	15.80	15.82	15.80	15.98	16.07	15.86	15.99
27	14.14	14.56	14.86	15.18	15.70	15.83	15.79	15.86	15.98	16.08	15.87	15.98
28	14.17	14.59	14.82	15.14	15.70	15.85	15.77	15.90	15.99	16.10	15.87	15.97
29	14.20	14.53	14.81	15.14	---	15.84	15.83	15.93	15.99	16.11	15.87	15.97
30	14.21	14.50	14.80	15.12	---	15.86	15.87	15.94	15.99	16.10	15.86	15.96
31	14.23	---	14.85	15.11	---	15.87	---	15.95	---	16.08	15.84	---
MEAN	14.11	14.43	14.65	14.98	15.38	15.71	15.84	15.86	15.90	16.00	15.93	15.94
MAX	14.23	14.59	14.90	15.19	15.70	15.87	15.89	15.95	15.99	16.11	16.07	15.99
MIN	14.04	14.26	14.46	14.84	15.09	15.63	15.77	15.79	15.82	15.90	15.84	15.84

WTR YEAR 1994 MAX 16.11 JULY 28, 29 MIN 14.03 OCT 21



HAWAII, ISLAND OF OAHU--Continued

212300158004801. Local number, 3-2300-06.

LOCATION.--Lat 21°23'00", long 158°00'48", Hydrologic Unit 20060000, next to Waikele canal in Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Depth 241 ft, 10-in steel pipe casing, cased to 104 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top of 10-in blind flange, elevation: 16.78 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, January 1974 to current year.
WATER QUALITY: 1972, 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.15 ft above mean sea level, Dec. 8, 1982; lowest, 12.68 ft above mean sea level, Sep. 20, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 15	14.43	DEC 15	15.80	MAR 2	14.78	MAY 20	a>16.78	JUL 11	a>16.78	SEP 19	a>16.78

212340158001901. Local number, 3-2300-18.

LOCATION.--Lat 21°23'40", long 158°00'19", Hydrologic Unit 20060000, 700 ft south of August Ahrens School, and 1,400 ft northeast of L'Orange Park, Waipahu. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal-water table well, depth 1,090 ft, casing diameter 12 in., cased to 38 ft. Well was deepened May 1980 and modified February 1984. Prior to May 1980, well depth 205 ft.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point: Top of casing, 27.73 ft above mean sea level.

REMARKS.--Geophysical logs are available in files of district office.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, November 1982 to July 1983, March 1984 to November 30, 1987. Occasional measurements, October 1987 to current year.
WATER QUALITY: 1930, 1942-45, 1947-49, 1951-54, 1968, 1983, 1985-86, 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 22.40 ft above mean sea level, Jan. 4, 1983; lowest 14.01 ft above mean sea level, Sept. 14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	15.00	DEC 15	16.23	MAR 16	17.74	MAY 20	17.62	JUL 11	17.62	SEP 19	17.68

> Actual value is known to be greater than the value shown
a Water level higher than the flange, unable to measure

HAWAII, ISLAND OF OAHU--Continued

212501158080701. Local number, 3-2508-02.

LOCATION.--Lat 21°25'01", long 158°08'07", Hydrologic Unit 20060000, 2.2 mi northeast from the intersection of Farrington Highway and Lualualei Naval Ammunition Depot, 0.4 mi southeast of entrance to Lualualei Naval Ammunition Depot, located inside the Depot. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Located at the bottom of a 30-degree inclined 6.8 ft by 7.8 ft shaft, 340 feet long.

DATUM.--Elevation of land-surface datum is 180 ft. Measuring point: Top of concrete above well, elevation; 13.16 feet above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, October 1972 to current year.
WATER QUALITY: 1971-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.40 ft above mean sea level, Oct. 3, 1972; lowest, 10.15 ft above mean sea level, Mar. 8, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	10.51	JAN 3	10.52	MAR 8	10.15	JUN 29	10.36	SEP 9	10.48

212659158004102. Local number, 3-2600-04.

LOCATION.--Lat 21°26'59", long 158°00'41", Hydrologic Unit 20060000, 30 ft south of Waiahole ditch, and 1.1 mi. east southeast of Kipapa School in Mililani. Owner: Honolulu Board of Water Supply.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 815 ft, casing diameter 16 in., cased to 705 ft.

DATUM.--Elevation of land-surface datum is 665 ft. Measuring point: Top of 16-inch casing, 666.62 ft. revised, above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, October 1983 to September 10, 1987. Occasional measurements, October 1987 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 24.49 ft above mean sea level, Apr. 5, 1989; lowest 16.74 ft above mean sea level, Sept.14, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 29	18.41	JAN 3	19.18	MAR 3	20.30	JUN 29	20.68	SEP 8	20.66

HAWAII, ISLAND OF OAHU--Continued

212813158080201. Local number, 3-2808-01.

LOCATION.--Lat 21°28'13", long 158°08'04", Hydrologic Unit 20060000, inside Lualualei Naval Ammunition Depot, 1000 ft west from the intersection of Kolekole Road and Radford Street, at Building 492, 3.3 miles north from the entrance of the depot. Owner: U.S. Navy.

AQUIFER.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Depth 535 ft, cased to 182 ft, diameter is 12-in to 185 ft, then 3-in to 535 ft.

DATUM.--Elevation of land-surface datum is 347 ft. Measuring point: 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 U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, June 1973 to current year.
WATER QUALITY: 1972-88.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 441.81 ft above mean sea level, Feb. 28, 1983; lowest, 420.78 ft above mean sea level, Oct. 24, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
JAN 7	430.09	MAR 8	a---	SEP 9	a---

a Unable to make measurement

HAWAII, ISLAND OF OAHU-Continued

212927158014801. Local number, 3-2901-07.

LOCATION.--Lat 21°29'27", long 158°01'48", Hydrologic Unit 20060000, across the main gate of Wheeler AFB, and 1,200 ft south of Wahiawa bridge on Kaukonohua Stream. Owner: U.S. Army.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Dug high-level water-table well, size 8 x 8 ft, length of 30-degree inclined shaft 1,148 ft.

DATUM.--Elevation of land-surface datum is 850 ft. Measuring point: Top of pump chamber floor at recorder, 287.00 ft above mean sea level.

REMARKS.--Water-level recorder is located on the pump chamber floor at the bottom of shaft. Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, November 1938 to current year.
WATER QUALITY: 1966-72, 1975 to 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 284.40 ft above mean sea level, May 12, 1969; lowest, 269.52 ft above mean sea level, Dec. 5, 1978.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
MAXIMUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
5	275.02	274.70	274.58	274.35	273.96	274.50	274.04	274.54	274.25	274.63	274.89	274.61
10	275.09	274.31	274.45	273.97	274.38	273.88	274.43	274.16	274.13	274.64	274.56	275.13
15	275.04	274.70	274.47	274.09	274.03	274.40	274.49	274.13	274.69	274.84	274.52	275.20
20	274.63	274.66	274.48	274.53	274.51	274.42	274.50	274.22	274.54	274.91	274.67	275.22
25	275.15	274.59	274.53	274.44	274.47	274.50	274.12	274.58	274.68	274.93	275.10	275.32
EOM	275.75	274.60	273.99	273.91	274.37	274.45	274.11	274.68	274.77	274.99	274.72	275.42

Note: Well being pumped throughout the year.

NONPUMPING VALUES

Water levels are read after all pumps in the pump chamber are turned off for two hours.

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	274.92	JAN 3	274.60	MAR 2	274.58	MAY 2	274.68	JUL 1	274.90	SEP 1	275.25
DEC 1	274.72	FEB 1	274.46	APR 1	274.64	JUN 1	274.82	AUG 1	275.13		

HAWAII, ISLAND OF OAHU--Continued

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.--Basalt of Waianae Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Depth 50 ft, cased to 21 ft with 6-in black steel pipe.

DATUM.--Elevation of land-surface datum is 26 ft. Measuring point: Top of 6-in casing, elevation: 26.47 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, October 1972 to current year.
WATER QUALITY: 1967, 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 7.92 ft above mean sea level, Jan. 2, 1975; lowest, 6.49 ft above mean sea level, July 15, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	7.08	JAN 3	7.05	MAR 2	7.01	JUN 14	6.97	SEP 9	7.08

213327157524401. Local number, 3-3352-01.

LOCATION.--Lat 21°33'27", long 157°52'44", Hydrologic Unit 20060000, at mouth of Kahana Valley, and 700 ft southwest of Kamehameha Highway, Kahana. Owner: Mary E. Foster Estate.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 441 ft, casing diameter 10 in., cased to 177 ft.

DATUM.--Elevation of land-surface datum is 6 ft. Measuring point: Top of "T", 7.31 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1935 to 1990.
WATER QUALITY: 1935 to 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, Mar. 29, 1966; lowest measured, 12.61 ft above mean sea level, July 5, 1984.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	13.90	JAN 5	13.63	MAR 4	15.51	MAY 20	16.51	AUG 25	15.13

HAWAII, ISLAND OF OAHU--Continued

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.--Basalt of Waianae Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Artesian well, depth 518 ft, cased to 440 ft, diameter 10-in to 8-in.

DATUM.--Elevation of land-surface datum is 8 ft. Measuring point: Chiseled 1 1/2-in square on concrete, 3.7 ft in front of door of well shelter, elevation: 8.48 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, December 1924 to current year.
WATER QUALITY: 1924-84.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 21.3 ft above mean sea level, Jan. 16, 1969; lowest, 16.75 ft above mean sea level, Aug. 6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	18.48	JAN 5	18.09	MAR 3	17.94	JUN 24	18.34	SEP 8	18.48

213446158104901. Local number, 3-3410-08.

LOCATION.--Lat 21°34'46", long 158°10'49", Hydrologic Unit 20060000, 0.5 mi east of Dillingham Airfield, and 1.1 mi southeast of Mokuleia Beach Park. Owner: Waialua Sugar Company, Inc.

AQUIFER.--Basalt of Waianae Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 447 ft, casing diameter 1 inch, cased to 410 ft, perforated from 410 to 447 ft.

DATUM.--Elevation of land-surface datum is 12 ft. Measuring point: Top of 12-inch stilling well, 20.53 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, January 1963 to February 1972. Occasional measurements, January 1929 to December 1962, March 1972 to current year.
WATER QUALITY: 1929 to 1985, 1989 to 1991.

EXTREMES FOR PERIOD OF RECORD.--Highest water level 19.98 ft above mean sea level, Jan. 5, 1969; lowest 16.08 ft above mean sea level, Aug.6, 1929.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	18.79	JAN 5	18.59	JUN 29	18.41	SEP 8	18.47

HAWAII, ISLAND OF OAHU--Continued

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.--Basalt of Koolau Volcanic Series, Pliocene (?) age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 397 ft, 12-in metal casing, cased to 172 ft.

DATUM.--Elevation of land-surface datum is 9 ft. Measuring point: Top of 10-in stand pipe, elevation; 16.01 ft above mean sea level.

REMARKS.--Prior to October 1993, unpublished records in files of the U.S. Geological Survey.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, August 1958 to December 1990.
Occasional measurements, March 1911 to May 1918, Mar 1921, January 1926 to August 1958, December 1990 to current year.
WATER QUALITY: 1908, 1911-16, 1924-78.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 17.12 ft above mean sea level, Jan. 1916; lowest, 8.00 ft above mean sea level, Oct. 5, 1962.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 20	12.68	JAN 7	12.62	MAR 10	13.00	MAY 16	13.31	AUG 25	13.29

214125158013401. Local number, 3-4101-03.

LOCATION.--Lat 21°41'25", long 158°01'34", Hydrologic Unit 20060000, 1,500 ft northeast of UH agriculture experiment Station in Waialee, and 1.9 mi northeast of Sunset Beach. Owner: State of Hawaii.

AQUIFER.--Basalt of Koolau Volcanic Series, Tertiary age.

WELL CHARACTERISTICS.--Drilled artesian well, depth 61 ft, casing diameter 8 in., cased to 36 ft.

DATUM.--Elevation of land-surface datum is 22 ft. Measuring point: Top of 4-in. pipe, 21.89 ft above mean sea level.

REMARKS.--Water-quality records for 1929-74 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, February 1929 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.60 ft above mean sea level, Nov. 14, 1932; lowest measured, 10.97 ft above mean sea level, July 1, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	13.41	JAN 7	13.15	MAR 10	13.05	MAY 16	13.11	AUG 25	13.53

HAWAII, ISLAND OF MOLOKAI

210425156483001. Local number, 4-0448-02.

LOCATION.--Lat 21°04'25", long 156°48'30", Hydrologic Unit 20050000, 100 ft north of Highway 45, and 0.8 mi west of Pukoo. Owner: P. Friel.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 22 ft.

DATUM.--Elevation of land-surface datum is 19 ft. Measuring point: Top of 2 x 2 inch steel plate bolted to top of concrete wall of well, 21.23 ft above mean sea level.

REMARKS.-- Water-quality records for 1970-1973 are available in files of district office.

PERIOD OF RECORD.--
WATER LEVEL: Water-level recorder, August 1970 to January 1973. Occasional measurements, February 1973 to current year.
WATER QUALITY: 1970-73, 1993-94.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 6.11 ft above mean sea level, Nov. 26, 1970; lowest measured, 3.67 ft above mean sea level, Feb. 8, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	4.42	JAN 3	4.10	APR 4	4.59	MAY 31	4.16	JUL 18	4.53	AUG 25	4.43
NOV 15	4.20	FEB 7	4.23								

210402156495801. Local number, 4-0449-01.

LOCATION.--Lat 21°04'02", long 156°49'58", Hydrologic Unit 20050000, 1,800 ft north of Ualapue Fishpond, and 0.5 mi northeast of Kilohana School. Owner: County of Maui.

AQUIFER.--East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 6 ft, depth 42 ft, lined with concrete to 42 ft; two infiltration tunnels, total length 214 ft.

DATUM.--Elevation of land-surface datum is 42 ft. Measuring point: Top of steel plate, 42.42 ft above mean sea level.

REMARKS.--Water from this well is used for public supply.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, 1938-39, 1941-63, November 1972 to current year.
WATER QUALITY: 1948, 1952-56, 1970-91, 1993-94.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 6.05 ft above mean sea level, Jan. 19, 1950; lowest measured, 2.09 ft above mean sea level, Sept. 16, 1975.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	3.36	JAN 3	3.18	APR 4	3.26	MAY 31	3.07	JUL 18	3.43	AUG 25	3.45
NOV 15	3.24	FEB 7	3.19								

HAWAII, ISLAND OF MOLOKAI--Continued

210419156570501. Local number, 4-0457-01.

LOCATION.--Lat 21°04'19", long 156°57'05", Hydrologic Unit 20050000, 0.5 mi northwest of Kakahaia Fishpond, and 0.5 mi northeast of Moku. Owner: County of Maui.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, size 4 x 4 ft, depth 38 ft, lined with concrete to 38 ft; two infiltration tunnels, total length 229 ft.

DATUM.--Elevation of land-surface datum is 38 ft. Measuring point: Top of steel plate, 37.37 ft, above mean sea level.

REMARKS.--Water from this well is used for public supply. Water level taken after pump turned off for one half hour.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, June 1947 to November 1960, January 1962 to February 1963, November 1972 to current year.
WATER QUALITY: 1948, 1954-56, 1960, 1962, 1971, 1973-91, 1993-94.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.78 ft above mean sea level, Feb. 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 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 4	2.05	JAN 3	1.76	APR 7	1.77	MAY 31	1.88	JUL 18	2.11	AUG 25	2.15
NOV 15	1.91	FEB 7	1.84								

210605157012001. Local number, 4-0601-01.

LOCATION.--Lat 21°06'05", long 157°01'20", Hydrologic Unit 20050000, 0.6 mi north of Kaunakakai School, and 0.9 mi east of Kalanianaole Colony. Owner: Molokai Ranch.

AQUIFER.--Basalt of East Molokai Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 59 ft, casing diameter 12 inch, cased to 20 ft.

DATUM.--Elevation of land-surface datum is 51 ft. Measuring point: Top of 15-inch surface casing, 51.95 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, May 1954 to current year.
WATER QUALITY: 1954 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.30 ft above mean sea level, Jan. 20, 1969; lowest measured, 1.60 ft above mean sea level, Dec. 5, 1964.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	2.77	JAN 6	2.56	APR 7	2.49	JUN 3	2.58	JUL 22	2.75	AUG 24	2.87
NOV 18	2.67	FEB 7	2.57								

HAWAII, ISLAND OF MOLOKAI--Continued

210711157000501. Local number, 4-0700-01.

LOCATION.--Lat 21°07'11", long 157°00'05", Hydrologic Unit 20050000, 2.3 mi northeast of Kaunakakai, and 2.4 mi north of Kamiloloa. Owner: Kaluakoi Corporation.

AQUIFER.--East Molokai Volcanic Series.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,080 ft, casing diameter 20 inch, cased to 956 ft, perforated from 956 to 1056 ft.

DATUM.--Measuring point: Top of casing, 979.00 ft, land-surface datum.

REMARKS.--Water-quality records for 1973-75 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1976 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 975.25 ft below land-surface datum, Apr. 27, 1988; lowest measured, 976.23 ft below land-surface datum, Sept. 10, 1986.

WATER LEVEL, IN FEET BELOW LAND SURFACE DATUM, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	975.88	JAN 6	975.93	APR 7	976.01	AUG 24	975.87

HAWAII, ISLAND OF MAUI

203908156041201. Local number, 6-3904-01.

LOCATION.--Lat 20°39'08", long 156°04'12", Hydrologic Unit 20020000, 1,300 ft northwest of Kakanoni Point, and 0.7 mi west of Kipahulu School. Owner: Cordelia May.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 150 ft, casing diameter 4 inch.

DATUM.--Elevation of land-surface datum is 133 ft. Measuring point: Top of 1-inch pipe nipple, 133.61 ft above mean sea level.

REMARKS.--Water-quality records for 1978 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, July 1978 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 2.97 ft above mean sea level, Jun. 29, 1988; lowest measured, 0.70 ft above mean sea level, July 2, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 21	2.15	JAN 12	1.61	APR 15	1.31	MAY 17	1.61	JUL 6	1.46	SEP 1	2.14
DEC 7	2.14	FEB 23	1.65								

203912156255901. Local number, 6-3925-01.

LOCATION.--Lat 20°39'12", long 156°25'59", Hydrologic Unit 20020000, 0.8 mi east of Keawalai Church, and 0.9 mi southeast of intersection of Kihei and Makena roads. Owner: State of Hawaii.

AQUIFER.--Hana Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 382 ft, casing diameter 8 inch, cased to 343 ft. perforated from 343 to 363 ft.

DATUM.--Elevation of land-surface datum is 352 ft. Measuring point: Top of 2-inch pipe attached to the casing cover, 352.29 ft above mean sea level.

REMARKS.--Water-quality records for 1964 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, August 1964, June 1972 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 0.47 ft above mean sea level, Aug. 24, 1964; lowest measured, 0.41 ft below mean sea level, May 4, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	0.07	JAN 18	0.01	MAY 2	-0.09	AUG 3	0.08

HAWAII, ISLAND OF MAUI--Continued

204827156242201. Local number, 6-4824-01.

LOCATION.--Lat 20°48'27", long 156°24'22", Hydrologic Unit 20020000, on Waiakoa Road 1,000 ft south of intersection with Kalaloa gulch, and 4 mi east of Kihei. Owner: state of Hawaii.

AQUIFER.--Kula volcanic series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 647 ft, casing diameter 12 inch, cased to 598 ft, screened from 598 to 638 ft.

DATUM.--Elevation of land-surface datum is 593 ft. Measuring point: Top of 3-inch pipe attached to the steel casing cover, 594.74 ft above mean sea level (levels of 12-10-93).

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, Jan. 17, 1974; lowest measured, 3.65 ft above mean sea level, Jan. 27, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 10	4.27	JAN 21	4.29	MAR 17	4.26	MAY 5	4.52	JUN 21	4.33	AUG 18	4.53

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 Volcanic Series, Piliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 219 ft, casing diameter 8 inch, cased to 187 ft.

DATUM.--Elevation of land-surface datum is 166 ft. Measuring point: Top of 8-inch casing, 166.60 ft above mean sea level.

REMARKS.--Water-quality records for 1965-67 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, January to July 1974. Occasional measurements, September 1972 to December 1973, August 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.76 ft above mean sea level, Nov. 30, 1983; lowest measured, 4.74 ft above mean sea level, Mar. 16, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 1	5.23	DEC 15	5.15	JAN 20	5.15	MAR 11	5.08	MAY 2	5.28	AUG 4	5.33

HAWAII, ISLAND OF MAUI--Continued

204909156281401. Local number, 6-4928-02.

LOCATION.--Lat 20°48'27", long 156°28'14", Hydrologic Unit 20020000, at Puunene Airport on Mokulele Highway 2.3 mi north of intersection with Kihei Road, Kihei. Owner: Hawaiian Commercial and Sugar Co.

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, 6 x 9 ft vertical shaft, depth 53 ft.

DATUM.--Elevation of land-surface datum is 50 ft. Measuring point: Top of angle iron at well, 50.08 ft above mean sea level.

REMARKS.--Water-quality records for 1973 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, March 1972 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.09 ft above mean sea level, Jan. 12, 1980; lowest measured, 3.05 ft above mean sea level, Mar. 5, 6, 1977.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 26	3.84	JAN 18	3.83	MAR 4	3.88	MAY 2	4.08	JUN 14	3.84	AUG 3	4.15
DEC 13	3.83										

205140156304501. Local number, 6-5130-01.

LOCATION.--Lat 20°51'40", long 156°30'45", Hydrologic Unit 20020000, 0.5 mi northwest of Waikapu, and 1.0 mi southeast of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 757 ft, casing diameter 8 inch, cased to 569 ft, perforated from 569 to 609 ft.

DATUM.--Elevation of land-surface datum is 551 ft. Measuring point: Top of 6-inch pipe coupling, 551.33 ft above mean sea level.

PERIOD OF RECORD.--Occasional measurements, June 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 30.90 ft above mean sea level, Oct. 13, 1982; lowest measured, 11.36 ft above mean sea level, Jan. 27, 1976.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	12.96	JAN 20	12.76	MAR 17	13.56	MAY 5	13.65	JUN 21	13.44	AUG 18	13.94
DEC 10	12.78										

HAWAII, ISLAND OF MAUI--Continued

205154156303801. Local number, 6-5130-02.

LOCATION.--Lat 20°51'54", long 156°30'38", Hydrologic Unit 20020000, 0.6 mi northwest of Waikapu, and 1.0 mi south- east of Wailuku Heights. Owner: State of Hawaii.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,020 ft, casing diameter 20 inch, cased to 520 ft, perforated from 520 to 570 ft.

DATUM.--Elevation of land-surface datum is 518 ft. Measuring point: Top of casing, 519.33 ft above mean sea level.

REMARKS.--Water-quality records for 1974 are available in files of district office.

PERIOD OF RECORD.--Water-level recorder, August 1983 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 15.03 ft above mean sea level, Jul. 15, 1987; lowest measured, 12.55 ft above mean sea level, Nov. 8, 1993 and June 21, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	12.55	JAN 20	12.61	MAR 17	12.62	MAY 5	12.72	JUN 21	12.55	AUG 18	12.92
DEC 10	12.56										

205412156193801. Local number, 6-5419-01.

LOCATION.--Lat 20°54'12", long 156°19'38", Hydrologic Unit 20020000, 0.9 mi south of Haiku Cannery, and 2 mi north west of Kaupakulua between the Haiku-Kokomo road and Maliko Gulch. Owner: State of Hawaii

AQUIFER.--Honomanu Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 859 ft, casing diameter 12 inch, cased to 829 ft, perforated from 829 to 859 ft.

DATUM.--Elevation of land-surface datum is 828 ft. Measuring point: Top of 6-inch pipe coupling, 828.44 ft above mean sea level.

REMARKS.--Water level readings are affected by oil floating on top of the water.

PERIOD OF RECORD.--Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 5.60 ft above mean sea level, May 2, 1989; lowest measured, 4.36 ft above mean sea level, July 9, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	4.78	JAN 21	4.87	MAR 22	4.74	MAY 5	5.20	JUN 21	4.96	AUG 18	5.01
DEC 10	4.80										

HAWAII, ISLAND OF MAUI--Continued

205419156304401. Local number, 6-5430-03.

LOCATION.--Lat 20°54'19", long 156°30'44", Hydrologic Unit 20020000, 2,000 ft north of Puuohala Village, and 0.5 mi northwest of Wailuku Sugar Mill reservoir. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 580 ft, 1.5-inch PVC casing, cased to 400 ft, perforated from 400 to 580 ft.

DATUM.--Elevation of land-surface datum is 415 ft. Measuring point: Top of 1-inch galvanized pipe, 416.75 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to February 1984. Occasional measurements, March 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 22.09 ft above mean sea level, Dec. 31, 1982; lowest measured, 12.15 ft above mean sea level, Aug. 10, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
NOV 8	13.74	JAN 19	14.27	MAR 17	14.60	APR 28	14.29	JUN 17	13.10	AUG 10	12.15
DEC 1	14.06										

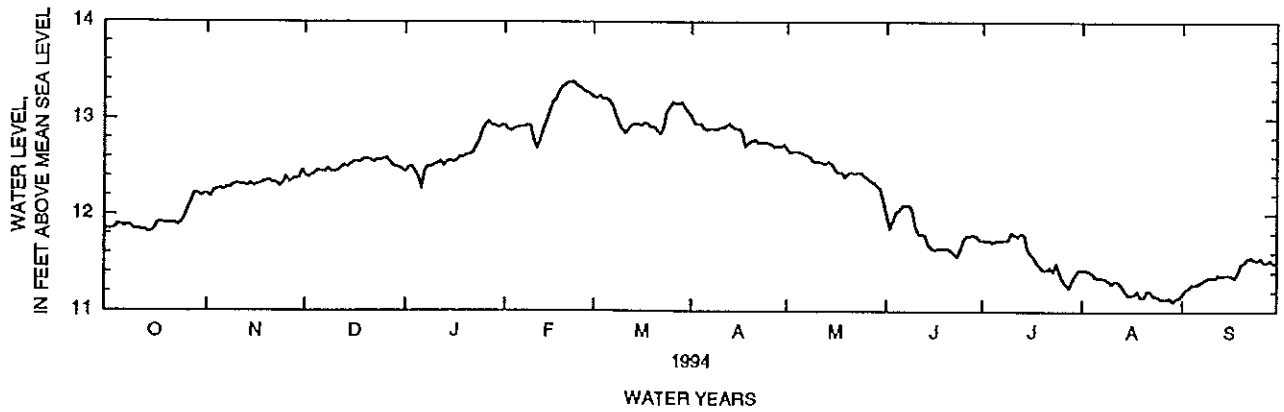
HAWAII, ISLAND OF MAUI--Continued

205405156305401. Local number, 6-5430-05.
LOCATION.--Lat 20°45'59", long 156°30'56", Hydrologic Unit 20020000, 1.0 mi southwest of intersection of Malaihi Road and Highway 33, and 1.2 mi south of Waihee. Owner: State of Hawaii.
AQUIFER.--Wailuku Volcanic Series, Pliocene age.
WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,400 ft, casing diameter 10 inch, cased to 400 ft.
DATUM.--Elevation of land-surface datum is 380 ft. Measuring point: Top of 10-inch casing, 380.84 ft., revised, above mean sea level.
PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, August 1983 to May 1986. Water-level recorder, June 1986 to current year.
WATER QUALITY: 1982, 1985 to current year.
EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.20 ft above mean sea level, Dec. 14, 1989; lowest measured, 11.03 ft above mean sea level, Aug. 29, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.86	12.21	12.41	12.45	12.93	13.23	13.03	12.69	11.99	11.74	11.43	11.19
2	11.85	12.19	12.39	12.49	12.89	13.22	12.96	12.65	11.86	11.73	11.43	11.23
3	11.85	12.25	12.41	12.50	12.88	13.24	12.95	12.66	11.94	11.73	11.42	11.25
4	11.86	12.26	12.44	12.45	12.90	13.21	12.95	12.66	12.03	11.72	11.40	11.28
5	11.90	12.27	12.46	12.39	12.91	13.21	12.90	12.65	12.05	11.73	11.36	11.28
6	11.89	12.26	12.45	12.27	12.92	13.19	12.89	12.64	12.10	11.73	11.35	11.29
7	11.88	12.28	12.45	12.46	12.92	13.14	12.90	12.62	12.10	11.73	11.35	11.31
8	11.89	12.28	12.48	12.50	12.93	13.04	12.90	12.61	12.10	11.74	11.34	11.33
9	11.88	12.31	12.45	12.50	12.93	12.95	12.89	12.56	12.05	11.74	11.32	11.35
10	11.85	12.32	12.45	12.52	12.78	12.89	12.91	12.55	11.88	11.81	11.29	11.35
11	11.85	12.31	12.46	12.53	12.70	12.86	12.91	12.55	11.80	11.79	11.31	11.35
12	11.84	12.31	12.49	12.55	12.78	12.90	12.93	12.54	11.80	11.78	11.31	11.38
13	11.84	12.30	12.51	12.51	12.89	12.94	12.95	12.53	11.79	11.80	11.28	11.37
14	11.82	12.32	12.50	12.55	12.97	12.95	12.92	12.55	11.70	11.79	11.23	11.38
15	11.82	12.30	12.53	12.56	13.07	12.95	12.90	12.53	11.66	11.64	11.18	11.38
16	11.85	12.31	12.55	12.55	13.17	12.94	12.90	12.47	11.64	11.59	11.18	11.37
17	11.91	12.32	12.55	12.56	13.20	12.96	12.86	12.44	11.65	11.56	11.18	11.35
18	11.92	12.34	12.55	12.60	13.28	12.95	12.72	12.44	11.65	11.50	11.21	11.40
19	11.91	12.35	12.58	12.60	13.33	12.92	12.75	12.39	11.65	11.46	11.15	11.49
20	11.91	12.35	12.58	12.62	13.35	12.92	12.77	12.43	11.65	11.43	11.15	11.51
21	11.91	12.33	12.57	12.63	13.38	12.88	12.78	12.44	11.63	11.43	11.21	11.55
22	11.91	12.33	12.55	12.64	13.38	12.85	12.76	12.43	11.60	11.45	11.21	11.56
23	11.90	12.30	12.57	12.71	13.37	12.91	12.76	12.44	11.57	11.42	11.17	11.54
24	11.91	12.33	12.57	12.77	13.34	13.07	12.76	12.44	11.64	11.49	11.16	11.53
25	11.96	12.39	12.58	12.88	13.32	13.12	12.75	12.40	11.74	11.39	11.14	11.55
26	12.05	12.34	12.59	12.94	13.29	13.17	12.74	12.38	11.78	11.32	11.13	11.51
27	12.13	12.36	12.55	12.97	13.28	13.16	12.71	12.35	11.78	11.28	11.13	11.51
28	12.22	12.38	12.51	12.93	13.26	13.16	12.72	12.33	11.79	11.25	11.14	11.53
29	12.22	12.38	12.50	12.93	---	13.17	12.71	12.30	11.78	11.33	11.11	11.50
30	12.20	12.46	12.49	12.91	---	13.11	12.73	12.27	11.74	11.39	11.14	11.51
31	12.21	---	12.47	12.93	---	13.07	---	12.14	---	11.43	11.15	---
MEAN	11.94	12.31	12.50	12.63	13.08	13.04	12.84	12.49	11.80	11.58	11.24	11.40
MAX	12.22	12.46	12.59	12.97	13.38	13.24	13.03	12.69	12.10	11.81	11.43	11.56
MIN	11.82	12.19	12.39	12.27	12.70	12.85	12.71	12.14	11.57	11.25	11.11	11.19

WTR YR 1994 MAX 13.45 FEB 22 MIN 11.03 AUG 29



HAWAII, ISLAND OF MAUI--Continued

205437156310501. Local number, 6-5431-01.

LOCATION.--Lat 20°54'37", long 156°31'05", Hydrologic Unit 20020000, 0.5 mi southwest of Waiehu Village, and 1.4 mi southwest of intersection of Malaihi Road and Kahekili Highway. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 555 ft, 1.5-inch PVC casing, cased to 515 ft, perforated from 515 to 555 ft.

DATUM.--Elevation of land-surface datum is 493 ft. Measuring point: Top of 1.5-inch PVC casing, 492.51 ft above mean sea level.

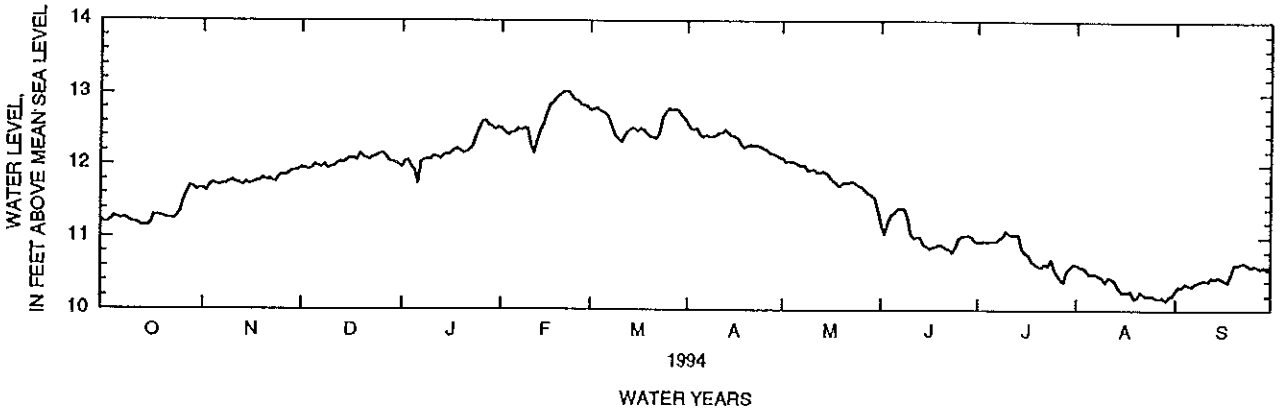
PERIOD OF RECORD.--Water-level recorder, August 1982 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 19.52 ft above mean sea level, Jan. 2, 1983; lowest measured, 10.03 ft above mean sea level, Aug. 29, 1994.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	11.22	11.67	11.96	11.97	12.51	12.77	12.58	12.10	11.18	10.94	10.63	10.28
2	11.20	11.64	11.95	12.05	12.46	12.78	12.51	12.05	11.05	10.94	10.60	10.33
3	11.20	11.71	11.93	12.06	12.42	12.80	12.50	12.05	11.20	10.95	10.59	10.33
4	11.23	11.75	11.95	11.97	12.45	12.76	12.51	12.05	11.31	10.94	10.56	10.37
5	11.28	11.73	12.00	11.91	12.46	12.74	12.42	12.04	11.34	10.95	10.50	10.35
6	11.26	11.72	11.98	11.75	12.50	12.71	12.40	12.01	11.40	10.95	10.50	10.34
7	11.25	11.74	11.97	12.04	12.49	12.63	12.41	11.99	11.40	10.95	10.50	10.37
8	11.26	11.74	12.00	12.07	12.51	12.51	12.40	12.00	11.40	10.99	10.47	10.39
9	11.24	11.77	11.95	12.08	12.50	12.40	12.40	11.93	11.30	11.01	10.45	10.41
10	11.21	11.78	11.97	12.08	12.28	12.36	12.41	11.93	11.06	11.09	10.39	10.42
11	11.20	11.76	11.98	12.12	12.17	12.33	12.45	11.94	10.99	11.05	10.45	10.41
12	11.19	11.75	12.02	12.11	12.33	12.41	12.45	11.90	11.00	11.04	10.44	10.45
13	11.16	11.72	12.04	12.09	12.47	12.47	12.49	11.90	11.00	11.04	10.41	10.44
14	11.16	11.76	12.03	12.13	12.56	12.51	12.45	11.91	10.90	11.04	10.32	10.46
15	11.16	11.74	12.07	12.15	12.70	12.51	12.41	11.89	10.88	10.84	10.26	10.44
16	11.19	11.75	12.09	12.15	12.83	12.48	12.40	11.84	10.85	10.79	10.26	10.42
17	11.30	11.77	12.09	12.20	12.87	12.51	12.37	11.79	10.87	10.76	10.25	10.40
18	11.30	11.78	12.07	12.22	12.92	12.49	12.29	11.76	10.88	10.67	10.26	10.49
19	11.29	11.82	12.15	12.20	12.97	12.44	12.25	11.71	10.90	10.64	10.17	10.63
20	11.28	11.79	12.11	12.17	13.01	12.40	12.27	11.75	10.89	10.61	10.19	10.63
21	11.26	11.80	12.09	12.18	13.02	12.39	12.28	11.76	10.85	10.60	10.25	10.65
22	11.26	11.78	12.08	12.21	13.02	12.37	12.27	11.76	10.84	10.64	10.22	10.66
23	11.25	11.77	12.11	12.26	12.96	12.45	12.27	11.77	10.80	10.61	10.20	10.63
24	11.29	11.84	12.12	12.39	12.91	12.66	12.26	11.76	10.86	10.70	10.20	10.60
25	11.35	11.86	12.15	12.51	12.89	12.74	12.23	11.72	10.98	10.56	10.20	10.62
26	11.51	11.86	12.16	12.60	12.84	12.79	12.22	11.70	11.02	10.49	10.18	10.60
27	11.61	11.88	12.12	12.61	12.83	12.77	12.17	11.65	11.02	10.43	10.17	10.58
28	11.70	11.91	12.05	12.55	12.81	12.78	12.16	11.61	11.03	10.39	10.18	10.60
29	11.69	11.92	12.04	12.54	---	12.77	12.14	11.59	11.01	10.54	10.15	10.56
30	11.65	11.93	12.03	12.50	---	12.69	12.11	11.55	10.95	10.58	10.20	10.59
31	11.67	---	12.00	12.52	---	12.65	---	11.39	---	10.63	10.21	---
MEAN	11.32	11.78	12.04	12.21	12.67	12.58	12.35	11.83	11.04	10.79	10.33	10.48
MAX	11.70	11.93	12.16	12.61	13.02	12.80	12.58	12.10	11.40	11.09	10.63	10.66
MIN	11.16	11.64	11.93	11.75	12.17	12.33	12.11	11.39	10.80	10.39	10.15	10.28

WTR YR 1994 MAX 13.13 FEB 22, MIN 10.03 AUG 29



HAWAII, ISLAND OF MAUI--Continued

205617156311101. Local number, 6-5631-01.

LOCATION.--Lat 20°56'17", long 156°31'11", Hydrologic Unit 20020000, 2,000 ft southwest of Waihee Farm, and 1.3 mi northwest of Waiehu Golf Course. Owner: Wailuku Sugar Co.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 300 ft, 1.5-inch PVC casing, cased to 260 ft, perforated from 260 to 300 ft.

DATUM.--Elevation of land-surface datum is 248 ft. Measuring point: Top of 1.5-inch PVC pipe, 248.05 ft above mean sea level.

PERIOD OF RECORD.--Water-level recorder, August 1982 to September 1984. Occasional measurements, October 1984 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 18.83 ft above mean sea level, Dec. 6, 1982; lowest measured, 14.15 ft above mean sea level, Aug. 23, 1993.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 1	14.16	JAN 19	14.35	MAR 17	14.58	APR 28	14.59	JUN 15	14.30	AUG 4	14.18
DEC 2	14.28										

HAWAII, ISLAND OF MAUI--Continued

205651156313201. Local number, 6-5631-02.

LOCATION.--Lat 20°56'51", long 156°31'32", Hydrologic Unit 20020000, 0.9 mi northwest of Waihee School, and 0.9 mi upstream from mouth of Waihee river. Owner: Hawaiian Investments.

AQUIFER.--Wailuku Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 387 ft, casing diameter 16 inch, cased to 290 ft, perforated from 290 to 310 ft.

DATUM.--Elevation of land-surface datum is 281 ft. Measuring point: Top of 16-inch casing, 284.78 ft above mean sea level.

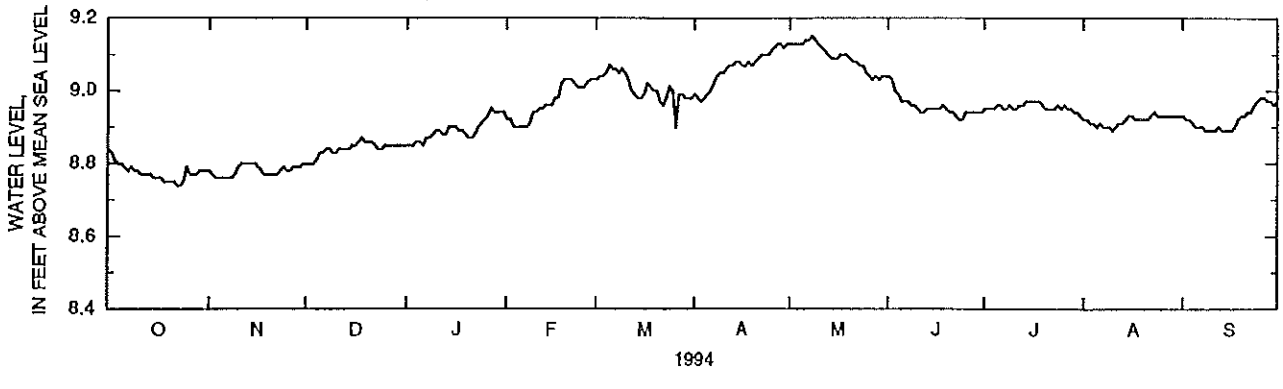
PERIOD OF RECORD.--Water-level recorder, April 1988 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 12.05 ft above mean sea level, Oct. 22, Nov. 2, 10-11, 1989. Lowest water level measured, 8.70 ft Sept. 12-15, 1993.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	8.84	8.78	8.80	8.85	8.92	9.03	8.99	9.13	9.04	8.95	8.92	8.93
2	8.83	8.77	8.80	8.85	8.92	9.04	8.98	9.13	9.03	8.95	8.92	8.92
3	8.81	8.76	8.80	8.85	8.90	9.04	8.97	9.13	9.00	8.95	8.91	8.92
4	8.80	8.76	8.81	8.86	8.90	9.05	8.98	9.13	8.99	8.95	8.91	8.91
5	8.80	8.76	8.83	8.86	8.90	9.07	8.99	9.13	8.97	8.96	8.90	8.90
6	8.79	8.76	8.83	8.85	8.90	9.06	9.00	9.14	8.97	8.96	8.91	8.90
7	8.78	8.76	8.84	8.87	8.90	9.06	9.02	9.14	8.97	8.95	8.90	8.90
8	8.79	8.76	8.84	8.87	8.91	9.05	9.04	9.15	8.96	8.95	8.90	8.89
9	8.78	8.77	8.83	8.88	8.94	9.06	9.05	9.14	8.96	8.96	8.90	8.89
10	8.78	8.79	8.83	8.89	8.94	9.05	9.05	9.13	8.95	8.95	8.89	8.89
11	8.77	8.80	8.84	8.89	8.95	9.03	9.06	9.12	8.94	8.95	8.90	8.89
12	8.77	8.80	8.84	8.88	8.95	9.00	9.07	9.11	8.94	8.96	8.91	8.90
13	8.77	8.80	8.84	8.88	8.96	8.99	9.07	9.10	8.95	8.96	8.91	8.89
14	8.77	8.80	8.84	8.90	8.96	8.98	9.08	9.09	8.95	8.97	8.92	8.89
15	8.76	8.80	8.85	8.90	8.96	8.98	9.08	9.09	8.95	8.97	8.93	8.89
16	8.76	8.79	8.85	8.90	8.98	8.99	9.07	9.09	8.95	8.97	8.93	8.89
17	8.76	8.78	8.86	8.89	8.98	9.02	9.07	9.10	8.95	8.97	8.92	8.90
18	8.75	8.77	8.87	8.89	9.02	9.01	9.08	9.10	8.96	8.97	8.92	8.92
19	8.75	8.77	8.86	8.88	9.03	9.00	9.07	9.10	8.95	8.96	8.92	8.93
20	8.75	8.77	8.86	8.87	9.03	9.00	9.08	9.09	8.94	8.95	8.92	8.93
21	8.75	8.77	8.86	8.87	9.03	8.97	9.09	9.08	8.94	8.95	8.92	8.94
22	8.74	8.77	8.85	8.88	9.02	8.96	9.10	9.08	8.93	8.95	8.93	8.94
23	8.74	8.78	8.84	8.90	9.01	8.98	9.10	9.07	8.92	8.95	8.94	8.96
24	8.75	8.79	8.84	8.91	9.01	9.01	9.10	9.07	8.92	8.96	8.93	8.97
25	8.79	8.78	8.85	8.92	9.01	9.00	9.11	9.05	8.94	8.95	8.93	8.98
26	8.77	8.78	8.85	8.93	9.02	8.90	9.12	9.04	8.94	8.96	8.93	8.98
27	8.77	8.79	8.85	8.95	9.03	8.99	9.13	9.03	8.94	8.95	8.93	8.97
28	8.77	8.79	8.85	8.94	9.03	8.99	9.13	9.04	8.94	8.95	8.93	8.97
29	8.78	8.79	8.85	8.94	---	8.98	9.12	9.03	8.94	8.94	8.93	8.96
30	8.78	8.80	8.85	8.94	---	8.98	9.13	9.04	8.94	8.94	8.93	8.97
31	8.78	---	8.85	8.94	---	8.98	---	9.04	---	8.93	8.93	---
MEAN	8.78	8.78	8.84	8.89	8.97	9.01	9.06	9.09	8.96	8.95	8.92	8.92
MAX	8.84	8.80	8.87	8.95	9.03	9.07	9.13	9.15	9.04	8.97	8.94	8.98
MIN	8.74	8.76	8.80	8.85	8.90	8.90	8.97	9.03	8.92	8.93	8.89	8.89

WTR YR 1994 MAX 9.17 MAY 2, 7-9, MIN 8.71 OCT 14-18



HAWAII, ISLAND OF MAUI--Continued

205856156400101. Local number, 6-5840-01.

LOCATION.--Lat 20°58'56", long 156°40'01", Hydrologic Unit 20020000, on sugar plantation road 0.9 mi east of Kahana, and 1.5 mi southwest of Honokahua. Owner: State of Hawaii.

AQUIFER.--Honolua Volcanic Series, Pliocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 274 ft, casing diameter 8 inch, cased to 264 ft, perforated from 264 to 274 ft. Hole was drilled to depth of 284 ft but plugged back 10 ft with cement.

DATUM.--Elevation of land-surface datum is 257 ft. Measuring point: Top of 9-inch casing, 257.45 ft above mean sea level. Levels of Aug. 11, 1993.

REMARKS.--Water-quality records for 1964, 1980 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, March 1972 to July 1975. Water-level recorder, August 1975 to June 25, 1993. Occasional measurements, July 1993 to current.

EXTREMES FOR PERIOD OF RECORD.--Highest water level, 3.68 ft above mean sea level, Sept. 20, 1981; lowest, 2.40 ft above mean sea level May 4, 5, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
MEAN VALUES

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 25	3.14	JAN 18	2.95	MAR 4	2.80	APR 29	2.95	JUN 14	2.94	AUG 3	3.20
DEC 14	2.96										

HAWAII, ISLAND OF HAWAII

190602155325901. Local number, 8-0632-01.

LOCATION.--Lat 19°06'02", long 155°32'59", Hydrologic Unit 20010000, 0.9 mi north of Whittington Park, and 3.3 mi northeast of Naalehu. Owner: Kau Agribusiness (formerly Kau Sugar Company).

AQUIFER.--Ninole Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table, depth 140 ft, casing diameter 14 inch, cased to 105 ft, perforated from 105 to 125 ft.

DATUM.--Elevation of land-surface datum is 102 ft. Measuring point: 1-inch hole in pump base, 103.26 ft above mean sea level.

REMARKS.--Water-quality records for 1972 and 1973 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, April 1972 to current year.

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, Oct. 19, 1978; lowest measured, 0.21 ft above mean sea level, June 19, 1989.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 7	2.06	DEC 8	2.07	FEB 22	1.42	APR 26	0.79	JUL 6	1.16	SEP 6	0.47

193017154502101. Local number, 8-3080-02.

LOCATION.--Lat 19°30'17", long 154°50'21", Hydrologic Unit 20010000, 0.5 mi south of intersection of Highway 132, and Highway 137 near Pahoa. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, depth 46 ft, casing diameter 66 inch, with two horizontal infiltration tunnels 2 x 50 ft extending in opposite directions from 3 ft above bottom of well.

DATUM.--Elevation of land-surface datum is 39 ft. Measuring point: Top of steel manhole cover at 1-inch hole, 39.50 ft above mean sea level.

REMARKS.--Water from this well is used for public supply and at times, water level affected by pumping.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1972 to current year.
WATER QUALITY: 1972-81, 1983 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.77 ft above mean sea level, Mar. 2, 1989; lowest measured, 1.18 ft above mean sea level, June 3, 1985.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	a---	MAR 1	a---	APR 21	4.08	JUN 24	4.39	SEP 6	4.48

a No measurement made, well pumping

HAWAII, ISLAND OF HAWAII--Continued

193339154594801. Local number, 8-3389-01.

LOCATION.--Lat 19°33'39", long 154°59'48", Hydrologic Unit 20010000, 3.5 mi northwest of Pahoa airstrip, and 5.5 mi southeast of Keaau. Owner: County of Hawaii.

AQUIFER.--Puna Volcanic Series, Holocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 475 ft, casing diameter 8 inch, cased to 403 ft, perforated from 403 to 475 ft.

DATUM.--Elevation of land-surface datum is 427 ft. Measuring point: Top of casing, 428.14 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, September 1974 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 27.76 ft above mean sea level, revised, Nov. 27, 1990; lowest measured, 9.92 ft above mean sea level, Jun. 9, 1992.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 2	16.64	MAR 1	19.16	APR 26	a---	MAY 5	17.87	JUN 24	18.23	SEP 7	18.56

194222155035101. Local number, 8-4203-04.

LOCATION.--Lat 19°42'22", long 155°03'51", Hydrologic Unit 20010000, 0.5 mi east of Hawaii Technical School, and 1.0 mi south of Hilo airport terminal. Owner: Hawaii Electric Light Company.

AQUIFER.--Kahuku Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 201 ft, casing diameter 16 inch, cased to 63 ft.

DATUM.--Elevation of land-surface datum is 47 ft. Measuring point: Top of 3-inch nipple above casing; 46.54 ft above mean sea level.

REMARKS.--Water-quality records for 1961 are available in files of district office. Water level affected by pumping of nearby industrial wells.

PERIOD OF RECORD.--Occasional measurements, July 1973 to current year.

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 11.34 ft above mean sea level, Nov. 26, 1990; lowest measured, 5.80 ft above mean sea level, Mar. 12, 1986.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
DEC 20	7.87	FEB 15	7.74	APR 21	7.56	JUN 24	6.82	SEP 7	7.99

a No measurement made

HAWAII, ISLAND OF HAWAII--Continued

195947155485801. Local number, 8-5948-01.

LOCATION.--Lat 19°59'47", long 155°48'58", Hydrologic Unit 20010000, 0.7 mi east of Hapuna Beach Park, and 3.1 mi southeast of Kawaihae. Owner: State of Hawaii.

AQUIFER.--Hamakua Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 268 ft, casing diameter 10 inch, cased to 246 ft, screened from 246 to 266 ft.

DATUM.--Elevation of land-surface datum is 244 ft. Measuring point: Hole in pumpbase, 246.47 ft above mean sea level.

REMARKS.--Water from this well is used for irrigation.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, April 1970, March 1973 to current year.
WATER QUALITY: 1970, 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1976-80 (Water level data), 1976-90 (Maximum and minimum water levels for the period of record).

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 4.83 ft above mean sea level, Aug. 29, 1994; lowest measured, 1.38 ft above mean sea level, Sep. 28, 1979.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 5	4.71	NOV 24	4.50	FEB 14	4.38	MAY 3	a---	JUN 28	4.34	AUG 29	4.83

200132155471101. Local number, 8-6147-01.

LOCATION.--Lat 20°01'32", long 155°47'10", Hydrologic Unit 20010000, on Highway 26, 3.1 mi east of Kawaihae, and 2.8 mi northeast of Hapuna Beach Park. Owner: State of Hawaii.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Drilled basal water-table well, depth 1,008 ft, casing diameter 8 inch, cased to 997 ft, perforated from 997 to 1,008 ft. Hole was drilled to 1,040 ft but was finally plugged back to 1,008 ft.

DATUM.--Elevation of land-surface datum is 982 ft. Measuring point: Top of pipe coupling on casing cover 983.08 ft, revised, Nov. 18, 1986, above mean sea level.

REMARKS.--Water-quality records for 1963-64 are available in files of district office.

PERIOD OF RECORD.--Occasional measurements, June to July 1963, June 1973 to current year.

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 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	4.93	NOV 24	4.78	FEB 14	4.69	MAY 3	4.66	JUN 28	5.78	AUG 31	6.07

a Pumping. No measurement made

HAWAII, ISLAND OF HAWAII--Continued

201603155521801. Local number, 8-7652-01.

LOCATION.--Lat 20°16'03", long 155°52'18", Hydrologic Unit 20010000, 0.3 mi west of Upolu Point Airfield, 3.1 mi northwest of Hawi, and 1.9 mi west of Hoea Camp. Owner: Kohala Corporation.

AQUIFER.--Pololu Volcanic Series, Pleistocene age.

WELL CHARACTERISTICS.--Dug basal water-table well, with horizontal infiltration tunnels from pump sump.

DATUM.--Elevation of land-surface datum is 33 ft. Measuring point: Top of 4-inch steel I-beam placed across sump, 7.75 ft above mean sea level.

PERIOD OF RECORD.--
WATER LEVEL: Occasional measurements, March 1973 to current year.
WATER QUALITY: 1973 to current year.

REVISED RECORDS.--WDR HI-91-1: 1988-90(The maximum water level for the period of record.)

EXTREMES FOR PERIOD OF RECORD.--Highest water level measured, 3.09 ft above mean sea level, Aug. 22, 1974; lowest measured, 1.45 ft above mean sea level, July 9, 1975, Jan. 16, 1980.

WATER LEVEL, IN FEET ABOVE MEAN SEA LEVEL, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL	DATE	WATER LEVEL
OCT 6	2.76	NOV 24	2.17	FEB 24	2.15	MAY 5	a---	JUN 13	1.95	AUG 30	2.85

a No measurement made

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF KAUAI					
220018159444702	2-0044-13	W34 KEKAHA	22 00 18 N	159 44 47 W	10-19-93	1250	490	22.5	a73
					12-07-93	1200	480	22.0	75
					02-01-94	1140	482	22.0	74
					04-12-94	1140	480	21.5	72
					06-07-94	1230	485	22.0	74
					08-10-94	1230	485	22.0	74
220016159442701	2-0044-15	S14 KEKAHA	22 00 16 N	159 44 27 W	10-18-93	0900	710	22.0	a130
					12-06-93	0900	980	22.0	210
					01-31-94	0855	745	22.0	140
					04-11-94	0900	740	22.5	130
					06-06-94	0915	900	22.0	190
					08-08-94	0835	1200	22.5	260
220136159205501	2-0120-01	W7 WAILUA	22 01 36 N	159 20 55 W	10-20-93	1210	890	26.0	a160
					12-20-93	1300	802	26.0	170
					04-18-94	1210	850	26.0	150
					06-13-94	1115	850	25.5	150
					08-15-94	1145	850	26.0	160
220148159453501	2-0145-10	W45F MANA	22 01 48 N	159 45 35 W	12-06-93	1115	518	21.5	75
					08-10-94	1240	680	21.5	120
220354159205601	2-0320-01	W9-1A WAIL	22 03 54 N	159 20 56 W	06-08-94	0840	440	24.0	56
220354159205602	2-0320-03	W9-1B WAIL	22 03 54 N	159 20 56 W	10-15-93	0830	398	25.0	a45
					12-10-93	0815	385	23.5	42
					02-08-94	0845	400	23.0	45
					04-08-94	0825	360	24.0	43
					08-05-94	0835	390	26.5	48
220341159453901	2-0345-04	S16 SAKIMA	22 03 41 N	159 45 39 W	10-18-93	0925	705	22.0	a140
					12-06-93	0935	970	22.0	210
					01-31-94	0940	690	21.5	130
					04-11-94	0940	755	22.0	150
					06-06-94	0955	1130	22.0	260
					08-08-94	0910	2290	23.0	630
220530159450401	2-0545-01	W59 KAULAU	22 05 30 N	159 45 07 W	10-18-93	1000	790	23.0	a150
					12-06-93	1010	775	22.5	150
					01-31-94	1010	745	22.0	140
					04-11-94	1015	755	23.0	140
					06-06-94	1025	750	25.0	140
					08-08-94	0950	750	24.0	140
220621159232101	2-0623-04	KAPAA	22 06 21 N	159 23 21 W	10-15-93	1405	120	33.5	13
					12-10-93	1320	119	25.0	12
					02-08-94	1315	110	26.0	11
					04-08-94	1305	110	26.0	12
					06-08-94	0900	130	27.5	13
220827159185401	2-0818-01	W90A ANAHO	22 08 27 N	159 18 54 W	10-15-93	0930	248	24.0	a21
					02-08-94	0940	250	24.0	22
					06-08-94	0945	230	24.0	23
220826159185401	2-0818-02	W90B ANAHO	22 08 26 N	159 18 54 W	12-10-93	0930	285	23.5	23
					04-08-94	0920	282	24.0	22
					08-05-94	0930	285	24.5	23
221141159252501	2-1125-01	N1 KILAUEA	22 11 41 N	159 25 25 W	10-15-93	1005	163	24.0	a16
					02-08-94	1015	165	21.5	16
					06-08-94	1020	183	23.0	18

a Chloride, Dissolved (Mg/L as CL)

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
			HAWAII, ISLAND OF KAUAI--Continued						
221141159252502	2-1125-02	N2 KILAUEA	22 11 41 N	159 25 25 W	12-10-93	0955	168	24.0	15
					04-08-94	0950	168	24.0	16
					08-05-94	0955	178	26.0	18
221150159264501	2-1126-01	KALIHIWAI	22 11 50 N	159 26 45 W	10-20-93	0800	200	22.5	a22
					02-02-94	0840	200	23.0	23
					04-15-94	0815	205	22.5	21
					08-12-94	0955	192	23.0	19
221151159265001	2-1126-02	KALIHIWAI	22 11 51 N	159 26 50 W	12-15-93	0840	195	22.5	22
					06-15-94	0755	195	22.5	21
221201159293401	2-1229-03	W73 HANALE	22 12 01 N	159 29 34 W	10-15-93	1150	245	23.0	a30
					12-10-93	1220	242	22.5	30
					02-08-94	1210	245	23.0	32
					04-08-94	1155	245	23.5	31
					06-08-94	1105	247	23.0	31
					08-05-94	1200	247	23.5	32
221247159324801	2-1232-01	W67 WAINIH	22 12 47 N	159 32 48 W	10-15-93	1120	139	26.0	a21
					12-10-93	1110	135	24.0	21
					02-08-94	1125	132	23.0	20
					04-08-94	1105	140	24.0	22
					06-08-94	1230	138	26.5	20
					08-05-94	1050	150	29.5	24
221318159335901	2-1333-01	W66 HAENA	22 13 18 N	159 33 59 W	10-15-93	1050	205	22.0	a19
					12-10-93	1050	210	21.5	23
					02-08-94	1110	219	22.0	19
					04-08-94	1040	210	22.0	20
215454159274201	2-5427-01	W16A KOLOA	21 54 54 N	159 27 42 W	10-14-93	0840	238	23.0	a26
					02-07-94	0830	237	22.5	26
					06-09-94	0805	240	22.5	26
					08-04-94	0815	228	22.5	20
215455159274201	2-5427-02	W16B KOLOA	21 54 55 N	159 27 42 W	12-09-93	0915	225	22.5	24
					04-07-94	0815	228	22.5	25
215528159303001	2-5530-02	W23 LAWAI	21 55 28 N	159 30 30 W	10-18-93	1520	250	22.5	a27
					02-07-94	1450	258	23.5	29
					04-18-94	0945	250	22.5	28
					06-13-94	0920	255	22.5	29
					08-15-94	0920	250	23.0	27
215535159302601	2-5530-03	W22 LAWAI	21 55 35 N	159 30 26 W	10-18-93	1525	218	23.5	a24
					12-06-93	1350	220	22.5	24
					02-07-94	1500	200	21.5	24
					04-18-94	0950	220	24.0	24
					06-13-94	0925	220	26.5	23
					08-15-94	0925	220	24.0	25
215522159342601	2-5534-03	W25-1 HANA	21 55 22 N	159 34 26 W	10-14-93	1030	439	24.0	a46
					12-09-93	1010	440	24.0	40
					02-07-94	0950	453	23.0	40
					04-07-94	1010	452	24.5	43
					06-09-94	0920	402	26.0	38
					08-04-94	1000	480	23.5	44
215635159355001	2-5635-01	S7 HANAPEP	21 56 35 N	159 35 50 W	10-25-93	0935	690	23.0	a140
					12-20-93	0915	690	23.0	140
					02-07-94	1355	675	23.0	130
					04-18-94	0910	680	22.5	130
					06-13-94	0815	675	23.0	130
					08-15-94	0815	678	23.0	130

a Chloride, Dissolved (Mg/L as CL)

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
				HAWAII, ISLAND OF KAUAI--Continued					
215803159401201	2-5840-01	W26 WAIMEA	21 58 03 N	159 40 12 W	10-14-93	1150	1040	25.0	a240
					12-09-93	1150	1060	24.5	250
					02-07-94	1220	1010	24.5	230
					04-07-94	1120	1050	24.5	240
					06-09-94	1140	990	24.5	220
					08-04-94	1115	730	26.0	140
215854159424601	2-5842-02	S11 KEKAHA	21 58 54 N	159 42 46 W	10-18-93	1205	700	24.5	a100
					12-06-93	1210	680	25.0	100
					01-31-94	1235	625	24.5	97
					04-11-94	1235	655	25.0	97
					06-06-94	1235	675	24.5	98
					08-08-94	1200	680	25.0	100
215843159422901	2-5842-03	S10 KEKAHA	21 58 43 N	159 42 29 W	10-18-93	1220	1110	24.0	a240
					12-06-93	1225	680	24.0	120
					01-31-94	1300	820	24.0	160
					04-11-94	1305	935	24.0	190
					06-06-94	1300	940	24.5	200
					08-08-94	1215	1060	24.5	220
215901159235301	2-5923-01	KILOHANA A	21 59 01 N	159 23 53 W	10-15-93	0800	260	24.0	a17
					06-08-94	0805	240	25.0	18
					08-05-94	0800	245	25.0	18
215901159235201	2-5923-07	KILOHANA I	21 59 01 N	159 23 52 W	10-15-93	0745	188	24.0	a19
					12-10-93	0725	187	23.0	19
					02-08-94	0750	192	22.0	20
					04-08-94	0730	200	23.0	30
					06-08-94	0740	207	23.5	25
					08-05-94	0705	207	23.5	20
215906159395601	2-5939-01	S9 WAIMEA	21 59 06 N	159 39 56 W	10-18-93	1400	270	23.5	a18
					12-09-93	1055	259	23.5	16
					02-07-94	1030	250	23.5	14
					04-07-94	1210	227	24.0	12
					06-09-94	1010	228	23.0	16
					08-04-94	1150	210	22.5	19
215937159434201	2-5943-01	S13 KEKAHA	21 59 37 N	159 43 42 W	10-18-93	0830	890	24.0	a170
					12-06-93	0840	900	24.0	170
					01-31-94	0830	755	23.5	160
					04-11-94	0830	825	24.0	150
					06-06-94	0840	860	23.0	160
					08-04-94	0810	850	24.5	160

a Chloride, Dissolved (Mg/L as CL)

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF OAHU					
211646157465201	3-1646-01	W1-B WAIAL	21 16 46 N	157 46 52 W	03-01-94	b0945	--	--	--
					05-24-94	c1010	--	--	--
					09-19-94	0835	855	21.5	--
211832157515501	3-1851-19	W102 TUBEA	21 18 32 N	157 51 55 W	10-20-93	d0850	--	--	--
					12-15-93	1010	32000	23.5	12000
					03-01-94	1055	30100	24.0	12000
					05-24-94	0900	31000	24.0	12000
					09-20-94	0840	32500	24.5	13000
211832157515502	3-1851-19	W102 TUBEB	21 18 32 N	157 51 55 W	10-20-93	0855	13200	23.5	--
					12-15-93	1015	13800	23.5	--
					03-01-94	1110	13800	24.0	--
					05-24-94	0900	13800	24.0	--
					09-20-94	0840	14000	24.5	--
212133158035501	3-2103-03	S14 MAKAKI	21 21 33 N	158 03 55 W	03-16-94	0930	1080	23.5	230
					05-23-94	0900	1100	23.0	230
					09-23-94	0920	1050	23.5	230
212106157533701	3-2153-02	W153 MOANA	21 21 06 N	157 53 37 W	10-15-93	1415	480	21.5	a95
					12-15-93	1230	480	22.0	95
					03-02-94	1010	485	22.5	97
					05-23-94	1400	480	22.5	97
					09-19-94	0915	482	22.0	100
212259157554201	3-2255-35	W189-3A	21 22 59 N	157 55 42 W	12-15-93	1305	1200	22.0	--
					05-23-94	1245	1150	23.0	--
					09-19-94	0950	1080	22.5	--
212258157554201	3-2255-36	W189-3B	21 22 58 N	157 55 42 W	12-15-93	1305	975	22.0	--
					03-02-94	1300	960	24.0	--
212238157561102	3-2256-12	W187-C	21 22 39 N	157 56 09 W	10-20-93	1505	875	24.0	--
					12-16-93	1500	880	23.0	--
					03-16-94	1310	850	22.5	220
					05-23-94	1330	870	24.0	220
					06-24-94	1120	875	24.0	220
					09-23-94	1240	870	24.0	220
212343158001001	3-2300-11	W238 WAIPH	21 23 43 N	158 00 10 W	10-21-93	1435	850	22.0	--
					12-15-93	1445	840	22.0	--
					03-01-94	1315	860	21.5	--
					05-20-94	1335	790	22.0	--
					07-11-94	1430	775	22.5	--
					09-19-94	1145	755	22.0	--

a Chloride, Dissolved (Mg/L as CL)
b Faucet broken, unable to collect sample
c Pump off, unable to collect sample
d Well not flowing, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SAMPLE DEPTH DIS-TANCE BELOW MSL FEET	SPE-CIFIC CON-DUCT-ANCE LAB (US/CM)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF OAHU--Continued					
212340158001901	3-2300-18	W241	21 23 40 N	158 00 19 W	12-14-93	f1230	400	777	220
					12-14-93	f1255	500	2200	620
					12-14-93	f1315	600	12700	4300
					12-14-93	f1335	650	18300	6300
					12-15-93	f1040	700	24100	8500
					12-15-93	f1110	750	28500	10000
					12-15-93	f1135	800	32000	11000
					12-15-93	f1205	850	36400	13000
					12-15-93	f1235	900	40700	15000
					12-15-93	f1305	950	43600	16000
					12-15-93	f1340	990	44600	17000
					03-10-94	f0955	400	734	180
					03-10-94	f1020	500	2130	610
					03-10-94	f1045	600	11900	4000
					03-10-94	f1110	650	18000	6200
					03-10-94	f1140	700	23200	8200
					03-10-94	f1205	750	27900	9800
					03-10-94	f1235	800	31700	11000
					03-10-94	f1305	850	35900	13000
					03-10-94	f1330	900	40600	15000
					03-10-94	f1400	950	43500	16000
					03-10-94	f1430	990	44400	17000
					08-31-94	f1025	400	816	200
					08-31-94	f1045	500	2290	680
					08-31-94	f1110	600	12600	4200
					08-31-94	f1130	650	18600	6500
					08-31-94	f1155	700	23800	8200
					08-31-94	f1215	750	28500	10000
					08-31-94	f1240	800	36700	13000
					08-31-94	f1305	850	36600	14000
					08-31-94	f1330	900	40200	15000
					08-31-94	f1355	950	43500	16000
					08-31-94	f1415	990	44300	16000

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
212358158010901	3-2301-09,10	W247-IJ	21 23 58 N	158 01 09 W	10-21-93	1405	820	22.5	--
					12-16-93	1020	830	22.0	--
					03-02-94	1400	800	22.5	--
					05-20-94	1230	840	22.5	--
					07-11-94	1145	820	23.0	--
					09-19-94	1300	851	22.5	--
212332157582201	3-2358-02	W201	21 23 32 N	157 58 22 W	10-20-93	1415	1010	21.5	--
					12-15-93	1345	1100	20.0	--
					03-01-94	1215	1000	21.0	--
					05-23-94	1130	1100	21.0	--
					09-19-94	1035	1080	21.0	--
212342157584301	3-2358-22	W204-4	21 23 42 N	157 58 43 W	10-21-93	1330	1070	20.0	--
					12-15-93	1355	1150	20.0	--
					03-01-94	1240	1170	20.5	--
					05-23-94	1030	1200	20.5	--
					07-11-94	1445	1490	20.5	--
					09-19-94	1105	1420	20.5	--

f Collected by non-USGS agency

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF OAHU--Continued					
212343157584701	3-2358-29	W204-9	21 23 43 N	157 58 47 W	10-21-93	1340	1400	20.0	--
					12-15-93	1350	2280	20.5	--
					03-01-94	1250	2750	20.5	--
					05-23-94	1020	3000	20.5	--
					07-11-94	1455	3700	20.5	--
					09-19-94	1100	3380	21.0	--
212336157591801	3-2359-05	W204-11	21 23 36 N	157 59 18 W	10-21-93	1400	2100	22.0	--
					12-15-93	1400	2100	22.0	--
					03-01-94	1305	2050	21.5	--
					05-20-94	1410	2600	22.0	--
					07-11-94	1508	2600	23.5	--
					09-19-94	1115	2610	22.5	--
212422157485601	3-2448-01	W416	21 24 22 N	157 48 56 W	01-05-94	d1030	--	--	--
					03-04-94	d1325	--	--	--
					05-19-94	d1445	--	--	--
					08-25-94	d0845	--	--	--
212556157500301	3-2550-01	W407-16	21 25 56 N	157 50 03 W	11-01-93	1245	135	23.5	--
					11-01-93	1310	135	23.5	a19
					01-05-94	1245	130	23.0	19
					03-04-94	1015	130	23.0	17
					05-19-94	1400	130	24.0	18
					08-25-94	0910	130	24.0	18
212506157582301	3-2558-10	S16	21 25 06 N	157 58 23 W	10-21-93	0910	260	21.0	--
					12-16-93	0955	255	21.0	--
					03-16-94	1240	260	21.0	--
					05-23-94	1045	255	21.0	--
					09-23-94	1120	255	21.5	--
212617158033801	3-2603-01	W330-8	21 26 17 N	158 03 38 W	10-21-93	1105	350	22.5	a47
					12-16-93	1100	350	22.0	47
					03-16-94	1025	350	23.0	48
					05-20-94	1110	350	23.0	49
					07-11-94	1255	350	23.5	50
212656158071801	3-2607-01	W277-97	21 26 56 N	158 07 18 W	01-07-94	0905	365	24.0	--
					03-08-94	0915	365	24.0	--
					06-29-94	0905	365	24.5	--
					09-09-94	0910	385	24.5	--

a Chloride, Dissolved (Mg/L as CL)
d Well not flowing, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE (US/CM)	CHLORIDE, (MG/L AS CL)
				HAWAII, ISLAND OF OAHU--Continued					
212614157594301	3-2659-01	WAIPIO-MAUKA M	21 26 14 N	157 59 43 W	12-21-93	f0950	400	g244	49
					12-21-93	f1020	500	g246	50
					12-21-93	f1045	600	g532	130
					12-21-93	f1115	700	g2300	650
					12-21-93	f1145	800	g4940	1500
					12-21-93	f1215	900	g21700	7500
					12-22-93	f1015	1000	g35200	13000
					12-22-93	f1110	1100	g40900	15000
					12-22-93	f1200	1200	g44200	16000
					12-22-93	f1245	1300	g45000	17000
					03-08-94	f1055	400	g230	45
					03-08-94	f1130	500	g232	45
					03-08-94	f1155	600	g317	68
					03-08-94	f1230	700	g2160	600
					03-08-94	f1300	800	g4850	1500
					03-08-94	f1330	900	g21900	7500
					03-08-94	f1410	1000	g35200	13000
					03-09-94	f1300	1100	g40800	15000
					03-09-94	f1345	1200	g44200	16000
					03-09-94	f1420	1300	g45900	17000
					06-06-94	f1010	400	242	48
					06-06-94	f1045	500	243	49
					06-06-94	f1130	600	301	69
					06-06-94	f1200	700	2260	650
					06-06-94	f1240	800	4940	1500
					06-06-94	f1325	900	g22100	7600
					06-06-94	f1410	1000	g35500	13000
					08-30-94	f0955	400	g246	49
					08-30-94	f1015	500	g255	52
					08-30-94	f1045	600	g317	68
					08-30-94	f1110	700	g2380	660
					08-30-94	f1140	800	g5220	1600
					08-30-94	f1205	900	g22100	8000
					08-30-94	f1235	1000	g35300	13000
					08-30-94	f1310	1100	g41100	15000
					08-30-94	f1345	1200	g44200	16000
					08-30-94	f1415	1300	g45600	17000

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
212803158000701	3-2800-01	W250-4A	21 28 03 N	158 00 06 W	10-28-93	1450	152	21.5	a18
					01-03-94	1430	150	21.5	16
					03-03-94	c1410	--	--	--
					06-17-94	c1450	--	--	--
					09-08-94	c1430	--	--	--
212828158092001	3-2809-06	TU WAIANAE	21 28 27 N	158 09 20 W	10-29-93	1040	375	22.5	--
					01-03-94	0950	380	22.0	--
					06-14-94	1445	380	23.0	--
					09-09-94	1035	400	22.5	--
212859158124301	3-2812-01	S1	21 28 59 N	158 12 43 W	12-14-93	1440	720	25.0	--
					06-14-94	1220	700	26.0	--
					09-16-94	1340	750	26.5	--

a Chloride, Dissolved (Mg/L as CL)
c Pump off, unable to collect sample
f Collected by non-USGS agency
g Laboratory Specific Conductance

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
			HAWAII, ISLAND OF OAHU--Continued						
212927158014801	3-2901-07	S4	21 29 27 N	158 01 48 W	10-22-93	0955	172	22.0	a18
					01-05-94	0900	172	22.0	18
					03-03-94	0910	170	21.0	18
					06-09-94	0935	160	21.5	18
					09-09-94	1305	180	21.5	19
212945158014301	3-2901-09	W330-6	21 29 45 N	158 01 43 W	10-28-93	1425	192	21.5	a22
					01-04-94	c1425	--	--	--
					03-03-94	1230	192	21.5	21
					06-17-94	1340	192	22.0	21
					09-08-94	h1400	--	--	--
212939158112301	3-2911-02	TU MAKAHA	21 29 39 N	158 11 23 W	10-21-93	0955	258	21.0	a28
					12-14-93	1415	260	21.0	--
					06-14-94	0925	250	21.5	25
					09-16-94	1320	270	21.0	26
213224158135901	3-3213-06	W277-101	21 32 24 N	158 13 59 W	10-21-93	1420	825	24.5	a210
					01-03-94	1055	850	24.0	200
					03-02-94	1145	860	22.5	200
					06-14-94	1350	840	23.5	200
					09-09-94	1120	890	23.0	200
213243157510001	3-3251-01	W406	21 32 43 N	157 51 00 W	10-21-93	0945	920	23.0	a240
					01-05-94	1145	990	23.0	250
					03-04-94	1140	995	23.0	250
					05-20-94	1250	1000	23.0	250
					08-25-94	0950	980	23.5	240
213327157524401	3-3352-01	W405	21 33 27 N	157 52 43 W	10-21-93	1020	255	23.0	a34
					01-05-94	1315	260	22.5	32
					03-04-94	1210	255	23.5	33
					05-20-94	1130	255	23.0	33
					08-25-94	1020	255	23.0	34
213429158055501	3-3405-01	W323-1	21 34 29 N	158 05 55 W	01-04-94	1400	395	22.0	--
					03-03-94	1155	400	22.0	--
					06-24-94	1445	400	22.0	--
213427158055501	3-3405-02	W323-2	21 34 27 N	158 05 55 W	10-28-93	1355	402	22.0	--
					09-08-94	1400	410	22.0	--
213411158074501	3-3407-25	W320	21 34 11 N	158 07 45 W	01-05-94	1100	1600	22.5	--
					06-29-94	1200	1450	22.5	--
					09-08-94	1135	1700	22.5	--
213444158075501	3-3407-30	W318-2	21 34 44 N	158 07 55 W	10-28-93	1315	7000	25.0	a2100
					01-05-94	c1010	--	--	--
					03-09-94	c1045	--	--	--
					06-24-94	1205	6600	24.5	1900
					09-08-94	1015	7000	24.5	2000
213446158104901	3-3410-08	W286	21 34 46 N	158 10 49 W	11-01-93	1100	710	21.5	--
					01-05-94	1445	700	21.5	--
					03-09-94	1330	710	21.5	--
					09-08-94	1115	740	21.5	--
213512158061601	3-3506-03	TO 04 W329 A-B W	21 35 12 N	158 06 16 W	01-05-94	c1015	--	--	--
					03-03-94	c1020	--	--	--
					06-24-94	1150	440	22.0	--
					09-08-94	1000	440	22.5	--

a Chloride, Dissolved (Mg/L as CL)
c Pump off, unable to collect sample
h Pump broken, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF OAHU--Continued					
213636158053701	3-3605-03	W334-C	21 36 36 N	158 05 37 W	10-28-93	1125	1550	21.0	--
					01-05-94	1030	1760	21.0	--
					03-03-94	1055	1710	21.0	--
					06-24-94	1120	1480	21.0	--
					09-08-94	0925	1500	21.0	--
213636158053702	3-3605-21	W334-U	21 36 35 N	158 05 40 W	10-28-93	1140	1280	21.0	--
					01-05-94	1045	1270	21.0	--
					06-24-94	1130	1270	21.0	--
					09-08-94	0940	1300	21.0	--
213656157550401	3-3655-01	W394	21 36 56 N	157 55 04 W	10-21-93	1105	245	21.0	a35
					01-05-94	1340	240	21.5	33
					03-04-94	1230	245	21.5	33
					05-20-94	1050	245	21.5	34
					09-20-94	1030	240	21.5	39
213902157561601	3-3956-04	W366	21 39 02 N	157 56 16 W	10-21-93	1420	360	22.0	a57
					01-05-94	1410	345	22.0	58
					03-10-94	0940	340	22.0	58
					05-20-94	1030	340	22.0	56
					08-25-94	1100	340	22.5	64
214157158000101	3-4100-01	W338	21 41 57 N	158 00 01 W	01-07-94	1250	300	21.5	50
					03-10-94	1310	325	22.5	55
					05-20-94	1010	325	21.0	55
					08-25-94	1245	335	22.0	60
214233157583501	3-4258-04	W345	21 42 33 N	157 58 35 W	10-21-93	1240	1700	24.0	a480
					03-10-94	1350	1550	25.5	460
					05-16-94	1030	1700	24.0	460
					08-25-94	d1220	--	--	--
					09-20-94	1220	2400	25.5	680

a Chloride, Dissolved (Mg/L as CL)
d Well not flowing, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
				HAWAII, ISLAND OF MOLOKAI					
210425156483001	4-0448-02	S8	21 04 25 N	156 48 30 W	10-04-93	1400	380	24.0	a20
					11-15-93	1405	371	24.0	22
					01-03-94	1410	359	24.0	20
					02-07-94	1310	358	23.5	21
					04-04-94	1500	383	24.0	21
					05-31-94	1255	367	24.0	23
					07-18-94	1400	356	23.5	21
					08-25-94	1135	357	24.0	20
210402156495801	4-0449-01	S6	21 04 02 N	156 49 58 W	10-04-93	1430	330	20.5	a60
					11-15-93	1430	315	20.5	a54
					01-03-94	1430	328	20.5	61
					02-07-94	1330	322	20.5	55
					04-04-94	1525	325	20.5	59
					05-31-94	1325	326	20.5	63
					07-18-94	1430	324	20.5	60
					08-25-94	1110	325	20.5	60
210414156565601	4-0456-04	KAWELA PLANTATION	21 04 14 N	156 56 56 W	10-06-93	f0904	400	--	160
					11-01-93	f1459	490	--	100
					12-06-93	f1440	520	--	110
					01-03-94	f1320	470	--	100
					02-08-94	f1025	379	--	73
					03-07-94	f1240	341	--	50
					04-05-94	f0850	213	--	24
					05-02-94	f1445	249	--	32
					06-03-94	f0745	429	--	90
					07-05-94	f1405	540	--	120
					08-25-94	f1305	1050	--	270
210429156565106	4-0456-06	KAWELA PLANTATION	21 04 29 N	156 56 51 W	10-06-93	f0822	295	--	55
					11-01-93	f1019	294	--	54
					12-06-93	f1415	281	--	51
					01-03-94	f1245	287	--	51
					02-08-94	f1016	295	--	54
					03-07-94	f1355	293	--	53
					04-05-94	f0740	278	--	49
					05-02-94	f1440	269	--	48
					06-03-94	f0735	263	--	47
					07-05-94	f1350	266	--	48
					08-25-94	f1300	269	--	49
210419156562108	4-0456-08	KAWELA PLANTATION	21 04 19 N	156 56 21 W	10-06-93	f0835	600	--	140
					10-06-93	f0849	1620	--	440
					11-01-93	f1413	1540	--	400
					12-06-93	f1345	1550	--	410
					01-03-94	f1308	1570	--	420
					02-08-94	f0940	1650	--	430
					03-07-94	f1418	1650	--	440
					04-05-94	f0810	1570	--	410
					05-02-94	f1400	442	--	94
					06-03-94	f0710	420	--	89
					07-05-94	f1315	428	--	93
					08-25-94	f1245	432	--	96
210426156563509	4-0456-09	KAWELA PLANTATION	21 04 26 N	156 56 35 W	10-06-93	f0835	600	--	--
					11-01-93	f1053	580	--	130
					12-06-93	f1400	562	--	130
					01-03-94	f1250	607	--	140
					02-08-94	f1003	617	--	140
					03-07-94	f1403	604	--	140
					04-05-94	f0755	597	--	140
					05-03-94	f1430	593	--	140
					06-03-94	f0730	572	--	130
					07-05-94	f1345	575	--	130
					08-25-94	f1255	589	--	140

a Chloride, Dissolved (Mg/L as CL)
f Collected by non-USGS agency

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
				HAWAII, ISLAND OF MOLOKAI--Continued					
210419156570501	4-0457-01	S4	21 04 19 N	156 57 05 W	10-04-93	1535	375	23.0	a71
					11-15-93	1515	394	23.0	a82
					01-03-94	1525	460	23.0	100
					02-07-94	1455	408	23.0	88
					04-07-94	1455	428	23.0	95
					05-31-94	1420	414	23.0	92
					07-18-94	1525	398	23.0	89
					08-25-94	1015	373	23.0	82
210433156574201	4-0457-04	KAWELA PLANTATION	21 04 33 N	156 57 42 W	10-06-93	f0743	1200	--	320
					11-01-93	f1300	1230	--	300
					12-07-93	f1015	1250	--	320
					01-03-94	f1410	1240	--	320
					02-08-94	f1045	1240	--	320
					03-07-94	f1436	1240	--	320
					04-05-94	f0720	1240	--	320
					05-02-94	f1030	1250	--	320
					06-03-94	f0810	1260	--	320
					07-05-94	f0955	1260	--	320
					08-25-94	f1315	1270	--	320
210605157012001	4-0601-01	W11	21 06 06 N	157 01 11 W	10-07-93	1130	330	24.0	a28
					11-18-93	1040	318	24.0	a27
					01-06-94	1330	245	23.5	14
					02-07-94	1400	252	23.5	14
					04-07-94	1355	192	23.5	11
					06-03-94	0840	258	24.0	13
					07-22-94	1035	299	24.0	20
					08-24-94	1320	315	24.0	22
210856157011201	4-0801-01	W16	21 08 56 N	157 01 12 W	10-15-93	c1400	--	--	--
					11-10-93	c0745	--	--	--
					12-10-93	c0730	--	--	--
					01-13-94	c1330	--	--	--
					02-02-94	c0745	--	--	--
					03-02-94	c0700	--	--	--
					04-01-94	c0700	--	--	--
					05-03-94	c0930	--	--	--
					06-23-94	c0915	--	--	--
					07-11-94	c0800	--	--	--
					08-01-94	c0800	--	--	--
					09-01-94	c0800	--	--	--
210857156010701	4-0801-02		21 08 57 N	157 01 07 W	10-15-93	f1400	387	--	a78
					11-10-93	f0745	393	--	a81
					12-10-93	f0730	399	--	85
					01-13-94	f1330	388	--	82
					02-02-94	f0745	394	--	84
					03-02-94	f0810	395	--	86
					04-01-94	f0700	393	--	81
					05-03-94	f1000	394	--	83
					06-23-94	f0900	384	--	82
					07-11-94	f0815	388	--	83
					08-04-94	f0845	388	--	84
					09-13-94	f1100	389	--	84
210903157013001	4-0901-01	W17	21 09 03 N	157 01 30 W	11-01-93	f0930	240	--	42
					12-01-93	f0830	238	--	42
					01-07-94	f0800	325	--	66
					01-31-94	f0900	251	--	45
					03-31-94	f1015	298	--	56
					05-03-94	f0840	291	--	52
					07-01-94	f0930	281	--	52
					07-27-94	f0930	281	--	52
					08-31-94	f0930	281	--	53
					09-30-94	f0930	280	--	53

a Chloride, Dissolved (Mg/L as CL)
c Pump broken, unable to collect sample
f Collected by non-USGS agency

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
				HAWAII, ISLAND OF MAUI					
203835156065001	6-3806-01	PUNAHOU SPRINGS	20 38 35 N	156 06 50 W	10-21-93	b1425	--	--	--
					12-07-93	b0945	--	--	--
					01-12-94	b1440	--	--	--
					02-23-94	b1420	--	--	--
					04-15-94	1515	641	19.5	150
					05-17-94	1015	616	20.0	150
					07-06-94	b1020	--	--	--
					09-01-94	b1050	--	--	--
203947156261201	6-3926-03	WAILEA 8	20 39 47 N	156 26 13 W	10-26-93	c1145	--	--	--
					12-13-93	c1125	--	--	--
					01-18-94	c1130	--	--	--
					03-04-94	c1200	--	--	--
					05-02-94	c1205	--	--	--
					06-14-94	h1230	--	--	--
					08-03-94	h1445	--	--	--
204601156001501	6-4600-01	W55	20 46 01 N	156 00 15 W	10-20-93	b1030	--	--	--
					12-07-93	b1330	--	--	--
					01-12-94	b0915	--	--	--
					02-23-94	0850	320	--	60
					04-14-94	1515	360	22.0	46
					05-18-94	0755	355	22.0	46
					07-06-94	1345	356	22.0	50
					09-02-94	b0915	--	--	--
204633156003201	6-4600-03	WAKIU B	20 46 36 N	156 00 30 W	10-20-93	1010	225	20.0	a41
					12-08-93	0800	142	19.0	20
					01-12-94	0900	142	19.5	20
					02-23-94	0835	130	19.0	16
					04-15-94	0830	125	19.0	12
					05-18-94	0820	123	20.0	12
					07-06-94	1400	192	22.0	35
					09-02-94	0945	149	19.5	25
204635156270101	6-4627-14	W226	20 46 35 N	156 27 01 W	10-26-93	1355	1640	23.0	a260
					01-18-94	1230	1630	23.0	260
					05-02-94	1340	1630	23.5	270
					08-03-94	1225	1620	23.0	260
204845156255001	6-4825-01	S15	20 48 45 N	156 25 50 W	11-08-93	b1055	--	--	--
					12-10-93	b1025	--	--	--
					03-17-94	b1400	--	--	--
					05-05-94	b1010	--	--	--
					06-17-94	b1045	--	--	--
					08-18-94	1420	1220	23.5	--
204931156371201	6-4937-01	S10	20 49 31 N	156 37 12 W	11-01-93	b1240	--	--	--
					12-15-93	b1240	--	--	--
					01-26-94	b1300	--	--	--
					03-11-94	b1140	--	--	--
					05-02-94	b1010	--	--	--
					08-04-94	b1115	--	--	--
205014156212701	6-5021-01	PUKALANI	20 50 14 N	156 21 27 W	10-28-93	b1445	--	--	--
					11-04-93	b0930	--	--	--
					11-29-93	b0930	--	--	--
					12-03-93	f0800	2170	--	610
					12-30-93	f0730	2200	--	610
					01-19-94	f1130	2200	--	610
					03-09-94	f1300	2200	--	610
					04-19-94	b1400	--	--	--
					06-16-94	b1330	--	--	--
					08-02-94	b1000	--	--	--

a Chloride, Dissolved (Mg/L as CL)
b Pump off, unable to collect sample
c Pump broken, unable to collect sample
f Collected by non-USGS agency
h Pipes were redone after pump repair. No sampling point, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF MAUI--Continued					
205102156282501	6-5128-02	S16	20 51 02 N	156 28 25 W	11-08-93	b1030	--	--	--
					12-10-93	b1010	--	--	--
					03-17-94	b1340	--	--	--
					05-05-94	b0950	--	--	--
					06-17-94	b1005	--	--	--
					08-18-94	1400	659	23.5	--
205243156243201	6-5224-02	S22	20 52 43 N	156 24 32 W	11-08-93	b1250	--	--	--
					11-10-93	b1410	--	--	--
					12-10-93	b1320	--	--	--
					03-22-94	b1405	--	--	--
					05-05-94	b1230	--	--	--
					06-17-94	b1120	--	--	--
					08-18-94	1450	1320	23.5	260
205255156404401	6-5240-01	S7	20 52 55 N	156 40 44 W	12-02-93	1035	1020	29.0	--
205227156401701	6-5240-03	S9	20 52 27 N	156 40 17 W	12-02-93	1050	1980	24.0	460
					05-12-94	1020	2100	24.5	470
205329156305502	6-5330-09	W15A	20 53 29 N	156 30 55 W	11-01-93	1430	640	22.0	a130
					12-15-93	0950	657	22.0	140
					01-19-94	b1410	--	--	--
					03-03-94	b1400	--	--	--
					05-02-94	b1250	--	--	--
					06-17-94	0910	658	22.5	140
					08-10-94	0950	938	22.0	220
205329156305501	6-5330-10	W15B	20 53 29 N	156 30 55 W	11-01-93	b1500	--	--	--
					12-15-93	b0955	--	--	--
					01-19-94	1415	507	22.0	93
					03-03-94	1410	330	22.0	55
					05-02-94	1245	495	22.0	89
					06-17-94	b0915	--	--	--
					08-10-94	0945	332	22.0	46
205330156305401	6-5330-11	W15F	20 53 30 N	156 30 54 W	11-01-93	1440	477	22.5	a82
					12-15-93	1000	466	22.0	80
					01-19-94	c1420	--	--	--
					03-03-94	1405	480	23.0	92
					05-02-94	b1255	--	--	--
					06-17-94	b0920	--	--	--
					08-10-94	0955	429	22.5	68
205322156394501	6-5339-01	W291	20 53 22 N	156 39 45 W	10-25-93	1050	539	22.0	--
					12-14-93	b0935	--	--	--
					01-18-94	b0945	--	--	--
					03-04-94	b1020	--	--	--
					04-29-94	1040	600	22.0	99
					06-14-94	b1030	--	--	--
					08-03-94	b1205	--	--	--
205320156394501	6-5339-02	W292	20 53 20 N	156 39 45 W	10-25-93	1045	552	21.5	a73
					12-14-93	b0930	--	--	--
					01-18-94	b0950	--	--	--
					03-04-94	b1025	--	--	--
					04-29-94	b1050	--	--	--
					06-14-94	1025	691	21.0	140
					08-03-94	1200	642	21.0	120
205343156401101	6-5340-01	S5	20 53 43 N	156 40 11 W	10-25-93	b1105	--	--	--
					12-02-93	0950	950	22.0	160
					12-14-93	1010	1160	21.5	270
					01-18-94	1040	1240	21.5	290
					02-23-94	0950	733	22.0	99
					03-04-94	1055	871	22.0	180
					04-29-94	b1050	--	--	--
					05-12-94	0840	651	21.5	140
					06-14-94	1055	915	21.5	200
					08-03-94	b1225	--	--	--

a Chloride, Dissolved (Mg/L as CL)
b Pump off, unable to collect sample
c Pump broken, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
				HAWAII, ISLAND OF MAUI--Continued					
205324156405701	6-5341-01	S6	20 53 23 N	156 41 01 W	12-02-93	1130	1890	25.5	440
					02-23-94	1010	1880	25.0	450
					05-12-94	1005	1750	25.5	380
205416156244301	6-5424-01	S24	20 54 16 N	156 24 43 W	11-08-93	b1245	--	--	--
					12-10-93	b1310	--	--	--
					03-22-94	b1415	--	--	--
					05-05-94	b1220	--	--	--
					06-17-94	b1130	--	--	--
					08-18-94	b1500	--	--	--

STATION NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	SPECIFIC CONDUCTANCE (US/CM)	CHLORIDE, (MG/L AS CL)
205405156305401	6-5430-05 WAIEHU MONITOR	20 54 59 N	156 30 54 W	11-18-93	0945	200	207	11
				11-18-93	1014	400	447	100
				11-18-93	1035	500	440	99
				11-18-93	1105	600	524	120
				11-18-93	1130	675	2260	700
				11-18-93	1205	750	22800	8500
				11-18-93	1240	800	45100	17000
				11-18-93	1310	825	47700	18000
				11-18-93	1335	850	48500	18000
				11-18-93	1410	900	49400	19000
				03-21-94	0930	200	213	12
				03-21-94	0950	400	428	94
				03-21-94	1010	500	440	97
				03-21-94	1035	600	542	130
				03-21-94	1100	675	2280	630
				03-21-94	1125	750	25400	9200
				03-21-94	1155	800	46300	17000
				03-21-94	1225	825	48700	18000
				03-21-94	1255	850	49300	19000
				03-21-94	1325	900	50200	19000
				06-24-94	1010	200	207	11
				06-24-94	1030	400	207	12
				06-24-94	1055	500	488	110
				06-24-94	1125	600	598	140
				06-24-94	1150	675	2530	720
				06-24-94	1215	750	26700	9500
				06-24-94	1245	800	47000	17000
				06-24-94	1315	825	49400	18000
				06-24-94	1345	850	49800	18000
				06-24-94	1415	900	50400	20000
				09-20-94	0945	200	210	11
				09-20-94	1005	400	208	11
				09-20-94	1020	500	456	100
				09-20-94	1040	600	558	130
				09-20-94	1110	675	2330	650
				09-20-94	1140	750	28300	11000
				09-20-94	1205	800	46500	17000
				09-20-94	1235	825	48900	18000
				09-20-94	1300	850	49400	18000
				09-20-94	1330	900	50100	19000

b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
				HAWAII, ISLAND OF MAUI--Continued					
205511156222101	6-5522-01	S31	20 55 11 N	156 22 21 W	11-08-93	b1235	--	--	--
					12-10-93	b1300	--	--	--
					03-22-94	b1225	--	--	--
					05-05-94	b1210	--	--	--
					06-17-94	b1140	--	--	--
					08-18-94	1510	1230	22.0	260
205651156401001	6-5640-01	S36	20 56 51 N	156 40 10 W	10-25-93	b1105	--	--	--
					12-02-93	0915	231	20.0	42
					12-14-93	b1040	--	--	--
					01-18-94	b0935	--	--	--
					02-23-94	0910	414	20.5	63
					03-04-94	b1130	--	--	--
					04-29-94	b1145	--	--	--
					05-12-94	0920	270	20.0	49
					06-14-94	b1115	--	--	--
					08-03-94	b1300	--	--	--
205635156413101	6-5641-01	S3	20 56 35 N	156 41 31 W	12-02-93	1020	2800	26.0	740
					02-23-94	0930	2760	25.5	730
					05-12-94	0945	2730	26.0	710
205837156384601	6-5838-01	NAPILI A	20 58 37 N	156 38 46 W	11-01-93	b0950	--	--	--
					12-14-93	b1155	--	--	--
					01-18-94	b1225	--	--	--
					03-04-94	b1310	--	--	--
					04-29-94	b1205	--	--	--
					06-14-94	b1230	--	--	--
					08-03-94	b1330	--	--	--
205838156383101	6-5838-02	NAPILI B	20 58 38 N	156 38 31 W	11-01-93	b0955	--	--	--
					12-14-93	1200	326	19.5	65
					01-18-94	b1230	--	--	--
					03-04-94	1325	332	20.0	69
					04-29-94	1220	406	20.0	88
					06-14-94	1245	404	19.5	88
					08-03-94	1340	400	20.0	88
205848156383601	6-5838-04	NAPILI	20 58 48 N	156 38 36 W	11-01-93	1000	850	20.5	a200
					12-14-93	1235	855	20.0	210
					03-04-94	1345	820	20.5	210
					06-14-94	1250	808	20.0	200
					08-03-94	1400	817	20.0	200

a Chloride, Dissolved (Mg/L as CL)
b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
			HAWAII, ISLAND OF HAWAII						
190347155354301	8-0335-01	NAALEHU W1	19 03 47 N	155 35 43 W	10-07-93	b1250	--	--	--
					12-08-93	b1240	--	--	--
					02-16-94	b1230	--	--	--
					04-26-94	b1255	--	--	--
					07-06-94	b1150	--	--	--
					09-06-94	b1200	--	--	--
190602155325901	8-0632-01	W10-1	19 06 02 N	155 32 59 W	10-07-93	b1225	--	--	--
					12-08-93	b1200	--	--	--
					02-22-94	b1255	--	--	--
					04-26-94	b1230	--	--	--
					07-06-94	b1140	--	--	--
					09-06-94	b1135	--	--	--
190832155310801	8-0831-01	NINOLE TH1	19 08 32 N	155 31 08 W	12-08-93	b1125	--	--	--
					04-26-94	b1210	--	--	--
					07-06-94	b1115	--	--	--
190832155310901	8-0831-02	NINOLE A	19 08 32 N	155 31 09 W	10-07-93	1130	790	18.5	200
					12-08-93	1120	760	18.5	190
					02-16-94	1130	740	18.0	180
					04-26-94	b1210	--	--	--
					07-06-94	b1115	--	--	--
191108155281701	8-1128-02	PALIMA	19 11 08 N	155 28 17 W	10-07-93	b1025	--	--	--
					12-08-93	b1025	--	--	--
					02-16-94	b1045	--	--	--
					04-26-94	1055	128	19.0	12
					07-06-94	b1050	--	--	--
					09-06-94	b1035	--	--	--
191114155294801	8-1129-01		19 11 14 N	155 29 48 W	10-07-93	b1055	--	--	--
					12-08-93	1050	98	18.0	4.2
					02-16-94	b1110	--	--	--
					04-26-94	1120	96	18.0	4.3
					07-06-94	1000	98	18.0	4.0
					09-06-94	b1100	--	--	--
191219155291601	8-1229-01	PAHALA	19 12 25 N	155 29 22 W	10-07-93	b1010	--	--	--
					12-08-93	1010	98	17.5	3.3
					02-16-94	1025	98	17.5	3.4
					04-26-94	b1025	--	--	--
					07-06-94	0945	98	17.5	4.0
					09-06-94	b1020	--	--	--
192456154571901	8-2487-01	W9-7	19 24 57 N	154 57 18 W	12-02-93	b1325	--	--	--
					03-01-94	b1245	--	--	--
					04-21-94	b1325	--	--	--
					06-24-94	b1120	--	--	--
					09-06-94	b1550	--	--	--
192457154571801	8-2487-02	KEAUOHANA2	19 24 57 N	154 57 18 W	12-02-93	b1325	--	--	--
					03-01-94	b1245	--	--	--
					04-21-94	b1335	--	--	--
					06-24-94	b1125	--	--	--
					09-06-94	b1550	--	--	--
192646155532001	8-2653-01	KEEI C	19 26 46 N	155 53 20 W	10-07-93	1400	365	19.5	72
					12-08-93	1400	370	19.5	74
					02-16-94	1330	395	19.5	79
					04-29-94	1155	395	19.5	80
					07-05-94	1355	395	19.5	78
					09-08-94	1305	395	19.5	78

b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENT-I-FIER	LAT-I-TUDE	LONG-I-TUDE	DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)
			HAWAII, ISLAND OF HAWAII--Continued						
192738155534201	8-2753-01	W12-4	19 27 31 N	155 53 41 W	10-07-93	b1435	--	--	--
					12-08-93	b1430	--	--	--
					02-16-94	1350	695	19.5	160
					04-29-94	1240	855	19.5	210
					07-05-94	1330	750	19.5	180
					09-08-94	b1230	--	--	--
192731155534101	8-2753-02	W12-8	19 27 22 N	155 53 38 W	10-07-93	b1450	--	--	--
					12-08-93	1440	1310	19.5	350
					02-16-94	b1455	--	--	--
					04-29-94	b1220	--	--	--
					07-05-94	1340	1290	19.5	340
					09-08-94	1245	1300	19.5	330
192924154564701	8-2986-01	W9-5B	19 29 24 N	154 56 47 W	12-01-93	1305	130	23.0	8.3
					03-01-94	b1100	--	--	--
					04-21-94	1355	130	23.0	6.4
					06-24-94	1030	127	23.5	6.0
					09-07-94	b1500	--	--	--
192923154564701	8-2986-02	W9-5A	19 29 23 N	154 56 47 W	12-01-93	b1250	--	--	--
					03-01-94	b1040	--	--	--
					04-21-94	b1415	--	--	--
					06-24-94	b1050	--	--	--
					09-07-94	1450	128	23.0	11
193017154502101	8-3080-02	S9	19 30 17 N	154 50 21 W	12-02-93	1425	1100	25.5	170
					03-01-94	1130	1130	25.0	180
					04-21-94	b1220	--	--	--
					06-24-94	b1200	--	--	--
					09-06-94	b1435	--	--	--
193113154555801	8-3185-01	W9-11 HAWN SHOR	19 31 13 N	154 55 58 W	12-02-93	1515	128	21.5	13
					04-21-94	1120	121	20.0	13
					06-24-94	1305	121	21.5	14
					09-07-94	b1415	--	--	--
193339154594801	8-3389-01	W9-4	19 33 39 N	154 59 48 W	12-02-93	b1235	--	--	--
					03-01-94	b1355	--	--	--
					04-26-94	b1545	--	--	--
					05-05-94	b1615	--	--	--
					06-24-94	b1400	--	--	--
					09-07-94	b0955	--	--	--
193510155570801	8-3557-01	W12-5	19 35 10 N	155 57 08 W	10-13-93	b1350	--	--	--
					12-07-93	1230	500	20.0	110
					02-10-94	1335	440	20.0	88
					04-28-94	1230	410	19.0	80
					04-29-94	1345	410	20.0	86
					07-05-94	1225	518	20.5	98
					09-08-94	1405	385	20.5	89
193505155570801	8-3557-02	W12-6	19 35 05 N	155 57 08 W	10-13-93	1445	850	20.5	200
					12-07-93	1245	900	20.0	220
					02-10-94	1350	910	20.5	220
					04-28-94	1255	940	18.5	220
					04-29-94	1330	880	20.0	220
					07-05-94	1245	900	20.5	220
					09-08-94	1345	940	20.5	230
193508155570701	8-3557-03	KAHALUU C	19 35 08 N	155 57 07 W	10-13-93	b1400	--	--	--
					10-13-93	1420	245	20.5	37
					12-07-93	1220	410	20.0	85
					02-10-94	1320	382	20.5	76
					04-28-94	1220	338	20.0	64
					07-05-94	1220	415	20.5	78
					09-08-94	1355	365	20.5	72

b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
193505155570701	8-3557-04	KAHALUU D	19 35 05 N	155 57 07 W	10-13-93	1515	480	20.5	100
					12-07-93	1305	475	20.5	100
					02-10-94	1410	300	20.5	100
					04-28-94	1245	520	18.0	110
					04-29-94	1320	500	20.5	110
					07-05-94	1235	520	20.5	110
					09-08-94	1340	525	20.5	120
193805155020201	8-3802-03	KEAAU 1	19 38 05 N	155 02 02 W	12-20-93	1140	78	19.0	3.6
					02-24-94	1430	84	19.0	3.4
					04-21-94	1455	80	19.0	3.8
					06-24-94	1435	80	19.0	4.0
					09-07-94	b1025	--	--	--
194037155035301	8-4003-01	W8-3	19 40 37 N	155 03 53 W	12-20-93	1000	80	20.0	4.2
					02-24-94	1450	82	20.0	4.3
					04-21-94	1515	83	20.0	4.8
					06-24-94	1520	85	20.5	5.0
					09-07-94	1315	85	20.5	5.0
194040155035201	8-4003-02	PANAEWA 2	19 40 40 N	155 03 52 W	02-24-94	1500	80	20.0	--
					04-21-94	1520	82	20.0	--
					06-24-94	1530	87	20.0	--
					09-07-94	1320	85	20.0	--
194039155035601	8-4003-03	PANAEWA 3	19 40 32 N	155 03 54 W	02-24-94	b1505	--	--	--
					04-21-94	1530	82	20.0	--
					06-24-94	b1535	--	--	--
					09-07-94	1325	84	20.5	--
194222155035101	8-4203-04	W8-2	19 42 22 N	155 03 51 W	12-20-93	b1100	--	--	--
					02-15-94	b1600	--	--	--
					04-21-94	b1600	--	--	--
					06-24-94	b1455	--	--	--
					09-07-94	b1245	--	--	--
194222155034801	8-4203-06	W8-2B	19 42 22 N	155 03 48 W	12-20-93	1110	121	25.0	15
					02-15-94	1610	112	24.5	12
					04-21-94	1610	108	24.5	11
					06-24-94	1505	108	23.0	10
					09-07-94	1255	100	24.0	4.0
194337155041801	8-4304-01	WAIAKEA DUG WELL	19 43 37 N	155 04 18 W	12-20-93	1310	5600	20.5	1600
					02-15-94	1525	4620	20.0	1300
					05-10-94	0925	590	20.5	150
					06-24-94	1605	1350	21.0	360
					08-30-94	1600	39000	21.0	13000
194818155582301	8-4858-02	KONA VILLAGE	19 48 18 N	155 58 23 W	10-13-93	1150	2450	21.0	490
					12-07-93	1430	2390	20.5	490
					02-10-94	b1215	--	--	--
					04-29-94	1445	2350	21.0	480
					07-05-94	1035	2270	21.0	480
					09-13-94	1410	2400	21.0	490
194820155582401	8-4858-03	KONA VILLAGE 3	19 48 20 N	155 58 24 W	10-13-93	b1150	--	--	--
					12-07-93	b1430	--	--	--
					02-10-94	b1215	--	--	--
					04-29-94	b1445	--	--	--
					07-05-94	b1035	--	--	--
					09-13-94	b1410	--	--	--
195035155054501	8-5005-01	W7-1	19 50 35 N	155 05 45 W	12-20-93	1400	190	21.5	13
					02-07-94	1415	203	22.0	13
					05-05-94	1425	208	22.0	14
					06-24-94	1645	205	21.0	14
					08-30-94	1510	197	22.0	13

b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
			HAWAII, ISLAND OF HAWAII--Continued						
195043155053801	8-5005-02	MAKAI	19 50 43 N	155 05 38 W	12-20-93	1345	182	22.5	13
					02-07-94	1405	192	22.5	14
					05-05-94	1410	192	22.5	14
					06-24-94	1635	208	22.5	18
					08-30-94	1505	190	23.0	14
195049155051601	8-5005-04	SALT WTR 2	19 50 49 N	155 05 16 W	12-20-93	1410	20200	18.0	6700
					02-07-94	1610	20800	17.5	6700
					05-05-94	1450	20000	18.0	7000
					06-24-94	1700	20000	18.0	6800
					08-30-94	1525	20000	18.0	6800
195546155462001	8-5546-01	WAIKOLOA WATER	19 55 46 N	155 46 20 W	12-16-93	1305	630	27.5	110
					05-10-94	1400	590	28.5	100
					07-01-94	b1340	--	--	--
					09-13-94	1255	595	28.5	100
195546155480301	8-5548-01	PARKER 1	19 55 46 N	155 48 03 W	10-06-93	b1055	--	--	--
					12-16-93	b1120	--	--	--
					02-15-94	b1135	--	--	--
					05-10-94	b1430	--	--	--
					07-01-94	b1410	--	--	--
					09-13-94	b1055	--	--	--
195724155455301	8-5745-01	PARKER 5	19 57 24 N	155 45 53 W	10-06-93	b1120	--	--	--
					12-16-93	1240	290	27.0	26
					02-15-94	b1225	--	--	--
					05-10-94	1330	295	27.0	28
					07-01-94	1315	300	26.5	27
					09-13-94	1200	295	27.0	27
195722155455201	8-5745-02	PARKER 4	19 57 22 N	155 45 52 W	10-06-93	b1150	--	--	--
					12-16-93	b1220	--	--	--
					02-15-94	b1250	--	--	--
					05-10-94	b1305	--	--	--
					07-01-94	1245	310	26.5	29
					09-13-94	b1230	--	--	--
195728155455401	8-5745-03	WAIKOLOA WELL 1	19 57 28 N	155 45 54 W	10-06-93	1130	285	27.0	26
					12-16-93	1230	282	26.5	25
					02-15-94	1235	288	26.5	25
					05-10-94	1315	282	26.5	26
					07-01-94	1300	290	27.0	26
					09-13-94	1215	278	27.0	26
195857155142301	8-5814-01	LAUPAHOEHO	19 58 57 N	155 14 23 W	10-05-93	b1100	--	--	--
					12-20-93	b1450	--	--	--
					02-07-94	b1500	--	--	--
					05-10-94	b1030	--	--	--
					06-28-94	b1015	--	--	--
					08-30-94	1425	319	20.0	--
195929155462501	8-5946-01	LALAMILO A	19 59 30 N	155 46 30 W	10-05-93	1350	540	26.5	97
					11-23-93	1325	540	26.5	98
					02-14-94	b1335	--	--	--
					04-22-94	b1210	--	--	--
					06-28-94	b1405	--	--	--
					08-29-94	1245	500	26.5	99
195912155464201	8-5946-02	LALAMILO B	19 59 14 N	155 46 39 W	10-05-93	b1410	--	--	--
					11-23-93	b1410	--	--	--
					02-14-94	b1305	--	--	--
					04-22-94	1225	352	26.0	48
					06-28-94	1355	359	27.0	48
					08-29-94	b1325	--	--	--

b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

STATION NUMBER	LOCAL NUMBER	LOCAL IDENTIFIER	LATITUDE	LONGITUDE	DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	CHLORIDE, (MG/L AS CL)
HAWAII, ISLAND OF HAWAII--Continued									
195939155464201	8-5946-03	LALAMILO C	19 59 34 N	155 46 45 W	10-05-93	1320	570	28.0	110
					11-23-93	1355	580	26.0	110
					02-14-94	1315	575	26.0	110
					04-22-94	1200	560	26.0	110
					06-28-94	1415	560	26.5	100
					08-29-94	1300	545	26.0	110
195953155464701	8-5946-04	LALAMILO D	19 59 53 N	155 46 47 W	06-28-94	1430	540	26.0	110
					08-29-94	1315	540	26.5	100
195947155485801	8-5948-01	HAPUNA PRK	19 59 47 N	155 48 58 W	10-05-93	1445	1920	26.0	490
					11-24-93	1350	1800	26.0	480
					02-14-94	1430	1880	25.5	490
					05-03-94	1330	1910	25.5	510
					06-28-94	1325	1920	26.0	500
					08-29-94	1400	1900	26.0	500
200132155471101	8-6147-01	W16	20 01 32 N	155 47 11 W	10-06-93	b1520	--	--	--
					11-24-93	b1455	--	--	--
					02-14-94	b1215	--	--	--
					05-03-94	b1250	--	--	--
					06-28-94	b1155	--	--	--
					08-31-94	b1300	--	--	--
200122155480901	8-6148-01	W14	20 01 22 N	155 48 09 W	10-05-93	b1530	--	--	--
					11-24-93	b1440	--	--	--
					02-14-94	b1235	--	--	--
					04-22-94	b1115	--	--	--
					06-28-94	b1210	--	--	--
					08-30-94	b1230	--	--	--
200121155480801	8-6148-02	W14B	20 01 21 N	155 48 08 W	10-05-93	b1530	--	--	--
					11-24-93	b1440	--	--	--
					02-14-94	b1235	--	--	--
					04-22-94	b1115	--	--	--
					06-28-94	b1210	--	--	--
					08-30-94	b1230	--	--	--
201406155454401	8-7445-01	KAPAMAIA	20 14 06 N	155 45 44 W	06-13-94	b1315	--	--	--
201603155521801	8-7652-01	S1 WAIKANE	20 16 03 N	155 52 18 W	10-06-93	1400	2200	21.5	580
					11-24-93	1230	2120	21.0	560
					02-24-94	1115	2240	21.0	580
					05-05-94	b1145	--	--	--
					06-13-94	1140	2200	21.5	590
					08-30-94	1100	2180	22.0	580

b Pump off, unable to collect sample

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU

213345158095301 - 3-3309-01 KAWAIHAPAI EXPLORATORY WELL (LAT 21°33'45" LONG 158°09'53")

DATE	TIME	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE (US/CM)	PH WATER WHOLE LAB (STANDARD UNITS)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT
JUN 17...	0936	917	529	7.5	22.0	0.20	160	26	23	34	31

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
JUN 17...	1	2.6	95	16	91	0.20	60	334	310	0.45

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
JUN 17...	<10	<10	<1	<100	5	<10	<1	2	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)
JUN 17...	4	<10	12	<1	<10	<4	<10	<1	<0.10	<1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
JUN 17...	<10	<1	<1	<1	<1	<1	<1.0	180	22	<10

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF OAHU--Continued

213345158091001 - 3-3309-02 MOKULEIA EXPLORATORY WELL (LAT 21°33'45" LONG 158°09'01")

DATE	TIME	FLOW RATE, INSTAN-TANEOUS (G/M)	SPE-CIFIC CON-DUCT-ANCE (US/CM)	PH WATER WHOLE LAB (STAND-ARD UNITS)	TEMPER-ATURE WATER (DEG C)	TUR-BID-ITY (NTU)	HARD-NESS TOTAL (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)
AUG 05...	1355	201	906	7.3	24.0	0.30	230	42	31	77

DATE	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	ALKA-LINITY LAB (MG/L AS CACO3)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)
AUG 05...	41	2	5.0	106	25	200	0.10	62	577	506

DATE	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	ALUM-INUM, TOTAL RECOV-ERABLE (UG/L AS AL)	ALUM-INUM, DIS-SOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	COBALT, TOTAL RECOV-ERABLE (UG/L AS CO)
AUG 05...	0.78	<10	<10	<1	<100	11	<10	<1	2	<1

DATE	COBALT, DIS-SOLVED (UG/L AS CO)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)
AUG 05...	<3	2	50	22	<1	<10	<4	<10	2	<0.10

DATE	MOLYB-DENUM, TOTAL RECOV-ERABLE (UG/L AS MO)	MOLYB-DENUM, DIS-SOLVED (UG/L AS MO)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	SILVER, TOTAL RECOV-ERABLE (UG/L AS AG)	SILVER, DIS-SOLVED (UG/L AS AG)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	VANA-DIUM, DIS-SOLVED (UG/L AS V)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)
AUG 05...	<1	<10	<1	<1	<1	<1	<1.0	320	17	40

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF MAUI

204900156063201 - BIG SPRINGS NEAR NAHIKU (LAT 20°49'00" LONG 156°06'32")

DATE	TIME	SPECIFIC CONDUCTANCE (US/CM)	TEMPERATURE WATER (DEG C)	TRITIUM TOTAL (PCI/L)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L)
FEB					
24...	1000	234	15.5	7.8	0.9
JUN					
14...	1630	230	15.0	8.0	1.0

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF HAWAII

193502155572301 - 8-3557-05 KAHALUU SHAFT (LAT 19°35'02" LONG 155°57'23")

DATE	TIME	SPE-CIFIC CON-DUCT-ANCE (US/CM)	TEMPER-ATURE WATER (DEG C)	CHLO-RIDE, (MG/L AS CL)	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL	TRITIUM TOTAL (PCI/L)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L)
OCT							
13...	1555	980	20.0	240	--	--	--
NOV							
04...	1040	1040	20.0	250	--	--	--
DEC							
07...	1325	990	20.0	250	--	--	--
JAN							
03...	1010	1240	20.0	310	--	--	--
FEB							
10...	1430	1050	20.0	260	--	--	--
14...	0900	--	--	--	-5.05	2.0	1.0
14...	0905	--	--	--	-5.02	3.0	1.0
14...	0925	--	--	--	-5.15	3.0	1.0
JUN							
02...	1040	1160	20.0	300	--	--	--
AUG							
11...	1020	1210	20.5	320	--	--	--

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF HAWAII--Continued

194222155583701 - 8-4258-03 HUALALAI EXPLORATORY WELL, NORTH KONA (LAT 19°42'22" LONG 155°58'37")

DATE	TIME	SAMPLE DEPTH DISTANCE BELOW MSL FEET	FLOW RATE, INSTANTANEOUS (G/M)	SPECIFIC CONDUCTANCE LAB (US/CM)	TEMPERATURE WATER (DEG C)	TURBIDITY (NTU)	HARDNESS TOTAL (MG/L AS CACO3)	CALCIUM DISSOLVED (MG/L AS CA)	MAGNESIUM, DISSOLVED (MG/L AS MG)	SODIUM, DISSOLVED (MG/L AS NA)	SODIUM PERCENT
OCT 14...	1345	1820	1020	237	21.0	0.20	53	8.7	7.7	26	49

DATE	SODIUM ADSORPTION RATIO	POTASSIUM, DISSOLVED (MG/L AS K)	ALKALINITY LAB (MG/L AS CACO3)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DISSOLVED (MG/L)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)
OCT 14...	2	3.6	79	25	7.4	0.50	49	171	175	0.23

DATE	ALUMINUM, TOTAL RECOVERABLE (UG/L AS AL)	ALUMINUM, DISSOLVED (UG/L AS AL)	ARSENIC TOTAL (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	COBALT, TOTAL RECOVERABLE (UG/L AS CO)	COBALT, DISSOLVED (UG/L AS CO)
OCT 14...	<10	<10	<1	<100	5	<10	<1	<1	<1	<3

DATE	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LITHIUM TOTAL RECOVERABLE (UG/L AS LI)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, TOTAL RECOVERABLE (UG/L AS MN)	MANGANESE, DISSOLVED (UG/L AS MN)	MERCURY TOTAL RECOVERABLE (UG/L AS HG)	MOLYBDENUM, TOTAL RECOVERABLE (UG/L AS MO)
OCT 14...	<1	50	10	<1	<10	<4	<10	3	<0.10	<1

DATE	MOLYBDENUM, DISSOLVED (UG/L AS MO)	NICKEL, TOTAL RECOVERABLE (UG/L AS NI)	NICKEL, DISSOLVED (UG/L AS NI)	SELENIUM, TOTAL (UG/L AS SE)	SELENIUM, DISSOLVED (UG/L AS SE)	SILVER, TOTAL RECOVERABLE (UG/L AS AG)	SILVER, DISSOLVED (UG/L AS AG)	STRONTIUM, DISSOLVED (UG/L AS SR)	VANADIUM, DISSOLVED (UG/L AS V)	ZINC, TOTAL RECOVERABLE (UG/L AS ZN)
OCT 14...	<10	2	<1	<1	1	<1	<1.0	24	89	<10

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

WATER QUALITY DATA, WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994

HAWAII, ISLAND OF HAWAII--Continued

194515155590301 - 8-4559-01 KALAOA WELL (LAT 19°45'15" LONG 155°59'03")

DATE	TIME	O-18 / O-16 STABLE ISOTOPE RATIO PER MIL (82085)	TRITIUM TOTAL (PCI/L) (07000)	TRITIUM 2 SIGMA WATER, WHOLE, TOTAL (PCI/L) (75985)
FEB 14...	1025	-6.55	<1.0	1.0

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

HAWAII, ISLAND OF KAUAI

220523159341201. State Key Number 1042.0 Waialae Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service accumulation raingage, with a custom-made reduced 1 to 2 ratio raingage catchment. Elevation of gage is 4,000 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Jul. 07 to Oct. 05	16.4
Oct. 05 to Jan. 06	24.4
Jan. 06 to Apr. 05	27.0
Apr. 05 to Aug. 09	18.0
Aug. 09 to Nov. 14	41.6

220504159321401. State Key Number 1045.0 Waialeale trail Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service accumulation raingage, with a custom-made 1 to 2 reduced ratio raingage catchment. Elevation of gage is 4,560 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Jul. 07 to Oct. 05	30.2
Oct. 05 to Jan. 06	59.6
Jan. 06 to Aug. 09	67.0
Aug. 09 to Dec. 28	68.4

HAWAII, ISLAND OF KAUAI--Continued

220427159300201. State Key Number 1047.0 Mount Waialeale Raingage near Lihue, Kauai.

LOCATION.--Lat 22°04'27", long 159°30'02", Hydrologic Unit 20070000, 9.2 mi south of Hanalei Bay and 11.6 mi west of Kapaa Beach Park.

PERIOD OF RECORD.--1910 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Custom-made 1 to 10 ratio accumulation raingage with a 300 inch capacity. Tipping-bucket raingage with a recorder. Elevation of gage is 5,150 feet from topographic map.

REMARKS.--Records poor. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.15	---	---	---	---	---	---	---	---	---	7.88
2	---	.15	---	---	---	---	---	---	---	---	---	1.22
3	---	.27	---	---	---	---	---	---	---	---	---	8.30
4	---	3.06	---	---	---	---	---	---	---	---	---	19.09
5	a.19	.15	---	---	---	---	---	---	---	---	---	---
6	.19	.08	---	b---	---	---	---	---	---	---	---	---
7	2.03	2.95	---	---	---	---	---	---	---	---	---	---
8	.31	4.36	---	---	---	---	---	---	---	---	---	---
9	.27	.42	---	---	---	---	---	---	---	---	---	---
10	6.01	.80	---	---	---	---	---	---	---	---	---	---
11	1.57	.23	---	---	---	---	---	---	---	---	---	---
12	.31	.11	---	---	---	---	---	---	---	---	c2.41	---
13	.34	.08	---	---	---	---	---	---	---	---	2.95	---
14	.99	.42	---	---	---	---	---	---	---	---	1.15	---
15	.08	.11	---	---	---	---	---	---	---	---	.15	---
16	2.30	1.61	---	---	---	---	---	---	---	---	.54	---
17	.46	1.65	---	---	---	---	---	---	---	---	.92	---
18	.15	1.15	---	---	---	---	---	---	---	---	.84	---
19	.61	.27	---	---	---	---	---	---	---	---	.61	---
20	.04	.15	---	---	---	---	---	---	---	---	1.68	---
21	.00	.42	---	---	---	---	---	---	---	---	1.45	---
22	.04	---	---	---	---	---	---	---	---	---	1.26	---
23	1.38	---	---	---	---	---	---	---	---	---	1.11	---
24	.46	---	---	---	---	---	---	---	---	---	2.30	---
25	.19	---	---	---	---	---	---	---	---	---	1.34	---
26	.00	---	---	---	---	---	---	---	---	---	1.87	---
27	.08	---	---	---	---	---	---	---	---	---	.99	---
28	.46	---	---	---	---	---	---	---	---	---	.92	---
29	1.38	---	---	---		---	---	---	---	---	.69	---
30	1.53	---	---	---		---	---	---	---	---	.00	d---
31	1.07		---	---		---		---		---	6.66	
TOTAL	---	---	---	---	---	---	---	---	---	---	---	---

a Partial daily record from 0830 hrs to 2400 hrs. Total accumulation rainfall from Sep. 1 to Oct. 5 (0830 hrs) is 24.3 inches.
b Total accumulation rainfall from Nov. 22 (0001 hrs) to Jan. 6 (0830 hrs) is 47.97 inches.
c Partial daily record from 0800 hrs to 2400 hrs. Total accumulation rainfall from Jan. 6 (0830 hrs) to Aug. 12 (0800 hrs) is 223 inches.
d Total accumulation rainfall from Sep. 5 (0001 hrs) to Dec. 28 (0930 hrs) is 197.67 inches.

HAWAII, ISLAND OF KAUAI--Continued

220356159281401. State Key Number 1051.0 North Wailua ditch Raingage 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 Raingage.

PERIOD OF RECORD.--1928 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service non-recording rain gage. Elevation of gage is 1,110 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest hundreds of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 27 to Oct. 04	7.20
Oct. 04 to Nov. 01	18.93
Nov. 01 to Dec. 06	18.91
Dec. 06 to Jan. 04	5.40
Jan. 04 to Jan. 31	11.62
Jan. 31 to Feb. 28	19.91
Feb. 28 to Apr. 04	8.99
Apr. 04 to May 02	10.95
May 02 to Jun. 06	10.74
Jun. 06 to Jul. 05	19.42
Jul. 05 to Aug. 01	9.06
Aug. 01 to Sep. 06	23.75
Sep. 06 to Oct. 03	24.52

HAWAII, ISLAND OF KAUAI--Continued

220443159235601. State Key Number 1068.0 Left Branch Opaekaa Raingage near Kapaa, Kauai.

LOCATION.--Lat 22°04'43", long 159°23'56", Hydrologic Unit 20070000, in USGS streamgage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service rain gage with tipping-bucket attachment and recorder. Elevation of gage is 470 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in hundreds of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.27	a.40	---	---	.00	.20	.10	.00	.00	.00	.14
2	5.71	.00	---	---	---	.00	.00	.10	.10	1.50	.00	.28
3	.00	.13	---	---	---	.00	.00	.10	.00	.10	.00	.09
4	.15	1.75	---	---	b---	.00	.10	.10	.00	.00	.10	.37
5	.22	.27	---	---	.00	.00	.30	.40	.10	.10	.00	.14
6	.07	.00	---	---	.00	.00	.00	.00	.00	.40	.00	.09
7	.88	.00	---	---	.10	.00	.10	.00	.10	.00	.00	.14
8	.00	.67	---	---	.00	.00	.20	.00	.10	.50	.10	.64
9	.07	.00	---	---	.10	.00	1.40	.00	.00	.00	.00	.55
10	2.12	.00	---	---	1.80	.00	1.50	.00	.00	.10	.00	.05
11	.07	.00	---	---	.30	.00	.60	.00	.00	.00	.00	.05
12	.00	.00	---	---	4.40	.10	.00	.00	.10	.00	.20	.41
13	.00	.00	---	---	9.30	.50	.40	.20	.00	.00	.10	.92
14	1.75	.00	---	---	.50	1.00	.10	.00	.10	.00	.00	.37
15	.00	.00	---	---	2.40	.40	.10	.70	.10	.00	.10	.51
16	.40	.67	---	---	15.80	.00	.00	.40	.70	.10	.00	.00
17	.00	.00	---	---	.10	.10	.30	.00	1.00	.10	.23	.05
18	.27	.54	---	---	.00	.00	.10	.50	1.10	1.20	.14	.92
19	.27	.00	---	---	1.10	.10	.70	.80	.80	.00	.09	.32
20	.00	.00	---	---	.20	.40	.40	.10	.10	.00	.41	2.44
21	.00	.00	---	---	.00	.10	.00	.10	.00	.00	.00	.00
22	.00	.00	---	---	.00	.20	.00	.50	1.10	.10	.28	.37
23	.40	.13	---	---	.50	1.80	.30	.00	.40	.20	.00	.09
24	.81	.13	---	---	.20	4.40	.10	.50	.20	.50	.09	.05
25	.54	.13	---	---	.20	1.30	.40	.10	1.70	.10	.05	.14
26	.00	.27	---	---	.00	1.90	.00	.50	.20	.20	.28	.00
27	.00	.27	---	---	.00	.70	.00	.00	.00	.00	.28	.23
28	.00	1.48	---	---	.00	.30	1.50	.20	.10	.00	.23	.37
29	.00	.13	---	---		.00	.00	.20	.60	.00	.46	.18
30	.40	.40	---	---		.00	.10	.00	.10	.00	.09	.00
31	.00		---	---		.40		.00		.00	1.10	
TOTAL	14.13	7.24	---	---	---	13.70	8.90	5.60	8.80	5.20	4.33	9.91

a Partial record 0001 to 0900 hrs.
b Total accumulated rainfall from Dec. 1 (0900 hrs) to Feb. 4 (2400 hrs) is 18.60 inches.

HAWAII, ISLAND OF KAUAI--Continued

220817159374401. State Key Number 1080.0 Paukahana Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service accumulation rain gage. Elevation of gage is 3,700 ft from topographic map.

REMARKS.--Records good. Rain gage found vandalized Jun. 28, 1994. Replaced rain gage on Oct. 18. No record Oct. 1-18. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Oct. 18 to Dec. 17	19.5
Dec. 17 to Feb. 07	7.2
Feb. 07 to Apr. 07	13.5
Apr. 07 to Jun. 13	5.5
Jun. 13 to Aug. 12	5.2
Aug. 12 to Oct. 07	14.4

220739159373001. State Key Number 1082.0 Waiakoali Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service accumulation rain gage with a custom made reduced 1 to 2 ratio raingage 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 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Aug. 12 to Oct. 18	9.2
Oct. 18 to Dec. 17	19.0
Dec. 17 to Feb. 07	7.6
Feb. 07 to Apr. 07	14.0
Apr. 07 to Jun. 13	5.6
Jun. 13 to Aug. 12	5.6
Aug. 12 to Oct. 07	17.0

HAWAII, ISLAND OF KAUAI--Continued

220713159361201. State Key Number 1083.0 Mohihi crossing Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service rain gage with tipping bucket attachment with recorder. Elevation of gage is 3,420 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.1	.9	.1	.0	.0	.0	.0	.0	.0	---	---	2.7
2	.2	.4	.1	.0	.0	.0	.0	.1	.0	---	---	.6
3	2.4	.0	.2	.0	.5	.0	.1	.0	.0	---	---	.6
4	.0	.1	1.1	.0	.3	.1	.0	.0	.0	---	---	1.2
5	.1	.0	1.9	.0	.0	.1	.0	.0	.1	---	---	.0
6	.1	.0	1.5	.1	.0	.0	.0	.0	.0	---	---	.1
7	.0	.0	.3	.0	.0	.0	.1	.0	.0	---	---	.0
8	.0	3.7	.0	.0	.0	.0	.0	.0	.1	---	---	.4
9	.0	.0	.0	.0	.0	.0	.2	.0	.0	---	---	.0
10	.0	.1	.0	.0	.0	.1	.5	.0	.0	---	---	.0
11	.1	.1	.0	.1	.1	.1	2.1	.0	.1	---	---	.0
12	.0	.0	.1	.0	3.9	.2	.2	.0	.1	---	b---	.3
13	.0	.1	.1	.0	1.6	.4	.2	.0	a .0	---	.0	.3
14	.1	.0	.0	.0	.1	.7	.0	.2	---	---	.0	.0
15	.0	.0	.1	.0	.2	1.0	.0	.4	---	---	.0	.0
16	.0	.1	.0	.1	1.5	.2	.1	.1	---	---	.0	.0
17	.1	.0	.0	.0	.1	.3	.2	.0	---	---	.0	.0
18	.0	.0	.0	.0	.1	.0	.0	.2	---	---	.0	.1
19	.0	.1	.0	.3	.0	.1	.7	.1	---	---	.0	2.1
20	.0	.0	.0	.7	.0	.2	.3	.1	---	---	.0	.2
21	.1	.2	.1	1.2	.1	.0	.0	.0	---	---	.1	.0
22	.0	.3	.0	1.4	.9	.5	.0	.0	---	---	.0	.2
23	.0	2.9	.0	1.3	.0	.3	.0	.0	---	---	.0	.0
24	.1	.9	.0	1.3	.0	1.7	.0	.0	---	---	.1	.0
25	.0	1.3	.0	.4	.0	.5	.0	.0	---	---	.0	.0
26	.1	.2	.1	.0	.0	.9	.0	.2	---	---	.4	.0
27	.1	.5	.0	.0	.0	.1	.0	.1	---	---	.0	.0
28	.1	.4	.0	.0	.0	.0	.1	.3	---	---	.5	.0
29	.1	.5	.0	.0	---	.0	.0	.2	---	---	.1	.1
30	.3	.2	.0	.0	---	.0	.0	.0	---	---	.0	.0
31	.7	---	.0	.0	---	.0	---	.1	---	---	.5	---
TOTAL	4.8	13.0	5.7	6.9	9.4	7.5	4.8	2.1	---	---	---	8.9

a Partial daily record from 0001 hrs to 1100 hrs.
b Total accumulated rainfall from Jun. 13 (1100 hrs.) to Aug. 12 (2400 hrs) is 5.10 inches.

HAWAII, ISLAND OF KAUAI--Continued

220927159355001. State Key Number 1084.0 Kilohana Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service accumulation raingage, with a custom-made reduced 1 to 4 ratio raingage catchment. Elevation of gage is 4,000 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Jul. 07 to Oct. 05	12.8
Oct. 05 to Jan. 06	23.2
Jan. 06 to Aug. 09	44.4
Aug. 09 to Dec. 28	23.2

220703159351201. State Key Number 1085.0 Mohihi-Koaie divide Raingage 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 in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service accumulation raingage. Elevation of gage is 4,000 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Jul. 07 to Oct. 05	12.1
Oct. 05 to Jan. 06	23.8
Jan. 06 to Aug. 09	19.0
Aug. 09 to Dec. 28	22.0

HAWAII, ISLAND OF OAHU

212304157542201. State Key Number 771.9 North Halawa Raingage near Honolulu, Oahu.

LOCATION.--Lat 21°23'04", Long 157°54'22", (Waipahu quadrangle, 1983, 1:24000), Hydrologic Unit 20060000, 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.--February 1, 1983 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service recording raingage. Elevation of gage is 180 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 08 to Oct. 12	2.1
Oct. 12 to Dec. 06	5.3
Dec. 06 to Jan. 21	2.1
Jan. 21 to Mar. 10	8.8
Mar. 10 to Apr. 18	1.0
Apr. 18 to May 05	1.1
May 05 to June 10	0.9
June 10 to July 03	3.1
July 03 to Aug. 30	0.5
Aug. 30 to Sep. 30	0.7

212253157522201. State Key Number 772.0 Moanalua Raingage 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.--1927 to 1978, 1979 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage with tipping- bucket attachment. Housed with recording crest-gage. A digital recorder using a 7 5/16 inch storage can was installed on May 17, 1994. Elevation of gage is 340 ft from topographic map.

REMARKS.--Records poor. Cummulative rainfall read in nearest tenths of an inch. Tipping-bucket malfunctioned throughout the year. Digital recorder operated May 17 to 28.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Aug. 31 to Oct. 19	8.1
Oct. 19 to Jan. 10	15.7
Jan. 10 to Apr. 15	18.0
Apr. 15 to May. 17	4.7
May. 17 to Aug. 22	14.5
Aug. 22 to Nov. 25	24.1

HAWAII, ISLAND OF OAHU--Continued

212346157533701. State Key Number 772.1 North Halawa Raingage near Aiea, Oahu.

LOCATION.--Lat 21°23'45", 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.--August 1929 to June 1933, July 1953 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--12-inch collector and 10-inch storage tank with float-type recorder system. Elevation of gage is 320 ft from topographic map.

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.1	.1	.0	---	.0	.1	.0	---	---	---	.0
2	---	.0	.1	.0	---	.0	.0	.1	---	---	---	.0
3	---	.1	.0	.0	---	.0	.0	.0	---	---	---	.0
4	---	.0	.1	.0	---	.0	.0	i.0	---	---	j.0	.0
5	---	.0	.3	.0	---	.0	.0	---	---	---	.0	.0
6	---	.1	.0	.0	---	.0	.0	---	---	---	.0	.1
7	---	.0	.0	.0	---	.0	.0	---	---	---	.0	.1
8	---	.7	.0	.0	---	g.0	.3	---	---	---	.0	.4
9	---	.0	.0	.0	---	---	.1	---	---	---	.0	.0
10	---	.2	.0	.0	---	---	.2	---	---	---	.0	.0
11	---	.1	.0	.0	---	---	.1	---	---	---	.0	.0
12	a.0	.0	.4	.0	---	---	.0	---	---	---	.0	.4
13	.0	.0	.1	.0	---	---	.0	---	---	---	.0	.3
14	.0	.0	.2	.0	---	---	.0	---	---	---	.0	.3
15	.0	.0	.3	.0	---	---	.0	---	---	---	.0	.0
16	.2	.7	.1	.0	---	---	.0	---	---	---	.0	.0
17	.2	.2	.0	.0	---	---	.0	---	---	---	.0	.0
18	.1	.3	.0	.5	f.0	h.0	.0	---	---	---	.0	.7
19	.0	.0	.0	.8	.0	.0	.0	---	---	---	.0	.1
20	.0	.0	.1	b.6	.0	.1	.0	---	---	---	.0	.0
21	.0	.0	.0	c---	.0	.0	.3	---	---	---	.0	.0
22	.0	.0	.0	.2	.0	.0	.0	---	---	---	.0	.0
23	.2	.0	.0	.4	.0	.0	.0	---	---	---	.0	.1
24	.1	.1	.0	d.1	.0	.0	.0	---	---	---	.0	.0
25	1.4	.2	.1	---	.0	.1	.0	---	---	---	.0	.0
26	.0	.0	.0	---	.0	.2	.1	---	---	---	.0	.0
27	.0	.2	.0	---	.0	.2	.0	---	---	---	.0	.1
28	.3	.2	.1	---	.0	.1	.0	---	---	---	.0	.0
29	.2	.5	.0	---	---	.1	.0	---	---	---	.0	.0
30	.5	.5	.0	---	---	.0	.0	---	---	---	.0	.0
31	.3	---	.0	---	---	.0	---	---	---	---	.0	---
TOTAL	---	4.2	2.0	---	---	---	1.2	---	---	---	---	2.6

a Partial daily record from 1600 hrs to 2400 hrs. No record from Oct. 1 (0001 hrs) to Oct. 12 (1600 hrs)
b Partial daily record from 0001 hrs to 1400 hrs
c Total accumulated rainfall from Jan. 20 (1400 hrs) to Jan. 21 (2400 hrs) is 1.1 inches
d Partial daily record from 0001 hrs to 0600 hrs
f Partial daily record from 1300 hrs to 2400 hrs. Total accumulated rainfall from Jan. 24 (0600 hrs) to Feb. 18 (1300 hrs) is 0.2 inches
g Partial daily record from 0001 hrs to 1020 hrs
h Partial daily record from 1100 hrs to 2400 hrs. Mar. 8 (1020 hrs) to Mar. 18 (1100 hrs), lost record
i Partial daily record from 0001 hrs to 1330 hrs
j Partial daily record from 1450 hrs to 2400 hrs. Total accumulated rainfall from May. 4 (1330 hrs) to Aug. 4 (1450 hrs) is 9.6 inches

HAWAII, ISLAND OF OAHU--Continued

212359157502601. State Key Number 772.3 Moanalua Raingage No.1 at altitude 1,000 feet 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.--June 25, 1968 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service collector and 7 5/16-inch can with recorder. Elevation of gage is 1,000 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.3	.9	.3	.0	.0	.1	.2	.0	.3	.1	.7
2	.1	.0	.1	.0	.0	.0	.1	.3	.0	.6	.0	1.4
3	.1	1.4	.1	.0	2.1	.0	.1	.0	.1	.2	.0	3.0
4	.0	.4	.1	.3	.5	.0	.7	1.1	.0	.0	.1	.4
5	.1	.3	.1	.7	.2	.3	.0	.0	.0	.0	.1	.4
6	.0	.0	.2	.0	.2	.0	.1	.0	.2	.3	.0	.7
7	.0	.1	.1	1.2	.0	.0	.8	.0	.2	.6	.0	.3
8	.0	1.4	.0	.0	.9	.0	2.0	.0	.1	.0	.0	1.2
9	.0	.0	.1	.0	1.3	.0	3.3	.0	.2	.0	.0	.3
10	.8	.2	.0	.0	.8	.1	---	.0	.0	.2	.2	.1
11	.0	.0	.0	.0	.7	.0	---	.0	.0	.3	.2	.8
12	.0	.0	1.0	.0	1.9	.0	---	.0	.1	.1	1.1	.6
13	.3	.0	.5	.6	1.2	.1	---	.3	.1	.1	---	.4
14	1.0	.0	1.6	.1	3.3	.1	---	.2	.6	.0	---	.5
15	.6	.0	.0	.1	1.3	.0	b.0	.0	.3	2.4	---	.0
16	.6	.5	1.6	.0	1.2	.0	.0	.2	.2	.1	---	.0
17	.1	.0	.6	1.4	.6	.0	1.9	.0	.6	.4	---	.1
18	.1	.1	.5	3.8	.0	.0	.5	.2	2.2	.5	---	4.7
19	.5	.0	.0	.5	.0	.0	.3	.9	1.3	.0	---	.2
20	.2	.0	.1	2.7	.0	---	1.2	.0	.1	.0	---	.8
21	.0	.0	.1	.1	.1	---	.1	.0	.2	.0	---	.2
22	.0	.2	.0	.3	.0	---	.0	.0	.6	.2	c.0	.2
23	5.1	.7	.0	1.0	.0	---	.5	.7	.0	.6	1.6	.4
24	.7	.1	.0	4.1	.0	---	.1	.0	.1	2.3	.1	.2
25	1.6	.1	.0	4.0	.8	---	.3	.7	4.5	.0	.4	.1
26	.0	.0	.0	.3	.6	---	.2	.9	.3	.0	.2	.1
27	.0	.7	.0	.0	.0	---	.0	.3	.1	.0	.0	.1
28	.3	.4	.9	.0	.0	---	3.6	.1	.1	.0	.0	.0
29	.3	.2	.1	.0	---	a---	.0	.1	.1	.0	.0	.0
30	1.1	1.7	.0	.0	---	.1	.1	.0	.1	.0	.0	.0
31	1.3	---	.0	.0	---	.0	---	.1	---	.0	5.4	---
TOTAL	14.9	8.8	8.7	21.5	17.7	---	---	6.3	12.4	9.2	---	17.9

a Total accumulated rainfall from Mar. 20 (0030 hrs) to Mar. 29 (2400 hrs) is unknown, rain can overflowed
b Partial daily record from 1200 hrs to 2400 hrs. Total accumulated rainfall from Apr. 10 (0001 hrs) to Apr. 15 (2400 hrs) is unknown, rain can overflowed
c Partial daily record from 1430 hrs to 2400 hrs. Total accumulated rainfall from Aug. 13 (0001 hrs) to Aug. 22 (1400 hrs) is unknown, rain can overflowed

HAWAII, ISLAND OF OAHU--Continued

212329157510501. State key No. 772.6 Moanalua Raingage near Kaneohe, Oahu.

LOCATION--Lat 21°23'29", Long: 157°51'05", (Kaneohe quadrangle, 1959, 1:24000), Hydrologic Unit 20060000, in USGS streamgage station 16227500, on left bank 3.3 mi northeast of Tripler Hospital, and 3.6 mi southwest of Kaneohe post office.

PERIOD OF RECORD.--October 1, 1968 to current year, prior to October 1992 unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service collector attached to 7 5/16-inch rain can. Elevation of gage is 660 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.3	.8	.1	.0	.0	---	.2	.0	.3	c.2	.6
2	.2	.0	.1	.0	.0	.0	---	.2	.1	.4	---	1.4
3	.0	1.0	.1	.0	1.5	.0	---	.0	.1	.1	---	1.5
4	.0	.3	.2	.3	.4	.1	---	.9	.1	.0	---	.1
5	.1	.0	.1	.4	.3	.6	---	.1	.0	.1	---	.5
6	.0	.0	.1	.1	.2	.0	---	.0	.5	.2	---	.7
7	.0	.0	.1	.8	.1	.0	---	.0	.2	.7	---	.2
8	.0	1.4	.0	.0	.7	.0	---	.0	.0	.0	---	1.3
9	.0	.0	.1	.0	.3	.1	---	.0	.2	.1	---	.3
10	.5	.2	.0	.0	.7	.0	---	.0	.0	.0	---	.1
11	.0	.0	.1	.0	.9	.1	---	.0	.0	.2	---	.6
12	.0	.0	.7	.0	1.6	.0	---	.0	.2	.1	---	.6
13	.3	.0	.4	.4	1.4	.1	---	.5	.1	.1	---	.5
14	1.1	.0	.9	.0	3.1	.3	---	.2	.6	.0	---	.4
15	.2	.0	.0	.1	1.1	.1	b.0	.2	.2	1.5	---	.1
16	.8	.5	1.4	.1	.8	.1	.0	.1	.2	.1	---	.0
17	.0	.1	.5	.8	.5	.1	1.3	.0	.7	.4	---	.2
18	.1	.0	.6	2.5	.0	.1	.4	.2	1.9	.3	---	3.4
19	.2	.0	.2	.5	.0	.1	.4	1.1	1.1	.1	---	.2
20	.0	.1	.0	2.6	.0	1.4	1.4	.1	.1	.0	---	.6
21	.0	.0	.1	.2	.1	.6	.2	.0	.3	.0	---	.1
22	.0	.2	.0	.6	.0	.9	.1	.1	.5	.1	d.0	.1
23	3.2	1.1	.0	.9	.0	a1.0	.8	.3	.1	.5	1.5	.1
24	.5	.1	.0	2.4	.0	---	.2	.1	.1	3.4	.0	.2
25	1.3	.3	.0	4.0	.4	---	.2	.6	2.8	.0	.8	.0
26	.0	.1	.0	.3	.4	---	.3	.9	.1	.0	.3	.1
27	.1	.5	.0	.0	.0	---	.1	.3	.1	.3	.0	.2
28	.4	.4	.5	.0	.0	---	2.9	.3	.1	.0	.0	.0
29	.2	.3	.0	.0	---	---	.1	.1	.1	.0	.0	.0
30	.8	1.0	.0	.0	---	---	.1	.1	.2	.0	.0	.0
31	1.1	---	.0	.0	---	---	---	.0	---	.1	3.2	---
TOTAL	11.1	7.9	7.0	17.1	14.5	---	---	6.6	10.7	9.1	---	14.1

a Partial daily record from 0001 hrs to 2200 hrs
b Partial daily record from 0930 hrs to 2400 hrs. Total accumulated rainfall from Mar. 23 (2200 hrs) to Apr. 15 (0930 hrs) is unknown, rain can overflowed
c Partial daily record from 0001 hrs to 0900 hrs
d Partial daily record from 1100 hrs to 2400 hrs. Total accumulated rainfall from Aug. 1 (0900 hrs) to Aug. 22 (1100 hrs) is unknown, rain can overflowed

HAWAII, ISLAND OF OAHU--Continued

212029157523601. State Key Number 773.3 Kalihi Raingage at Kalihi, Oahu.

LOCATION.--Lat 21°20'29", Long 157°52'36", Hydrologic Unit 20060000, in USGS streamgage station 16229300 on left bank, 0.4 mi northwest of Bishop Museum, and 2.4 mi northwest of Honolulu post office.

PERIOD OF RECORD.--July 1962 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage with tipping- bucket attachment and recorder. Elevation of gage is 70 ft from topographic map.

REMARKS.--Record poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.2	.0	---	---	---	---	.0	.0	.1	.0	.7
2	.0	.0	.1	---	---	---	---	.0	.0	.0	.0	.0
3	.0	.0	.0	b.0	---	---	---	.0	.0	.0	.0	.0
4	.0	.0	.1	.0	---	---	---	.0	.0	.0	.0	.0
5	.0	.0	.2	.0	---	---	d.0	.0	.1	.0	.0	.0
6	.0	.0	.0	.0	---	---	.0	.0	.0	.1	.0	.0
7	.0	.0	.0	.0	---	---	.0	.0	.0	.1	.0	.1
8	.0	.4	.0	.0	---	---	.3	.2	.0	.0	.0	.1
9	.0	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
10	.0	.2	.0	.0	---	---	.1	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	---	---	.1	.0	.0	.0	.0	.0
12	.0	.0	.1	.0	---	---	.1	.0	.0	.0	.0	.2
13	.0	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.1
14	.1	.0	.1	.0	---	---	.1	.1	.0	.0	.0	.1
15	.1	.0	.1	.0	---	---	.0	.0	.0	.0	.0	.0
16	.0	.2	.0	.0	---	---	.0	.0	.0	.0	.0	.0
17	.0	.0	.0	.1	---	---	.0	.0	.1	.1	.0	.0
18	.1	.0	.3	.0	---	---	.1	.1	.2	.1	.0	.2
19	.1	.0	.0	.2	---	---	.1	.2	.2	.0	.0	.3
20	.0	.0	.2	.2	---	---	.6	.0	.0	.0	.1	.0
21	.0	.1	.0	.0	---	---	.1	.0	.1	.0	.0	.0
22	.0	.0	.0	.1	---	---	.0	.0	.1	.0	.0	.1
23	.0	.2	.0	.2	---	---	.1	.2	.0	.2	.0	.0
24	.2	.1	.0	.7	---	---	.0	.0	.0	.0	.0	.0
25	1.3	.1	a.0	c.1	---	---	.1	.0	.1	.0	.1	.0
26	.0	.1	---	---	---	---	.0	.2	.1	.0	.2	.0
27	.0	.1	---	---	---	---	.0	.1	.0	.1	.0	.1
28	.3	.0	---	---	---	---	.3	.2	.0	.0	.0	.1
29	.2	.2	---	---	---	---	.0	.1	.0	.0	.0	.0
30	.2	.1	---	---	---	---	.0	.0	.0	.0	.0	.0
31	.3	---	---	---	---	---	---	.0	---	.1	.1	---
TOTAL	2.9	2.0	---	---	---	---	---	1.4	1.0	0.9	0.5	2.1

a Partial daily record from 0001 hrs to 2100 hrs.
b Partial daily record from 1300 hrs to 2400 hrs. No record from Dec. 25 (2100 hrs) to Jan. 3 (1300 hrs).
c Partial daily record from 0001 hrs to 0500 hrs.
d Partial daily record from 1200 hrs to 2400 hrs. No record from Jan. 25 (0500 hrs) to Apr. 5 (1200 hrs).

HAWAII, ISLAND OF OAHU--Continued

212342157484401. State Key Number 781.11 Luluku Raingage at altitude 220 ft. near Kaneohe, Oahu.

LOCATION.--Lat 21°23'42", Long 157°48'44", Hydrologic Unit 20060000, in USGS streamgage station 16270900 on right bank, 0.5 mi upstream from mouth, 1.4 mi southwest of Castle High School, and 1.9 mi South of Kaneohe Post office.

PERIOD OF RECORD.--1984 to current year. Station was relocated 400 ft downstream in 1984. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service tipping-bucket raingage. Elevation of gage is 200 ft. (from Corps of Engineers).

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.2	.2	.2	.0	.0	.1	.1	.0	.1	.1	.1
2	.0	.1	.0	.0	.0	.0	.0	.0	.0	.1	.0	.3
3	.0	1.0	.0	.0	.4	.0	.0	.0	.1	.0	.0	.1
4	.0	.1	.2	.2	.1	.0	.1	.5	.0	.0	.0	.0
5	.0	.0	.0	.0	.0	.4	.0	.1	.0	.0	.0	.0
6	.0	.0	.0	.1	.1	.0	.0	.0	.0	.0	.0	.3
7	.0	.0	.1	.4	.0	.0	.0	.0	.0	.0	.1	.0
8	.0	.5	.0	.0	.0	.0	.3	.0	.0	.0	.0	.4
9	.0	.0	.0	.0	.4	.0	.9	.1	.1	.1	.0	.1
10	.3	.1	.0	.0	.3	.0	.3	.0	.0	.0	.0	.0
11	.0	.1	.0	.0	.0	.2	.0	.0	.0	.0	.0	.1
12	.0	.0	.3	.0	1.7	.0	.0	.0	.0	.0	.9	.1
13	.2	.0	.1	.3	1.4	.0	.0	.4	.0	.1	.0	.5
14	.9	.0	.2	.1	3.5	.2	.2	.0	.1	.0	.0	.2
15	.9	.0	.0	.0	3.4	.0	.0	.0	.1	.5	.0	.0
16	.1	.1	.3	.0	1.6	.1	.0	.1	.0	.0	.0	.0
17	.0	.1	.2	.8	.5	.0	.9	.0	.2	.1	.0	.0
18	.3	.0	.2	1.1	.0	.0	.1	.1	.5	.0	.3	1.5
19	.5	.0	.0	.5	.0	.0	.3	.3	.4	.0	.2	.1
20	.0	.0	.0	.4	.2	.3	.2	.0	.0	.0	.1	.2
21	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.1	.0	.2	.0	.0	.4	.1	.1	.1
23	1.6	.1	.0	.2	.0	3.0	.0	.3	.0	.1	.2	.2
24	.5	.1	.0	2.7	.1	7.0	.1	.1	.1	1.0	.0	.1
25	1.3	.1	.0	.8	.8	.5	.1	.1	1.7	.0	.2	.0
26	.0	.2	.0	.2	.0	.2	.0	.2	.0	.1	.0	.1
27	.0	.2	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0
28	.1	.0	.5	.0	.0	.3	1.3	.0	.0	.0	.0	.0
29	.1	.1	.1	.0	---	.4	.0	.1	.1	.0	.0	.0
30	.5	.3	.0	.0	---	.2	.0	.0	.0	.0	.0	.0
31	.5	---	.0	.0	---	.0	---	.0	---	.0	1.6	---
TOTAL	7.8	3.4	2.4	8.1	14.5	13.1	4.9	2.6	3.8	2.3	3.8	4.5

WTR YR 1994 TOTAL 71.2

HAWAII, ISLAND OF OAHU--Continued

212322157474401. State Key Number 781.9 Right Branch Kamooalii Raingage near Kaneohe, Oahu.

LOCATION.--Lat 21°23'22" Long 157°47'44", Hydrologic Unit Code 20060000, in USGS streamgage station 16265600 on left bank, 0.3 mi south of Hawaiian Memorial Park Cemetery, 1.0 mi northwest of Pali Golf Course, and 1.3 mi south of Castle High School.

PERIOD OF RECORD.--February 1983 to current year. Prior to 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage. Elevation of gage is 210 ft from topographic map.

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.3	.1	.2	.0	.1	.0	.0	---	---	---	---
2	---	.1	.0	.0	.0	.0	.0	.0	---	---	---	---
3	---	1.6	.0	.0	.3	.0	.0	b.0	---	---	---	---
4	---	.1	.1	.2	.1	.0	.1	c.0	---	---	---	---
5	---	.0	.1	.0	.1	.3	.0	.0	---	---	---	---
6	---	.0	.0	.1	.0	.0	.0	.0	---	---	---	d---
7	---	.0	.0	.7	.0	.0	.1	.0	---	---	---	---
8	---	.4	.0	.0	.0	.0	.1	.0	---	---	---	---
9	---	.1	.0	.0	.2	.0	1.1	.0	---	---	---	---
10	---	.0	.0	.1	.5	.0	.1	.0	---	---	---	---
11	---	.0	.0	.0	.0	.1	.0	.0	---	---	---	---
12	---	.0	.2	.0	1.1	.0	.0	.0	---	---	---	---
13	---	.0	.1	.3	1.3	.0	.1	.1	---	---	---	---
14	---	.0	.2	.1	3.0	.1	.2	.0	---	---	---	---
15	---	.0	.0	.1	3.6	.1	.0	.1	---	---	---	---
16	---	.2	.1	.0	1.1	.0	.0	.0	---	---	---	---
17	---	.0	.1	1.8	.0	.0	1.0	.0	---	---	---	---
18	---	.0	.2	1.1	.0	.0	.2	.0	---	---	---	---
19	---	.0	.0	.3	.0	.0	.0	.5	---	---	---	---
20	---	.0	.0	.6	.0	.7	.3	.1	---	---	---	---
21	---	.0	.1	.0	.0	.0	.0	---	---	---	---	---
22	---	.1	.0	.0	.0	.2	.0	---	---	---	---	---
23	---	.2	.0	.4	.0	3.3	.1	---	---	---	---	---
24	---	.1	.0	3.1	.0	7.9	.0	---	---	---	---	---
25	a.0	.0	.0	.7	1.3	.6	.1	---	---	---	---	---
26	.0	.1	.0	.1	.0	.1	.1	---	---	---	---	---
27	.0	.1	.0	.0	.0	.1	.0	---	---	---	---	---
28	.0	.0	.9	.0	.0	.2	1.1	---	---	---	---	---
29	.3	.2	.0	.0	---	.2	.0	---	---	---	---	---
30	.3	.0	.0	.0	---	.1	.1	---	---	---	---	---
31	.1	---	.0	.0	---	.0	---	---	---	---	---	e---
TOTAL	---	3.6	2.2	9.9	12.6	14.1	4.8	---	---	---	---	---

a Partial daily record from 1400 hrs to 2400 hrs. No record from Sep. 22, 1993 (1320 hrs) to Oct 25, 1993 (1400 hrs), rain funnel blocked
b Partial daily record from 0001 hrs to 1000 hrs
c Partial daily record from 1340 hrs to 2400 hrs. Total accumulated rainfall from May 3 (1000 hrs) to May 4 (1340 hrs) is 0.3 inches
d No record from May 20 (0200 hrs) to Sep. 6 (1120 hrs), collector plugged
e Total accumulated rainfall from Sep. 6 (1120 hrs) to Oct. 14, 1994 (1206 hrs) is 3.8 inches

HAWAII, ISLAND OF OAHU--Continued

212114157435001. State Key Number 794.3 Waimanalo Raingage at Waimanalo, Oahu.

LOCATION.--Lat 21°21'14" Long 157°43'50", Hydrologic Unit 20060000, in USGS streamgage station 16249000, 260 ft downstream from Kalanianaole Highway, and 2.3 mi northwest of Waimanalo post office.

PERIOD OF RECORD.--January 1967 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage with recorder on tipping-bucket system. Elevation of gage is 20 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	---	.4	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	---	4.8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
4	---	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
5	---	.0	.2	.1	.0	.0	.0	.0	.0	.0	.0	.0
6	---	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
7	---	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
8	---	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	b.0
9	---	.0	.0	.0	.0	.0	.2	.0	.0	.1	.0	---
10	---	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	---
11	---	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	---
12	---	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	---
13	---	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	c.0
14	---	.0	.1	.2	1.7	.0	.0	.0	.0	.0	.0	.0
15	---	.0	.0	.0	.9	.0	.0	.0	.0	.0	.0	.0
16	---	.1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
17	---	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0
18	---	.0	.0	.0	.0	.1	.0	.0	.3	.0	.0	.0
19	---	.0	.0	.0	.0	.0	.0	.0	.1	.0	.0	.0
20	---	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0
21	---	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	---	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	---	.0	.0	.0	.0	.7	.0	.2	.0	.0	.0	.0
24	---	.0	.0	.5	.0	1.6	.0	.0	.0	.2	.0	.0
25	---	.0	.0	.0	.0	.0	.0	.1	.1	.0	.1	.0
26	---	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	---	.1	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0
28	---	.0	.4	.0	.0	.0	.7	.0	.0	.0	.0	.0
29	a.2	.0	.0	.0	---	.0	.1	.0	.0	.0	.0	.0
30	.3	.1	.0	.0	---	.0	.0	.0	.0	.0	.0	.0
31	.0	---	.0	.0	---	.0	---	.0	---	.0	.1	---
TOTAL	---	5.9	0.7	1.1	3.1	2.6	1.0	0.4	0.5	0.3	0.2	---

a Partial daily record from 1215 hrs to 2400 hrs. Total accumulated rainfall from Oct. 1 (0001 hrs) to Oct. 29 (1215 hrs) is 4.3 inches
b Partial daily record from 0001 hrs to 0400 hrs
c Partial daily record from 1115 hrs to 2400 hrs. Total accumulated rainfall from Sep. 8 (0400 hrs) to Sep. 13 (1115 hrs) is 0.9 inches

HAWAII, ISLAND OF OAHU--Continued

212813157574001. State Key Number 832.2 Kipapa Raingage near Wahiawa, Oahu.

LOCATION.--Lat 21°28'13", Long 157°57'50", Hydrologic Unit 20060000, in USGS streamgage station 16212800, on left bank of stream 1700 ft below Forest Reserve Boundary, 4.9 mi southeast of Wahiawa post office, and 6.3 mi northeast of Waipahu.

PERIOD OF RECORD.--January 2, 1957 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service collector attached to tipping-bucket counter and recorder. Elevation of gage is 690 ft from topographic map. Gage was relocated 15 ft downstream from old gage site to a new shelter and digital recorder using a float system was installed on Jan. 19, 1994. Storage can has a diameter of 7 5/16 inches.

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	.4	b.1	.0	---	---	---	.2	.0	.3	.0	.0
2	---	.1	---	.0	---	---	---	.1	.0	.0	.0	.0
3	---	.0	---	.0	---	---	---	.0	.0	.0	.0	.1
4	---	.0	---	.0	---	---	---	.4	.1	.0	.0	.0
5	---	.0	---	.0	---	---	---	.1	.0	.0	.1	1.0
6	---	.0	---	.1	---	---	---	.0	.3	.3	.1	.2
7	---	.0	---	.0	---	---	---	.0	.1	.5	.4	.0
8	---	.1	---	.0	---	g---	---	.1	.0	.0	.0	.3
9	---	.6	---	.0	---	---	---	.0	.0	.0	.0	.0
10	---	.2	---	.0	---	---	---	.0	.1	.0	.0	.1
11	---	.0	---	.0	---	---	---	.0	.1	.1	.0	.1
12	---	.0	---	.0	---	---	---	.0	.1	.0	.1	.5
13	---	.0	---	.0	---	---	---	.0	.0	.0	.0	.3
14	---	.0	---	d.1	---	---	---	.4	.1	.0	.0	.2
15	---	.0	c.1	---	---	---	---	.4	.0	.3	.0	.1
16	---	1.3	.2	---	---	---	---	.0	.2	.0	.0	.0
17	---	.0	.1	---	---	---	---	.1	.5	1.5	.0	.0
18	a.0	.5	.2	---	---	---	---	.2	.3	.4	.1	2.4
19	.0	.0	.1	e.1	---	---	---	.8	.2	.1	.3	.0
20	.0	.0	.1	.9	---	---	---	.1	.0	.0	.2	.1
21	.0	.0	.1	.1	---	---	---	.1	.3	.0	.1	.0
22	.1	.1	.0	.2	---	---	---	.0	.1	.0	.1	.2
23	.2	.5	.1	.4	---	---	---	.2	.1	.0	.2	.0
24	.1	.2	.0	.8	---	---	---	.1	.0	.5	.2	.0
25	1.4	.1	.0	.0	---	---	---	.0	.7	.1	.4	.1
26	.0	.3	.0	.1	---	---	h.0	.7	.0	.0	.3	.2
27	.0	.3	.0	.0	---	---	.0	.2	.1	.0	.0	.2
28	.3	.1	.1	.0	---	---	1.1	.5	.0	.0	.0	.1
29	.4	.7	.0	.0	---	---	.0	.3	.4	.1	.0	.0
30	.7	.2	.0	.0	---	---	.1	.0	.0	.0	.0	.0
31	.3	---	.0	f.0	---	---	---	.1	---	.2	.7	---
TOTAL	---	5.7	---	---	---	---	---	5.1	3.8	4.4	3.3	6.2

a Partial daily record from 1130 hrs to 2400 hrs. Total accumulated rainfall from Sep. 17, 1993 (0030 hrs) to Oct. 18 (1130 hrs) is 4.5 inches
b Partial daily record from 0001 hrs to 1100 hrs
c Partial daily record from 1000 hrs to 2400 hrs. Total accumulated rainfall from Dec. 1 (1100 hrs) to Dec. 15 (1000 hrs) is 2.6 inches
d Partial daily record from 0001 hrs to 0935 hrs
e Partial daily record from 1100 hrs to 2400 hrs. No record from Jan. 14 (0935 hrs) to Jan. 19 (1100 hrs), station being repaired
f Partial daily record from 0001 hrs to 2200 hrs
g Total accumulated rainfall from Jan. 31 (2200 hrs) to Mar. 8 (1245 hrs) is 11.4 inches
h Partial daily record from 1130 hrs to 2400 hrs. Total accumulated rainfall from Mar. 8 (1330 hrs) to Apr. 26 (1100 hrs) is 26.0 inches

HAWAII, ISLAND OF OAHU--Continued

212650157521001. State Key Number 839.11 Waihee at ridge crossing Raingage near Heeia, Oahu.

LOCATION.--Lat 21°26'50", Long 157°52'10", Hydrologic Unit 20060000, approximately 1,000 ft downstream from USGS streamgage station 16283600.

PERIOD OF RECORD.--Oct. 13, 1963 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage. Elevation of gage is 400 ft from topographic map.

REMARKS.--Records fair. Cummulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 11 to Oct. 13	14.9
Oct. 13 to Nov. 26	13.7
Nov. 26 to Jan. 28	22.1
Jan. 28 to Mar. 08	22.0
Mar. 08 to May 06	9.1
May. 06 to July 06	13.5
July 06 to Sep. 09	19.9
Sep. 09 to Oct. 05	11.1

HAWAII, ISLAND OF OAHU--Continued

212434157495601. State Key Number 839.3 Haiku Raingage near Heeia, Oahu.

LOCATION.--Lat 21°24'34", Long 157°49'56", approximately 1,600 ft inside of security fence at Haiku, on the right side of roadway.

PERIOD OF RECORD.--February 1, 1983 to current year. Prior to October 1992, unpublished records on file with U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service receiver and 7 5/16-inch storage can with recorder. Elevation of gage is 195 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.3	.4	.2	.0	.0	.0	.4	.0	---	.1	.1
2	.0	.2	.0	.0	.0	.0	.1	.0	.0	---	.0	.3
3	.0	1.3	.0	.0	.6	.0	.0	.1	.0	---	.0	.1
4	.0	.3	.0	.2	.3	.0	.4	.4	.0	---	.0	.0
5	.1	.0	.1	.3	.1	.5	.0	.1	.0	---	.0	.1
6	.0	.0	.0	.0	.0	.0	.0	.0	a.0	---	.2	.1
7	.0	.0	.1	.7	.0	.0	.1	.1	---	b.2	.0	.0
8	.0	.7	.0	.0	.2	.0	.2	.2	---	.0	.0	.6
9	.0	.0	.0	.0	.8	.0	1.6	.0	---	.1	.0	.0
10	.5	.0	.0	.0	.3	.0	.1	.0	---	.1	.0	.1
11	.0	.0	.0	.0	.0	.2	.1	.0	---	.1	.2	.3
12	.0	.0	.3	.0	2.0	.0	.0	.0	---	.1	1.0	.4
13	.2	.0	.1	.5	1.4	.1	.0	.0	---	.0	.0	.1
14	.6	.0	.5	.0	3.2	.1	.0	.0	---	.0	.0	.1
15	.6	.0	.0	.0	4.6	.0	.0	.1	---	.8	.0	.0
16	.2	.2	.1	.0	1.7	.0	.0	.1	---	.0	.0	.0
17	.0	.0	.2	1.0	.6	.0	1.3	.0	---	.2	.2	.1
18	.1	.0	.3	1.4	.0	.0	.1	.1	---	.1	.3	4.2
19	.4	.0	.0	.2	1.2	.0	.1	.2	---	.1	.4	.1
20	.0	.0	.0	.8	.0	.5	.3	.0	---	.0	.5	.3
21	.0	.0	.0	.0	.1	.0	.0	.0	---	.0	.0	.1
22	.1	.1	.0	.0	.0	.4	.0	.0	---	.1	.0	.2
23	2.0	.0	.0	.6	.0	4.2	.1	.4	---	.2	.4	.0
24	.5	.0	.0	3.3	.0	7.4	.0	.0	---	1.5	.0	.2
25	1.3	.1	.0	1.2	1.2	.4	.1	.2	---	.0	.3	.0
26	.0	.0	.0	.2	.2	.4	.2	.7	---	.0	.1	.1
27	.0	.2	.0	.0	.0	.4	.1	.0	---	.1	.0	.1
28	.0	.2	.4	.0	.0	.9	1.5	.1	---	.0	.0	.0
29	.1	.1	.0	.0	---	.0	.1	.0	---	.0	.0	.1
30	.5	.3	.0	.0	---	.3	.0	.0	---	.0	.0	.1
31	.0	---	.0	.0	---	.0	---	.0	---	.0	2.2	---
TOTAL	7.2	4.0	2.5	10.6	18.5	15.8	6.5	3.2	---	---	5.9	7.9

CAL YR 1993 TOTAL 51.3

a Partial daily record from 0030 hrs to 1300 hrs
b Partial daily record from 1430 hrs to 2400 hrs. Total accumulated rainfall from June 6 (1300 hrs) to July 7 (1430 hrs) is 5.4 inches.

HAWAII, ISLAND OF OAHU--Continued

212647157521201 (revised). State Key Number 839.9 South Fork Waihee Raingage near Heeia, Oahu.

LOCATION.--LAT 21°26'42", Long 157°52'10", Hydrologic Unit 20060000, 50 ft north of streamgage station 16283600, on side of a hill approximately 40 ft above station.

PERIOD OF RECORD.--Oct. 13, 1963 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service collector with 24-inch tall standard 8-inch can.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 11 to Oct. 13	14.3
Oct. 13 to Nov. 26	12.8
Nov. 26 to Jan. 28	22.4
Jan. 28 to Mar. 08	17.7
Mar. 08 to May 06	a>24.1
May 06 to July 06	11.9
July 06 to Sep. 08	18.9
Sep. 08 to Oct. 05	10.0

> Actual value is known to be greater than the value shown
a Can overflowed

HAWAII, ISLAND OF OAHU--Continued

213016158105901 (revised). State Key Number 842.1 Makaha Raingage near Makaha, Oahu.

LOCATION.--Lat 21°30'16", Long 158°10'59", Hydrologic Unit 20060000, in USGS streamgage station 16211600, on right bank, 1.5 mi northeast of Kaneaki Heiau, and 3.4 mi northeast of Makaha.

PERIOD OF RECORD.--July 1959 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service collector and 8-inch rain can, non-recording raingage. A digital recorder with a float system using a 7 5/16-in, 4-ft tall rain can, was installed on Dec. 14, 1993 an takes readings every 30 minutes. Elevation of gage is 957 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall only on visit by visit basis from Oct. 1 to Dec. 14, read in nearest tenths of an inch. Daily rainfall record from Dec. 14 to Sep. 30, read in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	---	---	---	.0	.0	.0	.0	.0	.0	.0	.0	.3
3	---	---	---	.0	.2	.0	.0	.0	.0	.0	.0	.3
4	---	---	---	.0	.0	.0	.0	.1	.0	.0	.0	.0
5	---	---	---	.7	.0	.8	.0	.0	.1	.0	.0	.0
6	---	---	---	.6	.0	.0	.0	.0	.0	.0	.0	.1
7	---	---	---	.0	.0	.0	.1	.0	.0	.0	.0	.0
8	---	---	---	.0	.0	.0	.1	.1	.0	.0	.0	.1
9	---	---	---	.0	.0	.0	.1	.1	.0	.0	.0	.1
10	---	---	---	.0	.0	.0	.2	.0	.0	.0	.0	.0
11	---	---	---	.0	.0	.8	.2	.0	.0	.0	.1	.0
12	---	---	---	.0	.6	.0	.1	.0	.0	.0	.0	.0
13	---	---	---	.1	1.9	.0	.0	.0	.0	.0	.0	.1
14	---	---	b.0	.0	2.1	.0	.1	.1	.1	.0	.0	.0
15	---	---	.0	.2	.4	.0	.0	.1	.1	.0	.0	.0
16	---	---	.0	.0	3.1	.0	.0	.0	.0	.0	.0	.0
17	---	---	.0	.5	.2	.0	.0	.0	.0	.4	.0	.0
18	---	---	.1	.6	.1	.0	.0	.0	.0	.1	.0	.2
19	---	---	.0	.3	.0	.0	.1	.5	.1	.0	.0	1.1
20	---	---	.0	.1	.4	.3	.1	.0	.0	.0	.6	.2
21	a---	---	.0	.1	.0	.0	.0	.0	.0	.0	.0	.0
22	---	---	.0	.0	.3	.0	.0	.0	.1	.0	.0	.0
23	---	---	.2	.0	.0	1.0	.0	.0	.0	.0	.0	.0
24	---	---	.0	.7	.1	8.0	.0	.1	.0	.0	.0	.0
25	---	---	.0	.2	.0	.8	.0	.0	1.6	.0	.0	.0
26	---	---	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0
27	---	---	.0	.1	.0	.1	.0	.0	.0	.0	.0	.0
28	---	---	.0	.0	.0	.1	.4	.0	.0	.0	.0	.3
29	---	---	.0	.0	---	.0	.0	.0	.1	.0	.0	.0
30	---	---	.0	.0	---	.0	.0	.1	.0	.0	.0	.0
31	---	---	.0	.0	---	.0	---	.0	---	.0	.2	---
TOTAL	---	---	---	4.2	9.4	12.1	1.5	1.2	2.2	0.5	0.9	2.8

a Total accumulated rainfall from July 7, 1993 (1150 hrs) to Oct. 21 (1125 hrs) is 8.7 inches
b Partial daily record from 1230 hrs to 2400 hrs. Total accumulated rainfall from Oct. 21 (1125 hrs) to Dec. 14 (1230 hrs) is 8.0 inches

HAWAII, ISLAND OF OAHU--Continued

213205157571001. State Key Number 882.3 Poamoho Raingage No. 3 near Wahiawa, Oahu.

LOCATION.--Lat 21°32'05", Long 157°57'10", Hydrologic Unit 20060000, on right side of Poamoho trail, 0.2 mi northeast from trail marker.

PERIOD OF RECORD.--July 12, 1967 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--3-inch diameter, 5-ft tall aluminum non-recording gage. Elevation of gage is 1,800 ft from topographic map.

REMARKS.--Record poor. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Oct. 01 to Oct. 05	a---
Oct. 05 to Jan. 04	9.2
Jan. 04 to Mar. 03	31.2
Mar. 03 to May 10	39.5
May 10 to Sep. 30	b---

a Station vandalized, no record Oct. 1-5
b Station vandalized, can missing. No record from May 10 to Sep. 30

HAWAII, ISLAND OF OAHU--Continued

213211157562400. State Key Number 882.4 Poamoho Raingage 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 Waihawa.

PERIOD OF RECORD.--June 8, 1967 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage with recorder. Elevation of gage is 1,960 ft from topographic map.

REMARKS.--Record good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.22	2.22	---	.03	.00	.02	.60	.08	.92	.56	.65
2	.00	.03	.80	---	.03	.00	.17	.38	.24	.51	.06	2.25
3	.00	.65	.40	---	1.20	.08	.20	.15	.08	.21	.00	3.30
4	.00	.55	.38	b.00	.75	.02	.60	.62	.11	.08	.05	.45
5	.02	.04	.39	.38	.18	.25	.08	.28	.11	.04	.08	.85
6	.05	.00	.08	.40	.23	.05	.02	.00	.55	.15	.42	1.20
7	.01	.21	.18	.82	.00	.03	.40	.00	.61	.67	.43	.10
8	.02	.20	.07	.02	.83	.06	2.25	.02	.05	.03	.02	1.13
9	.05	.00	.10	.03	2.05	.14	1.60	.00	.07	.14	.13	2.07
10	1.35	.10	.02	.02	3.45	.06	.85	.00	.05	.25	.40	.45
11	.10	.10	.11	.00	2.25	.21	.32	.04	.04	.11	.35	.35
12	.20	.12	.75	.03	6.10	.10	.08	.11	.32	.13	1.96	.55
13	.52	.28	.60	.37	1.80	.15	.00	.59	.10	.05	.13	.45
14	.75	.08	.95	.05	2.00	.40	.08	.15	1.35	.04	.05	1.13
15	.21	.00	.05	.14	3.80	.10	.07	.86	.72	2.92	.00	.17
16	.32	.51	2.20	.04	1.40	.10	.04	.44	.35	.09	.14	.05
17	.20	.29	1.55	.62	.40	.03	.16	.04	.88	1.15	.22	.05
18	.22	.40	1.05	2.27	.00	.03	.25	.29	.92	.88	.30	7.35
19	.00	.02	.02	.61	.00	.04	.25	1.79	1.10	.07	.30	.43
20	.00	.00	.13	3.68	.05	.85	1.67	.38	.07	.02	1.20	1.32
21	.03	.05	a.25	.97	.03	.65	.16	.35	.51	.03	.25	.30
22	.65	.15	---	.55	.02	.94	.04	.10	.97	.13	.20	.40
23	3.50	1.00	---	.67	.02	3.21	4.23	2.20	.11	.31	1.70	.09
24	.07	.23	---	2.03	.00	10.40	.65	.20	.22	2.01	.39	.00
25	1.36	.39	---	1.60	.38	1.28	.40	.38	2.90	.05	.61	.55
26	.09	.13	---	.04	.15	.74	.15	.72	.52	.05	.50	.40
27	.06	.62	---	.01	.00	.73	.15	.55	.19	.12	.05	.50
28	.57	.63	---	.00	.00	1.05	2.62	.40	.05	.08	.00	1.95
29	.45	.60	---	.00	---	.39	.13	.25	.39	.15	.05	.03
30	1.00	2.18	---	.00	---	.02	.10	.08	.41	.05	.18	.22
31	2.70	---	---	.05	---	.00	---	.16	---	.15	5.62	---
TOTAL	14.50	9.78	---	---	27.15	22.11	17.74	12.13	14.07	11.59	16.35	28.74

a Partial daily record from 0001 hrs to 1400 hrs
b Partial daily record from 1000 hrs to 2400 hrs. Total accumulated rainfall from Dec. 21 (1400 hrs) to Jan. 4 (1000 hrs) is 1.55 inches

HAWAII, ISLAND OF OAHU--Continued

213215157552800. State Key Number 883.12 Poamoho raingage 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.--June 1967 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage with recorder. Elevation is 2,480 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in hundredths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.15	2.90	.30	.00	.00	.00	.33	.15	1.00	.25	.75
2	.00	.15	.60	.03	.00	.00	.90	.30	.12	.50	.02	3.02
3	.10	1.35	.18	.00	.99	.00	.20	.02	.08	.16	.08	4.55
4	.00	.46	.22	.57	.24	.01	.37	.40	.07	.00	.12	.76
5	.00	.00	.15	.49	.23	.39	.09	.10	.00	.09	.08	.53
6	.00	.00	.15	.10	.20	.00	.04	.02	.35	.15	.40	1.00
7	.00	.03	.10	1.10	.03	.00	.20	.00	.43	a.15	.20	.15
8	.00	1.32	.02	.00	.75	.00	1.95	.00	.10	---	.00	.80
9	.00	.00	.13	.00	5.35	.20	1.70	.00	.05	---	.20	1.45
10	1.13	.32	.00	.00	2.95	.10	.82	.02	.05	---	.68	.50
11	.05	.06	.05	.00	.90	.40	.13	.02	.10	---	.37	.10
12	.12	.00	.68	.12	6.35	.10	.01	.08	.25	---	1.97	.40
13	.65	.27	.42	.98	3.60	.00	.04	.88	.15	b---	.06	.55
14	.43	.00	.90	.00	2.40	.20	.15	.10	1.33	.25	.22	1.18
15	.40	.00	.00	.27	6.90	.01	.00	.35	.85	2.10	.00	.42
16	.10	.43	1.40	.00	2.10	.06	.03	.70	.34	.10	.03	.03
17	.15	.10	1.12	1.08	.27	.00	.74	.00	.73	1.00	.07	.00
18	.25	.35	.66	2.28	.00	.00	.28	.25	.70	.25	.50	3.97
19	.08	.00	.02	.17	.03	.03	.00	1.55	1.15	.02	.30	2.55
20	.00	.00	.00	2.50	.35	.75	1.05	.37	.15	.03	1.08	.95
21	.27	.08	.36	.42	.05	.35	.10	.13	.35	.02	.04	.13
22	.45	.02	.03	.47	.02	.38	.00	.15	1.05	.13	.16	.22
23	4.35	.48	.03	.41	.18	2.32	3.25	1.95	.15	.55	1.62	.08
24	.45	.42	.00	2.30	.00	8.30	.85	.12	.05	2.00	.14	.42
25	1.67	.27	.08	1.85	1.00	.80	.35	.33	2.82	.00	.36	.05
26	.12	.04	.01	.05	.28	.40	.25	.80	.23	.00	.40	.17
27	.03	.39	.02	.01	.00	.86	.10	.20	.10	.20	.00	.18
28	.43	.45	.52	.00	.02	1.34	2.15	.30	.07	.00	.05	.28
29	.50	.45	.00	.00	---	.60	.05	.10	.33	.10	.23	.07
30	.72	1.50	.25	.00	---	.20	.15	.05	.40	.10	.07	.15
31	3.78	---	.00	.00	---	.00	---	.20	---	.25	4.78	---
TOTAL	16.23	9.09	11.00	15.50	35.19	17.80	15.95	9.82	12.70	---	14.48	25.41

CAL YR 1993 TOTAL 144.30

a Partial daily record from 0001 hrs to 1200 hrs.
b Total accumulated rainfall from July 7 (1200 hrs) to July 13 (2400 hrs) is 1.1 inches.

HAWAII, ISLAND OF OAHU--Continued

213221157541501. State Key Number 884.3 Punaluu Raingage 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 streamgage station on Punaluu ditch 16302000.

PERIOD OF RECORD.--July 14, 1967 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service collector with standard 8-inch can, and an auxiliary 3-inch diameter, 5-feet high measuring can. Elevation of gage is 750 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
July 27 to Dec. 03	17.8
Dec. 03 to Feb. 03	19.8
Feb. 03 to Apr. 29	a>60.0
Apr. 29 to July 01	13.4
July 01 to Sep. 08	19.3
Sep. 08 to Oct. 06	16.0

> Actual value is known to be greater than the value shown
a Can overflowed

HAWAII, ISLAND OF OAHU--Continued

213237157530701 (revised). State Key Number 886.4 Kahana Raingage at altitude 95 feet near Kahana, Oahu (revised).

LOCATION.--Lat 21°32'37", Long 157°53'07", Hydrologic Unit 20060000, on right bank, 600 ft upstream from Kawa Stream, approximately 40 ft bankward from USGS streamgage station 16296500, 1.1 mi southwest of Kahana, and 2.2 mi southwest of Swanzy Beach Park in Kaawa.

PERIOD OF RECORD.--December 1958 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--3-in x 5-ft tall rain can from Oct. 1, 1993 to June 17, 1994. Rain gage was relocated in new shelter on June 17, 1994. A digital recorder with a float system using an 8-inch receiver and 7 5/16-in diameter by 4-ft tall rain can takes readings at 30 minute intervals. Elevation of gage is 95 ft from topographic map.

REMARKS.--Records poor. Cumulative totals taken on a visit-by visit basis from Oct. 1 to June 13, read in nearest tenths of an inch. Daily rainfall records from June 13 to Sep. 30, read in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	---	.1	.0	.1
2	---	---	---	---	---	d---	---	---	---	.1	.1	.6
3	---	---	---	---	---	---	---	---	---	.0	.0	.5
4	---	---	---	---	---	---	---	---	---	.0	.0	.4
5	---	---	---	---	---	---	---	---	---	.0	.0	.1
6	---	---	---	---	---	---	---	---	---	.0	.0	.3
7	---	---	---	---	c---	---	---	---	---	.0	.0	.2
8	a---	---	---	---	---	---	---	---	---	.0	.0	.2
9	---	---	---	---	---	---	---	e---	---	.1	.1	.7
10	---	---	---	---	---	---	---	---	---	.0	.2	.2
11	---	---	---	---	---	---	---	---	---	.0	.0	.0
12	---	---	---	---	---	---	---	---	---	.0	1.4	.3
13	---	---	---	---	---	---	---	---	f---	.0	.0	.0
14	---	---	---	---	---	---	---	---	---	.0	.0	.3
15	---	---	---	---	---	---	---	---	---	.9	.0	.1
16	---	---	b---	---	---	---	---	---	---	.0	.1	.0
17	---	---	---	---	---	---	---	---	g.0	.2	.0	.0
18	---	---	---	---	---	---	---	---	.2	.2	.0	6.3
19	---	---	---	---	---	---	---	---	.7	.0	.1	1.7
20	---	---	---	---	---	---	---	---	.0	.0	.1	.4
21	---	---	---	---	---	---	---	---	.1	.0	.0	.0
22	---	---	---	---	---	---	---	---	1.0	.0	.1	.0
23	---	---	---	---	---	---	---	---	.0	.2	.6	.0
24	---	---	---	---	---	---	---	---	.0	1.3	.0	.0
25	---	---	---	---	---	---	---	---	1.1	.0	.0	.0
26	---	---	---	---	---	---	---	---	.2	.0	.0	.4
27	---	---	---	---	---	---	---	---	.0	.1	.0	.1
28	---	---	---	---	---	---	---	---	.0	.0	.0	.2
29	---	---	---	---	---	---	---	---	.0	.0	.1	.0
30	---	---	---	---	---	---	---	---	.2	.0	.1	.0
31	---	---	---	---	---	---	---	---	---	.0	1.6	---
TOTAL	---	---	---	---	---	---	---	---	---	3.2	4.6	13.1

a Total accumulated rainfall from July 16, 1993 (1300 hrs) to Oct. 8 (1010 hrs) is 36.9 inches
b Total accumulated rainfall from Oct. 8 (1010 hrs) to Dec. 16 (1014 hrs) is 15.7 inches
c Total accumulated rainfall from Dec. 16 (1014 hrs) to Feb. 7 (1245 hrs) is 13.6 inches
d Total accumulated rainfall from Feb. 7 (1245 hrs) to Mar. 2 (1345 hrs) is 33.8 inches
e No record from Mar. 2 (1345 hrs) to May 9 (1000 hrs), rain can vandalized
f Total accumulated rainfall from May 9 (1000 hrs) to June 13 (1249 hrs) is 6.2 inches
g Partial daily record from 1145 hrs to 2400 hrs. No record from June 13 (1249 hrs) to June 17 (1145 hrs), new gage was being built

HAWAII, ISLAND OF OAHU--Continued

213000157515401 (revised). State Key Number 886.6 Waikane Raingage at altitude 75 ft. at Waikane, Oahu.

LOCATION.--Lat 21°30'00", Long 157°51'54", Hydrologic Unit 20060000, in USGS streamgage 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.--December 1959 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service non-recording raingage. A digital recorder with a float system using a 7 5/16 inch, 4 ft tall, storage can was installed on May 17, 1994 and takes readings every 30 minutes.

REMARKS.--Records poor. Cumulative rainfall read in nearest tenths of an inch, Oct. 1 to May 18. Daily record read in nearest tenths of an inch, May 18 to Sep. 30.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1992 TO SEPTEMBER 1993
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	---	---	---	---	---	---	.0	.3	.3	.0
2	---	---	---	---	---	---	---	---	.0	.2	.0	.1
3	---	---	---	---	---	---	---	---	.0	.0	.0	.0
4	---	---	---	---	---	---	---	---	.0	g.0	.0	.0
5	---	---	---	---	---	---	---	---	.0	---	.0	.0
6	---	---	---	---	---	---	---	---	.0	---	.0	.1
7	---	---	---	---	---	---	---	---	.0	---	.1	.0
8	---	---	---	---	---	---	---	---	.0	h.0	.0	.2
9	---	---	---	---	---	---	---	---	.0	.0	.0	.1
10	---	---	---	---	---	---	---	---	.0	.0	.1	.5
11	---	---	---	---	---	---	---	---	.0	.0	.1	.0
12	---	---	---	---	---	---	---	---	.0	.1	.6	.4
13	a---	---	---	---	---	---	---	---	.0	.0	.0	.0
14	---	---	---	---	---	---	---	---	.0	.0	.0	.4
15	---	---	---	---	---	---	---	---	.0	.3	.0	.0
16	---	---	---	---	---	---	---	---	.1	.0	.0	.0
17	---	b---	---	---	---	---	---	---	.3	.0	.0	.0
18	---	---	---	---	---	---	---	f.2	.1	.1	.1	4.4
19	---	---	---	---	---	---	---	.2	.2	.0	.3	2.5
20	---	---	---	---	---	---	---	.1	.0	.0	.5	.0
21	---	---	---	---	---	---	---	.0	.0	.0	.0	.0
22	---	---	---	---	---	---	---	.0	.3	.0	.0	.1
23	---	---	c---	---	---	---	---	.2	.0	.1	.0	.2
24	---	---	---	---	d---	---	---	.0	.0	1.0	.0	.0
25	---	---	---	---	---	---	---	.0	1.1	.0	.0	.0
26	---	---	---	---	---	---	---	.6	.1	.0	.0	.0
27	---	---	---	---	---	---	---	.1	.0	.0	.0	.0
28	---	---	---	---	---	---	e---	.1	.0	.0	.0	.0
29	---	---	---	---	---	---	---	.0	.1	.0	.0	.0
30	---	---	---	---	---	---	---	.0	.0	.0	.0	.4
31	---	---	---	---	---	---	---	.0	---	.0	1.1	---
TOTAL	---	---	---	---	---	---	---	---	2.3	---	3.2	9.4

a Total accumulated rainfall from Sep. 23 (1130) to Oct. 13 (1430) is 3.8 inches
b Total accumulated rainfall from Oct. 13 (1430) to Nov. 17 (1130) is 8.3 inches
c Total accumulated rainfall from Nov. 17 (1130) to Dec. 23 (1000) is 3.4 inches
d Total accumulated rainfall from Dec. 23 (1000) to Feb. 24 (1055) is >24.0 inches, can overflowed
e Total accumulated rainfall from Feb. 24 (1055) to Apr. 28 (1230) is 18.0 inches
f Partial daily record from 1500 hrs to 2400 hrs. Total accumulated rainfall from Apr. 28 (1230) to May 18 (1500 hrs) is 0.0 inches
g Partial daily record from 0001 hrs to 1000 hrs
h Partial daily record from 1330 hrs to 2400 hrs. No record from July 4 (1000) to July 8 (1300 hrs)

HAWAII, ISLAND OF OAHU--Continued

213725158010401. State Key Number 897.1 Kamananui Raingage at Pupukea Military Road near Maunawai, Oahu

LOCATION.--Lat 21°37'25", long 158°01'04", Hydrologic Unit 20060000, on left bank, 75.0 ft upstream from Pupukea Military Road, and 3.5 mi southeast of Maunawai.

PERIOD OF RECORD.--July 1, 1963 to current year. Prior to October 1992, unpublished records in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service recording rain gage. Elevation of gage is 590 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.1	.2	.2	a.0	.0	.0	.2	.1	.4	.1	.1
2	.0	1.2	.4	.0	---	.0	.5	.1	.0	.1	.0	.0
3	.0	.2	.1	.0	---	.0	.1	.0	.0	.0	.0	.2
4	.1	.1	.3	.1	---	.0	.3	.6	.1	.0	.0	.0
5	.0	.0	.4	.3	---	.2	.0	.0	.0	.1	.0	.4
6	.0	.0	.1	.1	---	.0	.1	.0	.4	.2	.2	.4
7	.0	.0	.3	.1	---	.0	.1	.0	.1	.4	.4	.0
8	.0	.8	.0	.0	---	.0	.4	.1	.0	.0	.0	.3
9	.1	.0	.0	.0	---	.0	.4	.0	.1	.0	.0	.4
10	.3	.3	.0	.0	---	.0	.5	.0	.0	.0	.1	.0
11	.1	.2	.1	.0	---	.7	.2	.0	c.0	.1	.0	.1
12	.0	.0	.9	.0	---	.0	.0	.0	---	.0	.1	.5
13	.0	.1	.0	.1	---	.0	.0	.1	d.0	.0	.0	.4
14	.1	.1	.2	.0	---	.1	.0	.4	.1	.0	.0	.2
15	.0	.0	.0	1.4	---	.1	.0	.1	.0	.3	.0	.0
16	.1	.7	.5	.3	---	.1	.0	.1	.2	.0	.1	.0
17	.1	.0	.2	.0	---	.0	.4	.0	.3	1.0	.0	.0
18	.1	.1	.5	1.2	---	.0	.1	.8	.3	.3	.2	3.2
19	.1	.0	.0	.2	---	.1	.0	.7	.3	.0	.1	.0
20	.0	.0	.0	1.4	---	.3	1.0	.1	.0	.0	.2	.0
21	.0	.0	.1	.1	---	.3	.0	.2	.1	.0	.0	.0
22	.1	.0	.0	.3	b.0	.4	.0	.0	.3	.0	.1	.2
23	.8	.7	.2	.2	.0	1.2	.6	.3	.1	.1	.2	.0
24	.0	.2	.0	1.1	.0	9.2	.0	.0	.0	.4	.2	.0
25	2.2	.1	.0	1.3	.1	.3	.1	.3	1.3	.0	.3	.0
26	.3	.1	.0	.0	.0	.2	.0	.6	.0	.0	.2	.3
27	.0	.7	.0	.0	.0	.3	.1	.2	.0	.0	.0	.3
28	.1	.1	.0	.0	.0	.0	1.4	.5	.0	.0	.0	.1
29	.1	.4	.0	.0	---	.0	.0	.2	.4	.1	.1	.0
30	.6	.8	.0	.0	---	.0	.1	.0	.0	.0	.0	.0
31	.2	---	.0	.0	---	.0	---	.1	---	.1	.8	---
TOTAL	5.5	7.0	4.5	8.4	---	13.5	6.4	5.7	---	3.6	3.4	7.1

CAL YR 1993 TOTAL 61.6

a Partial daily record from 0001 hrs to 1500 hrs
b Partial daily record from 1505 hrs to 2400 hrs. Total accumulated rainfall from Feb. 1 (1500 hrs) to Feb. 22 (1505 hrs) is 13.8 inches.
c Partial daily record from 0001 hrs to 0100 hrs
b Partial daily record from 1410 hrs to 2400 hrs. Total accumulated rainfall from June 11 (0100 hrs) to June 13 (1410 hrs) is 0.4 inches.

HAWAII, ISLAND OF OAHU--Continued

213608158011101. State Key Number 897.9 Pupukea Rd. Raingage 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.--Nov. 1, 1967 to current year. Prior to October 1992, unpublished records in files of the U.S. Geological Survey.

GAGE.--Standard 8-inch National Weather Service rain collector attached to a 8-inch storage tank and recorder. Elevation of gage is 1,160 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in 0.12 of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.00	.12	.12	.24	.00	.00	.00	.12	.12	.24	.00	.00
2	.00	.48	.12	.00	.00	.00	.24	.36	.00	.00	.00	.12
3	.00	.12	.00	.00	.84	.00	.24	.00	.00	.00	.00	.00
4	.00	.12	.36	.12	.48	.00	.12	.36	.12	.00	.00	.00
5	.00	.00	.36	.24	.00	.24	.00	.12	.00	.00	.00	.60
6	.00	.00	.12	.12	.12	.00	.00	.00	.24	.24	.12	.24
7	.00	.00	.24	.24	.12	.00	.24	.00	.24	.72	.24	.00
8	.00	.96	.12	.00	.12	.00	.60	.00	.12	.00	.00	.36
9	.00	.12	.00	.00	.12	.00	.12	.00	.00	.00	.00	.24
10	.36	.12	.00	.00	.24	.00	.36	.00	.00	.00	.00	.00
11	.00	.12	.00	.00	.60	.60	.24	.00	.12	.00	.00	.00
12	.36	.00	.72	.00	1.08	.00	.00	.00	.12	.12	.12	.36
13	.12	.00	.12	.24	1.80	.00	.00	.12	.00	.00	.00	.36
14	.00	.00	.12	.00	1.68	.24	.12	.36	.12	.00	.00	.12
15	.12	.00	.00	.72	1.32	.12	.00	.48	.00	.24	.00	.12
16	.24	.72	.48	.12	1.32	.12	.00	.00	.12	.00	.12	.00
17	.00	.00	.12	.24	.24	.00	.12	.12	.48	1.44	.00	.00
18	.00	.36	.48	1.32	.00	.00	.12	1.20	.48	.60	.24	2.04
19	.00	.00	.00	.48	.00	.00	.12	.96	.24	.00	.24	.00
20	.00	.00	.12	1.56	.00	.72	1.20	.12	.00	.00	.36	.12
21	.00	.00	.00	.24	.00	.48	.24	.24	.24	.00	.00	.00
22	.00	.24	.00	.36	.12	.60	.00	.00	.60	.00	.12	.12
23	.96	.84	.24	.36	.00	1.68	1.08	.48	.00	.00	.00	.12
24	.00	.00	.00	.84	.00	6.84	.12	.00	.12	.24	.24	.00
25	1.92	.12	.00	.72	.12	.60	.12	.24	1.08	.00	.48	.00
26	.12	.12	.00	.00	.00	.36	.00	.60	.00	.00	.24	.12
27	.00	.60	.00	.00	.12	.36	.12	.24	.12	.12	.00	.36
28	.24	.24	.00	.00	.00	.12	.84	.72	.12	.00	.00	.12
29	.12	.72	.00	.00	---	.00	.00	.36	.24	.24	.00	.00
30	.48	.60	.00	.00	---	.00	.12	.00	.12	.00	.00	.00
31	.12	---	.00	.00	---	.00	---	.12	---	.24	.84	---
TOTAL	5.16	6.72	3.84	8.16	10.44	13.08	6.48	7.32	5.16	4.44	3.36	5.52

CAL YR 1993 TOTAL 80.92
WTR YR 1994 TOTAL 79.68

HAWAII, ISLAND OF MOLOKAI

210843156551801. State Key Number 540.1 Waikolu Raingage at altitude 900 ft, near Kalaupapa, Molokai.

LOCATION.--Lat 21°08'43", long 156°55'18", Hydrologic Unit 20050000, on left bank near USGS streamgage station 16405500, 1.8 miles southwest of Haupu Bay, 2.3 miles upstream from mouth and 5.2 miles southeast of Kalaupapa.

PERIOD OF RECORD.--1957 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard raingage with reduced 1:2 catchment. Elevation of gage is 900 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

PERIOD	RAINFALL
Aug. 04 to Oct. 06	16.0
Oct. 06 to Nov. 16	17.6
Nov. 16 to Jan. 05	18.6
Jan. 05 to Feb. 08	3.4
Feb. 08 to Apr. 06	31.2
Apr. 06 to Jun. 01	15.6
Jun. 01 to Jul. 20	12.6
Jul. 20 to Aug. 23	3.0
Aug. 23 to Oct. 19	4.6

210807156524601. State Key Number 543.1 Pelekunu Raingage at altitude 700 ft near Kalaupapa, Molokai.

LOCATION.--Lat 21°08'07", long 156°52'46", Hydrologic Unit 20050000, on Puu Hoi Ridge, 2.0 miles south of former village of Pelekunu, and 5.7 miles north of Kamalo.

PERIOD OF RECORD.--1968 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard raingage with reduced 1:2 catchment. Elevation of gage is 700 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

PERIOD	RAINFALL
Jul. 30 to Oct. 29	12.6
Oct. 29 to Mar. 01	46.6
Mar. 01 to Jun. 09	42.6
Jun. 09 to Sep. 15	22.0
Sep. 15 to Oct. 06	4.4

HAWAII, ISLAND OF MOLOKAI--Continued

211039157123101. State Key Number 551.5 Kakaako Raingage near Mauna Loa, Molokai.

LOCATION.--Lat 21°10'39", long 157°12'31", Hydrologic Unit 20050000, in the USGS streamgage station 16411400 on left bank, 1.0 miles downstream of Kamakahi gulch, 3.0 miles north of Mauna Loa school.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 380 ft from topographic map.

REMARKS.--Records poor. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	---	---	.0	.1	.0	---	---	.0	.0	.0	.0	.0
2	---	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0
3	---	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0
4	a---	---	.0	.0	.0	---	d.0	.0	.0	.0	.0	.0
5	---	---	.0	.0	.0	---	.0	.0	.0	.0	.0	.0
6	---	---	.0	.0	.1	---	.0	.0	.0	.0	.0	.0
7	---	---	.0	.0	c.0	---	.0	.0	.0	.0	.0	.0
8	---	---	.0	.0	---	---	.0	.0	.0	.0	.0	.0
9	---	---	.0	.0	---	---	.0	.0	.0	.0	.0	.0
10	---	---	.0	.0	---	---	.4	.0	.0	.0	.0	.0
11	---	---	.0	.0	---	---	.0	.0	.0	.0	.0	.0
12	---	---	.0	.0	---	---	.0	.0	.0	.0	.0	.0
13	---	---	.0	.0	---	---	.0	.0	.0	.0	.0	.0
14	---	---	.0	.0	---	---	.0	.0	.0	.0	.0	.0
15	---	b.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
16	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
17	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
18	---	.0	.3	.0	---	---	.0	.0	.0	.0	.0	.0
19	---	.0	.0	.0	---	---	.0	.1	.0	.0	.0	.0
20	---	.0	.0	.1	---	---	.1	.0	.0	.0	.1	.0
21	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
22	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
23	---	.0	.0	.0	---	---	.1	.0	.0	.0	.0	.0
24	---	.0	.0	.1	---	---	.0	.0	.0	.0	.0	.0
25	---	.0	.0	.1	---	---	.0	.0	.4	.0	.0	.0
26	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
27	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
28	---	.0	.1	.0	---	---	.0	.0	.0	.0	.0	.3
29	---	.0	.0	.0	---	---	.0	.0	.0	.0	.0	.0
30	---	.1	.0	.0	---	---	.0	.0	.0	.0	.0	.0
31	---	---	.0	.0	---	---	---	.0	---	.0	.2	---
TOTAL	---	---	0.4	0.4	---	---	---	0.1	0.4	0.0	0.3	0.3

a Total accumulated rainfall from Aug. 2, 1993 (1135 hrs) to Oct. 4 (1155 hrs) is 0.7 inches.
b Partial daily record from 1135 hrs to 2400 hrs. Total accumulated rainfall from Oct. 4 (1155 hrs) to Nov. 15 (1135 hrs) is 3.7 inches.
c Partial daily record from 0100 hrs to 1150 hrs.
d Partial daily record from 1200 hrs to 2400 hrs. Total accumulated rainfall from Feb. 7 (1150 hrs) to Apr. 4 (1200 hrs) is 9.9 inches.

HAWAII, ISLAND OF MAUI

203721156151601. State Key Number 255.0 Kepuni Gulch Raingage near Kaupo, Maui.

LOCATION.--Lat 20°37'21", long 156°15'16", Hydrologic Unit 20020000, in USGS streamgage station 16500100 on right bank, 120 ft upstream from bridge on Hwy 31, 400 ft upstream from Kamole Gulch, 1.1 miles east of Kahikinui house and 8.5 miles west of Kaupo.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 740 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	.0	.0	.0	.0	.0	.0	.0	.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	.0
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.4	.0	.0
8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	.0	.0	.0	.0	4.2	.0	.5	.0	.0	.0	.0	.0
10	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	.0	.0	.0	.0	.8	.0	.0	.0	.0	.0	.7	.0
13	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	.0	.0	.0	2.0	.0	.0	.0	.0	.1	.0	.0
15	.0	.0	.0	.0	.8	.0	.0	.0	.0	.3	.0	.0
16	.0	.0	.7	.0	.4	.0	.0	.0	.0	.0	.0	.0
17	.0	.0	.3	.0	3.2	.0	.0	.0	.0	.0	.0	.0
18	.0	.0	1.3	.0	.2	.0	.0	.0	.0	.0	.0	5.3
19	.0	.0	.0	.0	.6	.0	.0	.0	.0	.0	.0	.3
20	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1	.0
21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0
23	4.0	.0	.0	.0	.0	3.8	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	1.0	.0	3.7	.0	.0	.0	.0	.0	.0
25	5.7	.0	.0	.0	.0	1.0	.0	.0	.0	.0	.0	.0
26	.5	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	.0	.0	.0	.0	---	.0	.0	.0	.0	.0	.0	.0
30	.5	.0	.2	.0	---	.0	.0	.0	.0	.0	.0	.0
31	.0	---	.0	.0	---	.0	---	.0	---	.0	.0	---
TOTAL	10.7	0.0	2.5	1.0	12.2	9.0	0.5	0.0	0.0	0.8	0.8	5.6

CAL YR 1993 TOTAL 42.4
WTR YR 1994 TOTAL 43.1

HAWAII, ISLAND OF MAUI--Continued

204923156371501. State Key Number 297.0 Olowalu Raingage at Olowalu, Maui.

LOCATION.--Lat 20°49'23", long 156°37'15", Hydrologic Unit 20020000, in USGS streamgage station 16646200 on downstream side of center pier of plantation road bridge, 0.6 miles northeast of Olowalu, 5.5 miles southeast of Lahaina.

PERIOD OF RECORD.--1964 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 130 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	.0	.2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	.0	.3	.0	.0	.0	.0	.0	.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	.0
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	.0	.0	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0
10	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
13	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	.0	.0	.0	1.5	.0	.0	.0	.0	.0	.0	.0
15	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
16	.0	.0	.0	.0	.2	.0	.0	.0	.0	.0	.0	.0
17	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
18	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.1
19	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
20	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	.0	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	.1	.0	.5	.0	.0	.0	.0	.0	.0
25	1.3	.0	.0	.1	.0	.3	.0	.0	.1	.0	.0	.0
26	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	.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	1.3	0.5	0.0	0.2	1.9	1.3	0.5	0.0	0.1	0.0	0.0	0.1

CAL YR 1993 TOTAL 7.0
WTR YR 1994 TOTAL 5.9

HAWAII, ISLAND OF MAUI--Continued

204606156270301. State Key Number 311.3 Kulanihakoi Raingage near Kihei, Maui.

LOCATION.--Lat 20°46'06", long 156°27'03", Hydrologic Unit 20020000, in USGS streamgage station 16660000 on right bank, 0.5 miles northeast of Lihue cemetery, 0.8 miles upstream from mouth, and 1.3 miles southeast of Kihei.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service rain gage with recording tipping bucket attachment. Elevation of gage is 35 ft from topographic map.

REMARKS.--Records good. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
2	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
3	.0	.0	.0	.0	.0	.0	.0	.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	.0
6	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
7	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
8	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
9	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
10	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
11	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
12	.0	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0
13	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
14	.0	.0	.0	.0	.7	.0	.0	.0	.0	.0	.0	.0
15	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0
16	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
17	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
18	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0	.0
19	.0	.0	.0	.0	.5	.0	.0	.0	.0	.0	.0	.1
20	.0	.0	.0	.0	.1	.0	.0	.0	.0	.0	.0	.0
21	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
22	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
23	.0	.0	.0	.0	.0	.3	.0	.0	.0	.0	.0	.0
24	.0	.0	.0	.2	.0	1.4	.0	.0	.0	.0	.0	.0
25	.6	.0	.0	.2	.0	.1	.0	.0	.0	.0	.0	.0
26	.3	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
27	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
28	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0	.0
29	.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	0.9	0.0	0.0	0.4	2.1	1.9	0.0	0.0	0.0	0.0	0.0	0.1

CAL YR 1993 TOTAL 5.7
WTR YR 1994 TOTAL 5.4

HAWAII, ISLAND OF HAWAII

191027155355801. State Key Number 12.13 Hilea Gulch Tributary Raingage near Honuapo, Hawaii.

LOCATION.--Lat 19°10'27", long 155°35'58", Hydrologic Unit 20010000, at USGS streamgage station 16764000, 6.6 mi northwest of Honuapo, and 6.7 mi west of Punaluu.

PERIOD OF RECORD.--1967 to current year. Prior to October 1992, unpublished records in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service non-recording rain gage. Elevation of gage is 2,940 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 20 to Oct. 18	12.7
Oct. 18 to Dec. 09	10.3
Dec. 09 to Feb. 04	7.2
Feb. 04 to Mar. 18	16.9
Mar. 18 to Apr. 01	7.3
Apr. 01 to Jun. 17	23.6
Jun. 17 to Jun. 20	3.6
Jun. 20 to Jul. 28	18.5
Jul. 28 to Aug. 24	31.9
Aug. 24 to Nov. 02	20.2

193812155554501. State Key Number 70.7 Waiaha Raingage at Luawai, near Holualoa, Hawaii.

LOCATION.--Lat 19°38'12", long 155°55'45", Hydrologic Unit 20010000, 20 ft downstream of recording crest gage Waiaha Stream at Luawai, near Holualoa (16759300) on right bank, 1.8 mi northeast of Holualoa School, and 4.2 mi southeast of Honokohau School.

PERIOD OF RECORD.--1960 to current year. Prior to October 1992, unpublished records in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service non-recording rain gage. Elevation of gage is 2,580 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Aug. 03 to Oct. 06	12.1
Oct. 06 to Dec. 17	11.3
Dec. 17 to Feb. 11	1.9
Feb. 11 to Apr. 15	6.8
Apr. 15 to Jun. 02	5.9
Jun. 02 to Aug. 22	9.4
Aug. 22 to Nov. 01	4.7

HAWAII, ISLAND OF HAWAII--Continued

194117155174801. State Key Number 83.0 Quarry at Saddle Road Raingage, 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 in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service non-recording rain gage. Elevation of gage is 4,140 ft from topographic map.

REMARKS.--Records good. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 30 to Nov. 04	6.3
Nov. 04 to Dec. 07	13.7
Dec. 07 to Dec. 23	10.4
Dec. 23 to Jan. 20	1.5
Jan. 20 to Feb. 10	9.4
Feb. 10 to Feb. 11	0.5
Feb. 11 to Mar. 04	5.6
Mar. 04 to Apr. 13	22.3
Apr. 13 to Apr. 22	3.8
Apr. 22 to May 24	9.9
May 24 to Jul. 01	14.7
Jul. 01 to Jul. 27	17.9
Jul. 27 to Aug. 16	10.2
Aug. 16 to Sep. 08	17.6
Sep. 08 to Sep. 21	12.8
Sep. 21 to Nov. 01	8.2

194602155091801. State Key Number 125.12 Honolii Raingage near Papaikou, Hawaii

LOCATION.--Lat 19°46'02", long 155°09'18", Hydrologic Unit 20010000, 15 ft north of USGS stream gaging station 16717000 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.

PERIOD OF RECORD.--1990 to current year. Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Non-standard 8-inch National Oceanic and Atmospheric Administration rain gage. Elevation of gage is 1,540 ft from topographic map.

REMARKS.--Records poor. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Aug. 17 to Oct. 13	17.0
Oct. 13 to Nov. 23	>21.7
Nov. 23 to Dec. 10	14.9
Dec. 10 to Feb. 02	>21.0
Feb. 02 to Feb. 08	7.4
Feb. 08 to Mar. 17	>21.3
Mar. 17 to Mar. 23	11.5
Mar. 23 to Mar. 30	15.4
Mar. 30 to May 24	>21.4
May 24 to Aug. 10	>21.4
Aug. 10 to Aug. 12	18.5
Aug. 12 to Aug. 13	0.9
Aug. 13 to Sep. 29	>21.2
Sep. 29 to Oct. 07	0.8

> Actual value is known to be more than the value shown

HAWAII, ISLAND OF HAWAII--Continued

200517155404201. State Key Number 185.4 Upper Hamakua ditch Raingage below Kawaiki Stream near Kamuela, Hawaii.

LOCATION.--Lat 20°05'17", long 155°40'42", Hydrologic Unit 20010000, 15 ft from USGS streamgage 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 in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service non-recording 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 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 21 to Oct. 21	5.6
Oct. 21 to Dec. 14	>26.1
Dec. 14 to Feb. 24	21.8
Feb. 24 to Apr. 05	26.6
Apr. 05 to Apr. 06	0.5
Apr. 06 to May 19	>24.5
May 19 to Aug. 04	24.7
Aug. 04 to Oct. 20	>25.1

> Actual value is known to be more than the value shown

HAWAII, ISLAND OF HAWAII--Continued

200815155383301. State Key Number 185.5 Waimanu Raingage near Kamuela, Hawaii.

LOCATION.--Lat 20°08'15", long 155°38'33", Hydrologic Unit 20010000, in streamgage station 16737500, 8.25 mi north northeast of Kamuela Post Office, and 3.85 mi northwest of Waipio Valley Lookout.

PERIOD OF RECORD.--1991 to September 30, 1994 (discontinued). Prior to October 1992, unpublished records in files of the Geological Survey and at the National Weather Service.

GAGE.--Standard 8-inch National Weather Service raingage with recording tipping bucket attachment. Elevation of gage is 15 ft from topographic map.

REMARKS.--Records fair. Rainfall recorded in tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
DAILY SUM VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.0	.0	.0	.0	.0	.0	.0	.1	.0	---	---	---
2	.9	.0	.1	.9	.0	.0	.0	.2	.0	---	---	---
3	.1	.0	.5	.7	.4	.0	2.3	.0	.1	---	---	---
4	.0	.0	.0	.1	.7	.0	.8	.1	.7	---	---	---
5	.0	.4	.2	.0	1.2	.0	.1	.0	.9	---	---	---
6	.0	.6	.2	1.6	.6	.0	.1	.0	1.4	---	---	---
7	.0	.1	.1	.0	.6	.0	.0	.0	a---	---	---	---
8	.0	.4	.2	.0	.1	.0	.1	.1	---	---	---	---
9	.0	1.6	.0	.0	.2	.0	.2	.0	---	---	---	---
10	.5	.0	.0	.0	.9	.0	.0	.0	---	---	---	---
11	.1	.0	.9	.0	.6	.0	.5	.0	---	---	---	---
12	1.1	.6	1.5	.0	.2	1.9	1.1	.9	---	---	---	---
13	.0	.5	.7	.0	.0	.7	1.2	.2	---	---	---	---
14	.0	.8	.5	.0	1.2	.3	.1	.1	---	---	---	---
15	.0	.2	.8	.0	.3	.3	.2	.3	---	---	---	---
16	1.0	.4	1.1	3.4	.1	.0	.1	.0	---	---	---	---
17	.2	.4	.2	2.2	.5	.1	1.0	.4	---	---	---	---
18	.1	.2	1.2	.9	.5	.4	.5	.0	---	---	---	---
19	.0	.0	1.6	1.3	.1	.4	1.0	.1	---	---	---	---
20	.3	.1	.9	2.4	.0	.3	.4	.1	---	---	---	---
21	1.4	.0	.0	1.8	.0	2.0	.7	.1	---	---	---	---
22	.3	.2	.0	.3	.0	.2	.2	.0	---	---	---	---
23	.4	2.1	.0	.4	.0	2.1	.1	.1	---	---	---	---
24	.0	.7	.4	.8	1.2	2.7	.0	.0	---	---	---	---
25	.1	.0	.0	1.3	1.2	2.5	.5	.2	---	---	---	---
26	1.1	.8	.0	1.3	.4	.3	.1	.0	---	---	---	---
27	.0	.8	.0	.0	.0	.1	.5	.0	---	---	---	---
28	.3	.2	.0	.0	.0	.4	.0	.0	---	---	---	---
29	.0	.5	.0	.0	---	.0	.0	.1	---	---	---	---
30	.4	.1	.0	.0	---	.0	.2	.8	---	---	---	---
31	.2	---	.0	.0	---	.0	---	.0	---	---	---	---
TOTAL	8.5	11.7	11.1	19.4	11.0	14.7	12.0	3.9	---	---	---	---

a No data from Jun. 7 to Sep. 30

HAWAII, ISLAND OF HAWAII--Continued

200148155420501. State Key Number 190.4 Keanuiomano Raingage near Kamuela, Hawaii

LOCATION.--Lat 20°01'48", long 155°42'05", Hydrologic Unit 20010000, in USGS streamgage station 16756500 on left bank, 150 ft upstream from junction of State Highway 19 and 25, and 2.0 mi west of Kamuela.

PERIOD OF RECORD.--1963 to current year. Prior to October 1992, unpublished records in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service non-recording rain gage. Elevation of gage is 2,410 ft from topographic map.

REMARKS.--Records fair. Cumulative rainfall read in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
Sep. 30 to Dec. 16	6.3
Dec. 16 to Feb. 09	2.8
Feb. 09 to Apr. 14	11.8
Apr. 14 to May 20	1.5
May 20 to Aug. 05	2.8
Aug. 05 to Oct. 19	2.1

200543155385901. State Key Number 193.1 Waimanu Ridge Raingage near Kamuela, Hawaii

LOCATION.--Lat 20°05'43", long 155°38'59", raingage located at northern end of Waimanu Gap 5.3 mi. north-northeast of Kamuela Post Office and 4.5 mi. west south-west of Waipio Valley Lookout.

PERIOD OF RECORD.--1991 to September 30, 1994 (discontinued). Prior to October 1992, unpublished records in files of the Geological Survey.

GAGE.--Standard 8-inch National Weather Service raingage with recording tipping bucket attachment. Elevation of gage is 3,600 ft. from topographic map.

REMARKS.--Records poor. Cumulative rainfall in nearest tenths of an inch.

RAINFALL ACCUMULATED (INCHES), WATER YEAR OCTOBER 1993 TO SEPTEMBER 1994
INTERMITTENT READINGS

Period	Rainfall
May 04 to Oct. 25	>43.6
Oct. 25 to Jan. 28	>44.0
Jan. 28 to Sep. 30	a---

> Actual value is known to be more than the value shown
a No data from Jan. 28 to Sep. 30

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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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